

Off-line Filter Unit**FNA 045**

Operating pressure up to 7 bar / 101 psi · Nominal flow rate up to 45 l/min / 12 gpm



Off-line Filter Unit FNA 045

Description**Application**

In the by-pass flow of hydraulic and lubrication systems.

Performance features*Protection against wear:*

The EXAPOR®MAX 2 ultra-fine element meets the highest cleanliness standards, even at full flow.

Protection against failure:

The off-line filter includes a feature that guarantees a closed by-pass valve even at $v \leq 200 \text{ mm}^2/\text{s}$ / 930 SUS (cold start condition) within specified operating parameters.

Special design features*Housing cover:*

Fold-out handle parts at the cover facilitate the opening.

Compact:

The filter housing, the internal gear pump and the electric motor are screwed together to form a unit. No pipes are needed except for the connection lines. The filter units feature low power consumption and minimal operational noise.

Pressure relief valve:

An integrated PRV (pressure relief valve) protects against overload.

Dirt retention valve:

At the bottom of the filter element, flow through from the inside to the outside, there is a dirt retention valve. This closes while pulling the filter element, which is hung up at the cover, out of the housing. Sedimented dirt is removed together with the filter element. Because of the cover design, the filter element change can be carried out almost without losing any oil.

Filter elements

Flow direction from the inside to the outside. The star-shaped pleating of the filter material results in:

- › large filter surfaces
- › low pressure drop
- › high dirt-holding capacities
- › particularly long maintenance intervals

Filter maintenance

By using a clogging indicator, the correct moment for maintenance is stated, what guarantees optimum utilization of the filter life.

Materials

Pump and filter housing: Aluminum alloy
Cover: Aluminum alloy
Seals: NBR (FPM on request)
Filter media: EXAPOR®MAX 2 - inorganic, multi-layer microfiber web

Accessories

Water-absorbing filter elements EXAPOR®AQUA are available on request.
Electrical and / or optical clogging indicators are available on request – with either one or two switching points resp. temperature suppression.
For dimensions and technical data of the clogging indicators, please refer to catalog sheet 60.30.

Characteristics

Nominal flow rate

Up to 45 l/min at $v = 35 \text{ mm}^2/\text{s}$ /
up to 12 gpm at $v = 162 \text{ SUS}$
(see Selection Chart, column 2)

Connection

Threaded port according to ISO 228 or DIN 13.
Sizes see Selection Chart, column 9 and 10

Filter fineness

3 $\mu\text{m(c)}$... 10 $\mu\text{m(c)}$
 β -values according to ISO 16889
(see Selection Chart, column 4 and Diagram Dx)

Dirt-holding capacity

The dirt-holding capacity values in grams from the ISO MTD test dust are in accordance with the ISO 16889 requirements (see Selection Chart, column 4).

Hydraulic fluids

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

Temperature range of fluids

0 °C ... +65 °C / +32 °F ... +149 °F
(also see viscosity range)

Ambient temperature range

0 °C ... +50 °C / +32 °F ... +122 °F

Viscosity range

Electro motor air cooled type of protection: IP 55	Continuous operation min.	Continuous operation max.	Short-term max.
3 ~ 400 V / 460 V	15 mm ² /s / 70 SUS	600 mm ² /s / 2790 SUS	800 mm ² /s / 3720 SUS
1 ~ 230 V	15 mm ² /s / 70 SUS	600 mm ² /s / 2790 SUS	800 mm ² /s / 3720 SUS

Maximum suction height

max. 2 m / 6.56 ft (unfilled)
max. 6 m / 19.69 ft (in operating condition)

Operating pressure

Max. 7 bar / 101 psi,
pressure protection with pressure relief valve

Operating position

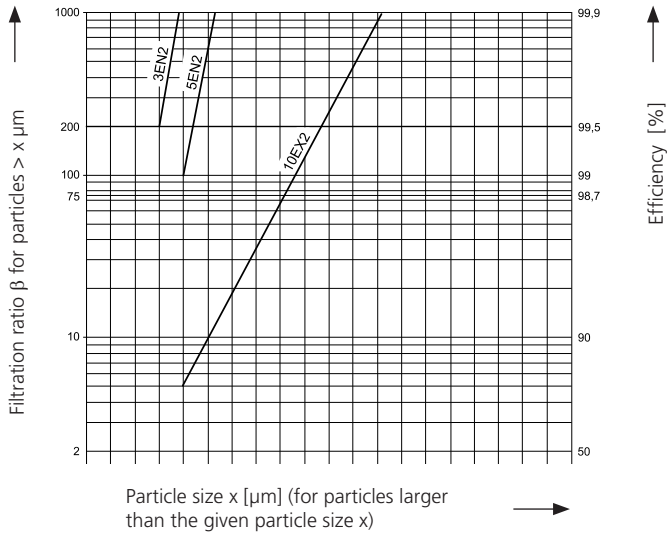
Vertical, pump block at the bottom

Recommended tank capacities

From 500 l up
For off-line filter units for smaller tank capacities
see catalog sheet 80.40.

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

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:

With EXAPOR®MAX2 elements:

- 3EN2 = $\bar{\beta}_{3(c)} = 200$ EXAPOR®MAX2
- 5EN2 = $\bar{\beta}_{5(c)} = 200$ EXAPOR®MAX2
- 10EX2 = $\bar{\beta}_{10(c)} = 200$ EXAPOR®MAX2

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

Selection Chart

Part No.	Nominal flow rate		Filter fineness s. diagram Dx	Dirt-holding capacity	E-motor operating voltage	E-motor operating frequency (max.)	E-motor power (max.)	Engine speed at 50 Hz (max.)
	l/min	gpm						
1	2		3	4	5	6	7	8
FNA 045-1553	45*	12*	3EN2	1,950	1 ~ 230 V	50(60)*	1.1*	1,500
FNA 045-1153	45*	12*	5EN2	1,980	1 ~ 230 V	50(60)*	1.1*	1,500
FNA 045-4553	45*	12*	3EN2	1,950	3 ~ 400/460 V	50(60)*	1.1*	1,500
FNA 045-4153	45*	12*	5EN2	1,980	3 ~ 400/460 V	50(60)*	1.1*	1,500

* Indications at 50 Hz. At 60 Hz, the value increases by approx. 20%.

Part No.	Connection A Inlet	Connection B Outlet	Max. operating pressure (PRV)		Symbols hydraulic	Symbols electric	Replacement filter element Part No.	Clogging indicator
			bar	psi				
1	9	10	11		12	13	14	15
FNA 045-1553	G1¼	G1	7	101	1	3	V7.1560-103	optional
FNA 045-1153	G1¼	G1	7	101	1	3	V7.1560-03	optional
FNA 045-4553	G1¼	G1	7	101	1	1, 2	V7.1560-103	optional
FNA 045-4153	G1¼	G1	7	101	1	1, 2	V7.1560-03	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 FNA 045-1553 has to be supplied with optical clogging indicator - response pressure 2.0 bar / 29 psi.

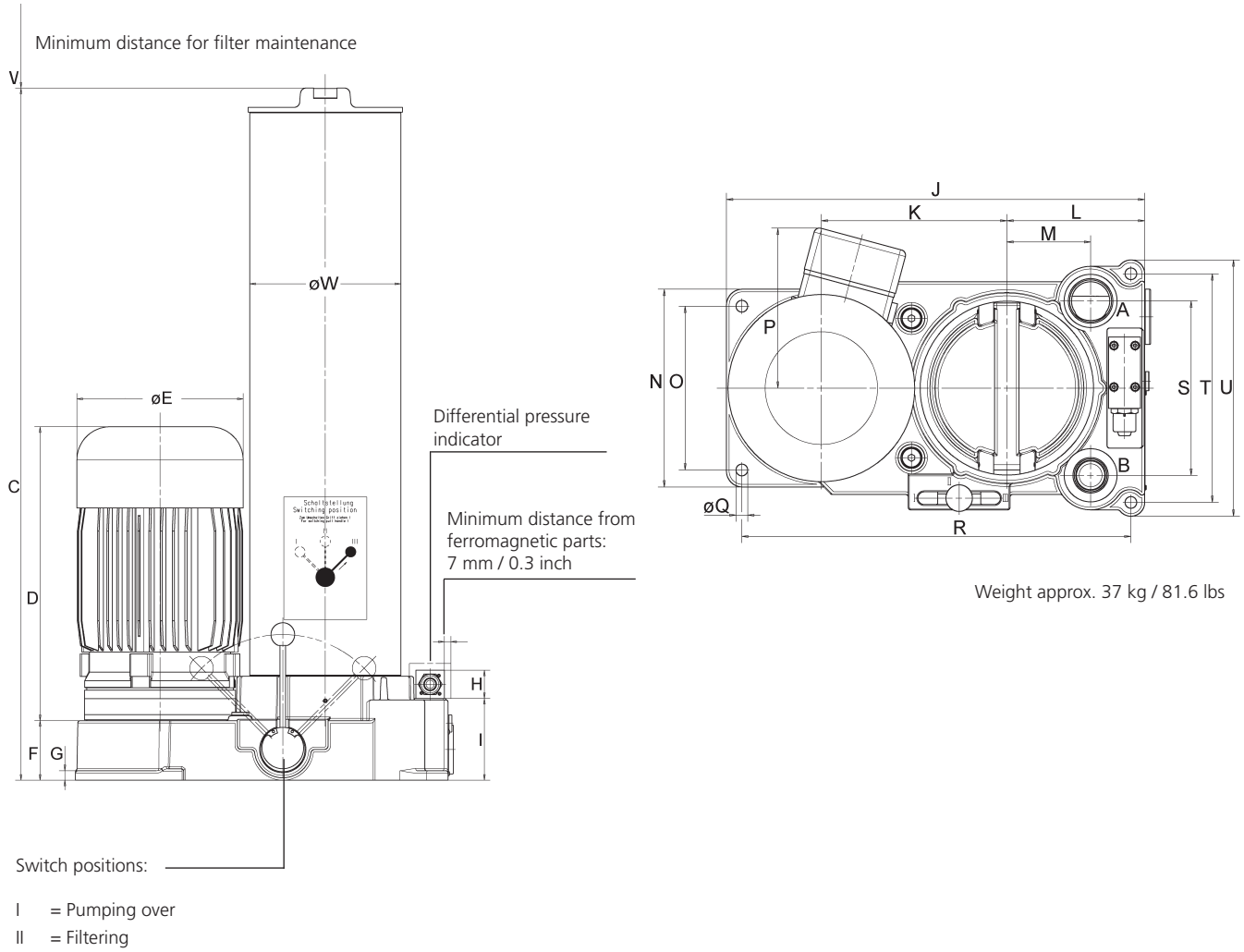
Order example: _____ **FNA 045-1553** / _____ **DG 042-01** **M**
Part No. (Basic unit) _____ **Mounted**
Clogging indicator _____

For appropriate clogging indicators see catalog sheet 60.30.

Remarks:

- › In case of an increasing operating frequency, the pump delivery volume will increase as well.
- › The filter units listed in this chart are standard units. If modifications are required, e.g. with water-absorbing filter elements, we kindly ask for your request.

Dimensions



Measurements in mm

Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
FNA 045	G1¼	G1	735	312	176	63	10	30	87	395	175	130	79	186	154

Type	P	Q	R	S	T	U	V	W							
FNA 045	150	11	367	164	215	241	700	160							

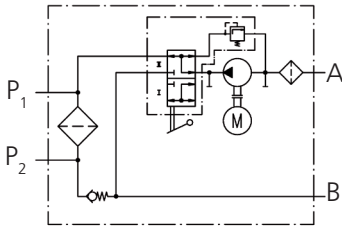
Measurements in inch

Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
FNA 045	G1¼	G1	28.94	12.28	6.93	2.48	0.39	1.18	3.43	15.55	6.89	5.12	3.11	7.32	6.06

Type	P	Q	R	S	T	U	V	W							
FNA 045	5.91	0.43	14.45	6.46	8.46	9.49	27.56	6.30							

Hydraulic symbol

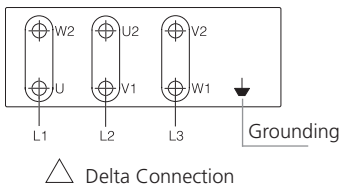
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Electric connections

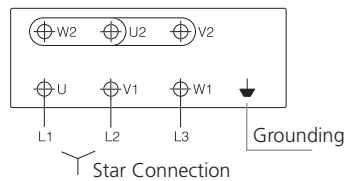
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Connections



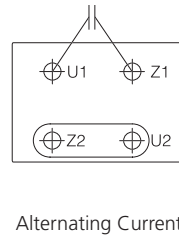
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Connections



3

Connections



Quality Assurance

Quality management according to DIN EN ISO 9001

To ensure constant quality in production and operation, ARGO-HYTOS filter elements undergo strict controls and tests according to the following ISO standards:

ISO 2941	Verification of collapse / burst pressure rating
ISO 2942	Verification of fabrication integrity (Bubble Point Test)
ISO 2943	Verification of material compatibility with fluids
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness and dirt-holding capacity)
ISO 23181	Determination of resistance to flow fatigue using high viscosity fluid

Various quality controls during the production process guarantee the leak-free function and solidity of our filters.

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