



High Pressure Filters – Worldline 400

HD 790 • HD 990

- In-line mounting
- Operating pressure up to 630 bar
- Nominal flow rate up to 1.000 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 $v \leq 200 \text{ mm}^2/\text{s}$ (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: Steel
 Housing cover: Spheroidal graphite cast iron (SGI)
 Coating: Powder paint
 Seals: NBR (FPM on request)
 Filter media: EXAPOR®MAX 2 – inorganic multi-layer microfibre 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 catalogue sheet 60.30.

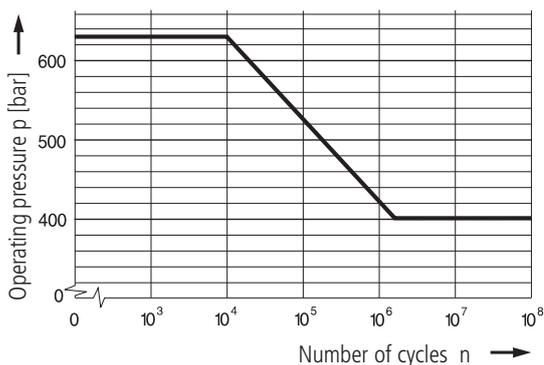
Characteristics

Operating pressure

0 ... 400 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 1000 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 $\mu\text{m(c)}$
 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: $v_{\text{max}} = 1.200 \text{ mm}^2/\text{s}$
- 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 % 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

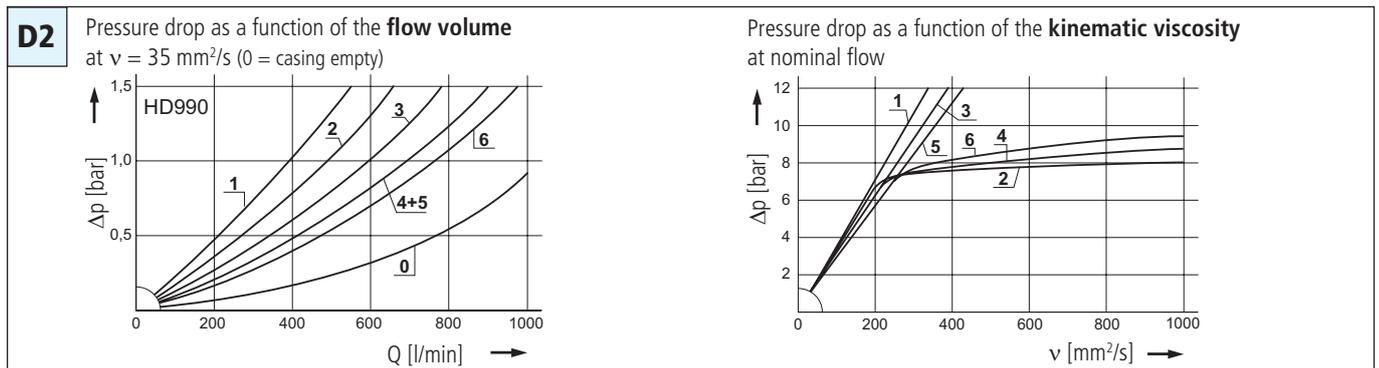
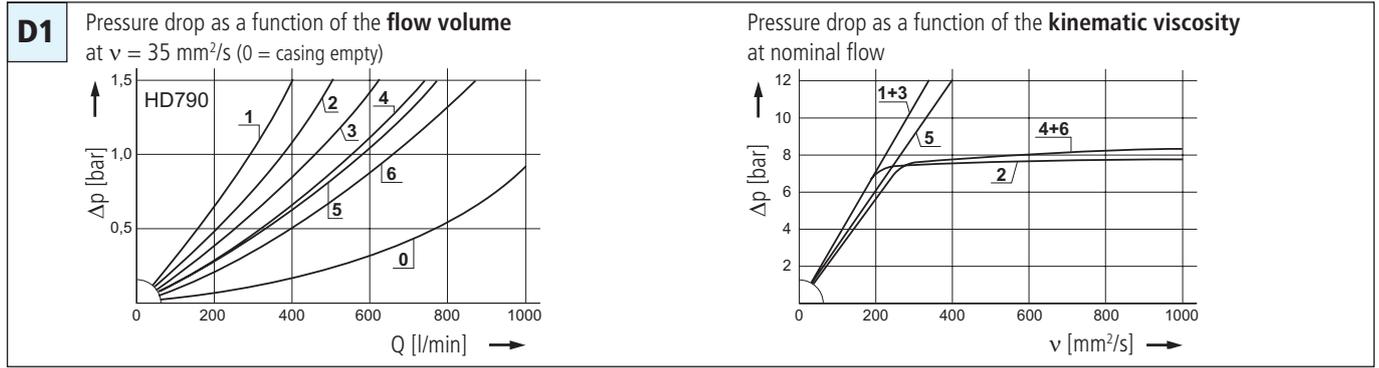
Preferably vertical. The filter head can be mounted in either the uppermost position or the inverse as required.

Connection

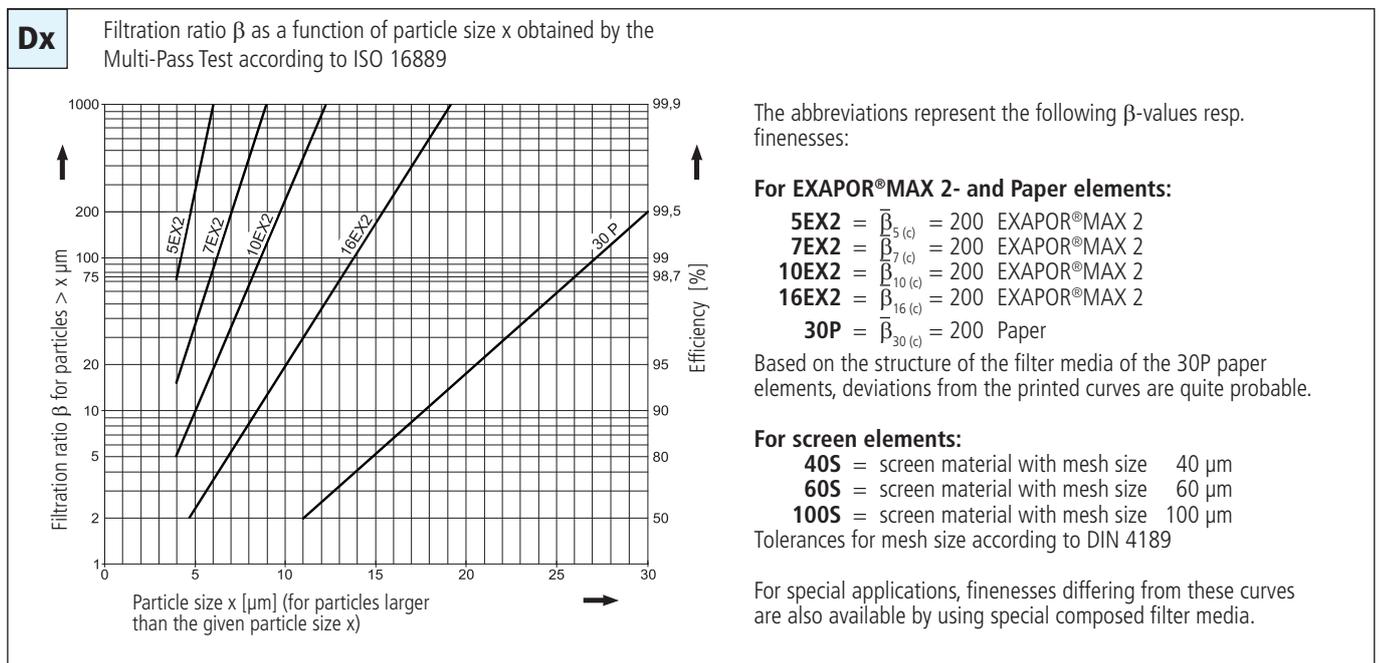
SAE-flange (6000 psi).
 Sizes see Selection Chart, column 6 (other connections on request).

Diagrams

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



Filter fineness curves in Selection Chart, column 4



Selection Charts

| Part No. | Nominal flow rate | Pressure drop see diagram D/curve no. | Filter fineness no. | 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 790-189 | 320 | D1/1 | 5EX2 | 58 | SAE2 | - | 7 | V3.1040-13* | 47 | optional | - |
| HD 790-159 | 440 | D1/2 | 5EX2 | 63 | SAE2 | 7 | 4 | V3.1040-03 | 46 | optional | - |
| HD 790-186 | 540 | D1/3 | 10EX2 | 71 | SAE2 | - | 7 | V3.1040-16* | 47 | optional | - |
| HD 790-156 | 640 | D1/4 | 10EX2 | 88 | SAE2 | 7 | 4 | V3.1040-06 | 46 | optional | - |
| HD 790-188 | 660 | D1/5 | 16EX2 | 72 | SAE2 | - | 7 | V3.1040-18* | 47 | optional | - |
| HD 790-158 | 750 | D1/6 | 16EX2 | 89 | SAE2 | 7 | 4 | V3.1040-08 | 46 | optional | - |
| HD 990-189 | 460 | D2/1 | 5EX2 | 85 | SAE2 | - | 7 | V3.1060-13* | 56 | optional | - |
| HD 990-159 | 570 | D2/2 | 5EX2 | 95 | SAE2 | 7 | 4 | V3.1060-03 | 55 | optional | - |
| HD 990-186 | 680 | D2/3 | 10EX2 | 110 | SAE2 | - | 7 | V3.1060-16* | 56 | optional | - |
| HD 990-156 | 780 | D2/4 | 10EX2 | 130 | SAE2 | 7 | 4 | V3.1060-06 | 55 | optional | - |
| HD 990-188 | 870 | D2/5 | 16EX2 | 110 | SAE2 | - | 7 | V3.1060-18* | 56 | optional | - |
| HD 990-158 | 1000 | D2/6 | 16EX2 | 140 | SAE2 | 7 | 4 | V3.1060-08 | 55 | 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 790-156 has to be supplied with optical clogging indicator – response pressure 5,0 bar

Order description: HD 790-156 / DG 042-02 M mounted

Part No. (Basic unit) _____

Clogging indicator _____

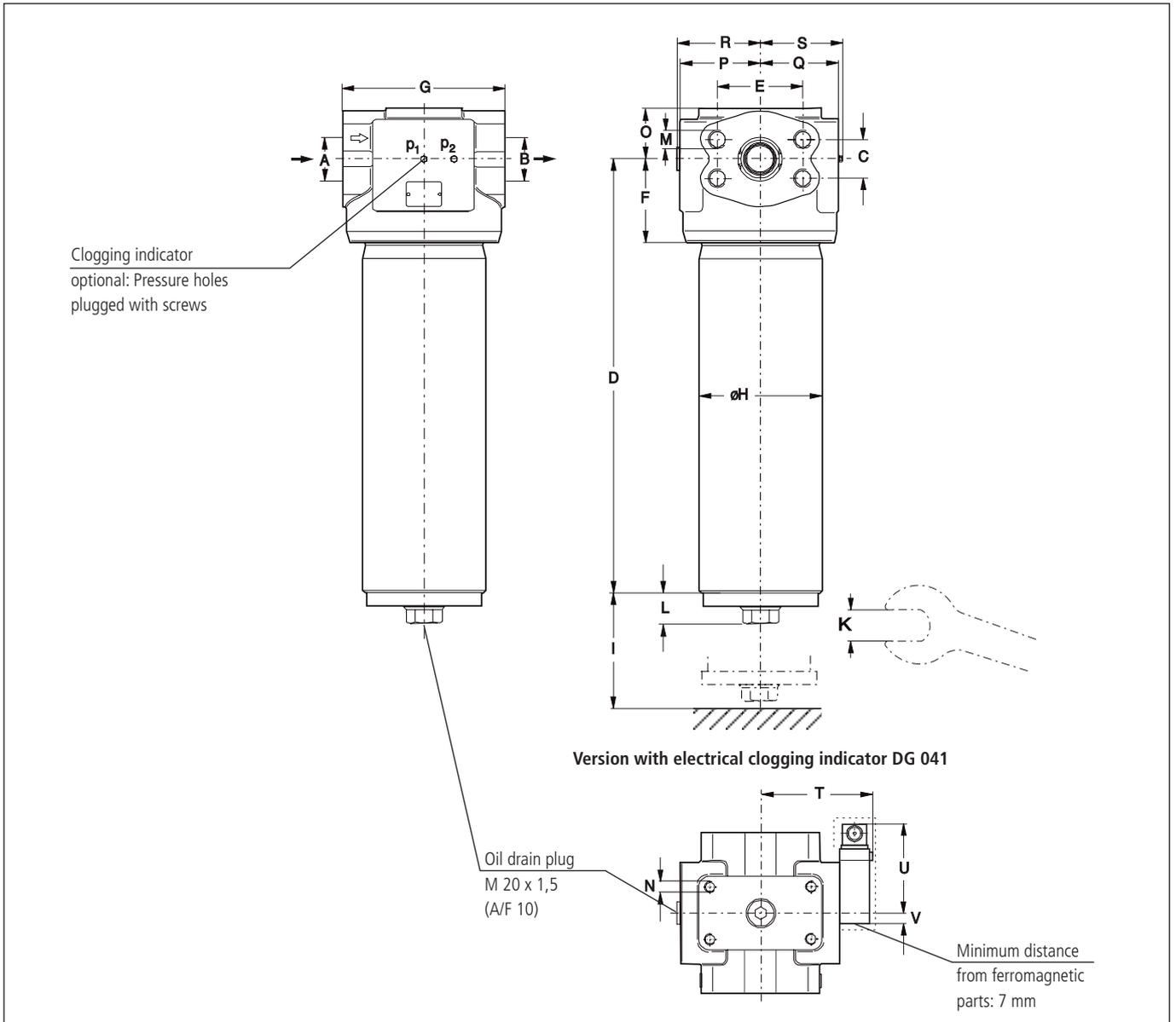
For the appropriate clogging indicators see catalogue sheet 60.30.

Remarks:

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

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

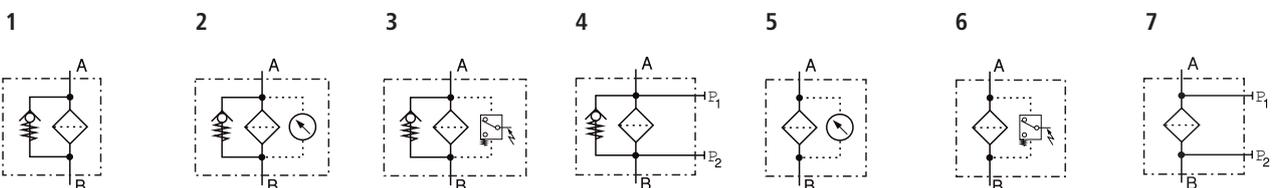
Dimensions



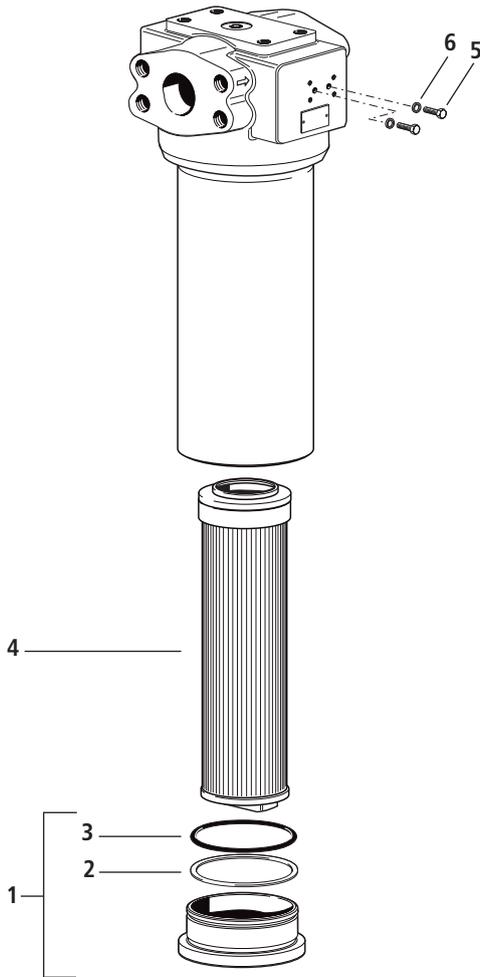
Measurements

| Type | A/B | C | D | E | F | G | H | I | K A/F | L | M Ø/depth | N Ø/depth | O | P | Q | R | S | T | U | V |
|--------|------|------|-----|------|----|-----|-----|-----|----------|----|--------------|--------------|----|----|----|----|----|-----|-----|----|
| HD 790 | SAE2 | 44,4 | 495 | 96,6 | 96 | 184 | 140 | 430 | 36 | 36 | M 20/32 | M 12/20 | 58 | 91 | 89 | 95 | 93 | 122 | 102 | 13 |
| HD 990 | SAE2 | 44,4 | 700 | 96,6 | 96 | 184 | 140 | 640 | 36 | 36 | M 20/32 | M 12/20 | 58 | 91 | 89 | 95 | 93 | 122 | 102 | 13 |

Symbols



Spare Parts



| Pos. | Designation | Part No. |
|------|---|--------------------|
| 1 | Housing cover (with Pos. 2 and 3) | HD 990.1900 |
| 2 | Back-ring | HD 256.0104 |
| 3 | O-ring 104.37 x 3.53 | N007.1044S |
| 4 | Filter element | see Chart / col. 9 |
| 5 | Hexagonal head screw M4 x 8 ISO 4017-8.8 | 11385800 |
| 6 | Bonded seal 4.1 x 7.2 x 1 | 12504600 |

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.

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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