

**High Pressure Filter Kits**
**HD 049 · HD 069 · HD 172 · HD 319 · HD 419 · HD 619**

Operating pressure up to 630 bar / 9137 psi · Nominal flow rate up to 450 l/min / 118.9 gpm

**M**


High Pressure Filter Kit HD 049

**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 bowl:	Cold extruded steel
Coating:	Powder paint
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX2 - inorganic multi-layer microfiber web

**Accessories**

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

For dimensions and technical data of integrable clogging indicators, see catalog sheet 60.40.

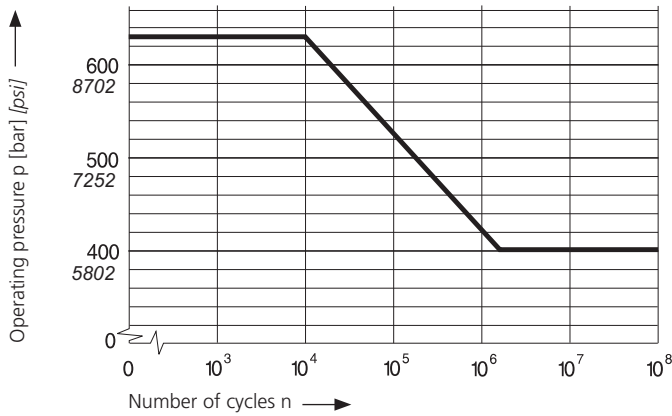
Flange-mounted clogging indicators optionally with one or two switching points resp. temperature suppression – Dimensions and technical data see catalog sheet 60.30.

**Operating Pressure**

0 ... 400 bar / 5800 psi, min.  $2 \times 10^6$  pressure cycles  
Nominal pressure according to 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 450 l/min / 118.9 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 psi  $\leq 39.4 \text{ ft/s}$

**Filter fineness**

5  $\mu\text{m(c)}$  ... 16  $\mu\text{m(c)}$   
 $\beta$ -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)  
-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%  $\Delta p$  of the cracking pressure of the by-pass valve on the vertical axis. Draw a horizontal line so that it intersects the  $\Delta p$  curve at a point. Read this point on the horizontal axis for the viscosity.

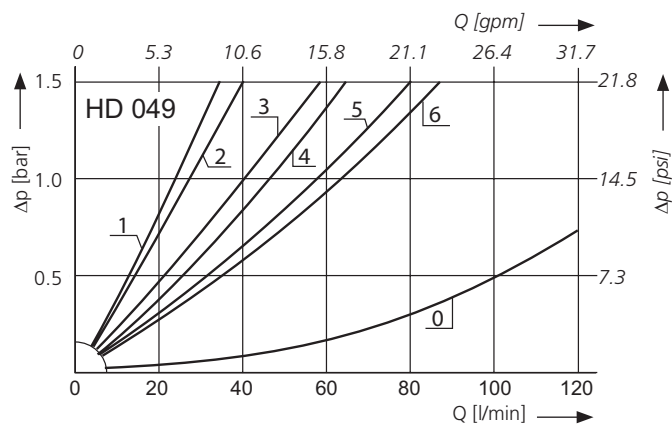
**Mounting position**

Preferably vertical.

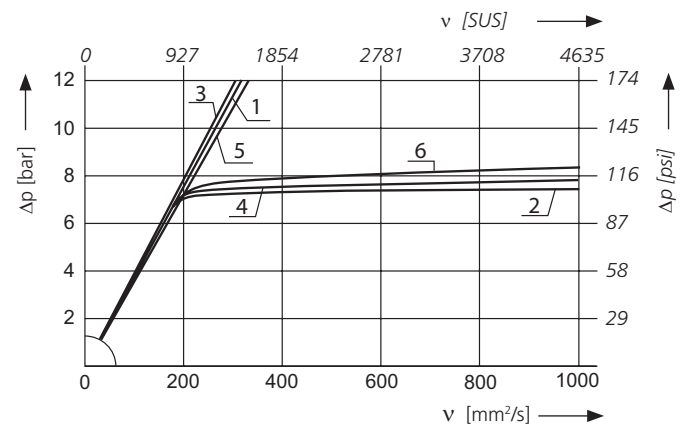
Diagrams

**$\Delta p$ -curves for complete filters in Selection Chart, column 3**

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

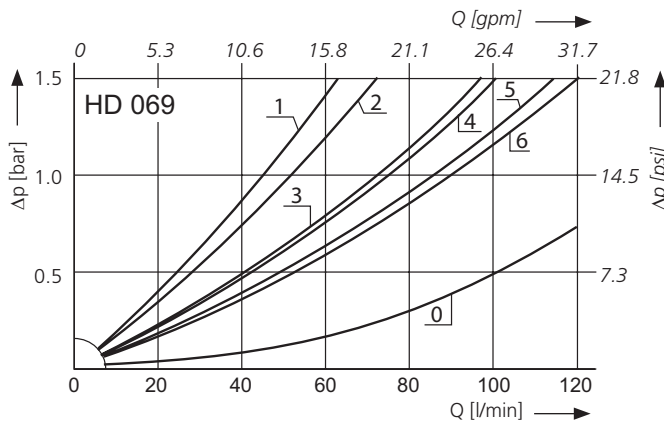


Pressure drop as a function of the **kinematic viscosity** at nominal flow

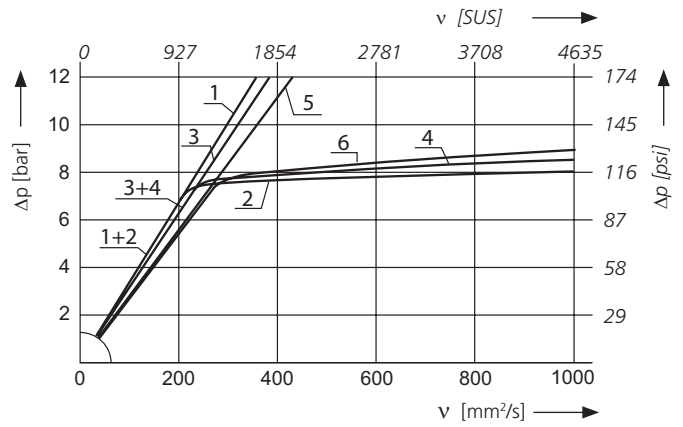


**Δp-curves for complete filters in Selection Chart, column 3**

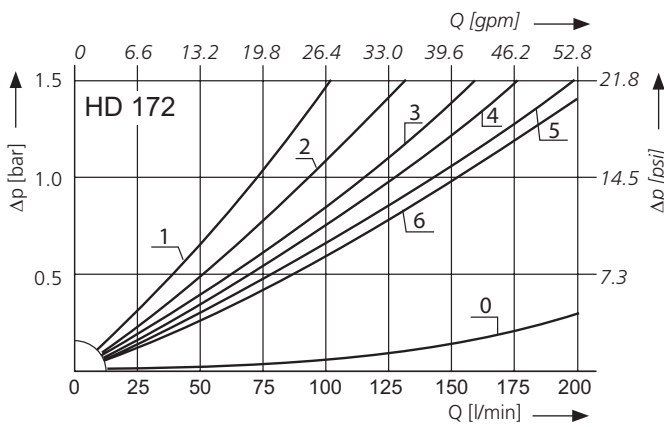
**D2** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$



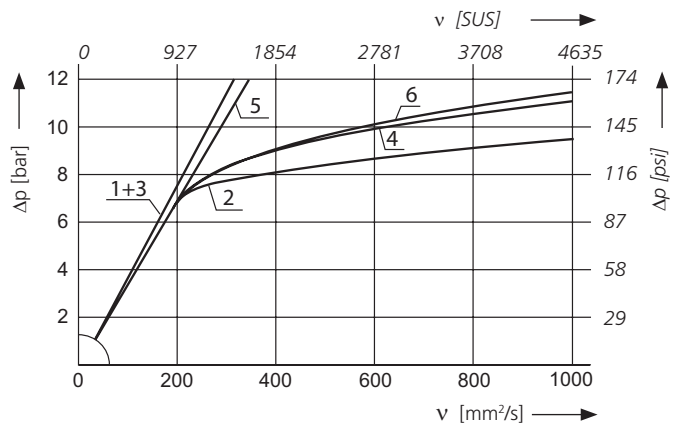
Pressure drop as a function of the **kinematic viscosity** at nominal flow



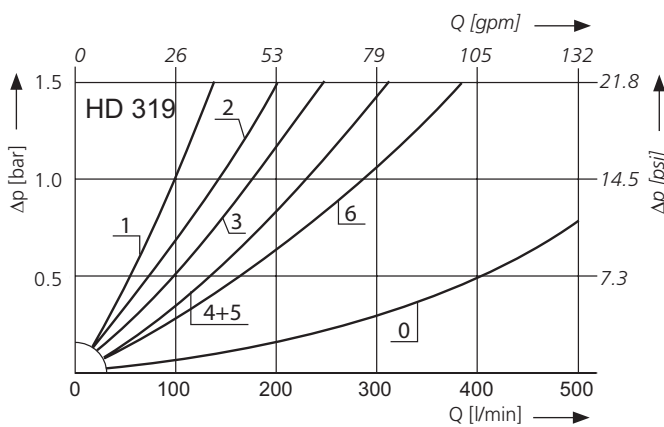
**D3** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$



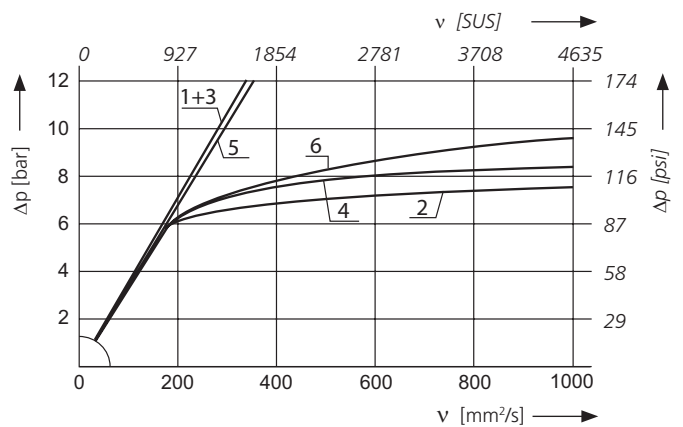
Pressure drop as a function of the **kinematic viscosity** at nominal flow



**D4** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$

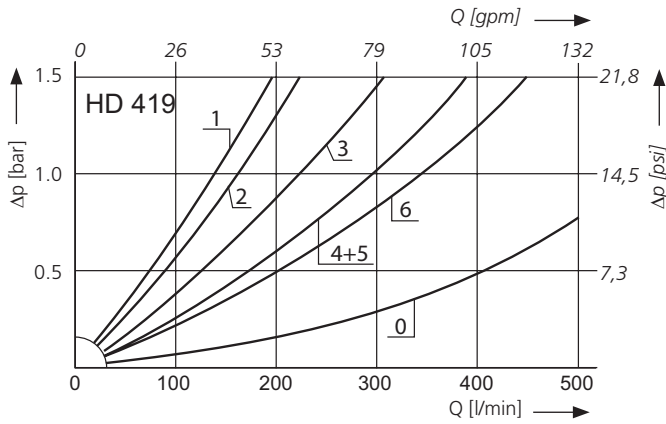


Pressure drop as a function of the **kinematic viscosity** at nominal flow

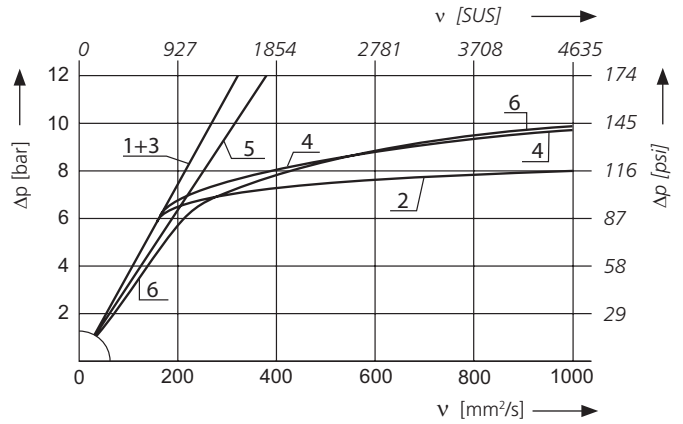


**Δp-curves for complete filters in Selection Chart, column 3**

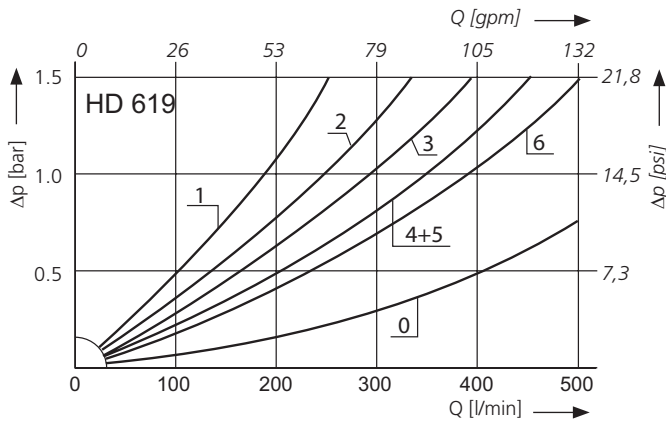
**D5** Pressure drop as a function of the **flow volume**  
at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$



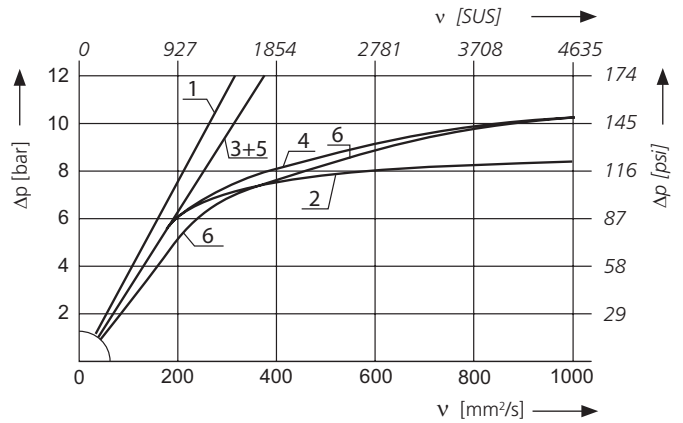
Pressure drop as a function of the **kinematic viscosity** at nominal flow



**D5** Pressure drop as a function of the **flow volume**  
at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$

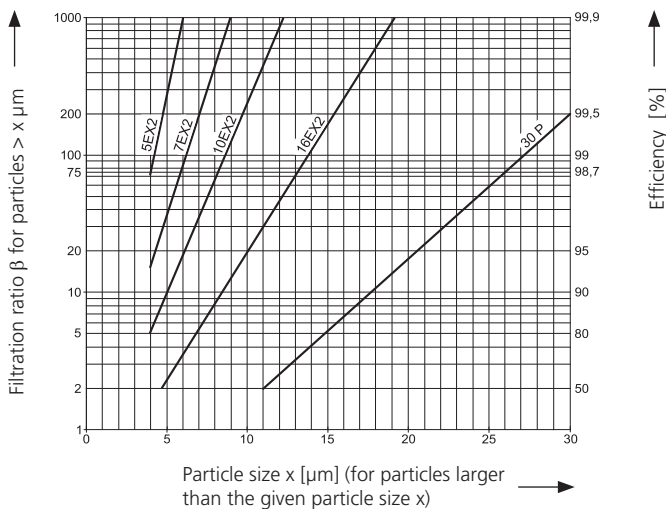


Pressure drop as a function of the **kinematic viscosity** at nominal flow



**Filter fineness curves in Selection Chart, column 4**

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



The abbreviations represent the following  $\beta$ -values resp. finenesses

**For EXAPOR®MAX2 and paper elements:**

- 5EX2 =  $\bar{\beta}_{5(c)}$  = 200 EXAPOR®MAX 2
- 7EX2 =  $\bar{\beta}_{7(c)}$  = 200 EXAPOR®MAX 2
- 10EX2 =  $\bar{\beta}_{10(c)}$  = 200 EXAPOR®MAX 2
- 16EX2 =  $\bar{\beta}_{16(c)}$  = 200 EXAPOR®MAX 2
- 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  $\mu\text{m}$
  - 60S = screen material with mesh size 60  $\mu\text{m}$
  - 100S = screen material with mesh size 100  $\mu\text{m}$
- 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 <b>D1</b> /curve no.	Filter fineness see diagr. <b>Dx</b>	Dirt-holding capacity			Cracking pressure of by-pass	Symbol	Replacement filter element Part No.	Weight		Remarks
	l/min	gpm			g	bar	psi				kg	lbs	
1	2		3	4	5	6		7	8	9		10	
HD 049-0213	27	7.1	<b>D1/1</b>	5EX2	5.2	-	-	5	V3.0510-13 <sup>2</sup>	1.6	3.5	with screw-in bushing	
HD 049-1503	30	7.9	<b>D1/2</b>	5EX2	4.9	7	102	1	V3.0510-03	1.5	3.3	-	
HD 049-0216	47	12.4	<b>D1/3</b>	10EX2	5.1	-	-	5	V3.0510-16 <sup>2</sup>	1.6	3.5	with screw-in bushing	
<b>HD 049-1506<sup>1</sup></b>	50	13.2	<b>D1/4</b>	10EX2	6.8	7	102	1	V3.0510-06	1.5	3.3	-	
HD 049-0218	65	17.2	<b>D1/5</b>	16EX2	5.6	-	-	5	V3.0510-18 <sup>2</sup>	1.6	3.5	with screw-in bushing	
<b>HD 049-1508<sup>1</sup></b>	75	19.8	<b>D1/6</b>	16EX2	6.9	7	102	1	V3.0510-08	1.5	3.3	-	
HD 069-0213	50	13.2	<b>D2/1</b>	5EX2	8.7	-	-	5	V3.0520-13 <sup>2</sup>	2.7	6.0	with screw-in bushing	
HD 069-1503	60	15.9	<b>D2/2</b>	5EX2	10	7	102	1	V3.0520-03	2.6	5.7	-	
HD 069-0216	80	21.1	<b>D2/3</b>	10EX2	11	-	-	5	V3.0520-16 <sup>2</sup>	2.7	6.0	with screw-in bushing	
<b>HD 069-1506<sup>1</sup></b>	85	22.5	<b>D2/4</b>	10EX2	14	7	102	1	V3.0520-06	2.6	5.7	-	
HD 069-0218	100	26.4	<b>D2/5</b>	16EX2	12	-	-	5	V3.0520-18 <sup>2</sup>	2.7	6.0	with screw-in bushing	
<b>HD 069-1508<sup>1</sup></b>	105	27.7	<b>D2/6</b>	16EX2	15	7	102	1	V3.0520-08	2.6	5.7	-	
HD 172-0213	80	21.1	<b>D3/1</b>	5EX2	16	-	-	5	V3.0623-13 <sup>2</sup>	4.2	9.3	with screw-in bushing	
HD 172-1503	105	27.7	<b>D3/2</b>	5EX2	17	7	102	1	V3.0623-03	3.9	8.6	-	
HD 172-0226	130	34.3	<b>D3/3</b>	10EX2	18	-	-	5	V3.0623-26 <sup>2</sup>	4.2	9.3	with screw-in bushing	
<b>HD 172-1506<sup>1</sup></b>	150	39.6	<b>D3/4</b>	10EX2	23	7	102	1	V3.0623-06	3.9	8.6	-	
HD 172-0218	165	43.6	<b>D3/5</b>	16EX2	19	-	-	5	V3.0623-18 <sup>2</sup>	4.2	9.3	with screw-in bushing	
<b>HD 172-1508<sup>1</sup></b>	180	47.6	<b>D3/6</b>	16EX2	25	7	102	1	V3.0623-08	3.9	8.6	-	
HD 319-0213	110	29.1	<b>D4/1</b>	5EX2	20	-	-	5	V3.0817-13 <sup>2</sup>	6.5	14.3	with screw-in bushing	
HD 319-1503	115	30.4	<b>D4/2</b>	5EX2	24	7	102	1	V3.0817-03	6	13.2	-	
HD 319-0216	195	51.5	<b>D4/3</b>	10EX2	24	-	-	5	V3.0817-16 <sup>2</sup>	6.5	14.3	with screw-in bushing	
<b>HD 319-1506<sup>1</sup></b>	250	66.0	<b>D4/4</b>	10EX2	33	7	102	1	V3.0817-06	6	13.2	-	
HD 319-0218	270	71.3	<b>D4/5</b>	16EX2	25	-	-	5	V3.0817-18 <sup>2</sup>	6,5	14.3	with screw-in bushing	
<b>HD 319-1508<sup>1</sup></b>	330	87.2	<b>D4/6</b>	16EX2	33	7	102	1	V3.0817-08	6	13.2	-	
HD 419-0213	155	40.9	<b>D5/1</b>	5EX2	29	-	-	5	V3.0823-13 <sup>2</sup>	8.8	19.4	with screw-in bushing	
HD 419-1503	190	50.2	<b>D5/2</b>	5EX2	33	7	102	1	V3.0823-03	8.2	18.1	-	
HD 419-0216	265	70.0	<b>D5/3</b>	10EX2	33	-	-	5	V3.0823-16 <sup>2</sup>	8.8	19.4	with screw-in bushing	
<b>HD 419-1506<sup>1</sup></b>	330	87.2	<b>D5/4</b>	10EX2	47	7	102	1	V3.0823-06	8.2	18.1	-	
HD 419-0218	330	87.2	<b>D5/5</b>	16EX2	35	-	-	5	V3.0823-18 <sup>2</sup>	8.8	19.4	with screw-in bushing	
<b>HD 419-1508<sup>1</sup></b>	380	100.4	<b>D5/6</b>	16EX2	48	7	102	1	V3.0823-08	8.2	18.1	-	

<sup>1</sup> Preferred type, no minimum order quantity required

<sup>2</sup> Element differential pressure stable up to 160 bar / 2320 psi, clogging indicator obligatory

## Selection Chart

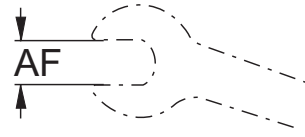
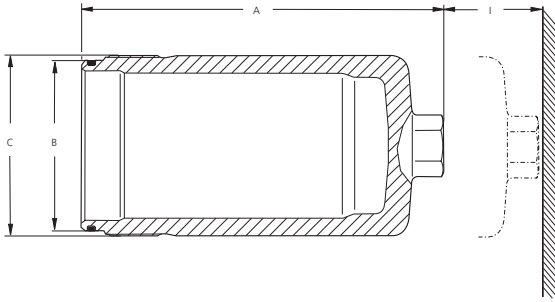
Part No.	Nominal flow rate		Pressure drop see diagram <b>D1</b> curve no.	Filter fineness see diagr. <b>Dx</b>	Dirt-holding capacity			Cracking pressure of by-pass	Symbol	Replacement filter element Part No.	Weight		Remarks
	l/min	gpm			g	bar	psi				kg	lbs	
1	2		3	4	5	6		7	8	9		10	
HD 619-0213	220	58.1	<b>D6/1</b>	5EX2	41	-	-	5	V3.0833-13 <sup>2</sup>	11.9	26.2	with screw-in bushing	
HD 619-1503	280	74.0	<b>D6/2</b>	5EX2	49	7	102	1	V3.0833-03	11.1	24.5	-	
HD 619-0216	330	87.2	<b>D6/3</b>	10EX2	49	-	-	5	V3.0833-16 <sup>2</sup>	11.9	26.2	with screw-in bushing	
<b>HD 619-1506<sup>1</sup></b>	400	105.7	<b>D6/4</b>	10EX2	67	7	102	1	V3.0833-06	11.1	24.5	-	
HD 619-0218	450	118.9	<b>D6/5</b>	16EX2	51	-	-	5	V3.0833-18 <sup>2</sup>	11.9	26.2	with screw-in bushing	
<b>HD 619-1508<sup>1</sup></b>	450	118.9	<b>D6/6</b>	16EX2	68	7	102	1	V3.0833-08	11.1	24.5	-	

<sup>1</sup> Preferred type, no minimum order quantity required

<sup>2</sup> Element differential pressure stable up to 160 bar / 2320 psi, clogging indicator obligatory

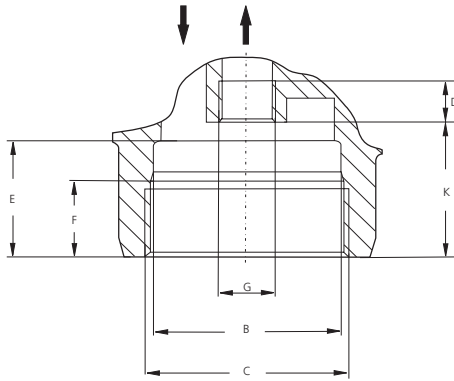
### Remarks:

- › Filter versions without by-pass valves must be equipped with a clogging indicator.
- › Optional integrable clogging indicators for screwing into the hydraulic block can be found under section Dimensions and in the catalog sheet 60.40.
- › For the appropriate, flange-mounted clogging indicators see catalog sheet 60.30.
- › The filter sets listed in this chart are standard filters. If modifications are required, we kindly ask for your request.

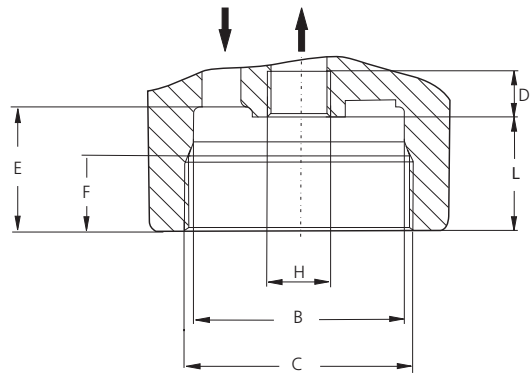


Version with by-pass valve

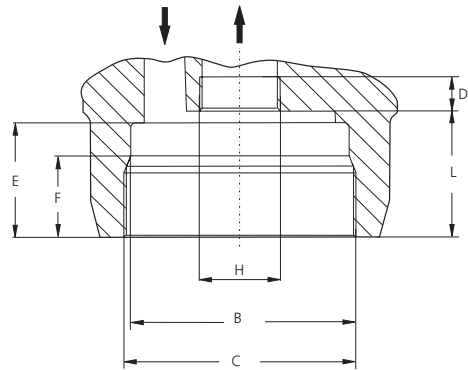
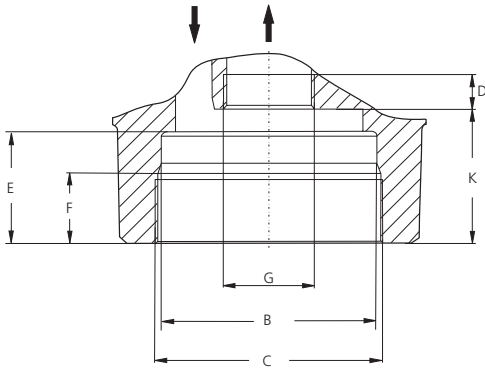
HD 049 / 069



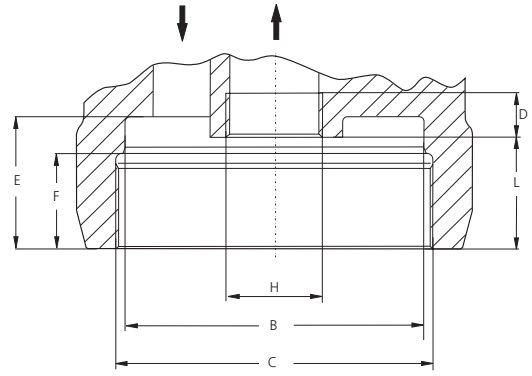
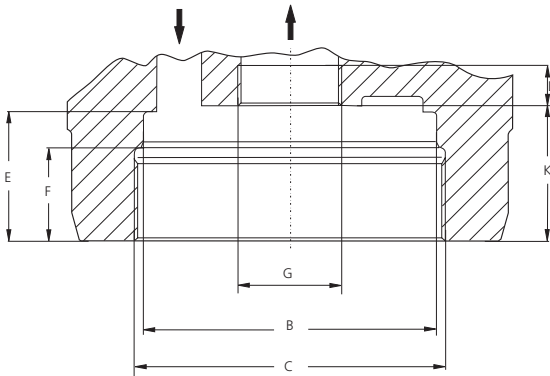
Version with screw-in bushing



HD 172



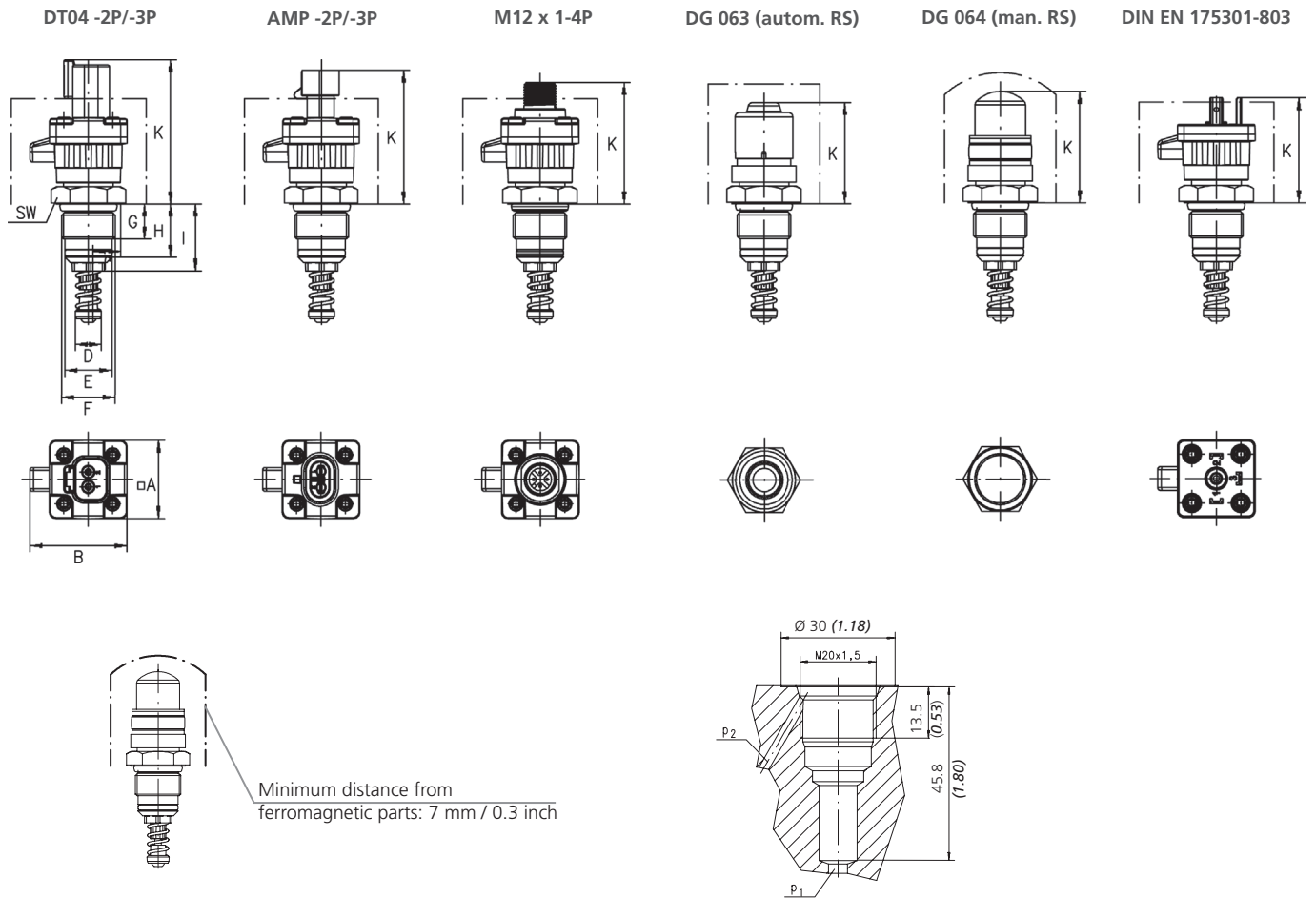
HD 319 / 419 / 619



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

## Dimensions

Extract from catalog sheet 60.40



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

## Measurements in mm

Type	A	B	C	D	E	F	G	H	I	K	L	M
HD 049/069	133/227.5	60	M65 x 1.5	min. 13	35.5	22.5	M18 x 1.5	M18 x 1.5	55	42	32.5	AF 36
HD 172	256.5	71	M75 x 1.5	min. 13	37	22.5	M30 x 1	M26 x 1.5	70	47.5	41	AF 27
HD 319/419/619	218/282/383	102	M108 x 1.5	min. 14	45	32.5	M36 x 1	M36 x 1.5	80	47	38	AF 32

Type	A	B	D	E	F	G	H	I	K	AF
DT04 -2P/-3P	□ 29	36.5	9.7	17.5	M20 x 1.5	13	20	25	55	24
AMP -2P/-3P	□ 29	36.5	9.7	17.5	M20 x 1.5	13	20	25	50	24
M12 x 1-4P	□ 29	36.5	9.7	17.5	M20 x 1.5	13	20	25	46	24
DG 063	-	-	9.7	17.5	M20 x 1.5	13	20	25	37.5	24
DG 064	-	-	9.7	17.5	M20 x 1.5	13	20	25	41.5	24
DIN EN 175301-803	□ 29	36.5	9.7	17.5	M20 x 1.5	13	20	25	39	24



## Measurements in inch

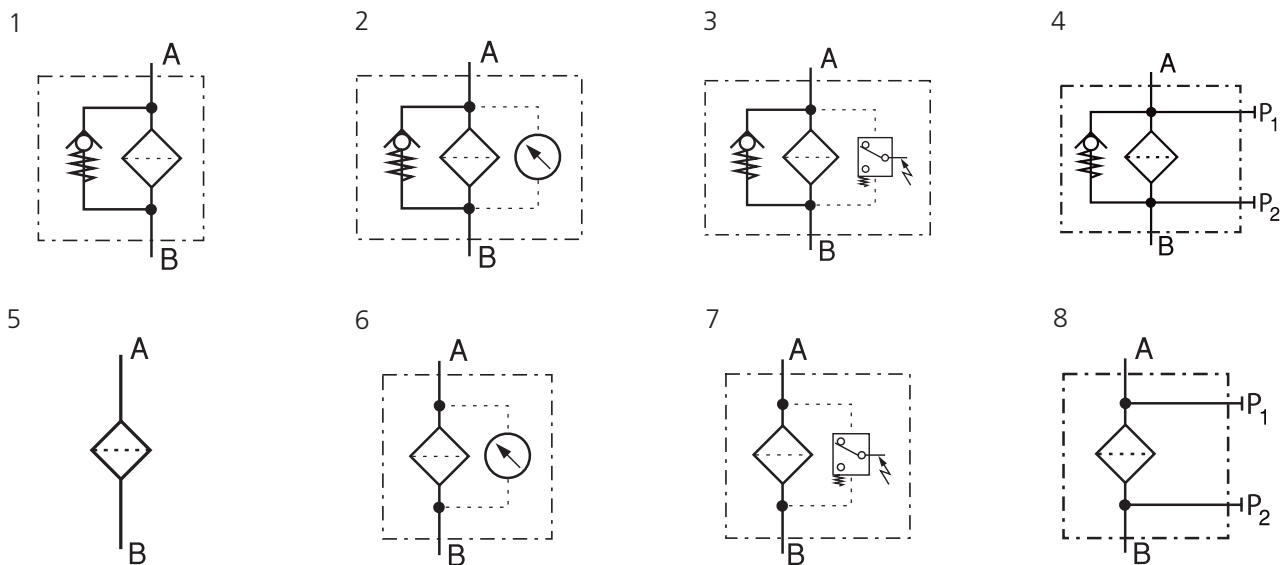
Type	A	B	C	D	E	F	G	H	I
HD 049/069	5.24/8.96	2.36	M65 x 1.5*	min. 0.51	1.40	0.89	M18 x 1.5*	M18 x 1.5*	2.17
HD 172	10.10	2.80	M75 x 1.5*	min. 0.51	1.46	0.89	M30 x 1*	M26 x 1.5*	2.76
HD 319/419/619	8.58/11.10/15.08	4.02	M108 x 1.5*	min. 0.55	1.77	1.28	M36 x 1*	M36 x 1.5*	3.15

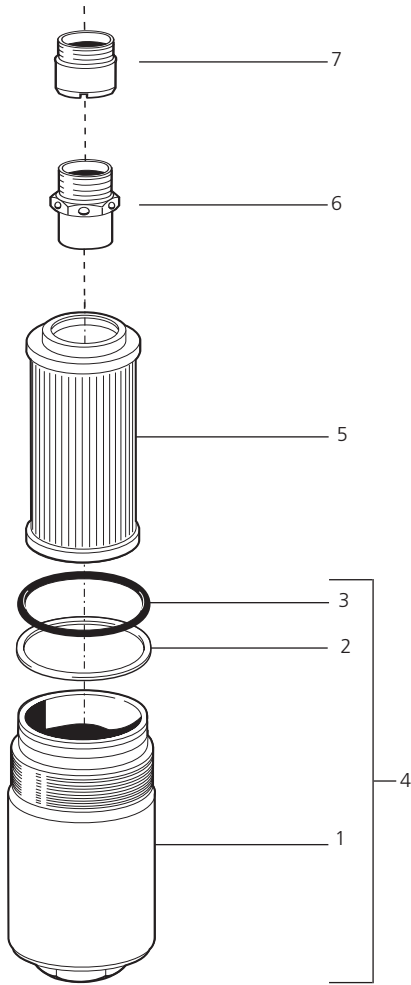
Type	K	L	M mm						
HD 049/069	1.65	1.28	AF 36						
HD 172	1.87	1.61	AF 27						
HD 319/419/619	1.85	1.50	AF 32						

Type	A	B	D	E	F mm	G	H	I	K	AF mm
DT04 -2P/-3P	□ 1.1	1.44	0.38	0.69	M20 x 1.5	0.51	0.79	0.98	2.17	24
AMP -2P/-3P	□ 1.1	1.44	0.38	0.69	M20 x 1.5	0.51	0.79	0.98	1.97	24
M12 x 1-4P	□ 1.1	1.44	0.38	0.69	M20 x 1.5	0.51	0.79	0.98	1.81	24
DG 063	-	-	0.38	0.69	M20 x 1.5	0.51	0.79	0.98	1.48	24
DG 064	-	-	0.38	0.69	M20 x 1.5	0.51	0.79	0.98	1.63	24
DIN EN 175301-803	□ 1.1	1.44	0.38	0.69	M20 x 1.5	0.51	0.79	0.98	2.54	24

\* Dimensions in mm

## Symbols





**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 mm 2.11 x 0.14 inch	N007.0543/1
5	Replacement 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 mm 2.48 x 0.14 inch	N007.0634
5	Replacement 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 mm 3.73 x 0.14 inch	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	Replacement 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.**

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