



HYDRAULIC MEGASTORE

Serving the Hydraulics Industry Worldwide



Return Filters

E212 E 222

- Tank top mounting
- Connection up to G1/4
- Nominal flow rate up to 220 l/min

Description

Application

In the return line 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: By means of full-flow filtration in the system return, the pumps above all are protected from dirt particles remaining in the system after assembly, repairs, or which are generated by wear or enter the system from outside.

Special features

By-pass valve: The location close to the inlet port prevents dirt particles retained by the filter element from entering into the clear oil side.

Removable bowl: In case of maintenance the filter bowl is removed together with the filter element - therefore dirt particles are not flushed back into the tank.

Filling filter/By-pass

protection strainer: The filling filter is integrated in the filter element and prevents coarse particles from entering during filling or re-filling due to maintenance or repair reasons. Filling can be carried out at the filter. Therefore the cover must be removed.
In operation, the filling filter functions as a by-pass protection strainer and prevents dirt from entering into the tank when the by-pass valve is open.

Port for

ventilating filter: The ventilating filter thread connection M 42 x 2 allows assembly of a ventilating filter, which assures ventilation of the tank.
The ventilating filter has to be ordered separately.

Extension pipe: A correct extension pipe length ensures oil outlet below minimum oil level and prevents foaming.

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

| | |
|-----------------|---|
| Screw-on cap: | Polyester, GF reinforced |
| Filter head: | Aluminium alloy |
| Filter bowl: | Polyamide, CF reinforced, electrically conducting |
| Seals: | NBR (FPM on request) |
| Filter media: | EXAPOR®MAX 2 - inorganic multi-layer microfibre web |
| | Paper - cellulose web, impregnated with resin |
| Filling filter: | Polyamide, GF reinforced; Polyester web |

Accessories

Electrical and optical clogging indicators are available on request. Dimensions and technical data see catalogue sheet 60.20. Ventilating filters with connection thread M 42 x 2 have to be ordered separately. Dimensions and technical data see catalogue sheet 50.20 and 50.30.

Extension pipes or diffusors on the bowl outlet are available on request.

Characteristics

Nominal flow rate

Return filter: Up to 220 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 $\leq 4,5 \text{ m/s}$

Filling filter: up to 20 l/min (see Selection Chart, column 3)

Connection

Threaded ports according to ISO 228 or DIN 13.

Sizes see Selection Chart, column 9 (other port threads on request)

Filter fineness

5 $\mu\text{m}(c)$... 30 $\mu\text{m}(c)$

β -values according to ISO 16889

(see Selection Chart, column 5 and diagram Dx)

Dirt-holding capacity

Values in g test dust ISO MTD according to ISO 16889

(see Selection Chart, column 6)

Hydraulic fluids

Mineral oil and biodegradable fluids

(HEES and HETG, see info-sheet 00.20)

With high filling conditions we recommend an electrical conductivity $\geq 500 \text{ pS/m}$ at 20°C.

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.

Operating pressure

Max. 10 bar

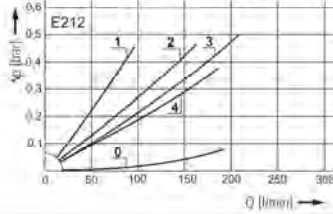
Mounting position

Preferably vertical, outlet downwards

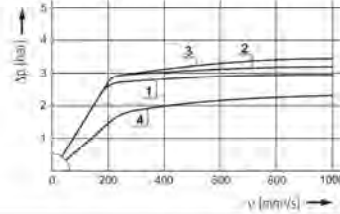
Diagrams

Δp -curves for complete filters in Selection Chart, column 4

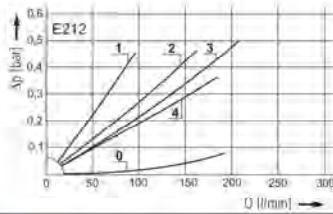
D1 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$ ($0=\text{casing empty}$)



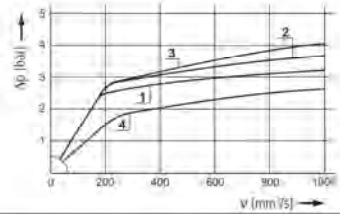
Pressure drop as a function of the **kinematic viscosity** at nominal flow



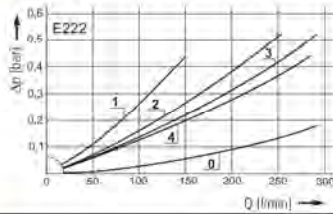
D2 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$ ($0=\text{casing empty}$)



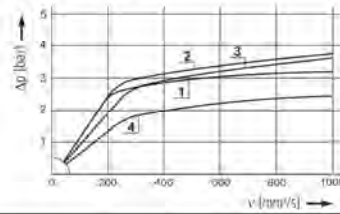
Pressure drop as a function of the **kinematic viscosity** at nominal flow



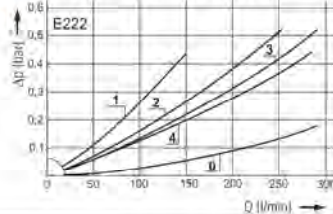
D3 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$ ($0=\text{casing empty}$)



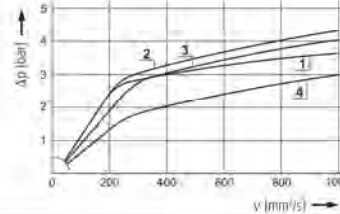
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D4 Pressure drop as a function of the **flow volume** at $v = 35 \text{ mm}^2/\text{s}$ ($0=\text{casing empty}$)

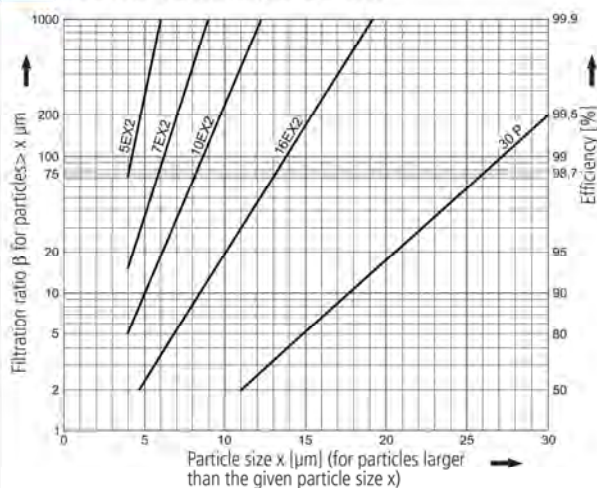


Pressure drop as a function of the **kinematic viscosity** at nominal flow



Filter fineness curves in Selection Chart, column 5

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 = $\beta_{5(\mu)}$ = 200 EXAPOR[®]MAX 2

7EX2 = $\beta_{7(\mu)}$ = 200 EXAPOR[®]MAX 2

10EX2 = $\beta_{10(\mu)}$ = 200 EXAPOR[®]MAX 2

16EX2 = $\beta_{16(\mu)}$ = 200 EXAPOR[®]MAX 2

30P = $\beta_{30(\mu)}$ = 200 Paper

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 Chart

| Part No. | Nominal flow rate return filter | Nominal flow rate filling filter ¹ | Pressure drop see diagram D/curve no. | Filter fineness see diag. Dx | Dirt-holding capacity | Filter fineness filling filter/ by-pass protection strainer | Filter surface filling filter/ by-pass protection strainer | Connection A, A ₁ | Cracking pressure of by-pass | Symbol | Replacement filter element Part No. | Ventilating filter thread connection M42x2 | Weight | Remarks |
|-----------|---------------------------------|---|---------------------------------------|------------------------------|-----------------------|---|--|------------------------------|------------------------------|--------|-------------------------------------|--|--------|---------|
| 1 | l/min | l/min | 4 | 5 | g | µm | cm ² | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| E 212-159 | 80 | - | D1/1 | 5EX2 | 29 | - | - | G1¼ | 2,5 | 1 | V7.0820-03 | - | 1,7 | |
| E 212-156 | 140 | - | D1/2 | 10EX2 | 43 | - | - | G1¼ | 2,5 | 1 | V7.0820-06 | - | 1,7 | |
| E 212-158 | 190 | - | D1/3 | 16EX2 | 43 | - | - | G1¼ | 2,5 | 1 | V7.0820-08 | - | 1,7 | |
| E 212-151 | 160 | - | D1/4 | 30 P | 21 | - | - | G1¼ | 1,5 | 1 | P7.0820-11 ² | - | 1,7 | |
| E 212-359 | 80 | 20 | D2/1 | 5EX2 | 29 | 450 | 85 | G1¼ | 2,5 | 3 | K7.0820-03 | • | 2,0 | 3 |
| E 212-356 | 140 | 20 | D2/2 | 10EX2 | 43 | 450 | 85 | G1¼ | 2,5 | 3 | K7.0820-06 | • | 2,0 | 3 |
| E 212-358 | 190 | 20 | D2/3 | 16EX2 | 43 | 450 | 85 | G1¼ | 2,5 | 3 | K7.0820-08 | • | 2,0 | 3 |
| E 212-351 | 160 | 20 | D2/4 | 30 P | 21 | 450 | 85 | G1¼ | 1,5 | 3 | K7.0820-11 ² | • | 2,0 | 3 |
| E 222-159 | 130 | - | D3/1 | 5EX2 | 50 | - | - | G1¼ | 2,5 | 1 | V7.0833-03 | - | 2,1 | |
| E 222-156 | 220 | - | D3/2 | 10EX2 | 74 | - | - | G1¼ | 2,5 | 1 | V7.0833-06 | - | 2,1 | |
| E 222-158 | 220 | - | D3/3 | 16EX2 | 76 | - | - | G1¼ | 2,5 | 1 | V7.0833-08 | - | 2,1 | |
| E 222-151 | 220 | - | D3/4 | 30 P | 35 | - | - | G1¼ | 1,5 | 1 | P7.0833-11 ² | - | 2,1 | |
| E 222-359 | 130 | 20 | D4/1 | 5EX2 | 50 | 450 | 85 | G1¼ | 2,5 | 3 | K7.0833-03 | • | 2,4 | 3 |
| E 222-356 | 220 | 20 | D4/2 | 10EX2 | 74 | 450 | 85 | G1¼ | 2,5 | 3 | K7.0833-06 | • | 2,4 | 3 |
| E 222-358 | 220 | 20 | D4/3 | 16EX2 | 76 | 450 | 85 | G1¼ | 2,5 | 3 | K7.0833-08 | • | 2,4 | 3 |
| E 222-351 | 220 | 20 | D4/4 | 30 P | 35 | 450 | 85 | G1¼ | 1,5 | 3 | K7.0833-11 ² | • | 2,4 | 3 |

All filters are delivered with a plugged clogging indicator connection M 12 x 1,5. As clogging indicators either manometers or electrical pressure switches can be used. Optional extension pipes adapt the filter length to various tank depths.
For ordering of accessories please use the below mentioned codes.

Order example: The filter E 222-151 has to be supplied with an extension pipe for a mounting depth of 500 mm.

Order description: _____ **E 222-151** _____ **EV 500**

Part No. (Basic unit) _____

Mounted extension pipe (4 various lengths are available on request) _____

E 212: EV 300, EV 366, EV 400, EV 466

E 222: EV 434, EV 500, EV 534, EV 600

For the appropriate ventilating filters with M42x2 thread connection see catalogue sheet 50.20 and 50.30, for the appropriate clogging indicators see catalogue sheet 60.20.

Remarks:

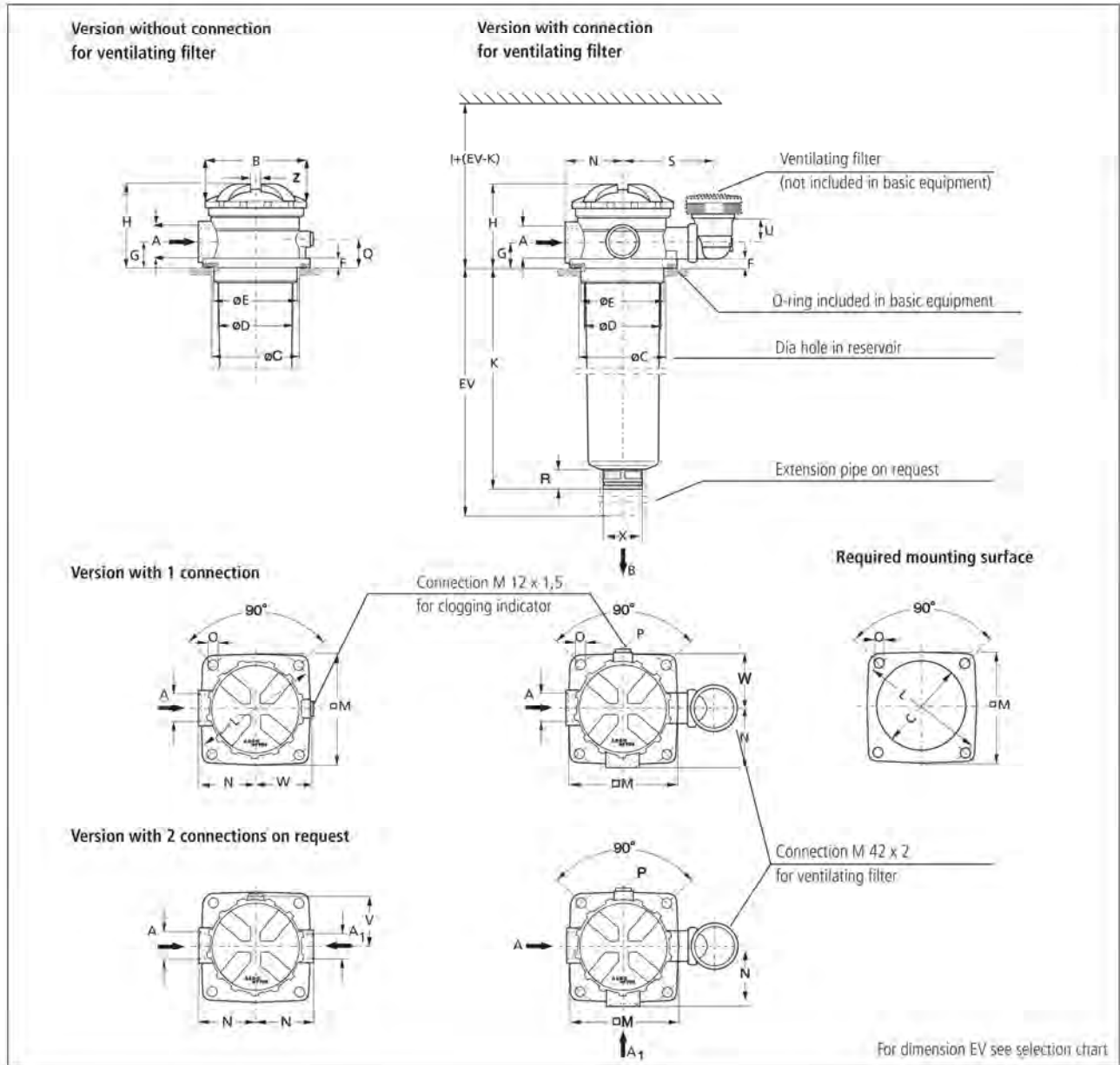
- The switching pressure of the electrical pressure switch has always to be lower than the cracking pressure of the by-pass valve (see Selection Chart, column 10).
- The clogging indicators are optionally available and will then be loosely provided.
- The filters listed in this chart are standard filters. Other designs available on request.

¹ at 200 mm²/s (ISO VG46 at ca. 15°C)

² Paper media supported with metal gauze

³ Open connection for ventilating filter. Please assemble ventilating filter before operating.

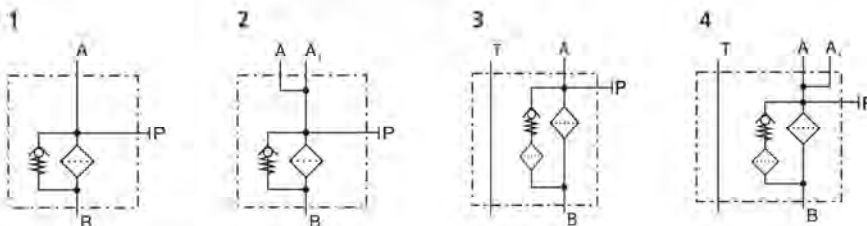
Dimensions



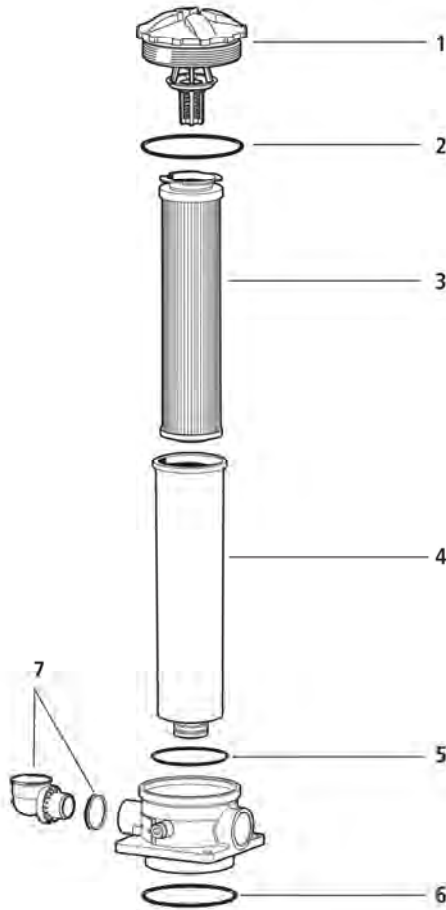
Measurements

| Typ | A, A ₁ | B | C min./max. | D | E | F | G | H | I | K | L | M | N | O | Q | R | S | U | V | W | X | Z |
|-------|-------------------|-----|----------------|----|-----|------|----|-----|-----|-----|-----|-----|----|----|----|----|-----|------|----|----|----|----|
| E 212 | G1¼ | 126 | 118/121 | 95 | 110 | 11,5 | 32 | 105 | 325 | 213 | 165 | 141 | 76 | 11 | 35 | 23 | 113 | 28,5 | 63 | 69 | 44 | 13 |
| E 222 | G1¼ | 126 | 118/121 | 95 | 110 | 11,5 | 32 | 105 | 455 | 347 | 165 | 141 | 76 | 11 | 35 | 23 | 113 | 28,5 | 63 | 69 | 44 | 13 |

Symbols



Spare Parts



| Pos. | Designation | Part No. |
|------|--|------------------|
| 1 | Screw-on cap with valve (2,5 bar) and Pos. 2 | E 221.1200 |
| 1 | Screw-on cap with valve (1,5 bar) and Pos. 2 | E 221.1210 |
| 2 | O-ring 100 x 4 | N007.1004 |
| 3 | Filter element | see Chart/col.12 |
| 4 | Filter bowl E 212* | E 212.0901 |
| 4 | Filter bowl E 222* | E 222.0901 |
| 5 | O-ring 90 x 4 | N007.0904 |
| 6 | O-ring 126 x 4 | N007.1264 |
| 7 | Connection for ventilating filter | |
| | O-ring 31 x 4 | E 222.1900 |

*Specify mounting depth (EV) in mm

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

Various quality controls during the production process guarantee the leakfree function and solidity of our filters.



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