HD 417 · HD 617

Bi-directional flow · In-line mounting · Operating pressure up to 500 bar / 7250 psi · Nominal flow rate up to 420 l/min / 111 gpm

High Pressure Filter HD 417

Description

Application

In the high pressure circuits of hydraulic systems with changing flow direction.

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 $\nu \leq 200$ mm²/s / 927 SUS (cold start condition).

Special features

Reverse flow valves:
The "Graetz" system (see Symbols) integrated into the head piece ensures the filtration of the hydraulic fluid in both flow directions.

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 3 - inorganic multi-layer microfiber web

Accessories

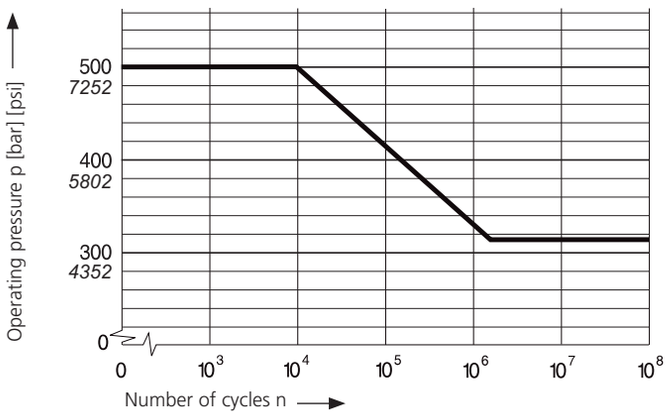
Electrical and / or optical clogging indicators are available - optionally with one or two switching points resp. temperature suppression.
Dimensions and technical data see catalog sheet 60.30.

Operating pressure

0 ... 315 bar / 4570 psi, min. 2 x 10^6 pressure cycles
Nominal pressure according to DIN 24550

0 ... 500 bar / 7250 psi, min. 10^4 pressure cycles
Quasi-static operating pressure

Permissible pressures for other numbers of cycles



Nominal flow rate

Up to 420 l/min / 111 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 $\nu \leq 200$ mm²/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 ≤ 8 m/s / up to 3626 psi ≤ 26.3 ft/s
  > 250 bar ≤ 12 m/s / > 3626 psi ≤ 39.4 ft/s

Filter fineness

5 µm(c) ... 16 µm(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)
-22 °F ... +212 °F (temporary -40 °F ... +248 °F)

- at operating temperature: $\nu < 60$ mm²/s / 280 SUS
- as starting viscosity: $\nu_{max} = 1200$ mm²/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

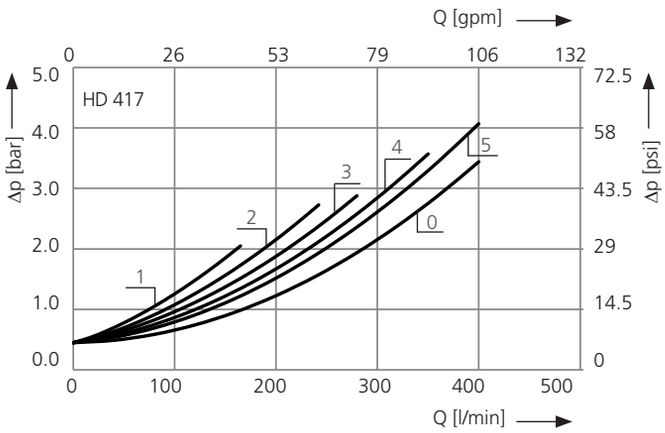
- SAE-flange (6000 psi).

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

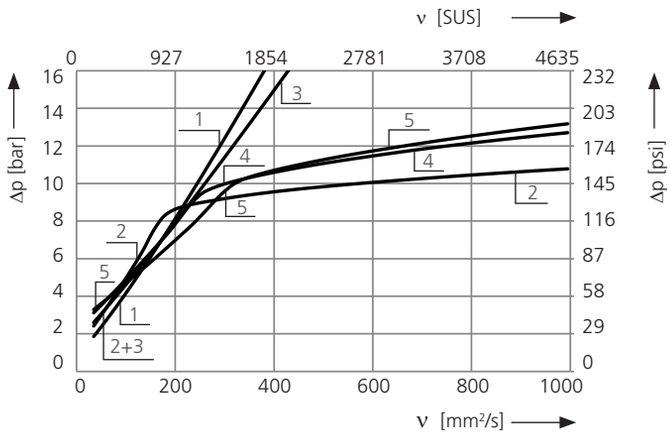
For installation recommendations, see info sheet 00.325.

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

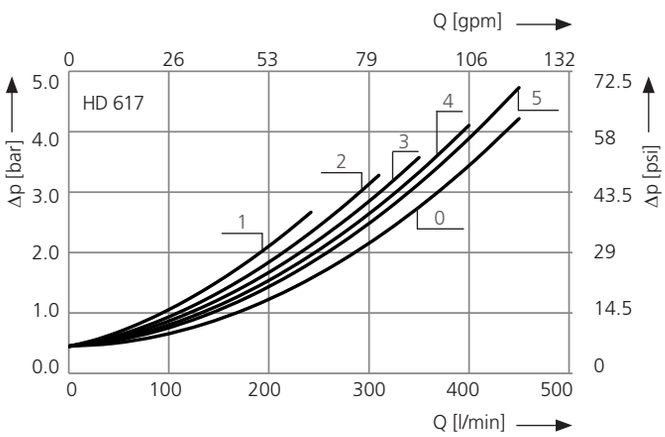
D1 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s / 162 SUS (0 = casing empty)



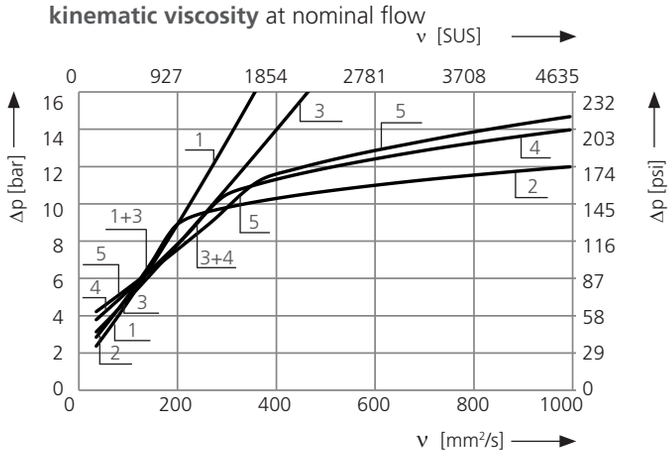
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D2 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s / 162 SUS (0 = casing empty)

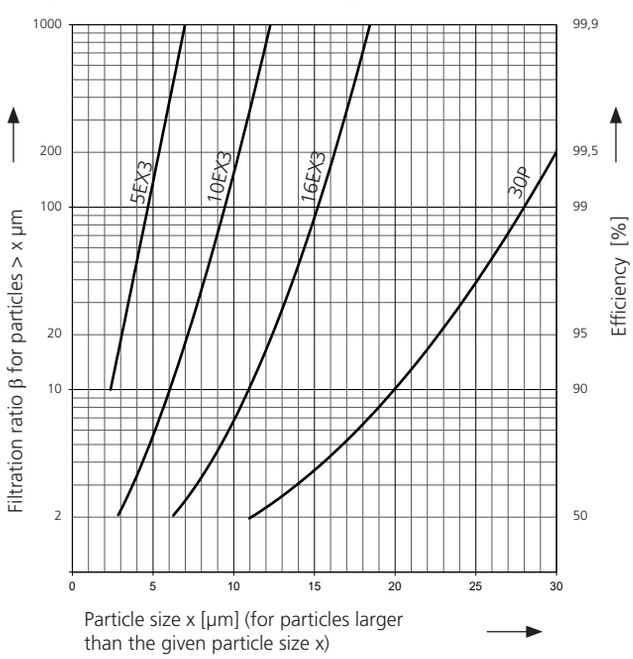


Pressure drop as a function of the **kinematic viscosity** at nominal flow



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. finenesses:

For EXAPOR®MAX 3 and Paper elements:

5EX3 =	$\overline{\beta}_{5\,(c)}$	= 200	EXAPOR®MAX 3
10EX3 =	$\overline{\beta}_{10\,(c)}$	= 200	EXAPOR®MAX 3
16EX3 =	$\overline{\beta}_{16\,(c)}$	= 200	EXAPOR®MAX 3
30P =	$\overline{\beta}_{30\,(c)}$	= 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 diagr. **Dx**	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass		Symbol	Replacement filter element Part No.	Weight		Clogging indicator	Remarks
	l/min	gpm			g		bar	psi			kg	lbs		
1	2		3	4	5	6	7		8	9	10		11	12
HD 417-149	150	39.6	**D1**/1	5EX3	31	SAE 1¼	-	-	2	V3.0823-13[1]	20.3	44.8	optional	[2]
HD 417-179	220	58.1	**D1**/2	5EX3	50	SAE 1¼	7	102	1	V3.0823-03	19.7	43.4	optional	-
HD 417-146	260	68.7	**D1**/3	10EX3	34	SAE 1¼	-	-	2	V3.0823-16[1]	20.3	44.8	optional	[2]
HD 417-176	320	84.5	**D1**/4	10EX3	52	SAE 1¼	7	102	1	V3.0823-06	19.7	43.4	optional	-
HD 417-168	350	92.5	**D1**/5	16EX3	53	SAE 1¼	7	102	1	V3.0823-08	19.7	43.4	optional	-
HD 617-149	220	58.1	**D2**/1	5EX3	45	SAE 1½	-	-	2	V3.0833-13[1]	23.1	50.9	optional	[2]
HD 617-179	280	74.0	**D2**/2	5EX3	74	SAE 1½	7	102	1	V3.0833-03	22.4	49.4	optional	-
HD 617-146	320	84.5	**D2**/3	10EX3	50	SAE 1½	-	-	2	V3.0833-16[1]	23.1	50.9	optional	[2]
HD 617-176	380	100.4	**D2**/4	10EX3	75	SAE 1½	7	102	1	V3.0833-06	22.4	49.4	optional	-
HD 617-178	420	111.0	**D2**/5	16EX3	75	SAE 1½	7	102	1	V3.0833-08	22.4	49.4	optional	-

[1] Element differential pressure up to 160 bar / 2320 psi
[2] Clogging indicator is obligatory

Optical or electrical clogging indicators can be provided for clogging monitoring. When ordering filters with clogging indicator for self-assembly, the abbreviation "M" must be used in the order designation of the clogging indicator. The corresponding installation accessories and installation instructions are included.

Order example: The filter HD 417-149 has to be supplied with electrical clogging indicator - cracking pressure 5.0 bar / 73 psi.

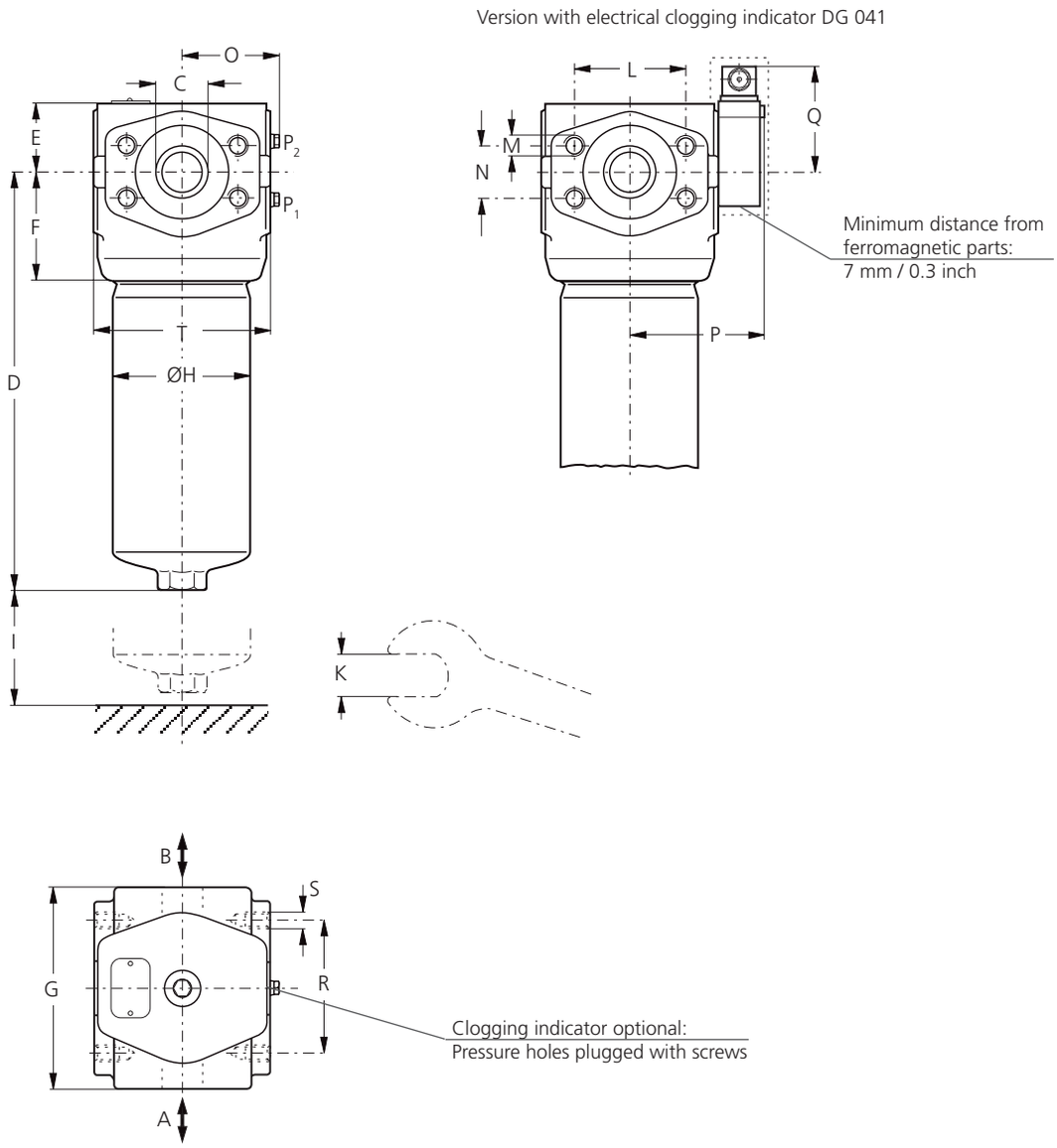
Order code: **HD 417-149** **/** **DG 041-33 M**
1. Part No. (Basic unit)
2. Part No. Clogging indicator

Suitable clogging indicators can be found in catalog sheet 60.30. These must be ordered separately and fitted by the customer. Installation instructions are enclosed.

Remarks:

› Filter versions without by-pass valves must always be equipped with a clogging indicator.
› The filters listed in this chart are standard filters. Other designs available on request.

Dimensions



Measurements in mm

Type	A/B	C	D	E	F	G	H	I	K	L	M Ø / depth	N	O	P	Q	R	S Ø / depth	T
HD 417	SAE 1¼	31.5	328	58	87.5	156	108	80	AF 32	66.7	M14 / 22	31.8	73	102	87	100	M12 / 18	138
HD 617	SAE 1½	31.5	428	58	87.5	156	108	80	AF 32	79.4	M16 / 24	36.5	73	102	87	100	M12 / 18	138

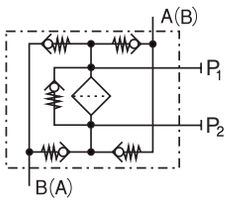
Measurements in inch

Type	A/B	C	D	E	F	G	H	I	K mm	L	M Ø / depth	N	O	P	Q
HD 417	SAE 1¼	1.24	12.91	2.28	3.44	6.14	4.25	3.15	AF 32	2.63	M14 / 0.87	1.25	2.87	4.02	3.43
HD 617	SAE 1½	1.24	16.85	2.28	3.44	6.14	4.25	3.15	AF 32	3.13	M16 / 0.95	1.44	2.87	4.02	3.43

Type	R	S Ø / depth	T
HD 417	3.94	M12 / 0.71	5.43
HD 617	3.94	M12 / 0.71	5.43

Symbols

1



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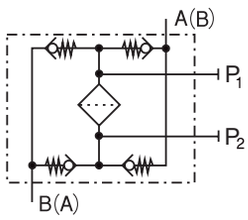
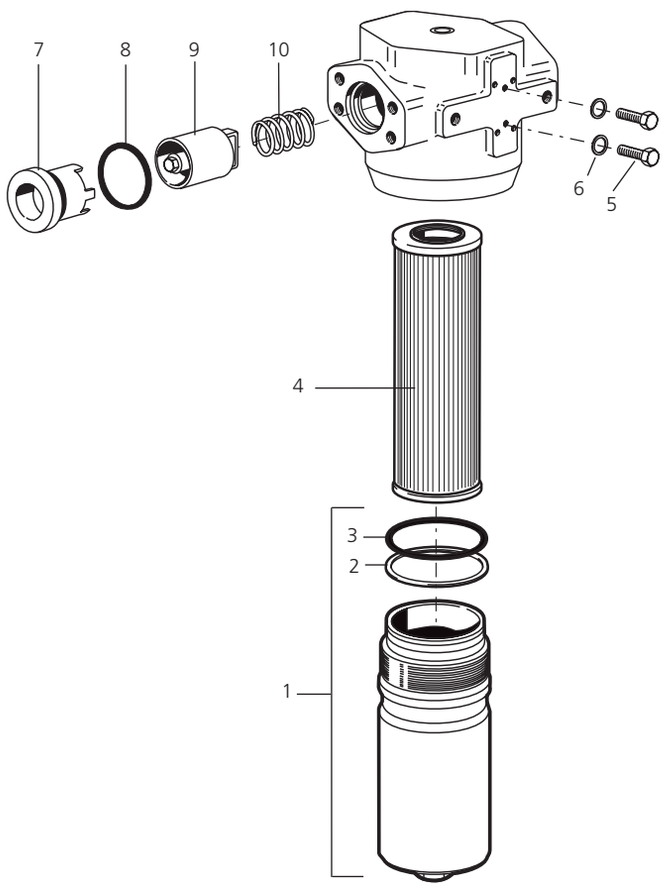


Spare Parts



Pos.	Designation	Part No.
1	Filter bowl HD 417 (with Pos. 2 and 3)	HD 451.0702
1	Filter bowl HD 617 (with Pos. 2 and 3)	HD 619.0701
2	Back-ring	HD 255.0102
3	O-ring 94.84 x 3.53 mm 3.73 x 0.14 inch	N007.0953
4	Replacement filter element	see Chart / col. 9
5	Hexagonal head screw M4 x 8 DIN 933-8.8	11385800
6	Bonded seal 4.1 x 7.2 x 1 mm 0.16 x 0.28 x 0.04 inch	12504600
7	Sleeve	HD 417.0505
8	O-ring 42.52 x 2.62 mm 1.67 x 0.1 inch	N007.0433
9	Reverse flow valve	HD 417.1520
10	Spring DM 38	N015.3801

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.