

High Pressure Filter Kits

HD 049 • HD 069

HD 172 • HD 319

HD 419 • HD 619

- Operating pressure up to 630 bar
- Nominal flow rate up to 450 l/min

Description

Application

In the high pressure circuits of hydraulic systems.

Performance features

Protection

against wear: By means of filter elements that, in full-flow filtration, meet even 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 $v \leq 200 \text{ mm}^2/\text{s}$ (cold start condition).

Filter elements

Flow direction from outside to centre. 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 bowl: Cold extruded steel
Coating: Powder paint
Seals: NBR (FPM on request)
Filter media: EXAPOR®MAX 2 - inorganic multi-layer microfibre web

Accessories

To monitor the clogging, screw-in (see section Dimensions) or flange-mounted differential pressure switches are available.

Flange-mounted clogging indicators optionally with one or two switching points resp. temperature suppression – Dimensions and technical data see catalogue sheet 60.30.

Characteristics

Operating pressure

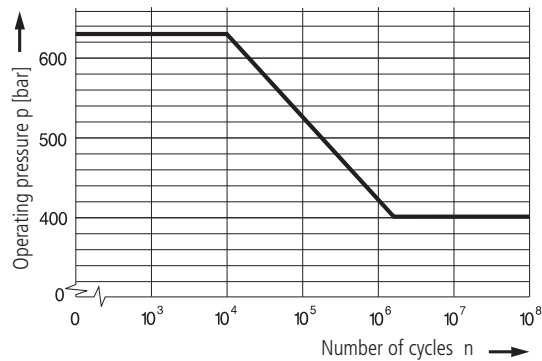
0 ... 400 bar, min. 2×10^6 pressure cycles

Nominal pressure according to DIN 24550

0 ... 630 bar, min. 10^4 pressure cycles

Quasi-static operating pressure

Permissible pressures for other numbers of cycles



Nominal flow rate

Up to 450 l/min (see Selection Chart, column 2)

The nominal flow rates indicated by ARGO-HYTOS are based on the following features:

- closed by-pass valve at $v \leq 200 \text{ mm}^2/\text{s}$
- element service life > 1.000 operating hours at an average fluid contamination of 0,07 g per l/min flow volume
- flow velocity in the connection lines:
 - up to 250 bar $\leq 8 \text{ m/s}$
 - > 250 bar $\leq 12 \text{ m/s}$

Filter fineness

5 $\mu\text{m(c)}$... 16 $\mu\text{m(c)}$

β -values according to ISO 16889

(see Selection Chart, column 4 and diagram Dx)

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)

Viscosity at nominal flow rate

- at operating temperature: $v < 60 \text{ mm}^2/\text{s}$

- as starting viscosity

- at initial operation:

$v_{\text{max}} = 1.200 \text{ mm}^2/\text{s}$

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.

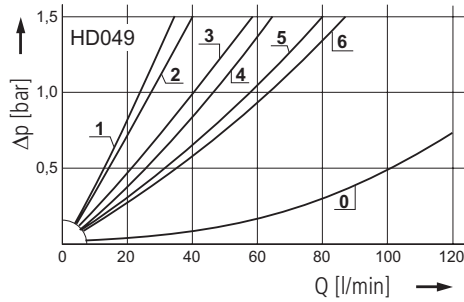
Mounting position

Preferably vertical

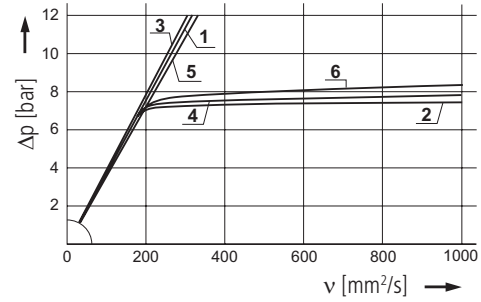
Diagrams

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

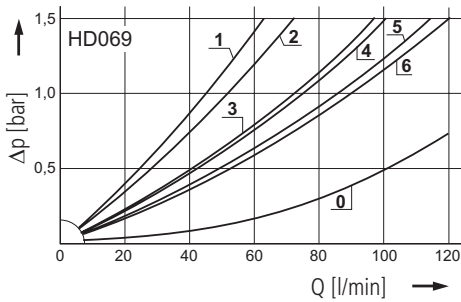
D1 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$



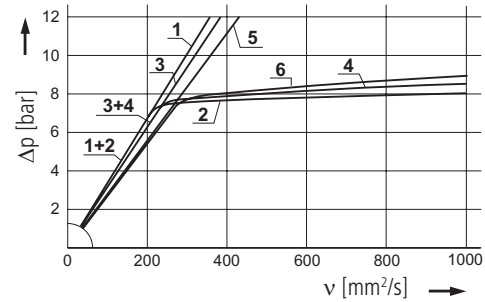
Pressure drop as a function of the **kinematic viscosity** at nominal flow



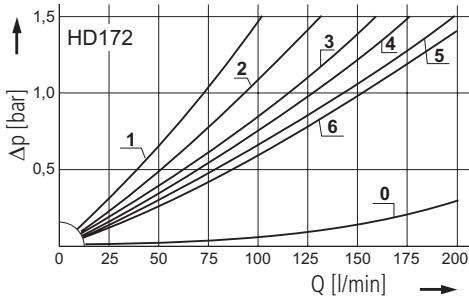
D2 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$



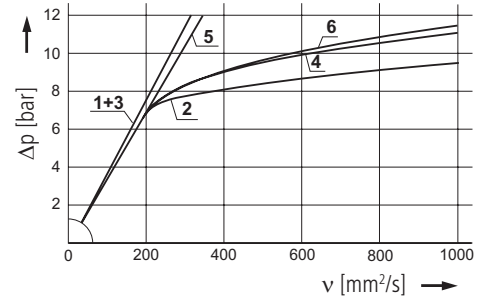
Pressure drop as a function of the **kinematic viscosity** at nominal flow



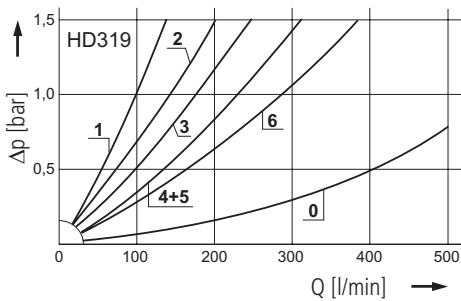
D3 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$



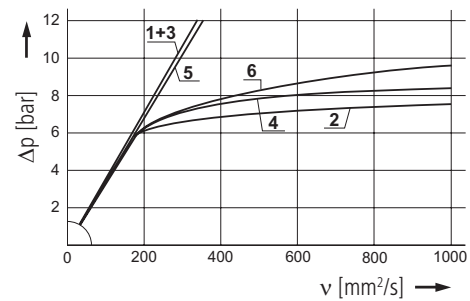
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D4 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$



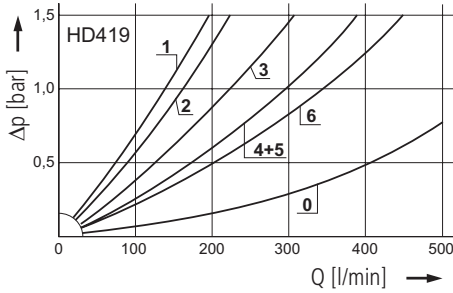
Pressure drop as a function of the **kinematic viscosity** at nominal flow



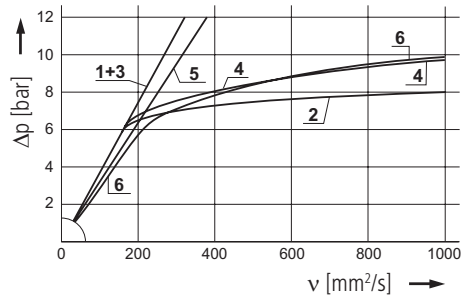
Diagrams

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

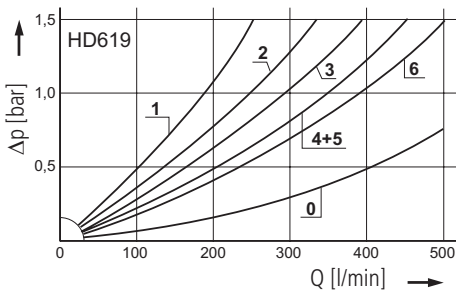
D5 Pressure drop as a function of the **flow volume**
at $v = 35 \text{ mm}^2/\text{s}$



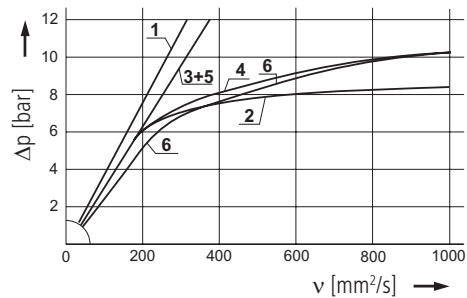
Pressure drop as a function of the **kinematic viscosity**
at nominal flow



D6 Pressure drop as a function of the **flow volume**
at $v = 35 \text{ mm}^2/\text{s}$

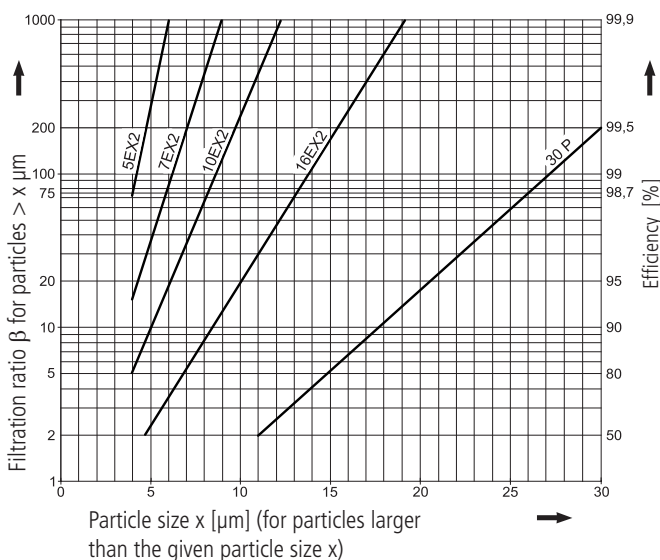


Pressure drop as a function of the **kinematic viscosity**
at nominal flow



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. finenesses:

For EXAPOR®MAX 2 and paper elements:

5EX2 = $\beta_{5(c)} = 200$ EXAPOR®MAX 2

7EX2 = $\beta_{7(c)} = 200$ EXAPOR®MAX 2

10EX2 = $\beta_{10(c)} = 200$ EXAPOR®MAX 2

16EX2 = $\beta_{16(c)} = 200$ EXAPOR®MAX 2

30P = $\beta_{30(c)} = 200$ 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, finenesses differing from these curves are also available by using special composed filter media.

Selection Chart

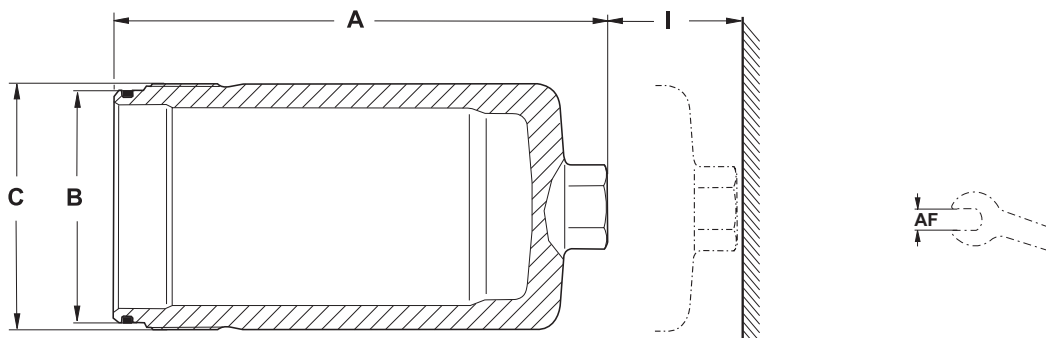
Part No.	Nominal flow rate	Pressure drop see diagram D /curve no.	Filter fineness see diagram Dx	Dirt-holding capacity	Cracking pressure of by-pass	Symbol	Replacement filter element Part No.	Weight	Remarks
1	l/min	3	4	g	bar	7	8	9	10
HD 049-0213	27	D1/1	5EX2	5,2	-	5	V3.0510-13*	1,6	with screw-in bushing
HD 049-1503	30	D1/2	5EX2	4,9	7	1	V3.0510-03	1,5	-
HD 049-0216	47	D1/3	10EX2	5,1	-	5	V3.0510-16*	1,6	with screw-in bushing
HD 049-1506	50	D1/4	10EX2	6,8	7	1	V3.0510-06	1,5	-
HD 049-0218	65	D1/5	16EX2	5,6	-	5	V3.0510-18*	1,6	with screw-in bushing
HD 049-1508	75	D1/6	16EX2	6,9	7	1	V3.0510-08	1,5	-
HD 069-0213	50	D2/1	5EX2	8,7	-	5	V3.0520-13*	2,7	with screw-in bushing
HD 069-1503	60	D2/2	5EX2	10	7	1	V3.0520-03	2,6	-
HD 069-0216	80	D2/3	10EX2	11	-	5	V3.0520-16*	2,7	with screw-in bushing
HD 069-1506	85	D2/4	10EX2	14	7	1	V3.0520-06	2,6	-
HD 069-0218	100	D2/5	16EX2	12	-	5	V3.0520-18*	2,7	with screw-in bushing
HD 069-1508	105	D2/6	16EX2	15	7	1	V3.0520-08	2,6	-
HD 172-0213	80	D3/1	5EX2	16	-	5	V3.0623-13*	4,2	with screw-in bushing
HD 172-1503	105	D3/2	5EX2	17	7	1	V3.0623-03	3,9	-
HD 172-0226	130	D3/3	10EX2	18	-	5	V3.0623-26*	4,2	with screw-in bushing
HD 172-1506	150	D3/4	10EX2	23	7	1	V3.0623-06	3,9	-
HD 172-0218	165	D3/5	16EX2	19	-	5	V3.0623-18*	4,2	with screw-in bushing
HD 172-1508	180	D3/6	16EX2	25	7	1	V3.0623-08	3,9	-
HD 319-0213	110	D4/1	5EX2	20	-	5	V3.0817-13*	6,5	with screw-in bushing
HD 319-1503	115	D4/2	5EX2	24	7	1	V3.0817-03	6	-
HD 319-0216	195	D4/3	10EX2	24	-	5	V3.0817-16*	6,5	with screw-in bushing
HD 319-1506	250	D4/4	10EX2	33	7	1	V3.0817-06	6	-
HD 319-0218	270	D4/5	16EX2	25	-	5	V3.0817-18*	6,5	with screw-in bushing
HD 319-1508	330	D4/6	16EX2	33	7	1	V3.0817-08	6	-
HD 419-0213	155	D5/1	5EX2	29	-	5	V3.0823-13*	8,8	with screw-in bushing
HD 419-1503	190	D5/2	5EX2	33	7	1	V3.0823-03	8,2	-
HD 419-0216	265	D5/3	10EX2	33	-	5	V3.0823-16*	8,8	with screw-in bushing
HD 419-1506	330	D5/4	10EX2	47	7	1	V3.0823-06	8,2	-
HD 419-0218	330	D5/5	16EX2	35	-	5	V3.0823-18*	8,8	with screw-in bushing
HD 419-1508	380	D5/6	16EX2	48	7	1	V3.0823-08	8,2	-
HD 619-0213	220	D6/1	5EX2	41	-	5	V3.0833-13*	11,9	with screw-in bushing
HD 619-1503	280	D6/2	5EX2	49	7	1	V3.0833-03	11,1	-
HD 619-0216	330	D6/3	10EX2	49	-	5	V3.0833-16*	11,9	with screw-in bushing
HD 619-1506	400	D6/4	10EX2	67	7	1	V3.0833-06	11,1	-
HD 619-0218	450	D6/5	16EX2	51	-	5	V3.0833-18*	11,9	with screw-in bushing
HD 619-1508	450	D6/6	16EX2	68	7	1	V3.0833-08	11,1	-

Remarks:

- Filter versions without by-pass valves must be equipped with a clogging indicator.
- The filter sets listed in this chart are standard filters. If modifications are required, we kindly ask for your request.
- Clogging indicators to screw into the hydraulic block see section Dimensions.
- For the appropriate, flange-mounted clogging indicators see catalogue sheet 60.30.

* Element differential pressure stable up to 160 bar, clogging indicator obligatory

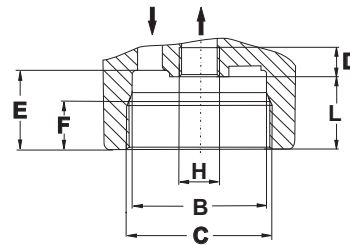
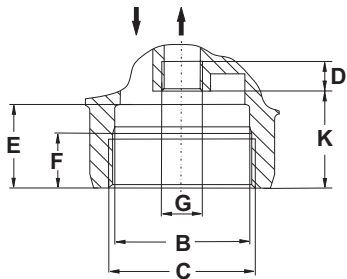
Dimensions



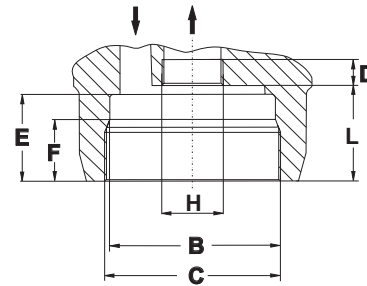
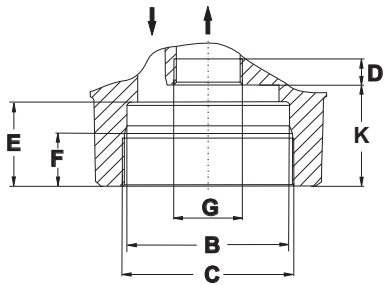
Version with by-pass valve

Version with screw-in bushing

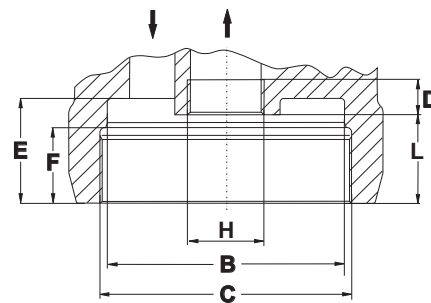
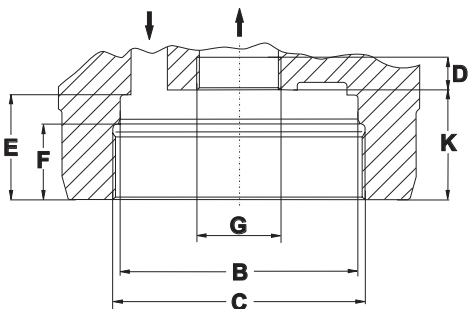
HD 049 / 069



HD 172



HD 319 / 419 / 619

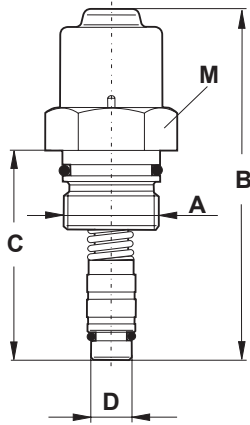


All measurements and tolerances required for machining are available on request.

Dimensions

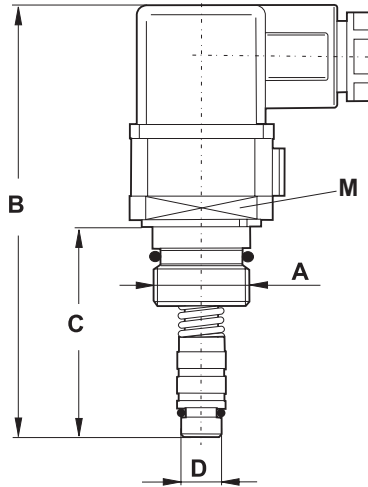
Optical differential pressure indicator

DG 032.1700



Electrical differential pressure switch (change over)

DG 031.1700

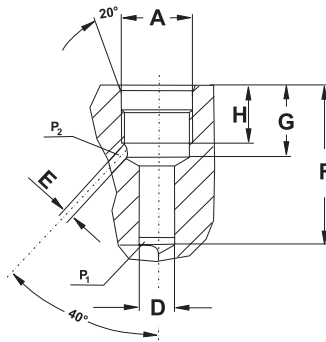
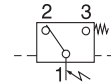


Response/Switching pressure of the clogging indicators
5 bar

Electrical clogging indicator

- Switching voltage: max. 120 V AC / 175 V DC
- Switching current: max. 0,17 A AC / 0,25 A DC
- Switching power: max. 3,5 VA AC / 5 W DC
- Type of contact: change over
- Electrical protection: IP 65 (with mounted and secured socket)

Terminal connection

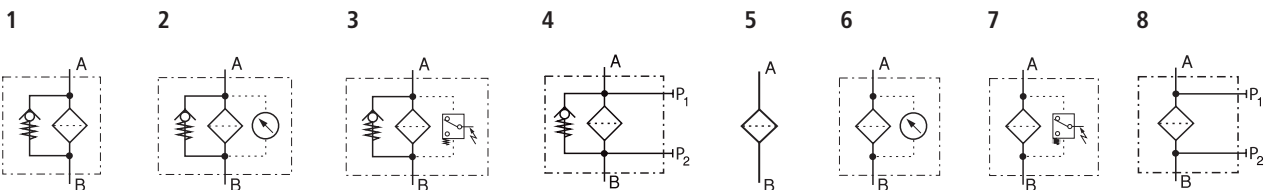


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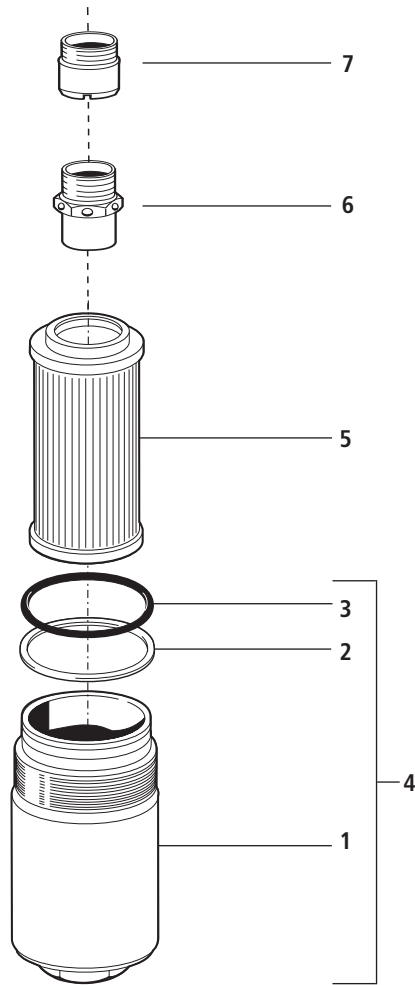
Measurements

Type	A	B	C	D	E	F	G	H	I	K	L	M
HD 049/069	133/227,5	60	M 65 x 1,5	min. 13	35,5	22,5	M 18 x 1,5	M 18 x 1,5	55	42	32,5	AF36
HD 172	256,5	71	M 75 x 1,5	min. 13	37	22,5	M 30 x 1	M 26 x 1,5	70	47,5	41	AF27
HD 319/419/619	218/282/383	102	M 108 x 1,5	min. 14	45	32,5	M 36 x 1	M 36 x 1,5	80	47	38	AF32
DG 031.1700	M 20 x 1,5	93	44	Ø10	Ø2,5	45,8	20,5	16,5	-	-	-	AF30
DG 032.1700	M 20 x 1,5	74	44	Ø10	Ø2,5	45,8	20,5	16,5	-	-	-	AF24

Symbols



Spare Parts



HD 049 / HD 069

Pos.	Designation	Part No.
1	Filter bowl HD 049	HD 052.0102
1	Filter bowl HD 069	HD 072.0102
3	O-ring 53,57 x 3,53	N007.0543/1
5	Filter element	see Chart / col. 8
6	By-pass valve	HD 045.1510
7	Screw-in bushing	HD 049.0503

HD 172

Pos.	Designation	Part No.
1	Filter bowl HD 172	HD 171.0102
3	O-ring 63 x 3,5	N007.0634
5	Filter element	see Chart / col. 8
6	By-pass valve	HD 172.1500
7	Screw-in bushing	HD 171.0205

HD 319 / HD 419 / HD 619

Pos.	Designation	Part No.
2	Back-ring	HD 255.0102
3	O-ring 94,84 x 3,53	N007.0953
4	Filter bowl HD 319 (with pos. 2 and 3)	HD 250.0701
4	Filter bowl HD 419 (with pos. 2 and 3)	HD 451.0702
4	Filter bowl HD 619 (with pos. 2 and 3)	HD 619.0701
5	Filter element	see Chart / col. 8
6	By-pass valve	HD 319.1510
7	Screw-in bushing	HD 319.0212

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 leakfree function and solidity of our filters.

Our engineers will be glad to advise you in questions concerning filter application, selection as well as the cleanliness class of the filtered medium attainable under practical operating conditions.

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