

HD 319 · HD 419 · HD 619

In-line mounting · Operating pressure up to 630 bar · Nominal flow rate up to 450 l/min



High Pressure Filter HD 419

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 head: | Spheroidal graphite cast iron (SGI) |
| Filter bowl: | Cold extruded steel |
| Coating: | Powder paint |
| Seals: | NBR (FPM on request) |
| Filter media: | EXAPOR®MAX 2 - inorganic multi-layer microfibre web |

Accessories

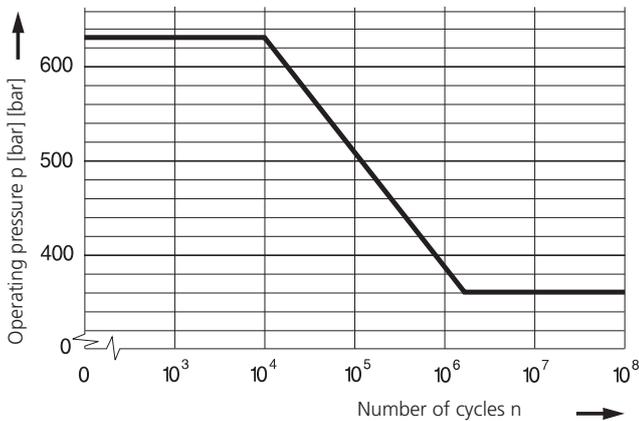
If an electrical indicator is used, a transparent socket with LED for optical indication is also available with Part No. DG 041.1200.

Operating pressure

0 ... 360 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 > 1000 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: $v_{\text{max}} = 1200 \text{ mm}^2/\text{s}$
- › 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 % 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

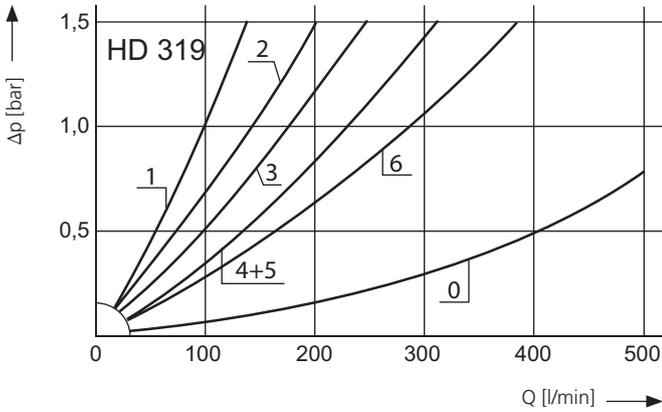
- › Threaded ports according to ISO 228 or DIN 13
- › SAE-flange (6000 psi)
Sizes see Selection Chart, column 6 and ordering example (other connections on request).

Electrical clogging indicator

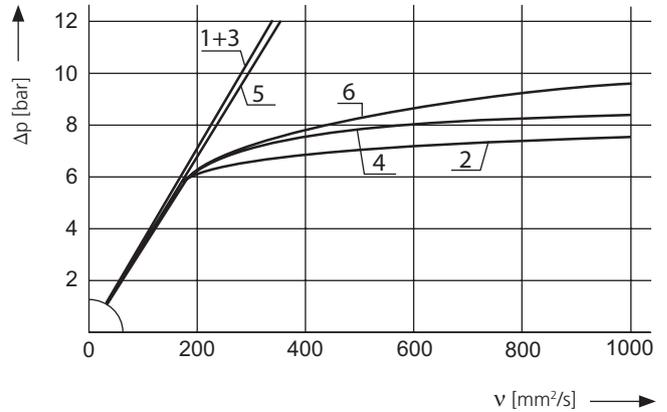
- › Switching voltage: max. 120 V AC / 175 V DC
- › Switching current: max. 0,17 A AC / 0,25 A DC
- › Switching power: max. 3,5 VA AC / 5 W DC
- › Type of contact: Change over
- › Electrical protection: IP 65 (with mounted and secured socket)

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

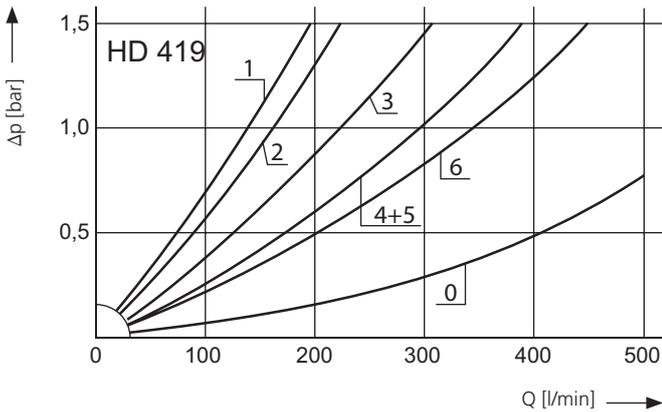
D1 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$ (0 = casing empty)



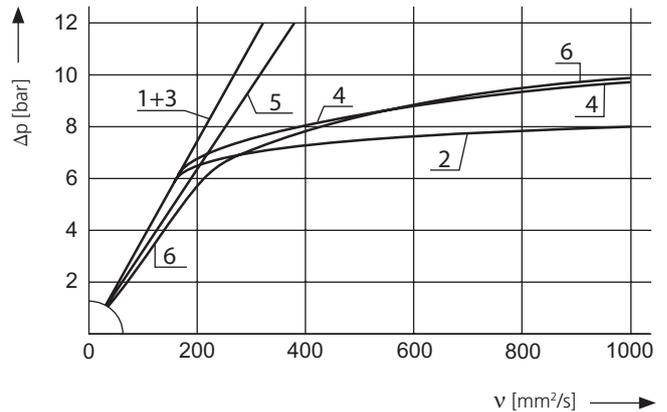
Pressure drop as a function of the **kinematic viscosity** at nominal flow



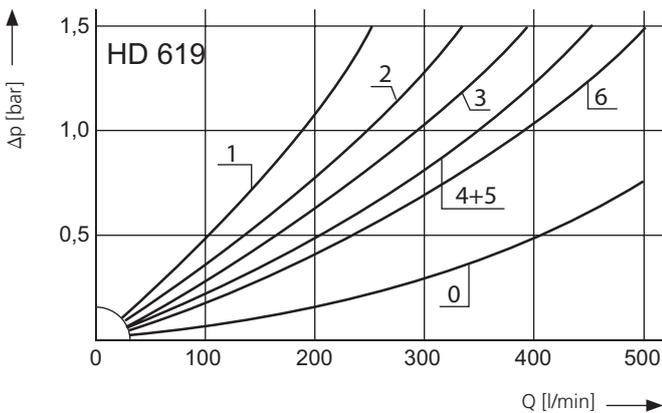
D2 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$ (0 = casing empty))



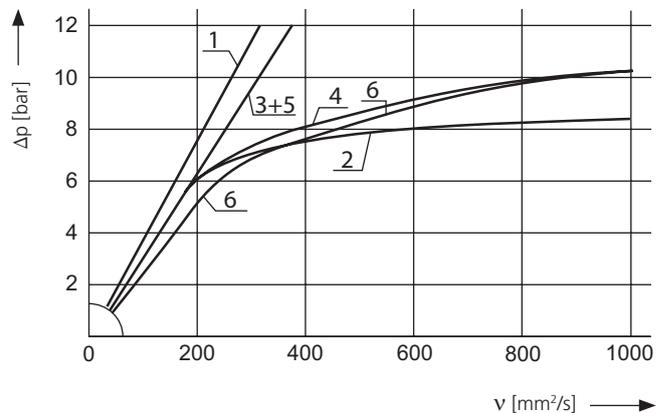
Pressure drop as a function of the **kinematic viscosity** at nominal flow



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

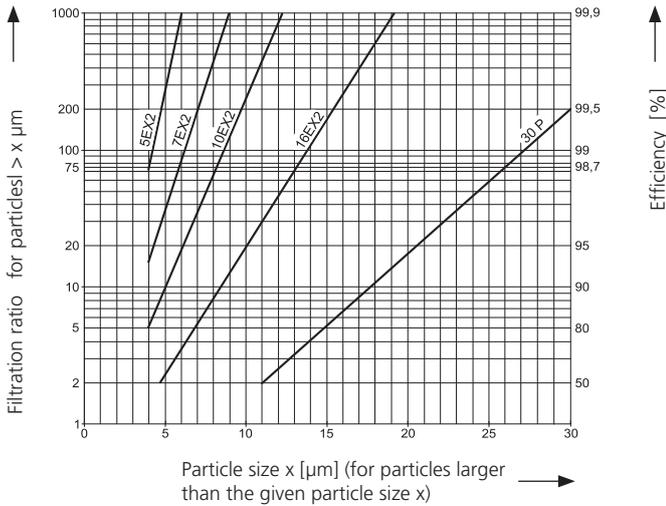


Pressure drop as a function of the **kinematic viscosity** at nominal flow



Filter fineness curves in Selection Chart, column 4

Dx Filtration ratio 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®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 μ m
 - 60S = screen material with mesh size 60 μ m
 - 100S = screen material with mesh size 100 μ 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.

Order Information

Two different head pieces with two various connecting options are available.

Order example: The Filter HD 319-289 has to be supplied with SAE 1¼ flanged connection.

Order description: **HD 319-189**

Connections:

2 options are available

- Flanged connection (A/B) SAE 1¼ (6000 psi) _____ 1 _____
- Threaded port (A/B) G1¼ bzw. G1½² _____ 2 _____

Remarks:

- ▶ The filters listed in this chart are standard filters. If modifications are required, e.g. bolt mounted indicators according to catalogue sheet 60.30, we kindly ask for your request.
- ▶ If an electrical indicator is used, a transparent socket with LED for optical indication is also available with Part No. DG 041.1200.

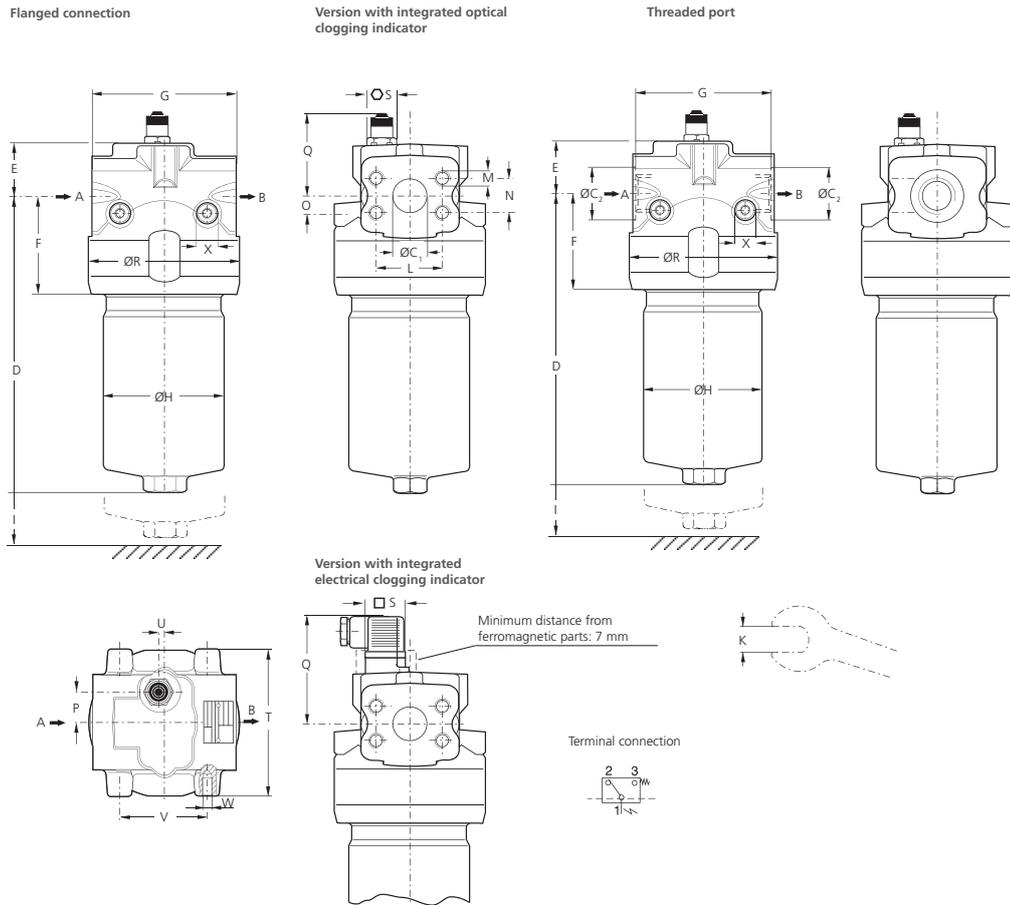
² G1½ from series HD 619

Selection Chart

| Part No. | Nominal flow rate | Pressure drop see diagram D /Curve no. | Filter fineness see diagram Dx | Dirt-holding capacity | Connection A/B | Cracking pressure of by-pass | Symbol | Replacement filter element Part No. | Weight | Clogging indicator Cracking pressure in () | Remarks |
|------------|-------------------|---|---------------------------------------|-----------------------|----------------|------------------------------|--------|-------------------------------------|--------|---|-------------|
| 1 | l/min | 3 | 4 | g | 6 | 7 | 8 | 9 | kg | 11 | 12 |
| HD 319-289 | 110 | D1/1 | 5EX2 | 20 | G1¼ | - | 6 | V3.0817-13 ¹ | 16,3 | electrical (5) | change-over |
| HD 319-279 | 155 | D1/2 | 5EX2 | 24 | G1¼ | 7 | 2 | V3.0817-03 | 15,9 | optical (5) | - |
| HD 319-259 | 155 | D1/2 | 5EX2 | 24 | G1¼ | 7 | 3 | V3.0817-03 | 15,9 | electrical (5) | change-over |
| HD 319-286 | 195 | D1/3 | 10EX2 | 24 | G1¼ | - | 6 | V3.0817-16 ¹ | 16,3 | electrical (5) | change-over |
| HD 319-276 | 250 | D1/4 | 10EX2 | 33 | G1¼ | 7 | 2 | V3.0817-06 | 15,9 | optical (5) | - |
| HD 319-256 | 250 | D1/4 | 10EX2 | 33 | G1¼ | 7 | 3 | V3.0817-06 | 15,9 | electrical (5) | change-over |
| HD 319-288 | 270 | D1/5 | 16EX2 | 25 | G1¼ | - | 6 | V3.0817-18 ¹ | 16,3 | electrical (5) | change-over |
| HD 319-278 | 330 | D1/6 | 16EX2 | 33 | G1¼ | 7 | 2 | V3.0817-08 | 15,9 | optical (5) | - |
| HD 319-258 | 330 | D1/6 | 16EX2 | 33 | G1¼ | 7 | 3 | V3.0817-08 | 15,9 | electrical (5) | change-over |
| HD 419-289 | 155 | D2/1 | 5EX2 | 29 | G1¼ | - | 6 | V3.0823-13 ¹ | 17,8 | electrical (5) | change-over |
| HD 419-279 | 190 | D2/2 | 5EX2 | 33 | G1¼ | 7 | 2 | V3.0823-03 | 17,2 | optical (5) | - |
| HD 419-259 | 190 | D2/2 | 5EX2 | 33 | G1¼ | 7 | 3 | V3.0823-03 | 17,2 | electrical (5) | change-over |
| HD 419-286 | 265 | D2/3 | 10EX2 | 33 | G1¼ | - | 6 | V3.0823-16 ¹ | 17,8 | electrical (5) | change-over |
| HD 419-276 | 330 | D2/4 | 10EX2 | 47 | G1¼ | 7 | 2 | V3.0823-06 | 17,2 | optical (5) | - |
| HD 419-256 | 330 | D2/4 | 10EX2 | 47 | G1¼ | 7 | 3 | V3.0823-06 | 17,2 | electrical (5) | change-over |
| HD 419-288 | 330 | D2/5 | 16EX2 | 35 | G1¼ | - | 6 | V3.0823-18 ¹ | 17,8 | electrical (5) | change-over |
| HD 419-278 | 380 | D2/6 | 16EX2 | 48 | G1¼ | 7 | 2 | V3.0823-08 | 17,2 | optical (5) | - |
| HD 419-258 | 380 | D2/6 | 16EX2 | 48 | G1¼ | 7 | 3 | V3.0823-08 | 17,2 | electrical (5) | change-over |
| HD 619-289 | 220 | D3/1 | 5EX2 | 41 | G1½ | - | 6 | V3.0833-13 ¹ | 20,6 | electrical (5) | change-over |
| HD 619-279 | 280 | D3/2 | 5EX2 | 49 | G1½ | 7 | 2 | V3.0833-03 | 19,9 | optical (5) | - |
| HD 619-259 | 280 | D3/2 | 5EX2 | 49 | G1½ | 7 | 3 | V3.0833-03 | 19,9 | electrical (5) | change-over |
| HD 619-286 | 330 | D3/3 | 10EX2 | 49 | G1½ | - | 6 | V3.0833-16 ¹ | 20,6 | electrical (5) | change-over |
| HD 619-276 | 400 | D3/4 | 10EX2 | 67 | G1½ | 7 | 2 | V3.0833-06 | 19,9 | optical (5) | - |
| HD 619-256 | 400 | D3/4 | 10EX2 | 67 | G1½ | 7 | 3 | V3.0833-06 | 19,9 | electrical (5) | change-over |
| HD 619-288 | 450 | D3/5 | 16EX2 | 51 | G1½ | - | 6 | V3.0833-18 ¹ | 20,6 | electrical (5) | change-over |
| HD 619-278 | 450 | D3/6 | 16EX2 | 68 | G1½ | 7 | 2 | V3.0833-08 | 19,9 | optical (5) | - |
| HD 619-258 | 450 | D3/6 | 16EX2 | 68 | G1½ | 7 | 3 | V3.0833-08 | 19,9 | electrical (5) | change-over |

¹ Element differential pressure stable up to 160 bar

Dimensions

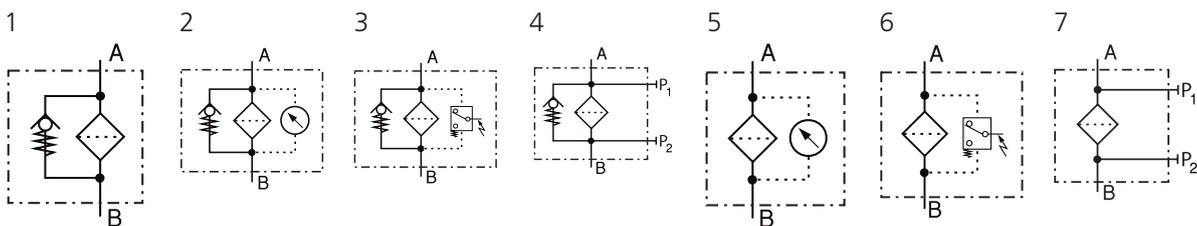


Measurements

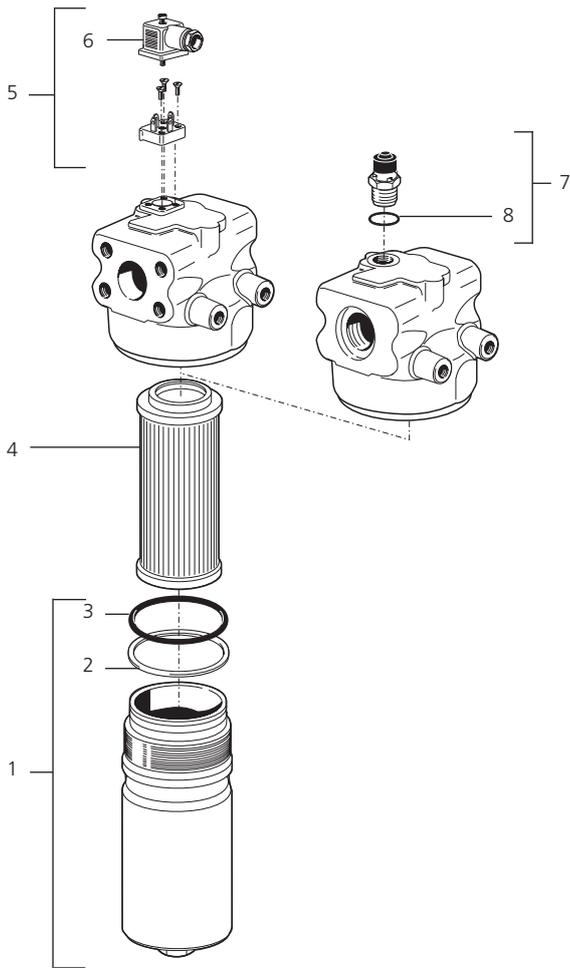
| Type | A/B | C ₁ | C ₂ | D | E | F | G | H | I | K | L | M Ø/depth | N | O | P | Q opt./electr. |
|--------|-----------|----------------|----------------|-----|----|----|-----|-----|----|----|------|--------------|------|------|----|-------------------|
| HD 319 | see | 31 | 65 | 255 | 45 | 86 | 145 | 109 | 80 | 32 | 66,7 | M14/22 | 31,8 | 18,5 | 33 | 75/92 |
| HD 419 | Selection | 31 | 65 | 319 | 45 | 86 | 145 | 109 | 80 | 32 | 66,7 | M14/22 | 31,8 | 18,5 | 33 | 75/92 |
| HD 619 | Chart | 31 | 65 | 420 | 45 | 86 | 145 | 109 | 80 | 32 | 66,7 | M14/22 | 31,8 | 18,5 | 33 | 75/92 |

| Type | R | S opt./electr | T | U | V | W Ø/depth | X | | | | | | | | | |
|--------|-----|------------------|-----|---|----|--------------|----|--|--|--|--|--|--|--|--|--|
| HD 319 | 152 | 24/30 | 148 | 8 | 80 | M12/18 | 27 | | | | | | | | | |
| HD 419 | 152 | 24/30 | 148 | 8 | 80 | M12/18 | 27 | | | | | | | | | |
| HD 619 | 152 | 24/30 | 148 | 8 | 80 | M12/18 | 27 | | | | | | | | | |

Symbols



Spare Parts



| Pos. | Designation | Part No. |
|------|--|--------------------|
| 1 | Filter bowl HD 319 (with Pos. 2 und 3) | HD 250.0701 |
| 1 | Filter bowl HD 419 (with Pos. 2 und 3) | HD 451.0702 |
| 1 | Filter bowl HD 619 (with Pos. 2 und 3) | HD 619.0701 |
| 2 | Back-ring | HD 255.0102 |
| 3 | O-ring 94,84 x 3,53 | N007.0953 |
| 4 | Filter element | see Chart / col. 9 |
| 5 | Reed switch with screws and socket (Pos. 6) | HD 049.1410 |
| 6 | Reed switch with screws DIN 43650 - AF3 | DG 041.1220 |
| 7 | Optical indicator (with Pos. 8) | HD 049.1400 |
| 8 | O-ring 17 x 2 | N007.0172 |

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.