

**Return Filter****D 170 · D 230**

In-line mounting · Connection G 1¼ / - 20 SAE · Nominal flow rate up to 225 l/min / 59.5 gpm



In-line Return filter D 170

**Description****Application**

In the return line circuits of hydraulic systems.

**Performance features***Protection against wear:*

By means of filter elements that even in full-flow filtration meet 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.

**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:	Aluminum alloy
Filter bowl:	Polyamide, GF reinforced
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic multi-layer microfiber web Paper - cellulose web, impregnated with resin

**Accessories**

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

### Nominal flow rate

Up to 225 l/min / 59.5 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  $v \leq 200 \text{ mm}^2/\text{s} / 927 \text{ SUS}$
- › element service life > 1000 operating hours at an average fluid contamination of 0.07 g per l/min / 0.27 g per gpm flow volume
- › flow velocity in the connection lines  $\leq 4,5 \text{ m/s} / 14.8 \text{ ft/s}$

### Connection

Threaded ports according to

- › ISO 228 or DIN 13
- › SAE standard J514

Sizes see Selection Chart, column 6,  
(other port threads on request).

### Filter fineness

10  $\mu\text{m(c)}$  ... 30  $\mu\text{m(c)}$   
 $\beta$ -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

-30 °C ... +100 °C (temporary -40 °C ... +120 °C)  
-22 °F ... +212 °F (temporary -40 °F ... +248 °F)

### Viscosity at nominal flow rate

- › at operating temperature:  $v < 60 \text{ mm}^2/\text{s} / 280 \text{ SUS}$
- › as starting viscosity:  $v_{\text{max}} = 1200 \text{ mm}^2/\text{s} / 5560 \text{ SUS}$
- › 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%  $\Delta p$  of the cracking pressure of the by-pass valve on the vertical axis. Draw a horizontal line so that it intersects the  $\Delta p$  curve at a point. Read this point on the horizontal axis for the viscosity.

### Operating pressure

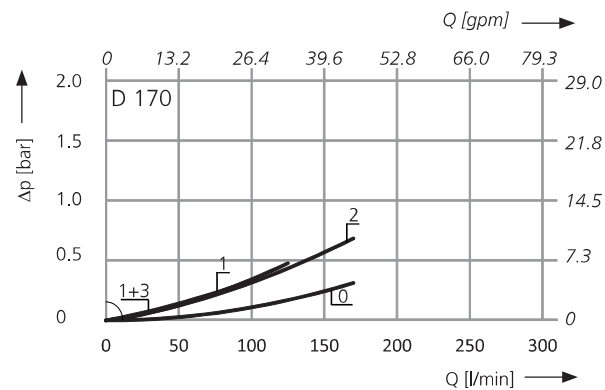
Maximal 10 bar / 145 psi

### Mounting position

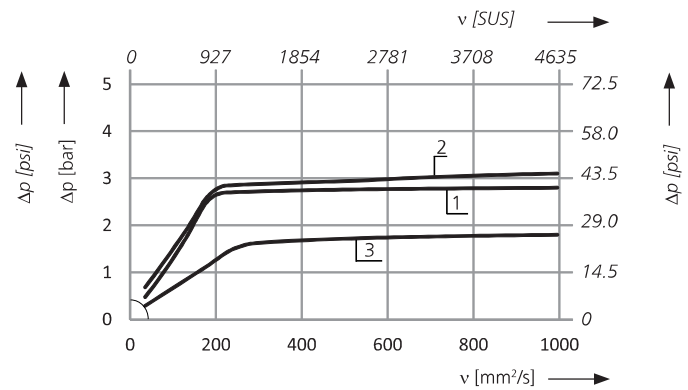
Preferably vertical, filter head on top.

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

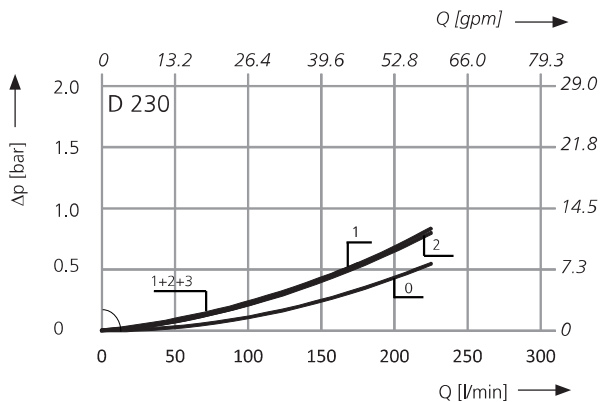
**D1** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$  (0 = casing empty)



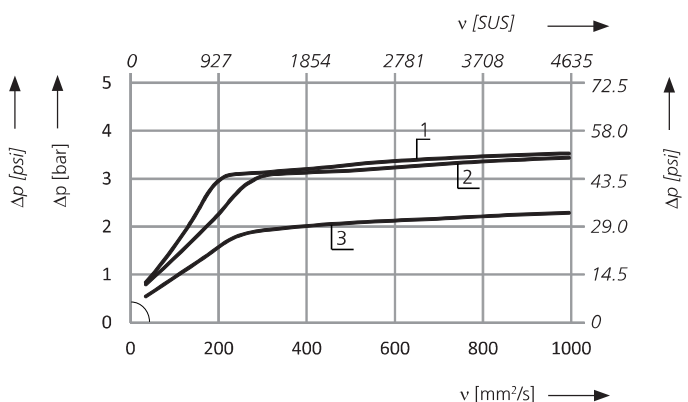
Pressure drop as a function of the **kinematic viscosity** at nominal flow



**D2** Pressure drop as a function of the **flow volume** at  $v = 35 \text{ mm}^2/\text{s} / 162 \text{ SUS}$  (0 = casing empty)

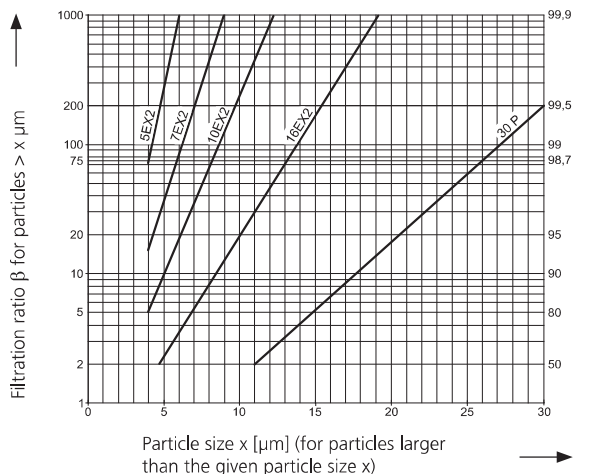


Pressure drop as a function of the **kinematic viscosity** at nominal flow



**Filter fineness curves in Selection Chart, column 4**

**Dx** Filtration ratio  $\beta$  as a function of particle size  $x$  obtained by the Multi-Pass Test according to ISO 16889



The abbreviations represent the following  $\beta$ -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  $\mu\text{m}$
- 60S = screen material with mesh size 60  $\mu\text{m}$
- 100S = screen material with mesh size 100  $\mu\text{m}$

Tolerances for mesh size according to DIN 4189

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. D <sub>x</sub>	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass	Symbol	Replacement element Part No.	Weight	Remarks
	l/min			g	bar				kg	
1	2	3	4	5	6	7	8	9	10	11
D 170-156	125	D1/1	10EX2	41	G1¼	2.5	2	V3.1014-26	1.9	-
D 170-158	170	D1/2	16EX2	42	G1¼	2.5	2	V3.1014-28	1.9	-
D 170-151	90	D1/3	30P	22	G1¼	1.5	2	P3.1014-01	1.9	-
D 230-156	225	D2/1	10EX2	80	G1¼	2.5	2	V3.1025-06	2.4	-
D 230-158	225	D2/2	16EX2	82	G1¼	2.5	2	V3.1025-08	2.4	-
D 230-151	175	D2/3	30P	42	G1¼	1.5	2	P3.1025-01	2.4	-

	gpm			g	SAE	psi			lbs	
1	2	3	4	5	6	7	8	9	10	11
D 170-756	33.0	D1/1	10EX2	41	-20*	36	2	V3.1014-26	4.12	-
D 170-758	44.9	D1/2	16EX2	42	-20*	36	2	V3.1014-28	4.12	-
D 170-751	23.8	D1/3	30P	22	-20*	22	2	P3.1014-01	4.12	-
D 230-756	59.5	D2/1	10EX2	80	-20*	36	2	V3.1025-06	5.29	-
D 230-758	59.5	D2/2	16EX2	82	-20*	36	2	V3.1025-08	5.29	-
D 230-751	46.2	D2/3	30P	42	-20*	22	2	P3.1025-01	5.29	-

\*Corresponds to 1½-12 UN-2B

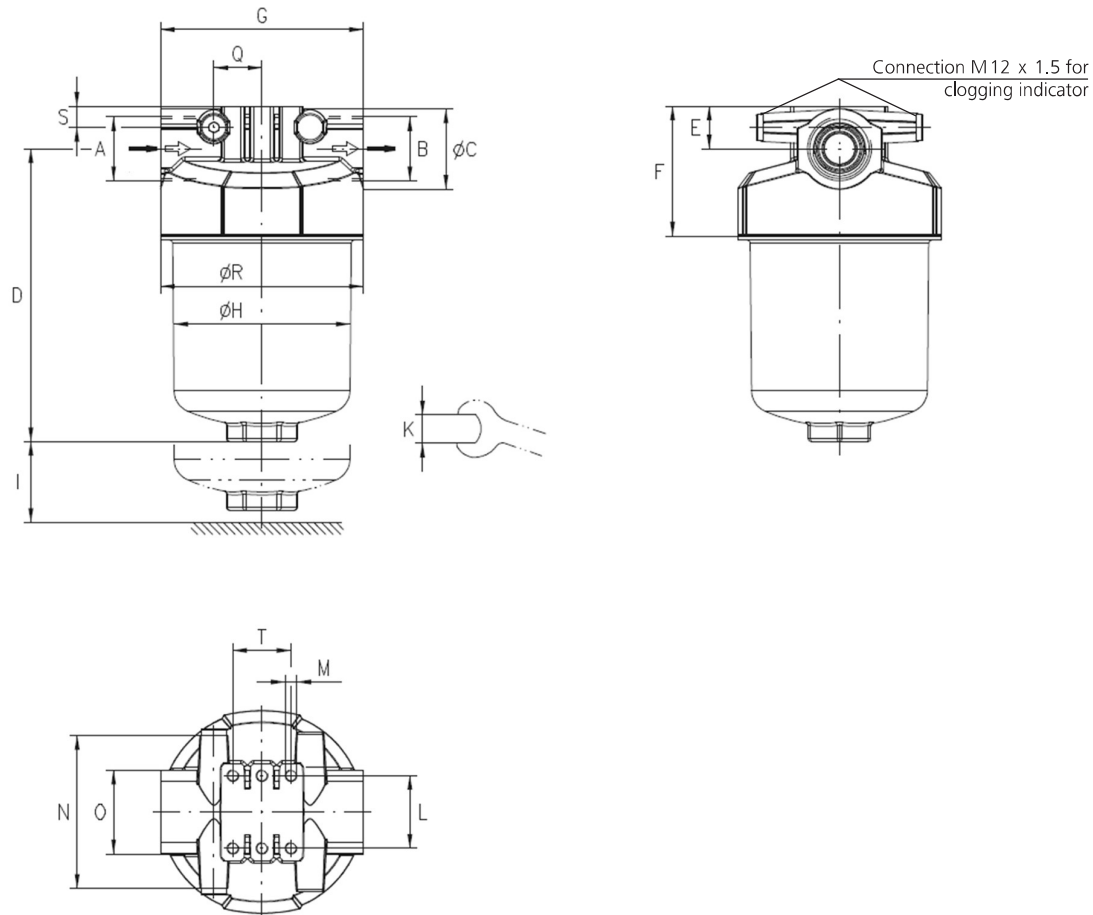
All filters are delivered with a plugged clogging indicator connection M12 x 1.5 mm.  
As clogging indicators either manometers or electrical pressure switches can be used.

**For the appropriate clogging indicator please see catalog sheet 60.20.**

### Remarks:

- › The indicating pressure of the pressure gauge or 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



## Measurements in mm

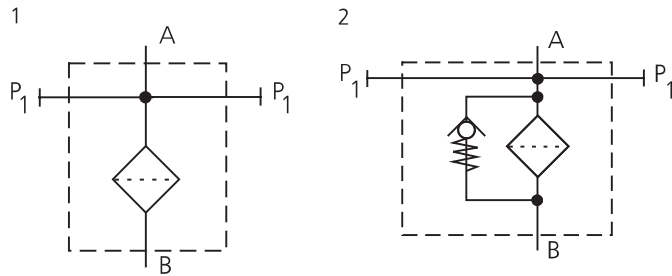
Type	A	B	C	D	E	F	G	H	I	K	L	M Ø / depth	N	O	Q	R
D 170	G1¼	G1¼	52	192	28	85	133	117	60	AF 41	47.6	M8 / 15	100	AF 55	31.5	133
D 230	G1¼	G1¼	52	302	28	85	133	117	60	AF 41	47.6	M8 / 15	100	AF 55	31.5	133
Type	S	T														
D 170	14	38.1														
D 230	14	38.1														

## Measurements in inch

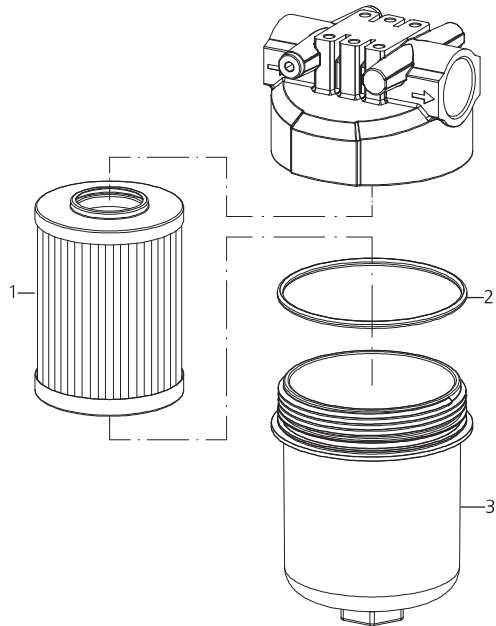
Type	A SAE	B SAE	C	D	E	F	G	H	I	K	L	M Ø / depth	N	O	Q	R
D 170	-20	-20	2.05	7.56	1.12	3.35	5.23	4.60	2.36	AF 41	1.87	M8 / 0.59	3.94	AF 55	1.24	5.24
D 230	-20	-20	2.05	11.89	1.12	3.35	5.23	4.60	2.36	AF 41	1.87	M8 / 0.59	3.94	AF 55	1.24	5.24
Type	S	T														
D 170	0.55	1.5														
D 230	0.55	1.5														

\* Corresponds to 1½-12 UN-2B

## Symbols



## Spare Parts



Pos.	Designation	Part No.
1	Replacement filter element	see Chart / col. 9
2	O-ring 115 x 4.5 mm 4.53 x 0.18 inch	N007.1155
3	Filter bowl D 170	D 230.0102
3	Filter bowl D 230	D 230.0101

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.**

Illustrations may sometimes differ from the original. ARGO-HYTOS is not responsible for any unintentional mistake in this specification sheet.