

**Pressure Filters**

**D 162 • D 232 • D 332**

- In-line mounting
- Operating pressure up to 63 bar
- Nominal flow rate up to 350 l/min

## Description

### Application

In the pressure circuits of hydraulic and lubrication 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: Through installation near to the control valves or other expensive components. The specific determined flow rate guarantees a closed by-pass valve even at  $v \leq 200 \text{ mm}^2/\text{s}$  (cold start condition).

### 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

Filter head: Aluminium alloy  
Filter bowl: Aluminium alloy  
Seals: NBR (FPM on request)  
Filter media: EXAPOR®MAX 2 - inorganic multi-layer microfibre web  
Paper - cellulose web, impregnated with resin

### Accessories

Electrical and/or optical clogging indicators are available - optionally with one or two switching points resp. temperature suppression.  
Dimensions and technical data see catalogue sheet 60.30.

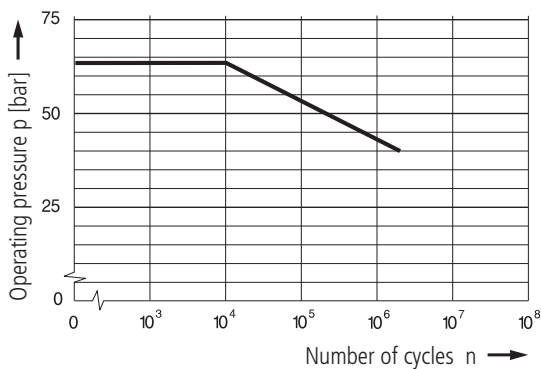
## Characteristics

### Operating pressure

0 ... 40 bar, min.  $3 \times 10^6$  pressure cycles  
Nominal pressure according to DIN 24550

0 ... 63 bar, min.  $10^4$  pressure cycles  
Quasi-static operating pressure

### Permissible pressures for other numbers of cycles



### Nominal flow rate

Up to 350 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:  
up to 100 bar  $\leq 6 \text{ m/s}$

### Filter fineness

$5 \mu\text{m(c)} \dots 30 \mu\text{m(c)}$   
 $\beta$ -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)

### 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 %  $\Delta p$  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.

### Mounting position

Preferably vertical, filter head on top

### Connection

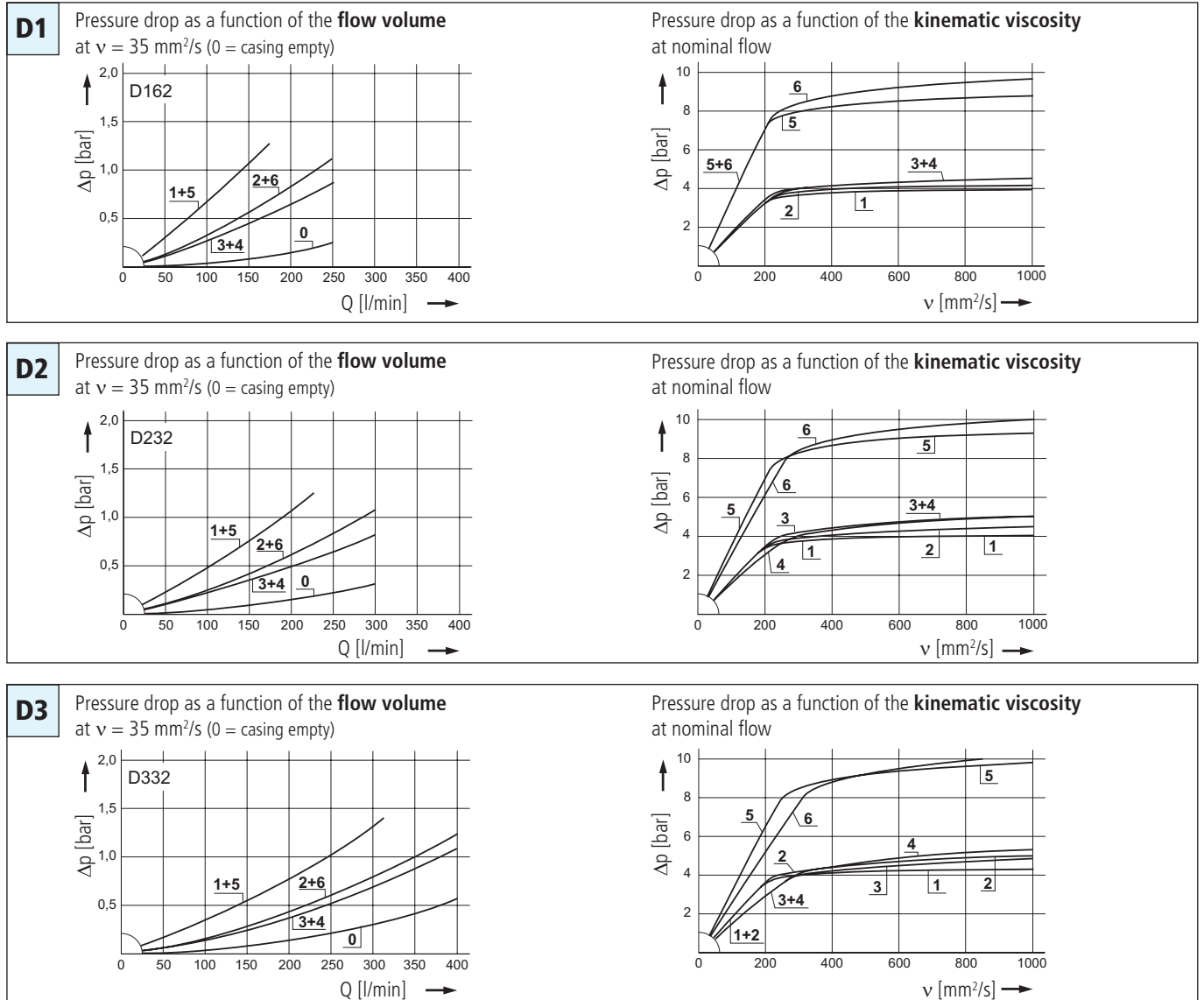
Threaded ports according to ISO 228 or DIN 13.  
Sizes see Selection Chart, column 6 (other port threads on request).

### Electrical clogging indicator

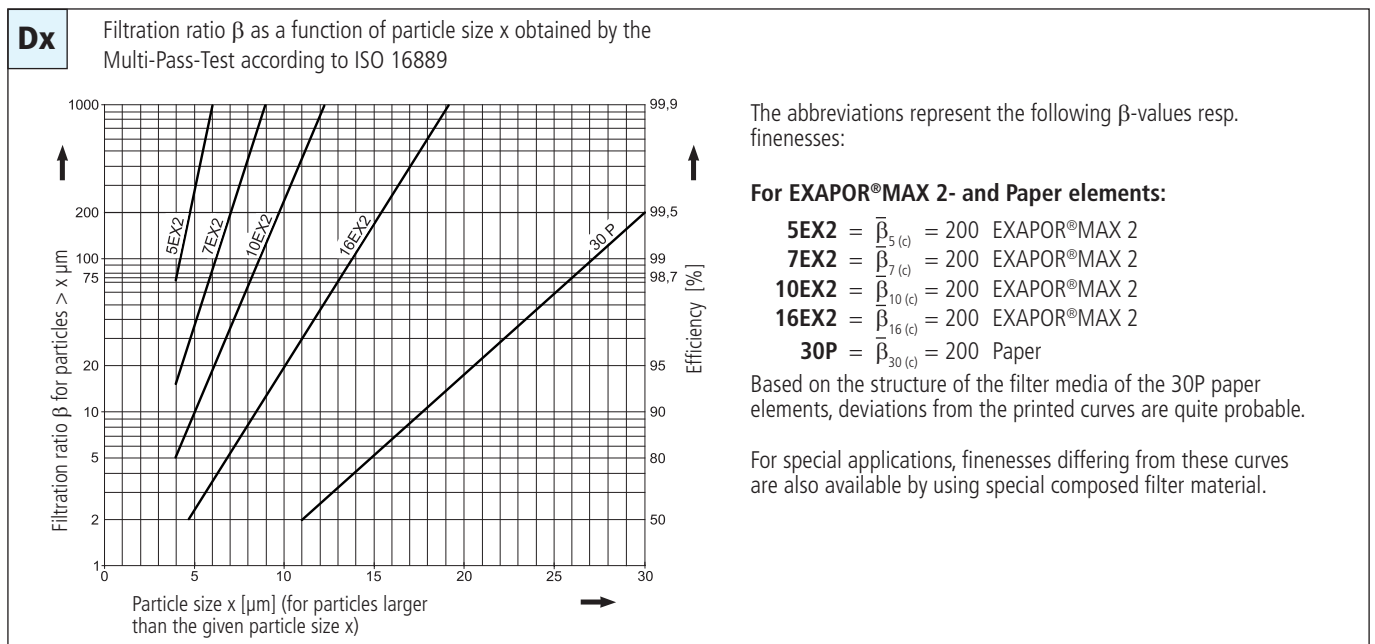
- Switching voltage: max. 120 V AC / 175 V DC
- Switching current: max. 0,17 A AC / 0,25 A DC
- Switching power: max. 3,5 VA AC / 5 W DC
- Type of contact: change-over
- Electrical protection: IP 65 (with mounted and secured socket)

# Diagrams

## $\Delta p$ -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/B	Cracking pressure of by-pass	Symbol	Replacement filter element	Weight	Clogging indicator	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
	l/min			g		bar			kg		
D 162-253	85	D1/1	5EX2	24	G1¼	3,5	4	V3.0817-03	2,4	optional	-
D 162-256	140	D1/2	10EX2	33	G1¼	3,5	4	V3.0817-06	2,4	optional	-
D 162-258	200	D1/3	16EX2	33	G1¼	3,5	4	V3.0817-08	2,4	optional	-
D 162-251	220	D1/4	30P	18	G1¼	3,5	4	P3.0817-01*	2,4	optional	-
D 162-283	160	D1/5	5EX2	24	G1¼	7	4	V3.0817-03	2,4	optional	-
D 162-286	250	D1/6	10EX2	33	G1¼	7	4	V3.0817-06	2,4	optional	-
D 232-253	120	D2/1	5EX2	33	G1¼	3,5	4	V3.0823-03	3,4	optional	-
D 232-256	195	D2/2	10EX2	47	G1¼	3,5	4	V3.0823-06	3,4	optional	-
D 232-258	275	D2/3	16EX2	48	G1¼	3,5	4	V3.0823-08	3,4	optional	-
D 232-251	280	D2/4	30P	26	G1¼	3,5	4	P3.0823-01*	3,4	optional	-
D 232-283	220	D2/5	5EX2	33	G1¼	7	4	V3.0823-03	3,4	optional	-
D 232-286	300	D2/6	10EX2	47	G1½	7	4	V3.0823-06	3,4	optional	-
D 332-253	170	D3/1	5EX2	49	G1¼	3,5	4	V3.0833-03	4,0	optional	-
D 332-256	275	D3/2	10EX2	67	G1¼	3,5	4	V3.0833-06	4,0	optional	-
D 332-258	280	D3/3	16EX2	68	G1¼	3,5	4	V3.0833-08	4,0	optional	-
D 332-251	350	D3/4	30P	34	G1½	3,5	4	P3.0833-01*	4,0	optional	-
D 332-283	280	D3/5	5EX2	49	G1¼	7	4	V3.0833-03	4,0	optional	-
D 332-286	350	D3/6	10EX2	67	G1½	7	4	V3.0833-06	4,0	optional	-

Optical or electrical indicators are available to monitor the clogging condition of the element. If the indicator should be already mounted onto the filter head use the abbreviation "M" behind the part number of the indicator. The printed order acknowledgements show both items separately.

**Order example: The Filter D 232-256 has to be supplied with optical clogging indicator - response pressure 2,0 bar.**

**Order description:** D 232-256 / DG 042-01 M  
**Part No. (basic unit)** \_\_\_\_\_ Mounted  
**Clogging indicator** \_\_\_\_\_

**For the appropriate clogging indicator see catalogue sheet 60.30.**

Besides these mounted clogging indicators we also offer - with a certain order quantity - clogging indicators integrated in the filter head (as listed under "dimensions").

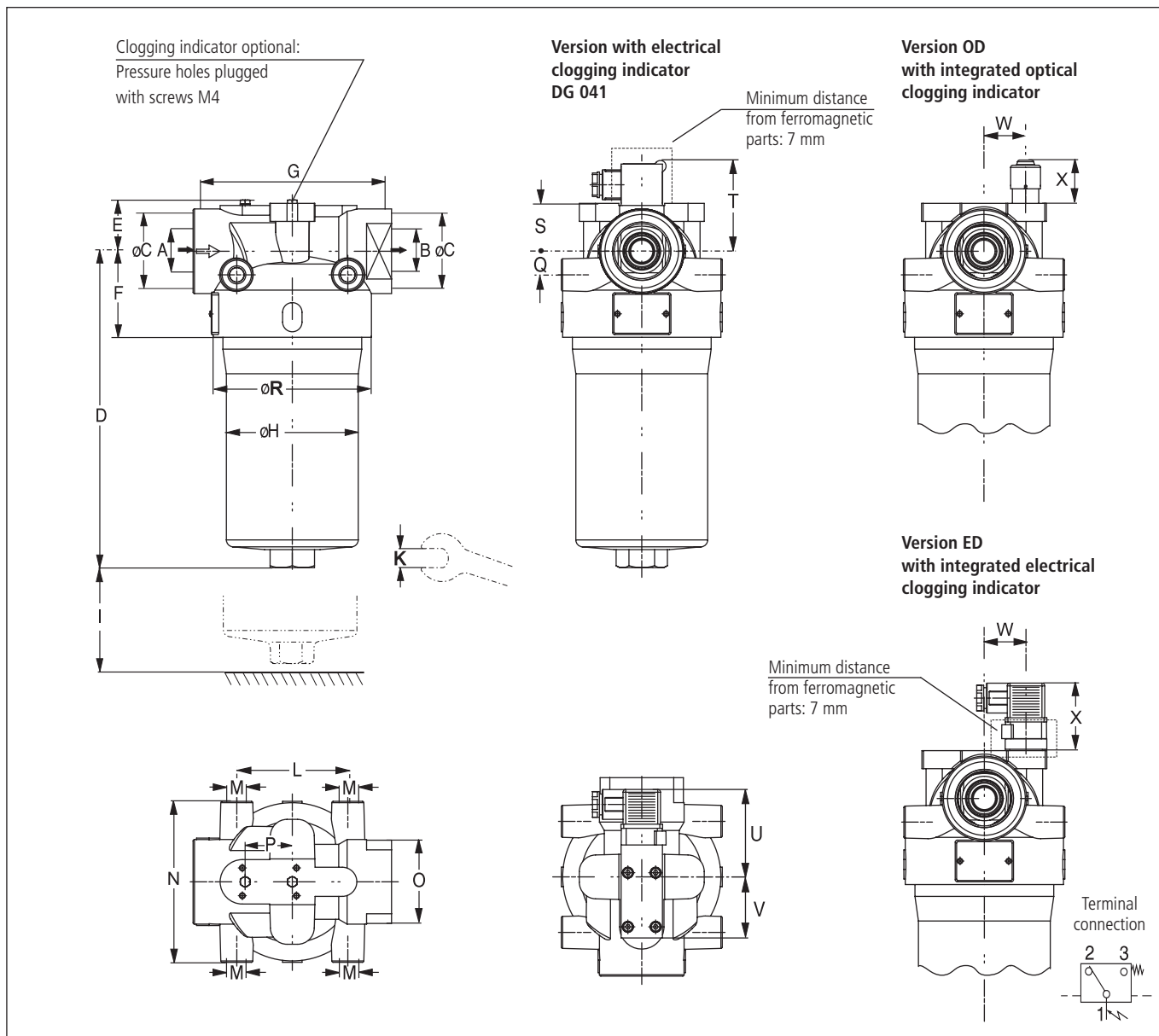
**Order examples:**  
 D 232-256 ED (electrical differential pressure switch) } the switching pressure matches the  
 D 232-256 OD (optical differential pressure indicator) } cracking pressure of the by-pass valve

**Remarks:**

- The switching pressure of the clogging indicator has always to be lower than the cracking pressure of the by-pass valve (see Selection Chart, column 7).
- The filters listed in this chart are standard filters. Other designs available on request.

\* Paper media supported with metal gauze

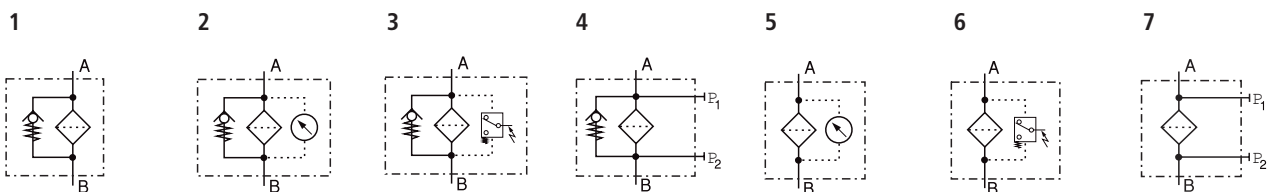
## Dimensions



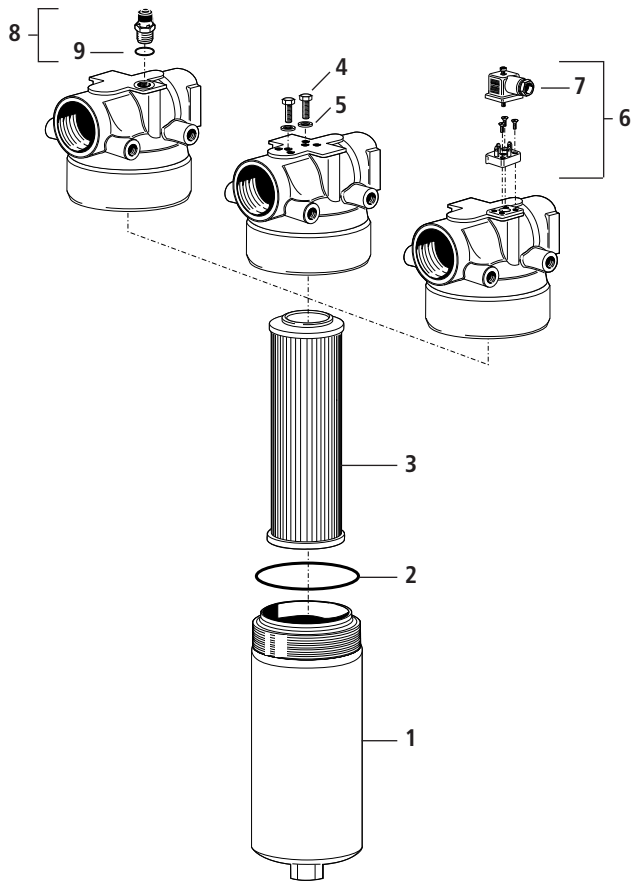
## Measurements

Type	A/B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	ED	OD
D 162	G1¼	61	232	38	62	140	95	80	32	80	M12/18	116	AF60	34	17	115	34	66	66	44	30	49	30	
D 232	G1¼, G1½	61	296	38	62	140	95	80	32	80	M12/18	116	AF60	34	17	115	34	66	66	44	30	49	30	
D 332	G1¼, G1½	61	396	38	62	140	101	80	32	80	M12/18	116	AF60	34	17	115	34	66	66	44	30	49	30	

## Symbols



## Spare Parts



Pos.	Designation	Part No.
1	Filter bowl D 162	D 162.0102
1	Filter bowl D 232	D 232.0102
1	Filter bowl D 332	D 332.0102
2	O-ring 88,57 x 2,62	N007.0886
3	Filter element (with seal)	see Chart / col. 9
4	Hexagonal head screw M4 x 8 DIN 933-8.8	11385800
5	Bonded seal 4,1 x 7,2 x 1	12504600
6	Reed switch with screws and socket (Pos. 7)	HD 049.1410
7	Socket DIN 43650 - AF3	DG 041.1220
8	Optical clogging indicator (with Pos. 9)	D 232.1400
9	O-ring 12,3 x 2,4	N007.0124

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:

<b>ISO 2941</b>	Verification of collapse/burst pressure rating
<b>ISO 2942</b>	Verification of fabrication integrity (Bubble Point Test)
<b>ISO 2943</b>	Verification of material compatibility with fluids

<b>ISO 3968</b>	Evaluation of pressure drop versus flow characteristics Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)
<b>ISO 16889</b>	
<b>ISO 23181</b>	Determination of resistance to flow fatigue using high viscosity fluid

Before release into the series production the filter casing is tested for fatigue strength in our pressure pulse test rig. 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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