

PRESSURE FILTER, change-over
Series DA 101 NPS 1" CLASS 150 PSI

Sheet No. **2163 B** 

```
1. Type index:
1.1. Complete filter: (ordering example)
DA. 101. 10VG. 30. E. P. -. FS. 5. -. -. AE. AV. IS21. F. F
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
1 series:
     DA = pressure filter change-over, according to ASME-code
 2 nominal size: 101
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 \text{ VG} = 20 \ \mu\text{m}_{(c)}, 16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}, 10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}, 6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}, 3 \ \text{VG} = 5 \ \mu\text{m}_{(c)} Interpor fleece (glass fiber)
     25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API
     25 P = 25 \mu m, 10 P = 10 \mu m paper
 4 resistance of pressure difference for filter element:
     30 = \Delta p \, 435 \, PSI
 5 filter element design:
     E = single-end open, S = with by-pass valve \Delta p 29 PSI,
                                                                 S1 = with by-pass valve Δp 51 PSI
 6 sealing material:
     P = Nitrile (NBR).
                              V = Viton (FPM)
 7 | filter element specification:

    standard,

                              VA = stainless steel
 8 process connection:
     FS = SAE-flange connection 3000 PSI
     FA11 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind 1600-3600 μin
     FA12 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind < 640 μin
9 process connection size:
     5 = 1"
10 filter housing specification:
         = standard
     IS12 = internal parts of change-over armature stainless steel, 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
 13 shut-off valve:
          without.
                              AV = shut-off valve, see sheet-no. 1655
 14 | specification pressure vessel:
         = standard (PED 97/23/EC)
     IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217
     IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415
     IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218
15 switch lever:
                               B = opposite IN/OUT
     F = toward IN/OUT,
16 air bleeding/drain:
     F = toward IN/OUT, B = opposite IN/OUT
1.2. Filter element: (ordering example)
01NL. 100. 10VG. 30. E. P. -
            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
                                                                                   weight: approx. 132 lbs.
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Changes of measures and design are subject to alterat ion!



- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

# 3. Spare parts:

- p					
item	qty.	designation	dimension	articl	e-no.
1	2	filter element	01NL.100		
2	1	change over UKK	1"		
3	2	O-ring	22 x 3,5 304341 (NBR)		304392 (FPM)
4	6	O-ring	54 x 3	304657 (NBR)	304720 (FPM)
5	6	screw plug	NPT ½	307	766
6	1	clogging indicator, visual	AOR or AOC	see sheet	t-no. 1606
7	1	clogging indicator, visual-electrical	OP	see sheet	t-no. 1628
8	1	clogging indicator, visual-electrical	OE	see sheet	t-no. 1628
9	1	clogging indicator, visual-electrical	AE	see sheet	t-no. 1609
10	1	clogging sensor, electronical	VS1	see sheet	t-no. 1607
11	1	clogging sensor, electronical	VS2	see sheet	t-no. 1608
12	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
13	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
14	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
15	2	screw plug	BSPP ¼	305	5000
16	1	pressure balance valve	3/8"	305	5000
17	2	O-ring (only for execution with ANSI-flange)	32,9 x 3,53	318850 (NBR)	338231(FPM)

item 15 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 101 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm(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.

# 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F - ambient temperature: - 40°F to +140°F

- 40°F to +212°F (short-time) - survival temperature: operating medium: mineral oil, other media on request 580 PSI

max. operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical bleeder connection : NPT 1/2" drain connection dirt side : NPT 1/2" drain connection clean side : NPT 1/2" volume tank: 2x .24 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 150 PSI

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)

# 6. Symbols:

with shut-off valve without indicator



with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with visual-electrical indicator AE 70 and AE 80



with electronical sensor VS2



with by-pass valve

with visual

indicator

AOR/AOC/OP

(





with visual-electrical indicator OE

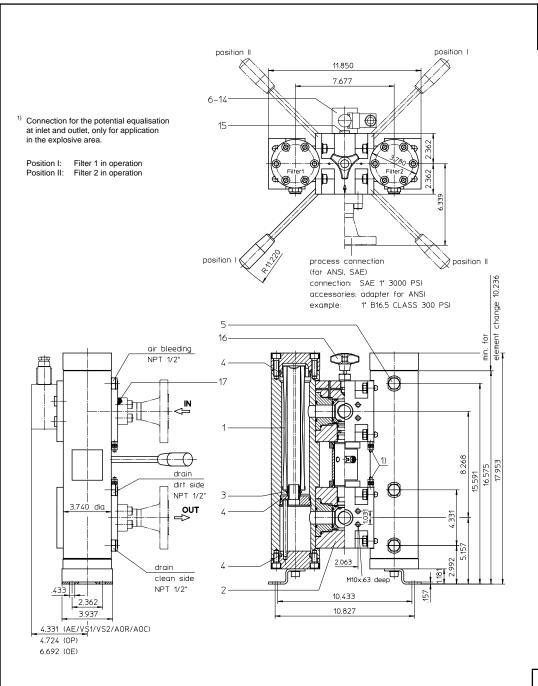


7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively Δp- curves; depending on filter fineness and viscosity.

#### 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, change-over
Series DA 100 NPS 1" CLASS 300 PSI

2152 C 1. Type index: 1.1. Complete filter: (ordering example) DA. 100. 10VG. 30. E. P. -. FS. 5. -. -. AE. AV. IS21. F. F 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 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, 10 G = 10 µm stainless steel wire mesh  $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API  $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper 4 resistance of pressure difference for filter element:  $30 = \Delta p \, 435 \, PSI$ 5 filter element design: E = single-end open,  $S = with by-pass valve <math>\Delta p 29 PSI$ , S1 = with by-pass valve Δp 51 PSI 6 sealing material: P = Nitrile (NBR). V = Viton (FPM) 7 | filter element specification: standard, VA = stainless steel 8 process connection: FS = SAE-flange connection 3000 PSI FA1 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind 1600-3600 μin FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin 9 process connection size: 5 = 1" 10 filter housing specification: = standard IS12 = internal parts of change-over armature stainless steel, 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 13 shut-off valve: without. AV = shut-off valve, see sheet-no. 1655 14 | specification pressure vessel: = standard (PED 97/23/EC) IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415 IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218 15 switch lever: B = opposite IN/OUT F = toward IN/OUT, 16 air bleeding/drain: F = toward IN/OUT, B = opposite IN/OUT 1.2. Filter element: (ordering example) 01NL. 100. 10VG. 30. E. P. -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

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Changes of measures and design are subject to alterat ion!



weight: approx. 132 lbs.

Sheet No.

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

# 3. Spare parts:

item	qty.	designation	dimension	articl	e-no.
1	2	filter element	01NL.100		
2	1	change over UKK	1"		
3	2	O-ring	22 x 3,5	304341 (NBR)	304392 (FPM)
4	6	O-ring	54 x 3	304657 (NBR)	304720 (FPM)
5	6	screw plug	NPT ½	307	766
6	1	clogging indicator, visual	AOR or AOC	see shee	t-no. 1606
7	1	clogging indicator, visual-electrical	OP	see shee	t-no. 1628
8	1	clogging indicator, visual-electrical	OE	see shee	t-no. 1628
9	1	clogging indicator, visual-electrical	AE	see shee	t-no. 1609
10	1	clogging sensor, electronical	VS1	see shee	t-no. 1607
11	1	clogging sensor, electronical	VS2	see shee	t-no. 1608
12	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
13	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
14	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
15	2	screw plug	BSPP ¼	305	5003
16	1	pressure balance valve	3/8"	305	5000
17	2	O-ring (only for execution with ANSI-flange)	32,9 x 3,53	318850 (NBR)	338231(FPM)

item 15 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 100 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F +14°F to +176°F - medium temperature: - 40°F to +140°F - ambient temperature:

- 40°F to +212°F (short-time) - survival temperature: operating medium: mineral oil, other media on request 580 PSI

max. operating pressure:

1,43 x operating pressure = 827 PSI test pressure acc. to PED 97/23/EC: test pressure acc. to ASME VIII Div. 1: 1,3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI SAE-flange connection 3000 PSI connection system:

housing material:

Nitrile (NBR) or Viton (FPM), other materials on request sealing material:

installation position: bleeder connection: NPT 1/2" drain connection dirt side NPT 1/2" NPT 1/2" drain connection clean side: volume tank: 2x .24 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 300 PSI

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) 6. Symbols: without indicator







with electronical sensor VS1



with shut-off valve

with visual-electrical indicator AE 70 and AE 80



with electronical sensor VS2



with by-pass valve



with visual indicator AOR/AOC/OP



with electrical indicator AE 30 and AE 40



with visual-electrical indicator OE



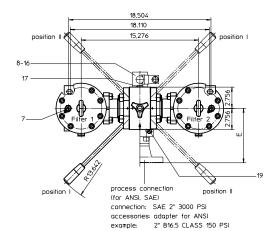
7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively Δp- curves; depending on filter fineness and viscosity.

#### 8. Test methods:

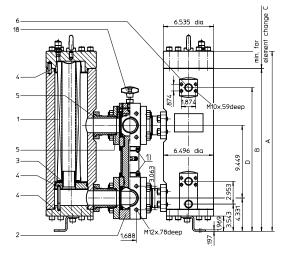
Filter elements are tested according to the following ISO standards:

	the are tested asserting to the remember 100 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

Position I: Filter 1 in operation Position II: Filter 2 in operation



mini-measure connection air bleedina (for ANSI, SAF) connection: NPT1/2", SAE3/4" 3000 PSI accessories, adapter for ANSI example: 3/4" CLASS 150 PSI mini-measure conn. BSPP1/4 at inlet and outlet ==drain dirt side (for ANSI, SAE) OUT connection: NPT1/2\*, SAE3/4\* 3000 PSI accessories: adapter for ANSI example: 3/4" CLASS 150 PSI clean side



#### 2. Dimensions: inch

type	connection	Α	В	С	D	E	weight lbs.
	SAE 2"					-	
DA 251	ANSI 2"	17.91	15.66	10.23	14.27	7.08	approx. 287
	ANSI 1 1/2"					7.04	
	SAE 2"					-	
DA 401	ANSI 2"	23.42	21.18	16.14	17.76	7.08	approx. 353
	ANSI 1 1/2"					7.04	

PRESSURE FILTER, change-over Series DA 251-401 NPS 2" CLASS 150 PSI Sheet No. 2164 B

# 1. Type index:

1.1. Complete filter: (ordering example)

DA. 401, 10VG, 30, E. P. -, FS, 8, -, -, AE, AV, IS21, F. F. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

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  $\mu$ m, 40 G = 40  $\mu$ m, 25 G = 25  $\mu$ m, 10 G = 10  $\mu$ m stainless steel wire mesh  $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \text{ VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \text{ VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \text{ VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \text{ VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 μm, 10 API = 10 μm Interpor fleece (glass fiber) according to API  $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:

30 =  $\Delta p \, 435 \, PSI$ 

5 filter element design:

E = single-end open, S = with by-pass valve  $\Delta p$  29 PSI, S1 = with by-pass valve ∆p 51 PSI

6 sealing material:

P = Nitrile (NBR), V = Viton (FPM)

7 | filter element specification: standard. VA = stainless steel

8 process connection:

FS = SAE-flange connection 3000 PSI

FA11 = ANSI-flange connection CLASS 150 PSI, sealing sealing surface rough grind 1600-3600 µin

FA12 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind < 640  $\mu$ in

9 process connection size:

 $7 = 1\frac{1}{2}$  (only with adapter),

= 2"

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, 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

13 shut-off valve:

= without, AV = shut-off valve, see sheet-no. 1655

14 specification pressure vessel:

standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

**1.2. Filter element:** (ordering example)

01NL. 400. 10VG. 30. E. P. -1

1 series:

01NL. = standard filter element according to DIN 24550, T3

2 nominal size: 250, 400

3 - 7 see type index complete filter

Changes of measures and design are subject to alteration!



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.531

5.118 (OP)

4.331 5.906

4.724 (AE/VS1/VS2/AOR/AOC)

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

item	qty.	designation	dime	nsion	articl	e-no.	
			DA 251	DA 401			
1	2	filter element	01NL. 250	01NL. 400			
2	1	change over UKK	2	2"			
3	2	O-ring	40	x 3	304389NBR)	305482FPM)	
4	6	O-ring	100	) x 5	327063 (NBR)	327064 (FPM)	
5	8	O-ring	56	x 3	305072 (NBR)	305322 (FPM)	
6	6	screw plug	NP	T ½	307	766	
7	2	mini-measuring connection	MA.	1.ST	305453		
8	1	clogging indicator, visual	AOR o	AOR or AOC		see sheet-no. 1606	
9	1	clogging indicator, visual-electrical	C	)P	see sheet-no. 1628		
10	1	clogging indicator, visual-electrical	C	E	see sheet-no. 1628		
11	1	clogging indicator, visual-electrical	Α	Æ	see sheet	t-no. 1609	
12	1	clogging sensor, electronical	V	S1	see sheet	t-no. 1607	
13	1	clogging sensor, electronical	V	S2	see sheet	t-no. 1608	
14	1	O-ring	15 2	¢ 1,5	315357 (NBR)	315427 (FPM)	
15	1	O-ring	22	x 2	304708 (NBR)	304721 (FPM)	
16	2	O-ring	14	x 2	304342 (NBR)	304722 (FPM)	
17	2	screw plug	BSF	BSPP 1/4		003	
18	1	pressure balance valve	3/	/8"	305	000	
19	2	O-ring (only for execution with ANSI-flange)	56,75 x 3,53		306035 (NBR)	310264 (FPM)	

item 17 execution only with clogging indicator or clogging sensor

# 5. Description:

Pressure filters, change-over series DA 251-401 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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 dirtretaining 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.

## 6. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F - 40°F to +140°F - ambient temperature:

- survival temperature: - 40°F to +212°F (short-time) mineral oil, other media on request operating medium:

max. operating pressure: 580 PSI

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1,3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

Nitrile (NBR) or Viton (FPM), other materials on request sealing material:

installation position: vertical

NPT 1/2" and SAE 3/4" 3000 PSI bleeder connection : drain connection dirt side NPT 1/2" and SAE 3/4" 3000 PSI

drain connection clean side : NPT 1/2" volume tank DA 251: 2x .79 Gal. DA 401: 2x 1.13 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 150 PSI

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) 7. Symbols:

without indicator

with visual-electrical

indicator

AE 50 and AE 62

1

 $\otimes$ 

with shut-off valve

罄

with by-pass valve

with electrical indicator AE 30 and AE 40

1



with visual indicator AOR/AOC/OP





with visual-electrical indicator OE



with electronical sensor VS1



with electronical sensor VS2

with visual-electrical

indicator

AE 70 and AE 80

 $\otimes$ 

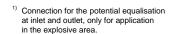


8. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively Δp- curves; depending on filter fin eness and viscosity.

#### 9. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance Verification of fabrication integrity ISO 2942 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



Position I: Filter 1 in operation Position II: Filter 2 in operation

mini-measure connection

air bleeding

(for ANSI, SAE)

connection: NPT1/2", SAE3/4" 3000 PSI

accessories: adapter for ANSI

example: 3/4" CLASS 300 PSI

BSPP1/4 at inlet and outlet

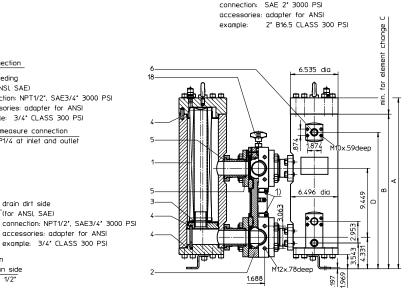
mini-measure connection

drain dirt side

(for ANSI, SAE)

OUT accessories: adapter for ANSI

example: 3/4' CLASS 300 PSI



18.504 18.110

process connection

(for ANSI, SAE)

Nonsition I

position II

position II

## 2. Dimensions: inch

clean side

NPT 1/2\*

	type	connection	Α	В	С	D	E	weight lbs.
ſ		SAE 2"					-	
	DA 250	ANSI 2"	17.91	15.66	10.23	14.27	7.36	approx. 287
L		ANSI 1 1/2"					7.78	
ſ		SAE 2"					-	
	DA 400	ANSI 2"	23.42	21.18	16.14	17.76	7.36	approx. 353
L		ANSI 1 ½"					7.78	

## PRESSURE FILTER, change-over NPS 2" CLASS 300 PSI Series DA 250-400

Sheet No. 2155 G

# 1. Type index:

**1.1. Complete filter:** (ordering example)

DA. 400, 10VG, 30, E. P. -, FS, 8, -, -, AE, AV, IS21, F. F. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

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  $\mu$ m, 40 G = 40  $\mu$ m, 25 G = 25  $\mu$ m, 10 G = 10  $\mu$ m stainless steel wire mesh

 $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \text{ VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \text{ VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \text{ VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \text{ VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 μm, 10 API = 10 μm Interpor fleece (glass fiber) according to API

 $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:

30 =  $\Delta p \, 435 \, PSI$ 

5 filter element design:

E = single-end open, S = with by-pass valve  $\Delta p$  29 PSI, S1 = with by-pass valve Δp 51 PSI

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

7 filter element specification:

 standard. VA = stainless steel

8 process connection:

FS = SAE-flange connection 3000 PSI

FA1 = ANSI-flange connection CLASS 300 PSI, sealing sealing surface rough grind 1600-3600 µin

FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin

9 process connection size:

 $7 = 1 \frac{1}{2}$ " (only with adapter),

= 2"

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028

11 internal valve:

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

13 shut-off valve: = without,

AV = shut-off valve, see sheet-no. 1655

14 specification pressure vessel:

standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT. B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

**1.2. Filter element:** (ordering example)

01NL. 400. 10VG. 30. E. P. -

1

01NL. = standard filter element according to DIN 24550, T3

2 nominal size: 250, 400

3 - 7 see type index complete filter

Changes of measures and design are subject to alteration!



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.531

4.331 5.906

5.118 (OP)

7.086 (OE)

4.724 (AE/VS1/VS2/AOR/AOC)

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

## Snare narte:

item	qty.	designation	dime	nsion	articl	e-no.	
			DA 250	DA 400			
1	2	filter element	01NL. 250	01NL. 400			
2	1	change over UKK	2"				
3	2	O-ring	40	x 3	304389NBR)	305482FPM)	
4	6	O-ring	100	) x 5	327063 (NBR)	327064 (FPM)	
5	8	O-ring	56	x 3	305072 (NBR)	305322 (FPM)	
6	6	screw plug	NP	T 1⁄2	307	766	
7	2	mini-measuring connection	MA.	1.ST	305453		
8	1	clogging indicator, visual	AOR o	AOR or AOC		see sheet-no. 1606	
9	1	clogging indicator, visual-electrical	C	)P	see sheet-no. 1628		
10	1	clogging indicator, visual-electrical	C	E	see sheet-no. 1628		
11	1	clogging indicator, visual-electrical	Д	Æ	see sheet	-no. 1609	
12	1	clogging sensor, electronical	V	S1	see sheet	-no. 1607	
13	1	clogging sensor, electronical	V	S2	see sheet	-no. 1608	
14	1	O-ring	15 )	¢ 1,5	315357 (NBR)	315427 (FPM)	
15	1	O-ring	22	x 2	304708 (NBR)	304721 (FPM)	
16	2	O-ring	14	x 2	304342 (NBR)	304722 (FPM)	
17	2	screw plug	BSF	PP ¼	305	003	
18	1	pressure balance valve	3/	/8"	305	000	
19	2	O-ring (only for execution with ANSI-flange)	56,75 x 3,53		306035 (NBR)	310264 (FPM)	

item 17 execution only with clogging indicator or clogging sensor

# 5. Description:

Pressure filters, change-over series DA 250-400 are suitable for operating pressure up to 580 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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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 dirtretaining 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.

#### 6. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F - 40°F to +140°F - ambient temperature:

- survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max. operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1,3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material: steel

Nitrile (NBR) or Viton (FPM), other materials on request sealing material:

installation position: vertical

NPT 1/2" and SAE 3/4" 3000 PSI bleeder connection : drain connection dirt side NPT 1/2" and SAE 3/4" 3000 PSI

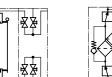
drain connection clean side: NPT ½" volume tank DA 250: 2x .79 Gal. DA 400: 2x 1.13 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 300 PSI

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) 7. Symbols:

without indicator

with shut-off valve



indicator AE 70 and AE 80



with electronical sensor VS1

with visual-electrical

indicator

AE 50 and AE 62

1

 $\otimes$ 



with visual-electrical



with electronical sensor VS2



with by-pass valve



with visual indicator AOR/AOC/OP



with electrical indicator AE 30 and AE 40



with visual-electrical indicator OE



# 8. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

Δp- curves; depending on filter fin eness and viscosity.

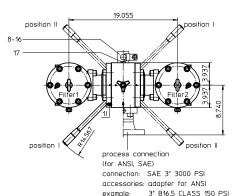
#### 9. Test methods

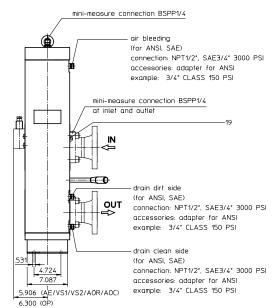
Filter elements are tested according to the following ISO standards:

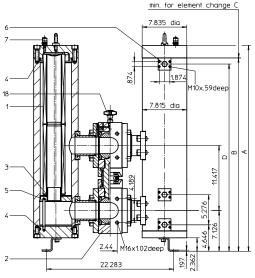
ISO 2941 Verification of collapse/burst resistance ISO 2942 Verification of fabrication integrity ISO 2943 Verification of material compatibility with fluids ISO 3723 Method for end load test ISO 3724 Verification of flow fatigue characteristics ISO 3968 Evaluation of pressure drop versus flow characteristics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

US 2155 G

Position I: Filter 1 in operation Position II: Filter 2 in operation







#### 2. Dimensions: inch

type	connection size	Α	В	С	D	weight lbs.
DA 631	SAE or ANSI 3"	27.04	24.84	16.14	23.77	approx. 639
DA 1001	SAE or ANSI 3"	36.10	33.89	25.19	32.83	approx. 771

# PRESSURE FILTER, change-over Series DA 631-1001 NPS 3" CLASS 150 PSI

Sheet No. 2165 B

```
1. Type index:
```

1.1. Complete filter: (ordering example)

DA. 1001. 10VG. 30. E. P. -. FS. A. -. -. AE. AV. IS21. F. F 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16

1 series:

DA = pressure filter change-over, according to ASME-code

nominal size: 631, 1001

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  $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API

 $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:

 $30 = \Delta p \, 435 \, PSI$ 

5 filter element design:

E = single-end open, S = with by-pass valve  $\Delta p$  29 PSI, S1 = with by-pass valve Δp 51 PSI

6 sealing material:

P = Nitrile (NBR). V = Viton (FPM)

7 filter element specification:

- = standard, VA = stainless steel

8 process connection:

FS = SAE-flange connection 3000 PSI

FA11 = ANSI-flange connection CLASS 150 PSI, sealing sealing surface rough grind 1600-3600 µin

FA12 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind < 640 μin

9 process connection size:

A = 3"

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, 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

13 shut-off valve:

without. AV = shut-off valve, see sheet-no. 1655

14 | specification pressure vessel:

standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

# 1.2. Filter element: (ordering example)

01NL. 1000. 10VG. 30. E. P. -3 | 4 | 5 | 6 | 7

1 series:

01NL. = standard filter element according to DIN 24550, T3

2 nominal size: 1000

3 - 7 see type index complete filter

Changes of measures and design are subject to alterat ion!



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8.267 (OE)

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

## 4. Spare parts:

item	qty.	designation	dime	ension	artic	le-no.	
			DA 631	DA 1001			
1	2	filter element	01NL.630	01NL.1000			
2	1	change over UKK	(	3"			
3	2	O-ring	60	x 3,5	304377 (NBR)	304398 (FPM)	
4	4	O-ring	135	x 4,75	326348 (NBR)	326349 (FPM)	
5	2	O-ring	136,12	2 x 3,53	320162 (NBR)	320163 (FPM)	
6	6	screw plug	NP	T ½	307	7766	
7	2	mini-measuring connection	MA.	1.ST	305453		
8	1	clogging indicator, visual	AOR (	AOR or AOC		see sheet-no. 1606	
9	1	clogging indicator, visual-electrical		)P	see sheet-no. 1628		
10	1	clogging indicator, visual-electrical		)E	see sheet-no. 1628		
11	1	clogging indicator, visual-electrical	P	ΛE	see shee	t-no. 1609	
12	1	clogging sensor, electronical	V	S1	see shee	t-no. 1607	
13	1	clogging sensor, electronical	V	S2	see shee	t-no. 1608	
14	1	O-ring	15	x 1,5	315357 (NBR)	315427 (FPM)	
15	1	O-ring	22	x 2	304708 (NBR)	304721 (FPM)	
16	2	O-ring	14 x 2		304342 (NBR)	304722 (FPM)	
17	2	screw plug	BSF	PP 1/4	305	5003	
18	1	pressure balance valve	3.	/8"	305	5000	
19	2	O-ring (only for execution with ANSI-flange)	85,32	x 3,53	305590 (NBR)	306308 (FPM)	

item 17 execution only with clogging indicator or clogging sensor

# 5. Description:

Pressure filters, change-over series DA 631-1001 are suitable for operating pressure up to 580 PSI

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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.

#### 6. Technical data:

temperature ranges

- calculation temperature (pressure vessel):

+14°F to +212°F +14°F to +176°F

- medium temperature: - ambient temperature:

- 40°F to +140°F

- survival temperature:

- 40°F to +212°F (short-time)

operating medium:

mineral oil, other media on request

max. operating pressure:

test pressure acc. to PED 97/23/EC:

1,43 x operating pressure = 827 PSI

test pressure acc. to ASME VIII Div. 1:

1,3 x operating pressure = 754 PSI 1,5 x operating pressure = 870 PSI

test pressure acc. to API 614, Chapter 1: connection system:

SAE-flange connection 3000 PSI

housing material:

sealing material:

Nitrile (NBR) or Viton (FPM), other materials on request

installation position: bleeder connection:

vertical NPT 1/2" and SAE 3/4" 3000 PSI

drain connection dirt side

NPT 1/2" and SAE 3/4" 3000 PSI

drain connection clean side :

NPT 1/2"

volume tank DA 631:

2x 2.20 Gal.

DA 1001:

operating pressure adapter flanges:

2x 3.12 Gal.

according to B16.5 CLASS 150 PSI 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)

7. Symbols:

without indicator

with visual-electrical

indicator

AE 50 and AE 62

with shut-off valve

# 幹

with visual-electrical indicator AE 70 and AE 80



with electronical sensor VS1







with electronical sensor VS2

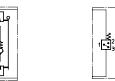


with by-pass valve

with visual

indicator

AOR/AOC/OP



with visual-electrical



indicator

with electrical

indicator

AE 30 and AE 40

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

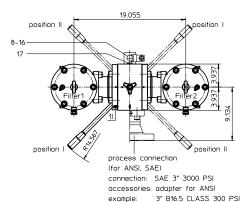
ISO 2943 Verification of material compatibility with fluids ISO 3723 Method for end load test

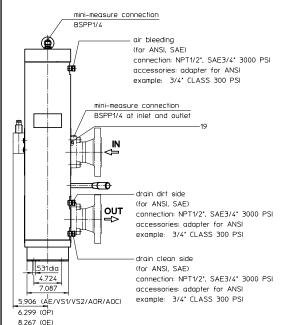
ISO 3724 Verification of flow fatigue characteristics

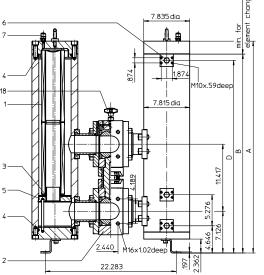
ISO 3968 Evaluation of pressure drop versus flow characteristics ISO 16889 Multi-pass method for evaluating filtration performance

US 2165 B

Position I: Filter 1 in operation Position II: Filter 2 in operation







#### 2. Dimensions: inch

type	connection size	Α	В	С	D	weight lbs.
DA 630	SAE 3"	27.04	24.84	16.14	23.77	approx. 639
DA 1000	SAE 3"	36.10	33.89	25.19	32.83	approx. 771

#### PRESSURE FILTER, change-over NPS 3" CLASS 300 PSI Series DA 630-1000

Sheet No. 2156 C

# 1. Type index:

1.1. Complete filter: (ordering example)

DA. 1000. 10VG. 30. E. P. -. FS. A. -. -. AE. AV. IS21. F. F 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

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  $\mu$ m, 40 G = 40  $\mu$ m, 25 G = 25  $\mu$ m, 10 G = 10  $\mu$ m stainless steel wire mesh  $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}, \ 16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}, \ 10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}, \ 6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}, \ 3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 μm, 10 API = 10 μm Interpor fleece (glass fiber) according to API 25 P = 25 um. 10 P = 10 um paper

4 resistance of pressure difference for filter element:

30 =  $\Delta p \, 435 \, PSI$ 

5 filter element design:

E = single-end open,  $S = with by-pass valve <math>\Delta p 29 PSI$ , S1 = with by-pass valve Δp 51 PSI

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

7 filter element specification:

 standard, VA = stainless steel

8 process connection:

FS = SAE-flange connection 3000 PSI

FA1 = ANSI-flange connection CLASS 300 PSI, sealing sealing surface rough grind 1600-3600 μin

FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin

9 process connection size:

A = 3"

10 filter housing specification:

- = standard

IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028

11 internal valve:

- = without

12 clogging indicator or clogging sensor:

= without, = 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

13 shut-off valve:

= without, AV = shut-off valve, see sheet-no. 1655

14 | specification pressure vessel:

= standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

B = opposite IN/OUT F = toward IN/OUT,

**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

nominal size: 630, 1000

- 7 | see type index complete filter

Changes of measures and design are subject to alterat ion!



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- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

## 4. Spare parts:

Spare	part	J.					
item	qty.	designation	dime DA 630	nsion DA 1000	articl	e-no.	
1	2	filter element	01NL. 630	01NL.1000			
2	1	change over UKK	;	3"			
3	2	O-ring	60 :	₹ 3,5	304377 (NBR)	304398 (FPM)	
4	4	O-ring	135	< 4,75	326348 (NBR)	326349 (FPM)	
5	2	O-ring	136,12	2 x 3,53	320162 (NBR)	320163 (FPM)	
6	6	screw plug	NP	T 1/2	307	766	
7	2	mini-measuring connection	MA.	MA.1.ST		305453	
8	1	clogging indicator, visual	AOR (	AOR or AOC		see sheet-no. 1606	
9	1	clogging indicator, visual-electrical	C	OP		see sheet-no. 1628	
10	1	clogging indicator, visual-electrical		E	see sheet-no. 1628		
11	1	clogging indicator, visual-electrical	P	Æ	see sheet-no. 1609		
12	1	clogging sensor, electronical	V	S1	see sheet	t-no. 1607	
13	1	clogging sensor, electronical	V	S2	see sheet	t-no. 1608	
14	1	O-ring	15:	< 1,5	315357 (NBR)	315427 (FPM)	
15	1	O-ring	22	x 2	304708 (NBR)	304721 (FPM)	
16	2	O-ring	14	x 2	304342 (NBR)	304722 (FPM)	
17	2	screw plug	BSF	PP ¼	305	5003	
18	1	pressure balance valve	3.	/8"	305000		
19	2	O-ring (only for execution with ANSI-flange)	85,32	x 3,53	305590 (NBR)	306308 (FPM)	

item 17 execution only with clogging indicator or clogging sensor

# 5. Description:

Pressure filters, change-over series DA 630-1000 are suitable for operating pressure up to 580 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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm(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 dirtretaining 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.

#### 6. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F - ambient temperature: - 40°F to +140°F

- 40°F to +212°F (short-time) - survival temperature: mineral oil, other media on request operating medium:

max, operating pressure: 580 PSI

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position:

bleeder connection : NPT 1/2" and SAE 3/4" 3000 PSI drain connection dirt side : NPT 1/2" and SAE 3/4" 3000 PSI drain connection clean side : NPT 1/2" and SAE 3/4" 3000 PSI

volume tank DA 630: 2x 2.19 Gal. DA 1000: 2x 3.11 Gal.

according to B16.5 CLASS 300 PSI operating pressure adapter flanges:

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) 7. Symbols:

without indicator

with visual-electrical

indicator

AE 50 and AE 62

 $\otimes$ 



幹

with visual-electrical indicator AE 70 and AE 80



pnp

with electronical with electronical sensor sensor VS1 VS2



with by-pass valve



with visual indicator AOR/AOC/OP



with electrical

indicator

AE 30 and AE 40

1

with visual-electrical indicator OE



8. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

Δp- curves; depending on filter fin eness and viscosity.

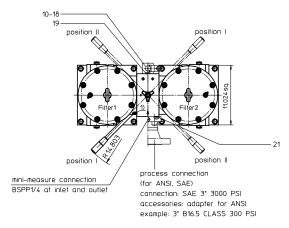
9. Test methods:

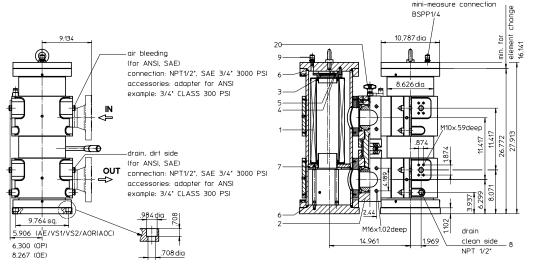
Filter elements are tested according to the following ISO standards:

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

US 2156 C

Position I: Filter 1 in operation Position II: Filter 2 in operation





PRESSURE FILTER, change-over NPS 3" CLASS 300 PSI Series DA 1004

Sheet No. 2185 A

1. Type index:

1.1. Complete filter: (ordering example)

DA. 1004. 10VG. 10. B. P. -. FS. A. -. -. AE. AV. IS21. F. F 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

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

 $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API

 $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:

 $10 = \Delta p 145 PSI$ 

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 process connection:

FS = SAE-flange connection 3000 PSI

FA1 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind 1600-3600  $\mu$ in

FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin

9 process connection size:

A = 3"

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028

11 internal valve: - = without.

S1 = with by-pass valve  $\Delta p$  51 PSI

12 clogging indicator or clogging sensor:

- = without,

OP = visual, see sheet-no. 1628 OE = visual-electrical, see sheet-no. 1628

AOR = visual, see sheet-no. 1606, 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

13 shut-off valve:

AV = shut-off valve, see sheet-no. 1655

without.

14 | specification pressure vessel:

= standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

1.2. Filter element: (ordering example)

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

weight: approx. 816 lbs.

Changes of measures and design are subject to alterat ion!



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- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

## 3. Spare parts:

Spare	; parti	J.				
item	qty.	designation	dimension	articl	e-no.	
1	2	filter element	01NR.1000			
2	1	change over UKK	3"			
3	4	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	766	
9	2	mini-measuring connection	MA.1.ST	305	453	
10	1	clogging indicator, visual	AOR or AOC	see sheet	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see sheet	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see sheet	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see sheet	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see sheet	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see sheet	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	305000	
21	2	O-ring (only for execution with ANSI-flange)	85,32 x 3,53	305590 (NBR)	306308 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 1004 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm(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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F +14°F to +176°F - medium temperature: - 40°F to +140°F

- ambient temperature: - survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection: NPT 1/2" and SAE 3/4" 3000 PSI drain connection dirt side : NPT 1/2" and SAE 3/4" 3000 PSI

drain connection clean side : NPT 1/2" 2x 5.02 Gal. volume tank :

operating pressure adapter flanges: according to B16.5 CLASS 300 PSI

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)

# 6. Symbols:

with shut-off valve without indicator



with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with visual-electrical indicator AE 70 and AE 80



with electronical sensor VS2



with by-pass valve



with visual indicator AOR/AOC/OP



with electrical indicator AE 30 and AE 40



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.

#### 8. Test methods:

Filter elements are tested according to the following ISO standards:

Multi-pass method for evaluating filtration performance

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

US 2185 A

Position I: Filter 1 in operation Position II: Filter 2 in operation

10.433

6.969 (AE/VS1/VS2/AOR/AOC)

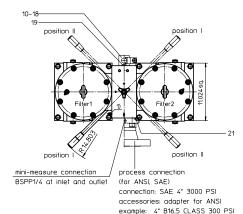
7.362 (OP)

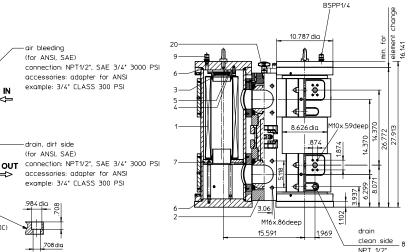
9.330 (OE)

air bleeding

(for ANSI, SAE)

drain, dirt side (for ANSI, SAE)





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 process connection: FS = SAE-flange connection 3000 PSI FA1 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind 1600-3600  $\mu$ in mini-measure connection FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin 9 process connection size: B = 4" 10 filter housing specification: = standard IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028 11 internal valve: - = without. S1 = with by-pass valve Δp 51 PSI 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 13 shut-off valve: without. AV = shut-off valve, see sheet-no. 1655 14 | specification pressure vessel: = standard (PED 97/23/EC) IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415 IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218 15 switch lever: F = toward IN/OUT, B = opposite IN/OUT 16 air bleeding/drain: F = toward IN/OUT, B = opposite IN/OUT **1.2. Filter element:** (ordering example) 01NR. 1000. 10VG. 10. B. P. -

PRESSURE FILTER, change-over

1.1. Complete filter: (ordering example)

4 resistance of pressure difference for filter element:

DA = pressure filter change-over, according to ASME-code

NPS 4" CLASS 300 PSI

DA. 1005. 10VG. 10. B. P. -. FS. B. -. -. AE. AV. IS21. F. F 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

 $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber)

80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm, 10 G = 10 µm stainless steel wire mesh

25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API

Series DA 1005

1. Type index:

2 nominal size: 1005

 $10 = \Delta p 145 PSI$ 

3 | filter-material and filter- fineness:

 $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

1 series:

internormen technology

2 nominal size: 1000

3 - 7 see type index complete filter

1 series:

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4 5 6 7

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

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Changes of measures and design are subject to alterat ion!



weight: approx. 915 lbs.

Sheet No.

2186 A

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet- no. 1659

#### 3. Spare parts:

Opaic	parte	)·				
item	qty.	designation	dimension	articl	e-no.	
1	2	filter element	01NR.1000			
2	1	change over UKK	4"			
3	4	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	766	
9	2	mini-measuring connection	MA.1.ST	305	305453	
10	1	clogging indicator, visual	AOR or AOC	see shee	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see shee	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see shee	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see shee	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see shee	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see shee	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	5000	
21	2	O-ring (only for execution with ANSI-flange)	110,72 x 3,53	316355 (NBR)	316356 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 1005 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm(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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F +14°F to +176°F - medium temperature:

- 40°F to +140°F - ambient temperature: - survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection: NPT 1/2" and SAE 3/4" 3000 PSI drain connection dirt side : NPT 1/2" and SAE 3/4" 3000 PSI

drain connection clean side : NPT 1/2" 2x 5.02 Gal. volume tank :

operating pressure adapter flanges: according to B16.5 CLASS 300 PSI

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)

# 6. Symbols:

with shut-off valve without indicator



with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with visual-electrical indicator AE 70 and AE 80



with electronical sensor VS2



with by-pass valve



with visual indicator AOR/AOC/OP



with visual-electrical indicator OE

with electrical

indicator

AE 30 and AE 40

1



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:

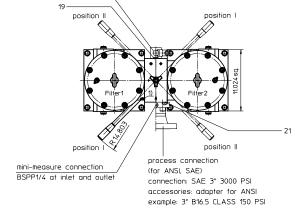
ISO 2941 Verification of collapse/burst resistance ISO 2942 Verification of fabrication integrity ISO 2943 Verification of material compatibility with fluids

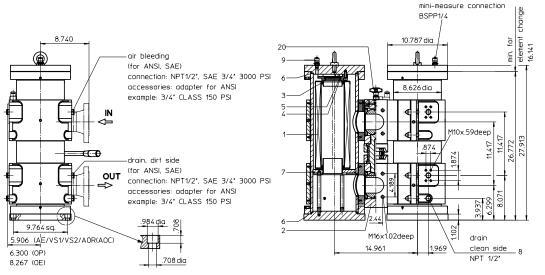
Method for end load test ISO 3723 ISO 3724 Verification of flow fatigue characteristics

ISO 3968 Evaluation of pressure drop versus flow characteristics ISO 16889 Multi-pass method for evaluating filtration performance

US 2186 A

Position I: Filter 1 in operation Position II: Filter 2 in operation





10-18

PRESSURE FILTER, change-over NPS 3" Series DA 1014 **CLASS 150 PSI**  Sheet No. 2180 A

```
1.1. Complete filter: (ordering example)
DA. 1014. 10VG. 10. B. P. -. FS. A. -. -. AE. AV. IS21. F. F
 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16
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  $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API  $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:  $10 = \Delta p 145 PSI$ 

5 filter element design: B = both-sides open 6 sealing material:

1. Type index:

P = Nitrile (NBR). V = Viton (FPM)

7 | filter element specification: standard, VA = stainless steel

8 process connection:

FS = SAE-flange connection 3000 PSI

FA11 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind 1600-3600 μin FA12 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind < 640 μin

9 process connection size:

A = 3"

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028

11 internal valve:

- = without. S1 = with by-pass valve  $\Delta p$  51 PSI

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

13 shut-off valve:

without. AV = shut-off valve, see sheet-no. 1655

14 | specification pressure vessel: = standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218 15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

1.2. Filter element: (ordering example)

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

weight: approx. 816 lbs.

Changes of measures and design are subject to alterat ion!



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- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

#### 3. Spare parts:

Opaic	parte	)·				
item	qty.	designation	dimension	articl	e-no.	
1	2	filter element	01NR.1000			
2	1	change over UKK	3"			
3	4	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	766	
9	2	mini-measuring connection	MA.1.ST	305	305453	
10	1	clogging indicator, visual	AOR or AOC	see shee	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see sheet	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see sheet	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see sheet	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see shee	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see shee	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	000	
21	2	O-ring (only for execution with ANSI-flange)	85,32 x 3,53	305590 (NBR)	306308 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 1014 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F +14°F to +176°F - medium temperature:

- 40°F to +140°F - ambient temperature: - survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection: NPT 1/2" and SAE 3/4" 3000 PSI drain connection dirt side : NPT 1/2" and SAE 3/4" 3000 PSI

drain connection clean side : NPT 1/2" 2x 5.02 Gal. volume tank :

operating pressure adapter flanges: according to B16.5 CLASS 150 PSI

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)

# 6. Symbols:

without indicator

with shut-off valve

幹



with by-pass valve

with visual

indicator

AOR/AOC/OP



with electrical

indicator

AE 30 and AE 40

with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with visual-electrical

indicator

AE 70 and AE 80



with electronical sensor VS2



with visual-electrical indicator OE



7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

Δp- curves; depending on filter fin eness 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

US 2180 A

Position I: Filter 1 in operation Position II: Filter 2 in operation

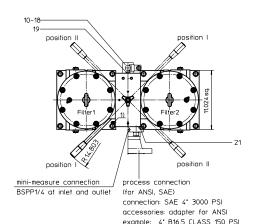
air bleedina

drain, dirt side

.708 dia

OUT

10.039



BSPP1/4 10.787 dia (for ANSI, SAE) connection: NPT1/2", SAE 3/4" 3000 PSI accessories; adapter for ANSI example: 3/4" CLASS 150 PSI (for ANSI, SAE) connection: NPT1/2", SAE 3/4" 3000 PSI accessories: adapter for ANSI example: 3/4" CLASS 150 PSI M16x.86deep clean side 8 NPT 1/2"

PRESSURE FILTER, change-over NPS 4" CLASS 150 PSI Series DA 1015

Sheet No. 2181 A

```
1. Type index:
```

1.1. Complete filter: (ordering example)

DA. 1015. 10VG. 10. B. P. -. FS. B. -. -. AE. AV. IS21. F. F 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

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

 $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API

 $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:

 $10 = \Delta p 145 PSI$ 

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 process connection:

FS = SAE-flange connection 3000 PSI

FA11 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind 1600-3600 μin

FA12 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind < 640 μin

9 process connection size:

B = 4"

mini-measure connection

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028

11 internal valve:

- = without. S1 = with by-pass valve  $\Delta p$  51 PSI

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

13 shut-off valve:

without. AV = shut-off valve, see sheet-no. 1655

14 | specification pressure vessel:

= standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

1.2. Filter element: (ordering example)

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

weight: approx. 915 lbs.

Changes of measures and design are subject to alterat ion!



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9.764 sq.

7.362 (OP)

9.330 (OE)

6.969 (AE/VS1/VS2/AOR/AOC)

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

#### 3. Spare parts:

item	qty.	designation	dimension	articl	e-no.	
1	2	filter element	01NR.1000			
2	1	change over UKK	4"			
3	4	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	307766	
9	2	mini-measuring connection	MA.1.ST	305	305453	
10	1	clogging indicator, visual	AOR or AOC	see sheet	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see sheet	see sheet-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see sheet	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see sheet	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see sheet	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see sheet	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	305000	
21	2	O-ring (only for execution with ANSI-flange)	110,72 x 3,53	316355 (NBR)	316356 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

#### 4. Description:

Pressure filters, change-over series DA 1015 are suitable for operating pressure up to 580 PSI.

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 outside 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 fiber element remove the cover and take out the element.

Filter finer than 40  $\mu$ m should use throw-away elements made of paper or Interpor fleece (glass fiber). 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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F

- ambient temperature: - 40°F to +140°F
- survival temperature: - 40°F to +212°F (short-time)
operating medium: mineral oil, other media on request

max, operating pressure: 580 l

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1,3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection : NPT ½" and SAE ¾" 3000 PSI drain connection dirt side : NPT ½" and SAE ¾" 3000 PSI

drain connection clean side : NPT ½" volume tank : 2x 5.02 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 150 PSI

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)

# 6. Symbols:

without indicator

with visual-electrical

indicator

AE 50 and AE 62

 $\otimes$ 

with shut-off valve

with visual-electrical

indicator

AE 70 and AE 80

幹



with by-pass valve

with visual indicator AOR/AOC/OP



with visual-electrical indicator OE



with electronical sensor VS1



with electronical sensor VS2



with electrical

indicator

AE 30 and AE 40

1

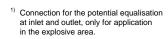
7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

8. Test methods:

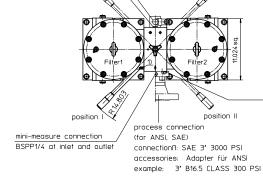
Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
Verification of fabrication integrity
Verification of material compatibility with fluids
Verification of flow fatigue characteristics
ISO 3724 Verification of flow fatigue characteristics
ISO 368 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

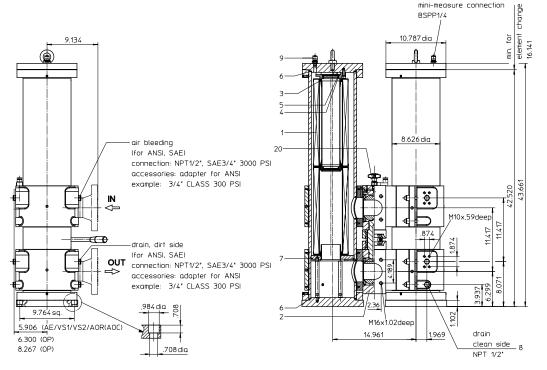
US 2181 A



Position I: Filter 1 in operation Position II: Filter 2 in operation



position I



10\_18

nosition II

#### PRESSURE FILTER, change-over NPS 3" CLASS 300 PSI Series DA 2204

Sheet No. 2188 A

```
1.1. Complete filter: (ordering example)
DA. 2204. 10VG. 10. B. P. -. FS. A. -. -. AE. AV. IS21. F. F
 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16
```

1 series:

DA = pressure filter change-over, according to ASME-code

2 | nominal size: 2204

1. Type index:

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  $25 \text{ VG} = 20 \ \mu\text{m}_{(c)}$ ,  $16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}$ ,  $10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}$ ,  $6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}$ ,  $3 \ \text{VG} = 5 \ \mu\text{m}_{(c)}$  Interpor fleece (glass fiber) 25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API

 $25 P = 25 \mu m$ ,  $10 P = 10 \mu m$  paper

4 resistance of pressure difference for filter element:

 $10 = \Delta p 145 PSI$ 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 process connection:

FS = SAE-flange connection 3000 PSI

FA1 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind 1600-3600  $\mu$ in

FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin

9 process connection size:

A = 3"

10 filter housing specification:

= standard

IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028

11 internal valve:

- = without: S1 = with by-pass valve  $\Delta p$  51 PSI

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

13 shut-off valve:

without. AV = shut-off valve, see sheet-no. 1655

14 | specification pressure vessel:

= standard (PED 97/23/EC)

IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217

IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415

IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218

15 switch lever:

F = toward IN/OUT, B = opposite IN/OUT

16 air bleeding/drain:

F = toward IN/OUT, B = opposite IN/OUT

# 1.2. Filter element: (ordering example)

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

weight: approx. 1080 lbs.

Changes of measures and design are subject to alterat ion!



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- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

#### 3. Spare parts:

Opaic	parte	<b>,</b>				
item	qty.	designation	dimension	artic	e-no.	
1	4	filter element	01NR.1000			
2	1	change over UKK	3"			
3	8	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	766	
9	2	mini-measuring connection	MA.1.ST	305	453	
10	1	clogging indicator, visual	AOR or AOC	see shee	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see shee	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see shee	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see shee	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see shee	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see shee	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	5000	
21	2	O-ring (only for execution with ANSI-flange)	85,32 x 3,53	305590 (NBR)	306308 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 2204 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F +14°F to +176°F - medium temperature:

- 40°F to +140°F - ambient temperature: - survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection: NPT 1/2" and SAE 3/4" 3000 PSI drain connection dirt side : NPT 1/2" and SAE 3/4" 3000 PSI

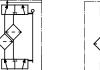
drain connection clean side : NPT 1/2" volume tank :

2x 7.92 Gal. operating pressure adapter flanges: according to B16.5 CLASS 300 PSI

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)

# 6. Symbols:

without indicator



with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with shut-off valve



with visual-electrical indicator AE 70 and AE 80



with electronical sensor VS2



with by-pass valve

with visual

indicator

AOR/AOC/OP



with electrical



with visual-electrical indicator OE



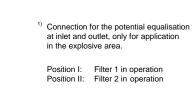
# 7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

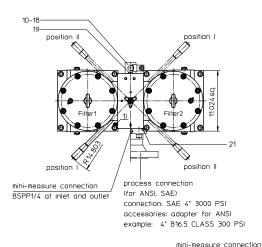
 $\Delta$ p- curves; depending on filter fin eness and viscosity.

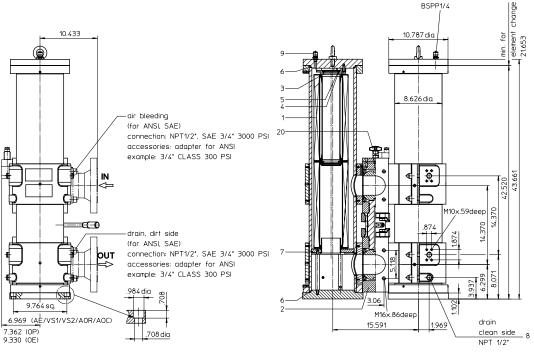
#### 8. Test methods:

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, change-over
Series DA 2205 NPS 4" CLASS 300 PSI

Sheet No. **2187 A** 

```
1. Type index:
1.1. Complete filter: (ordering example)
DA. 2205. 10VG. 10. B. P. -. FS. B. -. -. AE. AV. IS21. F. F
 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
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 \text{ VG} = 20 \ \mu\text{m}_{(c)}, 16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}, 10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}, 6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}, 3 \ \text{VG} = 5 \ \mu\text{m}_{(c)} Interpor fleece (glass fiber)
     25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API
     25 P = 25 \mu m, 10 P = 10 \mu m paper
 4 resistance of pressure difference for filter element:
     10 = \Delta p 145 PSI
 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 process connection:
     FS = SAE-flange connection 3000 PSI
     FA1 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind 1600-3600 \muin
     FA2 = ANSI-flange connection CLASS 300 PSI, sealing surface rough grind < 640 μin
9 process connection size:
     B = 4"
10 filter housing specification:
         = standard
     IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028
11 internal valve:
     - = without:
                              S1 = with by-pass valve \Delta p 51 PSI
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
 13 shut-off valve:
          without.
                              AV = shut-off valve, see sheet-no. 1655
 14 | specification pressure vessel:
         = standard (PED 97/23/EC)
     IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217
     IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415
     IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218
15 switch lever:
     F = toward IN/OUT, B = opposite IN/OUT
16 air bleeding/drain:
     F = toward IN/OUT,
                               B = opposite IN/OUT
1.2. Filter element: (ordering example)
01NR. 1000. 10VG. 10. B. P. -
                               4 5 6 7
 1 series:
     01NR. = standard-return-line filter element according to DIN 24550, T4
 2 nominal size: 1000
```

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3 - 7 see type index complete filter

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Changes of measures and design are subject to alterat ion!



weight: approx. 1102 lbs.

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 300 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

#### 3. Spare parts:

Opaic	parte	/•				
item	qty.	designation	dimension	articl	e-no.	
1	4	filter element	01NR.1000			
2	1	change over UKK	4"			
3	8	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	311471	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	318	481	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	766	
9	2	mini-measuring connection	MA.1.ST	305	453	
10	1	clogging indicator, visual	AOR or AOC	see shee	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see sheet	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see sheet	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see sheet	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see shee	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see shee	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	000	
21	2	O-ring (only for execution with ANSI-flange)	110,72 x 3,53	316355 (NBR)	316356 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 2205 are suitable for operating pressure up to 580 PSI.

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 outside to the i nside.

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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F +14°F to +176°F - medium temperature: - 40°F to +140°F

- ambient temperature: - survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure:

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1.3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection: NPT 1/2" and SAE 3/4" 3000 PSI drain connection dirt side : NPT 1/2" and SAE 3/4" 3000 PSI

drain connection clean side : NPT 1/2" 2x 7.92 Gal. volume tank :

operating pressure adapter flanges: according to B16.5 CLASS 300 PSI

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)

# 6. Symbols:

without indicator



with visual-electrical

indicator

AE 70 and AE 80

幹

with by-pass valve





with visual

indicator

with visual-electrical indicator OE

with electrical

indicator

AE 30 and AE 40

1



with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with electronical sensor VS2



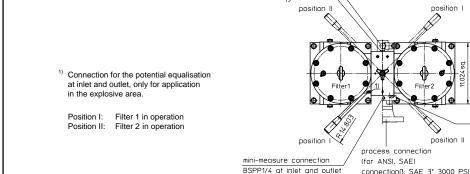
7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

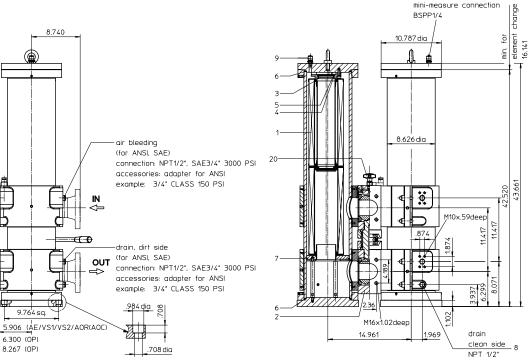
Δp- curves; depending on filter fin eness and viscosity.

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





10\_18

accessories: Adapter für ANSI

example: 3" B16.5 CLASS 150 PSI

-PRESSURE FILTER, change-over Series DA 2214 NPS 3" CLASS 150 PSI Sheet No. **2183 A** 

```
1. Type index:
1.1. Complete filter: (ordering example)
DA. 2214. 10VG. 10. B. P. -. FS. A. -. -. AE. AV. IS21. F. F
 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
 1 series:
     DA = pressure filter change-over, according to ASME-code
 2 | nominal size: 2214
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 \text{ VG} = 20 \ \mu\text{m}_{(c)}, 16 \ \text{VG} = 15 \ \mu\text{m}_{(c)}, 10 \ \text{VG} = 10 \ \mu\text{m}_{(c)}, 6 \ \text{VG} = 7 \ \mu\text{m}_{(c)}, 3 \ \text{VG} = 5 \ \mu\text{m}_{(c)} Interpor fleece (glass fiber)
     25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API
     25 P = 25 \mu m, 10 P = 10 \mu m paper
 4 resistance of pressure difference for filter element:
     10 = \Delta p 145 PSI
 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 process connection:
     FS = SAE-flange connection 3000 PSI
     FA11 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind 1600-3600 μin
     FA12 = ANSI-flange connection CLASS 150 PSI, sealing surface rough grind < 640 μin
9 process connection size:
     A = 3"
 10 filter housing specification:
         = standard
     IS12 = internal parts of change-over armature stainless steel, see sheet-no. 41028
11 internal valve:
     - = without:
                              S1 = with by-pass valve \Delta p 51 PSI
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
 13 shut-off valve:
          without.
                              AV = shut-off valve, see sheet-no. 1655
 14 | specification pressure vessel:
         = standard (PED 97/23/EC)
     IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217
     IS21 = ASME VIII Div.1 with U-stamp, see sheet-no. 43415
     IS23 = ASME VIII Div.1 without U-stamp, see sheet-no. 55218
15 switch lever:
     F = toward IN/OUT, B = opposite IN/OUT
16 air bleeding/drain:
     F = toward IN/OUT, B = opposite IN/OUT
1.2. Filter element: (ordering example)
01NR. 1000. 10VG. 10. B. P. -
                               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
                                                                                  weight: approx. 1080 lbs.
```

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- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

#### 3. Spare parts:

•	part		,			
item	qty.	designation	dimension	artic	le-no.	
1	4	filter element	01NR.1000			
2	1	change over UKK	3"			
3	8	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	1471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	7766	
9	2	mini-measuring connection	MA.1.ST	305	5453	
10	1	clogging indicator, visual	AOR or AOC	see shee	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see shee	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see shee	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see shee	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see shee	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see shee	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	5000	
21	2	O-ring (only for execution with ANSI-flange)	85,32 x 3,53	305590 (NBR)	306308 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 2214 are suitable for operating pressure up to 580 PSI.

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 outside 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 fiber 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 fiber). Filter elements as fine as 5 µm<sub>(c)</sub> 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.

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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F - ambient temperature: -40°F to +140°F - 40°F to +140°F

- ambient temperature: - 40°F to +140°F - survival temperature: - 40°F to +0°F to +12°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure: 580 F

max. operating pressure:

500 PSI

test pressure acc. to PED 97/23/EC:
1,43 x operating pressure = 827 PSI
test pressure acc. to ASME VIII Div. 1:
1,3 x operating pressure = 754 PSI
test pressure acc. to API 614, Chapter 1:
1,5 x operating pressure = 870 PSI
connection system:

SAE-flance connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection : NPT ½" and SAE ¾" 3000 PSI drain connection dirt side : NPT ½" and SAE ¾" 3000 PSI

drain connection clean side : NPT  $\frac{1}{2}$ " volume tank : 2x 7.92 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 150 PSI

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)

# 6. Symbols:

without indicator

with shut-off valve

with visual-electrical

indicator

AE 70 and AE 80

幹



with by-pass valve

with visual indicator AOR/AOC/OP



with visual-electrical indicator OE

with electrical

indicator

AE 30 and AE 40

1



with visual-electrical indicator AE 50 and AE 62



with electronical sensor VS1



with electronical sensor VS2



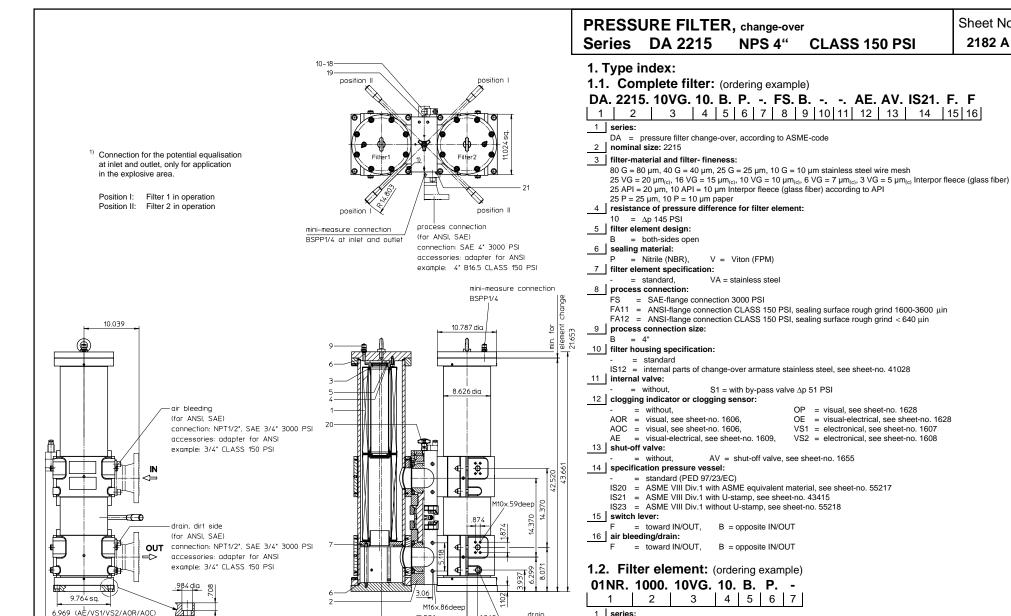
7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

8. Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941 Verification of collapse/burst resistance
Verification of fabrication integrity
Verification of material compatibility with fluids
Verification of material compatibility with fluids
Verification of flow fatigue characteristics
ISO 3724 Verification of flow fatigue characteristics
ISO 3688 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-pass method for evaluating filtration performance

US 2183 A



15.591

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1 series:

2 nominal size: 1000

3 - 7 see type index complete filter

drain

clean side 8

1.969

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

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Changes of measures and design are subject to alterat ion!



weight: approx. 1102 lbs.

Sheet No.

2182 A

7.362 (OP)

9.330 (OE)

.708 dia

- SAE-counter flanges, see sheet-no. 1652
- adapter for ANSI-connection B16.5 CLASS 150 PSI, see sheet-no. 1658
- drain- and bleeder connection, see sheet-no. 1659

#### 3. Spare parts:

Opaic	parte	)·				
item	qty.	designation	dimension	articl	e-no.	
1	4	filter element	01NR.1000			
2	1	change over UKK	4"			
3	8	O-ring	90 x 4	306941 (NBR)	307031 (FPM)	
4	2	O-ring	62 x 4	308045 (NBR)	311472 (FPM)	
5	2	circlip	DIN472-75x2,5-ST	311	471	
6	4	O-ring	200 x 4	334555 (NBR)	334554 (FPM)	
7	2	O-ring	185 x 6	335381 (NBR)	335306 (FPM)	
8	12	screw plug	NPT ½	307	766	
9	2	mini-measuring connection	MA.1.ST	305	453	
10	1	clogging indicator, visual	AOR or AOC	see shee	see sheet-no. 1606	
11	1	clogging indicator, visual-electrical	OP	see sheet	t-no. 1628	
12	1	clogging indicator, visual-electrical	OE	see sheet	t-no. 1628	
13	1	clogging indicator, visual-electrical	AE	see sheet	t-no. 1609	
14	1	clogging sensor, electronical	VS1	see shee	t-no. 1607	
15	1	clogging sensor, electronical	VS2	see shee	t-no. 1608	
16	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)	
17	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)	
18	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)	
19	2	screw plug	BSPP ¼	305	305003	
20	1	pressure balance valve	3/8"	305	000	
21	2	O-ring (only for execution with ANSI-flange)	110,72 x 3,53	316555 (NBR)	316356 (FPM)	

item 19 execution only with clogging indicator or clogging sensor

# 4. Description:

Pressure filters, change-over series DA 2215 are suitable for operating pressure up to 580 PSI.

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 outside 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 fiber element remove the cover and take out the element.

Filter finer than 40  $\mu$ m should use throw-away elements made of paper or Interpor fleece (glass fiber). 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.

#### 5. Technical data:

temperature ranges

- calculation temperature (pressure vessel): +14°F to +212°F - medium temperature: +14°F to +176°F

- ambient temperature: - 40°F to +140°F - survival temperature: - 40°F to +212°F (s

- survival temperature: - 40°F to +212°F (short-time) operating medium: mineral oil, other media on request

max, operating pressure: 580 F

test pressure acc. to PED 97/23/EC: 1,43 x operating pressure = 827 PSI test pressure acc. to ASME VIII Div. 1: 1,3 x operating pressure = 754 PSI test pressure acc. to API 614, Chapter 1: 1,5 x operating pressure = 870 PSI connection system: SAE-flange connection 3000 PSI

housing material:

sealing material: Nitrile (NBR) or Viton (FPM), other materials on request

installation position: vertical

bleeder connection: NPT ½" and SAE ¾" 3000 PSI drain connection dirt side: NPT ½" and SAE ¾" 3000 PSI

drain connection clean side : NPT  $\frac{1}{2}$ " volume tank : 2x 7.92 Gal.

operating pressure adapter flanges: according to B16.5 CLASS 150 PSI

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)

# 6. Symbols:

without indicator

with shut-off valve



with visual-electrical with visual-electrical indicator indicator
AE 50 and AE 62 AE 70 and AE 80



with electronical sensor VS1





with visual indicator AOR/AOC/OP

with by-pass valve



with visual-electrical

with electrical

indicator

AE 30 and AE 40

1

OE



with electronical sensor VS2



# 7. Pressure drop flow curves: Precise flow rates see 'INT-Expert-System Filter', respectively

Precise flow rates see 'INT-Expert-System Filter', respectivel Δp- curves; depending on filter fin eness 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