



Return Filters

E 094 · E 103 · E 143

- Tank top mounting
- Connection up to G1
- Nominal flow rate up to 135 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 clean 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.

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.

Materials

Screw-on cap: Polyamide, GF reinforced
Filter head: Aluminium alloy
Filter bowl: Polyamide, GF reinforced*
Seals: NBR (Viton on request)
Filter media: EXAPOR®MAX - inorganic multi-layer microfibre web
Paper - cellulose web, impregnated with resin

* due to the conductable plastic material no static charge can occur

Accessories

An optional oil separator (Part No. E 103.1702) prevents oil splashing through the ventilating filter at mobile applications.

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

Characteristics

Nominal flow rate

Up to 135 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 $\leq 4,5 \text{ m/s}$

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 $\geq 500 \text{ pS/m}$ 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: $v_{\text{max}} = 1200 \text{ mm}^2/\text{s}$
- at first 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

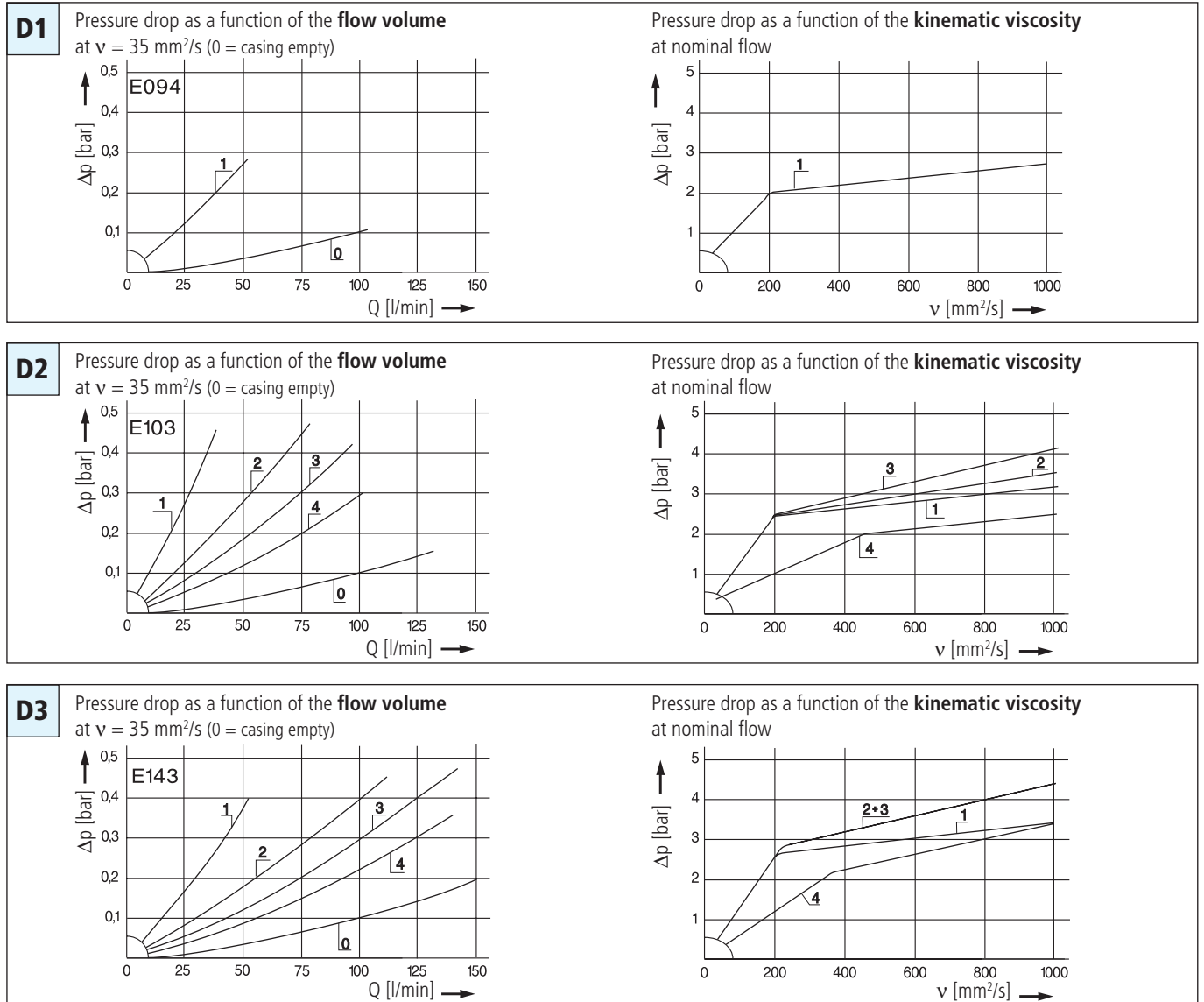
Max. 10 bar

Mounting position

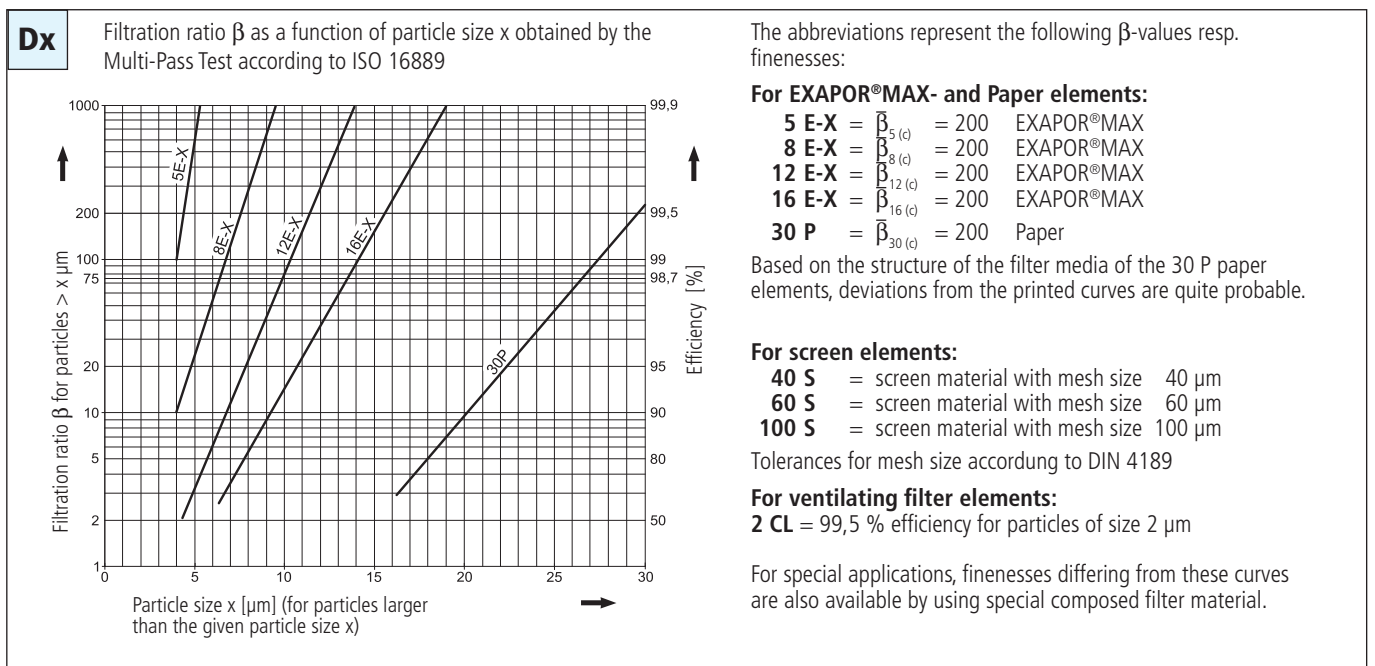
Preferably vertical, outlet downwards

Diagrams

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



Filter fineness curves in Selection Chart, column 4



Selection Chart

Part No.	Nominal flow 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.	Remarks		
1	l/min	3	g	bar	8	9	10	11	12		
E 094-661	50	D1/1	30 P	11	G ³ / ₄	1,5	2	P3.0613-51	0,8	L1.0503-03 (2 CL)	-
E 094-671	50	D1/1	30 P	11	G ³ / ₄	1,5	1	P3.0613-51	0,8	-	-
E 103-657	35	D2/1	5 E-X	13	G ¹ / ₂	2,5	2	V3.0620-53	1,0	L1.0503-03 (2 CL)	-
E 103-677	35	D2/1	5 E-X	13	G ¹ / ₂	2,5	1	V3.0620-53	1,0	-	-
E 103-676	75	D2/2	12 E-X	22	G ³ / ₄	2,5	2	V3.0620-56	1,0	L1.0503-03 (2 CL)	-
E 103-686	75	D2/2	12 E-X	22	G ³ / ₄	2,5	1	V3.0620-56	1,0	-	-
E 103-898	95	D2/3	16 E-X	24	G1	2,5	2	V3.0620-58	1,0	L1.0503-03 (2 CL)	-
E 103-888	95	D2/3	16 E-X	24	G1	2,5	1	V3.0620-58	1,0	-	-
E 103-871	70	D2/4	30 P	11	G ³ / ₄	1,5	2	P3.0620-51*	1,0	L1.0503-03 (2 CL)	-
E 103-861	70	D2/4	30 P	11	G ³ / ₄	1,5	1	P3.0620-51*	1,0	-	-
E 143-657	55	D3/1	5 E-X	21	G ³ / ₄	2,5	2	V3.0730-53	1,2	L1.0503-03 (2 CL)	-
E 143-667	55	D3/1	5 E-X	21	G ³ / ₄	2,5	1	V3.0730-53	1,2	-	-
E 143-676	115	D3/2	12 E-X	32	G1	2,5	2	V3.0730-56	1,2	L1.0503-03 (2 CL)	-
E 143-686	115	D3/2	12 E-X	32	G1	2,5	1	V3.0730-56	1,2	-	-
E 143-888	135	D3/3	16 E-X	36	G1	2,5	2	V3.0730-58	1,2	L1.0503-03 (2 CL)	-
E 143-688	135	D3/3	16 E-X	36	G1	2,5	1	V3.0730-58	1,2	-	-
E 143-851	120	D3/4	30 P	17	G1	1,5	2	P3.0730-51*	1,2	L1.0503-03 (2 CL)	-
E 143-861	120	D3/4	30 P	17	G1	1,5	1	P3.0730-51*	1,2	-	-

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 103-676 has to be supplied with an extension pipe for 300 mm length.

Order description: E 103-676 / EV 300

Part No. (basic unit) _____

Extension pipe (7 various lengths are available) _____

EV = K (Bowl length) + 19 / + 79 / + 123 / + 173 / + 223 / + 323 / + 423 mm (see dimensions and measurements)

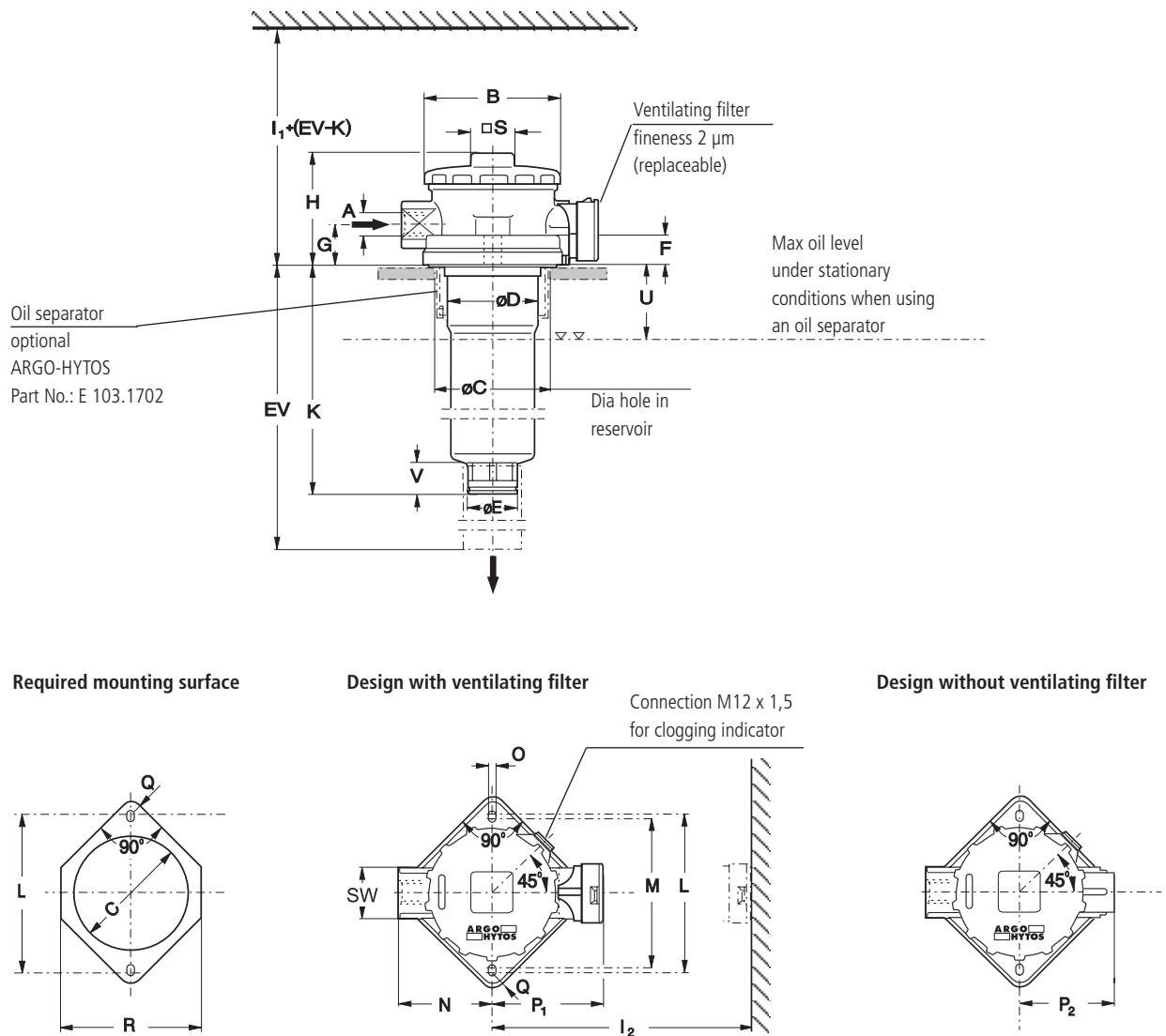
For the suitable clogging indicators please see catalogue sheet 60.20.

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).
- The clogging indicators are always delivered detached from the filter.
- The filters listed in this chart are standard filters. Other designs available on request.

* Paper media supported with metal gauze

Dimensions



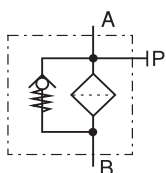
Measurements

Type	A	B	C min./max.	D	E	F	G	H	I ₁	I ₂	K	L	M	N	O	P ₁	P ₂	Q	R	S	SW	U	V
E 094	G ³ / ₄	105	87 / 91	73,5	38	20,5	30	88,5	235	95	111	115	110	70	11	82	69	13,5	107,5	32	41	50	23
E 103	G ¹ / ₂ , G ³ / ₄ , G1	105	87 / 91	73,5	38	20,5	30	88,5	300	95	177	115	110	70	11	82	69	13,5	107,5	32	41	50	23
E 143	G ³ / ₄ , G1	105	87 / 91	73,5	38	20,5	30	88,5	400	95	278	115	110	70	11	82	69	13,5	107,5	32	41	50	23

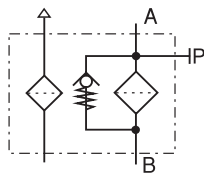
For calculation of EV use data in Selection Chart

Symbols

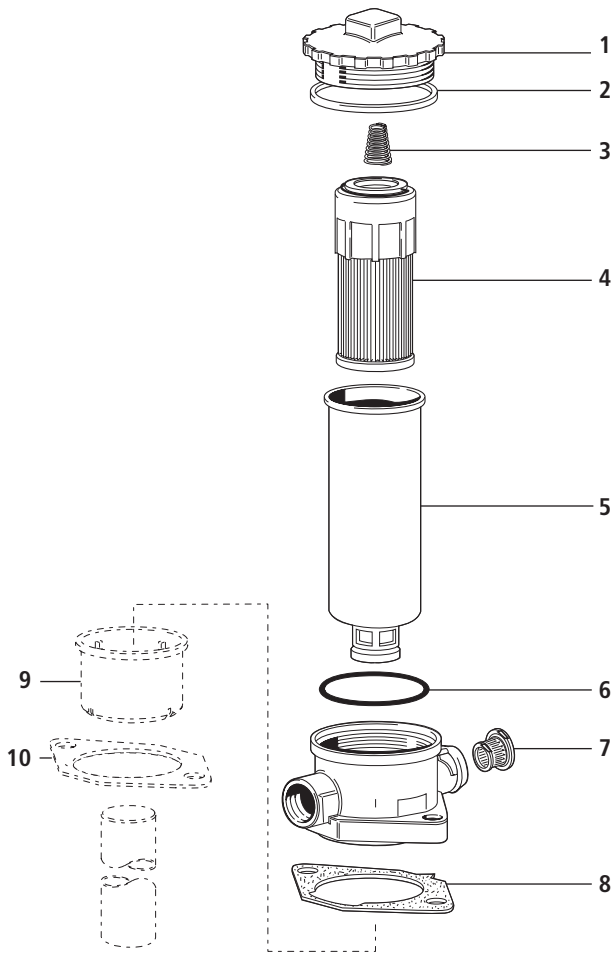
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Spare Parts



Pos.	Designation	Part No.
1	Screw-on cap	E 103.0201
2	Seal	N 031.0841
3	Compression spring	N015.3703
4	Filter element	see Chart / col. 9
5	Filter bowl E094 *	E 094.0903
5	Filter bowl E103 *	E 103.0912
5	Filter bowl E143 *	E 143.0903
6	O-ring 69,5 x 3,5	N 007.0703
7	Ventilating filter	L1.0503-03K
8	Seal (for versions without oil separator)	E 103.0147
9	Oil separator with Pos. 10	E 103.1702
10	Seal (for versions with oil separator)	E 103.0148

* Specify mounting depth 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 DIN and ISO standards:

DIN ISO 2941	Verification of collapse/burst resistance
DIN ISO 2943	Verification of material compatibility with fluids
DIN ISO 3724	Verification of flow fatigue characteristics

ISO 2942 ISO 3968 ISO 16889

Verification of fabrication integrity (Bubble Point Test)
Evaluation of pressure drop versus flow characteristics
Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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

Our engineers will be glad to advice 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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