



## High Pressure Filters

**HD 314 • HD 414  
HD 614**

- Flangeable
- Operating pressure up to 500 bar
- Nominal flow rate up to 400 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  $\leq 200 \text{ mm}^2/\text{s}$  (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 head: Spheroidal graphite cast iron (SGI)  
Filter bowl: Cold extruded steel  
Coating: Powder paint  
Seals: NBR (FPM on request)  
Filter media: EXAPOR®MAX - inorganic multi-layer microfibre web  
Paper - cellulose web, impregnated with resin

### Accessories

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

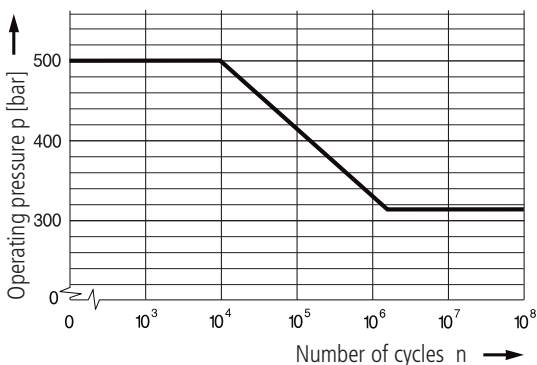
## Characteristics

### Operating pressure

0 ... 315 bar, min.  $2 \times 10^6$  pressure cycles  
Nominal pressure according to DIN 24550

0 ... 500 bar, min.  $10^4$  pressure cycles  
Quasi-static operating pressure

### Permissible pressures for other numbers of cycles



### Nominal flow rate

Up to 400 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

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

### Viscosity at nominal flow rate

- at operating temperature:  $v < 60 \text{ mm}^2/\text{s}$
- as starting viscosity:  $v_{\text{max}} = 1.200 \text{ mm}^2/\text{s}$
- 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, filter head on top

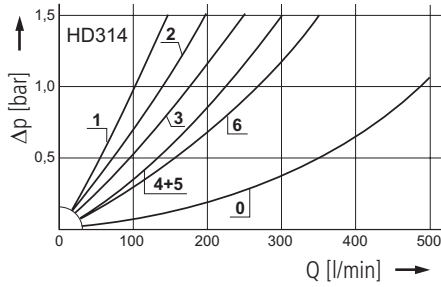
### Connection

$2 \times \text{Ø } 31 \text{ mm}$  on plain flange

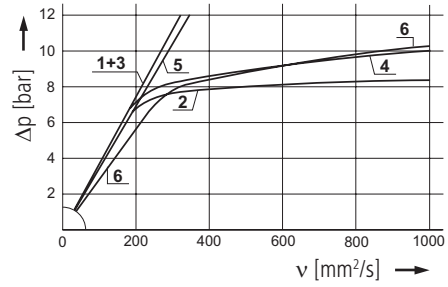
# Diagrams

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

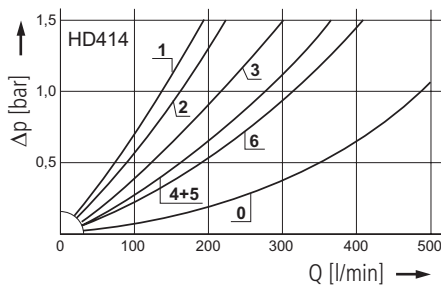
**D1** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s}$  (0 = casing empty)



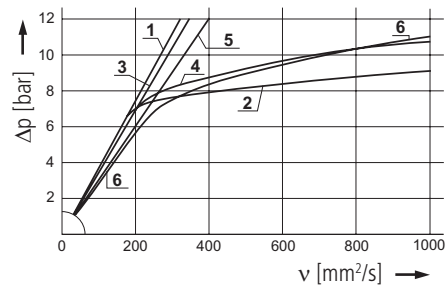
Pressure drop as a function of the **kinematic viscosity** at nominal flow



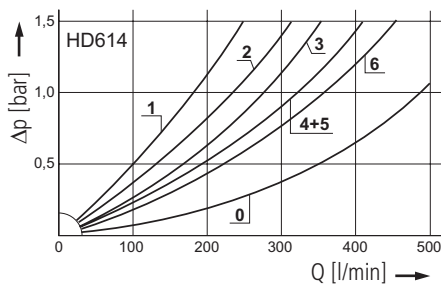
**D2** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s}$  (0 = casing empty)



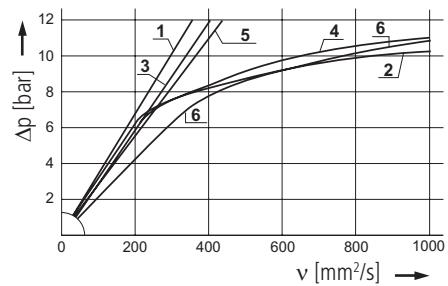
Pressure drop as a function of the **kinematic viscosity** at nominal flow



**D3** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s}$  (0 = casing empty)

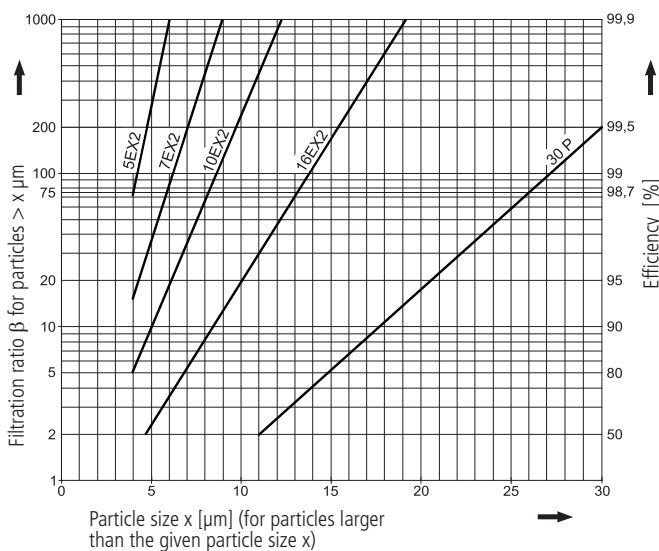


Pressure drop as a function of the **kinematic viscosity** at nominal flow



## Filter fineness curves in Selection Chart, column 4

**Dx** Filtration ratio  $\beta$  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<sup>®</sup>MAX 2- and Paper elements:**

**5EX2** =  $\beta_{5(c)} = 200$  EXAPOR<sup>®</sup>MAX 2

**7EX2** =  $\beta_{7(c)} = 200$  EXAPOR<sup>®</sup>MAX 2

**10EX2** =  $\beta_{10(c)} = 200$  EXAPOR<sup>®</sup>MAX 2

**16EX2** =  $\beta_{16(c)} = 200$  EXAPOR<sup>®</sup>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  $\mu\text{m}$

**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 D	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
1	2	3	4	5	6	7	8	9	10	11	12
	l/min			g		bar			kg		
HD 314-279	110	D1/1	5EX2	20	Ø 31	-	7	V3.0817-13*	14,2	optional	-
HD 314-259	155	D1/2	5EX2	24	Ø 31	7	4	V3.0817-03	13,8	optional	-
HD 314-246	195	D1/3	10EX2	24	Ø 31	-	7	V3.0817-16*	14,2	optional	-
HD 314-256	250	D1/4	10EX2	33	Ø 31	7	4	V3.0817-06	13,8	optional	-
HD 314-248	260	D1/5	16EX2	25	Ø 31	-	7	V3.0817-18*	14,2	optional	-
HD 314-258	300	D1/6	16EX2	33	Ø 31	7	4	V3.0817-08	13,8	optional	-
HD 414-279	155	D2/1	5EX2	29	Ø 31	-	7	V3.0823-13*	15,7	optional	-
HD 414-259	190	D2/2	5EX2	33	Ø 31	7	4	V3.0823-03	15,1	optional	-
HD 414-296	250	D2/3	10EX2	33	Ø 31	-	7	V3.0823-16*	15,7	optional	-
HD 414-256	310	D2/4	10EX2	47	Ø 31	7	4	V3.0823-06	15,1	optional	-
HD 414-298	310	D2/5	16EX2	35	Ø 31	-	7	V3.0823-18*	15,7	optional	-
HD 414-258	360	D2/6	16EX2	48	Ø 31	7	4	V3.0823-08	15,1	optional	-
HD 614-279	210	D3/1	5EX2	41	Ø 31	-	7	V3.0833-13*	18,5	optional	-
HD 614-259	270	D3/2	5EX2	49	Ø 31	7	4	V3.0833-03	17,8	optional	-
HD 614-246	310	D3/3	10EX2	49	Ø 31	-	7	V3.0833-16*	18,5	optional	-
HD 614-256	360	D3/4	10EX2	67	Ø 31	7	4	V3.0833-06	17,8	optional	-
HD 614-288	400	D3/5	16EX2	51	Ø 31	-	7	V3.0833-18*	18,5	optional	-
HD 614-258	400	D3/6	16EX2	68	Ø 31	7	4	V3.0833-08	17,8	optional	-

Optical or electrical indicators are available to monitor the clogging condition of the element. If the indicator should be already mounted onto the filter head use the abbreviation "M" behind the part number of the indicator. The printed order acknowledgements show both items separately.

**Order example: The filter HD 314-279 has to be supplied with optical clogging indicator - response pressure 5,0 bar**

**Order description:** HD 314-279 / DG 042-02 M

**Part No. (Basic unit)** \_\_\_\_\_ **Mounted**

**Clogging indicator** \_\_\_\_\_

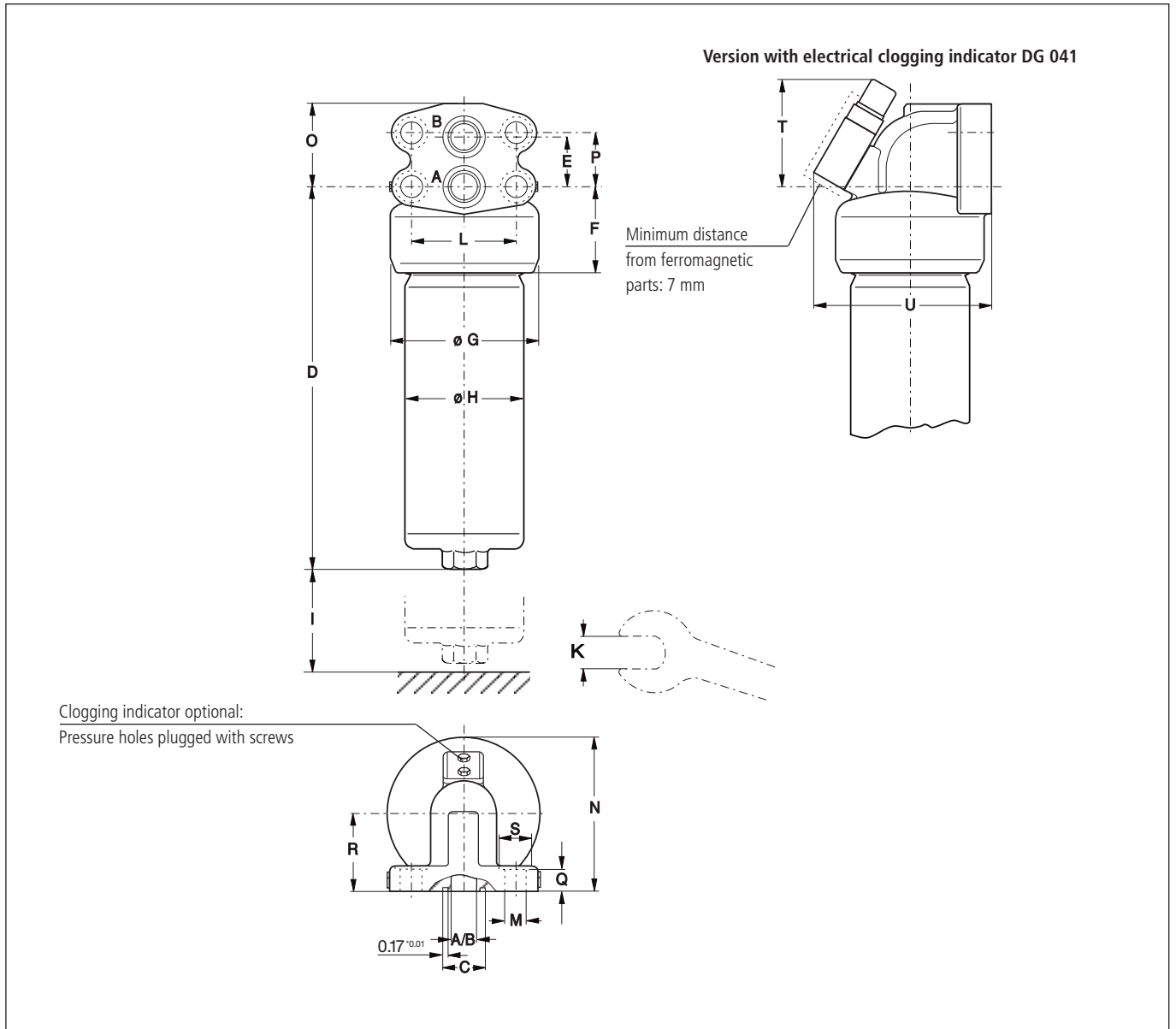
**For the appropriate clogging indicators see catalogue sheet 60.30.**

**Remarks:**

- Filter versions without by-pass valves must always be equipped with a clogging indicator.
- The filters listed in this chart are standard filters. If modifications are required, e.g. filter fineness 30 P, we kindly ask for your request.

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

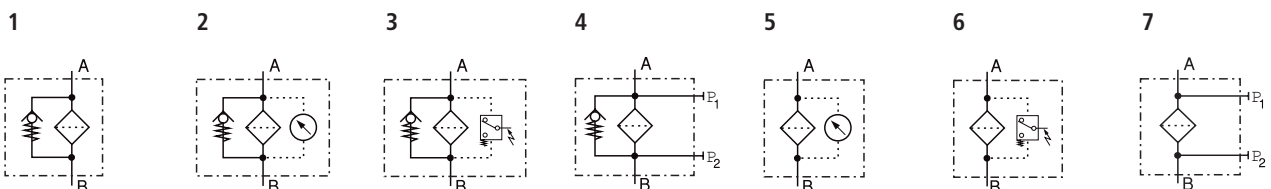
## Dimensions



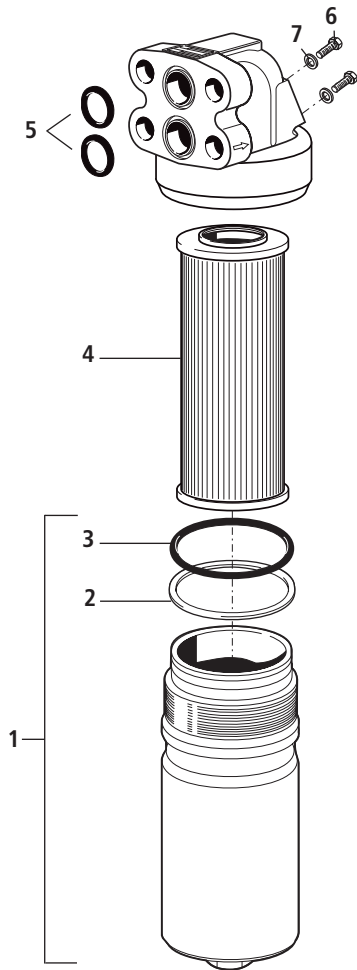
## Measurements

Type	A/B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U
HD 314	Ø 31	44,4	263	52	82	138	109	80	32	95	21,5	150	83	58	25	80	34	93	165
HD 414	Ø 31	44,4	325	52	82	138	109	80	32	95	21,5	150	83	58	25	80	34	93	165
HD 614	Ø 31	44,4	426	52	82	138	109	80	32	95	21,5	150	83	58	25	80	34	93	165

## Symbols



## Spare Parts



Pos.	Designation	Part No.
1	Filter bowl HD 314 (with Pos. 2 and 3)	HD 250.0701
1	Filter bowl HD 414 (with Pos. 2 and 3)	HD 451.0702
1	Filter bowl HD 614 (with Pos. 2 and 3)	HD 619.0701
2	Back-ring	HD 255.0102
3	O-ring 94,84 x 3,53	N007.0953
4	Filter element	s. Chart / col. 9
5	O-ring 37,69 x 3,53 *	N007.0384
6	Hexagonal head screw M4 x 8 DIN 933-8.8	11385800
7	Bonded Seal 4,1 x 7,2 x 1	12504600

\* Not supplied with filter - has to be ordered separately

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:

<b>ISO 2941</b>	Verification of collapse/burst pressure rating
<b>ISO 2942</b>	Verification of fabrication integrity (Bubble Point Test)
<b>ISO 2943</b>	Verification of material compatibility with fluids

<b>ISO 3968</b>	Evaluation of pressure drop versus flow characteristics
<b>ISO 16889</b>	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)
<b>ISO 23181</b>	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.



**We produce fluid power solutions**

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