

High Pressure Filters

**HD 314 · HD 414 · HD 614**

Flangeable · Operating pressure up to 500 bar / 7250 psi · Nominal flow rate up to 400 l/min / 105.7 gpm



High Pressure Filter HD 414

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  $\leq 200 \text{ mm}^2/\text{s}$  / 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 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.

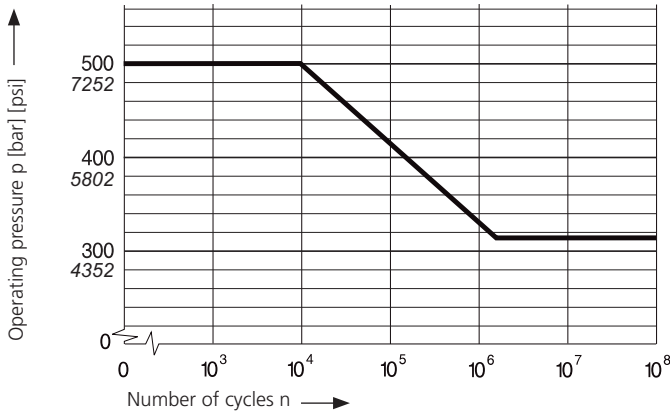
Dimensions and technical data see catalog sheet 60.30.

**Operating pressure**

0 ... 315 bar / 4570 psi, min.  $2 \times 10^6$  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 400 l/min / 105,7 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  $v \leq 200 \text{ mm}^2/\text{s} / 927 \text{ SUS}$
- › 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  $\leq 8 \text{ m/s} / \text{ up to } 3626 \text{ psi } \leq 26.3 \text{ ft/s}$   
 > 250 bar  $\leq 12 \text{ m/s} / > 3626 \text{ psi } \leq 39.4 \text{ ft/s}$

**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:  $v < 60 \text{ mm}^2/\text{s} / 280 \text{ SUS}$
- › as starting viscosity:  $v_{\text{max}} = 1200 \text{ mm}^2/\text{s} / 5560 \text{ SUS}$
- › 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, filter head on top.

**Connection**

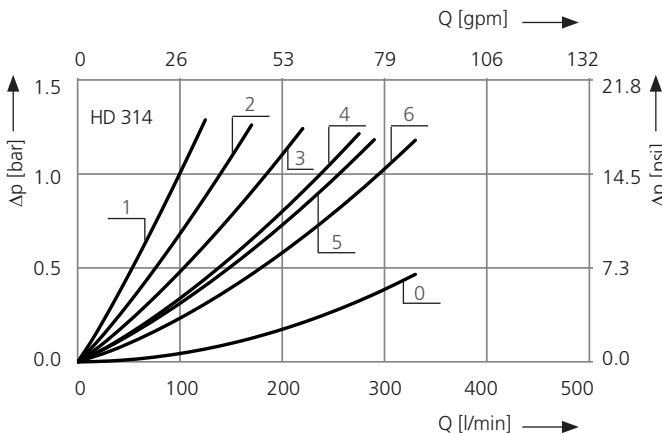
2 x  $\varnothing 31 \text{ mm} / 2 \text{ x } \varnothing 1.22 \text{ inch}$  on plain flange.

For installation recommendations, see info sheet 00.325.

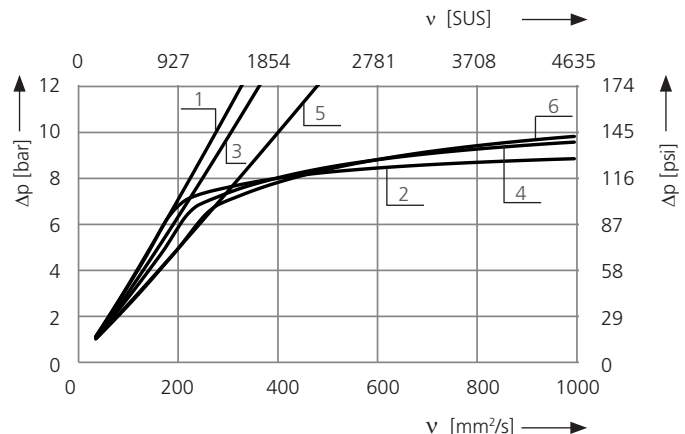
Diagrams

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

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

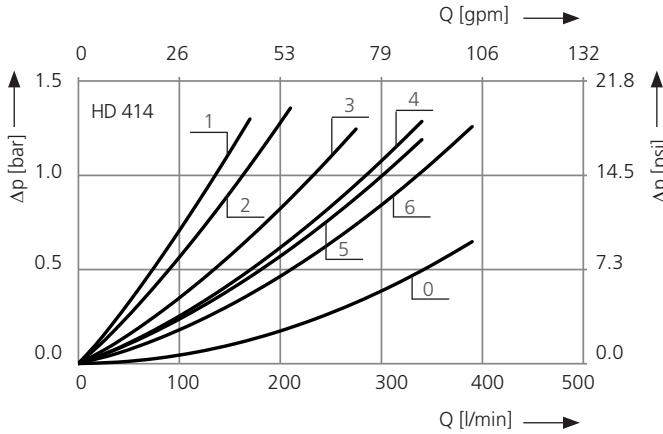


Pressure drop as a function of the **kinematic viscosity** at nominal flow

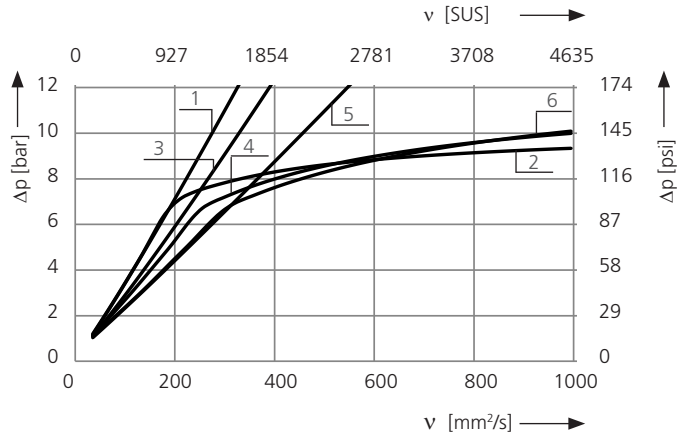


**Δp-curves for complete filters in Selection Chart, column 3**

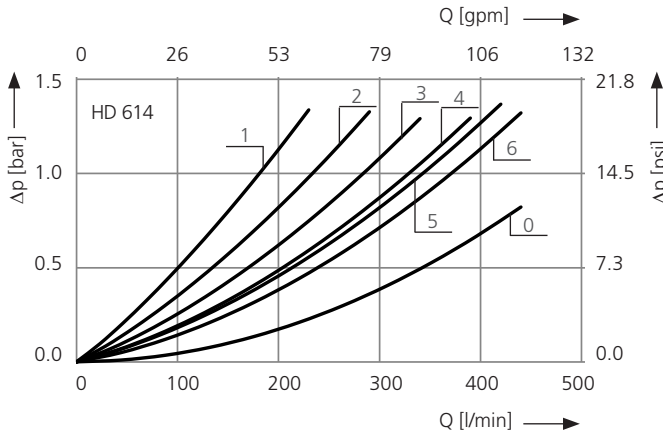
**D2** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$  (0 = casing empty)



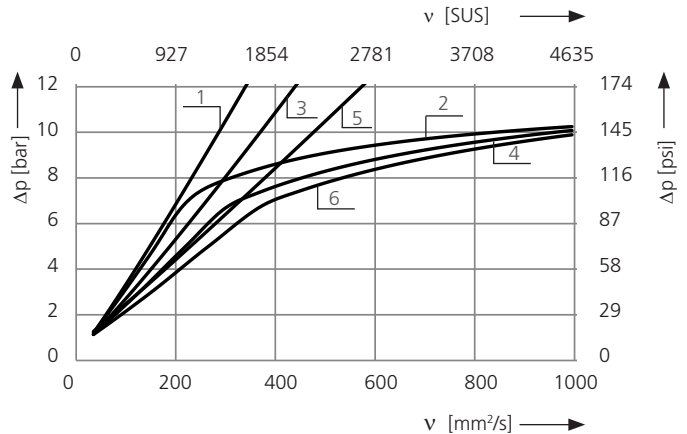
Pressure drop as a function of the **kinematic viscosity** at nominal flow



**D3** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$  (0 = casing empty)

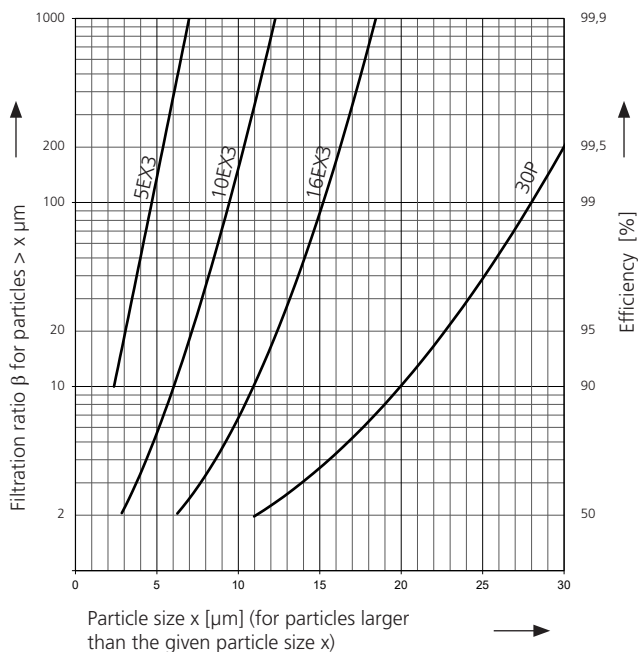


Pressure drop as a function of the **kinematic viscosity** at nominal flow



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

**Dx** Filtration ratio  $\beta$  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 3 and Paper elements:**

- 5EX3 =  $\beta_{5(c)} = 200$  EXAPOR<sup>®</sup>MAX 3
- 10EX3 =  $\beta_{10(c)} = 200$  EXAPOR<sup>®</sup>MAX 3
- 16EX3 =  $\beta_{16(c)} = 200$  EXAPOR<sup>®</sup>MAX 3
- 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 <b>D</b> /curve no.	Filter fineness see diagram <b>Dx</b>	Dirt-holding capacity		Connection A/B		Cracking pressure of by-pass		Replacement filter element Part No.	Weight		Clogging indicator
	l/min	gpm			g	mm	inch	bar	psi	Symbol		kg	lbs	
1	2		3	4	5	6		7		8	9	10		11
HD 314-279	110	29.1	<b>D1/1</b>	5EX3	22	Ø 31	Ø 1.22	-	-	2	V3.0817-13 <sup>2</sup>	14.2	31.3	retrofitable
HD 314-259	155	40.9	<b>D1/2</b>	5EX3	36	Ø 31	Ø 1.22	7	102	1	V3.0817-03	13.8	30.4	retrofitable
HD 314-246	195	51.5	<b>D1/3</b>	10EX3	24	Ø 31	Ø 1.22	-	-	2	V3.0817-16 <sup>2</sup>	14.2	31.3	retrofitable
<b>HD 314-256<sup>1</sup></b>	250	66.0	<b>D1/4</b>	10EX3	37	Ø 31	Ø 1.22	7	102	1	V3.0817-06	13.8	30.4	retrofitable
HD 314-248	260	68.7	<b>D1/5</b>	16EX3	25	Ø 31	Ø 1.22	-	-	2	V3.0817-18 <sup>2</sup>	14.2	31.3	retrofitable
<b>HD 314-258<sup>1</sup></b>	300	79.3	<b>D1/6</b>	16EX3	38	Ø 31	Ø 1.22	7	102	1	V3.0817-08	13.8	30.4	retrofitable
HD 414-279	155	40.9	<b>D2/1</b>	5EX3	31	Ø 31	Ø 1.22	-	-	2	V3.0823-13 <sup>2</sup>	15.7	34.6	retrofitable
HD 414-259	190	50.2	<b>D2/2</b>	5EX3	50	Ø 31	Ø 1.22	7	102	1	V3.0823-03	15.1	33.3	retrofitable
HD 414-296	250	66.0	<b>D2/3</b>	10EX3	34	Ø 31	Ø 1.22	-	-	2	V3.0823-16 <sup>2</sup>	15.7	34.6	retrofitable
<b>HD 414-256<sup>1</sup></b>	310	81.9	<b>D2/4</b>	10EX3	52	Ø 31	Ø 1.22	7	102	1	V3.0823-06	15.1	33.3	retrofitable
HD 414-298	310	81.9	<b>D2/5</b>	16EX3	35	Ø 31	Ø 1.22	-	-	2	V3.0823-18 <sup>2</sup>	15.7	34.6	retrofitable
<b>HD 414-258<sup>1</sup></b>	360	95.1	<b>D2/6</b>	16EX3	53	Ø 31	Ø 1.22	7	102	1	V3.0823-08	15.1	33.3	retrofitable
HD 614-279	210	55.5	<b>D3/1</b>	5EX3	45	Ø 31	Ø 1.22	-	-	2	V3.0833-13 <sup>2</sup>	18.5	40.8	retrofitable
HD 614-259	270	71.3	<b>D3/2</b>	5EX3	74	Ø 31	Ø 1.22	7	102	1	V3.0833-03	17.8	39.2	retrofitable
HD 614-246	310	81.9	<b>D3/3</b>	10EX3	50	Ø 31	Ø 1.22	-	-	2	V3.0833-16 <sup>2</sup>	18.5	40.8	retrofitable
<b>HD 614-256<sup>1</sup></b>	360	95.1	<b>D3/4</b>	10EX3	75	Ø 31	Ø 1.22	7	102	1	V3.0833-06	17.8	39.2	retrofitable
HD 614-288	400	105.7	<b>D3/5</b>	16EX3	51	Ø 31	Ø 1.22	-	-	2	V3.0833-18 <sup>2</sup>	18.5	40.8	retrofitable
<b>HD 614-258<sup>1</sup></b>	400	105.7	<b>D3/6</b>	16EX3	76	Ø 31	Ø 1.22	7	102	1	V3.0833-08	17.8	39.2	retrofitable

<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 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 HD 314-279 has to be supplied with optical clogging indicator - response pressure 5.0 bar / 73 psi**

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

1. Part No. (Basic unit) \_\_\_\_\_  
 2. Part No. Clogging indicator \_\_\_\_\_

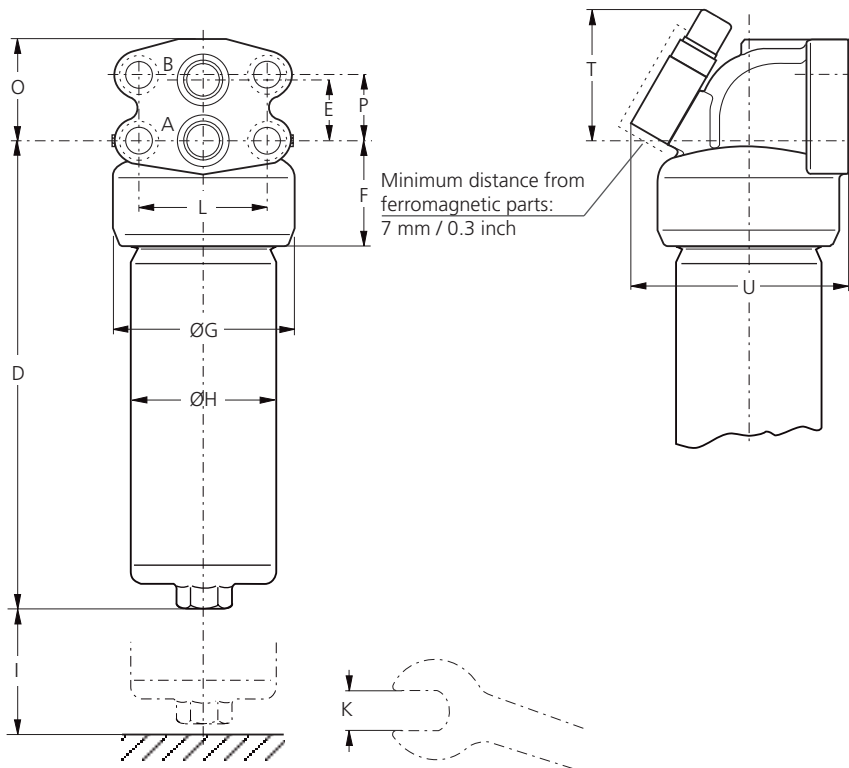
**Suitable clogging indicators can be found in catalog sheet 60.30. These must be ordered separately and fitted by the customer. Installation instructions are enclosed.**

**Remarks:**

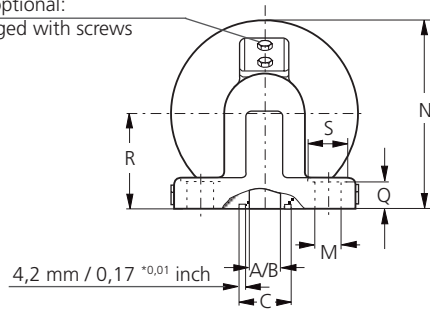
- › Filter versions without by-pass valves must always be equipped with a clogging indicator.
- › The filters listed in this chart are standard filters. If modifications are required, e.g. filter fineness 30P, we kindly ask for your request.

## Dimensions

Version with electrical clogging indicator DG 041



Clogging indicator optional:  
Pressure holes plugged with screws



### Measurements in mm

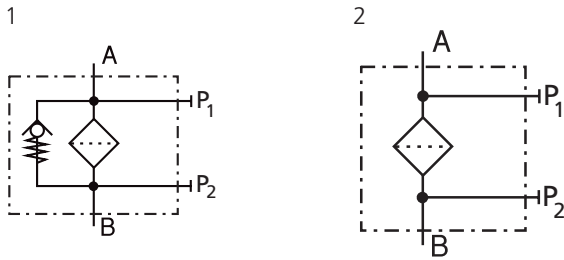
Type	A/B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U
HD 314	Ø 31	44.4	263	52	82	138	109	80	AF 32	95	21.5	150	83	58	25	80	34	93	165
HD 414	Ø 31	44.4	325	52	82	138	109	80	AF 32	95	21.5	150	83	58	25	80	34	93	165
HD 614	Ø 31	44.4	426	52	82	138	109	80	AF 32	95	21.5	150	83	58	25	80	34	93	165

### Measurements in inch

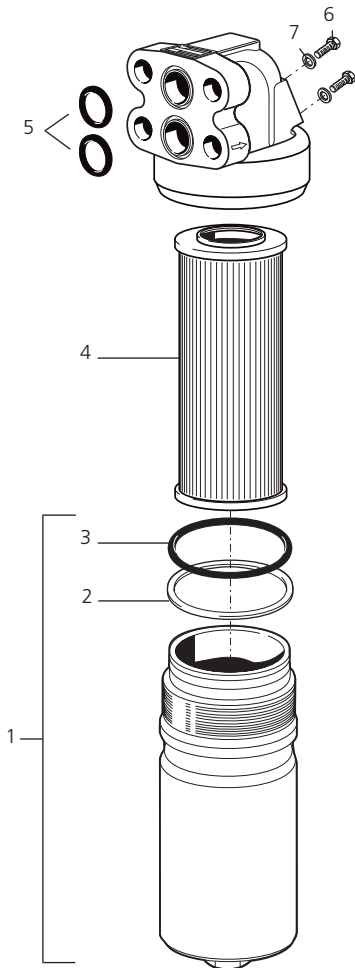
Type	A/B	C	D	E	F	G	H	I	K mm	L	M	N	O	P	Q	R
HD 314	Ø 1.22	1.75	10.35	2.05	3.23	5.43	4.29	3.15	AF 32	3.74	0.85	5.91	3.27	2.28	0.98	3.15
HD 414	Ø 1.22	1.75	12.80	2.05	3.23	5.43	4.29	3.15	AF 32	3.74	0.85	5.91	3.27	2.28	0.98	3.15
HD 614	Ø 1.22	1.75	16.77	2.05	3.23	5.43	4.29	3.15	AF 32	3.74	0.85	5.91	3.27	2.28	0.98	3.15

Type	S	T	U
HD 314	1.34	3.66	6.50
HD 414	1.34	3.66	6.50
HD 614	1.34	3.66	6.50

## Symbols



## Spare Parts



Pos.	Designation	Part No.
1	Filter bowl HD 314 (with Pos. 2 und 3)	HD 250.0701
1	Filter bowl HD 414 (with Pos. 2 und 3)	HD 451.0702
1	Filter bowl HD 614 (with Pos. 2 und 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	s. Chart / col. 9
5	O-ring 37.69 x 3.53* mm 1.48 x 0.14* inch	N007.0384
6	Hexagonal head screw M4 x 8 DIN 933-8.8	11385800
7	Bonded Seal 4.1 x 7.2 x 1 mm 0.16 x 0.28 x 0.04 inch	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:

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