Return Filters

E 043 · E 072

Tank top mounting · Connection up to G¾ · Nominal flow rate up to 70 l/min



Return Filter E 072

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 clean oil side.
- Removable bowl:
  In case of maintenance the filter bowl is removed together with the filter element – there fore dirt particles are not flushed back into the tank.
- 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

Ventilating filter

Ventilation of the reservoir by an integral star-shape pleated filter element:

- removable (replace annually!)
- splash-proof
- fineness 2 µm

Filter maintenance

By using a clogging indicator the correct moment for maintenance is stated and guarantees the optimum utilization of the filter life.

Minerials

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

Accessories

Electrical and optical clogging indicators are available on request. Dimensions and technical data see catalogue sheet 60.20.

An optional oil separator (Part No. E 043.1701) is available on request.

Extension pipes on the bowl outlet are available in several lengths on request.
A self-assembly system for installation of extension pipes can be ordered. For detailed information please see catalogue sheet 20.390.

Characteristics

Nominal flow rate

Up to 70 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 $\nu \leq 200$ mm²/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 ≤ 4,5 m/s

Connection

Threaded ports according to ISO 228 or DIN 13.
Sizes see Selection Chart, column 6 (other port threads on request)

Filter fineness

5 µm(c) ... 30 µm(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).
With high filling conditions we recommend an electrical conductivity >_ 500 pS/m at 20 °C.

Temperature range

-30 °C ... +100 °C (temporary -40 °C ... +120 °C)

Viscosity at nominal flow rate

- at operating temperature: $\nu < 60$ mm²/s
- as starting viscosity: $\nu_{max} = 1200$ mm²/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 inter-sects the Δp curve at a point. Read this point on the horizontal axis for the viscosity.

Operating pressure

Max. 10 bar

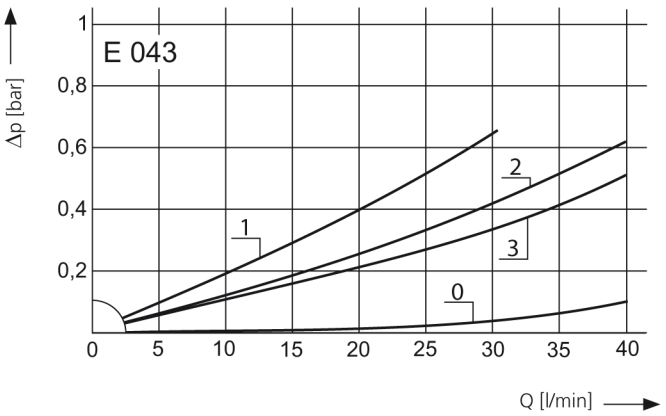
Mounting position

Preferably vertical, outlet downwards

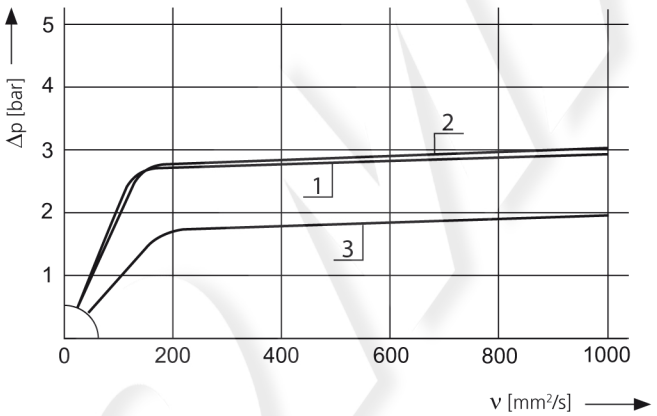
Diagrams

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

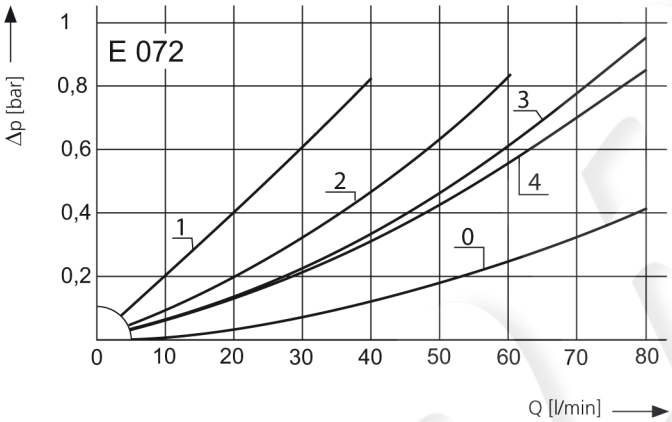
D1 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s (0 = casing empty)



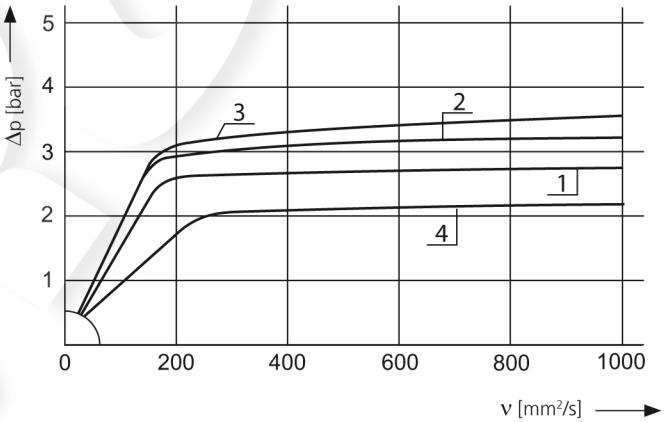
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D2 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s (0 = casing empty)

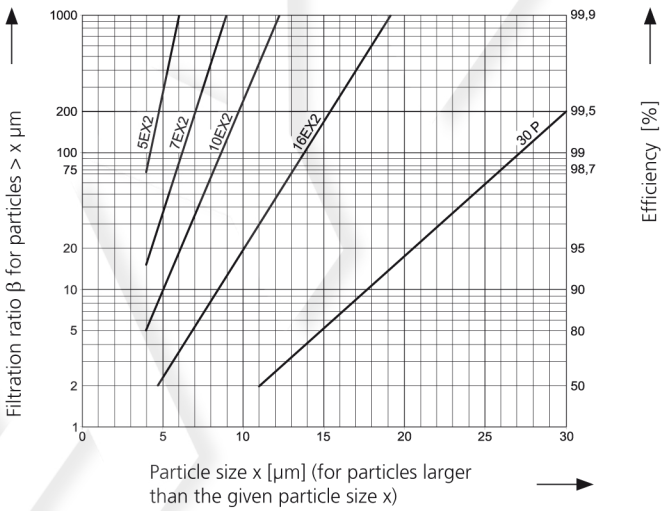


Pressure drop as a function of the **kinematic viscosity** at nominal flow



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®MAX 2 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	=	$\beta_{30\,(c)}$	= 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 ventilating filter elements:

2CL = 99,5 % efficiency for particles of size 2 µm

For special applications, finenesses differing from these curves are also available by using special composed filter material.

Selection Chart

Part No.	Nominal flow rate	Pressure drop see diagram **D/** curve no.	Filter fineness see Diagr. **Dx**	Dirt-holding capacity	Connection A	Cracking pressure of by-pass	Symbol	Replacement element Part No.	Weight	Replacement ventilating filter Part No. (Filter fineness see diagrams)	Remarks
	l/min			g		bar			kg		
1	2	3	4	5	6	7	8	9	10	11	12
E 043-156	25	**D1**/1	10EX2	6,1	G 1/2	2,5	2	V3.0510-56	0,6	L1.0403-01 (2CL)	-
E 043-166	25	**D1**/1	10EX2	6,1	G 1/2	2,5	1	V3.0510-56	0,6	-	-
E 043-158	35	**D1**/2	16EX2	6,1	G 1/2	2,5	2	V3.0510-58	0,6	L1.0403-01 (2CL)	-
E 043-168	35	**D1**/2	16EX2	6,1	G 1/2	2,5	1	V3.0510-58	0,6	-	-
E 043-151	30	**D1**/3	30P	4,0	G 1/2	1,5	2	P3.0510-51	0,6	L1.0403-01 (2CL)	-
E 043-161	30	**D1**/3	30P	4,0	G 1/2	1,5	1	P3.0510-51	0,6	-	-
E 072-153	25	**D2**/1	5EX2	7,7	G 3/4	2,5	2	V3.0520-53	0,8	L1.0403-01 (2CL)	-
E 072-163	25	**D2**/1	5EX2	7,7	G 3/4	2,5	1	V3.0520-53	0,8	-	-
E 072-156	50	**D2**/2	10EX2	13	G 3/4	2,5	2	V3.0520-56	0,8	L1.0403-01 (2CL)	-
E 072-166	50	**D2**/2	10EX2	13	G 3/4	2,5	1	V3.0520-56	0,8	-	-
E 072-158	70	**D2**/3	16EX2	13	G 3/4	2,5	2	V3.0520-58	0,8	L1.0403-01 (2CL)	-
E 072-168	70	**D2**/3	16EX2	13	G 3/4	2,5	1	V3.0520-58	0,8	-	-
E 072-151	50	**D2**/4	30P	6,6	G 3/4	1,5	2	P3.0520-51*	0,8	L1.0403-01 (2CL)	-
E 072-161	50	**D2**/4	30P	6,6	G 3/4	1,5	1	P3.0520-51*	0,8	-	-

* Paper media supported with metal gauze

All filters are delivered with a plugged clogging indicator connection M12 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 072-156 has to be supplied with an extension pipe for a mounting depth of 500 mm.

Order description: **E 072-156** / **EV 500**

Part No. (Basic unit)

Mounted extension pipe (5 various lengths are available on request)

E 043: EV 150, EV 200, EV 300, EV 400, EV 500
E 072: EV 250, EV 300, EV 400, EV 500, EV 600

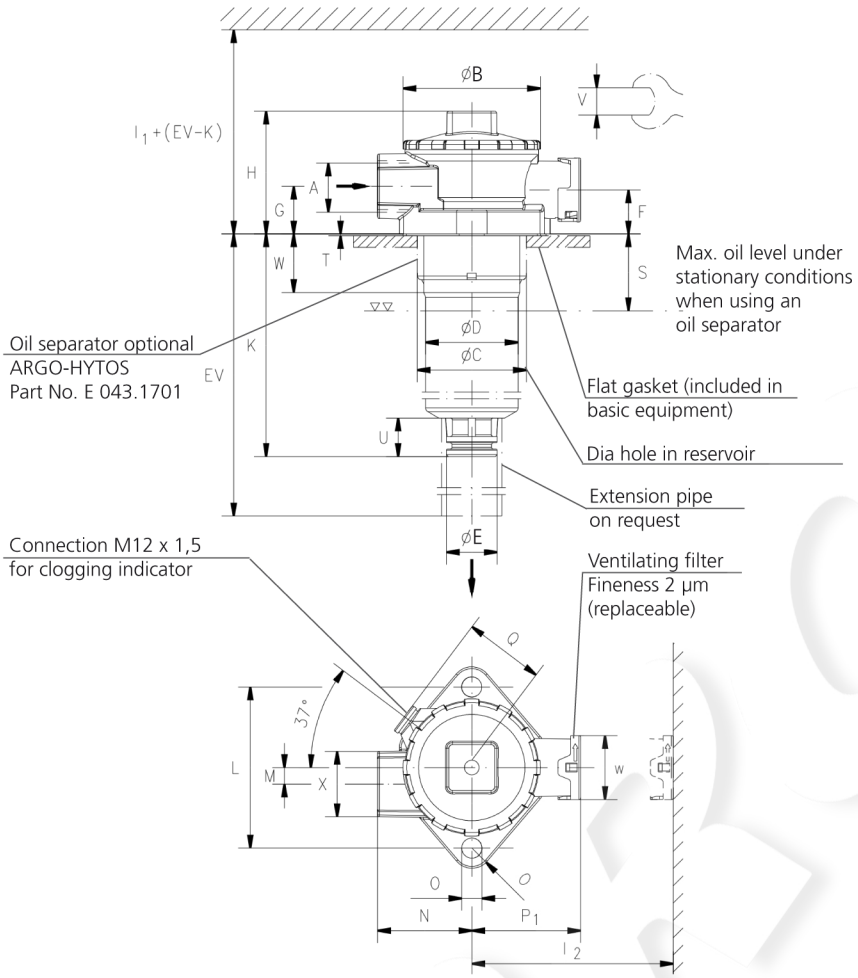
For the appropriate clogging indicators see catalogue sheet 60.20.

Remarks:

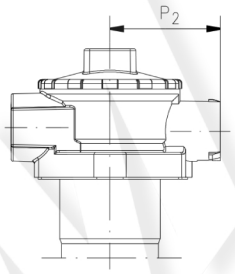
- The switching pressure of the electrical pressure switch has always to be lower than the cracking pressure of the by-pass valve (see Selection Chart, column 7).
- Clogging indicators are optional and always delivered detached from the filter.
- The filters listed in this chart are standard filters. Other designs available on request.

Dimensions

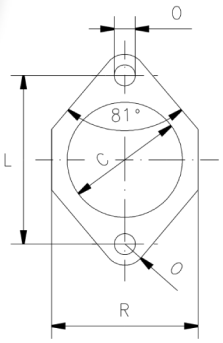
Design with ventilating filter



Design without ventilating filter



Required mounting surface



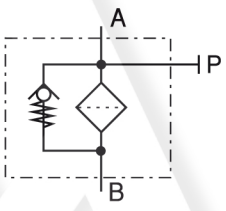
Measurements

Type	A	B	C min/max	D	E	F	G	H	I1	I2	K	L	M	N	O	P1	P2	Q	R	S
E 043	G1/2	75	60/63	51	27,8	24	26	67	175	110	83	88	9	51	11	59,5	57,5	46	79	42
E 072	G3/4	75	60/63	51	27,8	24	26	67	270	110	180	88	9	51	11	59,5	57,5	46	79	42

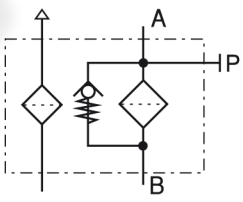
Type	T	U	V	W	X
E 043	2	21	AF 21	35	AF 36
E 043	2	21	AF 21	35	AF 36

Symbols

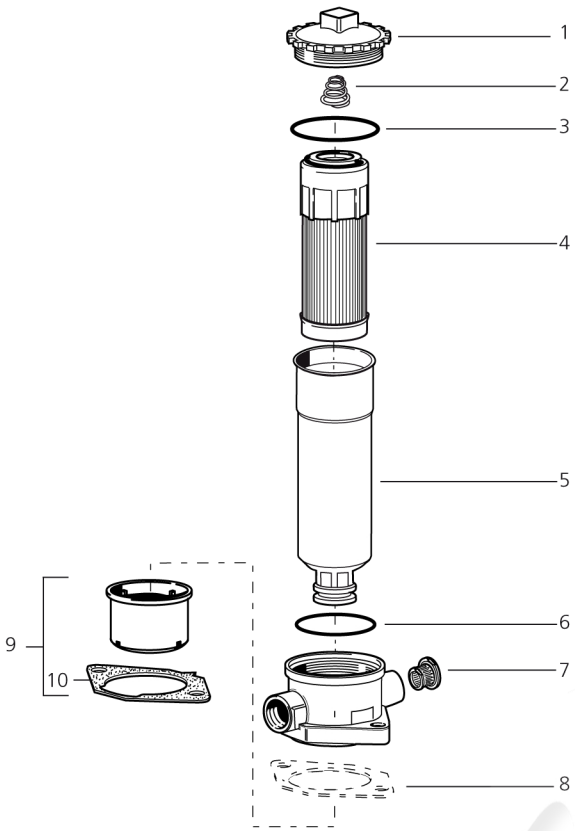
1



2



Spare Parts



Pos.	Designation	Part No.
1	Screw-on cap	FR 043.0201
2	Compression spring	N015.1606
3	O-ring 57 x 3	N007.0573
4	Filter element	see Chart / col. 9
5	Filter bowl E 043 *	FR 043.0107
5	Filter bowl E 072 *	FR 072.0104
6	O-ring 50 x 2	N007.0501
7	Ventilating filter	L1.0403-01
8	Flat gasket (for versions without oil separator)	D 043.0113
9	Oil separator with Pos. 10	E 043.1701
10	Flat gasket (for versions with oil separator)	D 043.0118

* 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.