



Return Filters

E 094 • E 103 • E 143

- Tank top mounting
- Connection -16 SAE
- Nominal flow rate up to 35.7 gpm

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.

Oil separator: Prevents oil splashing through the breather on mobile application.

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

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

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:	Aluminum alloy
Filter bowl:	Polyamide, CF reinforced, electrically conducting
Seals:	NBR (FKM on request)
Filter media:	EXAPOR®MAX 2 - inorganic 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 catalog sheet 60.20.

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 catalog sheet 20.390.

Characteristics

Nominal flow rate

Up to 35.7 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 ≤ 14.8 ft/s

Connection

Threaded ports according to SAE standard J1514.

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 68 °F

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.

Operating pressure

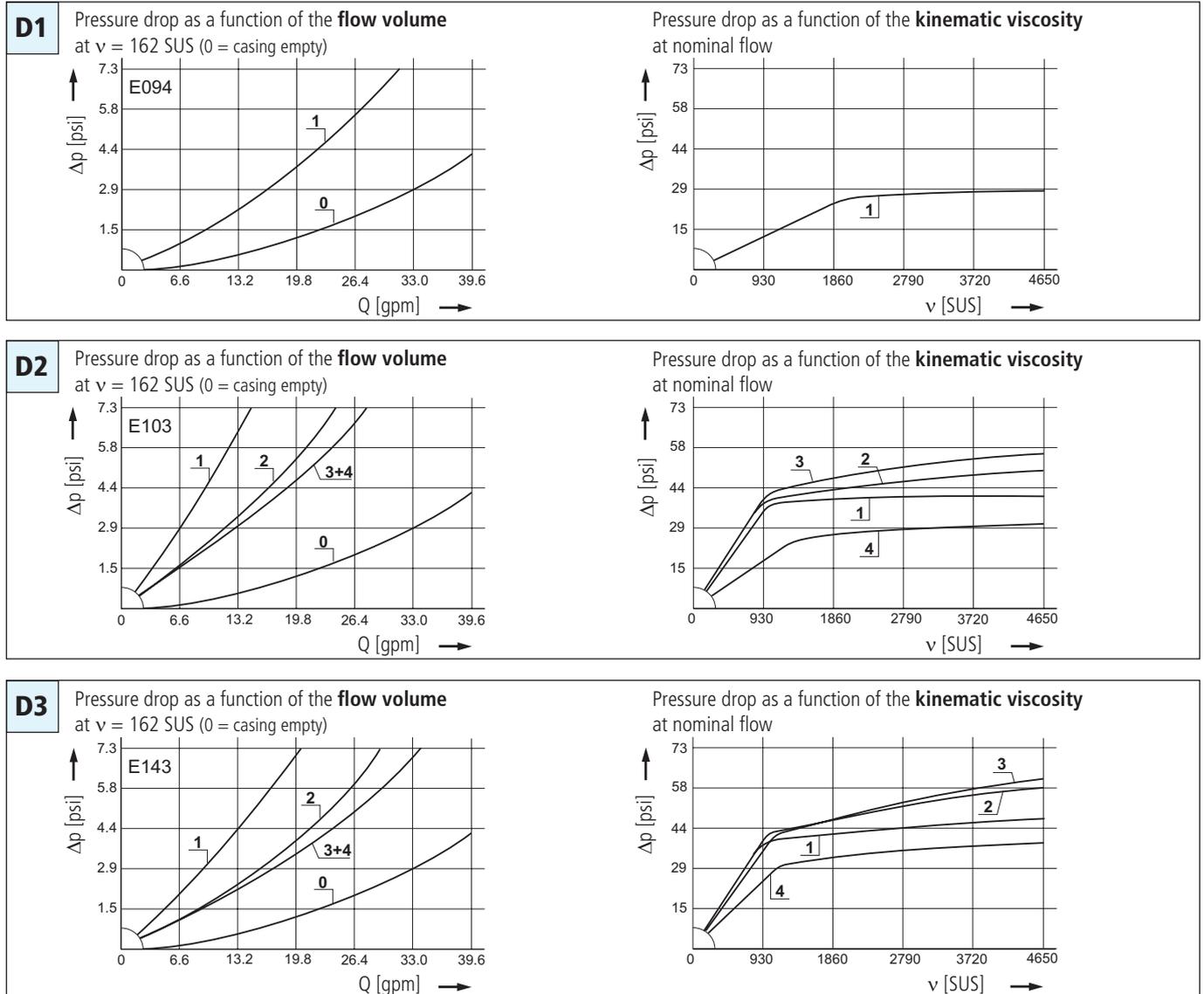
Max. 145 psi

Mounting position

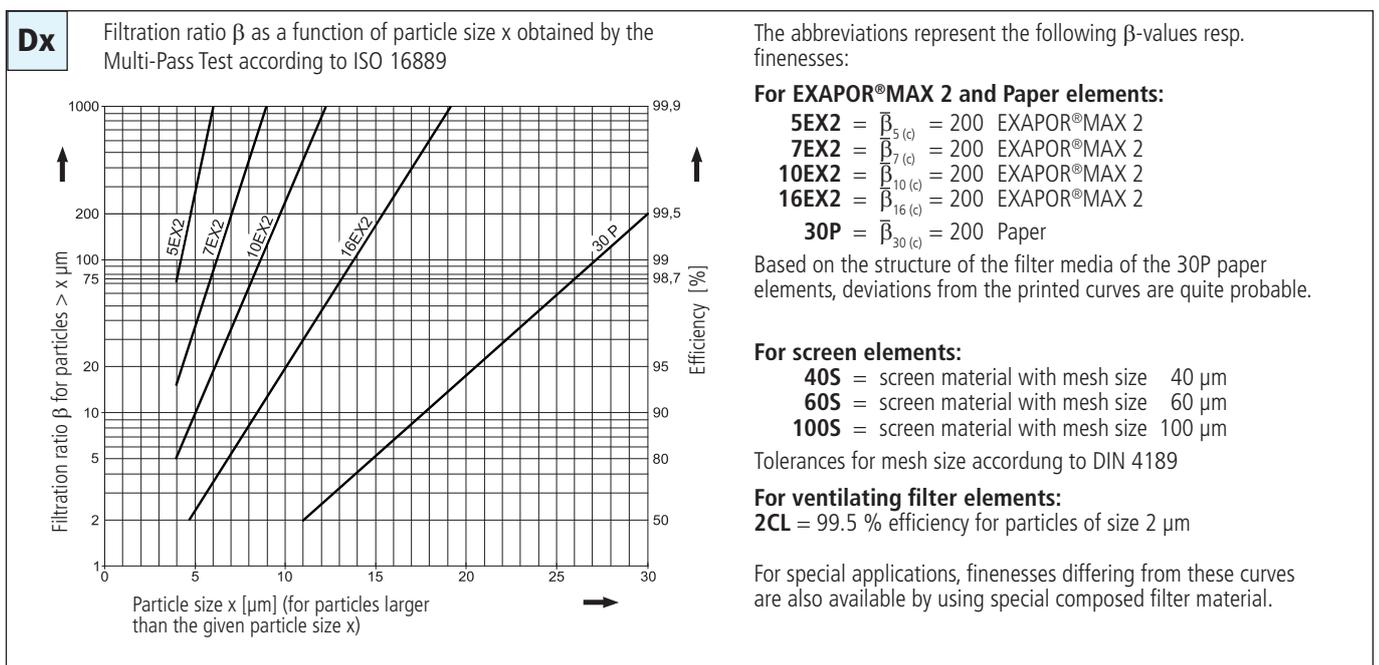
Preferably vertical, outlet downwards

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 rate	Pressure drop see diagram D /curve no.	Filter fineness see Dx	Dirt-holding capacity	Connection A	Cracking pressure of by-pass	Replacement element Part No.	Weight	Replacement ventilating filter Part No. (Filter fineness, see diagrams)	Remarks	
1	gpm	3	4	g	SAE	psi	8	9	10	11	12
E 094-761	13.2	D1 /1	30P	11	-16 ¹	22	2	P3.0613-51	1.8	L1.0503-03 (2CL)	with oil separator
E 094-751	13.2	D1 /1	30P	11	-16 ¹	22	1	P3.0613-51	1.8	-	-
E 103-763	11.9	D2 /1	5EX2	18	-16 ¹	36	2	V3.0620-53	2.2	L1.0503-03 (2CL)	with oil separator
E 103-753	11.9	D2 /1	5EX2	18	-16 ¹	36	1	V3.0620-53	2.2	-	-
E 103-777	21.1	D2 /2	10EX2	25	-16 ¹	36	2	V3.0620-56	2.2	L1.0503-03 (2CL)	with oil separator
E 103-756	21.1	D2 /2	10EX2	25	-16 ¹	36	1	V3.0620-56	2.2	-	-
E 103-798	29.1	D2 /3	16EX2	25	-16 ¹	36	2	V3.0620-58	2.2	L1.0503-03 (2CL)	with oil separator
E 103-788	29.1	D2 /3	16EX2	25	-16 ¹	36	1	V3.0620-58	2.2	-	-
E 103-761	18.5	D2 /4	30P	11	-16 ¹	22	2	P3.0620-51 ²	2.2	L1.0503-03 (2CL)	with oil separator
E 103-751	18.5	D2 /4	30P	11	-16 ¹	22	1	P3.0620-51 ²	2.2	-	-
E 143-763	18.5	D3 /1	5EX2	28	-16 ¹	36	2	V3.0730-53	2.7	L1.0503-03 (2CL)	with oil separator
E 143-753	18.5	D3 /1	5EX2	28	-16 ¹	36	1	V3.0730-53	2.7	-	-
E 143-776	30.4	D3 /2	10EX2	38	-16 ¹	36	2	V3.0730-56	2.7	L1.0503-03 (2CL)	with oil separator
E 143-786	30.4	D3 /2	10EX2	38	-16 ¹	36	1	V3.0730-56	2.7	-	-
E 143-788	35.7	D3 /3	16EX2	38	-16 ¹	36	2	V3.0730-58	2.7	L1.0503-03 (2CL)	with oil separator
E 143-798	35.7	D3 /3	16EX2	38	-16 ¹	36	1	V3.0730-58	2.7	-	-
E 143-761	31.7	D3 /4	30P	17	-16 ¹	22	2	P3.0730-51 ²	2.7	L1.0503-03 (2CL)	with oil separator
E 143-751	31.7	D3 /4	30P	17	-16 ¹	22	1	P3.0730-51 ²	2.7	-	-

All filters are delivered with a plugged clogging indicator connection M12 x 1.5 mm. 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 103-763 has to be supplied with an extension pipe for a mounting depth of 500 mm (resp. 19.69 inch)

Order description: **E 103-763** **EV 500**
Part No. (Basic unit) _____

Mounted extension pipe (7 various lengths are available on request) _____

E 094: EV 130 (5.12 inch), EV 190 (7.48 inch), EV 234 (9.21 inch), EV 284 (11.18 inch), EV 334 (13.15 inch), EV 434 (17.09 inch), EV 534 (21.02 inch)

E 103: EV 196 (7.71 inch), EV 256 (10.08 inch), EV 300 (11.81 inch), EV 350 (13.78 inch), EV 400 (15.74 inch), EV 500 (19.69 inch), EV 600 (23.62 inch)

E 143: EV 297 (11.69 inch), EV 357 (14.06 inch), EV 400 (15.74 inch), EV 450 (17.71 inch), EV 500 (19.69 inch), EV 600 (23.62 inch), EV 700 (27.56 inch)

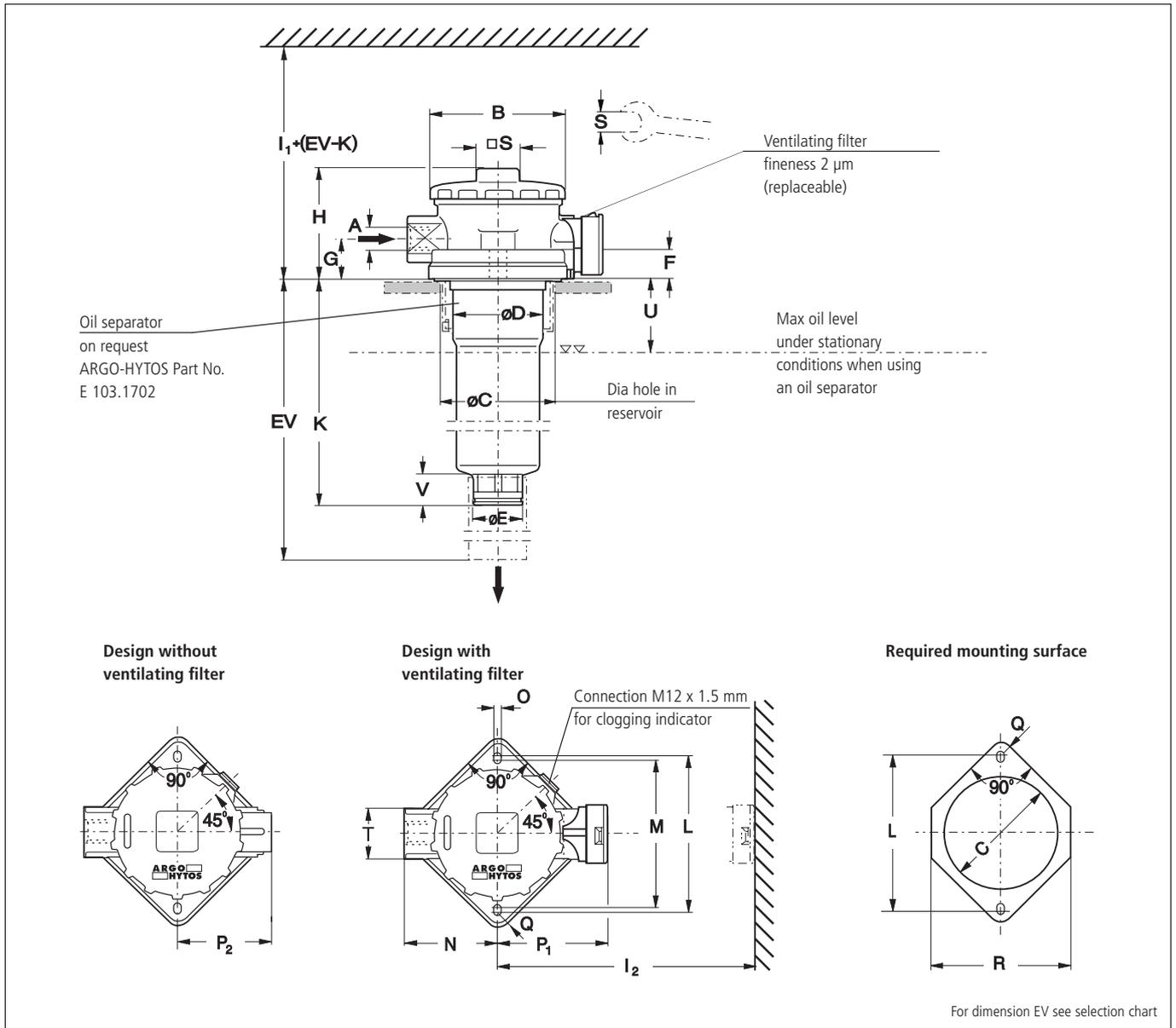
For the suitable clogging indicators please see catalog sheet 60.20.

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.

¹ corresponds to 1³/₁₆-12 UN-2B ² Paper media supported with metal gauze

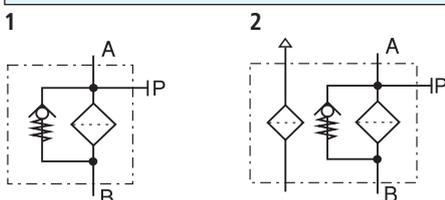
Dimensions



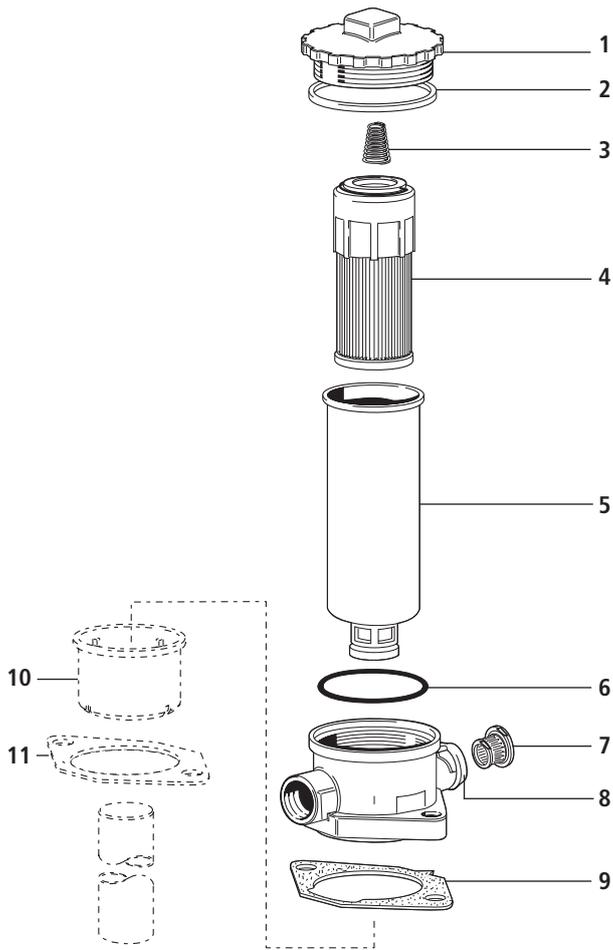
Measurements

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
E 094	-16 SAE	4.13	3.43/3.58	2.9	1.5	0.81	1.18	3.48	9.25	4.92	4.37	4.53	4.33	2.76	0.43	3.23	2.72	0.53	4.23
E 103	-16 SAE	4.13	3.43/3.58	2.9	1.5	0.81	1.18	3.48	11.81	4.92	6.97	4.53	4.33	2.76	0.43	3.23	2.72	0.53	4.23
E 143	-16 SAE	4.13	3.43/3.58	2.9	1.5	0.81	1.18	3.48	15.75	4.92	10.94	4.53	4.33	2.76	0.43	3.23	2.72	0.53	4.23
Type	S mm	T mm	U	V															
E 094	AF 32	AF 41	1.97	0.91															
E 103	AF 32	AF 41	1.97	0.91															
E 143	AF 32	AF 41	1.97	0.91															

Symbols



Spare Parts



Pos.	Designation	Part No.
1	Screw-on cap	E 103.0201
2	Flat gasket	N031.0841
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 2.74 x 0.14	N007.0703
7	Ventilating filter	L1.0503-03K
8	Housing (for pos. 7)	L1.0503-0801
9	Flat gasket (for versions without oil separator)	E 103.0147
10	Oil separator with Pos. 11	E 103.1702
11	Flat gasket (for versions with oil separator)	E 103.0148

* 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.

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

ARGO-HYTOS Inc. · P.O. Box 28 · Bowling Green, OH 43402 · USA
 Phone: +1-419-353-6070 · Fax: +1-419-354-3496 · info.us@argo-hytos.com · www.argo-hytos.com

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