



High Pressure Filters – Worldline 400

HD 790 • HD 990

- In-line mounting
- Operating pressure up to 9137 psi
- Nominal flow rate up to 264.2 gpm

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 $v \leq 930$ 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:	Steel
Housing cover:	Spheroidal graphite cast iron (SGI)
Coating:	Powder paint
Seals:	NBR (FKM 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 catalog sheet 60.30.

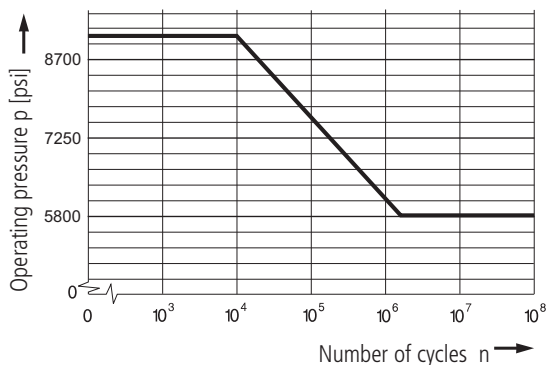
Characteristics

Operating pressure

0 ... 5800 psi, min. 2×10^6 pressure cycles
Nominal pressure according to DIN 24550

0 ... 9137 psi, min. 10^4 pressure cycles
Quasi-static operating pressure

Permissible pressures for other numbers of cycles



Nominal flow rate

Up to 264.2 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 $v \leq 930$ SUS
- element service life > 1,000 operating hours at an average fluid contamination of 0.27 g per gpm flow volume
- flow velocity in the connection lines:
 - up to 3626 psi \leq 26.3 ft/s
 - > 3626 psi \leq 39.4 ft/s

Filter fineness

5 μ m(c) ... 16 μ 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

-22 °F ... +212 °F (temporary -40 °F ... +248 °F)

Viscosity at nominal flow rate

- at operating temperature: $v < 280$ SUS
- as starting viscosity: $v_{\max} = 5560$ 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. The filter head can be mounted in either the uppermost position or the inverse as required.

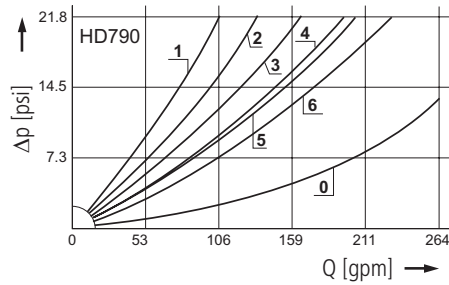
Connection

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

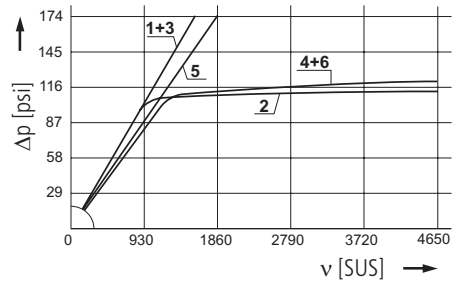
Diagrams

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

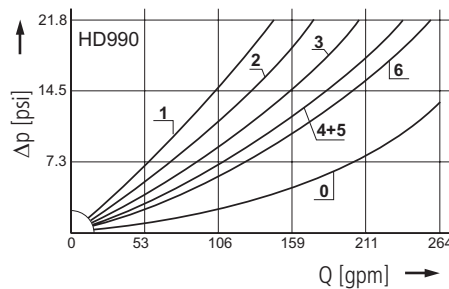
D1 Pressure drop as a function of the **flow volume**
at $v = 162 \text{ SUS}$ (0 = casing empty)



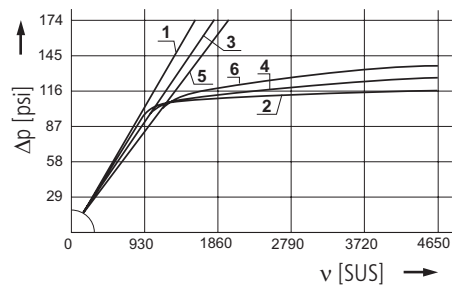
Pressure drop as a function of the **kinematic viscosity**
at nominal flow



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

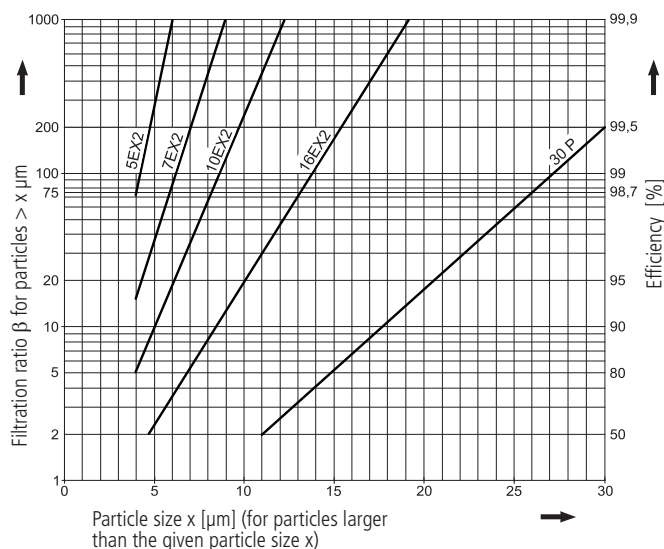


Pressure drop as a function of the **kinematic viscosity**
at nominal flow



Filter fineness curves in Selection Chart, column 4

Dx Filtration ratio 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 2 and Paper elements:

5EX2 = $\beta_{5(c)} = 200$ EXAPOR®MAX 2

7EX2 = $\beta_{7(c)} = 200$ EXAPOR®MAX 2

10EX2 = $\beta_{10(c)} = 200$ EXAPOR®MAX 2

16EX2 = $\beta_{16(c)} = 200$ EXAPOR®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 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 Charts

[illegible]

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 790-356 has to be supplied with optical clogging indicator – response pressure 73 psi

Order description: HD 790-356 / DG 042-02 M

Part No. (Basic unit) _____ mounted

Clogging indicator _____

For the appropriate clogging indicators see catalog 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 2320 psi, clogging indicator is obligatory

Dimensions

Clogging indicator
optional: Pressure holes
plugged with screws

Version with electrical clogging indicator DG 041

Oil drain plug
M20 x 1.5
(A/F 10)

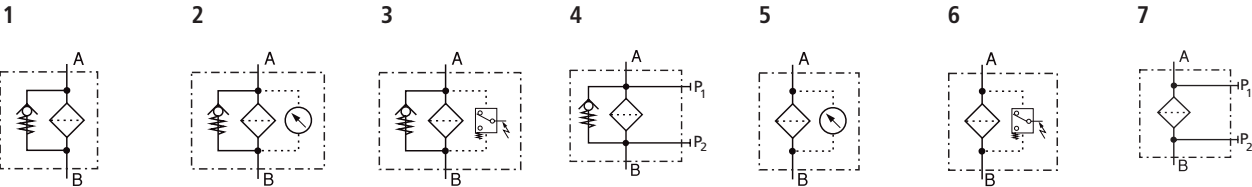
Minimum distance
from ferromagnetic
parts: 0.3 inch

Measurements

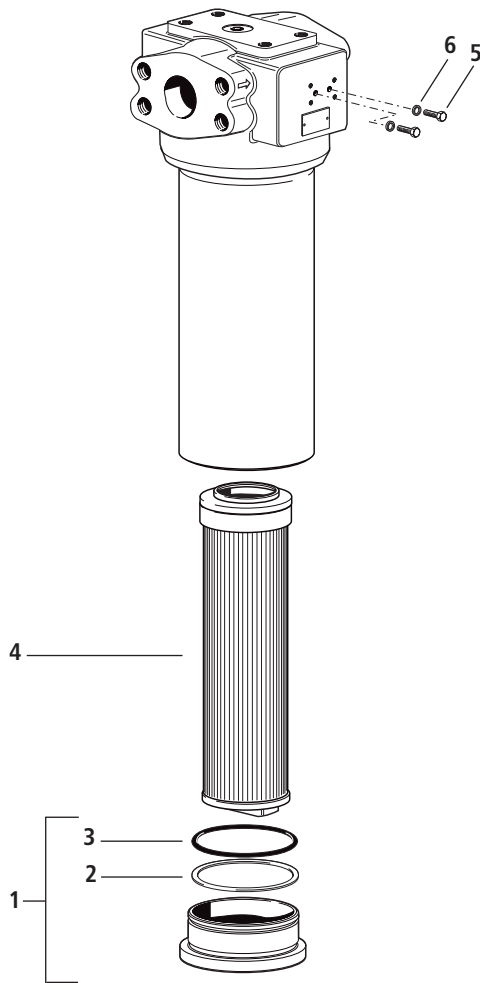
Type	A/B	C	D	E	F	G	H	I	K A/F	L	M Ø/depth	N Ø/depth	O	P	Q	R	S	T	U	V
HD 790	SAE 2	1.75	19.49	3.80	3.78	7.24	5.51	16.93	36*	1.42	**	***	2.28	3.58	3.50	3.74	3.66	4.80	4.02	0.51
HD 990	SAE 2	1.75	27.56	3.80	3.78	7.24	5.51	25.20	36*	1.42	**	***	2.28	3.58	3.50	3.74	3.66	4.80	4.02	0.51

* Dimensions in mm ** 3/4"-10 UNC-2B/1.26 *** 1/2"-13 UNC-2B/0.79

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 4.11 x 0.14	N007.1044S
4	Filter element	see Chart / col. 9
5	Hexagonal head screw M4 x 8 ISO 4017-8.8	11385800
6	Bonded seal 0.16 x 0.28 x 0.04	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.