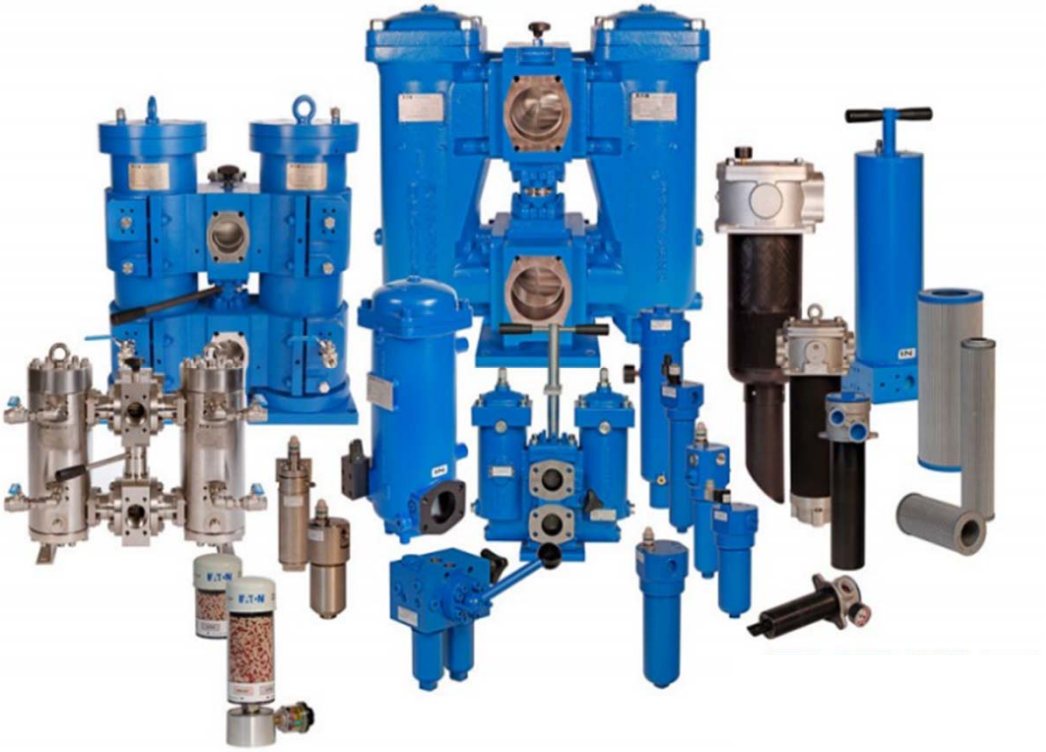
HYDRAULIC & LUBRICATION FILTER









주식회사 플루마

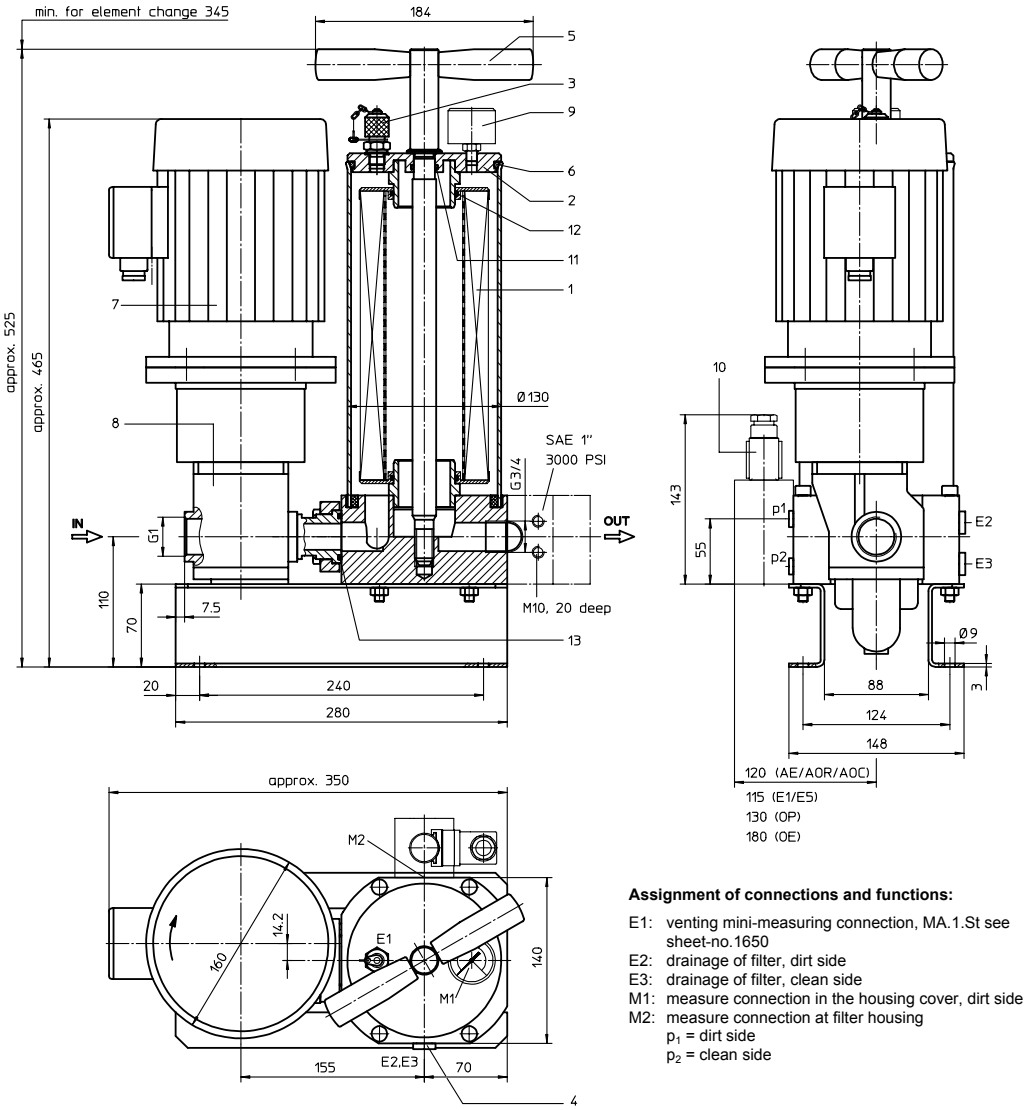
Fluma Co., Ltd.

HYDRAULIC, PNEUMATIC AND ELECTRIC TECHNOLOGY

FILTER UNIT, stationary
Series US 20

Sheet No. **4008.1 G**
Sheet 1/3

- preference version -



Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

1. Type index:

1.1. Filter unit: (ordering example)

US. 20. 6VG. 10. B. P. -. P01. D03. O. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 20

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P01 = pump unit 01, NG 20.16 (standard-pump unit / setting range 1-15 bar)

9 **motor:** (D = rotary current motor / W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D03 [1)]	230/400V	50Hz	22,7 l/min	10-400 mm²/s	4 bar	-	-	42742-4
D03 [1)]	265/460V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	-	-	42742-4
D34	230/400V	50Hz	22,7 l/min	10-400 mm²/s	4 bar	S	K	
D34	265/460V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	S	K	
W01 [1)]	110V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	-	-	43066-4
W03	230V	50Hz	22,7 l/min	10-400 mm²/s	4 bar	S	K	43044-4
W07	110V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	S	K	43045-4

[1)] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR. 250. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 250

3 - 7 see type index-filter unit

Changes of measures and design are subject to alteration!

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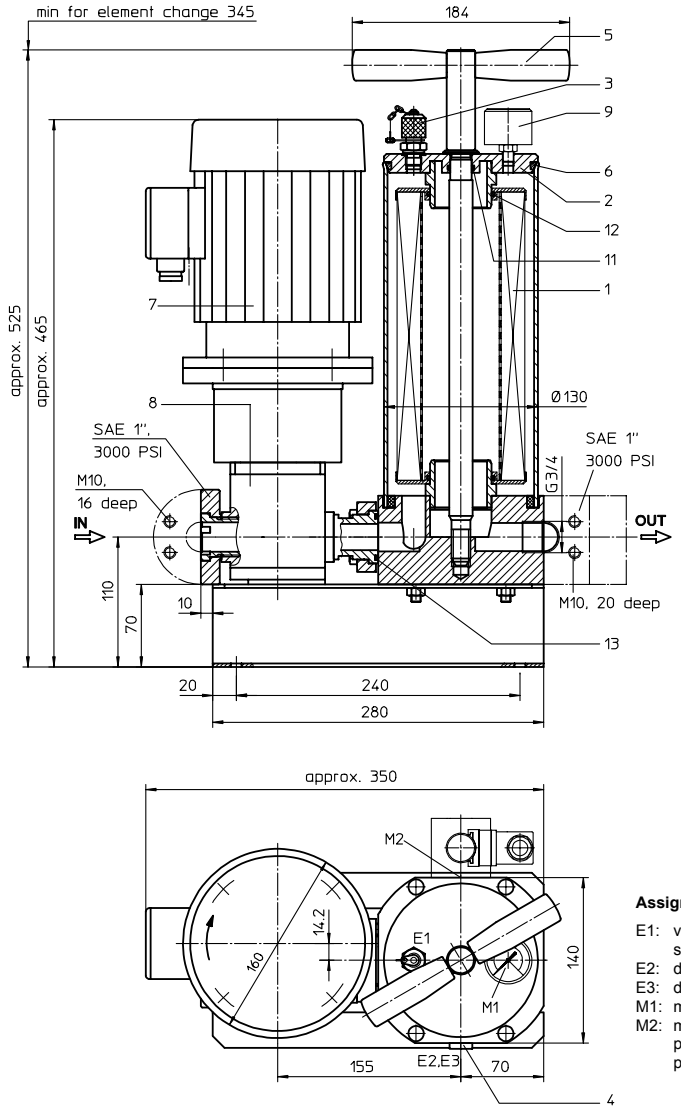
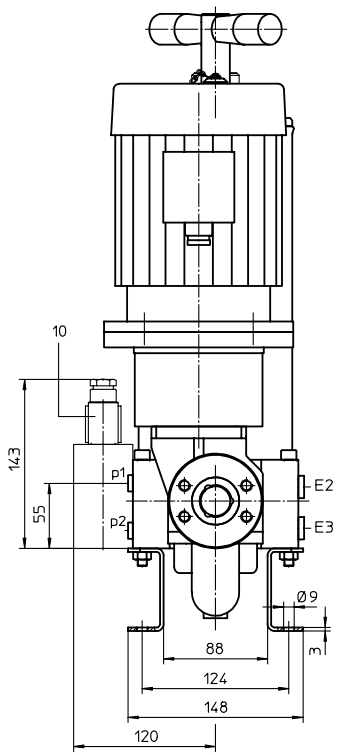
FILTER UNIT, stationary
Series US 21

- preference version -





Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

EDV 08/06

1. Type index:

1.1. Filter unit: (ordering example)

US. 21. 6VG. 10. B. P. -. P08. D03. O. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 21

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P08 = pump unit 08, NG 20.16 (standard-pump unit / setting range 1-15 bar)

9 **motor:** (D = rotary current motor / W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D03 [1]	230/400V	50Hz	22,7 l/min	10-400 mm²/s	4 bar	-	-	42742-4
D03 [1]	265/460V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	-	-	42742-4
D34	230/400V	50Hz	22,7 l/min	10-400 mm²/s	4 bar	S	K	
D34	265/460V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	S	K	
W01 [1]	110V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	-	-	43066-4
W03	230V	50Hz	22,7 l/min	10-400 mm²/s	4 bar	S	K	43044-4
W07	110V	60Hz	27,2 l/min	10-400 mm²/s	4 bar	S	K	43045-4

[1] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR. 250. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 250

3 - 7 see type index-filter unit

Changes of measures and design are subject to alteration!

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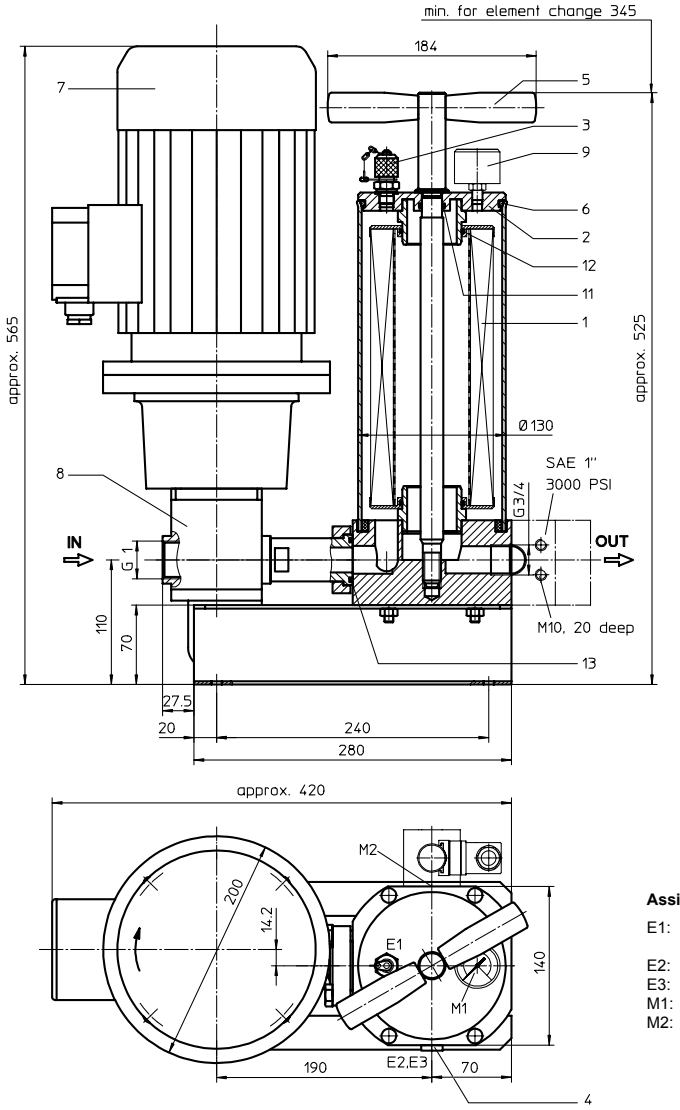
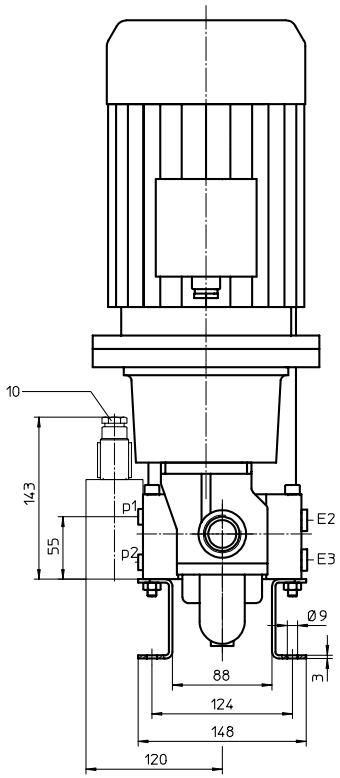
FILTER UNIT, stationary
Series US 22

- preference version -





Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

1. Type index:

1.1. Filter unit: (ordering example)

US. 22. 6VG. 10. B. P. -. P14. D13. O. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 22

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P14 = pump unit 14, NG 20.16 (standard-pump unit / setting range 1-15 bar)

9 **motor:** (D = rotary current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D12	230/400V	50Hz	11,4 l/min	10-1200 mm²/s	15 bar	S	K	42743-4
D12	265/460V	60Hz	13,6 l/min	10-1000 mm²/s	15 bar	S	K	42743-4
D13[1)]	230/400V	50Hz	11,4 l/min	10-1200 mm²/s	7 bar	-	-	43656-4
D13[1)]	265/460V	60Hz	13,6 l/min	10-1000 mm²/s	7 bar	-	-	43656-4
D26	400/690V	50Hz	11,4 l/min	10-1200 mm²/s	7 bar	-	-	44908-4
D26	460/790V	60Hz	13,6 l/min	10-1000 mm²/s	7 bar	-	-	44908-4

[1)] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR. 250. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 250

3 - 7 see type index-filter unit

Changes of measures and design are subject to alteration!

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

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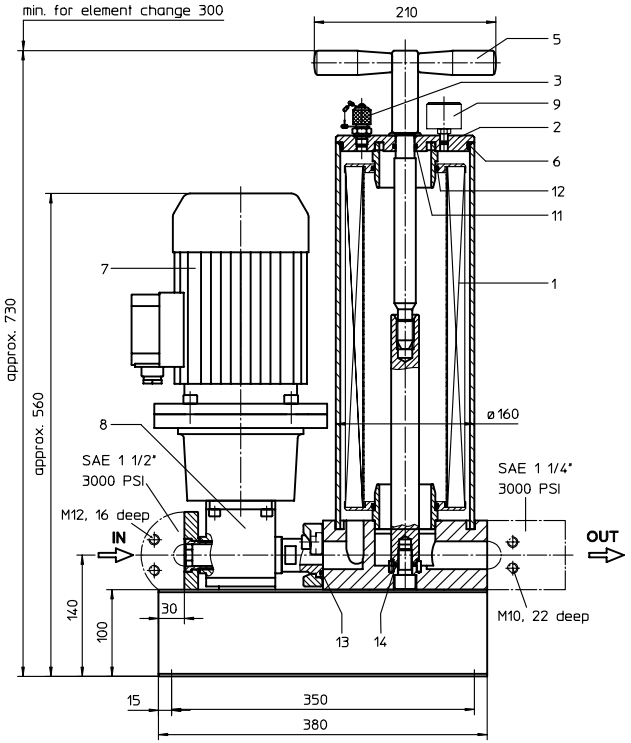
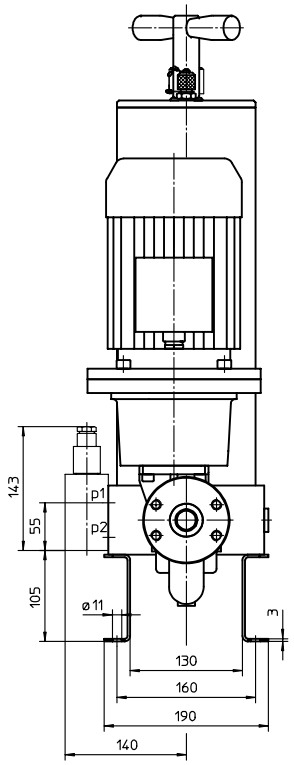
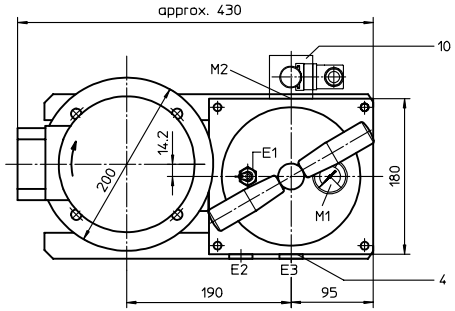
- preference version -







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

EDV 08/06

FILTER UNIT, stationary
Series US 40

Sheet No. **4011.1 F**
Sheet 1/2

1. Type index:

1.1. Filter unit: (ordering example)

US. 40. 6VG. 10. B. P. -. P05. D05. O. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 40

3 **filter-material and filter-fineness:**
10 VG = 10 µm(c), 6 VG = 7 µm(c), 3 VG = 5 µm(c), 1 VG = 4 µm(c) Interpor fleece (glass fibre)
10 WVG = 10 µm(c), 3 WVG = 5 µm(c) Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P05 = pump unit 05, NG 40.25 (standard-pump unit / setting range 1-15 bar)

9 **motor:** (D = rotary current motor / W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D05 [1]	230/400V	50Hz	35,5 l/min	10-400 mm²/s	6 bar	-	-	42549-4
D05 [1]	265/460V	60Hz	42,5 l/min	10-400 mm²/s	6 bar	-	-	42549-4
W10	230V	50Hz	35,5 l/min	10-400 mm²/s	6 bar	S	K	42754-4
W11	110V	60Hz	42,5 l/min	10-400 mm²/s	6 bar	S	K	42877-4

[1] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR. 630. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Changes of measures and design are subject to alteration!

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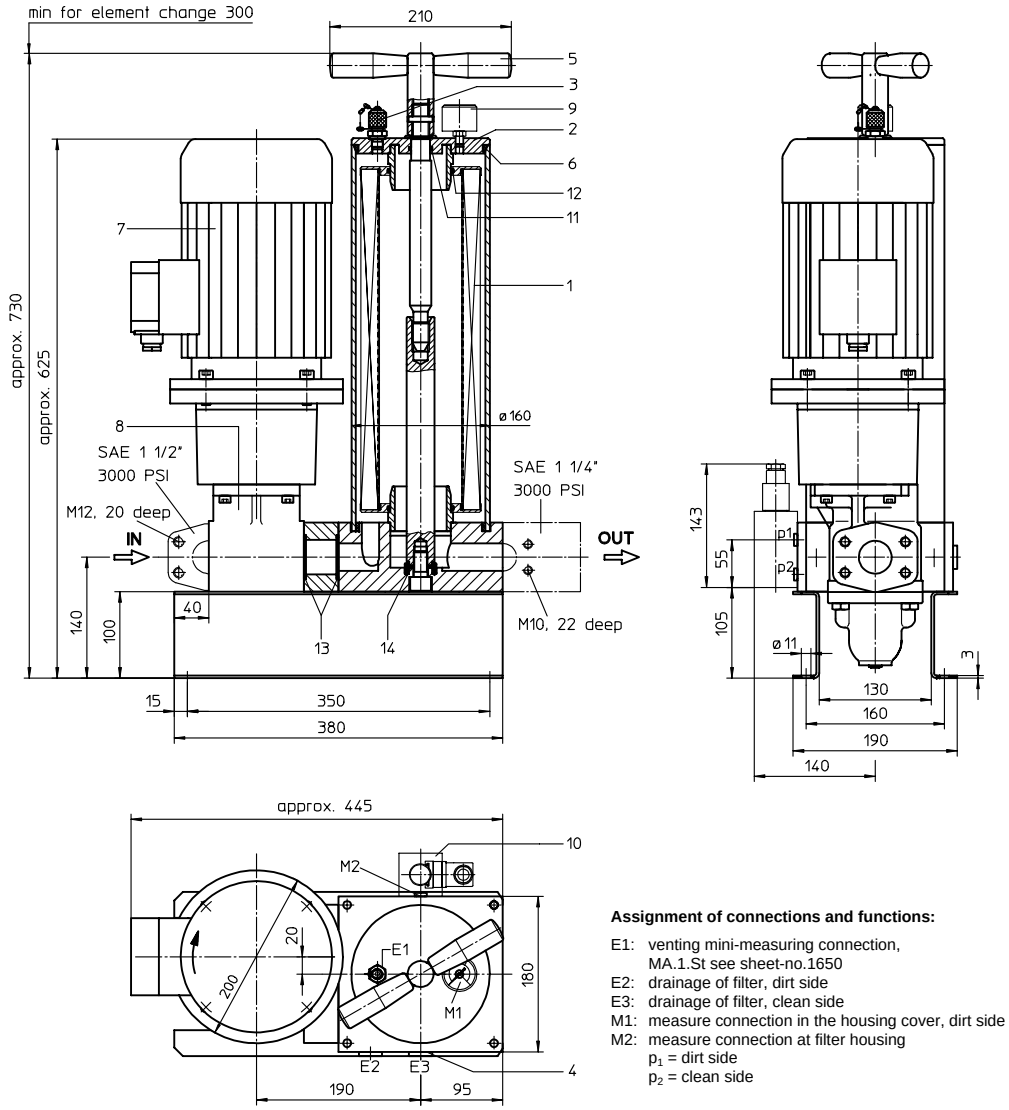
FILTER UNIT, stationary
Series US 80

Sheet No.
4009.1 E
Sheet 1/2

- preference version -



Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

EDV 08/06

1. Type index:

1.1. Filter unit: (ordering example)

US. 80. 6VG. 10. B. P. -. P04. D01. O. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 80

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR), V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard, VA = stainless steel, IS06 = see sheet-no. 31601

8 **pump unit:**
P04 = pump unit 04, NG 80.50 (standard-pump unit / setting range 1-15 bar)

9 **motor:** (D = rotary current motor / W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D01 [1)]	230/400V	50Hz	71,0 l/min	10-400 mm²/s	5 bar	-	-	41969-4
D01 [1)]	265/460V	60Hz	85,0 l/min	10-400 mm²/s	5 bar	-	-	41969-4
D17	230/400V	50Hz	71,0 l/min	10-400 mm²/s	9 bar	S	K	
D17	265/460V	60Hz	85,0 l/min	10-400 mm²/s	8 bar	S	K	
D18	230/400V	50Hz	47,5 l/min	10-800 mm²/s	4 bar	-	-	
D18	265/460V	60Hz	57,0 l/min	10-650 mm²/s	4 bar	-	-	
D31	230/400V	50Hz	71,0 l/min	10-400 mm²/s	15 bar	-	-	
D31	265/460V	60Hz	85,0 l/min	10-400 mm²/s	15 bar	-	-	
W06	230V	50Hz	71,0 l/min	10-400 mm²/s	5 bar	S	K	43056-4
W09	110V	60Hz	85,0 l/min	10-400 mm²/s	4 bar	S	K	43057-4
W12 [1)]	110V	60Hz	85,0 l/min	10-400 mm²/s	4 bar	-	-	43067-4
W18	230V	50Hz	71,0 l/min	10-400 mm²/s	9 bar	S	K	43060-4

[1)] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR. 630. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Changes of measures and design are subject to alter ation!

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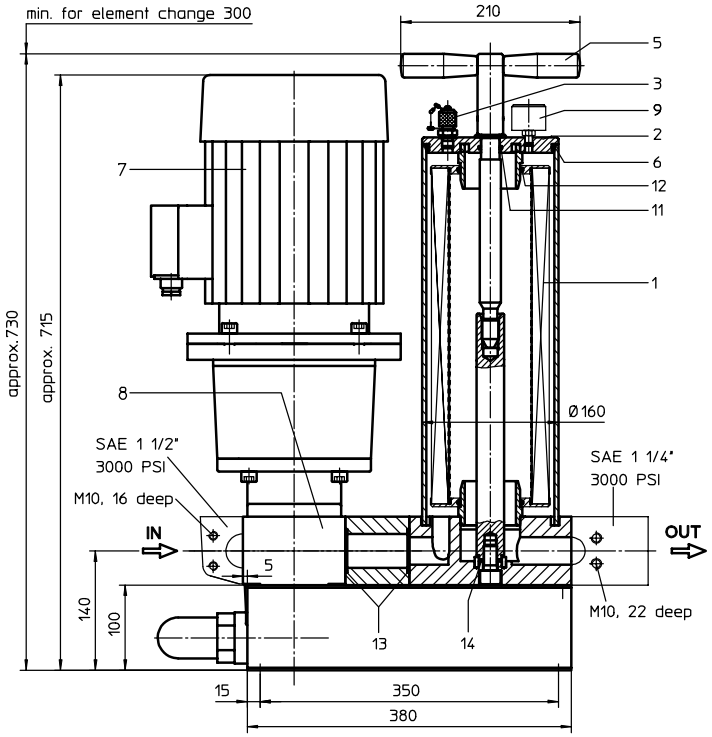
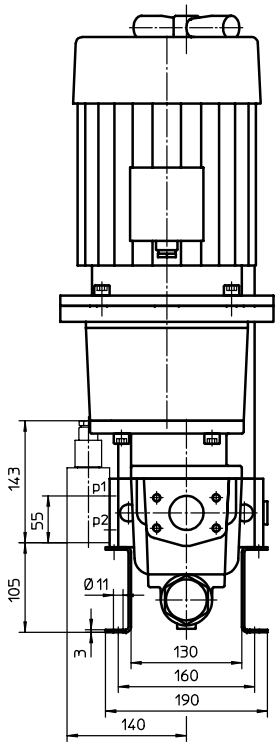
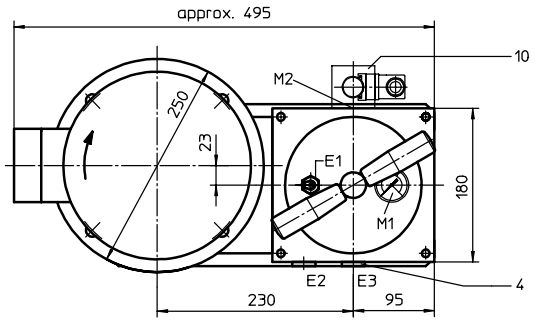
- preference version -







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

EDV 08/06

FILTER UNIT, stationary
Series US 160

Sheet No. **4010.1 G**
Sheet 1/3

1. Type index:

1.1. Filter unit: (ordering example)

US. 160. 6VG. 10. B. P. -. P03. D04. O. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 160

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR), V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
IS06 = see sheet-no. 31601
VA = stainless steel

8 **pump unit:**
P03 = pump unit 03, NG 160.100 (standard-pump unit / setting range 4-8 bar)

9 **motor:** (D = rotary current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D04 [1)]	230/400V	50Hz	142,0 l/min	10-400 mm²/s	4 bar	-	-	42485-4
D04 [1)]	265/460V	60Hz	170,0 l/min	10-400 mm²/s	4 bar	-	-	42485-4
D06	110/190V	50Hz	142,0 l/min	10-400 mm²/s	4 bar	-	-	
D08	400/690V	50Hz	142,0 l/min	10-400 mm²/s	8 bar	-	-	42744.4
D08	460/790V	60Hz	170,0 l/min	10-400 mm²/s	8 bar	-	-	42744-4
D19	400/690V	50Hz	95,0 l/min	10-600 mm²/s	4 bar	-	-	34374-4
D19	460/790V	60Hz	114,0 l/min	10-600 mm²/s	4 bar	-	-	34374-4
D24	400/690V	50Hz	142,0 l/min	10-400 mm²/s	8 bar	-	-	
D24	460/790V	60Hz	170,0 l/min	10-400 mm²/s	8 bar	-	-	

[1)] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR. 630. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Changes of measures and design are subject to alter ation!

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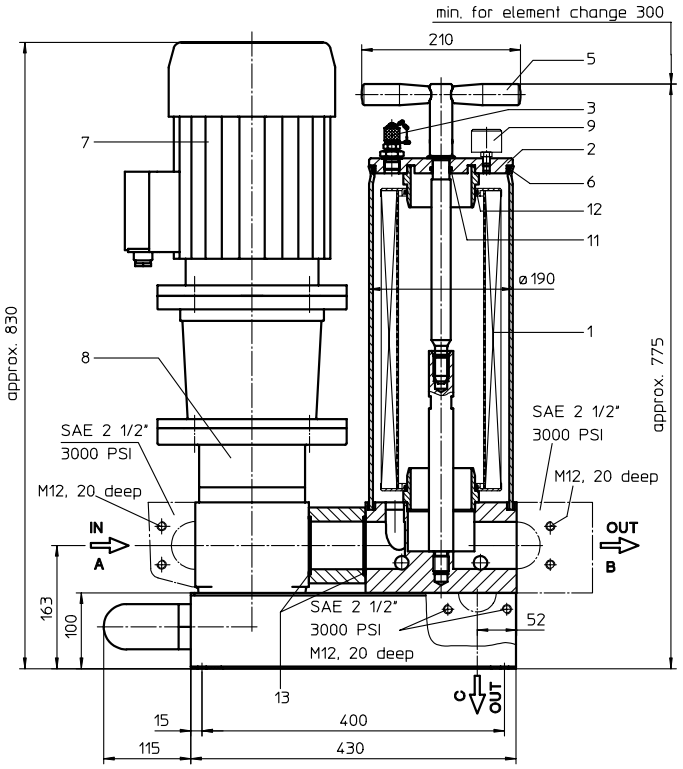
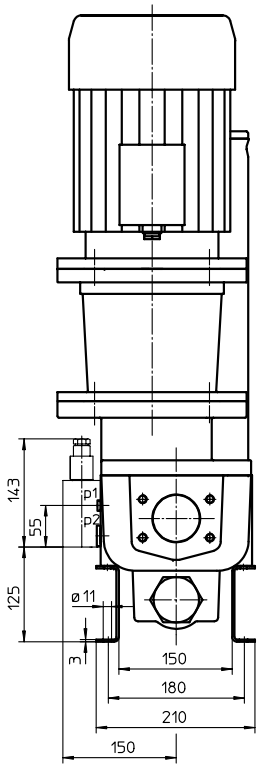
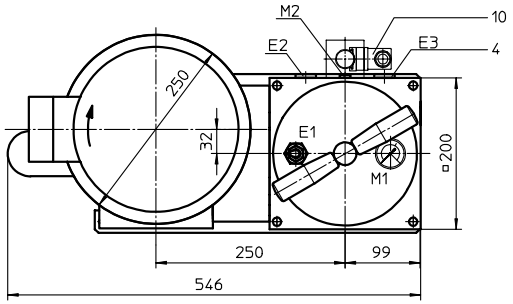
FILTER UNIT, stationary
Series US 320

Sheet No.
4012.1 E
Sheet 1/2

- preference version -







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

EDV 08/06

1. Type index:

1.1. Filter unit: (ordering example)

US.	320.	6VG.	10.	B.	P.	-.	P06.	D08.	3.	O.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
US = filter unit, stationary

2 **nominal size:** 320

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR), V = Viton (FPM) , by agreement

7 **filter element specification:**
- = standard, VA = stainless steel, IS06 = see sheet-no. 31601

8 **pump unit:**
P06 = pump unit 06, NG 320.200 (standard-pump-unit / setting range 4-8 bar)

9 **motor:** (D = rotary current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D08[1)]	400/690V	50Hz	284,0 l/min	10-100 mm²/s	4 bar	-	-	42744-4
D08[1)]	460/790V	60Hz	340,0 l/min	10-100 mm²/s	4 bar	-	-	42744-4
D24	400/690V	50Hz	284,0 l/min	10-100 mm²/s	4 bar	-	-	
D24	460/790V	60Hz	340,0 l/min	10-100 mm²/s	4 bar	-	-	

[1)] standard motor

10 **connection variant:**

variant	connection A		connection B		connection C	
	type	size	type	size	type	size
3	FS	9	FS	9	-	-
4	FS	9	FS	9	FS	9

type: FS = flange SAE 3000 PSI
size: 9 = 2 ½"
- = no connection

11 **clogging indicator at M1:**
- = without, O = visual, 2,5 bar

12 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1 , 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1 , 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR.	1000.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-filter unit

Changes of measures and design are subject to alter ation!

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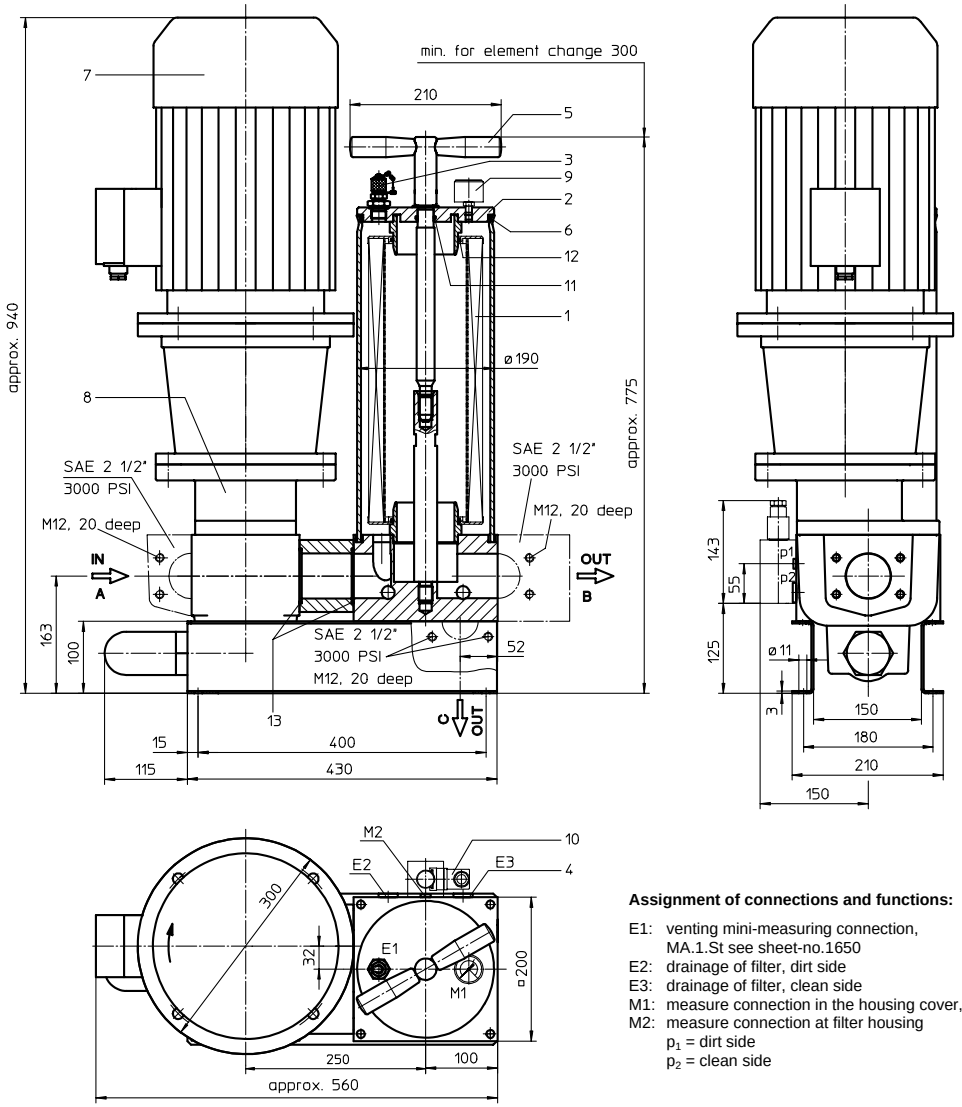
FILTER UNIT, stationary
Series US 321

- preference version -



Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

1. Type index:

1.1. Filter unit: (ordering example)

US.	321.	6VG.	10.	B.	P.	-.	P07.	D07.	3.	O.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
US = filter unit, stationary

2 **nominal size:** 321

3 **filter-material and filter-fineness:**
10 VG = 10 µm(c), 6 VG = 7 µm(c), 3 VG = 5 µm(c), 1 VG = 4 µm(c) Interpor fleece (glass fibre)
10 WVG = 10 µm(c), 3 WVG = 5 µm(c) Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR), V = Viton (FPM) , by agreement

7 **filter element specification:**
- = standard, VA = stainless steel, IS06 = see sheet-no. 31601

8 **pump unit:**
P07 = pump unit 07, NG 320.200 (standard-pump-unit / setting range 4-8 bar)

9 **motor:** (D = rotary current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D07 [1]	400/690V	50Hz	284,0 l/min	10-400 mm²/s	4 bar	-	-	34378-4
D07 [1]	460/790V	60Hz	340,0 l/min	10-400 mm²/s	4 bar	-	-	34378-4
D22	400/690V	50Hz	190,0 l/min	10-800 mm²/s	6 bar	-	-	34486-4
D22	460/790V	60Hz	228,0 l/min	10-800 mm²/s	6 bar	-	-	34486-4

[1] standard motor

10 **connection variant:**

variant	connection A		connection B		connection C	
	type	size	type	size	type	size
3	FS	9	FS	9	-	-
4	FS	9	FS	9	FS	9

type: FS = flange SAE 3000 PSI
size: 9 = 2 ½"
- = no connection

11 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

12 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1 , 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1 , 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR.	1000.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-filter unit

Changes of measures and design are subject to alter ation!

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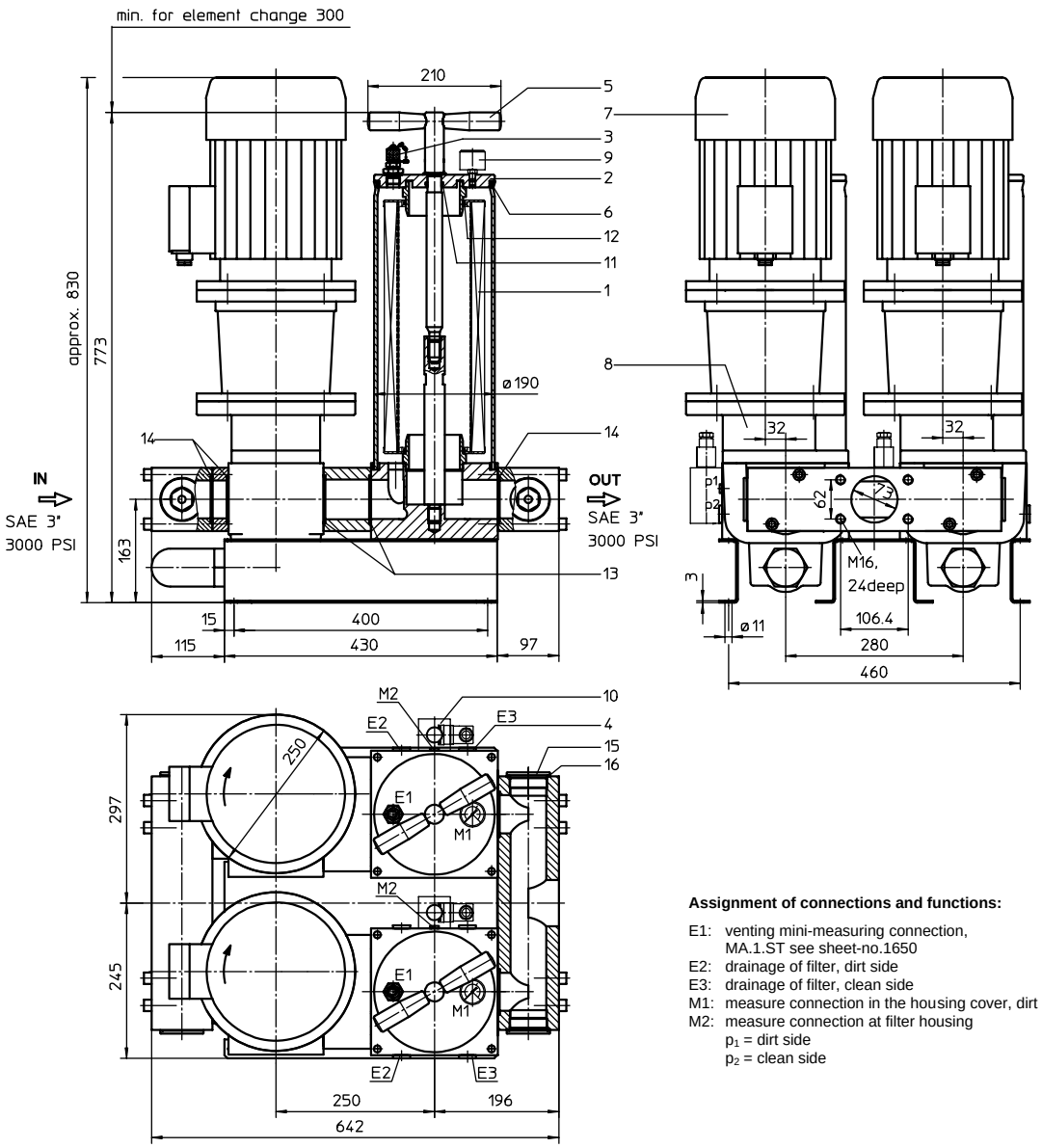
FILTER UNIT, stationary
Series US 640

Sheet No. **4062 A**



Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.ST see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side

1. Type index:

1.1. Filter unit: (ordering example)

US.	640.	6VG.	10.	B.	P.	-.	P06.	D08.	O.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
US = filter unit, stationary

2 **nominal size:** 640

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM) , by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P06 = pump unit 06, NG 320.200 (standard-pump-unit / setting range 4-8 bar)

9 **motor:** (D = rotary current motor)

motor	electrical connection		volume flow	max. viscosity	max. pressure	on/off switch	cable	doc.-no.
D08[1)]	400/690V	50Hz	284,0 l/min	10-100 mm²/s	4 bar	-	-	42744-4
D08[1)]	460/790V	60Hz	340,0 l/min	10-100 mm²/s	4 bar	-	-	42744-4
D24	400/690V	50Hz	284,0 l/min	10-100 mm²/s	4 bar	-	-	
D24	460/790V	60Hz	340,0 l/min	10-100 mm²/s	4 bar	-	-	

[1)] standard motor

10 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

11 **clogging indicator at M2:**
- = without
AOR = AOR.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AOC = AOC.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1606,
AE = AE30.2,5... electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
OP = OP.2,5..., visual, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
OE = OE.2,5..., visual-electrical, at p_1 and p_2, 2,5 bar, see sheet-no. 1628
E1 = E1.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616
E5 = E5.2,5 electrical at p_1, 2,5 bar, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR.	1000.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-filter unit!

Notice:
Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

Changes of measures and design are subject to alteration!

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1. Technical data

NO	Model	Flow rate at 60Hz	Motor	Weight	Spare Element	
					Specification	Q'ty
1	US.20	27.2 l/min	220/440V/60Hz/4P/0.37Kw	28 kg	01NR.250	1
2	US.21	27.2 l/min	220/440V/60Hz/4P/0.37Kw	28 kg	01NR.250	1
3	US.22	13.6 l/min	220/440V/60Hz/4P/0.75Kw	35 kg	01NR.250	1
4	US.40	42.5 l/min	220/440V/60Hz/4P/0.75Kw	38 kg	01NR.630	1
5	US.80	85 l/min	220/440V/60Hz/4P/1.5Kw	59 kg	01NR.630	1
6	US.160	170 l/min	220/440V/60Hz/4P/2.2Kw	95 kg	01NR.630	1
7	US.320	340 l/min	220/440V/60Hz/4P/3.7Kw	110 kg	01NR.1000	1
8	US.321	340 l/min	220/440V/60Hz/4P/3.7Kw	125 kg	01NR.1000	1
9	US.640	640 l/min	220/440V/60Hz/4P/3.7Kw * 2	230 kg	01NR.1000	2

2. Description

The stationary filter unit is intended for oil maintenance on hydraulic systems.
The area of application comprises: - secondary flow filtration in addition to the existing operating filter
secondary flow filtration without the action of the operating filter
- filtration when filling the oil reservoir.

The filter unit must not be used to pump contaminated hydraulic fluids and is therefore designed without a switchover fitting to by-pass the filter. The compact structural design on a base plate without pipe satisfies the prerequisites for small dimensions and high reliability.

The device is equipped with a gear pump driven by an E-motor. The flow conveyed by the geared pump is fed over a filter element to DIN 24550, T4, nominal size 250.

Depending on the customer's wishes, the filter fineness is either 4, 5, 7 or 10 $\mu m_{(c)}$. The contamination level of the filter element can be read off from a pressure display in the cover of the filter.

At a pressure >2,5 bar (red area of the scale field), the filter element is contaminated and it must be replaced with a new filter element.

The filter element can be changed without tools. After removing the straining screw and taking off the housing cover, the filter element is accessible and it can be exchanged. The filter elements are supplied complete with seals. Since it is not possible to clean the elements, the user must always keep an adequate supply of spare elements in stock.

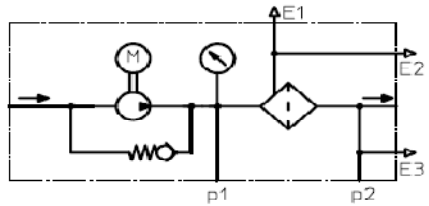
To protect against overpressure, the filter unit is fitted with a safety valve. The initial response pressure difference valve is set according to pressure stated in the table on the type plate under item 9. If a different pressure setting is requested, please state the initial response presse with respect to the set pressure range of the pump unit in the plain text when ordering.

Stationary filter units with motors without combined protective motor switch and ON/OFF switch and without any cable with plug (see switch „-", cable „-" under item 9 of the type plate) can be operated without supervision if the electrical connection is fitted with an overload protection corresponding to the current consumption of the selected E-motor and if the switch-off function of the E-motor of the electrical clogging indicator is dise ngaged at 2,5 bar

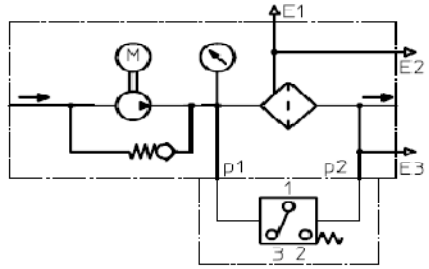
The line, venting and draining connections are identified according to their function. Drainage is necessary when cleaning the filter unit in connection with the change of filter element, and when setting the medium..

3. Symbols

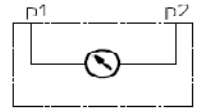
Filter unit without clogging indicator



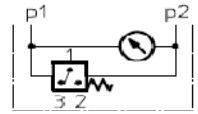
Filter unit with electrical clogging indicator AE30



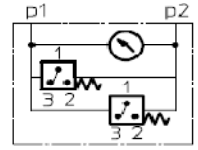
Filter unit with visual clogging indicator AOR, AOC, OP



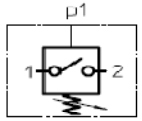
Filter unit with visual-electrical clogging indicator OE1



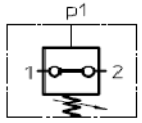
Filter unit with visual-electrical clogging indicator OE2



Filtor unit with clectrical clogging indicator contact maker E1

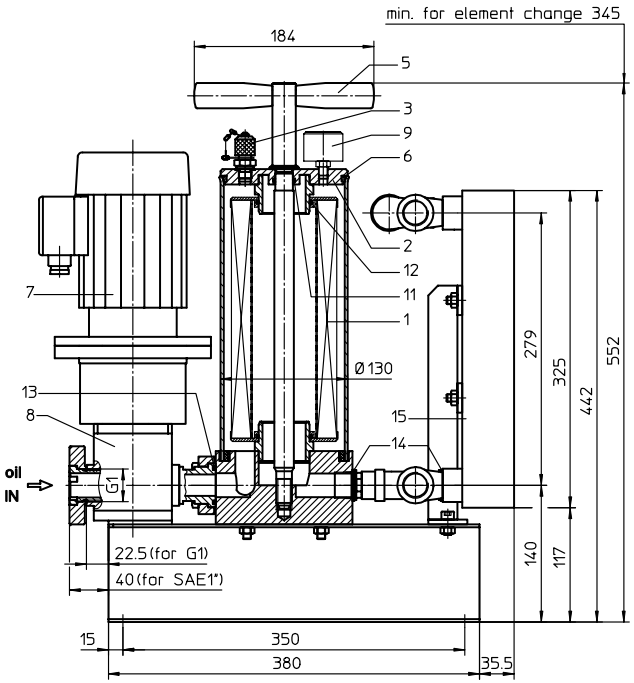


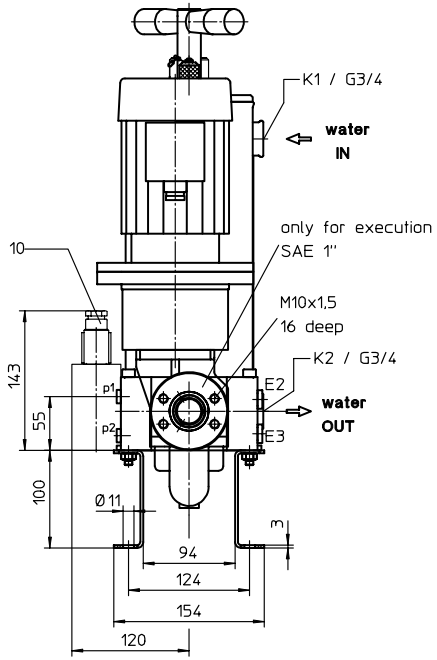
Filter unit with electrical clogging indicator contact breaker E5

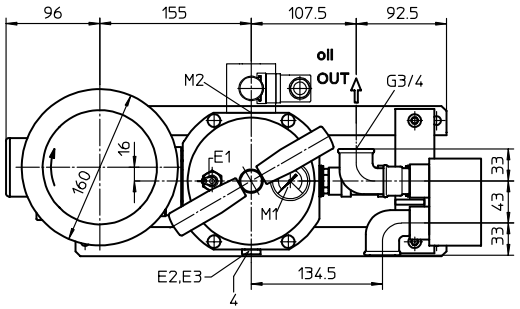


FILTER UNIT, stationary with plate-exchanger
Series USP 20 PN 6

Sheet No. **4020 C**







Assignment of connections and functions

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side manometer 0-16 bar
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side
K1: cooling water IN
K2: cooling water OUT

1. Type index:

1.1. Filter unit: (ordering example)

USP. 20. 6VG. 10. B. P. -. P01. D03. CP12. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
USP = filter unit, stationary with plate-exchanger
2 **nominal size:** 20
3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element
4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar
5 **filter element design:**
B = both sides open
6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement
7 **filter element specification:**
- = standard
VA = stainless steel
8 **pump unit:**
P01 = pump unit 01, NG 20.16, G.5 with suction connection G1
P08 = pump unit 08, NG 20.16, FS.5 with connection SAE1"
9 **motor:**
D03 = B5/71/4.0,37.1500.230/400.D.50.1.-.-.-
rotay current motor 230/400 V, 50 Hz, approx. 1420 rpm, 0,37 kW, type of protection IP 54
10 **plate-exchanger unit:**
CP12 = plate-exchanger unit CP12
11 **clogging indicator at M2:**
- = without
AE = AE30.2,5.P.-.B electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
AOR = AOR.2,5.P.- visual, 2,5 bar, see sheet-no. 1606
AOC = AOC.2,5.P.- visual, 2,5 bar, see sheet-no. 1606

1.2. Filter element: (ordering example)

01NR. 250. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4
2 **nominal size:** 250
3 - 7 see type index-filter unit

Changes of measures and design are subject to alteration!

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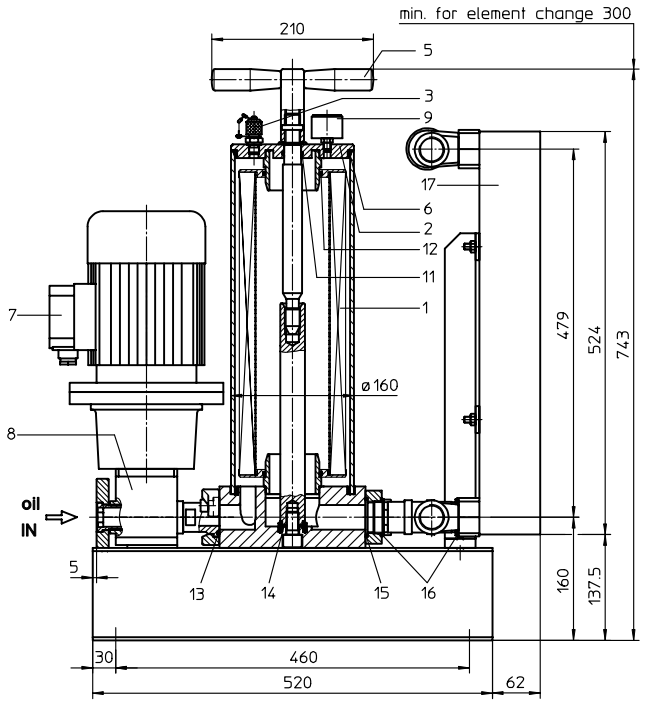
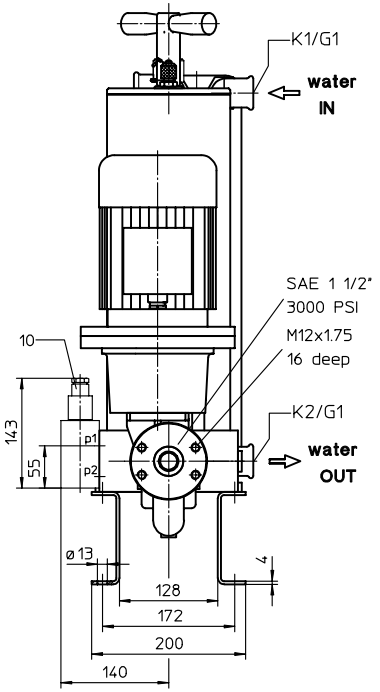
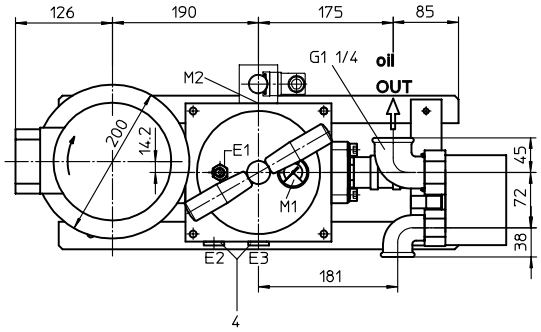
FILTER UNIT, stationary with plate-exchanger
Series USP 41 PN 6

Sheet No. **4021 E**







Assignment of connections and functions

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side manometer 0-16 bar
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side
K1: cooling water IN
K2: cooling water OUT

1. Type index:

1.1. Filter unit: (ordering example)

USP. 41. 6VG. 10. B. P. -. P05. D05. CP16. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series**:
USP = filter unit, stationary with plate-exchanger
2 **nominal size:** 41
3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element
4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar
5 **filter element design:**
B = both sides open
6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement
7 **filter element specification:**
- = standard
VA = stainless steel
8 **pump unit:**
P05 = pump unit 05, NG 40.25
9 **motor:**
D05 = B5/80/4.0,75.1500.230/400.D.50.1.-.-.-
rotay current motor 230/400 V, 50 Hz, approx. 1420 rpm, 0,75 kW, type of protection IP 54
10 **plate-exchanger unit:**
CP16 = plate-exchanger unit CP16
11 **clogging indicator at M2:**
- = without
AE = AE30.2,5.P.-.B electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
AOR = AOR.2,5.P.- visual, 2,5 bar, see sheet-no. 1606
AOC = AOC.2,5.P.- visual, 2,5 bar, see sheet-no. 1606

1.2. Filter element: (ordering example)

01NR. 630. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4
2 **nominal size:** 630
3 - 7 see type index-filter unit

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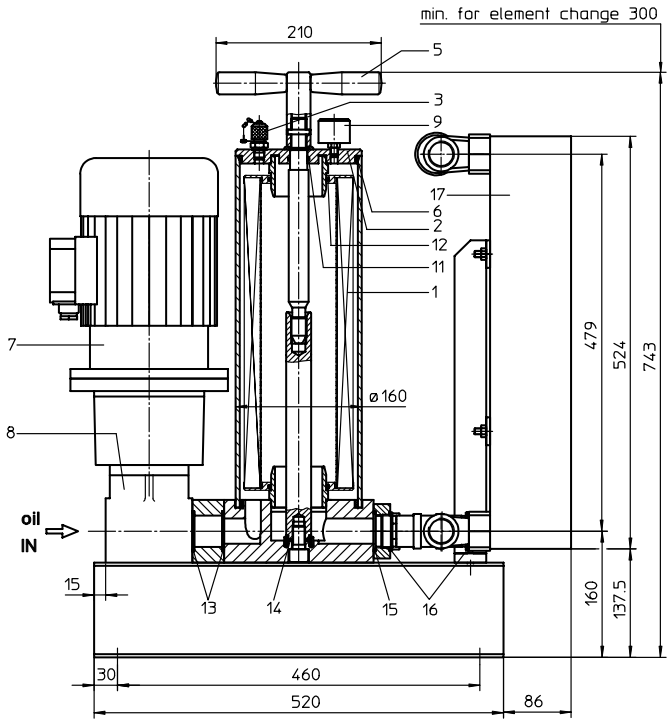
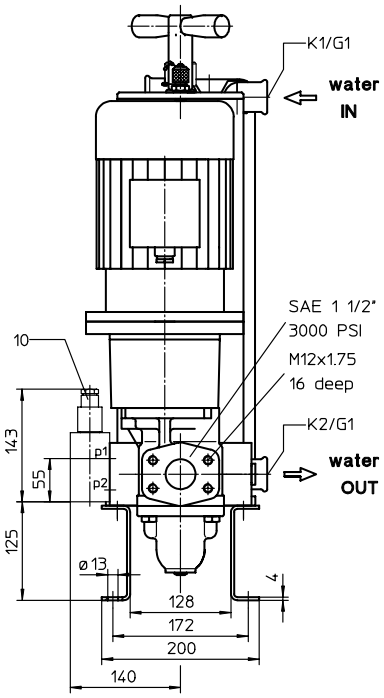
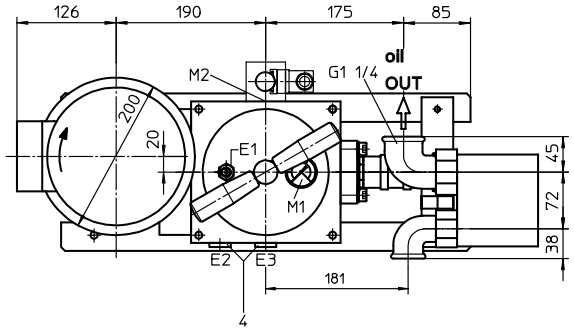
FILTER UNIT, stationary with plate-exchanger
Series USP 81 PN 6

Sheet No. **4022 E**







Assignment of connections and functions

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side manometer 0-16 bar
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side
K1: cooling water IN
K2: cooling water OUT

1. Type index:

1.1. Filter unit: (ordering example)

USP. 81. 6VG. 10. B. P. -. P04. D01. CP18. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
USP = filter unit, stationary with plate-exchanger

2 **nominal size:** 81

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel

8 **pump unit:**
P04 = pump unit 04, NG 80.50

9 **motor:**
D01 = B5/90L/4.1,5.1500.230/400.D.50.1.-.-.-
rotay current motor 230/400 V, 50 Hz, approx. 1420 rpm, 1,5 kW, type of protection IP 54

10 **plate-exchanger unit:**
CP18 = plate-exchanger unit CP18

11 **clogging indicator at M2:**
- = without
AE = AE30.2,5.P.-.B electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
AOR = AOR.2,5.P.- visual, 2,5 bar, see sheet-no. 1606
AOC = AOC.2,5.P.- visual, 2,5 bar, see sheet-no. 1606

1.2. Filter element: (ordering example)

01NR. 630. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

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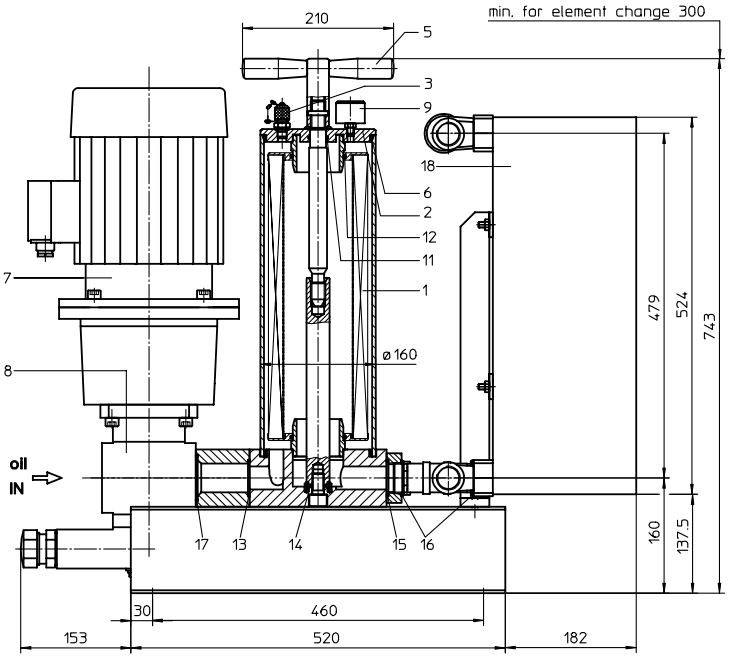
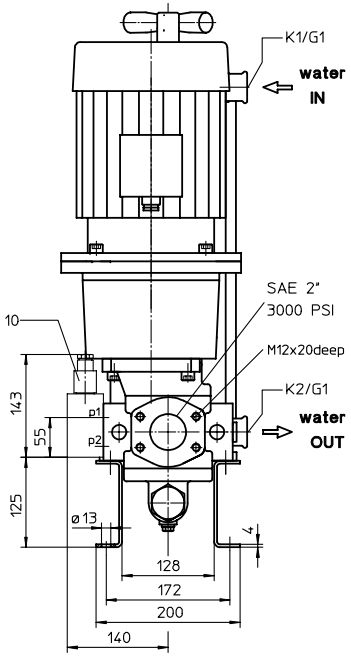
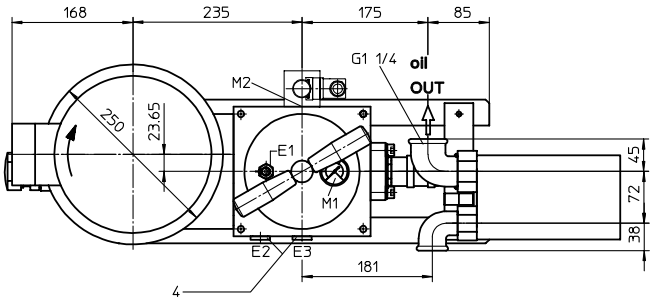
FILTER UNIT, stationary with plate-exchanger
Series USP 161 PN 8

Sheet No. **4023 E**







Assignment of connections and functions

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side manometer 0-16 bar
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side
K1: cooling water IN
K2: cooling water OUT

1. Type index:

1.1. Filter unit: (ordering example)

USP. 161. 6VG. 10. B. P. -. P18. D11. CP20. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
USP = filter unit, stationary with plate-exchanger

2 **nominal size:** 161

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel

8 **pump unit:**
P18 = pump unit 18, NG 160.100.6, adjustable pressure 6 bar
pump unit 18, NG 160.100.8, adjustable pressure 8 bar

9 **motor:**
D11 = B5/100LB/4.3,0.1500. 400/690.D.50.1.-.-.- rotay current motor 400/690V, 50 Hz, approx. 1420 rpm, 3,0 kW, type of protect ion IP 54 — $\nu \leq 100$ mm²/s
D08 = B5/112M/4.4,0.1500.400/690.D.50.1.-.-.- rotay current motor 400/690V, 50 Hz, approx. 1420 rpm, 4,0 kW, type of protection IP 54 — $\nu > 100$ mm²/s, $\nu \leq 150$ mm²/s

10 **plate-exchanger unit:**
CP20 = plate-exchanger unit CP20

11 **clogging indicator at M2:**
- = without
AE = AE30.2,5.P.-.B electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
AOR = AOR.2,5.P.- visual, 2,5 bar, see sheet-no. 1606
AOC = AOC.2,5.P.- visual, 2,5 bar,see sheet-no. 1606

1.2. Filter element: (ordering example)

01NR. 630. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Changes of measures and design are subject to alteration!

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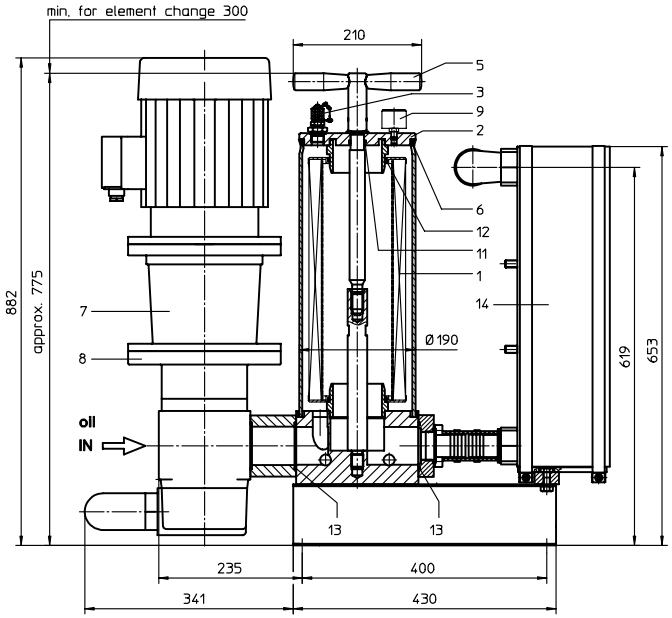
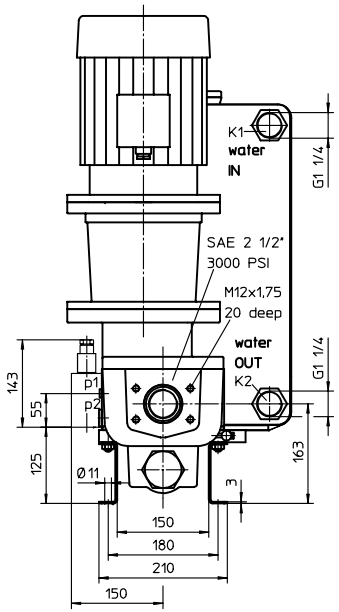
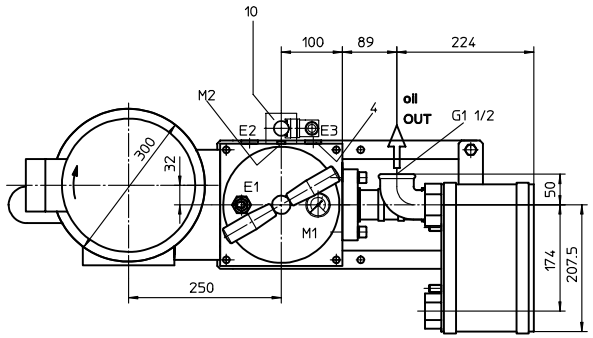
FILTER UNIT, stationary with plate-exchanger
Series USP 320 PN 6

Sheet No. **4024 B**







Assignment of connections and functions

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side manometer 0-16 bar
M2: measure connection at filter housing
p_1 = dirt side
p_2 = clean side
K1: cooling water IN
K2: cooling water OUT

1. Type index:

1.1. Filter unit: (ordering example)

USP. 320. 6VG. 10. B. P. -. P07. D07. CP30. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
USP = filter unit, stationary with plate-exchanger

2 **nominal size:** 320

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel

8 **pump unit:**
P07 = pump unit 07, NG 320.200

9 **motor:**
D07 = B5/132S/4.5,5.1500.400/690.D.50.1.-.-.-
rotay current motor 400/690V, 50 Hz, approx. 1420 rpm, 5,5 kW, type of protection IP 54

10 **plate-exchanger unit:**
CP30 = plate-exchanger unit CP30

11 **clogging indicator at M2:**
- = without
AE = AE30.2,5.P.-.B electrical at p_1 and p_2, 2,5 bar, see sheet-no. 1609
AOR = AOR.2,5.P.- visual, 2,5 bar, see sheet-no. 1606
AOC = AOC.2,5.P.- visual, 2,5 bar, see sheet-no. 1606

1.2. Filter element: (ordering example)

01NR. 1000. 6VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-filter unit

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1. Technical data

NO	Model	Spare Element		Motor	Flow rate at 50 Hz	Cooling capacity	Weight
		Specification	Q'ty				
1	USP.20	01NR.250	1	230V/400V/50Hz/4P/0.37Kw	22.7 l/min	7.6 Kw	35 kg
2	USP.41	01NR.630	1	230V/400V/50Hz/4P/0.75Kw	35.5 l/min	19.9 Kw	58 kg
3	USP.81	01NR.630	1	230V/400V/50Hz/4P/1.5Kw	71.0 l/min	35 Kw	80 kg
4	USP.161	01NR.630	1	230V/400V/50Hz/4P/3Kw(4Kw)	142.0 l/min	76.3 Kw	120 kg
5	USP.320	01NR.1000	1	230V/400V/50Hz/4P/5.5Kw	284.0 l/min	128 Kw	155 kg

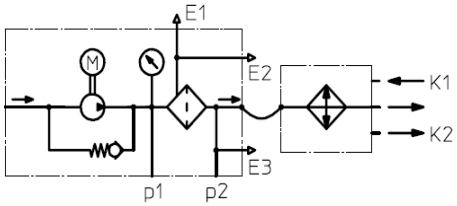
2. Description

The stationary filter unit with plate-exchanger is intended for oil maintenance and for oil cooling on hydraulic systems.
The area of application comprises:
- secondary flow filtration in addition to the existing operating filter and the oil cooling
- secondary flow filtration without the action of the operating filter and the oil co oling
- filtration when filling the oil reservoir.

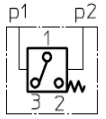
The filter unit must not be used to pump contaminated hydraulic fluids and is therefore designed without a switchover fitting to by-pass the filter. The compact structural design with plate interlacing without pipe satisfies the prerequisites for small dimensions and high reliability.
The device is equipped with a gear pump driven by an e-motor. The flow conveyed by the geared pump is fed over a filter element to DIN 24550, T4, nominal size 250 and is led afterwards over a plate cooler.
Depending on the customer's wishes, the filter fineness is either 4, 5, 7 or 10 µm $_{(c)}$.
At the measuring point M1, the working pressure before the element is shown. The pollution of the element is indicated with the clogging indicator at the measuring point M2.
At a pressure difference > 2,5 bar , the element is polluted and has to be removed with a new element.
The filter element can be changed without tools. After removing the straining screw and taking off the housing cover, the filter element is accessible and it can be exchanged. The filter elements are supplied complete with seals. Since it is not possible to clean the elements, the user must always keep an adequate supply of spare elements in stock.
To protect against overpressure, the filter unit is fitted with a safety valve, pressure setting approx. 6 bar.
The cooling capacity is shown at the cooling capacity graph for the chosen field of application, depending on the input temperature, the streams of the medium and the type of medium. The cooling capacity graph is intended for the choice of application of the suitable filter unit with cooler. For the fields of application which are not shown in the cooling capacity graph, the capacity data have to be asked for at the manufacturer.
Stationary filter units can be operated without supervision if the electrical connection is fitted with an overload protection corresponding to the current consumption of the selected e-motor and the switch-off function of the e-motor of the electrical clogging indicator will disengaged at 2,5 bar.
The line, venting and draining connections are identified according to their function. Drainage is necessary when cleaning the filter unit in connection with the change of filter element, and when setting the medium.

3. Symbols

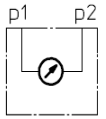
Filter unit with cooler
without clogging indicator



with electrical
clogging indicator AE30

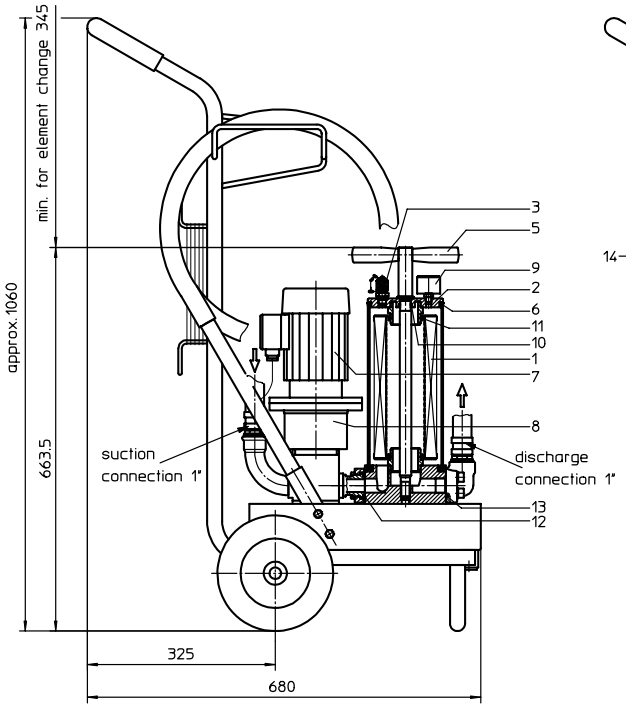


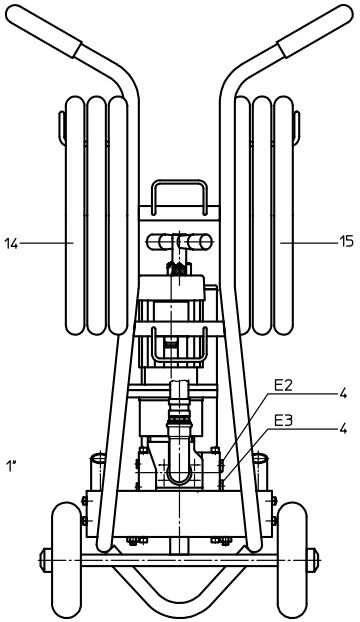
with visual
clogging indicator
AOR, AOC

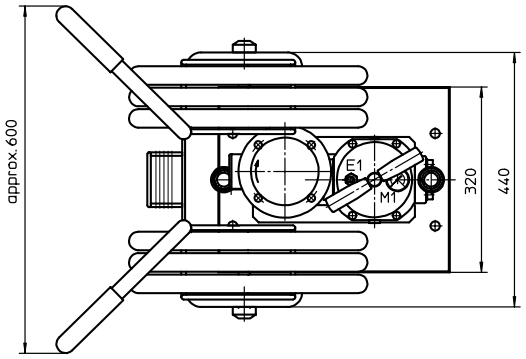


FILTER UNIT, mobile
Series UM 20 PN 4

Sheet No. **4013 F**







Assignment of connections and functions:

E1: venting mini-measuring connection MA.1.ST, see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side

1. Type index:

1.1. Filter unit: (ordering example)

UM.	20.	6VG.	10.	B.	P.	-.	P01.	W03.	L07.	L11.	O
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
UM = filter unit, mobile

2 **nominal size:** 20

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4$\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P01 = pump unit 01, NG 20.16 (standard-pump unit)

9 **motor:** (W = alternating current motor)

motor	electrical connection		volume flow	max. capacity	doc.-no.
W03 [1)]	230V	50Hz	22,7 l/min	10-400 mm²/s	43044-4
W07 [1)]	110V	60Hz	27,2 l/min	10-400 mm²/s	43045-4

[1)] standard-motor

10 **suction connection 1" :** (see sheet-no. 31992-4)
L07 = hose-lance
L08 = hose-fitting-lance
L09 = hose-lance-protective filter
L10 = hose- fitting-lance-protective filter

11 **discharge connection 1" :** (see sheet-no. 31992-4)
L11 = hose-lance
L12 = hose-fitting-lance

12 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

1.2. Filter element: (ordering example)

01NR.	250.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 250

3 - 7 see type index-filter unit

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

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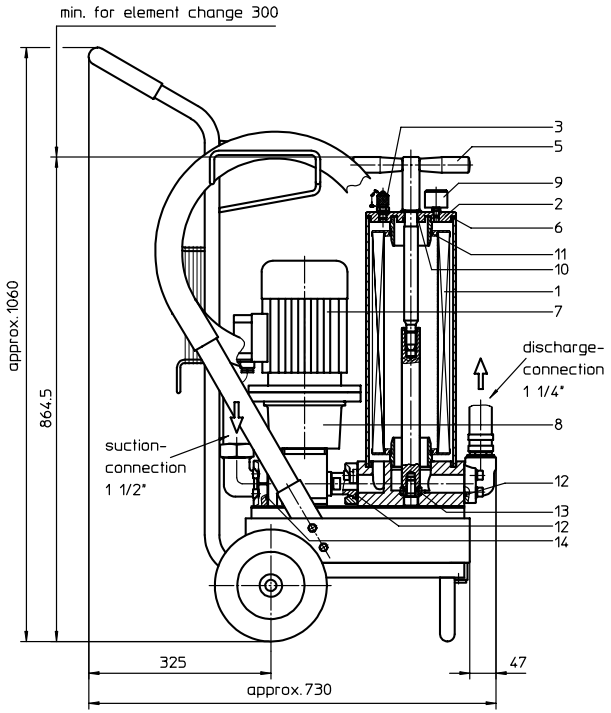
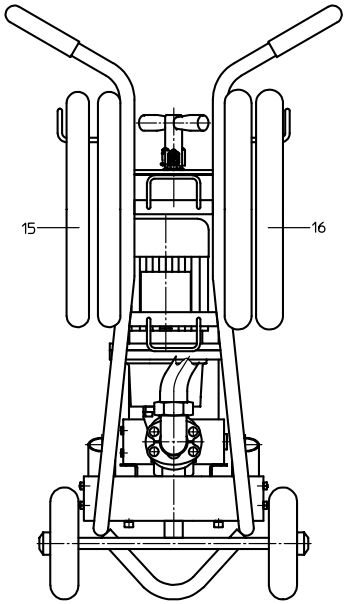
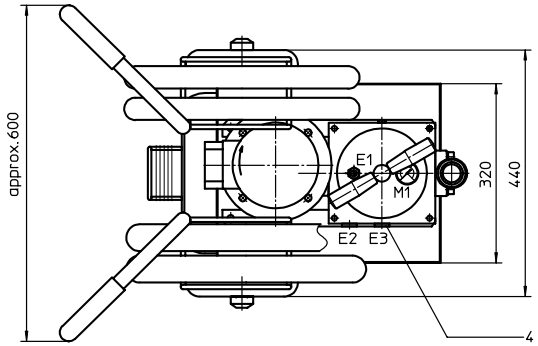
FILTER UNIT, mobile
Series UM 40 PN 4

Sheet No. **4014 E**







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side

1. Type index:

1.1. Filter unit: (ordering example)

UM.	40.	6VG.	10.	B.	P.	-.	P05.	W10.	L01.	L05.	O
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
UM = filter unit, mobile

2 **nominal size:** 40

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P05 = pump unit 05, NG 40.25 (standard-pump unit)

9 **motor:** (W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	doc.-no.
W10 [1)]	230V	50Hz	35,5 l/min	10-400 mm²/s	42754-4
W11 [1)]	110V	60Hz	42,5 l/min	10-400 mm²/s	42877-4

[1)] standard-motor

10 **suction connection 1 ½ " :** (see sheet-no. 31961-4)
L01 = hose-lance
L02 = hose-fitting-lance
L03 = hose-lance-protective filter
L04 = hose- fitting-lance-protective filter
L22 = hose- fitting

11 **discharge connection 1 ¼ " :** (see sheet-no. 31961-4)
L05 = hose-lance
L06 = hose-fitting-lance
L21 = hose-fitting

12 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

1.2. Filter element: (ordering example)

01NR.	630.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

Changes of measures and design are subject to alteration!

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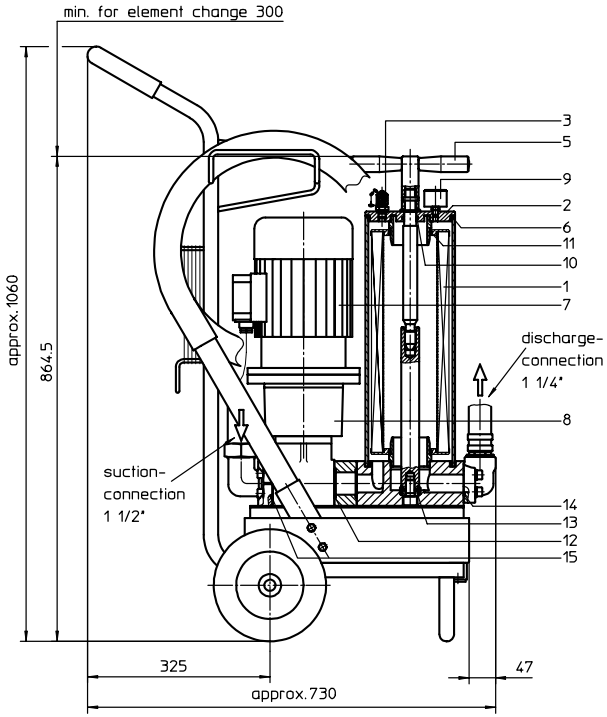
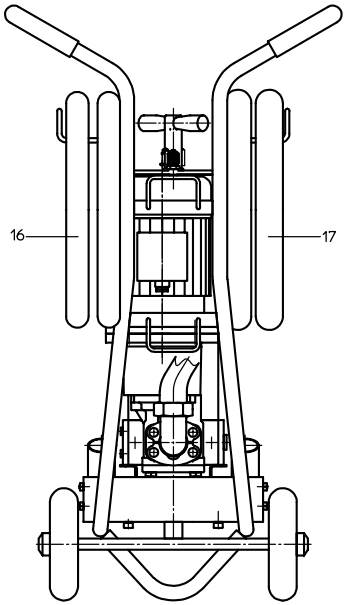
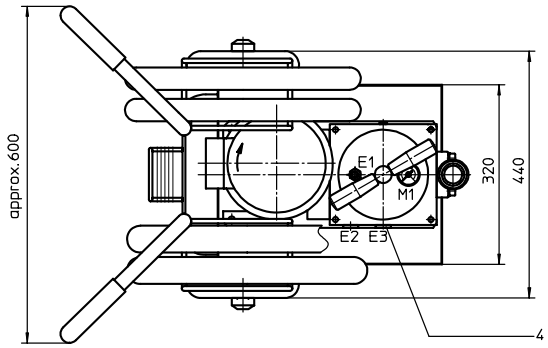
FILTER UNIT, mobile
Series UM 80 PN 4

Sheet No. **4015 E**







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt sid e
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side

1. Type index:

1.1. Filter unit: (ordering example)

UM.	80.	6VG.	10.	B.	P.	-.	P04.	W06.	L01.	L05.	O
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
UM = filter unit, mobile

2 **nominal size:** 80

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4$\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P04 = pump unit 04, NG 80.50 (standard-pump unit)

9 **motor:** (W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	doc.-no.
W06 [1]	230V	50Hz	71,0 l/min	10-400 mm²/s	43056-4
W09 [1]	110V	60Hz	85,0 l/min	10-400 mm²/s	43057-4

[1] standard-motor

10 **suction connection 1 ½ " :** (see sheet-no. 31961-4)
L01 = hose-lance
L02 = hose-fitting-lance
L03 = hose-lance-protective filter
L04 = hose- fitting-lance-protective filter

11 **discharge connection 1 ¼ " :** (see sheet-no. 31961-4)
L05 = hose-lance
L06 = hose-fitting-lance

12 **clogging indicator at M1:**
- = without
O = visual, 2,5 bar

1.2. Filter element: (ordering example)

01NR.	630.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

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1. Technical data

NO	Model	Flow rate at 60Hz	Motor	Weight	Spare Element	
					Specification	Q'ty
1	UM.20	27.2 l/min	110V/60Hz/4P/0.37Kw	42 kg	01NR.250	1
2	UM.40	42.5 l/min	110V/60Hz/4P/0.75Kw	52 kg	01NR.630	1
3	UM.80	85.0 l/min	110V/60Hz/4P/1.5Kw	73 kg	01NR.630	1

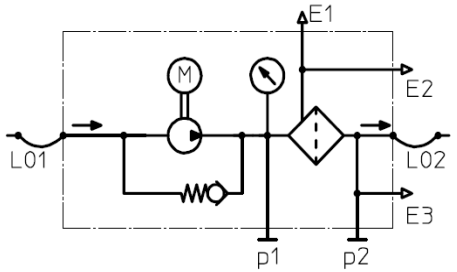
2. Description

The mobile filter unit is intended for oil maintenance on hydraulic systems.
The area of application comprises:
- secondary flow filtration in addition to the existing operating filter
- secondary flow filtration without the action of the operating filter
- filtration when filling the oil reservoir.

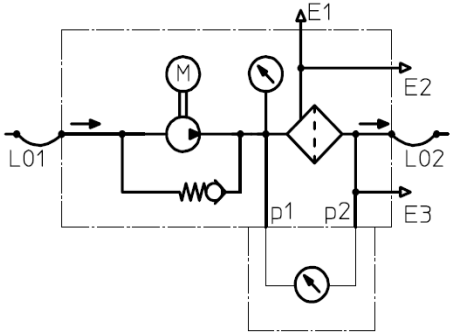
The filter unit must not be used to pump contaminated hydraulic fluids and is therefore designed without a switchover fitting to by-pass the filter. The compact structural design on a base plate without pipe satisfies the prerequisites for small dimensions and high reliability.The transporting trolley makes it possible to move close up to confined locations with difficult access, and to fix the accessories (such as hoses and the connection cable) in a safe and r eliable manner.
Oil flowing out of the suction and/or discharge hose or the outflow openings is collected by the filter unit's oil trough, without causing any environmental damage. The suction hose DN 25 and the discharge hose DN 25 are approximately 2700 mm long inclusive of the lance.
The device is equipped with a gear pump driven by an E-motor. The flow conveyed by the geared pump is fed over a filter element to DIN 24550, T4, nominal size 250.
Depending on the customer's wishes, the filter fineness is either 4, 5, 7 or 10 $\mu m_{(c)}$. The contamination level of the filter element can be read off from a pressure display in the cover of the filter.
At a pressure >2,5 bar (red area of the scale field), the filter element is contaminated and it must be replaced with a new filter element.
The filter element can be changed without tools. After removing the straining screw and taking off the housing cover, the filter element is accessible and it can be exchanged. The filter elements are supplied complete with seals. Since it is not possible to clean the elements, the user must always keep an adequate supply of spare elements in stock.
To protect against overpressure, the filter unit is fitted with a safety valve. Pressure setting about 4 bar.
The E-motor is made safe with a motor-protection-switch against overloading. At a working pressure > 4 bar, the motor-protection-switch cuts the E-motor out.
The line, venting and draining connections are identified according to their function. Drainage is necessary when cleaning the filter unit in connection with the change of filter element, and when changing the fluid m edium.

3. Symbols

filter unit without clogging indicator

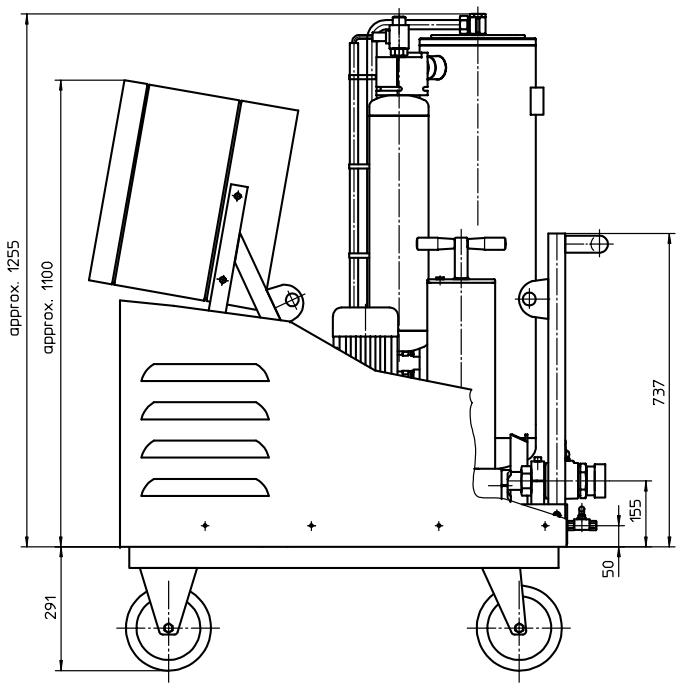


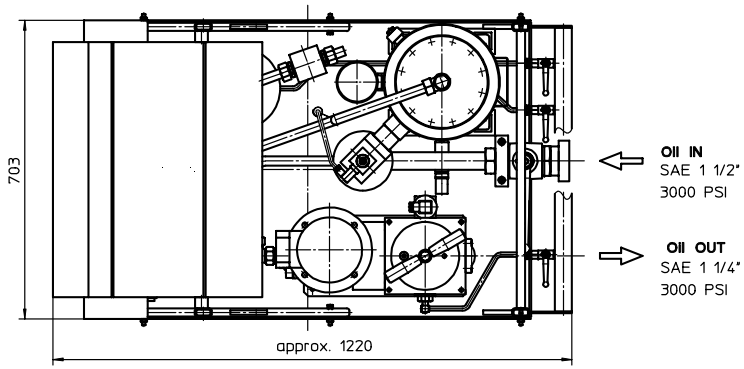
filter unit with visual clogging indic ator



FLUID PURIFIER SYSTEMS, mobile
Series IFPM 21

Sheet No.
4035 D





1. Type index:

1.1. Fluid Purifier Systems: (ordering example)

IFPM.	21.	6VG.	10.	B.	V.	-.	P21.	D23.	VP01.	VS1.	A
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
IFPM = INTERNORMEN-Fluid Purifier Systems, mobile

2 **nominal size:** 21

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P21 = pump unit 21, NG 20.16

9 **motor:**
D23 = B5/80/6.0,55.1000.230/400.D.50.1.-.-.-
rotary current motor 230/400 V, 50 Hz, approx. 950 rpm, 0,55 KW, protection IP 55

10 **vacuum pump:**
VP01 = vacuum pump 01, 230/400 V, 3-Phase, 50 Hz, 0,55 KW, protection IP 55

11 **clogging sensor:**
VS1 = VS1.1,5.V.-.GS.B.E electronical, at p_1 and p_2, 1,5 bar, see sheet-no. 1607

12 **supply voltage:**
A = 400V, 3-phase
B = 480V, 3- phase
C = 208V, 3- phase
D = customised

1.2. Filter element: (ordering example)

01NR.	630.	6VG.	10.	B.	V.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index- INTERNORMEN-Fluid Purifier Systems

Changes of measures and design are subject to alteration!

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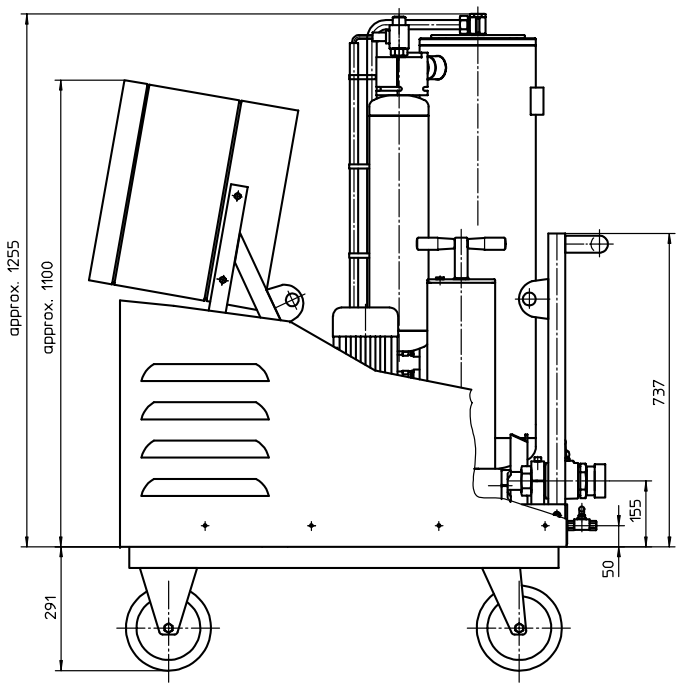
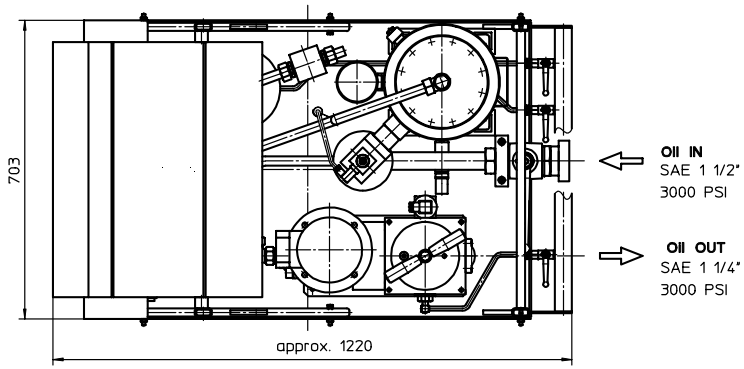
FLUID PURIFIER SYSTEMS, mobile
Series IFPM 31

Sheet No. **4036 C**





1. Type index:

1.1. Fluid Purifier Systems: (ordering example)

IFPM.	31.	6VG.	10.	B.	V.	-.	P22.	D27.	VP01.	VS1.	A
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
IFPM = INTERNORMEN-Fluid Purifier Systems, mobile

2 **nominal size:** 31

3 **filter-material and filter-fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P22 = pump unit 22, NG 60.40

9 **motor:**
D27 = B5/100/8.0,75.750.230/400.D.50.1.-.-.-
rotary current motor 230/400 V, 50 Hz, approx. 710 rpm, 0,75 KW, protection IP 55

10 **vacuum pump:**
VP01 = vacuum pump 01, 230/400 V, 3- phase, 50 Hz, 0,55 KW, protection IP 55

11 **clogging sensor:**
VS1 = VS1.1,5.V.-.GS.B.E electronical, at p_1 and p_2, 1,5 bar, see sheet-no. 1607

12 **supply voltage:**
A = 400V, 3-phase
B = 480V, 3- phase
C = 208V, 3- phase
D = customised

1.2. Filter element: (ordering example)

01NR.	630.	6VG.	10.	B.	V.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index- INTERNORMEN-Fluid Purifier Systems

Changes of measures and design are subject to alteration!

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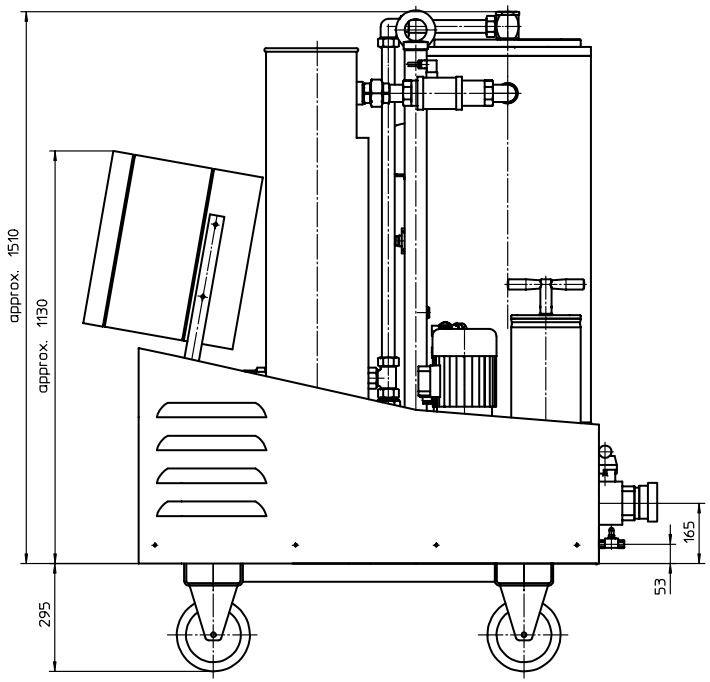
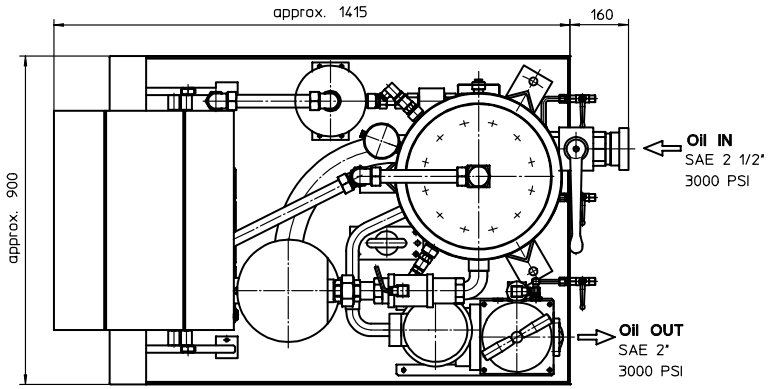
FLUID PURIFIER SYSTEMS, mobile
Series IFPM 71

Sheet No. **4046 A**





1. Type index:

1.1. Fluid Purifier Systems: (ordering example)

IFPM.	71.	6VG.	10.	B.	V.	-.	P23.	D01.	VP07.	VS1.	A
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
IFPM = INTERNORMEN-Fluid Purifier Systems, mobile

2 **nominal size:** 71

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P23 = pump unit 23, NG 80.50

9 **motor:**
D01 = B5/90L/4.1,5.1500.230/400.D.50.1.-.-.-
rotary current motor 230/400 V, 50 Hz, approx. 1450 rpm, 1,5 KW, protection IP 55

10 **vacuum pump:**
VP07 = vacuum pump 07, 230/400 V, 3-phase, 50 Hz, 1,25 KW, protection IP 55

11 **clogging sensor:**
VS1 = VS1.1,5.V.-.GS.B.E electronical, at p_1 and p_2, 1,5 bar, see sheet-no. 1607

12 **supply voltage:**
A = 400V, 3-phase
B = 480V, 3-phase
C = 208V, 3-phase
D = customised

1.2. Filter element: (ordering example)

01NR.	1000.	6VG.	10.	B.	V.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index- INTERNORMEN-Fluid Purifier Systems

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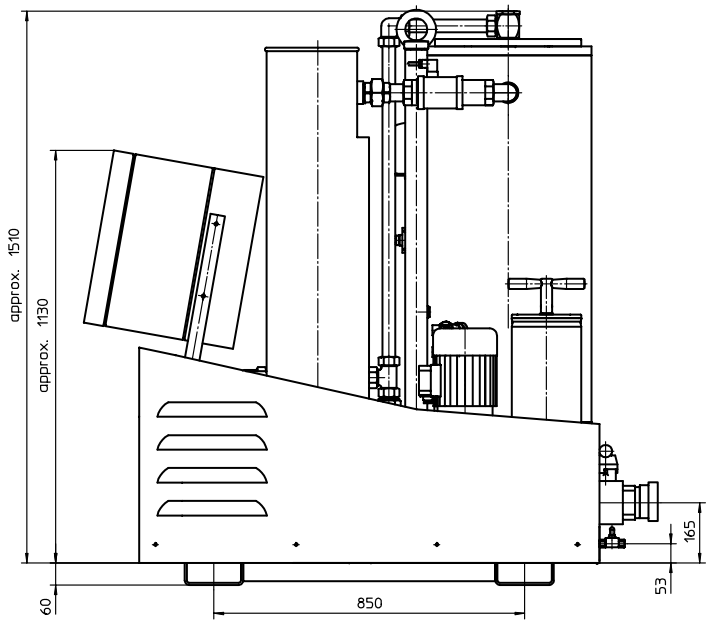
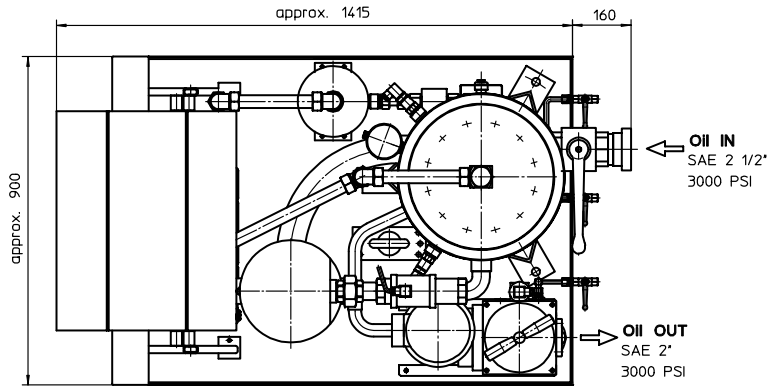
FLUID PURIFIER SYSTEMS, stationary
Series IFPS 71

Sheet No. **4045 B**





1. Type index:

1.1. Fluid Purifier Systems: (ordering example)

IFPS.	71.	6VG.	10.	B.	V.	-.	P23.	D01.	VP07.	VS1.	A
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
IFPS = INTERNORMEN-Fluid Purifier Systems, stationary

2 **nominal size:** 71

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P23 = pump unit 23, NG 80.50

9 **motor:**
D01 = B5/90L/4.1,5.1500.230/400.D.50.1.-.-.-
rotary current motor 230/400 V, 50 Hz, approx. 1450 rpm, 1,5 KW, protection IP 55

10 **vacuum pump:**
VP07 = vacuum pump 07, 230/400 V, 3-phase, 50 Hz, 1,25 KW, protection IP 55

11 **clogging sensor:**
VS1 = VS1.1,5.V.-.GS.B.E electronical, at p_1 and p_2, 1,5 bar, see sheet-no. 1607

12 **supply voltage:**
A = 400V, 3-phase
B = 480V, 3-phase
C = 208V, 3-phase
D = customised

1.2. Filter element: (ordering example)

01NR.	1000.	6VG.	10.	B.	V.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index- INTERNORMEN-Fluid Purifier Systems

Changes of measures and design are subject to alteration!

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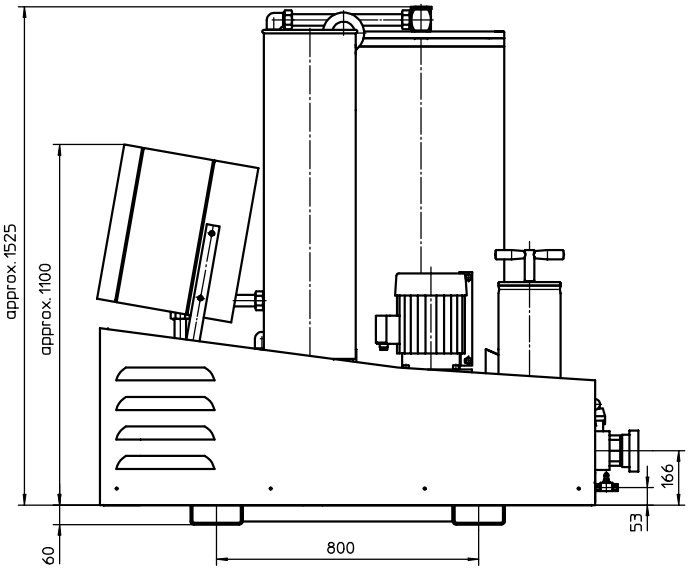
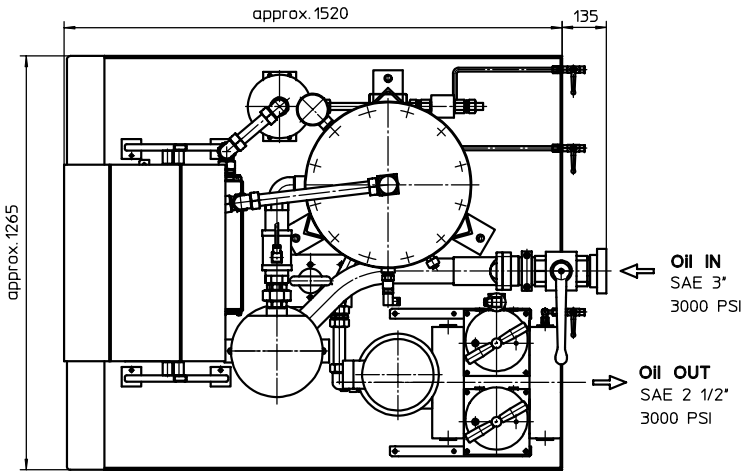
FLUID PURIFIER SYSTEMS, stationary
Series IFPS 101

Sheet No. **4043 B**





1. Type index:

1.1. Fluid Purifier Systems: (ordering example)

IFPS.	101.	6VG.	10.	B.	V.	-.	P22.	D04.	VP04.	VS1.	A
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
IFPS = INTERNORMEN-Fluid Purifier Systems, stationary

2 **nominal size:** 101

3 **filter-material and filter-fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P22 = pump unit 22, NG 125.80

9 **motor:**
D04 = B5/100L/4.2,2.1500.230/400.D.50.1.-.-.-
rotary current motor 230/400 V, 50 Hz, approx. 1420 rpm, 2,2 KW, protection IP 54

10 **vacuum pump:**
VP04 = vacuum pump 04, 230/400 V, 3-phase, 50 Hz, 1,8 KW, protection IP 54

11 **clogging sensor:**
VS1 = VS1.1,5.V.-.GS.B.E electronical, at p_1 and p_2, 1,5 bar, see sheet-no. 1607

12 **supply voltage:**
A = 400V, 3-phase
B = 480V, 3-phase
C = 208V, 3-phase
D = customised

1.2. Filter element: (quantity 2, ordering example)

01NR.	1000.	6VG.	10.	B.	V.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index- INTERNORMEN-Fluid Purifier Systems

Changes of measures and design are subject to alteration!

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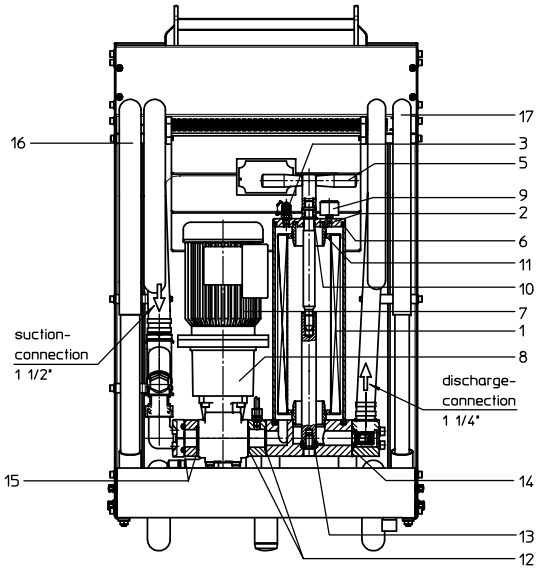
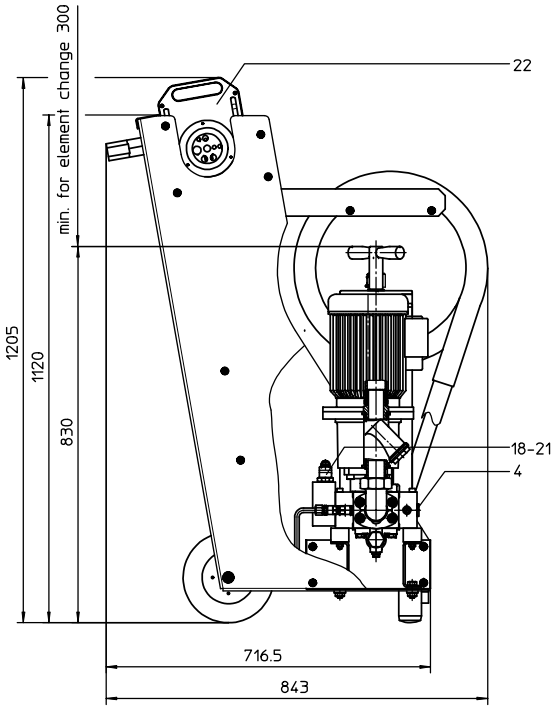
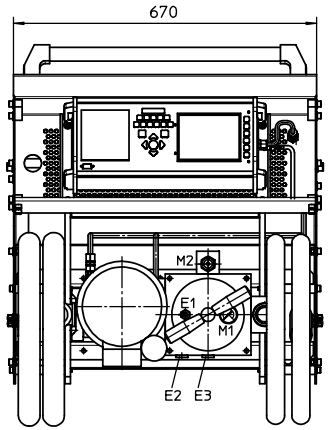
FILTER UNIT, mobile for contamination control
Series UMCC 40 PN 8

Sheet No. **4033**







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side
manometer 0-16 bar
M2: measure connection at filter housing, dirt side
p_1 = dirt side
p_2 = clean side

1. Type index:

1.1. Filter unit: (ordering example)

UMCC.	40.	6VG.	10.	B.	P.	-.	P30.	W06.	L03.	L28.	AOR.	CCS2
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
UMCC = filter unit, mobile for contamination control

2 **nominal size:** 40

3 **filter-material and filter- fineness:**
10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$, 1 VG = 4 $\mu m_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 $\mu m_{(c)}$, 3 WVG = 5 $\mu m_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P30 = pump unit 30, NG 40.25 (standard-pump unit)

9 **motor:** (W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	doc.-no.
W06 [1]	230V	50Hz	35,5 l/min	400 mm²/s	43056-4
W09 [1]	110V	60Hz	42,5 l/min	400 mm²/s	43057-4

[1] standard-motor

10 **suction connection 1 $^1/_2$" :** (see sheet-no. 31961-4)
L03 = hose-lance-protective filter
L04 = hose-fitting-lance-protective filter

11 **discharge connection 1 $^1/_4$" :** (see sheet-no. 40572-4)
L28 = hose-lance
L29 = hose-fitting-lance

12 **clogging indicator at M2:**
AOR = visual, Δp 2,5 bar, see sheet-no. 1606
AOC = visual, Δp 2,5 bar, see sheet-no. 1606

13 **contamination control system:**
- = without
CCS2 = with contamination control system CCS2

1.2. Filter element: (ordering example)

01NR.	630.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

Changes of measures and design are subject to alteration!

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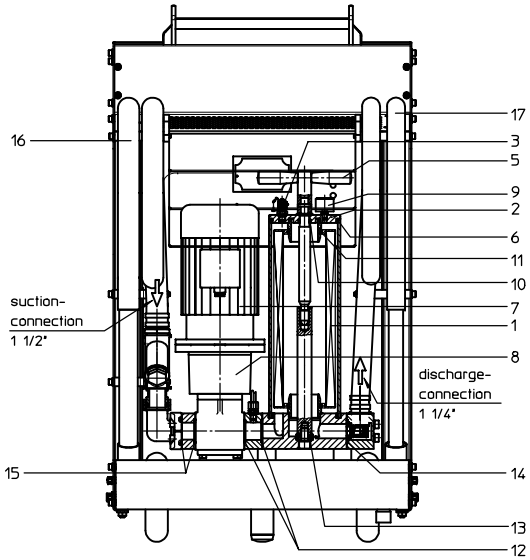
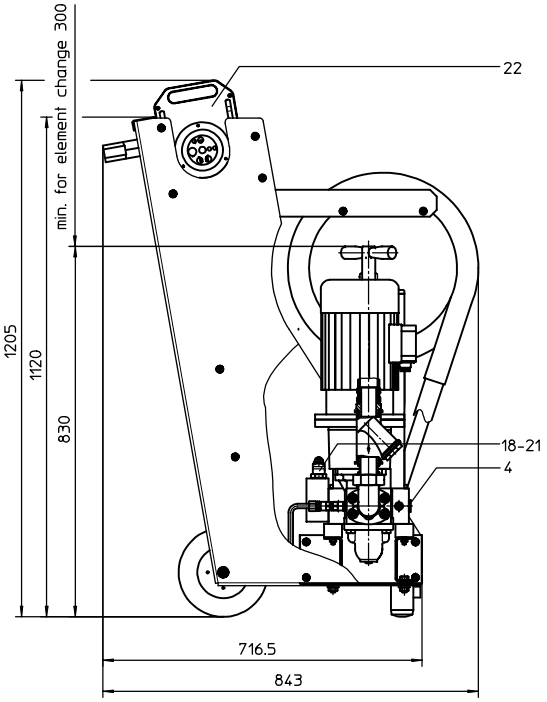
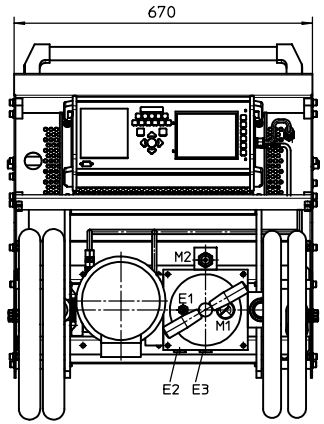
FILTER UNIT, mobile for contamination control
Series UMCC 80 PN 8

Sheet No. **4032 B**







Assignment of connections and functions:

E1: venting mini-measuring connection, MA.1.St see sheet-no.1650
E2: drainage of filter, dirt side
E3: drainage of filter, clean side
M1: measure connection in the housing cover, dirt side manometer 0-16 bar
M2: measure connection at filter housing, dirt side
p_1 = dirt side
p_2 = clean side

1. Type index:

1.1. Filter unit: (ordering example)

UMCC.	80.	6VG.	10.	B.	P.	-.	P28.	W18.	L03.	L28.	AOR.	CCS2
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
UMCC = filter unit, mobile for contamination control

2 **nominal size:** 80

3 **filter-material and filter- fineness:**
10 VG = 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$, 1 VG = 4 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM), by agreement

7 **filter element specification:**
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **pump unit:**
P28 = pump unit 28, NG 80.50 (standard-pump unit)

9 **motor:** (W = alternating current motor)

motor	electrical connection		volume flow	max. viscosity	doc.-no.
W18 [1)]	230V	50Hz	71,0 l/min	400 mm²/s	43060-4
W06	230V	50Hz	71,0 l/min	100 mm²/s	43056-4

[1)] standard-motor

10 **suction connection 1 $^1/_2$" :** (see sheet-no. 31961-4)
L03 = hose-lance-protective filter
L04 = hose-fitting-lance-protective filter

11 **discharge connection 1 $^1/_4$" :** (see sheet-no. 40572-4)
L28 = hose-lance
L29 = hose-fitting-lance

12 **clogging indicator at M2:**
AOR = visual, Δp 2,5 bar, see sheet-no. 1606
AOC = visual, Δp 2,5 bar, see sheet-no. 1606

13 **contamination control system:**
- = without
CCS2 = with contamination control system CCS2

1.2. Filter element: (ordering example)

01NR.	630.	6VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 630

3 - 7 see type index-filter unit

Notice:

Only operate all motors listed on this data sheet in combination with the pump unit specified on the type plate under item 8.

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fax +49 - (0)6205 - 2094-40 url www.internormen.com

1. Technical data

NO	Model	Spare Element		Circulation flow rate	Water extraction rate	Heater capacity	MOTOR		Weight	Remark
		Specification	Q'ty				For Hydraulic Pump	For Vacuum Pump		
1	IFPM.21	01NR.630	1	20.0 l/min	75 l/day	3000 Watt	230/400V/3Ph/50Hz/0.55Kw	230/400V/3Ph/50Hz/0.55Kw	315kg	
2	IFPM.31	01NR.630	1	30.0 l/min	105 l/day	3000 Watt	230/400V/3Ph/50Hz/0.75Kw	230/400V/3Ph/50Hz/0.55Kw	325 kg	
3	IFPM.71	01NR.1000	1	70.0 l/min	315 l/day	4000 Watt	230/400V/3Ph/50Hz/1.50Kw	230/400V/3Ph/50Hz/1.25Kw	590 kg	
4	IFPS.71	01NR.1000	1	70.0 l/min	315 l/day	4000 Watt	230/400V/3Ph/50Hz/1.50Kw	230/400V/3Ph/50Hz/1.25Kw	590 kg	
5	IFPS.101	01NR.1000	1	100.0 l/min	450 l/day	8000 Watt	230/400V/3Ph/50Hz/2.2Kw	230/400V/3Ph/50Hz/1.8Kw	790 kg	
6	UMCC.40	01NR.630	1	42.5 l/min	–	–	110V/3Ph/60Hz/0.75Kw		113 kg	CCS2
7	UMCC.80	01NR.630	1	82.8 l/min	–	–	220V/3Ph/60Hz/1.5Kw		150 kg	CCS2

2. Description for IFPM & IFPS

2.1. Effects of Water Contamination:

Water is one of the most common contaminants and the second most destructive besides particulate contamination. Some of the most damaging problems water contamination can cause are:

- Fluid breakdown
  - Additive depletion
  - Reduction of the lubrication properties of the fluid
  - Oil oxidation
- Internal corrosion
- Abrasive wear in system components
- Reduced dielectric strength

2.2. Principle of Operation:

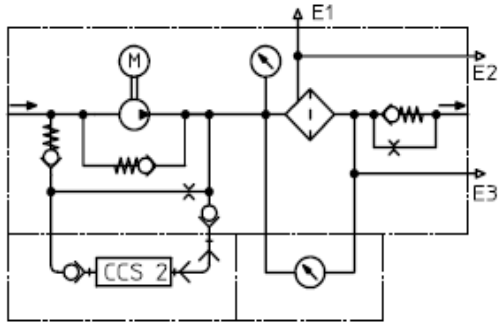
Contaminated fluid is drawn into the Internormen Fluid Purifier System by a vacuum of 0,6 to 0,9 bars.
The fluid is passing a heater which is raising the temperature in order to increase the filtration speed.
The fluid then enters through a vacuum actuated inlet valve into the vacuum chamber, where it is then allowed to cascade over the dispersal elements to break it into droplets in the tower. This increases the exposed surface area of the fluid and converts the water into vapour form, which is drawn out of the tower with a vacuum pump through the condenser to the drainage reservoir for drain off. The water-free fluid is drawn out of the tower by a hydraulic pump and sent through a high efficiency particulate removal filter back to the system.
The installed water sensor allows a permanent control of the saturation of the fluid.

3. Description for UMCC

The mobile filter unit is intended for oil maintenance on hydraulic systems.
The area of application comprises:
- secondary flow filtration in addition to the existing operating filter
- secondary flow filtration without the action of the operating filter
- filtration when filling the oil reservoir.

The filter unit must not be used to pump contaminated hydraulic fluids and is therefore designed without a switchover fitting to by-pass the filter. The compact structural design on a base plate without pipe satisfies the prerequisites for small dimensions and high reliability.The transporting trolley makes it possible to move close up to confined locations with difficult access, and to fix the accessories (such as hoses and the connection cable) in a safe and r eliable manner.
Oil flowing out of the suction and/or discharge hose or the outflow openings is collected by the filter unit's oil trough, without cauing any environmental damage.
The device is equipped with a gear pump driven by an E-motor. The flow conveyed by the geared pump is fed over a filter element to DIN 24550, T4, nominal size 630.
Depending on the customer's wishes, the filter fineness is either 4, 5, 7 or 10 µm $_{(c)}$.
At a pressure difference > 2,5 bar , the element is polluted and has to be removed with a new element .
The filter element can be changed without tools. After removing the straining screw and taking off the housing cover, the filter element is accessible and it can be exchanged. The filter elements are supplied complete with seals. Since it is not possible to clean the elements, the user must always keep an adequate supply of spare elements in stock.
To protect against overpressure, the filter unit is fitted with a safety valve. Pressure setting about 8 bar.
The E-motor is made safe with a motor-protection-switch against overloading. At a working pressure > 8 bar, the motor-protection-switch cuts the E-motor out.
The line, venting and draining connections are identified according to their function. Drainage is necessary when cleaning the filter unit in connection with the change of filter element, and when changing the fluid m edium.
In order to measure the contamination class of the oil taken in, there is a connection for the electronic particle counter CCS 2 ahead the filter. The CCS 2 is supplied complete with case and extra connection hoses and can also be used separately. When measuring at the mobile filter unit please consider that a change of the measured contamination classes is shown after an adequate operation time only, depending on the total oil volume and its mixing with the filtered oil.
To protect the pump a cleanable coarse filter made of metal wire mesh with mesh size 250 µm is being placed in the suction h ose.

4. Symbols for UMCC :

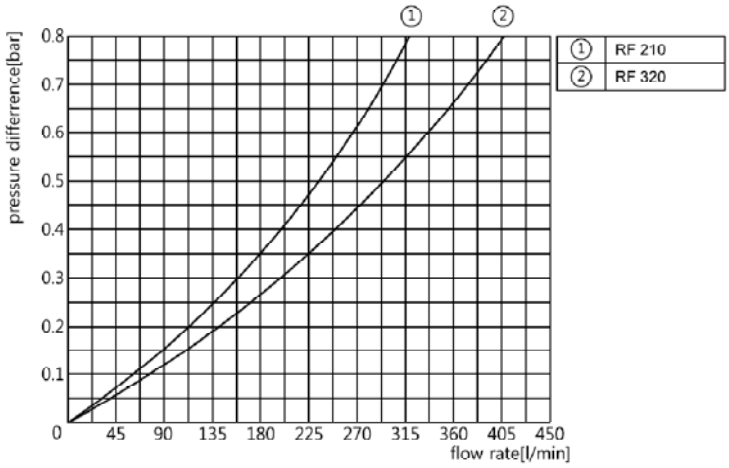


INITIAL DIFFERENCE PRESSURE

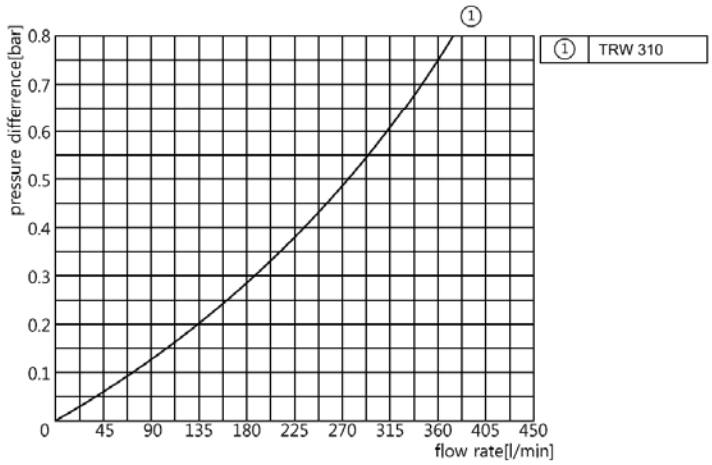
FOR RETURN FILTER SERIES - 1

Sheet No.

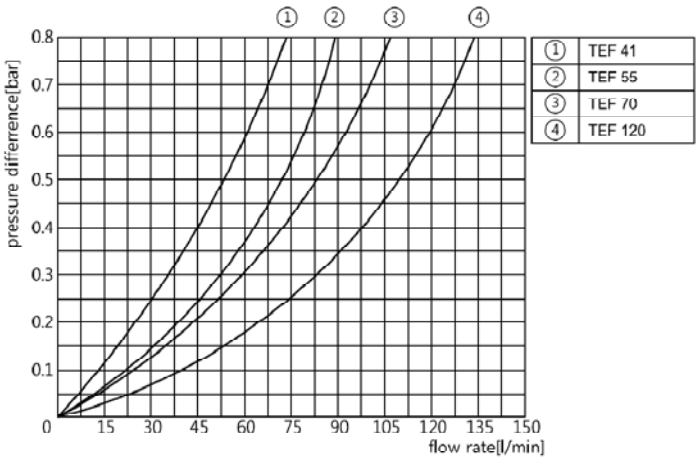
RF210~320 SERIES



TRW 310 SERIES



TEF41~120 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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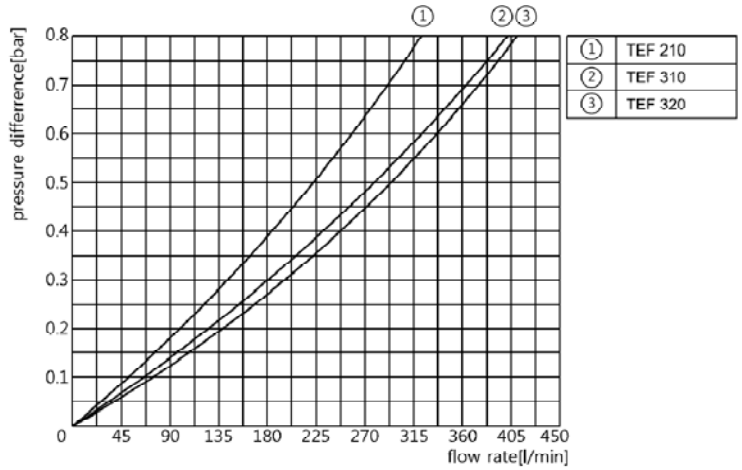
INITIAL DIFFERENCE PRESSURE

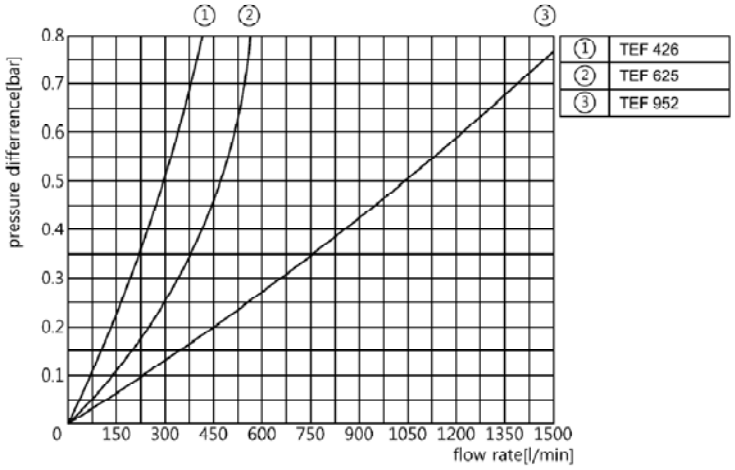
FOR RETURN FILTER SERIES - 2

Sheet No.

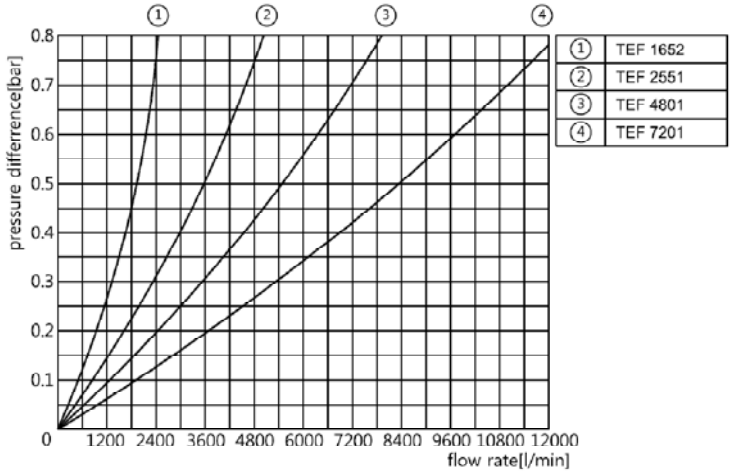
TEF 210~320 SERIES



TEF426~952 SERIES



TEF1652~7201 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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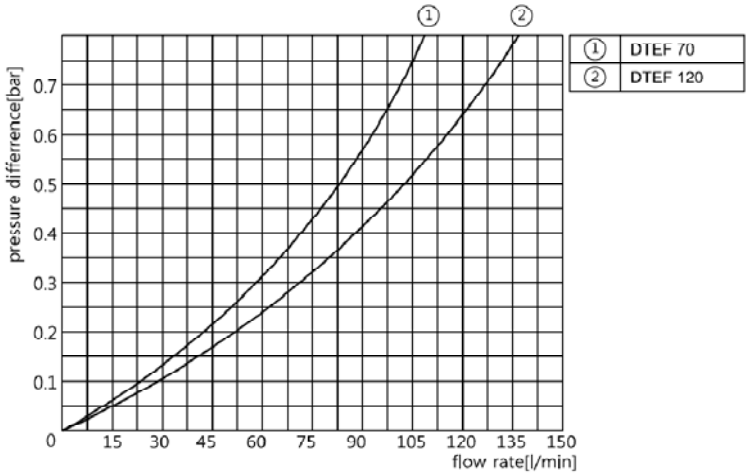
INITIAL DIFFERENCE PRESSURE

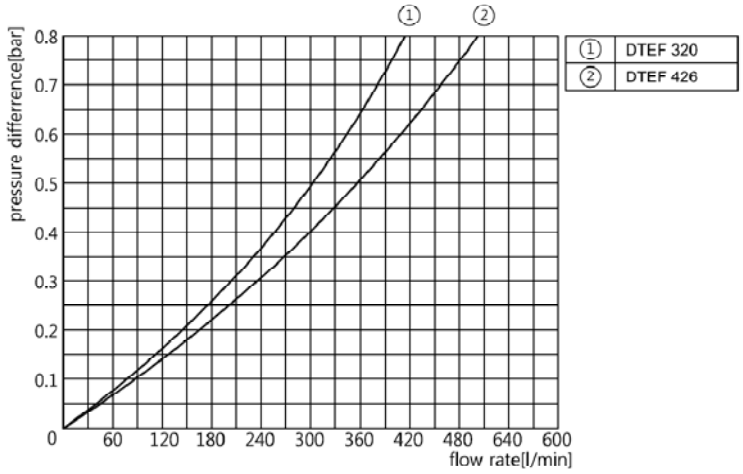
FOR RETURN FILTER SERIES - 3

Sheet No.

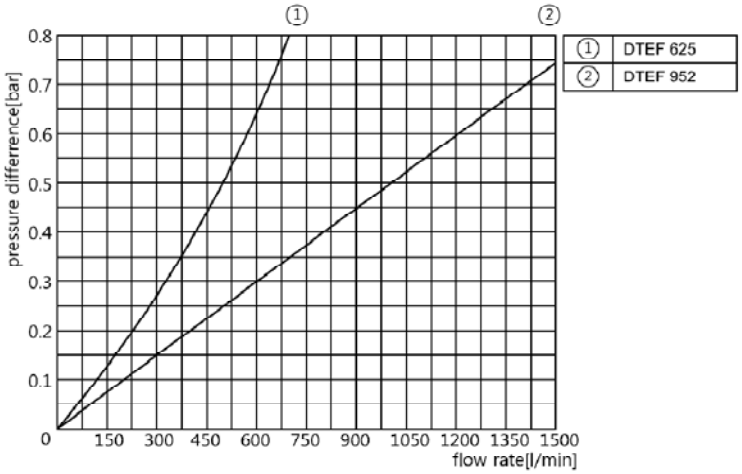
DTEF70~120 SERIES



DTEF320~426 SERIES



DTEF 625~952 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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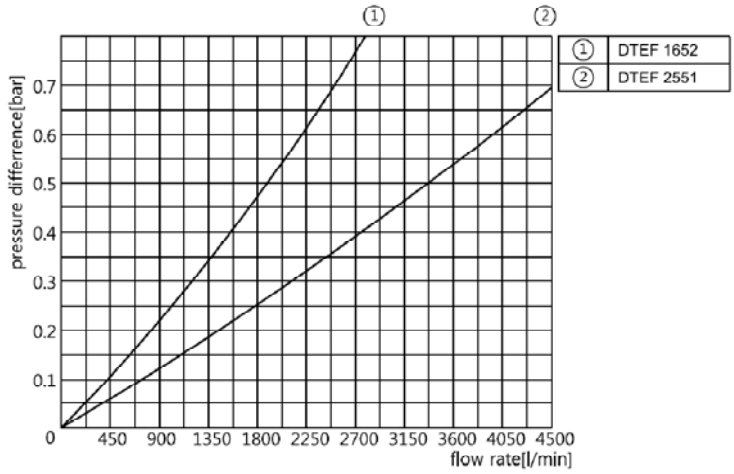
INITIAL DIFFERENCE PRESSURE

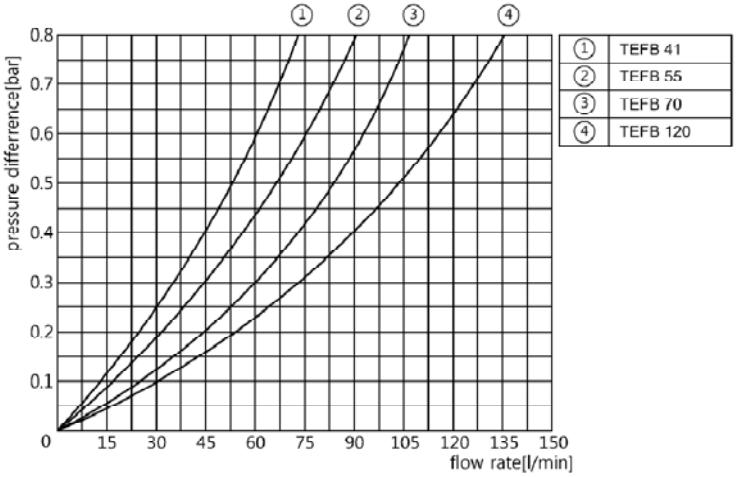
FOR RETURN FILTER SERIES - 4

Sheet No.

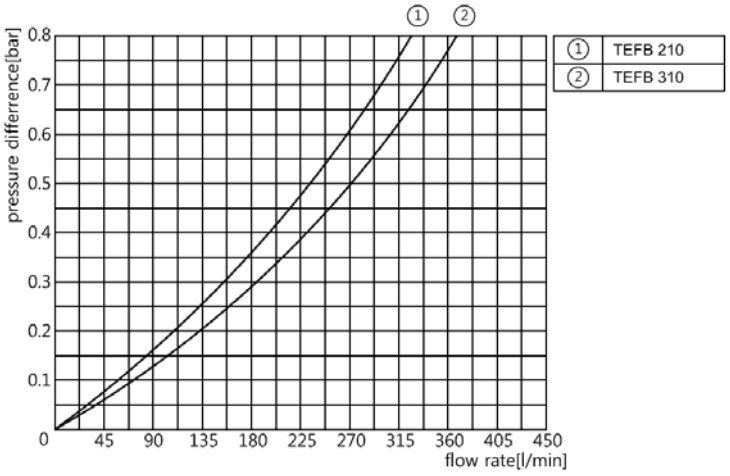
DTEF 1652~2551 SERIES



TEFB41~120 SERIES



TEFB210~310 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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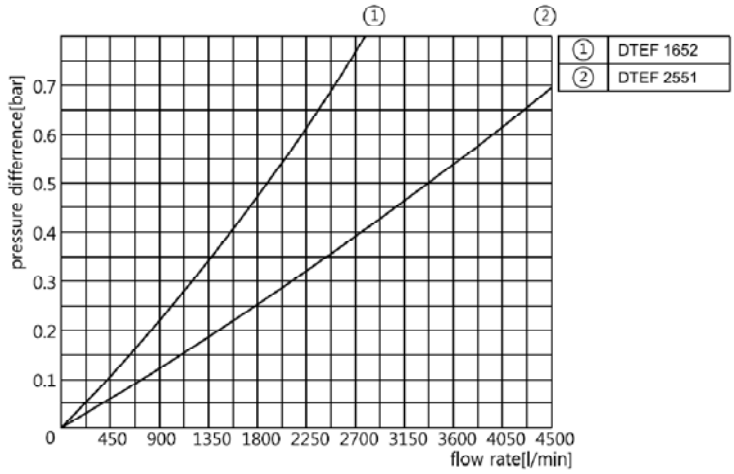
INITIAL DIFFERENCE PRESSURE

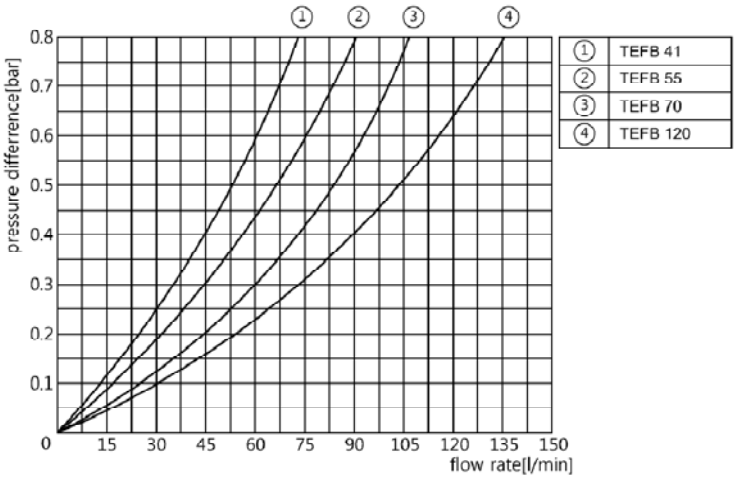
FOR RETURN FILTER SERIES - 5

Sheet No.

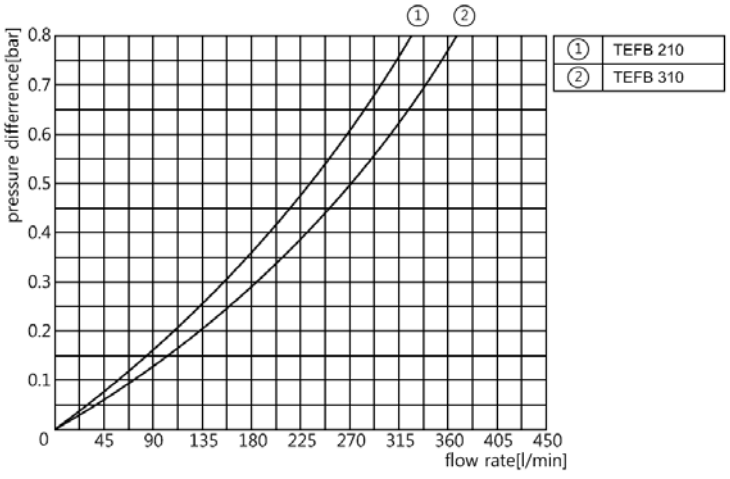
DTEF 1652~2551 SERIES



TEFB41~120 SERIES



TEFB210~310 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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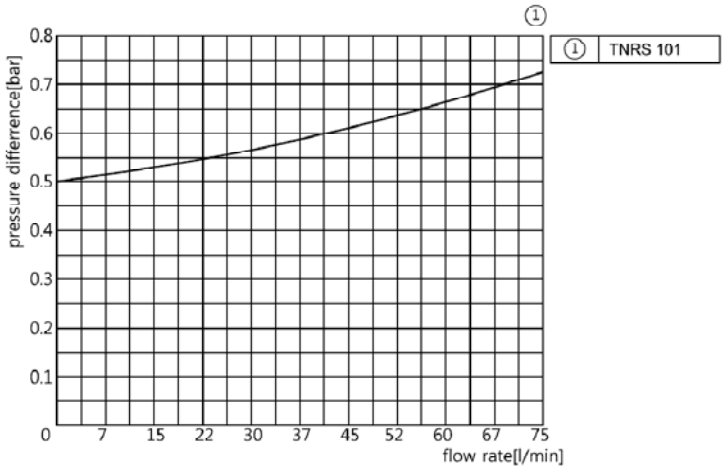
INITIAL DIFFERENCE PRESSURE

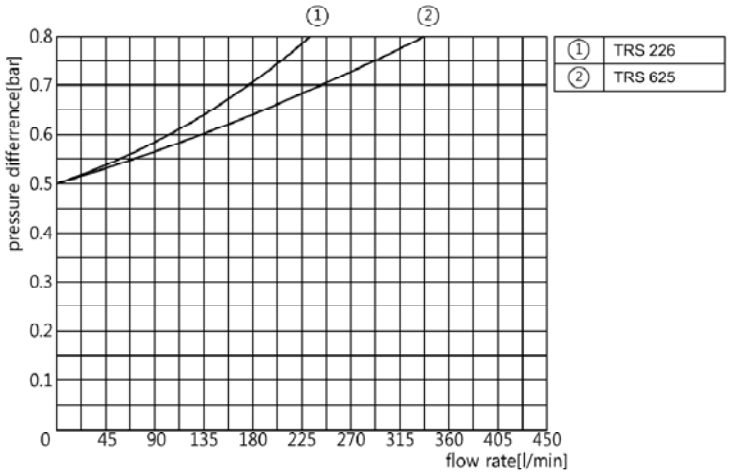
FOR RETURN FILTER SERIES - 6

Sheet No.

TNRS101 SERIES



TRS226~625 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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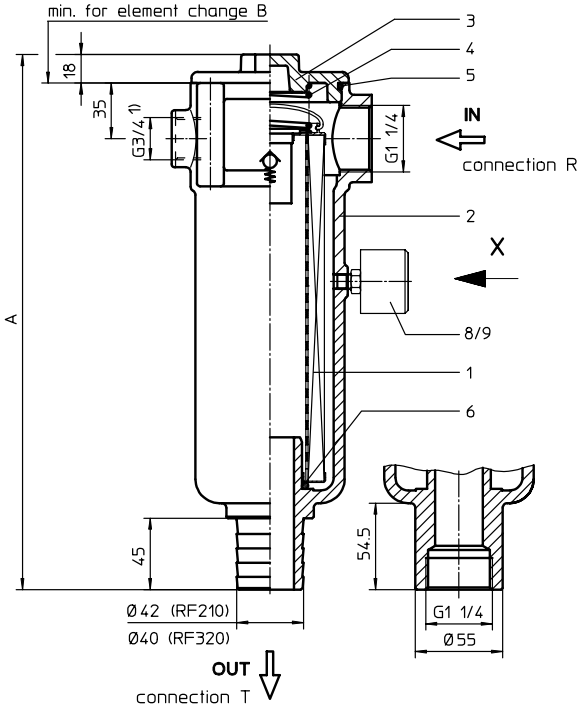
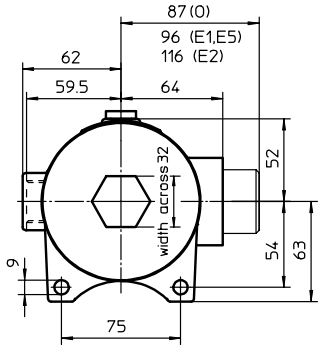
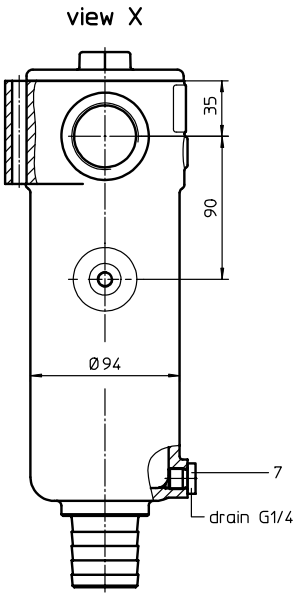
RETURN LINE FILTER
Series RF 210-320 DN 32 PN 10

Sheet No.
1102 G







1. Type index:

1.1. Complete filter: (ordering example)

RF.	210.	10VG.	16.	S.	P.	-.	G.	4.	-.	O
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
RF = return-line filter

2 **nominal size:** 210, 320

3 **filter- material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
S = with by-pass valve, Δp 2,0 bar
E = without by-pass valve

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **no. of version:**

version		3	4
connection R	**type**	G	G
	size	6	6
connection T	**type**	G	SA
	size	6	42 or 40

type: G = thread
SA = hose nozzle

size: 6 = G 1 ¼
42 = ∅ 42 (RF 210)
40 = ∅ 40 (RF 320)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

1.2. Filter element: (ordering example)

01E.	210.	10VG.	16.	S.	P.	-.	D
1	2	3	4	5	6	7	8

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 210, 320

3 - 7 see type index-complete filter

8 **accessories:**
D = with wire strap

2. Dimensions:

type	A	B	weight kg	volume tank
RF 210	337	205	2,7	1,2 l
RF 320	422	290	3,5	1,7 l

[1] additional connection „IN“ max. G ¾, by agreement

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3. Spare parts:

item	qty.	designation	dimension		article-no.	
			RF 210	RF 320		
1	1	filter element	01E. 210	01E. 320		
2	1	filter housing	NG 210	NG 320		
3	1	screw plug	M90 x 2		301910	
4	1	spring			302144	
5	1	O-ring	82 x 3		305191 (NBR)	305298 (FPM)
6	1	O-ring	40 x 3		304389 (NBR)	304391 (FPM)
7	1	screw plug	G ¼		305003	
8	1	clogging indicator, visual	O		301721	
9	1	pressure switch, electrical	E1, E2 or E5		see sheet-no. 1616	

4. Description:

Return-line filters RF 210-320 are designed for connection in return pipes. The feed pressure at „IN“ connections can be pressurized to 10 bar.
The return pipes at the „OUT“ connection must be < 1m long. The pressure in the return pipe is added to the differential pressure over the filter element and must be considered when consulting the contamination indicator.
The filter element consist of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside.
Filter finer than 40 microns should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 microns$_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter can be used with mineral oils, bio-oils, emulsions and most synthetic hydraulic fluids and lubricating oils.
During changing of the filter element care should be taken to ensure that the contaminated side of the filter is emtied before the filter is removed, to ensure that no contaminated liquid enters the discharge pipes. After depressurizing the filter or emptying the contaminated side of the filter and removing the filter cover, the element should be removed by the wire strap and a new element fitted.
Disposal of the contaminated fluid removed from the filter must be carried out in accordance with national regulations.

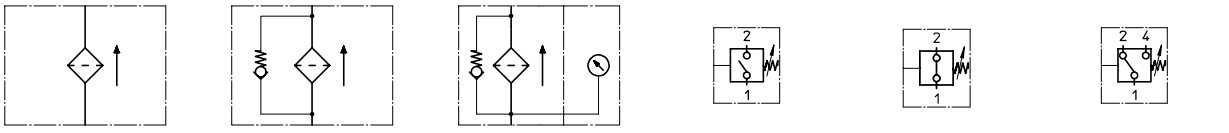
5. Technical data:

temperature range:	-10°C bis +80°C (for a short time +100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	10 bar
opening pressure by-pass valve:	2,0 bar
connection system:	thread connection according to DIN 3852, T2
output:	hose nozzle or thread connection
housing material:	Al-cast; glass fiber reinforced polyamide (filter cover)
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:

without accessories | with by-pass valve | visual O | electrical contact maker E1 | electrical contact breaker E5 | electrical contact maker/breaker E2



7. Pressure drop flow curves:

Precise flow rates see ‘INF-Expert-System Filter’, respectively Δp-curves ; depending on filter fineness and viscosity.

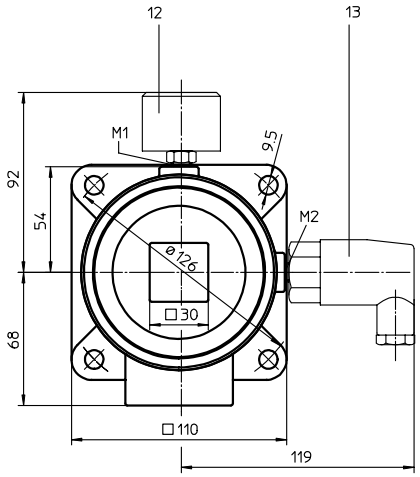
8. Test methods:

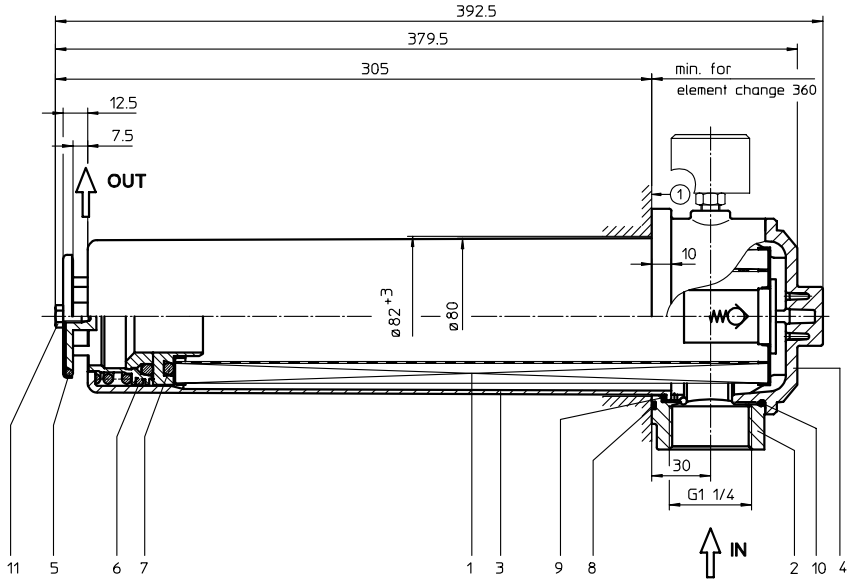
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

RETURN LINE FILTER, for horizontal tank-mounting
Series TRW 310 DN 32 PN 10

Sheet No.
1068 C





1. Type index:

1.1. Complete filter: (ordering example)

TRW.	310.	10VG.	16.	S.	P.	-.	G.	6.	-.	O.	E2
1	2	3	4	5	6	7	8	9	10	11	12

1 series:
TRW = return-line-filter for horizontal tank-mounting

2 nominal size: 310

3 filter-material and filter-fineness:
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 resistance of pressure difference for filter element:
16 = Δp 16 bar

5 filter element design:
E = without by-pass valve
S = with by-pass valve, Δp 2,0 bar

6 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification:
- = standard
VA = stainless steel

8 connection:
G = thread connection according to DIN 3852, T2

9 connection size:
6 = G 1 ¼

10 filter housing specification:
- = standard

11 clogging indicator at M1:
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 clogging indicator at M2:
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01E.	320.	10VG.	16.	S.	P.	-
1	2	3	4	5	6	7

1 series:
01E. = filter element according to INTERNORMEN factory specification

2 nominal size: 320

3 - **7** see type index-complete filter

mounting surface ①

surface quality 3,2

flatness tolerance ⏥ 0,2

weight: approx. 2,8 kg

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2. Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	filter element	01.E 320		
2	1	filter head	NG 210-310	304423	
3	1	filter bowl	NG 310		
4	1	screw plug	M 90 x 2	316637	
5	1	O-ring	53 x 4	309143 (NBR)	- (FPM)
6	1	O-ring	62 x 4	308045 (NBR)	311472 (FPM)
7	2	O-ring	44 x 6	302222 (NBR)	304384 (FPM)
8	1	O-ring	88 x 3	304417 (NBR)	310266 (FPM)
9	1	O-ring	75 x 3	302215 (NBR)	304729 (FPM)
10	1	O-ring	82 x 3	305191 (NBR)	305298 (FPM)
11	1	sheet metal screw	DIN 7976-F 6,3x13	316641	
12	1	clogging indicator, visual	O	301721	
13	1	pressure switch, electrical	E1, E2 or E5	see sheet-no. 1616	

3. Description:

Return-line filters in the TRW series are suitable for a working pressure up to 10 bar.
Pressure peaks will be absorbed by a sufficient margin of safety.
The TRW-filters are directly mounted to the reservoir and connected to the return-line. The return-area „IN“ must be below the oil level.
The filter element consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside. Filters finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filters can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.
INTERNORMEN-Filters elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.
When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

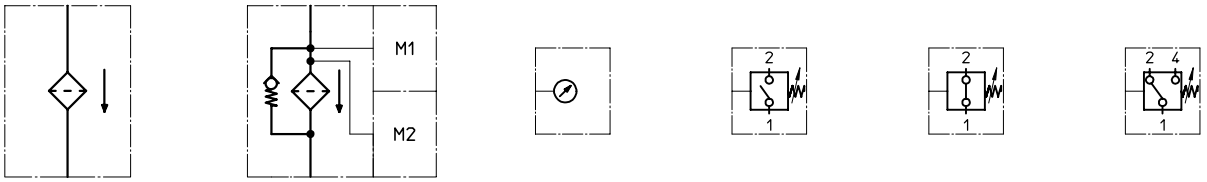
4. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	10 bar
opening pressure by-pass valve:	2,0 bar
connection system:	thread connection according to DIN 3852, T2
housing material:	Al-cast, glass fiber reinforced polyamide
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	1,5 l

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

5. Symbols:

without indicator | with by-pass valve | visual O | electrical contact maker E1 | electrical contact breaker E5 | electrical contact maker/breaker E2



6. Pressure drop flow curves:

Precise flow rates see ‘INF-Expert-System Filter’, respectively Δp-curves; depending on filter fineness and viscosity.

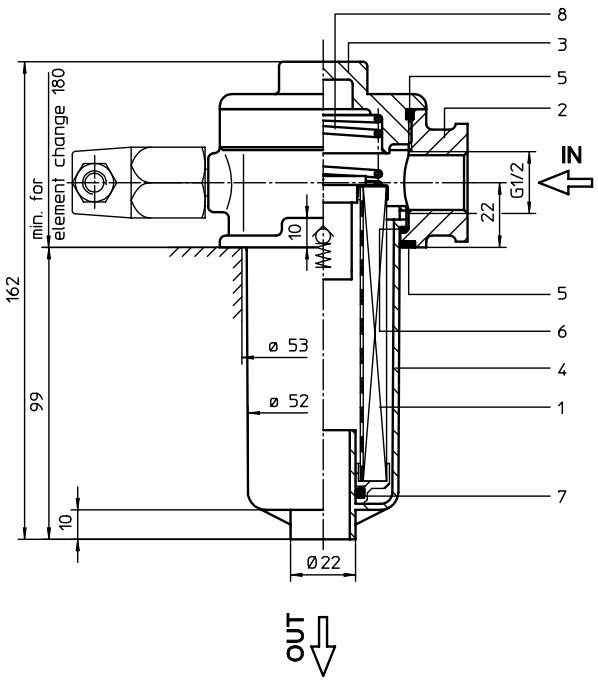
7. Test methods:

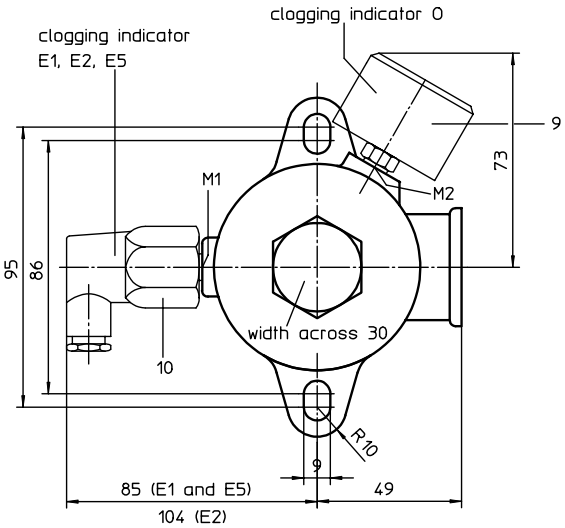
Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

RETURN LINE FILTER
Series TEF 41 DN 16 PN 10

Sheet No.
1040 D





When equiped with one clogging indicator use preferably connection M1.

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 41. 10VG. 16. S. P. -. G. 3. -. E1. O (filter with by-pass valve)

1	2	3	4	5	6	7	8	9	10	11	12

TEF. 41. 10VG. 30. E. P. -. G. 3. -. E1. O (filter without by-pass valve)

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEF = tank-mounted return-line-filter

2 **nominal size:** 41

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$,
3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper only with 01E.41

4 **resistance of pressure difference for filter element:**
16 = 01E.41 for Δp 16 bar (standard with by-pass valve)
30 = 01E.60 for Δp 30 bar (standard without by-pass valve)

5 **filter element design:**
E = without by-pass valve (01E.60)
S = with by-pass valve (01E.41) Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
3 = G ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 41. 10VG. 16. S. P. - (with by-pass valve)

1	2	3	4	5	6	7

01E. 60. 10VG. 30. E. P. - (without by-pass valve)

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size**: 41, 60

3 - 7 see type index-complete filter

weight: 0,8 kg

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Changes of measures and design are subject to alteration!

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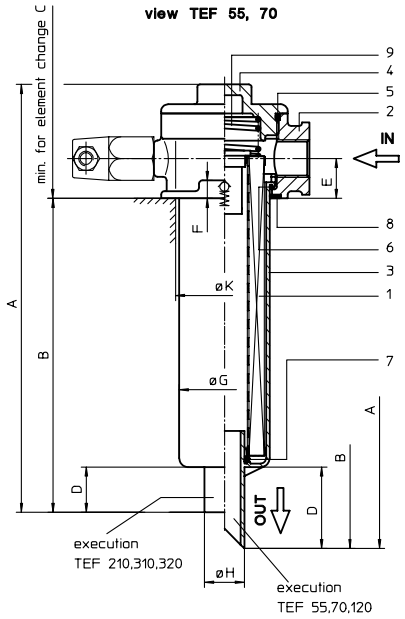
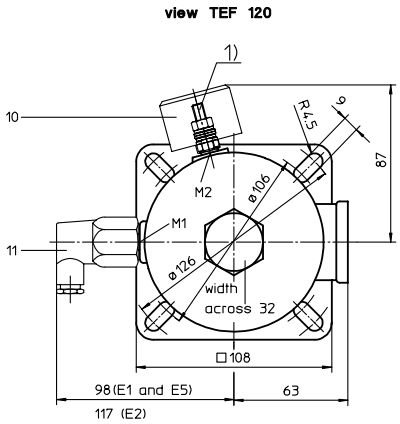
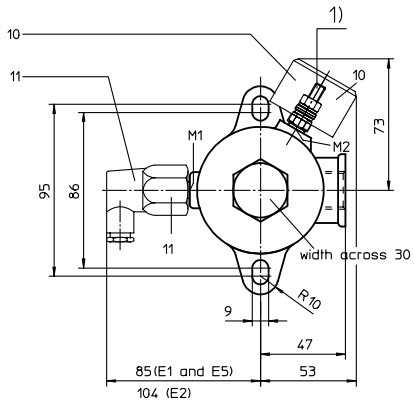
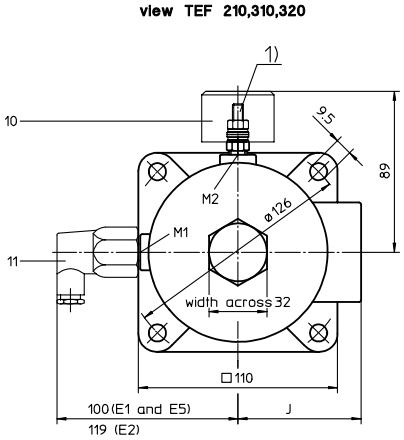
RETURN LINE FILTER
Series TEF 55-320 DN 16-40 PN 10

Sheet No. **1002 S**









When equiped with one clogging indicator use preferably connection M1.

[1] connection for the potential equalisation, only for application in the explosive area

2. Dimensions:

type	connection	A	B	C	D	E	F	G	H	J	K	weight kg	volume tank
TEF 55	G ½	257	194	270	45	22	10	52	21	-	53	0,9	0,3 l
TEF 70	G ¾	257	194	270	45	22	10	52	21	-	53	0,9	0,3 l
TEF 120	G1	285	211	300	65	27	10	70	24	-	72^{+10}	1,5	0,6 l
TEF 210	G 1 ¼	302	227	350	25	30	10	80	38	68	82^{+3}	2,1	1,1 l
TEF 310	G 1 ¼	387	312	405	25	30	10	80	38	68	82^{+3}	2,5	1,4 l
TEF 320	G 1 ½	418	327	465	40	36	10	85	44	71	86^{+6}	2,8	1,7 l

EDV 10/07

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 70. 10VG. 16. S. P. -. G. 4. -. E1. O

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEF = tank-mounted return-line filter

2 **nominal size:** 55, 70, 120, 210, 310, 320

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
3 = G ½ TEF 55
4 = G ¾ TEF 70
5 = G1 TEF 120
6 = G1 ¼ TEF 210/310
7 = G 1 ½ TEF 320

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS11 = see sheet-no. 40530

11 **measure connection at M1:**
- = without clogging indiator
O = visual see, sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616
PA = potential equalisation

12 **mesure connection at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 70. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 70 (TEF55/70), 120 (TEF120), 210 (TEF210), 320 (TEF310/320)

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration

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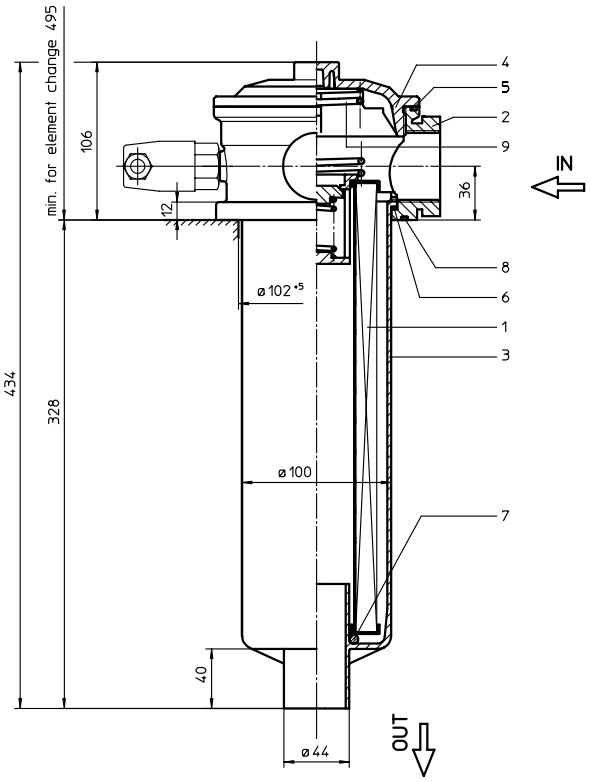
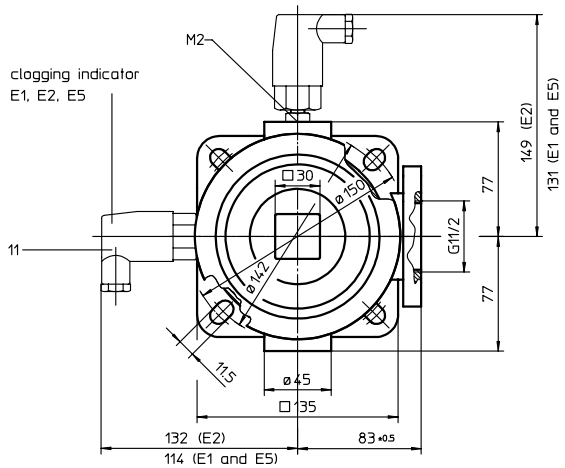
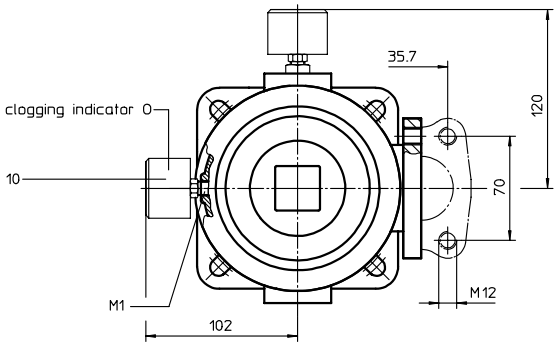
RETURN LINE FILTER
Series TEF 426 DN 40 PN 10

Sheet No.
1043 F







When equiped with one clogging indicator use preferably connection M1.

1. Type index:

1.1. Complete filter: (ordering example)

TEF.	426.	10VG.	16.	S.	P.	-.	G.	7.	-.	O.	E1
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEF = tank-mounted return-line-filter

2 **nominal size:** 426

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2
FS = SAE-flange connection 3000 PSI

9 **connection size:**
7 = G 1 ½ or 1 ½“ SAE

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E.	425.	10VG.	16.	S.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 425

3 - 7 see type index-complete filter

weight: 2,6 kg

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EDV 05/05

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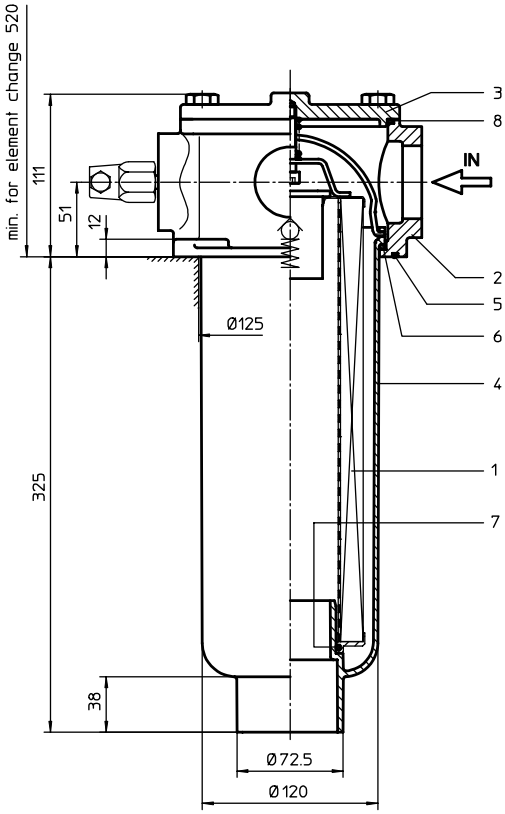
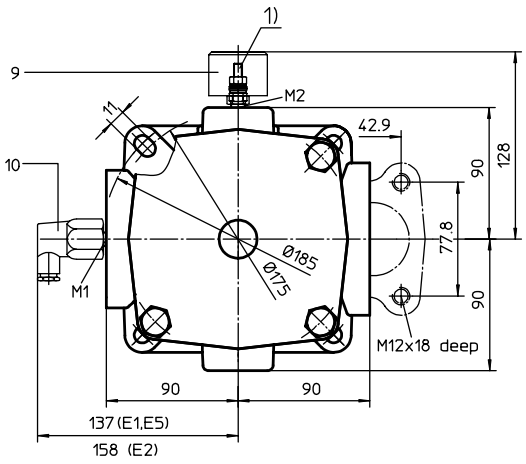
RETURN LINE FILTER
Series TEF 625 DN 50 PN 10

Sheet No.
1042 F





When equiped with one clogging indicator use preferably connection M1.

[1)] connection for the potential equalisation, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 625. 10VG. 16. S. P. -. FS. 8. -. E1. O

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEF = tank-mounted return-line-filter

2 **nominal size:** 625

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material**:
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
8 = 2“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS11 = see sheet-no. 40530

11 **measuring connection at M1:**
- = without clogging indicator
O = clogging indicator visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616
PA = potential equalisation

12 **measuring connection at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 631. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 631

3 - 7 see type index complete filter

2. Accessories:

- Counter flange, see sheet-no. 1652

weight: 4,5 kg

EDV 06/07

Changes of measures and design are subject to alteration!

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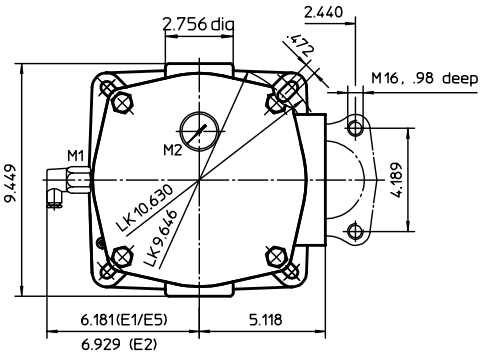
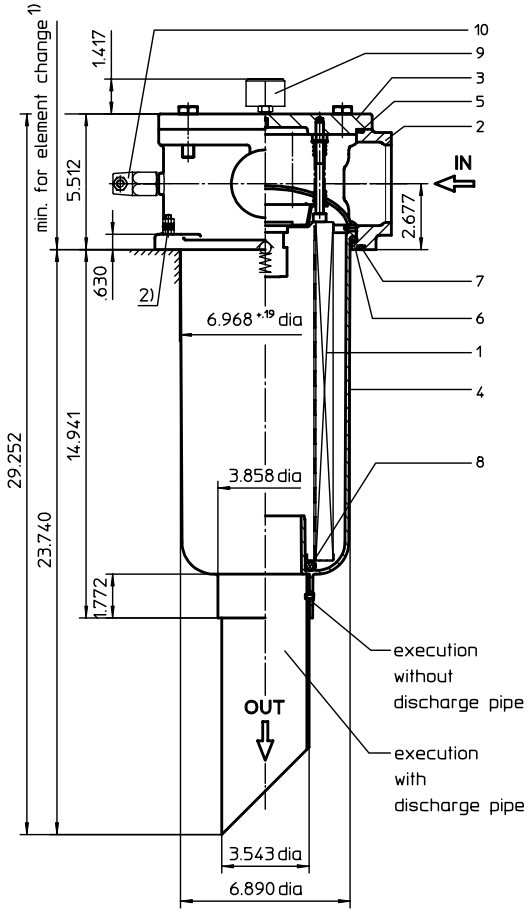
RETURN LINE FILTER
Series TEF 952 145 PSI

Sheet No.
1060 D



1) min. for element change without discharge pipe 21.88
min. for element change witht discharge pipe 30.70



When equiped with one clogging indicator use preferably connection M1.

2) Connection for the potential equalisation, only for application on the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 952. 10VG. 10. S. P. -. FS. A. -. E1. O. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TEF = tank-mounted return-line-filter

2 **nominal size**: 952

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 145 PSI

5 **filter element design:**
E = without by-pass valve
S = with by-pass Δp valve 29 PSI

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
A = 3”

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS11 = see sheet-no. 40530

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **discharge pipe:**
- = without
1 = with discharge pipe

1.2. Filter element: (ordering example)

01E. 950. 10VG. 10. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 950

3 - 7 see type index-complette filter

2. Accessories:

- Counter flange see sheet-no. 1652

weight: 40 lbs.

Changes of measures and design are subject to alteration!

EDV 09/07

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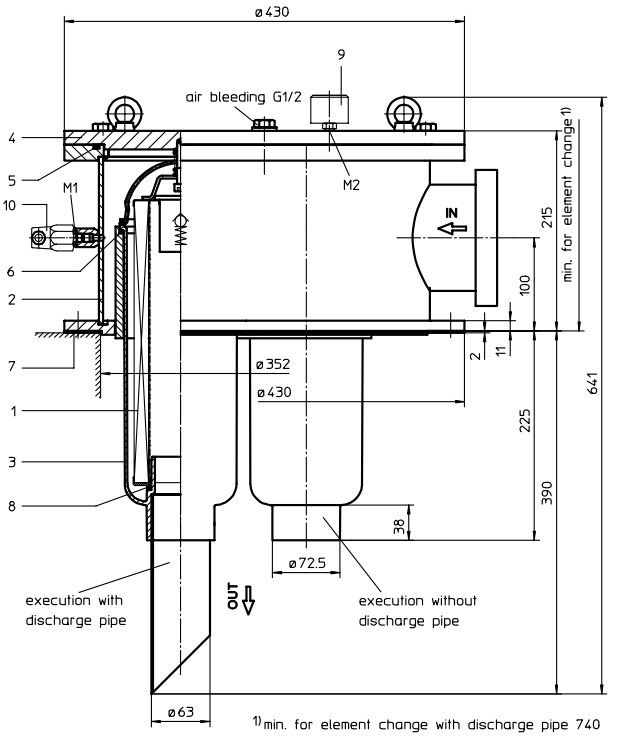
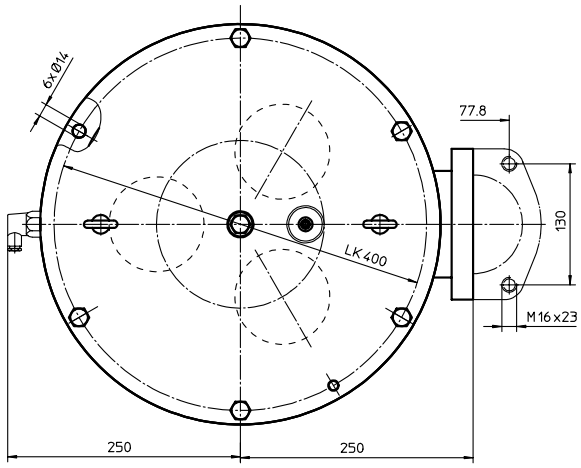
RETURN LINE FILTER
Series TEF 1652 DN 100 PN 10

Sheet No.
1056 D



1) min. for element change with discharge pipe 740
min. for element change without discharge pipe 575



When equiped with one clogging indicator use preferably connection M1.

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 1652. 10VG. 16. S. P. - FS. B. - E1. O. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TEF = tank-mounted return-line-filter

2 **nominal size:** 1652

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
B = 4“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **discharge pipe:**
- = without
1 = with discharge pipe

1.2. Filter element: (ordering example)

01E. 631. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 631

3 - 7 see type index-complete filter

2. Accessories:

- Counter flange see sheet-no. 1652

weight: approx. 55 kg

Changes of measures and design are subject to alteration!

EDV 08/03

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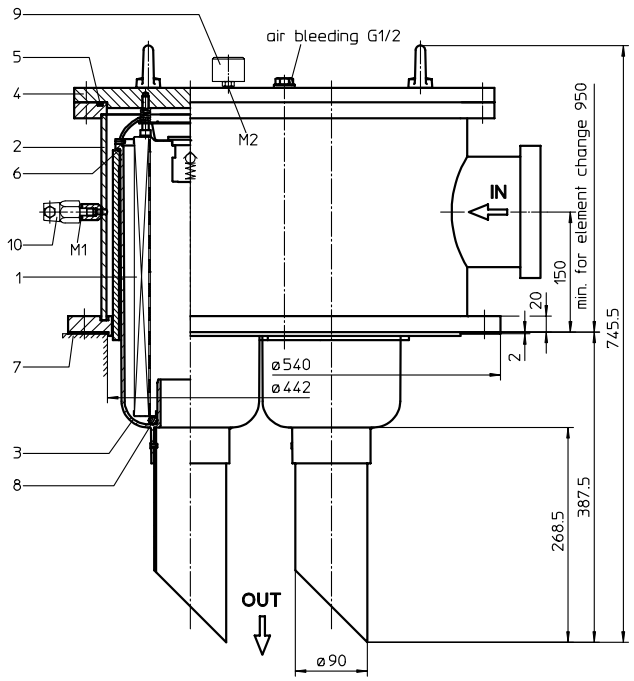
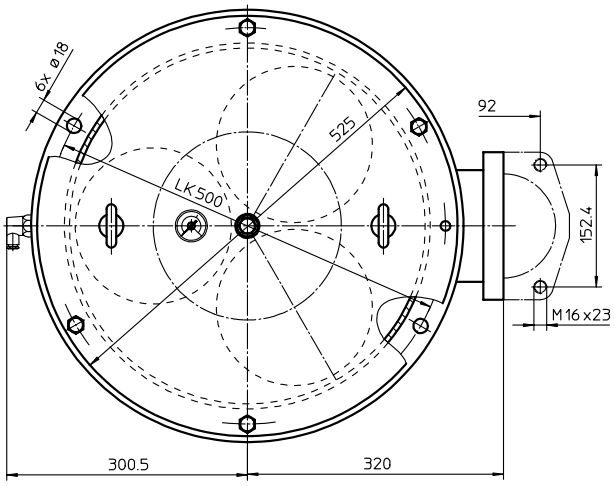
RETURN LINE FILTER
Series TEF 2551 DN 125 PN 10

Sheet No.
1015 O





When equiped with one clogging indicator use preferably connection M1.

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 2551. 10VG. 10. S. P. -. FS. C. -. E1. O

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEF = tank-mounted return-line-filter

2 **nominal size:** 2551

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
C = 5“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 950. 10VG. 10. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 950

3 - 7 see type index-complete filter

2. Accessories:

- Counter flange, see sheet-no. 1652

weight: approx. 125 kg

EDV 08/06

Changes of measures and design are subject to alteration!

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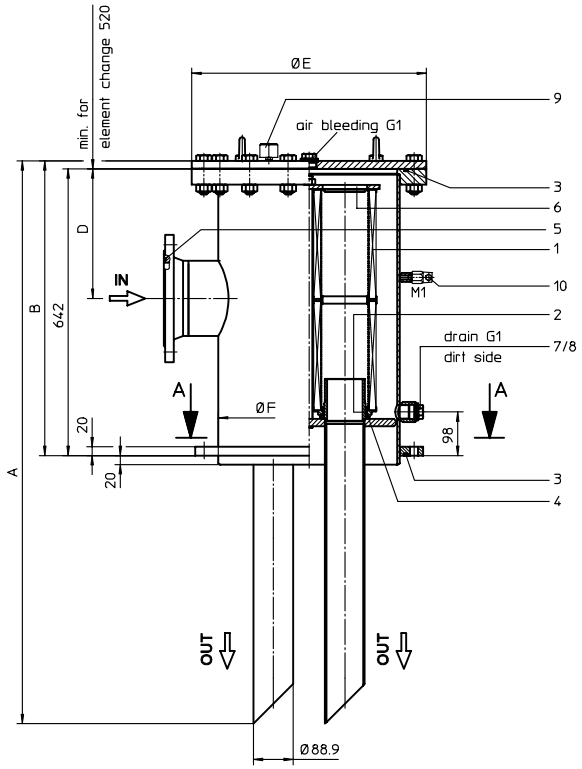
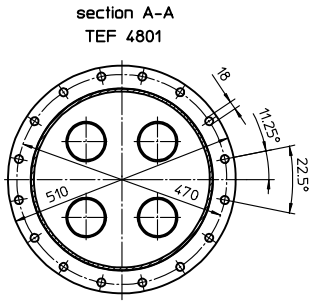
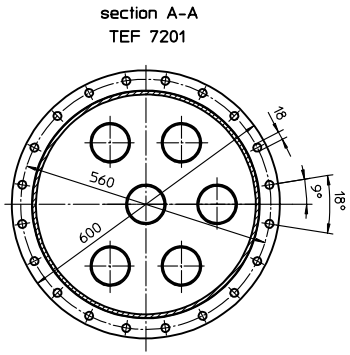
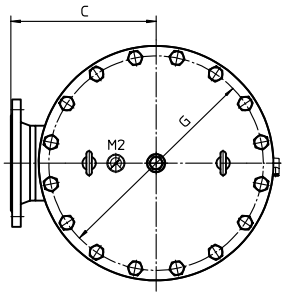
RETURN LINE FILTER
Series TEF 4801-7201 DN 150-200 PN 10

Sheet No. **1058 D**









When equiped with one clogging indicator use preferably connection M1.

2. Dimensions:

type	connection	A	B	C	D	E	F	G	weight	volume tank
TEF 4801	DN 150	1260	660	325	290	525	406	480	193	75,0 l
TEF 7201	DN 200	1264	664	400	280	615	508	570	252	117,0 l

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 4801. 10VG. 10. S. P. -. FD3. D. -. E1. O

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEF = tank-mounted return-line filter

2 **nominal size:** 4801, 7201

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FD3 = flange DIN 2633 with O-ring groove (TEF 4801)
FD13 = flange DIN 2632 with O-ring groove (TEF 7201)

9 **connection size:**
D = DN 150 (TEF 4801)
E = DN 200 (TEF 7201)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual see, sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 1201. 10VG. 10. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 1201

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration!

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EDV 08/05

1. Technical data

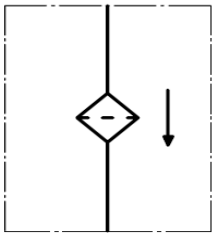
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	TEF.41	01E.41	1	With by-pass valve(△p 16bar)
2	TEF.41	01E.60	1	Without by-pass valve(△p 30bar)
3	TEF.55	01E.70	1	
4	TEF.70	01E.70	1	
5	TEF.120	01E.120	1	
6	TEF.210	01E.210	1	
7	TEF.310	01E.320	1	
8	TEF.320	01E.320	1	
9	TEF.426	01E.425	1	
10	TEF.625	01E.631	1	
11	TEF.952	01E.950	1	
12	TEF.1652	01E.631	3	
13	TEF.2551	01E.950	3	
14	TEF.4801	01E.1201	4	
15	TEF.7201	01E.1201	6	

2. Description

Return-line filters in the TEF series are suitable for a working pressure up to 10 bar.
Pressure peaks will be absorbed by a sufficient margin of safety.
The TEF-filters are directly mounted to the reservoir and connected to the return-line.
The filter element consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside. Filters finer than 40 µm should use throw-away elements made of paper or Interpor fleece. Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filters can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.
INTERNORMEN-Filters elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.
When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

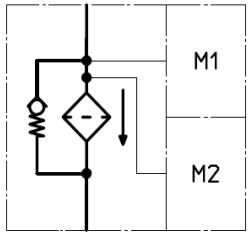
3. Symbols

without indicator

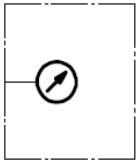


visual O

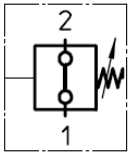
with by-pass valve

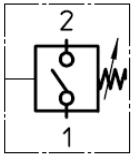


electrical
contact maker
E1

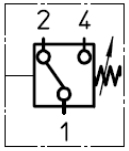


electrical
contact breaker
E5





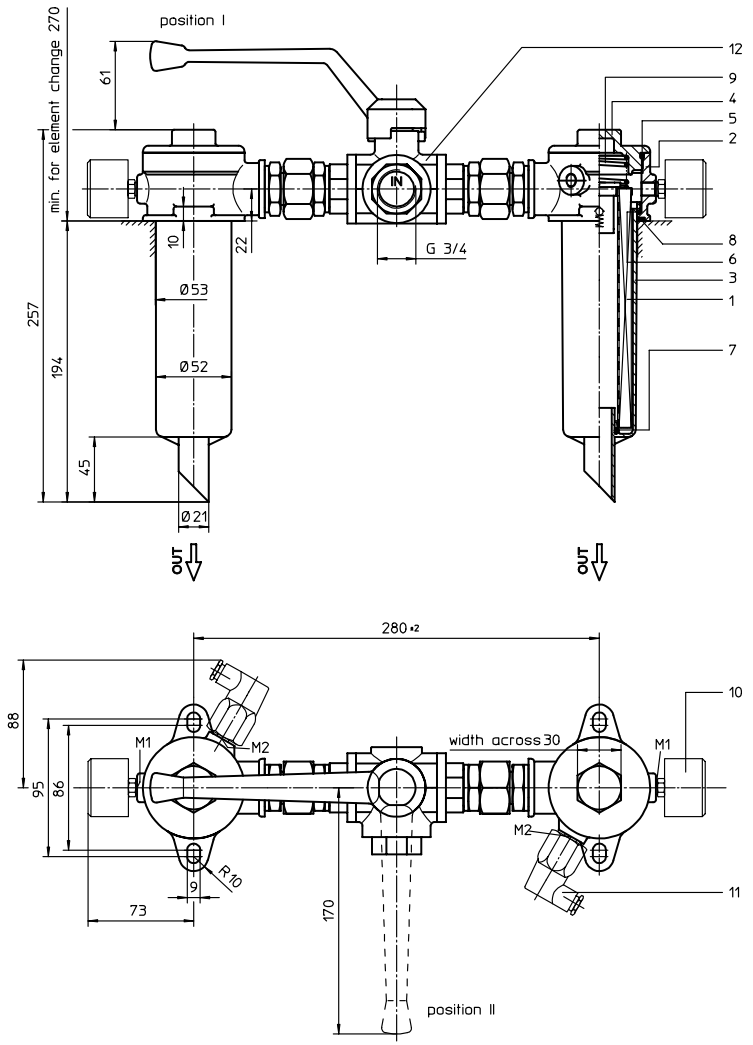
electrical
contact maker/breaker
E2



RETURN LINE FILTER, change-over

Series DTEF 70 DN 20 PN 10

Sheet No. **1021 E**



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 70. 10VG. 16. S. P. -. G. 4. -. O. E5

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 70

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
4 = G ¾

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 70. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 70

3 - 7 see Type index-complete filter

weight: approx. 3,7 kg

Changes of measures and design are subject to alteration!

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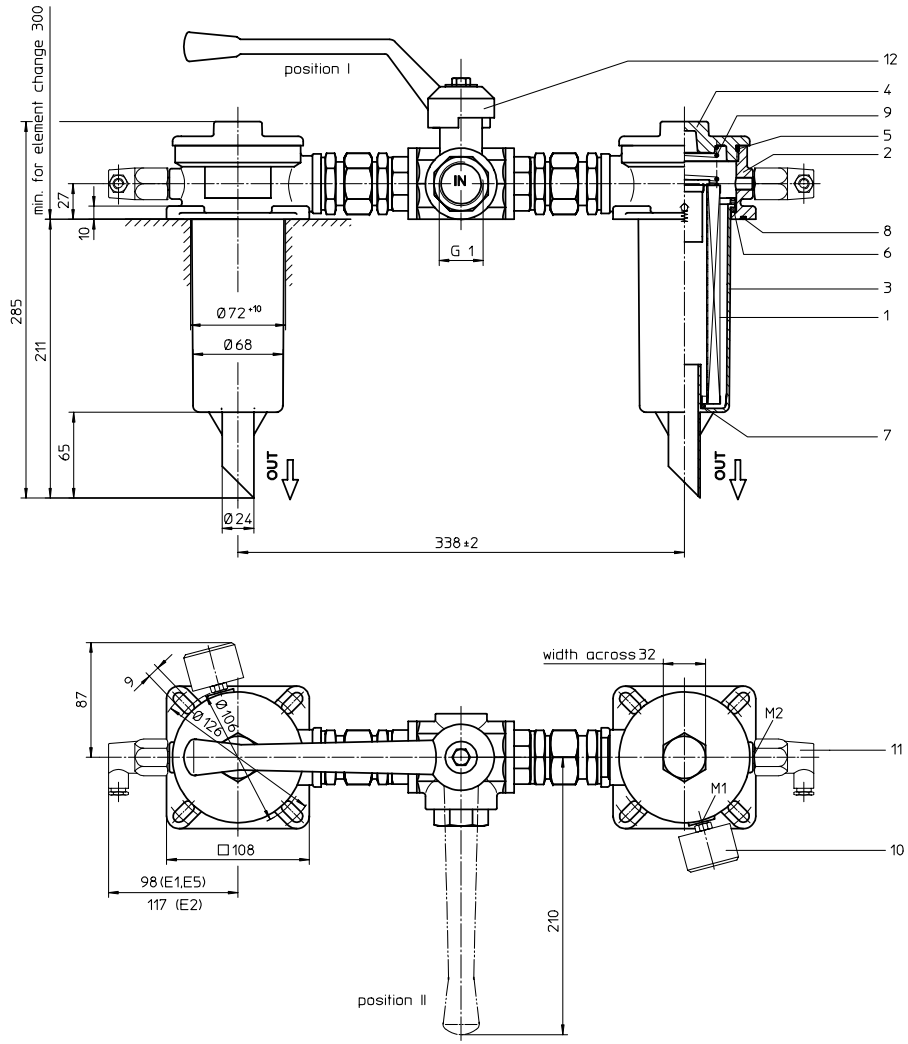
RETURN LINE FILTER, change-over
Series DTEF 120 DN 25 PN 10

Sheet No. **1022 E**



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 120. 10VG. 16. S. P. -. G. 5. -. O. E1

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 120

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
5 = G 1

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 120. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 120

3 - 7 see Type index-complete filter

weight: approx. 6,0 kg

Changes of measures and design are subject to alteration!

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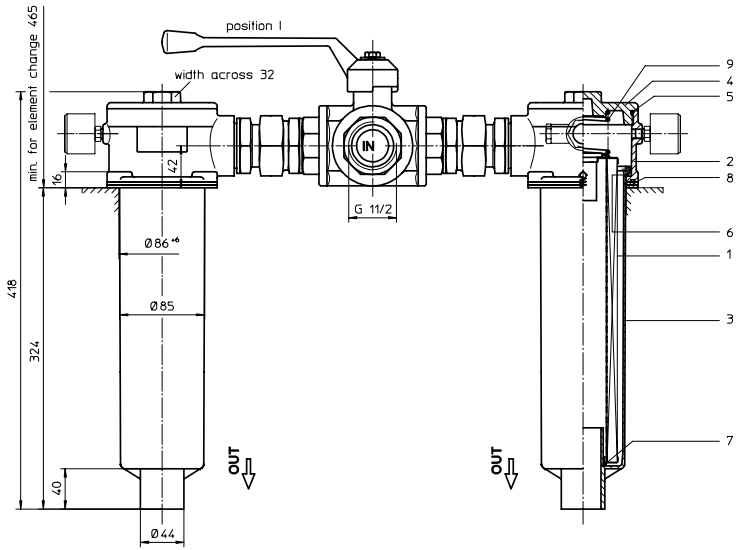
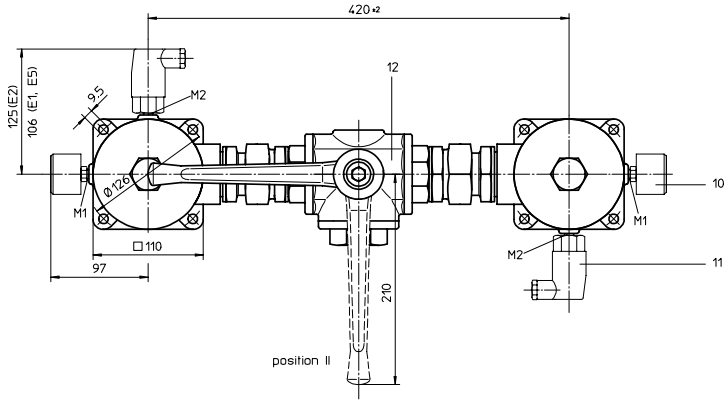
RETURN LINE FILTER, change-over

Series DTEF 320 DN 40 PN 10

Sheet No. **1023 L**





Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 320. 10VG. 16. S. P. -. G. 7. -. O. E1

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 320

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
7 = G 1 ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 320. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 320

3 - 7 see Type index-complete filter

weight: approx. 10 kg

Changes of measures and design are subject to alteration!

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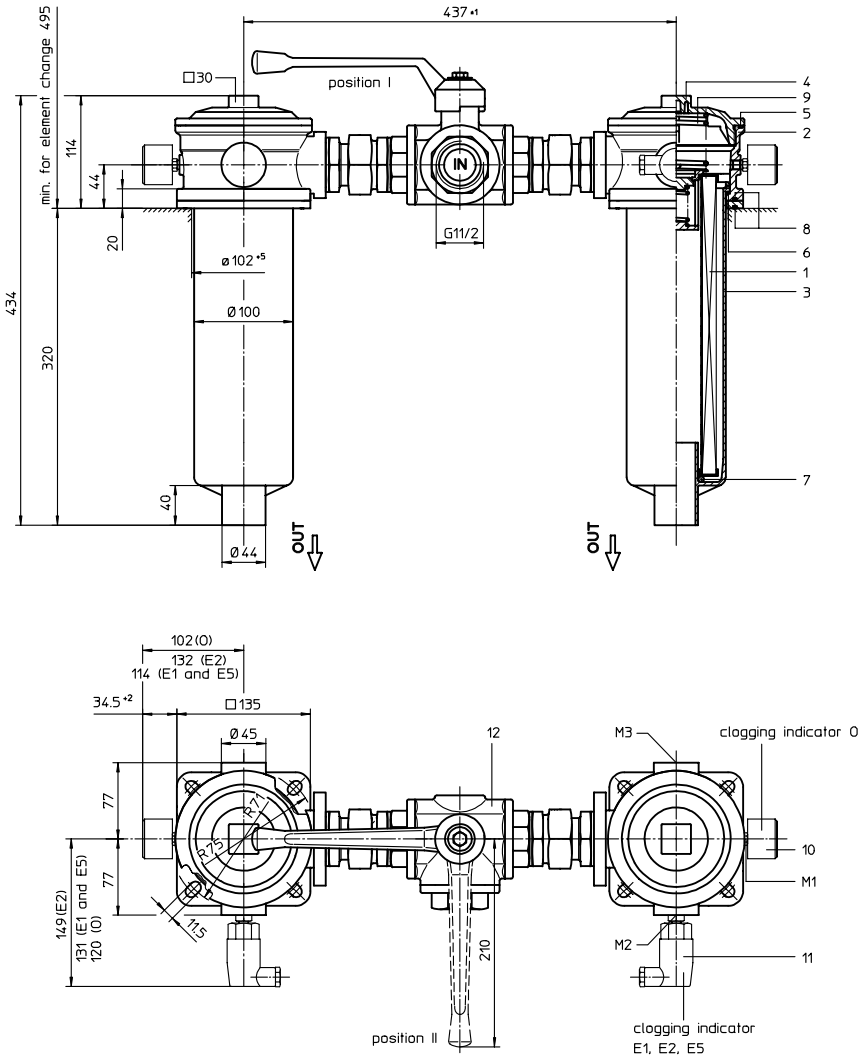
RETURN LINE FILTER, change-over

Series DTEF 426 DN 40 PN 10

Sheet No. **1035 D**



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 426. 10VG. 16. S. P. -. G. 7. -. O. E1. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 426

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
7 = G 1 ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **clogging indicator at M3:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 425. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 425

3 - 7 see Type index-complete filter

weight: approx. 12,5 kg

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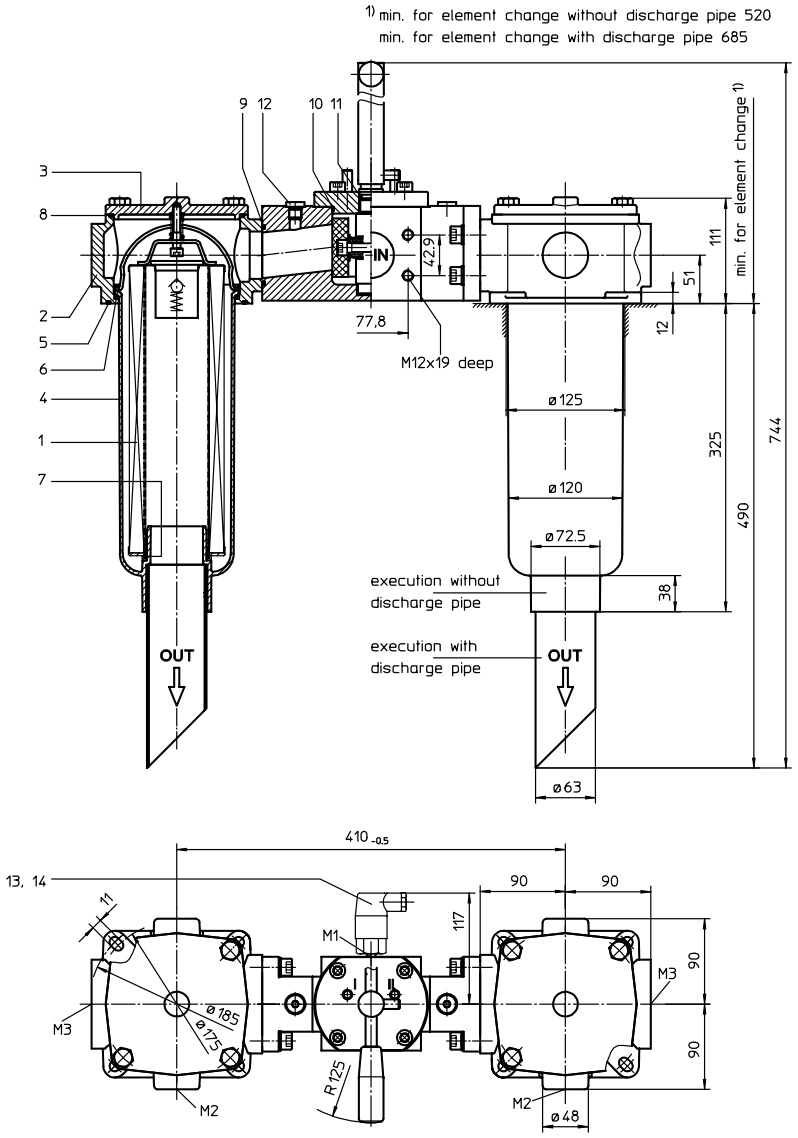
RETURN LINE FILTER, change-over

Series DTEF 625 DN 50 PN 10

Sheet No. **1074 B**



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 625. 10VG. 16. S. P. -. FS. 8. -. E2. -. -. -

1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 625

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
8 = 2“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **clogging indicator at M3:**
possible indicators see position 11 of the type index

14 **discharge pipe:**
- = without
1 = with discharge pipe

1.2. Filter element: (ordering example)

01E. 631. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 631

3 - 7 see Type index-complete filter

weight: approx. 15 kg

Changes of measures and design are subject to alteration!

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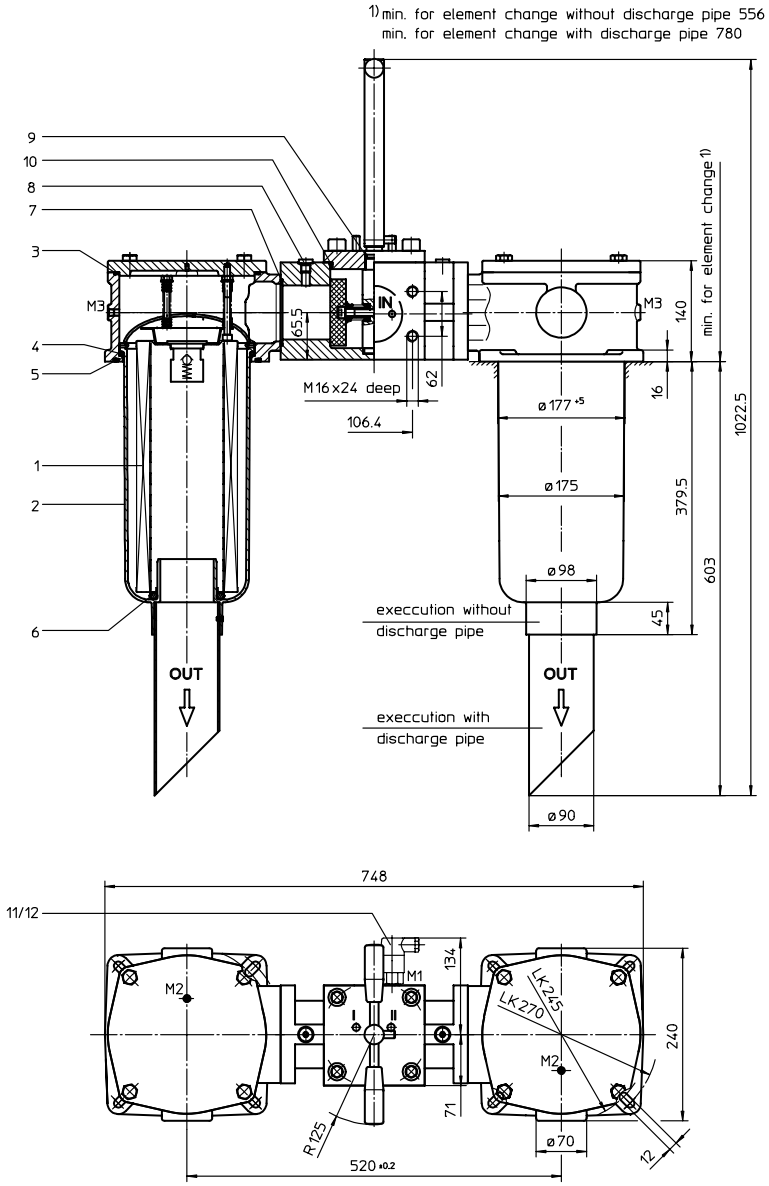
RETURN LINE FILTER, change-over

Series DTEF 952 DN 80 PN 10

Sheet No. **1075 B**



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 952. 10VG. 10. S. P. -. FS. A. -. E2. -. -. -

1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 952

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
A = 3“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **clogging indicator at M3:**
possible indicators see position 11 of the type index

14 **discharge pipe:**
- = without
1 = with discharge pipe

1.2. Filter element: (ordering example)

01E. 950. 10VG. 10. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 950

3 - 7 see Type index-complete filter

2. Accessories:

- counter flange, see sheet-no.1652

weight: approx. 54 kg

Changes of measures and design are subject to alteration!

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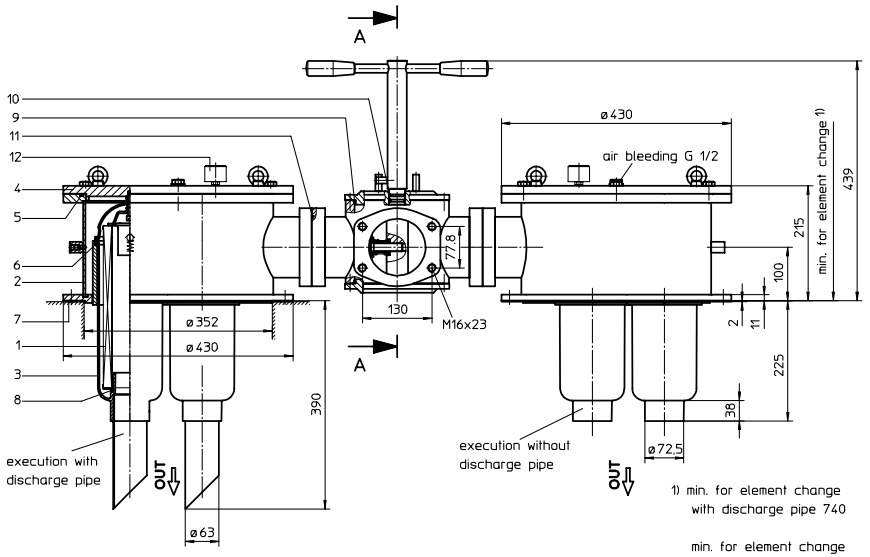
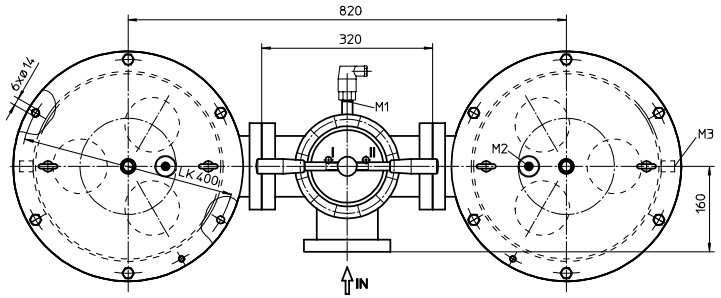
EDV 03/06

RETURN LINE FILTER, change-over

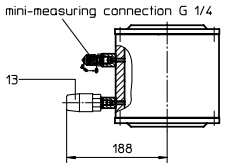
Series DTEF 1652 DN 100 PN 10

Sheet No. **1038 D**





partial section A-A



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 1652. 10VG. 16. S. P. -. FS. B. -. E1. O. -. -

1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 1652

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass; S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR); V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
B = 4"

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **clogging indicator at M3:**
possible indicators see position 11 of the type index

14 **discharge pipe:**
- = without
1 = with discharge pipe

1.2. Filter element: (ordering example)

01E. 631. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 631

3 - 7 see Type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuations- or bleeder connections, see sheet-no. 1651
- counter flange, see sheet-no.1652

weight: approx. 124 kg

Changes of measures and design are subject to alteration!

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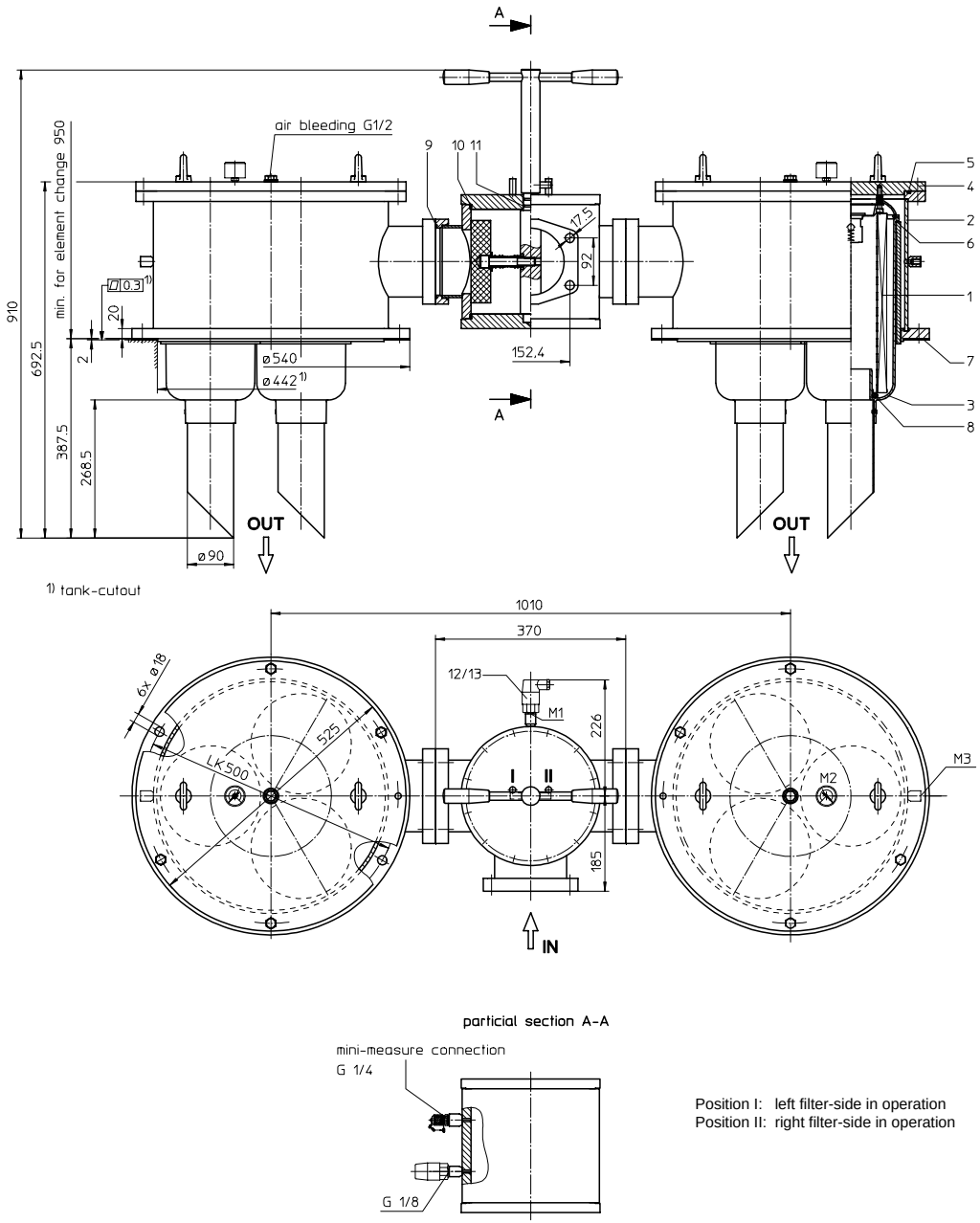
RETURN LINE FILTER, change-over

Series DTEF 2551 DN 125 PN 10

Sheet No. **1029 K**



Position I: left filter-side in operation
Position II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DTEF. 2551. 10VG. 10. S. P. -. FS. C. -. E2. O. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
DTEF = tank-mounted return-line filter, change-over

2 **nominal size:** 2551

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass
S = with by-pass, Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
C = 5“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **clogging indicator at M3:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 950. 10VG. 10. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 950

3 - 7 see Type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuations- or bleeder connections, see sheet-no. 1651
- counter flange, see sheet-no.1652

weight: approx. 275 kg

Changes of measures and design are subject to alteration!

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EDV 08/06

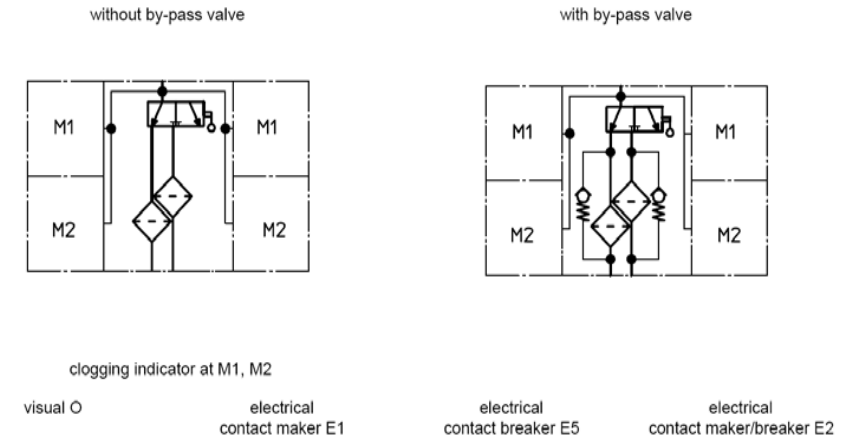
1. Technical data

NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	DTEF.70	01E.70	2	With by-pass valve(△p 16bar)
2	DTEF.120	01E.120	2	Without by-pass valve(△p 30bar)
3	DTEF.320	01E.320	2	
4	DTEF.426	01E.425	2	
5	DTEF.625	01E.631	2	
6	DTEF.952	01E.950	2	
7	DTEF.1652	01E.631	6	
8	DTEF.2251	01E.950	6	

2. Description

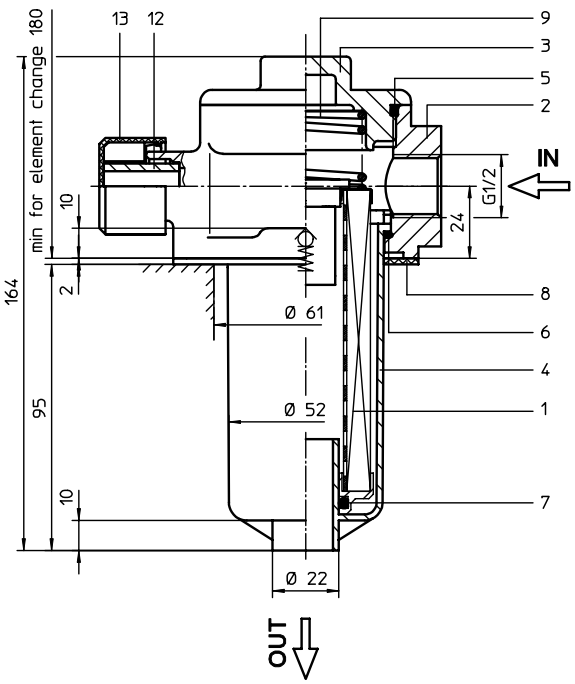
Return-line filters change-over in the DTEF series are suitable for a working pressure up to 10 bar. Pressure peaks will be absorbed by a sufficient margin of safety. The DTEF-filters are directly mounted to the reservoir and connected to the return-line.
A three-way-change-over valve which is integrated in the middle of the housing makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operat ion.
The filter element consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside. Filters finer than 40 µm should use throuw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 µm $_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filters can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.
INTERNORMEN-Filters elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.
When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

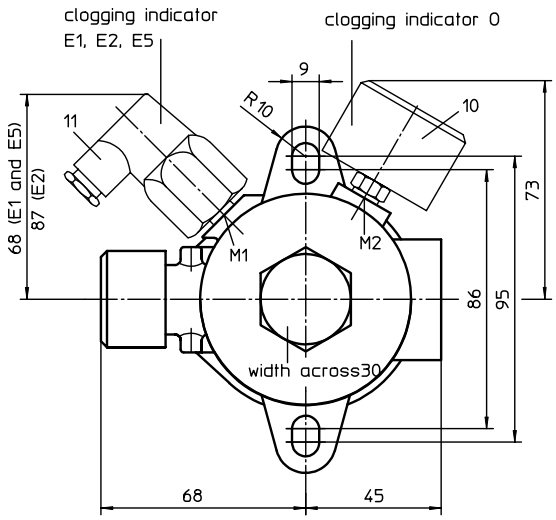
3. Symbols



RETURN LINE FILTER with breather filter
Series TEFB 41 DN 16 PN 10

Sheet No.
1041 E





When equiped with one clogging indicator use preferably connection M2.

1. Type index:

1.1. Complete filter: (ordering example)

TEFB. 41. 10VG. 16. S. P. -. G. 3. -. E1. O (filter with by-pass valve)

1	2	3	4	5	6	7	8	9	10	11	12

TEFB. 41. 10VG. 30. E. P. -. G. 3. -. E1. O (filter without by-pass valve)

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
TEFB = tank-mounted return-line-filter with breather filter

2 **nominal size:** 41

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$,
3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper only with 01E.41

4 **resistance of pressure difference for filter element:**
16 = 01E.41 for Δp 16 bar (standard with by-pass valve)
30 = 01E.60 for Δp 30 bar (standard without by-pass valve)

5 **filter element design:**
E = without by-pass valve (01E.60)
S = with by-pass valve (01E.41) Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
3 = G ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01E. 41. 10VG. 16. S. P. - (with by-pass valve)

1	2	3	4	5	6	7

01E. 60. 10VG. 30. E. P. - (without by-pass valve)

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size**: 41, 60

3 - 7 see type index-complete filter

weight: 0,9 kg

EDV 08/03

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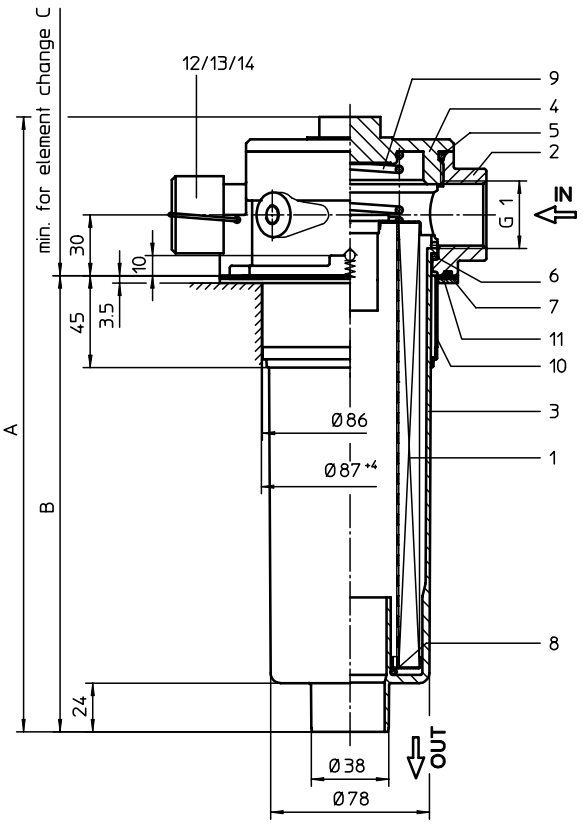
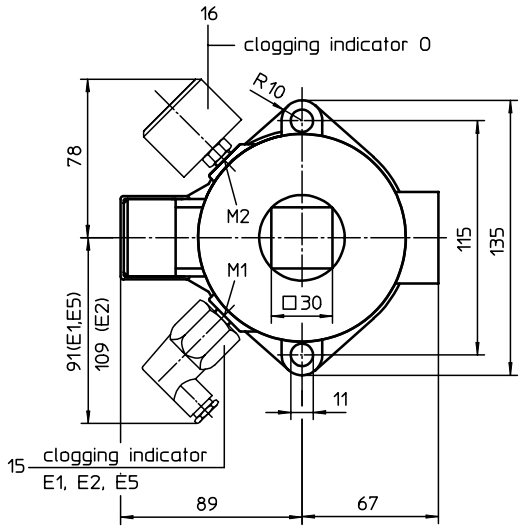
RETURN LINE FILTER
Series TEFB 210-310 DN 25 PN 10

Sheet No.
1062 E





When equiped with one clogging indicator use preferably connection M2.

1. Type index:

1.1. Complete filter: (ordering example)

TEFB.	210.	10VG.	16.	S.	P.	-.	G.	5.	-.	E1.	O.	1
1	2	3	4	5	6	7	8	9	10	11	12	13

1 series:
TEFB = tank-mounted return-line-filter with breather filter

2 nominal size: 210, 310

3 filter-material and filter-fineness:
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 resistance of pressure difference for filter element:
16 = Δp 16 bar

5 filter element design:
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification: (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 connection:
G = thread connection according to DIN 3852, T2

9 connection size:
5 = G 1

10 filter housing specification: (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 clogging indicator at M1:
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 clogging indicator at M2:
possible indicators see position 11 of the type index

13 oil separator:
- = without
1 = with oil separator

1.2. Filter element: (ordering example)

01E.	210.	10VG.	16.	S.	P.	-
1	2	3	4	5	6	7

1 series:
01E. = filter element according to INTERNORMEN factory specification

2 nominal size: 210, 320

3 - 7 see type index complete filter

2. Dimensions:

type	A	B	C	weight kg	volume tank
TEFB 210	302	224	350	2,1	1,0 l
TEFB 310	387	309	435	2,3	1,4 l

Changes of measures and design are subject to alteration!

EDV 02/06

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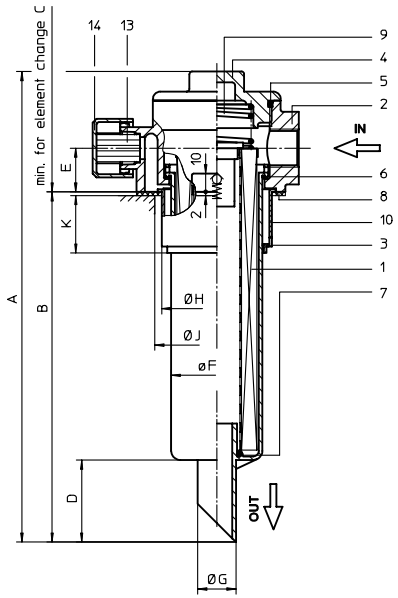
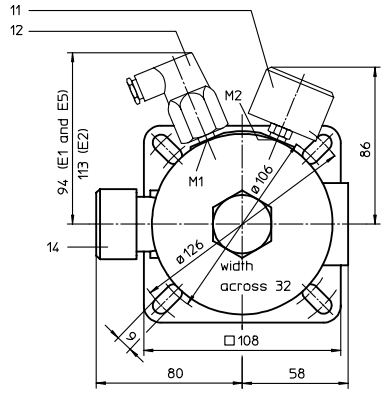
RETURN LINE FILTER, with breather filter
Series TEFB 55-120 DN 16-25 PN 10

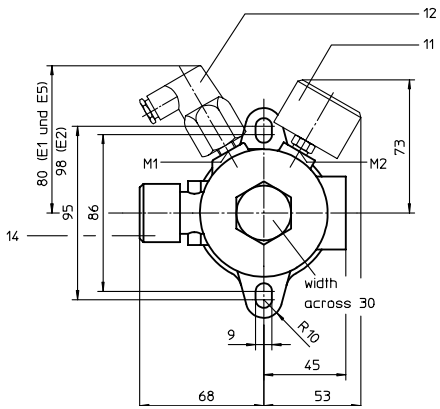
Sheet No. **1061 J**

views TEFB 55, 70



view TEFB 120





When equiped with one clogging indicator use preferably connection M2.

2. Dimensions:

type	connection	A	B	C	D	E	F	G	H	J	K	weight kg	volume tank
TEFB 55	G ½	258	192	270	45	24	52	21	60,5	61	31,5	1	0,3 l
TEFB 70	G ¾	258	192	270	45	24	52	21	60,5	61	31,5	1	0,3 l
TEFB 120	G1	284	208	300	65	30	70	24	78,5	79	42	1,5	0,6 l

1. Type index:

1.1. Complete filter: (ordering example)

TEFB. 120. 10VG. 16. S. P. -. G. 5. -. E1. O. 1

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TEFB = tank-mounted return-line filter with breather filter

2 **nominal size:** 55, 70, 120

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
3 = G ½ TEFB 55
4 = G ¾ TEFB 70
5 = G1 TEFB 120

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

13 **oil separator:**
- = without
1 = with oil separator

1.2. Filter element: (ordering example)

01E. 120. 10VG. 16. S. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 70, 120

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration!

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1. Technical data

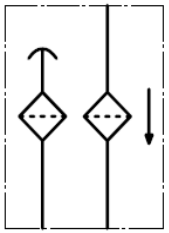
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	TEFB.41	01E.41	1	With by-pass valve
		01E.60	1	Without by-pass valve
2	TEFB.210	01E.210	1	
3	TEFB.310	01E.320	1	
4	TEFB.55	01E.70	1	
5	TEFB.70	01E.70	1	
6	TEFB.120	01E.120	1	

2. Description

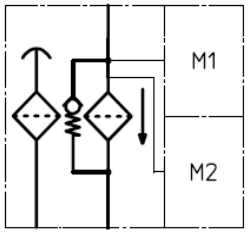
Return-line filters in the TEFB series are suitable for a working pressure up to 10 bar.
Pressure peaks will be absorbed by a sufficient margin of safety. The TEFB-filters are directly mounted to the reservoir and connected to the return-line. No connection is needed for the build-in air filter. The air filter has a 10 µm throw-away element.
The filter element consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside. Filters finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 µm $_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filters can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.
INTERNORMEN-Filters elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.
When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

3. Symbols

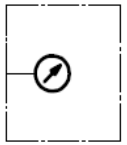
without indicator



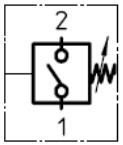
with by-pass valve



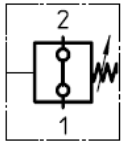
visual O



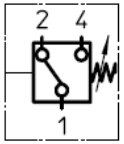
electrical
contact maker E1



electrical
contact breaker E5

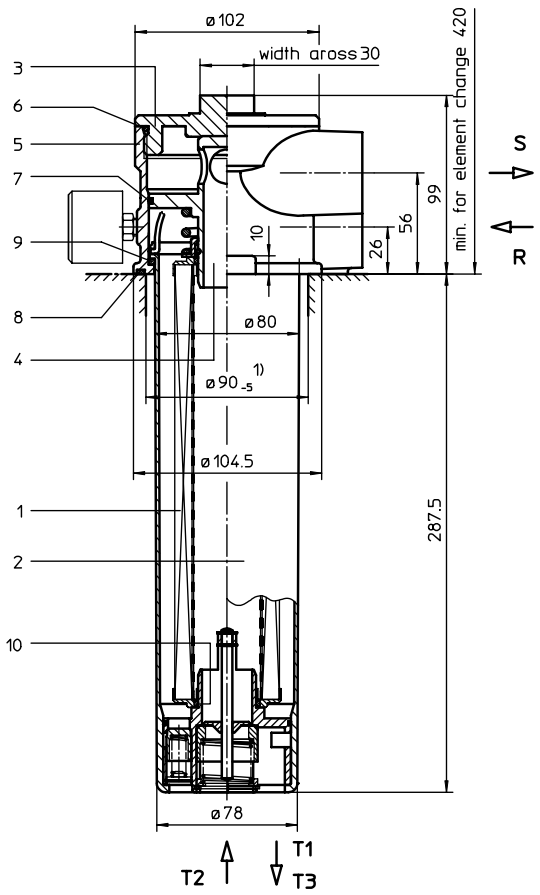


electrical
contact maker/breaker E2

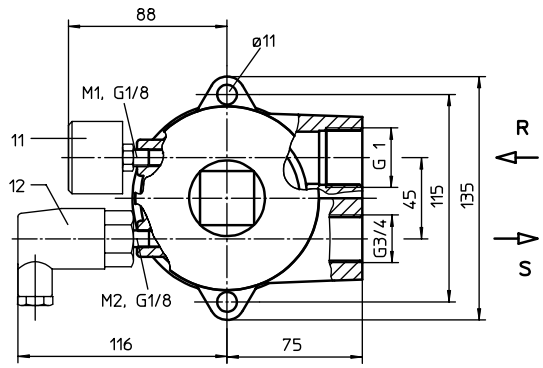


RETURN LINE FILTER, with suction connection
Series TNRS 101 DN 25 PN 10

Sheet No.
1070 E



1) tank cutout according to DIN 24550, T5



1. Type index:

1.1. Complete filter: (ordering example)

TNRS.	101.	10VG.	10.	B.	P.	-.	G.	5.	-.	S2,5.	Z.	O.	E2
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 series:
TNRS = tank-mounted return-line filter according to DIN 24550, T5 with suction connection

2 nominal size: 101

3 filter-material and filter-fineness:
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 resistance of pressure difference for filter element:
10 = Δp 10 bar

5 filter element design:
B = both sides open

6 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification:
- = standard
VA = stainless steel

8 connection:
G = thread connection according to DIN 3852, T2

9 connection size:
5 = G1

10 filter housing specification:
- = standard

11 internal valve:
S2,5 = with by-pass valve Δp 2,5 bar

12 suction valve:
Z = with suction valve

13 clogging indicator at M1:
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

14 preload pressure indicator at M2:
- = without
E2 = pressure switch, see sheet-no. 1616

1.2. Filter element: (ordering example)

01NR.	100.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 series:
01NR. = standard-return-line filter element according to DIN 24550, T4

2 nominal size: 100

3 - 7 see type index-complete filter

weight: approx. 2,1 kg

EDV 09/04

Changes of measures and design are subject to alteration!

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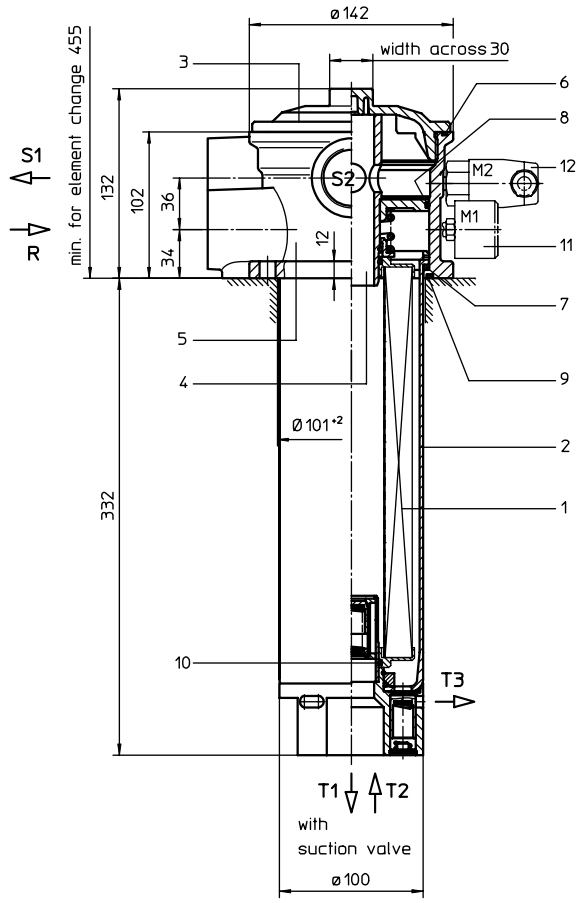
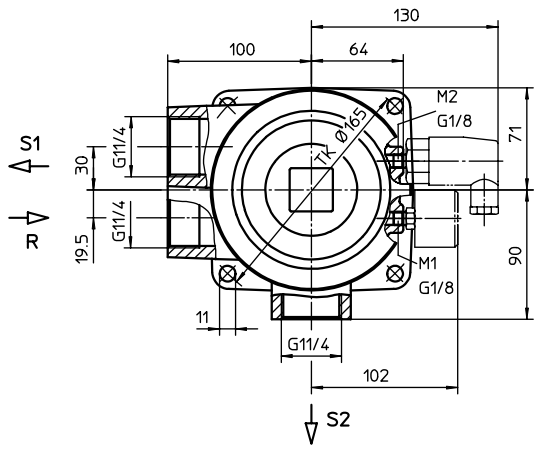
RETURN LINE FILTER, with suction connection
Series TRS 226 DN 32 PN 10

Sheet No.
1065 C





1. Type index:

1.1. Complete filter: (ordering example)

TRS.	226.	10VG.	10.	B.	P.	-.	G.	6.	-.	S2,5.	Z.	O.	E2
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
TRS = tank-mounted return-line filter with suction connection

2 **nominal size:** 226

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
6 = G 1 ¼

10 **filter housing specification:**
- = standard

11 **internal valve:**
S2,5 = with by-pass valve Δp 2,5 bar

12 **suction valve:**
Z = with suction valve

13 **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

14 **preload pressure indicator at M2:**
- = without
O1 = visual, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616

1.2. Filter element: (ordering example)

01RS.	225.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01RS. = return-line suction filter element

2 **nominal size:** 225

3 - 7 see type index-complete filter

weight: approx. 3,2 kg

Changes of measures and design are subject to alteration!

EDV 01/05

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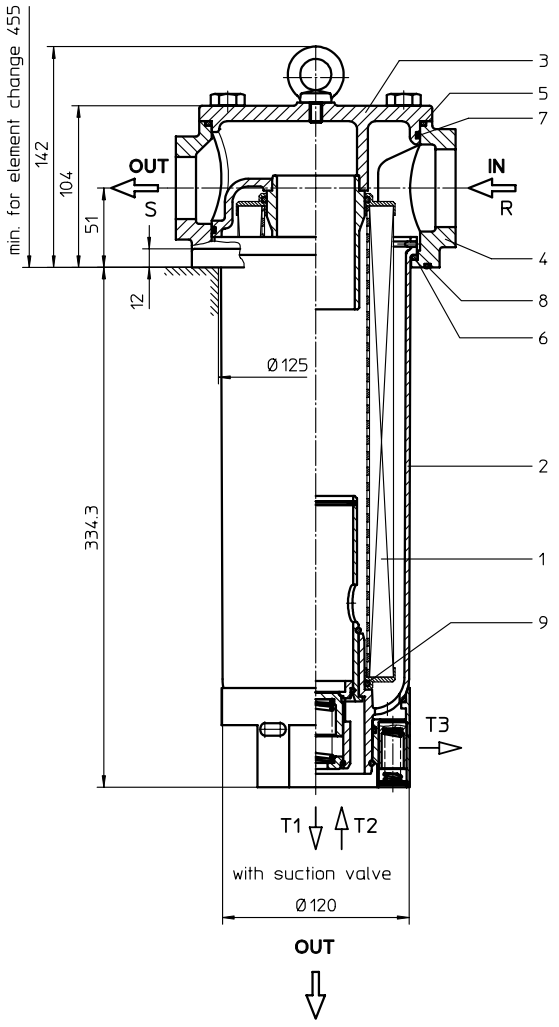
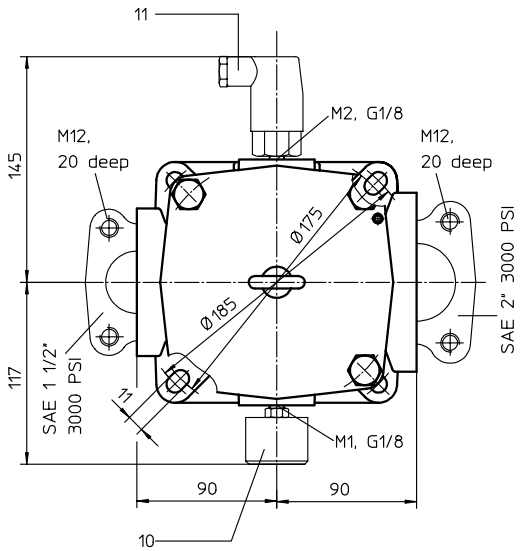
RETURN LINE FILTER, with suction connection
Series TRS 625 DN 50 PN 10

Sheet No.
1066 C





1. Type index:

1.1. Complete filter: (ordering example)

TRS. 625. 10VG. 10. B. P. -. FS. 8. -. S2,5. Z. O. E2

1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 | series:
TRS = tank-mounted return-line filter with suction connection

2 | nominal size: 625

3 | filter-material and filter-fineness:
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 | resistance of pressure difference for filter element:
10 = Δp 10 bar

5 | filter element design:
B = both sides open

6 | sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 | filter element specification:
- = standard
VA = stainless steel

8 | connection:
FS = SAE-flange connection 3000 PSI

9 | connection size:
8 = 2“

10 | filter housing specification:
- = standard

11 | internal valve:
S2,5 = with by-pass valve Δp 2,5 bar

12 | suction valve:
Z = with suction valve

13 | clogging indicator at M1:
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616

14 | preload pressure indicator at M2:
- = without
E2 = pressure switch, see sheet-no. 1616

1.2. Filter element: (ordering example)

01E. 625. 10VG. 10. B. P. -

1	2	3	4	5	6	7

1 | series:
01E. = filter element according to INTERNORMEN factory specicfication

2 | nominal size: 625

3 - **7** see type index-complete filter

weight: approx. 6,0 kg

EDV 08/03

Changes of measures and design are subject to alteration!

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1. Technical data

NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	TNRS.101	01NR.100	1	
2	TRS.226	01.RS225	1	
3	TRS.625	01E.625	1	

2. Description

2-1 TRS

The filters of the series TRS are tank-top mounted in-line filters. In addition to the return-line connection they have a suction connection on the clean-side. This suction connection has a preload pressure (fitting pressure) of ≥ 0,5 bar.
This combination, return-line and suction filter, is foreseen for hydraulic circuits which are equiped with minimum 2 feed pumps (2 hydraulic circuits). The preload suction connection is for the full volume flow filtration for the pump with the smaller volume flow.
The operating status in general wherein the preload pressure and the full stream filtration are effecting the Q_R (return-line flow) > Q_S (sum of the suction flows at S1 and S2). When the operating status is $Q_R = Q_S$ no preload pressure is effective. For circuits wherein the operating status $Q_R < Q_S$ appears for a short time, the suction valve operates and as a result a feeding out of the vessel is possible without preload pressure and without filter effect.
Return-line filters in the TRS series are suitable for a working pressure up to 10 bar. Pressure peaks will be absorbed by a sufficient margin of safety.
The filter element consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside. Filter finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filters can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.
INTERNORMEN-Filters elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.
When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

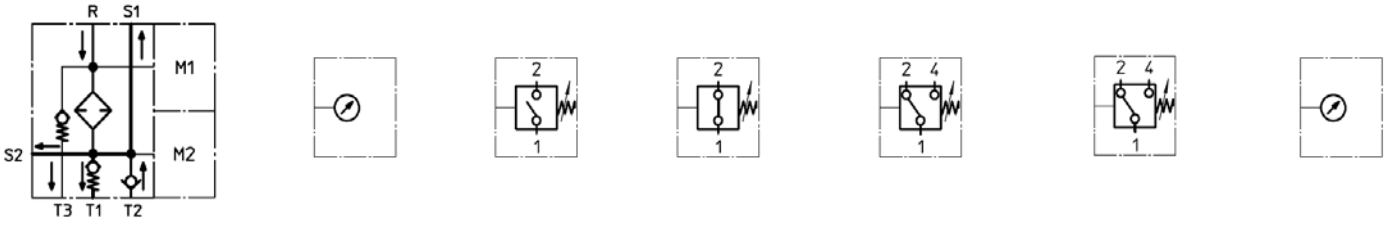
2-2 TNRS

The filters of the series TNRS are tank-top mounted in-line filters. In addition to the return-line connection they have a suction connection on the clean-side. This suction connection has a preload pressure (fitting pressure) of ≥ 0,5 bar.
This combination, return-line and suction filter, is foreseen for hydraulic circuits which are equiped with minimum 2 feed pumps (2 hydraulic circuits). The preload suction connection is for the full volume flow filtration for the pump with the smaller volume flow.
The operating status in general wherein the preload pressure and the full stream filtration are effecting the Q_R (return-line flow) > Q_S (suction flow). When the operating status is $Q_R = Q_S$ no preload pressure is effective.
During the operating status $Q_R < Q_S$ the suction valve is effective operates at the connection T2, what makes a feeding out of the receptable possible without preload pressure and without filter efficiency.
Return-line filters in the TNRS series are suitable for a working pressure up to 10 bar. Pressure peaks will be absorbed by a sufficient margin of safety.
The filter element according to DIN 24550, T4 consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside. Filter finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filters can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.
INTERNORMEN-Filters elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.
When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

3. Symbols

clogging indicator at M1 | clogging indicator at M2

filter with suction valve and by-pass valve	visual	electrical contact maker	electrical contact breaker	electrical contact maker/breaker	electrical contact maker/breaker	visual
	O	E1	E5	E2	E2	O1

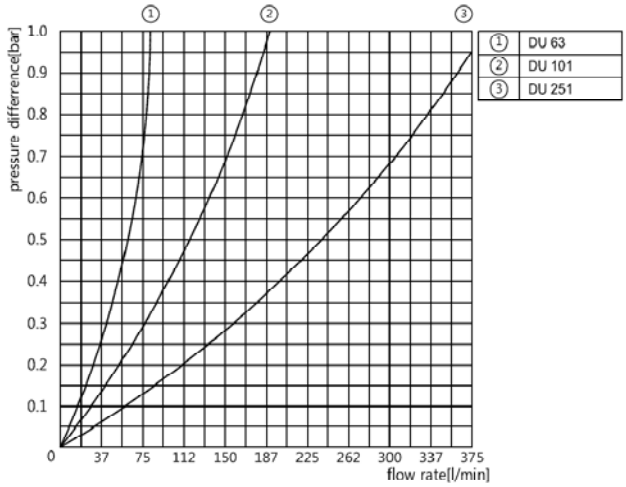


INITIAL DIFFERENCE PRESSURE

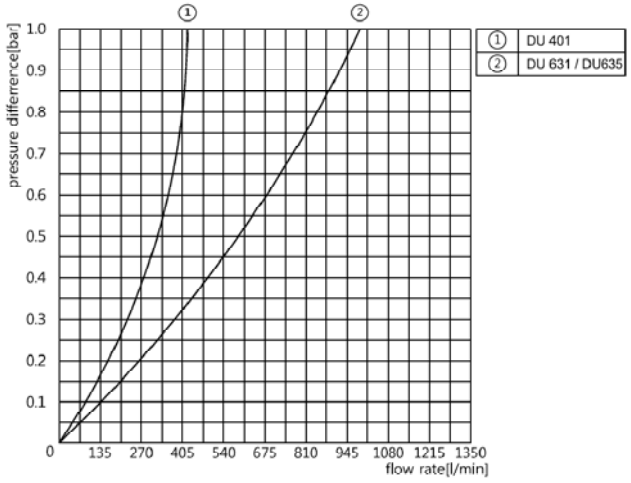
FOR DUPLEX FILTER SERIES - 1

Sheet No.

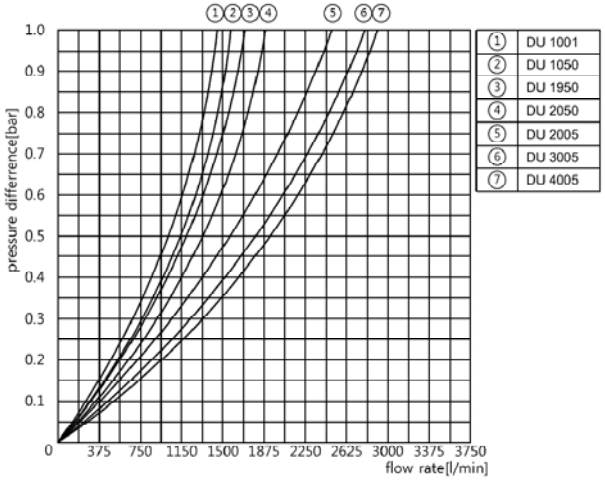
DU63~251 SERIES



DU401~635 SERIES



DU1001~4005 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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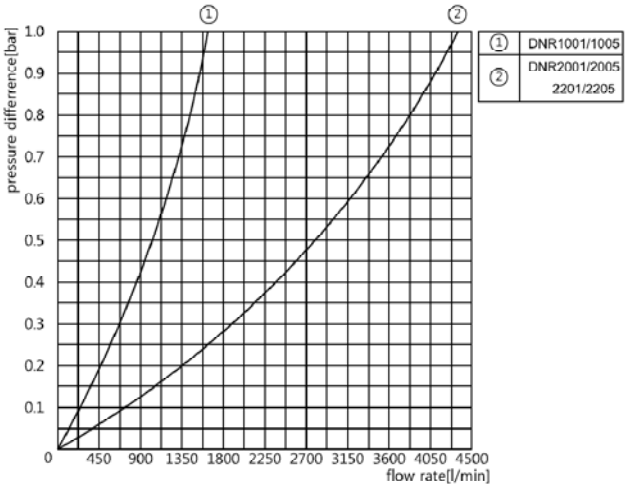
INITIAL DIFFERENCE PRESSURE

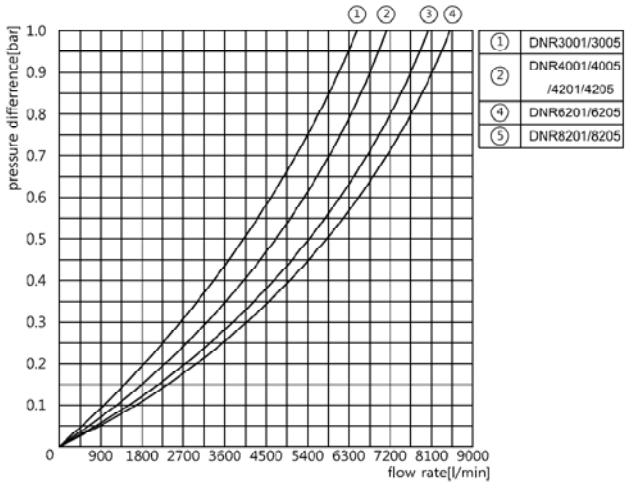
FOR DUPLEX FILTER SERIES - 2

Sheet No.

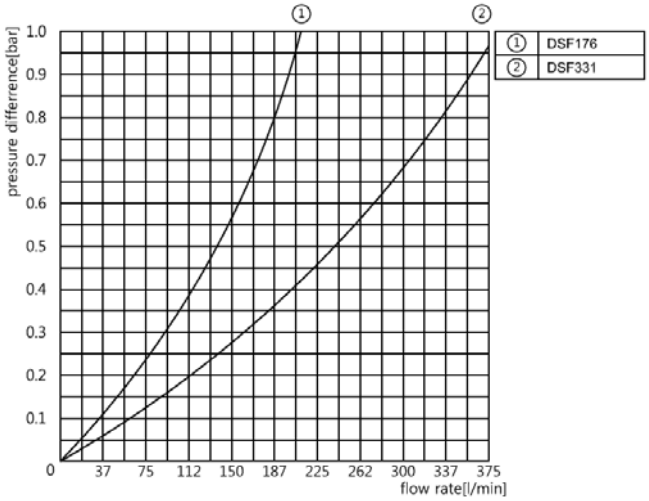
DNR1001~2205 SERIES



DNR3001~8205 SERIES



DSF176~331 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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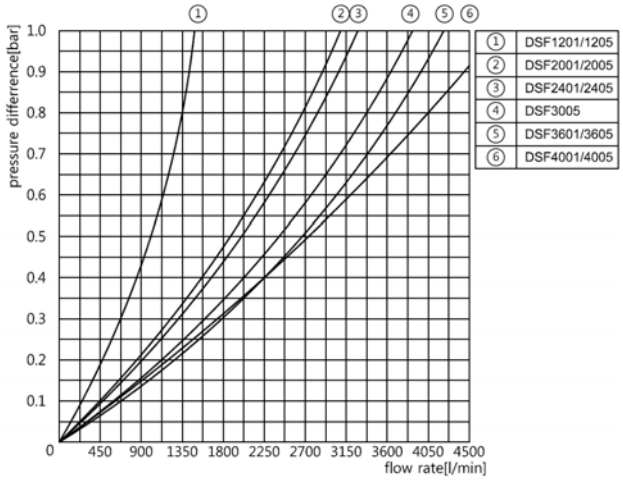
INITIAL DIFFERENCE PRESSURE

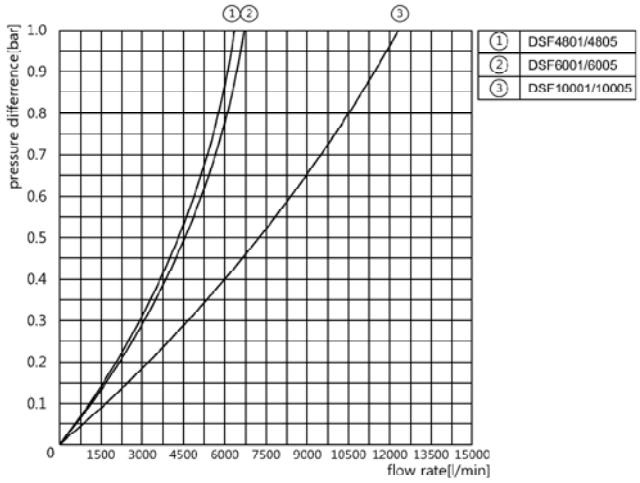
FOR DUPLEX FILTER SERIES - 3

Sheet No.

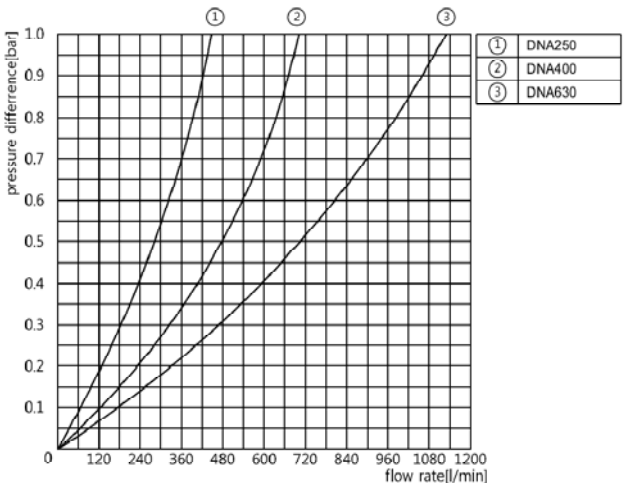
DSF1201~4005 SERIES



DSF 4801~10005 SERIES



DNA250~630 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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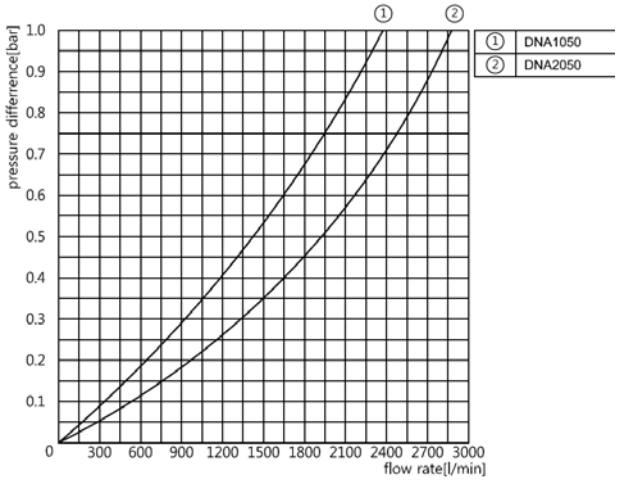
INITIAL DIFFERENCE PRESSURE

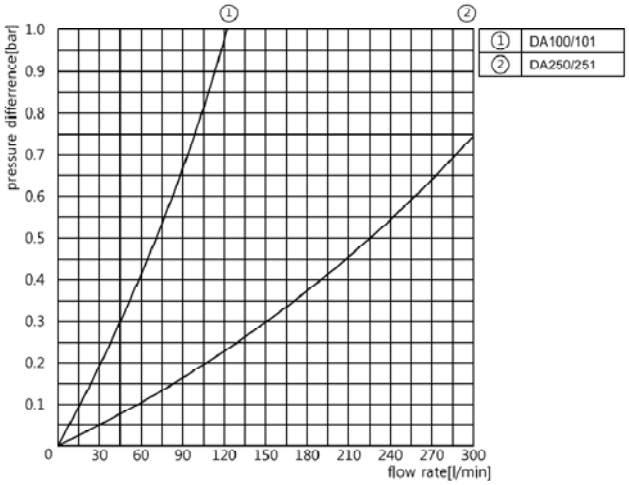
FOR DUPLEX FILTER SERIES - 4

Sheet No.

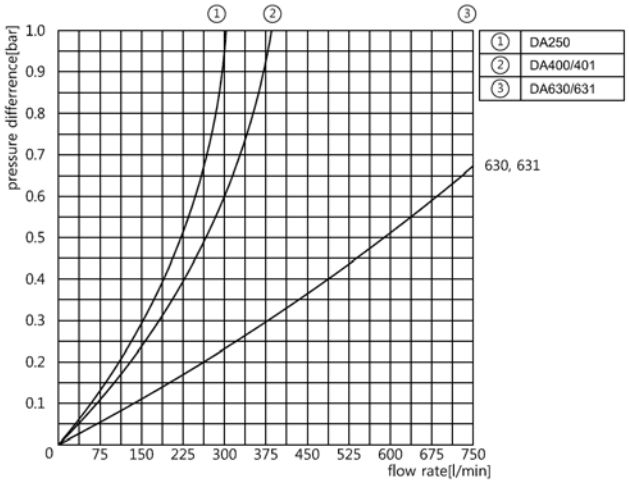
DNA1050~2050 SERIES



DA100~251 SERIES



DA150~631 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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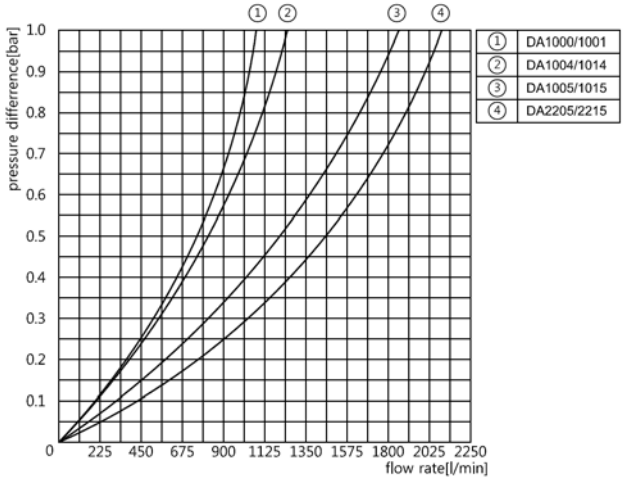
INITIAL DIFFERENCE PRESSURE

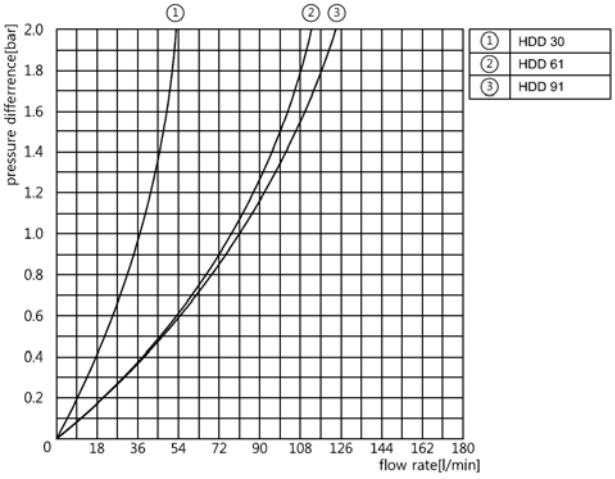
FOR DUPLEX FILTER SERIES - 5

Sheet No.

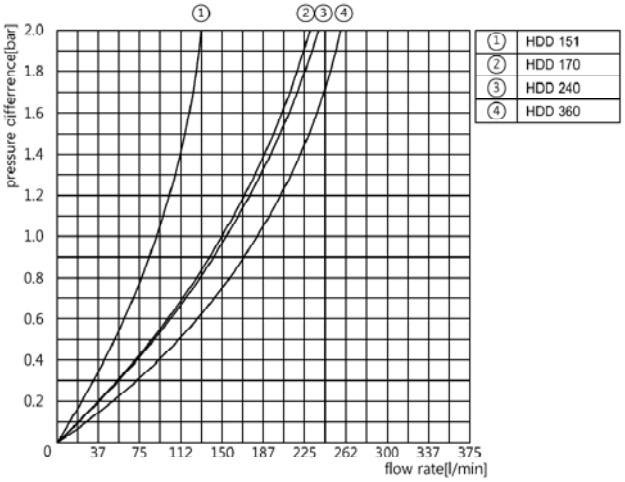
DA1000~2215 SERIES



HDD30~91 SERIES



HDD151~360 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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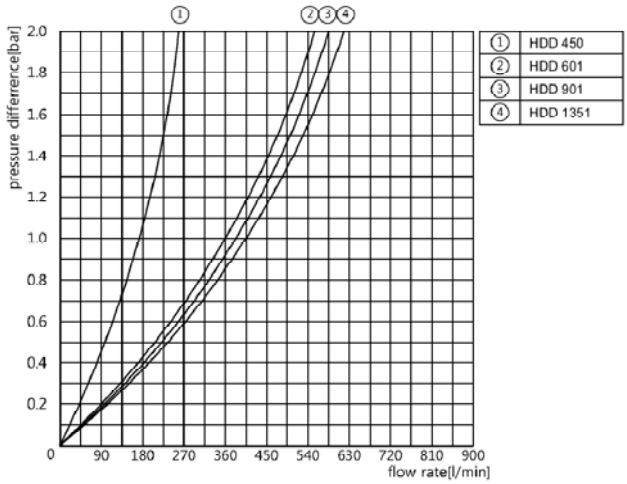
INITIAL DIFFERENCE PRESSURE

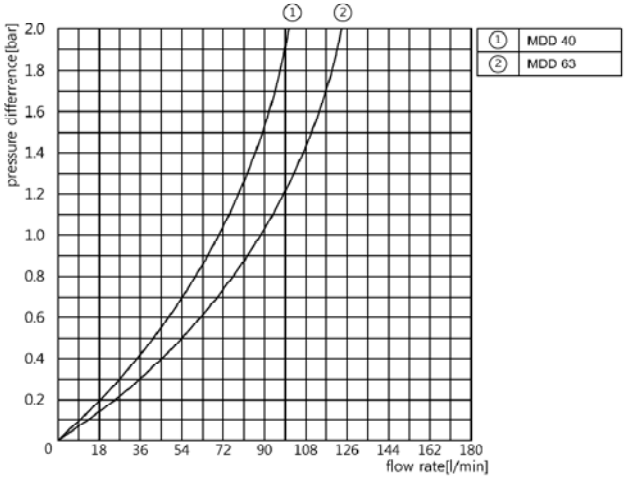
FOR DUPLEX FILTER SERIES - 6

Sheet No.

HDD450~1351 SERIES



MDD40~63 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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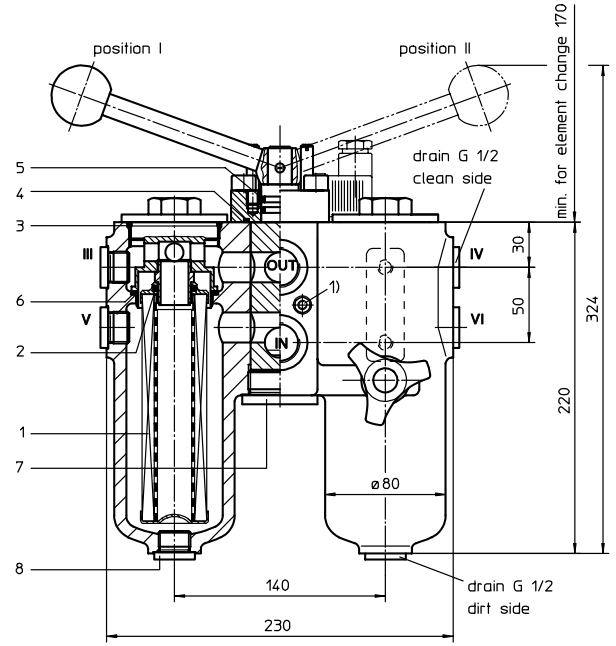
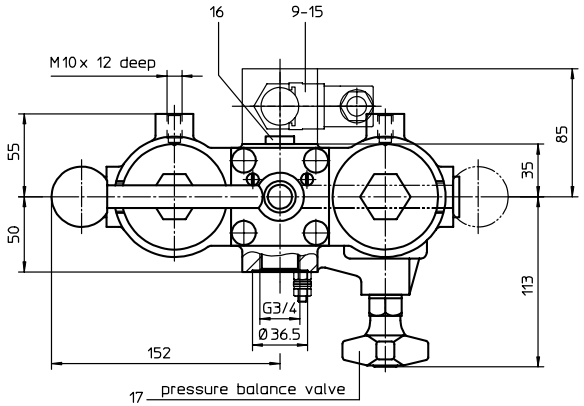
PRESSURE FILTER, change-over
Series DU 63 DN 20 PN 32

Sheet No. **2121 K**





1) connection for the potential equalisation,
only for application in the explosive area

Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

measure connection III, IV: air bleeding, pressure relief G ½ - clean side
measure connection V, VI: air bleeding, pressure relief G ½ - dirt side

1. Type index:

1.1. Complete filter: (ordering example)

DU. 63. 10VG. 30. E. P. -. G. 4. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DU = pressure filter, change-over

2 **nominal size:** 63

3 **filter-fineness and filter-material:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
4 = G ¾

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01NL. 63. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 63

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder-connections, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651

weight: 15 kg

Changes of measures and design are subject to alteration!

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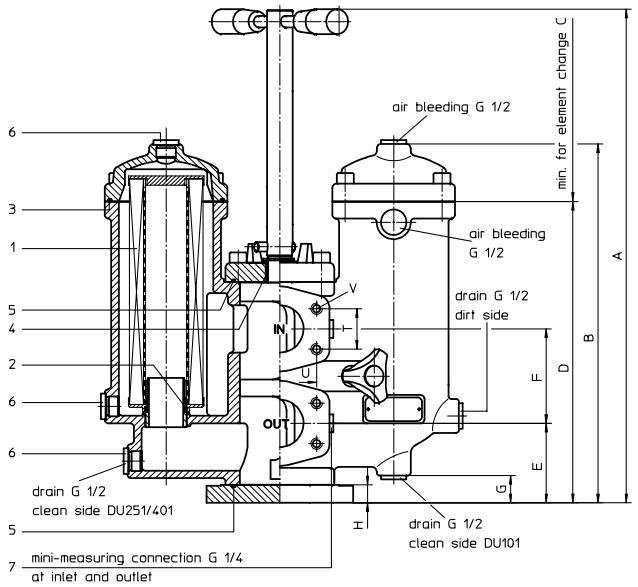
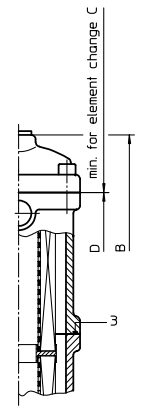
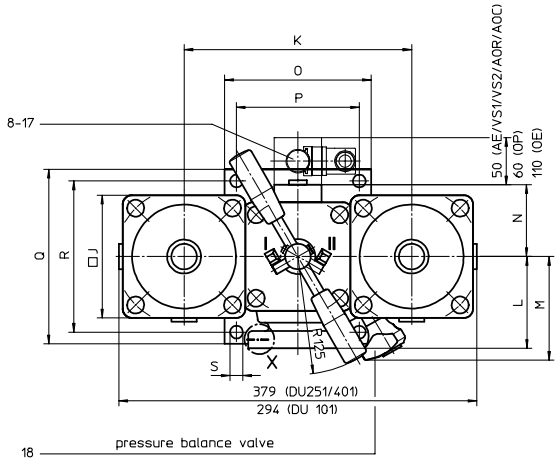
PRESSURE FILTER, change-over
Series DU 101-401 DN 32-50 PN 32

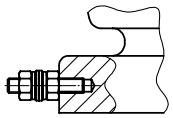
Sheet No. **2117 M**





filter head execution
with DU401





connection for the potential equalisation
at outlet, only for application
in the explosive area

Pos I: left filter-side in operation
Pos II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DU.	251.	10VG.	30.	E.	P.	-.	FS.	8.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DU = pressure filter, change-over

2 **nominal size:** 101, 251, 401

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar, (01.N 100) 30 = Δp 30 bar, (01NL. 250, 400)

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:**
- = standard VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size**:
6 = 1 ¼ " (DU 101) 8 = 2" (DU 251/401)

10 **filter housing specification:**
- = standard IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without, OP = visual, see sheet-no. 1628
AOR = visual, see sheet-no. 1606, OE = visual-electrical, see sheet-no. 1628
AOC = visual, see sheet-no. 1606, VS1 = electronical, see sheet-no. 1607
AE = visual-electrical, see sheet-no. 1609, VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL.	250.	10VG.	30.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01N. = standard filter element according to INTERNORMEN factory specification
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 100 (01N.); 250, 400 (01NL.)

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuation and bleeder-conections, see sheet-no. 1651
- counter flanges, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

3. Dimensions:

type	connection	SAE-connection size	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	weight kg
DU 101	DN 25[1]	SAE 1 ¼"	463	310	210	265	55	80	22	16	95	180	60	100	50	140	115	140	115	12	30,2	58,7	M10, 19 deep	23
DU 101	DN 32	SAE 1 ¼"																						
DU 251	DN 40[2]	SAE 2"	522	380	260	319	84	100	-	19	130	241	97	110	76	155	130	185	160	13,5	42,9	77,8	M12, 18 deep	40
DU 251	DN 50	SAE 2"																						
DU 401	DN 50	SAE 2"	632	530	410	469	84	100	-	19	130	241	97	110	76	155	130	185	160	13,5	42,9	77,8	M12, 18 deep	50

[1] by counter flange BFS.6.A.33,7x2,6.St.P.3000
[2] by counter flange BFS.8.A.48,3x3,7.St.P.3000

Instaed of P (Nitrile) also V (Viton) can be chosen.

Changes of measures and design are subject to alteration!

EDV 10/06

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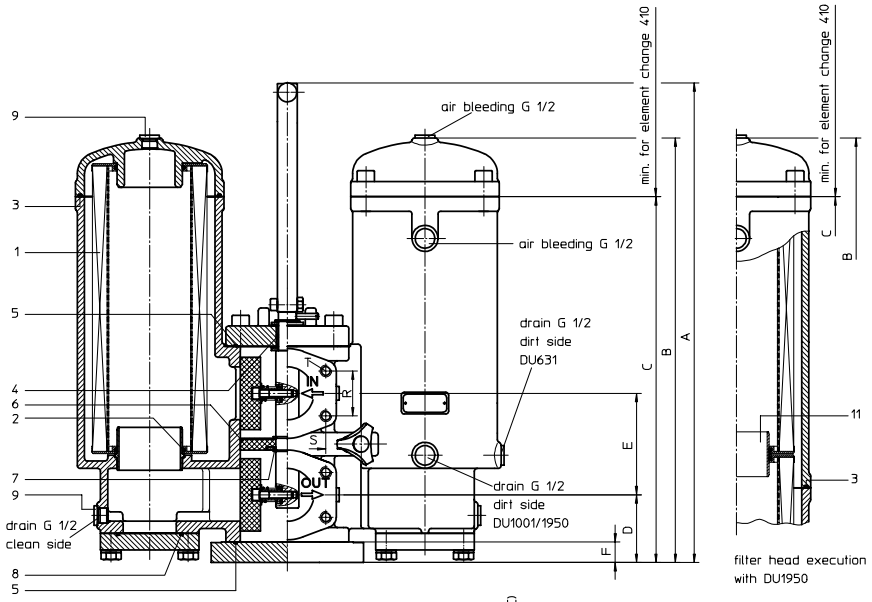
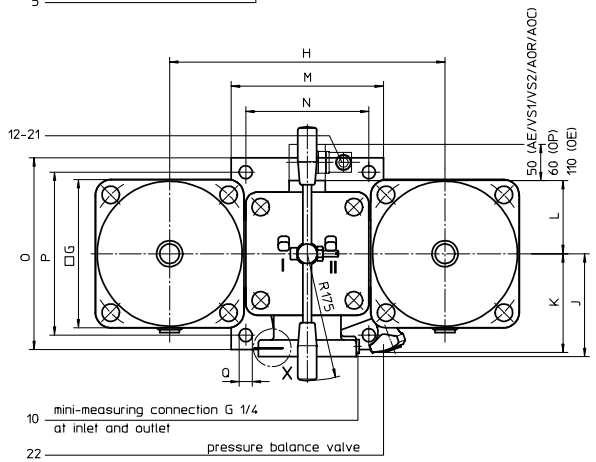
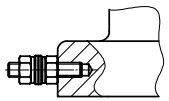
PRESSURE FILTER, change-over
Series DU 631-1950 DN 65-80 PN 32

Sheet No. **2118 G**





detail X



connection for the potential equalisation at outlet, only for application in the explosive area

Pos. I: left filter-side in operation
Pos. II: lright filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DU. 631. 10VG. 30. E. P. -. FS. 9. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 series:
DU = pressure filter, change-over

2 nominal size: 631, 1001, 1950

3 filter-material and filter- fineness:
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 resistance of pressure difference for filter element:
30 = Δp 30 bar (01NL. 630) 10 = Δp 10 bar (01NR. 1000);

5 filter element design:
E = single-end open (DU 631) B = both sides open (DU 1001/1950)
S = with by-pass valve Δp 2,0 bar (DU 631) S1 = with by-pass valve Δp 3,5 bar (DU 631)

6 sealing material:
P = Nitrile (NBR) V = Viton (FPM)

7 filter element specification: (see catalog)
- = standard VA = stainless steel IS06 = see sheet-no. 31601 IS07 = see sheet-no. 31602

8 connection:
FS = SAE-flange connection 3000 PSI

9 connection size:
9 = 2 ½ " (DU 631) A = 3" (DU 1001/1950)

10 filter housing specification: (see catalog)
- = standard IS06 = see sheet-no. 31605 IS12 = see sheet-no. 41028

11 internal valve:
- = without
S = with by-pass valve Δp 2,0 bar (DU 1001/1950)
S1 = with by-pass valve Δp 3,5 bar (DU 1001/1950)

12 clogging indicator or clogging sensor:
- = without, OP = visual, see sheet-no. 1628
AOR = visual, see sheet-no. 1606, OE = visual-electrical, see sheet-no. 1628
AOC = visual, see sheet-no. 1606, VS1 = electronical, see sheet-no. 1607
AE = visual-electrical, see sheet-no. 1609, VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL. 630. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 series:
01NL. = standard filter element according to DIN 24550, T3
01NR. = standard-return-line filter element according to DIN 24550, T4

2 nominal size: 630 (01NL.), 1000 (01NR.)

3 - **7** see type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuation and bleeder-conections, see sheet-no. 1651
- counter flanges, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

3. Dimensions:

type	connection	SAE-connection size	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	weight kg
DU 631	DN 65	SAE 2 ½"	693	568	497	110	115	24	160	284	120	121	83	140	115	210	185	13,5	50,8	89	M12, 18 deep	90
DU 1001	DN 80	SAE 3"	717	586	505	93,5	140	28,5	205	380	142	137	101	210	170	265	225	18	62	106,4	M16, 23 deep	116
DU 1950	DN 80	SAE 3"	1119	988	907	93,5	140	28,5	205	380	142	137	101	210	170	265	225	18	62	106,4	M16, 23 deep	170

Changes of measures and design are subject to alteration!

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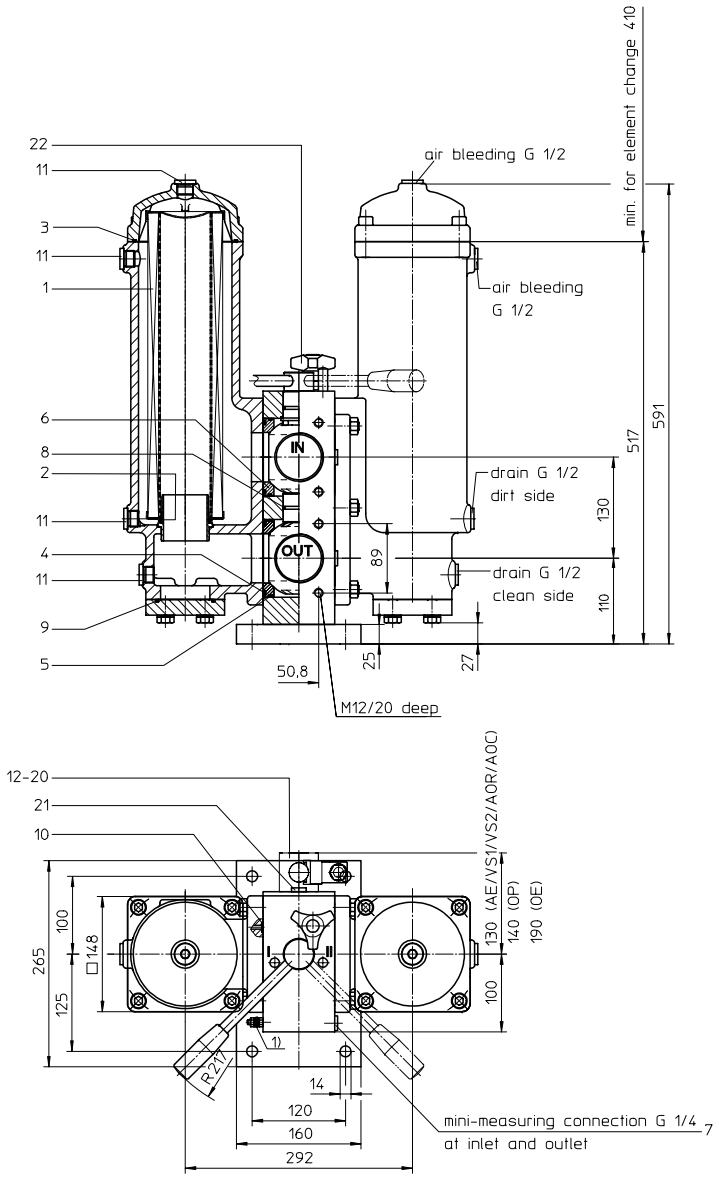
PRESSURE FILTER, change-over ball valve
Series DU 635 DN 65 PN 32

Sheet No. **2128 E**



1) connection for the potential equilisation, at outlet, only for application in the explosive area

Pos. I: left filter-side in operation
Pos. II: lright filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DU. 635. 10VG. 30. E. P. -. FS. 9. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DU = pressure filter, change-over

2 **nominal size:** 635

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
9 = 2 ½ “

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605 IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL. 630. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 630

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuation and bleeder-conections, see sheet-no. 1651
- counter flanges, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. 90 kg

Changes of measures and design are subject to alteration!

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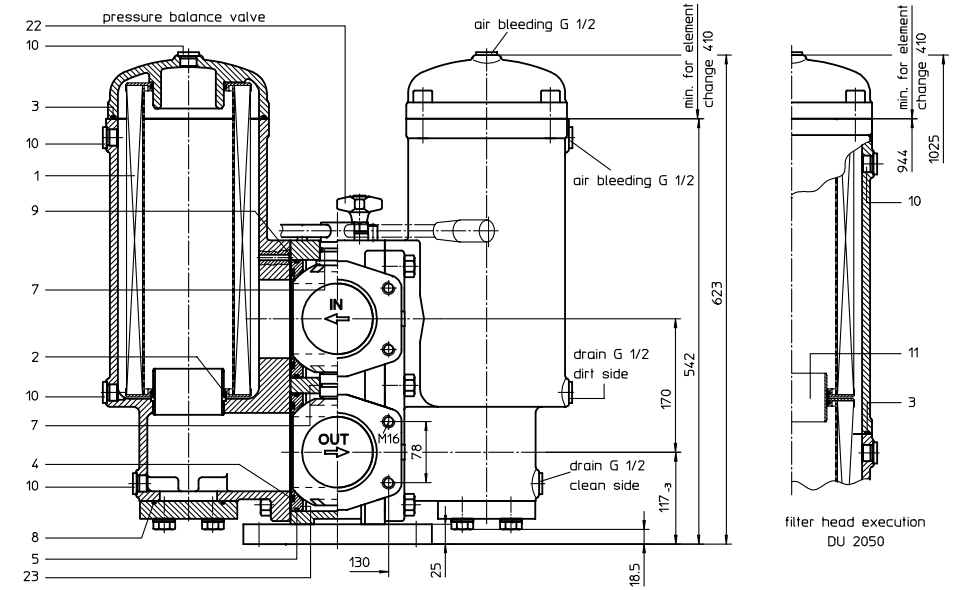
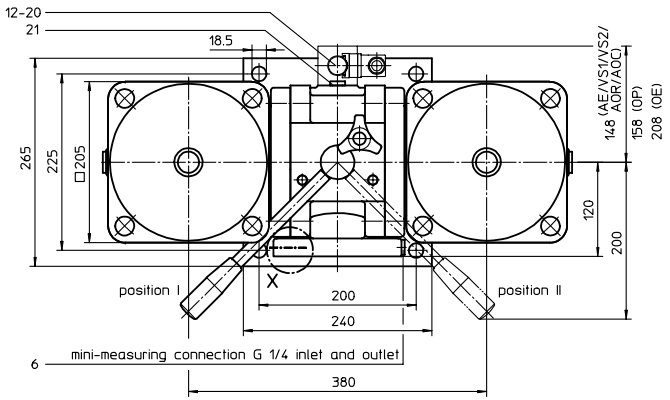
EDV 02/05

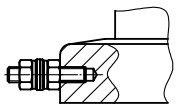
PRESSURE FILTER, change-over ball valve
Series DU 1050-2050 DN 80-100 PN 32

Sheet No. **2119 K**





detail X



connection for the potential equalisation at outlet, only for application in the explosive area

Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

3. Dimensions:

type	connection	SAE-connection size	weight kg
DU 1050	DN 80[1)]	SAE 4“	150
DU 1050	DN 100	SAE 4“	150
DU 2050	DN 80[1)]	SAE 4“	200
DU 2050	DN 100	SAE 4“	200

[1)] by counter flange BFS.B.E.88,9x3,2.St.P.3000
Instead of P (Nitrile) also V (Viton) can be chosen.

1. Type index:

1.1. Complete filter: (ordering example)

DU. 1050. 10VG. 10. B. P. -. FS. B. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DU = pressure filter, change-over

2 **nominal size:** 1050, 2050

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
B = 4“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S = with by-pass valve Δp 2 bar
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR. 1000. 10VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- evacuation- and bleeder-connection, see sheet-no. 1651
- counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

Changes of measures and design are subject to alteration!

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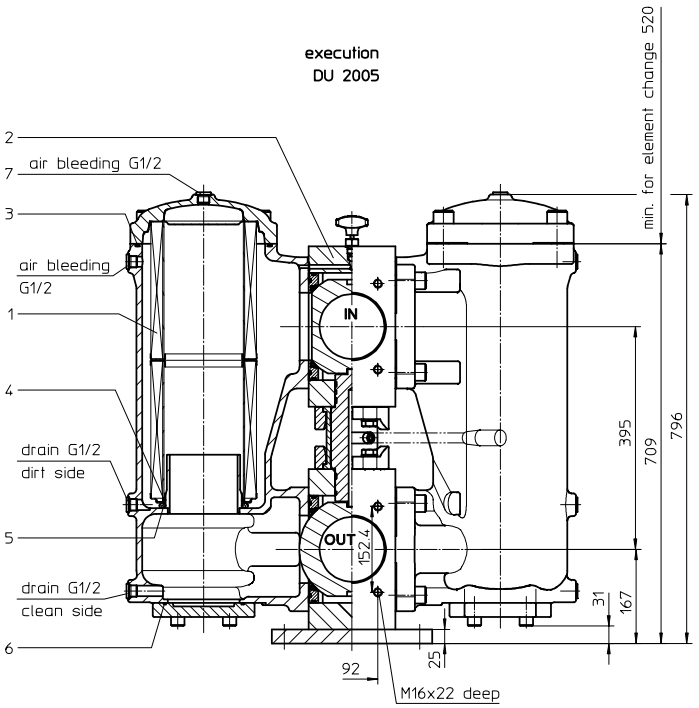
PRESSURE FILTER, change-over ball valve

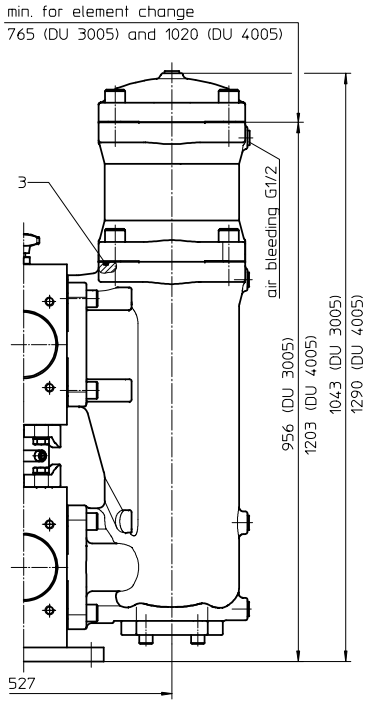
Series DU 2005-4005 DN 125 PN 32

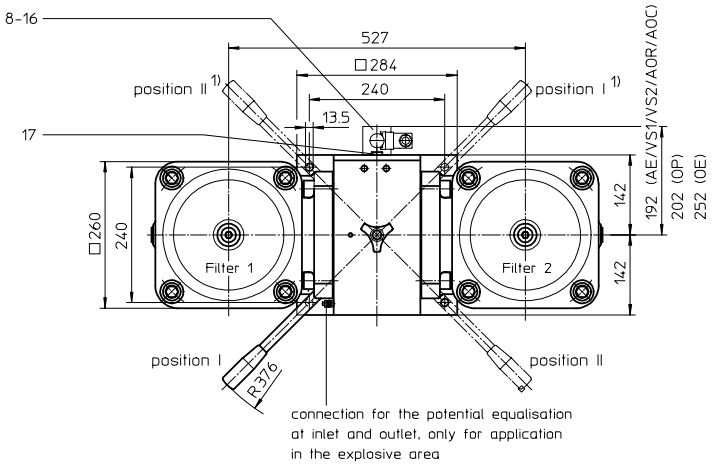
Sheet No. **2153**

execution
DU 2005



execution
DU 3005/DU 4005





1) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Pos. I: filter 1 in operation
Pos. II: filter 2 in operation

filter	weight kg
DU 2005	340
DU 3005	402
DU 4005	436

1. Type index:

1.1. Complete filter: (ordering example)

DU. 2005. 10VG. 10. E. P. -. FS. C. -. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
DU = pressure filter, change-over

2 **nominal size:** 2005, 3005, 4005

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
C = 5“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS12 = see sheet-no. 41028

11 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01E. 2001. 10VG. 10. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 2001, 3001, 4001

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- evacuation- and bleeder-connection, see sheet-no. 1651
- counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

Changes of measures and design are subject to alteration!

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EDV 02/06

1. Technical data

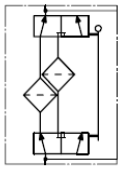
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	DU.63	01NL.63	2	
2	DU.101	01N.100	2	
3	DU.25	01NL.250	2	
4	DU.401	01NL.400	2	
5	DU.631	01NR.630	2	
6	DU.1001	01NR.1000	2	
7	DU.1950	01NR.1000	4	
8	DU.635	01NR.630	2	
9	DU.1050	01NR.1000	2	
10	DU.2050	01NR.1000	4	
11	DU.2005	01E.2001	2	
12	DU.3005	01E.3001	2	
13	DU.4005	01E.4001	2	

2. Description

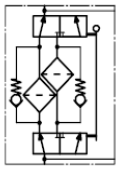
Pressure filter of the series DU 63 are suitable for a working pressure up to 32 bar.
The pressure peaks are absorbed by a sufficient margin of safety.
Rotary slide valve which is integrated in the middle of the housing makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction-filters.
The filter element consist of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside.
Filter finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre).
Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
Approvals according to TÜV, and the major „Shipyard Classification Societies“ D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S. and others are possible.
The internal valve is integrated in the filter cover. After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter.

3. Symbols

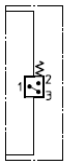
without indicator



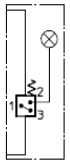
with by-pass valve



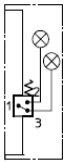
with electrical indicator
AE 30 and AE 40



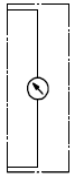
with visual-electrical indicator
AE 50 and AE 60



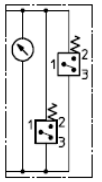
with visual-electrical indicator
AE 70 and AE 80



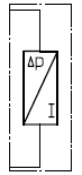
with visual indicator
OP



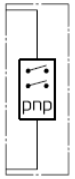
with visual-electrical indicator
OE



with electronical clogging sensor
VS1

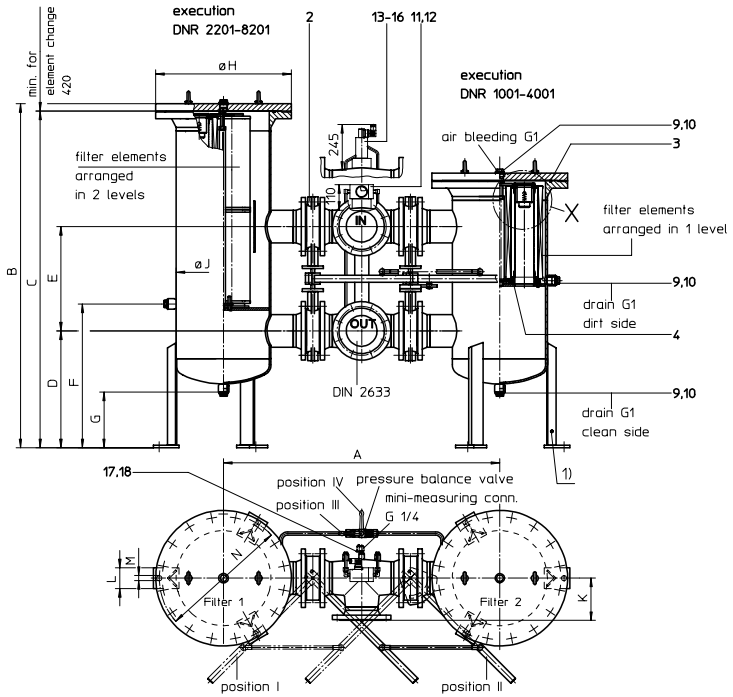


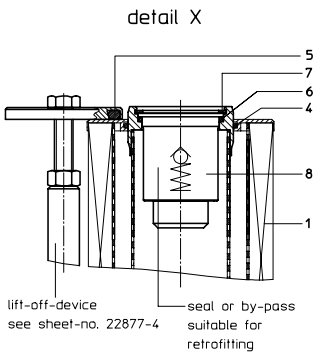
with electronical clogging sensor
VS2



PRESSURE FILTER, change -over
Series DNR 1001-8201 DN 50-250 PN 16

Sheet No. **2135 J**





Pos. I: filter 1 in operation
Pos II: filter 2 in operation

with pressure balance valve:
Pos III: valve open
Pos IV: valve closed

Connection standard as in drawing.
On request: inlet- on top and backside
outlet - bottom and backside

Please specify on order!

1) connection for the potential equalisation, only for application in the explosive area

3. Dimensions:

type	connection DN	A	B	C	D	E	F	G	H	J	K	L	M	N	weight kg	volume tank
DNR 1001	50	796	915	890	395	330	465	190	340	219	111	70	18	330	170	2x 22,5 l
	65	822	915	890	395	347	465				123					2x 22,5 l
	80	862	965	940	395	400	515				138					2x 24,0 l
	100	914	995	970	395	421	545				159					2x 25,0 l
DNR 2001	80	1092	1105	1070	500	400	645	250	580	406	138	90	22	550	530	2x 94,0 l
	100	1144	1135	1100	500	421	675				159					2x 98,0 l
	125	1182	1175	1140	500	446	715				181					2x 103,0 l
	150	1212	1235	1200	500	492	775				200					2x 109,0 l
DNR 3001	100	1144	1135	1100	500	421	675	250	580	406	159	90	22	550	540	2x 98,0 l
	125	1182	1175	1140	500	446	715				181					2x 103,0 l
	150	1212	1235	1200	500	492	775				200					2x 109,0 l
	200	1330	1345	1310	530	543	885				242					2x 121,0 l
DNR 4001	100	1274	1165	1130	520	421	705	240	715	508	159	90	22	650	550	2x 152,0 l
	125	1322	1205	1170	520	446	745				181					2x 165,0 l
	150	1352	1275	1240	530	492	815				200					2x 178,0 l
	200	1440	1375	1340	560	543	915				242					2x 195,0 l
DNR 2201	80	862	1365	1340	395	400	515	190	340	219	138	70	18	330	240	2x 38,0 l
	100	914	1395	1370	395	421	545				159					2x 39,0 l
	125	1000	1395	1370	410	446	545				181					2x 39,0 l
	150	1060	1395	1370	420	492	545				200					2x 39,0 l
DNR 4201	80	1092	1475	1440	500	400	615	250	580	406	138	90	22	550	960	2x 137,0 l
	100	1144	1475	1440	500	421	615				159					2x 137,0 l
	125	1182	1475	1440	500	446	615				181					2x 137,0 l
	150	1212	1475	1440	500	492	615				200					2x 137,0 l
	200	1330	1575	1540	550	543	675				242					2x 149,0 l
DNR 6201	100	1144	1475	1440	500	421	615	240	580	406	159	90	22	550	570	2x 137,0 l
	125	1182	1475	1440	500	446	615				181					2x 137,0 l
	150	1212	1475	1440	500	492	615				200					2x 137,0 l
	200	1330	1535	1500	530	543	675				242					2x 145,0 l
	250	1450	1595	1560	560	618	735				288					2x 151,0 l
DNR 8201	100	1274	1495	1460	520	421	635	240	715	508	159	90	22	650	830	2x 218,0 l
	125	1322	1495	1460	520	446	635				181					2x 218,0 l
	150	1352	1515	1480	530	492	655				200					2x 222,0 l
	200	1440	1575	1540	560	543	715				242					2x 233,0 l

EDV 04/07

1. Type index:

1.1. Complete filter: (ordering example)

DNR. 3001. 10VG. 10. B. P. -. FD1. D. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DNR = duplex filter with standard-return-line filter elements

2 **nominal size:** 1001, 2001, 3001, 4001 (1 level)
2201, 4201, 6201, 8201 (2 levels)

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard ; VA = stainless steel ; IS06 = see sheet-no. 31601 ; IS07 = see sheet-no. 31602

8 **connection:**
FD1 = flange DIN 2633, design C DIN 2526
FD2 = flange DIN 2633, design E DIN 2526

9 **connection size:**

filter nominal size	DNR 1001	DNR 2001	DNR 3001	DNR 4001
connection size	8-9-A-B	A-B-C-D	B-C-D-E	B-C-D-E
filter nominal size	DNR 2201	DNR 4201	DNR 6201	DNR 8201
connection size	A-B-C-D	A-B-C-D-E	B-C-D-E-F	B-C-D-E

8 = DN 50 ; 9 = DN 65 ; A = DN 80 ; B = DN 100 ; C = DN 125 ; D = DN 150 ; E = DN 200 ; F = DN 250

10 **filter housing specification:**
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without ; S1 = with by-pass valve 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no.1609
OP = visual, see sheet-no.1614 ; VS1 = electronical, see sheet-no.1607
OE = visual-electrical, see sheet-no 1614 ; VS2 = electronical, see sheet-no.1608

1.2. Filter element: (ordering example)

01NR. 1000. 10VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- evacuation- and bleeder-connection, see sheet-no. 1651
- counter flange, see sheet-no. 1653
- shut-off valve, see sheet-no. 1655
- lifting mechanism, see sheet-no. 1661

Changes of measures and design are subject to alteration!

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4. Spare parts:

4.1. Depending on different series:

item	designation	qty.	dimension and article-no. DNR 1001	qty.	dimension and article-no. DNR 2001	qty.	dimension and article-no. DNR 3001	qty.	dimension and article-no. DNR 4001	qty.	dimension and article-no. DNR 2201	qty.	dimension and article-no. DNR 4201	qty.	dimension and article-no. DNR 6201	qty.	dimension and article-no. DNR 8201
1	filter element	2	01NR. 1000	4	01NR. 1000	6	01NR. 1000	8	01NR. 1000	4	01NR. 1000	8	01NR. 1000	12	01NR. 1000	16	01NR. 1000
2	stop flap [1]	4	DN 50-100	4	DN 80-150	4	DN 100-200	4	DN 100-200	4	DN 100-150	4	DN 80-200	4	DN 100-250	4	DN 100-200
3	O-ring	2	225 x 5 308652 (NBR) 311473 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	516 x 6 301962 (NBR) 311474 (FPM)	2	225 x 5 308652 (NBR) 311473 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	516 x 6 301962 (NBR) 311474 (FPM)
4	O-ring	6	90 x 4 306941 (NBR) 307031 (FPM)	12	90 x 4 306941 (NBR) 307031 (FPM)	18	90 x 4 306941 (NBR) 307031 (FPM)	24	90 x 4 306941 (NBR) 307031 (FPM)	10	90 x 4 306941 (NBR) 307031 (FPM)	20	90 x 4 306941 (NBR) 307031 (FPM)	30	90 x 4 306941 (NBR) 307031 (FPM)	40	90 x 4 306941 (NBR) 307031 (FPM)
5	O-ring	2	78 x 10 305017 (NBR) 305552 (FPM	2	78 x 10 305017 (NBR) 305552 (FPM	2	78 x 10 305017 (NBR) 305552 (FPM	2	78 x 10 305017 (NBR) 305552 (FPM	2	78 x 10 305017 (NBR) 305552 (FPM	2	78 x 10 305017 (NBR) 305552 (FPM	2	78 x 10 305017 (NBR) 305552 (FPM	2	170 x 10 308662 (NBR) 317149 (FPM
6	O-ring	2	62 x 4 308045 (NBR) 311472 (FPM)	4	62 x 4 308045 (NBR) 311472 (FPM)	6	62 x 4 308045 (NBR) 311472 (FPM)	8	62 x 4 308045 (NBR) 311472 (FPM)	2	62 x 4 308045 (NBR) 311472 (FPM)	4	62 x 4 308045 (NBR) 311472 (FPM)	6	62 x 4 308045 (NBR) 311472 (FPM)	8	62 x 4 308045 (NBR) 311472 (FPM)
7	circlip	2	DIN 472-75x2,5 311471	4	DIN 472-75x2,5 311471	6	DIN 472-75x2,5 311471	8	DIN 472-75x2,5 311471	2	DIN 472-75x2,5 311471	4	DIN 472-75x2,5 311471	6	DIN 472-75x2,5 311471	8	DIN 472-75x2,5 311471
8	by-pass valve	2	DN 50 311974	4	DN 50 311974	6	DN 50 311974	8	DN 50 311974	2	DN 50 311974	4	DN 50 311974	6	DN 50 311974	8	DN 50 311974
9	screw plug	6	G1 309732														
10	gasket	6	A 33 x 39 308257														

[1] dimension of stop flap = connection size

4.2. Independing on the series:

item	qty.	designation	dimension	article-no.	
11	1	clogging indicator, visual	OP	see sheet-no. 1614	
12	1	clogging indicator, visual-electrical	OE	see sheet-no. 1614	
13	1	clogging indicator, visual-electrical	AE	see sheet-no. 1609	
14	1	clogging sensor, electronical	VS1	see sheet-no. 1607	
15	1	clogging sensor, electronical	VS2	see sheet-no. 1608	
16	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
17	2	gasket	A 14 x 18	306330	
18	2	screw plug	G ¼	309734	

5. Description:

Duplex filters of the series DNR 1001-8201 are suitable for a working pressure up to 16 bar.
Pressure peaks can be absorbed with a sufficient margin of safety.
Four mechanically connected change-over flaps enabling the change-over without service-interruption from the clean to the dirty filter-side.
The filters can be installed as suction filter, pressure filter or return-line filter.
The filter element consist of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter finer than 40 µm should use throuw-away elements made of Interpor fleece (glass fibre). Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
Approvals according to TÜV, and the mayor „Shipyard Classification Societies“ D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S.; P.R.S.;USS.R.S. and others are possible.

6. Technical data:

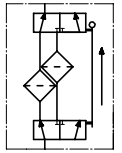
temperature range:	- 10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	16 bar
test pressure:	23 bar
connection system:	flange DIN 2633, 16 bar
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
mini-measuring connection:	G ¼ for screw coupling (mini-measuring)

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

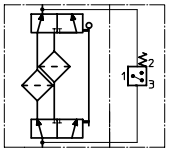
E 2135 J

7. Symbols:

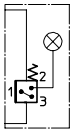
without indicator



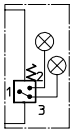
with electrical indicator
AE 30 and AE 40



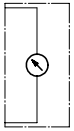
with visual - electrical indicator
AE 50 and AE 61



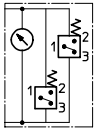
with visual - electrical indicator
AE 70 and AE 80



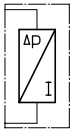
with visual indicator
OP



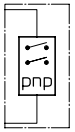
with visual - electrical indicator
OE



with electronical clogging sensor
VS1



with electronical clogging sensor
VS2



8. Pressure drop flow curves:

Precise flow rates see ‘INT-Expert-System Filter’, respectively Δp-curves; depending on filter fineness and viscosity.

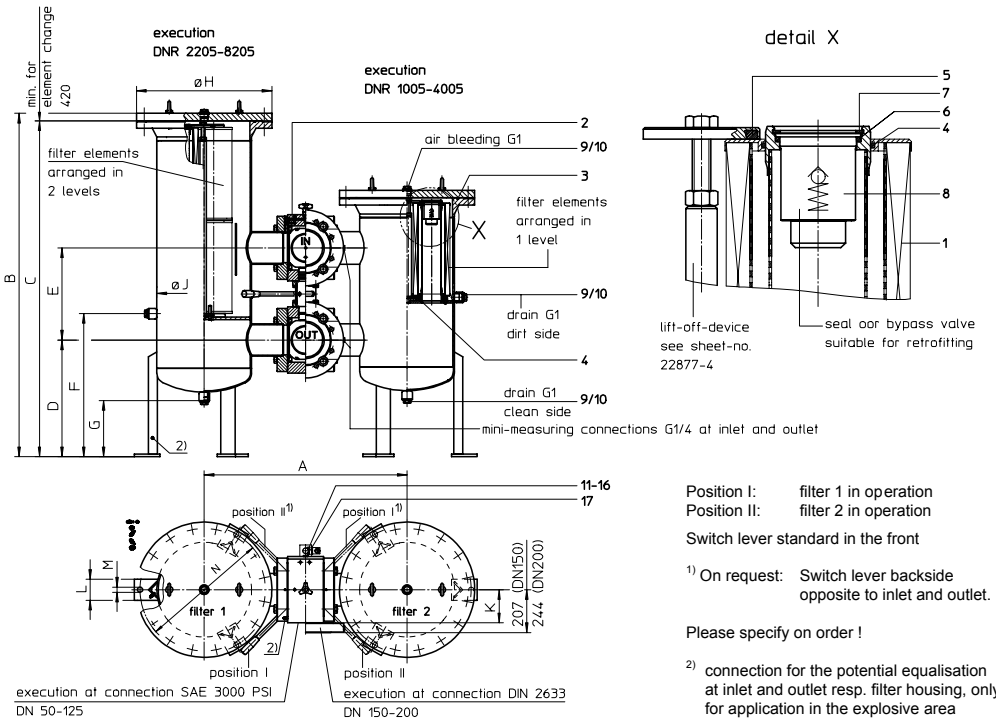
9. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

PRESSURE FILTER, change-over
Series DNR 1005-8205 DN 50-200 PN 16

Sheet No. **2141 F**



Position I: filter 1 in operation
Position II: filter 2 in operation

Switch lever standard in the front

1) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

2) connection for the potential equalisation at inlet and outlet resp. filter housing, only for application in the explosive area

3. Dimensions:

type	DN	A	B	C	D	E	F	G	H	J	K	L	M	N	weight kg	volume tank
DNR 1005	50	610	915	890	365	175	463	180	340	219	74	70	18	330	180	2x 22,5 l
	65	560	915	890	365	270	463				90				200	2x 22,5 l
	80	585	925	900	375	290	473				100				210	2x 23,0 l
	100	620	955	930	390	365	503				127				230	2x 24,0 l
DNR 2005	80	780	1105	1070	500	290	643	240	580	406	100	90	22	550	510	2x 94,0 l
	100	810	1105	1070	500	365	643				127				520	2x 94,0 l
	125	870	1145	1110	500	395	683				142				540	2x 99,0 l
	150	900	1195	1160	500	440	733				-				560	2x 105,0 l
DNR 3005	100	810	1105	1070	500	365	643	240	580	406	127	90	22	550	520	2x 94,0 l
	125	870	1145	1110	500	395	683				142				540	2x 99,0 l
	150	900	1195	1160	500	440	733				-				560	2x 105,0 l
	200	990	1345	1310	535	520	883				-				590	2x 121,0 l
DNR 4005	100	910	1165	1130	520	365	703	240	715	508	127	90	22	650	540	2x 152,0 l
	125	970	1165	1130	520	395	703				142				560	2x 152,0 l
	150	1040	1235	1200	530	440	773				-				1020	2x 167,0 l
	200	1090	1375	1340	560	520	913				-				1290	2x 193,0 l
DNR 2205	80	585	1325	1300	375	290	473	180	340	219	100	70	18	330	250	2x 36,0 l
	100	620	1355	1330	390	365	503				127				270	2x 37,0 l
	125	680	1375	1350	400	395	523				142				280	2x 38,0 l
	150	710	1405	1380	415	440	553				-				300	2x 40,0 l
DNR 4205	80	780	1475	1440	500	290	613	240	580	406	100	90	22	550	540	2x 137,0 l
	100	810	1475	1440	500	365	613				127				550	2x 137,0 l
	125	870	1475	1440	500	395	613				142				570	2x 137,0 l
	150	900	1505	1470	510	440	643				-				590	2x 141,0 l
	200	990	1535	1500	530	520	673				-				620	2x 145,0 l
DNR 6205	100	810	1475	1440	500	365	613	240	580	406	127	90	22	550	580	2x 137,0 l
	125	870	1475	1440	500	395	613				142				600	2x 137,0 l
	150	900	1475	1440	500	440	613				-				620	2x 137,0 l
	200	990	1535	1500	530	520	673				-				650	2x 145,0 l
DNR 8205	100	910	1495	1460	520	365	633	240	715	508	127	90	22	650	830	2x 218,0 l
	125	970	1495	1460	520	395	633				142				850	2x 218,0 l
	150	1040	1515	1480	530	440	653				-				870	2x 222,0 l
	200	1090	1575	1540	560	520	713				-				900	2x 233,0 l

EDV 04/07

1. Type index:

1.1. Complete filter: (oedering example)

DNR. 3005. 10VG. 10. B. P. -. FS. B. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DNR = duplex filter with standard-return-line filter elements

2 **nominal size:** 1005, 2005, 3005, 4005 (1 level)
2205, 4205, 6205, 8205 (2 levels)

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR) ; V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard ; VA = stainless steel ; IS06 = see sheet-no. 31601 ; IS07 = see sheet-no. 31602

8 **connection:**
FS = flange connection SAE 3000 PSI , only for DN 50-125
FD1 = flange connection DIN 2633, design C DIN 2526, only for DN 150-200
FD2 = flange connection DIN 2633, design E DIN 2526, only for DN 150-200

9 **connection size:**

filter-nominal size	DNR 1005	DNR 2005	DNR 3005	DNR 4005	DNR 2205	DNR 4205	DNR 6205	DNR 8205
connection size	8-9-A-B	A-B-C-D	B-C-D-E	B-C-D-E	A-B-C-D	A-B-C-D-E	B-C-D-E	B-C-D-E

8 = DN 50 ; 9 = DN 65 ; A = DN 80 ; B = DN 100 ; C = DN 125 ; D = DN 150 ; E = DN 200

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without; AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628; VS1 = electronical, see sheet-no. 1607
OE = visual-electrical, see sheet-no. 1628; VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR. 1000. 10VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter ele ment according to DIN 24550, T4

2 **Nenngröße:** 1000

3 - 7 see type index-complete filter

2. Accessories:

- measure -and bleeder-connections, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- shut-off valve, see sheet-no. 1655
- couner flange, see sheet-no. 1652
- adaptor for flange DIN 2633 (DN 50-125) see sheet-no. 1657
- lifting mechanism, see sheet-no. 1661

Changes of measures and design are subject to alteration!

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fax +49 - (0)6205 - 2094-40 url www.internormen.com

4. Spare parts:

4.1. Depending on different series:

item	designation	qty.	dimension and article-no. DNR 1005	qty.	dimension and article-no. DNR 2005	qty.	dimension and article-no. DNR 3005	qty.	dimension and article-no. DNR 4005	qty.	dimension and article-no. DNR 2205	qty.	dimension and article-no. DNR 4205	qty.	dimension and article-no. DNR 6205	qty.	dimension and article-no. DNR 8205
1	filter element	2	01NR. 1000	4	01NR. 1000	6	01NR. 1000	8	01NR. 1000	4	01NR. 1000	8	01NR. 1000	12	01NR. 1000	16	01NR. 1000
2	change over UKK	1	DN 50-100	1	DN 80-150	1	DN 100-200	1	DN 100-200	1	DN 80-150	1	DN 80-200	1	DN 100-200	1	DN 100-200
3	O-ring	2	225 x 5 308652 (NBR) 311473 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	516 x 6 301962 (NBR) 311474 (FPM)	2	225 x 5 308652 (NBR) 311473 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	429 x 6 308659 (NBR) 310273 (FPM)	2	516 x 6 301962 (NBR) 311474 (FPM)
4	O-ring	6	90 x 4 306941 (NBR) 307031 (FPM)	12	90 x 4 306941 (NBR) 307031 (FPM)	18	90 x 4 306941 (NBR) 307031 (FPM)	24	90 x 4 306941 (NBR) 307031 (FPM)	10	90 x 4 306941 (NBR) 307031 (FPM)	20	90 x 4 306941 (NBR) 307031 (FPM)	30	90 x 4 306941 (NBR) 307031 (FPM)	40	90 x 4 306941 (NBR) 307031 (FPM)
5	O-ring	-	-	2	78 x 10 305017 (NBR) 305552 (FPM)	2	78 x 10 305017 (NBR) 305552 (FPM)	2	78 x 10 305017 (NBR) 305552 (FPM)	2	78 x 10 305017 (NBR) 305552 (FPM)	2	78 x 10 305017 (NBR) 305552 (FPM)	2	78 x 10 305017 (NBR) 305552 (FPM)	2	170 x 10 308662 (NBR) 317149 (FPM)
6	O-ring	2	62 x 4 308045 (NBR) 311472 (FPM)	4	62 x 4 308045 (NBR) 311472 (FPM)	6	62 x 4 308045 (NBR) 311472 (FPM)	8	62 x 4 308045 (NBR) 311472 (FPM)	2	62 x 4 308045 (NBR) 311472 (FPM)	4	62 x 4 308045 (NBR) 311472 (FPM)	6	62 x 4 308045 (NBR) 311472 (FPM)	8	62 x 4 308045 (NBR) 311472 (FPM)
7	circlip	2	DIN 472-75x2,5 311471	4	DIN 472-75x2,5 311471	6	DIN 472-75x2,5 311471	8	DIN 472-75x2,5 311471	2	DIN 472-75x2,5 311471	4	DIN 472-75x2,5 311471	6	DIN 472-75x2,5 311471	8	DIN 472-75x2,5 311471
8	bypass valve	2	DN 50 311974	4	DN 50 311974	6	DN 50 311974	8	DN 50 311974	2	DN 50 311974	4	DN 50 311974	6	DN 50 311974	8	DN 50 311974
9	screw plug	6	G1 309732														
10	gasket	6	A 33 x 39 308257														

4.2. Independing on the series:

item	qty.	designation	dimension	article-no.	
11	1	clogging indicator, visual	OP	see sheet-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see sheet-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see sheet-no. 1609	
14	1	clogging sensor, electronical	VS1	see sheet-no. 1607	
15	1	clogging sensor, electronical	VS2	see sheet-no. 1608	
16	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
17	2	screw plug	G ¼	305003	

5. Description:

Duplex filters of the series DNR 1005-8205 are suitable for a working pressure up to 16 bar.
Pressure peaks can be absorbed with a sufficient margin of safety.
Change-over ball valve between the two filter housings makes it possible to switch from the dirty filter-side to the clean filter-side without interruting operat ion.
The filters can be installed as suction filter, pressure filter or return-line filter.
The filter element consist of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter finer than 40 microns should use throw-away elements made of Interpor fleece (glass fibre). Filter elements as fine as 5 microns $_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
Approvals according to TÜV, and the mayor „Shipyard Classification Societies“ D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S.; P.R.S.;USS.R.S. and others are possible.

6. Technical data:

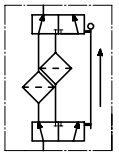
temperature range:	- 10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	16 bar
test pressure:	23 bar
connection system:	SAE-flange connection 3000 PSI or flange connection DIN 2633, 16 bar
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
mini-measuring connection:	G ¼

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

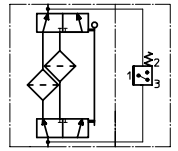
E 2141 F

7. Symbols:

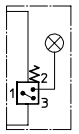
without indicator



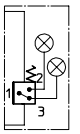
with electrical indicator AE 30 and AE 40



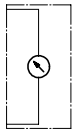
with visual - electrical indicator AE 50 and AE 61



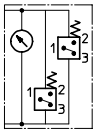
with visual - electrical indicator AE 70 and AE 80



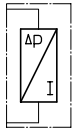
with visual indicator OP



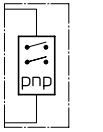
with visual - electrical indicator OE



with electronical clogging sensor VS1



with electronical clogging sensor VS2



8. Pressure drop flow curves:

Precise flow rates see ‘INT-Expert-System Filter’, respectively Δp-curves; depending on filter fin eness and viscosity.

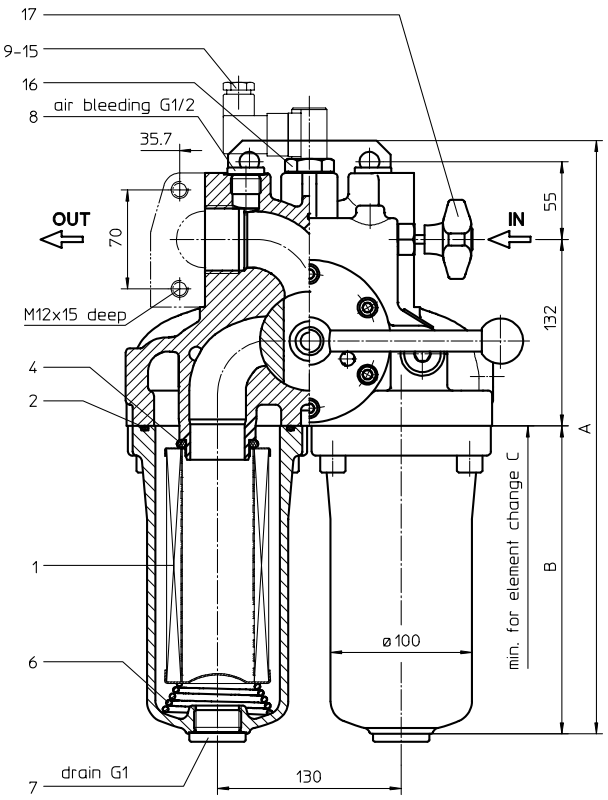
9. Test methods:

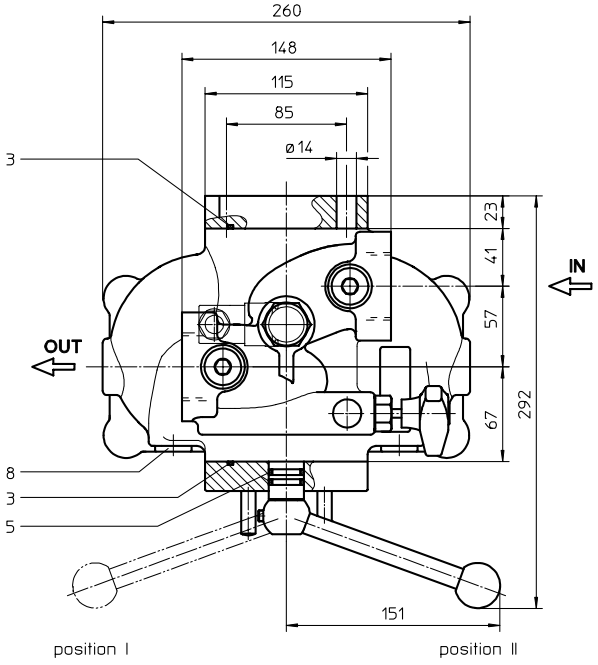
Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

PRESSURE FILTER, change-over
Series DSF 176 - 331 DN 40 PN 25

Sheet No.
2148





Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

On request:
Switch lever backside (IN left/OUT right)
Please specify on order !

1. Type index:

1.1. Complete filter: (ordering example)

DSF.	176.	10VG.	16.	E.	P.	-.	FS.	7.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DSF = duplex filter, change-over

2 **nominal size**: 176, 331

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = without by-pass valve

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
G = thread connection according to DIN 3852, T2

9 **connection size:**
7 = 1 ½“

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = witrhout
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor** :
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	175.	10VG.	16.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 175, 330

3 - 7 see type index complete filter

2. Accessories:

- counter flange see sheet-no. 1652

3. Dimensions:

type	A	B	C	weight kg	volume tank
DSF 176	420	218	250	36	2x 1,2 l
DSF 331	555	353	390	38	2x 2,0 l

Changes of measures and design are subject to alteration!

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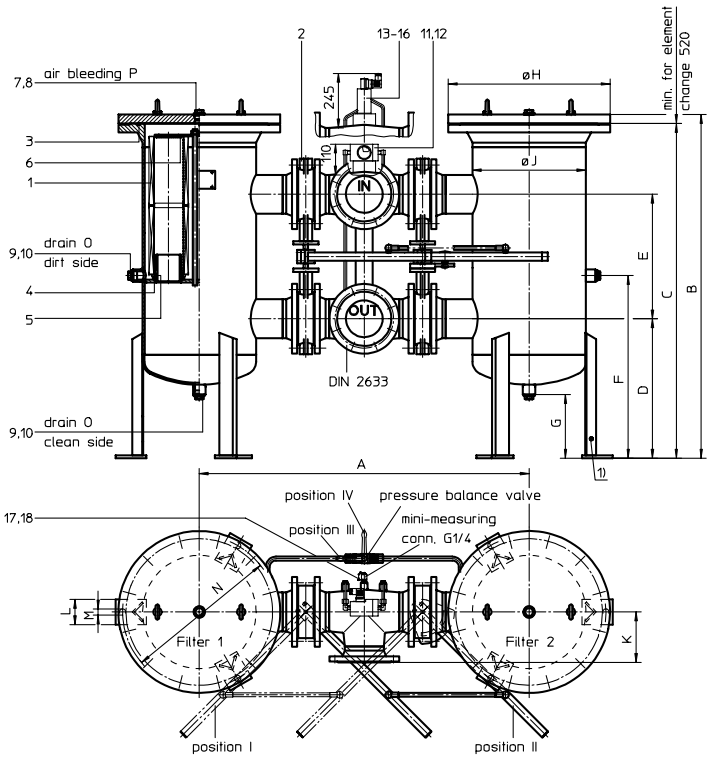
PRESSURE FILTER, change-over
Series DSF 1201-10001 DN 50-250 PN 16

Sheet No. **2133 M**



Pos. I: filter 1 in operation
Pos II: filter 2 in operation

with pressure balance valve:
Pos III: valve open
Pos IV: valve closed

Connection standard as in drawing.
On request: inlet- on top and backside
outlet - bottom and backside

Please specify on order!

1) connection for the potential equalisation, only for application in the explosive area

3. Dimensions:

Typ	connection DN	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	weight kg	volume tank
DSF 1201	50	796	1035	1015	395	330	490	183	340	219	111	70	18	330	G1	G ½	200	2x 26,0 l
	65	822				347					123							
	80	862				400					138							
	100	914				421					159							
DSF 2001	65	902	1100	1075	425	347	550	186	405	273	123	70	18	380	G1	G1	280	2x 44,0 l
	80	942				400					138							
	100	984				421					159							
	125	1032				446					181							
DSF 2401	65	952	1115	1085	425	347	540	183	460	324	123	70	18	450	G1	G1	355	2x 63,0 l
	80	982				400					138							
	100	1034				421					159							
	125	1082				446					181							
	150	1150	1185	1155	445	492	610				200							2x 67,0 l
DSF 3601	80	1092	1235	1200	500	400	655	238	580	406	138	90	22	550	G1	G1	580	2x 109,0 l
	100	1144				421					159							
	125	1182				446					181							
	150	1212				492					200							
DSF 4001	65	902	1596	1570	425	347	550	186	405	273	123	70	18	380	G1	G1	340	2x 70,0 l
	80	942				400					138							
	100	984				421					159							
	125	1032				446					181							
DSF 4801 DSF 6001	100	1274	1240	1200	520	421	655	232	715	508	159	90	22	650	G1	G1	800	2x 171,0 l
	125	1322				446					181							2x 171,0 l
	150	1352	1290	1250	530	492	705				200							2x 180,0 l
	200	1440	1390	1350	560	543	765				242							2x 199,0 l
DSF 10001	125	1592	1615	1300	620	446	755	283	910	711	181	120	22	900	G1 ½	G1 ½	950	2x 355,0 l
	150	1632	1665	1350	630	492	805				200							2x 374,0 l
	200	1700	1765	1450	650	543	870				242							2x 411,0 l
	250	1800	1895	1580	680	618	1000				288							2x 460,0 l

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1. Type index:

1.1. Complete filter: (ordering example)

DSF. 3601. 10VG. 10. E. P. -. FD1. B. -. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
DSF = duplex filter

2 **nominal size:** 1201, 2001, 2401, 3601, 4001, 4801, 6001, 10001

3 **filter material and filter fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve; S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR); V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FD1 = flange connection DIN 2633, design C DIN 2526; FD2 = flange connection DIN 2633, design E DIN 2526

9 **connection size:**

DN	filter nominal size							
8 = 50	1201							
9 = 65	1201	2001	2401		4001			
A = 80	1201	2001	2401	3601	4001			
B = 100	1201	2001	2401	3601	4001	4801	6001	
C = 125		2001	2401	3601	4001	4801	6001	10001
D = 150			2401	3601		4801	6001	10001
E = 200						4801	6001	10001
F = 250								10001

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
- = without
OP = visual, see sheet-no.1614
AE = visual-electrical, see sheet-no.1609; VS1 = electronical, see sheet-no.1607
OE = visual-electrical, see sheet-no 1614; VS2 = electronical, see sheet-no.1608

1.2. Filter element: (ordering example)

01E. 1201. 10VG. 10. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 1201, 2001, 4001

3 - 7 see type index-complete filter

2. Accessories:

- measure-and bleeder -connections, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- counter flanges, see sheet-no. 1653
- shut-off valve, see sheet-no. 1655
- lifting mechanism, see sheet-no. 1661

Changes of measures and design are subject to alteration!

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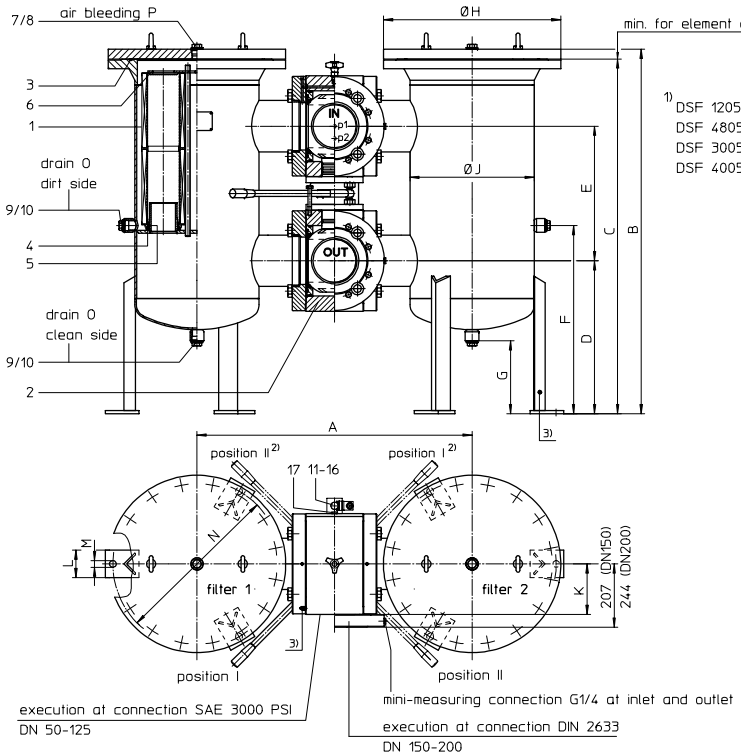
PRESSURE FILTER, change-over ball valve

Series DSF 1205-10005 DN 50-200 PN 16

Sheet No. **2134 F**



1) DSF 1205/2005/2405/3605 = 520mm
DSF 4805/6005/10005 = 520mm
DSF 3005 = 765mm
DSF 4005 = 1020mm

Position I: filter 1 in operation
Position II: filter 2 in operation

Switch lever standard in the front

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

3) connection for the potential equalisation at inlet and outlet resp. filter housing, only for application in the explosive area

3. Dimensions:

type	DN	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	weight kg	volume tank
DSF 1205	50	610	1009	985	365	175	460	185	340	219	74	70	18	330	G1	G ½	200	2x 26 l
	65	560	1009	985	365	270	460				90							2x 26 l
	80	585	1009	985	375	290	460				100							2x 26 l
	100	620	1024	1000	390	365	475				127							2x 26 l
DSF 2005	65	630	1011	985	380	270	460	185	405	273	90	70	18	380	G1	G1	280	2x 39 l
	80	640	1011	985	380	290	460				100							2x 39 l
	100	670	1046	1020	400	365	495				127							2x 41 l
	125	730	1086	1060	420	395	535				142							2x 43 l
DSF 2405	65	680	1053	1025	390	270	480	185	460	324	90	70	18	450	G1	G1	355	2x 58 l
	80	700	1053	1025	400	290	480				100							2x 58 l
	100	730	1078	1050	410	365	505				127							2x 60 l
	125	770	1113	1085	425	395	540				142							2x 63 l
DSF 3005	65	630	1258	1232	380	270	460	185	405	273	90	70	18	380	G1	G ½	310	2x 52 l
	80	640	1258	1232	380	290	460				100							2x 52 l
	100	670	1293	1267	400	365	495				127							2x 54 l
	125	730	1333	1307	420	395	535				142							2x 56 l
DSF 3605	80	780	1152	1120	480	290	575	235	580	406	100	90	22	550	G1	G1	580	2x 97 l
	100	810	1152	1120	480	365	575				127							2x 97 l
	125	870	1192	1160	500	395	615				142							2x 103 l
	150	900	1192	1160	500	440	615				-							2x 103 l
DSF 4005	65	630	1506	1480	380	270	460	185	405	273	90	70	18	380	G1	G1	340	2x 65 l
	80	640	1506	1480	380	290	460				100							2x 65 l
	100	670	1541	1515	400	365	495				127							2x 67 l
	125	730	1581	1555	420	395	535				142							2x 69 l
DSF 4805 DSF 6005	100	910	1216	1180	520	365	635	235	715	508	127	90	22	650	G1	G1	800	2x 165 l
	125	970	1216	1180	520	395	635				142							2x 165 l
	150	1040	1236	1200	530	440	655				-							2x 171 l
	200	1090	1376	1340	560	520	795				-							2x 197 l
DSF 10005	125	1170	1625	1310	630	395	765	285	910	711	142	120	22	900	G1 ½	G1 ½	950	2x 358 l
	150	1250	1625	1310	630	440	765				-							2x 358 l
	200	1290	1765	1450	660	520	905				-							2x 408 l

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1. Type index:

1.1. Complete filter: (oedering example)

DSF. 3605. 10VG. 10. E. P. -. FS. B. -. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
DSF = duplex filter

2 **nominal size:** 1205, 2005, 2405, 3005, 3605, 4005, 4805, 6005, 10005

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = flange connection SAE 3000 PSI , only for DN 50-125
FD1 = flange connection DIN 2633, design C DIN 2526, only for DN 150-200
FD2 = flange connection DIN 2633, design E DIN 2526, only for DN 150-200

9 **connection size:**

filter-nominal size	DSF 1205	DSF 2005	DSF 2405	DSF 3005	DSF 3605
connection size	8-9-A-B	9-A-B-C	9-A-B-C	9-A-B-C	A-B-C-D
filter-nominal size	DSF 4005	DSF 4805	DSF 6005	DSF 10005	
connection size	9-A-B-C	B-C-D-E	B-C-D-E	C-D-E	

8 = DN 50 9 = DN 65 A = DN 80 B = DN 100 C = DN 125 D = DN 150 E = DN 200

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
- = without
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
AE = visual-electrical, see sheet-no. 1609
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01E. 1201. 10VG. 10. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **Nenngröße:** 1201, 2001, 3001, 4001

3 - 7 see type index-complete filter

2. Accessories:

- measure -and bleeder-connections, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- shut-off valve, see sheet-no. 1655
- counter flanges, see sheet-no. 1652
- adaptor for flange DIN 2633 (DN 50-125), see sheet-no. 1657
- lifting mechanism, see sheet-no. 1661

Changes of measures and design are subject to alteration!

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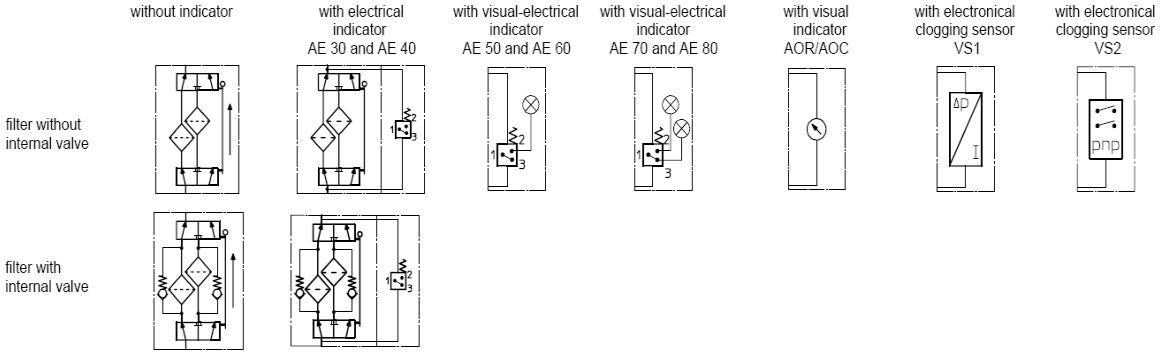
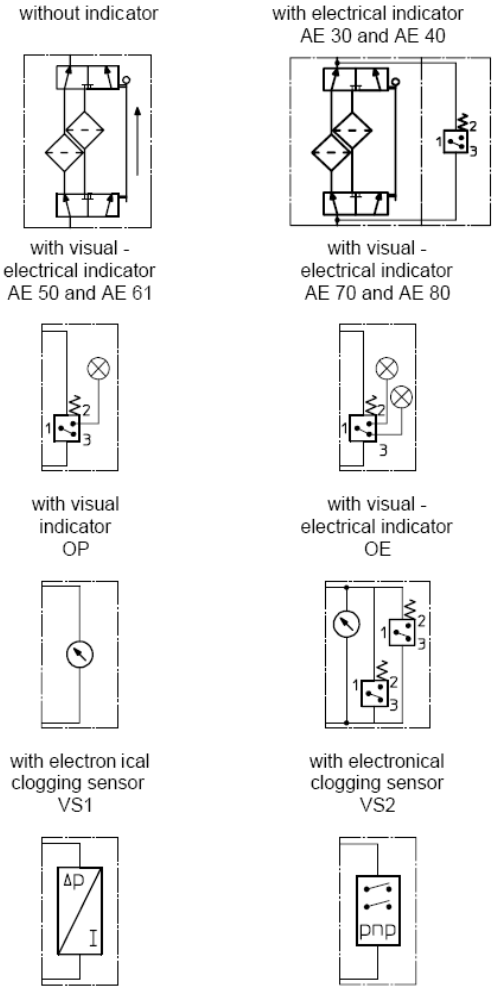
1. Technical data

NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	DSF.176	01E.175	2	
2	DSF.331	01E.330	2	
3	DSF.1201	01E.1201	2	
4	DSF.2001	01E.2001	2	
5	DSF.2401	01E.1201	4	
6	DSF.3601	01E.1201	6	
7	DSF.4001	01E.4001	2	
8	DSF.4801	01E.1201	8	
9	DSF.6001	01E.2001	6	
10	DSF.10001	01E.2001	10	
11	DSF.1205	01E.1201	2	
12	DSF.2005	01E.2001	2	
13	DSF.2405	01E.1201	4	
14	DSF.3005	01E.3001	2	
15	DSF.3605	01E.1201	6	
16	DSF.4005	01E.4001	2	
17	DSF.4805	01E.1201	8	
18	DSF.6005	01E.2001	6	
19	DSF.1005	01E.2001	10	

2. Symbols for DSF176-331

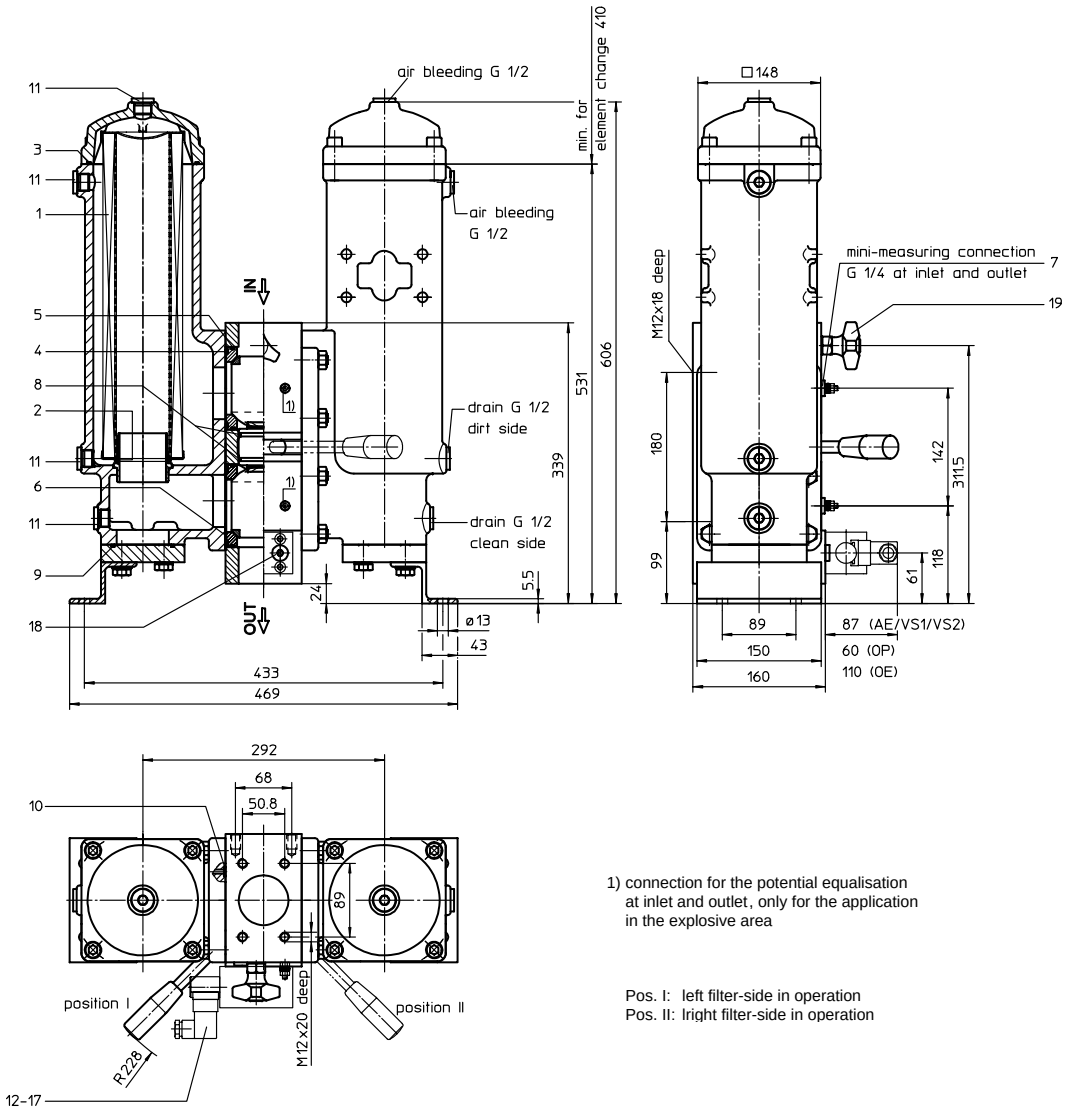


3. Symbols for DSF1201 - 10005



PRESSURE FILTER, change-over ball valve
Series DUV 635 DN 65 PN 32

Sheet No. **2146 C**



1) connection for the potential equalisation at inlet and outlet, only for the application in the explosive area

Pos. I: left filter-side in operation
Pos. II: lright filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

DUV. 635. 10VG. 30. E. P. -. FS. 9. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DUV = pressure filter, change-over with vertical connecting line

2 **nominal size:** 635

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar, S = with by-pass Δp 2,0 bar, S1 = with by-pass Δp 3,5 bar,

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
9 = 2 ½ “

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605, IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL. 630. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 630

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuation and bleeder-conections, see sheet-no. 1651
- counter flanges, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. 90 kg

Changes of measures and design are subject to alteration!

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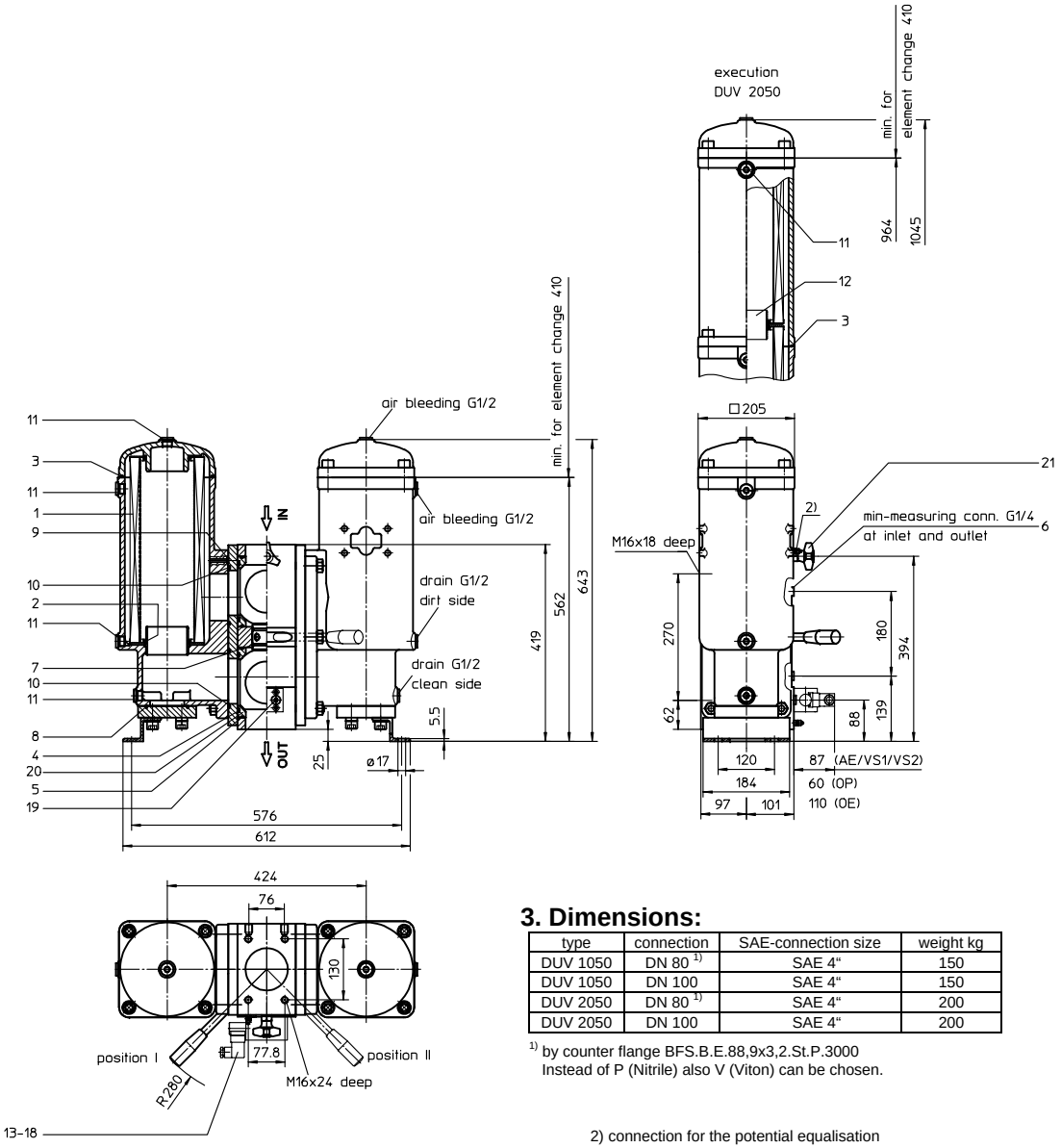
PRESSURE FILTER, change-over ball valve
Series DUV 1050-2050 DN 80-100 PN 32

Sheet No. **2147 C**



1. Type index:

1.1. Complete filter: (ordering example)

DUV.	1050.	10VG.	10.	B.	P.	-.	FS.	B.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DUV = pressure filter, change-over with vertical connecting line

2 **nominal size:** 1050, 2050

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
B = 4“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S = with by-pass valve Δp 2 bar
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- evacuation- and bleeder-connection, see sheet-no. 1651
- counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

3. Dimensions:

type	connection	SAE-connection size	weight kg
DUV 1050	DN 80 [1)]	SAE 4“	150
DUV 1050	DN 100	SAE 4“	150
DUV 2050	DN 80 [1)]	SAE 4“	200
DUV 2050	DN 100	SAE 4“	200

[1)] by counter flange BFS.B.E.88,9x3,2.St.P.3000
Instead of P (Nitrile) also V (Viton) can be chosen.

2) connection for the potential equalisation at inlet and outlet, only for the application in the explosive area

Pos. I: left filter-side in operation
Pos. II: lright filter-side in operation

Changes of measures and design are subject to alteration!

EDV 07/06

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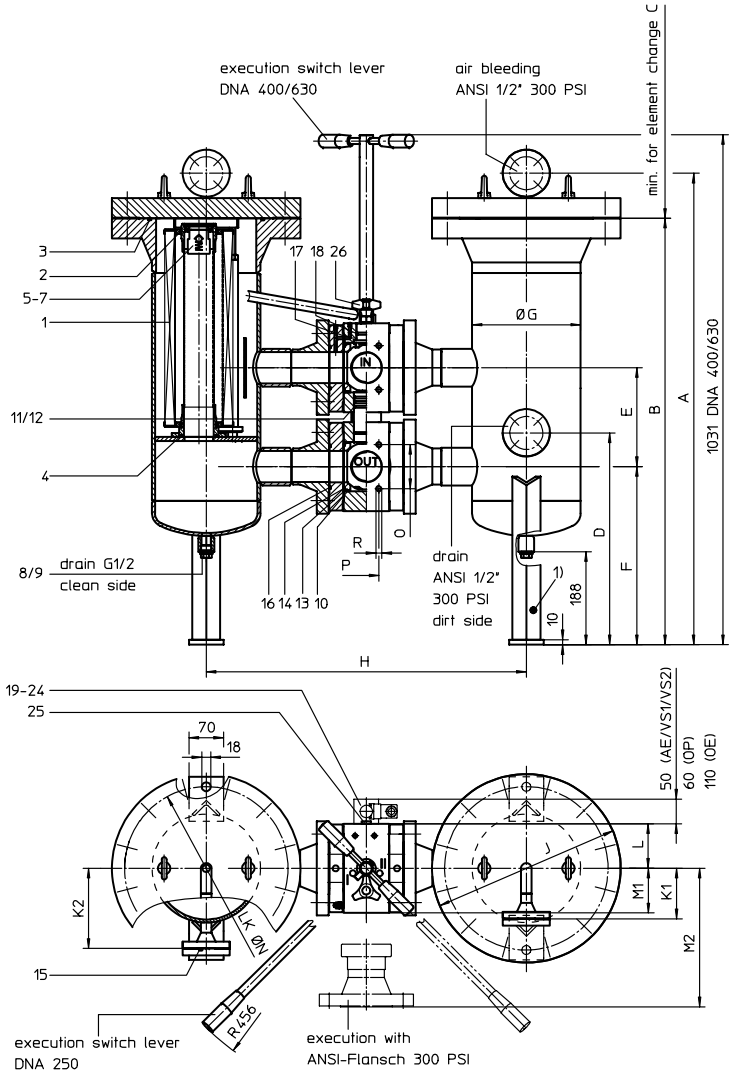
PRESSURE FILTER, change-over
Series DNA 250-630 DN 50-65 PN 16

Sheet No. **2137 H**



Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

[1] connection for the potential equalisation at inlet and outlet resp. filter housing, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

DNA. 630. 10VG. 10. B. P. -. FS. 9. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
DNA = pressure filter, change-over according to ASME-code

2 **nominal size:** 250, 400, 630

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design**:
B = both sides open

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:**
- = standard VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA = ANSI-flange connection 300 PSI

9 **connection size:**
8 = 2" (DNA 250)
9 = 2 ½" (DNA 400/630)

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628 VS1 = electronical, see sheet-no. 1607
OE = visual-electrical, see sheet-no. 1628 VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR. 630. 10VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 250, 400, 630

3 - 7 see type index-complete filter

2. Accessories:

- shut-off valve see sheet-no. 1655
- counter-flange see sheet-no. 1652
- adaptor for ANSI-flange 300 PSI see sheet-no. 1658

3. Dimensions:

type	connection	A	B	C	D	E	F	G	H	J	K1	K2	L	M1	M2	N	O	P	R	weight kg	volume tank
DNA 250	DN 50	821	715	270	433	175	365	168,3	603	317,5	82	136,5	74	74	191	278	42,9	77,8	M12x20 tief	223	2x 9 l
DNA 400	DN 65	847	756	270	472	200	360	219,1	647	381	102	162	90	90	218	330	52,8	89	M12x22 tief	264	2x 17 l
DNA 630	DN 65	953	862	420	428	200	360	219,1	647	381	102	162	90	90	218	330	52,8	89	M12x22 tief	272	2x 21 l

Changes of measures and design are subject to alteration!

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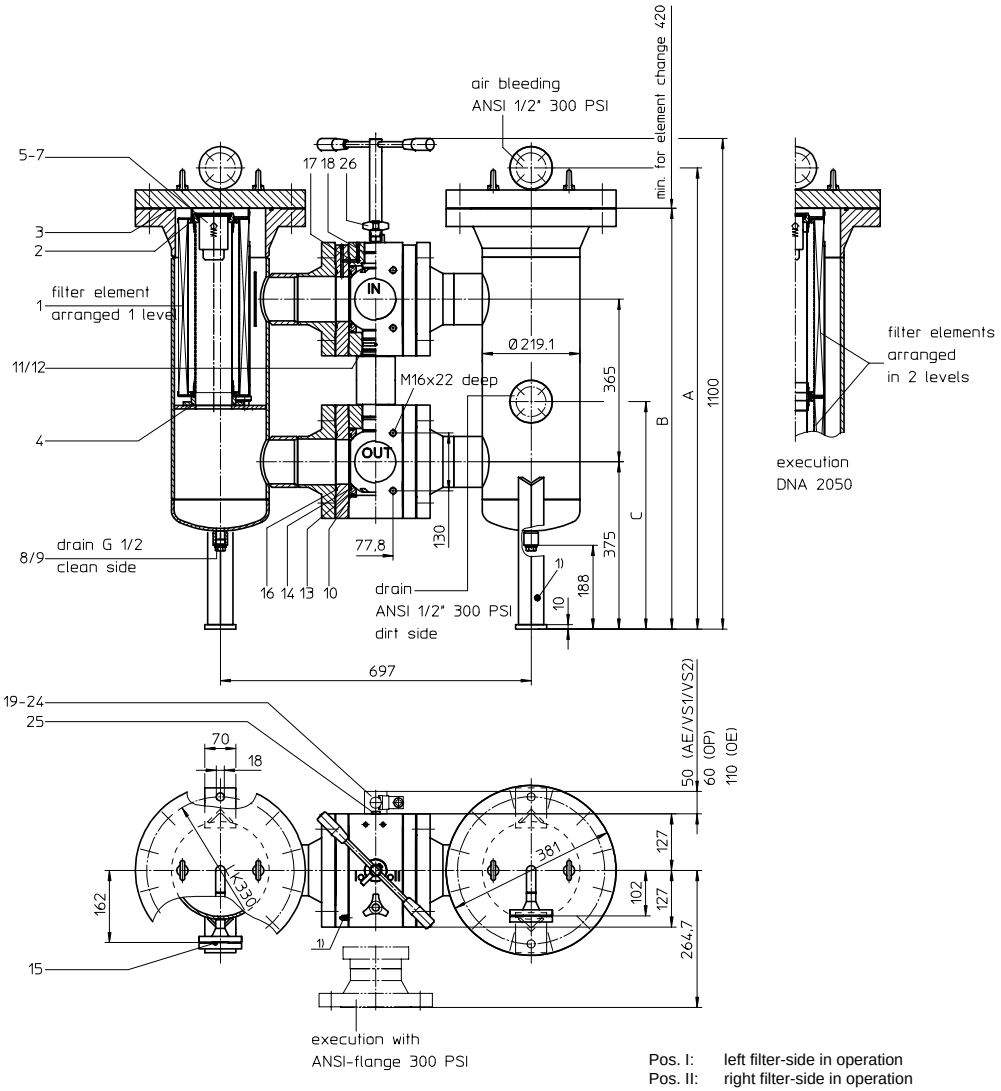
PRESSURE FILTER, change-over
Series DNA 1050-2050 DN 100 PN 16

Sheet No. **2138 H**



Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

[1] connection for the potential equalisation at inlet and outlet resp. filter housing, only for application in the explosive area

3. Dimensions:

type	connection	A	B	C	weight kg	volume tank
DNA 1050	DN 100	1035	944	510	446	2x 24 l
DNA 2050	DN 100	1391	1300	467	476	2x 35 l

1. Type index:

1.1. Complete filter: (ordering example)

DNA. 1050. 10VG. 10. B. P. -. FS. B. -. -. AE

1	2	3	4	6	6	7	8	9	10	11	12

1 **series:**
DNA = pressure filter, change-over according to ASME-code

2 **nominal size:** 1050, 2050

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA = ANSI-flange connection 300 PSI

9 **connection size:**
B = 4"

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR. 1000. 10VG. 10. B. P. -

1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-complete filter

2. Accessories:

- shut-off valve, see sheet-no. 1655
- counter-flange see sheet-no. 1652
- adaptor for ANSI-flange 300 PSI, see sheet-no. 1658

Changes of measures and design are subject to alteration!

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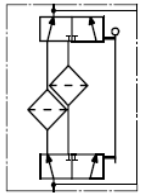
1. Technical data

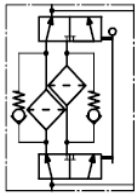
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	DUV.635	01NL.630	2	NO with by-pass valve
2	DUV.1050	01NR.1000	2	
3	DUV.2050	01NR.1000	4	
4	DNA.250	01NR.250	2	
5	DNA.400	01NR.400	2	
6	DNA.630	01NR.630	2	
7	DNA.1050	01NR.1000	2	
8	DNA.2050	01NR.1000	4	

2. Symbols for DUV Model

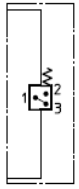
without indicator



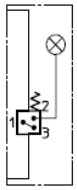
with by-pass valve



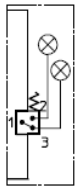
with electrical indicator AE 30 and AE 40



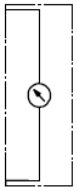
with visual-electrical indicator AE 50 and AE 61



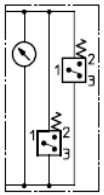
with visual-electrical indicator AE 70 and AE 80



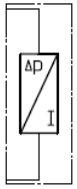
with visual indicator OP



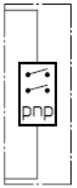
with visual-electrical indicator OE



with electronical clogging sensor VS1

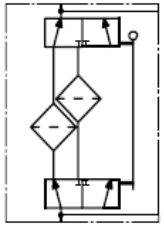


with electronical clogging sensor VS2

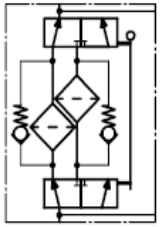


3. Symbols for DNA Model

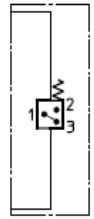
without indicator



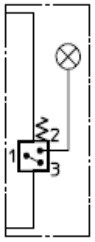
with by-pass valve



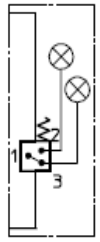
with electrical indicator AE 30 and AE 40



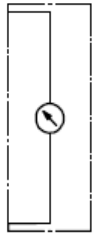
with visual-electrical indicator AE 50 and AE 61



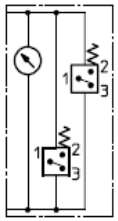
with visual-electrical indicator AE 70 and AE 80



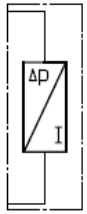
with visual indicator OP



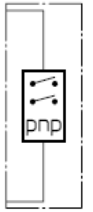
with visual-electrical indicator OE



with electronical clogging sensor VS1

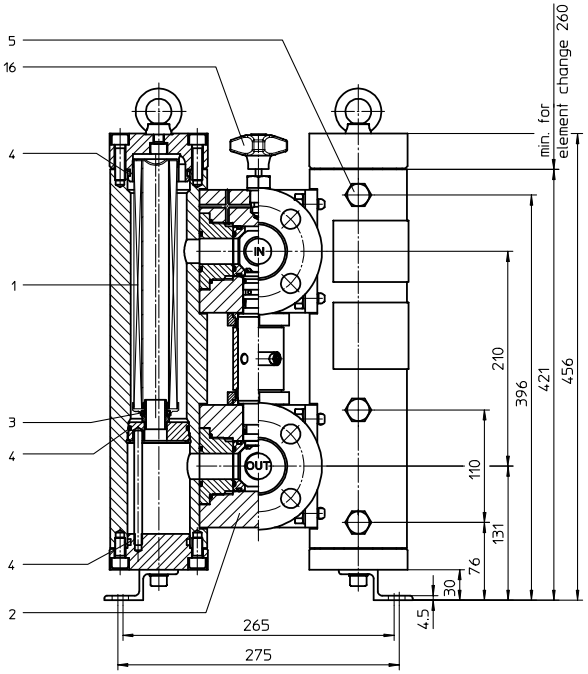


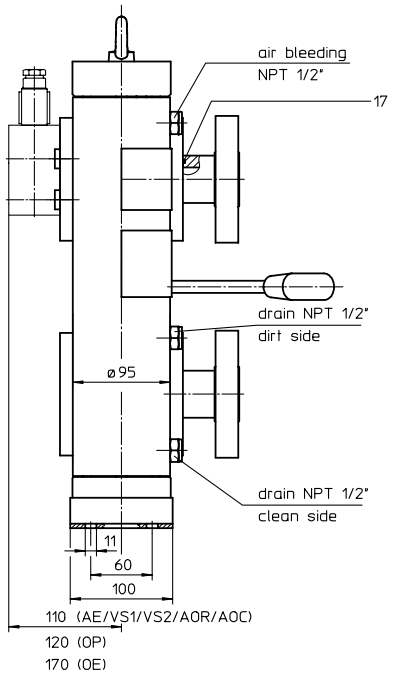
with electronical clogging sensor VS2

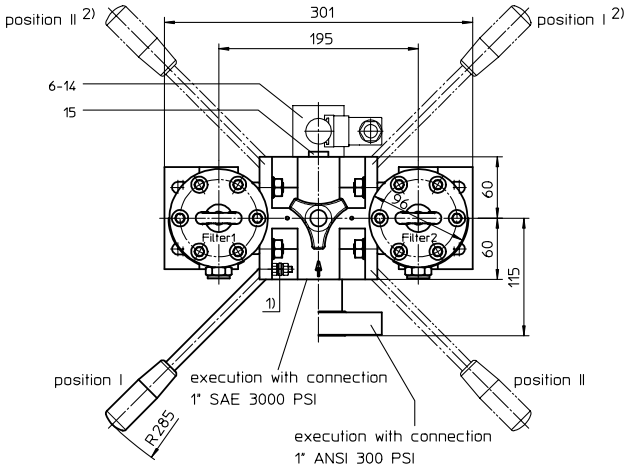


PRESSURE FILTER, change-over
Series DA 100 DN 25 PN 40

Sheet No. **2152A**







1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

1. Type index:

1.1. Complete filter: (ordering example)

DA. 100. 10VG. 30. E. P. -. FS. 5. -. -. AE. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 100

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
5 = 1"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL. 100. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 100

3 - 7 see type index complete filter

2. Accessories:

- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. 60 kg

Changes of measures and design are subject to alteration!

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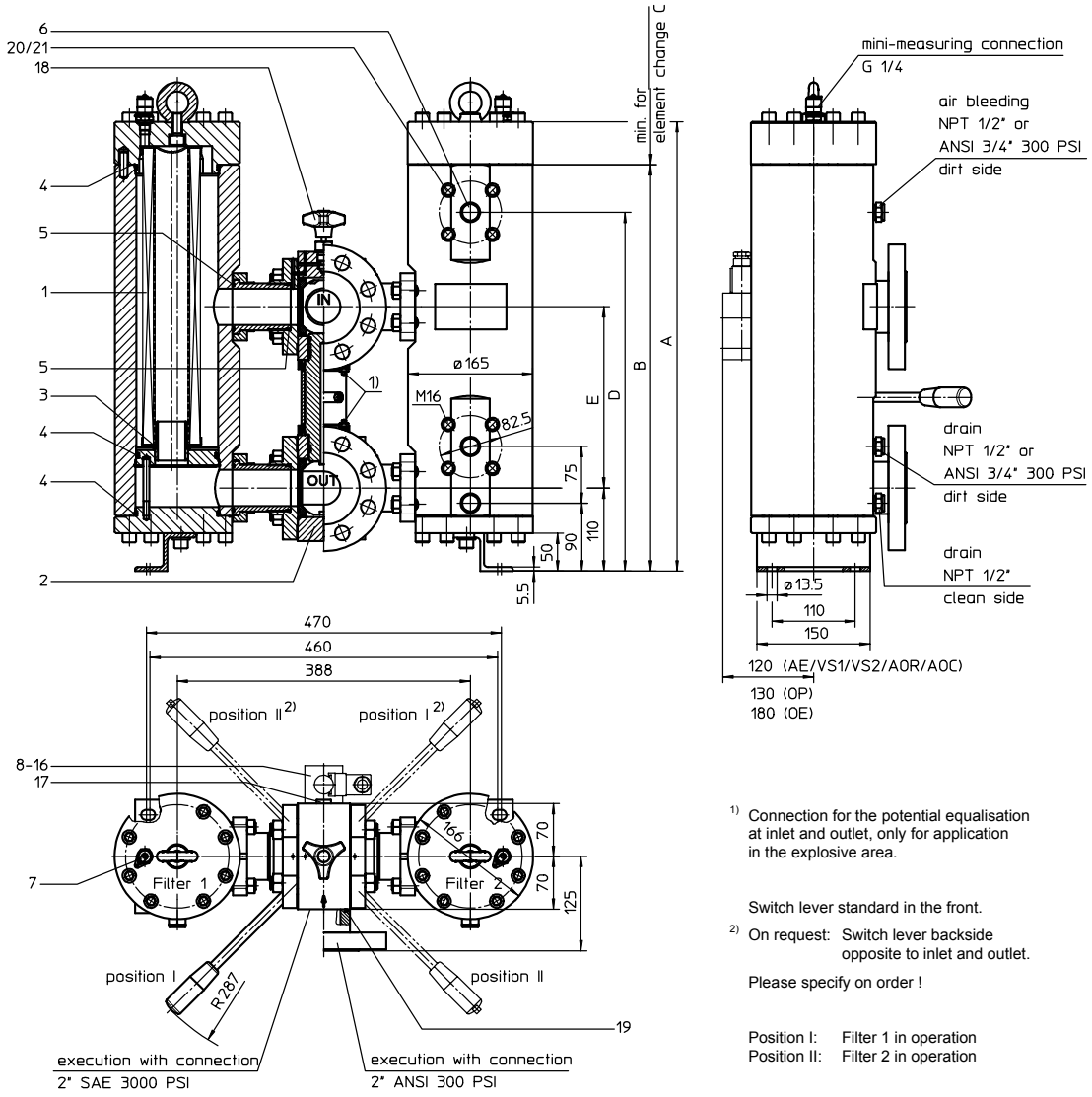
PRESSURE FILTER, change-over

Series DA 250-400 DN 50 PN 40

Sheet No. **2155 E**



1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

1. Type index:

1.1. Complete filter: (ordering example)

DA. 400. 10VG. 30. E. P. -. FS. 8. -. -. AE. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 250, 400

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
8 = 2"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL. 400. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 250, 400

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-ounter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

3. Dimensions:

type	connection	connection size	A	B	C	D	E	weight kg
DA 250	DN 50	SAE or ANSI 2"	445	388	260	325	200	approx. 130
DA 400	DN 50	SAE or ANSI 2"	595	538	410	475	240	approx. 160

Changes of measures and design are subject to alteration!

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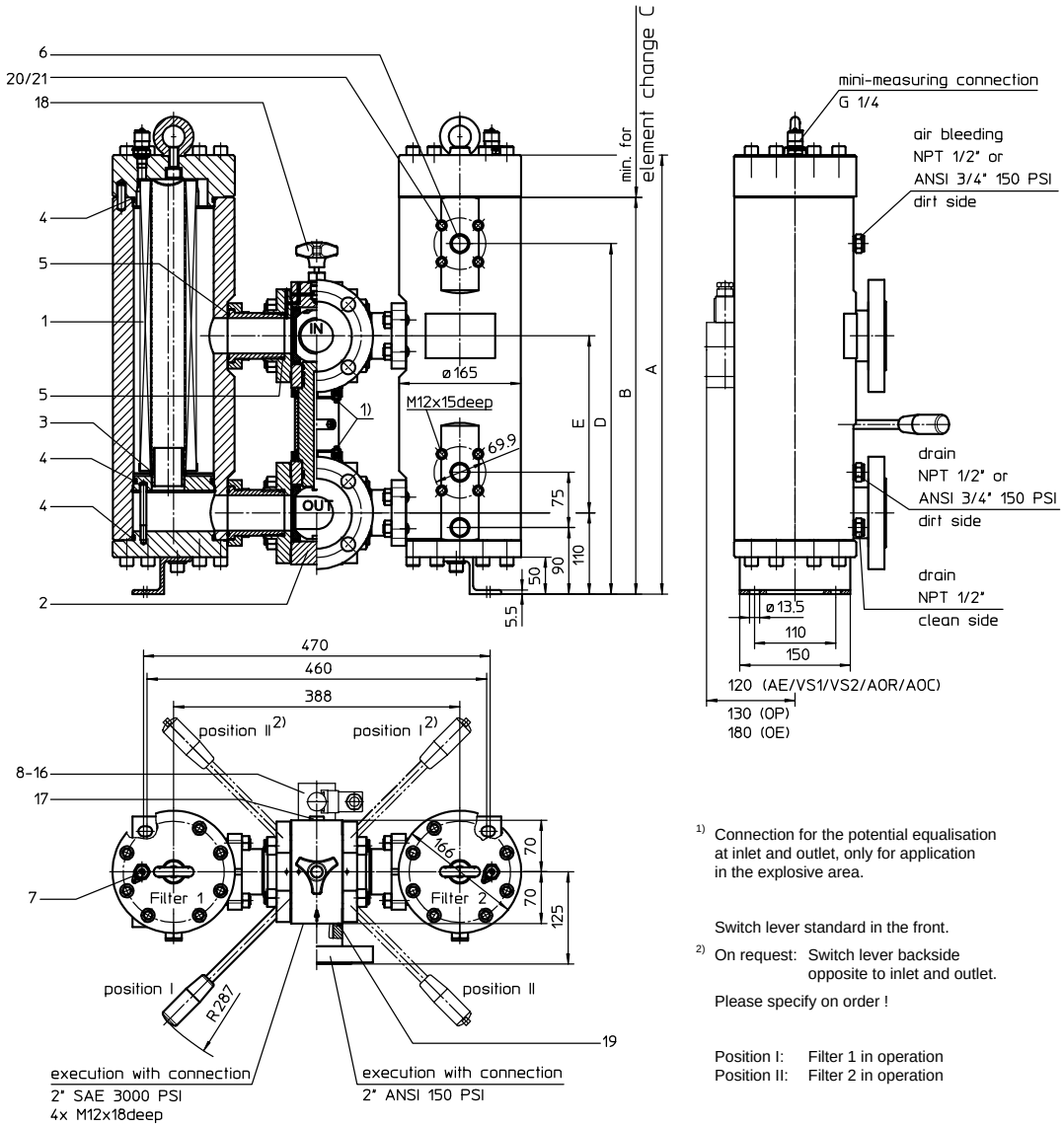
PRESSURE FILTER, change-over

Series DA 251-401 DN 50 PN 20

Sheet No. **2164 A**



1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

3. Dimensions:

type	connection	connection size	A	B	C	D	E	weight kg
DA 251	DN 50	SAE or ANSI 2"	445	388	260	325	200	approx. 130
DA 401	DN 50	SAE or ANSI 2"	595	538	410	475	240	approx. 160

1. Type index:

1.1. Complete filter: (ordering example)

DA. 401. 10VG. 30. E. P. -. FS. 8. -. -. AE. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 251, 401

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA11 = ANSI-flange connection 150 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA12 = ANSI-flange connection 150 PSI, sealing surface R_z = 16 µm

9 **connection size:**
8 = 2"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL. 400. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 250, 400

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

Changes of measures and design are subject to alteration!

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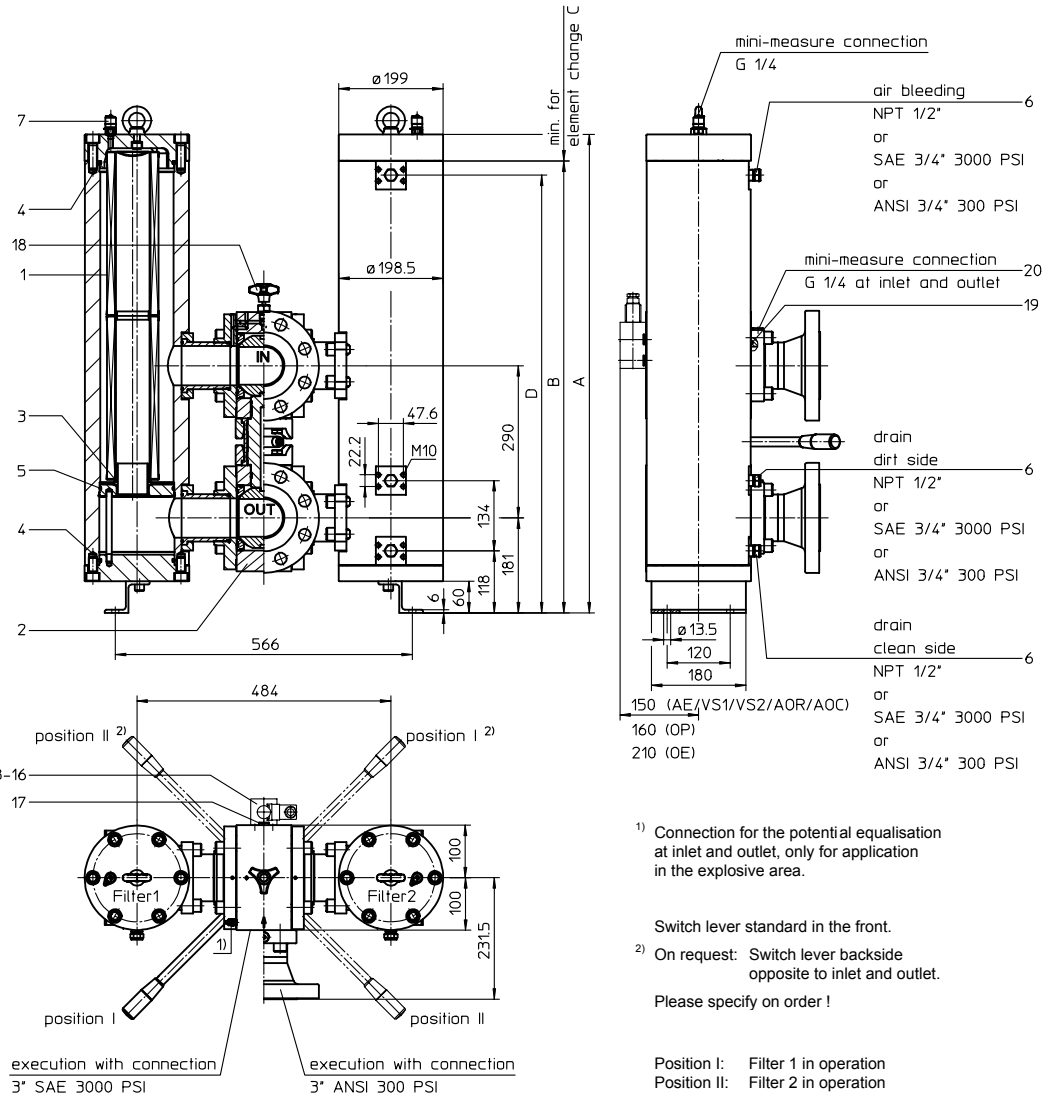
PRESSURE FILTER, change-over

Series DA 630-1000 DN 80 PN 40

Sheet No. **2156 A**



[1] Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

[2] On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

1. Type index:

1.1. Complete filter: (ordering example)

DA.	1000.	10VG.	30.	E.	P.	-.	FS.	A.	-.	-.	AE.	-
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 630, 1000

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
A = 3"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL.	1000.	10VG.	30.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 630, 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- adaptor for ANSI-flange 300 PSI, see sheet-no. 1658
- shut-off valve, see sheet-no. 1655

3. Dimensions:

type	connection	connection size	A	B	C	D	weight kg
DA 630	DN 80	SAE or ANSI 3"	682	631	410	604	approx. 290
DA 1000	DN 80	SAE or ANSI 3"	912	861	640	834	approx. 350

Changes of measures and design are subject to alteration!

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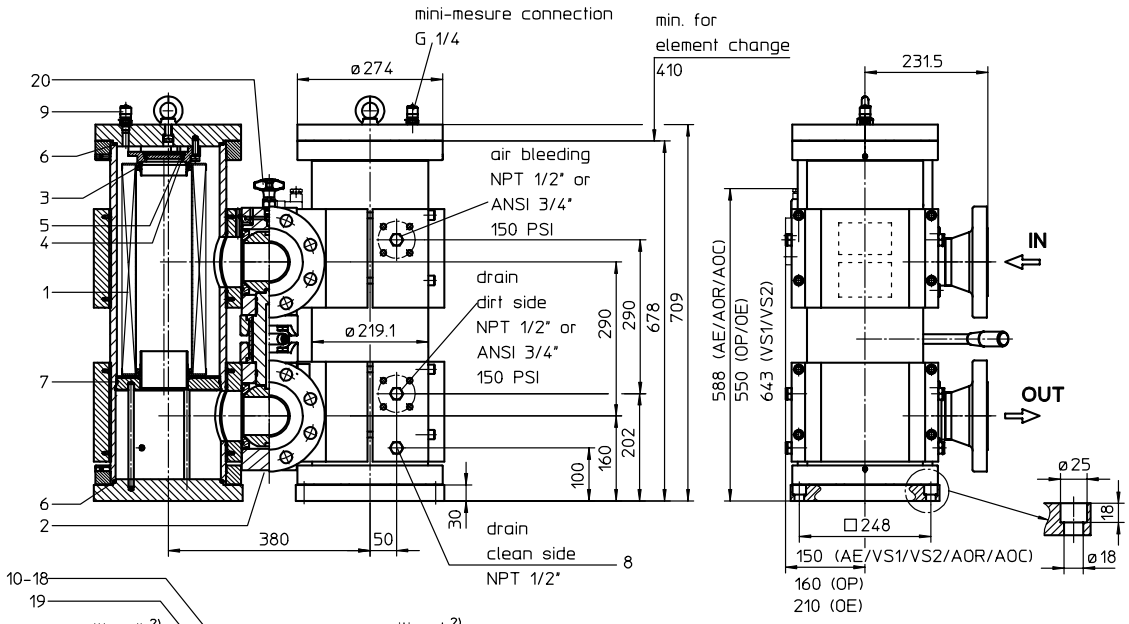
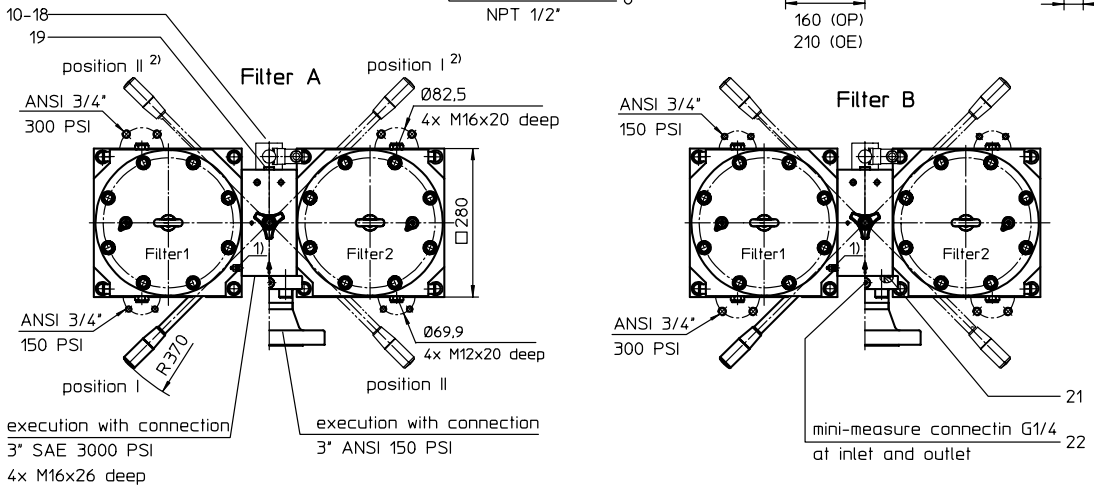
PRESSURE FILTER, change-over
Series DA 1004 DN 80 PN 40

Sheet No. **2185**





1. Type index:

1.1. Complete filter: (ordering example)

DA.	1004.	10VG.	10.	B.	P.	-.	FS.	A.	-.	-.	AE.	-.	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 1004

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
A = 3"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

14 **execution: (air bleeding/drain)**
A = filter A
B = filter B

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. xxx kg

Changes of measures and design are subject to alteration!

[1] Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

[2] On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

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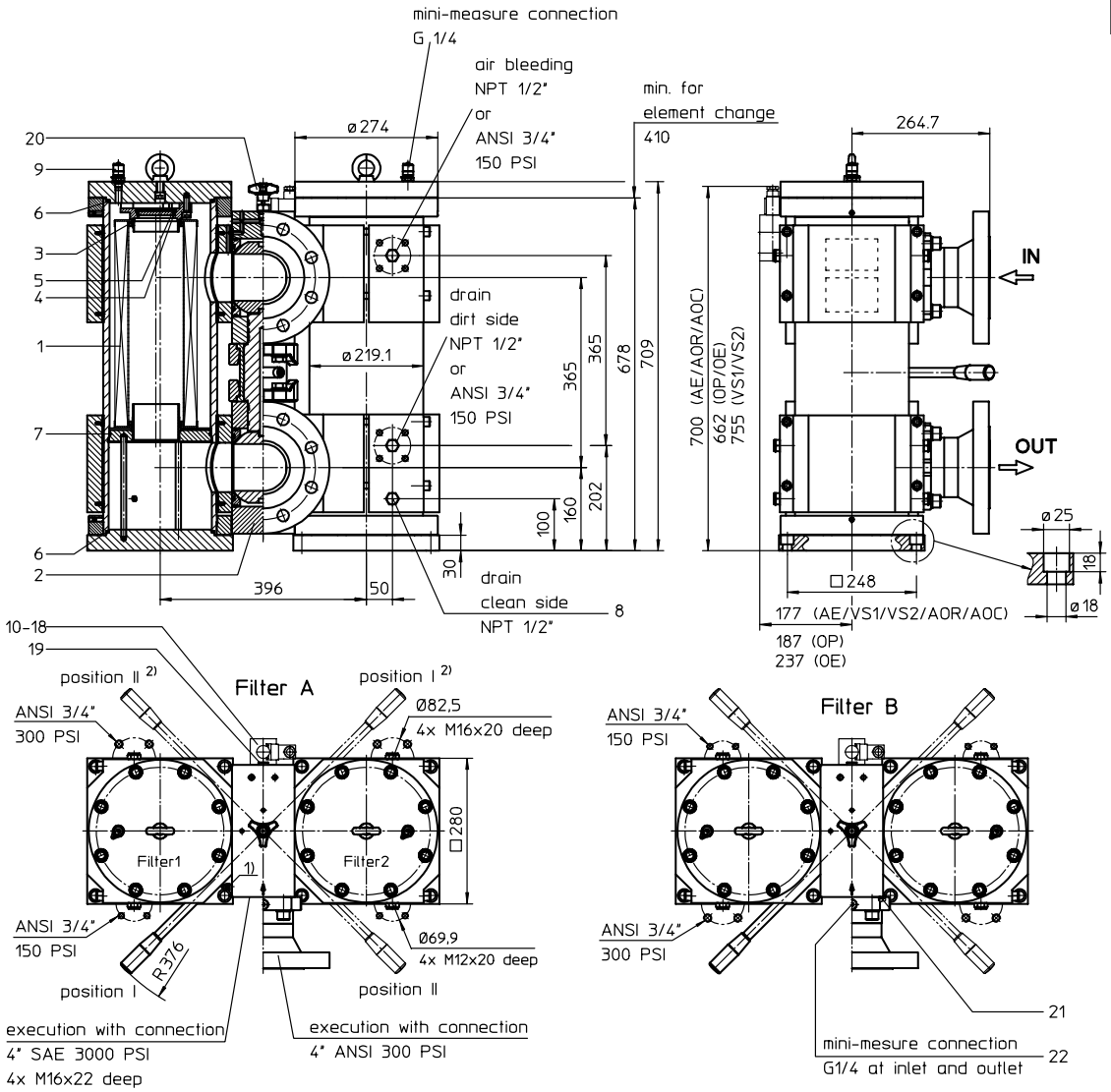
PRESSURE FILTER, change-over
Series DA 1005 DN 100 PN 40

Sheet No. **2186**



1. Type index:

1.1. Complete filter: (ordering example)

DA.	1005.	10VG.	10.	B.	P.	-.	FS.	B.	-.	-.	AE.	-.	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 1005

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
B = 4"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

14 **execution: (air bleeding/drain)**
A = filter A
B = filter B

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. xxx kg

Changes of measures and design are subject to alteration!

[1] Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

[2] On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

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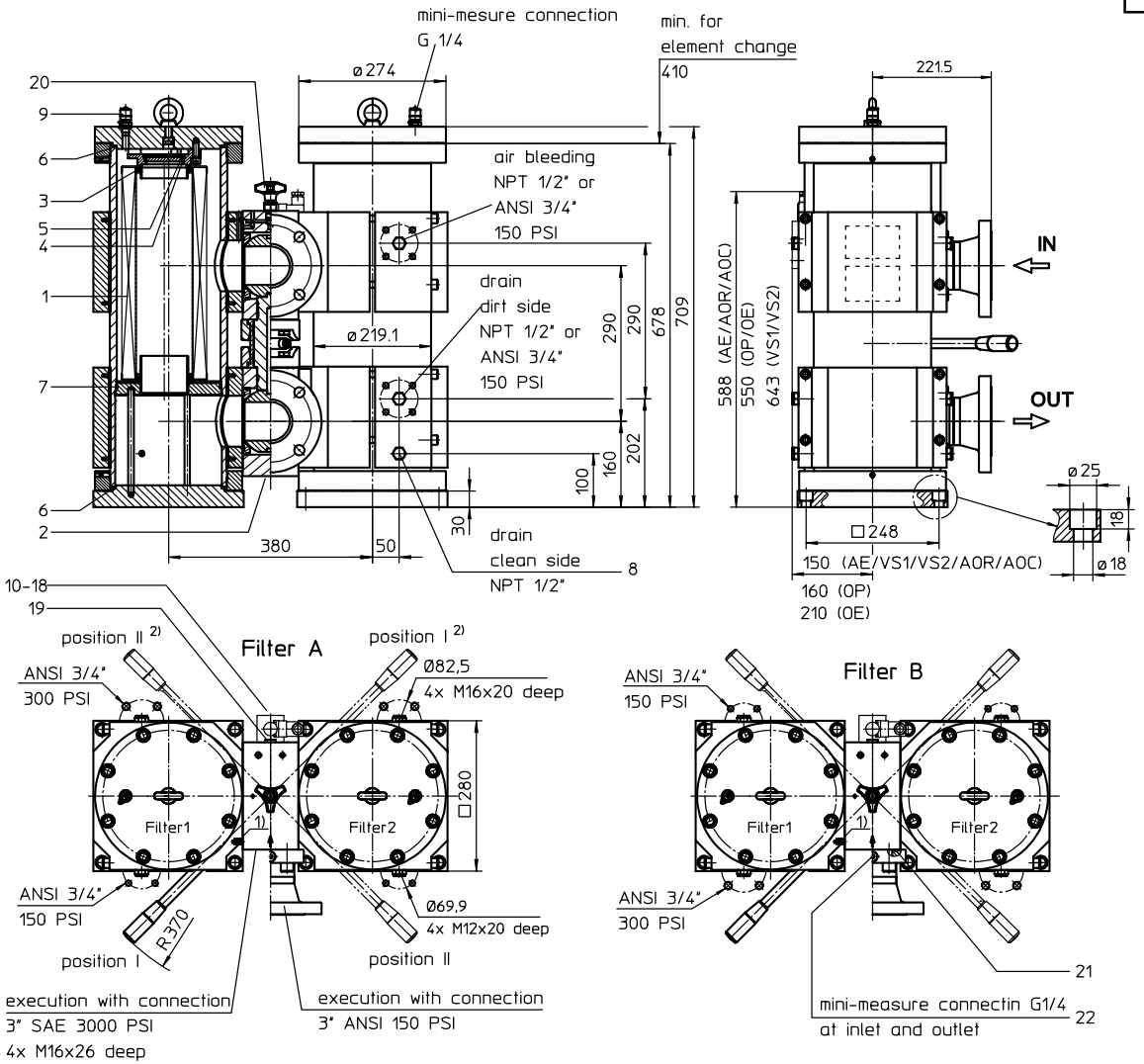
PRESSURE FILTER, change-over
Series DA 1014 DN 80 PN 20

Sheet No. **2180**



1. Type index:

1.1. Complete filter: (ordering example)

DA.	1014.	10VG.	10.	B.	P.	-.	FS.	A.	-.	-.	AE.	-.	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 1014

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA11 = ANSI-flange connection 150 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA12 = ANSI-flange connection 150 PSI, sealing surface R_z = 16 µm

9 **connection size:**
A = 3"

10 **filter housing specification:**
- = standard
IS12 = see sheet no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

14 **execution: (air bleeding/drain)**
A = filter A
B = filter B

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. xxx kg

Changes of measures and design are subject to alteration!

1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

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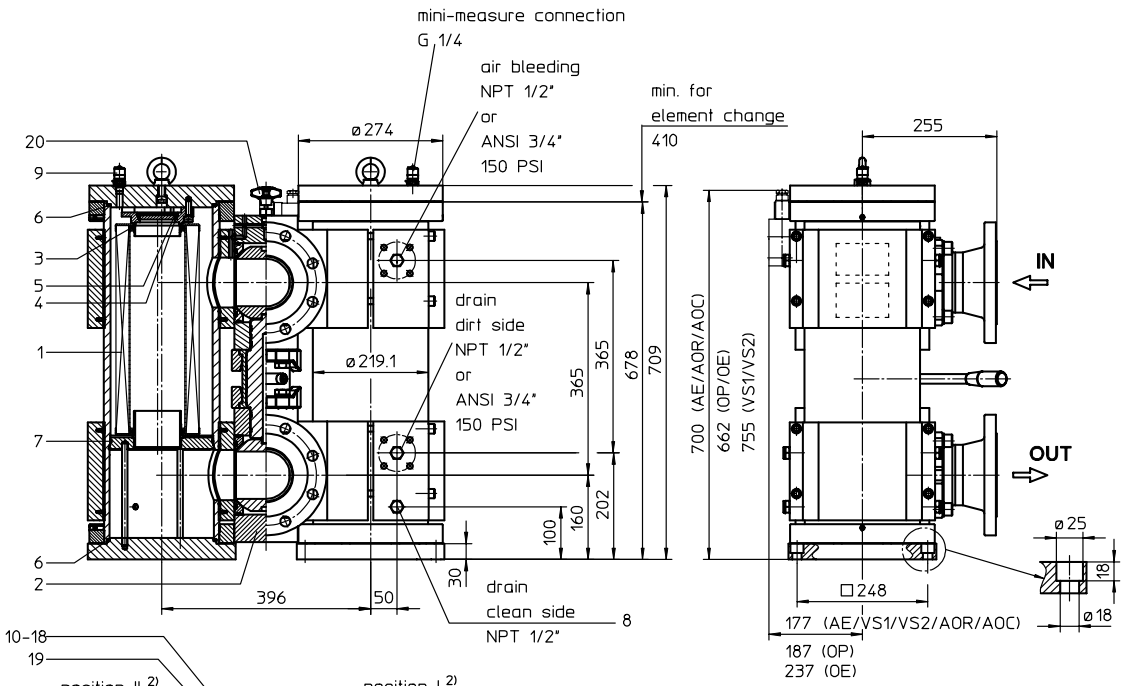
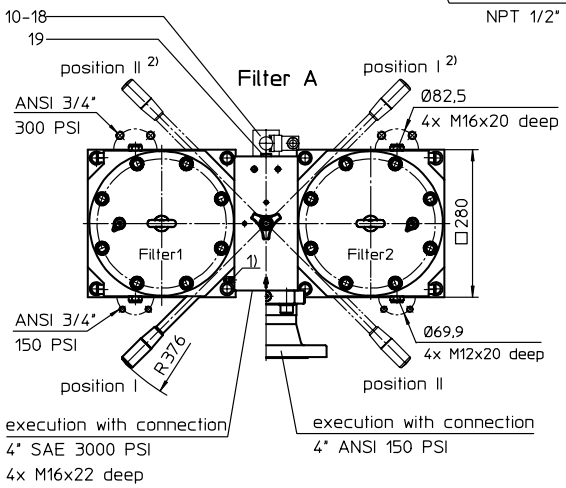
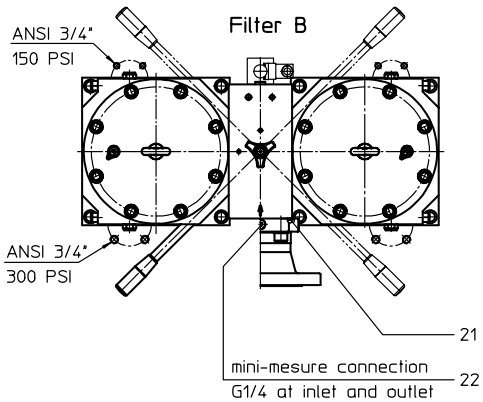
PRESSURE FILTER, change-over
Series DA 1015 DN 100 PN 20

Sheet No. **2181**







[1] Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

[2] On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

1. Type index:

1.1. Complete filter: (ordering example)

DA.	1015.	10VG.	10.	B.	P.	-.	FS.	B.	-.	-.	AE.	-.	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 1015

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA11 = ANSI-flange connection 150 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA12 = ANSI-flange connection 150 PSI, sealing surface R_z = 16 µm

9 **connection size:**
B = 4"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

14 **execution: (air bleeding/drain)**
A = filter A
B = filter B

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. xxx kg

Changes of measures and design are subject to alteration!

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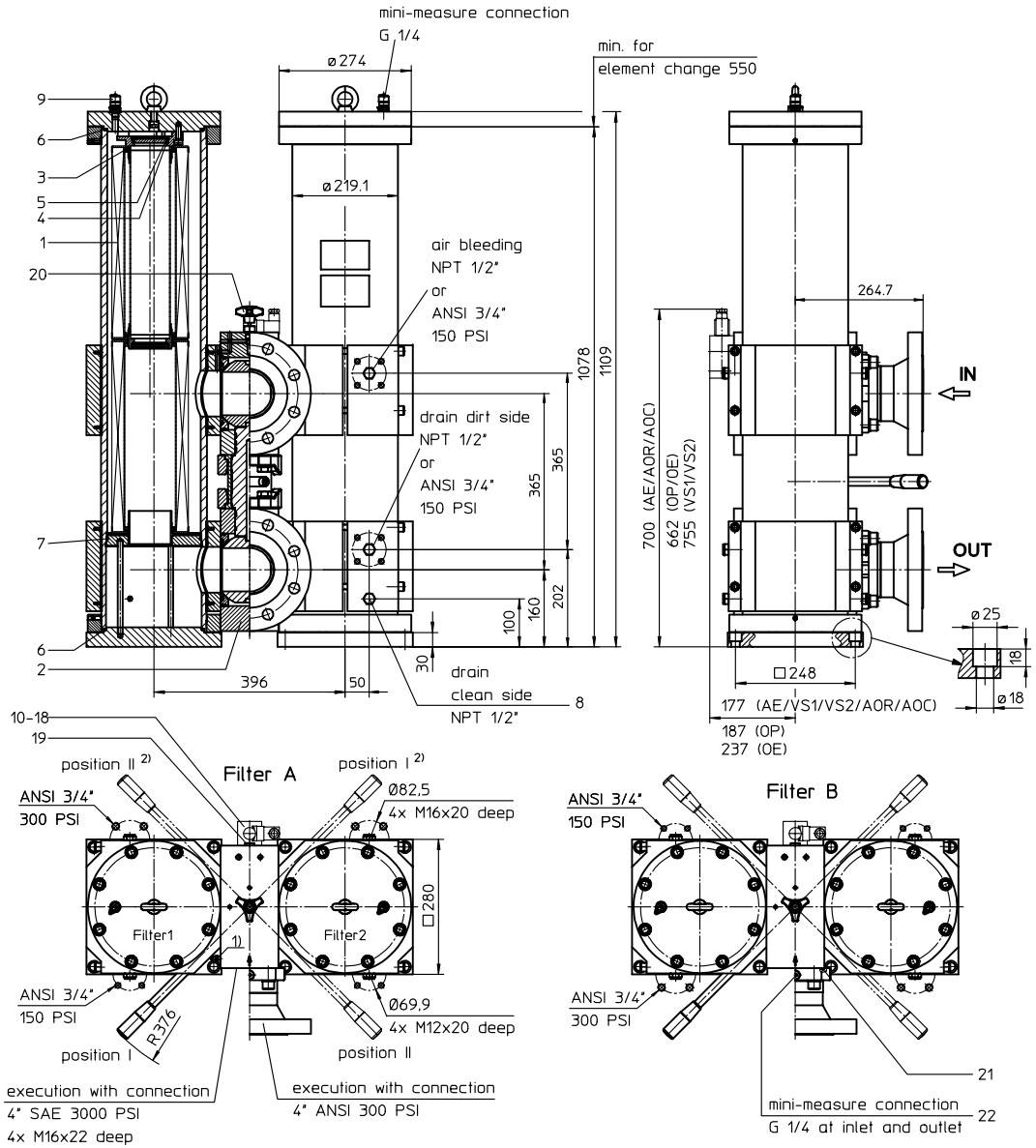
PRESSURE FILTER, change-over
Series DA 2205 DN 100 PN 40

Sheet No. **2187**



1. Type index:

1.1. Complete filter: (ordering example)

DA.	2205.	10VG.	10.	B.	P.	-.	FS.	B.	-.	-.	AE.	-.	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 2205

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
B = 4"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

14 **execution: (air bleeding/drain)**
A = filter A
B = filter B

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. xxx kg

Changes of measures and design are subject to alteration!

1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

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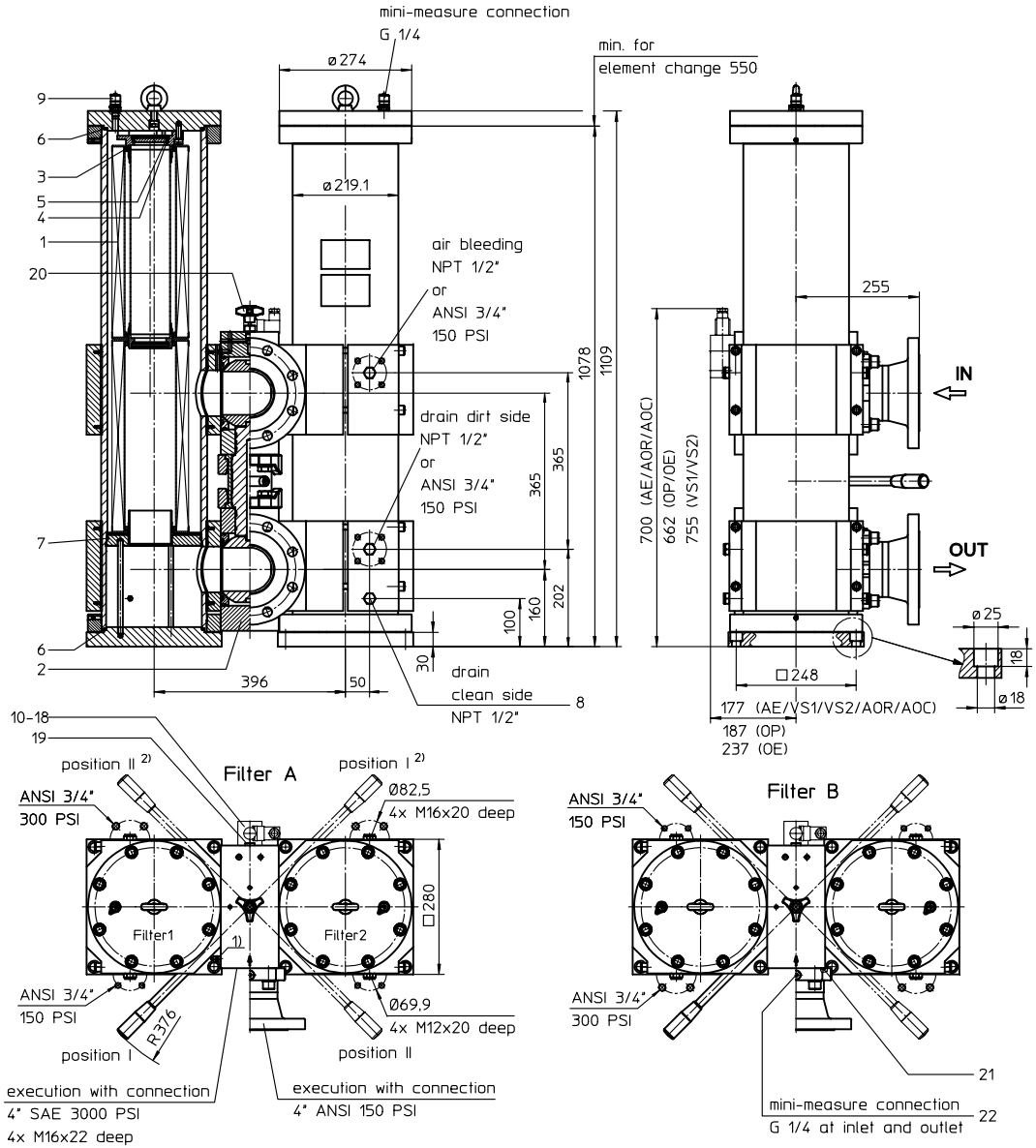
PRESSURE FILTER, change-over
Series DA 2215 DN 100 PN 20

Sheet No. **2182**



1. Type index:

1.1. Complete filter: (ordering example)

DA.	2215.	10VG.	10.	B.	P.	-.	FS.	B.	-.	-.	AE.	-.	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
DA = pressure filter change-over, according to ASME-code

2 **nominal size:** 2215

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA11 = ANSI-flange connection 150 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA12 = ANSI-flange connection 150 PSI, sealing surface R_z = 16 µm

9 **connection size:**
B = 4"

10 **filter housing specification:**
- = standard
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

14 **execution: (air bleeding/drain)**
A = filter A
B = filter B

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. xxx kg

Changes of measures and design are subject to alteration!

1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

EDV 03/09

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1. Technical data

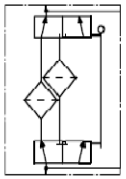
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	DA.100	01NL.100	2	
2	DA.250	01NL.250	2	
3	DA.400	01NL.400	2	
4	DA.251	01NL.250	2	
5	DA.401	01NL.400	2	
6	DA.630	01NL.630	2	
7	DA.1000	01NL.100	2	
8	DA.1004	01NR.1000	2	
9	DA.1005	01NR.1000	2	
10	DA.1014	01NR.1000	2	
11	DA.1015	01NR.1000	2	
12	DA.2205	01NR.1000	4	
13	DA.2215	01NR.1000	4	

2. Description

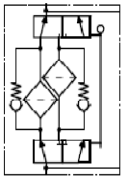
Pressure filters, change-over series DA 100 are suitable for operating pressure up to 40 bar.
Pressure peaks can be absorbed with a sufficient margin o safety.
Change-over ball valve which, integrated in the middle of the housing, makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outs ide to the inside.
These filters can be installed as suction filters
For cleaning (see special leaflet 21070-4 and 34448-4) the mesh element respectively to change the glass fibre element remove the cover and take out the element.
Filter finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 $\mu m_{(c)}$ are available, finer filter elements on request.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-rotaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
The inspection according to TÜV, according to ASME VIII Div.1 and the major „Shipyard Classification Societies" D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S. and others are possible. If inspection is required please indicate in your order.

3. Symbols

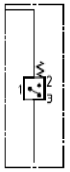
without indicator



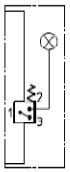
with by-pass valve



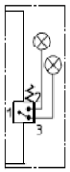
with olectric indicator
ΛE 30 and Λ



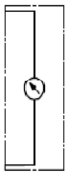
with visual-electrical indicator
AE 50 and AE 61



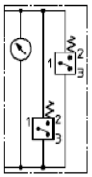
with visual-electrical indicator
AE 70 and AE 80



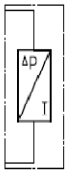
with visua indicator
AOR/AOC/



with visual-olectrical indicator
OE



with olectronical clogging sonsor
VS1

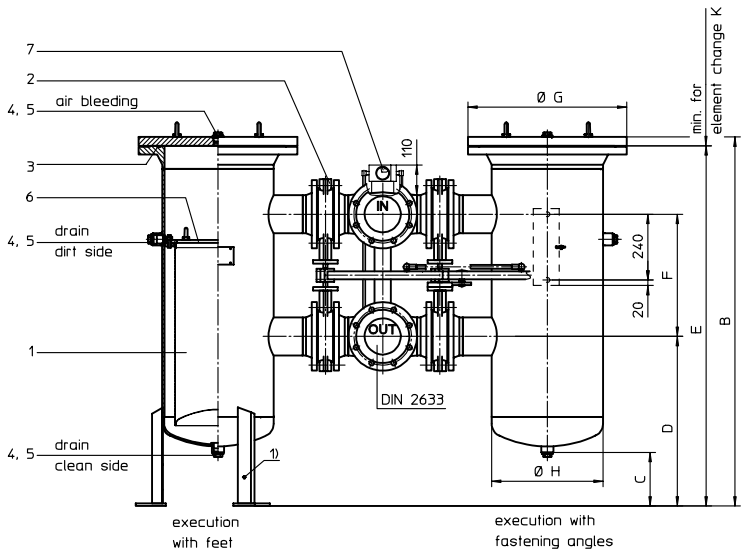


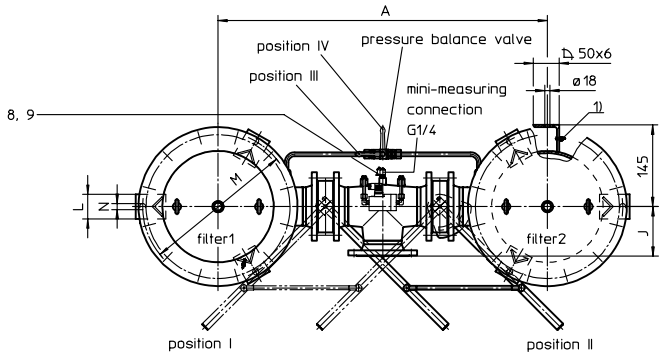
with olectroni clogging son
VS2

DUPLEX COARSE FILTER, change-over

Series DGFK 01-06 DN 50-250 PN 16

Sheet No. **3109 D**





Pos. I: filter 1 in operation
Pos II: filter 2 in operation

with pressure balance valve:
Pos III: valve open
Pos IV: valve closed

Connection standard as in drawing.
On request: inlet- on top or backside
outlet - bottom or backside

Please specify on order!

1) connection for the potential equalisation, only for applicatrion in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

DGFK. 04. ST. 0,50G. P. FD1. B. -. OE

1	2	3	4	5	6	7	8	9

1 **series:**
DGFK = duplex coarse filter with strainer basket

2 **nominal size:** 01, 02, 04, 06

3 **housing material:**
ST = of steel
VA = of stainless steel

4 **filter-material and filter-fineness:**
0,25 G = 0,25 mm, 0,50 G = 0,50 mm, 0,75 G = 0,75 mm,
1,00 G = 1,00 mm, 1,50 G = 1,50 mm stainless steel wire mesh

5 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

6 **connection:**
FD1 = flange, design C, DIN 2633
FD2 = flange, design E, DIN 2633

7 **connection size:**

DN	filter nominal-size			
8 = 50	01	02		
9 = 65	01	02		
A = 80	01	02	04	
B = 100		02	04	
C = 125		02	04	06
D = 150			04	06
E = 200				06
F = 250				06

8 **manner of fastening:**
- = execution with feet
B = fastening angle (only with DGFK 01)

9 **clogging indicator :**
- = without clogging indicator
OE = clogging indicator, visual-electrical see sheet -no. 1614
DM = differential pressure gauge
DKM = differential pressure gauge with contact

1.2. Strainer basket: (ordering example)

Gr04. 0.50G. VA

1	2	3

1 **size of strainer basket:** Gr 01, Gr 02, Gr 04, Gr 06

2 **filter-material and filter-fineness:**
0,25 G = 0,25 mm, 0,50 G = 0,50 mm, 0,75 G = 0,75 mm,
1,00 G = 1,00 mm, 1,50 G = 1,50 mm stainless steel wire mesh

3 **strainer basket material:**
VA = stainless steel

2. Dimensions:

type	connection DN	Q = m³/h	A	B	C	D	E	F	G	H	J	K	L	M	N	weight kg	volume tank
DGFK 01	50	25	796	740	120	305	720	330	280	194	111	420	70	300	18	150	2x 14,0 l
	65	35	822			273		347			123						2x 14,5 l
	80	55	862	805		285	785	400			138						2x 16,0 l
DGFK 02	50	25	876	1020	170	515	995	330	405	273	111	550	70	380	18	170	2x 41,0 l
	65	35	902			498		347			123						
	80	55	942			445		400			138						
	100	90	984	1045		424	1020	421			159						2x 42,0 l
	125	110	1032			399		446			181						
DGFK 04	80	55	942	1555	170	938	1530	400	405	273	138	1050	70	380	18	220	2x 70,0 l
	100	90	984			917		421			159						
	125	110	1032			892		446			181						
	150	192	1082			846		492			200						
DGFK 06	125	110	1202	1350	180	619	1315	446	580	406	181	720	90	550	22	400	2x 127,0 l
	150	192	1232			573		492			200						
	200	288	1350	1370		542	1335	543			242						2x 130,0 l
	250	440	1460	1450		517	1415	618			288						2x 138,0 l

EDV 08/06

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3. Spare parts:

item	qty.	designation	dimension and article-no.			
			DGFK 01	DGFK 02	DGFK 04	DGFK 06
1	2	strainer basket	Gr 01	Gr 02	Gr 04	Gr 06
2	4	stop flap [1)]	DN 50-80	DN 50-125	DN80-150	DN 125-250
3	2	O-ring	190 x 5 305432 (NBR) 310283 (FPM)	275 x 5 307414 (NBR) 310288 (FPM)		429 x 6 308659 (NBR) 310273 (FPM)
4	6	screw plug	G ½ 309730	G 1 309732		
5	6	gasket	A 22 x 27 305564	A 33 x 39 308257		
6	2	spring	Da = 95 304414	pressure plate		
7	1	clogging indicator	OE, DM or DKM			
8	2	screw plug	G ¼ 309734			
9	2	gasket	A 14 x 18 306330			

[1)] dimension of stop flap = connection size

4. Description:

Duplex filters of the series DGFK 01-06 are suitable for a working pressure up to 16 bar.
Pressure peaks can be absorbed with a sufficient margin of safety.
Four mechanically connected change-over flaps enabling the change-over without service-interruption from the clean to the dirty filter-side.
The filters can be installed as suction filter, pressure filter or return-line filter.
The filter elements are filter baskets with steel wire mesh as filter material. The perforated centre tube is layed out with steel wire mesh. The flow direction is from outside to the inside.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
Approvals according to TÜV, and the major „Shipyard Classification Societies“ D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S.; P.R.S.;USS.R.S. and others are possible.

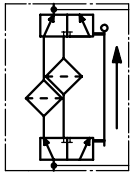
5. Technical data:

temperature range:	- 10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	16 bar
test pressure:	20,8 bar
connection system:	flange DIN 2633, 16 bar
housing material:	C-steel or stainless steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
mini-measuring connection:	G ¼

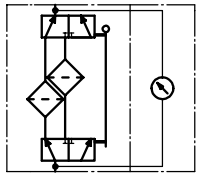
Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:

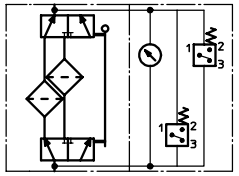
without indicator



with visual indicator



with visual-electrical indicator OE

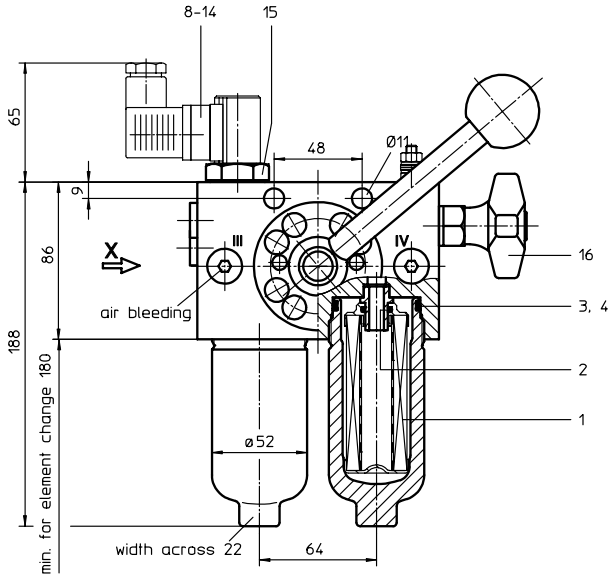


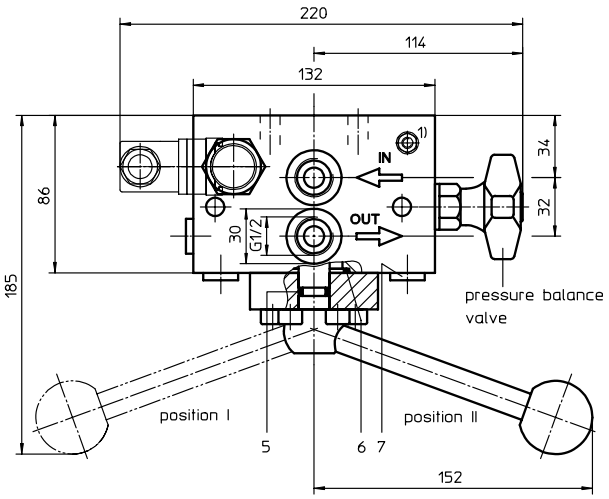
7. Pressure drop flow curves:

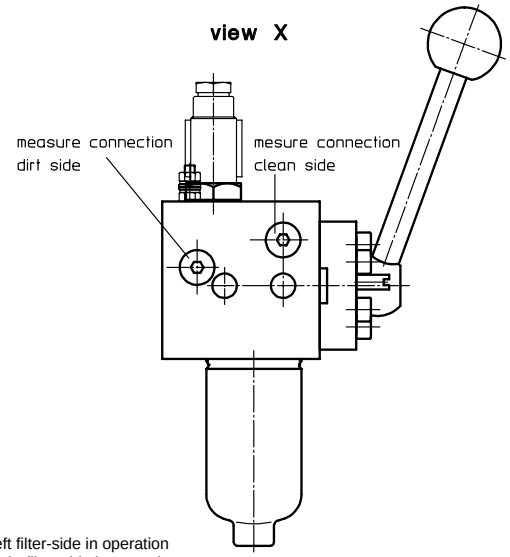
Precise flow rates see ‘INT-Expert-System Filter’, respectively Δp-curves; depending on filter fineness and viscosity.

PRESSURE FILTER, change-over
Series HDD 30 DN 15 PN 315

Sheet No.
2510 G







Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection III and IV to be used to bleed filter or to relieve pressure

1) connection for the potential equalisation, only for the application in the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

HDD.	30.	10VG.	HR.	E.	P.	-.	G.	3.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
HDD = pressure filter, change-over

2 **nominal size**: 30

3 **filter-material and filter- fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG= 15 µm$_{(c)}$, 10 VG= 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½

10 **filter housing specification:**
- = standard

11 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 30

3 - 7 see type index-complete filter

2. Accessories:
- measure- and bleeder connection, see sheet-no. 1650

weight: 8 kg

EDV 08/06

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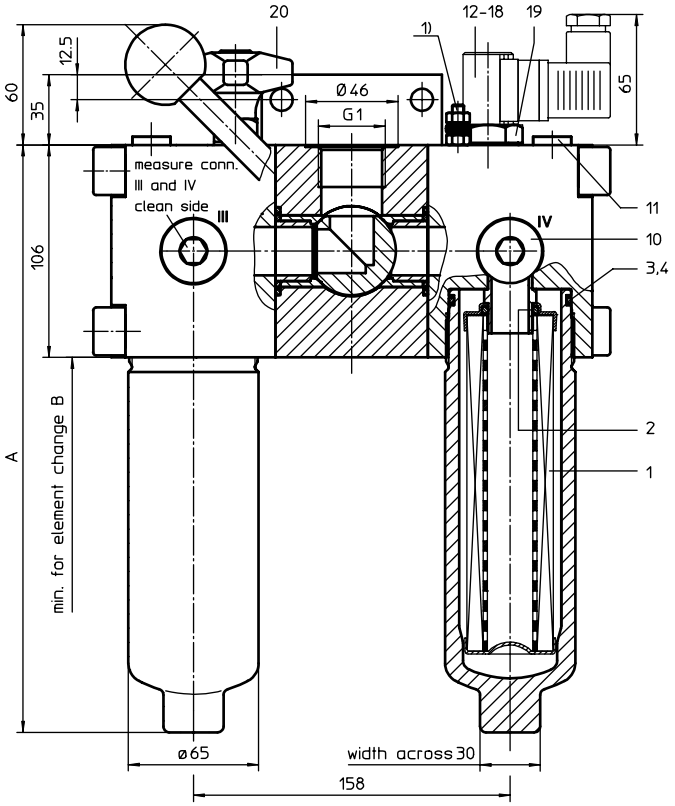
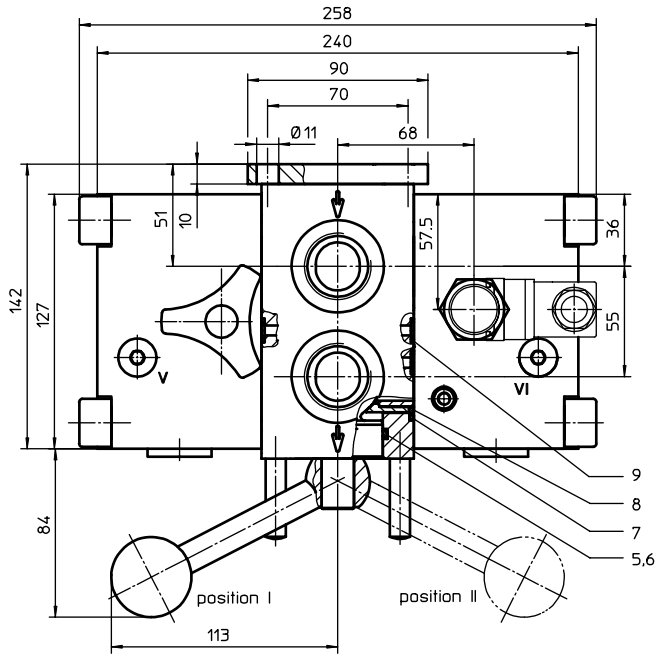
PRESSURE FILTER, change-over
Series HDD 61-151 DN 25 PN 315

Sheet No.
2517 D





Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection V and VI to be used to bleed filter or to relieve pressure

1) connection for the potential equalisation, only for the application in the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

HDD.	91.	10VG.	HR.	E.	P.	-.	G.	5.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 series:
HDD = pressure filter, change-over

2 nominal size: 61, 91, 151

3 filter-material and filter- fineness:
25 VG = 20 µm(c), 16 VG= 15 µm(c), 10 VG= 10 µm(c),
6 VG = 7 µm(c), 3 VG= 5 µm(c) Interpor fleece (glass fibre)

4 resistance of pressure difference for filter element:
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 filter element design:
E = single-end open

6 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification: (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 connection:
G = thread connection according to ISO 228

9 connection size:
5 = G 1

10 filter housing specification: (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 internal valve:
- = without valve
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 clogging indicator or clogging sensor:
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 series:
01E. = filter element according to INTERNORMEN factory specification

2 nominal size: 60, 90, 150

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650

3. Dimensions:

type	connection	A	B	weight kg	volume tank
HDD 61	G1	228	275	24	2x 0,3 l
HDD 91		293	340	25	2x 0,4 l
HDD 151		402	450	27	2x 0,6 l

EDV 11/06

Changes of measures and design are subject to alteration!

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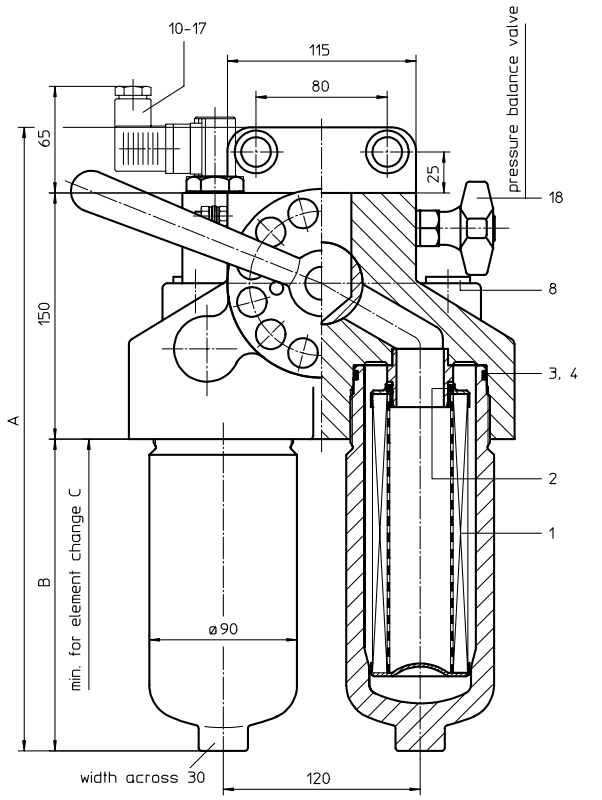
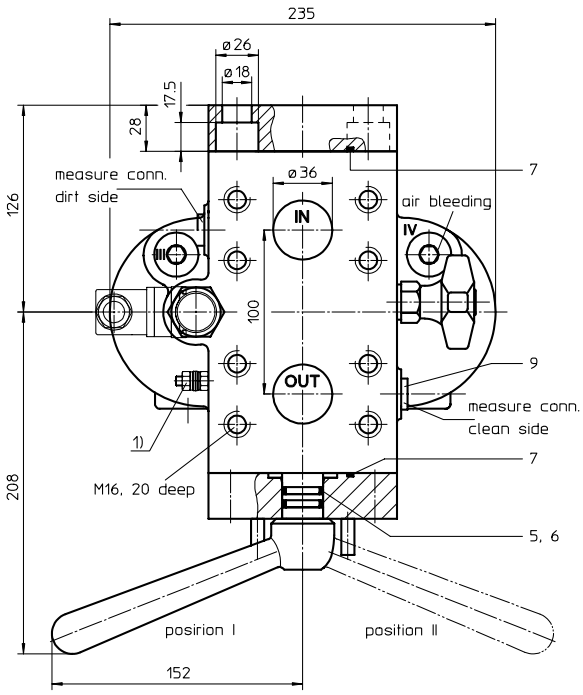
PRESSURE FILTER, change-over
Series HDD 170 - 450 DN 40 PN 315

Sheet No.
2514 N





Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection III and IV to be used to bleed filter or to relieve pressure

1) connection for the potential equalisation, only for the application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

HDD.	170.	10VG.	HR.	E.	P.	-.	FS.	7.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HDD = pressure filter, change-over

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter- fineness:**
25 VG = 20 µm(C), 16 VG = 15 µm(C), 10 VG = 10 µm(C), 6 VG = 7 µm(C), 3 VG = 5 µm(C) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 6000 PSI

9 **connection size:**
7 = 1 ½''

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	170.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650

3. Dimensions:

type	connection	A	B	C	weight kg	volume tank
HDD 170	SAE 1 ½"	380	190	350	39	2x 0,7 l
HDD 240		430	240	400	41	2x 0,9 l
HDD 360		510	320	480	45	2x 1,2 l
HDD 450		615	425	585	50	2x 1,6 l

EDV 08/06

Changes of measures and design are subject to alteration!

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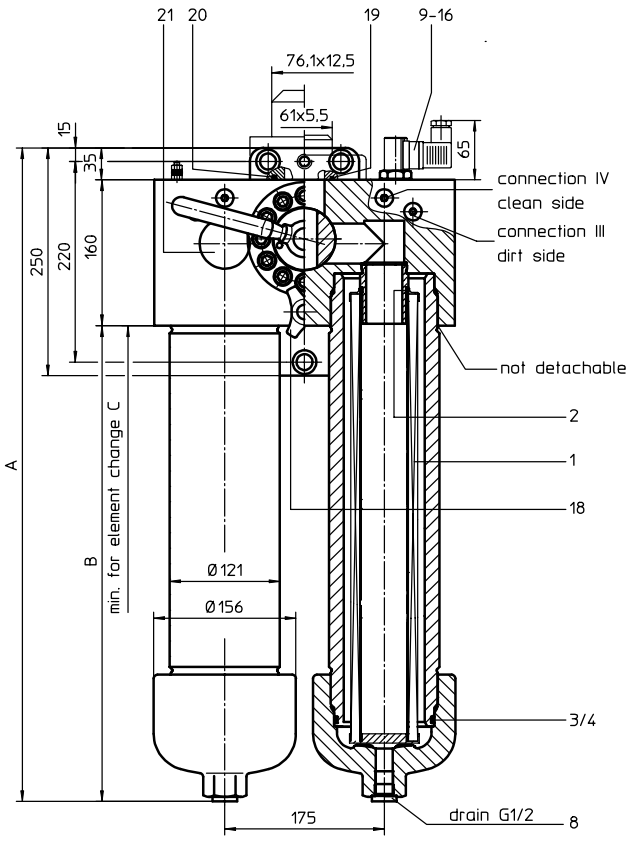
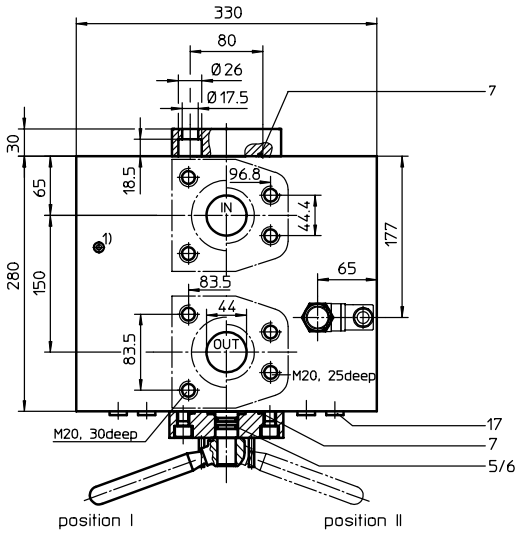
PRESSURE FILTER, change-over
Series HDD 601- 1351 DN 50 PN 315

Sheet No.
2525 K





Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection III and IV to be used to bleed filter or to relieve pressure

1) connection for the potential equalisation, only for the application in the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

HDD. 901. 10VG. HR. E. P. -. FS. 8. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HDD = pressure filter, change-over

2 **nominal size**: 601, 901,1351

3 **filter-material and filter- fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 6000 PSI (standard)
FV = AVIT-flange connection 320 bar (special design)

9 **connection size:**
8 = 2“

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,348 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 900. 10VG. HR. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- AVIT-counter flange, see sheet-no. 1654

3. Dimensions:

type	connection	A	B	C	weight kg	volume tank
HDD 601	2“	567	372	790	143	2x 2,1 l
HDD 901	2“	717	522	940	150	2x 3,1 l
HDD 1351	2“	965	770	1440	162	2x 4,6 l

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1. Technical data

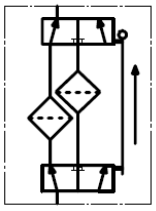
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HDD.30	01E.30	2	
2	HDD.61	01E.60	2	
3	HDD.91	01E.90	2	
4	HDD.151	01E.150	2	
5	HDD.170	01E.170	2	
6	HDD.240	01E.240	2	
7	HDD.360	01E.360	2	
8	HDD.450	01E.450	2	
9	HDD.601	01E.600	2	
10	HDD.901	01E.900	2	
11	HDD.1351	01E.1350	2	

2. Description

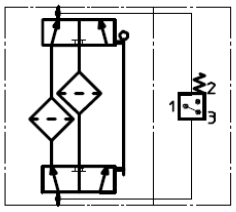
Duplex pressure filters with change-over valve type HDD are suitable for a working pressure up to 315 bar.
The pressure peaks are absorbed by a sufficient margin of safety. Duplex filters can be serviced without interruption of operation. The upper part has a three-way-change-over valve which allows to change-over the flow from the dirty filter-side to the clean filter-side without interrupting the operation. The change-over procedure does not lead to a cross sectional contraction. Prior to the change-over procedure a built-in pressure balance valve equalizes the housing pressure. After change-over the pressure balance valve is to be closed again. The closed filter-side has to be air-bled by vent III respectively by vent IV. Then change filter element. After screw in the filter bowl the pressure balance has to be opened shortly and the just serviced filter-side has to be air-bled. Filter elements are available down to a filter fineness of $4\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available with a pressure difference resistance up to Δp 160 bar and a rupture strength up to Δp 250 bar.

3. Symbols

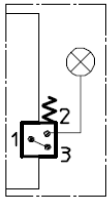
without indicator



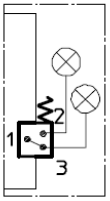
with electrical indicator
AE 30 and AE 40



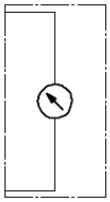
with visual-electrical indicator
AE 50 and AE 61



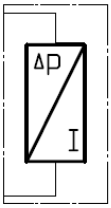
with visual-electrical indicator
AE 70 and AE 80



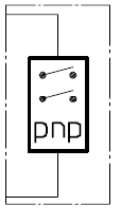
with visual indicator
AOR/AOC



with electronical clogging sensor
VS1

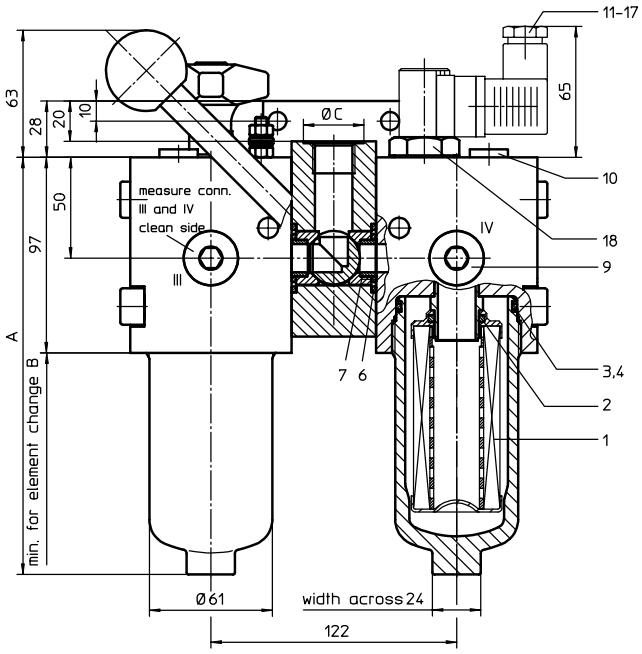


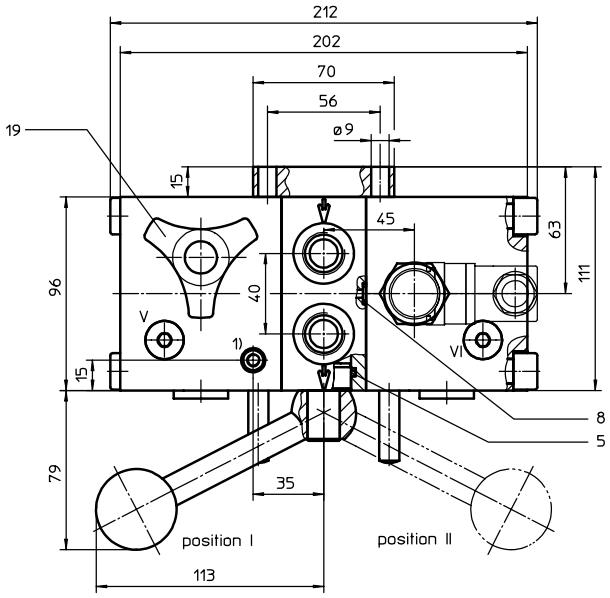
with electronical clogging sensor
VS2



PRESSURE FILTER, change-over
Series MDD 40-63 DN 15-20 PN 200

Sheet No.
2516 D





1) connection for the potential equalisation, only for application in the explosive area.

Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection V and VI to be used to bleed filter or to relieve pressure

1. Type index:

1.1. Complete filter: (ordering example)

MDD.	40.	10VG.	HR.	E.	P.	-.	G.	3.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
MDD = medium pressure filter, change-over

2 **nominal size:** 40, 63

3 **filter-material and filter- fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG= 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½ (MDD 40)
4 = G ¾ (MDD 63)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS12 = see sheet-no. 41028

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01NL.	40.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according toDIN 24550, T3

2 **nominal size:** 40, 63

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650

3. Dimensions:

type	connection	A	B	C	weight kg	volume tank
MDD 40	G ½	207	285	30	15,5	2x 0,25 l
MDD 63	G ¾	267	345	36,5	16,5	2x 0,35 l

EDV 11/04

Changes of measures and design are subject to alteration!

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4. Spare parts:

item	qty.	designation	dimension MDD 40	dimension MDD 63	article-no.	
1	2	filter element	01NL.40	01NL.63		
2	2	O-ring	22 x 3,5		304341 (NBR)	304392 (FPM)
3	2	O-ring	54 x 3		304657 (NBR)	304720 (FPM)
4	2	support ring	60 x 2,6 x 1		311779	
5	3	O-ring	26 x 3		304379 (NBR)	318576 (FPM)
6	4	O-ring	28 x 3		316778 (NBR)	318366 (FPM)
7	4	O-ring	18 x 3		304359 (NBR)	304399 (FPM)
8	4	O-ring	6,5 x 2		313553 (NBR)	318577 (FPM)
9	2	screw plug	G ½		304678	
10	2	screw plug	G ¼		305003	
11	1	clogging indicator, visual	AOR or AOC		see sheet-no. 1606	
12	1	clogging indicator, visual-electrical	AE		see sheet-no. 1615	
13	1	clogging sensor, electronical	VS1		see sheet-no. 1617	
14	1	clogging sensor, electronical	VS2		see sheet-no. 1618	
15	1	O-ring	15 x 1,5		315357 (NBR)	315427 (FPM)
16	1	O-ring	22 x 2		304708 (NBR)	304721 (FPM)
17	1	O-ring	14 x 2		304342 (NBR)	304722 (FPM)
18	1	screw plug	20913-4		309817	
19	1	pressure balance valve				

item 16 execution only without clogging indicator or clogging sensor

5. Description:

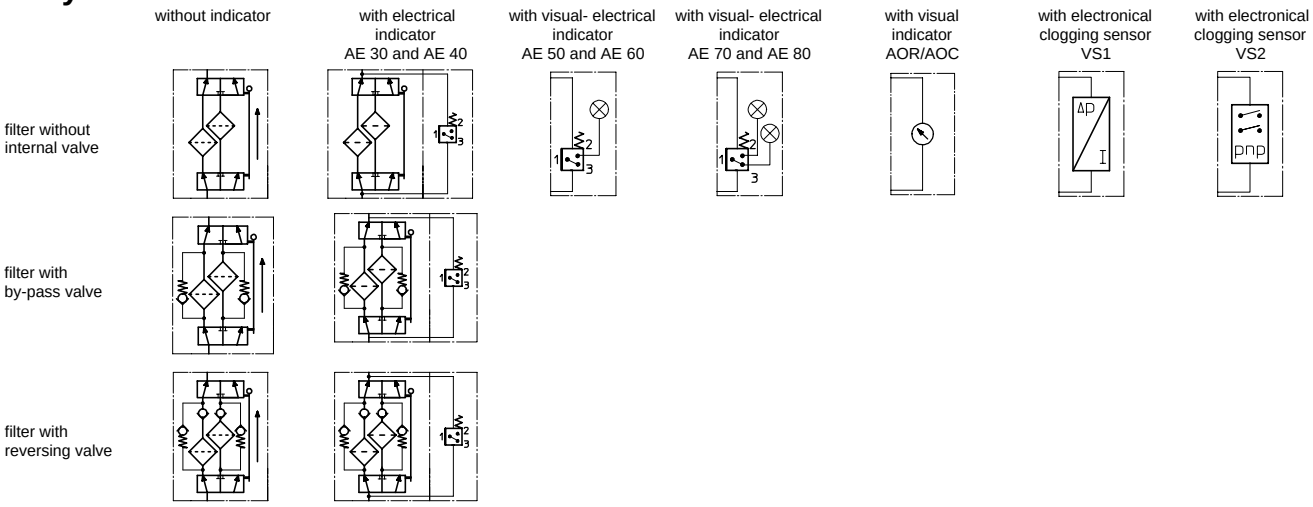
Duplex pressure filters with change-over valve type MDD are suitable for a working pressure up to 200 bar.
The pressure peaks are absorbed by a sufficient margin of safety. Duplex filters can be serviced without interruption of operation. The upper part has a three-way-change-over valve which allows to change-over the flow from the dirty filter-side to the clean filter-side without interrupting the operation. The change-over procedure does not lead to a cross sectional contraction. Prior to the change-over procedure a built-in pressure balance valve equalizes the housing pressure. After change-over the pressure balance valve is to be closed again. The closed filter-side has to be air-bled by vent V respectively by vent VI. Then change filter element. After screw in the filter bowl the pressure balance has to be opened shortly and the just serviced filter-side has to be air-bled. Filter elements are available down to a filter fineness of 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available with a pressure difference resistance up to Δp 160 bar and a rupture strength up to Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element. After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

6. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	200 bar
test pressure:	260 bar
connection system:	thread connection according to ISO 228
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
air bleeding and mini-measuring connections dirt side:	G ¼
measuring connections clean side:	G ½

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

7. Symbols:



8. Pressure drop flow curves:

Precise flow rates see 'INF-Expert-System Filter' respectively Δp-curves ; depending on filter fineness and viscosity.

9. Test methods:

Filter elements are tested according to the following ISO standards:

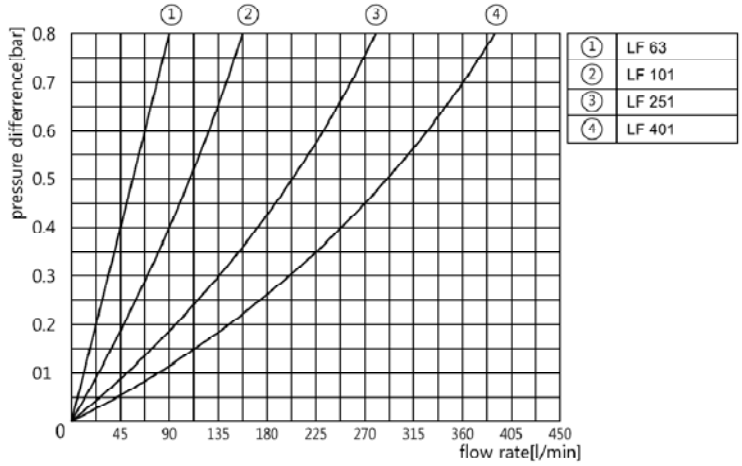
ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

INITIAL DIFFERENCE PRESSURE

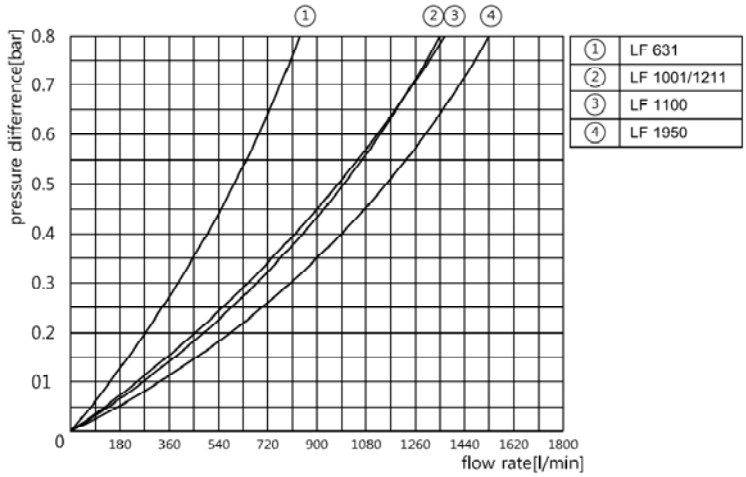
FOR LOW PRESSURE FILTER SERIES - 1

Sheet No.

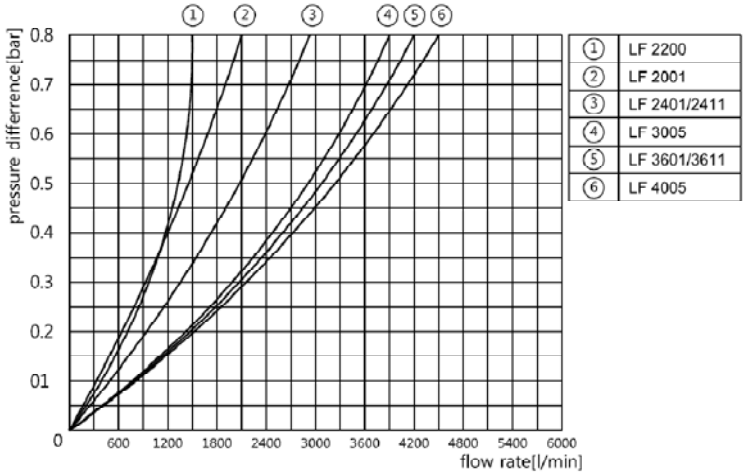
LF63~401 SERIES



LF631~1950 SERIES



LF2200~4005 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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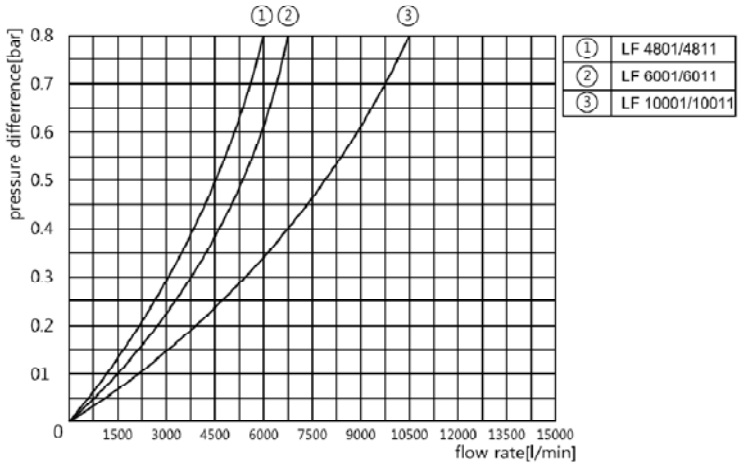
INITIAL DIFFERENCE PRESSURE

FOR LOW PRESSURE FILTER SERIES - 2

Sheet No.

LF4801~10011 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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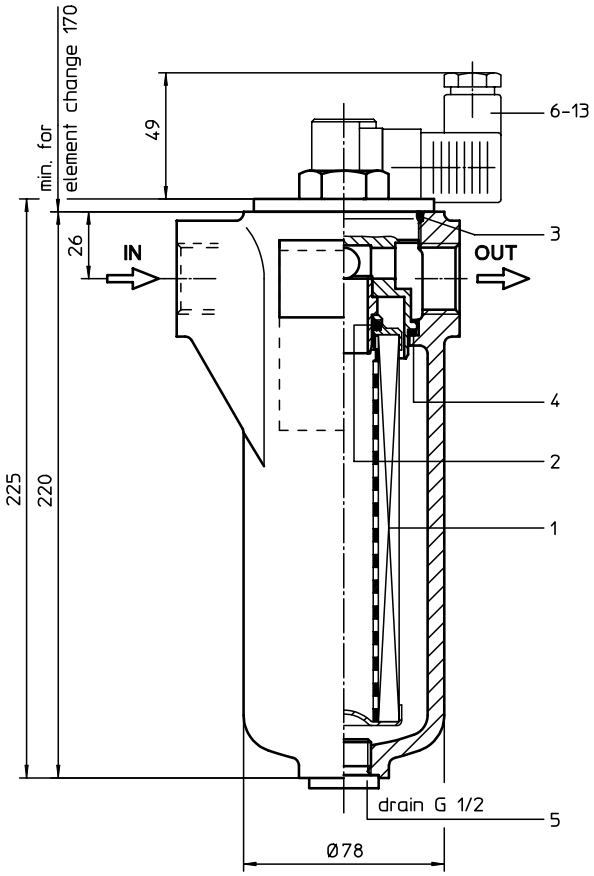
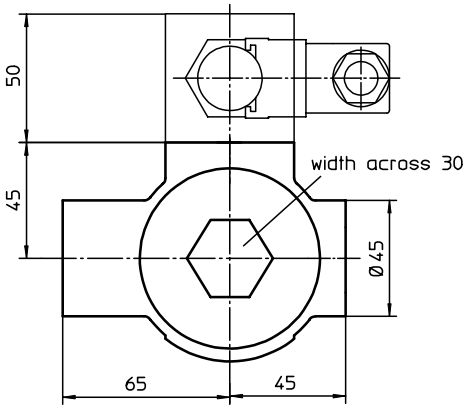
PRESSURE FILTER
Series LF 63 DN 20 PN 25

Sheet No.
1109 G





1. Type index:

1.1. Complete filter: (ordering example)

LF.	63.	10VG.	30.	E.	P.	-.	G.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
LF = in-line filter

2 **nominal size:** 63

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
4 = G ¾

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01NL.	63.	10VG.	30.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 63

3 - 7 see type index-complete filter

weight: 2,0 kg

Changes of measures and design are subject to alteration!

EDV 08/03

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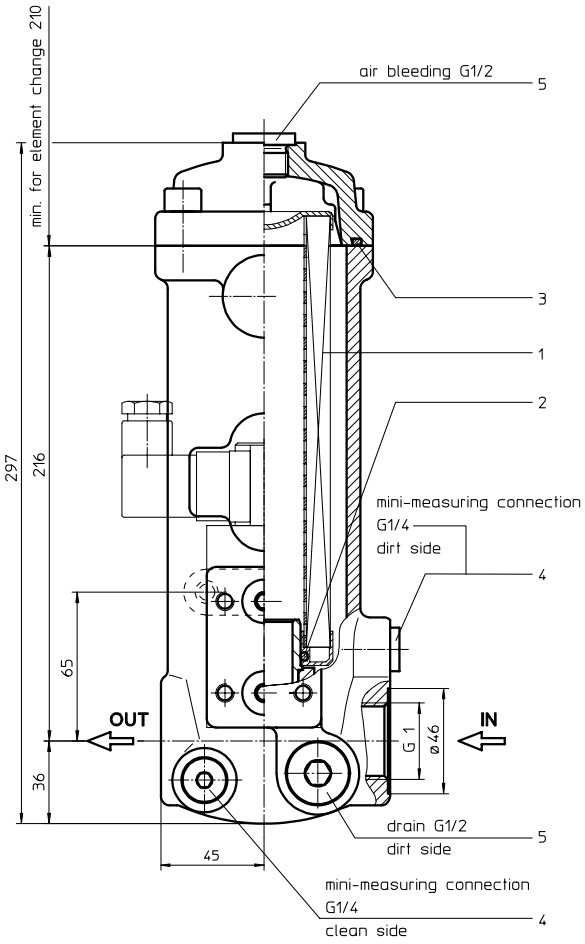
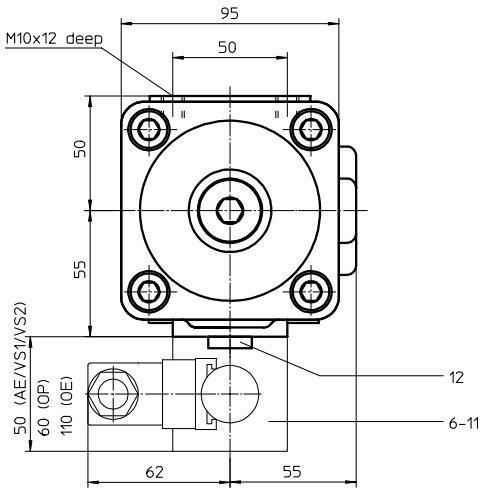
PRESSURE FILTER
Series LF 101 DN 25 PN 32

Sheet No.
1125 B





1. Type index:

1.1. Complete filter: (ordering example)

LF.	101.	10VG.	16.	E.	P.	-.	G.	5.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
LF = in-line filter

2 **nominal size:** 101

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
16 = Δp 16 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
5 = G 1

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor :**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01N.	100.	10VG.	16.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01N. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 100

3 - 7 see type index-complete filter

weight: 3,5 kg

Changes of measures and design are subject to alteration!

EDV 01/05

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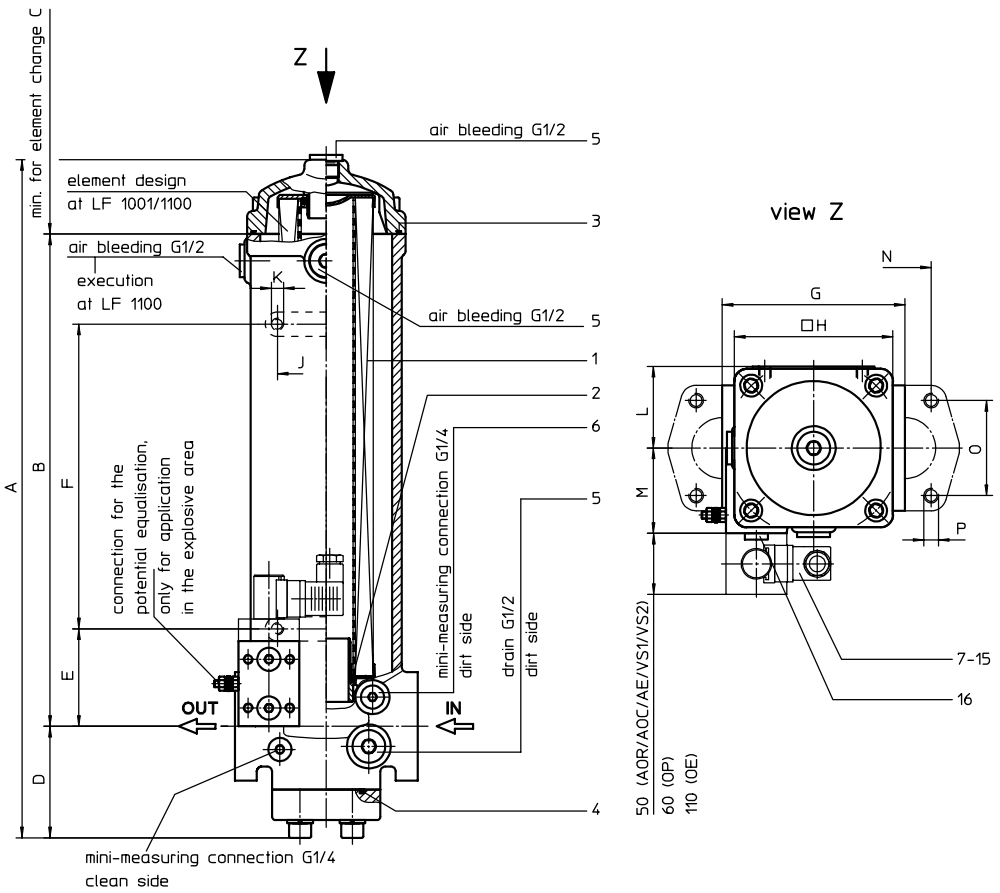
PRESSURE FILTER
Series LF 251-1100 DN 40-125 PN 32

Sheet No. 1117 L



3. Dimensions:

type	LF 251	LF 401	LF 631	LF 1001	LF 1100
connection	SAE 1 ½"	SAE 2"	SAE 2 ½"	SAE 3"	SAE 5"
A	354	550	561	583	641
B	254	404	406	404	430
C	260	410	410	410	410
D	39	85	86	100	130
E	80	80	80	90	116
F	-	250	250	250	250
G	140	150	170	220	220
H	130	130	160	205	205
J	80	80	80	116	116
K	M10x12 deep	M10x12 deep	M12x18 deep	M12x18 deep	M12x18 deep
L	67	67	82	106	106
M	72	70	86	106	106
N	35,7	42,9	50,8	62	92
O	70	77,8	89	106,4	152,4
P	M12x19 deep	M12x19 deep	M12x19 deep	M16x24 deep	M16x24 deep
weight kg	16	25	35	45	51
volume tank	2,4 l	3,6 l	5,3 l	11,5 l	11,5 l

1. Type index:

1.1. Complete filter: (ordering example)

LF. 401. 10VG. 30. E. P. -. FS. 8. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
LF = in-line filter

2 **nominal size:** 251, 401, 631, 1001, 1100

3 **filter material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar (01NR.) 30 = Δp 30 bar (01NL.)

5 **filter element design:**
E = single-end open S = with by-pass valve Δp 2,0 bar
B = both sides open (LF 1001/1100) S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard VA = stainless steel IS06 = see sheet-no. 31601 IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI (LF 251-1100)

9 **connection size:**
7 = 1 ½" (LF 251) 9 = 2 ½" (LF 631) C = 5" (LF 1100)
8 = 2" (LF 401) A = 3" (LF 1001)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S = with by-pass valve Δp 2,0 bar (LF 1001/1100)
S1 = with by-pass valve Δp 3,5 bar (LF 1001/1100)

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL. 400. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3
01NR. = standard-return-line filter element according to DIN 24550, T4

2 **nominal size:** 250, 400, 630 (01NL.), 1000 (01NR.)

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650
- evacuation- and bleeder connection, see sheet-no. 1651
- counter flange, see sheet-no. 1652

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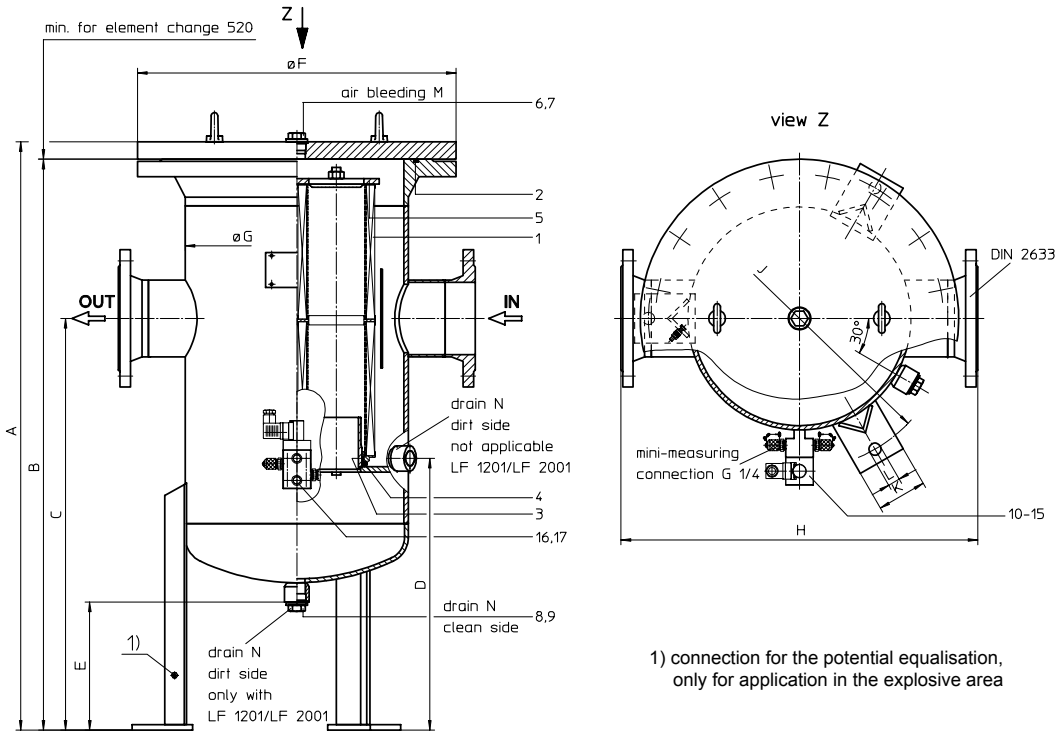
EDV 08/07

PRESSURE FILTER

Series LF 1201-10001 DN 50-250 PN 16

Sheet No. **1118 J**



1) connection for the potential equalisation, only for application in the explosive area

3. Dimensions:

type	connection DN	A	B	C	D	E	F	G	H	J	K	L	M	N	weight kg	volume tank
LF 1201	50	1052	1028	400	-	188	340	219	412	330	70	18	G ½	G1	60	26,0 l
	65	1071	1047													27,0 l
	80	1052	1028													26,0 l
	100	1128	1104													29,0 l
LF 2001	65	1093	1067	425	-	186	405	273	494	380	70	18	G1	G1	110	43,5 l
	80	1112	1086													44,5 l
	100	1100	1074													43,5 l
	125	1188	1162													48,0 l
LF 2401	65	1018	990	700	445	183	460	324	600	450	70	18	G1	G1	130	55,0 l
	80															
	100															
	125															
LF 3601	80	1072	1040	750	495	238	580	406	650	550	90	22	G1	G1	260	90,0 l
	100															
	125															
	150															
LF 4801 LF 6001	100	1116	1080	800	535	232	715	508	800	650	90	22	G1	G1	310	145,0 l
	125															
	150															
	200															
LF 10001	125	1425	1110	800	570	283	910	711	1000	900	120	22	G1 ½	G1 ½	560	283,0 l
	150															
	200															
	250															

EDV 04/07

1. Type index:

1.1. Complete filter: (ordering example)

LF. 2001. 10VG. 10. E. P. -. FD1. 9. -. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
LF = in-line filter

2 **nominal size:** 1201, 2001, 2401, 3601, 4801, 6001, 10001

3 **filter material and filter fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FD1 = flange connection DIN 2633, design C DIN 2526; FD2 = flange connection DIN 2633, design E DIN 2526

9 **connection size:**

DN	filter nominal size						
8 = 50	1201						
9 = 65	1201	2001	2401				
A = 80	1201	2001	2401	3601			
B = 100	1201	2001	2401	3601	4801	6001	
C = 125		2001	2401	3601	4801	6001	10001
D = 150				3601	4801	6001	10001
E = 200					4801	6001	10001
F = 250							10001

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no.1609
OP = visual, see sheet-no.1628; VS1 = electronical, see sheet-no.1607
OE = visual-electrical, see sheet-no 1628; VS2 = electronical, see sheet-no.1608

1.2. Filter element: (ordering example)

01E. 2001. 10VG. 10. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 1201, 2001

3 - 7 see type index-complete filter

2. Accessories:

- measure-and bleeder -connection see sheet-no. 1650
- evacuation- and bleeder-connection see sheet-no. 1651
- counter flange see sheet-no. 1653
- lifting mechanism see sheet-no. 1661

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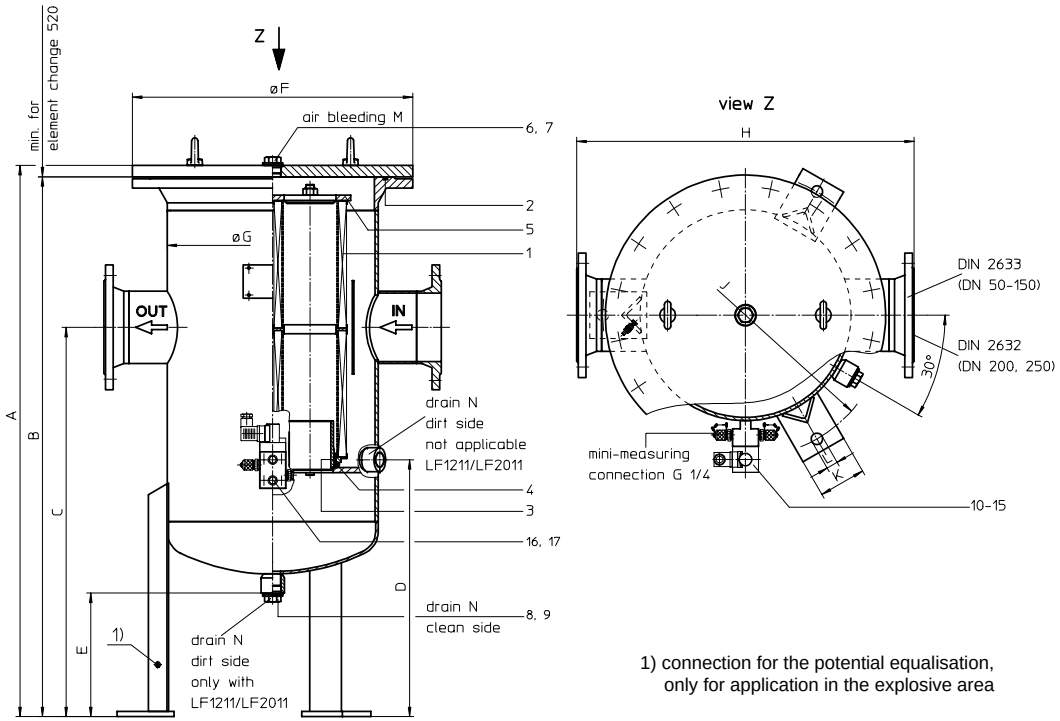
PRESSURE FILTER
Series LF 1211-10011 DN 50-250 PN 10

Sheet No. **1127 B1**



1) connection for the potential equalisation, only for application in the explosive area

3. Dimensions:

type	connection DN	A	B	C	D	E	F	G	H	J	K	L	M	N	weight kg	volume tank
LF 1211	50	1052	1028	400	-	188	340	219	412	330	70	18	G ½	G1	60	26,0 l
	65	1071	1047													27,0 l
	80	1052	1028													26,0 l
	100	1128	1104													29,0 l
LF 2011	65	1093	1067	425	-	186	395	273	494	380	70	18	G1	G1	110	43,5 l
	80	1112	1086													44,5 l
	100	1100	1074													43,5 l
	125	1188	1162													48,0 l
LF 2411	65	1016	990	700	445	183	445	324	600	450	70	18	G1	G1	130	55,0 l
	80															
	100															
	125															
LF 3611	80	1066	1040	750	495	238	565	406	650	550	90	22	G1	G1	260	90,0 l
	100															
	125															
	150															
LF 4811 LF 6011	100	1108	1080	800	535	232	670	508	800	650	90	22	G1	G1	310	145,0 l
	125															
	150															
	200															
LF 10011	125	1400	1110	800	570	288	895	711	1000	900	120	22	G1 ½	G1 ½	560	283,0 l
	150															
	200															
	250															

EDV 04/07

1. Type index:

1.1. Complete filter: (ordering example)

LF. 2011. 10VG. 10. E. P. -. FD1. 9. -. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
LF = in-line filter

2 **nominal size:** 1211, 2011, 2411, 3611, 4811, 6011, 10011

3 **filter material and filter fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve; S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR) ; V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FD11 = flange DIN 2632, design C DIN 2526; FD12 = flange DIN 2632, design E DIN 2526 (DN 200, 250)
FD1 = flange DIN 2633, design C DIN 2526; FD2 = flange DIN 2633, design E DIN 2526 (DN 50-150)

9 **connection size:**

DN	filter nominal size						
8 = 50	1211						
9 = 65	1211	2011	2411				
A = 80	1211	2011	2411	3611			
B = 100	1211	2011	2411	3611	4811	6011	
C = 125		2011	2411	3611	4811	6011	10011
D = 150				3611	4811	6011	10011
E = 200					4811	6011	10011
F = 250							10011

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no.1609
OP = visual, see sheet-no.1628; VS1 = electronical, see sheet-no.1607
OE = visual-electrical, see sheet-no 1628 VS2 = electronical, see sheet-no.1608

1.2. Filter element: (ordering example)

01E. 2001. 10VG. 10. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 1201, 2001

3 - 7 see type index-complete filter

2. Accessories:

- measure-and bleeder -connections, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- counter flanges, see sheet-no. 1653
- lifting mechanism, see sheet-no. 1661

Changes of measures and design are subject to alteration!

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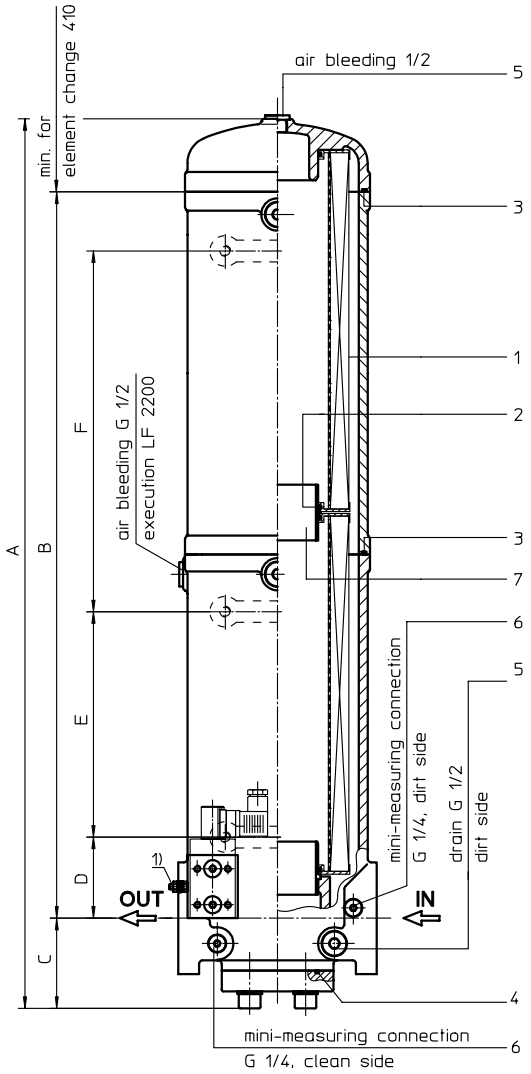
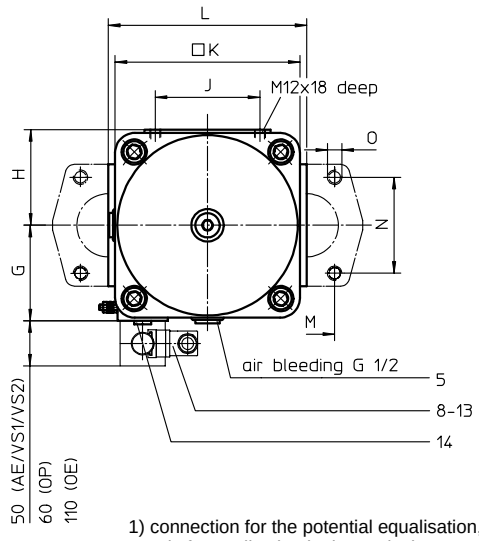
PRESSURE FILTER
Series LF 1950-2200 DN 80-125 PN 32

Sheet No.
1119 K





1) connection for the potential equalisation, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

LF.	1950.	10VG.	10.	B.	P.	-.	FS.	A.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
LF = in-line filter

2 **nominal size:** 1950, 2200

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25µm
stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
A = 3“ (LF 1950)
C = 5“ (LF 2200)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor :**
- = without
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
AE = visual-electrical, see sheet-no. 1609
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series**:
01NR. = standard filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-complete filter

2. Accessories:
- measure- and bleeder-connection, se sheet-no. 1650
- evacuation- and bleeder-connection, see shet-no. 1651
- counter flange, see sheet-no. 1652

3. Dimensions:

type	connection	A	B	C	D	E	F	G	H	J	K	L	M	N	O	weight kg
LF 1950	SAE 3“	987	806	100	90	250	400	106	106	116	205	220	62	106,4	M16 x 24 deep	68
LF 2200	SAE 5“	1043	832	130	116	250	400	106	106	116	205	220	92	152,4	M16 x 24 deep	74

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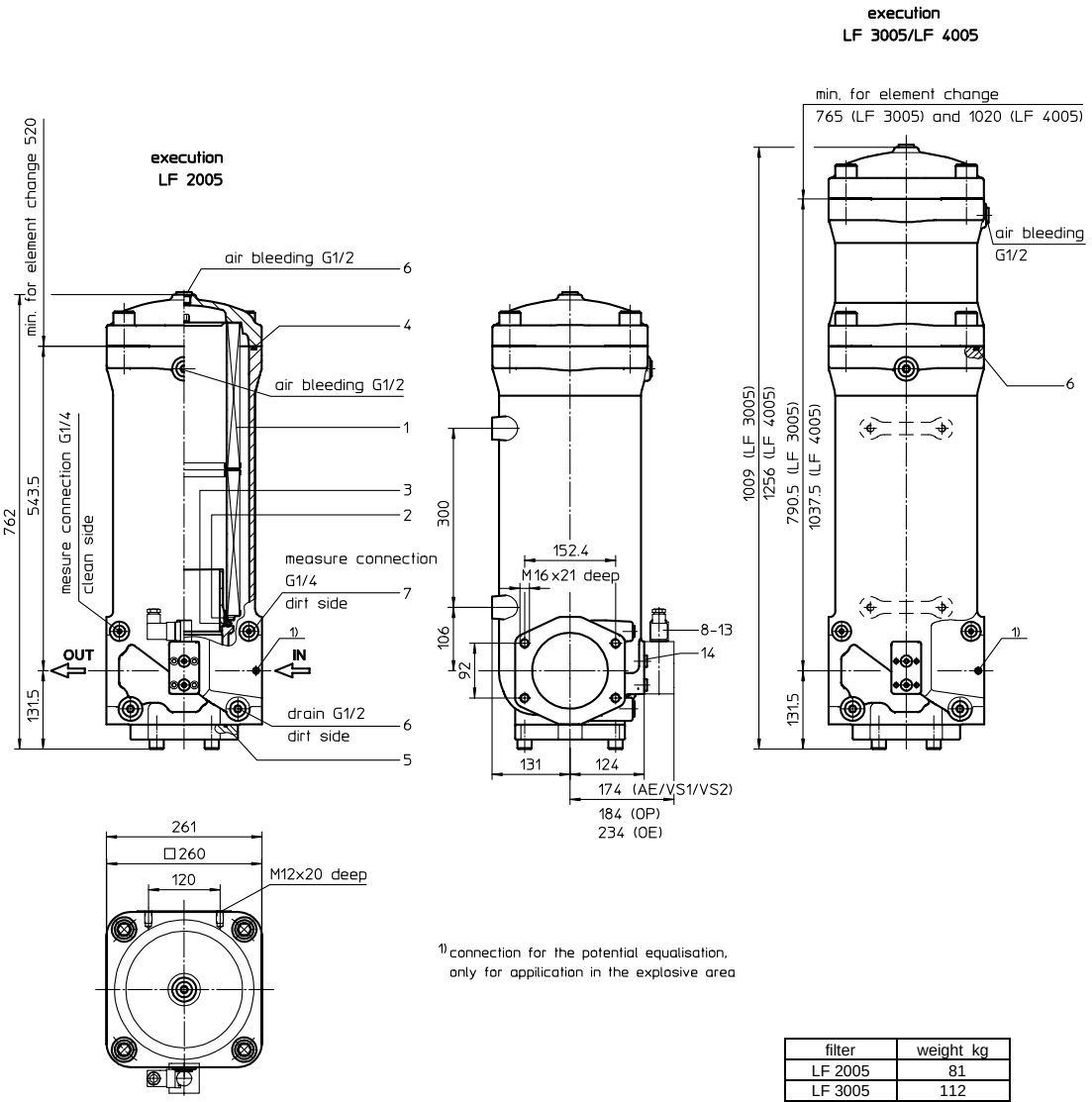
PRESSURE FILTER
Series LF 2005-4005 DN 125 PN 32

Sheet No. **1128**



1) connection for the potential equalisation, only for appilication in the explosive area

filter	weight kg
LF 2005	81
LF 3005	112
LF 4005	129

1. Type index:

1.1. Complete filter: (ordering example)

LF. 2005. 10VG. 10. E. P. -. FS. C. -. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
LF = in-line filter

2 **nominal size:** 2005, 3005, 4005

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 2,0 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
C = 5"

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01E. 2001. 10VG. 10. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 2001, 3001, 4001

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- evacuation- and bleeder-connection, see sheet-no. 1651
- counter flange, see sheet-no. 1652

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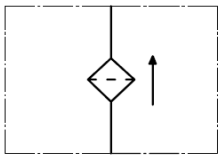
1. Technical data

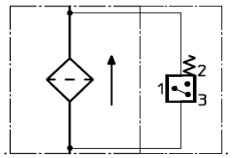
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	LF.63	01NL.63	1	
2	LF.101	01N.100	1	
3	LF.251	01NL.250	1	
4	LF.401	01NL.400	1	
5	LF.631	01NL.630	1	
6	LF.1001	01NR.1000	1	
7	LF.1100	01NR.1000	1	
8	LF.1950	01NR.1000	1	
9	LF.2200	01NR.1000	1	
10	LF.1211	01E.1201	1	
11	LF.2011	01E.2001	1	
12	LF.2411	01E.1201	2	
13	LF.3611	01E.1201	3	
14	LF.4811	01E.1201	4	
15	LF.6011	01E.2001	3	
16	LF.10011	01E.2001	5	
17	LF.1201	01E.1201	1	
18	LF.2001	01E.2001	1	
19	LF.2401	01E.1201	2	
20	LF.3601	01E.1201	3	
21	LF.4801	01E.1201	4	
22	LF.6001	01E.2001	3	
23	LF.10001	01E.2001	5	
24	LF.2005	01E.2001	1	
25	LF.3005	01E.3001	1	
26	LF.4005	01E.4001	1	

2. Symbols

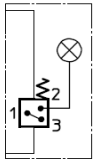
without indicator



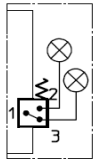
with electrical indicator
AE 30 and AE 40



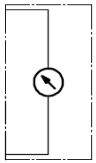
with visual -
electrical indicator
AE 50 and AE 61



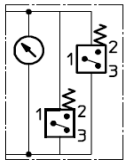
with visual -
electrical indicator
AE 70 and AE 80



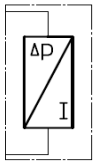
with visual
indicator
OP



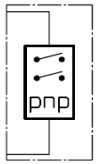
with visual -
electrical indicator
OE



with electronical
clogging sensor
VS1

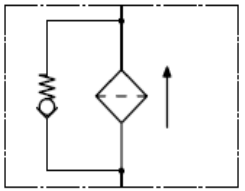


with electronical
clogging sensor
VS2

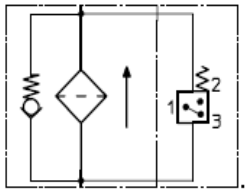


filter with
by-pass valve

without indicator

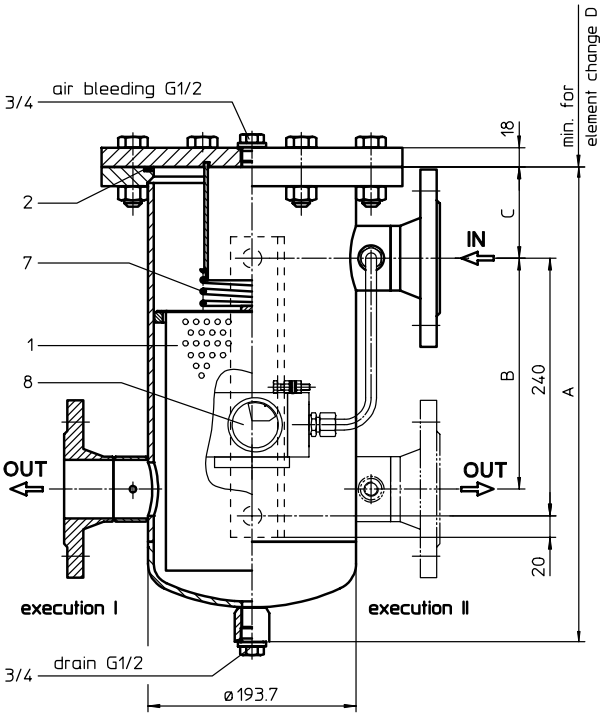


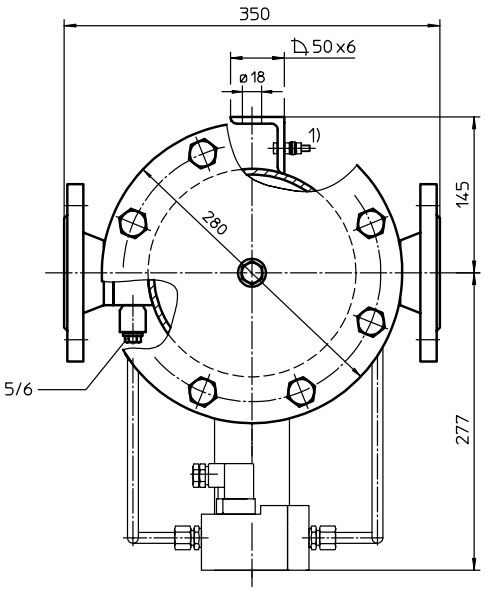
with electrical indicator
AE 30 and AE 40



COARSE FILTER
Series GFK 50-80 DN 50-80 PN 16

Sheet No.
3005 C





1) connection for the potential equalisation, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

GFK.	50.	I.	ST.	0,50G.	P.	FD1.	8.	OE
1	2	3	4	5	6	7	8	9

1 **series:**
GFK = coarse filter with strainer basket

2 **nominal size:** 50, 65, 80

3 **execution:**
I = filter outlet according to I
II = filter outlet according to II

4 **housing material:**
ST = housing of steel
VA = housing of stainless steel

5 **filter-material and filter-fineness:**
0,25 G = 0,25 mm, 0,50 G = 0,50 mm, 0,75 G = 0,75 mm,
1,00 G = 1,00 mm, 1,50 G = 1,50 mm stainless steel wire mesh

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **connection:**
FD1 = flange DIN 2633, form C DIN 2526
FD2 = flange DIN 2633, form E DIN 2526

8 **connection size:**
8 = DN 50 (GFK50)
9 = DN 65 (GFK65)
A = DN 80 (GFK80)

9 **clogging indicator:**
- = without
OE = clogging indicator, visual-electrical, see sheet-no. 1614
DM = pressure difference gauge
DKM = pressure difference gauge with contact

1.2. Strainer basket: (ordering example)

Gr.00.	0,50.	ST
1	2	3

1 **size of strainer basket :** Gr. 00, Gr. 01

2 **filter-material and filter-fineness:**
0,25 G = 0,25 mm, 0,50 G = 0,50 mm, 0,75 G = 0,75 mm,
1,00 G = 1,00 mm, 1,50 G = 1,50 mm stainless steel wire mesh

3 **material of strainer basket:**
ST = strainer basket of steel, wire mesh of stainless steel
VA = strainer basket and wire mesh of stainless steel

2. Dimensions:

type	GFK 50	GFK 65	GFK 80
connection	DN 50	DN 65	DN 80
size of strainer basket	Gr. 00	Gr. 01	Gr. 01
Q = m³/h	25	35	55
filter surface m²	0,12	0,18	0,18
A	442	587	587
B	215	340	340
C	85	100	100
D	300	420	420
weight kg	40	44	45
volume tank	10 l	14 l	14 l

Changes of measures and design are subject to alteration !

EDV 07/06

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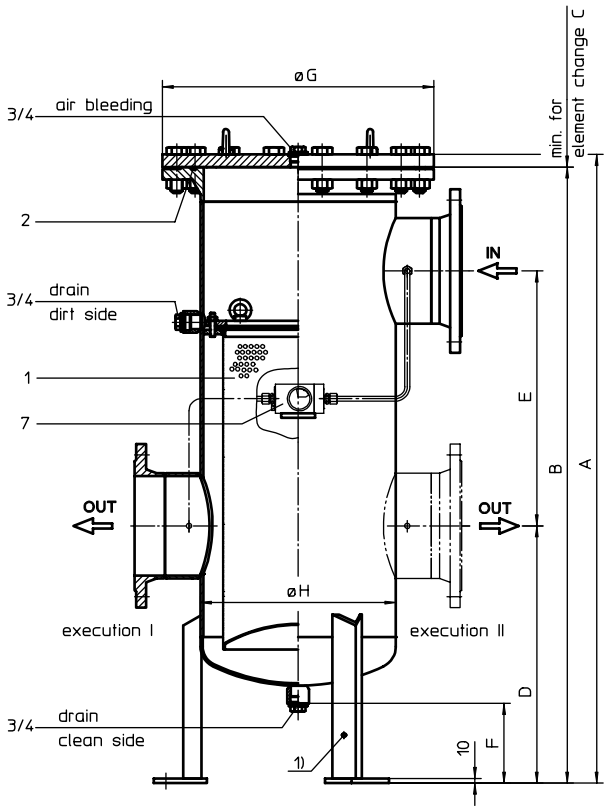
COARSE FILTER
Series GFK 100-500 DN 100-500 PN 10

Sheet No.
3006 F



1) connection for the potential equalisation, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

GFK. 200. I. ST. 0,50G. P. FD11. E. OE

1	2	3	4	5	6	7	8	9

1 **series:**
GFK = coarse filter with strainer basket

2 **nominal size:** 100, 125, 150, 200, 250, 300, 350, 400, 500

3 **execution:**
I = filter outlet according to I
II = filter outlet according to II

4 **housing material:**
ST = housing of steel
VA = housing of stainless steel

5 **filter-material and filter-fineness:**
0,25 G = 0,25 mm, 0,50 G = 0,50 mm, 0,75 G = 0,75 mm, 1,00 G = 1,00 mm, 1,50 G = 1,50 mm stainless steel wire mesh

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **connection:**
FD1 = flange DIN 2633, form C DIN 2526 (DN100-150)
FD2 = flange DIN 2633, form E DIN 2526 (DN100-150)
FD11 = flange DIN 2632, form C DIN 2526 (DN200-500)
FD12 = flange DIN 2632, form E DIN 2526 (DN200-500)

8 **connection size:**
B = DN 100 (GFK100)
C = DN 125 (GFK125)
D = DN 150 (GFK150)
E = DN 200 (GFK200)
F = DN 250 (GFK250)
G = DN 300 (GFK300)
H = DN 350 (GFK350)
I = DN 400 (GFK400)
K = DN 500 (GFK500)

9 **clogging indicator:**
- = without
OE = clogging indicator, visual-electrical, see sheet-no. 1614
DM = pressure difference gauge
DKM = pressure difference gauge with contact

1.2. Strainer basket: (ordering example)

Gr.06. 0,50. ST

1	2	3

1 **size of strainer basket :** Gr. 02, Gr. 04, Gr. 06, Gr. 07

2 **filter-material and filter-fineness:**
0,25 G = 0,25 mm, 0,50 G = 0,50 mm, 0,75 G = 0,75 mm, 1,00 G = 1,00 mm, 1,50 G = 1,50 mm stainless steel wire mesh

3 **material of strainer basket:**
ST = strainer basket of steel, wire mesh of stainless steel
VA = strainer basket and wire mesh of stainless steel

2. Dimensions:

type	GFK 100	GFK 125	GFK 150	GFK 200	GFK 250	GFK 300	GFK 350	GFK 400	GFK 500
connection	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 500
size of strainer basket	Gr. 02	Gr. 02	Gr. 04	Gr. 06	Gr. 06	Gr. 07	Gr. 04	Gr. 07	Gr. 04
Q = m³/h	90	110	192	288	440	630	650	850	1350
filter surface m²	0,25	0,25	0,5	0,6	0,6	1,0	2,0	3,0	6,0
A	1021	1021	1556	1306	1366	1788	1865	2000	2100
B	995	995	1530	1280	1340	1760	1835	1960	2060
C	550	550	1050	700	700	1050	800	1130	1130
D	370	385	420	535	550	575	1005	1030	940
E	435	410	870	530	550	900	540	600	740
F	170	170	170	165	165	180	200	200	200
G	405	405	405	565	565	670	780	1115	1115
H	273	273	273	406	406	508	610	914	914
J	480	480	480	680	680	750	950	1300	1300
K	380	380	380	550	550	650	800	1130	1130
L	70	70	70	90	90	90	100	100	100
M	18	18	18	22	22	22	27	35	35
N	320	320	320	385	385	435	485	640	640
weight kg	95	97	130	200	210	320	630	1015	1350
volume tank	41 l	41 l	70 l	127 l	130 l	217 l	448 l	1097 l	1160 l

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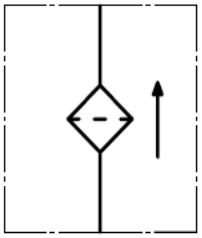
url www.internormen.com

1. Technical data

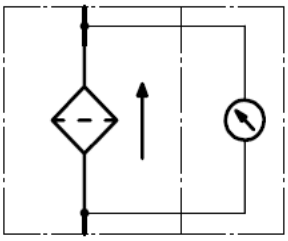
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	GFK.50	Gr.00	1	
2	GFK.65	Gr.01	1	
3	GFK.80	Gr.01	1	
4	GFK.100	Gr.02	1	
5	GFK.125	Gr.02	1	
6	GFK.150	Gr.04	1	
7	GFK.200	Gr.06	1	
8	GFK.250	Gr.06	1	
9	GFK.300	Gr.07	1	
10	GFK.350	Gr.04	4	
11	GFK.400	Gr.07	3	
12	GFK.500	Gr.04	12	

2. Symbols

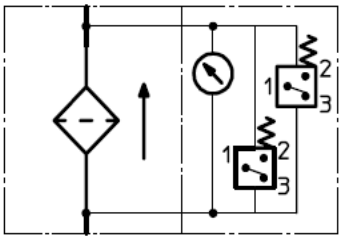
without indicator



with visual indicator



with visual-electrical indicator OE

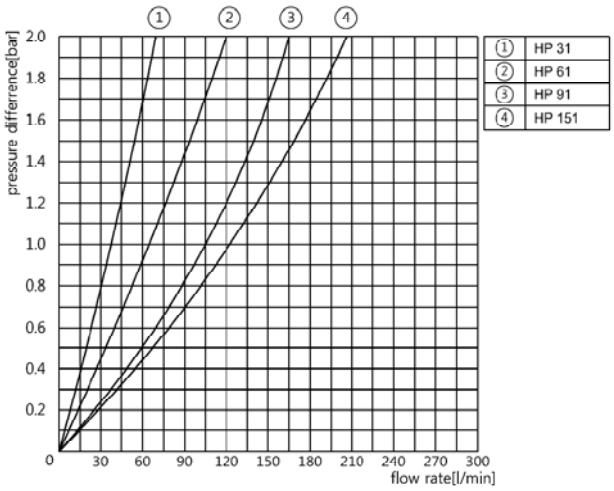


INITIAL DIFFERENCE PRESSURE

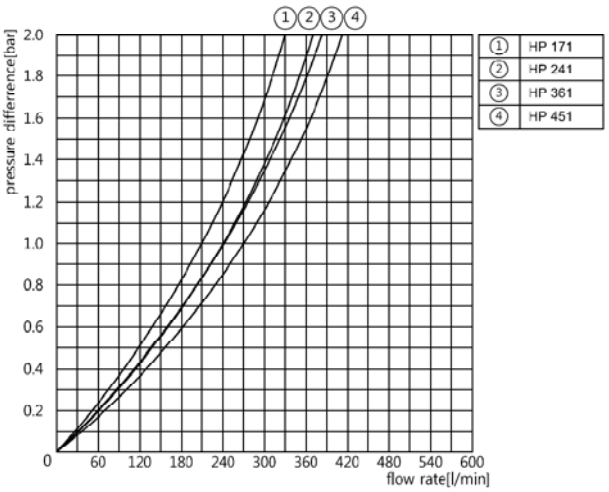
FOR HIGH PRESSURE FILTER SERIES - 1

Sheet No.

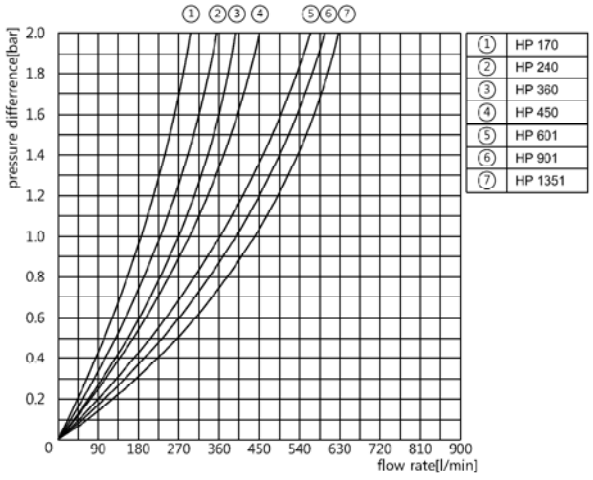
HP31~151 SERIES



HP171~361 SERIES



HP170~1351 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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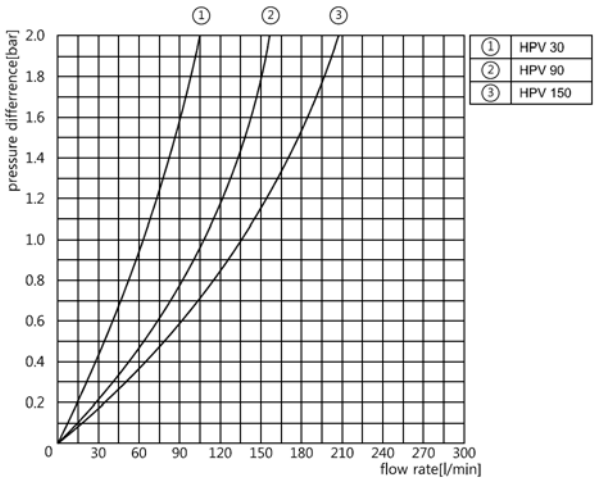
INITIAL DIFFERENCE PRESSURE

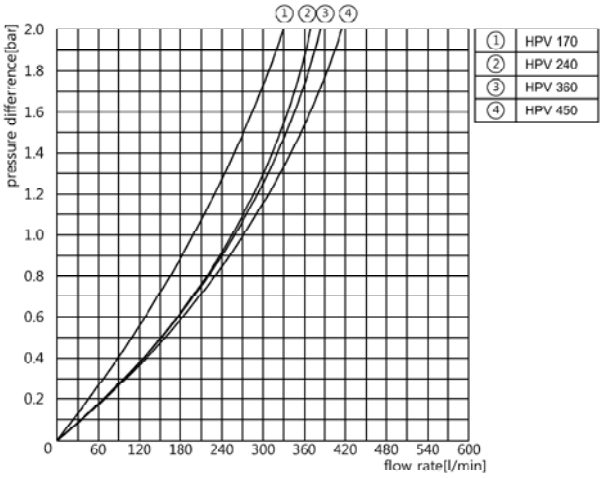
FOR HIGH PRESSURE FILTER SERIES - 2

Sheet No.

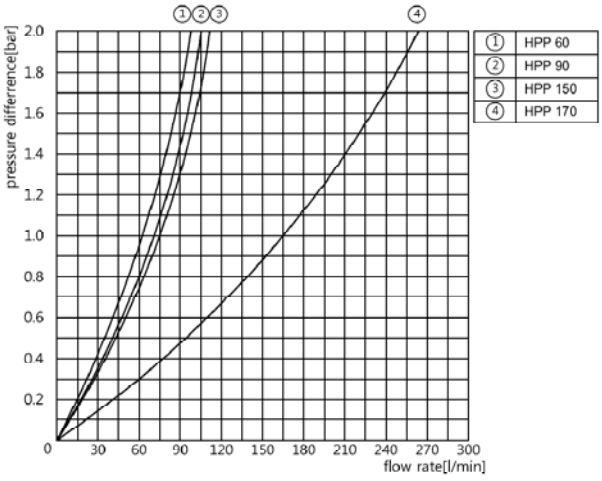
HPV30~150 SERIES



HPV170~450 SERIES



HPP60~170 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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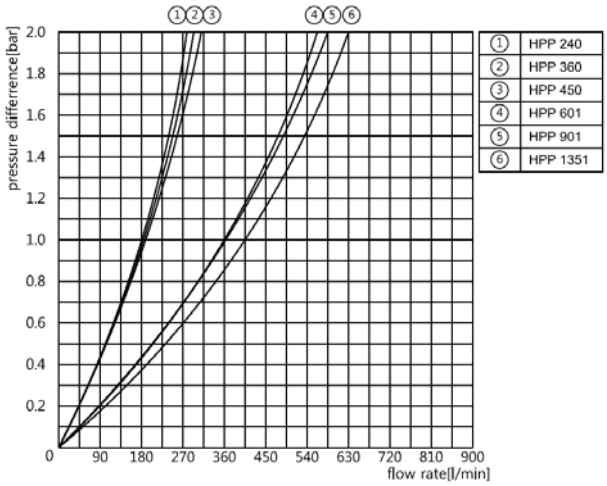
INITIAL DIFFERENCE PRESSURE

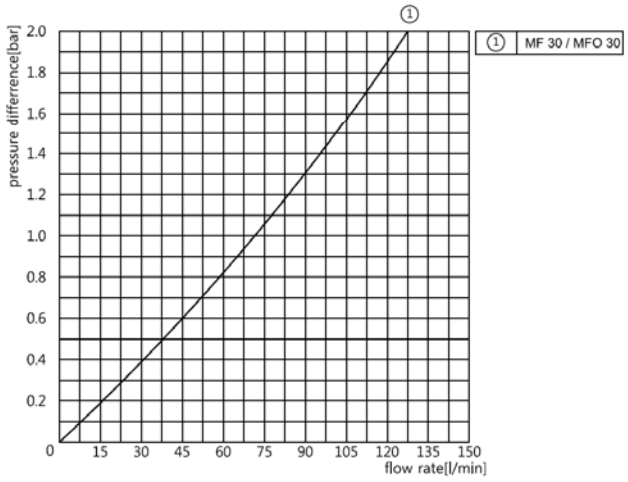
FOR HIGH PRESSURE FILTER SERIES - 3

Sheet No.

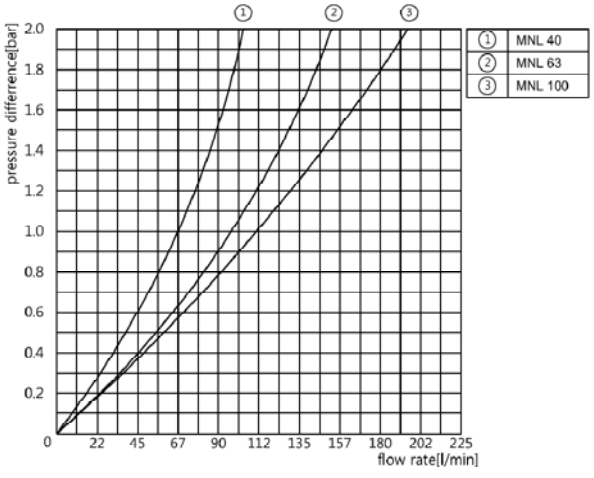
HPP240~1351SERIES



MF30/MFO30 FILTER



MNL40~100 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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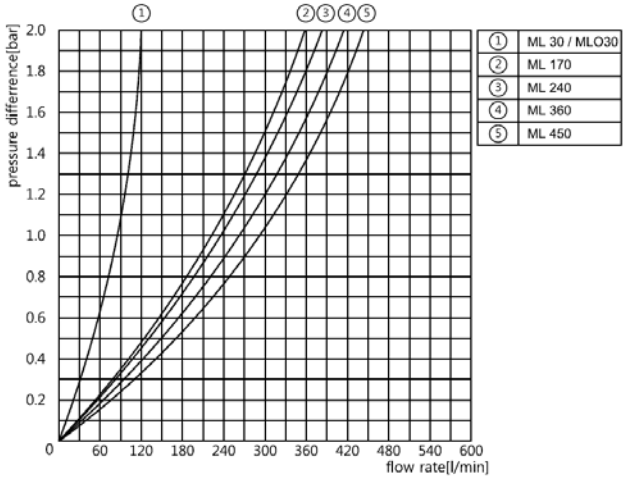
INITIAL DIFFERENCE PRESSURE

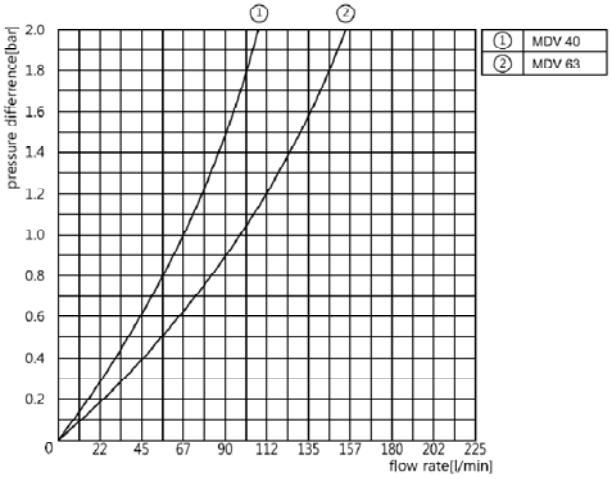
FOR HIGH PRESSURE FILTER SERIES - 4

Sheet No.

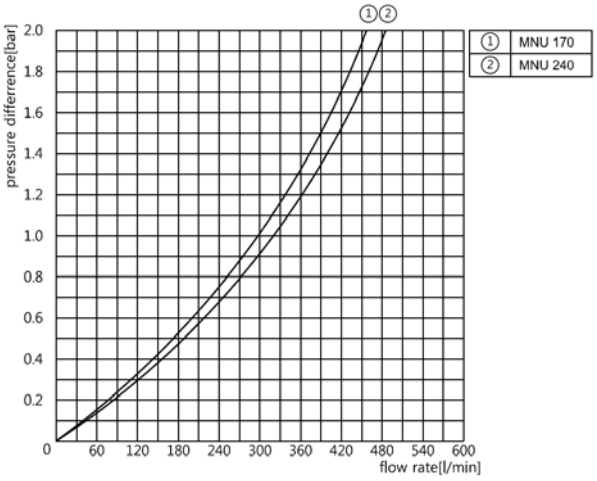
MLO30/ML170~450 SERIES



MDV40~63 SERIES



MNU170~240 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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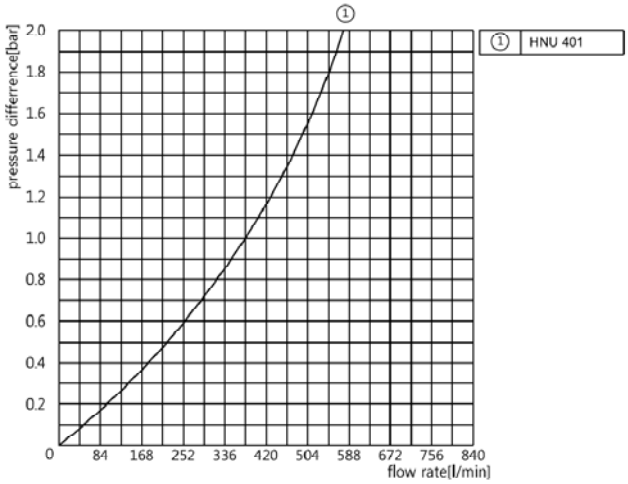
INITIAL DIFFERENCE PRESSURE

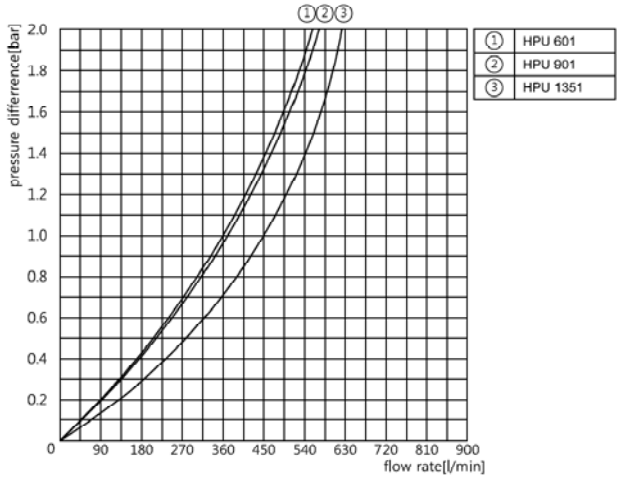
FOR HIGH PRESSURE FILTER SERIES - 5

Sheet No.

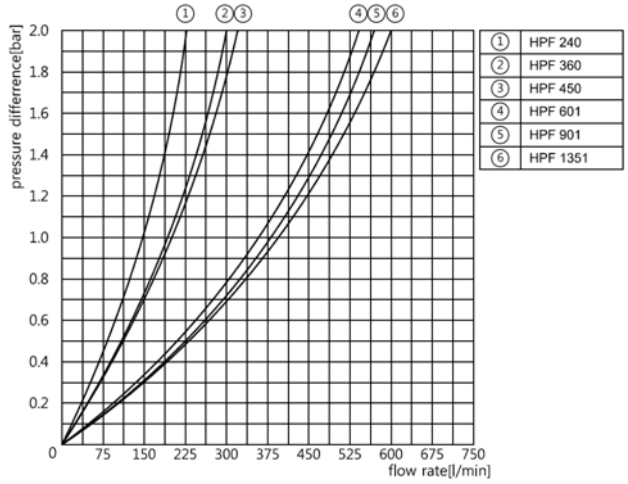
HNU401 FILTER



HPU601~1351 SERIES



HPF240~1351 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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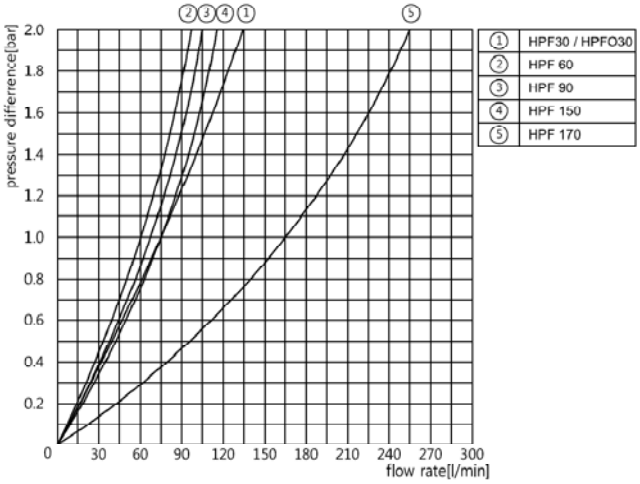
INITIAL DIFFERENCE PRESSURE

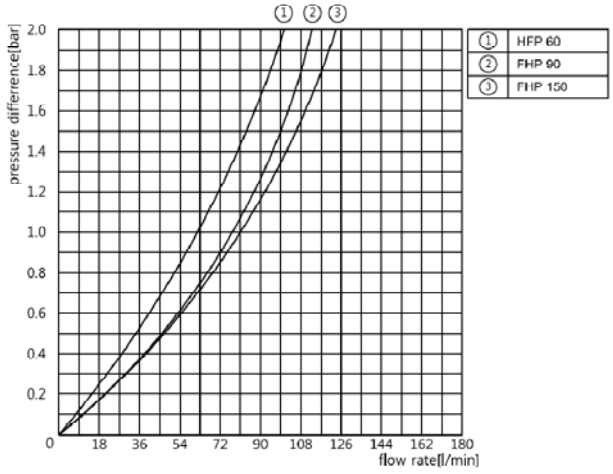
FOR HIGH PRESSURE FILTER SERIES - 6

Sheet No.

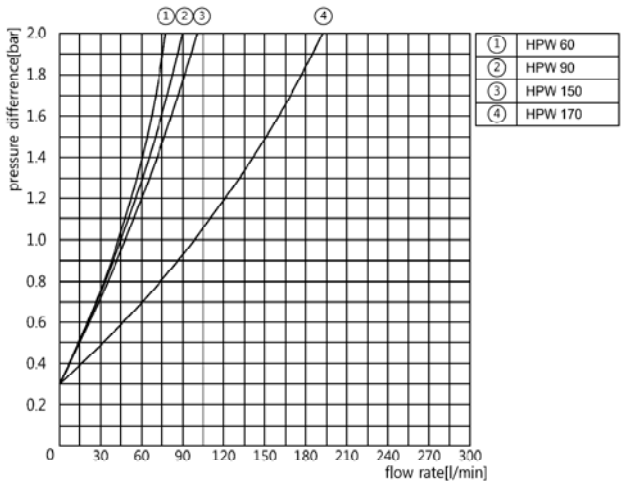
HPFO30/HPF30~170 SERIES



FHP60~150 SERIES



HPW60~170 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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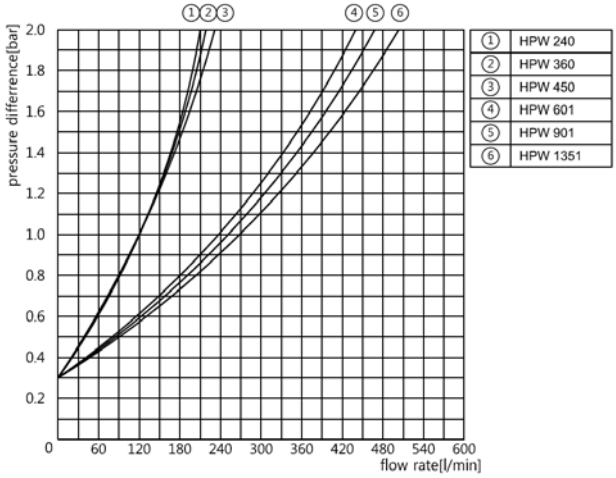
INITIAL DIFFERENCE PRESSURE

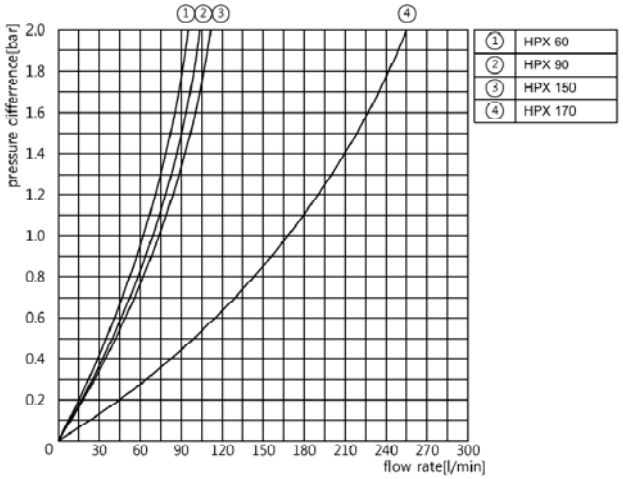
FOR HIGH PRESSURE FILTER SERIES - 7

Sheet No.

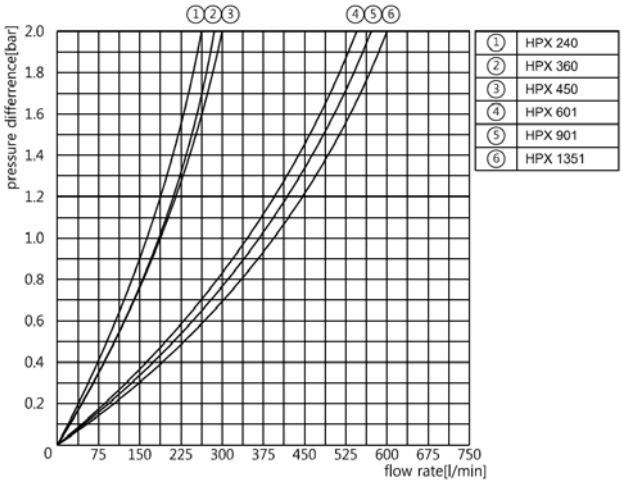
HPW240~1351 SERIES



HPX60~170 SERIES



HPX240~1351 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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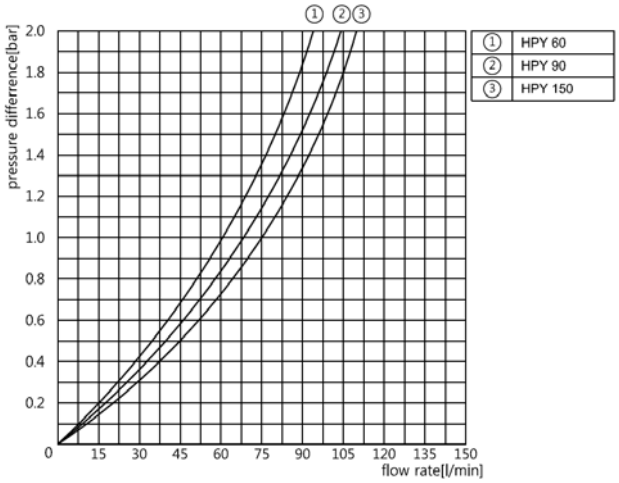
INITIAL DIFFERENCE PRESSURE

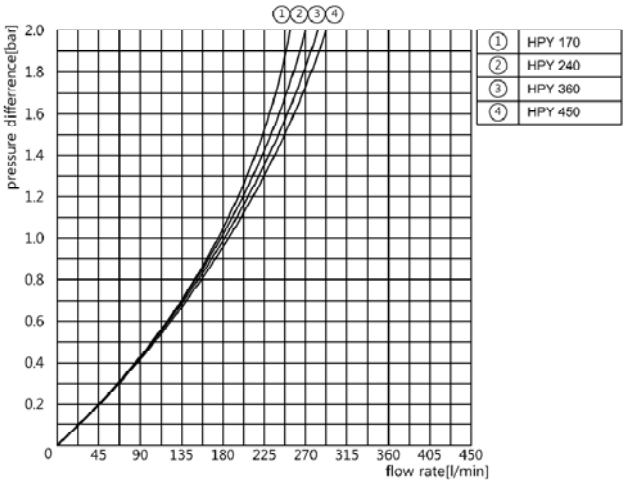
FOR HIGH PRESSURE FILTER SERIES - 8

Sheet No.

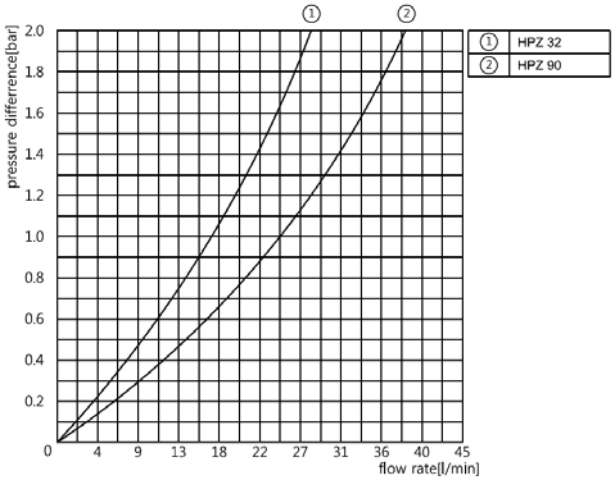
HPY60~150 SERIES



HPY170~450 SERIES



HPZ32~90 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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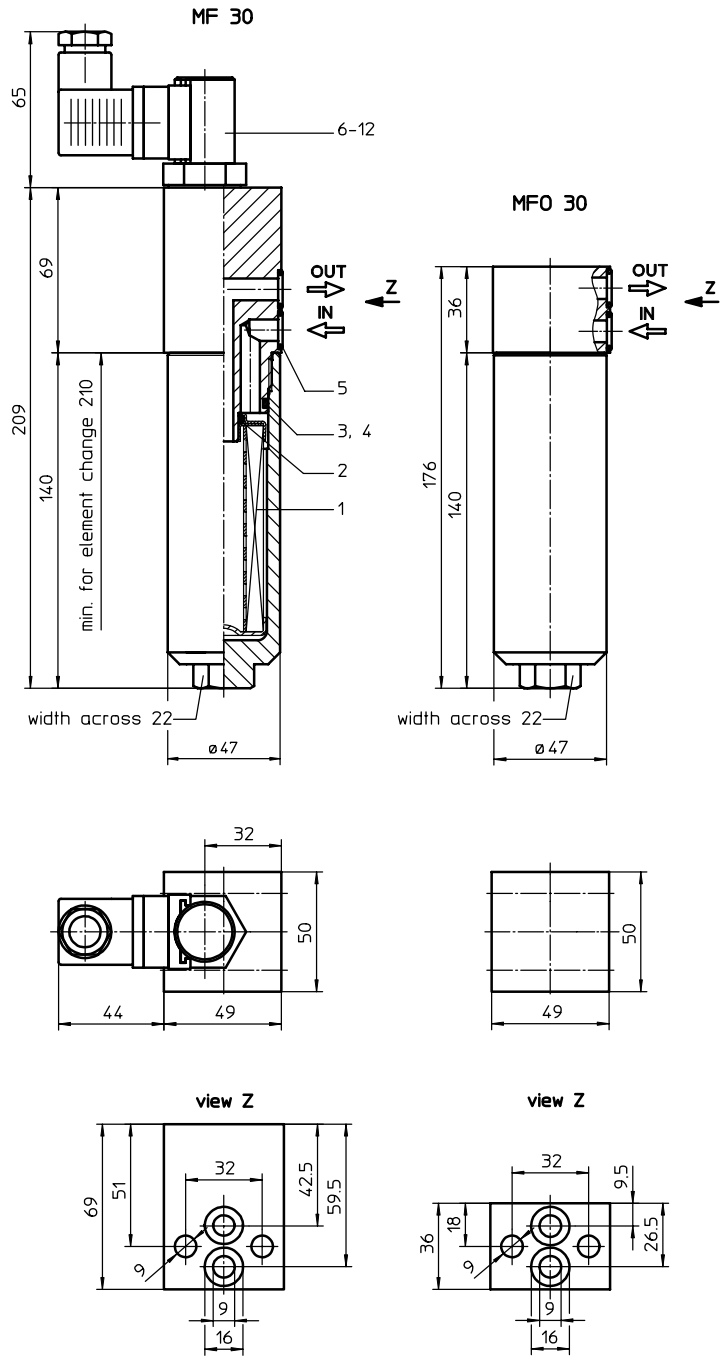
PRESSURE FILTER, manifold mounted
Series MF 30, MFO 30 DN 10 PN 160

Sheet No.
1416 E



1. Type index:

1.1. Complete filter: (ordering example)

MF.	30.	10VG.	HR.	E.	P.	-.	F.	2.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
- MF = medium pressure filter, manifold mounted with indicator
- MFO = medium pressure filter, manifold mounted without indicator

2 **nominal size:** 30

3 **filter-material and filter-fineness:**
25 VG= 20 µm$_{(c)}$, 16 VG= 15 µm$_{(c)}$, 10 VG= 10 µm$_{(c)}$, 6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
- 30 = Δp 30 bar
- HR = Δp 160 bar (rupture strenght Δp 250 bar)

5 **filter element design:**
- E = single-end open

6 **sealing material:**
- P = Nitrile (NBR)
- V = Viton (FPM)

7 **filter element specification:** (see catalog)
- - = standard
- VA = stainless steel
- IS06 = see sheet-no. 31601

8 **connection:**
- F = manifold mounted

9 **connection size:**
- 2 = DN 10

10 **filter housing specification:** (see catalog)
- - = standard
- IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
series MFO:
- - = without

series MF:
- AOR = visual, see sheet-no. 1606
- AOC = visual, see sheet-no. 1606
- AE = visual-electrical, see sheet-no. 1615
- VS1 = electronical, see sheet-no. 1617
- VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
- 01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 30

3 - 7 see type index-complete filter

weight without indicator: approx. 1,2 kg
weight with indicator : approx. 1,4 kg

Changes of measures and design are subject to alteration!

EDV 02/04

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2. Spare parts:

item	qty.	designation	dimensions	article-no.	
1	1	filter element	01E. 30		
2	1	O-ring	11 x 3	312603 (NBR)	312727 (FPM)
3	1	O-ring	32 x 2,5	306843 (NBR)	308268 (FPM)
4	1	support ring	37 x 2,1 x 1	305466	
5	2	O-ring	12 x 2	311014 (NBR)	310271 (FPM)
6	1	clogging indicator, visual	AOR or AOC	see sheet-no. 1606	
7	1	clogging indicator, visual-electrical	AE	see sheet-no. 1615	
8	1	clogging sensor, electronical	VS1	see sheet-no. 1617	
9	1	clogging sensor, electronical	VS2	see sheet-no. 1618	
10	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
11	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
12	1	O-ring	14 x 2	304342 (NBR)	304722 (FPM)

3. Description:

Pressure filter of the series MF 30 and MFO 30 are suitable for a working pressure up to 160 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The filters are flange mounted to the hydraulic system.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.
Filter elements are available down to 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.

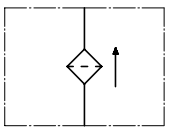
4. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	160 bar
test pressure:	208 bar
connection system:	manifold mounted
housing material:	Al; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	0,1 l

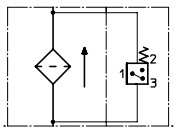
Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

5. Symbols:

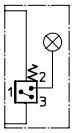
without indicator



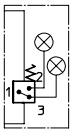
with electrical indicator AE 30 and AE 40



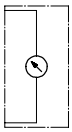
with visual-electrical indicator AE 50 and AE 60



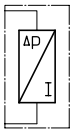
with visual-electrical indicator AE 70 and AE 80



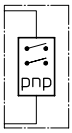
with visual indicator AOR/AOC



with electronical clogging sensor VS1



with electronical clogging sensor VS2



6. Pressure drop flow curves:

Precise flow rates see INF-Expert-System Filter respectively Δp-curves - depending on filter fineness and viscosity.

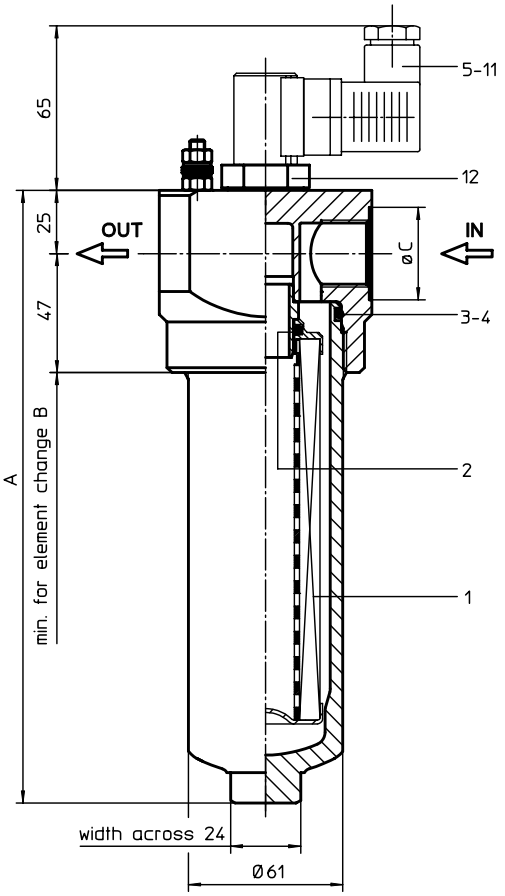
7. Test methods:

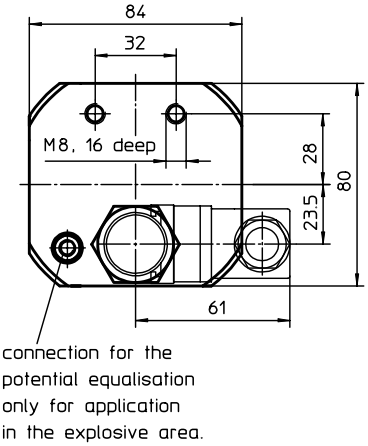
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER
Series MNL 40 - 100 DN 15 - 25 PN 160

Sheet No.
1427 E





connection for the potential equalisation only for application in the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

MNL.	63.	10VG.	HR.	E.	P.	-.	G.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
MNL = standard in-line filter-medium pressure range according to DIN 24550 T1, T2

2 **nominal size:** 40, 63, 100

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c), 6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½
4 = G ¾
5 = G 1

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

2. Dimensions:

type	MNL 40	MNL 63	MNL100
connection	G ½	G ¾	G 1
A	182	242	332
B	210	270	360
C	30	36,5	46
weight kg	2,0	2,5	3,3
volume tank	0,25 l	0,35 l	0,55 l

Connection assignments as shown in the table are standard according to DIN 24 550 T1. Are the connection assignments against DIN 24 550 T1, see item 9 of the type code.

1.2. Filter element: (ordering example)

01NL.	63.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 40, 63, 100

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration!

EDV 10/04

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3. Spare parts:

item	qty.	designation	dimension			article-no.	
			MNL 40	MNL 63	MNL 100		
1	1	filter element	01NL.40	01NL.63	01NL.100		
2	1	O-ring	22 x 3,5			304341 (NBR)	304392 (FPM)
3	1	O-ring	54 x 3			304657 (NBR)	304720 (FPM)
4	1	support ring	60 x 2,6 x 1			311779	
5	1	clogging indicator visual	AOR or AOC			see sheet-no. 1606	
6	1	clogging indicator visual-electrical	AE			see sheet-no. 1615	
7	1	clogging sensor electronical	VS1			see sheet-no. 1617	
8	1	clogging sensor electronical	VS2			see sheet-no. 1618	
9	1	O-ring	15 x 1,5			315357 (NBR)	315427 (FPM)
10	1	O-ring	22 x 2			304708 (NBR)	304721 (FPM)
11	1	O-ring	14 x 2			304342 (NBR)	304722 (FPM)
12	1	screw plug	20913-4			309817	

item 12 execution only without clogging indicator or clogging sensor

4. Description:

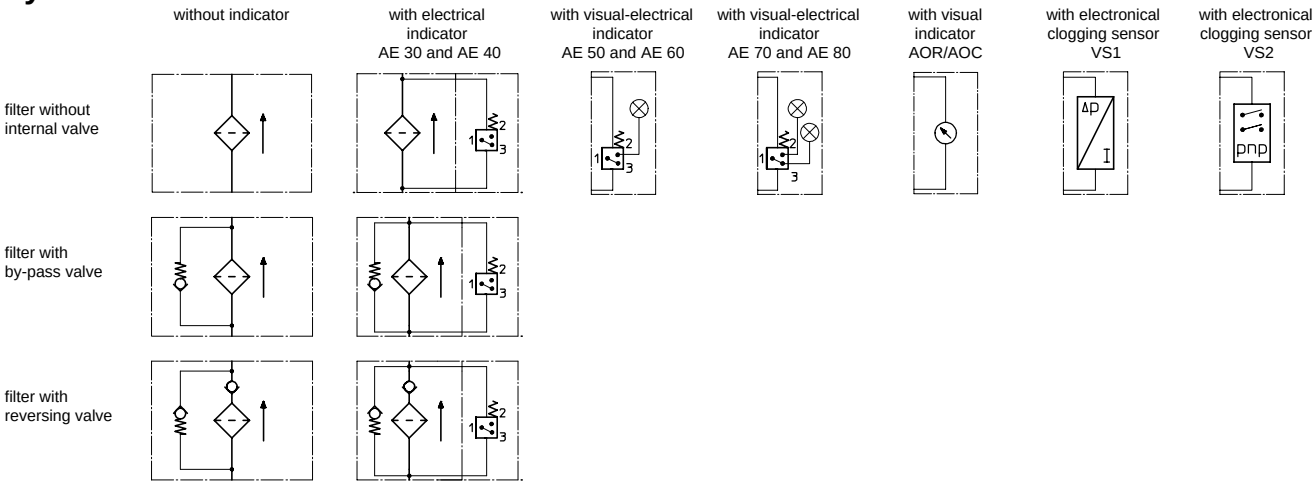
The pressure filters of the series MNL 40-100 are suitable for a working pressure up to 160 bar and equiped with elements according to DIN 24 550 T3.
The pressure peaks are absorbed by a sufficient margin of safety. The MNL-filter is in-line mounted.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter elements are available down to $4\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element.
After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

5. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	160 bar
test pressure:	208 bar
connection system:	thread connection according to ISO 228
housing material:	aluminium forging alloy; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:



7. Pressure drop flow curves:

Precise flow rates see 'INF-Expert-System Filter' respectively Δp-curves ; depending on filter fineness and viscosity.

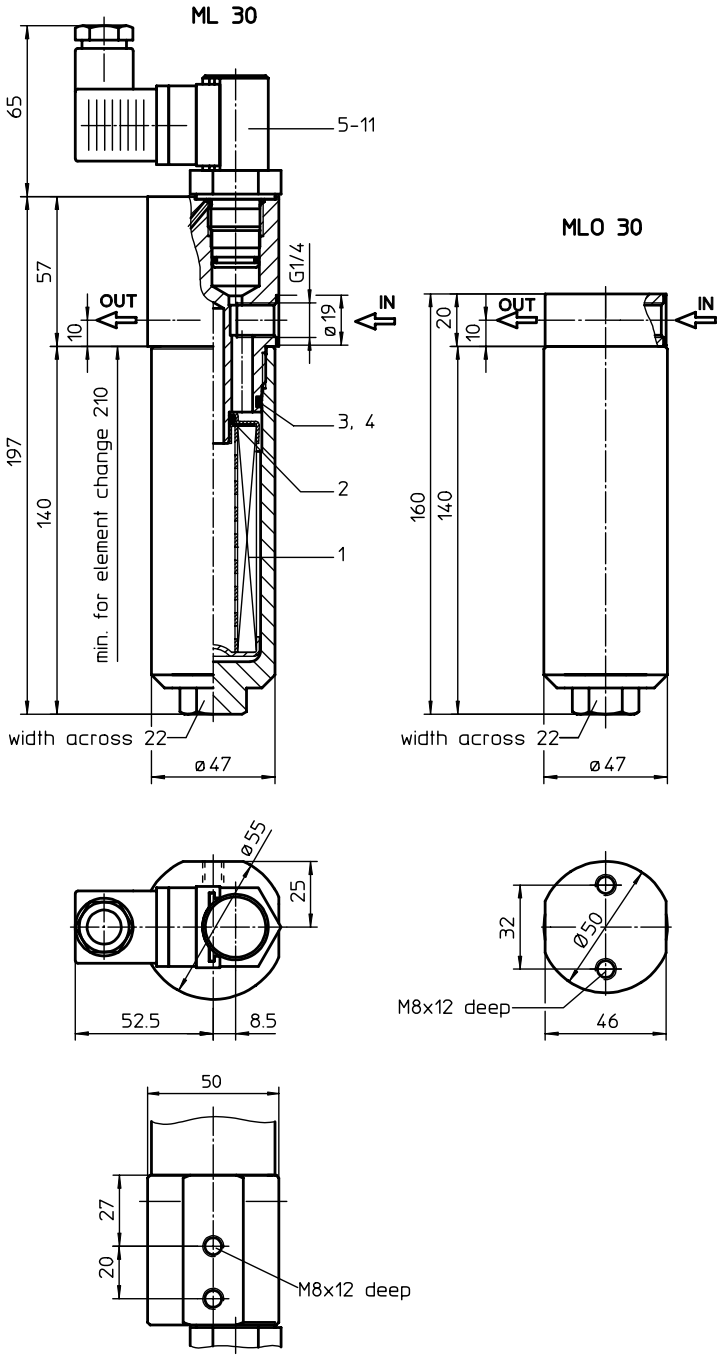
8. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER
Series ML 30, MLO 30 DN 6 PN 160

Sheet No.
1417 E



1. Type index:

1.1. Complete filter: (ordering example)

ML.	30.	10VG.	HR.	E.	P.	-.	G.	1.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
- ML = in-line filter-medium pressure range with indicator
- MLO = in-line filter-medium pressure range without indicator

2 **nominal size:** 30

3 **filter-material and filter-fineness:**
25 VG= 20 µm$_{(c)}$, 16 VG= 15 µm$_{(c)}$, 10 VG= 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
- 30 = Δp 30 bar
- HR = Δp 160 bar (rupture strenght Δp 250 bar)

5 **filter element design:**
- E = single-end open

6 **sealing material:**
- P = Nitrile (NBR)
- V = Viton (FPM)

7 **filter element specification:** (see catalog)
- - = standard
- VA = stainless steel
- IS06 = see sheet-no. 31601

8 **connection:**
- G = thread connection according to ISO 228

9 **connection size:**
- 1 = G ¼

10 **filter housing specification:** (see catalog)
- - = standard
- IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
series MLO:
- - = without

series ML:
- AOR = visual, see sheet-no. 1606
- AOC = visual, see sheet-no. 1606
- AE = visual-electrical, see sheet-no. 1615
- VS1 = electronical, see sheet-no. 1617
- VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
- 01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 30

3 - 7 see type index-complete filter

weight without indicator: approx. 1,1 kg
weight with indicator : approx. 1,3 kg

Changes of measures and design are subject to alteration!

EDV 02/04

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2. Spare parts:

item	qty.	designation	dimensions	article-no.	
1	1	filter element	01E.30		
2	1	O-ring	11 x 3	312603 (NBR)	312727 (FPM)
3	1	O-ring	32 x 2,5	306843 (NBR)	308268 (FPM)
4	1	support ring	37 x 2,1 x 1	305466	
5	1	clogging indicator, visual	AOR or AOC	see sheet-no. 1606	
6	1	clogging indicator, visual-electrical	AE	see sheet-no. 1615	
7	1	clogging sensor, electronical	VS1	see sheet-no. 1617	
8	1	clogging sensor, electronical	VS2	see sheet-no. 1618	
9	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
10	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
11	1	O-ring	14 x 2	304342 (NBR)	304722 (FPM)

3. Description:

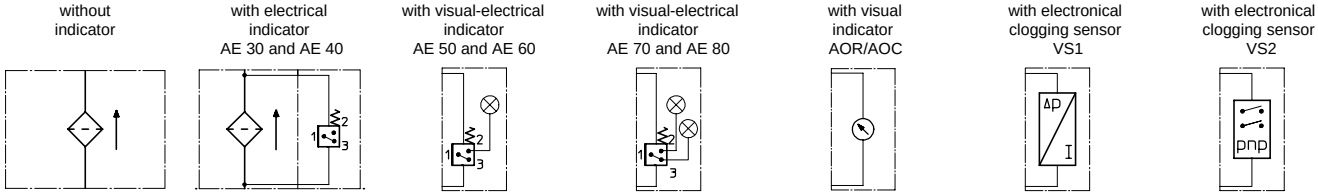
Pressure filter of the series ML 30 and MLO 30 are suitable for a working pressure up to 160 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The filter is in-line mounted.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.
Filter elements are available down to 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.

4. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	160 bar
test pressure:	208 bar
connection system:	thread connection according to ISO 228
housing material:	Al; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	0,1 l

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

5. Symbols:



6. Pressure drop flow curves:

Precise flow rates see INF-Expert-System Filter respectively Δp-curves - depending on filter fineness and viscosity.

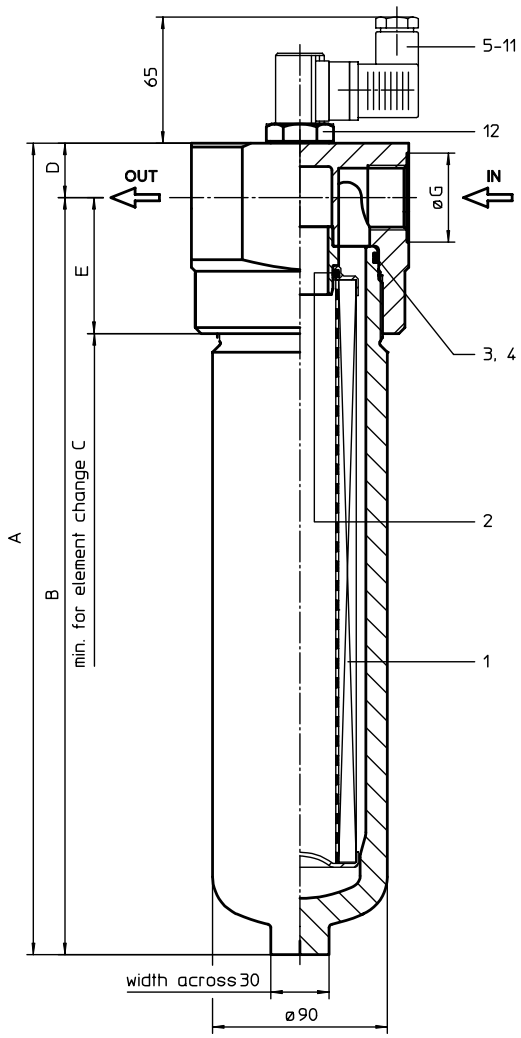
7. Test methods:

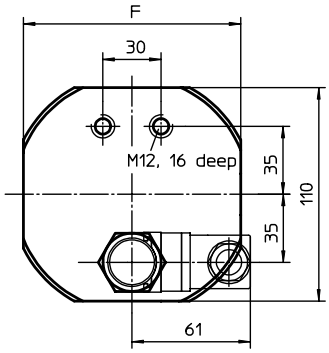
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER
Series ML 170 - 450 DN 25 - 40 PN 160

Sheet No.
1429 E





1. Type index:

1.1. Complete filter: (ordering example)

ML	.	360	.	10VG	.	HR	.	E	.	P	.	-.	G	.	5	.	-.	-.	AE
1		2		3		4		5		6		7	8		9		10	11	12

1 **series:**
ML = in-line filter-medium pressure range

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
5 = G 1
7 = G 1 ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E	.	360	.	10VG	.	HR	.	E	.	P	.	-
1		2		3		4		5		6		7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	ML 170		ML 240		ML 360		ML 450	
connection	G1	G1 ½	G1	G1 ½	G1	G1 ½	G1	G1 ½
A	288	300	338	350	418	430	523	535
B	260	265	310	315	390	395	495	500
C	350	350	400	400	480	480	585	585
D	28	35	28	35	28	35	28	35
E	70	75	70	75	70	75	70	75
F	112	116	112	116	112	116	112	116
G	46	63,5	46	63,5	46	63,5	46	63,5
weight kg	7.5	7.9	8.5	8.9	10.1	10.5	13.1	13.5
volume tank	0,7 l	0,7 l	0,9 l	0,9 l	1,2 l	1,2 l	1,6 l	1,6 l

Changes of measures and design are subject to alteration!

EDV 07/03

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3. Spare parts:

item	qty.	designation	dimension				article-no.	
			ML 170	ML 240	ML 360	ML 450		
1	1	filter element	01E. 170	01E. 240	01E. 360	01E. 450		
2	1	O-ring	34 x 3,5				304338 (NBR)	304730 (FPM)
3	1	O-ring	75 x 3				302215 (NBR)	304729 (FPM)
4	1	support ring	81 x 2,6 x 1				304581	
5	1	clogging indicator visual	AOR or AOC				see sheet-no. 1606	
6	1	clogging indicator visual-electrical	AE				see sheet-no. 1615	
7	1	clogging sensor electronical	VS1				see sheet-no. 1617	
8	1	clogging sensor electronical	VS2				see sheet-no. 1618	
9	1	O-ring	15 x 1,5				315357 (NBR)	315427 (FPM)
10	1	O-ring	22 x 2				304708 (NBR)	304721 (FPM)
11	1	O-ring	14 x 2				304342 (NBR)	304722 (FPM)
12	1	screw plug	20913-4				309817	

item 12 execution only without clogging indicator or clogging sensor

4. Description:

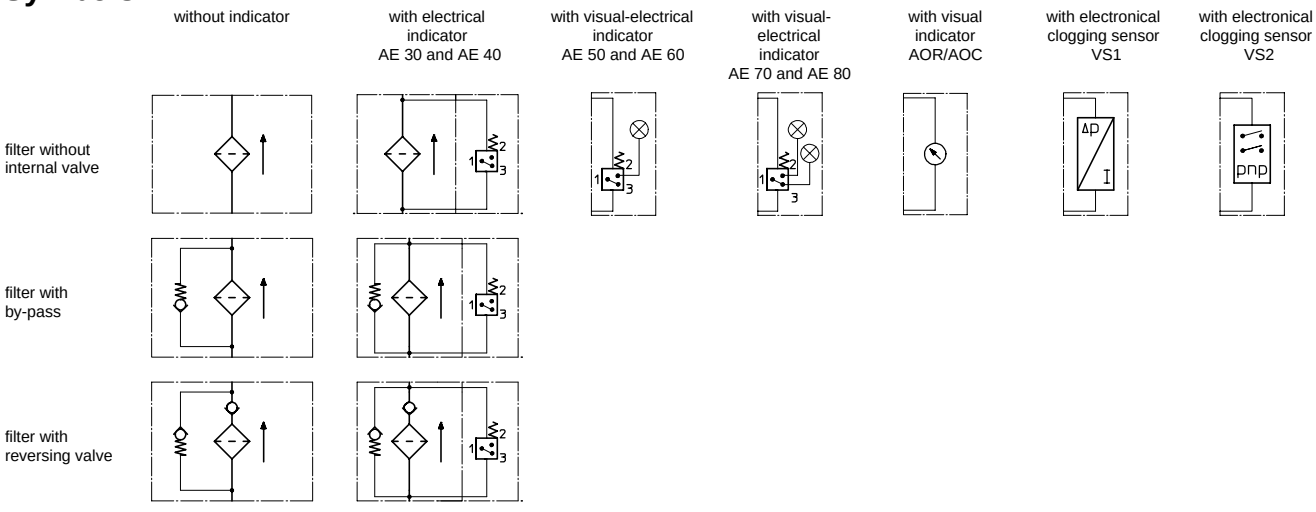
The pressure filters of the series ML 170-450 are suitable for a working pressure up to 160 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The ML-filter is in-line mounted.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter elements are available down to $4\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element.
After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

5. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	160 bar
test pressure:	208 bar
connection system:	thread according to ISO 228
housing material:	Al; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:



7. Pressure drop flow curves:

Precise flow rates see 'INF-Expert-System Filter' respectively Δp-curves ; depending on filter fineness and viscosity.

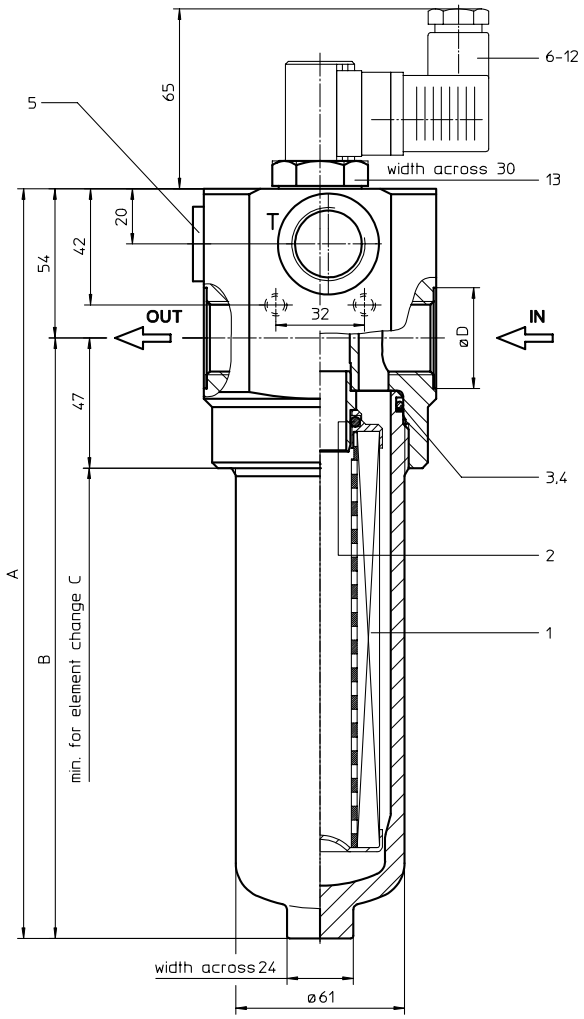
8. Test methods:

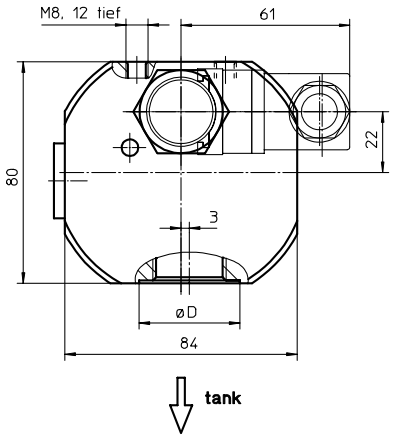
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER
Series MDV 40-63 DN 15 - 20 PN 200

Sheet No.
1419 C





1. Type index:

1.1. Complete filter: (ordering example)

MDV.	40.	10VG.	HR.	E.	P.	-.	G.	3.	-.	D2.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
MDV = medium pressure filter with differential pressure-valve

2 **nominal size:** 40, 63

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½
4 = G ¾

10 **filter housing specification:**
- = standard

11 **internal valve:**
D1 = differential pressure-valve Δp 3,5 bar
D2 = differential pressure-valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01NL.	40.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 40, 63

3 - 7 see type index-complete filter

2. Dimensions:

type	connection	A	B	C	D	weight kg	volume tank
MDV 40	G ½	211	157	265	30	2,7	0,25 l
MDV 63	G ¾	271	217	325	36,5	3,2	0,35 l

Connection assignments as shown in the table are standard according to DIN 24 550 T1.
Are the connection assignments against DIN 24 550 T1, see item 9 of the type code.

Changes of measures and design are subject to alteration!

EDV 08/03

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3. Spare parts:

item	qty.	designation	dimension MDV 40	dimension MDV 63	article-no.	
1	1	filter element	01NL.40	01NL.63		
2	1	O-ring	22 x 3,5		304341 (NBR)	304392 (FPM)
3	1	O-ring	54 x 3		304657 (NBR)	304720 (FPM)
4	1	support ring	60 x 2,6 x 1		311779	
5	1	screw plug	G ½		304678	
6	1	clogging indicator visual	AOR or AOC		see sheet-no. 1606	
7	1	clogging indicator visual-electrical	AE		see sheet-no. 1615	
8	1	clogging sensor electronical	VS1		see sheet-no. 1617	
9	1	clogging sensor electronical	VS2		see sheet-no. 1618	
10	1	O-ring	15 x 1,5		315357 (NBR)	315427 (FPM)
11	1	O-ring	22 x 2		304708 (NBR)	304721 (FPM)
12	1	O-ring	14 x 2		304342 (NBR)	304722 (FPM)
13	1	screw plug	20913-4		309817	

item 13 execution only without clogging indicator or clogging sensor

4. Description:

The pressure filters of the series MDV are suitable for a working pressure up to 200 bar and equiped with elements according to DIN 24 550 T3.
The pressure peaks are absorbed by a sufficient margin of safety. The MDV-filter is in-line mounted.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter elements are available down to $4\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The differential pressure-valve opens independently of the operating pressure at a chosen differential pressure-valve between IN and OUT and leaves an unfiltered partial-flow flowing from „IN“ to the tank.

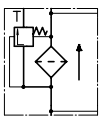
5. Technical data:

temperature range:	- 10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	200 bar
test pressure:	260 bar
connection system:	thread connection according to ISO 228
housing material:	aluminium forging alloy; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

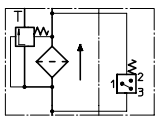
Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:

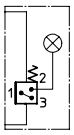
without indicator



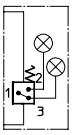
with electrical indicator AE 30 and AE 40



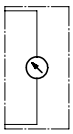
with visual-electrical indicator AE 50 and AE 60



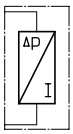
with visual-electrical indicator AE 70 and AE 80



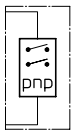
with visual indicator AOR/AOC



with electronical clogging sensor VS1



with electronical clogging sensor VS2



7. Pressure drop flow curves:

Precise flow rates see ‘INF-Expert-System Filter’ respectively Δp-curves ; depending on filter fineness and viscosity.

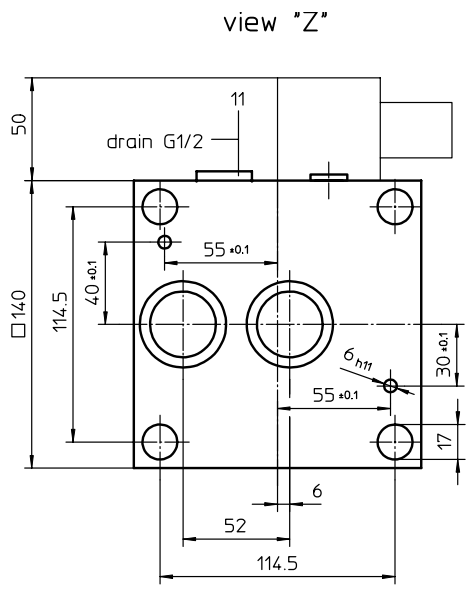
8. Test methods:

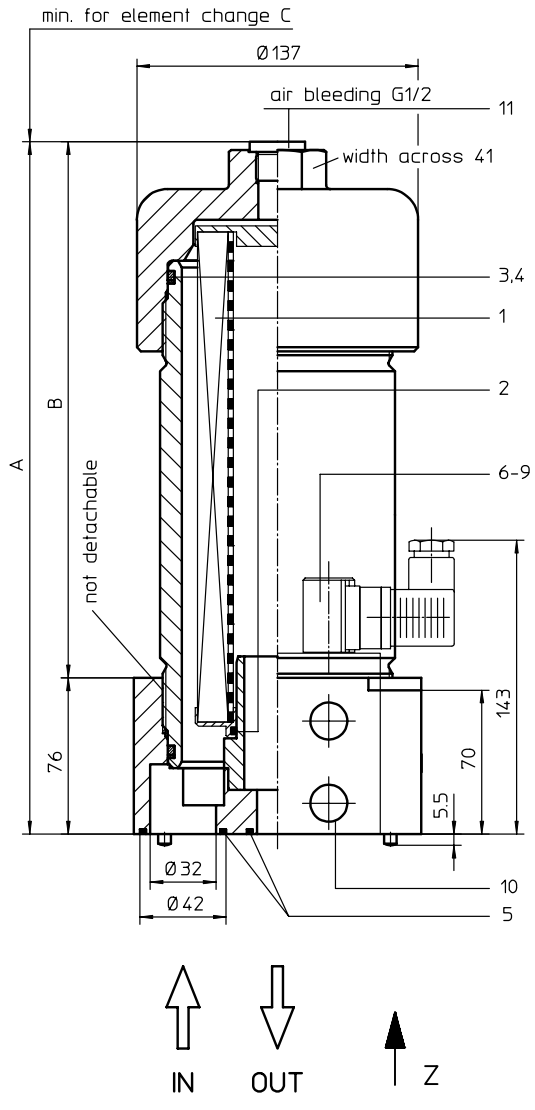
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER, manifold mounted
Series MNU 250 - 400 DN 32 PN 160

Sheet No.
1428 H





1. Type index:

1.1. Complete filter: (ordering example)

MNU.	250.	10VG.	30.	E.	P.	-.	P.	6.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
MNU = medium pressure standard filter for manifold mounted

2 **nominal size:** 250, 400

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference:**
30 = filter element for Δp 30 bar
HR = filter element for Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
P = manifold mounted

9 **connection size:**
6 = DN 32

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL.	250.	10VG.	30.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24 550, T3

2 **nominal size:** 250, 400

3 - 7 see type index-complete filter

2. Dimensions:

type	connection	A	B	C	weight kg	volume tank
MNU 250	DN 32	337	261	210	20	1,6 l
MNU 400	DN 32	487	411	360	24	2,6 l

Changes of measures and design are subject to alteration!

EDV 08/03

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3. Spare parts:

item	qty.	designation	dimension		article-no.	
			MNU 250	MNU 400		
1	1	filter element	01NL. 250	01NL. 400		
2	1	O-ring	40 x 3		304389 (NBR)	304391 (FPM)
3	1	O-ring	98 x 4		301914 (NBR)	304765 (FPM)
4	1	support ring	107 x 3,5 x 1,5		317663	
5	2	O-ring	36 x 3		304358 (NBR)	313900(FPM)
6	1	clogging indicator,visual-electrical	AE		see sheet-no. 1609	
7	1	clogging sensor,electronical	VS1		see sheet-no. 1607	
8	1	clogging sensor,electronical	VS2		see sheet-no. 1608	
9	2	O-ring	14 x 2		304342 (NBR)	304722 (FPM)
10	2	screw plug	$G\ ^1/_8$		304791	
11	2	screw plug	G ½		304678	

item 10 execution only without clogging indicator or clogging sensor

4. Description:

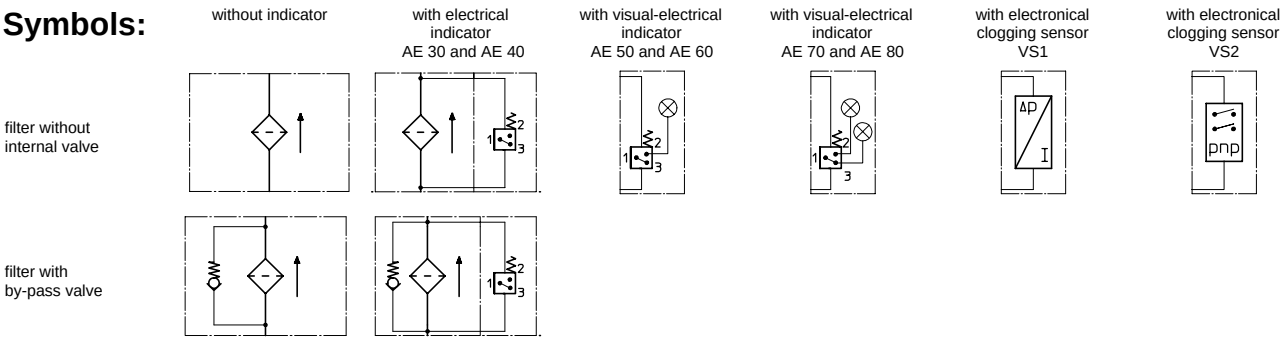
Pressure filters of the series MNU are suitable for a working pressure up to 160 bar and equiped with filter elements according to DIN 24550, T3. The pressure peaks are absorbed by a sufficient margin of safety.The MNU-filters are flange-mounted to the hydraulic system.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive.
The flow direction is from outside to the inside. Filter elements are available down to 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element.
After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter.

5. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	160 bar
test pressure:	208 bar
connection system:	manifold mounted
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:



7. Pressure drop flow curves:

Precise flow rates see 'INF-Expert-System Filter' respectively Δp-curves ; depending on filter fineness and viscosity.

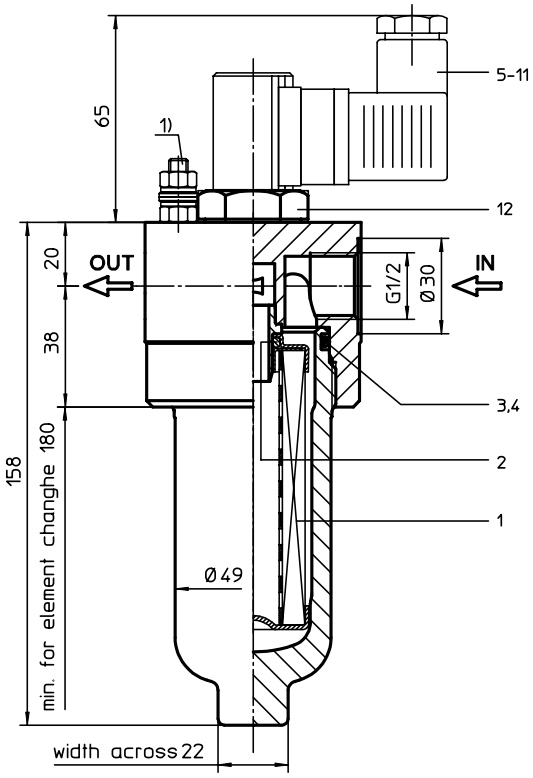
8. Test methods:

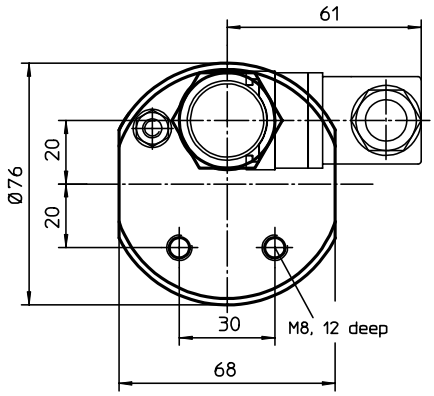
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER
Series HP 31 DN 15 PN 420

Sheet No.
1459 C





1) connection for the potential equalisation, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

HP .	31.	10VG.	HR.	E.	P.	-.	G.	3.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HP = pressure filter

2 **nominal size:** 31

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 30

3 - 7 see type index-complete filter

weight: approx. 3,0 kg

EDV 08/06

Changes of measures and design are subject to alteration!

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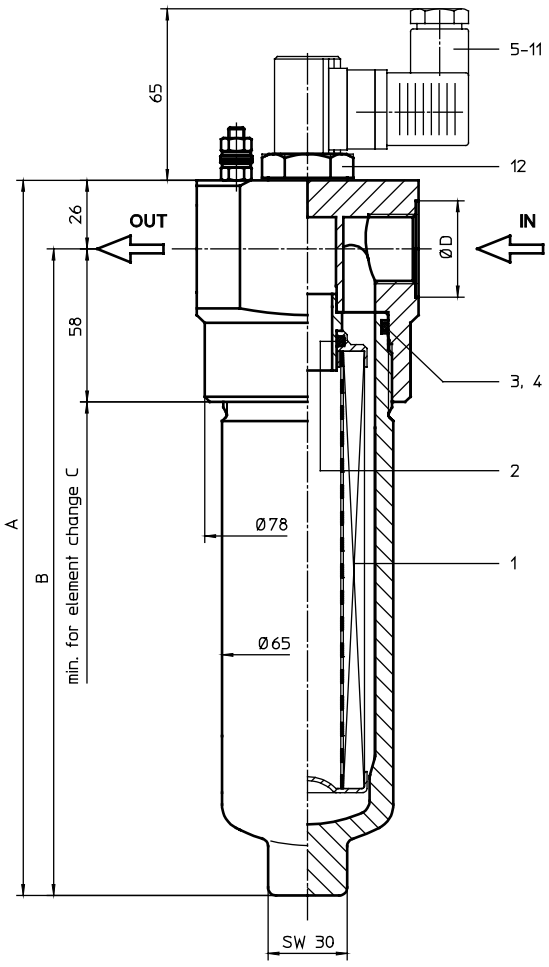
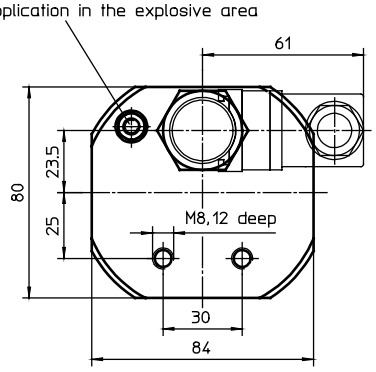
PRESSURE FILTER
Series HP 61-151 DN 15 - 25 PN 420

Sheet No.
1477 E



connection for the potential equalisation,
only for application in the explosive area



2. Dimensions:

type	HP 61	HP 91	HP 151
connection	G ½	G ¾	G 1
A	206	271	380
B	180	245	354
C	270	335	445
D	30	36,5	46
weight kg	4	4,5	5,5
volume tank	0,3 l	0,4 l	0,6 l

Connection assignments as shown in the table are standard. To exchange connections see item 9 in type index.

1. Type index:

1.1. Complete filter: (ordering example)

HP .	91.	10VG.	HR.	E.	P.	-.	G.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HP = pressure filter

2 **nominal size:** 61, 91, 151

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½
4 = G ¾
5 = G 1

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

EDV 04/05

Changes of measures and design are subject to alteration!

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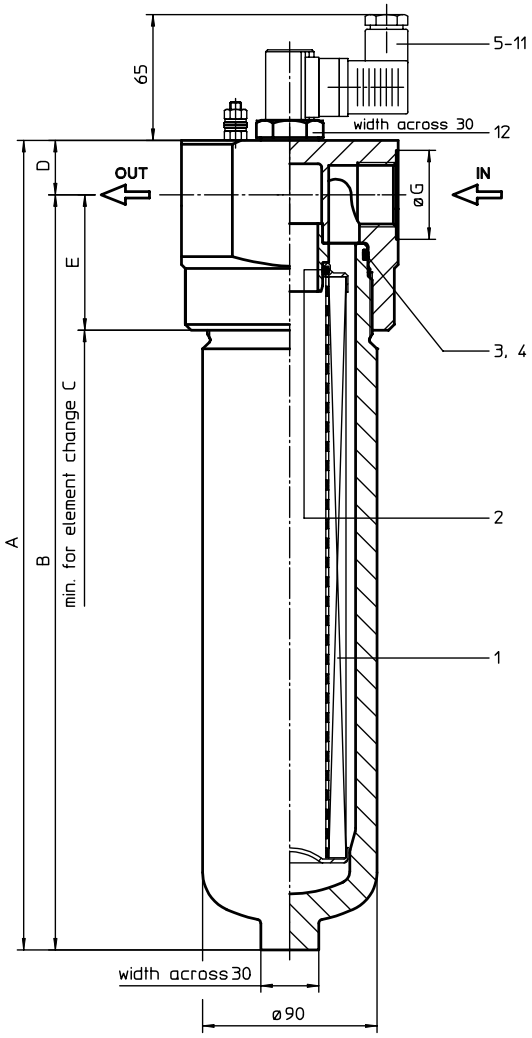
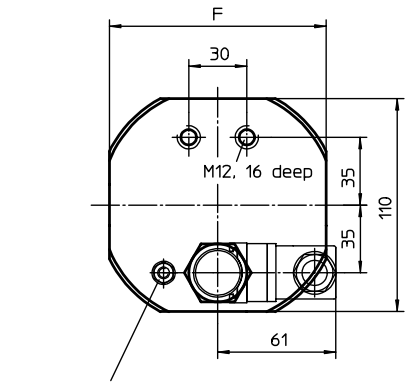
PRESSURE FILTER
Series HP 171 - 451 DN 25 - 40 PN 420

Sheet No.
1468 D





connection for the potential equalisation,
only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

HP .	361.	10VG.	HR.	E.	P.	-.	G.	5.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HP = pressure filter

2 **nominal size:** 171, 241, 361, 451

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
5 = G 1
6 = G 1 ¼
7 = G 1 ½

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	360.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	HP 171			HP 241			HP 361			HP 451		
connection	G 1	G 1 ¼	G 1 ½	G 1	G 1 ¼	G 1 ½	G 1	G 1 ¼	G 1 ½	G 1	G 1 ¼	G 1 ½
A	288	295	300	338	345	350	418	425	430	523	530	535
B	260	263	265	310	313	315	390	393	395	495	498	500
C	350	350	350	400	400	400	480	480	480	585	585	585
D	28	32	35	28	32	35	28	32	35	28	32	35
E	70	73	75	70	73	75	70	73	75	70	73	75
F	112	116	116	112	116	116	112	116	116	112	116	116
G	46	57	63,5	46	57	63,5	46	57	63,5	46	57	63,5
weight kg	10,8	11,4	11,8	12,1	12,7	13,1	14	14,6	15	16,5	17,1	17,5
volume tank	0,7 l			0,9 l			1,2 l			1,6 l		

Connection assignments as shown in the table are standard. To exchange connections see item 9 in type index.

EDV 11/06

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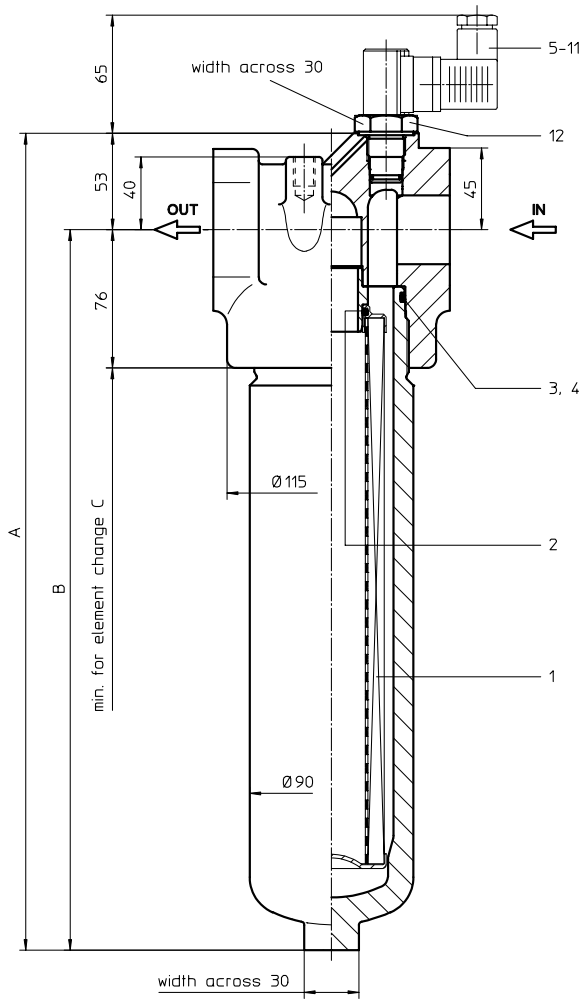
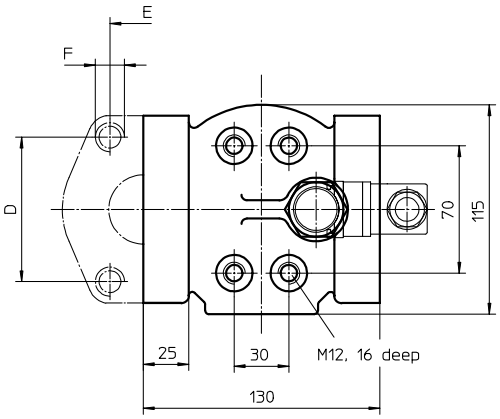
PRESSURE FILTER
Series HP 170 - 450 DN 40 PN 420

Sheet No.
1462 N





1. Type index:

1.1. Complete filter: (ordering example)

HP .	170.	10VG.	HR.	E.	P.	-.	FS.	7.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HP = pressure filter

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 6000 PSI

9 **connection size:**
7 = 1 ½“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	170.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	HP 170	HP 240	HP 360	HP 450
connection	SAE 1 ½“			
A	319	368	449	554
B	266	316	396	501
C	350	400	480	585
D	79,4			
E	36,7			
F	M16, 20 deep			
weight kg	13	14	16	19
volume tank	0,7 l	0,9 l	1,2 l	1,6 l

Changes of measures and design are subject to alteration!

EDV 07/03

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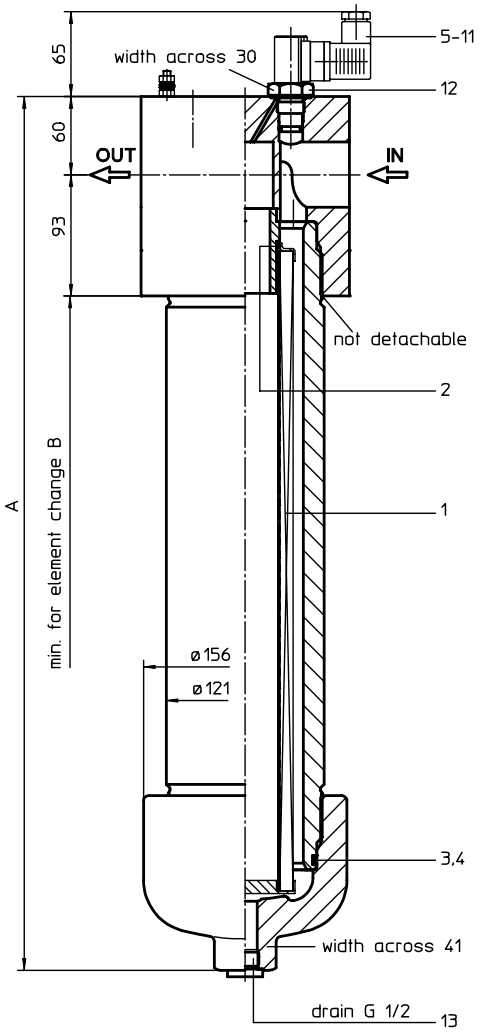
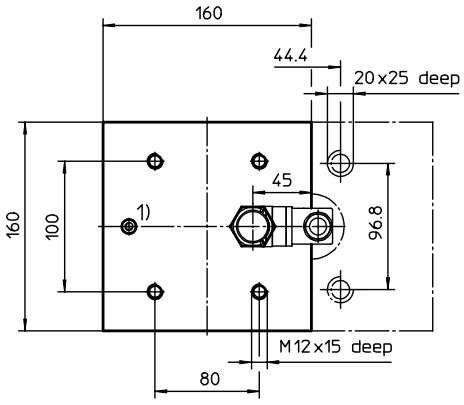
PRESSURE FILTER
Series HP 601-1351 DN 50 PN 420

Sheet No.
1465 J





1) connection for the potential equalisation, only for the application in the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

HP .	901.	10VG.	HR.	E.	P.	-.	FS.	8.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HP = pressure filter

2 **nominal size:** 601, 901, 1351

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 6000 PSI

9 **connection size:**
8 = 2“

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,348 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Dimensions:

type	HP 601	HP 901	HP 1351
connection	SAE 2“		
A	520	670	918
B	790	940	1440
weight kg	49	56	68
volume tank	2,1 l	3,1 l	4,6 l

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Changes of measures and design are subject to alteration!

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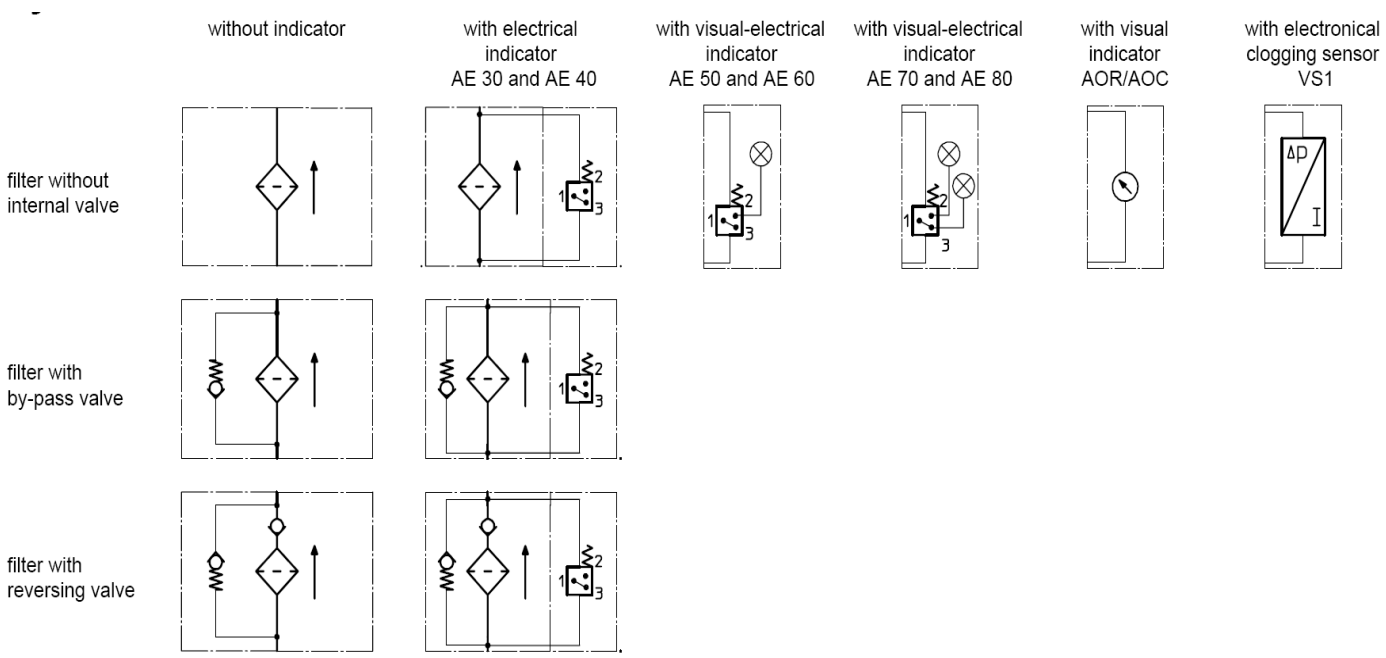
1. Technical data

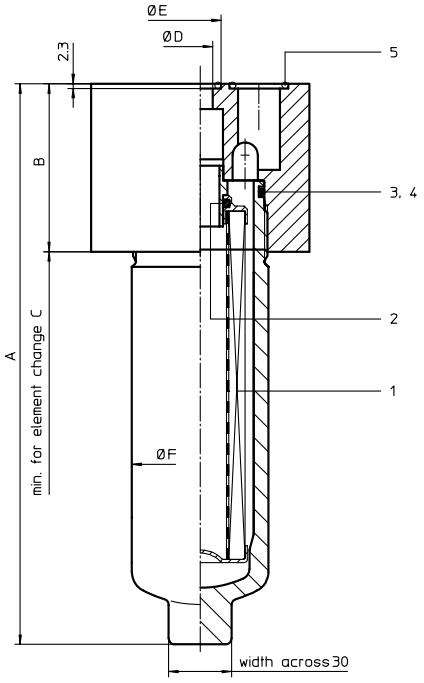
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HP.31	01E.30	1	
2	HP.61	01E.60	1	
3	HP.91	01E.900	1	
4	HP.151	01E.150	1	
5	HP.170	01E.170	1	
6	HP.240	01E.240	1	
7	HP.360	01E.360	1	
8	HP.450	01E.450	1	
9	HP.171	01E.170	1	
10	HP.241	01E.240	1	
11	HP.361	01E.360	1	
12	HP.451	01E.450	1	
13	HP.601	01E.600	1	
14	HP.901	01E.900	1	
15	HP.1351	01E.1350	1	

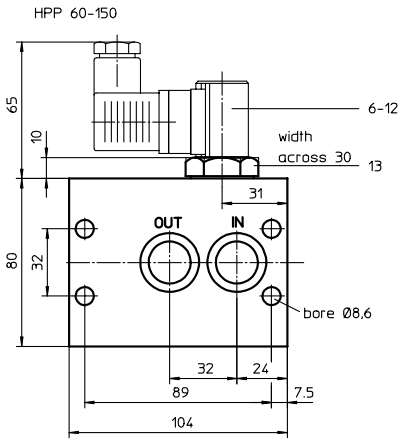
2. Symbols

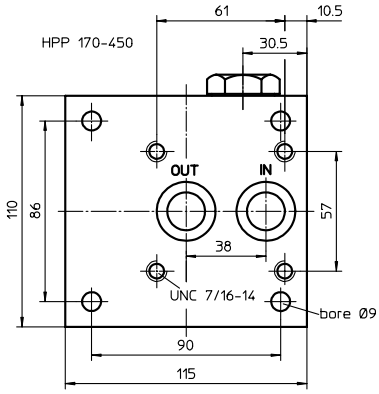


PRESSURE FILTER, manifold mounted
Series HPP 60 - 450 DN 20-22 PN 315

Sheet No.
1471 N







1. Type index:

1.1. Complete filter: (ordering example)

HPP.	90.	10VG.	HR.	E.	P.	-.	P.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPP = pressure filter, manifold mounted

2 **nominal size:** 60, 90, 150, 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG= 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
P = manifold mounted

9 **connection size:**
4 = DN 20 (HPP 60-150)
5 = DN 22 (HPP 170-450)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min (HPP 60-150)
Q ≤ 211,008 l/min (HPP 170-450)

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150, 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	HPP 60	HPP 90	HPP 150	HPP 170	HPP 240	HPP 360	HPP 450
connection	DN 20			DN 22			
A	202	267	376	285	335	415	522
B	80	80	80	95	95	95	95
C	270	335	445	350	400	480	585
D	20	20	20	22	22	22	22
E	28	28	28	30	30	30	30
F	65	65	65	90	90	90	90
weight kg	5	5,5	6,5	15	16	18	20
volume tank	0,3 l	0,4 l	0,6 l	0,7 l	0,9 l	1,2 l	1,6 l

EDV 10/07

Changes of measures and design are subject to alteration!

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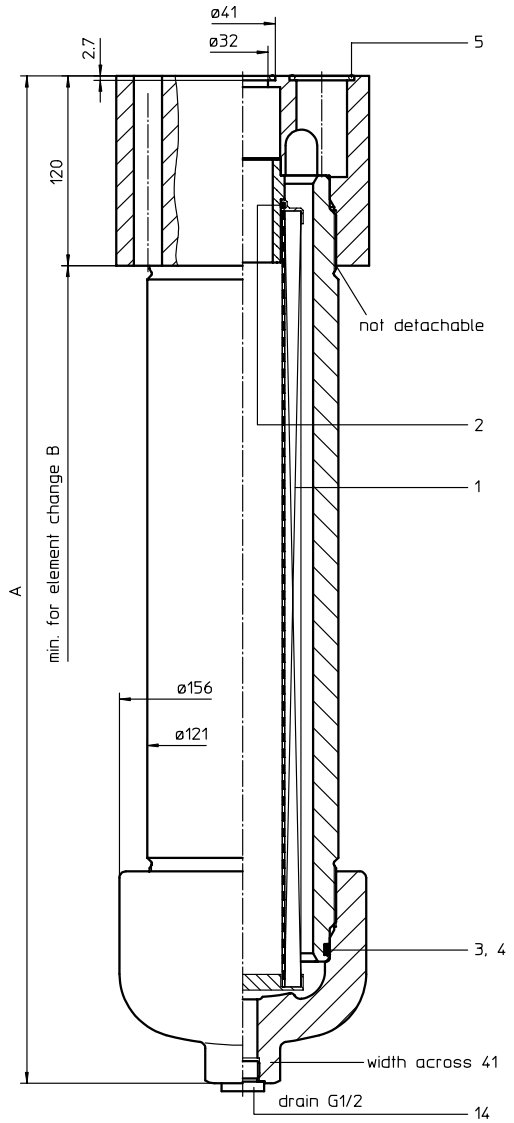
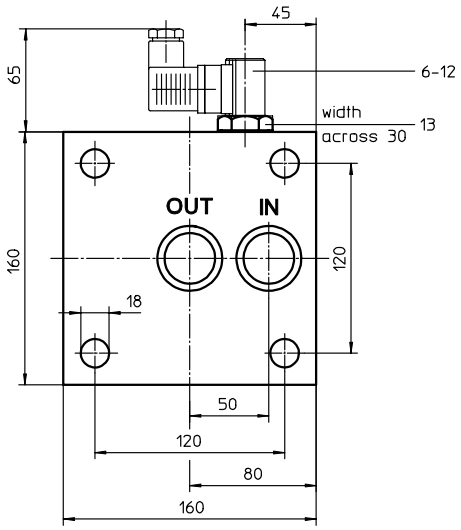
PRESSURE FILTER, manifold mounted
Series HPP 601-1351 DN 32 PN 315

Sheet No.
1470 H





1. Type index:

1.1. Complete filter: (ordering example)

HPP.	901.	10VG.	HR.	E.	P.	-.	P.	6.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPP = pressure filter, manifold mounted

2 **nominal size:** 601, 901, 1351

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
P = manifold mounted

9 **connection size:**
6 = DN 32

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,348 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Dimensions:

type	HPP 601	HPP 901	HPP 1351
connection	DN 32	DN 32	DN 32
A	487	637	885
B	790	940	1440
weight kg	39	46	58
volume tank	2,1 l	3,1 l	4,6 l

EDV 02/05

Changes of measures and design are subject to alteration!

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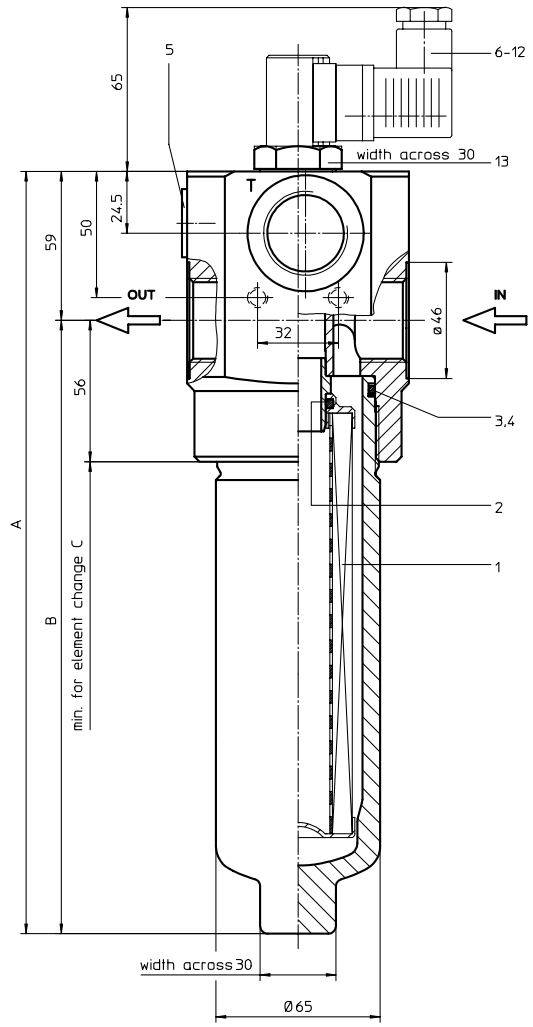
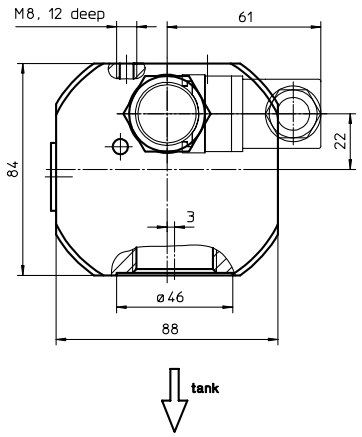
PRESSURE FILTER
Series HPV 60-150 DN 25 PN 420

Sheet No.
1478 C





1. Type index:

1.1. Complete filter: (ordering example)

HPV.	90.	10VG.	HR.	E.	P.	-.	G.	5.	-.	D2.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPV = pressure filter with differential pressure-valve

2 **nominal size:** 60, 90, 150

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
5 = G 1

10 **filter housing specification:**
- = standard

11 **internal valve:**
D1 = differential pressure-valve Δp 3,5 bar
D2 = differential pressure-valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN specification

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

2. Dimensions:

type	HPV 60	HPV 90	HPV 150
connection		G 1	
A	237	302	411
B	178	243	352
C	270	335	445
weight kg	6,5	7	8
volume tank	0,3 l	0,4 l	0,6 l

Changes of measures and design are subject to alteration!

EDV 08/03

internormen technology

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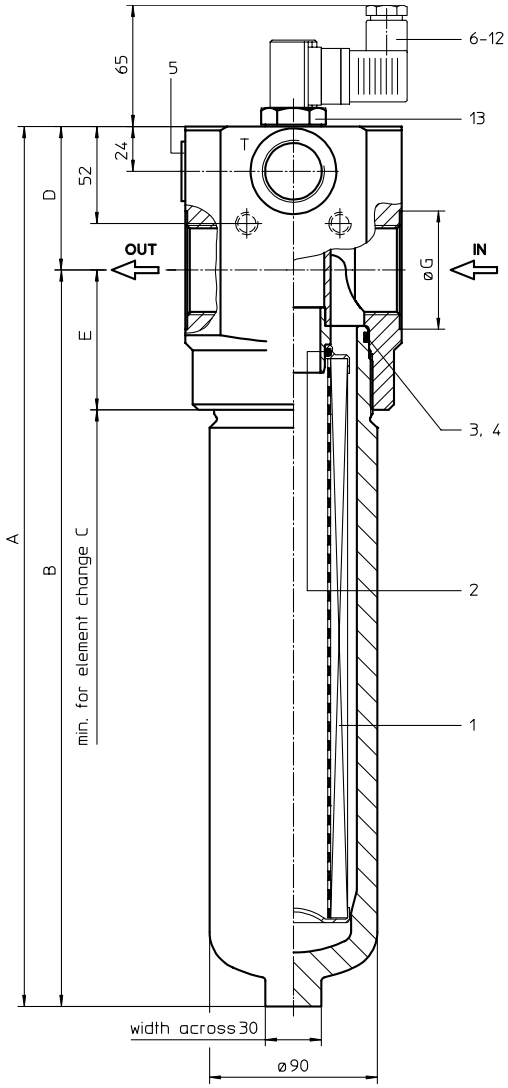
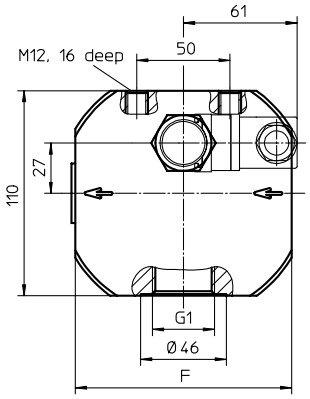
PRESSURE FILTER
Series HPV 170-450 DN 25-40 PN 420

Sheet No.
1479 B





1. Type index:

1.1. Complete filter: (ordering example)

HPV.	360.	10VG.	HR.	E.	P.	-.	G.	7.	-.	D2.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPV = pressure filter with differential pressure-valve

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread according to ISO 228

9 **connection size:**
5 = G 1
6 = G 1 ¼
7 = G 1 ½

10 **filter housing specification:**
- = standard

11 **internal valve:**
D1 = differential pressure-valve Δp 3,5 bar
D2 = differential pressure-valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	360.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	HPV 170			HPV 240			HPV 360			HPV 450		
connection	G 1	G 1 ¼	G 1 ½	G 1	G 1 ¼	G 1 ½	G 1	G 1 ¼	G 1 ½	G 1	G 1 ¼	G 1 ½
A	326	333	338	376	383	388	456	463	468	561	568	573
B	260	263	265	310	313	315	390	393	395	495	498	500
C	350	350	350	400	400	400	480	480	480	585	585	585
D	66	70	73	66	70	73	66	70	73	66	70	73
E	70	73	75	70	73	75	70	73	75	70	73	75
F	112	116	116	112	116	116	112	116	116	112	116	116
G	46	57	63,5	46	57	63,5	46	57	63,5	46	57	63,5
weight kg	13,5	14,5	14,9	14,8	15,8	16,2	16,7	17,7	18,1	19,2	20,2	20,6
volume tank	0,7 l			0,9 l			1,2 l			1,6 l		

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Changes of measures and design are subject to alteration!

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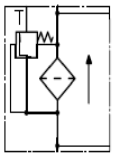
1. Technical data

NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HPV.60	01E.60	1	
2	HPV.90	01E.90	1	
3	HPV.150	01E.150	1	
4	HPV.170	01E.170	1	
5	HPV.240	01E.240	1	
6	HPV.360	01E.360	1	
7	HPV.450	01E.450	1	
8	HPP.60	01E.60	1	
9	HPP.90	01E.90	1	
10	HPP.150	01E.150	1	
11	HPP.170	01E.170	1	
12	HPP.240	01E.240	1	
13	HPP.360	01E.360	1	
14	HPP.450	01E.450	1	
15	HPP.601	01E.600	1	
16	HPP.901	01E.900	1	
17	HPP.1351	01E.1350	1	

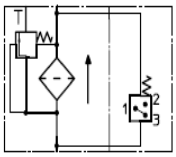
2. Symbols

2-1 HPV

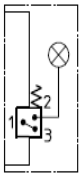
without indicator



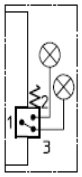
with electrical indicator AE 30 and AE 40



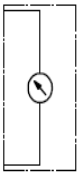
with visual-electrical indicator AE 50 and AE 60



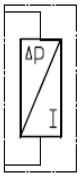
with visual-electrical indicator AE 70 and AE 80



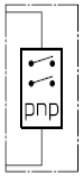
with visual indicator AOR/AOC



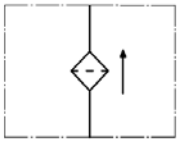
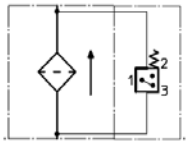
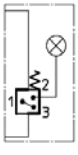
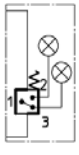
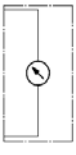
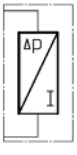
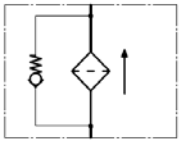
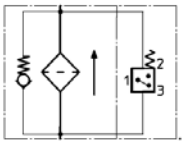
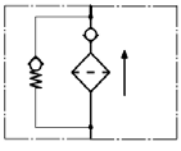
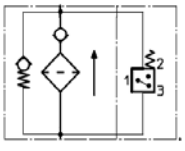
with electronical clogging sensor VS1



with electronical clogging sensor VS2

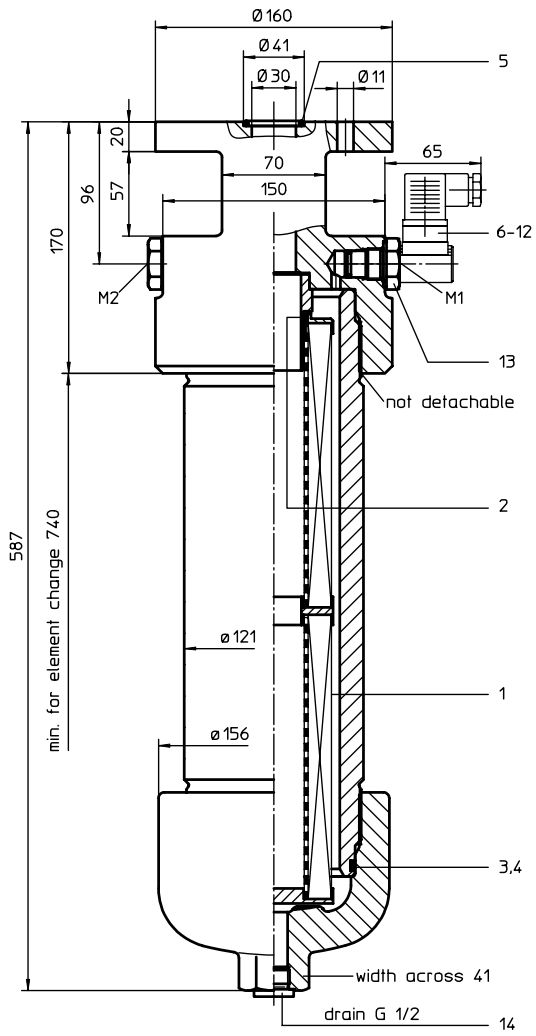


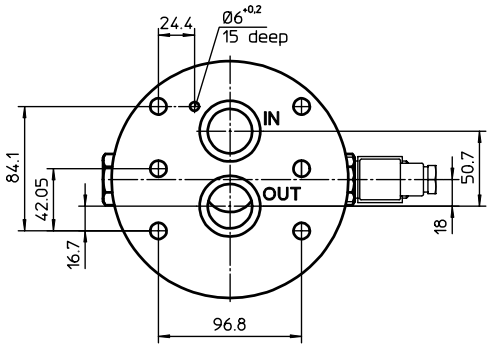
2-2 HPP

	without indicator	with electrical indicator AE 30 and AE 40	with visual-electrical indicator AE 50 and AE 60	with visual-electrical indicator AE 70 and AE 80	with visual indicator AOR/AOC	with electronical clogging sensor VS1
filter without internal valve						
filter with by-pass valve						
filter with reversing valve						

PRESSURE FILTER, manifold mounted
Series HNU 401 DN 32 PN 315

Sheet No.
1476 E





1. Type index:

1.1. Complete filter: (ordering example)

HNU.	401.	10VG.	HR.	E.	P.	-.	P.	6.	-.	-.	AE.	-
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
HNU = pressure filter, manifold mounted

2 **nominal size:** 401

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
P = manifold mounted

9 **connection size:**
6 = DN 32

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator at M1:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01NL.	400.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 400

3 - 7 see type index-complete filter

weight: approx. 40 kg

Changes of measures and design are subject to alteration!

EDV 08/03

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2. Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	filter element	01NL. 400		
2	1	O-ring	48 x 3	304357 (NBR)	304404 (FPM)
3	1	O-ring	98 x 4	301914 (NBR)	304765 (FPM)
4	1	support ring	110 x 3,5 x 2	304802	
5	2	O-ring	34 x 3,5	304338 (NBR)	304730 (FPM)
6	1	clogging indicator, visual	AOR or AOC	see sheet no. 1606	
7	1	clogging indicator, visual-electrical	AE	see sheet no. 1615	
8	1	clogging sensor, electronical	VS1	see sheet no. 1617	
9	1	clogging sensor, electronical	VS2	see sheet no. 1618	
10	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
11	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
12	1	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
13	2	screw plug	20913-4	309817	
14	1	screw plug	G ½	304678	

item 13 execution only without clogging indicator or clogging sensor

3. Description:

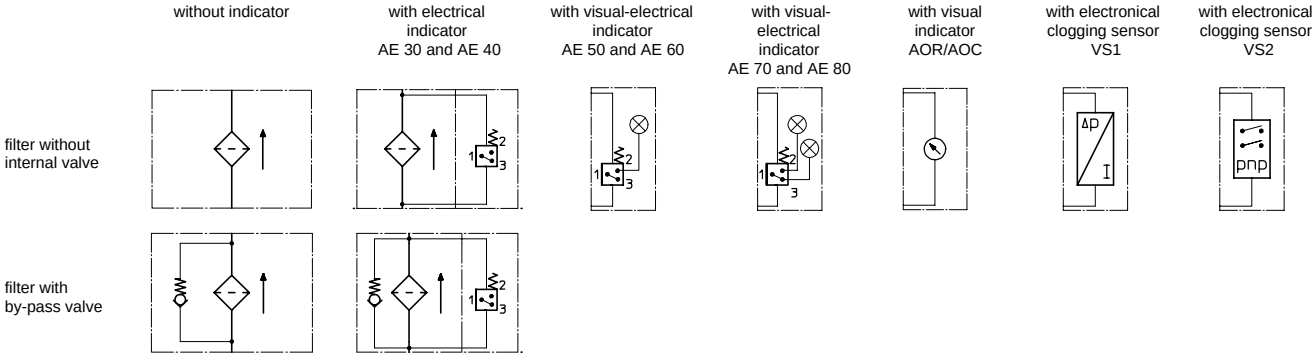
The pressure filters of the series HNU 401 are suitable for a working pressure up to 315 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The HNU-filters are flange mounted to the hydraulic system.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter elements are available down to 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element.
After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter.

4. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	315 bar
test pressure:	410 bar
connection system:	manifold mounted
housing material:	GGG 40.3; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	2,5 l

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

5. Symbols:



6. Pressure drop flow curves:

Precise flow rates see 'INF-Expert-System Filter', respectively Δp-curves; depending on filter fineness and viscosity.

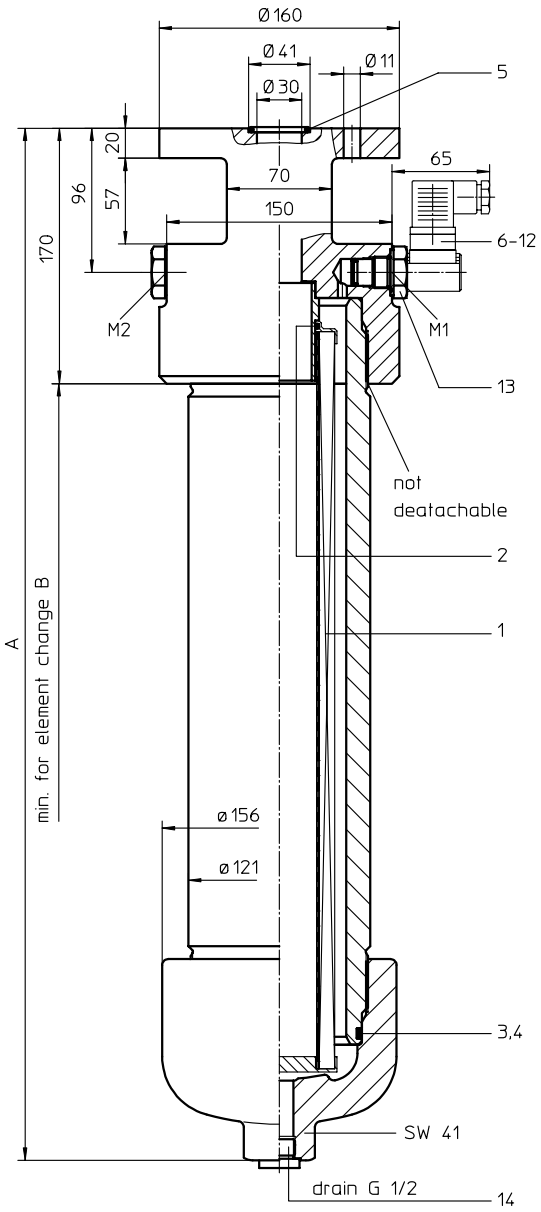
7. Test methods:

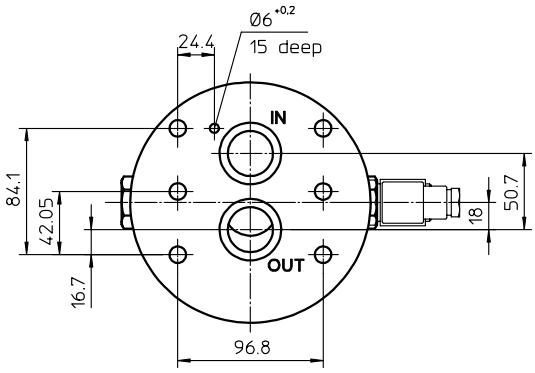
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER, manifold mounted
Series HPU 601-1351 DN 32 PN 315

Sheet No.
1480 D





1. Type index:

1.1. Complete filter: (ordering example)

HPU.	901.	10VG.	HR.	E.	P.	-.	P.	6.	-.	-.	AE.	-
1	2	3	4	5	6	7	8	9	10	11	12	13

1 series:
HPU = pressure filter, manifold mounted

2 nominal size: 601, 901, 1351

3 filter-material and filter-fineness:
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 resistance of pressure difference for filter element:
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 filter element design:
E = single-end open

6 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification: (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 connection:
P = manifold mounted

9 connection size:
6 = DN 32

10 filter housing specification: (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 internal valve:
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,348 l/min

12 clogging indicator at M1:
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

13 clogging indicator at M2:
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 series:
01E. = filter element according to INTERNORMEN-factory specification

2 nominal size: 600, 900, 1350

3 - 7 see type index-complete filter

2. Dimensions:

type	HPU 601	HPU 901	HPU 1351
connection	DN 32		
A	537	687	935
B	790	940	1440
weight kg	37,5	46	59
volume tank	2,1 l	3,1 l	4,6 l

EDV 02/05

Changes of measures and design are subject to alteration!

internormen technology

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url www.internormen.com

2. Spare parts:

item	qty.	designation	dimension			article-no.	
			HPU 601	HPU 901	HPU 1351		
1	1	filter element	01E. 600	01E. 900	01E. 1350		
2	1	O-ring	48 x 3			304357 (NBR)	304404 (FPM)
3	1	O-ring	98 x 4			301914 (NBR)	304765 (FPM)
4	1	support ring	110 x 3,5 x 2			304802	
5	2	O-ring	34 x 3,5			304338 (NBR)	304730 (FPM)
6	1	clogging indicator, visual	AOR or AOC			see sheet no. 1606	
7	1	clogging indicator, visual-electrical	AE			see sheet no. 1615	
8	1	clogging sensor, electronical	VS1			see sheet no. 1617	
9	1	clogging sensor, electronical	VS2			see sheet no. 1618	
10	1	O-ring	15 x 1,5			315357 (NBR)	315427 (FPM)
11	1	O-ring	22 x 2			304708 (NBR)	304721 (FPM)
12	1	O-ring	14 x 2			304342 (NBR)	304722 (FPM)
13	2	screw plug	20913-4			309817	
14	1	screw plug	½ BSPP			304678	

item 13 execution only without clogging indicator or clogging sensor

3. Description:

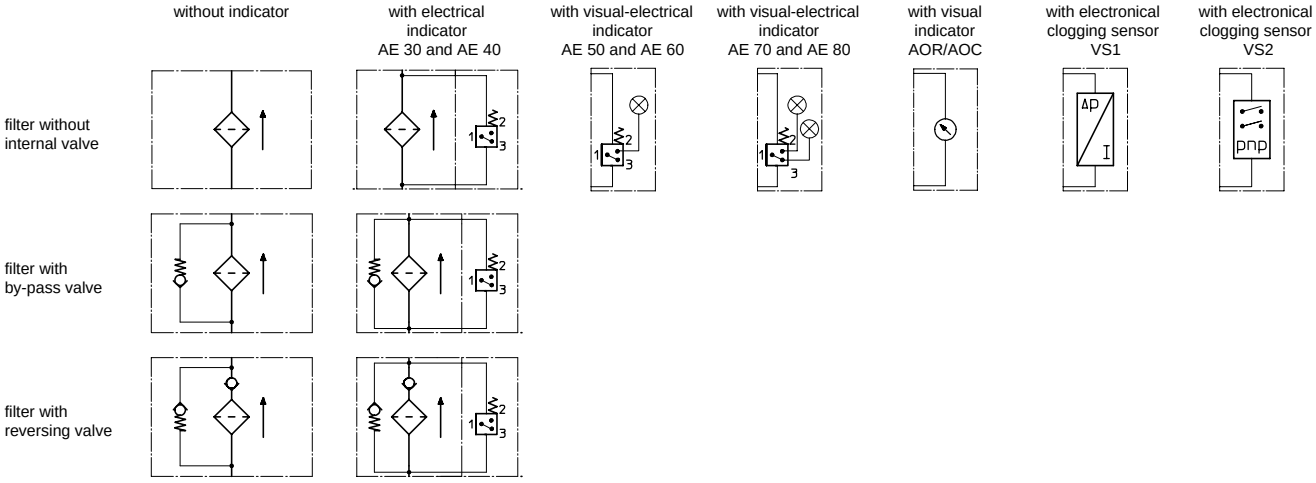
The pressure filters of the series HPU 601-1351 are suitable for a working pressure up to 315 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The HPU-filters are flange mounted to the hydraulic system.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. Filter elements are available down to 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element.
After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

4. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	315 bar
test pressure:	410 bar
connection system:	manifold mounted
housing material:	GGG 40.3; C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

5. Symbols:



6. Pressure drop flow curves:

Precise flow rates see 'INF-Expert-System Filter', respectively Δp-curves; depending on filter fineness and viscosity.

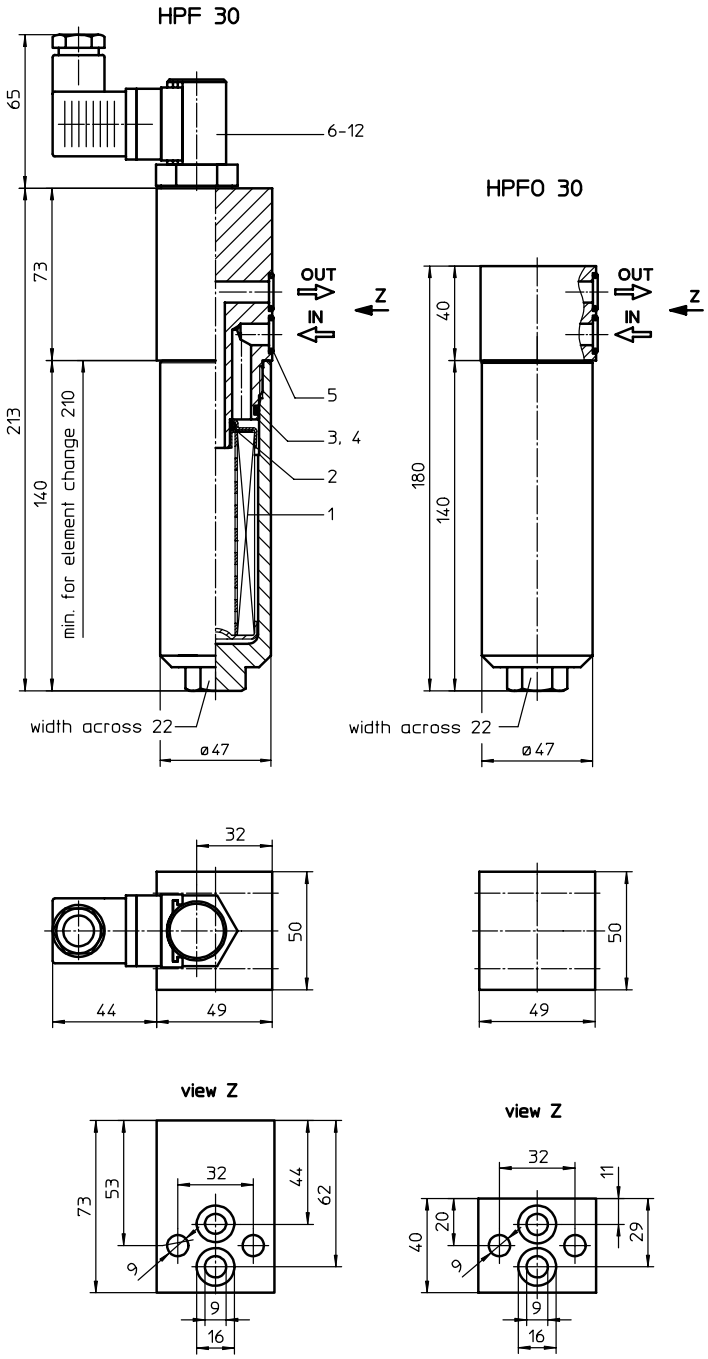
7. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

PRESSURE FILTER, manifold mounted
Series HPF 30, HPFO 30 DN 10 PN 315

Sheet No.
1495 A



1. Type index:

1.1. Complete filter: (ordering example)

HPF.	30.	10VG.	HR.	E.	P.	-.	F.	2.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
HPF = medium pressure filter, manifold mounted with indicator
HPFO = medium pressure filter, manifold mounted without indicator

2 **nominal size:** 30

3 **filter-material and filter-fineness:**
25 VG= 20 µm$_{(c)}$, 16 VG= 15 µm$_{(c)}$, 10 VG= 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strenght Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
2 = DN 10

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor:**
series HPFO:
- = without
series HPF:
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 30

3 - 7 see type index-complete filter

weight without indicator: approx. 1,8 kg
weight with indicator : approx. 2,4 kg

Changes of measures and design are subject to alteration!

EDV 02/04

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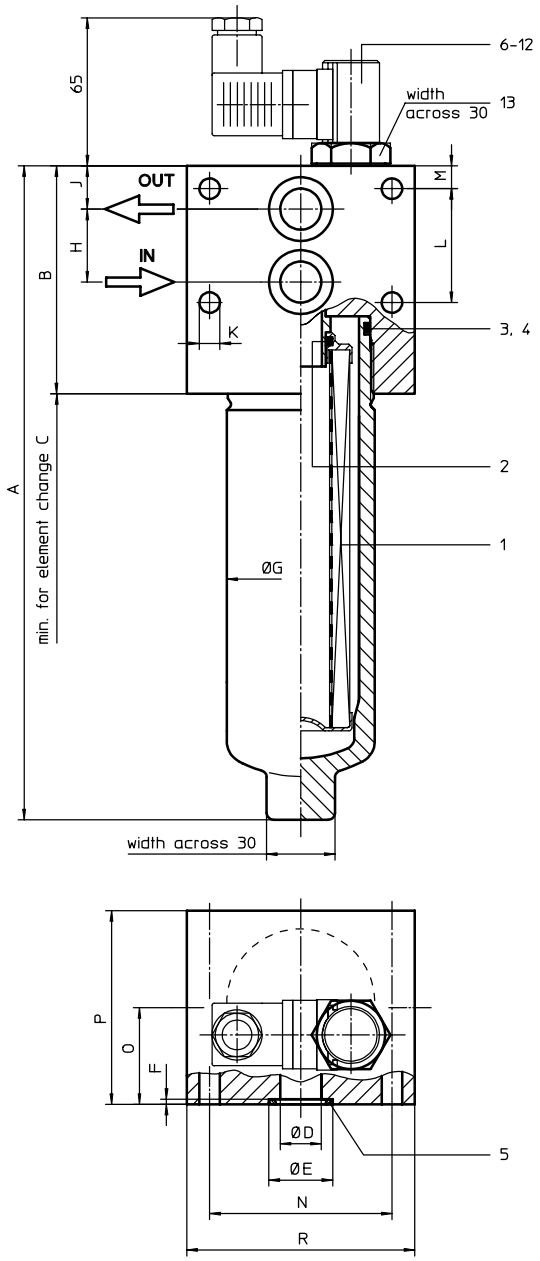
PRESSURE FILTER, manifold mounted
Series HPF 60 - 450 DN 18 - 28 PN 315

Sheet No.
1473 N



1. Type index:

1.1. Complete filter: (ordering example)

HPF.	90.	10VG.	HR.	E.	P.	-.	F.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPF = pressure filter, manifold mounted

2 **nominal size:** 60, 90, 150, 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
4 = DN 18 (HPF 60-150)
5 = DN 28 (HPF 170-450)

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min (HPF 60-150)
Q ≤ 211,008 l/min (HPF 170-450)

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

2. Dimensions:

type	HPF 60	HPF 90	HPF 150	HPF 170	HPF 240	HPF 360	HPF 450
connection	DN18	DN18	DN18	DN28	DN28	DN28	DN28
A	218	283	392	330	380	460	565
B	96	96	96	140	140	140	140
C	270	335	445	350	400	480	585
D	18	18	18	28	28	28	28
E	28	28	28	38	38	38	38
F	2,3	2,3	2,3	1,8	1,8	1,8	1,8
G	65	65	65	90	90	90	90
H	32	32	32	44	44	44	44
J	19	19	19	28	28	28	28
K	9	9	9	14	14	14	14
L	50	50	50	44	44	44	44
M	10	10	10	28	28	28	28
N	80	80	80	80	80	80	80
O	42,5	42,5	42,5	57,5	57,5	57,5	57,5
P	85	85	85	115	115	115	115
R	96	96	96	115	115	115	115
weight kg	5,5	6	7	17	18	20	23
volume tank	0,3 l	0,4 l	0,6 l	0,7 l	0,9 l	1,2 l	1,6 l

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150, 170, 240, 360, 450

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration!

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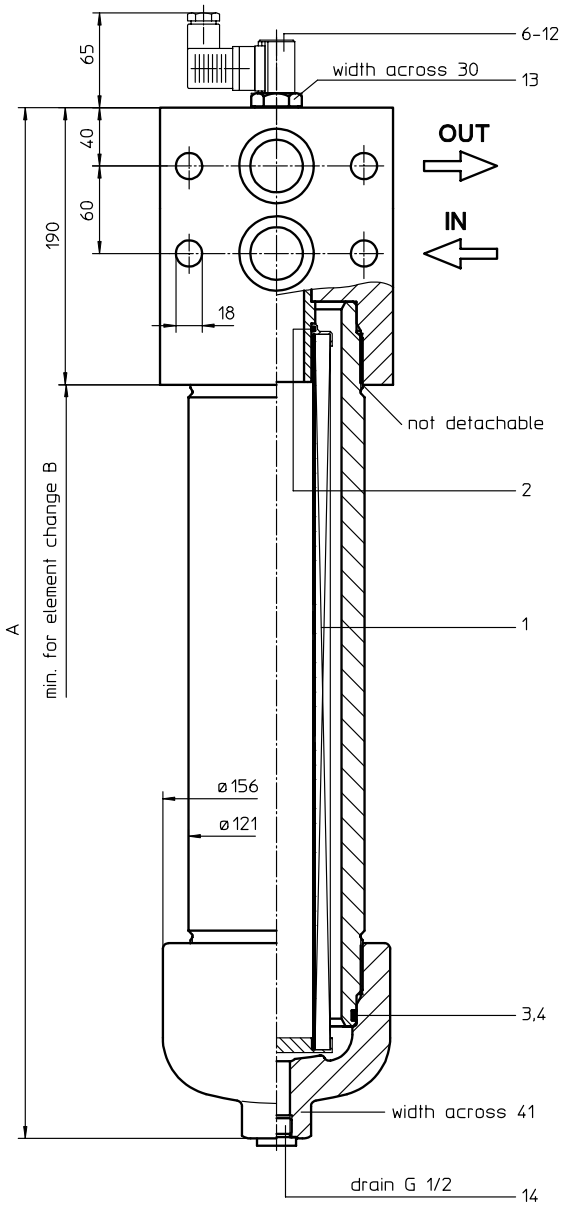
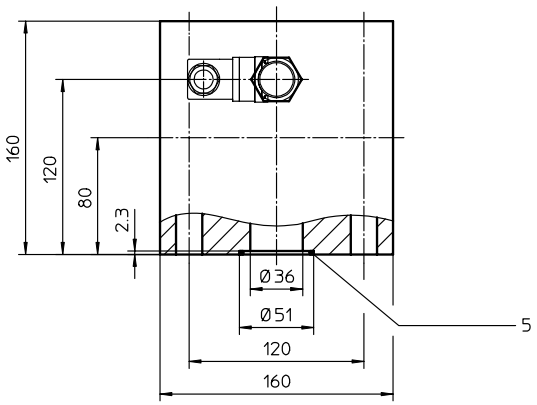
PRESSURE FILTER, manifold mounted
Series HPF 601-1351 DN 36 PN 315

Sheet No.
1472 G





1. Type index:

1.1. Complete filter: (ordering example)

HPF.	901.	10VG.	HR.	E.	P.	-.	F.	6.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPF = pressure filter, manifold mounted

2 **nominal size:** 601, 901, 1351

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
6 = DN 36

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,348 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Dimensions:

type	HPF 601	HPF 901	HPF 1351
connection	DN 36	DN 36	DN 36
A	557	707	955
B	790	940	1440
weight kg	47	54	66
volume tank	2,1 l	3,1 l	4,6 l

Changes of measures and design are subject to alteration!

EDV 02/05

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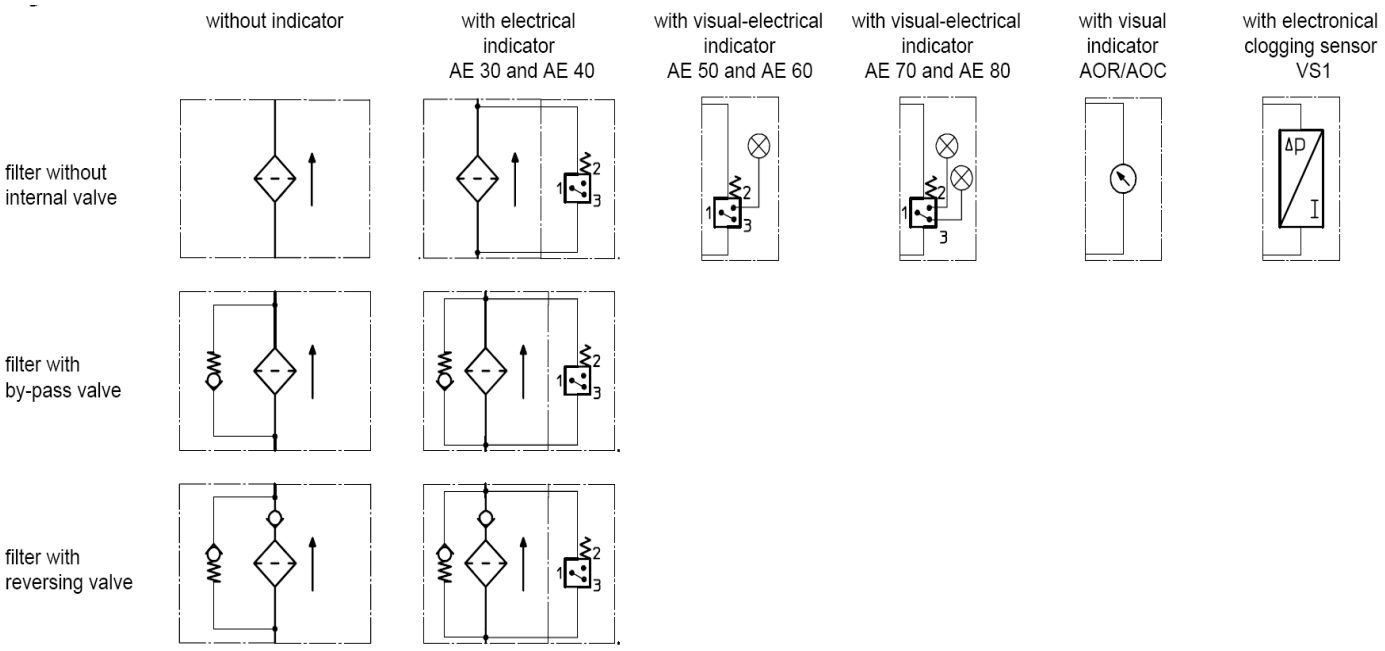
1. Technical data

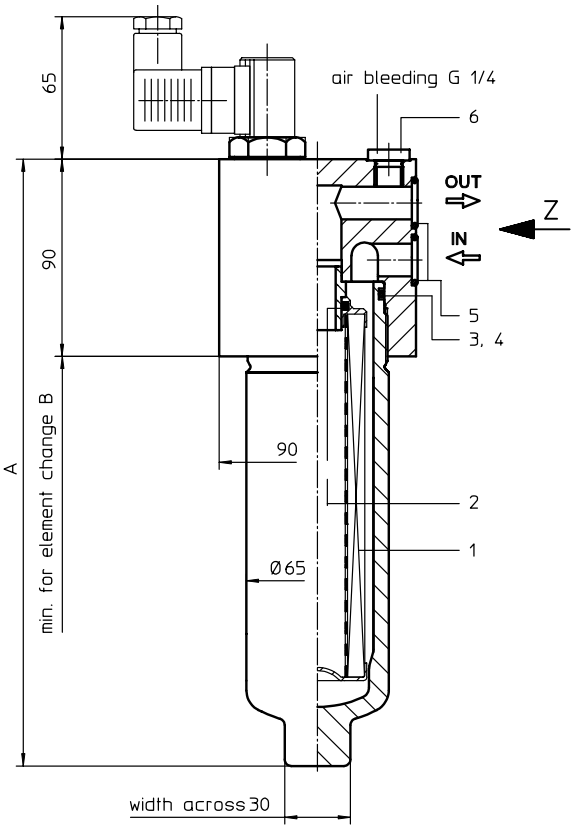
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HPF.30	01E.30	1	Without internal valve
2	HPFO.30	01E.30	1	Without internal valve
3	HPF.60	01E.60	1	
4	HPF.90	01E.900	1	
5	HPF.150	01E.150	1	
6	HPF.170	01E.170	1	
7	HPF.240	01E.240	1	
8	HPF.360	01E.360	1	
9	HPF.450	01E.450	1	
10	HPF.601	01E.600	1	
11	HPF.901	01E.900	1	
12	HPF.1351	01E.1350	1	

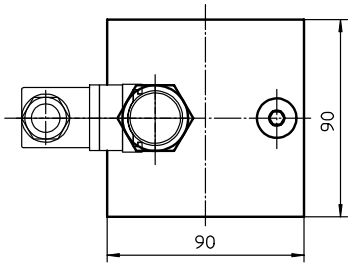
2. Symbols

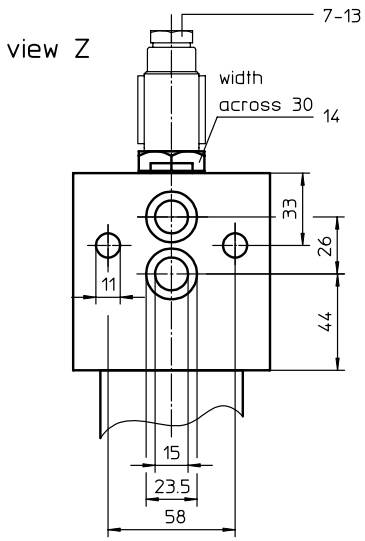


PRESSURE FILTER, manifold mounted
Series FHP 60 - 150 DN 15 PN 250

Sheet No.
1474 F







1. Type index:

1.1. Complete filter: (ordering example)

FHP.	90.	10VG.	HR.	E.	P.	-.	F.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
FHP = pressure filter, manifold mounted

2 **nominal size:** 60, 90, 150

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
4 = DN 15

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

2. Dimensions:

type	FHP 60	FHP 90	FHP 150
connection	DN 15		
A	212	277	386
B	270	335	445
weight kg	5	5,5	6,5
volume tank	0,3 l	0,4 l	0,6 l

Changes of measures and design are subject to alteration!

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3. Spare parts:

item	qty.	designation	dimensions FHP 60	FHP 90	FHP 150	article-no.	
1	1	filter element	01E. 60	01E. 90	01E. 150		
2	1	O-ring	22 x 3,5			304341 (NBR)	304392 (FPM)
3	1	O-ring	54 x 3			304657 (NBR)	304720 (FPM)
4	1	support ring	61 x 2,6 x 1			304660	
5	2	O-ring	18 x 2,5			304371 (NBR)	
6	1	screw plug	G ¼			305003	
7	1	clogging indicator, visual	AOR or AOC			see sheet-no. 1606	
8	1	clogigng indicator, visual-electrical	AE			see sheet-no. 1615	
9	1	clogging sensor, electronical	VS1			see sheet-no. 1617	
10	1	clogging sensor, electronical	VS2			see sheet-no. 1618	
11	1	O-ring	15 x 1,5			315357 (NBR)	315427 (FPM)
12	1	O-ring	22 x 2			304708 (NBR)	304721 (FPM)
13	1	O-ring	14 x 2			304342 (NBR)	304722 (FPM)
14	1	screw plug	20913-4			309817	

item 14 execution only without clogging indicator or clogging sensor

4. Description:

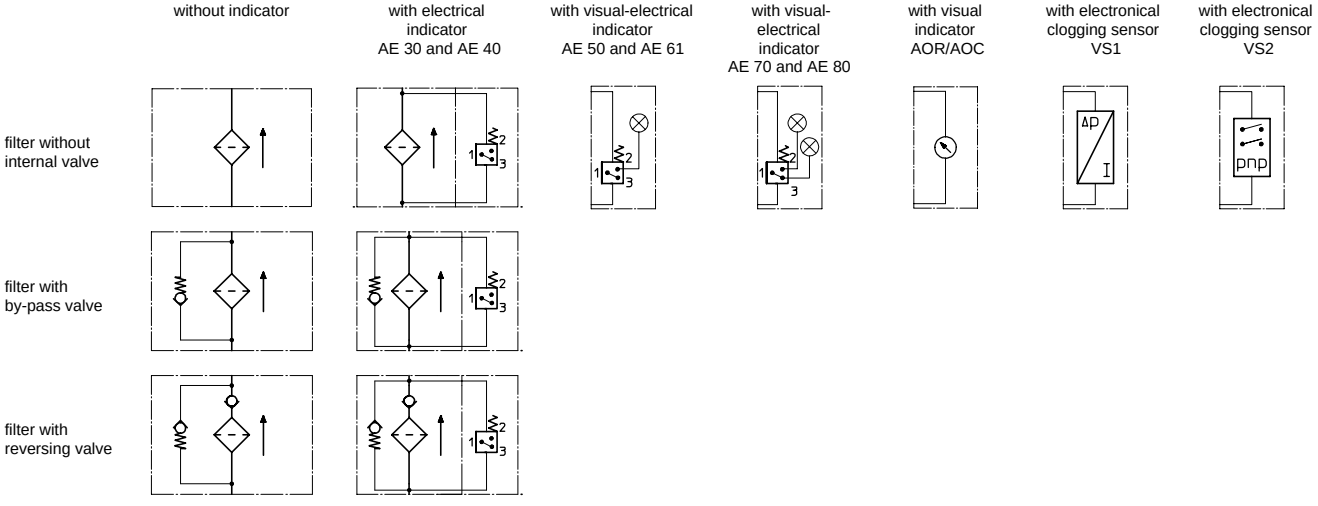
Pressure filter of the series FHP are suitable for a working pressure up to 250 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The FHP-filters are flange mounted to the hydraulic system.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.
Filter elements are available down to 4 $\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.
The internal valves are integrated into the centering pivot for the filter element.
After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

5. Technical data:

temperature range:	-10°C to + 80°C (for a short time + 100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	250 bar
test pressure:	325 bar
connection system:	manifold mounted
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Vessel Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:



7. Pressure drop flow curves:

Precise flow rates see INT-Expert-System Filter respectively Δp-curves - depending on filter fineness and viscosity.

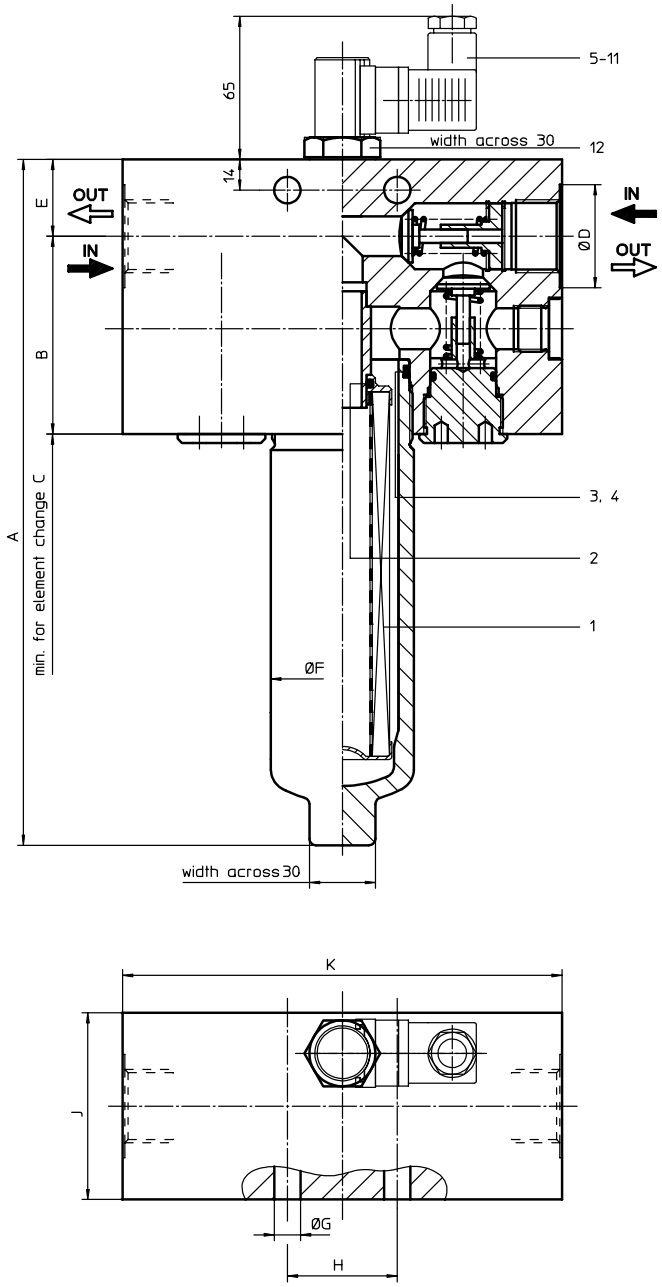
8. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

PRESSURE FILTER for reversable filtration
Series HPW 60 - 450 DN 25 - 40 PN 315

Sheet No.
1481 J



1. Type index:

1.1. Complete filter: (ordering example)

HPW. 170. 10VG. HR. E. P. -. G. 7. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 series:
HPW = pressure filter for reversable filtration

2 nominal size: 60, 90, 150, 170, 240, 360, 450

3 filter-material and filter-fineness:
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 resistance of pressure difference for filter element:
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 filter element design:
E = single-end open

6 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification:
- = standard
VA = stainless steel

8 connection:
G = thread connection according to DIN 3852, T2

9 connection size:
5 = G 1 HPW 60-150
7 = G 1 ½ HPW 170-450

10 filter housing specification:
- = standard

11 internal valve:
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 clogging indicator or clogging sensor:
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 170. 10VG. HR. E. P. -

1	2	3	4	5	6	7

1 series:
01E. = filter element according to INTERNORMEN factory specification

2 nominal size: 60, 90, 150, 170, 240, 360, 450

3 - **7** see type index-complete filter

2. Dimensions:

type	HPW 60	HPW 90	HPW 150	HPW 170	HPW 240	HPW 360	HPW 450
connection	G 1			G 1 ½			
A	247	312	421	350	400	480	585
B	90	90	90	120	120	120	120
C	270	335	445	350	400	480	585
D	47	47	47	61	61	61	61
E	35	35	35	40	40	40	40
F	65	65	65	90	90	90	90
G	12	12	12	14	14	14	14
H	50	50	50	60	60	60	60
J	85	85	85	115	115	115	115
K	200	200	200	270	270	270	270
weight kg	16,0	16,5	17,0	39,0	40,0	42,0	44,0
volume tank	0,3 l	0,4 l	0,6 l	0,7 l	0,9 l	1,2 l	1,6 l

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Changes of measures and design are subject to alteration!

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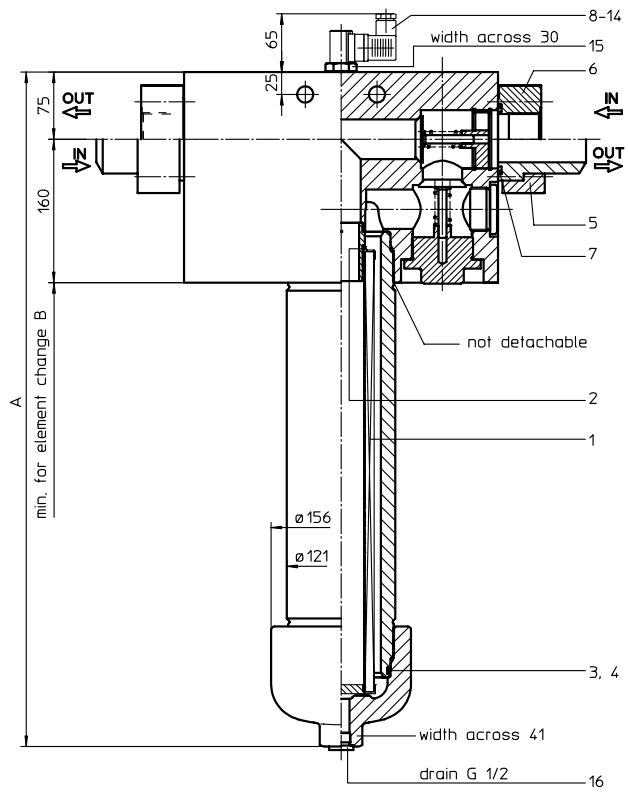
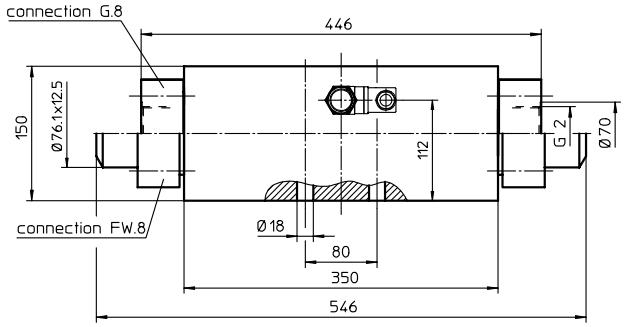
PRESSURE FILTER for reversable filtration
Series HPW 601-1351 DN 50 PN 315

Sheet No.
1482 F





1. Type index:

1.1. Complete filter: (ordering example)

HPW. 901. 10VG. HR. E. P. -. FW. 8. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPW = pressure filter for reversable filtration

2 **nominal size:** 601, 901, 1351

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FW = flange connection factory specification
G = thread connection according to ISO 228

9 **connection size:**
8 = 2“

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 900. 10VG. HR. E. P. -

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Accessories:
- counter flange, see sheet-no. 1654

3. Dimensions:

type	HPW 601	HPW 901	HPW 1351
connection	2“	2“	2“
A	602	752	1000
B	790	940	1440
weight kg	115	122	134
volume tank	2,1 l	3,1 l	4,6 l

EDV 02/05

Changes of measures and design are subject to alteration!

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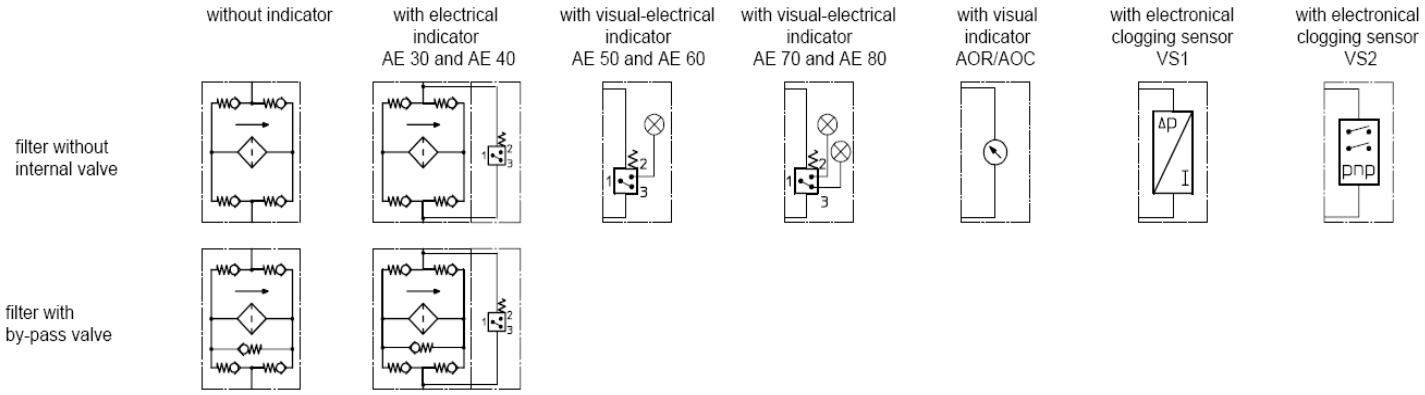
1. Technical data

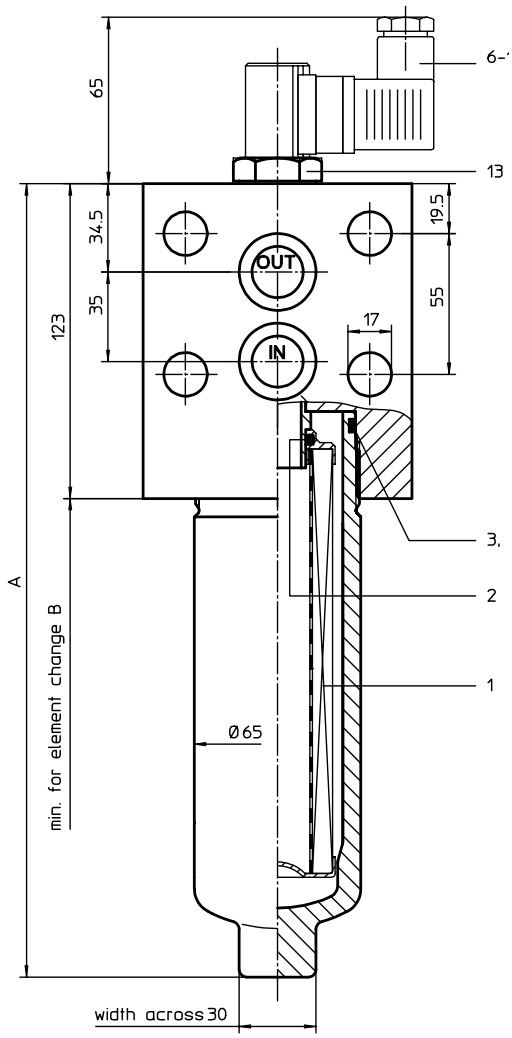
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HPW.60	01E.60	1	
2	HPW.90	01E.90	1	
3	HPW.150	01E.150	1	
4	HPW.170	01E.170	1	
5	HPW.240	01E.240	1	
6	HPW.360	01E.360	1	
7	HPW.450	01E.450	1	
8	HPW.601	01E.600	1	
9	HPW.901	01E.900	1	
10	HPW.1351	01E.1350	1	

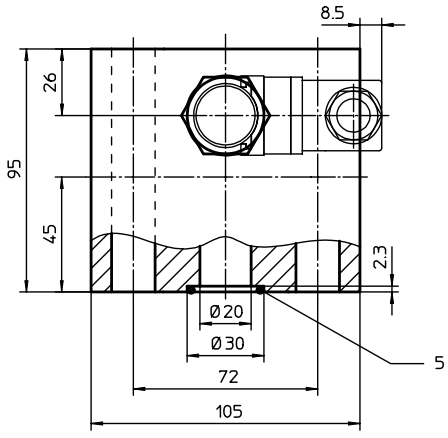
2. Symbols



PRESSURE FILTER, manifold mounted
Series HPX 60-150 DN 20 PN 315

Sheet No.
1483 B





1. Type index:

1.1. Complete filter: (ordering example)

HPX .	90.	10VG.	HR.	E.	P.	-.	F.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPX = pressure filter, manifold mounted

2 **nominal size:** 60, 90, 150

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG= 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
4 = DN 20

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

2. Dimensions:

type	HPX 60	HPX 90	HPX 150
connection		DN 20	
A	245	310	419
B	270	335	445
weight kg	9	9,5	10,5
volume tank	0,3 l	0,4 l	0,6 l

Changes of measures and design are subject to alteration!

EDV 07/03

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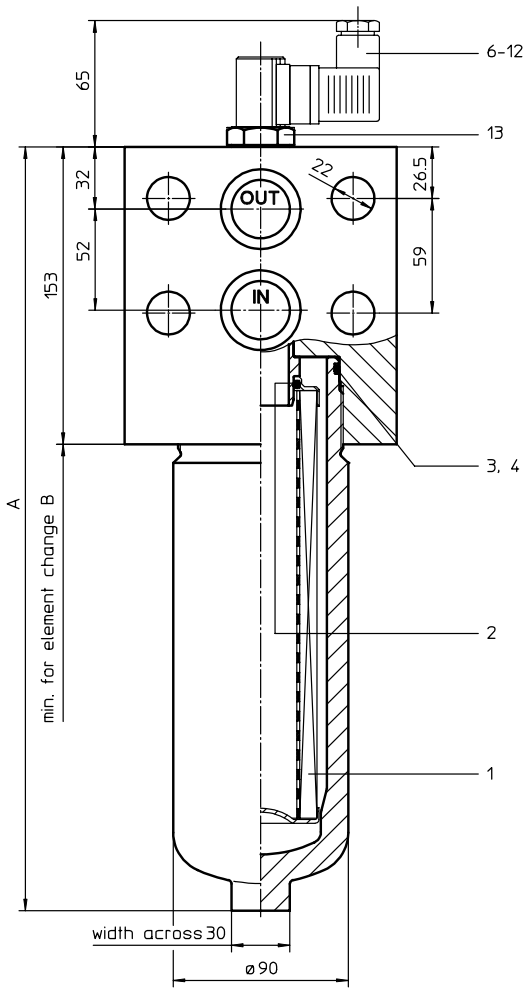
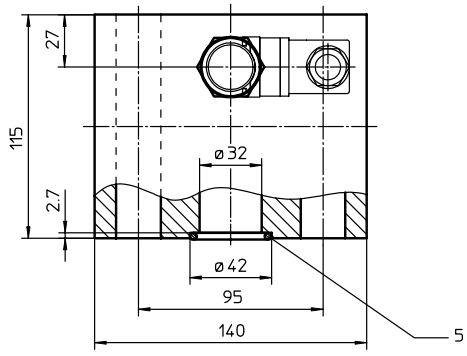
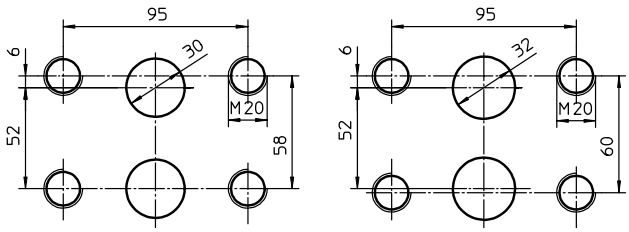
PRESSURE FILTER, manifold mounted
Series HPX 170-450 DN 32 PN 315

Sheet No.
1485 B





possible connection masses



1. Type index:

1.1. Complete filter: (ordering example)

HPX .	360.	10VG.	HR.	E.	P.	-.	F.	6.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPX = pressure filter, manifold mounted

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
6 = DN 32

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	360.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	HPX 170	HPX 240	HPX 360	HPX 450
connection	DN 32			
A	343	393	473	580
B	350	400	480	585
weight kg	21	22,3	24	27,7
volume tank	0,7 l	0,9 l	1,2 l	1,6 l

Changes of measures and design are subject to alteration!

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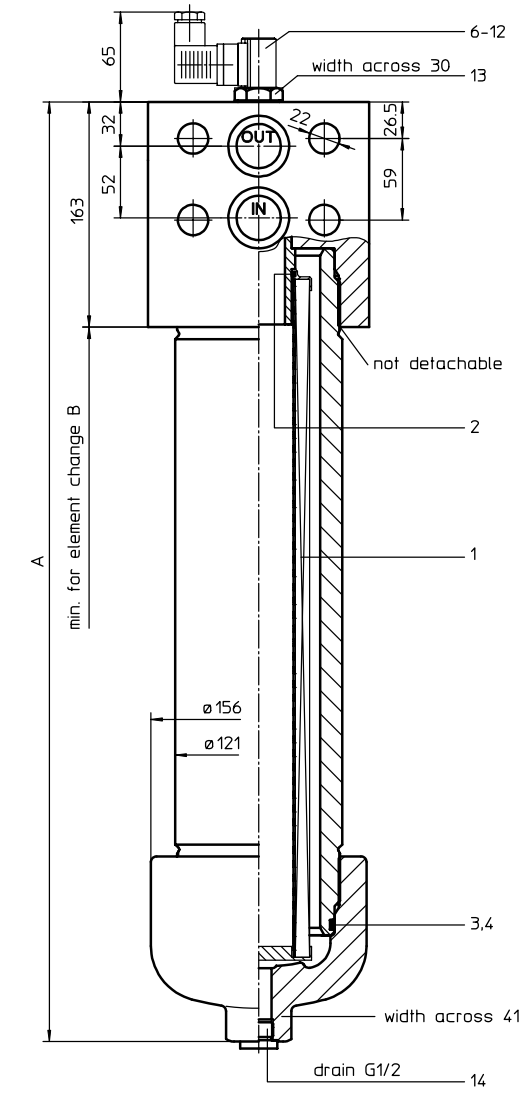
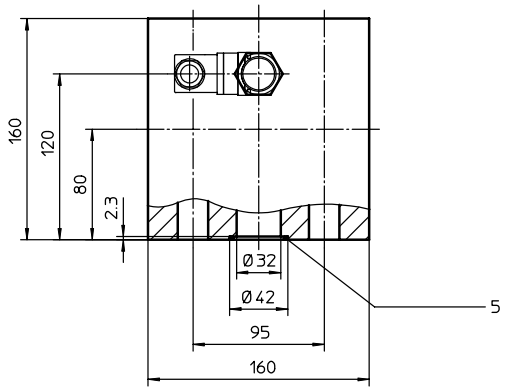
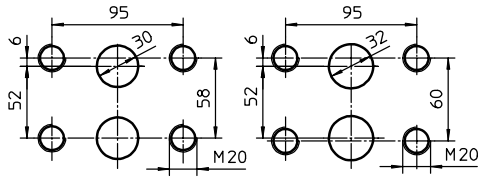
PRESSURE FILTER, manifold mounted
Series HPX 601-1351 DN 32 PN 315

Sheet No. **1487**





possible connection masses



1. Type index:

1.1. Complete filter: (ordering example)

HPX .	901.	10VG.	HR.	E.	P.	-.	F.	6.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPX = pressure filter, manifold mounted

2 **nominal size:** 601, 901, 1351

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
6 = DN 32

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Dimensions:

type	HPX 601	HPX 901	HPX 1351
connection	DN 32		
A	530	680	928
B	790	940	1440
weight kg	55	62	74
volume tank	2,1 l	3,1 l	4,6 l

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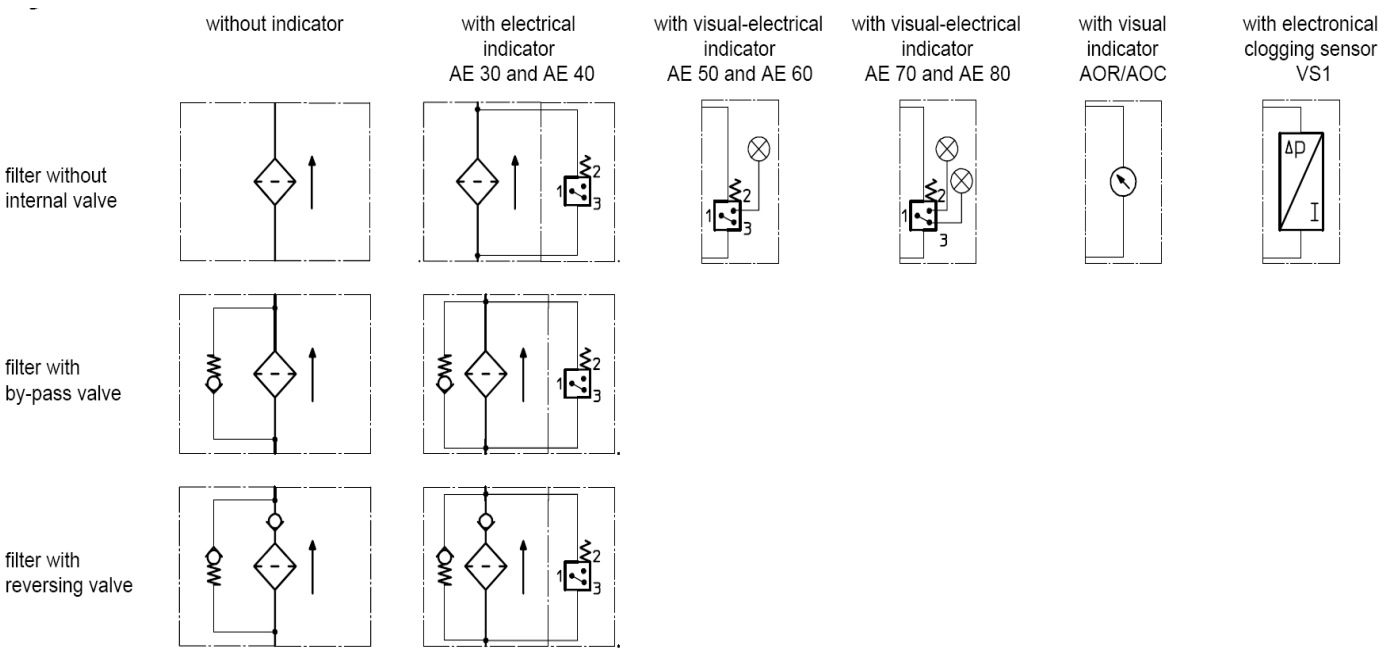
1. Technical data

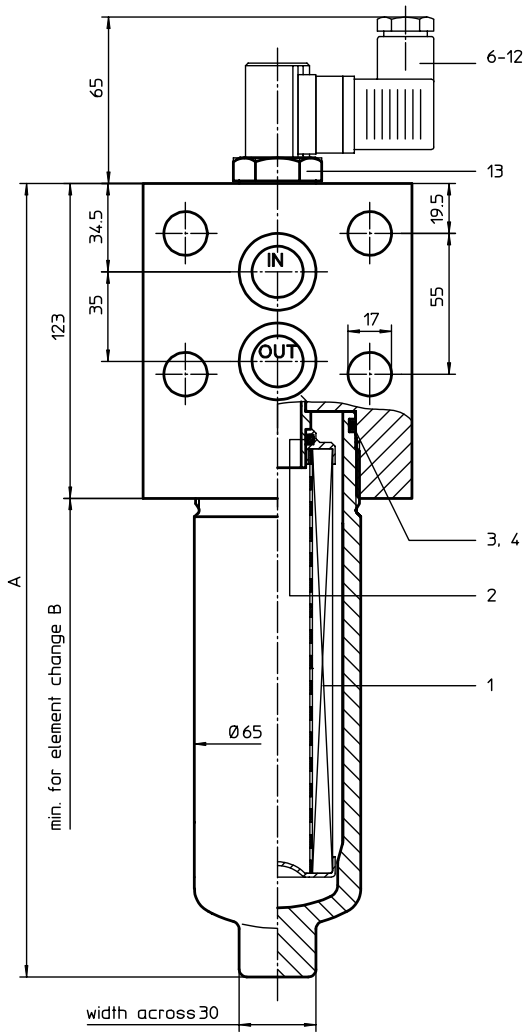
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HPX.60	01E.60	1	
2	HPX.90	01E.90	1	
3	HPX.150	01E.150	1	
4	HPX.170	01E.170	1	
5	HPX.240	01E.240	1	
6	HPX.360	01E.360	1	
7	HPX.450	01E.450	1	
8	HPX.601	01E.600	1	
9	HPX.901	01E.900	1	
10	HPX.1351	01E.1350	1	

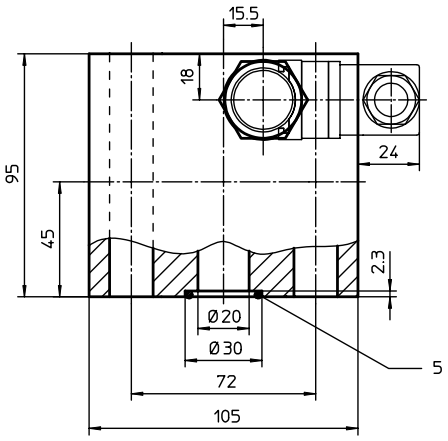
2. Symbols



PRESSURE FILTER, manifold mounted
Series HPY 60-150 DN 20 PN 315

Sheet No.
1484 B





2. Dimensions:

type	HPY 60	HPY 90	HPY 150
connection		DN 20	
A	245	310	419
B	270	335	445
weight kg	9	9,5	10,5
volume tank	0,3 l	0,4 l	0,6 l

1. Type index:

1.1. Complete filter: (ordering example)

HPY .	90.	10VG.	HR.	E.	P.	-.	F.	4.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPY = pressure filter, manifold mounted

2 **nominal size:** 60, 90, 150

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
4 = DN 20

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration!

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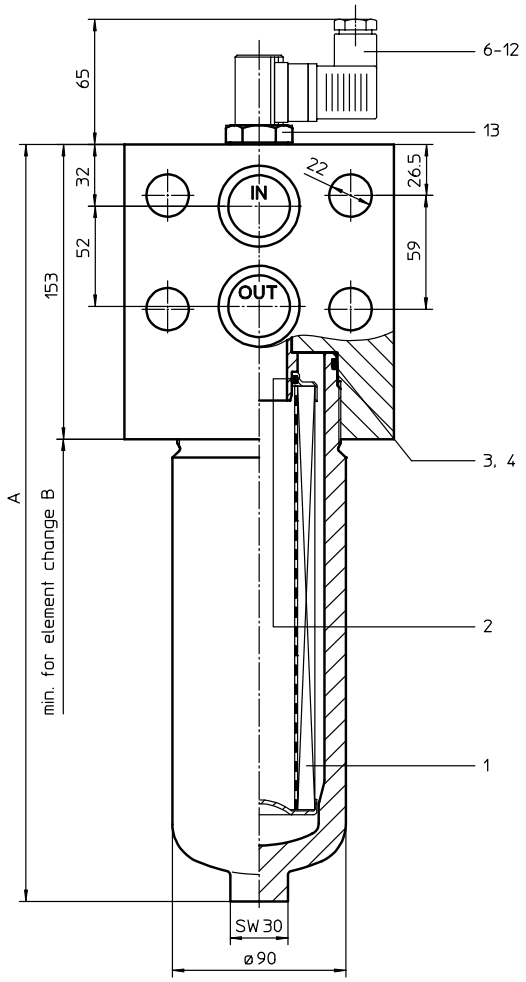
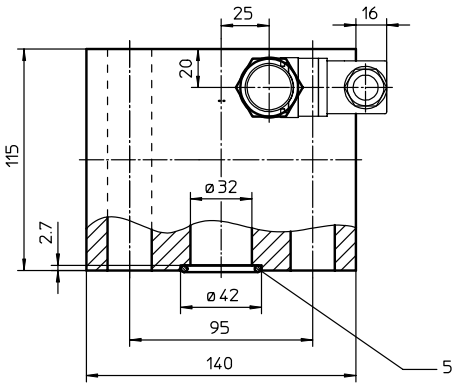
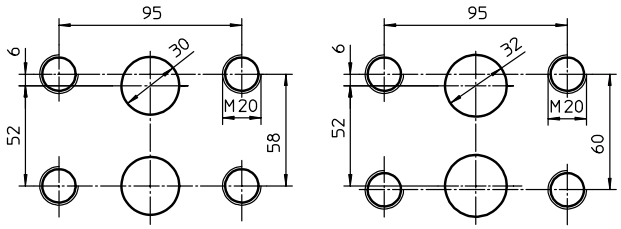
PRESSURE FILTER, manifold mounted
Series HPY 170-450 DN 32 PN 315

Sheet No.
1486 B





possible connection masses



1. Type index:

1.1. Complete filter: (ordering example)

HPY .	360.	10VG.	HR.	E.	P.	-.	F.	6.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPY = pressure filter, manifold mounted

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter-fineness:**
25 VG = 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
F = manifold mounted

9 **connection size:**
6 = DN 32

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	360.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	HPY 170	HPY 240	HPY 360	HPY 450
connection	DN 32			
A	343	393	473	580
B	350	400	480	585
weight kg	21	22,3	24	27,7
volume tank	0,7 l	0,9 l	1,2 l	1,6 l

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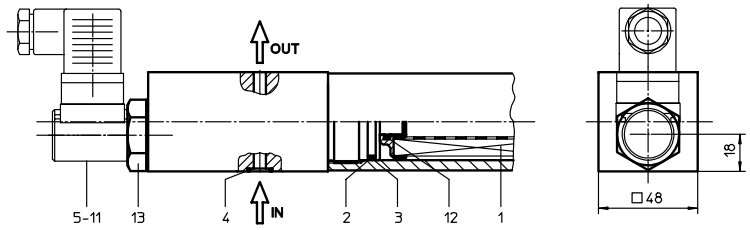
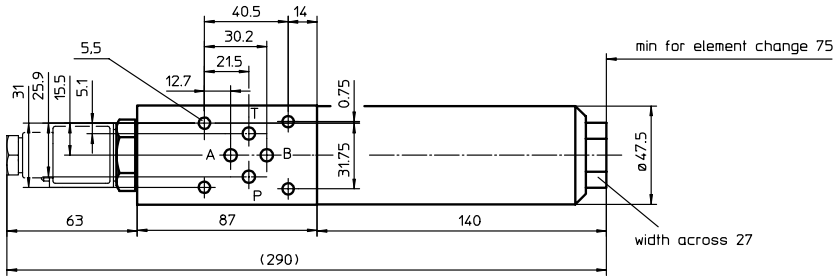
PRESSURE FILTER, for sandwich stacking
Series HPZ 32 DN 6 PN 350

Sheet No.
1491 O

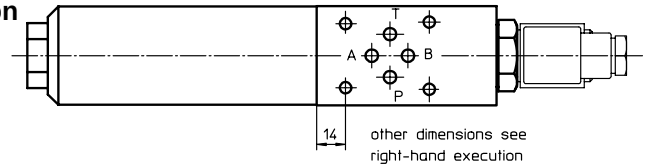
right-hand execution



right-hand execution



left-hand execution



1. Type index:

1.1. Complete filter: (ordering example)

HPZ.	32.	10VG.	HR.	E.	P.	-.	Z.	1.	-.	R.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPZ = pressure filter for sandwich stacking

2 **nominal size:** 32

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
Z = sandwich stacking according to DIN 24340, T2

9 **connection size:**
1 = A 6 according to DIN 24340, T2

10 **filter housing specification:**
- = standard

11 **head design:**
R = right-hand execution L = left-hand execution

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size**: 30

3 - 7 see type index-complete filter

weight: 3,5 kg

EDV 00/04

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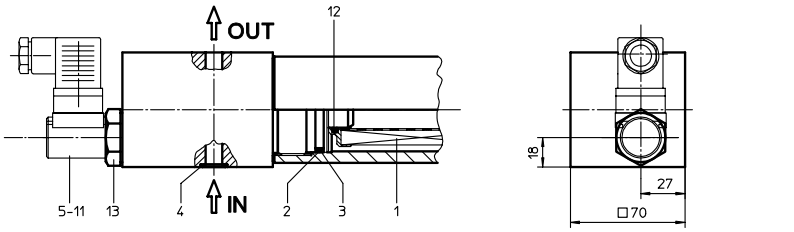
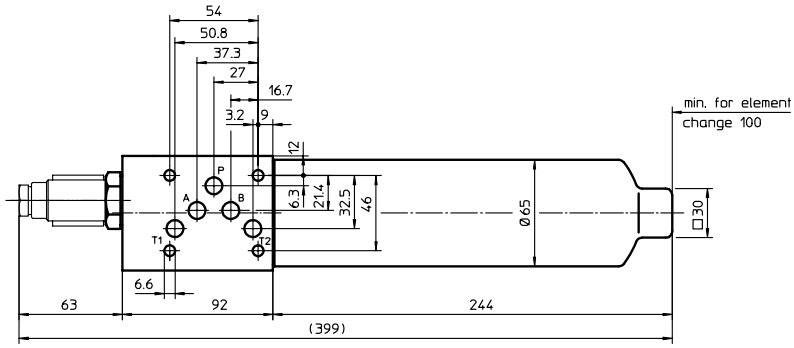
PRESSURE FILTER, for sandwich stacking
Series HPZ 90 DN 10 PN 350

Sheet No.
1493 G

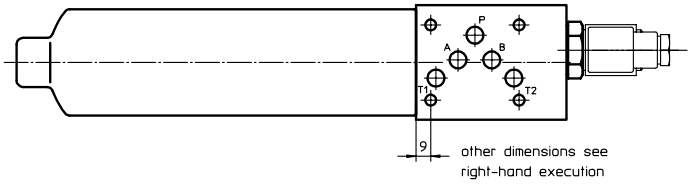
right-hand execution



right-hand execution



left-hand execution



1. Type index:

1.1. Complete filter: (ordering example)

HPZ.	90.	10VG.	HR.	E.	P.	-.	Z.	2.	-.	R.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPZ = pressure filter for sandwich stacking

2 **nominal size:** 90

3 **filter-material and filter-fineness:**
25 VG = 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c),3 VG = 5 µm(c) Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
Z = sandwich stacking according to DIN 24340, T2

9 **connection size:**
2 = A 10 according to DIN 24340, T2

10 **filter housing specification:**
- = standard

11 **head design:**
R = right-hand execution L = left-hand execution

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size**: 90

3 - 7 see type index-complete filter

weight: 6,5 kg

EDV 08/03

Changes of measures and design are subject to alteration!

internormen technology

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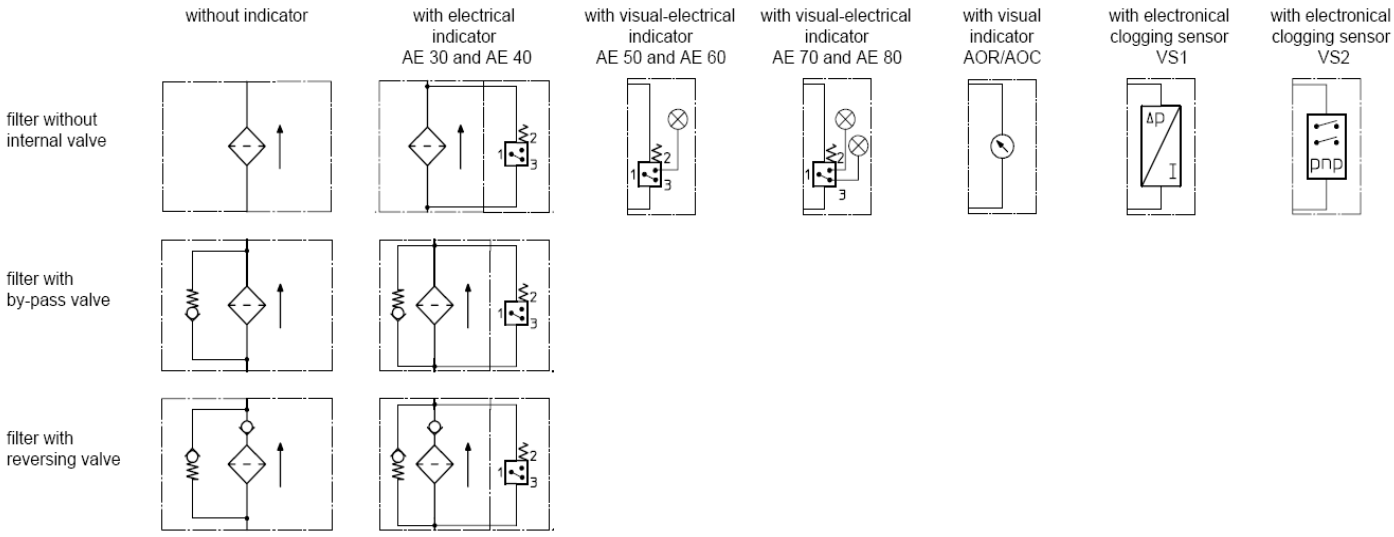
1. Technical data

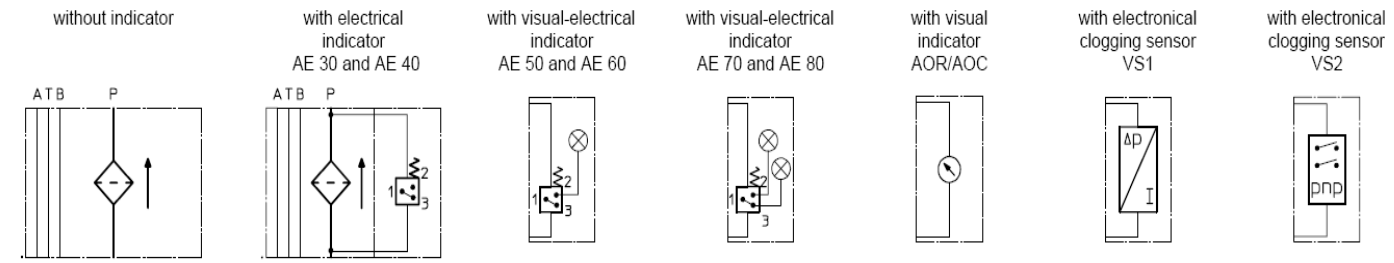
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	HPY.60	01E.60	1	
2	HPY.90	01E.90	1	
3	HPY.150	01E.150	1	
4	HPY.170	01E.170	1	
5	HPY.240	01E.240	1	
6	HPY.360	01E.360	1	
7	HPY.450	01E.450	1	
8	HPZ.32	01E.30	1	
9	HPZ.90	01E.90	1	

2. Symbols

2-1. HPY



2-1. HPZ

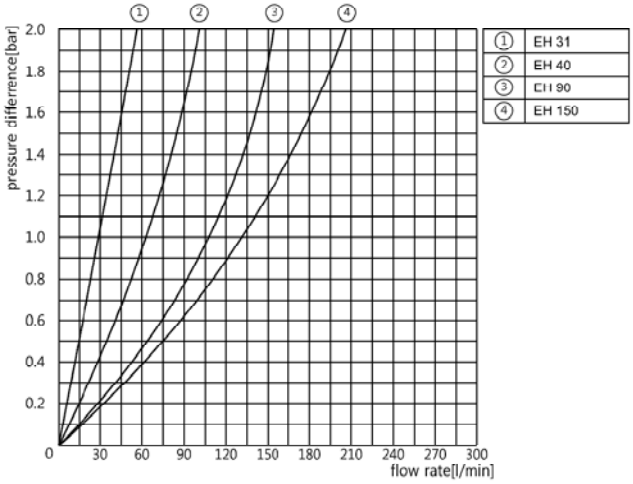


INITIAL DIFFERENCE PRESSURE

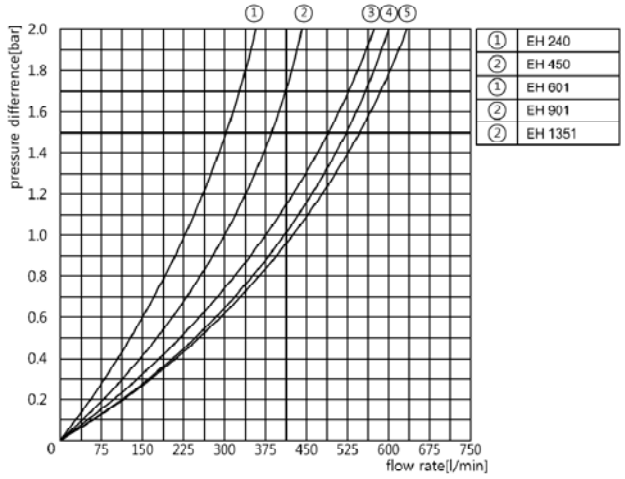
FOR STAINLESS STEEL FILTER SERIES - 1

Sheet No.

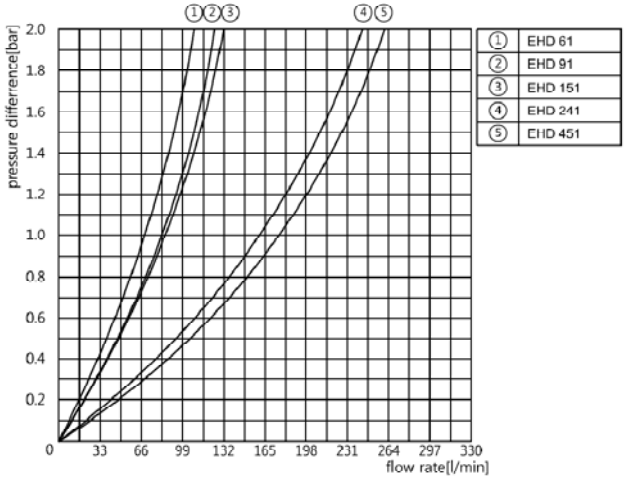
EH31~150 SERIES



EH240~1351 SERIES



EHD 61~451 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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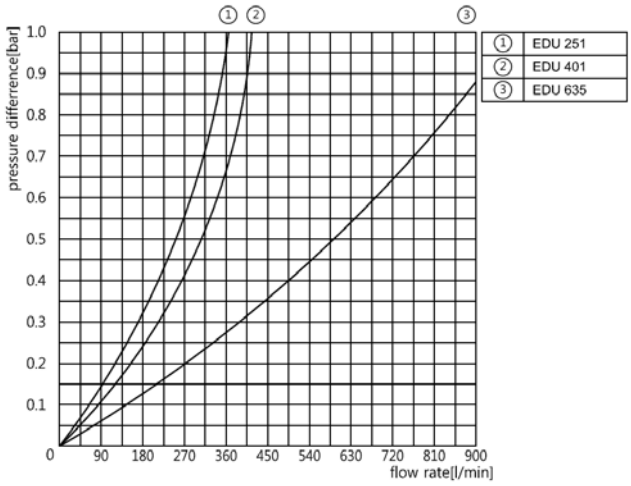
INITIAL DIFFERENCE PRESSURE

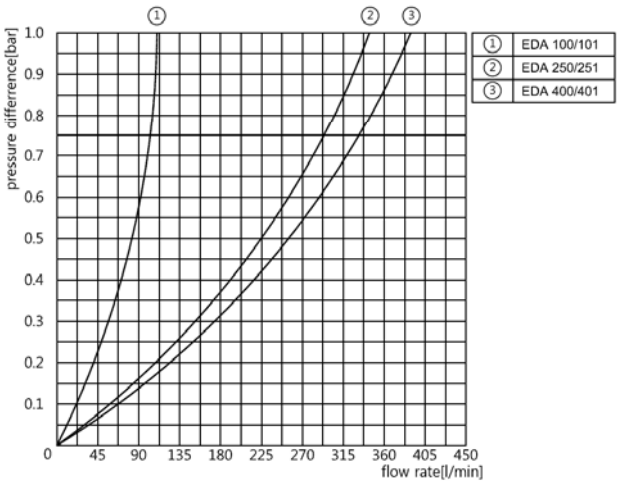
FOR STAINLESS STEEL FILTER SERIES - 2

Sheet No.

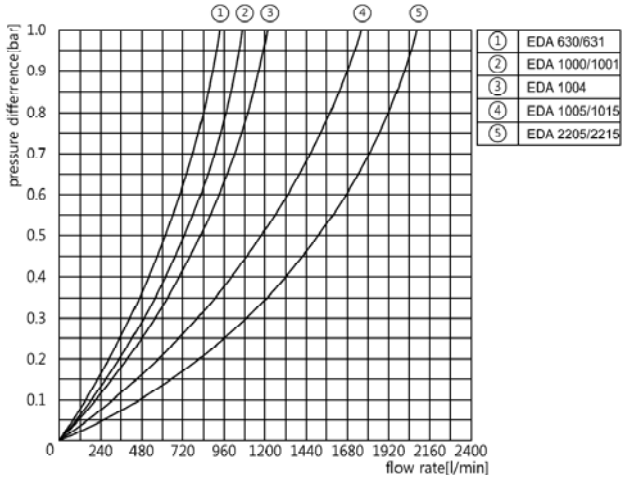
EDU251~635 SERIES



EDA100~401 SERIES



EDA630~2215 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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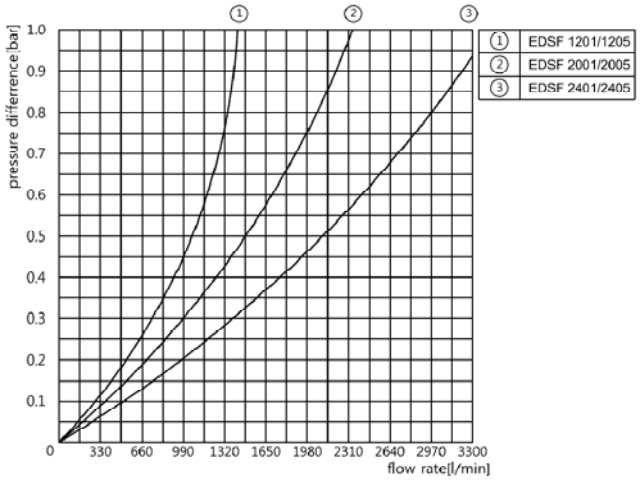
INITIAL DIFFERENCE PRESSURE

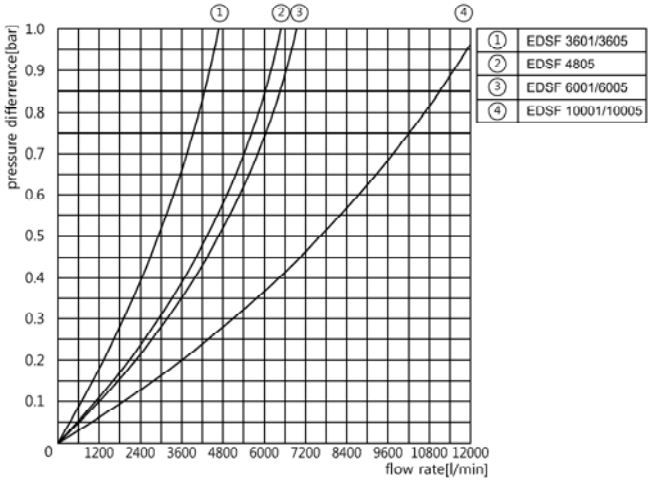
FOR STAINLESS STEEL FILTER SERIES - 3

Sheet No.

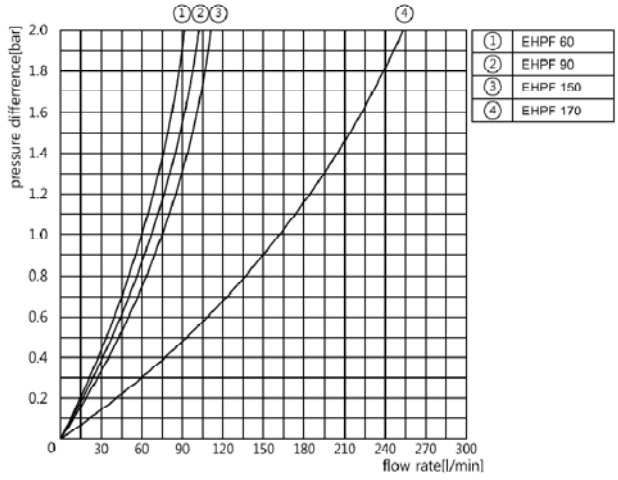
EDSF1201~2405 SERIES



EDSF 3601~10005 SERIES



EHPF60~170 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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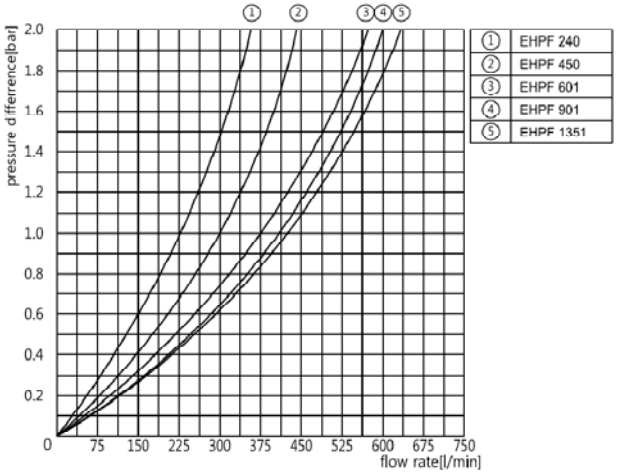
INITIAL DIFFERENCE PRESSURE

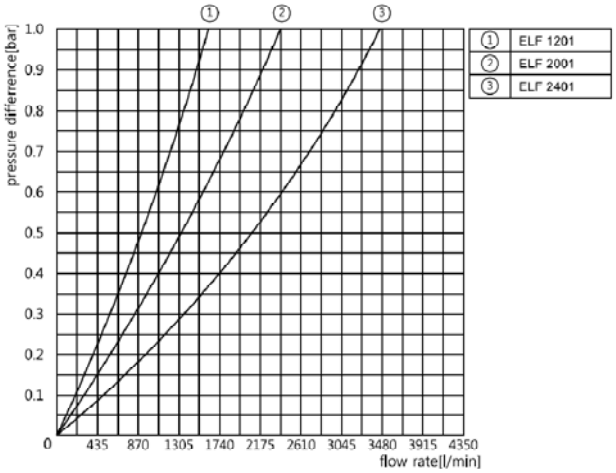
FOR STAINLESS STEEL FILTER SERIES - 4

Sheet No.

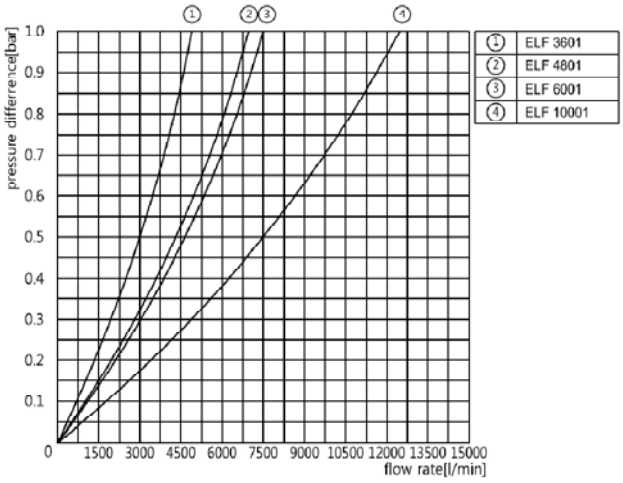
EHPF240~1351 SERIES



ELF1201~2401 SERIES



ELF3601~10001 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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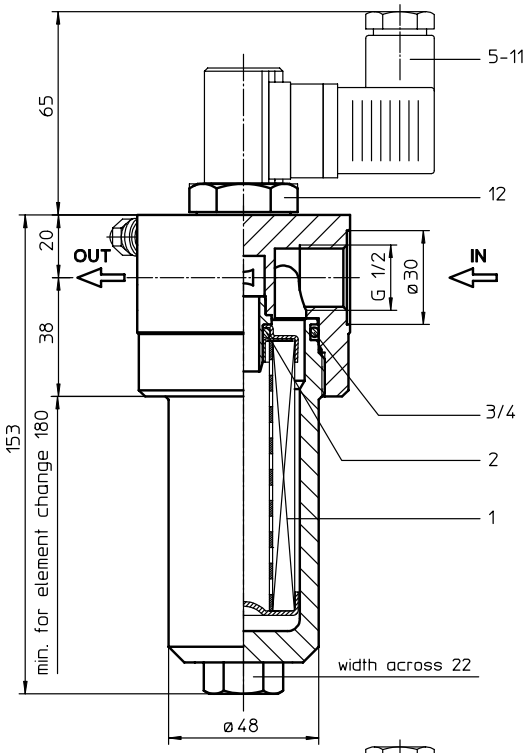
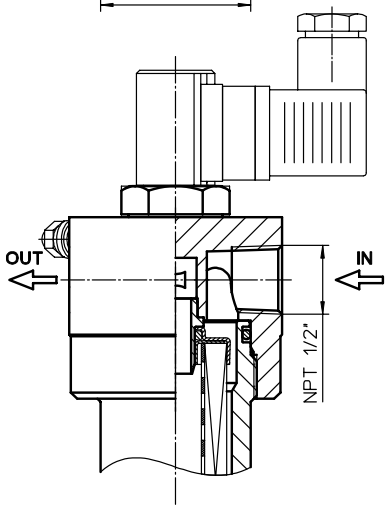
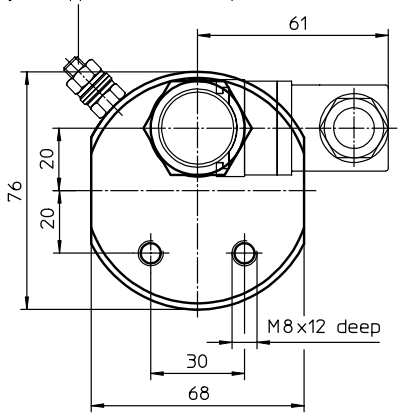
STAINLESS STEEL-PRESSURE FILTER
Series EH 31 DN 15 PN 420

Sheet No.
1435 C





connection for the potential equalisation,
only for application in the explosive area



1. Type index:

1.1. Complete filter: (ordering example)

EH .	31.	10VG.	HR.	E.	P.	VA.	G.	3.	VA.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EH = stainless steel-pressure filter

2 **nominal size:** 31

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm, 25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228
NPT = thread connection

9 **connection size:**
3 = ½"

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	VA
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 30

3 - 7 see type index-complete filter

weight: approx. 3,0 kg

EDV 09/06

Changes of measures and design are subject to alteration!

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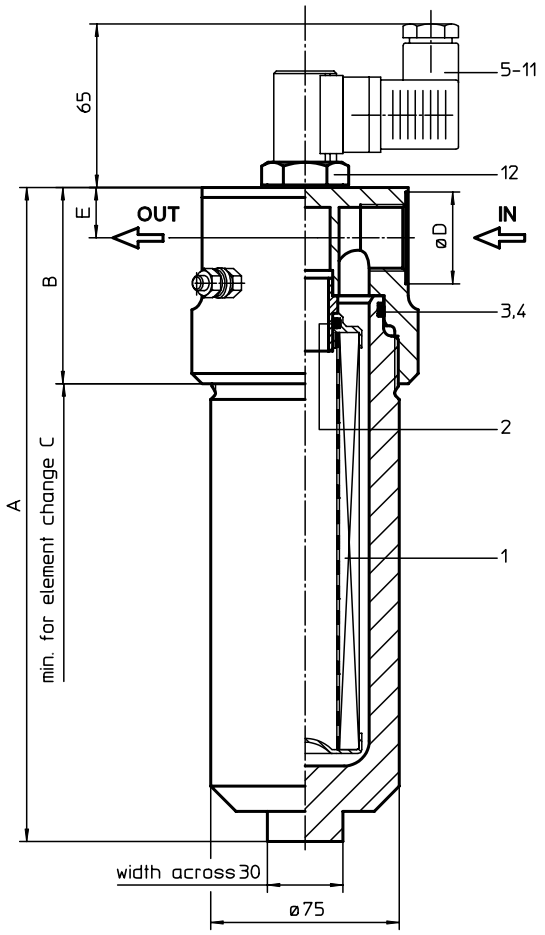
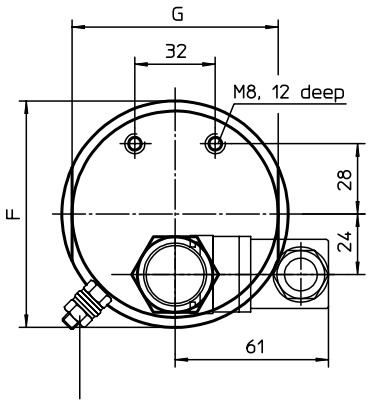
STAINLESS STEEL- PRESSURE FILTER
Series EH 60-150 DN 15-25 PN 420

Sheet No.
1430 K





connection for the potential equalisation, only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

EH. 90. 10VG. HR. E. P. VA. G. 4. VA. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EH = stainless steel-pressure filter

2 **nominal size:** 60, 90, 150

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm,
25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
3 = G ½
4 = G ¾
5 = G 1

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 90. 10VG. HR. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

2. Dimensions:

type	connection	A	B	C	D	E	F	G	weight kg	volume tank
EH 60	G ½	195	78	215	30	20	90	82	8,5	0,3 l
EH 90	G ¾	260	78	280	36,5	20	90	82	9,5	0,4 l
EH 150	G 1	370	84	390	40	23	95	84	12,5	0,6 l

Connection assignments as shown in the table are standard. To exchange connections see item 9 in type index.

EDV 09/06

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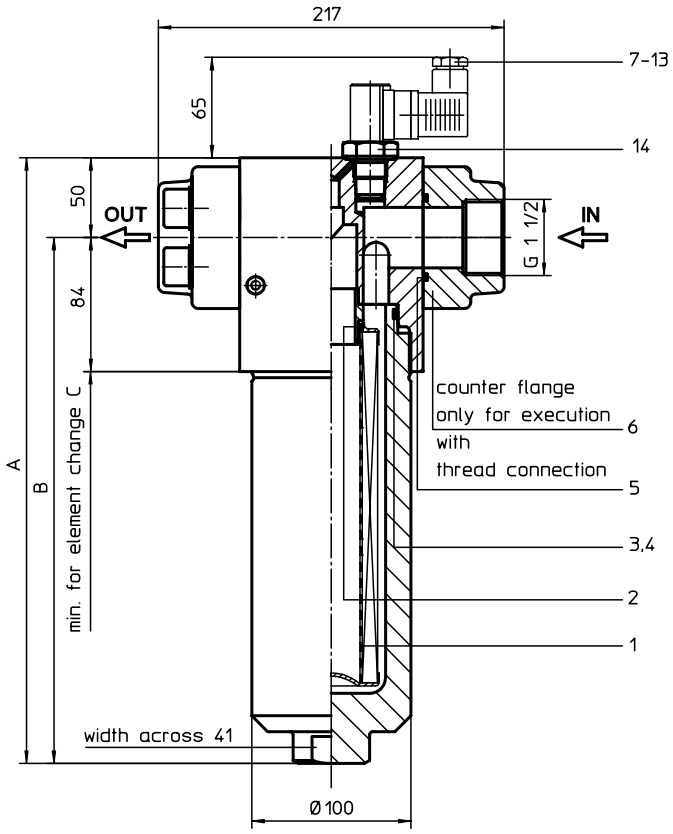
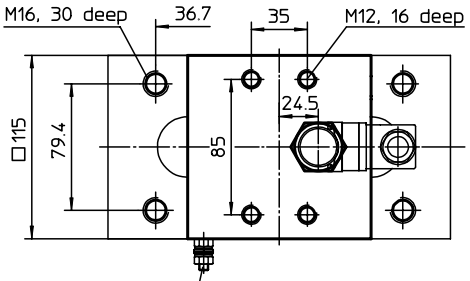
STAINLESS STEEL- PRESSURE FILTER
Series EH 240 - 450 DN 40 PN 420

Sheet No.
1431 H



delineation without counter flange



connection for the potential equalisation,
only for application in the explosive area

1. Type index:

1.1. Complete filter: (ordering example)

EH. 240. 10VG. HR. E. P. VA. FS. 7. VA. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EH = stainless steel-pressure filter

2 **nominal size:** 240, 450

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm,
25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 see sheet-no. 31601

8 **connection:**
G = thread connection (only with counter flange)
FS = SAE-flange connection 6000 PSI

9 **connection size:**
7 = 1 ½“

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 240. 10VG. HR. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 240, 450

3 - 7 see type index-complete filter

2. Dimensions:

type	connection	A	B	C	weight kg	volume tank
EH 240	G1 ½ or	380	330	320	22	0,85 l
EH 450	SAE 1 ½“	565	515	500	30	1,55 l

EDV 05/06

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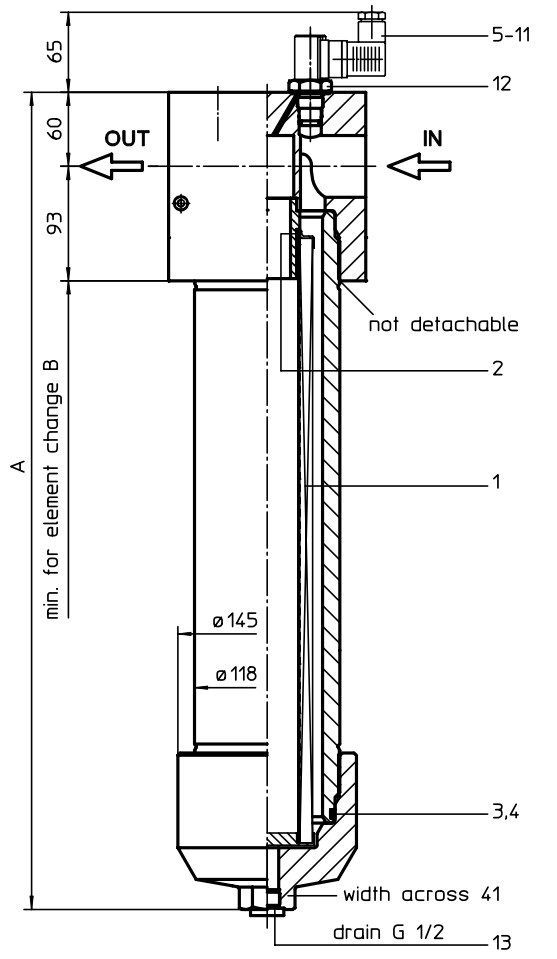
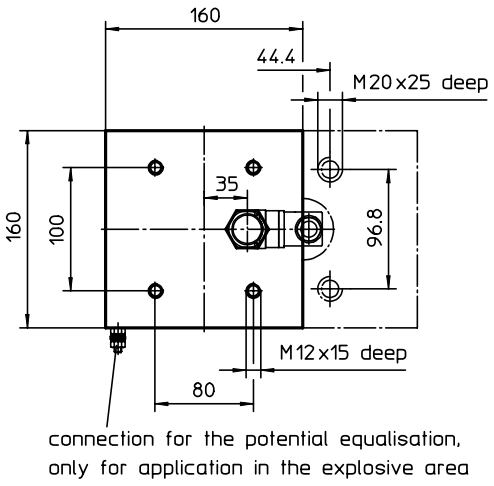
fax +49 - (0)6205 - 2094-40 url www.internormen.com

STAINLESS STEEL- PRESSURE FILTER
Series EH 601-1351 DN 50 PN 315

Sheet No.
1434 F





1. Type index:

1.1. Complete filter: (ordering example)

EH.	901.	10VG.	HR.	E.	P.	VA.	FS.	8.	VA.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EH = stainless steel-pressure filter

2 **nominal size:** 601, 901, 1351

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm,
25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 6000 PSI

9 **connection size:**
8 = 2“

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,348 l/min

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	VA
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 600, 900, 1350

3 - 7 see type index-complete filter

2. Dimensions:

type	EH 601	EH 901	EH 1351
connection	SAE 2“	SAE 2“	SAE 2“
A	520	670	918
B	790	940	1440
weight kg	49	56	68
volume tank	2,1 l	3,1 l	4,6 l

EDV 05/06

Changes of measures and design are subject to alteration!

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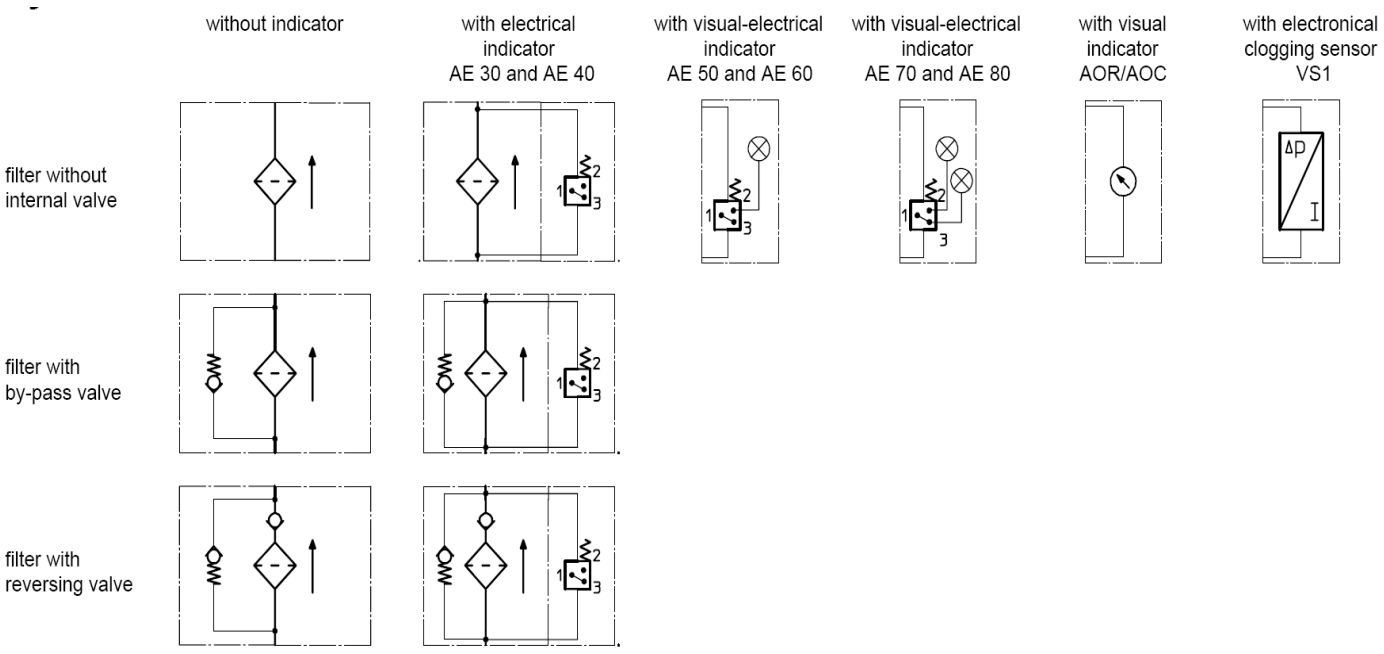
1. Technical data

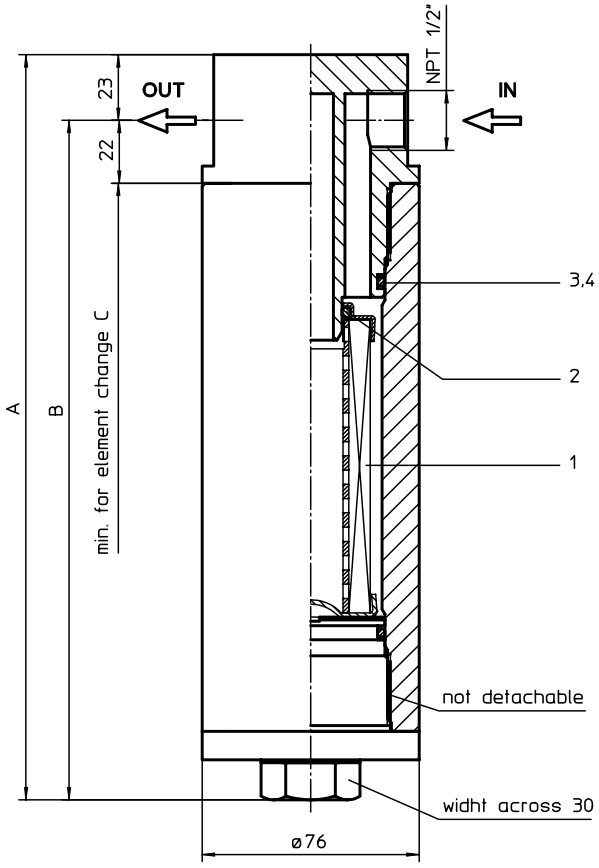
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	EH.31	01E.30	1	NO reversing valve
2	EH.60	01E.60	1	
3	EH.90	01E.90	1	
4	EH.150	01E.150	1	
5	EH.240	01E.240	1	
6	EH.450	01E.450	1	
7	EH.601	01E.600	1	
8	EH.901	01E.900	1	
9	EH.1351	01E.1350	1	

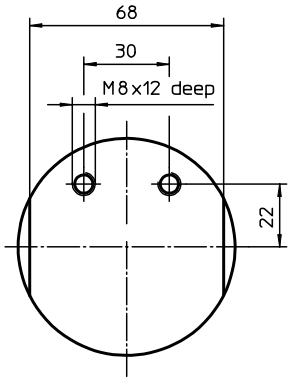
2. Symbols



STAINLESS STEEL- PRESSURE FILTER
Series EHP 60-90 DN 15 PN 700/1400

Sheet No.
1436 B





1. Type index:

1.1. Complete filter: (ordering example)

EHP.	90.	10VG.	HR.	E.	P.	VA.	NPT.	3.	VA.	700
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
EHP = stainless steel-pressure filter

2 **nominal size:** 60, 90

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm,
25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 see sheet-no. 31601

8 **connection:**
NPT = thread connection

9 **connection size:**
3 = NPT ½

10 **filter housing specification:**
VA = stainless steel

11 **pressure level:**
700 = max. operating pressure 700 bar
1400 = max. operating pressure 1400 bar

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	VA
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 60, 90

3 - 7 see type index-complete filter

2. Dimensions:

type	EHP 60	EHP 90
A	261	326
B	238	303
C	360	425
weight kg	8,5	9,7
volume tank	0,3 l	0,4 l

EDV 08/07

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3. Spare parts:

item	qty.	designation	dimension		article-no.	
			EHP 60	EHP 90		
1	1	filer element	01E.60	01E.90		
2	1	O-ring	22 x 3,5		304341 (NBR)	304392 (FPM)
3	1	O-ring	45 x 3		304991 (NBR)	304997 (FPM)
4	1	support ring	52 x 2,6 x 1		311013	

4. Description:

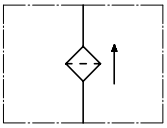
The pressure filters of the series EHP are suitable for a working pressure up to 700 respectively 1400 bar.
The pressure peaks are absorbed by a sufficient margin of safety. The EHP-filter is in-line mounted.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside. Filter elements are available down to a filter fineness of $4\mu m_{(c)}$.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
INTERNORMEN-Filter elements are available up to a pressure difference resistance of Δp 160 bar and a rupture strength of Δp 250 bar.

5. Technical data:

temperature range:	- 10°C to +80°C (for a short time +100°C)
operating medium:	mineral oil, other media on request
max. operating pressure:	700 bar / 1400 bar
test pressure:	1000 bar / 2000 bar
connection system:	thread connection
housing material:	EN10088-3 - 1.4418 + QT900
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Pressure stage 700: Classified under the Pressure Equipment Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para 3.
Pressure stage 1400: Classified under the Pressure Equipment Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para 1.1.b) Category I (Modul A)
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbol:



7. Pressure drop flow curves:

Precise flow rates see 'INT-Expert-System Filter', respectively Δp-curves; depending on filter fineness and viscosity.

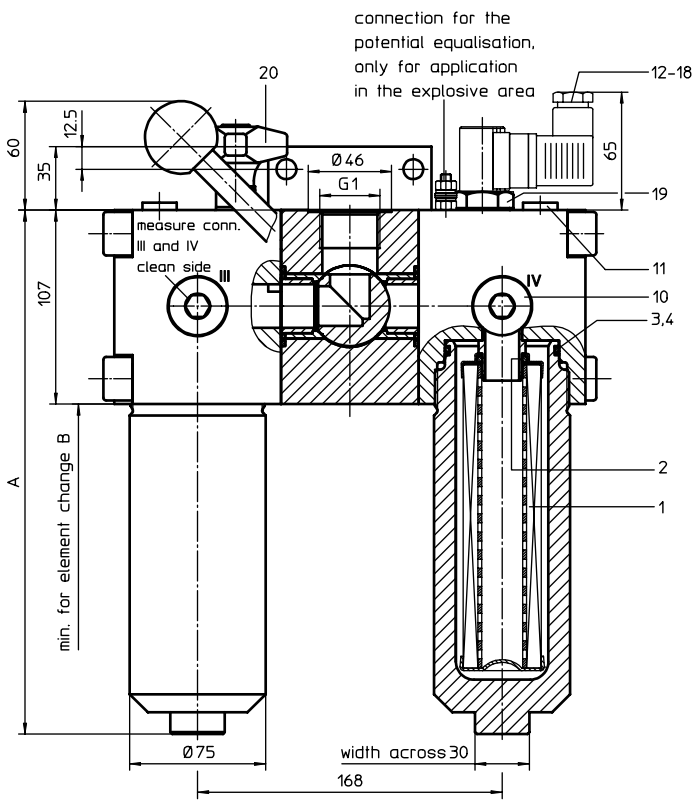
8. Test methods:

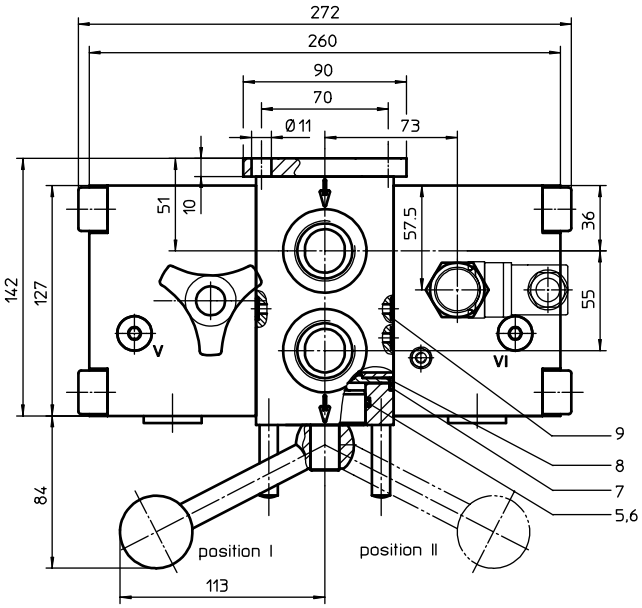
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

STAINLESS STEEL-PRESSURE FILTER, change-over
Series EHD 91-151 DN 25 PN 315

Sheet No.
2530 D





Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection V and VI to be used to bleed filter or to relieve pressure

1. Type index:

1.1. Complete filter: (ordering example)

EHD. 91. 10VG. HR. E. P. VA. G. 5. VA. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EHD = stainless steel-pressure filter, change-over

2 **nominal size:** 91, 151

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm,
25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 see sheet-no. 31601

8 **connection:**
G = thread connection according to ISO 228

9 **connection size:**
5 = G 1

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 70,06 l/min

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 90. 10VG. HR. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 90, 150

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650

3. Dimensions:

type	connection	A	B	weight kg	volume tank
EHD 91	G1	289	340	32	2x 0,4 l
EHD 151		399	450	35	2x 0,6 l

EDV 05/06

Changes of measures and design are subject to alteration!

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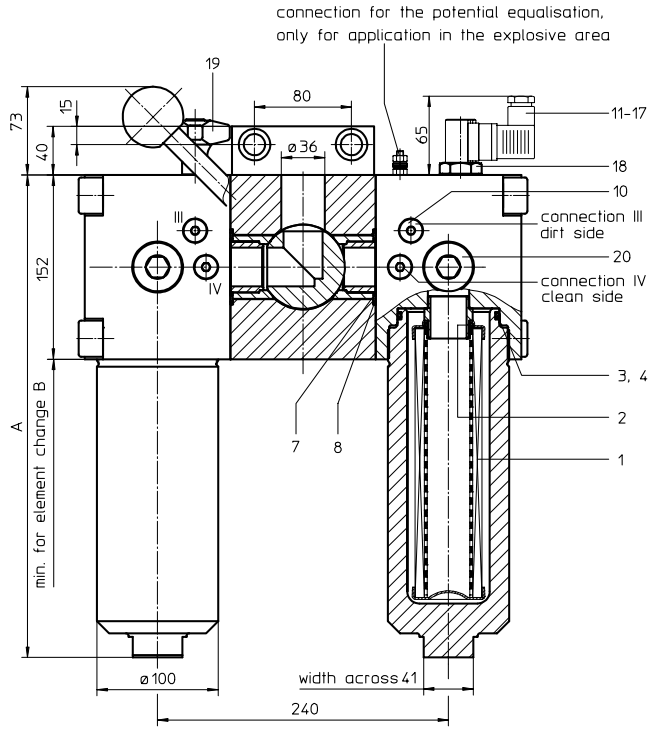
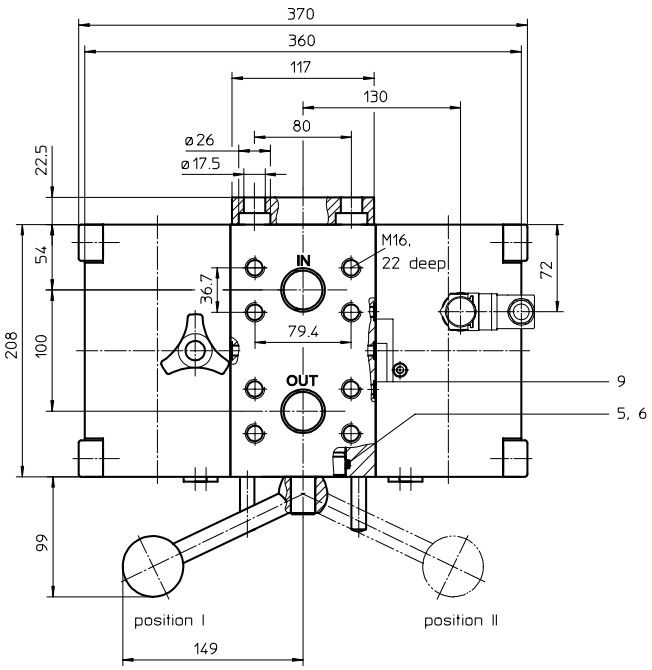
STAINLESS STEEL- PRESSURE FILTER, change-over
Series EHD 241 - 451 DN 40 PN 315

Sheet No.
2533 D





Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

Connection III and IV to be used to bleed filter or to relieve pressure.

1. Type index:

1.1. Complete filter: (ordering example)

EHD. 241. 10VG. HR. E. P. VA. FS. 7. VA. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EHD = stainless steel-pressure filter, change-over

2 **nominal size:** 241, 451

3 **filter-material and filter-fineness:**
80G = 80 µm, 40G = 40 µm,
25G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 6000 PSI

9 **connection size:**
7 = 1 ½"

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar
S2 = with by-pass valve Δp 7,0 bar
R = reversing valve, Q ≤ 211,008 l/min

12 **clogging indicator or clogging sensor :**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

1.2. Filter element: (ordering example)

01E. 240. 10VG. HR. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to INTERNORMEN factory specification

2 **nominal size:** 240, 450

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650

3. Dimensions:

type	connection	A	B	weight kg	volume tank
EHD 241	SAE	398	340	102	2x 0,85 l
EHD 451	1 ½"	583	525	116	2x 1,55 l

Changes of measures and design are subject to alteration!

EDV 05/07

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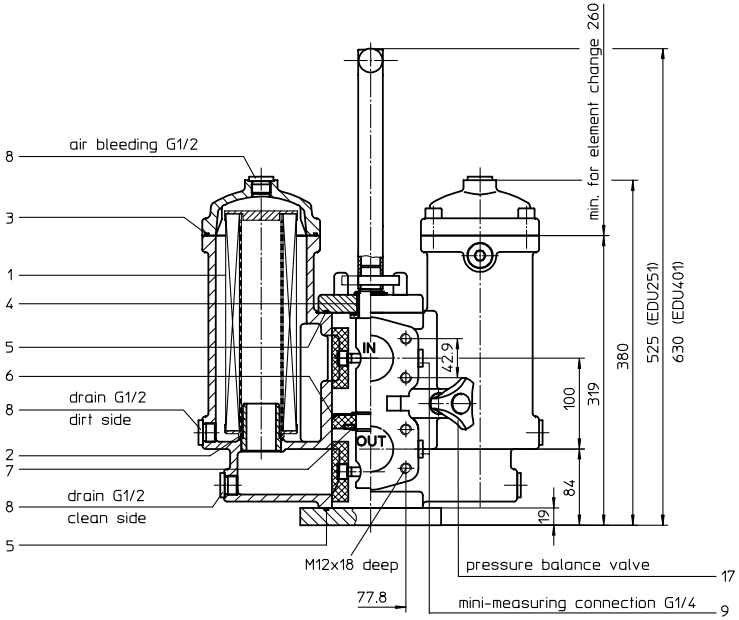
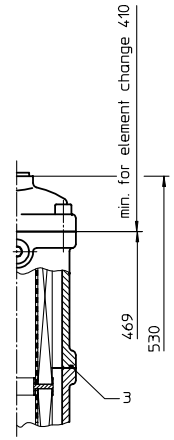
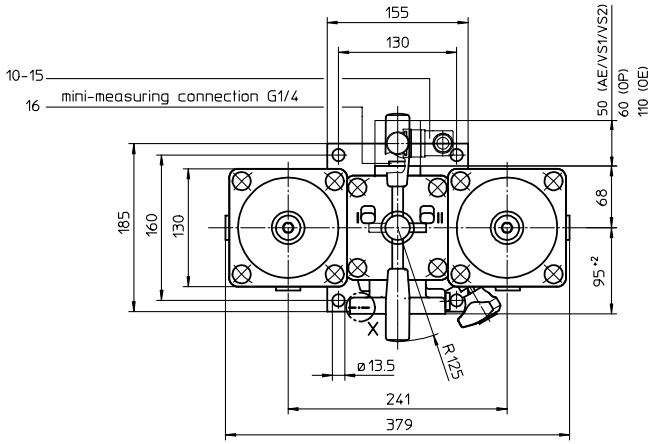
STAINLESS STEEL-PRESSURE FILTER, change-over
Series EDU 251-401 DN 50 PN 25

Sheet No. **2124 H**

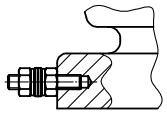




filter head execution
with EDU 401



detail X



connection for the potential equalisation
at outlet, only for application
in the explosive area

Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

EDU. 251. 10VG. 30. E. P. VA. FS. 8. VA. AE

1	2	3	4	5	6	7	8	9	10	11

1 **series:**
EDU = stainless steel-pressure filter, change-over

2 **nominal size:** 251, 401

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no.31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
8 = 2 ''

10 **filter housing specification:**
VA = stainless steel

11 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL. 250. 10VG. 30. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 250, 400

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder-connections, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight EDU 251: approx. 40 kg
weight EDU 401: approx. 50 kg

Changes of measures and design are subject to alteration!

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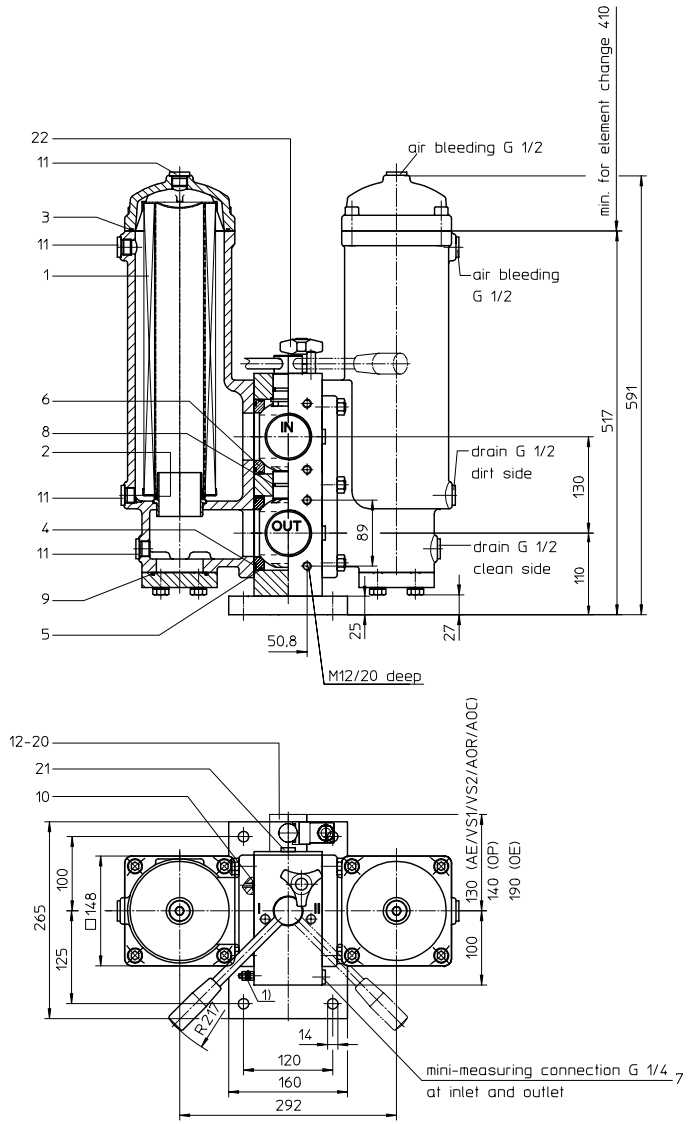
STAINLESS STEEL-PRESSURE FILTER, change-over
Series EDU 635 DN 65 PN 25

Sheet No. **2150 A**



1) connection for the potential equilisation, at outlet, only for application in the explosive area

Pos. I: left filter-side in operation
Pos. II: lright filter-side in operation

1. Type index:

1.1. Complete filter: (ordering example)

EDU. 635. 10VG. 30. E. P. VA. FS. 9. VA. -. AE

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
EDU = stainless steel-pressure filter, cha nge-over

2 **nominal size:** 635

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh,
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
IS07 = see sheet-no. 31602

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
9 = 2 ½ "

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NL. 630. 10VG. 30. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 630

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connections, see sheet-no. 1650
- evacuation and bleeder-conections, see sheet-no. 1651
- counter flanges, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. 90 kg

Changes of measures and design are subject to alteration!

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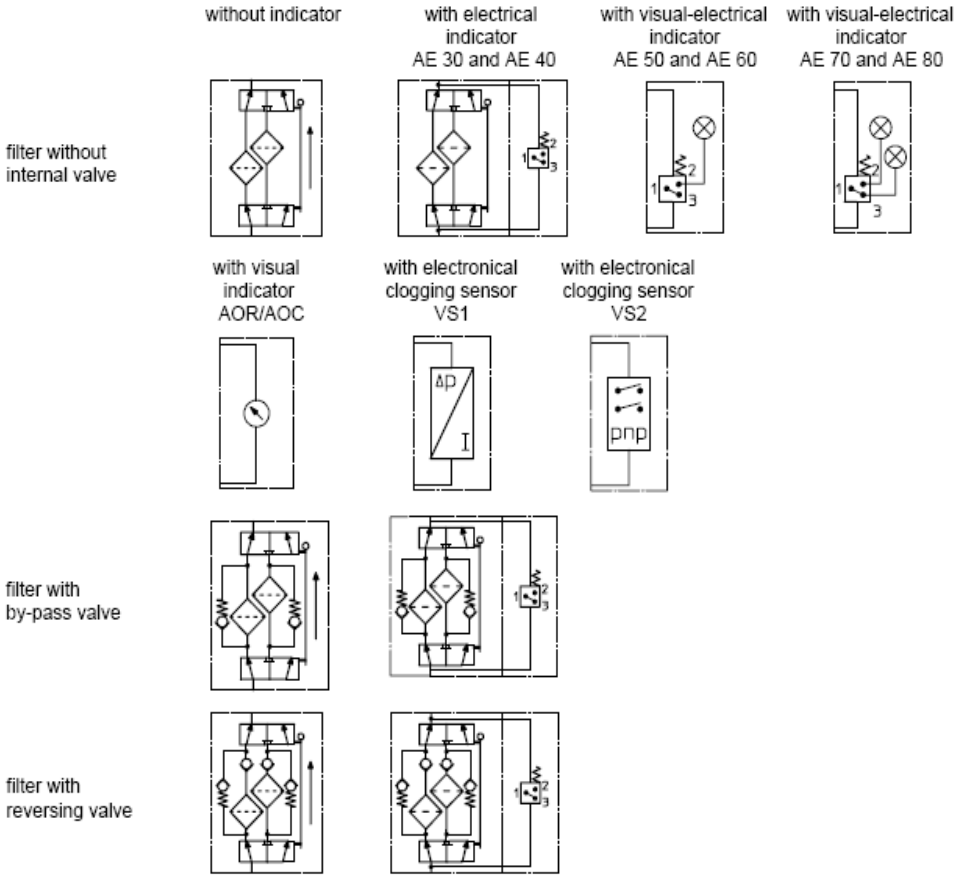
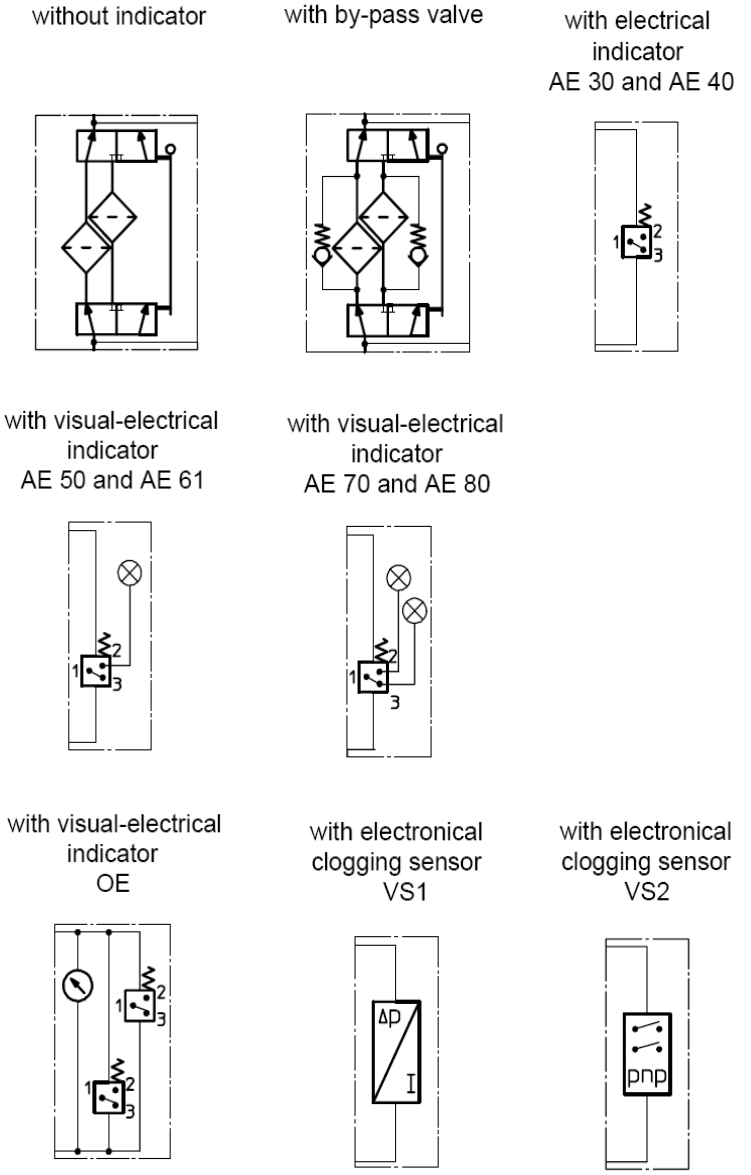
1. Technical data

NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	EHD.91	01E.90	2	
2	EHD.151	01E.150	2	
3	EHD.241	01E.240	2	
4	EHD.451	01E.450	2	
5	EDU.251	01NL.250···VA	2	
6	EDU.401	01NL.400···VA	2	
7	EDU.635	01NL.630···VA	2	

2. Symbols For EHD model



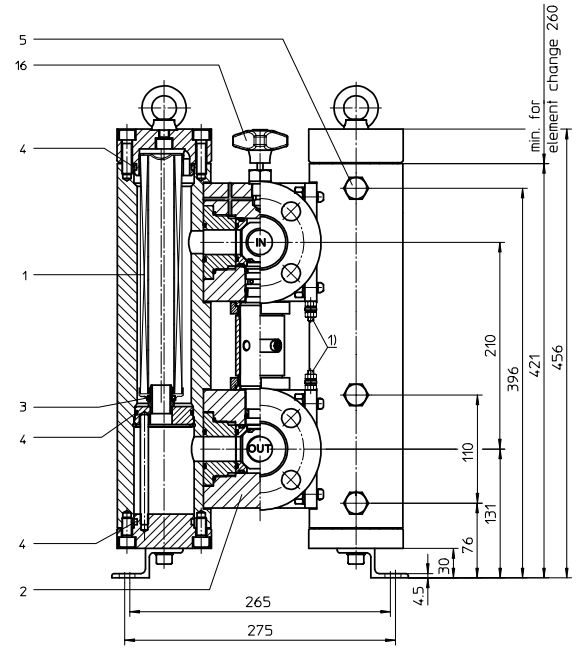
3. Symbols For EDU model

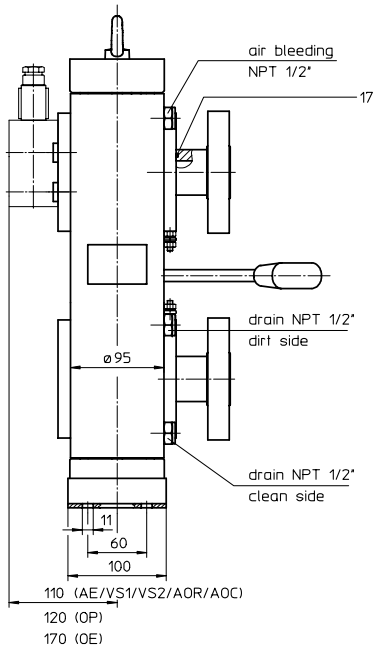


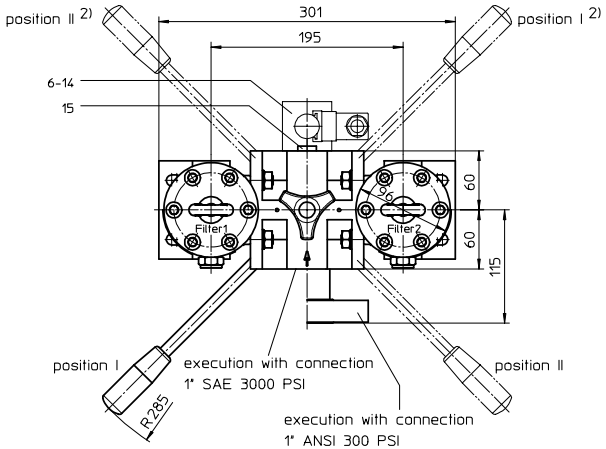
STAINLESS STEEL-PRESSURE FILTER, change-over

Series EDA 100 DN 25 PN 40

Sheet No. **2159 A**







1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

1. Type index:

1.1. Complete filter: (ordering example)

EDA. 100. 10VG. 30. E. P. VA. FS. 5. VA. -. AE. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
EDA = stainless steel-pressure filter change-over, according to ASME-code

2 **nominal size:** 100

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
5 = 1"

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL. 100. 10VG. 30. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 100

3 - 7 see type index complete filter

2. Accessories:

- counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

weight: approx. 63 kg

Changes of measures and design are subject to alteration!

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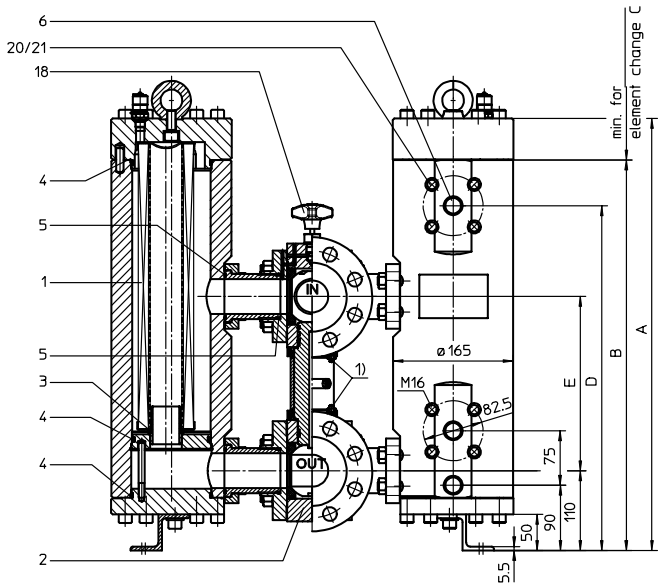
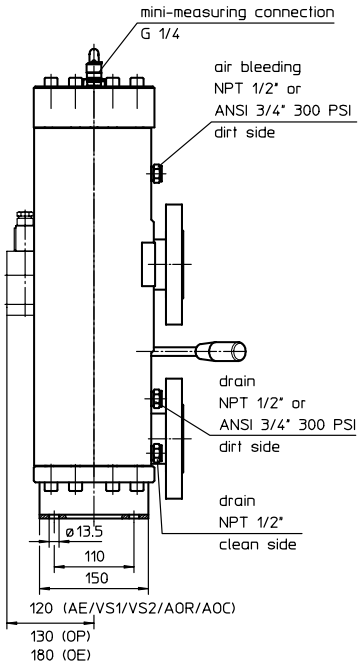
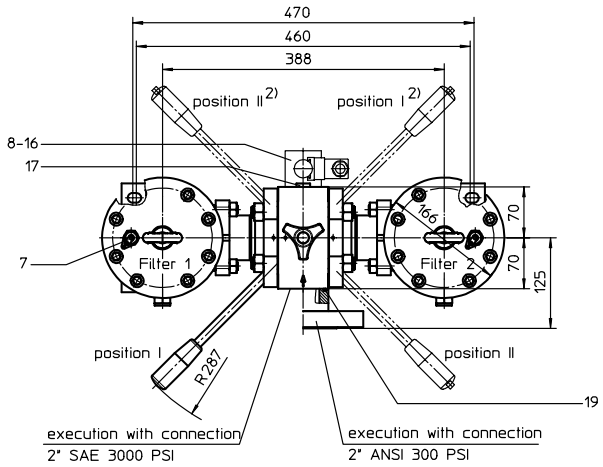
STAINLESS STEEL-PRESSURE FILTER, change-over

Series EDA 250-400 DN 50 PN 40

Sheet No. **2157 A**







1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: filter 1 in operation
Position II: filter 2 in operation

3. Dimensions:

type	connection	connection size	A	B	C	D	E	weight kg
EDA 250	DN 50	SAE or ANSI 2"	445	388	260	325	200	approx. 132
EDA 400	DN 50	SAE or ANSI 2"	595	538	410	475	240	approx. 163

1. Type index:

1.1. Complete filter: (ordering example)

EDA. 400. 10VG. 30. E. P. VA. FS. 8. VA. -. AE. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
EDA = stainless steel-pressure filter change-over, according to ASME-code

2 **nominal size:** 250, 400

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
8 = 2"

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL. 400. 10VG. 30. E. P. -

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 250, 400

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

Changes of measures and design are subject to alteration!

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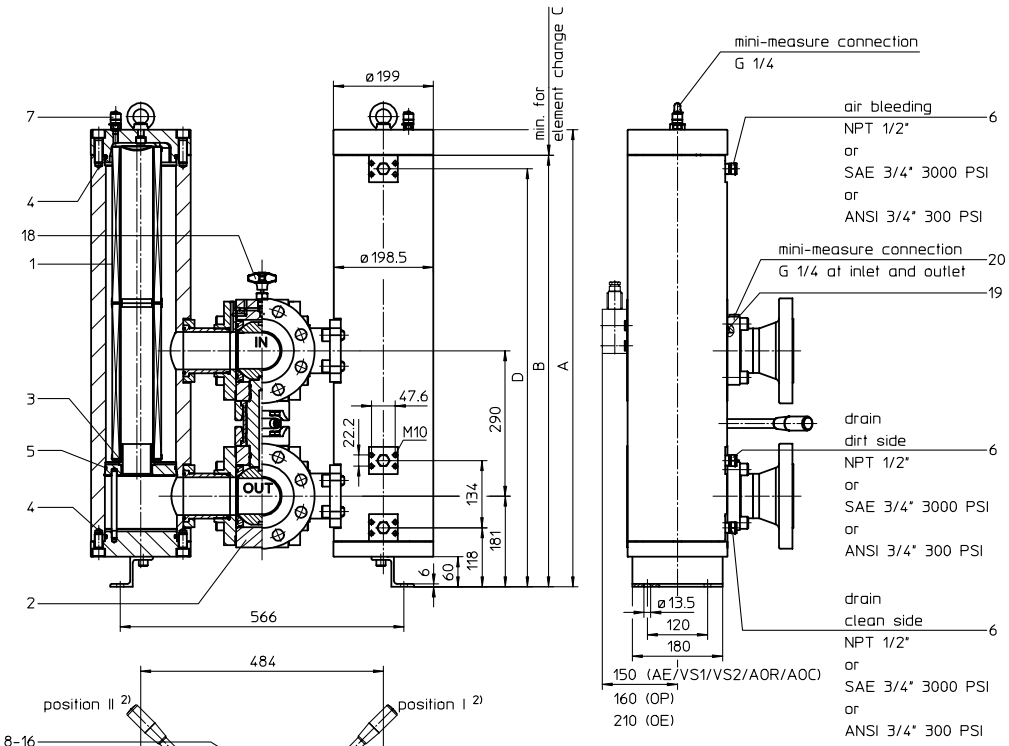
STAINLESS STEEL-PRESSURE FILTER, change-over

Series EDA 630-1000 DN 80 PN 40

Sheet No. **2158 A**



1) Connection for the potential equalisation at inlet and outlet, only for application in the explosive area.

Switch lever standard in the front.

2) On request: Switch lever backside opposite to inlet and outlet.

Please specify on order !

Position I: Filter 1 in operation
Position II: Filter 2 in operation

1. Type index:

1.1. Complete filter: (ordering example)

EDA. 1000. 10VG. 30. E. P. VA. FS. A. VA. -. AE. -

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
EDA = stainless steel-pressure filter change-over, according to ASME-code

2 **nominal size:** 630, 1000

3 **filter-material and filter- fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
30 = Δp 30 bar

5 **filter element design:**
E = single-end open
S = with by-pass valve Δp 2,0 bar
S1 = with by-pass valve Δp 3,5 bar

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI
FA1 = ANSI-flange connection 300 PSI, sealing surface R_z = 160 µm (not finer than 40µm)
FA2 = ANSI-flange connection 300 PSI, sealing surface R_z = 16 µm

9 **connection size:**
A = 3"

10 **filter housing specification:**
VA = stainless steel

11 **internal valve:**
- = without

12 **clogging indicator or clogging sensor:**
- = without,
AOR = visual, see sheet-no. 1606,
AOC = visual, see sheet-no. 1606,
AE = visual-electrical, see sheet-no. 1609,
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **specification pressure vessel:**
- = standard (PED 97/23/EC)
IS21 = see sheet-no. 43415 (ASME VIII Div.1)

1.2. Filter element: (ordering example)

01NL. 1000. 10VG. 30. E. P. VA

1	2	3	4	5	6	7

1 **series:**
01NL. = standard filter element according to DIN 24550, T3

2 **nominal size:** 630, 1000

3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder -connection, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- adaptor for ANSI-flange 300 PSI, see sheet-no. 1658
- shut-off valve, see sheet-no. 1655

3. Dimensions:

type	connection	connection size	A	B	C	D	weight kg
EDA 630	DN 80	SAE or ANSI 3"	682	631	410	604	approx. 294
EDA 1000	DN 80	SAE or ANSI 3"	912	861	640	834	approx. 354

Changes of measures and design are subject to alteration!

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1. Technical data

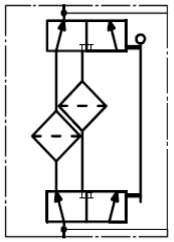
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	EDA.100	01NL.100	2	
2	EDA.250	01NL.250	2	
3	EDA.400	01NL.400	2	
4	EDA.630	01NL.630	2	
5	EDA.1000	01NL.1000	2	

2. Description

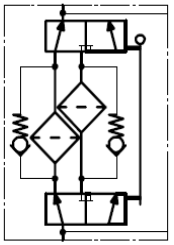
Stainless steel-pressure filters, change-over series EDA 630-1000 are suitable for operating pressure up to 40 bar.
Pressure peaks can be absorbed with a sufficient margin o safety.
Change-over ball valve which, integrated in the middle of the housing, makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation.
The filter element consists of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outs ide to the inside.
These filters can be installed as suction filters.
For cleaning (see special leaflet 21070-4 and 34448-4) the mesh element respectively to change the glass fibre element remove the cover and take out the element.
Filter finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
INTERNORMEN-Filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.
INTERNORMEN-Filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.
The inspection according to TÜV, according to ASME VIII Div.1 and the major „Shipyard Classification Societies“ D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S. and others are possible. If inspection is required please indicate in your order.

3. Symbols

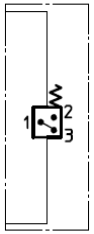
without indicator



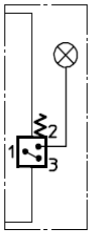
with by-pass valve



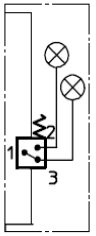
with electrical indicator
AE 30 and AE 40



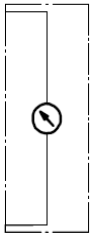
with visual-electrical indicator
AE 50 and AE 61



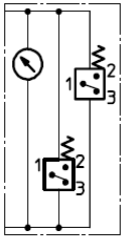
with visual-electrical indicator
AE 70 and AE 80



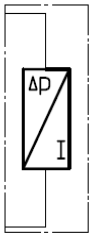
with visual indicator
AOR/AOC/OP



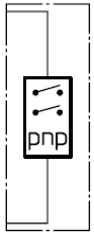
with visual-electrical indicator
OE



with electronical clogging sensor
VS1

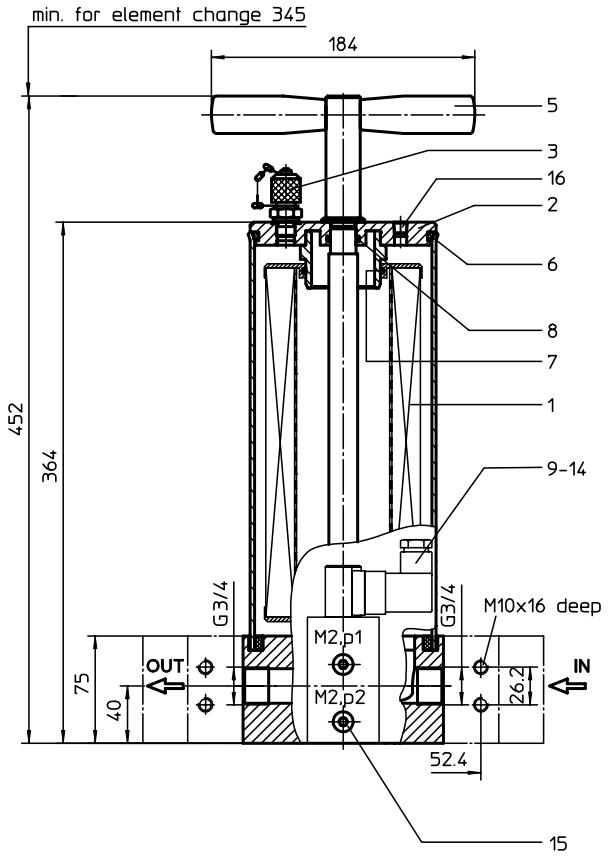


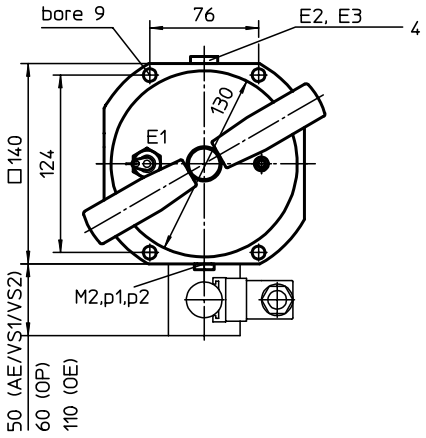
with electronical clogging sensor
VS2



PARTIAL FLOW FILTER
Series NF 250 DN 25 PN 16

Sheet No.
1100 C





M2,p1 = measure connection dirt-side
M2,p2 = measure connection clean-side
E1 = air bleeding dirt-side
E2 = drain dirt-side
E3 = drain clean-side

1. Type index:

1.1. Complete filter: (ordering example)

NF.	250.	10VG.	10.	B.	P.	-.	FS.	5.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
NF = partial flow filter

2 **nominal size:** 250

3 **filter-material and filter-fineness:**
25 VG= 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$,10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI [1)]

9 **connection size:**
5 = 1“ [1)]

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor :**
- = without
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
AE = visual-electrical, see sheet-no. 1609
VS1 = electrical, see sheet-no. 1607
VS2 = electrical, see sheet-no. 1608

[1)] in addition available
thread G ¾ according to DIN 3852 T2, design Z

1.2. Filter element: (ordering example)

01NR.	250.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 series:
01NR. = standard return line filter element according to DIN 24550, T4

2 nominal size: 250

3 - 7 see type index-complete filter

2. Accessories:
- measure- and bleeder connection, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651

weight : approx. 7 kg

Changes of measures and design are subject to alteration!

EDV 10/03

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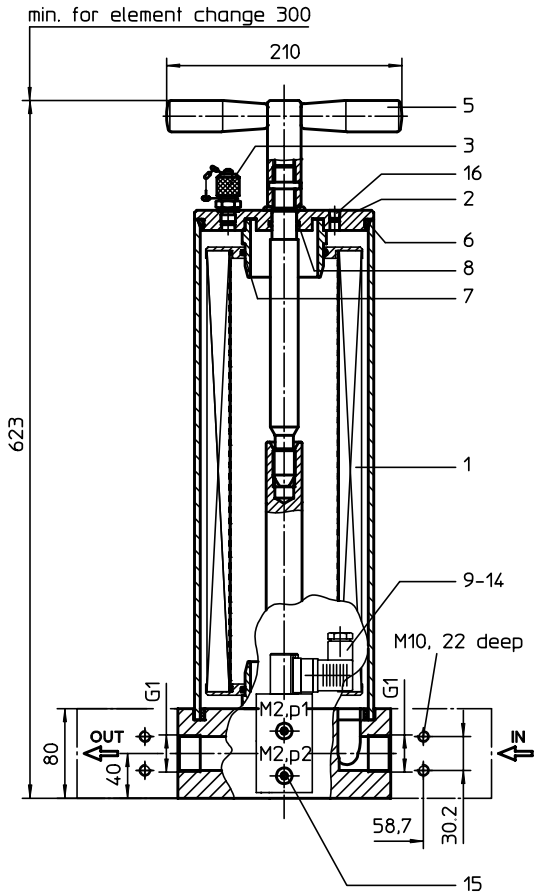
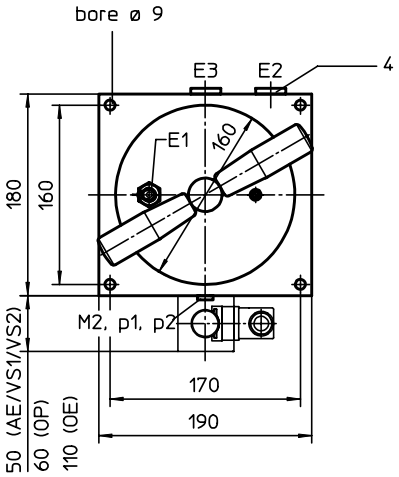
PARTIAL FLOW FILTER
Series NF 631 DN 32 PN 16

Sheet No.
1115 I





M2,p1 = measure connection dirt-side
M2,p2 = measure connection clean-side
E1 = air bleeding dirt-side
E2 = drain dirt-side
E3 = drain clean-side

1. Type index:

1.1. Complete filter: (ordering example)

NF.	631.	10VG.	10.	B.	P.	-.	FS.	6.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
NF = partial flow filter

2 **nominal size:** 631

3 **filter-material and filter-fineness:**
25 VG= 20 µm$_{(c)}$, 16 VG = 15 µm$_{(c)}$, 10 VG = 10 µm$_{(c)}$,
6 VG = 7 µm$_{(c)}$, 3 VG = 5 µm$_{(c)}$ Interpor fleece (glass fibre)
10 WVG = 10 µm$_{(c)}$, 3 WVG = 5 µm$_{(c)}$ Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI [1)]

9 **connection size:**
6 = 1 ¼“ [1)]

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **clogging indicator or clogging sensor :**
- = without
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
AE = visual-electrical, see sheet-no. 1609
VS1 = electrical, see sheet-no. 1607
VS2 = electrical, see sheet-no. 1608

[1)] in addition available
thread G1 according to DIN 3852 T2, design Z

1.2. Filter element: (ordering example)

01NR.	630.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 series:
01NR. = standard return line filter element according to DIN 24550, T4

2 nominal size: 630

3 - 7 see type index-complete filter

2. Accessories:
- measure- and bleeder connection, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- counter flange, see sheet-no. 1652

weight : approx. 17 kg

EDV 10/03

Changes of measures and design are subject to alteration!

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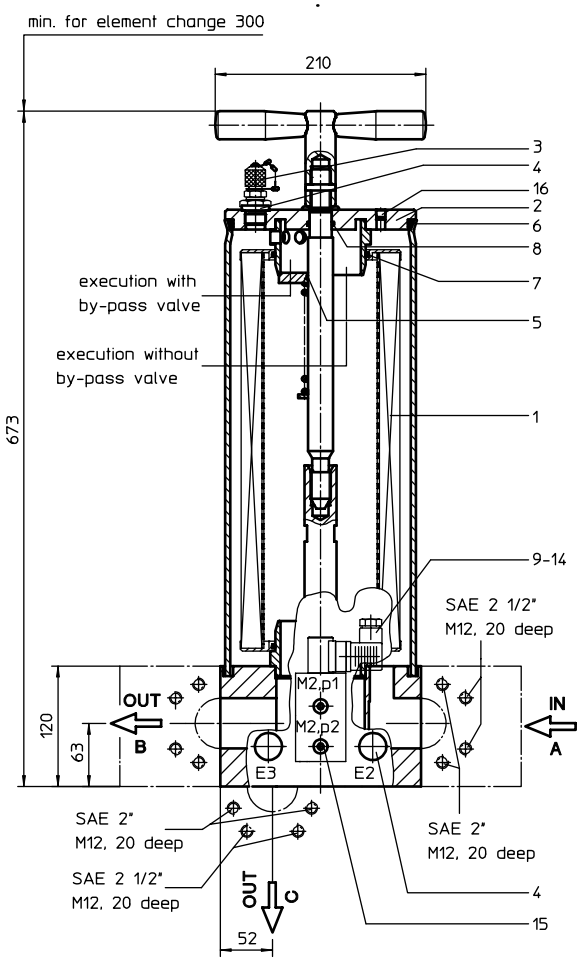
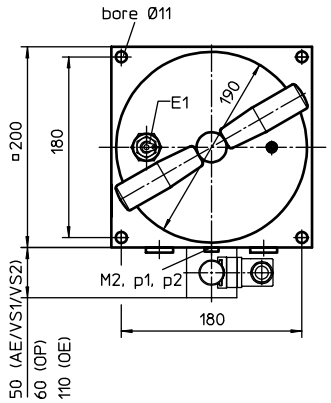
PARTIAL FLOW FILTER
Series NF 1000 DN 50-65 PN 16

Sheet No.
1116 I





M2, p1 = measure connection dirt side
M2, p2 = measure connection clean side
E1 = aie bleeding dirt side
E2 = drain dirt side
E3 = drain clean side

1. Type index:

1.1. Complete filter: (ordering example)

NF.	1000.	10VG.	10.	B.	P.	-.	FS.	3.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
NF = partial flow filter

2 **nominal size:** 1000

3 **filter-material and filter-fineness:**
25 VG= 20 µm(c), 16 VG = 15 µm(c), 10 VG = 10 µm(c),
6 VG = 7 µm(c), 3 VG = 5 µm(c) Interpor fleece (glass fibre)
10 WVG = 10 µm(c), 3 WVG = 5 µm(c) Watersorp-filter element

4 **resistance of pressure difference for filter element:**
10 = Δp 10 bar

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **no. of version:**

version	connection A connection size	connection B connection size	connection C connection size
1	8	8	-
2	8	8	8
3	9	9	-
4	9	9	9

connection size: 8 = 2“
9 = 2 ½“
- = without connection

10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605

11 **internal valve:**
- = without
S1 = with by-pass valve Δp 3,5 bar

12 **clogging indicator or clogging sensor :**
- = without
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
AE = visual-electrical, see sheet-no. 1609
VS1 = electrical, see sheet-no. 1607
VS2 = electrical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

1 **series:**
01NR. = standard return line filter element according to DIN 24550, T4

2 **nominal size:** 1000

3 - 7 see type index-complete filter

2. Accessories:

- measure- and bleeder connection, see sheet-no. 1650
- evacuation- and bleeder-connections, see sheet-no. 1651
- counter flange, see sheet-no. 1652

weight : approx. 23 kg

EDV 10/03

Changes of measures and design are subject to alteration!

internormen technology

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phone +49 - (0)6205 - 2094-0 e-mail sales@internormen.com
fax +49 - (0)6205 - 2094-40 url www.internormen.com

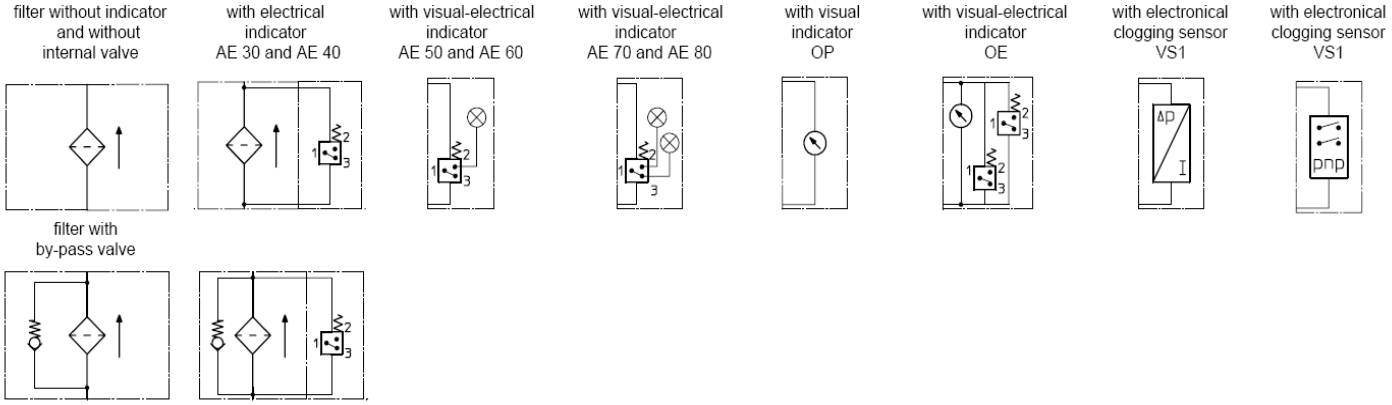
1. Technical data

NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	NF.250	01NR.250	1	No with by-pass valve
2	NF.631	01NR.630	1	No with by-pass valve
3	NF.1000	01NR.1000	1	

2.Description

The partial flow filter NF is foreseen for the fine filtration of hydraulic and lubrication circuits additionally to the main filter.
The big filtration area in comparison to the nominal size is the premise for a high dirt-retaining capacity even in case of small filter-fineness.
Filter elements as fine as 5 $\mu m_{(c)}$ are available; finer filter elements on request.
To protect the filter elements and the filter housing equipment with by-pass valves is foreseen. Element change without tools is possible. After release of the straining screw and removal of the cover the elements are accessible and could be changed. The filter elements were delivered completely inclusive seals. Cleaning of the elements not possible therefore the user should have enough spare elements on stock.

3. Symbols

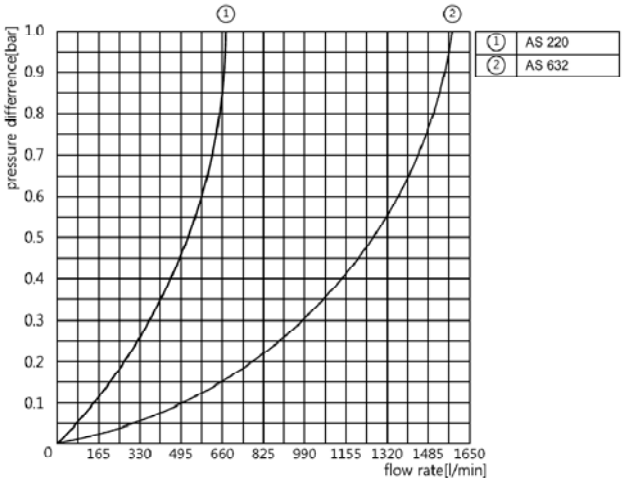


INITIAL DIFFERENCE PRESSURE

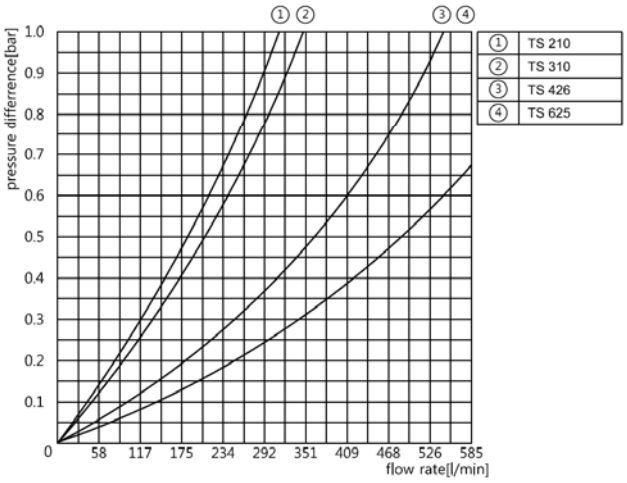
FOR SUCTION FILTER SERIES

Sheet No.

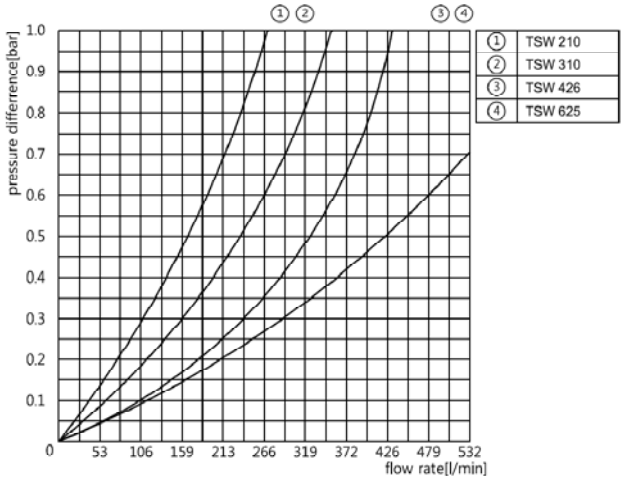
AS220~632 SERIES



TS210~625 SERIES



TSW 210~625 SERIES



* Selection condition is as below

1) Filter fineness : 10VG

2) Viscosity : ISO VG 32 (30cSt @ 45℃)

3) Port size is depended on each filter specification.

4) This data can be changed other factors of hydraulic and lubrication system.

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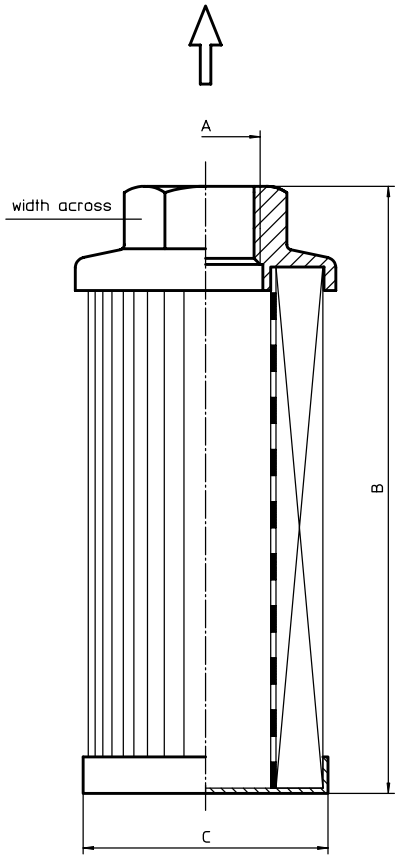
SUCTION STRAINER
Series ASF 25 - 275 DN 15 - 50

Sheet No.
1701 J



1. Type index:

1.1. Complete filter: (ordering example)

ASF. 165. 25G

1	2	3

1 **series:**
ASF = suction strainer

2 **nominal size:** 25, 40, 60, 90, 165, 275

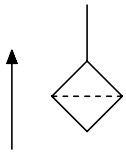
3 **filter-material and filter-fineness:**
25 G = 25 µm, 80 G = 80 µm,
130 G = 130µm stainless steel wire mesh

2. Dimensions:

type	A	B	C	width across	F	weight kg
ASF 25	G ½	117	50	27	250	0,13
ASF 40	G ¾	138	68	36	350	0,24
ASF 60	G 1	195	68	41	750	0,32
ASF 90	G 1 ¼	186	88	50	750	0,40
ASF 165	G 1 ½	199	102	70	1400	0,68
ASF 275	G2	244	102	70	2100	0,75

F = filter surface in cm²

Symbol



Changes of measures and design are subject to alteration!

EDV 05/02

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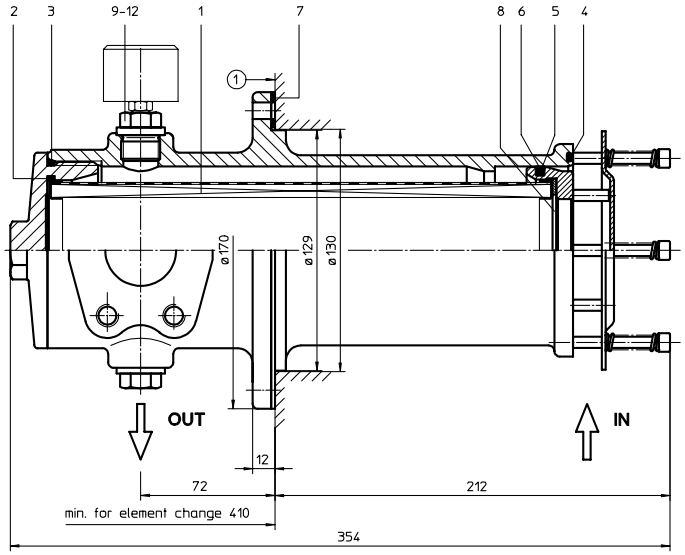
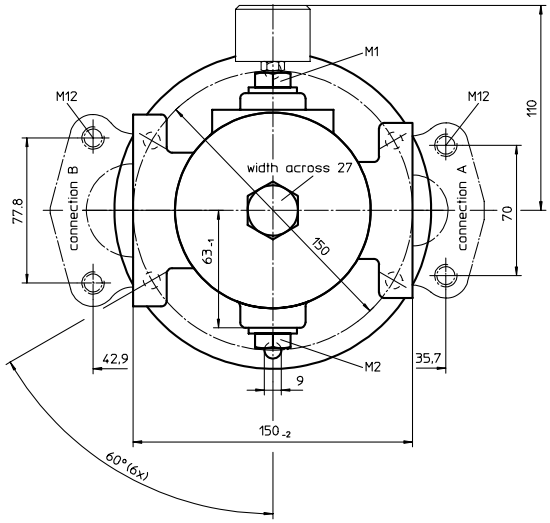
SUCTION FILTER
Series AS 220 DN 40 - 50

Sheet No.
1903 G





1. Type index:

1.1. Complete filter: (ordering example)

AS. 220. 40G. -. B. P. -. FS. 8. -. O1. -

1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
AS = suction filter

2 **nominal size:** 220

3 **filter-material and filter-fineness:**
80 G= 80 µm, 40 G= 40 µm stainless steel wire mesh, other materials on request

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **no. of version:**

version		7	4	8
connection A	**type**	-	FS	FS
	size	-	7	7
connection B	**type**	FS	-	FS
	size	8	-	8

type: FS = SAE-flange 3000 PSI
size: - = no connection
7 = 1 ½ “
8 = 2 “

10 **filter housing specification:**
- = standard

11 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4.-0,25 = pressure switch, see sheet-no. 1616

12 **clogging indicator at M2:**
possible indicators see position 11 of the type index

1.2. Filter element: (ordering example)

01AS. 220. 40G. -. B -. -

1	2	3	4	5	6	7

1 **series:**
01AS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 220

3 - 5 , 7 see type index complete-filter

6 **sealing material:**
- = without

2. Accessories:

- counter flange see sheet-no. 1652

mounting area ①

surface quality 3,2

flatness tolerance ⏥ 0,2

weight: approx. 4,5 kg

Changes of measures and design are subject to alteration!

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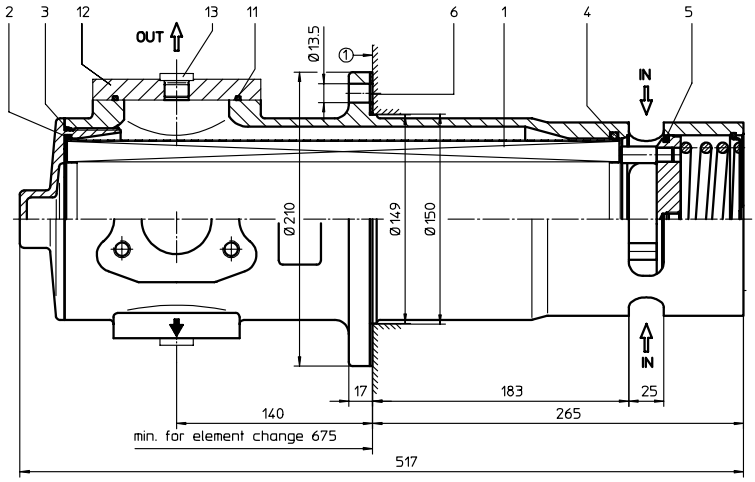
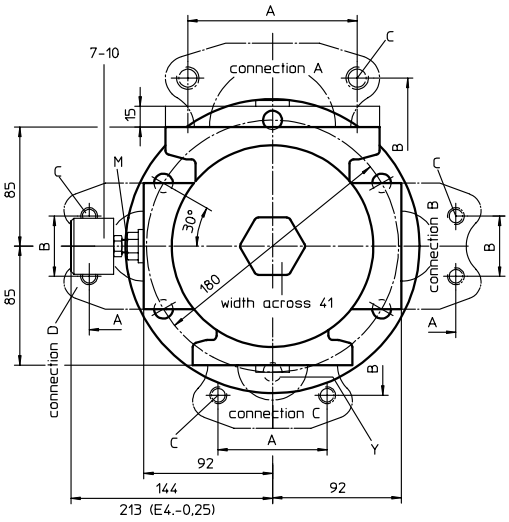
SUCTION FILTER
Series AS 632 DN 50 - 90

Sheet No.
1909 F





1. Type index:

1.1. Complete filter: (ordering example)

AS.	632.	40G.	-.	B.	P.	-.	FS.	11.	-.	O1
1	2	3	4	5	6	7	8	9	10	11

1 **series:**
AS = suction filter

2 **nominal size:** 632

3 **filter-material and filter-fineness:**
80 G= 80 µm, 40 G= 40 µm stainless steel wire mesh, other materials on request

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR); V = Viton (FPM)

7 **filter element specification:**
- = standard; VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **no. of version:**

version		1	5	6	10	11	12	14	21
connection A	**type**	XY	XY	XY	FS	FS	FS	-	FS
	size				A1	A1	A1		A
connection B	**type**	Y	M	M	FS	FS	-	FS	Y
	size				8	9		8	
connection C	**type**	FS	FS	FS	Y	Y	Y	FS	Y
	size	8	9	9				8	
connection D	**type**	FS	FS	-	Y	M	M	FS	FS
	size	8	9					8	8

type: FS = SAE-flange 3000 PSI
M = adapter M18 x 1,5 - R 1/8
Y = drain M18 x 1,5
X = adapter SAE 3“ - M18 x 1,5
- = no connection

size: 8 = 2“
9 = 2 ½“
A = 3“
A1 = 3 ½“

10 **filter housing specification:**
- = standard

11 **clogging indicator:**
- = without
O1 = visual, see sheet-no. 1616
E4.-0,25 = pressure switch, see sheet-no. 1616

1.2. Filter element: (ordering example)

01AS.	631.	40G	-.	B	-.	-
1	2	3	4	5	6	7

1 **series:**
01AS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 631

3 - 5 , 7 see type index-complete filter

6 **sealing material:**
- = without

2. Dimensions:

connection size	2“	2 ½“	3“	3 ½“
dimension A	78	89	106,4	121
dimension B	43	51	62	70
thread C	M12, 18 deep	M12, 18 deep	M16, 22 deep	M16, 22 deep

3. Accessories:

- counter flange, see sheet-no. 1652

mounting area (1)

surface quality 3,2

flatness tolerance ⏥ 0,2

weight: approx. 12 kg

Changes of measures and design are subject to alteration!

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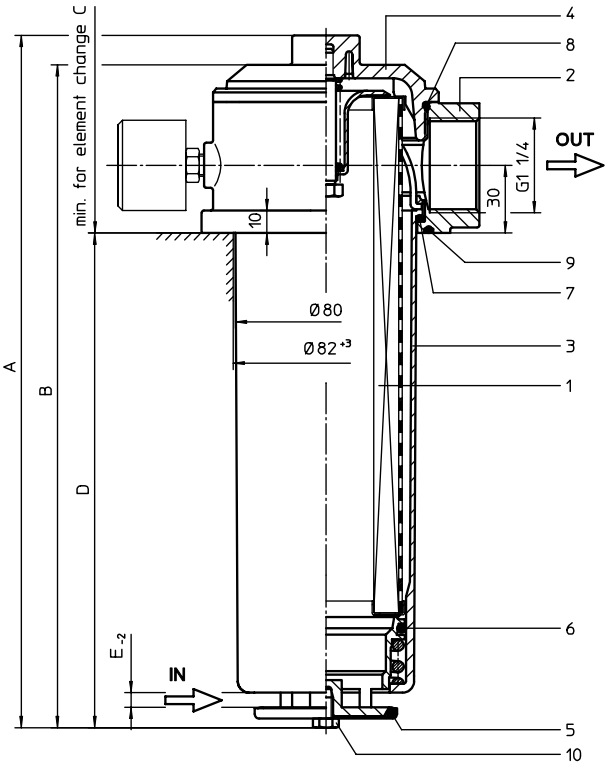
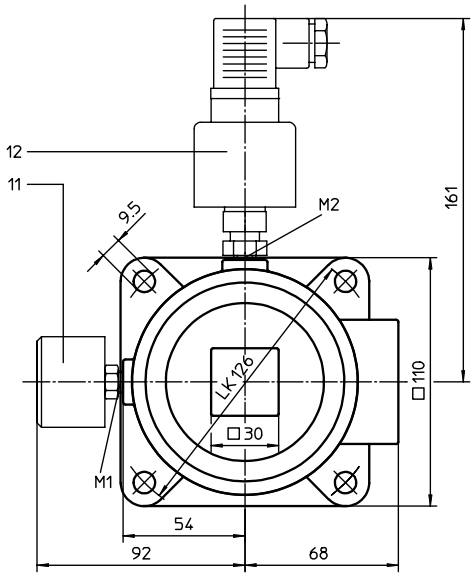
SUCTION FILTER, for vertical tank-mounting
Series TS 210 - 310 DN 32

Sheet No.
1904 H





1. Type index:

1.1. Complete filter: (ordering example)

TS.	210.	10VG.	-.	B.	P.	-.	G.	6.	-.	-.	O1.	E4
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TS = suction filter for vertical tank-mounting

2 **nominal size:** 210, 310

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG= 20 $\mu m_{(c)}$, 16 VG = 16 $\mu m_{(c)}$, 10 VG= 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
6 = G 1¼

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S = with by-pass valve Δp 0,28 bar

12 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS.	210.	10VG.	-.	B.	-.	-
1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 210, 310

3 - 5 , 7 see type index-complete filter

6 **sealing material:**
- = without

2. Dimensions:

type	connection	A	B	C	D	E	weight kg
TS 210	G 1 ¼	307	294	290	219	6,5	2,3
TS 310	G 1 ¼	393	380	375	305	7,5	3,0

Changes of measures and design are subject to alteration!

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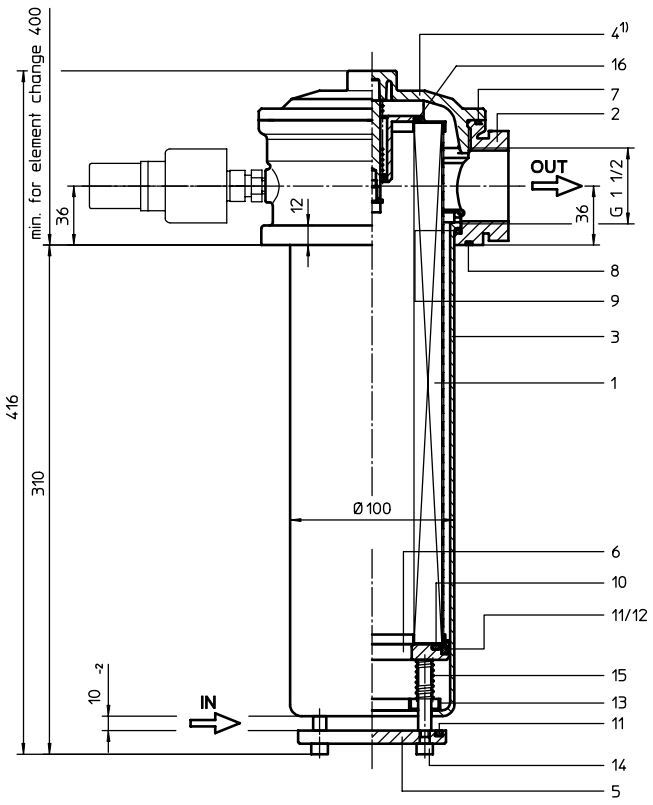
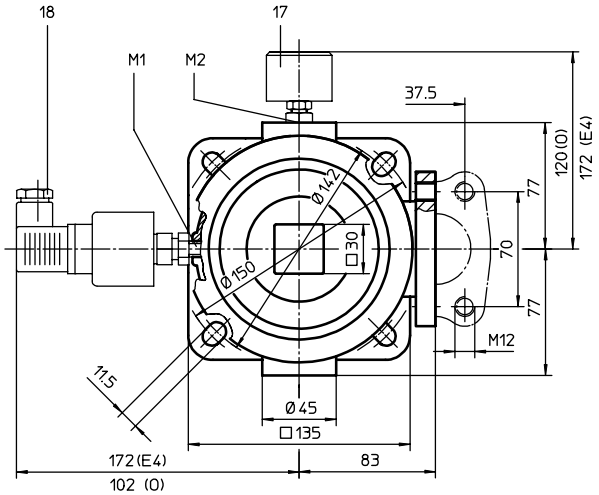
SUCTION FILTER, for vertical tank-mounting
Series TS 426 DN 40

Sheet No.
1908 D





1) The bypass valve is integrated in the screw plug. For the filter without a by-pass valve the opening function is raised up to Δp > 1 bar

1. Type index:

1.1. Complete filter: (ordering example)

TS. 426. 10VG. -. B. P. -. G. 7. -. -. E4. O1

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TS = suction filter for vertical tank-mounting

2 **nominal size:** 426

3 **filter-material and filter-fineness**:
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG= 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
G = thread connection according to DIN 3852, T2
FS = SAE-flange connection 3000 PSI

9 **connection size:**
7 = G 1 ½ or SAE 1 ½"

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S = with by-pass valve Δp 0,28 bar

12 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS. 425. 10VG. -. B. -. -

1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 425

3 - 5 , 7 see type index-complete filter

6 **sealing material:**
- = without

weight: 5,7 kg

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Changes of measures and design are subject to alteration!

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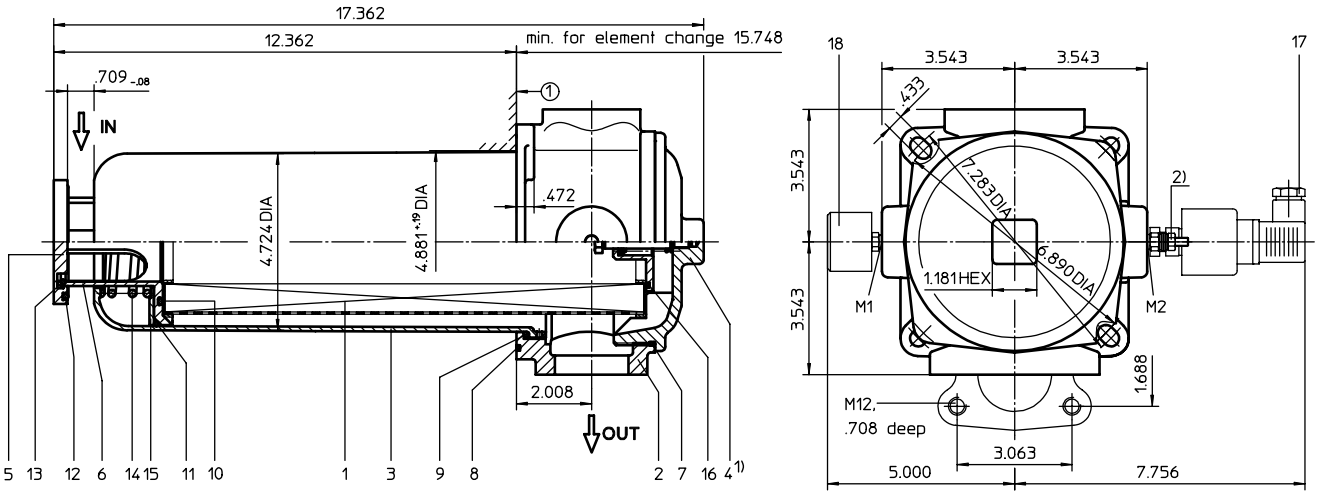
SUCTION FILTER, for horizontal tank-mounting
Series TSW 625

Sheet No.
1911 C



1. Type index:

1.1. Complete filter: (ordering example)

TSW.	625.	10VG.	-.	B.	P.	-.	FS.	8.	-.	-.	O1.	E4
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TSW = suction filter for horizontal tank-mounting

2 **nominal size:** 625

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
8 = 2“

10 **filter element specification:**
- = standard
IS11 = see sheet-no. 40530

11 **internal valve:**
- = without;
S = with by-pass valve Δp 4.1 PSI

12 **measure connection at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616
PA = potential equalisation

13 **measure connection at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS.	625.	10VG.	-.	B.	-.	-
1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 625

3 - 5 , 7 see type index complete filter

6 **sealing material:**
- = without

mounting surface ①

surface quality .12 µin

flatness tolerance ▱ .01”

[1] The by-pass valve is integrated in the screw plug. For the filter without a bypss-valve the opening function is raised up to Δp > 14.5 PSI.

[2] Connection for the potential equalisation, only for application in the explosive area.

weight: approx. 12 lbs.

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Changes of measures and design are subject to alteration!

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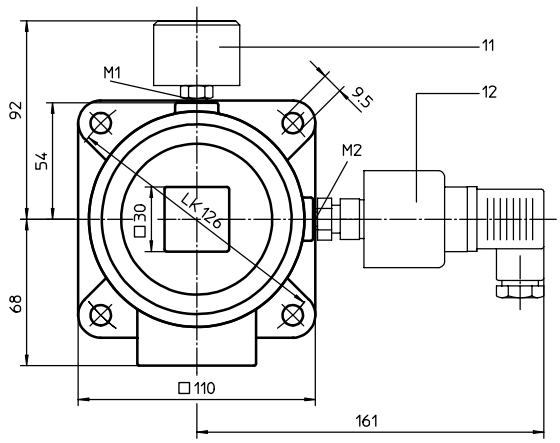
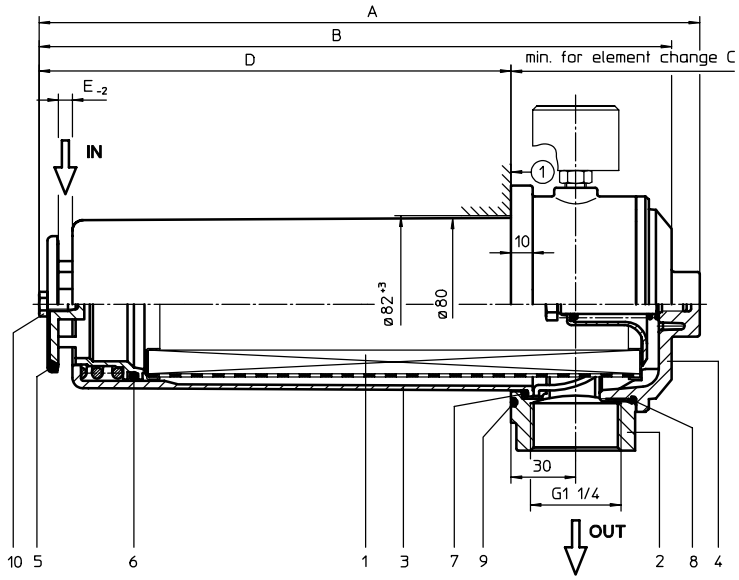
SUCTION FILTER, for horizontal tank-mounting
Series TSW 210-310 DN 32

Sheet No.
1905 G





1. Type index:

1.1. Complete filter: (ordering example)

TSW.	210.	10VG.	-.	B.	P.	-.	G.	6.	-.	-.	O1.	E4
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TS = suction filter for horizontal tank-mounting
W

2 **nominal size**: 210, 310

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG= 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:**
- = standard VA = stainless steel

8 **connection:**
G = thread connection according to DIN 3852, T2

9 **connection size:**
6 = G 1 ¼

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S = with by-pass valve Δp 0,28 bar

12 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS.	210.	10VG.	-.	B.	-.	-
1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 210, 310

3 - 5 , 7 see type index-complete filter

6 **sealing material:**
- = without

2. Dimensions:

type	connection	A	B	C	D	E	weight kg
TSW 210	G 1 ¼	307	294	290	219	6,5	2,3
TSW 310	G 1 ¼	393	380	375	305	7,5	3,0

mounting surface ①

surface quality 3,2

flatness tolerance ⏥ 0,2

weight: approx. 2,7 kg

Changes of measures and design are subject to alteration!

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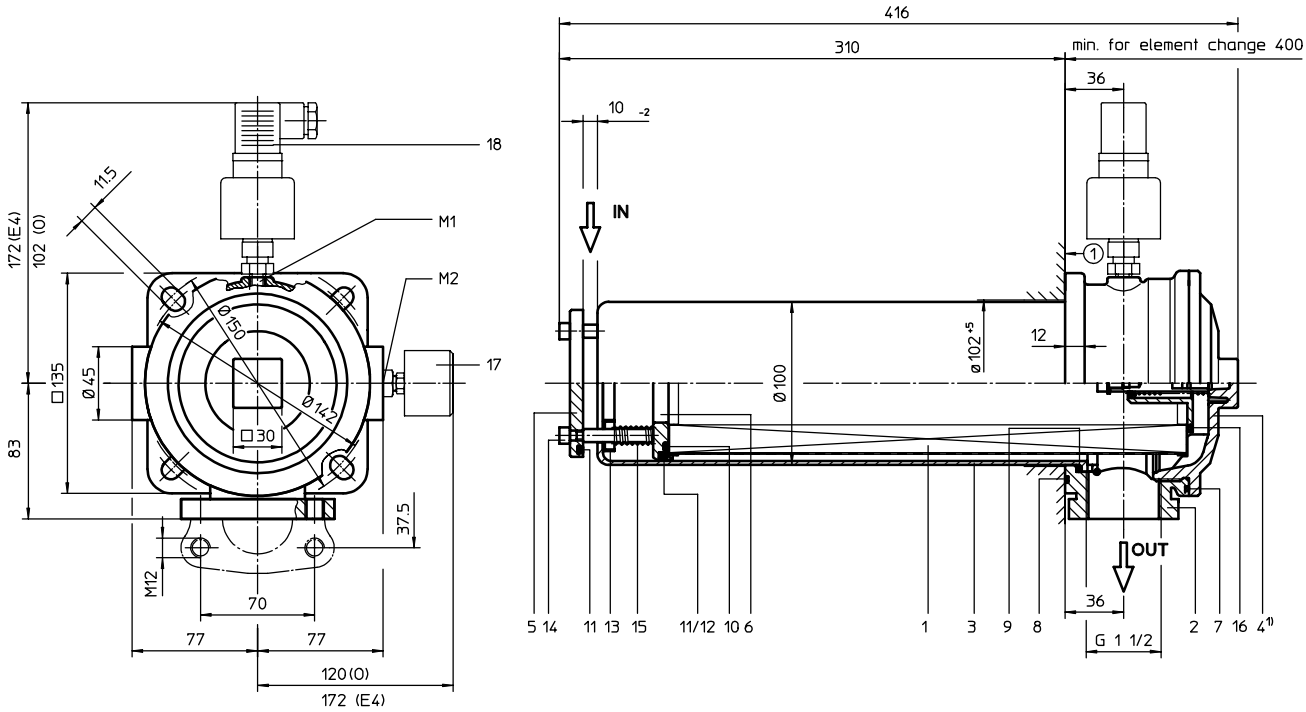
SUCTION FILTER, for horizontal tank-mounting
Series TSW 426 DN 40

Sheet No.
1906 D



1. Type index:

1.1. Complete filter: (ordering example)

TSW. 426. 10VG. -. B. P. -. G. 7. -. -. E4. O1

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TS = suction filter for horizontal tank-mounting
W

2 **nominal size:** 426

3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR) V = Viton (FPM)

7 **filter element specification:**
- = standard VA = stainless steel

8 **connection:**
G = thread connection according to DIN 3852, T2
FS = SAE-flange connection 3000 PSI

9 **connection size:**
7 = G 1 ½ or SAE 1 ½"

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without S = with by-pass valve Δp 0,28 bar

12 **clogging indicator at M1**:
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS. 425. 10VG. -. B. -. -

1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 425

3 - 5 , 7 see type index complete filter

6 **sealing material:**
- = without

mounting surface ①

surface quality 3,2

flatness tolerance ⏥ 0,2

[1] The by-pass valve is integrated in the screw plug. For the filter without a bypss-valve the opening function is raised up to Δp > 1 bar.

weight: 5,7 kg

Changes of measures and design are subject to alteration!

EDV 08/03

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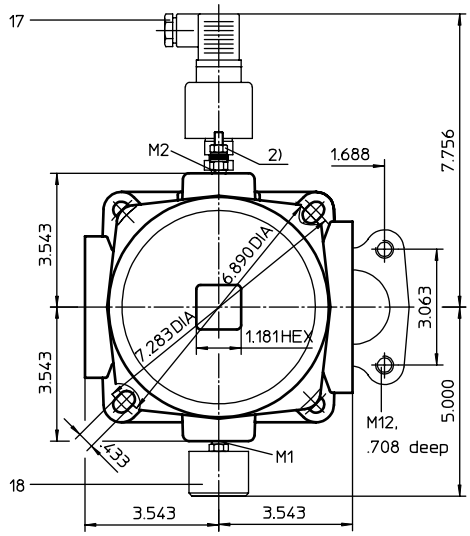
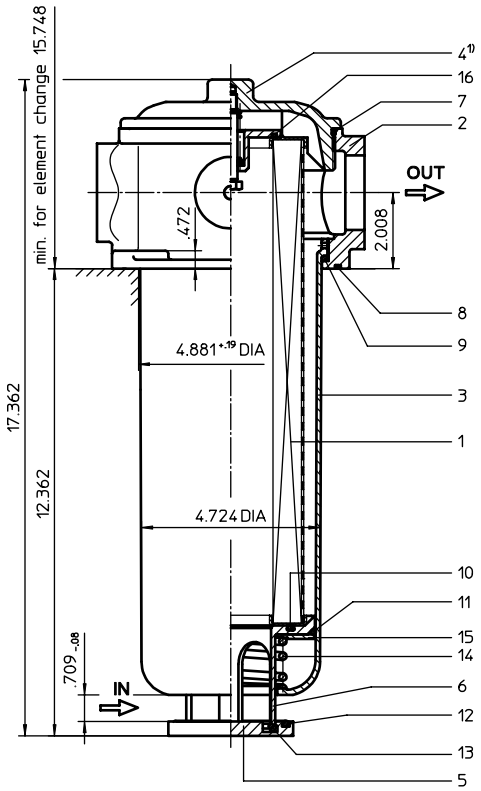
SUCTION FILTER, for vertical tank-mounting
Series TS 625

Sheet No.
1910 C





1) The by-pass valve is integrated in the screw plug. For the filter without a bypss-valve the opening function is raised up to Δp > 14.5 PSI.

2) Connection for the potential equalisation, only for application in the explosive area.

1. Type index:

1.1. Complete filter: (ordering example)

TS. 625. 10VG. -. B. P. -. FS. 8. -. -. O1. E4

1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TS = suction filter for vertical tank-mounting

2 **nominal size:** 625

3 **filter-material and filter-fineness**:
80 G = 80 µm, 40 G = 40 µm,
25 G = 25µm stainless steel wire mesh
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$,
6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)
25 P = 25 µm, 10 P = 10 µm paper

4 **resistance of pressure difference for filter element:**
- = not specified

5 **filter element design:**
B = both sides open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **connection:**
FS = SAE-flange connection 3000 PSI

9 **connection size:**
8 = 2“

10 **filter housing specification:**
- = standard
IS11 = see sheet-no. 40530

11 **internal valve:**
- = without
S = with by-pass valve Δp 4.1 PSI

12 **measure connection at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616
PA = potential equalisation

13 **measure connection at M2:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS. 625. 10VG. -. B. -. -

1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to INTERNORMEN factory specification

2 **nominal size:** 625

3 - 5 , 7 see type index-complete filter

6 **sealing material:**
- = without

weight: approx. 12 lbs.

EDV 08/07

Changes of measures and design are subject to alteration!

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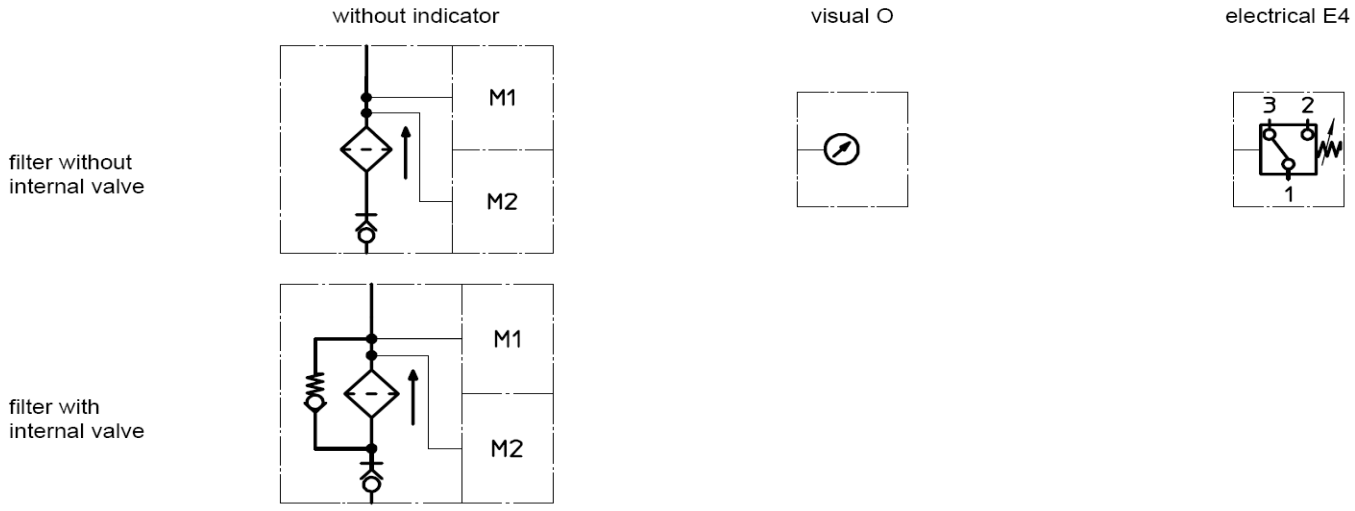
1. Technical data

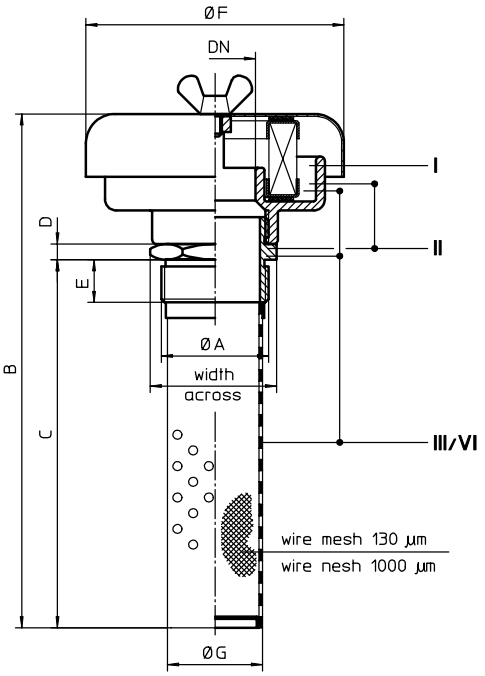
NO	Model	Spare Element		REMARK
		Specification	Q'ty	
1	AS.220	01AS.220	1	No with internal valve
2	AS.632	01AS.631	1	No with internal valve
3	TS.210	01TS.210	1	
4	TS.310	01TS.310	1	
5	TS.426	01TS.425	1	
6	TS.625	01TS.625	1	
7	TSW.210	01TS.210	1	
8	TSW.310	01TS.310	1	
9	TSW.426	01TS.425	1	
10	TSW.625	01TS.625	1	

2. Symbols



BREATHER FILTER
Series NBF, BF - WP

Sheet No.
6000 P



1. Type index:

1.1. Complete filter: (ordering example)

NBF. 25. 3VL. P. G. 5. III. -

1	2	3	4	5	6	7	8

1 **series:**
NBF = breather filter

2 **nominal size:** 25, 40, 55, 85

3 **filter-material and filter-fineness:**
10 P = 10 µm paper
3 VL = filtration efficiency D 100 = 3

4 **sealing material:**
P = Nitrile (NBR); V = Viton (FPM), only for 3VL

5 **connection:**
G = thread connection

6 **connection size:**
5 = G1; 7 = G 1 ½ ; 8 = G2; A = G3

7 **execution:**
I = only breather cap
II = breather cap and thread double nipple
III = complete as shown with filler filter 130 µm
VI = complete as shown with filler filter 1000 µm

8 **tank weld coupling:**
- = without

1.2. Filter element: (ordering example)

01NBF. 25-40. 3VL. P

1	2	3	4

filter element for NBF 25-40

01NBF. 55-85. 3VL. P

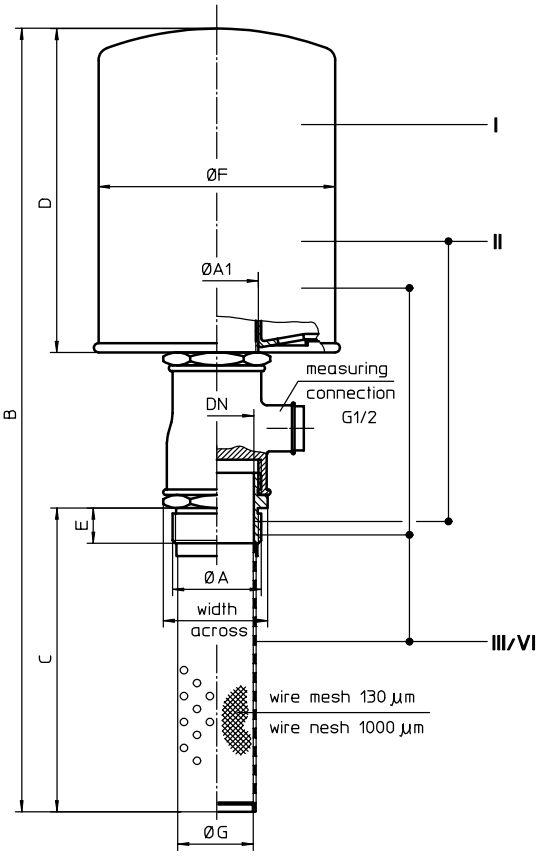
1	2	3	4

filter element for NBF 55-85

2. Dimensions:

type	DN	width across	A	B	C	D	E	F	G	Q in l/min	weight kg
NBF 25	25	41	G 1	186	120	6	18	115	28	450	0,8
NBF 40	40	55	G 1 ½	232	165	7	19	115	42	1150	1,2
NBF 55	50	70	G 2	332	230	7	24	190	54	1800	2,5
NBF 85	80	100	G 3	369	265	9	29	190	82	3500	2,5

Q = flow rate of air l/min, Δp approx. 10 mbar



1. Type index:

1.1. Complete filter: (ordering example)

BF-WP. 90. 10P. P. G. 7. III. -

1	2	3	4	5	6	7	8

1 **series:**
BF-WP = spin on - vent filter

2 **nominal size:** 45, 90

3 **filter-material and filter-fineness:**
10 P = 10 µm paper

4 **sealing material:**
P = Nitrile (NBR)

5 **connection:**
G = thread connection

6 **connection size:**
5 = G1; 7 = G 1 ½

7 **execution:**
I = only breather cap
II = breather cap and thread double nipple
III = complete as shown with a filler filter 130 µm
VI = complete as shown with a filler filter 1000 µm

8 **tank weld coupling:**
- = without

1.2. Filter element: (ordering example)

WP. 90. 10P. P

1	2	3	4

series:
1 WP = spin-on cartridge
2 - 4 see type index-complete filter

2. Dimensions:

type	DN	width across	A	A1	B	C	D	E	F	G	Q in l/min	weight kg
BF-WP 45	25	41	G 1	G ¾	335	120	145	18	92	28	400	0,8
BF-WP 90	40	55	G 1 ½	G 1 ¼	410	165	175	20	128	42	750	1,0

Q = flow rate of air l/min, Δp approx. 10 mbar

Changes of measures and design are subject to alteration!

EDV 02/05

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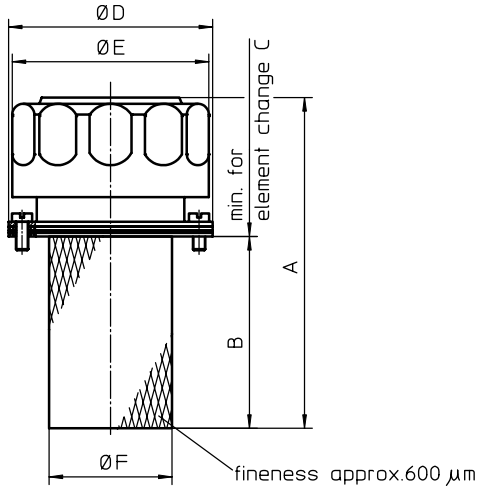
BREATHER FILTER
Series EBF 30 and 50, TBF 3/4, BF

Sheet No.
6002 C2



1. Type index:

1.1. Complete filter: (ordering example)

EBF. 50. 10P. V1

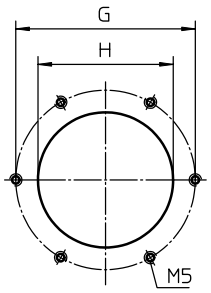
1	2	3	4

1 **series:**
EBF = breather filter

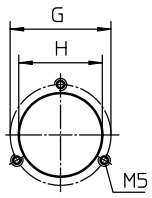
2 **nominal size:** 30, 50

3 **filter-material and filter-fineness:**
10 P = 10 µm paper

4 **internal valve:**
\- = without
V 1 = preload valve 0,35 bar ± 10 %, only for nominal size 50 available



bore draft EBF 50

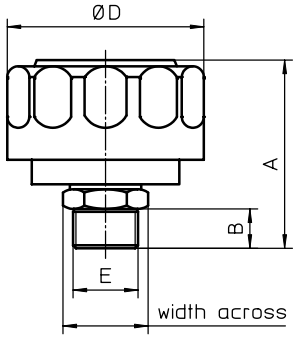


bore draft EBF 30

2. Dimensions:

type	A	B	C	D	E	F	G	H	Q1	Q2	weight kg
EBF 30	111	63	80	52	46	29	41	34	200	300	0,1
EBF 50	134	78	100	83	80	50	73	55	600	1000	0,3

Q1 = air flow rate l/min, with Δp 0,01 bar
Q2 = air flow rate l/min, with Δp 0,03 bar



1. Type index:

1.1. Complete filter: (ordering example)

TBF. 3/4 . 3

1	2	3

1 **series:**
TBF = tank breather filter

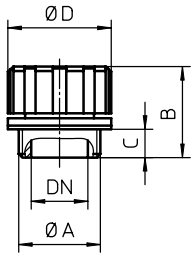
2 **nominal size:** connection G ¾

3 **filter-fineness:**
3 = 3 µm

2. Dimensions:

type	A	B	D	E	width across	Q1	Q2	weight kg
TBF ¾	55	16	80	G ¾ A	35	300	600	0,3

Q1 = air flow rate l/min, with Δp 0,01 bar
Q2 = air flow rate l/min, with Δp 0,03 bar



1. Type index:

1.1. Complete filter: (ordering example)

BF. G1

1	2

1 **series:**
BF = breather filter

2 **connection size:** G ¼, G ½, G1

2. Dimensions:

type	DN	A	B	C	D	Q in l/min
BF G ¼	8	G ¼	30	10	30	70
BF G ½	15	G ½	30	8	31	100
BF G 1	25	G 1	37	10	42	400

Q = flow rate of air l/min, filter-fineness 40 µm

Changes of measures and design are subject to alteration!

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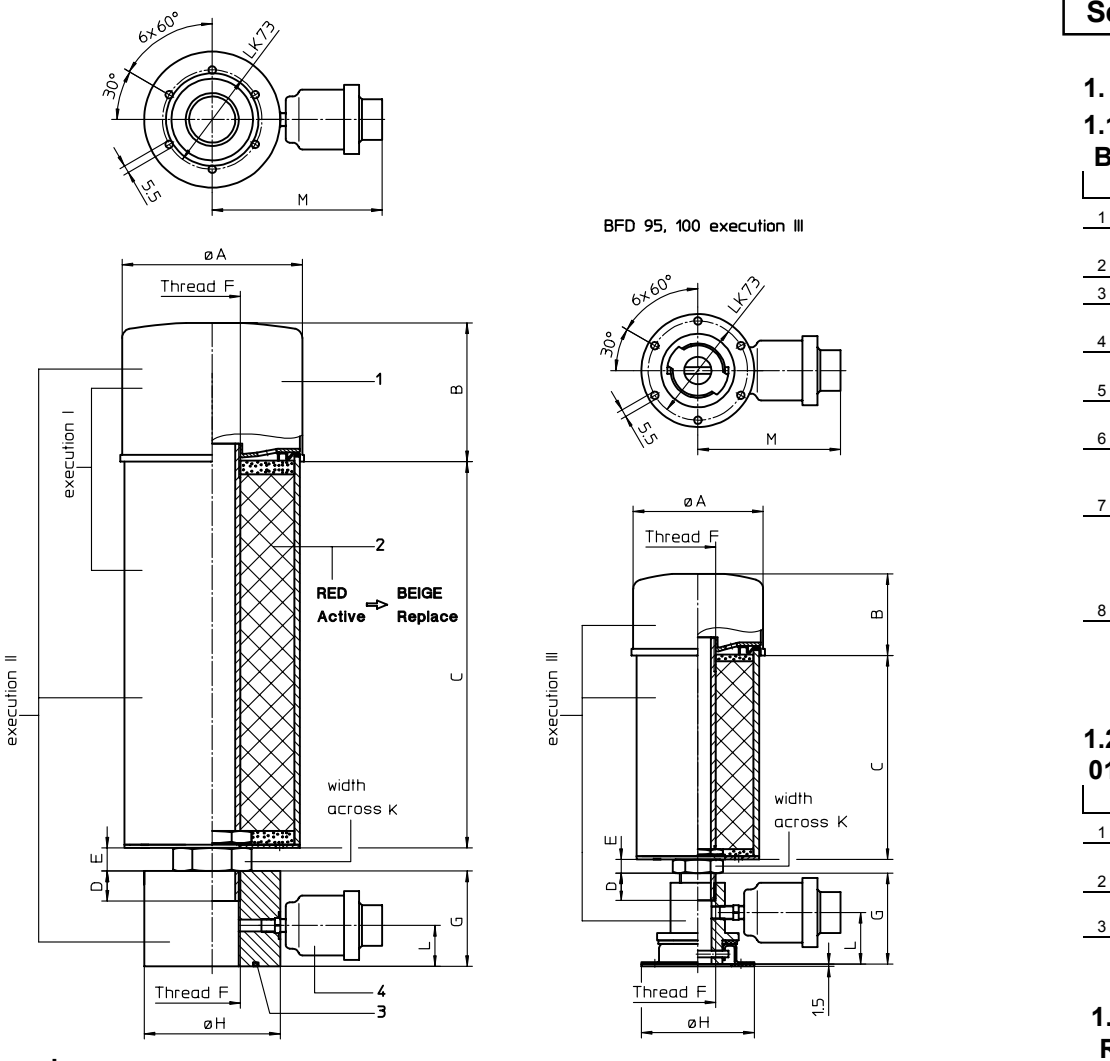
BREATHER FILTER
Series BFD 95-130

Sheet No. **6003 C**

BFD 95, 100, 125, 130 execution II



1. Type index:

1.1. Complete filter: (ordering example)

BFD.	95.	3VL.	P.	G.	4.	II.	FMI
1	2	3	4	5	6	7	8

1 **series:**
BFD = Silicagel Desiccant breather

2 **nominal size:** 95, 100, 125, 130

3 **filter-material and filter-fineness:**
3VL = filtration efficiency D 100 = 3

4 **sealing material:**
P = Nitrile (NBR)

5 **connection:**
G = threaded connection (BSPP)

6 **connection size:**
4 = G ¾ (size 95, 100)
6 = G 1 ¼ (size 125, 130)

7 **execution:**
I = without adapter
II = with adapter AP1 (only for size 95, 100) or with adapter AP2 (only for size 125, 130)
III = with adapter AP3 to retrofit EBF.50 (only for size 95, 100)

8 **clogging indicator:**
- = without
FMI = filter minder (only for execution II and III)

1.2. Filter element: (ordering example)

01WP.	95/100.	3VL.	P
1	2	3	4

1 **series:**
01WP = spin-on cartridge

2 **nominal size:** WP 95/100 (for BFD 95, 100)
WP 125/130 (for BFD 125, 130)

3 - 4 see Type index-complete filter

1.3. Replacement Gel: (ordering example)

RG.	95
1	2

1 **series:**
RG = Replacement Gel

2 **nominal size:** 95, 100, 125, 130

2. Dimensions:

Type	execution	A	B	C	D	E	F	G	H	K	L	M	weight (g)
BFD 95	I	95	60	90	20	10	G ¾	-	-	32	-	-	1150
BFD 100	I			150									1400
BFD 125	I	125	102	145	30	10	G 1 ¼	-	-	50	-	-	3400
BFD 130	I			255									4300
BFD 95	II	95	60	90	20	10	G ¾	50	88	32	30	119	1350
BFD 100	II			150									1600
BFD 125	II	125	102	145	30	10	G 1 ¼	70	100	50	30	125	4600
BFD 130	II			255									5500
BFD 95	III	95	60	90	20	10	G ¾	67	83	32	38	105	1450
BFD 100	III			150									1700

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2. Spare parts:

item	designation	qty.	dimension	article-no.
1	spin-on cartridge	1	01WP....	
2	replacement gel	1	RG....	
3	O-ring	1	47,22 x 3,53	305078 (NBR)
4	clogging indicator	1	FMI	

3. Description:

3.1 Condensation in reservoirs:

When the reservoir breathers, air containing water vapor is ingested into the system. Temperature fluctuations will cause the water vapor to condense. This condensed Water will speed up the oxidation of the oil and lead to damage in the machine. The Catalytic action of metal particles present in the contamination process speeds up Both these processes. The air conditioner first dries the air as it passes through the Silica gel granules and the dry air passes through a 3 micron rated synthetic Media element to remove any solid contamination particles.

The expelled air reaches the atmosphere via the same route but in the opposite direction.

Air Driver - As moistore is absorbed, the silica gel granules will gradually change color from a deep red to beige.
When the granules are beige, replace the silica gel.

3.2 Mounting:

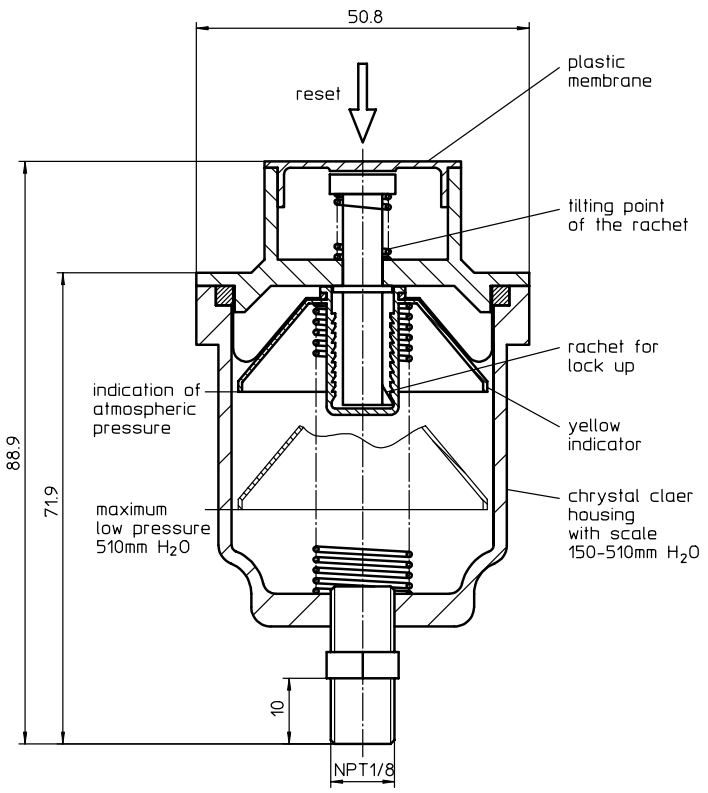
Direct mount onto the reservoir or use an adaptor plate which fits the standard 6-bolt pattern for filler breathers.
Remove protective coverning from silica gel inlet holes before installation.

4. Technical data:

Type	max. Volume flow (m^3/min)	max. hygroscapacity (g)	Silica gel filling weight (g)
BFD 95	0,5	86,5	225
BFD 100	0,5	173	450
BFD 125	1,25	288	750
BFD 130	1,25	576	1500

5. Filter minder: (ordering example)

FMI = filter minder



5.1 Description:

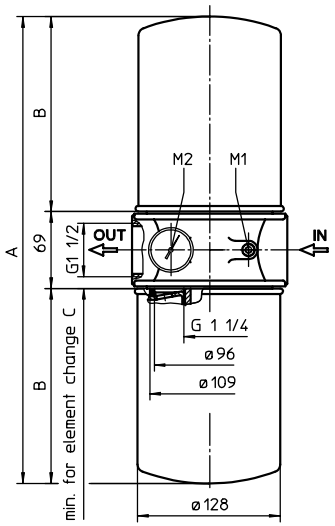
Air Filter -The adaptor plate has a connection for the „filter minder“. This gives a static indic ation of the air breather.
The unit can be reset when the element is Changed.

SPIN-ON FILTER

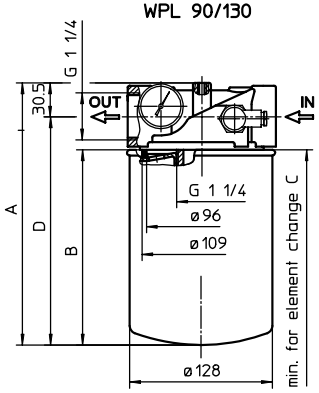
Series WPL 45-260 DN 20-40 PN 10

Sheet No. **9000 M**

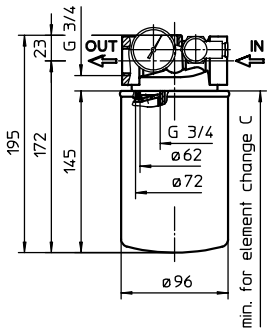
WPL 180/260

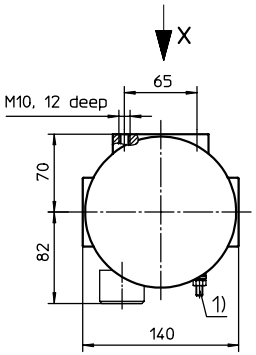


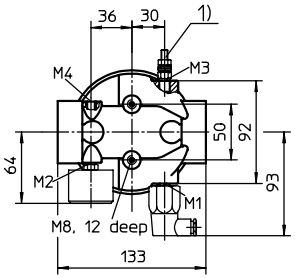
WPL 90/130

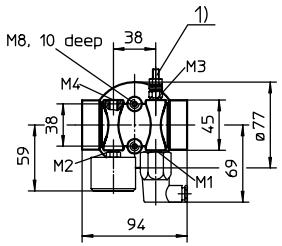


WPL 45

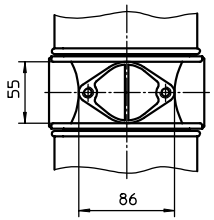








view X



measuring connection M1/M2/M3/M4 = thread R 1/8"

1) connection for the potential equalisation, only for application in the explosive area

Dimensions:

type	A	B	C	D
WPL 90	235	175	195	205
WPL 130	285	225	245	255
WPL 180	419	175	195	-
WPL 260	519	225	245	-

1. Type index:

1.1. Complete filter: (ordering example)

WPL. 90. 10P. R. E1. -. -. -

1	2	3	4	5	6	7	8

1 **series:**
WPL = spin-on filter

2 **nominal size:** 45, 90, 130, 180, 260

3 **filter-fineness and filter-material:**
10 P = 10 µm paper
10 VG = 10 µm(c) Interpor fleece (glass fibre) WPL 45/90/180

4 **internal valve:**
- = without (WPL 45/90/130)
S = by-pass valve suction filter Δp 0,28 bar
R = by-pass valve pressure filter Δp 2,0 bar

5 **measuring connection M1:**
- = without clogging indicator
O = clogging indicator visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616
PA = potential equalisation

6 **measuring connection M2:**
- = without clogging indicator
O1 = clogging indicator visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616
PA = potential equalisation

7 **measuring connection M3:**
possible indicators see position 5 of the type index (WPL 45/90/130)

8 **measuring connection M4:**
possible indicators see position 6 of the type index (WPL 45/90/130)

1.2. Filter element: (ordering example)

WP. 90. 10P

1	2	3

1 **series:**
WP = spin-on cartridge for in-lin filter

2 **nominal size:** 45, 90, 130
WPL 180 = 2x NG 90
WPL 260 = 2x NG 130

3 **filter-fineness and filter-material:**
10 P = 10 µm paper
10 VG = 10 µm(c) Interpor fleece (glass fibre), WPL 45/90/180

2. Description:

In-line filter series WPL and WP-spin-on-cartridges are suitable for an operating pressure up to 10 bar. They are appointed for mounting into pressure lines and return lines. the spin-on-cartridges, e.g. are directly screwed to hydrostatic drives. These series allow an easy maintaining with short operating interruption. After pollution the complete spin-on-cartridges has to be changed. The WPL-filter can alternatively be equiped with pressure switch and/or pressure gauge. The serie can be used for all mineral oils (hydraulic- and lubrication oils).

3. Technical data:

temperature range	- 10 °C to + 110°C
operating medium:	mineral oil, other media on request
max. operating pressure:	10 bar
test pressure:	13 bar
opening pressure by-pass valve for pressure filter:	Δp 2,0 bar
opening pressure by-pass valve for suction filter:	Δp 0,28 bar
pressure switch:	Δp 1,5 bar see sheet-no. 1616
pressure switch:	Δp 0,25 bar see sheet-no. 1616
gaskets:	Nitrile (NBR)

Classified under the Pressure Equipment Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

4. Pressure drop flow curves:

Precise flow rates see 'INT-Expert-System Filter', respectively Δp-curves; depending on filter fineness and viscosity.

5. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
ISO 2942 Verification of fabrication integrity
ISO 2943 Verification of material compatibility with fluids
ISO 3723 Method for end load test
ISO 3724 Verification of flow fatigue characteristics
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

Changes of measures and design are subject to alteration!

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Inhaltsverzeichnis / list of contents

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Artikelnr. Artikelbezeichnung
Ident.no. Designation

2. Abmessungen/Sizes Hydac

2.1 Filterelemente/Filter Elements 02.R..HC

323181	02.0060 R.3VG.30.HC.S.P	0060 R 003 BN HC
324829	02.0060 R.6VG.30.HC.S.P	0060 R 005 BN HC
322642	02.0060 R.10VG.30.HC.S.P	0060 R 010 BN HC
322087	02.0060 R.20VG.30.HC.S.P	0060 R 020 BN HC
323103	02.0060 R.25G.30.HC.S.P	0060 R 025 W HC
1)	02.0060 R MEHRPREIS VITON DICHTUNG	
324832	02.0110 R.3VG.30.HC.S.P	0110 R 003 BN HC
324834	02.0110 R.6VG.30.HC.S.P	0110 R 005 BN HC
322668	02.0110 R.10VG.30.HC.S.P	0110 R 010 BN HC
322085	02.0110 R 20VG.30.HC.S.P	0110 R 020 BN HC
322409	02.0110 R.25G.30.HC.S.P	0110 R 025 W HC
1)	02.0110 R MEHRPREIS VITON DICHTUNG	
310581	02.0160 R.3VG.30.HC.S.P	0160 R 003 BN HC
310584	02.0160 R.6VG.30.HC.S.P	0160 R 005 BN HC
310585	02.0160 R.10VG.30.HC.S.P	0160 R 010 BN HC
310586	02.0160 R.20VG.30.HC.S.P	0160 R 020 BN HC
311039	02.0160 R.25G.30.HC.S.P	0160 R 025 W HC
1)	02.0160 R MEHRPREIS VITON DICHTUNG	
325671	02.0165 R.3VG.30.HC.S.P	0165 R 003 BN HC
324389	02.0165 R.6VG.30.HC.S.P	0165 R 005 BN HC
320121	02.0165 R.10VG.30.HC.S.P	0165 R 010 BN HC
319506	02.0165 R.20VG.30.HC.S.P	0165 R 020 BN HC
324697	02.0165 R.25G.30.HC.S.P	0165 R 025 W HC
1)	02.0165 R MEHRPREIS VITON DICHTUNG	
310591	02.0240 R.3VG.30.HC.S.P	0240 R 003 BN HC
310592	02.0240 R.6VG.30.HC.S.P	0240 R 005 BN HC
310593	02.0240 R.10VG.30.HC.S.P	0240 R 010 BN HC
310594	02.0240 R.20VG.30.HC.S.P	0240 R 020 BN HC
311041	02.0240 R.25G.30.HC.S.P	0240 R 025 W HC
1)	02.0240 R MEHRPREIS VITON DICHTUNG	
307308	02.0330 R.3VG.30.HC.S.P	0330 R 003 BN HC
307309	02.0330 R.6VG.30.HC.S.P	0330 R 005 BN HC
307302	02.0330 R.10VG.30.HC.S.P	0330 R 010 BN HC
307310	02.0330 R.20VG.30.HC.S.P	0330 R 020 BN HC
311043	02.0330 R.25G.30.HC.S.P	0330 R 025 W HC
1)	02.0330 R MEHRPREIS VITON DICHTUNG	
307311	02.0500 R.3VG.30.HC.S.P	0500 R 003 BN HC
307312	02.0500 R.6VG.30.HC.S.P	0500 R 005 BN HC
307215	02.0500 R.10VG.30.HC.S.P	0500 R 010 BN HC
307313	02.0500 R.20VG.30.HC.S.P	0500 R 020 BN HC
311045	02.0500 R.25G.30.HC.S.P	0500 R 025 W HC
1)	02.0500 R MEHRPREIS VITON DICHTUNG	

1) Surplus price: viton sealing

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
307617	02.0660 R.3VG.30.HC.S.P	0660 R 003 BN HC
307618	02.0660 R.6VG.30.HC.S.P	0660 R 005 BN HC
307620	02.0660 R.10VG.30.HC.S.P	0660 R 010 BN HC
307621	02.0660 R.20VG.30.HC.S.P	0660 R 020 BN HC
311047	02.0660 R.25G.30.HC.S.P	0660 R 025 W HC
326614	02.0660 R.50G.30.HC.S.P	0660 R 050 W HC
1)	02.0660 R MEHRPREIS VITON DICHTUNG	
307622	02.0850 R.3VG.30.HC.S.P	0850 R 003 BN HC
307623	02.0850 R.6VG.30.HC.S.P	0850 R 005 BN HC
307624	02.0850 R.10VG.30.HC.S.P	0850 R 010 BN HC
307625	02.0850 R.20VG.30.HC.S.P	0850 R 020 BN HC
311049	02.0850 R.25G.30.HC.S.P	0850 R 025 W HC
1)	02.0850 R MEHRPREIS VITON DICHTUNG	
310573	02.0950 R.3VG.30.HC.S.P	0950 R 003 BN HC
310574	02.0950 R.6VG.30.HC.S.P	0950 R 005 BN HC
310575	02.0950 R.10VG.30.HC.S.P	0950 R 010 BN HC
310576	02.0950 R.20VG.30.HC.S.P	0950 R 020 BN HC
311051	02.0950 R.25G.30.HC.S.P	0950 R 025 W HC
1)	02.0950 R MEHRPREIS VITON DICHTUNG	
310557	02.1300 R.3VG.30.HC.S.P	1300 R 003 BN HC
310558	02.1300 R.6VG.30.HC.S.P	1300 R 005 BN HC
310559	02.1300 R.10VG.30.HC.S.P	1300 R 010 BN HC
310560	02.1300 R.20VG.30.HC.S.P	1300 R 020 BN HC
311053	02.1300 R.25G.30.HC.S.P	1300 R 025 W HC
1)	02.1300 R MEHRPREIS VITON DICHTUNG	
322897	02.1700 R.3VG.30.HC.S.P	1700 R 003 BN HC
322363	02.1700 R.6VG.30.HC.S.P	1700 R 005 BN HC
319011	02.1700 R 10VG.30.HC.S.P	1700 R 010 BN HC
319012	02.1700 R 20VG.30.HC.S.P	1700 R 020 BN HC
	02.1700 R 25G.30.HC.S.P	1700 R 025W HC
1)	02.1700 R MEHRPREIS VITON DICHTUNG	
322788	02.2600 R.3VG.30.HC.S.P	2600 R 003 BN HC
322789	02.2600 R.6VG.30.HC.S.P	2600 R 005 BN HC
315502	02.2600 R.10VG.30.HC.S.P	2600 R 010 BN HC
323912	02.2600 R.20VG.30.HC.S.P	2600 R 020 BN HC
319469	02.2600 R.25G.30.HC.S.P	2600 R 025 W HC
1)	02.2600 R MEHRPREIS VITON DICHTUNG	

1) Surplus price: viton sealing

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	

2.2 Filterelemente/Filter Elements 02.D..HC

305276	02.0060 D.3VG.30.HC.E.P	0060 D 003 BN HC
306002	02.0060 D.3VG.HR.HC.E.P	0060 D 003 BH HC
300400	02.0060 D.6VG.30.HC.E.P	0060 D 005 BN HC
300833	02.0060 D.6VG.HR.HC.E.P	0060 D 005 BH HC
300398	02.0060 D.10VG.30.HC.E.P	0060 D 010 BN HC
300399	02.0060 D.10VG.HR.HC.E.P	0060 D 010 BH HC
300832	02.0060 D.20VG.30.HC.E.P	0060 D 020 BN HC
302192	02.0060 D.20VG.HR.HC.E.P	0060 D 020 BH HC
317991	02.0060 D.25G.30.HC.E.P	0060 D 025 W HC
1)	02.0060 D MEHRPREIS VITON DICHTUNG	
306194	02.0110 D.3VG.30.HC.E.P	0110 D 003 BN HC
300839	02.0110 D.3VG.HR.HC.E.P	0110 D 003 BH HC
303530	02.0110 D.6VG.30.HC.E.P	0110 D 005 BN HC
300405	02.0110 D.6VG.HR.HC.E.P	0110 D 005 BH HC
300403	02.0110 D.10VG.30.HC.E.P	0110 D 010 BN HC
300840	02.0110 D.10VG.HR.HC.E.P	0110 D 010 BH HC
300404	02.0110 D.20VG.30.HC.E.P	0110 D 020 BN HC
300841	02.0110 D.20VG.HR.HC.E.P	0110 D 020 BH HC
323407	02.0110 D.25G.30.HC.E.P	0110 D 25 W HC
1)	02.0110 D MEHRPREIS VITON DICHTUNG	
306199	02.0140 D.3VG.30.HC.E.P	0140 D 003 BN HC
306203	02.0140 D.3VG.HR.HC.E.P	0140 D 003 BH HC
306200	02.0140 D.6VG.30.HC.E.P	0140 D 005 BN HC
306204	02.0140 D.6VG.HR.HC.E.P	0140 D 005 BH HC
303306	02.0140 D.10VG.30.HC.E.P	0140 D 010 BN HC
306334	02.0140 D.10VG.HR.HC.E.P	0140 D 010 BH HC
306202	02.0140 D.20VG.30.HC.E.P	0140 D 020 BN HC
306205	02.0140 D.20VG.HR.HC.E.P	0140 D 020 BH HC
	02.0140 D.25G.30.HC.E.P	0140 D 25 W HC
1)	02.0140 D MEHRPREIS VITON DICHTUNG	
304872	02.0160 D.3VG.30.HC.E.P	0160 D 003 BN HC
300847	02.0160 D.3VG.HR.HC.E.P	0160 D 003 BH HC
300416	02.0160 D.6VG.30.HC.E.P	0160 D 005 BN HC
300417	02.0160 D.6VG.HR.HC.E.P	0160 D 005 BH HC
300848	02.0160 D.10VG.30.HC.E.P	0160 D 010 BN HC
300412	02.0160 D.10VG.HR.HC.E.P	0160 D 010 BH HC
300413	02.0160 D.20VG.30.HC.E.P	0160 D 020 BN HC
300414	02.0160 D.20VG.HR.HC.E.P	0160 D 020 BH HC
324245	02.0160 D.25G.30.HC.E.P	0160 D 025 W HC
1)	02.0160 D MEHRPREIS VITON DICHTUNG	
306211	02.0240 D.3VG.30.HC.E.P	0240 D 003 BN HC
300853	02.0240 D.3VG.HR.HC.E.P	0240 D 003 BH HC
300426	02.0240 D.6VG.30.HC.E.P	0240 D 005 BN HC
306214	02.0240 D.6VG.HR.HC.E.P	0240 D 005 BH HC
300423	02.0240 D.10VG.30.HC.E.P	0240 D 010 BN HC
302841	02.0240 D.10VG.HR.HC.E.P	0240 D 010 BH HC

1) Surplus price: viton sealing

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
300425	02.0240 D.20VG.30.HC.E.P	0240 D 020 BN HC
304431	02.0240 D.20VG.HR.HC.E.P	0240 D 020 BH HC
325077	02.0240 D.25G.30.HC.E.P	0240 D 025 W HC
1)	02.0240 D MEHRPREIS VITON DICHTUNG	
306217	02.0280 D.3VG.30.HC.E.P	0280 D 003 BN HC
306221	02.0280 D.3VG.HR.HC.E.P	0280 D 003 BH HC
306218	02.0280 D.6VG.30.HC.E.P	0280 D 005 BN HC
306222	02.0280 D.6VG.HR.HC.E.P	0280 D 005 BH HC
306219	02.0280 D.10VG.30.HC.E.P	0280 D 010 BN HC
306223	02.0280 D.10VG.HR.HC.E.P	0280 D 010 BH HC
306220	02.0280 D.20VG.30.HC.E.P	0280 D 020 BN HC
306224	02.0280 D.20VG.HR.HC.E.P	0280 D 020 BH HC
	02.0280 D.25G.30.HC.E.P	0280 D 025 W HC
1)	02.0280 D MEHRPREIS VITON DICHTUNG	
300431	02.0330 D.3VG.30.HC.E.P	0330 D 003 BN HC
300861	02.0330 D.3VG.HR.HC.E.P	0330 D 003 BH HC
300864	02.0330 D.6VG.30.HC.E.P	0330 D 005 BN HC
300865	02.0330 D.6VG.HR.HC.E.P	0330 D 005 BH HC
300862	02.0330 D.10VG.30.HC.E.P	0330 D 010 BN HC
300432	02.0330 D.10VG.HR.HC.E.P	0330 D 010 BH HC
300863	02.0330 D.20VG.30.HC.E.P	0330 D 020 BN HC
300433	02.0330 D.20VG.HR.HC.E.P	0330 D 020 BH HC
326 980	02.0330 D.25G.30.HC.E.P	0330 D 025 W HC
1)	02.0330 D MEHRPREIS VITON DICHTUNG	

1) Surplus price: viton sealing

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	
306230	02.0500 D.3VG.30.HC.E.P	0500 D 003 BN HC
306234	02.0500 D.3VG.HR.HC.E.P	0500 D 003 BH HC
306231	02.0500 D.6VG.30.HC.E.P	0500 D 005 BN HC
306235	02.0500 D.6VG.HR.HC.E.P	0500 D 005 BH HC
306232	02.0500 D.10VG.30.HC.E.P	0500 D 010 BN HC
306236	02.0500 D.10VG.HR.HC.E.P	0500 D 010 BH HC
306233	02.0500 D.20VG.30.HC.E.P	0500 D 020 BN HC
306237	02.0500 D.20VG.HR.HC.E.P	0500 D 020 BH HC
306229	02.0500 D.25G.30.HC.E.P	0500 D 025 W HC
1)	02.0500 D MEHRPREIS VITON DICHTUNG	
301800	02.0660 D.3VG.30.HC.E.P	0660 D 003 BN HC
303658	02.0660 D.3VG.HR.HC.E.P	0660 D 003 BH HC
306239	02.0660 D.6VG.30.HC.E.P	0660 D 005 BN HC
300441	02.0660 D.6VG.HR.HC.E.P	0660 D 005 BH HC
300438	02.0660 D.10VG.30.HC.E.P	0660 D 010 BN HC
303305	02.0660 D.10VG.HR.HC.E.P	0660 D 010 BH HC
300439	02.0660 D.20VG.30.HC.E.P	0660 D 020 BN HC
300440	02.0660 D.20VG.HR.HC.E.P	0660 D 020 BH HC
319747	02.0660 D.25G.30.HC.E.P	0660 D 025 W HC
1)	02.0660 D MEHRPREIS VITON DICHTUNG	
*	02.0990 D.3VG.30.HC.E.P	0990 D 003 BN HC
*	02.0990 D.3VG.HR.HC.E.P	0990 D 003 BH HC
*	02.0990 D.6VG.30.HC.E.P	0990 D 005 BN HC
*	02.0990 D.6VG.HR.HC.E.P	0990 D 005 BH HC
*	02.0990 D.10VG.30.HC.E.P	0990 D 010 BN HC
*	02.0990 D.10VG.HR.HC.E.P	0990 D 010 BH HC
*	02.0990 D.20VG.30.HC.E.P	0990 D 020 BN HC
*	02.0990 D.20VG.HR.HC.E.P	0990 D 020 BH HC
*	02.0990 D.25G.30.HC.E.P	0990 D 025 W HC
1)	02.0990 D MEHRPREIS VITON DICHTUNG	

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	
	02.1320 D.3VG.30.HC.E.P	1320 D 003 BN HC
321741	02.1320 D.3VG.HR.HC.E.P	1320 D 003 BH HC
	02.1320 D.6VG.30.HC.E.P	1320 D 005 BN HC
	02.1320 D.6VG.HR.HC.E.P	1320 D 005 BH HC
	02.1320 D.10VG.30.HC.E.P	1320 D 010 BN HC
321740	02.1320 D.10VG.HR.HC.E.P	1320 D 010 BH HC
	02.1320 D.20VG.30.HC.E.P	1320 D 020 BN HC
	02.1320 D.20VG.HR.HC.E.P	1320 D 020 BH HC
	02.1320 D.25G.30.HC.E.P	1320 D 025 W HC
1)	02.1320 D MEHRPREIS VITON DICHTUNG	

2.3 Filterelemente/Filter Elements 02.RN..HC

317483	01.NR 63.3VG.10.B.P.-	0063 RN 003 BN HC
317484	01.NR 63.6VG.10.B.P.-	0063 RN 005 BN HC
314218	01.NR 63.10VG.10.B.P.-	0063 RN 010 BN HC
312792	01.NR 63.25VG.10.B.P.-	0063 RN 025 BN HC
1)	01.NR 63 MEHRPREIS VITON DICHTUNG	
2)	01.NR 63 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

317487	01.NR 100.3VG.10.B.P.-	0100 RN 003 BN HC
316886	01.NR 100.6VG.10.B.P.-	0100 RN 005 BN HC
313167	01.NR 100.10VG.10.B.P.-	0100 RN 010 BN HC
312504	01.NR 100.25VG.10.B.P.-	0100 RN 025 BN HC
1)	01.NR 100 MEHRPREIS VITON DICHTUNG	
2)	01.NR 100 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

314485	01.NR 160.3VG.10.B.P.-	0160 RN 003 BN HC
314486	01.NR 160.6VG.10.B.P.-	0160 RN 005 BN HC
314220	01.NR 160.10VG.10.B.P.-	0160 RN 010 BN HC
314449	01.NR 160.25VG.10.B.P.-	0160 RN 025 BN HC
1)	01.NR 160 MEHRPREIS VITON DICHTUNG	
2)	01.NR 160 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

Artikelnr. Ident.no.	Artikelbezeichnung Designation		
314491	01.NR 250.3VG.10.B.P.-	0250 RN 003 BN HC	
314492	01.NR 250.6VG.10.B.P.-	0250 RN 005 BN HC	
314191	01.NR 250.10VG.10.B.P.-	0250 RN 010 BN HC	
314454	01.NR 250.25VG.10.B.P.-	0250 RN 025 BN HC	
1)	01.NR 250 MEHRPREIS VITON DICHTUNG		
2)	01.NR 250 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
317489	01.NR 400.3VG.10.B.P.-	0400 RN 003 BN HC	
314817	01.NR 400.6VG.10.B.P.-	0400 RN 005 BN HC	
314870	01.NR 400.10VG.10.B.P.-	0400 RN 010 BN HC	
317492	01.NR 400.25VG.10.B.P.-	0400 RN 025 BN HC	
1)	01.NR 400 MEHRPREIS VITON DICHTUNG		
2)	01.NR 400 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
304533	01.NR 630.3VG.10.B.P.-	0630 RN 003 BN HC	
304534	01.NR 630.6VG.10.B.P.-	0630 RN 005 BN HC	
304535	01.NR 630.10VG.10.B.P.-	0630 RN 010 BN HC	
305036	01.NR 630.25VG.10.B.P.-	0630 RN 025 BN HC	
1)	01.NR 630 MEHRPREIS VITON DICHTUNG		
2)	01.NR 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
306604	01.NR 1000.3VG.10.B.P.-	1000 RN 003 BN HC	
305449	01.NR 1000.6VG.10.B.P.-	1000 RN 005 BN HC	
306605	01.NR 1000.10VG.10.B.P.-	1000 RN 010 BN HC	
306606	01.NR 1000.25VG.10.B.P.-	1000 RN 025 BN HC	
1)	01.NR 1000 MEHRPREIS VITON DICHTUNG		
2)	01.NR 1000 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. Artikelbezeichnung
Ident.no. Designation

2.4 Filterelemente/Filter Elements 02.DN..HC

312621	01.NL 40.3VG.30.E.P.-	0040 DN 003 BN HC
313873	01.NL 40.3VG.HR.E.P.-	0040 DN 003 BH HC
312623	01.NL 40.6VG.30.E.P.-	0040 DN 005 BN HC
312884	01.NL 40.6VG.HR.E.P.-	0040 DN 005 BH HC
311433	01.NL 40.10VG.30.E.P.-	0040 DN 010 BN HC
312299	01.NL 40.10VG.HR.E.P.-	0040 DN 010 BH HC
312542	01.NL 40.25VG.30.E.P.-	0040 DN 025 BN HC
314169	01.NL 40.25VG.HR.E.P.-	0040 DN 025 BH HC
1)	01.NL 40 MEHRPREIS VITON DICHTUNG	
2)	01.NL 40 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

312636	01.NL 63.3VG.30.E.P.-	0063 DN 003 BN HC
316536	01.NL 63.3VG.HR.E.P.-	0063 DN 003 BH HC
312637	01.NL 63.6VG.30.E.P.-	0063 DN 005 BN HC
317323	01.NL 63.6VG.HR.E.P.-	0063 DN 005 BH HC
311365	01.NL 63.10VG.30.E.P.-	0063 DN 010 BN HC
311487	01.NL 63.10VG.HR.E.P.-	0063 DN 010 BH HC
311571	01.NL 63.25VG.30.E.P.-	0063 DN 025 BN HC
315123	01.NL 63.25VG.HR.E.P.-	0063 DN 025 BH HC
1)	01.NL 63 MEHRPREIS VITON DICHTUNG	
2)	01.NL 63 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

312649	01.NL 100.3VG.30.E.P.-	0100 DN 003 BN HC
312797	01.NL 100.3VG.HR.E.P.-	0100 DN 003 BH HC
312651	01.NL 100.6VG.30.E.P.-	0100 DN 005 BN HC
313670	01.NL 100.6VG.HR.E.P.-	0100 DN 005 BH HC
311574	01.NL 100.10VG.30.E.P.-	0100 DN 010 BN HC
312301	01.NL 100.10VG.HR.E.P.-	0100 DN 010 BH HC
312653	01.NL 100.25VG.30.E.P.-	0100 DN 025 BN HC
301752	01.NL 100.25VG.HR.E.P.-	0100 DN 025 BH HC
1)	01.NL 100 MEHRPREIS VITON DICHTUNG	
2)	01.NL 100 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

Vergleichsliste Filterelemente
Cross Reference List Filter - Elements

Artikelnr. / Ident.no.	Artikelbezeichnung / Designation		
300784	01.NL 250.3VG.30.E.P.-	0250 DN 003 BN HC	
300790	01.NL 250.6VG.30.E.P.-	0250 DN 005 BN HC	
300367	01.NL 250.10VG.30.E.P.-	0250 DN 010 BN HC	
301900	01.NL 250.25VG.30.E.P.-	0250 DN 025 BN HC	
1)	01.NL 250 MEHRPREIS VITON DICHTUNG		
2)	01.NL 250 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
307250	01.NL 400.3VG.30.E.P.-	0400 DN 003 BN HC	
311449	01.NL 400.3VG.HR.E.P.-	0400 DN 003 BH HC	
307251	01.NL 400.6VG.30.E.P.-	0400 DN 005 BN HC	
311448	01.NL 400.6VG.HR.E.P.-	0400 DN 005 BH HC	
307252	01.NL 400.10VG.30.E.P.-	0400 DN 010 BN HC	
312800	01.NL 400.10VG.HR.E.P.-	0400 DN 010 BH HC	
307255	01.NL 400.25VG.30.E.P.-	0400 DN 025 BN HC	
314880	01.NL 400.25VG.HR.E.P.-	0400 DN 025 BH HC	
1)	01.NL 400 MEHRPREIS VITON DICHTUNG		
2)	01.NL 400 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
300371	01.NL 630.3VG.30.E.P.-	0630 DN 003 BN HC	
300795	01.NL 630.6VG.30.E.P.-	0630 DN 005 BN HC	
300791	01.NL 630.10VG.30.E.P.-	0630 DN 010 BN HC	
300792	01.NL 630.25VG.30.E.P.-	0630 DN 025 BN HC	
1)	01.NL 630 MEHRPREIS VITON DICHTUNG		
2)	01.NL 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr.	Artikelbezeichnung	
Ident.no.	Designation	

3. Abmessungen/Sizes EPE

3.1 Filterelemente/Filter Elements 03.1.56...03.1.1801

306379	03.1.56.3VG.16.B.O	1.56 H 3 SL
306380	03.1.56.6VG.16.B.O	1.56 H 6 SL
303721	03.1.56.10VG.16.B.O	1.56 H 10 SL
300448	03.1.56.25VG.16.B.O	1.56 H 20 SL
300449	03.1.56.25G.16.B.O	1.56 G 25
300884	03.1.56.40G.16.B.O	1.56 G 40
306377	03.1.56.60G.16.B.O	1.56 G 60
300450	03.1.56.100G.16.B.O	1.56 G 100
306381	03.1.90.3VG.16.B.O	1.90 H 3 SL
306382	03.1.90.6VG.16.B.O	1.90 H 6 SL
304548	03.1.90.10VG.16.B.O	1.90 H 10 SL
303736	03.1.90.25VG.16.B.O	1.90 H 20 SL
300885	03.1.90.25G.16.B.O	1.90 G 25
300451	03.1.90.40G.16.B.O	1.90 G 40
300886	03.1.90.60G.16.B.O	1.90 G 60
300887	03.1.90.100G.16.B.O	1.90 G 100
306385	03.1.140.3VG.16.B.O	1.140 H 3 SL
306386	03.1.140.6VG.16.B.O	1.140 H 6 SL
302098	03.1.140.10VG.16.B.O	1.140 H 10 SL
306387	03.1.140.25VG.16.B.O	1.140 H 20 SL
300888	03.1.140.25G.16.B.O	1.140 G 25
300452	03.1.140.40G.16.B.O	1.140 G 40
306383	03.1.140.60G.16.B.O	1.140 G 60
300453	03.1.140.100G.16.B.O	1.140 G 100
306390	03.1.225.3VG.16.B.O	1.225 H 3 SL
306391	03.1.225.6VG.16.B.O	1.225 H 6 SL
300454	03.1.225.10VG.16.B.O	1.225 H 10 SL
303275	03.1.225.25VG.16.B.O	1.225 H 20 SL
300455	03.1.225.25G.16.B.O	1.225 G 25
302229	03.1.225.40G.16.B.O	1.225 G 40
306388	03.1.225.60G.16.B.O	1.225 G 60
300889	03.1.225.100G.16.B.O	1.225 G 100
319249	03.1.361.3VG.16.B.P	1.361 H 3 SL
321246	03.1.361.6VG.16.B.P	1.361 H 6 SL
314527	03.1.361.10VG.16.B.P	1.361 H 10 SL
321206	03.1.361.25VG.16.B.P	1.361 H 20 SL
317535	03.1.361.25G.16.B.P	1.361 G 25
323658	03.1.361.40G.16.B.P	1.361 G 40
	03.1.361.60G.16.B.P	1.361 G 60
323086	03.1.361.100G.16.B.P	1.361 G 100
[1)]	03.1.361 MEHRPREIS VITON DICHTUNG	

1) Surplus price: viton sealing

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
323368	03.1.561.3VG.16.B.P	1.561 H 3 SL
	03.1.561.6VG.16.B.P	1.561 H 6 SL
323819	03.1.561.10VG.16.B.P	1.561 H 10 SL
325169	03.1.561.25VG.16.B.P	1.561 H 20 SL
321098	03.1.561.25G.16.B.P	1.561 G 25
314524	03.1.561.40G.16.B.P	1.561 G 40
321873	03.1.561.60G.16.B.P	1.561 G 60
315407	03.1.561.100G.16.B.P	1.561 G 100
[1)]	03.1.561 MEHRPREIS VITON DICHTUNG	
	03.1.901.3VG.16.B.P	1.901 H 3 SL
316638	03.1.901.6VG.16.B.P	1.901 H 6 SL
311596	03.1.901.10VG.16.B.P	1.901 H 10 SL
317207	03.1.901.25VG.16.B.P	1.901 H 20 SL
319450	03.1.901.25G.16.B.P	1.901 G 25
312528	03.1.901.40G.16.B.P	1.901 G 40
312529	03.1.901.60G.16.B.P	1.901 G 60
312530	03.1.901.100G.16.B.P	1.901 G 100
[1)]	03.1.901 MEHRPREIS VITON DICHTUNG	
322812	03.1.1401.3VG.16.B.P	1.1401 H 3 SL
312076	03.1.1401.6VG.16.B.P	1.1401 H 6 SL
316656	03.1.1401.10VG.16.B.P	1.1401 H 10 SL
305404	03.1.1401.25VG.16.B.P	1.1401 H 20 SL
317437	03.1.1401.25G.16.B.P	1.1401 G 25
317598	03.1.1401.40G.16.B.P	1.1401 G 40
317980	03.1.1401.60G.16.B.P	1.1401 G 60
321591	03.1.1401.100G.16.B. P	1.1401 G 100
[1)]	03.1.1401 MEHRPREIS VITON DICHTUNG	
320300	03.1.1801.3VG.16.B.P	1.1801 H 3 SL
318820	03.1.1801.6VG.16.B.P	1.1801 H 6 SL
316301	03.1.1801.10VG.16.B.P	1.1801 H 10 SL
312270	03.1.1801.25VG.16.B.P	1.1801 H 20 SL
314228	03.1.1801.25G.16.B.P	1.1801 G 25
318837	03.1.1801.40G.16.B.P	1.1801 G 40
322748	03.1.1801.60G.16.B.P	1.1801 G 60
	03.1.1801.100G.16.B.P	1.1801 G 100
[1)]	03.1.1801 MEHRPREIS VITON DICHTUNG	

3.2 Filterelemente/Filter Elements 03.2.56...03.2.900

306338	03.2.56.3VG.16.E.P	2.56 H 3 SL
306339	03.2.56.6VG.16.E.P	2.56 H 6 SL
300476	03.2.56.10VG.16.E.P	2.56 H 10 SL
304957	03.2.56.25VG.16.E.P	2.56 H 20 SL
300477	03.2.56.25G.16.E.P	2.56 G 25
300478	03.2.56.40G.16.E.P	2.56 G 40
300906	03.2.56.60G.16.E.P	2.56 G 60
300479	03.2.56.100G.16.E.P	2.56 G 100
[1)]	03.2.56 MEHRPREIS VITON DICHTUNG	

1) Surplus price: viton sealing

Artikelnr. / Ident.no.	Artikelbezeichnung / Designation	
306340	03.2.90.3VG.16.E.P	2.90 H 3 SL
300907	03.2.90.6VG.16.E.P	2.90 H 6 SL
300480	03.2.90.10VG.16.E.P	2.90 H 10 SL
300482	03.2.90.25VG.16.E.P	2.90 H 20 SL
300483	03.2.90.25G.16.E.P	2.90 G 25
300484	03.2.90.40G.16.E.P	2.90 G 40
300485	03.2.90.60G.16.E.P	2.90 G 60
300486	03.2.90.100G.16.E.P	2.90 G 100
1)	03.2.90 MEHRPREIS	VITON DICHTUNG
300908	03.2.140.3VG.16.E.P	2.140 H 3 SL
300912	03.2.140.6VG.16.E.P	2.140 H 6 SL
300487	03.2.140.10VG.16.E.P	2.140 H 10 SL
300910	03.2.140.25VG.16.E.P	2.140 H 20 SL
300488	03.2.140.25G.16.E.P	2.140 G 25
300911	03.2.140.40G.16.E.P	2.140 G 40
300491	03.2.140.60G.16.E.P	2.140 G 60
300492	03.2.140.100G.16.E.P	2.140 G 100
1)	03.2.140 MEHRPREIS	VITON DICHTUNG
300493	03.2.225.3VG.16.E.P	2.225 H 3 SL
306341	03.2.225.6VG.16.E.P	2.225 H 6 SL
300913	03.2.225.10VG.16.E.P	2.225 H 10 SL
300914	03.2.225.25VG.16.E.P	2.225 H 20 SL
300495	03.2.225.25G.16.E.P	2.225 G 25
300497	03.2.225.40G.16.E.P	2.225 G 40
300498	03.2.225.60G.16.E.P	2.225 G 60
300499	03.2.225.100G.16.E.P	2.225 G 100
1)	03.2.225 MEHRPREIS	VITON DICHTUNG
306342	03.2.360.3VG.16.E.P	2.360 H 3 SL
306343	03.2.360.6VG.16.E.P	2.360 H 6 SL
300500	03.2.360.10VG.16.E.P	2.360 H 10 SL
300919	03.2.360.25VG.16.E.P	2.360 H 20 SL
300502	03.2.360.25G.16.E.P	2.360 G 25
300920	03.2.360.40G.16.E.P	2.360 G 40
300921	03.2.360.60G.16.E.P	2.360 G 60
300922	03.2.360.100G.16.E.P	2.360 G 100
1)	03.2.360 MEHRPREIS	VITON DICHTUNG
306349	03.2.460.3VG.16.E.P	2.460 H 3 SL
306350	03.2.460.6VG.16.E.P	2.460 H 6 SL
304958	03.2.460.10VG.16.E.P	2.460 H 10 SL
306351	03.2.460.25VG.16.E.P	2.460 H 20 SL
306347	03.2.460.25G.16.E.P	2.460 G 25
306346	03.2.460.40G.16.E.P	2.460 G 40
306345	03.2.460.60G.16.E.P	2.460 G 60
306344	03.2.460.100G.16.E.P	2.460 G 100
1)	03.2.460 MEHRPREIS	VITON DICHTUNG

1) Surplus price: viton sealing

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	
306356	03.2.560.3VG.16.E.P	2.560 H 3 SL
306357	03.2.560.6VG.16.E.P	2.560 H 6 SL
300503	03.2.560.10VG.16.E.P	2.560 H 10 SL
303274	03.2.560.25VG.16.E.P	2.560 H 20 SL
303276	03.2.560.25G.16.E.P	2.560 G 25
305275	03.2.560.40G.16.E.P	2.560 G 40
306353	03.2.560.60G.16.E.P	2.560 G 60
306352	03.2.560.100G.16.E.P	2.560 G 100
[1)]	03.2.560 MEHRPREIS VITON DICHTUNG	
300923	03.2.900.3VG.16.E.P	2.900 H 3 SL
306362	03.2.900.6VG.16.E.P	2.900 H 6 SL
305860	03.2.900.10VG.16.E.P	2.900 H 10 SL
306363	03.2.900.25VG.16.E.P	2.900 H 20 SL
300504	03.2.900.25G.16.E.P	2.900 G 25
306360	03.2.900.40G.16.E.P	2.900 G 40
306359	03.2.900.60G.16.E.P	2.900 G 60
306358	03.2.900.100G.16.E.P	2.900 G 100
[1)]	03.2.900 MEHRPREIS VITON DICHTUNG	

3.3 Filterelemente/Filter Elements 03.RL...

306429	03.RL 65.3VG.16.E.O	RL65 H 3 SL
306430	03.RL 65.6VG.16.E.O	RL65 H 6 SL
306431	03.RL 65.10VG.16.E.O	RL65 H 10 SL
306432	03.RL 65.25VG.16.E.O	RL65 H 20 SL
300506	03.RL 65.25G.16.S.O	RL65 G 25
300925	03.RL 65.40G.16.S.O	RL65 G 40
300926	03.RL 65.60G.16.S.O	RL65 G 60
300507	03.RL 65.100G.16.S.O	RL65 G 100
306433	03.RL 85.3VG.16.E.O	RL85 H 3 SL
306434	03.RL 85.6VG.16.E.O	RL85 H 6 SL
306435	03.RL 85.10VG.16.E.O	RL85 H 10 SL
300931	03.RL 85.25VG.16.E.O	RL85 H 20 SL
300508	03.RL 85.25G.16.S.O	RL85 G 25
300934	03.RL 85.40G.16.S.O	RL85 G 40
300509	03.RL 85.60G.16.S.O	RL85 G 60
303217	03.RL 85.100G.16.S.O	RL85 G 100
306436	03.RL 125.3VG.16.E.O	RL125 H 3 SL
306437	03.RL 125.6VG.16.E.O	RL125 H 6 SL
302167	03.RL 125.10VG.16.E.O	RL125 H 10 SL
306438	03.RL 125.25VG.16.E.O	RL125 H 20 SL
300510	03.RL 125.25G.16.S.O	RL125 G 25
300939	03.RL 125.40G.16.S.O	RL125 G 40
300940	03.RL 125.60G.16.S.O	RL125 G 60
300941	03.RL 125.100G.16.S.O	RL125 G 100

1) Surplus price: viton sealing

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
306440	03.RL 165.3VG.16.E.O	RL165 H 3 SL
300953	03.RL 165.6VG.16.E.O	RL165 H 6 SL
300511	03.RL 165.10VG.16.E.O	RL165 H 10 SL
300949	03.RL 165.25VG.16.E.O	RL165 H 20 SL
300513	03.RL 165.25G.16.S.O	RL165 G 25
300514	03.RL 165.40G.16.S.O	RL165 G 40
300515	03.RL 165.60G.16.S.O	RL165 G 60
300516	03.RL 165.100G.16.S.O	RL165 G 100
306441	03.RL 250.3VG.16.E.O	RL250 H 3 SL
306442	03.RL 250.6VG.16.E.O	RL250 H 6 SL
300955	03.RL 250.10VG.16.E.O	RL250 H 10 SL
300517	03.RL 250.25VG.16.E.O	RL250 H 20 SL
300518	03.RL 250.25G.16.S.O	RL250 G 25
300520	03.RL 250.40G.16.S.O	RL250 G 40
300521	03.RL 250.60G.16.S.O	RL250 G 60
300522	03.RL 250.100G.16.S.O	RL250 G 100
306443	03.RL 330.3VG.16.E.P	RL330 H 3 SL
306444	03.RL 330.6VG.16.E.P	RL330 H 6 SL
300523	03.RL 330.10VG.16.E.P	RL330 H 10 SL
306201	03.RL 330.25VG.16.E.P	RL330 H 20 SL
300525	03.RL 330.25G.16.S.P	RL330 G 25
300526	03.RL 330.40G.16.S.P	RL330 G 40
300967	03.RL 330.60G.16.S.P	RL330 G 60
300527	03.RL 330.100G.16.S.P	RL330 G 100
306445	03.RL 500.3VG.16.E.O	RL500 H 3 SL
306446	03.RL 500.6VG.16.E.O	RL500 H 6 SL
303213	03.RL 500.10VG.16.E.O	RL500 H 10 SL
300528	03.RL 500.25VG.16.E.O	RL500 H 20 SL
300529	03.RL 500.25G.16.S.O	RL500 G 25
300531	03.RL 500.40G.16.S.O	RL500 G 40
300532	03.RL 500.60G.16.S.O	RL500 G 60
300533	03.RL 500.100G.16.S.O	RL500 G 100
306448	03.RL 660.3VG.16.E.O	RL660 H 3 SL
306449	03.RL 660.6VG.16.E.O	RL660 H 6 SL
306450	03.RL 660.10VG.16.E.O	RL660 H 10 SL
300534	03.RL 660.25VG.16.E.O	RL660 H 20 SL
300536	03.RL 660.25G.16.S.O	RL660 G 25
300538	03.RL 660.40G.16.S.O	RL660 G 40
300539	03.RL 660.60G.16.S.O	RL660 G 60
300540	03.RL 660.100G.16.S.O	RL660 G 100
300541	03.RL 750.3VG.16.E.O	RL750 H 3 SL
300981	03.RL 750.6VG.16.E.O	RL750 H 6 SL
300974	03.RL 750.10VG.16.E.O	RL750 H 10 SL
300543	03.RL 750.25VG.16.E.O	RL750 H 20 SL
300545	03.RL 750.25G.16.S.O	RL750 G 25
300979	03.RL 750.40G.16.S.O	RL750 G 40
300980	03.RL 750.60G.16.S.O	RL750 G 60
300982	03.RL 750.100G.16.S.O	RL750 G 100

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Artikelnr. Artikelbezeichnung
Ident.no. Designation

3.4 Filterelemente/Filter Elements 03.DL...

306415	03.DL 65.3VG.16.E.P	DL65 H 3 SL
300984	03.DL 65.6VG.16.E.P	DL65 H 6 SL
306416	03.DL 65.10VG.16.E.P	DL65 H 10 SL
300988	03.DL 65.25VG.16.E.P	DL65 H 20 SL
300943	03.DL 65.25G.16.S.P	DL65 G 25
300552	03.DL 65.40G.16.S.P	DL65 G 40
300553	03.DL 65.60G.16.S.P	DL65 G 60
300555	03.DL 65.100G.16.S.P	DL65 G 100
306417	03.DL 85.3VG.16.E.P	DL85 H 3 SL
300998	03.DL 85.6VG.16.E.P	DL85 H 6 SL
301845	03.DL 85.10VG.16.E.P	DL85 H 10 SL
300993	03.DL 85.25VG.16.E.P	DL85 H 20 SL
300556	03.DL 85.25G.16.S.P	DL85 G 25
300996	03.DL 85.40G.16.S.P	DL85 G 40
300557	03.DL 85.60G.16.S.P	DL85 G 60
300558	03.DL 85.100G.16.S.P	DL85 G 100
306419	03.DL 125.3VG.16.E.P	DL125 H 3 SL
306420	03.DL 125.6VG.16.E.P	DL125 H 6 SL
301001	03.DL 125.10VG.16.E.P	DL125 H 10 SL
301002	03.DL 125.25VG.16.E.P	DL125 H 20 SL
300560	03.DL 125.25G.16.S.P	DL125 G 25
300561	03.DL 125.40G.16.S.P	DL125 G 40
300562	03.DL 125.60G.16.S.P	DL125 G 60
301006	03.DL 125.100G.16.S.P	DL125 G 100

Artikelnr.	Artikelbezeichnung	
Ident.no.	Designation	

3.5 Filterelemente/Filter Elements 03.1.0063...03.1.1000

317483	01.NR 63.3VG.10.B.P.-	1.0063 H 3 SL
317484	01.NR 63.6VG.10.B.P.-	1.0063 H 6 SL
314218	01.NR 63.10VG.10.B.P.-	1.0063 H 10 SL
312792	01.NR 63.25VG.10.B.P.-	1.0063 H 20 SL
1)	01.NR 63 MEHRPREIS VITON DICHTUNG	
2)	01.NR 63 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	

317487	01.NR 100.3VG.10.B.P.-	1.0100 H 3 SL
316886	01.NR 100.6VG.10.B.P.-	1.0100 H 6 SL
313167	01.NR 100.10VG.10.B.P.-	1.0100 H 10 SL
312504	01.NR 100.25VG.10.B.P.-	1.0100 H 20 SL
1)	01.NR 100 MEHRPREIS VITON DICHTUNG	
2)	01.NR 100 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	

314485	01.NR 160.3VG.10.B.P.-	1.0160 H 3 SL
314486	01.NR 160.6VG.10.B.P.-	1.0160 H 6 SL
314220	01.NR 160.10VG.10.B.P.-	1.0160 H 10 SL
314449	01.NR 160.25VG.10.B.P.-	1.0160 H 20 SL
1)	01.NR 160 MEHRPREIS VITON DICHTUNG	
2)	01.NR 160 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	

314491	01.NR 250.3VG.10.B.P.-	1.0250 H 3 SL
314492	01.NR 250.6VG.10.B.P.-	1.0250 H 6 SL
314191	01.NR 250.10VG.10.B.P.-	1.0250 H 10 SL
314454	01.NR 250.25VG.10.B.P.-	1.0250 H 20 SL
1)	01.NR 250 MEHRPREIS VITON DICHTUNG	
2)	01.NR 250 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

Artikelnr. Ident.no.	Artikelbezeichnung Designation		
317489	01.NR 400.3VG.10.B.P.-	1.0400 H 3 SL	
314817	01.NR 400.6VG.10.B.P.-	1.0400 H 6 SL	
314870	01.NR 400.10VG.10.B.P.-	1.0400 H 10 SL	
317492	01.NR 400.25VG.10.B.P.-	1.0400 H 20 SL	
1)	01.NR 400 MEHRPREIS VITON DICHTUNG		
2)	01.NR 400 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
304533	01.NR 630.3VG.10.B.P.-	1.0630 H 3 SL	
304534	01.NR 630.6VG.10.B.P.-	1.0630 H 6 SL	
304535	01.NR 630.10VG.10.B.P.-	1.0630 H 10 SL	
305036	01.NR 630.25VG.10.B.P.-	1.0630 H 20 SL	
1)	01.NR 630 MEHRPREIS VITON DICHTUNG		
2)	01.NR 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
306604	01.NR 1000.3VG.10.B.P.-	1.1000 H 3 SL	
305449	01.NR 1000.6VG.10.B.P.-	1.1000 H 6 SL	
306605	01.NR 1000.10VG.10.B.P.-	1.1000 H 10 SL	
306606	01.NR 1000.25VG.10.B.P.-	1.1000 H 20 SL	
1)	01.NR 1000 MEHRPREIS VITON DICHTUNG		
2)	01.NR 1000 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. / Ident.no.	Artikelbezeichnung / Designation		Netto-Preis / Unit-Price
	3.6 Filterelemente/Filter Elements 03.2.0040...03.2.0630		
312621	01.NL 40.3VG.30.E.P.-	2.0040 H 3 SL	
313873	01.NL 40.3VG.HR.E.P.-	2.0040 H 3 SL.B	
312623	01.NL 40.6VG.30.E.P.-	2.0040 H 6 SL	
312884	01.NL 40.6VG.HR.E.P.-	2.0040 H 6 SL.B	
311433	01.NL 40.10VG.30.E.P.-	2.0040 H 10 SL	
312299	01.NL 40.10VG.HR.E.P.-	2.0040 H 10 SL.B	
312542	01.NL 40.25VG.30.E.P.-	2.0040 H 20 SL	
314169	01.NL 40.25VG.HR.E.P.-	2.0040 H 20 SL.B	
1)	01.NL 40 MEHRPREIS VITON DICHTUNG		
2)	01.NL 40 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
312636	01.NL 63.3VG.30.E.P.-	2.0063 H 3 SL	
316536	01.NL 63.3VG.HR.E.P.-	2.0063 H 3 SL.B	
312637	01.NL 63.6VG.30.E.P.-	2.0063 H 6 SL	
317323	01.NL 63.6VG.HR.E.P.-	2.0063 H 6 SL.B	
311365	01.NL 63.10VG.30.E.P.-	2.0063 H 10 SL	
311487	01.NL 63.10VG.HR.E.P.-	2.0063 H 10 SL.B	
311571	01.NL 63.25VG.30.E.P.-	2.0063 H 20 SL	
315123	01.NL 63.25VG.HR.E.P.-	2.0063 H 20 SL.B	
1)	01.NL 63 MEHRPREIS VITON DICHTUNG		
2)	01.NL 63MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
312649	01.NL 100.3VG.30.E.P.-	2.0100 H 3 SL	
312797	01.NL 100.3VG.HR.E.P.-	2.0100 H 3 SL.B	
312651	01.NL 100.6VG.30.E.P.-	2.0100 H 6 SL	
313670	01.NL 100.6VG.HR.E.P.-	2.0100 H 6 SL.B	
311574	01.NL 100.10VG.30.E.P.-	2.0100 H 10 SL	
312301	01.NL 100.10VG.HR.E.P.-	2.0100 H 10 SL.B	
312653	01.NL 100.25VG.30.E.P.-	2.0100 H 20 SL	
301752	01.NL 100.25VG.HR.E.P.-	2.0100 H 20 SL.B	
1)	01.NL 100 MEHRPREIS VITON DICHTUNG		
2)	01.NL 100 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. / Ident.no.	Artikelbezeichnung / Designation		Netto-Preis / Unit-Price
300784	01.NL 250.3VG.30.E.P.-	2.0250 H 3 SL	
300790	01.NL 250.6VG.30.E.P.-	2.0250 H 6 SL	
300367	01.NL 250.10VG.30.E.P.-	2.0250 H 10 SL	
301900	01.NL 250.25VG.30.E.P.-	2.0250 H 20 SL	
1)	01.NL 250 MEHRPREIS VITON DICHTUNG		
2)	01.NL 250 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
307250	01.NL 400.3VG.30.E.P.-	2.0400 H 3 SL	
311449	01.NL 400.3VG.HR.E.P.-	2.0400 H 3 SL.B	
307251	01.NL 400.6VG.30.E.P.-	2.0400 H 6 SL	
311448	01.NL 400.6VG.HR.E.P.-	2.0400 H 6 SL.B	
307252	01.NL 400.10VG.30.E.P.-	2.0400 H 10 SL	
312800	01.NL 400.10VG.HR.E.P.-	2.0400 H 10 SL.B	
307255	01.NL 400.25VG.30.E.P.-	2.0400 H 20 SL	
314880	01.NL 400.25VG.HR.E.P.-	2.0400 H 20 SL.B	
1)	01.NL 400 MEHRPREIS VITON DICHTUNG		
2)	01.NL 400 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
300371	01.NL 630.3VG.30.E.P.-	2.0630 H 3 SL	
300795	01.NL 630.6VG.30.E.P.-	2.0630 H 6 SL	
300791	01.NL 630.10VG.30.E.P.-	2.0630 H 10 SL	
300792	01.NL 630.25VG.30.E.P.-	2.0630 H 20 SL	
1)	01.NL 630 MEHRPREIS VITON DICHTUNG		
2)	01.NL 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. Artikelbezeichnung
Ident.no. Designation

4. Abmessungen/Sizes Mahle

4.1 Filterelemente/Filter Elements 04.PI...

302240	04.PI 2105.3VG.16.E.O	PI 2105 SMX 3
306470	04.PI 2108.3VG.16.E.O	PI 2108 SMX 3
306482	04.PI 2111.3VG.16.E.O	PI 2111 SMX 3
300814	04.PI 2115.3VG.16.E.O	PI 2115 SMX 3
300815	04.PI 2130.3VG.16.E.O	PI 2130 SMX 3
303025	04.PI 2145.3VG.16.E.O	PI 2145 SMX 3
301034	04.PI 2205.3VG.HR.E.O	PI 2205 SMX VST 3
301035	04.PI 2208.3VG.HR.E.O	PI 2208 SMX VST 3
306149	04.PI 2211.3VG.HR.E.O	PI 2211 SMX VST 3
301036	04.PI 2215.3VG.HR.E.O	PI 2215 SMX VST 3
300816	04.PI 2230.3VG.HR.E.O	PI 2230 SMX VST 3
306521	04.PI 2245.3VG.HR.E.O	PI 2245 SMX VST 3
300817	04.PI 3105.10VG.16.E.O	PI 3105 SMX 10
303313	04.PI 3108.10VG.16.E.O	PI 3108 SMX 10
300818	04.PI 3111.10VG.16.E.O	PI 3111 SMX 10
301039	04.PI 3115.10VG.16.E.O	PI 3115 SMX 10
300819	04.PI 3130.10VG.16.E.O	PI 3130 SMX 10
301040	04.PI 3145.10VG.16.E.O	PI 3145 SMX 10
301042	04.PI 3205.10VG.HR.E.O	PI 3205 SMX VST 10
301043	04.PI 3208.10VG.HR.E.O	PI 3208 SMX VST 10
300820	04.PI 3211.10VG.HR.E.O	PI 3211 SMX VST 10
300821	04.PI 3215.10VG.HR.E.O	PI 3215 SMX VST 10
301044	04.PI 3230.10VG.HR.E.O	PI 3230 SMX VST 10
301045	04.PI 3245.10VG.HR.E.O	PI 3245 SMX VST 10
301046	04.PI 4105.25VG.16.E.O	PI 4105 SMX 25
301047	04.PI 4108.25VG.16.E.O	PI 4108 SMX 25
306483	04.PI 4111.25VG.16.E.O	PI 4111 SMX 25
303318	04.PI 4115.25VG.16.E.O	PI 4115 SMX 25
300822	04.PI 4130.25VG.16.E.O	PI 4130 SMX 25
306517	04.PI 4145.25VG.16.E.O	PI 4145 SMX 25
301851	04.PI 4205.25VG.HR.E.O	PI 4205 SMX VST 25
301049	04.PI 4208.25VG.HR.E.O	PI 4208 SMX VST 25
301050	04.PI 4211.25VG.HR.E.O	PI 4211 SMX VST 25
301967	04.PI 4215.25VG.HR.E.O	PI 4215 SMX VST 25
300823	04.PI 4230.25VG.HR.E.O	PI 4230 SMX VST 25
301051	04.PI 4245.25VG.HR.E.O	PI 4245 SMX VST 25
311314	04.PI 5105.6VG.16.E.O	PI 5105 SMX 6
311317	04.PI 5108.6VG.16.E.O	PI 5108 SMX 6
	04.PI 5111.6VG.16.E.O	PI 5111 SMX 6
303314	04.PI 5115.6VG.16.E.O	PI 5115 SMX 6
322470	04.PI 5130.6VG.16.E.O	PI 5130 SMX 6
319334	04.PI 5145.6VG.16.E.O	PI 5145 SMX 6

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
	04.PI 5205.6VG.HR.E.O	PI 5205 SMX VST 6
	04.PI 5208.6VG.HR.E.O	PI 5208 SMX VST 6
	04.PI 5211.6VG.HR.E.O	PI 5211 SMX VST 6
301037	04.PI 5215.6VG.HR.E.O	PI 5215 SMX VST 6
301038	04.PI 5230.6VG.HR.E.O	PI 5230 SMX VST 6
319461	04.PI 5245.6VG.HR.E.O	PI 5245 SMX VST 6
301052	04.PI 8205.25G.16.E.O	PI 8205 DRG 25
306472	04.PI 8208.25G.16.E.O	PI 8208 DRG 25
306485	04.PI 8211.25G.16.E.O	PI 8211 DRG 25
304590	04.PI 8215.25G.16.E.O	PI 8215 DRG 25
301053	04.PI 8230.25G.16.E.O	PI 8230 DRG 25
301054	04.PI 8245.25G.16.E.O	PI 8245 DRG 25
303309	04.PI 8305.40G.16.E.O	PI 8305 DRG 40
306473	04.PI 8308.40G.16.E.O	PI 8308 DRG 40
306486	04.PI 8311.40G.16.E.O	PI 8311 DRG 40
303316	04.PI 8315.40G.16.E.O	PI 8315 DRG 40
303580	04.PI 8330.40G.16.E.O	PI 8330 DRG 40
302040	04.PI 8345.40G.16.E.O	PI 8345 DRG 40
303308	04.PI 8405.60G.16.E.O	PI 8405 DRG 60
306474	04.PI 8408.60G.16.E.O	PI 8408 DRG 60
306487	04.PI 8411.60G.16.E.O	PI 8411 DRG 60
303317	04.PI 8415.60G.16.E.O	PI 8415 DRG 60
301825	04.PI 8430.60G.16.E.O	PI 8430 DRG 60
306519	04.PI 8445.60G.16.E.O	PI 8445 DRG 60
300824	04.PI 8505.100G.16.E.O	PI 8505 DRG 100
306475	04.PI 8508.100G.16.E.O	PI 8508 DRG 100
306489	04.PI 8511.100G.16.E.O	PI 8511 DRG 100
306497	04.PI 8515.100G.16.E.O	PI 8515 DRG 100
300825	04.PI 8530.100G.16.E.O	PI 8530 DRG 100
306520	04.PI 8545.100G.16.E.O	PI 8545 DRG 100
303310	04.PI 9205.25G.HR.E.O	PI 9205 DRG VST 25
306477	04.PI 9208.25G.HR.E.O	PI 9208 DRG VST 25
306492	04.PI 9211.25G.HR.E.O	PI 9211 DRG VST 25
306500	04.PI 9215.25G.HR.E.O	PI 9215 DRG VST 25
306513	04.PI 9230.25G.HR.E.O	PI 9230 DRG VST 25
306523	04.PI 9245.25G.HR.E.O	PI 9245 DRG VST 25
306467	04.PI 9305.40G.HR.E.O	PI 9305 DRG VST 40
306478	04.PI 9308.40G.HR.E.O	PI 9308 DRG VST 40
306493	04.PI 9311.40G.HR.E.O	PI 9311 DRG VST 40
306501	04.PI 9315.40G.HR.E.O	PI 9315 DRG VST 40
306514	04.PI 9330.40G.HR.E.O	PI 9330 DRG VST 40
306524	04.PI 9345.40G.HR.E.O	PI 9345 DRG VST 40

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	
306468	04.PI 9405.60G.HR.E.O	PI 9405 DRG VST 60
303724	04.PI 9408.60G.HR.E.O	PI 9408 DRG VST 60
306494	04.PI 9411.60G.HR.E.O	PI 9411 DRG VST 60
306502	04.PI 9415.60G.HR.E.O	PI 9415 DRG VST 60
306515	04.PI 9430.60G.HR.E.O	PI 9430 DRG VST 60
306525	04.PI 9445.60G.HR.E.O	PI 9445 DRG VST 60
306469	04.PI 9505.100G.HR.E.O	PI 9505 DRG VST 100
306479	04.PI 9508.100G.HR.E.O	PI 9508 DRG VST 100
306495	04.PI 9511.100G.HR.E.O	PI 9511 DRG VST 100
306503	04.PI 9515.100G.HR.E.O	PI 9515 DRG VST 100
306516	04.PI 9530.100G.HR.E.O	PI 9530 DRG VST 100
306526	04.PI 9545.100G.HR.E.O	PI 9545 DRG VST 100

4.2 Filterelemente/Filter Elements 04.852...

306678	04.852 024.25G.16.B.P	852 024 DRG 25
306679	04.852 024.60G.16.B.P	852 024 DRG 60
306680	04.852 024.100G.16.B.P	852 024 DRG 100
306681	04.852 034.3VG.16.E.P	852 034 SMX 3
306682	04.852 034.3VG.HR.E.P	852 034 SMX VST 3
303321	04.852 034.10VG.16.E.P	852 034 SMX 10
300801	04.852 034.10VG.HR.E.P	852 034 SMX VST 10
304485	04.852 034.25VG.16.E.P	852 034 SMX 25
306683	04.852 034.25VG.HR.E.P	852 034 SMX VST 25
303323	04.852 034.25G.16.E.P	852 034 DRG 25
306686	04.852 034.25G.HR.E.P	852 034 DRG VST 25
303324	04.852 034.60G.16.E.P	852 034 DRG 60
306687	04.852 034.60G.HR.E.P	852 034 DRG VST 60
306684	04.852 034.100G.16.E.P	852 034 DRG 100
306688	04.852 034.100G.HR.E.P	852 034 DRG VST 100
306707	04.852 059.10VG.16.B.O	852 059 SMX 10
306708	04.852 059.25VG.16.B.O	852 059 SMX 25
303326	04.852 059.25G.16.B.O	852 059 DRG 25
306710	04.852 059.60G.16.B.O	852 059 DRG 60
306711	04.852 059.100G.16.B.O	852 059 DRG 100
306726	04.852 070.3VG.16.B.P	852 070 SMX 3
300803	04.852 070.10VG.16.B.P	852 070 SMX 10
303327	04.852 070.25VG.16.B.P	852 070 SMX 25
306728	04.852 070.25G.16.B.P	852 070 DRG 25
306729	04.852 070.60G.16.B.P	852 070 DRG 60
306730	04.852 070.100G.16.B.P	852 070 DRG 100
306731	04.852 087.10VG.16.B.O	852 087 SMX 10
306732	04.852 087.25VG.16.B.O	852 087 SMX 25
306734	04.852 087.25G.16.B.O	852 087 DRG 25
303331	04.852 087.60G.16.B.O	852 087 DRG 60
306735	04.852 087.100G.16.B.O	852 087 DRG 100
303024	04.852 125.3VG.16.E.P	852 125 SMX 3
303023	04.852 125.3VG.HR.E.P	852 125 SMX VST 3

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
303333	04.852 125.10VG.16.E.P	852 125 SMX 10
303050	04.852 125.10VG.HR.E.P	852 125 SMX VST 10
306736	04.852 125.25VG.16.E.P	852 125 SMX 25
300804	04.852 125.25VG.HR.E.P	852 125 SMX VST 25
306737	04.852 125.25G.16.E.P	852 125 DRG 25
306742	04.852 125.25G.HR.E.P	852 125 DRG VST 25
306738	04.852 125.40G.16.E.P	852 125 DRG 40
306743	04.852 125.40G.HR.E.P	852 125 DRG VST 40
306739	04.852 125.60G.16.E.P	852 125 DRG 60
306744	04.852 125.60G.HR.E.P	852 125 DRG VST 60
306740	04.852 125.100G.16.E.P	852 125 DRG 100
306745	04.852 125.100G.HR.E.P	852 125 DRG VST 100
306746	04.852 126.3VG.16.E.P	852 126 SMX 3
306747	04.852 126.3VG.HR.E.P	852 126 SMX VST 3
300805	04.852 126.10VG.16.E.P	852 126 SMX 10
300806	04.852 126.10VG.HR.E.P	852 126 SMX VST 10
300807	04.852 126.25VG.16.E.P	852 126 SMX 25
306749	04.852 126.25VG.HR.E.P	852 126 SMX VST 25
306750	04.852 126.25G.16.E.P	852 126 DRG 25
303337	04.852 126.25G.HR.E.P	852 126 DRG VST 25
306751	04.852 126.40G.16.E.P	852 126 DRG 40
306753	04.852 126.40G.HR.E.P	852 126 DRG VST 40
303339	04.852 126.60G.16.E.P	852 126 DRG 60
303338	04.852 126.60G.HR.E.P	852 126 DRG VST 60
303340	04.852 126.100G.16.E.P	852 126 DRG 100
300808	04.852 126.100G.HR.E.P	852 126 DRG VST 100
303049	04.852 127.3VG.16.E.P	852 127 SMX 3
303027	04.852 127.3VG.HR.E.P	852 127 SMX VST 3
303342	04.852 127.10VG.16.E.P	852 127 SMX 10
303026	04.852 127.10VG.HR.E.P	852 127 SMX VST 10
303341	04.852 127.25VG.16.E.P	852 127 SMX 25
306072	04.852 127.25VG.HR.E.P	852 127 SMX VST 25
306755	04.852 127.25G.16.E.P	852 127 DRG 25
303343	04.852 127.25G.HR.E.P	852 127 DRG VST 25
303344	04.852 127.40G.16.E.P	852 127 DRG 40
306758	04.852 127.40G.HR.E.P	852 127 DRG VST 40
303345	04.852 127.60G.16.E.P	852 127 DRG 60
306759	04.852 127.60G.HR.E.P	852 127 DRG VST 60
306756	04.852 127.100G.16.E.P	852 127 DRG 100
306760	04.852 127.100G.HR.E.P	852 127 DRG VST 100
306761	04.852 264.10VG.16.B.O	852 264 SMX 10
306762	04.852 264.25VG.16.B.O	852 264 SMX 25
306764	04.852 264.25G.16.B.O	852 264 DRG 25
306765	04.852 264.60G.16.B.O	852 264 DRG 60
306766	04.852 264.100G.16.B.O	852 264 DRG 100
306776	04.852 444.6VG.16.B.P	852 444 SMX 6
306777	04.852 444.10VG.16.B.P	852 444 SMX 10
303531	04.852 444.25VG.16.B.P	852 444 SMX 25
306778	04.852 444.25G.16.B.P	852 444 DRG 25
302044	04.852 444.40G.16.B.P	852 444 DRG 40

Artikelnr.	Artikelbezeichnung	
Ident.no.	Designation	

4.3 Filterelemente/Filter Elements 04.PI...RN

317483	01.NR 63.3VG.10.B.P.-	PI 21006 RN SMX 3
317484	01.NR 63.6VG.10.B.P.-	PI 22006 RN SMX 6
314218	01.NR 63.10VG.10.B.P.-	PI 23006 RN SMX 10
312792	01.NR 63.25VG.10.B.P.-	PI 25006 RN SMX 25
1)	01.NR 63 MEHRPREIS VITON DICHTUNG	
2)	01.NR 63 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

317487	01.NR 100.3VG.10.B.P.-	PI 21010 RN SMX 3
316886	01.NR 100.6VG.10.B.P.-	PI 22010 RN SMX 6
313167	01.NR 100.10VG.10.B.P.-	PI 23010 RN SMX 10
312504	01.NR 100.25VG.10.B.P.-	PI 25010 RN SMX 25
1)	01.NR 100 MEHRPREIS VITON DICHTUNG	
2)	01.NR 100 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

314485	01.NR 160.3VG.10.B.P.-	PI 21016 RN SMX 3
314486	01.NR 160.6VG.10.B.P.-	PI 22016 RN SMX 6
314220	01.NR 160.10VG.10.B.P.-	PI 23016 RN SMX 10
314449	01.NR 160.25VG.10.B.P.-	PI 25016 RN SMX 25
1)	01.NR 160 MEHRPREIS VITON DICHTUNG	
2)	01.NR 160 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

314491	01.NR 250.3VG.10.B.P.-	PI 21025 RN SMX 3
314492	01.NR 250.6VG.10.B.P.-	PI 22025 RN SMX 6
314191	01.NR 250.10VG.10.B.P.-	PI 23025 RN SMX 10
314454	01.NR 250.25VG.10.B.P.-	PI 25025 RN SMX 25
1)	01.NR 250 MEHRPREIS VITON DICHTUNG	
2)	01.NR 250 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

Artikelnr. Ident.no.	Artikelbezeichnung Designation		
317489	01.NR 400.3VG.10.B.P.-	PI 21040 RN SMX 3	
314817	01.NR 400.6VG.10.B.P.-	PI 22040 RN SMX 6	
314870	01.NR 400.10VG.10.B.P.-	PI 23040 RN SMX 10	
317492	01.NR 400.25VG.10.B.P.-	PI 25040 RN SMX 25	
1)	01.NR 400 MEHRPREIS VITON DICHTUNG		
2)	01.NR 400 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
304533	01.NR 630.3VG.10.B.P.-	PI 21063 RN SMX 3	
304534	01.NR 630.6VG.10.B.P.-	PI 22063 RN SMX 6	
304535	01.NR 630.10VG.10.B.P.-	PI 23063 RN SMX 10	
305036	01.NR 630.25VG.10.B.P.-	PI 25063 RN SMX 25	
1)	01.NR 630 MEHRPREIS VITON DICHTUNG		
2)	01.NR 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		
306604	01.NR 1000.3VG.10.B.P.-	PI 21100 RN SMX 3	
305449	01.NR 1000.6VG.10.B.P.-	PI 22100 RN SMX 6	
306605	01.NR 1000.10VG.10.B.P.-	PI 23100 RN SMX 10	
306606	01.NR 1000.25VG.10.B.P.-	PI 25100 RN SMX 25	
1)	01.NR 1000 MEHRPREIS VITON DICHTUNG		
2)	01.NR 1000 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

4.4 Filterelemente/Filter Elements 04.PI...DN

312621	01.NL 40.3VG.30.E.P.-	PI 21004 DN SMX 3	
313873	01.NL 40.3VG.HR.E.P.-	PI 71004 DN SMX VST 3	
312623	01.NL 40.6VG.30.E.P.-	PI 22004 DN SMX 6	
312884	01.NL 40.6VG.HR.E.P.-	PI 72004 DN SMX VST 6	
311433	01.NL 40.10VG.30.E.P.-	PI 23004 DN SMX 10	
312299	01.NL 40.10VG.HR.E.P.-	PI 73004 DN SMX VST 10	
312542	01.NL 40.25VG.30.E.P.-	PI 25004 DN SMX 25	
314169	01.NL 40.25VG.HR.E.P.-	PI 75004 DN SMX VST 25	
1)	01.NL 40 MEHRPREIS VITON DICHTUNG		
2)	01.NL 40 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
312636	01.NL 63.3VG.30.E.P.-	PI 21006 DN SMX 3
316536	01.NL 63.3VG.HR.E.P.-	PI 71006 DN SMX VST 3
312637	01.NL 63.6VG.30.E.P.-	PI 22006 DN SMX 6
317323	01.NL 63.6VG.HR.E.P.-	PI 72006 DN SMX VST 6
311365	01.NL 63.10VG.30.E.P.-	PI 23006 DN SMX 10
311487	01.NL 63.10VG.HR.E.P.-	PI 73006 DN SMX VST 10
311571	01.NL 63.25VG.30.E.P.-	PI 25006 DN SMX 25
315123	01.NL 63.25VG.HR.E.P.-	PI 75006 DN SMX VST 25
1)	01.NL 63 MEHRPREIS VITON DICHTUNG	
2)	01.NL 63 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

312649	01.NL 100.3VG.30.E.P.-	PI 21010 DN SMX 3
312797	01.NL 100.3VG.HR.E.P.-	PI 71010 DN SMX VST 3
312651	01.NL 100.6VG.30.E.P.-	PI 22010 DN SMX 6
313670	01.NL 100.6VG.HR.E.P.-	PI 72010 DN SMX VST 6
311574	01.NL 100.10VG.30.E.P.-	PI 23010 DN SMX 10
312301	01.NL 100.10VG.HR.E.P.-	PI 73010 DN SMX VST 10
312653	01.NL 100.25VG.30.E.P.-	PI 25010 DN SMX 25
301752	01.NL 100.25VG.HR.E.P.-	PI 75010 DN SMX VST 25
1)	01.NL 100 MEHRPREIS VITON DICHTUNG	
2)	01.NL 100 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

300784	01.NL 250.3VG.30.E.P.-	PI 21025 DN SMX 3
300790	01.NL 250.6VG.30.E.P.-	PI 22025 DN SMX 6
300367	01.NL 250.10VG.30.E.P.-	PI 23025 DN SMX 10
301900	01.NL 250.25VG.30.E.P.-	PI 25025 DN SMX 25
1)	01.NL 250 MEHRPREIS VITON DICHTUNG	
2)	01.NL 250 MEHRPREIS AUSF. KPL. EDELSTAHL	
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06	10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08	25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. Ident.no.	Artikelbezeichnung Designation		
307250	01.NL 400.3VG.30.E.P.-	PI 21040 DN SMX 3	
311449	01.NL 400.3VG.HR.E.P.-	PI 71040 DN SMX VST 3	
307251	01.NL 400.6VG.30.E.P.-	PI 22040 DN SMX 6	
311448	01.NL 400.6VG.HR.E.P.-	PI 72040 DN SMX VST 6	
307252	01.NL 400.10VG.30.E.P.-	PI 23040 DN SMX 10	
312800	01.NL 400.10VG.HR.E.P.-	PI 73040 DN SMX VST 10	
307255	01.NL 400.25VG.30.E.P.-	PI 25040 DN SMX 25	
314880	01.NL 400.25VG.HR.E.P.-	PI 75040 DN SMX VST 25	
1)	01.NL 400 MEHRPREIS VITON DICHTUNG		
2)	01.NL 400 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

300371	01.NL 630.3VG.30.E.P.-	PI 21063 DN SMX 3	
300795	01.NL 630.6VG.30.E.P.-	PI 22063 DN SMX 6	
300791	01.NL 630.10VG.30.E.P.-	PI 23063 DN SMX 10	
300792	01.NL 630.25VG.30.E.P.-	PI 25063 DN SMX 25	
1)	01.NL 630 MEHRPREIS VITON DICHTUNG		
2)	01.NL 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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Artikelnr. Artikelbezeichnung
Ident.no. Designation

5. Abmessungen/Sizes PALL

5.1 Filterelemente/Filter Elements 05...

306531	05.8300.3VG.10.B.P.8	HC8300 F*P 8 H
305209	05.8300.3VG.10.B.P.16	HC8300 F*P 16 H
301916	05.8300.3VG.10.B.P.39	HC8300 F*P 39 H
304655	05.8300.6VG.10.B.P.8	HC8300 F*N 8 H
301081	05.8300.6VG.10.B.P.16	HC8300 F*N 16 H
301059	05.8300.6VG.10.B.P.39	HC8300 F*N 39 H
306532	05.8300.12.200.10.B.P.8	HC8300 F*S 8 H
301080	05.8300.12.200.10.B.P.16	HC8300 F*S 16 H
301056	05.8300.12.200.10.B.P.39	HC8300 F*S 39 H
301826	05.8300.25VG.10.B.P.8	HC8300 F*T 8 H
301057	05.8300.25VG.10.B.P.16	HC8300 F*T 16 H
301058	05.8300.25VG.10.B.P.39	HC8300 F*T 39 H
1)	05.8300 MEHRPREIS VITON DICHTUNG	

306533	05.8400.3VG.10.B.P.8	HC8400 F*P 8 H
306537	05.8400.3VG.10.B.P.16	HC8400 F*P 16 H
306540	05.8400.3VG.10.B.P.26	HC8400 F*P 26 H
306543	05.8400.3VG.10.B.P.39	HC8400 F*P 39 H
306534	05.8400.6VG.10.B.P.8	HC8400 F*N 8 H
306538	05.8400.6VG.10.B.P.16	HC8400 F*N 16 H
301084	05.8400.6VG.10.B.P.26	HC8400 F*N 26 H
306544	05.8400.6VG.10.B.P.39	HC8400 F*N 39 H
306535	05.8400.12.200.10.B.P.8	HC8400 F*S 8 H
306539	05.8400.12.200.10.B.P.16	HC8400 F*S 16 H
306541	05.8400.12.200.10.B.P.26	HC8400 F*S 26 H
306545	05.8400.12.200.10.B.P.39	HC8400 F*S 39 H
306536	05.8400.25VG.10.B.P.8	HC8400 F*T 8 H
301082	05.8400.25VG.10.B.P.16	HC8400 F*T 16 H
306542	05.8400.25VG.10.B.P.26	HC8400 F*T 26 H
306546	05.8400.25VG.10.B.P.39	HC8400 F*T 39 H
1)	05.8400 MEHRPREIS VITON DICHTUNG	

306547	05.8500.3VG.10.B.P.8	HC8500 F*P 8 H
306550	05.8500.3VG.10.B.P.13	HC8500 F*P 13 H
301085	05.8500.3VG.10.B.P.26	HC8500 F*P 26 H
306548	05.8500.6VG.10.B.P.8	HC8500 F*N 8 H
301060	05.8500.6VG.10.B.P.13	HC8500 F*N 13 H
301090	05.8500.6VG.10.B.P.26	HC8500 F*N 26 H
306549	05.8500.12.200.10.B.P.8	HC8500 F*S 8 H
305443	05.8500.12.200.10.B.P.13	HC8500 F*S 13 H
301086	05.8500.12.200.10.B.P.26	HC8500 F*S 26 H
301087	05.8500.25VG.10.B.P.8	HC8500 F*T 8 H
301088	05.8500.25VG.10.B.P.13	HC8500 F*T 13 H
301089	05.8500.25VG.10.B.P.26	HC8500 F*T 26 H
1)	05.8500 MEHRPREIS VITON DICHTUNG	

* Hier kann beliebig D, K oder U eingesetzt werden / Here you can fit in D, K or U

1) Surplus price: viton sealing

Artikelnr. Ident.no.	Artikelbezeichnung Designation	
306551	05.8700.3VG.10.B.P.4	HC8700 F*P 4 H
301091	05.8700.3VG.10.B.P.8	HC8700 F*P 8 H
306552	05.8700.6VG.10.B.P.4	HC8700 F*N 4 H
301094	05.8700.6VG.10.B.P.8	HC8700 F*N 8 H
312747	05.8700.12.200.10.B.P.4	HC8700 F*S 4 H
312746	05.8700.12.200.10.B.P.8	HC8700 F*S 8 H
306553	05.8700.25VG.10.B.P.4	HC8700 F*T 4 H
301093	05.8700.25VG.10.B.P.8	HC8700 F*T 8 H
1)	05.8700 MEHRPREIS VITON DICHTUNG	
306554	05.8900.3VG.10.E.P.8	HC8900 F*P 8 H
306561	05.8900.3VG.10.E.P.13	HC8900 F*P 13 H
301095	05.8900.3VG.10.E.P.16	HC8900 F*P 16 H
318751	05.8900.3VG.10.E.P.26	HC8900 F*P 26 H
	05.8900.3VG.10.E.P.39	HC8900 F*P 39 H
306555	05.8900.6VG.10.E.P.8	HC8900 F*N 8 H
306562	05.8900.6VG.10.E.P.13	HC8900 F*N 13 H
301096	05.8900.6VG.10.E.P.16	HC8900 F*N 16 H
318753	05.8900.6VG.10.E.P.26	HC8900 F*N 26 H
321936	05.8900.6VG.10.E.P.39	HC8900 F*N 39 H
306559	05.8900.12.200.10.E.P.8	HC8900 F*S 8 H
312748	05.8900.12.200.10.E.P.13	HC8900 F*S 13 H
306565	05.8900.12.200.10.E.P.16	HC8900 F*S 16 H
318750	05.8900.12.200.10.E.P.26	HC8900 F*S 26 H
318766	05.8900.12.200.10.E.P.39	HC8900 F*S 39 H
306560	05.8900.25VG.10.E.P. 8	HC8900 F*T 8 H
306564	05.8900.25VG.10.E.P.13	HC8900 F*T 13 H
306566	05.8900.25VG.10.E.P.16	HC8900 F*T 16 H
318752	05.8900.25VG.10.E.P.26	HC8900 F*T 26 H
317615	05.8900.25VG.10.E.P.39	HC8900 F*T 39 H
1)	05.8900 MEHRPREIS VITON DICHTUNG	
301061	05.9020.3VG.10.E.P.4	HC9020 F*P 4 H
301097	05.9020.3VG.10.E.P.8	HC9020 F*P 8 H
301102	05.9020.6VG.10.E.P.4	HC9020 F*N 4 H
306567	05.9020.6VG.10.E.P.8	HC9020 F*N 8 H
301098	05.9020.12.200.10.E.P.4	HC9020 F*S 4 H
301099	05.9020.12.200.10.E.P.8	HC9020 F*S 8 H
301100	05.9020.25VG.10.E.P.4	HC9020 F*T 4 H
301101	05.9020.25VG.10.E.P.8	HC9020 F*T 8 H
1)	05.9020 MEHRPREIS VITON DICHTUNG	
301104	05.9021.3VG.210.E.P.4	HC9021 F*P 4 H
301105	05.9021.3VG.210.E.P.8	HC9021 F*P 8 H
301107	05.9021.6VG.210.E.P.4	HC9021 F*N 4 H
301108	05.9021.6VG.210.E.P.8	HC9021 F*N 8 H
301106	05.9021.12.200.210.E.P.4	HC9021 F*S 4 H
312762	05.9021.12.200.210.E.P.8	HC9021 F*S 8 H
303167	05.9021.25VG.210.E.P.4	HC9021 F*T 4 H
306568	05.9021.25VG.210.E.P.8	HC9021 F*T 8 H
1)	05.9021 MEHRPREIS VITON DICHTUNG	

* Hier kann beliebig D, K oder U eingesetzt werden / Here you can fit in D, K or U

** Preise auf Anfrage / prices on request

1) Surplus price: viton sealing

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	
	05.9400.3VG.10.B.P.13	HC9400 F*P 13 H
309654	05.9400.3VG.10.B.P.26	HC9400 F*P 26 H
304784	05.9400.3VG.10.B.P.39	HC9400 F*P 39 H
	05.9400.6VG.10.B.P.13	HC9400 F*N 13H
	05.9400.6VG.10.B.P.26	HC9400 F*N 26H
323931	05.9400.6VG.10.B.P.39	HC9400 F*N 39 H
	05.9400.12.200.10.B.P.13	HC9400 F*S 13 H
312764	05.9400.12.200.10.B.P.26	HC9400 F*S 26 H
326835	05.9400.12.200.10.B.P.39	HC9400 F*S 39 H
	05.9400.25VG.10.B.P.13	HC9400 F*T 13 H
327025	05.9400.25VG.10.B.P.26	HC9400 F*T 26 H
	05.9400.25VG.10.B.P.39	HC9400 F*T 39 H
[1)]	05.9400 MEHRPREIS VITON DICHTUNG	
301110	05.9600.3VG.10.E.P.4	HC9600 (9620) F*P 4 H
301062	05.9600.3VG.10.E.P.8	HC9600 (9620) F*P 8 H
301063	05.9600.3VG.10.E.P.13	HC9600 (9620) F*P 13 H
301064	05.9600.3VG.10.E.P.16	HC9600 (9620) F*P 16 H
301115	05.9600.6VG.10.E.P.4	HC9600 (9620) F*N 4 H
301070	05.9600.6VG.10.E.P.8	HC9600 (9620) F*N 8 H
301071	05.9600.6VG.10.E.P.13	HC9600 (9620) F*N 13 H
301072	05.9600.6VG.10.E.P.16	HC9600 (9620) F*N 16 H
312752	05.9600.12.200.10.E.P.4	HC9600 (9620) F*S 4 H
301065	05.9600.12.200.10.E.P.8	HC9600 (9620) F*S 8 H
312751	05.9600.12.200.10.E.P.13	HC9600 (9620) F*S 13 H
312753	05.9600.12.200.10.E.P.16	HC9600 (9620) F*S 16 H
301067	05.9600.25VG.10.E.P.4	HC9600 (9620) F*T 4 H
301068	05.9600.25VG.10.E.P.8	HC9600 (9620) F*T 8 H
301069	05.9600.25VG.10.E.P.13	HC9600 (9620) F*T 13 H
301114	05.9600.25VG.10.E.P.16	HC9600 (9620) F*T 16 H
[1)]	05.9600 (9620) MEHRPREIS VITON DICHTUNG	
301073	05.9601.3VG.210.E.P.4	HC9601 F*P 4 H
301117	05.9601.3VG.210.E.P.8	HC9601 F*P 8 H
301118	05.9601.3VG.210.E.P.13	HC9601 F*P 13 H
301074	05.9601.3VG.210.E.P.16	HC9601 F*P 16 H
301129	05.9601.6VG.210.E.P.4	HC9601 F*N 4 H
301130	05.9601.6VG.210.E.P.8	HC9601 F*N 8 H
301131	05.9601.6VG.210.E.P.13	HC9601 F*N 13 H
301132	05.9601.6VG.210.E.P.16	HC9601 F*N 16 H
312769	05.9601.12.200.210.E.P.4	HC9601 F*S 4 H
312766	05.9601.12.200.210.E.P.8	HC9601 F*S 8 H
312768	05.9601.12.200.210.E.P.13	HC9601 F*S 13 H
312767	05.9601.12.200.210.E.P.16	HC9601 F*S 16 H
301125	05.9601.25VG.210.E.P.4	HC9601 F*T 4 H
303350	05.9601.25VG.210.E.P.8	HC9601 F*T 8 H
301127	05.9601.25VG.210.E.P.13	HC9601 F*T 13 H
301128	05.9601.25VG.210.E.P.16	HC9601 F*T 16 H
[1)]	05.9601 MEHRPREIS VITON DICHTUNG	

* Hier kann beliebig D, K oder U eingesetzt werden / Here you can fit in D, K or U

1) Surplus price: viton sealing

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Artikelnr. Ident.no.	Artikelbezeichnung Designation	
303348	05.9800.3VG.10.E.P.4	HC9800 F*P 4 H
306570	05.9800.3VG.10.E.P.8	HC9800 F*P 8 H
301137	05.9800.6VG.10.E.P.4	HC9800 F*N 4 H
305375	05.9800.6VG.10.E.P.8	HC9800 F*N 8 H
312775	05.9800.12.200.10.E.P.4	HC9800 F*S 4 H
312776	05.9800.12.200.10.E.P.8	HC9800 F*S 8 H
301076	05.9800.25VG.10.E.P.4	HC9800 F*T 4 H
301077	05.9800.25VG.10.E.P.8	HC9800 F*T 8 H
1)	05.9800 MEHRPREIS VITON DICHTUNG	
301138	05.9801.3VG.210.E.P.4	HC9801 F*P 4 H
301139	05.9801.3VG.210.E.P.8	HC9801 F*P 8 H
306571	05.9801.3VG.210.E.P.13	HC9801 F*P 13 H
301145	05.9801.6VG.210.E.P.4	HC9801 F*N 4 H
301146	05.9801.6VG.210.E.P.8	HC9801 F*N 8 H
306572	05.9801.6VG.210.E.P.13	HC9801 F*N 13 H
301079	05.9801.12.200.210.E.P.4	HC9801 F*S 4 H
312782	05.9801.12.200.210.E.P.8	HC9801 F*S 8 H
312784	05.9801.12.200.210.E.P.13	HC9801 F*S 13 H
301143	05.9801.25VG.210.E.P.4	HC9801 F*T 4 H
301144	05.9801.25VG.210.E.P.8	HC9801 F*T 8 H
306573	05.9801.25VG.210.E.P.13	HC9801 F*T 13 H
1)	05.9801 MEHRPREIS VITON DICHTUNG	
306578	05.9901.3VG.210.B.P.13	HC9901 F*P 13 H
301981	05.9901.3VG.210.B.P.26	HC9901 F*P 26 H
306579	05.9901.6VG.210.B.P.13	HC9901 F*N 13 H
306582	05.9901.6VG.210.B.P.26	HC9901 F*N 26 H
306580	05.9901.12.200.210.B.P.13	HC9901 F*S 13 H
306583	05.9901.12.200.210.B.P.26	HC9901 F*S 26 H
306581	05.9901.25VG.210.B.P.13	HC9901 F*T 13 H
306584	05.9901.25VG.210.B.P.26	HC9901 F*T 26 H
1)	05.9901 MEHRPREIS VITON DICHTUNG	

* Hier kann beliebig D, K oder U eingesetzt werden / Here you can fit in D, K or U

1) Surplus price: viton sealing

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Artikelnr. Ident.no.	Artikelbezeichnung Designation		
	5.2 Filterelemente/Filter Elements 05...		
317487	01.NR 100.3VG.10.B.P.-	HC0251 F*P 10 H	
316886	01.NR 100.6VG.10.B.P.-	HC0251 F*N 10 H	
313167	01.NR 100.10VG.10.B.P.-	HC0251 F*S 10 H	
1)	01.NR 100 MEHRPREIS VITON DICHTUNG		
2)	01.NR 100 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
314491	01.NR 250.3VG.10.B.P.-	HC0252 F*P 10 H	
314492	01.NR 250.6VG.10.B.P.-	HC0252 F*N 10 H	
314191	01.NR 250.10VG.10.B.P.-	HC0252 F*S 10 H	
1)	01.NR 250 MEHRPREIS VITON DICHTUNG		
2)	01.NR 250 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
304533	01.NR 630.3VG.10.B.P.-	HC0171 F*P 16 H	
304534	01.NR 630.6VG.10.B.P.-	HC0171 F*N 16 H	
304535	01.NR 630.10VG.10.B.P.-	HC0171 F*S 16 H	
1)	01.NR 630 MEHRPREIS VITON DICHTUNG		
2)	01.NR 630 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%
306604	01.NR 1000.3VG.10.B.P.-	HC0600 F*P 16 H	
305449	01.NR 1000.6VG.10.B.P.-	HC0600 F*N 16 H	
306605	01.NR 1000.10VG.10.B.P.-	HC0600 F*S 16 H	
1)	01.NR 1000 MEHRPREIS VITON DICHTUNG		
2)	01.NR 1000 MEHRPREIS AUSF. KPL. EDELSTAHL		
3)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 06		10%
4)	MEHRPREIS FÜR ELEMENTE AUSFÜHRUNG IS 08		25%

* Hier kann beliebig D, K oder U eingesetzt werden / Here you can fit in D, K or U

1) Surplus price: viton sealing
2) Surplus price: execution complete stainless steel
3) Surplus price: element execution IS 06
4) Surplus price: element execution IS 08

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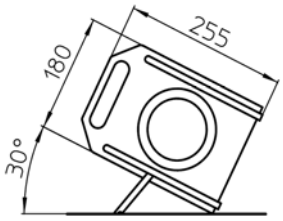
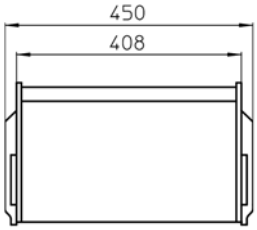
CONTAMINATION CONTROL SYSTEM
CCS2 and BSS2

Sheet No.
CCS-7901

CCS2

The CCS2 is a various mobile measuring system for the initiation and automatic surveillance of hydraulic and lubrication systems. The measuring and data managing functions allow a continuous and discontinuous systme surveillance in a high accuracy over a big range of use without additional equipment. The CCS2 enables the rating of solid partcles contamination of mineral oils through the determination of number and size distribution of particles and the analysis of the results according to ISO 4406, NAS 1638 or SAE AS 4059





Technical data:

Measuring system :	Light gate principle with laser sensor (670 nm)
Counting system :	8-channel particle counting
	>4µm, >4,6µm, >6µm, >6,4µm, >10µm, >14µm,
	>21µm, >37µm
Calibration :	ISO-MTD in oil (ISO 11171)
Input operation pressure:	1,5 - 420 bar
Viscosity :	10 - 400 mm2/s
Oil temperature range :	0 ~ 80℃ (32 ~ 176°F)
Ambient temperature range :	0 ~ 50℃ (32 ~ 122°F)
Internal temperature range :	0 ~ 45℃ (32 ~ 113°F)
Weight:	10,8 kg
Dimensions:	445 x 180 x 255 mm
Connections:	Mini-measuring connection with screw coupling
	M 16x2, Connector coupling for hose DN 6
Storage capacity:	4 x 100 measuring values
Power supply:	90 .. 250 V AC 50/60Hz, 12 V DC
Internal battery:	12V DC

BSS2

The bottle sampling system BSS 2 is an optional unit to the mobile particle counting device CCS 2. The BSS 2 (Bottle Sampling System) serves for the optimal preparation and supply of liquid samples in bottles to the CCS 2 measuring system in laboratory quality.

Technical data:

Pressure range:	0 ... 4 bar
Vacuum range:	0 .... - 0,95 bar (-95 kPa)
External supply pressure:	min. 5 bar, max. 10 bar
Pneumatic Pressure range:	5 ~ 7bar
air volume	Qmin= 40 l/min
Connection :	Mini-measuring connection with screw
	coupling M 16x2
Supply pressure connection:	Quick coupling NW 7.2
Hose connection:	Mini-measuring connection with screw
	coupling M 16x2
Weight:	6,5 kg
Dimensions:	220 x 240 x 390 mm
Power supply:	110 .. 230 V AC, 12 V DC

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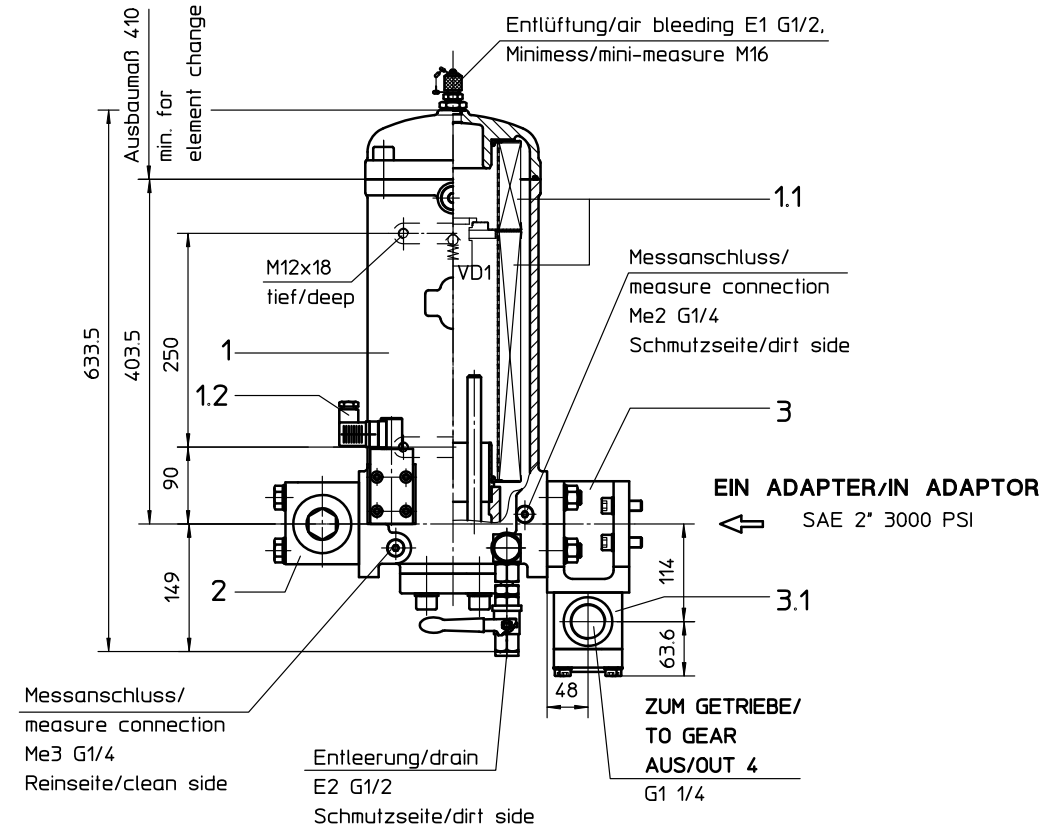
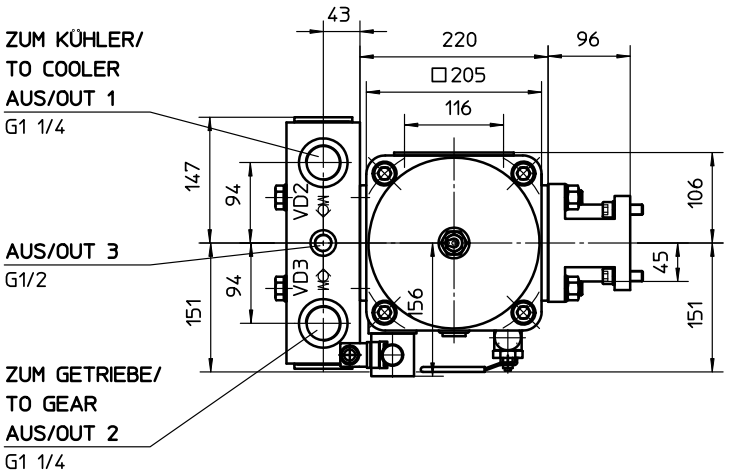




TWIN-Filter
TWF1001.

bestehend aus/consists of

Pos. 1 Filterbaugruppe/filter assemly
Dok./doc.: 33801-4
LF1001.33801.V.1.FS.A.-.AE

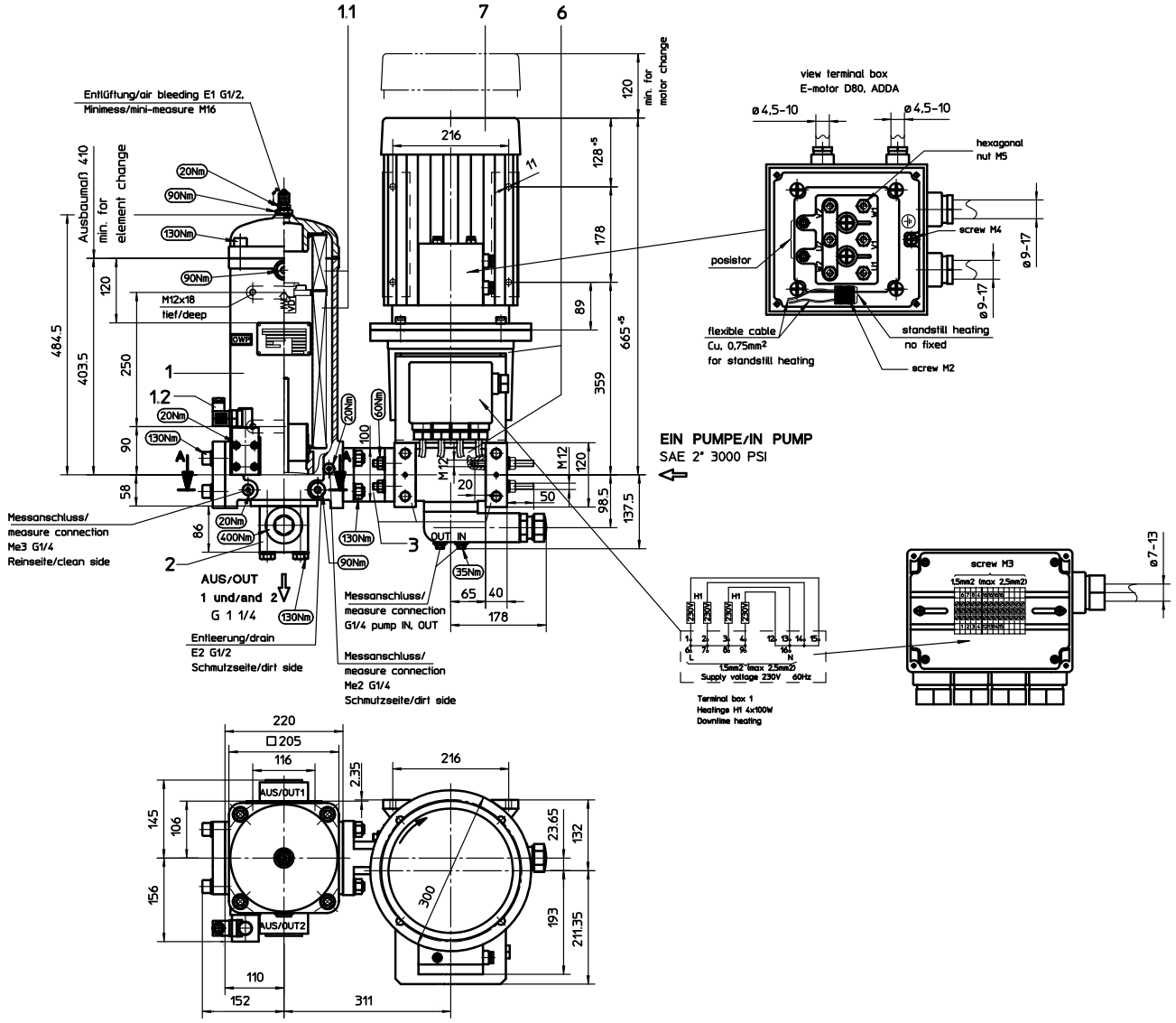
Pos. 1.1 Stufenfilterelement/stage filter element
Dok./doc.: 33801-4
01NR.1000.32227.10VG.25G.25.B.V.-.S1

Pos. 1.2 Verschmutzungsanzeiger/clogging indicator
Dok./doc.: 1609
AE70.2,5.V.-.B

Pos. 2 Anschluß AUS/connection OUT
Stromteilventil/current part valve
Dok./doc.: 33803-4
STV.32.33803.0,5.1.6,0.V.FS.A.G.6

Pos. 3 Anschluß EIN/connection IN
Adapter/adaptor
Dok./doc.: 42935-4
ASS.42935.FS.A.FS.8.V.33807.1

Pos. 3.1 Druckbegrenzungsventil/pressure relief valve
Dok./doc.: 33807
DBV.25.33807.12.V.FW02.G.6



TWIN-Filter
TWF1001.

bestehend aus/consists of

Pos. 1 Filterbaugruppe/filter assembly
Dok./doc.: 44747-4, version 2
LF1001.44747.P.1FS.A.-.AE

Pos. 1.1 Stufenfilterelement/stage filter element
Dok./doc.: 44747-4, version 2
01NR.1000.32227.10VG.25G.25.B.P.-.S1

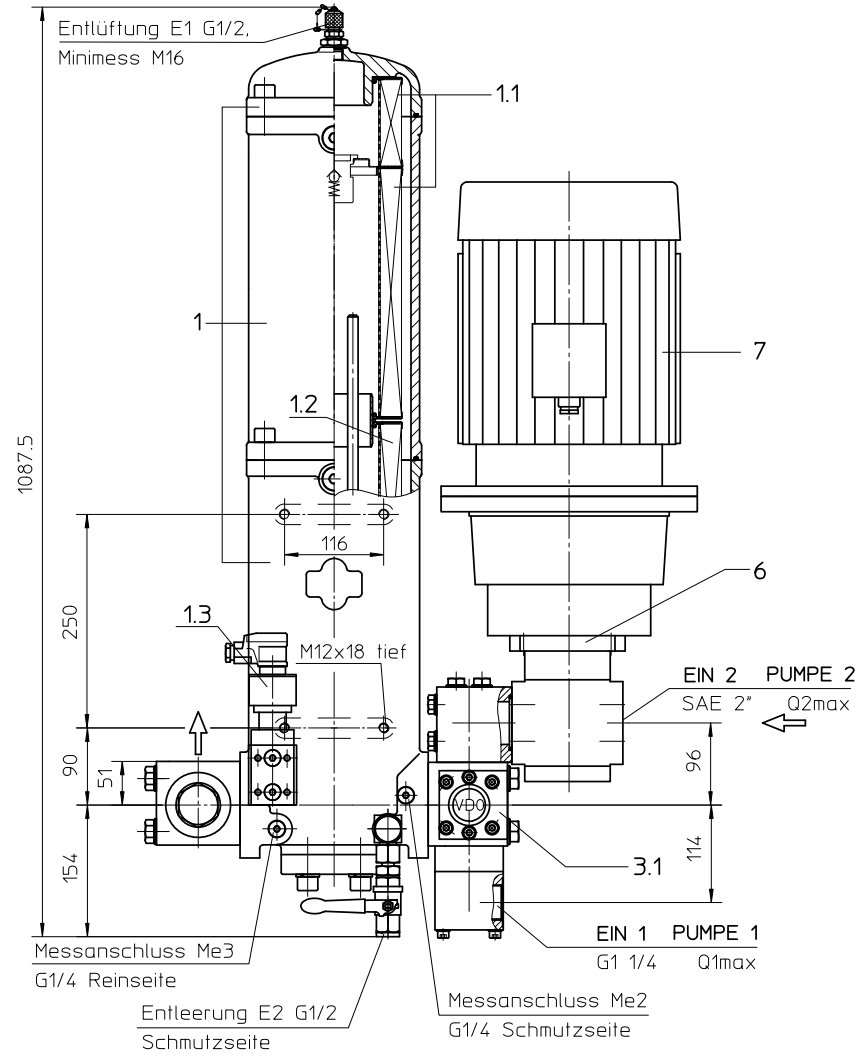
Pos. 1.2 Verschmutzungsanzeiger/clogging indicator
Dok./doc.: 1609, version 3
AE70.2,5.P.-.B

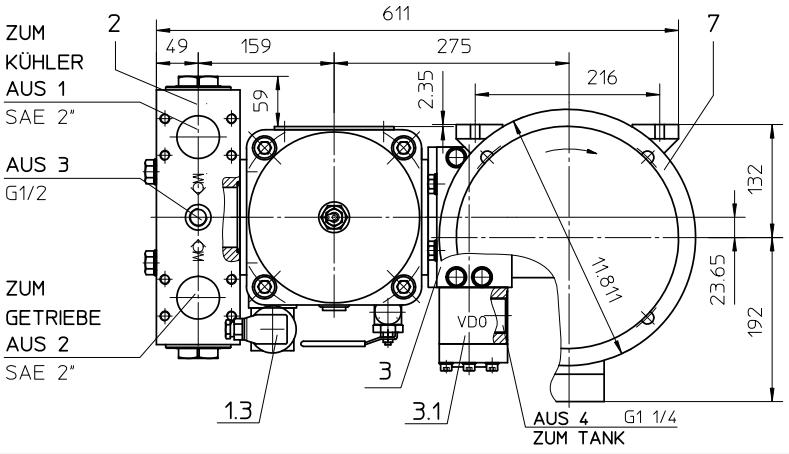
Pos. 2 Anschluß AUS/connection OUT
Stromteilventil/current part valve
Dok./doc.: 44869-4, version 2
STV.32.44869.0,5.1.4,0.P.FS.A.G.6

Pos. 3 Pumpenheizung/pump heating
Dok./doc.: 48431-4
PHZ.50.48431.4x100.230.P.FS.A.FS.8
4x100W, 230V

Pos. 6 Pumpeneinheit/pump unit
Dok./doc.: 42519-4,version 2
P40.160.100.ZP.P.FS.8.132.15

Pos. 7 E-Motor/E-motor
Dok./doc.: 48637-4
D80.B3-B5-132M-6.5,5.400-690.D.60.1
Drehstrommotor/rotary current motor 400-690V, 60Hz,
ca./approx. 1140 U/min/rpm, 5,5 kW,
Stillstandsheizung/downtime heating 13W, 230V / 40W, 400V
Schutzart/protection IP55





TWIN-Filter
TWF1950.

bestehend aus

Pos. 1 Filter, Dok.: 33802-4
LF1950.33802.V.1.2.FS.A.-.VS

Pos. 1.1 Stufenfilterelement, Dok.: 33802-4
01NR.1000.32227.10VG.25G.25.B.V.-.S1

Pos. 1.2 Einfachfilterelement, Dok.: 33802-4
01NR.1000.6VG.10.B.V.-

Pos. 1.3 Verschmutzungsanzeiger, Dok.: 1608
VS2.2,5.V.GS.B.E

Pos. 2 Ventilblock AUS, Stromteilventil,
Dok.: 42850-4
STV.50.42850.0,5.I.6,0.V.FS.A.FS.8

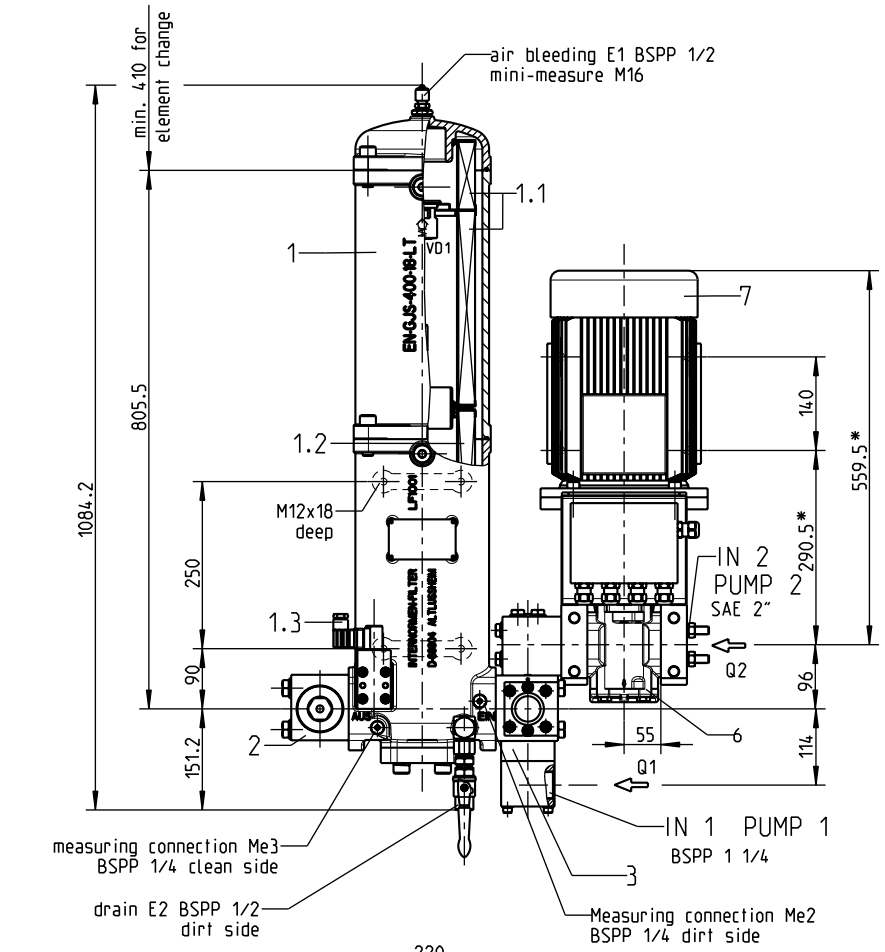
Pos. 3 Ventilblock EIN, Ventilkombination,
Dok.: 34290-4
VK.32.34290.0,35.V.FS.8.G.6.1.33807.1

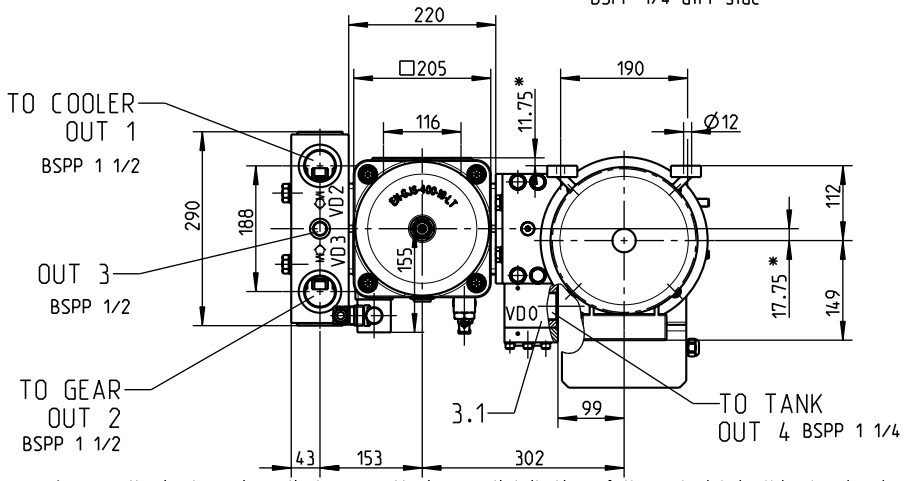
Pos. 3.1 Druckbegrenzungsventil, Dok.: 33807-4
DBV.25.33807.12.V.FW02.G.6

Pos. 6 Pumpeneinheit, Dok.: 34375-4
P24.125.80.ZP.V.FS.8.132.-

Pos. 7 E-Motor D62 B3-B5-132M-8/4.2,6/4,2.690.D.50.1
Drehstrommotor 690V, 50Hz, ca.720/1450 U/min,
2,6/4,2 KW, Schutzart IP54

Bemaßung in mm, falls nicht anders angegeben
Dimensions in mm, unless specified otherwise





TWIN-Filter
TWF1950.

consisting of

Pos. 1 Filter, Doc.: 33802-4
LF1950.33802.P.1.2.FS.A.-.AE.-

Pos. 1.1 Steps filter element, Doc.: 33802-4
01NR.1000.32227.10VG.25G.25.B.P.-.S1

Pos. 1.2 Simple filter element, Doc.: 33802-4
01NR.1000.6VG.10.B.P.-

Pos. 1.3 Clogging indicator, Doc.: 1609
AE70.2.5.P.-.B

Pos. 2 Valve block OUT, Current part valve
Doc.: 41459-4
STV.40.41459.0.5.1.6.0.P.FS.A.G.7

Pos. 3 Valve block IN, valve combination,
Doc.: 34290-4
VK.32.34290.0.35.P.FS.8.G.6.1.33807.1

Pos. 3.1 Pressure relief valve, Doc.: 33807-4
DBV.25.33807.14.P.FW02.G.6

Pos. 5 Pump heating Doc.: 54891-4
HP.50.54891.4x100.230.P.FS.8.110
4x100W, 230V

Pos. 6 Pump unit, Doc.: 46622-4
P60.80.50.ZP.P.FS.8.112.-.S0

Pos. 7 E-motor, Doc.: 49404-4
D84 B3-B5-112M-6.2.2.400-690.D.50.1
Rotary current motor 400-690V, 50Hz, ca.950 rpm,
2.2 kW, protection IP54, standstill heater 40W-400V

Monitoring and Diagnostic Solutions

WSPS 01 Sensor

- The WSPS 01 is a monitoring and diagnostic sensor, to be used for hydraulic and lubricating fluids. It is meant for quick and reliable off-line measurements of saturated water in oil (analogue output of water saturation in volt). Simply and easily cleaned.

Technical Data

Measuring range	0%...100 %
Accuracy	+/- 2%
Ambient temperature	-40°C...+80°C
Flow velocity	maximum 2 m/s
Power supply	6 V...30 V DC
Analogue output	0 V...1 V
Cable length	1,5 m
Protection class sensor	IP 67

Recommended display unit
WSH 01
coloured LED display
for mobile off-line applications

WSPS 05 Sensor

- The WSPS 05 is an effective diagnostic system able to determine the saturation level of water in oil. The sensor detects the presence of free or emulsified water in hydraulic or lubrication systems, thereby enabling the user to prevent accelerated oil ageing, increased wear, malfunctions and failure of components.
- The saturation of the fluid with water is shown in percent. The indication 100 % means that the fluid is completely saturated.
- Additionally the WSPS 05 has an integrated temperature sensor which determines the exact temperature of the fluid during a measurement (saturation values depend on the temperature of the fluid).

Technical Data

Measuring range	
Saturation level	0 - 100 %
Temperature	-25°C...+100°C
Accuracy	
Saturation level	± 2 %
Temperature	± 0,4 %
Operating pressure	0...25 bar
Flow velocity	≤ 2m/s
Ambient temperature	-25°C...+85°C
Temperature range of fluid	-40°C...+90°C (temporary 100°C)
Power supply	12...30VDC
Analogue outputs	2 x 4...20 mA
Protection class	IP 67
Screw thread	G ¾

Recommended display unit
WSTM 01
numeric 4-row display
for stationary in-line applications
results ca be desplayed in ppm
for certain fluids

WSH 01 - Set

- The WSH 01 is a comfortable handheld measuring device, consisting of a WSPS 01 sensor and a WSH 01 display unit with a coloured LED display.
- It is meant for quick, simple and reliable mobile off-line measurements of saturated water in oil.
- Battery powered and simple to be cleaned.

WSTM 01 - Set

- The WSTM 01-Set is meant for reliable, stationary in-line measurements of saturated water in oil and temperature as well.
- The set consists of a WSPS 05 sensor and a WSTM 01 display unit (4-row numeric display, simple menu), displaying results in either saturation level or theoretical ppm.
- Serial interface (RS 232), CAN-bus interface acc. to ISO 11898, CAN 2.0A, CANopen compatible

MSS 01

Enables the operation of up to 8 separate WSPS sensors with only one WSTM 01 display unit

WSSB

Water sensor sample bottle, for direct measurements when using the CCS (Contamination Control System)

Fluid compatibility

Mineral oil based fluids as well as synthetic fluids such as hydraulic oils, lubricating oils, transformer oils, and ester based synthetic oils.

Tested and for the WSTM 01 pre-programmed fluids

- ✔ HLP 22 (Shell)
- ✔ HLP 46 (Shell)
- ✔ HLP 68 (Shell)
- ✔ MIL-H 5606 (Shell)
- ✔ CLP 220 (Shell)
- ✔ HEES 46 (Fuchs)
- ✔ ...

Additional fluids are being tested constantly and added to the programme. Research on special fluids is available (upon request).

In-line Monitoring Solutions

MPS 01.2 - Metal Particle Sensor

- Metal particle sensor based on an inductive measurement technique for hydraulic and lubricating fluids
- Detects metal particles >200µm
- Designed as an inexpensive in-line monitoring solution for stationary and permanent operations
- Suitable for installation in new or existing systems
- Two output signals; counting impulses (24V, 7ms) as well as a diagnostic signal

GL OPERATING 24/7

CERTIFIED!

Technical data

Fluid compatibility	Hydraulic and lubricating fluids, as well as synthetic esters
Measuring	Inductive method
Metal particles	>200µm
Detection rate	max. 100 particles/sec
Pressure	up to 20 bar
Temperature range	-40...80 °C
Flow velocity	50 l/min
Connections	Hose or flange
Electronic	M12, 4 poles
Power supply	24 V DC

MPM 01 Set - Metal Particle Monitor System

- Consists of the metal particle sensor MPS 01.2, based on an inductive measurement technique, and the control and display unit MPM 01 for direct measurement survey
- Detection and counting of metal particles >200µm
- Designed as an inexpensive in-line monitoring solution for stationary and permanent operation
- Suitable for installation in new or existing systems
- Internal storage of measurements
- Automatic monitoring function with control signal output if set thresholds are exceeded
- RS 232 interface
- Data-transfer to an external PC
- Data management using a MS-Excel based LabVIEW Data-Manager software
- Comfortable and user-friendly software
- Numeric 4-line display
- Robust case

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In-line Monitoring Solutions

PFS 01 - Laser Sensor

- Consists of two sensor elements, a laser sensor for particle counting and a thermal flow sensor for volume flow measurements
- Advantages of the thermal volume flow sensor: no mobile component parts, no abrasion, simple electronic evaluation procedures, the sensor is insensitive to contamination
- The laser sensor integrated in the PFS operates based on the light cover principle
- Advantages over precision sensors: compact construction, lower costs, applicable for permanent and spontaneous monitoring
- Calibrated according to ISO 11171:99
- Suitable for installation in new or existing systems
- Intended to be used with the CCT 01 or CCM 01

Operating fluids: Hydraulic oils H, HL, HLP and HV; Gear oils C, CL, CLP; Motor oils, gas oils; MIL-H-5606 E; Vegetable oils (HTG, Triglyceride); Synthetic esters (HEES)

Technical data

Calibration of the particle size	ISO MTD in oil (ISO 11171:2000)
Max. acceptable operating pressure	≤ 50 bar
Max. oil temperature (short term)	70 °C
Viscosity range	10...400 mm²/s
Ambient temperature	0...45° C
Max. acceptable volume flow	50 l/min
Connections	Pipes, 1" or ¾"
Protection class	IP 65
Weight	1,5 kg

CCM 01 Set - Contamination Control Monitor System

- The system consists of the PFS 01, particle counter with a laser sensor for hydraulic and lubricating fluids, and the CCM 01, a monitor and display unit
- Designed as an inexpensive in-line monitoring solution for stationary and permanent operations
- Reliable determination of contamination classes according to ISO 4406:99 or NAS 1638 (switchable)
- CAN-interface acc. to ISO 11898, CAN 2.0A, CANopen compatible
- Suitable for installation in new or existing systems
- Results displayed immediately
- Internal storage of measurements
- Automatic monitoring function with control signal output if set thresholds are exceeded
- RS 232 interface
- Data transfer to an external PC
- Data management using a MS-Excel based LabVIEW Data-Manager software
- Comfortable and user-friendly software
- Numeric 4-line display
- Robust case

Technical data

Fluid compatibility	Hydraulic and lubricating fluids as well as synthetic esters
Laser	650 nm
Counting channels	4; sizes (switchable): $\geq 4\mu m_{(c)}$, $\geq 6\mu m_{(c)}$, $\geq 14\mu m_{(c)}$, $\geq 21\mu m_{(c)}$ *or* $\geq 6.4\mu m_{(c)}$, $\geq 14\mu m_{(c)}$, $\geq 21\mu m_{(c)}$, $\geq 37\mu m_{(c)}$
Pressure	up to 50 bar
Temperature range	0...70 °C
Calibration	ISO MTD in oil
Connection	1" or 3/4" pipes
Power supply	24 V DC

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Competence through Experience

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In-line Monitoring Solutions

CCT 01 Set - Contamination Control Transmitter System

- Particle counter with the PFS 01 laser sensor for hydraulic and lubricating fluids
- Contamination monitoring at different test stands, for hydraulic components, filter service devices, wind energy plants, mobile and stationary hydraulic systems in general
- Inexpensive and reliable in-line system for contamination class control
- Consists of the contamination class transmitter CCT 01 with an integrated three-channel particle counter combined with the particle flow sensor PFS 01
- CAN-interface acc. ISO 11898, CAN 2.0A, CANopen compatible
- When used as a contamination class transmitter, the CCT 01 transforms measurement signals, received from the laser sensor, into contamination classes which are being displayed as analogue outputs (4...20mA)
- The emitted signals are consistent with the contamination classes based on ISO 4406:99 (≥ 4 $\mu m_{(c)}$, ≥ 6 $\mu m_{(c)}$, ≥ 14 $\mu m_{(c)}$)
- Measurements can be saved in user-defined intervals (up to 1000 measurements)
- By using an USB-interface the CCT 01 can be PC-configured, calibration values can be set and current or saved particle numbers can be transmitted to a PC

Technical data

Interface	USB (for configuration) M 12 - connector, CAN - option
Dimensions	201 x 85 x 35 mm x mm x mm
Mass	380 g
Output signals	3 x 4...20 mA

A complex interaction of market and technological innovations, brought up outstanding solutions - accurate, immediate, mobile and stationary fluid monitoring and particle counting according to ISO, NAS and SAE standards.

.... making your systems operate at their maximum capacity.

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Oil Condition Monitoring Systems

IVS 01 - In-line Multifunction Oil Condition Sensor

- In-line multifunction sensor meant for oil condition monitoring in hydraulic and lubrication systems
- Able to determine the ageing condition of oil and detect various mixtures by measuring and detecting changes of viscosity, temperature and relative dielectricity before system failures can occur
- Enables the user to programme an automatic oil condition monitoring function, make a precise assessment of the condition of a system and perform maintenance accurately timed
- Simple screw-in assembling G 3/4

Technical data

Operating parameters:	
Max. admissible pressure	25 bar
Ambient temperature	-40...70 °C
Power supply	24 V DC
Output interface	analogue, 4...20 mA (4x) **or** CAN-Open
Connection thread	G 3/4
Protection class	IP 65
Measurement parameters:	
Dynamic viscosity	5...1500 mPas
Temperature	-30...130 °C
Relative dielectricity	1...10
Accuracy of measurements	viscosity: ± 2.5 % temperature: ± 0.5 °C rel.dielectric.constant: ± 0.15
Reproducibility viscosity/temperature	± 1%

OCM 01 - Oil Condition Monitor

- Mobile diagnostic system able to determine the ageing condition of oil in hydraulic and lubrication systems by measuring solid contamination, water saturation, temperature, viscosity and relative dielectricity
- Applicable for both pressure and suction lines (can as well be used when working with foamed oils in gears)
- Enables the user to make a precise assessment of the condition of a system and perform a cost-effective maintenance on time

Technical data

Operating parameters:	
Voltage supply	90...230 V, 50/60 Hz
Pressure operating range	-0,2…40 bar
Viscosity range	1...400 mm²/s
Max. permitted oil temperature	0...70 °C
Ambient temperature	0...50 °C
Protection class	IP 67 (with cover closed)
Measurement parameters:	
Particle counting according to ISO 4406:99, NAS 1638, SAE AS 4059	
Automatic particle counting in 8-channels	4,0 $\mu m_{(c)}$, 4,6 $\mu m_{(c)}$, 6,0 $\mu m_{(c)}$, 6,4 $\mu m_{(c)}$, 10 $\mu m_{(c)}$, 14 $\mu m_{(c)}$, 21 $\mu m_{(c)}$, 37 $\mu m_{(c)}$
Coincidence barrier	10.000 particles / ml
Calibration	ISO MTD in oil (ISO 11171:2000)
Measuring accuracy	± 1 (contamination class)
Water saturation	0...100%
Dynamic viscosity	0,8…320 mPas
Temperature	0...70 °C
Relative dielectricity constant	1…10

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Competence through Experience

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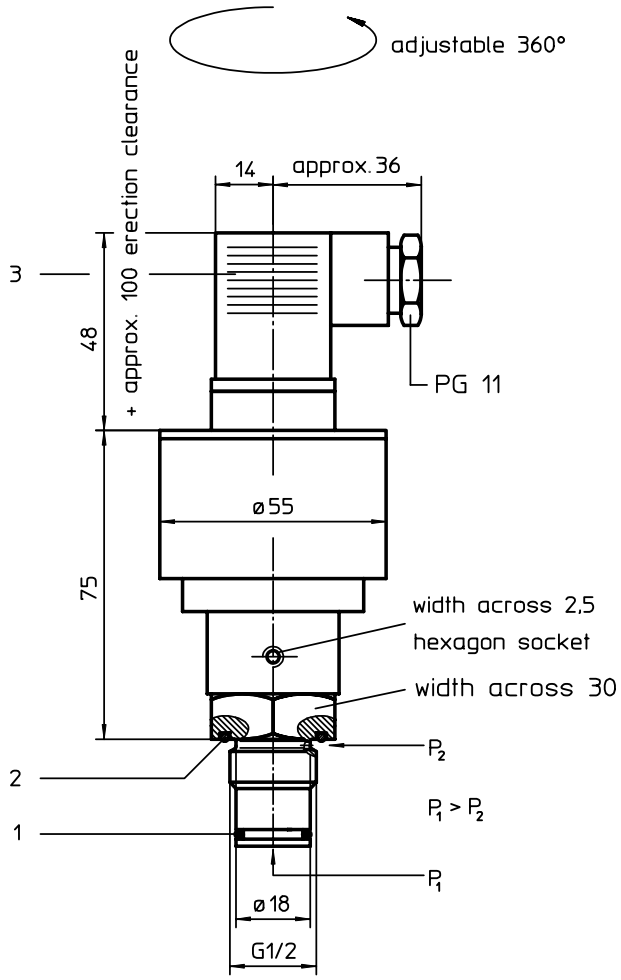
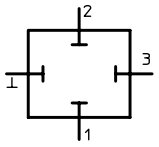
ELECTRONICAL CLOGGING SENSOR
Series VS 1 and Indicating System AG 1 (thread execution)

Sheet No.
1617 D

Clogging sensor VS1

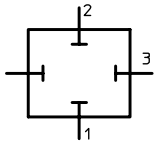


Connection configuration



⊥ : 0 V
1 : + 24 V DC
2 : 4 ... 20 mA

earthed



: 0 V
1 : + 24 V DC
2 : 4 ... 20 mA

free of earthing

1. Type index: (ordering example)

VS	1.	1,5.	P.	-.	GS.	-.	E
1	2		3	4	5	6	7

1 series:
VS1 = electronical clogging sensor with analog 4...20mA output signal

2 indicator-pressure difference: Δp-nominal
1,5 = 1,5 bar
2,5 = 2,5 bar
5,0 = 5,0 bar
6,0 = 6,0 bar

3 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

4 material:(screw-in-housing)
- = standard
VA = stainless steel

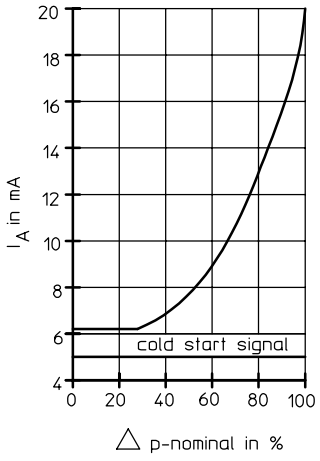
5 connection:
GS = line adapter DIN 43650-A, three-channel plug

6 execution:
- = standard

7 earthing:
E = 0 volt free of earthing
G = 0 volt earthed

2. Technical data:

max. operating pressure:	420 bar
max. pressure difference:	160 bar
distribution voltage:	24 V DC ± 20% residual ripple: < 10%
temperature range:	- 10 °C to + 100 °C (fluid) - 10 °C to + 80 °C (electronics)
output signal:	4...20mA; max. load: 400 Ohm
error of measurement:	± 5% v. Δp-nominal



3. Functions:

- Continuous pressure difference measuring
- Cold start indication up to approx. + 25°C
- Suppression of pressure peaks
- Dust-proof and splash-proof aluminium or stainless steel housing
- Interference-free signal transmission over longer distances
- Optimal utilization of the filter elements based on a high definition of the measure value within the final measure range
- Interchangeable with clogging indicator type AE (INF)

4. Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
2	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
3	1	GS	DIN 43650-A	312492	

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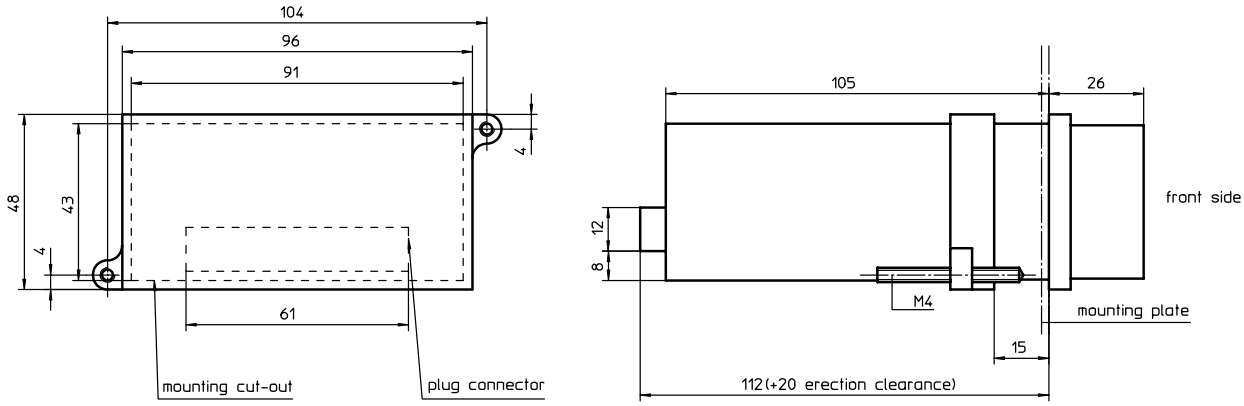
Indicating System AG 1

1. Type index: (ordering example)

AG1.
1

1 **series:**
AG 1 = electronic display unit with clear protective cover,
mounts remote in control cabinets
to be used with electronic clogging sensor VS1



2. Technical data:

distribution voltage:	24 V DC ± 20% residual ripple: < 10%	
contacts:	2 x contact maker; (K1/K2)	U_{max} : 240 V AC I_{max} : 0,5 A P_{max} : 10 Watt
temperature range:	0 to + 70°C	
system of protection:	IP 53 with transparent protection cap	
housing dimensions:	according to DIN 43700 (see illustration)	

3. Functions:

- Evalution set for current signals emitted by VS1
- Pressure difference indication by LED - band
- 2 x relay switching contacts
  (75% and 100% of the Δp -nominal range)
- Indication of switching position by LED
- Cold start indication by LED
- Adjustable pressure peak suppression up
  to 60 seconds

4. Connection configuration:

24V_		K1		K2						24V_	
⊥	+	1	2	1	2				4...20 mA	+	⊥
1	2	3	4	5	6	7	8	9	10	11	12

1, 2 = distribution voltage
10, 11, 12 = VS1 - connection

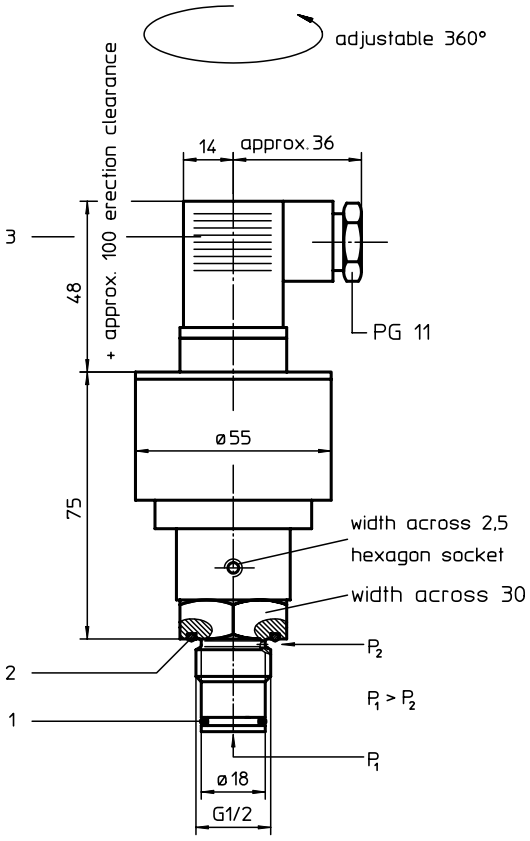
LED-Indicating scheme

I_A-VS1 in mA	[v]	[< 50]	[50]	[75]	[90]	[100]	[S1]	[S2]	filter element - contamination level
	ye	gr	gr	ye	ye	rd	rd	rd	
4...6	x	x							- cold start indication (fluid temperature < 25°C) no information about the contamination level
6...8		x							- filter element unused pressure difference: < 50% Δp-nominal
8...12		x	x						- initial contamination pressure difference: ≥ 50% Δp-nominal
12...16		x	x	x			x		- moderate contamination pressure difference: ≥ 75% Δp-nominal warning contact 1 switched
16...20		x	x	x	x		x		- heavy contamination pressure difference: ≥ 90% Δp-nominal
20		x	x	x	x		x	x	- filter element used up pressure difference: ≥ 100% Δp-nominal warning contact 2 switched

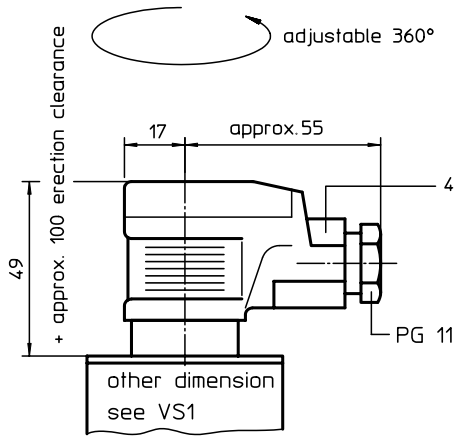
ELECTRONICAL CLOGGING SENSOR
Series VS 2 (thread execution)

Sheet No.
1618 D

Clogging sensor VS 2 ... GS



Clogging sensor VS 2 ... SS1



1. Type index: (ordering example)

VS 2.	1,5.	P.	-.	GS.	-.	E
1	2	3	4	5	6	7

1 series:
VS2 = electronical clogging sensor with 2x PNP-switching contacts (75% and 100% of the Δp-nominal range)

2 indicator-pressure difference: (Δ p-nominal)
1,5 = 1,5 bar
2,5 = 2,5 bar
5,0 = 5,0 bar
6,0 = 6,0 bar

3 sealing material:
P = Nitrile (NBR)
V = Viton (FPM)

4 material: (screw-in-housing)
- = standard
VA = stainless steel

5 connection:
GS = line adapter DIN 43650-A, three-channel plug
SS1 = line adapter DIN 43650-A, three-channel plug with LED switch-position indicator for VS 2

6 execution:
- = standard

7 earthing:
E = 0 volt free of earthing
G = 0 volt earthed

2. Technical data:

max. operating pressure:	420 bar
max. pressure difference:	160 bar
distribution voltage:	24 V DC ± 20% residual ripple: < 10%
temperature range:	- 10 °C to + 100 °C (fluid) - 10 °C to + 80 °C (electronics)
PNP-switching contacts:	conatct maker; I_{max} =200 mA with 24V
protection:	IP 65

3. Functions:

- Discrete control of the filter contamination by means of two PNP-switching contacts (75% and 100% of the Δp-nominal range)
- Indication of switching position by LED immediately at the sensor in connection with the signal plug SS1
- Cold start suppression up to approx. 25°C
- Suppression of pressure peaks
- Interchangeable with clogging indicator type AE (INF)

4. Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	O-ring	14 ×2	304342 (NBR)	304722 (FPM)
2	1	O-ring	22 × 2	304708 (NBR)	304721 (FPM)
3	1	GS	DIN 43650-A	312492	
4	1	SS1	DIN 43650-A	310403	

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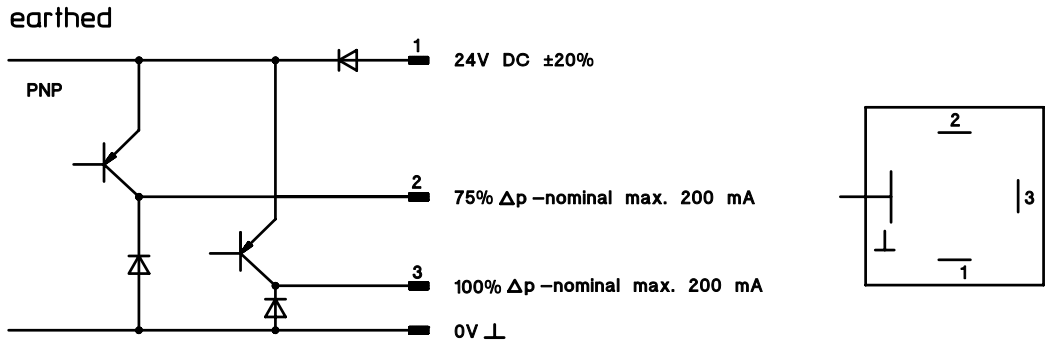
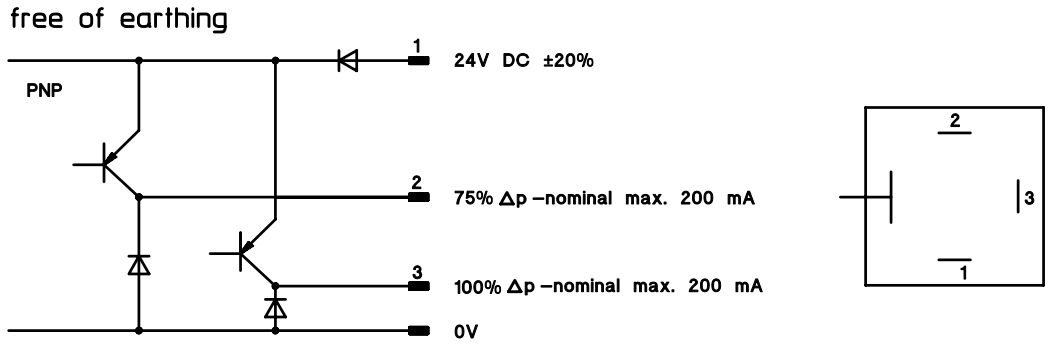
5. Connection configuration :

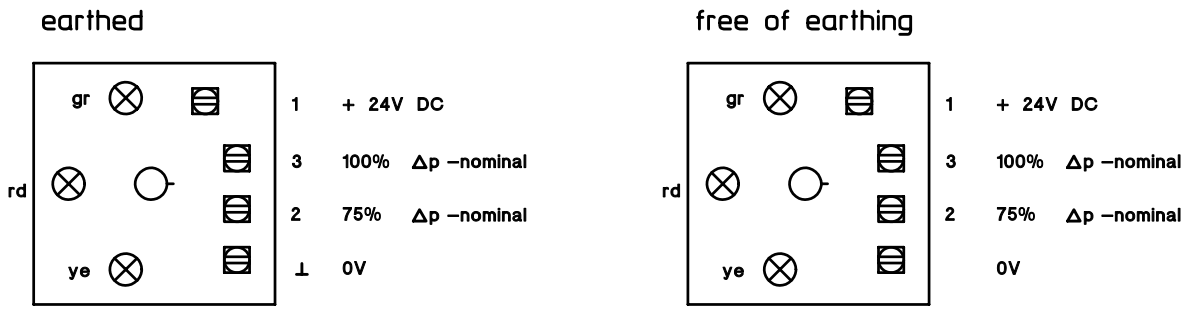
Connection configuration VS 2





Connection configuration SS 1

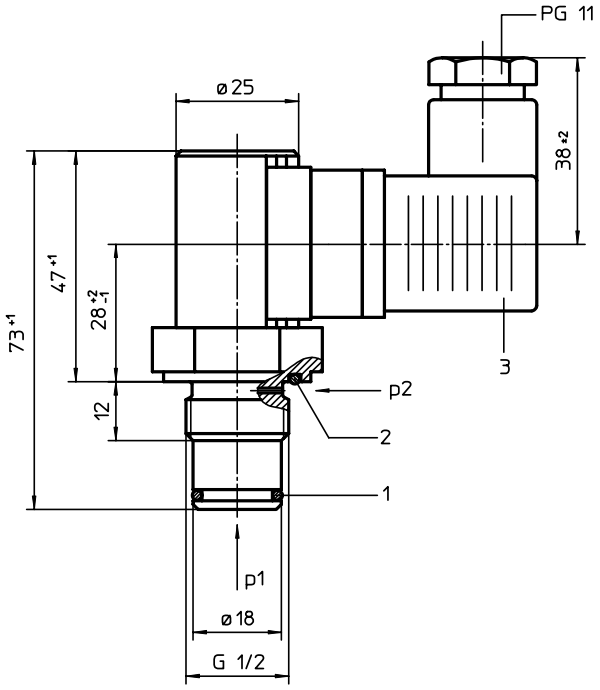
The signal plug SS1 is used to indicate the actual switching position at the VS2.

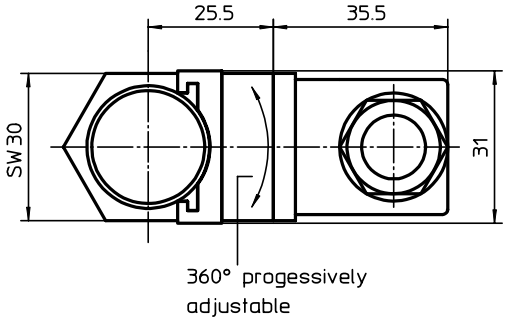


LED - green - on: operating pressure in on-position
LED - yellow - on: switching contact 75% Δp-nominal switched
LED - red - on: switching contact 100% Δp-nominal switched

CLOGGING INDICATOR
Series AE (electrical / visual-electrical, thread execution)

Sheet No.
1615 G





1. Clogging indicator AE

1.1. Type index: (ordering example)

AE.	30.	1,5.	P.	-.	-
1	2	3	4	5	6

1 **series:**
AE = clogging indicator, electrical / visual-electrical

2 **version:**
30-80 = see table below

3 **indicator-pressure difference:** Δp-nominal
1,5 = 1,5 bar
2,5 = 2,5 bar
5,0 = 5,0 bar

4 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

5 **material:**
- = standard
VA = stainless steel

6 **execution:**
- = standard

2. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
max. operating pressure:	420 bar
max. pressure difference:	160 bar
installation position:	vertical

Clogging indicator AE with redundant switches, see data sheet-no. 40968-4

version	luminous indication	contact	voltage	max. rupturing capacity (resistive load)	max. switching current (resistive load)	connection protection
30	-	contact maker and contact breaker	..... 175V DC ..... 125V AC	3 VA 3 Watt	0,25 A 0,25 A	line adapter DIN 43650-A/PG11
40	-		..... 175V DC ..... 230V AC	20 VA 10 Watt	1,0 A 0,5 A	
50	2x LED [1]		120V AC/DC	3 Watt/VA	0,025 A with 120V AC/DC	DIN 14050-IP 65
62	1x LED		110....230V AC/DC	20 Watt/VA	0,180 A with 110V AC/DC 0,090 A with 230V AC/DC	
70	2x LED		24V DC	3 VA	0,080 A with 24V DC	
80	2x LED		24V DC	20 VA	0,750 A with 24V DC	

[1] LED = light emitting diode

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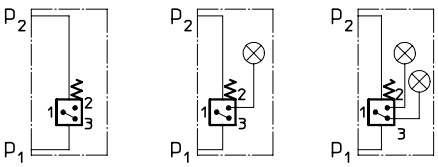
3. Spare parts:

item	qty.	designation	dimension	article-no.	type
1	1	O-ring	14 x 2	304342 (NBR)	versions 30 - 80
				304722 (FPM)	
2	1	O-ring	22 x 2	304708 (NBR)	
				304721 (FPM)	
3	1	line adapter	DIN 43650-A	312492	versions 30 and 40
	1	line adapter with LED 24V		315012	versions 70 and 80
	1	line adapter with LED 120V		331867	version 50
	1	line adapter with LED 110...230V		331867	version 62

4. Symbols:

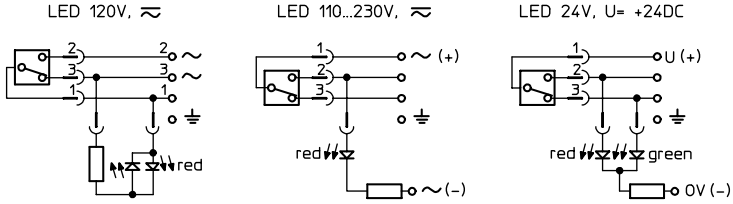
hydraulic-electrical symbol

versions 30 and 40 | versions 50 and 62 | versions 70 and 80



connection configuration for LED

version 50 | version 62 | versions 70 and 80



p_1 = measure connection supply
p_2 = measure connection output

5. Description:

The AE 30 and AE 40 pollution indicators are electrical differential pressure indicators.
The AE 50 to AE 80 pollution indicators are combined optical and electrical differential pressure indicators. These differential pressure indicators can be fitted to all pressure filters $p \leq 420$ bar for which there is a corresponding assignment on the relevant dimension drawing. As the degree of pollution of the filter element rises, so the difference between the entry pressure p_1 and the exit pressure p_2 of the filter increases. Depending on this pressure difference and irrespective of the operating pressure, in the pollution indicators

- AE 30 and AE 40, two electrical signals (contact maker/contact breaker) are triggered
- AE 50 and AE 62, two electrical signals (contact maker/contact breaker) are triggered and one optical signal is formed
- AE 70 and AE 80, two electrical signals (contact maker/contact breaker) are triggered and two optical signals are formed.

A metering piston subjected to the entry and exit pressure moves against a metering spring according to the pressure differential. Depending on the path a permanent magnet integrated in the metering piston activates a reed contact (electromagnetic switch) and triggers the electrical signal. The electrical and optical indication is effected as a digital signal at the given switching pressure. Versions 50 to 80 of the pollution indicator are fitted with additional LED displays. The optical LED signal becomes visible according to the selected version in the translucent cover plate of the line box on the pollution indicator.
In the pollution indicators

- AE 50 and AE 62, the red LED signal that the filter element needs to be changed
- AE 70 and AE 80, the green LED signal the normal operating state (filter element not yet polluted to an unacceptable level), while the red LED signal that the filter element needs to be changed.

6. Operating instructions:

Normally filters are supplied with mounted clogging indicator. When retrofitting - the filter is to be discharged of the operating pressure.

- dismantling the screw plug out of the bare hole which is foreseen for the clogging indicator
- screw in the clogging inidcator into the bare hole (starting torque 125 Nm)

It is necessary to make sure the availability and the right positioning of sealing parts

- O-ring 22 x 2 and
- O-ring 14 x 2

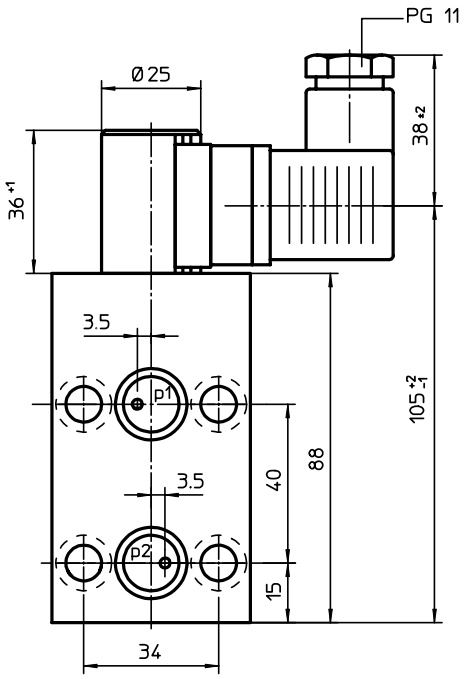
as well as a dirt-free mounting. The electrical contacts are to be connected according to the graphical symbol shown on the type plate of the clogging indicator.

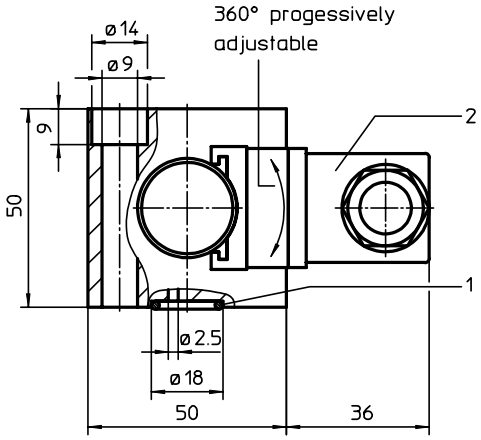
7. Maintenance:

The device is maintenance-free, however, note that no cleaning fluids and solvents get on the transparent cap of the optical indicator.

CLOGGING INDICATOR
Series AE (electrical / visual-electrical, block execution)

Sheet No.
1609 E





1. Clogging indicator AE

1.1. Type index: (ordering example)

AE. 30. 1,5. P. -. B

1	2	3	4	5	6

1 **series:**
AE = clogging indicator, electrical / visual-electrical

2 **version:**
30-80 = see table below

3 **indicator-pressure difference:** Δp-nominal
1,5 = 1,5 bar (0,15 MPa)
2,5 = 2,5 bar (0,25 MPa)
5,0 = 5,0 bar (0,50 MPa)

4 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

5 **material:** (block)
- = standard
VA = stainless steel

6 **execution**:
B = block execution

2. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
max. operating pressure:	420 bar (42 MPa)
max. pressure difference:	160 bar (16 MPa)
installation position:	vertical

version	luminous indication	contact	voltage	max. rupturing capacity (resistive load)	max. switching current (resistive load)	connection protection
30	-	contact maker and contact breaker	..... 175V DC ..... 125V AC	3 VA 3 Watt	0,25 A 0,25 A	line adapter DIN 43650-A/PG11
40	-		..... 175V DC ..... 230V AC	20 VA 10 Watt	1,0 A 0,5 A	
50	2x LED [1]		120V AC/DC	3 Watt/VA	0,025 A with 120V AC/DC	DIN 14050-IP 65
62	1x LED		110....230V AC/DC	20 Watt/VA	0,180 A with 110V AC/DC 0,090 A with 230V AC/DC	
70	2x LED		24V DC	3 VA	0,080 A with 24V DC	
80	2x LED		24V DC	20 VA	0,750 A with 24V DC	

[1] LED = light emitting diod

Changes of measures and design are subject to alteration!

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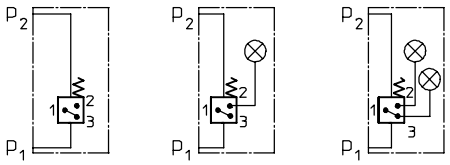
3. Spare parts:

item	qty.	designation	dimension	article-no.	type
1	2	O-ring	14 x 2	304342 (NBR)	AE version 30 - 80
				304722 (FPM)	
2	1	line adapter	DIN 43650-A	312492	AE version 30 and 40
	1	line adapter with LED 24V		315012	AE version 70 and 80
	1	line adapter with LED 120V		331867	AE version 50
	1	line adapter with LED 110...230V		331867	AE version 62

4. Symbols:

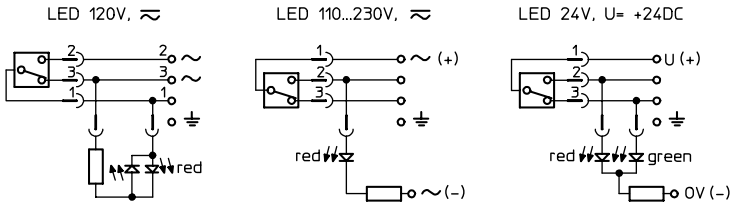
hydraulic-electrical symbol

versions 30 and 40 | versions 50 and 62 | versions 70 and 80



connection configuration for LED

version 50 | version 62 | versions 70 and 80



p_1 = measure connection supply
p_2 = measure connection output

5. Description:

The AE 30 and AE 40 pollution indicators are electrical differential pressure indicators.
The AE 50 to AE 80 pollution indicators are combined optical and electrical differential pressure indicators. These differential pressure indicators can be fitted to all pressure filters $p \leq 420$ bar (42 MPa) for which there is a corresponding assignment on the relevant dimension drawing. As the degree of pollution of the filter element rises, so the difference between the entry pressure p_1 and the exit pressure p_2 of the filter increases. Depending on this pressure difference and irrespective of the operating pressure, in the pollution indicators

- AE 30 and AE 40, two electrical signals (contact maker/contact breaker) are triggered
- AE 50 and AE 62, two electrical signals (contact maker/contact breaker) are triggered and one optical signal is formed
- AE 70 and AE 80, two electrical signals (contact maker/contact breaker) are triggered and two optical signals are formed.

A metering piston subjected to the entry and exit pressure moves against a metering spring according to the pressure differential. Depending on the path a permanent magnet integrated in the metering piston activates a reed contact (electromagnetic switch) and triggers the electrical signal. The electrical and optical indication is effected as a digital signal at the given switching pressure. Versions 50 to 80 of the pollution indicator are fitted with additional LED displays. The optical LED signal becomes visible according to the selected version in the translucent cover plate of the line box on the pollution indicator.
In the pollution indicators

- AE 50 and AE 62, the red LED signals that the filter element needs to be changed
- AE 70 and AE 80, the green LED signals the normal operating state (filter element not yet polluted to an unacceptable level), while the red LED signals that the filter element needs to be changed.

6. Operating instructions:

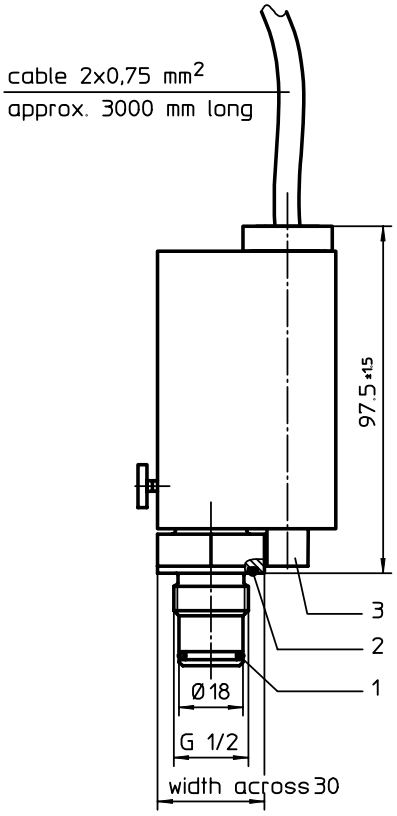
Normally filters are supplied with mounted clogging indicators.
It is necessary to make sure the availability and the right positioning of sealing parts O-ring 14 x 2 as well as a dirt-free mounting.
The electrical contacts are to be connected according to the graphical symbol shown on the type plate of the clogging indicator.

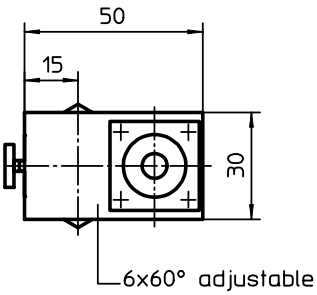
7. Maintenance:

The device is maintenance-free, however, note that no cleaning fluids and solvents get on the transparent cap of the optical indicator.

CLOGGING INDICATOR
Series AE (electrical) explosion-proof

Sheet No.
1625 B





1. Type index: (oredering example)

AE. 10. 1,5. P. VA. Ex

1	2	3	4	5	6

1 **series:**
AE = clogging indicator electrical

2 **contact:**
10 = contact maker

3 **indicator-pressure difference: Δp nominal**
1,5 = 1,5 bar; 2,5 = 2,5 bar; 5,0 = 5,0 bar

4 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

5 **material:**
VA = stainless steel

6 **execution:**
Ex = explosion-proof

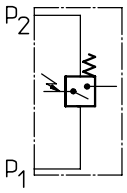
2. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
max. operating pressure:	420 bar
max. pressure difference:	160 bar

3. Electrical limit facts:

execution:	V DC/V AC 200/250 V, max. 30 Watt
switch contact:	contact maker
protection:	EEx m II T6

4. Symbol:



contact maker

5. Spare parts:

item	qty.	designation	dimension	article-no.
1	1	O-ring	14 x 2	304342 (NBR) 304722 (FPM)
2	1	O-ring	22 x 2	304708 (NBR) 304721 (FPM)
3	1	switch explosion-proof		315461

Changes of measures and design are subject to alteration!

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5. Description:

The AE 10 pollution indicator is an electrical differential pressure indicator.
The differential pressure indicator can be fitted to all pressure filters $p \leq 420$ bar for which there is a corresponding assignment on the relevant dimension drawing. As the degree of pollution of the filter element rises, so the difference between the entry pressure p_1 and the exit pressure p_2 of the filter increases. Depending on this pressure difference and irrespective of the operating pressure, an electrical signal on the AE 10 pollution indicator will be released.
A metering piston subjected to the entry and exit pressure moves against a metering spring according to the pressure differential. Depending on the path a permanent magnet integrated in the metering piston activates a reed contact (electromagnetic switch) and triggers the electrical signal. The electrical indication is effected as a digital signal at the given switching pressure.
At the AE 10 pollution indicator the closed condition signalizes that the change of the filter element is necessary.

6. Operating instructions:

Normally filters are supplied with mounted clogging indicator. When retrofitting - the filter is to be discharged of the operating pressure.
- dismantling the screw plug out of the bare hole which is foreseen for the clogging indicator
- screw in the clogging inidcator into the bare hole (starting torque 125 Nm).

It is necessary to make sure the availability and the right positioning of sealing parts
- O-ring 22 x 2 and
- O-ring 14 x 2

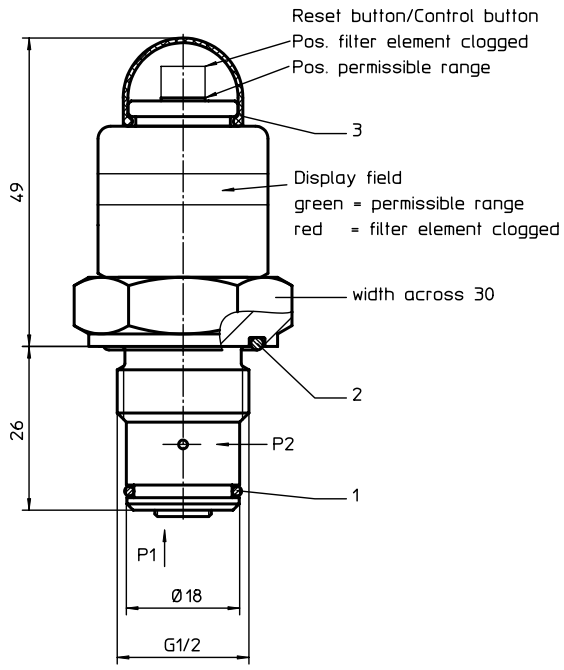
as well as a dirt-free mounting. The electrical contacts are to be connected according to the graphical symbol shown on the type plate of the clogging indicator.

7. Maintenance:

The device is maintenance-free, however, note that no cleaning fluids and solvents get on the housing and the cable of the switch.

CLOGGING INDICATOR
Series AOR, AOC (thread execution)

Sheet No.
1606 A



1. Clogging indicator AOR, AOC

1.1. Type index: (ordering example)

AOR. 1,5. P. -

1	2	3	4

1 **series:**
- AOR = clogging indicator, visual with reset function
- AOC = clogging indicator, visual with control function

2 **indicator-pressure difference:** Δp-nominal
- 1,5 = 1,5 bar
- 2,5 = 2,5 bar
- 5,0 = 5,0 bar

3 **sealing material:**
- P = Nitrile (NBR)
- V = Viton (FPM)

4 **material:**
- \- = standard
- VA = stainless steel

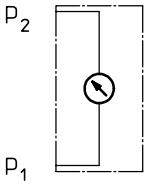
2. Technical data:

temperature range:	-10°C to +80°C (for a short time +100°C)
max. operating pressure:	420 bar
max. pressure difference:	160 bar
reset condition:	< 60% Δp-nominal
control condition:	< 80% Δp-nominal
max. display error:	± 10%

3. Spare parts:

item	qty.	designation	dimension	article-no.
1	1	O-ring	15 x 1,5	315357 (NBR) 315427 (FPM)
2	1	O-ring	22 x 2	304708 (NBR) 304721 (FPM)
3	1	cap		315325 (PUR)

4. Symbol:



p_1 = measure connection supply
p_2 = measure connection output

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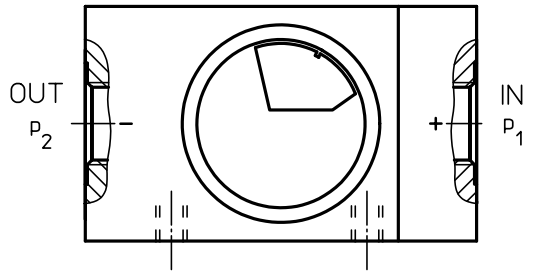
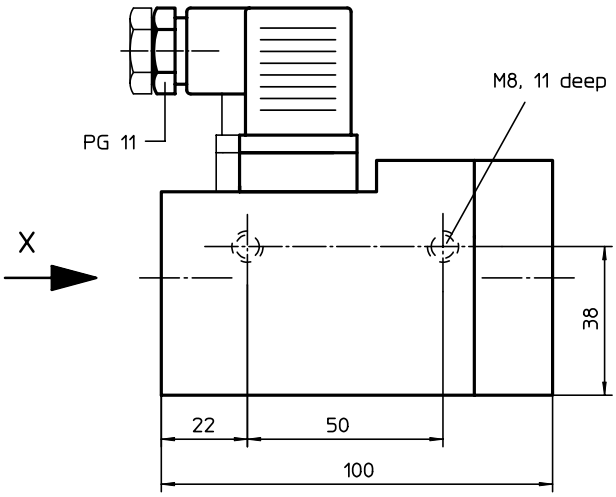
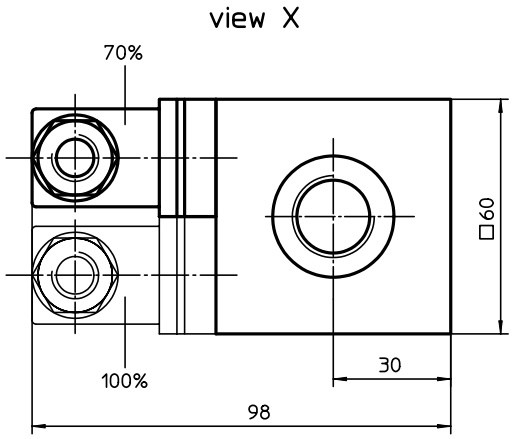
CLOGGING INDICATOR
Series OP (visual), OE (visual-electrical)

Sheet No.
1614 D







1. Clogging indicator OP-OE

1.1. Type index: (ordering example)

OE1.	1,2.	G.	1.	P.	-.	1
1	2	3	4	5	6	7

1 **series:**
- OE1 = clogging indicator, visual-electrical with 1 contact maker and contact breaker with 70% switching pressure difference
- OE2 = clogging indicator, visual-electrical with 1 contact maker and contact breaker with 70% and 100% switching pressure difference
- OP = clogging indicator, visual (according to series OE without switching contacts)

2 **indicator-pressure difference:** Δp-nominal
- 0,8 = 0,8 bar
- 1,2 = 1,2 bar
- 2,5 = 2,5 bar
- 4,5 = 4,5 bar

3 **connection:**
- G = thread connection according to DIN 3852, T2

4 **connection size:**
- 1 = G ¼
- 3 = G ½

5 **sealing material:**
- P = Nitrile (NBR)
- V = Viton (FPM)

6 **material:**
- - = standard
- VA = stainless steel

7 **execution:**
- 1 = execution 1 (electrical limit facts see item 3)
- 2 = execution 2 (electrical limit facts see item 3)

2. Technical data:

permissible operating pressure:	63 bar
permissible operating temperature:	80°C
permissible pressure difference:	$p_1 - p_2 \leq 16$ bar
indicator-pressure difference Δp:	0,8; 1,2; 2,5; 4,5 bar

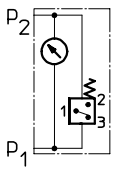
The electrical signal takes place at 70% of the switching pressure difference using the design with two contacts the second signal takes place at 100% of the switching pressure difference.

3. Electrical limit facts:

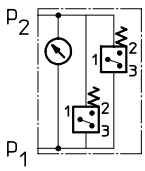
execution 1:	175V DC, 0,25A, 3 VA 125V AC, 0,25A, 3 Watt
execution 2:	175V DC, 1A, 20 VA 230V AC, 0,5A, 10 Watt
switch-over contact:	contact maker and contact breaker
protection:	IP 65

4. Symbols:

execution OE1



execution OE2



1+2 contact maker
1+3 contact breaker

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5. Functioning:

The clogging indicator OE is a combined visual and electrical pressure difference indicator.
This type of pressure difference indicator can be mounted on all pressure filters with operating pressure ≤ 63 bar, if the corresponding measuring ports on the filter housing are available.
With contamination of the filter element the difference between the supply pressure and the output pressure of the filter is increasing. Depending on this pressure difference but independent of the operating pressure, visual and electrical signals are released.
A pressure difference dependent measuring piston, charged with supply pressure and output pressure, moves towards a measuring spring.
Concerning the OE1 a permanent magnet which is integrated in the measuring piston switches - depending on the gauge length - a Reed-contact (magnetic-switch) and releases electrical control signals upon reaching a pressure difference of 70%.
The OE2 is equiped with two magnetic switches which release electrical control signals in a sequence of 70% and 100% of the switching pressure.
The visual control signal is indicated by a blue-red scale which is connected to the magnetic measuring piston.
In the range of low pressure differences - depending on the gauge length of the measuring piston - the blue range of the scale appears first.
The indicated switching pressure difference is reached when the dividing line between the red and the blue range of the scale points to the marking on the display window.

6. Operating instruction:

- Connection

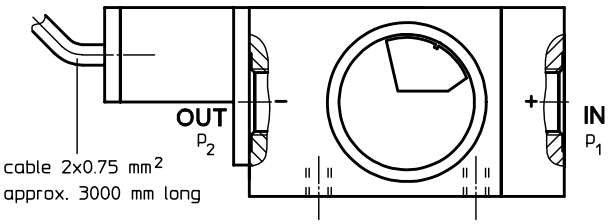
Upon connecting the indicator to the filter make sure that the connection marked „+“ is connected to the dirt oil side (IN) and the connection marked „-“ is connected to the clean oil side (OUT).
Note: Consider data and connecting conditions mentioned in items 2 to 4.

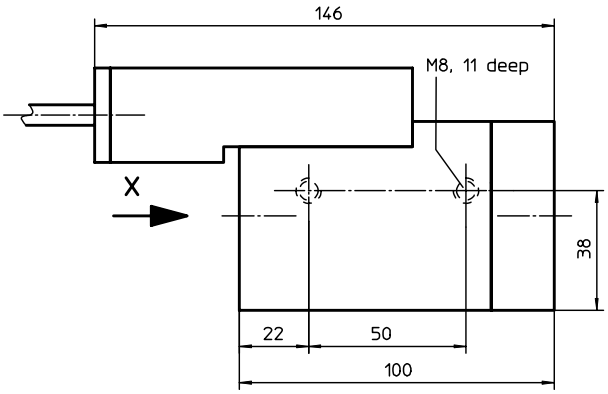
7. Maintenance:

The device is maintenance-free. However, make sure that no solvents get in touch with the display window visual indicator nor with the piston-spring-system of the clogging indicator.

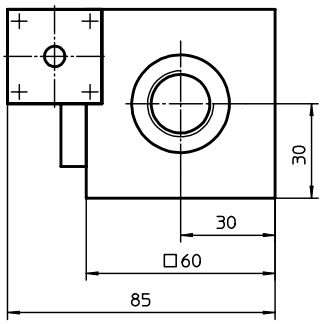
CLOGGING INDICATOR
OE (visual-electrical) explosion-proof

Sheet No.
1624 C





view X



1. Type index: (ordering example)

OE.	1,2.	G.	1.	P.	VA.	Ex
1	2	3	4	5	6	7

1 series:
OE = clogging indicator, visual-electrical with 1 contact maker with 70% switching pressure difference

2 indicator-pressure difference: Δp-nominal
0,8 = 0,8 bar
1,2 = 1,2 bar
2,5 = 2,5 bar
4,5 = 4,5 bar

3 connection:
G = thread connection according to DIN 3852, T2

4 connection size:
1 = G ¼
3 = G ½

5 sealing material:
P = Nitile (NBR)
V = Viton (FPM)

6 material:
VA = stainless steel

7 execution:
Ex = explosion-proof

2. Technical data:

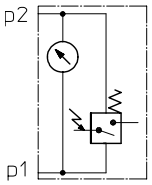
permissible operating pressure:	63 bar
permissible operating temperature:	-20°C to +60°C
permissible pressure difference:	$p_1 - p_2 \leq 16$ bar
indicator-pressure difference Δp:	0,8; 1,2; 2,5; 4,5 bar

The electrical signal takes place at 70% of the switching pressure difference.

3. Electrical limit facts:

execution:	V DC/V AC 200/250 V, max. 30 Watt
switch-over contact:	contact maker
protection:	EEx m II T6

4. Symbol:



1+2 contact maker

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5. Functioning:

The clogging indicator OE is a combined visual and electrical pressure difference indicator.
This type of pressure difference indicator can be mounted on all pressure filters with operating pressure ≤ 63 bar, if the corresponding measuring ports on the filter housing are available.
With contamination of the filter element the difference between the supply pressure and the output pressure of the filter is increasing. Depending on this pressure difference but independent of the operating pressure, visual and electrical signals are released.
The visual control signal is indicated by a blue-red scale which is connected to the magnetic measuring piston.
In the range of low pressure differences - depending on the gauge length of the measuring piston - the blue range of the scale appears first.
The indicated switching pressure difference is reached when the dividing line between the red and the blue range of the scale points to the marking on the display window.

6. Operating instruction:

- Connection

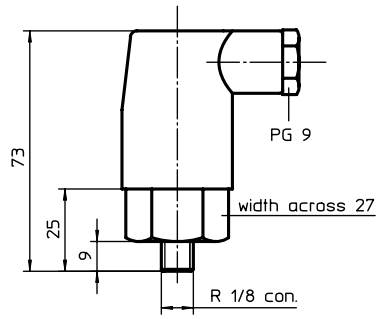
Upon connecting the indicator to the filter make sure that the connection marked „+“ is connected to the dirt oil side (IN) and the connection marked „-“ is connected to the clean oil side (OUT).
Note: Consider data and connecting conditions mentioned in items 2 to 4**.**

7. Maintenance:

The device is maintenance-free. However, make sure that no solvents get in touch with the display window visual indicator nor with the piston-spring-system of the clogging indicator.

CLOGGING INDICATOR
Series E (electrical), O (visual)

Sheet No.
1616 H



1. Type index: (ordering example)

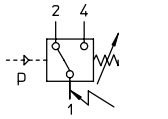
E2.0,3 = pressure switch, contact maker and contact breaker, switching pressure 0,3 bar
E2.1,5 = pressure switch, contact maker and contact breaker, switching pressure 1,5 bar
E2.2,5 = pressure switch, contact maker and contact breaker, switching pressure 2,5 bar

2. Technical data:

max. pressure to 100 bar

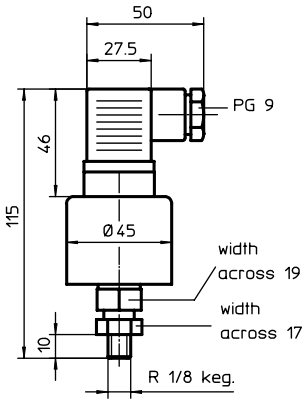
temperature range:	-20°C to +80°C
max. contact load:	max.250 V ≅ /2A
protection:	IP 55

3. Symbol:



1 + 2 contact breaker
1 + 4 contact maker

The functions contact making, contact breaking or contact making and breaking refer to the increasing pressure.



1. Type index: (ordering example)

E4.-0,25 = pressure switch, contact maker and contact breaker, switching pressure -0,25 bar

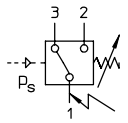
2. Technical data:

max. pressure to 80 bar

temperature range:	-20°C to +80°C
max. contact load:	max.250 V ≅ /5A
protection:	IP 65

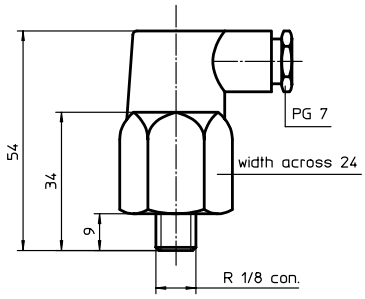
For the electrical connection please use only enclosed utensil socket. Other utensil sockets have a longer fixing screw which can destroy the inside micro switch.
The screw of an available utensil socket should have a max. thread reach of 28 mm. Do not forget the shaped packing by sticking up the utensil and tighten the fixing screw moderately.

3. Symbol:



1 + 2 contact maker
1 + 3 contact breaker

The functions contact making, contact breaking or contact making and breaking refer to the increasing pressure (0 bar → -0,25 bar) .



1. Type index: (ordering example)

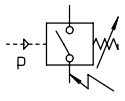
E1.1,5 = pressure switch, contact maker, switching pressure 1,5 bar
E1.2,5 = pressure switch, contact maker, switching pressure 2,5 bar
E5.1,5 = pressure switch, contact breaker, switching pressure 1,5 bar
E5.2,5 = pressure switch, contact breaker, switching pressure 2,5 bar
E5.5,0 = pressure switch, contact breaker, switching pressure 5,0 bar

2. Technical data:

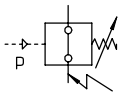
max. pressure to 300 bar

temperature range:	-20°C to +100°C
max. contact load:	max.250 V ≅ /2A
protection:	IP 55

3. Symbol:

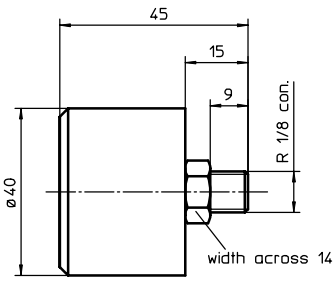


1 + 2 contact maker



1 + 2 contact breaker

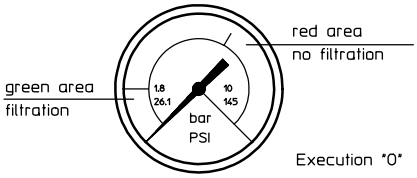
The function contact making or contact breaking refer to the increasing pressure.



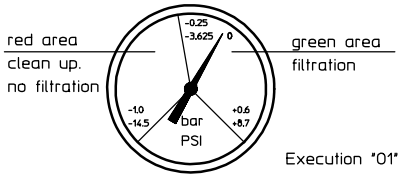
1. Type index: (ordering example)

O = clogging indicator visual, 0 to 10 bar
O1 = clogging indicator visual, + 0,6 bar to -1,0 bar

2. Symbol:



Execution "0"



Execution "01"

EDV 08/07

Changes of measures and design are subject to alteration!

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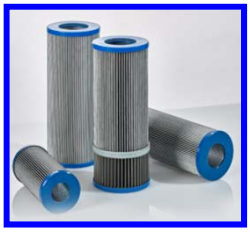



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