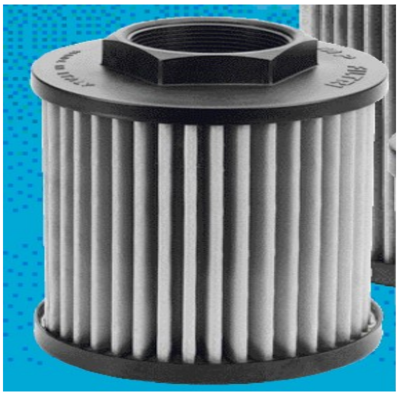
FILTRACJA



BTH HYDROTECHNIK FILTRATION 1/2009

FLUID AND MOTION CONTROL * SENSORS & MEASUREMENT *FILTRATION & FLUID MANAGEMENT

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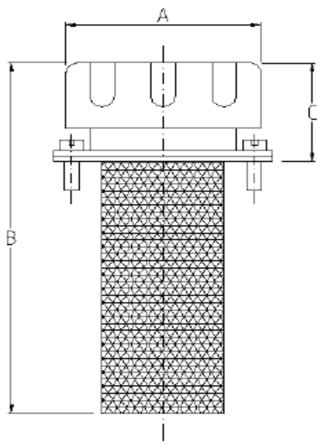
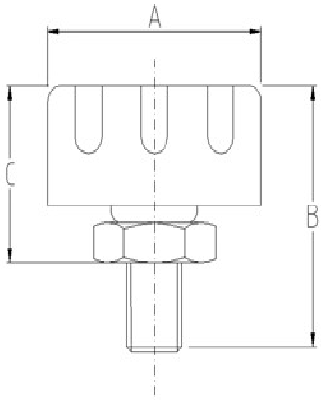
TYP: TA..   KORKI / FILTRY WLEWOWE

TA 80 B 10 2

TA 80 G 03





Materiał wykonania: stal ocynkowana, uszczelka korkowa

Code	Dimension A	Dimension B	Dimension C	Hole circle	Tank borehole	Fixation	Degree of filtration	Weight kg
HK TA 46 B 03	46	111	48	41	30	3 x M5	3 µm	0.20
HK TA 46 B 10	46	111	48	41	30	3 x M5	10 µm	0.20
HK TA 80 G 03	80	68	52		G 3/4"	G 3/4"	3 µm	0.22
HK TA 80 G 10	80	68	52		G 3/4"	G 3/4"	10 µm	0.22
HK TA 80 B 03 1	80	134	56	73	51	6 x M5	3 µm	0.28
HK TA 80 B 10 1	80	134	56	73	51	6 x M5	10 µm	0.28
HK TA 80 B 03 2	80	204	56	73	51	6 x M5	3 µm	0.32
HK TA 80 B 10 2	80	204	56	73	51	6 x M5	10 µm	0.32

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TYP: LE… FILTRY WELWEOWE

Temperature range hydraulic fluid
- 30 °C ... + 100 °C (temporary - 40 °C ... + 120 °C)

Temperature range environment
- 30 °C ... + 100 °C

Materials

Cap:	Polyamide, GF reinforced
Base:	Polyamide, GF reinforced
Filler screen:	Steel, galvanized
Spanner:	Steel, galvanized
Gaskets:	NBR (Viton on request)

Part No.	Pressure drop see diagram D/curve no.	Nominal flow rate filling filter	Nominal flow rate ventilating filter	Filter fineness ventilating filter	Filter surface ventilating filter	Filter fineness filling filter	Filter surface filling filter	Cracking pressure air IN	Cracking pressure air OUT	Spare ventilating filter	Symbol	Weight	Remarks
		l/min	l/min		cm²	µm	cm²	bar	bar			g	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
LE.0716-02	**D1**/1	80[1]	250	2 CL	46	800	160	-	-	L1.0706-02	1	255	without chain[3]
LE.0817-01	**D1**/2	80[1]	850	2 CL	320	800	160	-	-	L1.0807-31	1	350	-
LE.0817-91	**D2**/2	80[1]	550[2]	2 CL	320	800	160	-0,03	0,20	L1.0807-91	2	370	-
LE.0817-51	**D2**/1	80[1]	550[2]	2 CL	320	800	160	-0,03	0,35	L1.0807-51	2	370	-
LE.0827-01	**D1**/2	140[1]	850	2 CL	320	800	285	-	-	L1.0807-31	1	400	-
LE.0827-91	**D2**/2	140[1]	550[2]	2 CL	320	800	285	-0,03	0,20	L1.0807-91	2	420	-
LE.0827-51	**D2**/1	140[1]	550[2]	2 CL	320	800	285	-0,03	0,35	L1.0807-51	2	420	-
LE.0818-01[4]	**D1**/2	80[1]	850	2 CL	320	800	160	-	-	L1.0808-00	1	350	with spanner SW 47
LE.0818-53[4]	**D2**/2	80[1]	550[2]	2 CL	320	800	160	-0,03	0,20	L1.0808-53	2	370	with spanner SW 47
LE.0818-51[4]	**D2**/1	80[1]	550[2]	2 CL	320	800	160	-0,03	0,35	L1.0808-52	2	370	with spanner SW 47
LE.0819-01[4]	**D1**/2	80[1]	850	2 CL	320	800	160	-	-	L1.0809-01	1	350	with Easy Lock Pin
LE.0819-54[4]	**D2**/2	80[1]	550[2]	2 CL	320	800	160	-0,03	0,20	L1.0809-54	2	370	with Easy Lock Pin
LE.0819-55[4]	**D2**/1	80[1]	550[2]	2 CL	320	800	160	-0,03	0,35	L1.0809-55	2	370	with Easy Lock Pin

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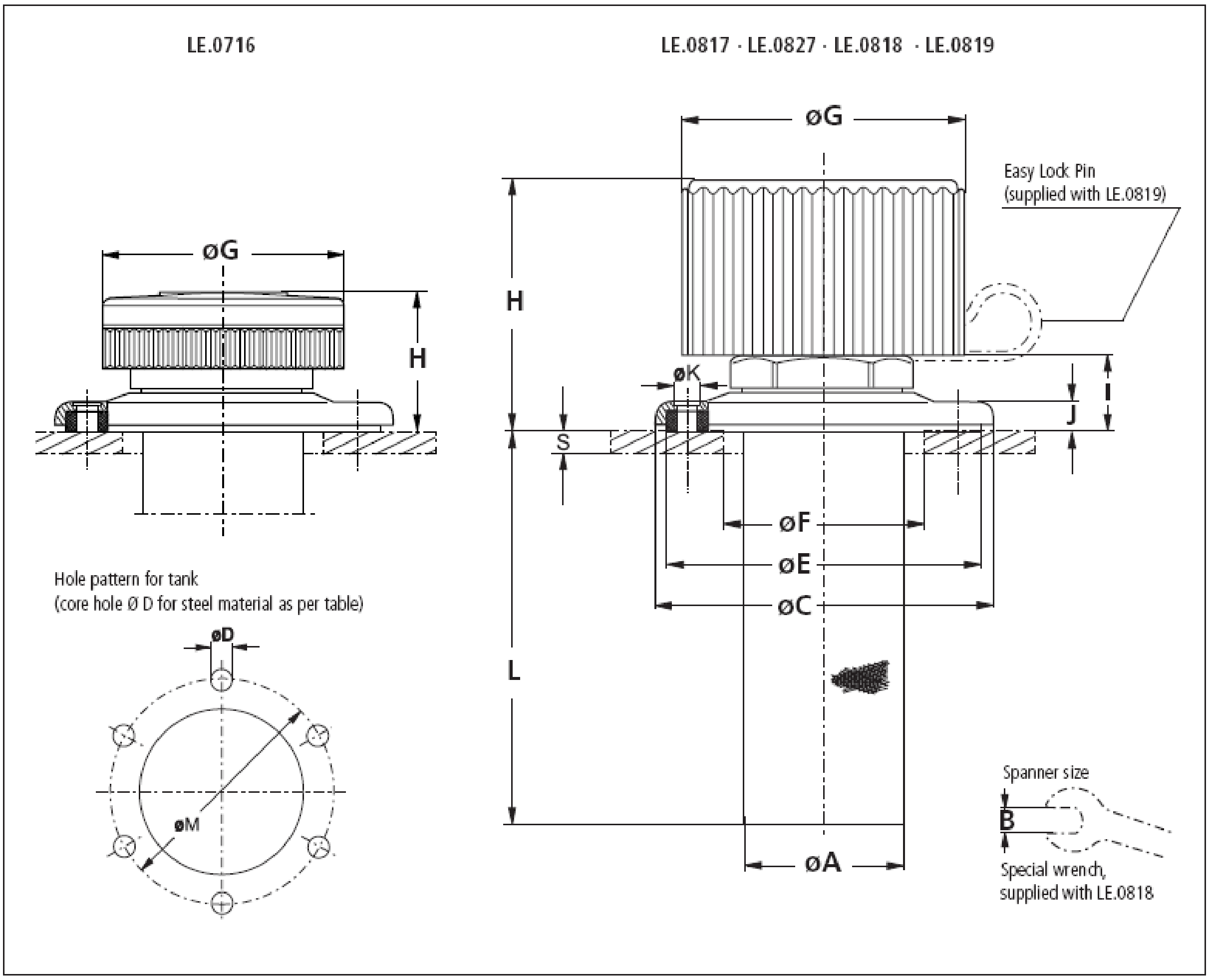
TYP: LE... - WYMIARY

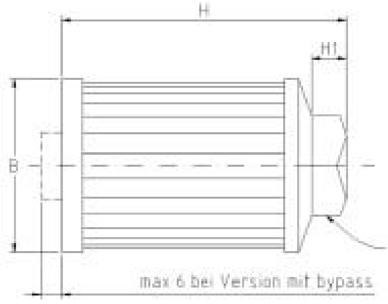


Type	A	B	C	E	F	G	H	I	J	K	L	M
LE.0716	46	-	89,5	84,5	58	66	36	15	6	5,6 ± 0,3	111	73
LE.0817	46	47	89,5	84,5	58	80	61	20	6	5,6 ± 0,3	111	73
LE.0827	46	47	89,5	84,5	58	80	61	20	6	5,6 ± 0,3	200	73
LE.0818	46	47	89,5	84,5	58	80	61	20	6	5,6 ± 0,3	111	73
LE.0819	46	47	89,5	84,5	58	80	61	20	6	5,6 ± 0,3	111	73

Plate thickness S over/up to	hole D*
1,00 / 1,75	3,9
1,75 / 3,00	4,1
3,00 / 4,75	4,4
4,75	M5

* Core hole Ø D for self-tapping screws according to DIN 7975 for versions without double check valve. For versions with double check valve always use M5.
Fastening screws included in basic equipment.

TYP: STR FILTRY SSAWNE



Materiał wykonania: stal, nylon

Dokładność filtracyjna: 90 µm

Temp. pracy: -25°C +110°C

Oznaczenie	Gwint BSP	H (mm)	H1 (mm)	B (mm)	CH (mm)	Max. Przepływ l/min
STR050 1 S M90	3/8"	78	10	52	30	20
STR050 2 S M90	1/2"	78	10	52	30	28
STR070 1 S M90	1/2"	95	10	70	42	28
STR070 2 S M90	3/4"	95	10	70	42	66
STR070 3 S M90	3/4"	140	10	70	42	66
STR070 4 S M90	1"	140	10	70	42	130
STR100 1 S M90	1 1/4"	135	15	99	69	170
STR100 2 S M90	1 1/4"	225	15	99	69	170
STR100 3 S M90	1 1/2"	225	15	99	69	250
STR100 4 S M90	2"	225	15	99	69	470
STR100 5 S M90	1 1/2"	135	15	99	69	250
STR140 1 S M90	1 1/2"	160	15	130	70	250
STR140 2 S M90	2"	160	15	130	70	470
STR140 3 S M90	2"	262	15	130	70	470
STR140 4 S M90	2 1/2"	270	20	130	101	840
STR140 5 S M90	3"	270	20	130	101	980
STR140 6 S M90	3"	330	20	130	101	980

Wariant produktu : dokładność filtracyjna 60 lub 250 µm, z zaworem baypass,

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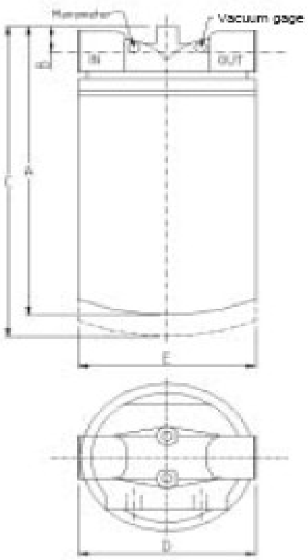
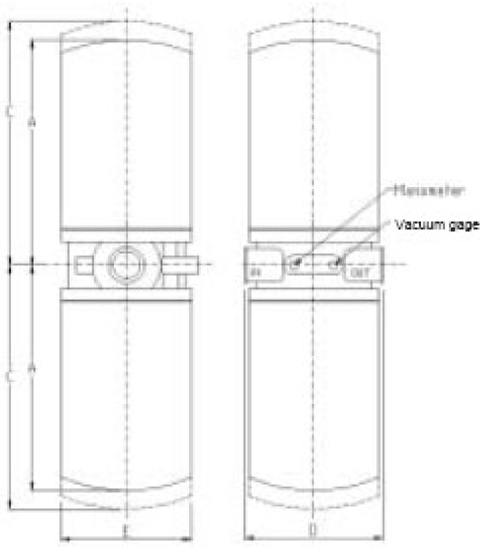
TYP: MPS FILTRY POWROTNE LINIOWE

Spin-on filters – pipe fitting

- *Degree of filtration: 10 µm*
- *Operating pressure: max. 12 bar*
- *Differential pressure: P - filter element max. 4 bar*
  A - filter element max. 4 bar
- *Design: With bypass valve 1.75 bar, without contamination indicator*
- *Designed (Q_{max}) for medium ISO VG 46 at 50 °C (30 mm²/s) at Δptotal: 0.4 bar*
- *We shall be pleased to advise you about other filter materials, types of oil, viscosities and temperatures.*



Dimensioned sketch 1



Dimensioned sketch 2

TYP: MPS

Code	Pipe connection BSF/SAE flange	P10 - filter element		A10 - filter element		Design dimen-sioned sketch	A	B	C	D	E	Weight kg
		Filter surface cm²	Q max l/min	Filter surface cm²	Q max l/min							
MPS050 RG1 ***	3/4"	2240	56	1900	48	1	180	22	200	95	96	1.0
MPS070 RG1 ***	3/4"	4140	65	3160	53	1	248	22	268	95	96	1.3
MPS100 RG1 ***	1 1/4"	4300	149	3950	110	1	241	30	286	133	129	2.2
MPS150 RG1 ***	1 1/4"	5760	156	5390	115	1	286	30	311	133	129	2.3
MPS200 RG1 ***	1 1/2"	2 x 4300	282	2 x 3160	220	2	216		241	140	129	4.0
MPS250 RG1 ***	1 1/2"	2 x 5760	293	2 x 5390	250	2	261		286	140	129	4.2
MPS300 RF1 ***	1 1/2" SAE 3000 PSI/M	2 x 4300	282	2 x 3950	220	3	265	47	290	130	129	5.4
MPS300 RG1 ***	1 1/2"	2 x 4300	282	2 x 3950	220	3	265	47	290	130	129	5.4
MPS350 RF1 ***	1 1/2" SAE 3000 PSI/M	2 x 5760	293	2 x 5390	250	3	310	47	335	130	129	5.6
MPS350 RG1 ***	1 1/2"	2 x 5760	293	2 x 5390	250	3	310	47	335	130	129	5.6

*** = P10 Paper filter (10 µm), nominal filtering
*** = A10 With inorganic filter (10 µm), absolute filtering

GŁOWICE FILTRÓW:

Code	Pipe connection BSF/SAE flange	For return filter	For suction filter	Suitable for filter type MPS
MPS050070 RG1	3/4"	X		050-070
MPS100150 RG1	1 1/4"	X		100-150
MPS200250 RG1	1 1/2"	X		200-250
MPS300350 RG1	1 1/2"	X		300-350
MPS300350 RF1	1 1/2" SAE 3000 PSI/M	X		300-350
MPS050070 SG1	3/4"		X	050-070
MPS100150 SG1	1 1/4"		X	100-150
MPS200250 SG1	1 1/2"		X	200-250
MPS300350 SG1	1 1/2"		X	300-350
MPS300350 SF1	1 1/2" SAE 3000 PSI/M		X	300-350

Dostępne wkłady filtracyjne: 3, 6, 10 oraz 25 mµ.

Dodatkowe wyposażenie: wskaźnik wymiany/ zabrudzenia filtra.

*broszura poglądowa, dostępne karty katalogowe produktu,

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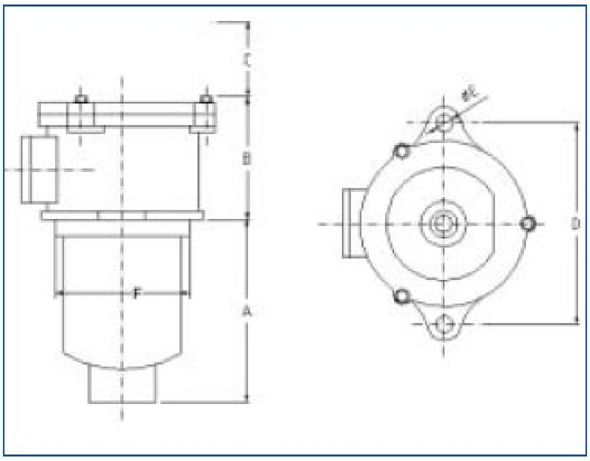
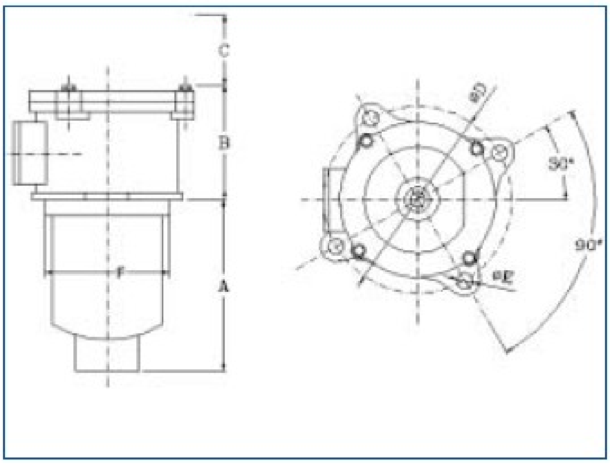
TYP: MPF FILTRY POWROTNE NAZBIORNIKOWE

Return filters – tank fitting

- *Degree of filtration: 10 µm*
- *Operating pressure: max. 3 bar*
- *Differential pressure: P - filter element max. 3 bar*
  A - filter element max. 10 bar
- *Design: With bypass valve 1.75 bar, without contamination indicator*
- *Designed ($Q_{max.}$) for medium ISO VG 46 at 50 °C 30 mm²/s) at Δp_{total}: 0.40 bar*
- *We shall be pleased to advise you about other filter materials, types of oil, viscosities and temperatures.*



Dimensioned sketch 1



Dimensioned sketch 2

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TYP: MPF

Code	Pipe connection BSP/SAE flange	P10 - filter element		A10 - filter element		Design dimensioned sketch	A	B	C	D	E	F	Weight kg
		Filter surface cm²	Q max l/min	Filter surface cm²	Q max l/min								
MPF030 1 G1 ***	1/2"	410	34	335	21	1	86	56	100	90	7	66	0.36
MPF100 1 G1 ***	1/2"	1020	56	630	35	1	100	75	120	115	8.5	88	0.74
MPF100 1 G2 ***	3/4"	1020	56	630	35	1	100	75	120	115	8.5	88	0.74
MPF100 1 G3 ***	1"	1020	59	630	35	1	100	75	120	115	8.5	88	0.74
MPF100 2 G2 ***	3/4"	1660	88	1000	45	1	150	75	170	115	8.5	88	0.76
MPF100 2 G3 ***	1"	1660	96	1000	45	1	150	75	170	115	8.5	88	0.76
MPF100 3 G2 ***	3/4"	1900	95	1730	70	1	225	75	250	115	8.5	88	0.88
MPF100 3 G3 ***	1"	1900	125	1730	70	1	225	75	250	115	8.5	88	0.88
MPF180 1 G1 ***	1 1/4"	4000	190	4300	160	3-hole	231	89	250	175	10.7	129	1.86
MPF400 1 G1 ***	1 1/4"	4480	232	4740	170	2	178	98.5	200	220	11.5	173.5	3.42
MPF400 1 G2 ***	1 1/2"	4480	232	4740	170	2	178	98.5	200	220	11.5	173.5	3.42
MPF400 1 G3 ***	2"	4480	250	4740	170	2	178	98.5	200	220	11.5	173.5	3.42
MPF400 2 G2 ***	1 1/2"	6550	300	6930	240	2	238	98.5	250	220	11.5	173.5	3.48
MPF400 2 G3 ***	2"	6550	328	6930	240	2	238	98.5	250	220	11.5	173.5	3.48
MPF400 3 G2 ***	1 1/2"	8280	372	8760	300	2	288	98.5	310	220	11.5	173.5	3.68
MPF400 3 G3 ***	2"	8280	416	8760	300	2	288	98.5	310	220	11.5	173.5	3.68
MPF750 1 G1 ***	2"	13450	446	11400	375	2	430	105	450	220	11.5	173.5	5.68
MPF750 1 F1 ***	2" SAE 3000 PSI/M	13450	446	11400	375	2	430	105	450	220	11.5	173.5	5.68

*** = P10 Paper filter (10 µm), nominal filtering
*** = A10 With inorganic filter (10 µm), absolute filtering
without *** Without filter, that is filter casing only
Dimension „C“ needed space for filter change

Code	For pot length
HK MF030 1 ***	1
HK MF100 1 ***	1
HK MF100 2 ***	2
HK MF100 3 ***	3
HK MF180 1 ***	1
HK MF400 1 ***	1
HK MF400 2 ***	2
HK MF400 3 ***	3
HK MF750 1 ***	1

*** = P10 Paper filter (10 µm), nominal filtering
*** = A10 With inorganic filter (10 µm), absolute filtering
Pot length: see dimension A

TYP: D023, D043 FILTRY POWROTNE

- **MONTAŻ NAZBIORNIKOWY**
- **PRZYŁĄCZA G ½"**
- **PRZEPLYW DO 45L/MIN**

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.
Dirt collecting bowl:	Prevents back-flushing of collected dirt particles during element replacement.
Connection:	A female thread in the bowl outlet makes in-line mounting possible.

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

In filters with a magnetic system, the ferromagnetic particles in the fluid pass first through a strong magnetic field and are separated.

Ventilating Filter
Ventilation of the reservoir by an integral star-shape pleated filter element:
- removable (replace annually!)
- splash-proof
- fineness 2 µm

Some versions are also available with galvanized steel wool.

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
Housing:	Aluminium alloy
Seals:	NBR (Viton on request)
Filter media:	EXAPOR®MAX - inorganic microfibre web Paper - cellulose web, impregnated with resin Stainless steel wire mesh (1.4301) with mesh size 40 and 60 µm, bronce screen (2.1020) is used with 100 µm

Accessories
An optional oil separator (Part No. D 023.1702) 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.

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SPECYFIKACJA PRODUKTU:

Nominal flow rate
Up to 45 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 $\nu \leq 200\ mm^2/s$
- 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
12 µm(c) ... 100 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 or 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: $\nu < 60\ mm^2/s$
- as starting viscosity: $\nu_{max} = 1200\ mm^2/s$
- 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. 16 bar

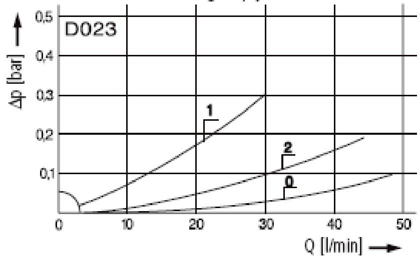
Mounting position
Preferably vertical, outlet downwards

CHARAKTERYSTYKA:

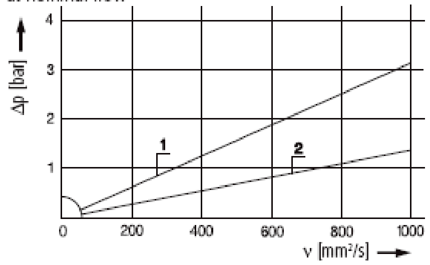
Δp-curves for complete filters in Selection Chart, column 3

D1

Pressure drop as a function of the **flow volume**
at $\nu = 35\ mm^2/s$ (0 = casing empty)

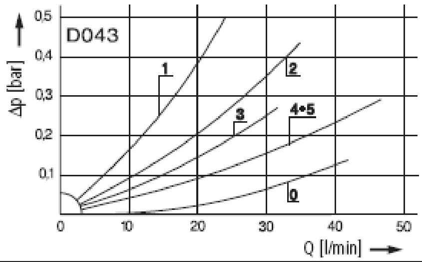


Pressure drop as a function of the **kinematic viscosity**
at nominal flow

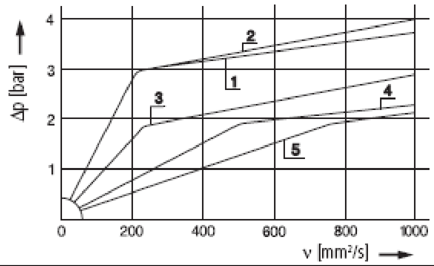


D2

Pressure drop as a function of the **flow volume**
at $\nu = 35\ mm^2/s$ (0 = casing empty)



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



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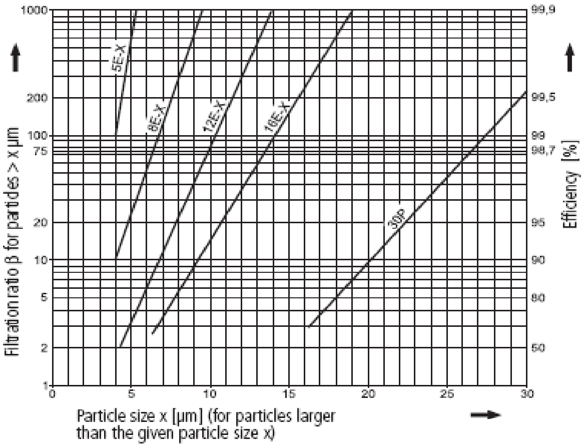
Filter fineness curves in Selection Chart, column 4

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- and Paper elements:

5 E-X = $\overline{\beta}_{5(c)}$ = 200 EXAPOR®MAX
8 E-X = $\overline{\beta}_{8(c)}$ = 200 EXAPOR®MAX
12 E-X = $\overline{\beta}_{12(c)}$ = 200 EXAPOR®MAX
16 E-X = $\overline{\beta}_{16(c)}$ = 200 EXAPOR®MAX
30 P = $\overline{\beta}_{30(c)}$ = 200 Paper

Based on the structure of the filter media of the 30 P paper elements, deviations from the printed curves are quite probable.

For screen elements:

40 S = screen material with mesh size 40 µm
60 S = screen material with mesh size 60 µm
100 S = screen material with mesh size 100 µm

Tolerances for mesh size according to DIN 4189

For ventilating filter elements:

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

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

Part No.	Nominal flow	Pressure drop see Diagram **D**/curve no.	Filter fineness see Diagr. **Dx**	Dirt-holding capacity Filter surface in ( )	Connection A/B	Cracking pressure of by-pass	Symbol	Replacement filter 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
D 023-05	15	**D1/1**	40 S	(80 cm²)	G½*	-	5	S0.0408-05	0,4	steel wool breather	with magnetic system
D 023-01	25	**D1/2**	100 S	(80 cm²)	G½	-	5	S0.0408-01	0,4	steel wool breather	with magnetic system
D 043-56	23	**D2/1**	12 E-X	5,3	G½	2,5	2	V3.0510-56	0,4	L1.0406-01 (2 CL)	-
D 043-86	23	**D2/1**	12 E-X	5,3	G½	2,5	1	V3.0510-56	0,4	-	-
D 043-58	35	**D2/2**	16 E-X	5,7	G½	2,5	2	V3.0510-58	0,4	L1.0406-01 (2 CL)	-
D 043-88	35	**D2/2**	16 E-X	5,7	G½	2,5	1	V3.0510-58	0,4	-	-
D 043-51	30	**D2/3**	30 P	4,0	G½	1,5	2	P3.0510-51	0,4	L1.0406-01 (2 CL)	-
D 043-73	30	**D2/3**	30 P	4,0	G½*	1,5	1	P3.0510-51	0,4	-	-
D 043-05	40	**D2/4**	40 S	(220 cm²)	G½*	1,5	4	S3.0508-55	0,47	steel wool breather	with magnetic system
D 043-10	45	**D2/5**	60 S	(220 cm²)	G½*	1,5	4	S3.0508-50	0,47	steel wool breather	with magnetic system

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 D 043-56 has to be supplied with an extension pipe (EV) for a mounting depth of 200 mm.

Order description: **D 043-56 / EV 200**

Part No. (Basic unit)

Extension pipe (5 various lengths are available)
EV = K + 62 / + 112 / + 212 / + 312 / + 412 (see dimensions and measurements)

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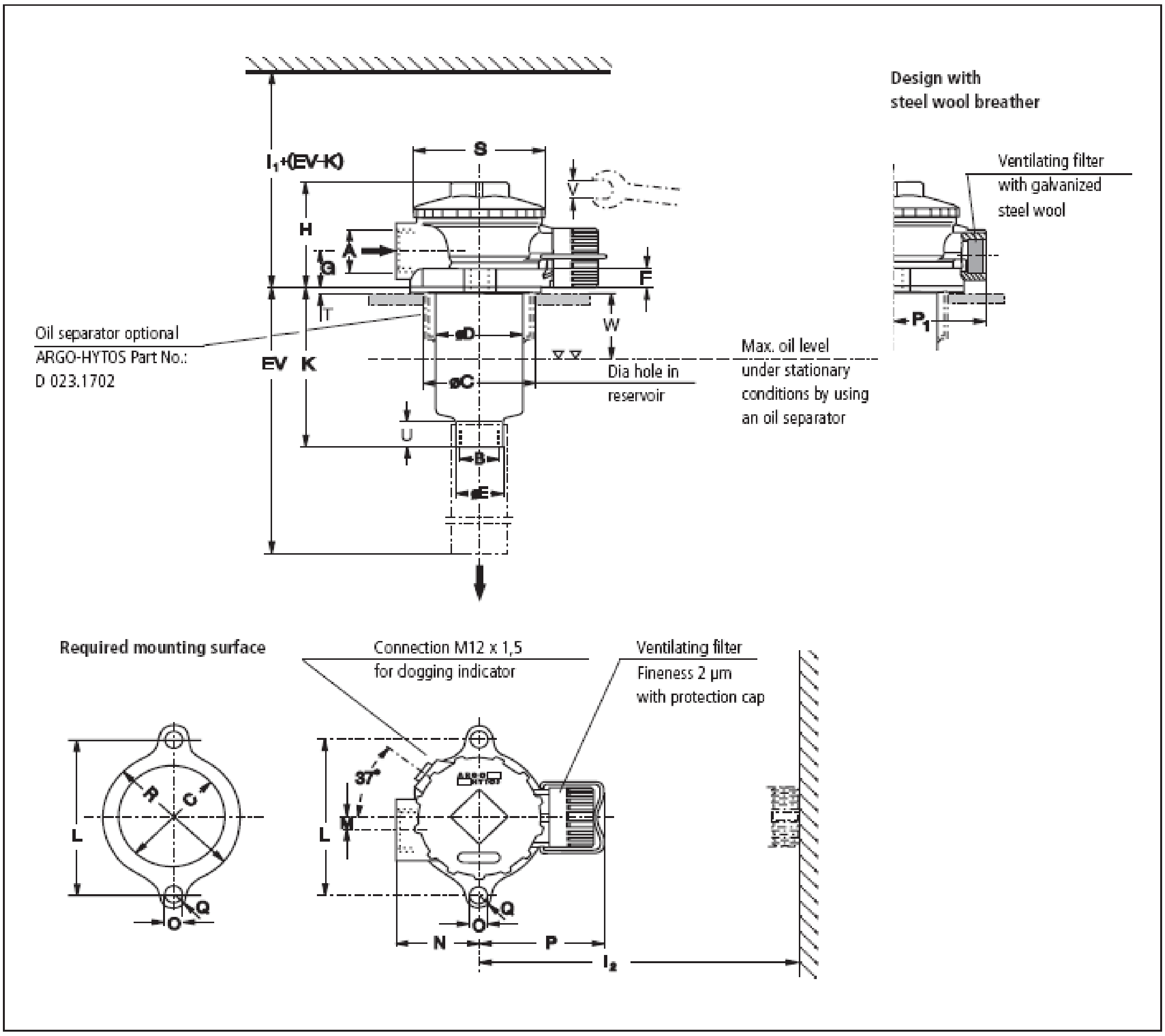
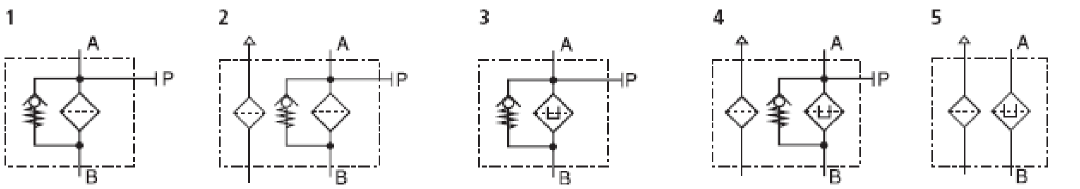
WYMIARY:



Type	A	B*	C min./max.	D	E	F	G	H	I_1	I_2	K	L	M	N	O	P	P_1	Q	R	S
D 023	G½	G½	60/63	52	27,8	11,5	24	67	125	-	87,5	88	9	50	11	-	45	9,5	75,5	73,5
D 043	G½	G½	60/63	52	27,8	11,5	24	67	150	72	87,5	88	9	50	11	68,5	45	9,5	75,5	73,5
Type	**T**	**U**	**V**	**W**																
D 023	2	18	27	42																
D 043	2	18	27	42																

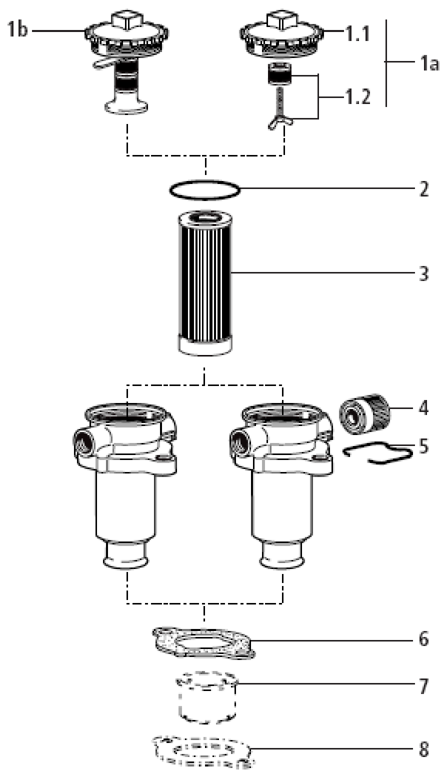
* also see Selection Chart, column 6

Symbols



CZĘŚCI ZAMIENNE:

Spare Parts



Pos.	Designation	Part No.
1a	Screw-on cap with Pos. 2 for D 043 with magnetic system	D 043.1210
1b	Screw-on cap with Pos. 2 for D 043 with magnetic system	D 023.1210
1.1	Screw-on cap	D 043.2202
1.2	Magnetic system	M0.2501-00
2	Seal	N 031.0562
3	Filter element	see Chart / col. 9
4	Ventilating filter (with Pos. 5)	L1.0406-01K7
5	Clip	N 026.0253
6	Flat gasket	D 023.0704
7	Oil separator (with Pos. 8)	D 023.1702
8	Flat gasket	D 023.0718

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	Verification of fabrication integrity (Bubble Point Test)
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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.

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TYP: E043, E072 FILTRY POWROTNE

- MONTAŻ NAZBIORNIKOWY

- PRZYŁĄCZA G 3/4”

- PRZEPLYW DO 70L/MIN

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.
Extension pipe:	Easy and fast adaptation to various lengths due to the "do-it-yourself"-system.

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, CF reinforced, electrically conducting
Seals:	NBR (Viton on request)
Filter media:	EXAPOR®MAX - inorganic multi-layer microfibre web Paper - cellulose web, impregnated with resin

Accessories
An optional oil separator (Part No. E 043.1701) 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.

For mounting of extension pipes ("do-it-yourself"-system) the following parts are needed:

Aluminium pipe (Length xxx in mm)	Part No. FR 043.Lxxx
O-Ring	Part No. N 007.0203
Crimping tool	Part No. FR 043.1770

SPECYFIKACJA PRODUKTU:

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 or 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 intersects the Δp curve at a point. Read this point on the horizontal axis for the viscosity.

Operating pressure
Max. 10 bar

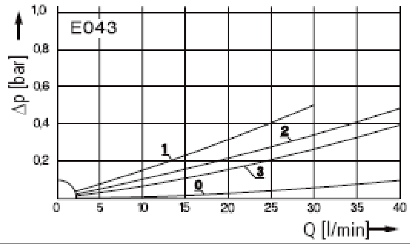
Mounting position
Preferably vertical, outlet downwards

CHARAKTERYSTYKA:

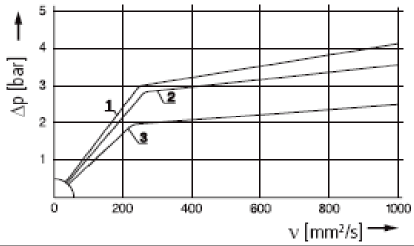
Δp-curves for complete filters in Selection Chart, column 3

D1

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

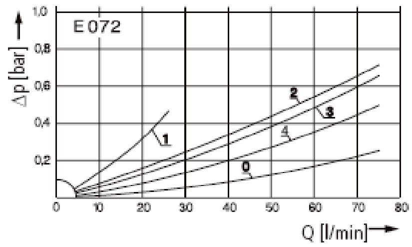


Pressure drop as a function of the **kinematic viscosity** at nominal flow

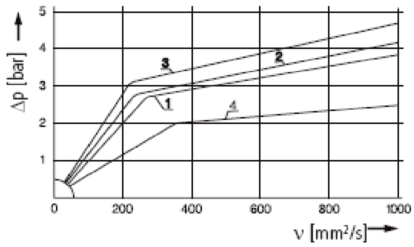


D2

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



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



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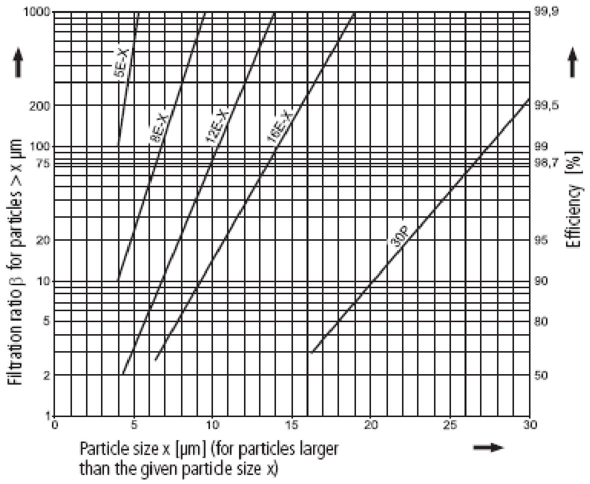
Filter fineness curves in Selection Chart, column 4

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- and Paper elements:

5 E-X = $\overline{\beta}_{5(c)}$ = 200 EXAPOR®MAX
8 E-X = $\overline{\beta}_{8(c)}$ = 200 EXAPOR®MAX
12 E-X = $\overline{\beta}_{12(c)}$ = 200 EXAPOR®MAX
16 E-X = $\overline{\beta}_{16(c)}$ = 200 EXAPOR®MAX
30 P = $\overline{\beta}_{30(c)}$ = 200 Paper

Based on the structure of the filter media of the 30 P paper elements, deviations from the printed curves are quite probable.

For screen elements:

40 S = screen material with mesh size 40 µm
60 S = screen material with mesh size 60 µm
100 S = screen material with mesh size 100 µm

Tolerances for mesh size accordung to DIN 4189

For ventilating filter elements:

2 CL = 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.

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. (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	12 E-X	5,3	G1/2	2,5	2	V3.0510-56	0,6	L1.0403-01 (2 CL)	-
E 043-166	25	**D1**/1	12 E-X	5,3	G1/2	2,5	1	V3.0510-56	0,6	-	-
E 043-158	35	**D1**/2	16 E-X	5,7	G1/2	2,5	2	V3.0510-58	0,6	L1.0403-01 (2 CL)	-
E 043-168	35	**D1**/2	16 E-X	5,7	G1/2	2,5	1	V3.0510-58	0,6	-	-
E 043-151	30	**D1**/3	30 P	4,0	G1/2	1,5	2	P3.0510-51	0,6	L1.0403-01 (2 CL)	-
E 043-161	30	**D1**/3	30 P	4,0	G1/2	1,5	1	P3.0510-51	0,6	-	-
E 072-153	25	**D2**/1	5 E-X	6,7	G3/4	2,5	2	V3.0520-53	0,8	L1.0403-01 (2 CL)	-
E 072-163	25	**D2**/1	5 E-X	6,7	G3/4	2,5	1	V3.0520-53	0,8	-	-
E 072-156	50	**D2**/2	12 E-X	11	G3/4	2,5	2	V3.0520-56	0,8	L1.0403-01 (2 CL)	-
E 072-166	50	**D2**/2	12 E-X	11	G3/4	2,5	1	V3.0520-56	0,8	-	-
E 072-158	70	**D2**/3	16 E-X	12	G3/4	2,5	2	V3.0520-58	0,8	L1.0403-01 (2 CL)	-
E 072-168	70	**D2**/3	16 E-X	12	G3/4	2,5	1	V3.0520-58	0,8	-	-
E 072-151	50	**D2**/4	30 P	6,6	G3/4	1,5	2	P3.0520-51*	0,8	L1.0403-01 (2 CL)	-
E 072-161	50	**D2**/4	30 P	6,6	G3/4	1,5	1	P3.0520-51*	0,8	-	-

Order example: The filter E 072-156 has to be supplied with an extension pipe (EV) for a mounting depth of 495 mm.

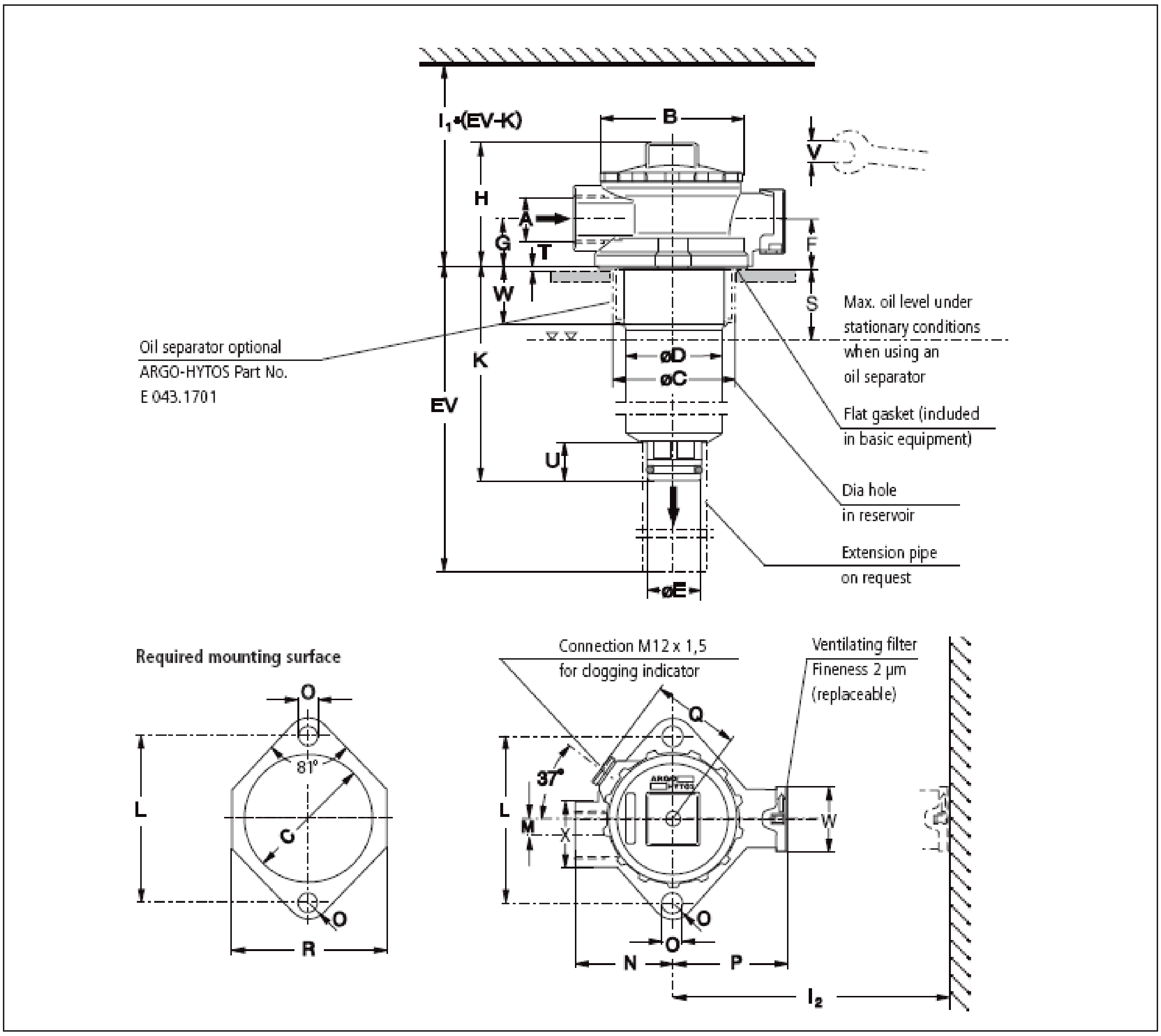
Order description: **E 072-156 / EV 495**

Part No. (basic unit) → E 072-156

Extension pipe (5 various lengths are available) → EV 495
EV = K + 65 / + 115 / + 215 / + 315 / + 415 mm (see dimensions and measurements)

For the appropriate clogging indicators see catalogue sheet 60.20.

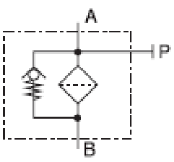
WYMIARY:



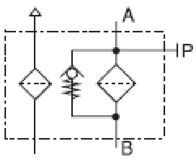
Type	A	B	C min./max.	D	E	F	G	H	l_1	l_2	K	L	M	N	O	P	Q	R	S	T
E 043	G1/2	75	60/63	51	27,8	24	26	67	175	110	83	88	9	51	11	59,5	46	79	42	2
E 072	G3/4	75	60/63	51	27,8	24	26	67	270	110	180	88	9	51	11	59,5	46	79	42	2
Type	U	V	W	X																
E 043	21	SW27	35	SW36																
E 072	21	SW27	35	SW36																

Symbols

1



2



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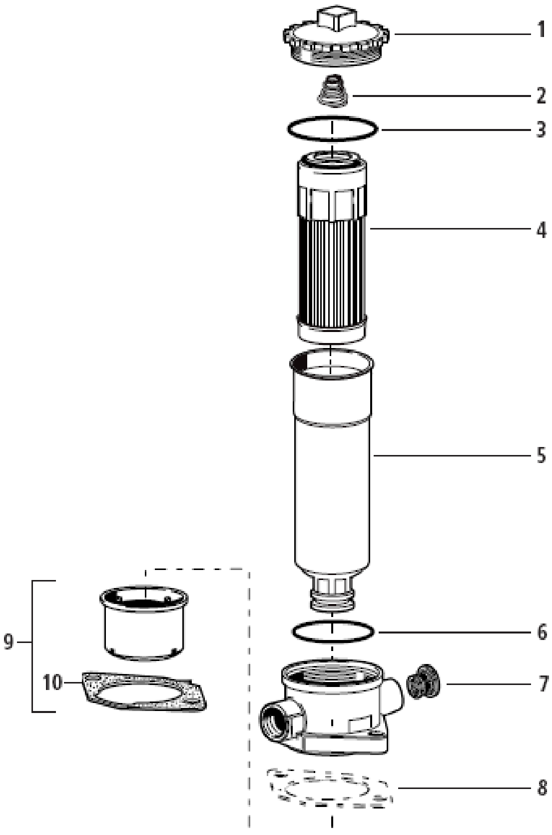
CZĘŚCI ZAMIENNE:

Spare Parts



Pos.	Designation	Part No.
1	Screw-on cap	FR 043.0201
2	Compression spring	N 015.1606
3	O-ring 57 x 3	N 007.0573
4	Filter element	see Chart / col. 9
5	Filter bowl E043 *	FR 043.0107
5	Filter bowl E072 *	FR 072.0104
6	O-ring 50 x 2	N 007.0501
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 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 Verification of fabrication integrity (Bubble Point Test)
ISO 3968 Evaluation of pressure drop versus flow characteristics
ISO 16889 Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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.

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TYP: E094, E103, E143

FILTRY POWROTNE

- MONTAŻ NAZBIORNIKOWY
- PRZYŁĄCZA DO G 1"
- PRZEPLYW DO 135L/MIN

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 cataologue sheet 60.20.

SPECYFIKACJA PRODUKTU:

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 $\nu \leq 200$ 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 $\leq 4{,}5$ 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)

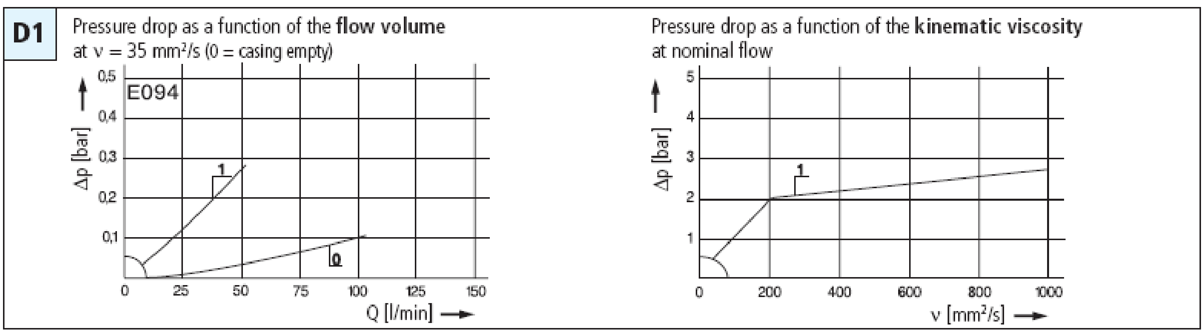
Viscosity at nominal flow rate
- at operating temperature: $\nu < 60$ mm²/s
- as starting viscosity: $\nu_{max} = 1200$ mm²/s
- at first operation: The recommended starting viscosity can be read from the Diagram D (pressure drop as a function of the kinematic viscosity) as follows: Find the 70% Δp of 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

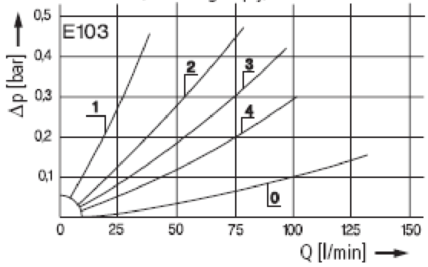
Mounting position
Preferably vertical, outlet downwards

CHARAKTERYSTYKA:

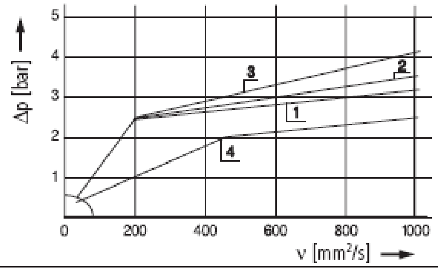
Δp-curves for complete filters in Selection Chart, column 3



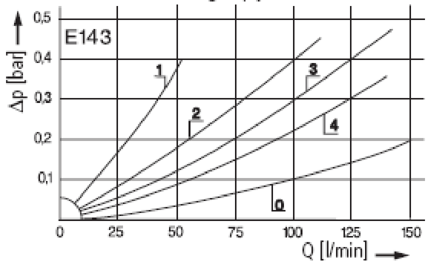
D2 Pressure drop as a function of the **flow volume**
at ν = 35 mm²/s (0 = casing empty)



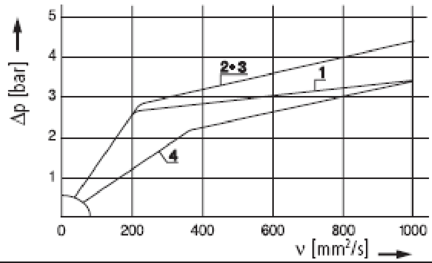
Pressure drop as a function of the **kinematic viscosity**
at nominal flow



D3 Pressure drop as a function of the **flow volume**
at ν = 35 mm²/s (0 = casing empty)

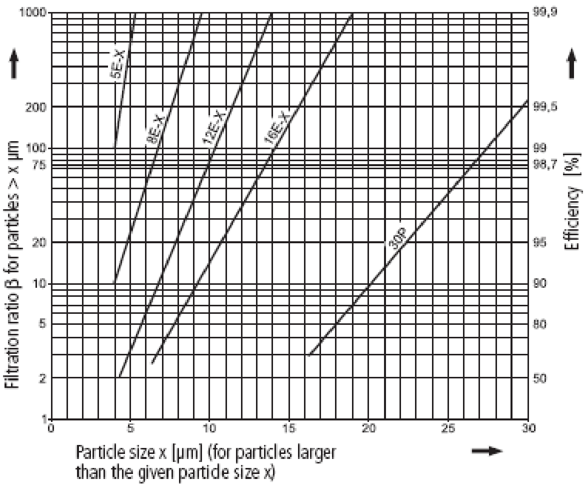


Pressure drop as a function of the **kinematic viscosity**
at nominal flow



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- and Paper elements:

5 E-X = $\overline{\beta}_{5(c)}$ = 200 EXAPOR®MAX
8 E-X = $\overline{\beta}_{8(c)}$ = 200 EXAPOR®MAX
12 E-X = $\overline{\beta}_{12(c)}$ = 200 EXAPOR®MAX
16 E-X = $\overline{\beta}_{16(c)}$ = 200 EXAPOR®MAX
30 P = $\overline{\beta}_{30(c)}$ = 200 Paper

Based on the structure of the filter media of the 30 P paper elements, deviations from the printed curves are quite probable.

For screen elements:

40 S = screen material with mesh size 40 µm
60 S = screen material with mesh size 60 µm
100 S = screen material with mesh size 100 µm

Tolerances for mesh size accordung to DIN 4189

For ventilating filter elements:
2 CL = 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.

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. Filter fineness see Diagrams	Remarks
	l/min			g		bar			kg		
1	**2**	**3**	**4**	**5**	**6**	**7**	**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**

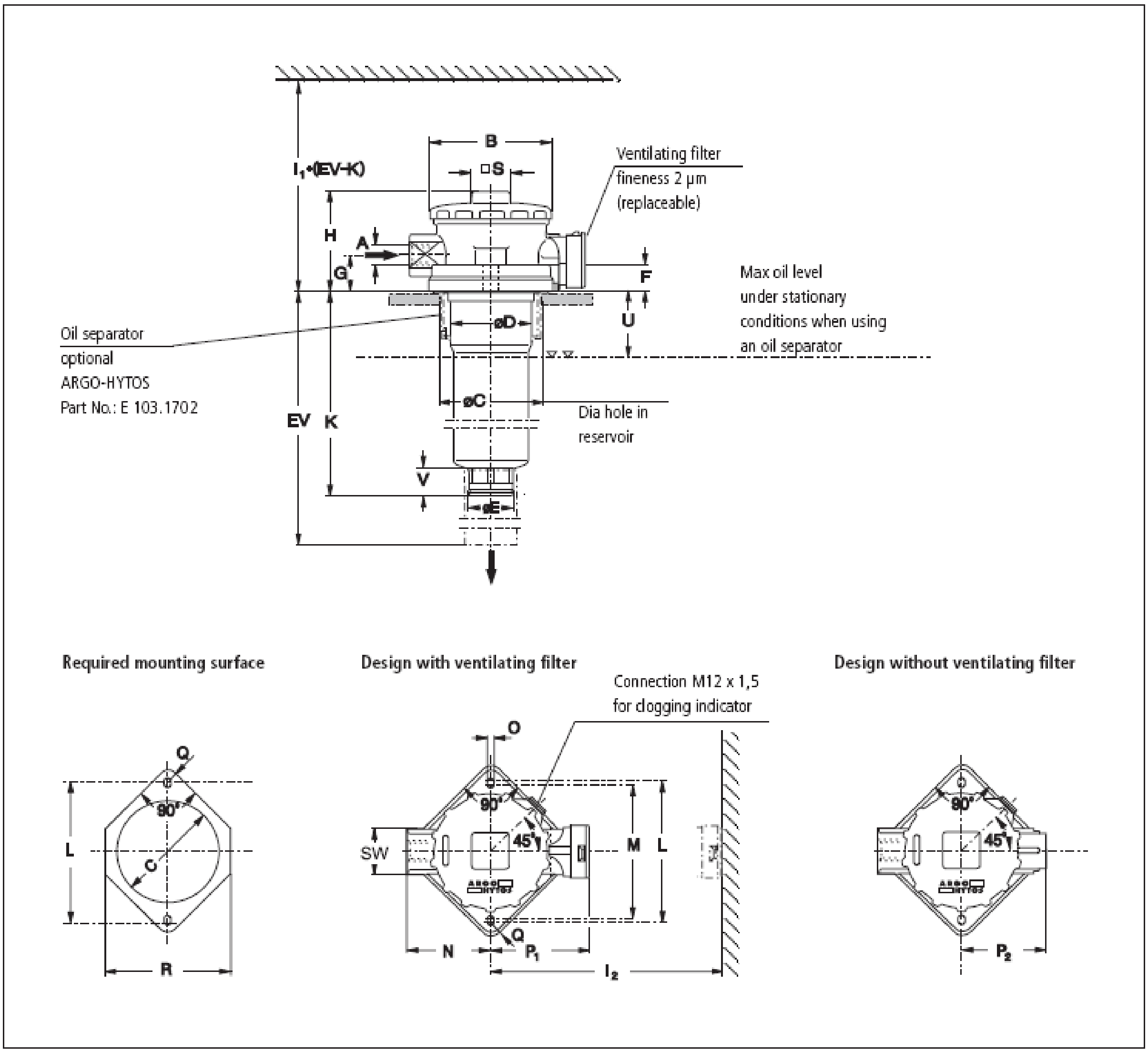
Part No. (basic unit)

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.

WYMIARY:

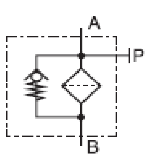


Type	A	B	C min./max.	D	E	F	G	H	l_1	l_2	K	L	M	N	O	P_1	P_2	Q	R	S	SW	U	V
E 094	G¾	105	87 / 91	73,5	38	20,5	30	88,5	235	95	111	115	110	70	11	82	69	13,5	107,5	32	41	50	23
E 103	G½, G¾, G1	105	87 / 91	73,5	38	20,5	30	88,5	300	95	177	115	110	70	11	82	69	13,5	107,5	32	41	50	23
E 143	G¾, G1	105	87 / 91	73,5	38	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

1



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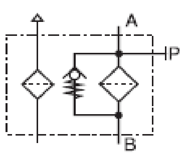

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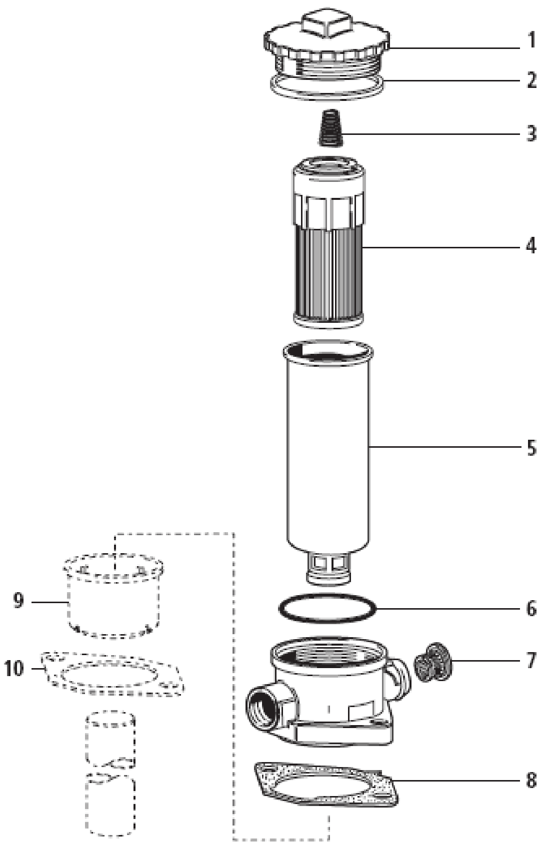
Spare Parts



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 E 103 *	E 103.0912
5	Filter bowl E 143 *	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	Verification of fabrication integrity (Bubble Point Test)
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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.

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TYP: E210, E211, E221 FILTRY POWROTNE

- MONTAŻ NAZBIORNIKOWY

- PRZYŁĄCZA DO G 1 1/4”

- PRZEPLYW DO 210L/MIN

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 clear 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

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

Materials

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

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

SPECYFIKACJA PRODUKTU:

Nominal flow rate
Up to 210 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 or HETG, see info-sheet 00.20)

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

Viscosity at nominal flow rate

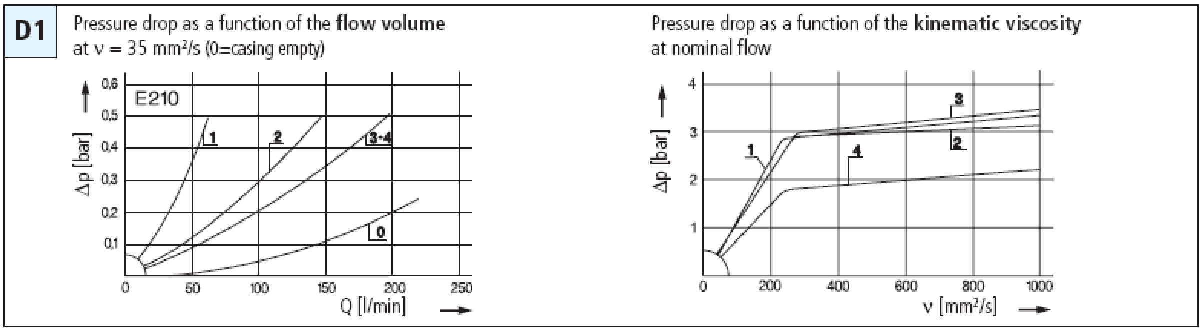
- at operating temperature: $\nu < 60$ mm²/s
- as starting viscosity: $\nu_{max} = 1200$ mm²/s
- at first operation: The recommanded starting viscosity can be read from the Diagram D (pressure drop as a function of the kinematic viscosity) as follows: Find the 70% Δp of the cracking pressure of the by-pass 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

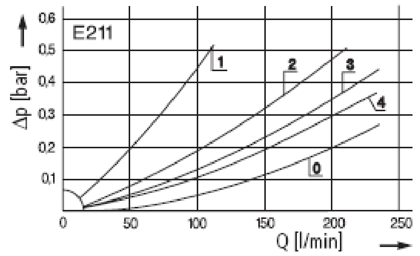
Mounting position
Preferably vertical, outlet downwards

CHARAKTERYSTYKA:

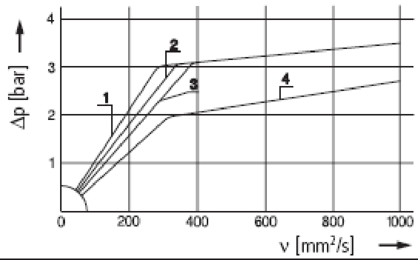
Δp-curves for complete filters in Selection Chart, column 3



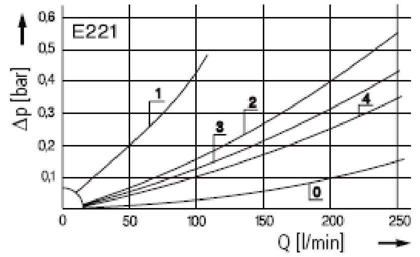
D2 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s (0=casing empty)



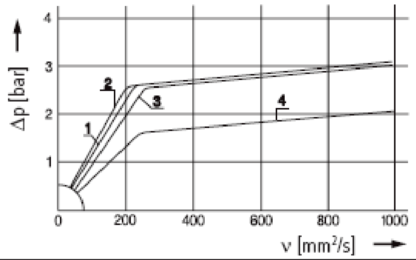
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D3 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s (0=casing empty)

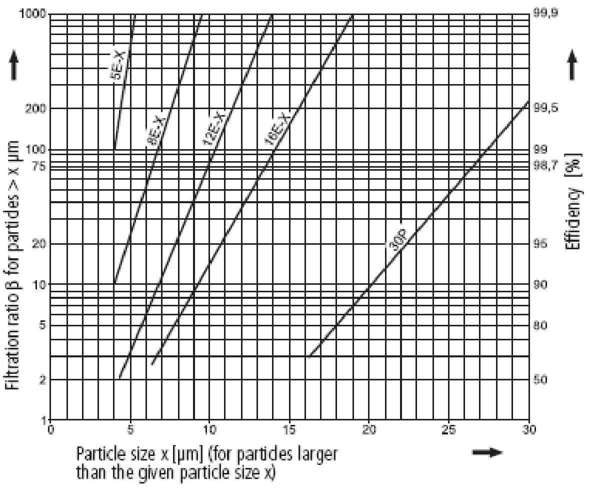


Pressure drop as a function of the **kinematic viscosity** at nominal flow



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- and Paper elements:

5 E-X = $\bar{\beta}_{5(c)}$ = 200 EXAPOR®MAX
8 E-X = $\bar{\beta}_{8(c)}$ = 200 EXAPOR®MAX
12 E-X = $\bar{\beta}_{12(c)}$ = 200 EXAPOR®MAX
16 E-X = $\bar{\beta}_{16(c)}$ = 200 EXAPOR®MAX
30 P = $\bar{\beta}_{30(c)}$ = 200 Paper

Based on the structure of the filter media of the 30 P paper elements, deviations from the printed curves are quite probable.

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

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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 filter element Part No.	Weight	Remarks
	l/min			g		bar			kg	
1	2	3	4	5	6	7	8	9	10	11
E 210-59	60	**D1**/1	5 E-X	25	G 1	2,5	1	V2.0920-03	2,3	-
E 210-66	130	**D1**/2	12 E-X	40	G 1	2,5	1	V2.0920-06	2,3	-
E 210-58	180	**D1**/3	16 E-X	47	G1¼	2,5	1	V2.0920-08	2,3	-
E 210-51	120	**D1**/4	30 P	22	G1¼	1,5	1	P2.0920-11*	2,3	-
E 211-59	110	**D2**/1	5 E-X	50	G 1	2,5	1	2 x V2.0920-03	3,4	-
E 211-56	210	**D2**/2	12 E-X	80	G1¼	2,5	1	2 x V2.0920-06	3,4	-
E 211-58	210	**D2**/3	16 E-X	94	G1¼	2,5	1	2 x V2.0920-08	3,4	-
E 211-51	210	**D2**/4	30 P	44	G1¼	1,5	1	2 x P2.0920-11*	3,4	-
E 221-59	100	**D3**/1	5 E-X	36	G 1	2,5	1	V2.0833-03	3,3	-
E 221-56	210	**D3**/2	12 E-X	58	G1¼	2,5	1	V2.0833-06	3,3	-
E 221-58	210	**D3**/3	16 E-X	67	G1¼	2,5	1	V2.0833-08	3,3	-
E 221-51	210	**D3**/4	30 P	36	G1¼	1,5	1	P2.0833-01*	3,3	-

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 210-66 has to be supplied with an extension pipe (EV) for a mounting depth of 300 mm.

Order description: **E 210-66 / EV 300**

Part No. (Basic unit) → E 210-66

Extension pipe (4 various lengths are available) → EV 300

E 210 / E 211: EV = K + 95 / + 195 / + 295 / + 395

E 221: EV = K + 139 / + 239 / + 339 / + 439

(see dimensions and measurements)

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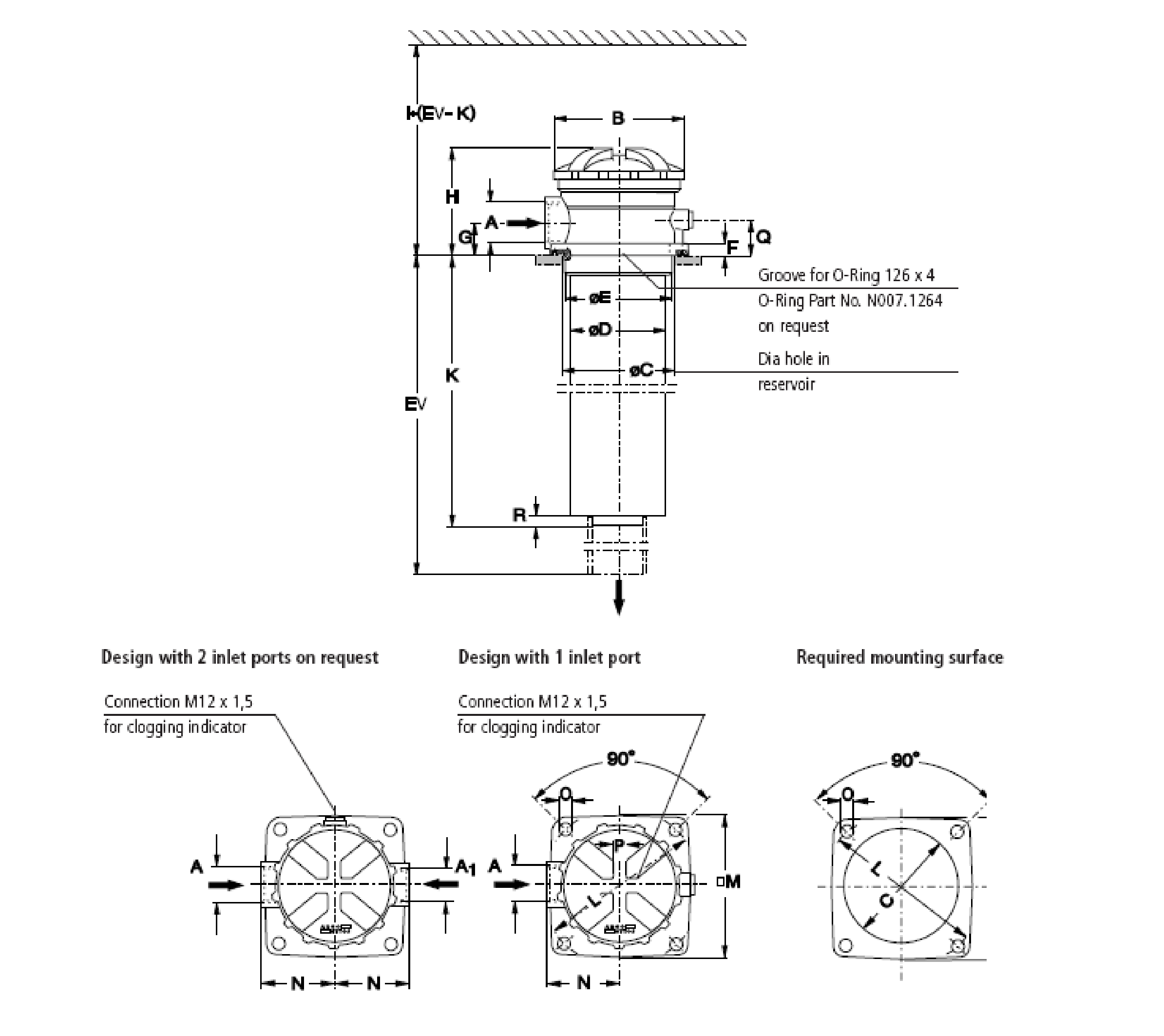
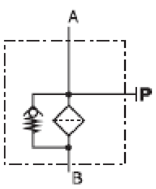


Type	A	B	C min./max.	D	E	F	G	H	I	K	L	M	N	O	P	Q	R
E 210	G1, G1¼	126,5	111/121	95,5	110	11,5	32	106	325	205	165	141	76	11	13	35	-
E 211	G1, G1¼	126,5	111/121	95,5	110	11,5	32	106	525	405	165	141	76	11	13	35	-
E 221	G1, G1¼	126,5	111/121	95,5	110	11,5	32	106	465	361	165	141	76	11	13	35	15

Symbols

1



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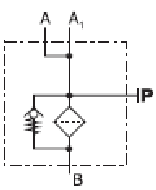

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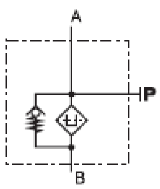

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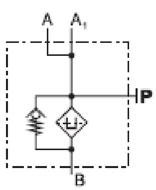

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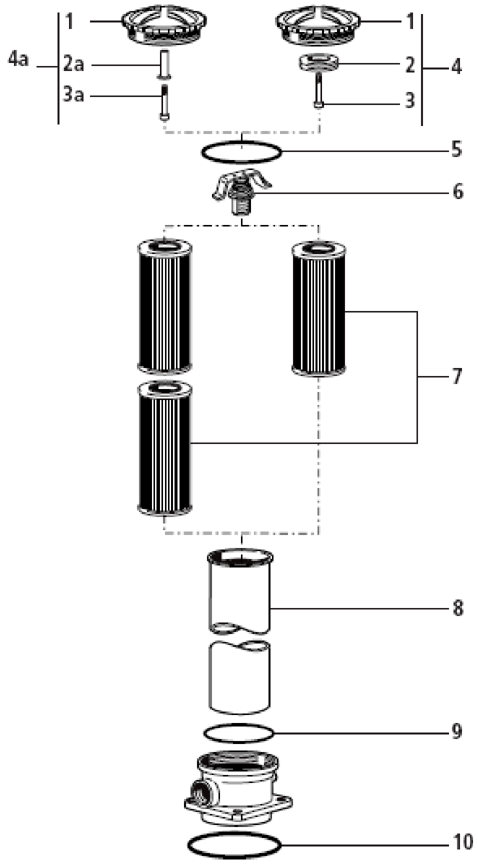
Spare Parts



Pos.	Designation	Part No.
1	Screw-on cap with Pos. 5	ES 074.1212
2	Magnetic system	D 020.1401
2a	Hollow rivet A 8 x 0,75 x 25 DIN 7340-St	3309059
3	Cylinder screw assy	E 210.1201
3a	Cylinder screw M6x35 DIN 912-8.8	3302006
4	Screw-on cap assy with Pos. 5	E 210.1210
4a	Screw-on cap assy with Pos. 5	E 210.1200
5	O-ring 100 x 4	N 007.1004
6	By-pass E 210/E 211 (1,5 bar)	E 210.1903
6	By-pass E 210/E 211 (2,5 bar)	E 210.1905
6	By-pass E 221 (1,5 bar)	E 221.1903
6	By-pass E 221 (2,5 bar)	E 210.1905
7	Filter element	see Chart / col. 9
8	Filter bowl E 210 *	E 210.1901
8	Filter bowl E 211 *	E 211.1901
8	Filter bowl E 221 *	E 221.1901
9	O-ring 90 x 4	N 007.0904
10	O-ring 126 x 4 **	N 007.1264

[1] Specify mounting depth in mm
[2] Not included in basic equipment

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	Verification of fabrication integrity (Bubble Point Test)
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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.

TYP: D042, D062 FILTRY CIŚNIENIOWE

- MONTAŻ LINIOWY

- CIŚNIENIE DO 100 BAR

- MODELE DO 70L/MIN

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 $\nu \leq 200$ mm²/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 (Viton on request)
Filter media:	EXAPOR®MAX - inorganic multi-layer microfibre web Paper - cellulose web, impregnated with resin

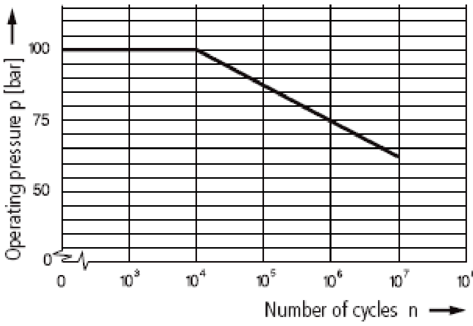
Accessories
Electrical and/or optical clogging indicators are available - optionally with one or two switching points resp. temperature suppression.
Dimensions and technical data see catalogue sheet 60.30.

SPECYFIKACJA PRODUKTU:

Operating pressure
0 ... 63 bar, min. 10^7 pressure cycles
Nominal pressure according to DIN 24550

0 ... 100 bar, min. 10^4 pressure cycles
Quasi-static operating pressure

Permissible pressures for other numbers of cycles



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:
  up to 40 bar ≤ 4,5 m/s
  up to 250 bar ≤ 8 m/s

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 or 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: $\nu < 60$ 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 intersects the Δp curve at a point. Read this point

  on the horizontal axis for the viscosity.

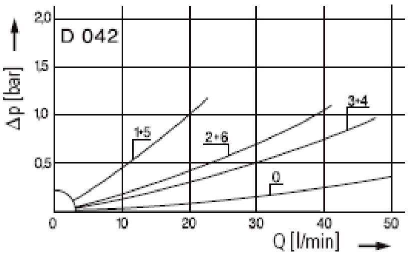
Mounting position
Preferably vertical, filter head on top

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

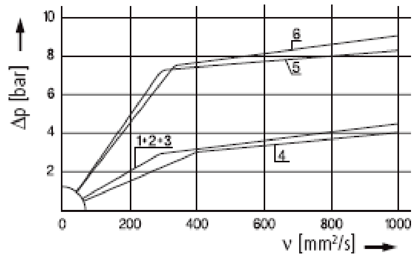
CHARAKTERYSTYKA:

D1

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

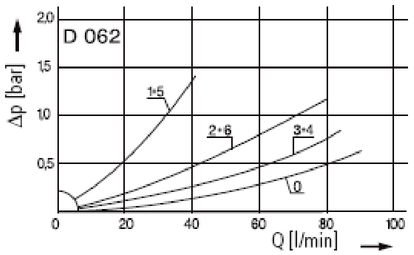


Pressure drop as a function of the **kinematic viscosity**
at nominal flow

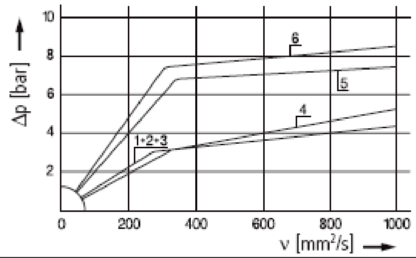


CHARAKTERYSTYKA:

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

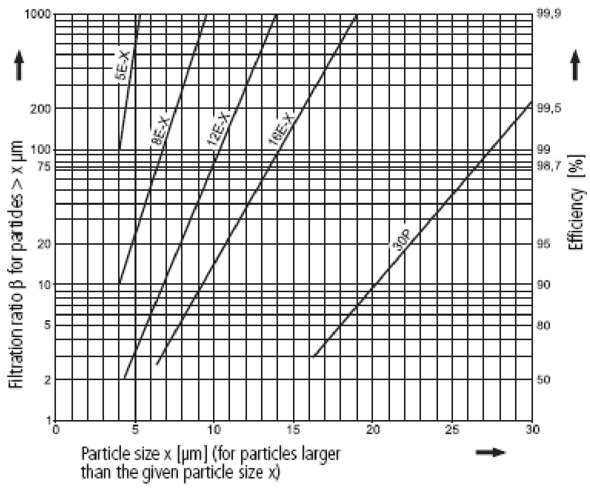


Pressure drop as a function of the **kinematic viscosity**
at nominal flow



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- and Paper elements:

5 E-X = $\overline{\beta}_{5(c)}$ = 200 EXAPOR®MAX
8 E-X = $\overline{\beta}_{8(c)}$ = 200 EXAPOR®MAX
12 E-X = $\overline{\beta}_{12(c)}$ = 200 EXAPOR®MAX
16 E-X = $\overline{\beta}_{16(c)}$ = 200 EXAPOR®MAX
30 P = $\overline{\beta}_{30(c)}$ = 200 Paper

Based on the structure of the filter media of the 30 P paper elements, deviations from the printed curves are quite probable.

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

Part No.	Nominal flow	Pressure drop see diagram D/curve no.	Filter fineness see diagr. Dx	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass	Symbol	Replacement filter element Part No.	Weight	Clogging indicator	Remarks
	l/min			g		bar			kg		
1	2	3	4	5	6	7	8	9	10	11	12
D 042-153	9	**D1**/1	5 E-X	3,8	G½	3,5	4	V3.0510-03	0,8	optional	-
D 042-156	15	**D1**/2	12 E-X	6,1	G½	3,5	4	V3.0510-06	0,8	optional	-
D 042-158	30	**D1**/3	16 E-X	6,6	G½	3,5	4	V3.0510-08	0,8	optional	-
D 042-151	35	**D1**/4	30 P	3,6	G½	3,5	4	P3.0510-11*	0,8	optional	-
D 042-183	20	**D1**/5	5 E-X	3,8	G½	7	4	V3.0510-03	0,8	optional	-
D 042-186	35	**D1**/6	12 E-X	6,1	G½	7	4	V3.0510-06	0,8	optional	-
D 062-153	20	**D2**/1	5 E-X	7,6	G½	3,5	4	V3.0520-03	1,1	optional	-
D 062-156	30	**D2**/2	12 E-X	13	G¾	3,5	4	V3.0520-06	1,1	optional	-
D 062-158	60	**D2**/3	16 E-X	14	G¾	3,5	4	V3.0520-08	1,1	optional	-
D 062-151	70	**D2**/4	30 P	7,1	G¾	3,5	4	P3.0520-01*	1,1	optional	-
D 062-183	40	**D2**/5	5 E-X	7,6	G½	7	4	V3.0520-03	1,1	optional	-
D 062-196	70	**D2**/6	12 E-X	13	G¾	7	4	V3.0520-06	1,1	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 042-156 has to be supplied with optical clogging indicator - response pressure 2,0 bar

Order description: D 042-156 / DG 042-01 M

Part No. (Basic unit) — D 042-156

Clogging indicator — DG 042-01

M — **Mounted**

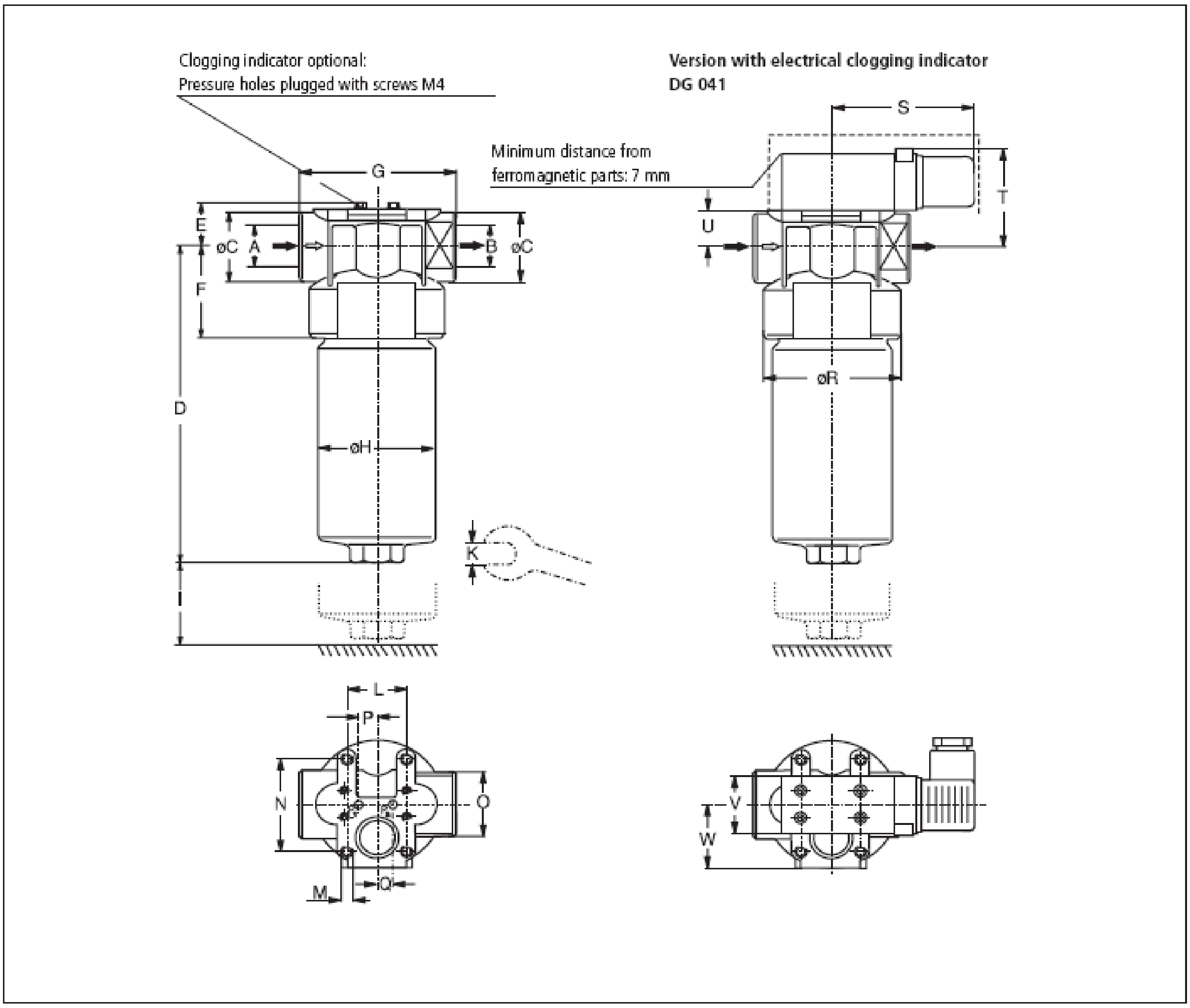
For the appropriate clogging indicators see catalogue sheet 60.30

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

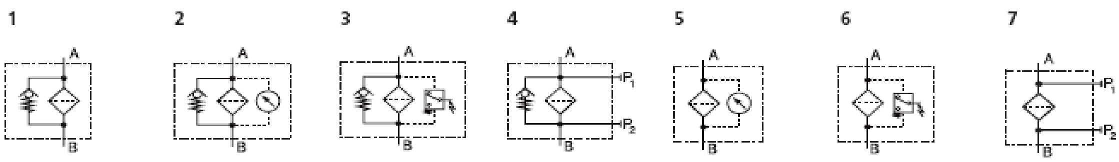
WYMIARY:



Measurements

Type	A/B	C	D	E	F	G	H	I	K	L	M ø/depth	N	O	P	Q	R	S	T	U	V	W
D 042	G½	39	148	27	45,5	80	58,5	55	27	35	M6/8	44	36	19	15	70	81	55	23	30	35,5
D 062	G½, G¾	39	244	27	45,5	80	58,5	55	27	35	M6/8	44	36	19	15	70	81	55	23	30	35,5

Symbols



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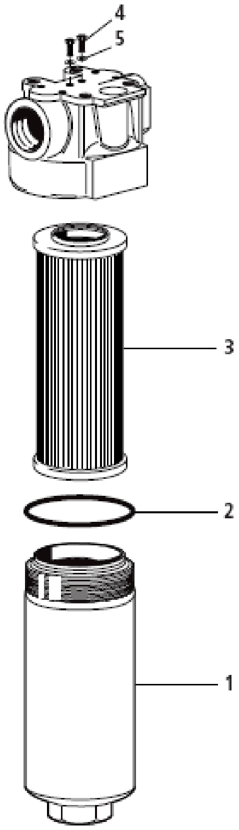
CZĘŚCI ZAMIENNE:

Spare Parts



Pos.	Designation	Part No.
1	Filter bowl D 042	D 044.0101
1	Filter bowl D 062	D 064.0101
2	O-ring 50 x 2	N 007.0501
3	Filter element (with seal)	see Chart / col. 9
4	Hexagonal head screw M4 x 8 DIN 933-8.8	3301051
5	Bonded seal 4,1 x 7,2 x 1	3404074

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	Verification of fabrication integrity (Bubble Point Test)
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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.

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TYP: D162, D232, D332 FILTRY CIŚNIENIOWE

- MONTAŻ LINIOWY

- CIŚNIENIE DO 63 BAR

- MODELE DO 300L/MIN

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 $\nu \leq 200$ mm²/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 (Viton on request)
Filter media:	EXAPOR®MAX - 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.

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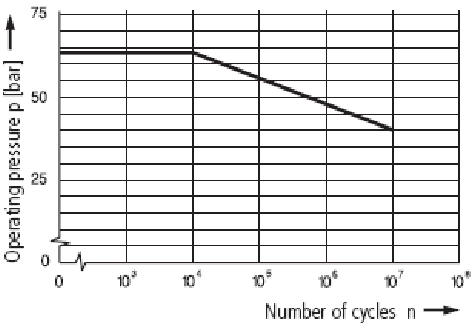
SPECYFIKACJA PRODUKTU:

Operating pressure
0 ... 40 bar, min. 10^7 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



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 or 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: $\nu < 60$ mm²/s
- as starting viscosity: $\nu_{max} = 1200$ mm²/s
- at initial operation: 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.

Nominal flow rate
Up to 300 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:
  up to 40 bar ≤ 4,5 m/s
  up to 250 bar ≤ 8 m/s

Filter fineness
5 µm(c) ... 30 µm(c)
β-values according to ISO 16889
(see Selection Chart, column 4 and diagram Dx)

Mounting position
Preferably vertical, filter head on top

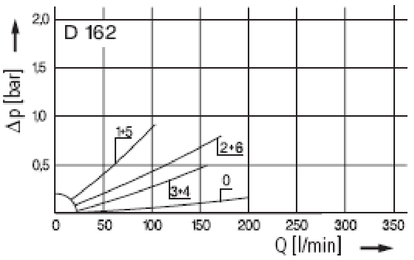
Connection
Threaded ports according to ISO 228 or DIN 13.
Sizes see Selection Chart, column 6 (other port threads on request).

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)

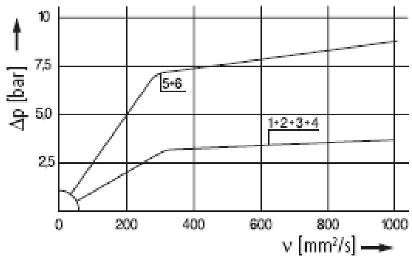
CHARAKTERYSTYKA:

D1

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

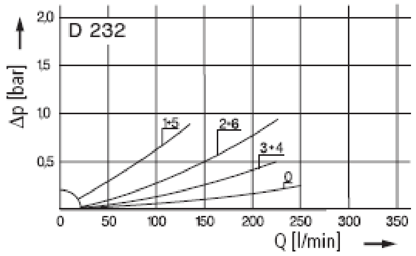


Pressure drop as a function of the **kinematic viscosity**
at nominal flow

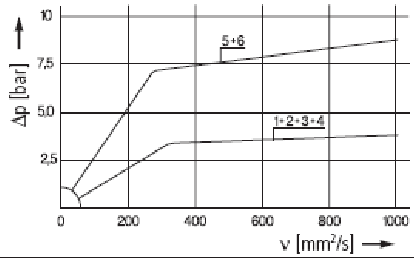


CHARAKTERYSTYKA:

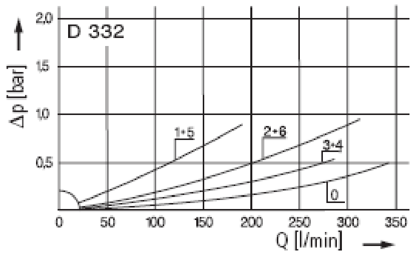
D2 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s (0 = casing empty)



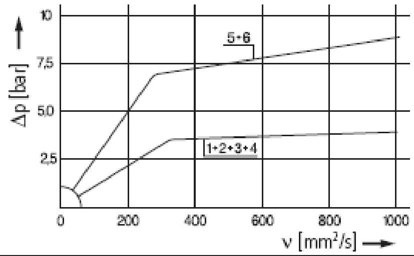
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D3 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s (0 = casing empty)

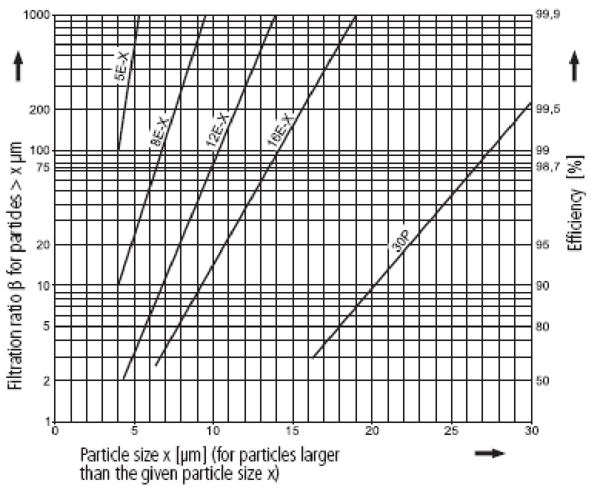


Pressure drop as a function of the **kinematic viscosity** at nominal flow



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- and Paper elements:

5 E-X	= $\overline{\beta}_{5(c)}$	= 200	EXAPOR®MAX
8 E-X	= $\overline{\beta}_{8(c)}$	= 200	EXAPOR®MAX
12 E-X	= $\overline{\beta}_{12(c)}$	= 200	EXAPOR®MAX
16 E-X	= $\overline{\beta}_{16(c)}$	= 200	EXAPOR®MAX
30 P	= $\overline{\beta}_{30(c)}$	= 200	Paper

Based on the structure of the filter media of the 30 P paper elements, deviations from the printed curves are quite probable.

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

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Part No.	Nominal flow	Pressure drop see diagram D/curve no.	Filter fineness see diagr. Dx	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass	Symbol	Replacement filter element Part No.	Weight	Clogging indicator	Remarks
	l/min			g		bar			kg		
1	2	3	4	5	6	7	8	9	10	11	12
D 162-253	40	**D1**/1	5 E-X	18	G1¼	3,5	4	V3.0817-03	3,2	optional	-
D 162-256	65	**D1**/2	12 E-X	28	G1¼	3,5	4	V3.0817-06	3,2	optional	-
D 162-258	105	**D1**/3	16 E-X	30	G1¼	3,5	4	V3.0817-08	3,2	optional	-
D 162-251	130	**D1**/4	30 P	18	G1¼	3,5	4	P3.0817-01*	3,2	optional	-
D 162-283	95	**D1**/5	5 E-X	18	G1¼	7	4	V3.0817-03	3,2	optional	-
D 162-286	150	**D1**/6	12 E-X	28	G1¼	7	4	V3.0817-06	3,2	optional	-
D 232-253	55	**D2**/1	5 E-X	26	G1¼	3,5	4	V3.0823-03	3,4	optional	-
D 232-256	90	**D2**/2	12 E-X	41	G1¼	3,5	4	V3.0823-06	3,4	optional	-
D 232-258	150	**D2**/3	16 E-X	46	G1¼	3,5	4	V3.0823-08	3,4	optional	-
D 232-251	180	**D2**/4	30 P	26	G1¼	3,5	4	P3.0823-01*	3,4	optional	-
D 232-283	130	**D2**/5	5 E-X	26	G1¼	7	4	V3.0823-03	3,4	optional	-
D 232-286	210	**D2**/6	12 E-X	41	G1½	7	4	V3.0823-06	3,4	optional	-
D 332-253	80	**D3**/1	5 E-X	36	G1¼	3,5	4	V3.0833-03	4,0	optional	-
D 332-256	130	**D3**/2	12 E-X	58	G1¼	3,5	4	V3.0833-06	4,0	optional	-
D 332-258	210	**D3**/3	16 E-X	67	G1¼	3,5	4	V3.0833-08	4,0	optional	-
D 332-251	260	**D3**/4	30 P	34	G1½	3,5	4	P3.0833-01*	4,0	optional	-
D 332-283	190	**D3**/5	5 E-X	36	G1¼	7	4	V3.0833-03	4,0	optional	-
D 332-286	300	**D3**/6	12 E-X	58	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) — D 232-256

Clogging indicator — DG 042-01

Mounted — M

For the appropriate clogging indicator see catalogue sheet 60.30.

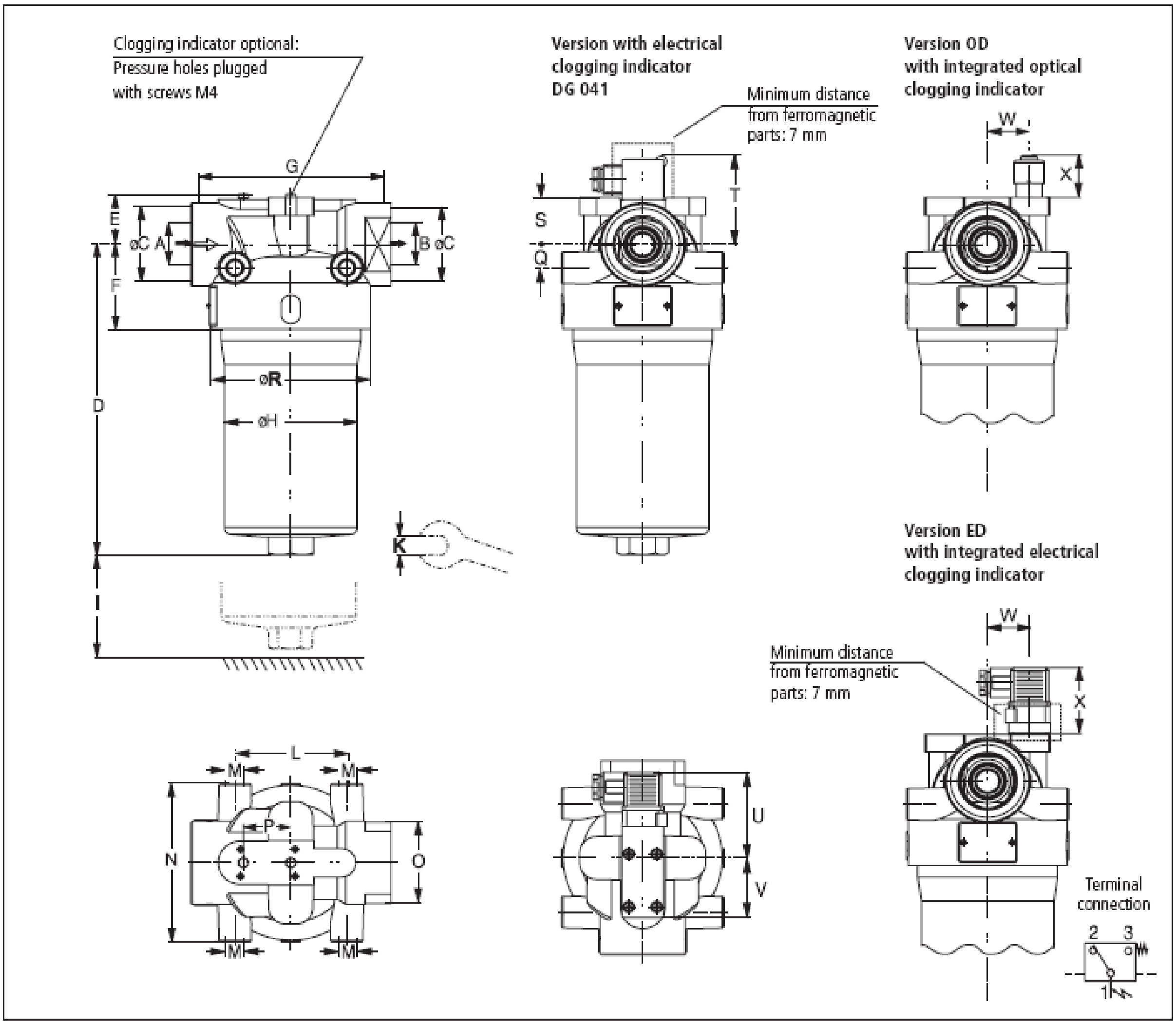
Besides these mounted clogging indicators we also offer - with a certain order quantity - clogging indicators integrated in the filter head (as listed under "dimensions").

Order examples:
D 232-256 ED (electrical differential pressure indicator)
D 232-256 OD (optical differential pressure indicator)
} the switching pressure matches the 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

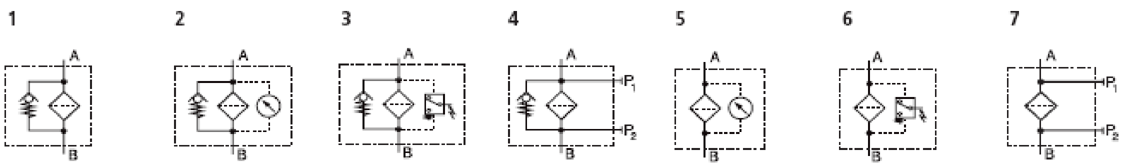
WYMIARY:



Measurements

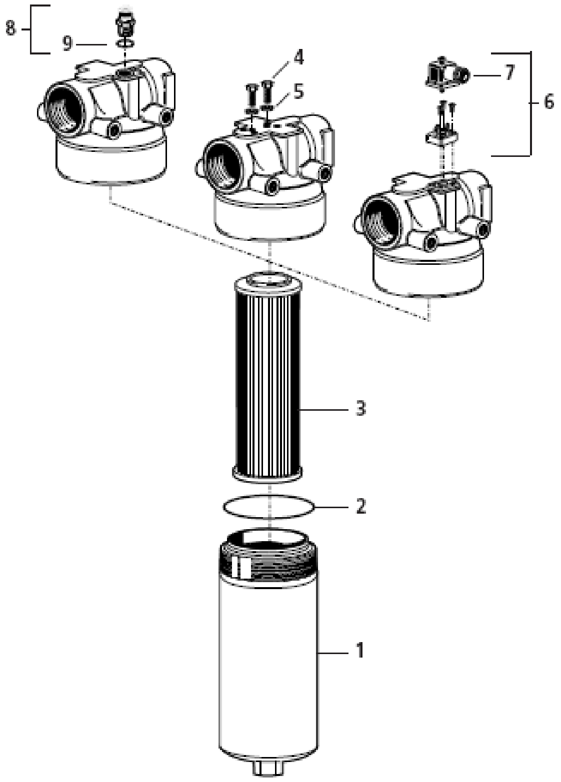
Type	A/B	C	D	E	F	G	H	I	K	L	M ø/depth	N	O	P	Q	R	S	T	U	V	W	X ED	X OD
D 162	G1¼	61	232	38	62	140	95	80	32	80	M12/18	116	SW60	34	17	115	34	66	66	44	30	49	30
D 232	G1¼, G1½	61	296	38	62	140	95	80	32	80	M12/18	116	SW60	34	17	115	34	66	66	44	30	49	30
D 332	G1¼, G1½	61	396	38	62	140	95	80	32	80	M12/18	116	SW60	34	17	115	34	66	66	44	30	49	30

Symbols



CZĘŚCI ZAMIENNE:

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	N 007.0886
3	Filter element (with seal)	see Chart / col. 9
4	Hexagonal head screw M4 x 8 DIN 933-8.8	3301051
5	Bonded seal 4,1 x 7,2 x 1	3404074
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	N 007.0124

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Quality Assurance

Quality management according to DIN EN ISO 9001

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DIN ISO 2943	Verification of material compatibility with fluids
DIN ISO 3724	Verification of flow fatigue characteristics
ISO 2942	Verification of fabrication integrity (Bubble Point Test)
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)

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.

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TYP: FHP FILTRY CIŚNIENIOWE

Pressure filters – pipe fitting 420 bar

- Degree of filtration: 6/10 µm absolute
- Operating pressure: max. 420 bar
- Differential pressure: A**H - filter element max. 210 bar
- Design: Without bypass valve, without contamination indicator
- Designed (Q_{max}) for medium ISO VG 46 at 50 °C (30 mm²/s) at Δptotal: 1.25 bar
- We shall be pleased to advise you about other filter materials, types of oil, viscosities and temperatures.

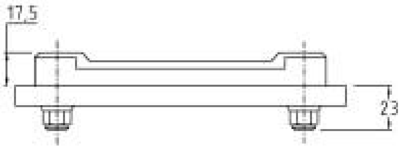
Code	Pipe connection BSP/SAE flange	A06H - filter element		A10H - filter element		A	B	C	D	E	Weight kg
		Filter surface cm²	Q max l/min	Filter surface cm²	Q max l/min						
FHP065 1 SG1 ****	1/2"	386	20	386	40	192	100	23	85	66	3.9
FHP065 2 SG2 ****	3/4"	544	35	544	45	221	100	23	85	66	4.2
FHP065 3 SG2 ****	3/4"	1094	60	1094	70	323	100	23	85	66	5.7
FHP135 2 SG2 ***	1"	1655	110	1655	110	367	125	36	109.5	80	9.4
FHP320 2 SF5 ***	1 1/4" SAE 6000 PSI/M	3258	250	3258	225	411	150	40	140	105	16.5

**** = A06H With inorganic filter (6 µm), absolute filtering
**** = A10H With inorganic filter (10 µm), absolute filtering
without **** Without filter, that is filter casing only

Dostępne wkłady filtracyjne HP.. oraz wskaźniki VA.. produktu.

*broszura poglądowa, dostępne karty katalogowe www.mpfiltri.com

TYP: C5… , LVA WSKAŹNIKI POZIOMU OLEJU



Max Ciśnienie: 1 bar

Temp. pracy: -20°C +80°C

Oznaczenie	Termometr °C	Rozstaw śrub montażowych (mm)	Rozmiar śrub montażowych	Waga kg
LVA10 S M10	NIE	76	2 x M10	0.12
LVA10 T M10	TAK	76	2 x M10	0.12
LVA10 S M12	NIE	76	2 x M12	0.12
LVA10 T M12	TAK	76	2 x M12	0.12
LVA20 S M10	NIE	127	2 x M10	0.16
LVA20 S M12	NIE	127	2 x M12	0.16
LVA20 T M12	TAK	127	2 x M12	0.16
LVA30 S M10	NIE	254	2 x M10	0.22
LVA30 T M10	TAK	254	2 x M10	0.22
LVA30 S M12	NIE	254	2 x M12	0.22
LVA30 T M12	TAK	254	2 x M12	0.22

Wariant produktu : wersja z termostatem NO lub NC,

*broszura poglądowa, dostępne karty katalogowe produktu,

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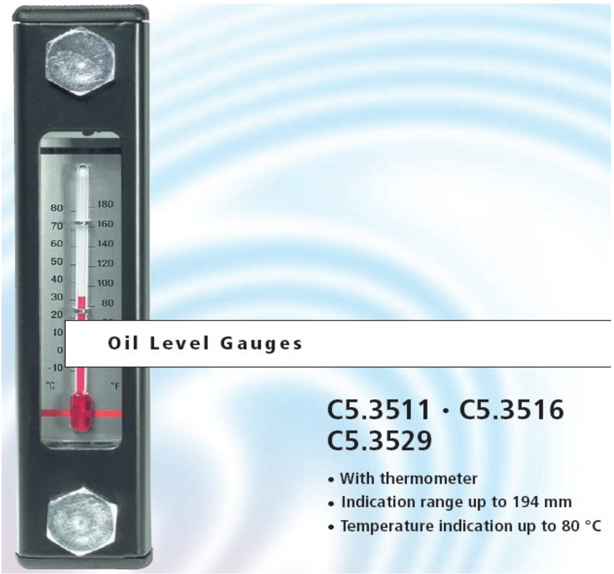
TYP: C5… WSKAŹNIKI POZIOMU OLEJU



- MONTAŻ NAZBIORNIKOWY

- TERMOMETR

- ROZMIARY DO 194 MM

Application
Indicates the oil level and the oil temperature in hydraulic oil or lubricant reservoirs.

Design and function
ARGO-HYTOS oil level gauges consist of a robust metal housing equipped with a sight level tube and built-in thermometer. The fluid enters the thermometer chamber through the mounting bolts, which are hollow. O-rings provide a seal against the housing and the reservoir wall.

Special features
- The robust metal housing is designed to withstand even the most severe operating conditions.
- The integrated scale shows the oil temperature in °C and °F.

Mounting
The hollow screws and the locking nuts supplied with the gauge, enable installation on the reservoir wall by using two bores.
The locking nuts serve the purpose of retightening the bolts from the outside (assembly torque: 8 Nm).
Threaded holes are required instead of smooth bore holes if the wall of the reservoir is more than 8 mm thick.

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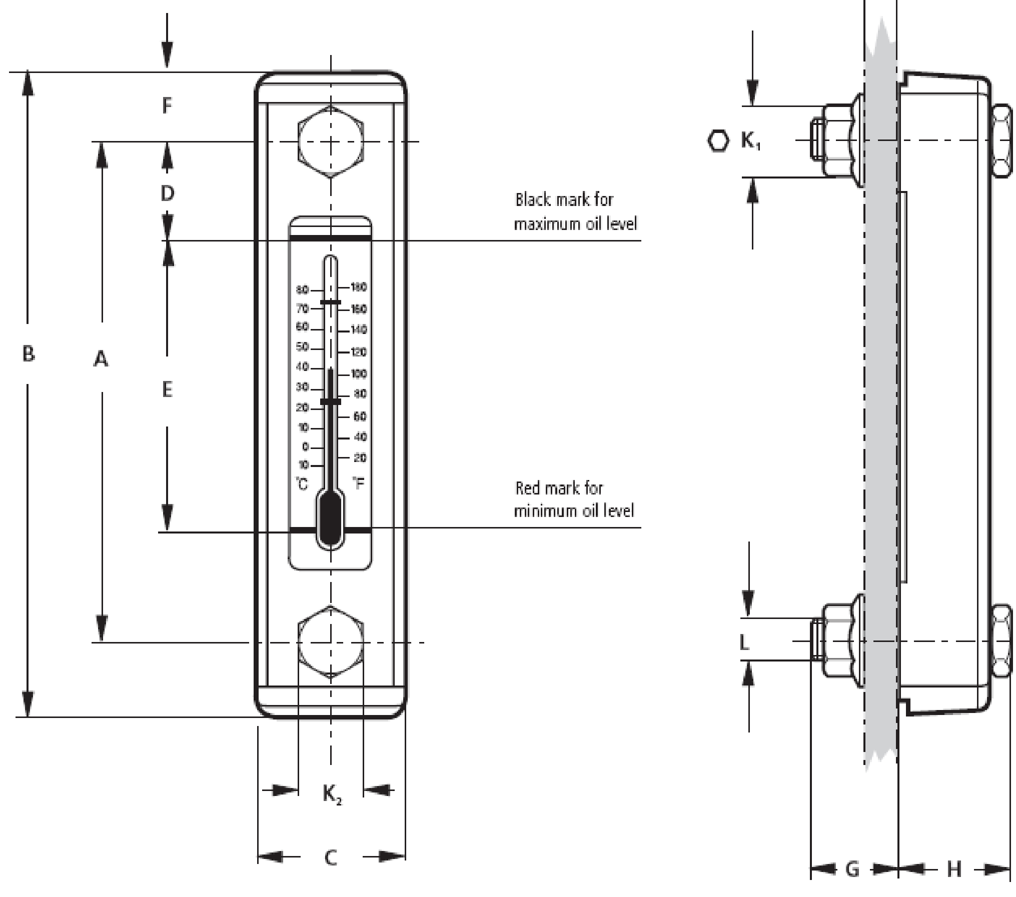
Selection Chart

Part No.	Oil level indicating range E	Total height B	Temperature indicating range	Temperature indicating range	Mounting bolts	Weight	Remarks
	mm	mm	°C	°F		kg	
1	2	3	4	5	6	7	8
C5.3511-50	33	108	+20 ... +80	80 ... 180	M10	0,18	-
C5.3516-50	74	159	-10 ... +80	20 ...180	M12	0,24	-
C5.3529-50	194	285	-10 ... +80	20 ... 180	M12	0,32	-



At the housing C5.3529-50 the vision panel is splitted in two sections.

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Type	A	B	C	D	E	F	G	H	I max.	K_1	K_2	L
C5.3511-50	76	108	34,5	22,5	33	16	18	29	8	17	17	M10
C5.3516-50	127	159	34,5	26,5	74	16	18	29	8	18	17	M12
C5.3529-50	254	285	34,5	28	194	16	18	29	8	18	17	M12

Operating pressure
Max. 2 bar (abs.)

Connection
Threaded ports according to DIN 13. Sizes see Selection Chart, column 6 and section Dimensions

Hydraulic fluids
Mineral oil and biodegradable fluids (HEES and HETG, see info-sheet 00.20)

Temperature range
- 20 °C ... + 80 °C

Ambient temperature range
- 25 °C ... + 80 °C

Materials

Housing:	Steel, powder coated, black
Sight level tube:	Polyamide
Scale:	Aluminium
Thermometer:	Glass
Bolts:	Steel, zinc plated
Seals:	NBR (Viton on request)

Mounting position
In the min./max. oil level range on the side wall of the hydraulic oil reservoir.

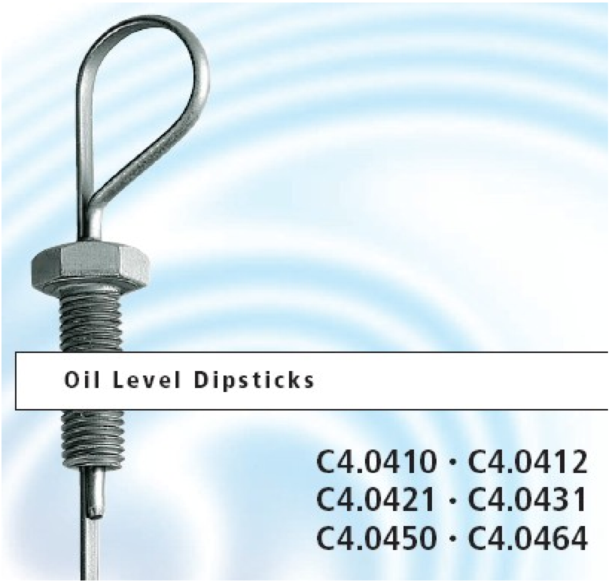
Quality Assurance

Quality management according to DIN EN ISO 9001

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

ARGO HYTOS
We produce fluid power solutions
ARGO-HYTOS GMBH · Industriestraße 9 · D-76703 Kraichtal
Tel: +49 7250 76-0 · Fax: +49 7250 76-199 · info.de@argo-hytos.com

TYP: C4… BAGNETY OLEJOWE



- MONTAŻ NAZBIORNIKOWY
- ROZMIAR ŚRUBY M10
- DŁUGOŚCI DO 640 MM

Application
Controlling the oil level in hydraulic oil or lubricant reservoirs

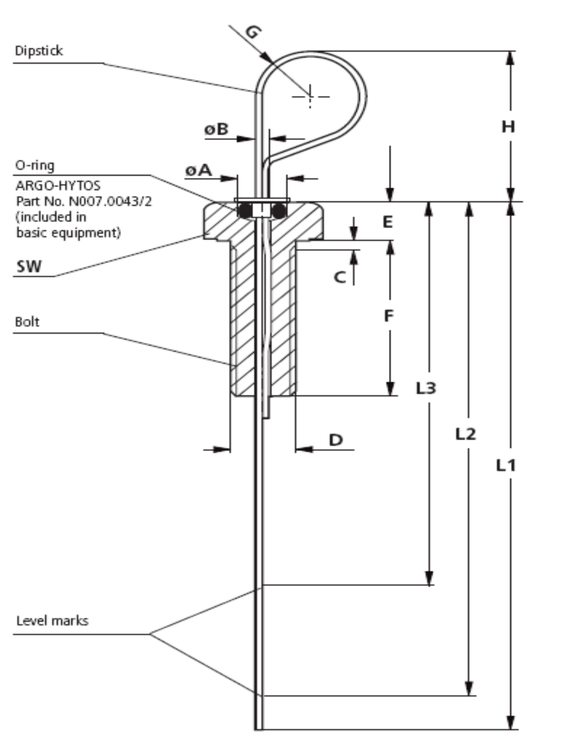
Construction and function
ARGO-HYTOS oil level dipsticks are robust semicircular metal rods with an O-ring seal.
A mounting bolt with a suitable hole is supplied with each dipstick.
Dipsticks are available in various lengths, with various markings, and with various mounting bolts (see selection chart).

Special features
- The robust material withstands even the most severe operating conditions
- The integral O-ring provides a 100% tight seal
- A suitable dipstick mounting bolt can also replace one of the mounting bolts of an in-tank return or suction filter

Mounting
The bolt supplied with the oil level dipstick is installed either in a separate threaded hole or in an already existing mounting hole for an in-tank filter.
This eliminates the need to machine an extra mounting hole.
If used as a filter mounting bolt, care should be taken to provide a proper seal between the tank, the filter and the mounting bolt.

Part No.	Dipstick dimension L1	Dipstick dimension L2	Dipstick dimension L3	Mounting bolt	Grade	Remarks
	mm	mm	mm			
1	2	3	4	5	7	8
C4.0410-00330	100	-	-	SV.2810.05	8.8	-
C4.0410-01330	100	95	64	SV.2810.05	8.8	-
C4.0412-00330	120	-	-	SV.2810.05	8.8	-
C4.0412-03330	120	97	47	SV.2810.05	8.8	-
C4.0412-04330	120	100	75	SV.2810.05	8.8	-
C4.0421-00330	210	-	-	SV.2810.05	8.8	-
C4.0421-04330	210	118	88	SV.2810.05	8.8	-
C4.0421-06330	210	71	46	SV.2810.05	8.8	-
C4.0431-00330	310	-	-	SV.2810.05	8.8	-
C4.0431-01330	310	190	160	SV.2810.05	8.8	-
C4.0450-00330	500	-	-	SV.2810.05	8.8	-
C4.0464-00330	640	-	-	SV.2810.05	8.8	-
C4.0464-01330	640	630	90	SV.2810.05	8.8	-

Dipstick with bolt



Dimensions

Bolt	A	B	C	D	E	F	G	H	SW
SV.2810.05	10	3,7	4,5	M10	7	30	10	39	17

Operating pressure
Max. 1 bar (abs.)
(Not suitable for use in pressurized hydraulic oil tanks)

Connection
Threaded ports according to ISO 228 or DIN 13.
Sizes see section Dimensions (other port threads on request)

Hydraulic fluids
Mineral oil and biodegradable fluids
(HEES and HETG, see info-sheet 00.20)

Temperature range
- 30 °C ... + 100 °C (temporary + 125 °C)

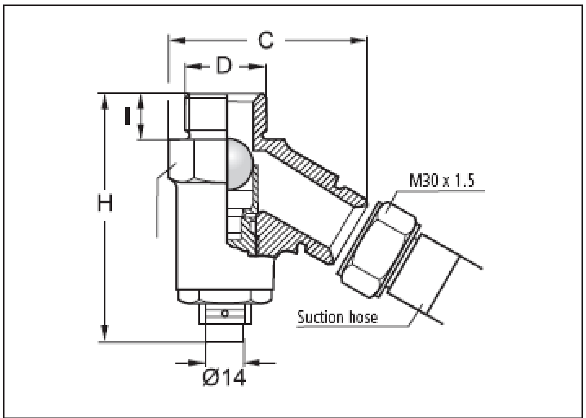
Ambient temperature range
- 30 °C ... + 80 °C (temporary + 100 °C)

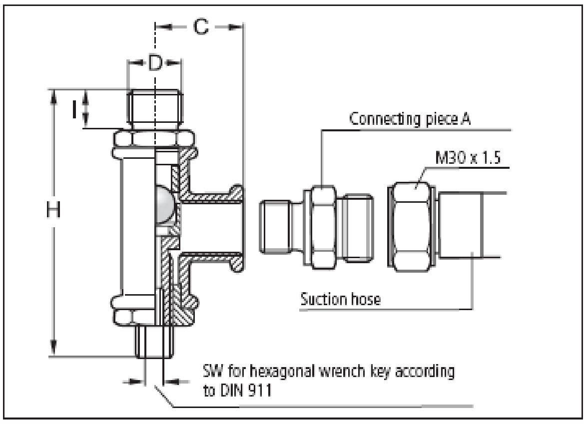
Materials

Dipsticks:	Steel, zinc plated
Bolts:	Steel, zinc plated
Seals:	NBR (Viton on request)

Mounting position
Preferably in vertical position, above the oil level

TYP: AV TV ZAWORY SPUSTOWE OLEJU





TYPE AV

Type	D	C	H	I	A/F	Part-No.
AV20	M32 x 1.5	75	93	16	14	EC330400
AV20/1	M30 x 1.5	75	93	16	14	EC330410

TYPE TV

Type	D	C	H	I	Connection A	A/F	Part-No.
TV R ½"	R 1/2"	28	92	15	M30 x 1.5 to R 1/2"	6	EC330110
TV R ¾"	R 3/4"	33	102	16	M30 x 1.5 to R 3/4"	8	EC330120
TV R 1" *	R 1"	38	125	18	M30 x 1.5 to R 1"	8	EC330130

* For Type TV R1" the spindle is additionally sealed with cap nut and flat gasket (not shown in drawing).