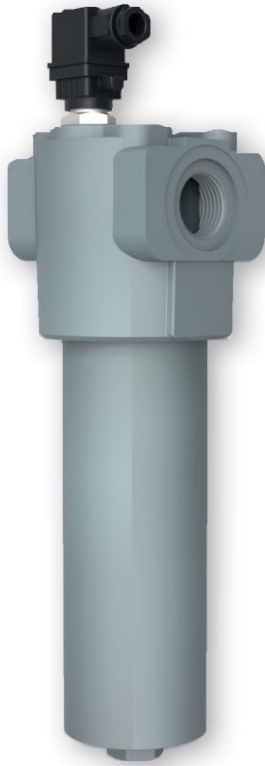


High Pressure Filters

HFL 152 · HFL 172

In-line mounting · Operating pressure up to 630 bar / 9137 psi · Nominal flow rate up to 190 l/min / 50.2 gpm



High Pressure Filter HFL 172

Description

Application

In the high pressure circuits of hydraulic systems.

Performance features

Protection against wear:

By means of filter elements that even in full-flow filtration meet the highest demands regarding cleanliness classes.

Protection against malfunction:

Through installation near to the control valves or other expensive components. The specific determined flow rate guarantees a closed by-pass valve even at $v \leq 200 \text{ mm}^2/\text{s}$ / 927 SUS (cold start condition).

Filter elements

Flow direction from outside to center.

The star-shaped pleating of the filter material results in:

- › large filter surfaces
- › low pressure drop
- › high dirt-holding capacities
- › long service life

Filter maintenance

By using a clogging indicator the correct moment for maintenance is stated and guarantees the optimum utilization of the filter life.

Materials

Filter head:	Spheroidal graphite cast iron (SGI)
Filter bowl:	Cold extruded steel
Coating:	Powder paint
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 / MAX 3 - inorganic multi-layer microfiber web
	Paper - cellulose web, impregnated with resin
Wire Mesh:	Stainless Steel

Accessories

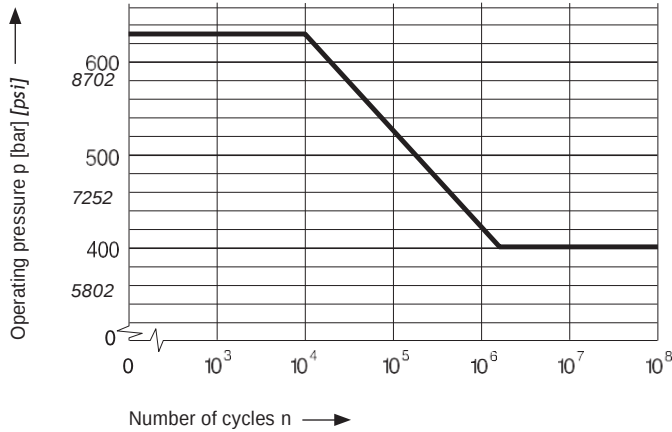
Electrical and / or optical clogging indicators are available on request. Dimensions and technical data see catalog sheet 60.40.

Operating pressure

0 ... 400 bar / 5800 psi, min. 2×10^6 pressure cycles
Nominal pressure according DIN 24550

0 ... 630 bar / 9137 psi, min. 10^4 pressure cycles
Quasi-static operating pressure

Permissible pressures for other numbers of cycles



Nominal flow rate

Up to 190 l/min / 47.6 gpm (see Selection Chart, column 2)
The nominal flow rates indicated by ARGO-HYTOS are based on the following features:

- › closed by-pass valve at $v \leq 200 \text{ mm}^2/\text{s}$ / 927 SUS
- › element service life > 1000 operating hours at an average fluid contamination of 0.07 g per l/min / 0.27 g per gpm flow volume
- › flow velocity in the connection lines:
up to 250 bar $\leq 8 \text{ m/s}$ / up to 3626 psi $\leq 26.3 \text{ ft/s}$
> 250 bar $\leq 12 \text{ m/s}$ / > 3626 ps $\leq 39.4 \text{ ft/s}$

Filter fineness

5 $\mu\text{m(c)}$... 30 $\mu\text{m(c)}$ – For microfiber and cellulose media
 β -values according to ISO 16889
(see Selection Chart, column 4 and diagram Dx).
40 μm ... 100 μm – For Wire-mesh

Dirt-holding capacity

Values in g test dust ISO MTD according to ISO 16889
(see Selection Chart, column 5).

Hydraulic fluids

Mineral oil and biodegradable fluids
(HEES and HETG, see info-sheet 00.20).

Temperature range

-30 °C ... +100 °C (temporary -40 °C ... +120 °C)
-22 °F ... +212 °F (temporary -40 °F ... +248 °F)

Viscosity at nominal flow rate

- › at operating temperature: $v < 60 \text{ mm}^2/\text{s}$ / 280 SUS
- › as starting viscosity: $v_{\text{max}} = 1200 \text{ mm}^2/\text{s}$ / 5560 SUS
- › at initial operation:
The recommended starting viscosity can be read from the diagram D (pressure drop as a function of the kinematic viscosity) as follows: Find the 70% Δp of the cracking pressure of the by-pass valve on the vertical axis. Draw a horizontal line so that it intersects the Δp curve at a point. Read this point on the horizontal axis for the viscosity.

Mounting position

Preferably vertical, filter head on top.

Connection

Threaded ports according to

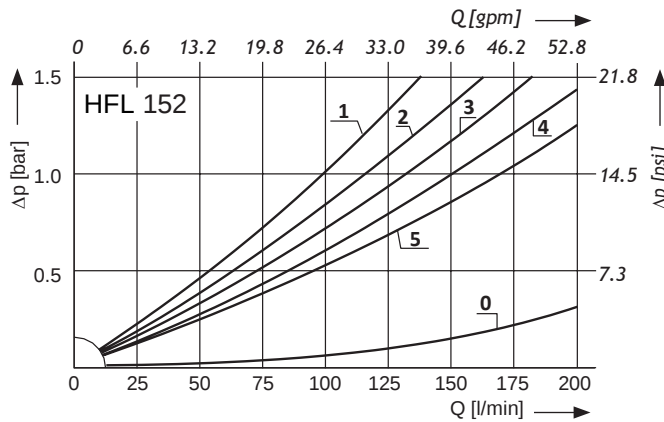
- › ISO 228 or DIN 13
- › SAE standard J514

Sizes see Selection Chart, column 6
(other port threads on request).

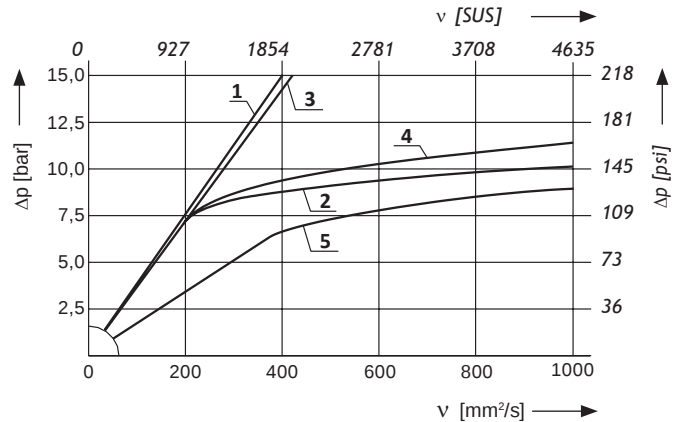
Δp-curves for complete filters in Selection Chart, column 3

For 150 mm²/s oil, consider nominal flow rate 15% higher than what is shown in the below graphs.

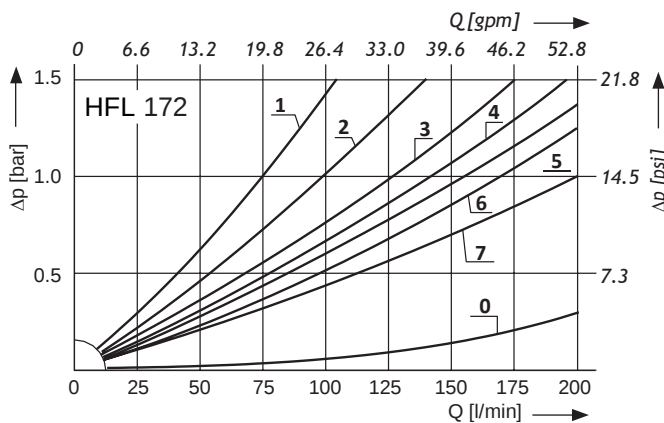
D1 Pressure drop as a function of the **flow volume**
at $v = 35 \text{ mm}^2/\text{s}$ / 162 SUS (0 = casing empty)



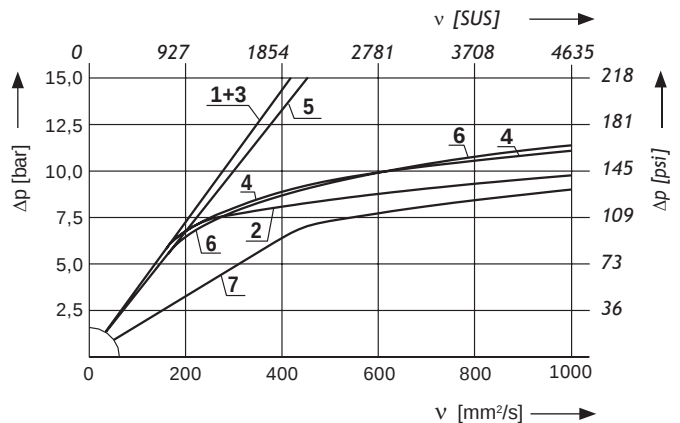
Pressure drop as a function of the
kinematic viscosity at nominal flow



D1 Pressure drop as a function of the **flow volume**
at $v = 35 \text{ mm}^2/\text{s}$ / 162 SUS (0 = casing empty)

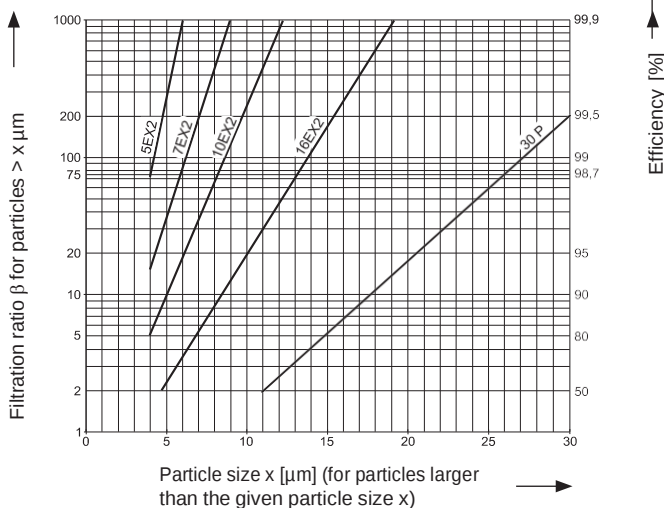


Pressure drop as a function of the
kinematic viscosity at nominal flow



Filter fineness curves in Selection Chart, column 4

Dx Filtration ratio β as a function of particle size x obtained
by the Multi-Pass Test according to ISO 16889



The abbreviations represent the following β -values resp. fineness:

For EXAPOR[®]MAX2 and Paper elements:

5EX2 = $\bar{\beta}_{5(c)}$ = 200	EXAPOR [®] MAX 2 / MAX 3
7EX2 = $\bar{\beta}_{7(c)}$ = 200	EXAPOR [®] MAX 2 / MAX 3
10EX2 = $\bar{\beta}_{10(c)}$ = 200	EXAPOR [®] MAX 2 / MAX 3
16EX2 = $\bar{\beta}_{16(c)}$ = 200	EXAPOR [®] MAX 2 / MAX 3
30P = $\bar{\beta}_{30(c)}$ = 200	Paper

Based on the structure of the filter media of the 30P paper elements, deviations from the printed curves are quite probable.

For screen elements

40S = screen material with mesh size 40 μm
60S = screen material with mesh size 60 μm
100S = screen material with mesh size 100 μm
Tolerances for mesh size according to DIN 4189

For special applications, fineness differing from these curves are also available by using special composed filter media.

Selection Chart

Part No.	Nominal flow rate	Pressure drop see diagram D/curve no.	Filter fineness see diagr. Dx	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass	Symbol	Replacement filter element	Weight	Clogging indicator	Cracking pressure ()	Remarks
	l/min			g		bar			kg			
1	2	3	4	5	6 ■■	7	8	9	10	11 ●●	12	
HFL-152-■■-G6-A●●-100	110	D1/1	10EX2	13	GC- G $\frac{3}{4}$ UC- SAE-12 ¹	-	Refer Page 7	V3.0617-726 ⁴	7.1	AA ⁵ (-), EF (5), KL (5), KW (5)	-	-
HFL-152-■■-G1-X●●-100	125	D1/2	10EX2	17	GC- G $\frac{3}{4}$ UC- SAE-12 ¹	7		V3.0617-706	6.9		-	-
HFL-152-■■-I6-A●●-100	150	D1/3	16EX2	14	GD- G1 UD- SAE-16 ²	-		V3.0617-718 ⁴	7.1		-	-
HFL-152-■■-I1-X●●-100	175	D1/4	16EX2	17	GD- G1 UD- SAE-16 ²	7		V3.0617-708	6.9		-	-
HFL-152-■■-N3-X●●-100	130	D1/5	30P	8.7	GD- G1 UD- SAE-16 ²	7		P3.0617-01 ³	6.9		-	-
HFL-172-■■-D6-A●●-100	80	D2/1	5EX2	16	GD- G1 UD- SAE-16 ²	-		V3.0623-713 ⁴	8.4		-	-
HFL-172-■■-D1-X●●-100	110	D2/2	5EX2	17	GD- G1 UD- SAE-16 ²	7		V3.0623-703	8.0		-	-
HFL-172-■■-G6-A●●-100	140	D2/3	10EX2	18	GD- G1 UD- SAE-16 ²	-		V3.0623-726 ⁴	8.4		-	-
HFL-172-■■-G1-X●●-100	160	D2/4	10EX2	23	GD- G1 UD- SAE-16 ²	7		V3.0623-706	8.0		-	-
HFL-172-■■-I6-A●●-100	180	D2/5	16EX2	19	GD- G1 UD- SAE-16 ²	-		V3.0623-718 ⁴	8.4		-	-
HFL-172-■■-I1-X●●-100	190	D2/6	16EX2	25	GD- G1 UD- SAE-16 ²	7		V3.0623-708	8.0		-	-
HFL-172-■■-N3-X●●-100	150	D2/7	30P	14	GD- G1 UD- SAE-16 ²	7		P3.0623-01 ³	8.0		-	-

¹ Corresponds to 1 $\frac{1}{16}$ -12 UN-2B

² Corresponds to 1 $\frac{1}{16}$ -12 UN-2B

³ Paper media supported with metal gauze

⁴ Filter element differential pressure stable up to 160 bar / 2320.6 psi, clogging indicator required

⁵ Not applicable for non-bypass filters with 160bar collapse rated element

●● AA – No indicator, EF – Optical Indicator (5bar), KL – Electrical Indicator with DIN EN 175301-803 socket (5bar), KW - Electrical Indicator with visual indication DG 041.1200 with 2 LEDs (5bar)

Optical or electrical clogging indicators are available to monitor the clogging condition of the element. When ordering filters with integrated monitoring, the abbreviation of the clogging indicator has to be added to the order code of the desired filter variant.

For the appropriate clogging indicator see catalog sheet 60.40.

Remarks:

- The switching pressure of the clogging indicator has always to be lower than the cracking pressure of the by-pass valve(see Selection Chart, column 7).
- The filters listed in this chart are standard filters. Other designs available on request as per Order Code definitions given in Page 5.
- Other indicators available on request as per catalog sheet 60.40.

Order Code Definition - Filter Assembly

1 2 3 4 5 6					
XXX - XXX - XX - XX - X XX - 100					
1					
Type of filter	Code				
High Pressure, Line-Mounted	HFL				
		6			
		Clogging Indicator			
		No Indicator & No Cavity - Symbol 1			
		5.0bar / 72psi Optical Indicator with Auto reset - Symbol 2 (for 7bar bypass only)			
		5.0bar / 72psi Electrical Indicator with DIN EN 175301-803 connector - Symbol 3 (for 7bar bypass & No-bypass only)			
		5.0bar / 72psi Electrical Indicator with DIN EN 175301-803 connector and LED Contact box DG 041.1200 - Symbol 4 (for 7bar bypass & No-bypass only)			
2					
Flow rate max *	Code				
175 l/min / 46 gpm	152				
190 l/min / 50 gpm	172				
* Exact value depends on Port size, Filtration Fineness & Bypass cracking pressure					
		5			
		Bypass setting			
		7.0bar / 102psi (for 5µm, 10µm, 16µm & 30µm)			
		No Bypass (for 5µm, 10µm & 16µm)			
3					
Connection ports	Code				
G3/4"	GC				
G1"	GD				
-12 SAE (1 1/16-12 UN-2B) **	UC				
-16 SAE (1 5/16-12 UN-2B) **	UD				
** Available on request					
		4			
		Filter fineness βx(c)=200			
		5EX2 - 5 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)			
		10EX2 - 10 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)			
		16EX2 - 16 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)			
		30P - 30 µm Cellulose Paper (10 bar collapse rating)			
		5EX2 - 5 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ****			
		10EX2 - 10 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ***			
		16EX2 - 16 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ***			

6	
Clogging Indicator	Code
No Indicator & No Cavity - Symbol 1	AA
5.0bar / 72psi Optical Indicator with Auto reset - Symbol 2 (for 7bar bypass only)	EF
5.0bar / 72psi Electrical Indicator with DIN EN 175301-803 connector - Symbol 3 (for 7bar bypass & No-bypass only)	KL
5.0bar / 72psi Electrical Indicator with DIN EN 175301-803 connector and LED Contact box DG 041.1200 - Symbol 4 (for 7bar bypass & No-bypass only)	KW

5	
Bypass setting	Code
7.0bar / 102psi (for 5µm, 10µm, 16µm & 30µm)	X
No Bypass (for 5µm, 10µm & 16µm)	A

4	
Filter fineness βx(c)=200	Code
5EX2 - 5 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)	D1
10EX2 - 10 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)	G1
16EX2 - 16 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)	I1
30P - 30 µm Cellulose Paper (10 bar collapse rating)	N3
5EX2 - 5 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ****	D6
10EX2 - 10 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ***	G6
16EX2 - 16 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ***	I6

*** Available on request

**** Available on request only for HFL 172

Order Code Definition - Filter Element

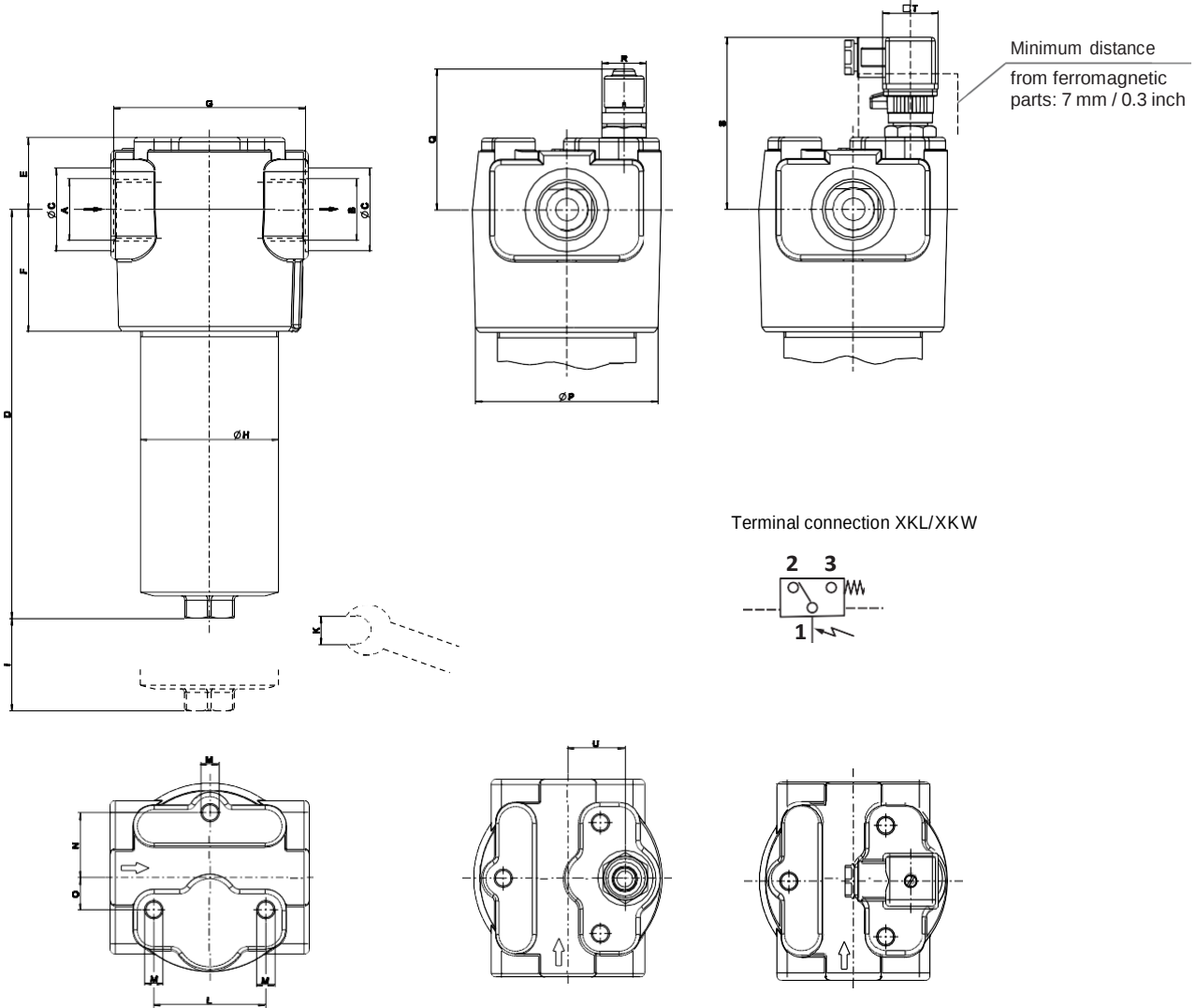
Filter fineness βx(c)=200	Code	HFL-152	HFL-172
5EX2 - 5 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)	D1	Not available	V3.0623-703K1
10EX2 - 10 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)	G1	V3.0617-706K1	V3.0623-706K1
16EX2 - 16 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (20 bar collapse rating)	I1	V3.0617-708K1	V3.0623-708K1
30P - 30 µm Cellulose Paper (10 bar collapse rating)	N3	P3.0617-01K	P3.0623-01K
5EX2 - 5 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ****	D6	Not available	V3.0623-713K1
10EX2 - 10 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ***	G6	V3.0617-726K1	V3.0623-726K1
16EX2 - 16 µm EXAPOR ® MAX 2 / MAX 3, Glass Fibre (160 bar collapse rating) ***	I6	V3.0617-718K1	V3.0623-718K1

*** Available on request **** Available on request only for HFL 172

Dimensions

Version with integrated optical
clogging indicator XEF

Version with integrated electrical
clogging indicator XKL/XKW with DIN EN 175301-803 socket



Measurements in mm

Type	A/B	C	D	E	F	G	H	I	K	L	M Ø / depth	N	O	P	Q	R	S	T	U
HFL152	G $\frac{3}{4}$, G1	36 / 45	222	39	66	104	75	70	AF 27	60	M10 / 12	35	17.5	99	77	AF 24	93	□ 30	31
HFL172	G $\frac{3}{4}$, G1	36 / 45	286	39	66	104	75	70	AF 27	60	M10 / 12	35	17.5	99	77	AF 24	93	□ 30	31

Measurements in inch

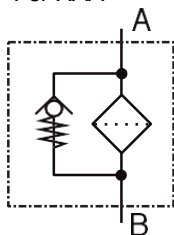
Type	A/B SAE	C	D	E	F	G	H	I	K mm	L	M Ø / depth	N	O	P
HFL152	-12 / -16	1.42 / 1.77	8.74	1.54	2.60	4.09	2.95	2.76	AF 27	2.36	²	1.38	0.71	3.90
HFL172	-12 / -16	1.42 / 1.77	11.26	1.54	2.60	4.09	2.95	2.76	AF 27	2.36	²	1.38	0.71	3.90

Type	Q	R mm	S	T mm	U
HFL152	3.03	AF 24	3.66	□ 1.18	1.22
HFL172	3.03	AF 24	3.66	□ 1.18	1.22

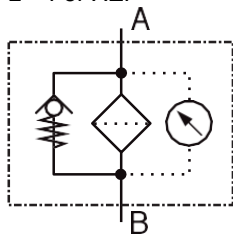
² $\frac{3}{8}$ -16 UNC-2B / 0.47

Symbols

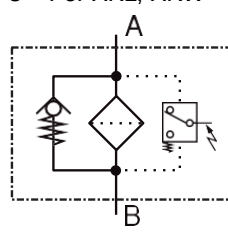
1 - For XAA



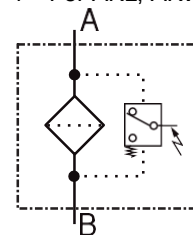
2 - For XEF



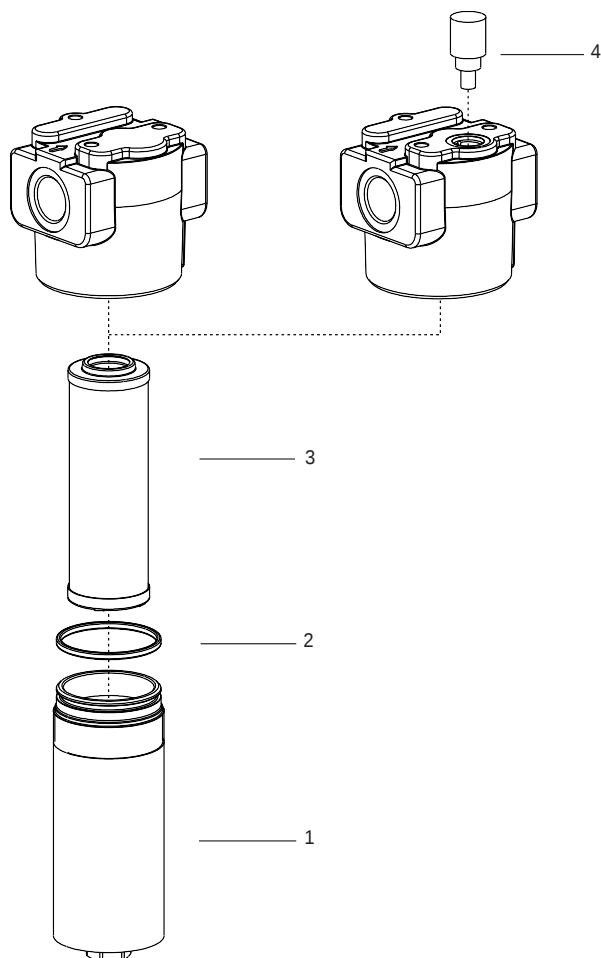
3 - For XKL, XKW



4 - For AKL, AKW



Spare Parts



Pos.	Designation	Part No.
1	Filter bowl HFL 152	HFL 152.0102
1	Filter bowl HFL 172	HFL 171.0102
2	O-ring 63 x 3.5 mm 2.48 x 0.14 inch	N007.0634
3	Replacement filter element	see Chart/col. 9
4	Clogging indicator	see catalog sheet 60.40

The functions of the complete filters as well as the outstanding features of the filter elements assured by ARGO-HYTOS can only be guaranteed if original ARGO-HYTOS spare parts are used.

Quality Assurance

Quality management according to DIN EN ISO 9001

To ensure constant quality in production and operation, ARGO-HYTOS filter elements undergo strict controls and tests according to the following ISO standards:

ISO 2941	Verification of collapse/burst pressure rating
ISO 2942	Verification of fabrication integrity (Bubble Point Test)
ISO 2943	Verification of material compatibility with fluids
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)
ISO 23181	Determination of resistance to flow fatigue using high viscosity fluid

Before release into the series production the filter casing is tested for fatigue strength in our pressure pulse test rig. Various quality controls during the production process guarantee the leak-free function and solidity of our filters.

Illustrations may sometimes differ from the original. ARGO-HYTOS is not responsible for any unintentional mistake in this specification sheet.