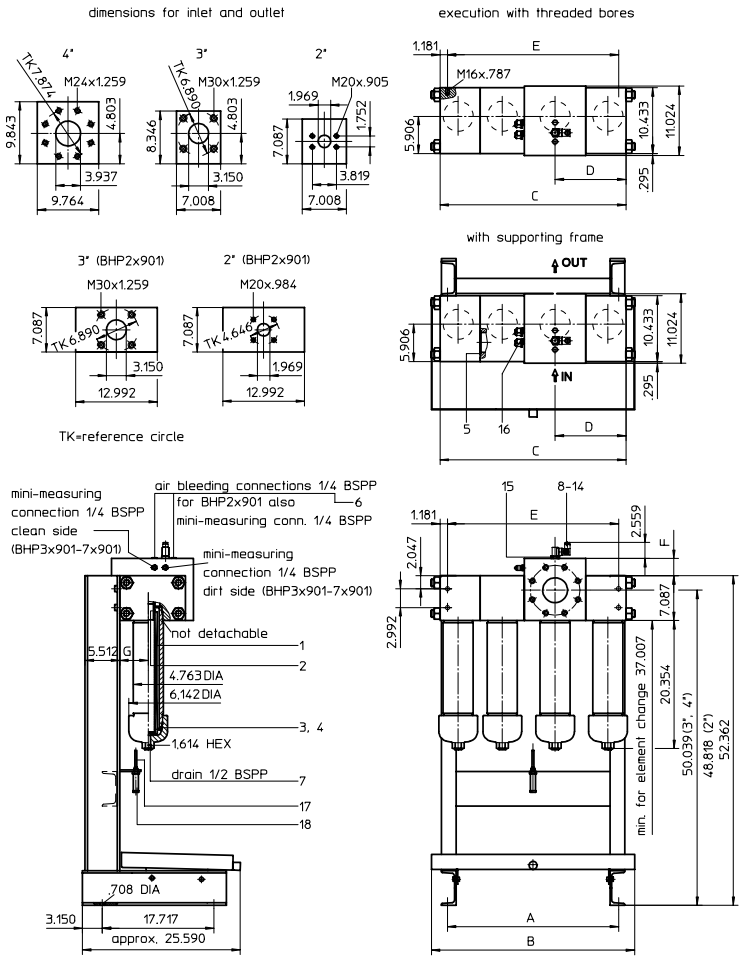
FILTER-BATTERY
Series BHP 2x901-7x901 4568 PSI

Sheet No. **1467 E**



2. Dimensions: inch

filter-battery	connection	A	B	C	D	E	F	G	weight lbs. without supporting frame	weight lbs. with supporting frame
BHP2x901	3"	10.63	15.75	12.99	6.50	10.63	1.26	3.86	374	462
	2"	10.63	15.75	12.99	6.50	10.63	-	3.86	374	462
BHP3x901	4"	20.16	25.28	22.52	11.26	20.16	2.76	4.53	620	763
	3", 2"	17.40	22.52	19.80	9.88	17.40	1.26	4.53	535	678
BHP4x901	4"	27.17	32.30	29.53	11.26	27.17	2.76	4.53	792	942
	3", 2"	24.40	29.52	26.77	9.88	24.40	1.26	4.53	706	856
BHP5x901	4"	34.20	39.30	36.53	18.27	34.20	2.76	4.53	966	1122
	3", 2"	31.42	36.53	33.78	16.89	31.42	1.26	4.53	880	1036
BHP6x901	4"	41.20	46.30	43.54	18.27	41.20	2.76	4.53	1137	1300
	3", 2"	38.43	43.54	40.79	16.89	38.43	1.26	4.53	1052	1214
BHP7x901	4"	48.20	53.31	50.55	25.28	48.20	2.76	4.53	1310	1476
	3", 2"	45.43	50.55	47.80	23.90	45.43	1.26	4.53	1223	1390

EDV 11/07

1.1. Complete filter: (ordering example)

BHP. 4x901. 10VG. HR. E. P. -. FV. A. -. -. AE. T

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

1 **series:**
BHP = battery-pressure filter

2 **nominal size:**
2x901; 5x901
3x901; 6x901
4x901; 7x901

3 **filter-material and filter-fineness:**
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)

4 **resistance of pressure difference for filter element:**
30 = Δp 435 PSI
HR = Δp 2320 PSI (rupture strength Δp 3625 PSI)

5 **filter element design:**
E = single-end open

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

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

8 **connection:**
FS = SAE-flange connection 6000 PSI
FV = AVIT-flange connection 4640 PSI

9 **connection size:**
8 = 2" with FS (up to BHP 3x901 preferably)
= or with FV (only BHP 2x901)
A = 3" with FV (up to BHP 5x901 preferably)
B = 4" with FV (BHP 3x901 up to 7x901 preferably)

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

11 **internal valve:**
- = without
S1 = with by-pass valve, Δp 51 PSI
S2 = with by-pass valve, Δp 102 PSI
R = reversing valve, Q ≤ 122.94 GPM

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1615
VS1 = electronical, see sheet-no. 1617
VS2 = electronical, see sheet-no. 1618

13 **fixing:**
- = without supporting frame with fastening bores
T = with supporting frame

1.2. Filter element: (ordering example)

01E. 900. 10VG. HR. E. P. -

1	2	3	4	5	6	7

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

2 **nominal size:** 900

3 - 7 see type index-complete filter

Changes of measures and design are subject to alteration!

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3. Accessories:

- Counter flange see sheet-no. 1654

4. Spare parts:

item	qty. BHP2x901	qty. BHP3x901	qty. BHP4x901	qty. BHP5x901	qty. BHP6x901	qty. BHP7x901	designation	dimension	article-no.	
1	2	3	4	5	6	7	filter element	01E.900		
2	2	3	4	5	6	7	O-ring	48 x 3	304357 (NBR)	304404 (FPM)
3	2	3	4	5	6	7	O-ring	98 x 4	301914 (NBR)	304754 (FPM)
4	2	3	4	5	6	7	support ring	110 x 3,5 x 2	304802	
5	-	4	6	8	10	12	O-ring	85 x 3,5	311309 (NBR)	317033 (FPM)
6	2	2	2	2	2	2	screw plug	¼ BSPP	305003	
7	2	3	4	5	6	7	screw plug	½ BSPP	304678	
8	1	1	1	1	1	1	clogging indicator, visual	AOR or AOC	see sheet-no. 1606	
9	1	1	1	1	1	1	clogging indicator, visual-electrical	AE	see sheet-no. 1615	
10	1	1	1	1	1	1	clogging sensor, electronical	VS1	see sheet-no. 1617	
11	1	1	1	1	1	1	clogging sensor, electronical	VS2	see sheet-no. 1618	
12	1	1	1	1	1	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
13	1	1	1	1	1	1	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
14	1	1	1	1	1	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
15	1	1	1	1	1	1	screw plug	20913-4	314442	
16	2	2	2	2	2	2	mini-measuring conn.	MA.1.St	305453	
17	1	1	1	1	1	1	high pressure hose	M16.2000	see sheet-no. 1650	
18	1	1	1	1	1	1	spray protection	M16	see sheet-no. 1650	

5. Description:

The filter-batteries of the series BHP are suitable for the filtration of large flow volumes up to a working pressure of 4568 PSI and are stressing a high filter efficiency. The filters of the filter-battery consist of spheroidal graphite cast iron (EN-GJS-400-18-LT) respectively of C-steel.

For changing the filter elements the filter tubes have to be opened at the tube plug (bottom part of the filter). Filter elements are available down to a filter fineness of 4 $\mu m_{(c)}$.

INTERNORMEN-Filter elements consist of filter materials with a high intrinsic stability, an excellent particle retention, respectively a high dirt holding capacity and provide a long service life.

INTERNORMEN-Filters can be used for mineral oil based fluids, HW-emulsions, water glycols, most synthetic hydraulic fluids and lubrication fluids.

INTERNORMEN-Filter elements are available with a pressure difference resistance up to Δp 2320 PSI and a rupture strength up to Δp 3625 PSI.

The internal valves are integrated into the centering pivot for the filter element. After reaching the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

6. Technical data:

temperature range:	+14°F to +176°F (for a short time +212°F)
operating medium:	mineral oil, other media on request
max. operating pressure:	4568 PSI
test pressure:	5945 PSI
connection system:	SAE-flange connection 6000 PSI, AVIT-flange connection 4640 PSI
air bleeding and mini-measuring connection:	¼ BSPP
contents:	BHP2x901 = 2.1 gal., BHP5x901 = 7.9 gal. BHP3x901 = 4.8 gal., BHP6x901 = 9.5 gal. BHP4x901 = 6.3 gal., BHP7x901 = 11.1 gal.

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. Pressure drop flow rates:

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

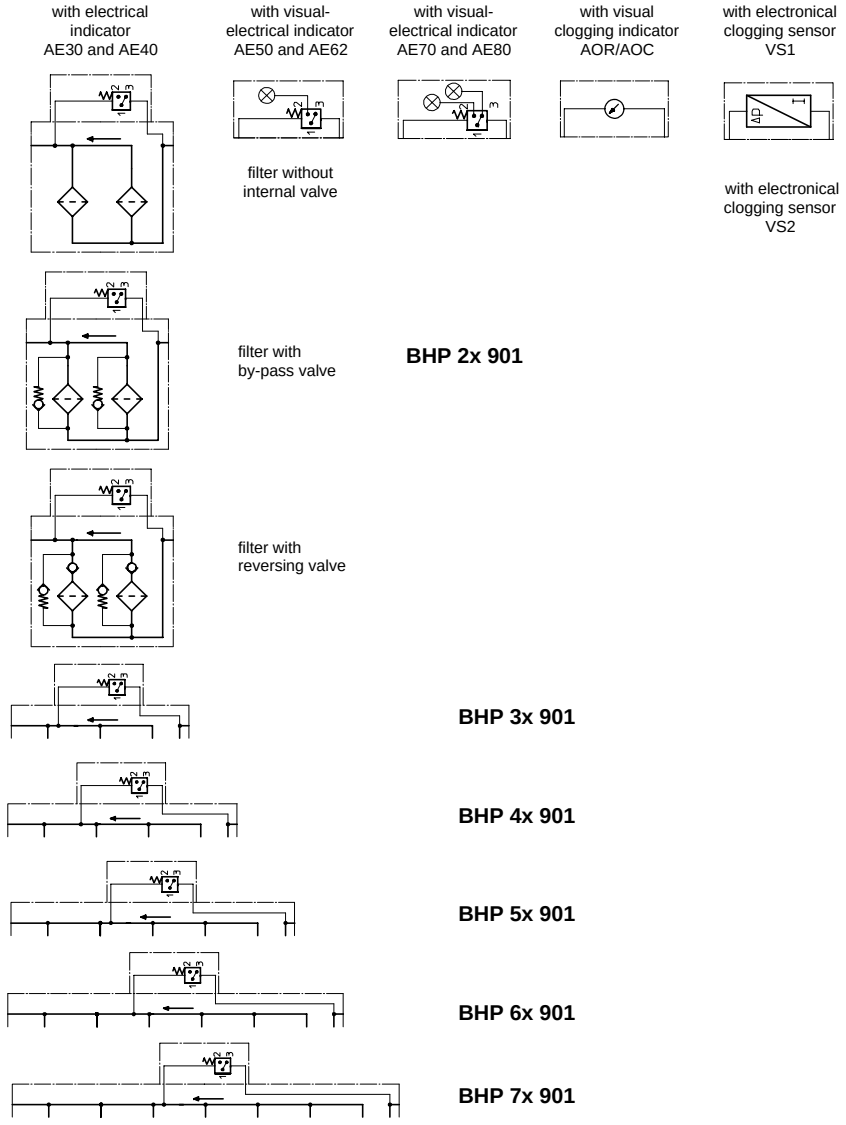
8. Test methods:

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

US 1467 E

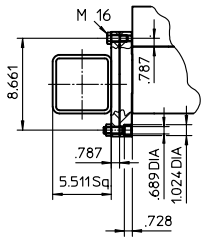
9. Symbols:



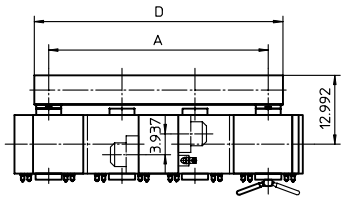
FILTER-BATTERY, change-over
Series BHDD 2x901/1351- 4x901/1351 4568 PSI

Sheet No. 2526 J

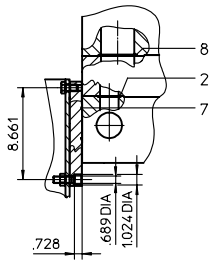
single unit X
with cleat



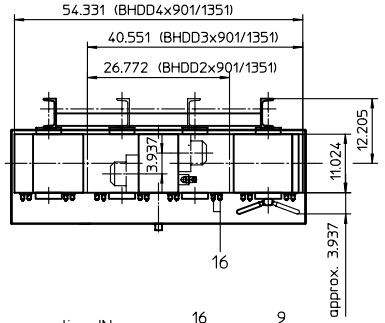
execution with cleat

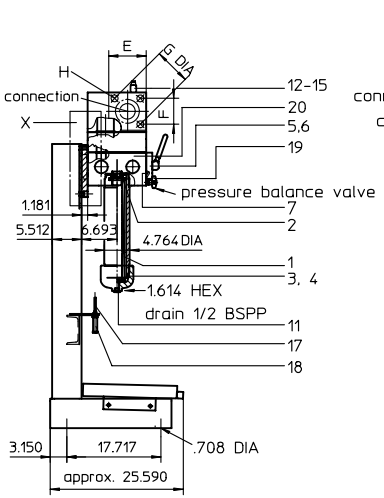


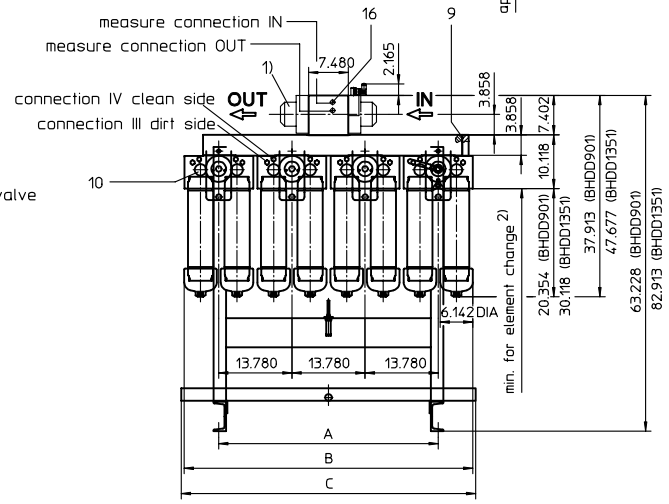
single unit X
with supporting frame



execution with supporting frame







Measuring connections III and IV to be used to bleed filter or to relieve pressure.
1) Flanges are not part of the connecting block. If required they have to be ordered separately.

filter-battery	A	B	C	D
BHDD 2x901/1351	13.37	26.77	27.95	19.29
BHDD 3x901/1351	27.55	40.55	41.73	33.07
BHDD 4x901/1351	41.33	54.33	55.51	46.85

connection	E	F	G	H
2“	4.72	3.28	4.64	M20 x .98 deep
2 ½“	5.90	4.03	5.70	M24 x 1.18 deep
3“	7.08	4.87	6.88	M30 x 1.26 deep

2) min. for element change: 37.00 (BHDD901)
56.70 (BHDD1351)

EDV 04/06

1. Type index:

1.1. Complete filter: (ordering example)

BHDD. 4x901. 10VG. HR. E. P. -. FV. A. -. -. AE. T

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

1 **series:**
BHDD = battery-pressure filter, change-over

2 **nominal size:**
2x901, 2x1351
3x901, 3x1351
4x901, 4x1351

3 **filter-material and filter-fineness:**
25 VG = 20 $\mu m_{(c)}$, 16 VG = 15 $\mu m_{(c)}$, 10 VG = 10 $\mu m_{(c)}$, 6 VG = 7 $\mu m_{(c)}$, 3 VG = 5 $\mu m_{(c)}$ Interpor fleece (glass fiber)

4 **resistance of pressure difference for filter element:**
30 = Δp 435 PSI
HR = Δp 2320 PSI (rupture strength Δp 3625 PSI)

5 **filter element design:**
E = single-end open

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

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

8 **connection:**
FV = AVIT-flange connection 4640 PSI

9 **connection size:**
8 = 2“
9 = 2 ½“
A = 3“

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

11 **internal valve:**
- = without
S1 = with by-pass valve, Δp 51 PSI
S2 = with by-pass valve, Δp 102 PSI
R = reversing valve, Q ≤ 122.94 GPM

12 **clogging indicator or clogging sensor:**
- = without
AE = visual-electrical, see sheet-no. 1609
VS1 = electronical, see sheet-no. 1607
VS2 = electronical, see sheet-no. 1608

13 **fixing:**
- = without supporting frame with fastening bores
B = with cleat
T = with supporting frame

1.2. Filter element: (ordering example)

01E. 900. 10VG. HR. E. P. -

1	2	3	4	5	6	7

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

2 **nominal size:** 900, 1350

3 - 7 see type index-complete filter

Changes of measures and design are subject to alterat ion!

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2. Accessories:

- counter flange see sheet-no. 1654

3. Spare parts:

item	qty. BHDD 2x901/1351	qty. BHDD 3x901/1351	qty. BHDD 4x901/1351	designation	dimension	article-no.	
1	4	6	8	filter element (BHDD 2-4x901)	01E.900		
				filter element (BHDD 2-4x1351)	01E.1350		
2	8	12	16	O-ring	48 x 3	304357 (NBR)	304404 (FPM)
3	4	6	8	O-ring	98 x 4	301914 (NBR)	304754 (FPM)
4	4	6	8	support ring	110 x 3,5 x 2	304802	
5	4	6	8	O-ring	18 x 3	304359 (NBR)	304399 (FPM)
6	4	6	8	support ring	25 x 2,5 x 0,5	311311	
7	4	6	8	O-ring	71 x 3	306451 (NBR)	306897 (FPM)
8	2	2	2	O-ring	85 x 3,5	310785 (NBR)	
9	2	2	2	O-ring	69,45 x 3,53	305868 (NBR)	307357 (FPM)
10	16	24	32	screw plug	1 ½ BSPP	311475	
11	4	6	8	screw plug	½ BSPP	304678	
12	1	1	1	clogging indicator, visual-electrical	AE	see sheet-no. 1609	
13	1	1	1	clogging sensor, electronical	VS1	see sheet-no. 1607	
14	1	1	1	clogging sensor, electronical	VS2	see sheet-no. 1608	
15	2	2	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
16	10	14	18	mini-measuring connection	MA.1.St	305453	
17	1	1	1	high pressure hose	M16.2000	see sheet-no. 1650	
18	1	1	1	spray protection	M16	see sheet-no. 1650	
19	2	3	4	pressure balance valve	NG 10	305000	
20	2	3	4	pressure filter, change-over	HDD 901 resp. HDD 1351	see sheet-no. 2524	

4. Description:

The filter-batteries of the series BHDD are suitable for the filtration of large flow volumes up to a working pressure of 4568 PSI and are stressing a high filter efficiency. The duplex pressure filters, of the filter-batteries consist of high quality spheroidal graphite cast iron (GGG 40.3). The intrinsic joint plate is made out of high-tensile aluminium alloy.
Duplex filters can be maintained without interruption of operation, as the change-over device allows to change-over the flow from the dirt filter-side to the clean filter-side after opening of pressure balance valve. For changing the filter elements the filter tubes have to be opened at the tube plug (bottom part of the filter). Filter elements are available down to a filter fineness of 5µm $_{(c)}$.
INTERNORMEN-Filter elements consist of filter materials with a high intrinsic stability, an excellent particle retention, respectively a high dirt holding capacity and provide a long service life.
INTERNORMEN-Filters can be used for mineral oil based fluids, HW-emulsions, water glycols, most synthetic hydraulic fluids and lubrication fluids.
INTERNORMEN-Filter elements are available with a pressure difference resistance up to Δp 2320 PSI and a rupture strength up to Δp 3625 PSI.
The internal valves are integrated into the centering pivot for the filter element. After reaching the by-pass valve causes that an unfiltered partial flow passes the filter. With the reverse valve a protection of the filter element is given when having a reverse flow inside the filter. The reverse flow will not be filtered.

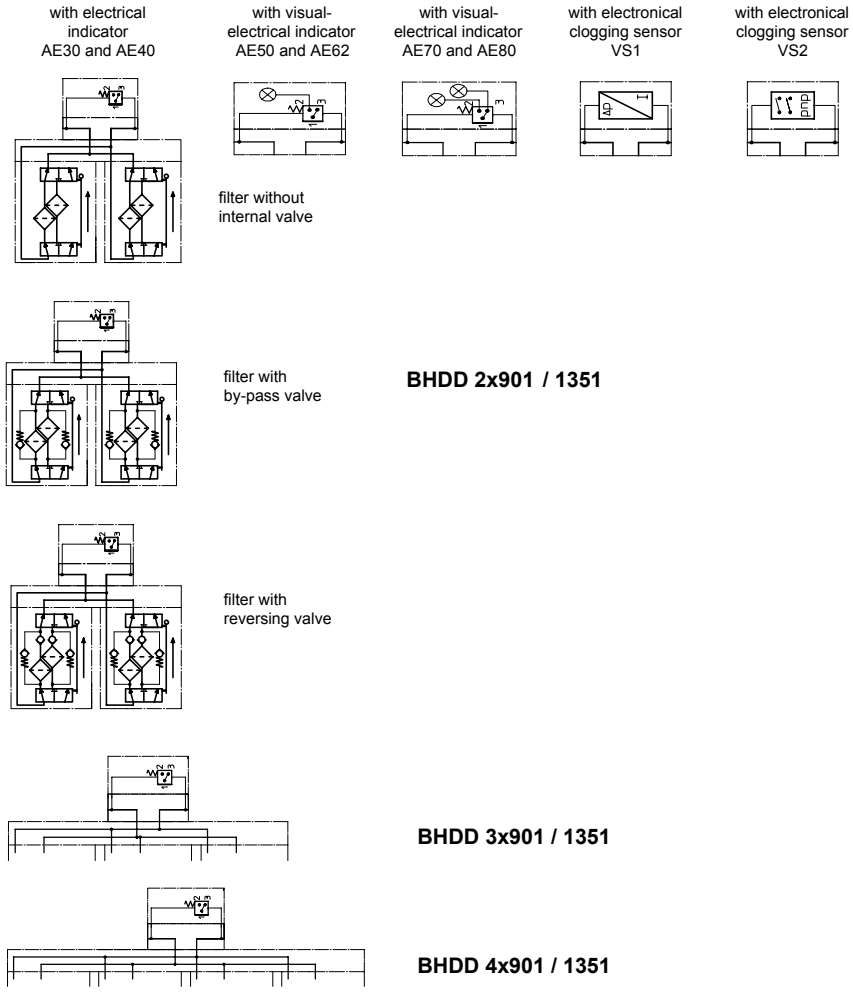
5. Technical data:

temperature range:	+14°F to +176°F (for a short time +212°F)	
operating medium:	mineral oil, other media on request	
max. operating pressure:	4568 PSI	
test pressure:	5945 PSI	
connection system:	AVIT-flange connection 4640 PSI	
air bleeding and mini-measuring connection:	¼ BSPP	
contents:	BHDD 2x901 = 6.6 gal.	BHDD 2x1351 = 9 gal.
	BHDD 3x901 = 9.5 gal.	BHDD 3x1351 = 13 gal.
	BHDD 4x901 = 12.6 gal.	BHDD 4x1351 = 17.5 gal.
weight:	BHDD 2x901 = 1025 lbs.	BHDD 2x1351 = 1054 lbs.
	BHDD 3x901 = 1466 lbs.	BHDD 3x1351 = 1534 lbs.
	BHDD 4x901 = 1907 lbs.	BHDD 4x1351 = 1995 lbs.

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

US 2526 J

6. Symbols:



7. Pressure drop flow rates:

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