We produce fluid power **solutions**

ARGO HYTOS
A Voith Company

Fluid Management

Off-line Filters
Off-line Filter Units
Oil Service Units
Dewatering Systems
Filter Elements

Products with these icons are specially made for:
Industrial Applications

Mobile Applications

Content

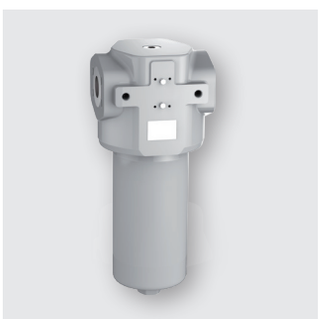
Filtration

Suction filters

Return-suction filters

Return filters

Pressure filters



High pressure filters

Clogging Indicators

Tank solutions

Filling and ventilating filters

Description

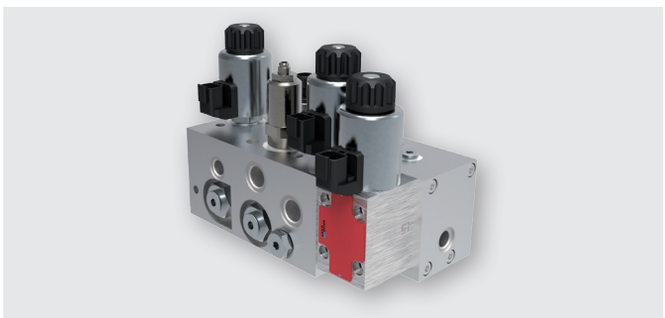
ARGO-HYTOS produces sophisticated filter solutions together with hydraulic and lubrication systems. The range of solutions we have implemented extends from fixed-position industrial plants to mobile applications.

As well as customized developments, exactly adjusted to the individual requirements of the customer, ARGO-HYTOS offers a comprehensive range of innovative standard solutions for a wide variety of applications:

- Suction filters
- Return-suction filters and return filters
- Pressure and high pressure filters
- Filling and ventilating filters
- Tank solutions
- Filter and tank accessories

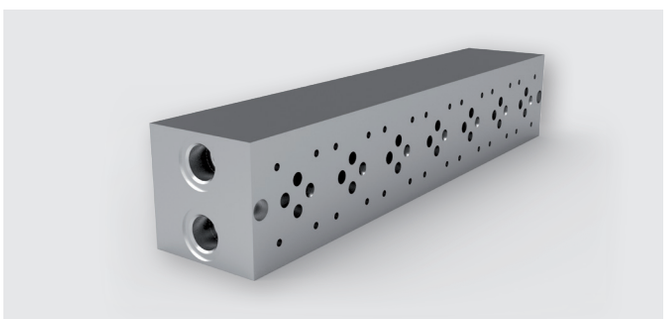
Fluid and Motion Control

Customized solutions



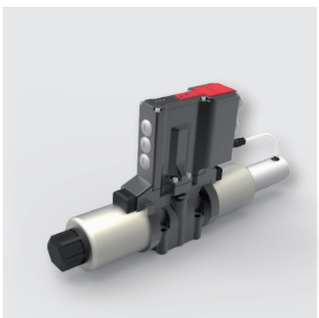
Control solutions

Gear pumps



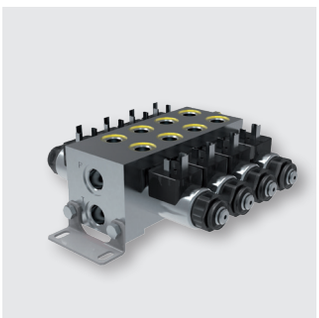
Plates

Fluid and Motion Control



Directional and proportional valves

Modular valves



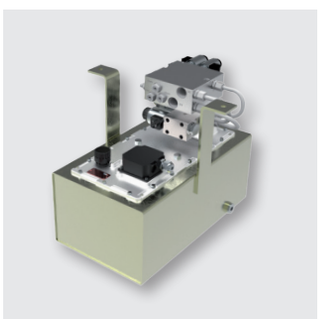
Bankable modular valve assembly

Screw-in cartridge valves

Slip-in cartridge valves

Load motion cartridges

Explosion proof valves



Hydraulic power packs

Description

ARGO-HYTOS' expertise in control technology is the fruit of more than 70 years' experience. We focus here on a wide range of valves, power units and integrated manifolds featuring all commonly used design features and functions, together with proportional valves and the associated control electronics:

- Directly operated directional valves in CETOP 02 to CETOP 05 and pilot operated directional valves in CETOP 07 and CETOP 08
- Valves sub-plate and sandwich type – flow control, pressure and check valves in CETOP 02 to CETOP 05
- Cartridge valves
- Directly activated proportional valves with compensator sandwich valve, in CETOP 02 to CETOP 05
- Analog and digital control electronics – on-board, or for installation in control cabinets
- Power pack assembly kits
- Customized control blocks

Fluid Management


Off-line filter


Off-line filter

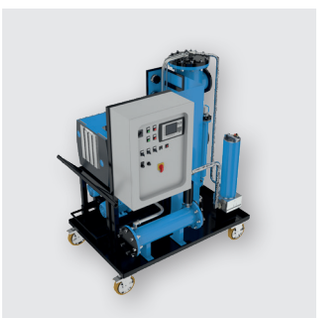

Off-line filter unit


Off-line filter unit


Oil service unit


Oil service unit


Compact filter pack


Dewatering system

Description

As well as reducing maintenance and servicing costs, effective fluid management is also a key factor in boosting the reliability, productivity and cost-effectiveness of the operation.
ARGO-HYTOS supplies application-oriented products for manual and automatic cleaning of hydraulic fluids:

- Off-line filters
- Off-line filter units
- Oil service units
- Dewatering systems
- Compact filter pack

Sensors and Measurement

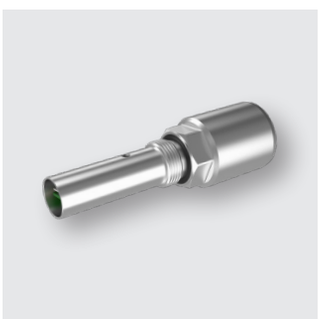

Portable particle counter


Portable particle monitor

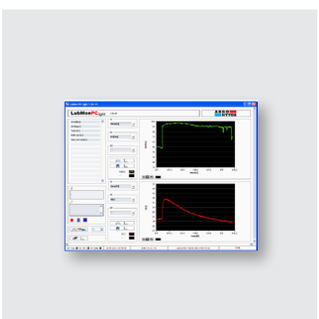

Particle monitor


Wear sensor


Humidity sensor


Condition sensors


Remote interfaces / display units


Software

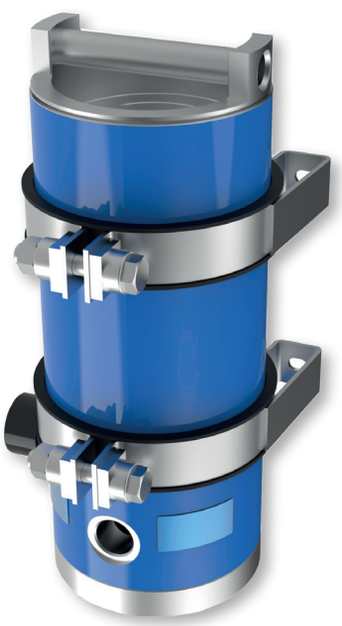
Description

Systems that provide reliable assessment of the condition of hydraulic fluids are the key feature of continuous fluid monitoring.
The sensors and measurement technology from ARGO-HYTOS precisely targets this range of tasks. Our fluid monitoring products comprise equipment and system solutions to enable online monitoring during continuous operation as well as analysis of bottled samples under laboratory conditions.

- Portable oil diagnosis equipment
- Stationary and portable particle monitor
- Oil condition sensors
- Software to evaluate data and analyze trends

FN1 040

In-line mounting · Operating pressure up to 12 bar / 174 psi · Nominal flow rate 40 l/min / 10.6 gpm



Off-line Filter FN1 040

Description

Application

Return-flow filter or off-line filter in hydraulic and lubrication systems.

Performance features

The EXAPOR®MAX 2 and EXAPOR®AQUA ultra-fine elements are the heart of the ARGO-HYTOS off-line filters. High separation efficiencies guarantee excellent cleanliness levels and thereby highest protection of components. The high dirt and water capacity of the EXAPOR®MAX 2 and EXAPOR®AQUA elements allows economical operation of the machine.

Special design features

User-friendly filter element change:
The cover of the FN 040 can be opened without special auxiliary tools. The filter element can be removed from the housing together with the cover.

Dirt retention valve:
The element is flown through from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the 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

Operating pressure

Max. 12 bar / 174 psi

Cracking pressure of by-pass

3.5 bar / 51 psi

Nominal flow rate

40 l/min / 10 gpm up to 60 l/min / 15 gpm
The nominal flow rates indicated by ARGO-HYTOS are based on the following features:

- closed by-pass valve at $\nu \leq 200$ mm²/s / 930 SUS
- element service life > 1000 operating hours at an average fluid contamination of 0.07 g per l/min / 0.27 g per gpm flow volume
- flow velocity in the connection lines:
  up to 10 bar ≤ 4.5 m/s / 145 psi ≤ 14.8 ft/s

Filter fineness

- 3 µm(c) ... 10 µm(c) for EXAPOR®MAX 2
  separating solid particles
- 3 µm(c) ... 7 µm(c) for EXAPOR®AQUA
  separating water and solid particles

β-values according to ISO 16889
(see Ordering Code, table filter element)

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 Ordering Code, table Filter Element).

Materials

Filter housing:	Aluminum alloy powder painted RAL 5015
Filter end plate:	Aluminum alloy
Cover:	Aluminum alloy
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic, multi-layer microfiber web EXAPOR®AQUA - combination of water absorbing filter layers and inorganic, multi-layer microfiber web

Remarks

Other colors of the filter housing are available on request.
Special versions, not shown in this catalog, are also available on request.

Hydraulic fluids

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

Temperature range

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

Viscosity at nominal flow rate

- at operating temperature: $\nu < 35$ mm²/s / 162 SUS
- as starting viscosity: $\nu_{max} = 1200$ mm²/s / 5560 SUS
- at initial operation:
  The recommended starting viscosity can be read from the diagram D (pressure drop as a function of the kinematic viscosity) as follows: Find the 70% Δp of the cracking pressure of the by-pass valve on the vertical axis. Draw a horizontal line so that it intersects the Δp curve at a point. Read this point on the horizontal axis for the viscosity.

Mounting position

Vertical, connection port at the bottom

Weight

Without mounting clamps: 6.7 kg / 14.77 lbs
With mounting clamps: 8.3 kg / 18.3 lbs

Connection

Threaded ISO 228 or UNF ports
(see Dimensions Drawing)

Accessories

A mounting kit (2 pcs of mounting clamps) may be ordered together with the off-line filter (M in the order code) or separately (order code FNS 060.1730).

Electrical and / or optical clogging indicators may be ordered together with the off-line filter. For choosing the proper clogging indicator, see table Clogging Indicator in the Ordering Code. The clogging indicator can be ordered separately.
For dimensions and technical data of the clogging indicators, see catalog sheets 60.20 and 60.30.

Ordering Code

FN1 040 ___ - ___ - ___ ___

Type of filter	Code
Off-line filter	FN1

Nominal flow rate	Code
40 l/min / 10 gpm	040

Connection port	Code
In: G1 Out: G¾	G
In: $1^{5}/_{16}$-12 UN-2B Out: $1^{1}/_{16}$-12 UN-2B	U

Filter element						Code
	Fineness (β=200) Dirt-holding capacity at nominal flow 40 l/min / 10 gpm		Water capacity	Cracking pressure of by-pass	Spare filter element code	
EXAPOR®MAX 2	3 µm	190 g	-	3.5 bar / 51 psi	V7.1220-113	V003
EXAPOR®MAX 2	5 µm	190 g	-	3.5 bar / 51 psi	V7.1220-13	V005
EXAPOR®MAX 2	10 µm	148 g	-	3.5 bar / 51 psi	V7.1220-06	V010
EXAPOR®AQUA	3 µm	80.5 g	300 ml	3.5 bar / 51 psi	Y7.1220-113	Y003
EXAPOR®AQUA	7 µm	60.5 g	330 ml	3.5 bar / 51 psi	Y7.1220-05	Y007

Clogging indicator					Code
Type		Code of indicator	Connection	Hydraulic symbol	
Manometer	optical	DG 200-16	M12 x 1.5	1	O
Pressure switch	electrical	DG 813-21	M12 x 1.5	2	E
Pressure switch	optical / electrical	DG 815-12	M12 x 1.5	3	EO
without indicator			M12 x 1.5	4	X
Differential pressure clogging indicator	optical	DG 042-01	Flange	5	OD
	electrical	DG 041-31	Flange	6	ED
	optical + electrical	DG 041-44	Flange	7	EOD
without indicator			Flange	8	XD

Mounting clamps	Code
No	
Yes	M

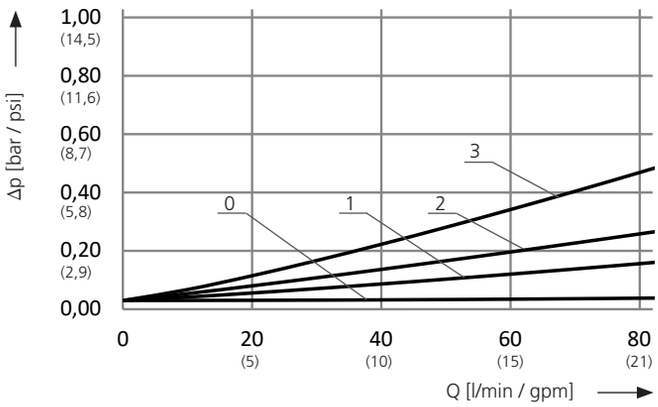
Order example:

FN1 040G-Y003-ED off-line filter with inlet port G1, outlet port G¾, water absorbing filter element 3µm, electrical differential pressure clogging indicator, without mounting clamps.

Remarks:

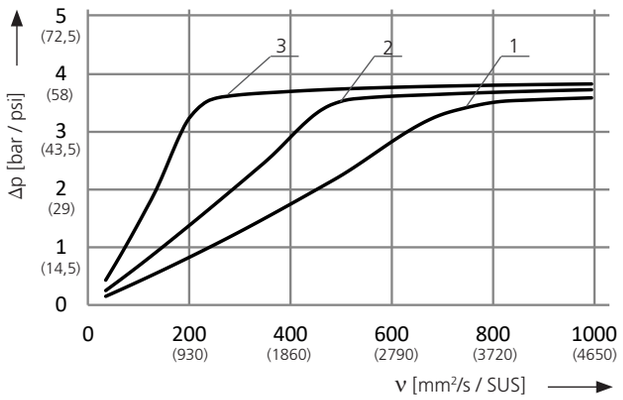
Combinations listed in this order code are standard units. If modifications are required, we kindly ask for your request.
For preferred types (available in short time) see table at the last page of this data sheet.

D1 FN1 040 with **EXAPOR®MAX 2** filter element
Pressure drop as a function of the **flow volume**
at ν = 35 mm²/s / 162 SUS

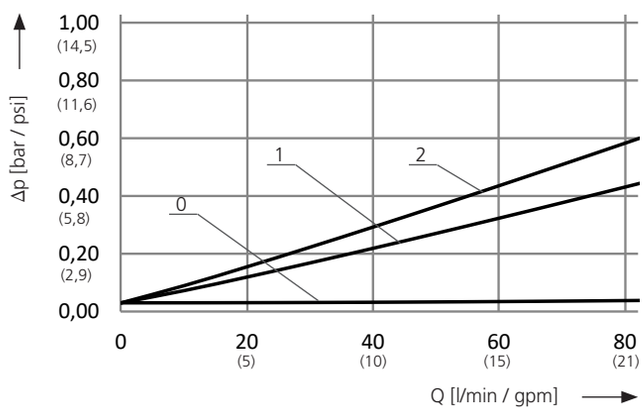


0 = housing empty
1 = with EXAPOR®MAX 2 filter element 10 µm
2 = with EXAPOR®MAX 2 filter element 5 µm
3 = with EXAPOR®MAX 2 filter element 3 µm

FN1 040 with **EXAPOR®MAX 2** filter element
Pressure drop as a function of the **kinematic viscosity**
at nominal flow

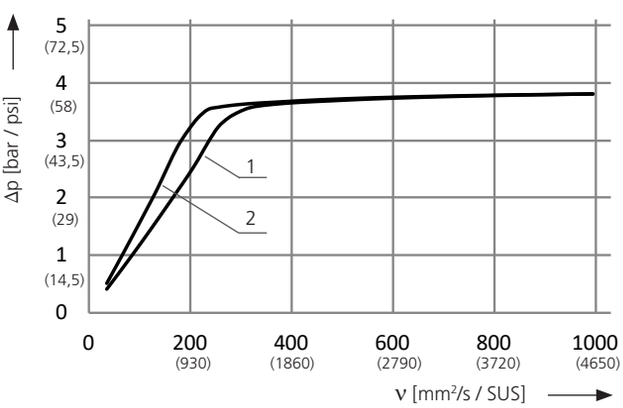


D2 FN1 040 with **EXAPOR®AQUA** filter element
Pressure drop as a function of the **flow volume**
at ν = 35 mm²/s / 162 SUS

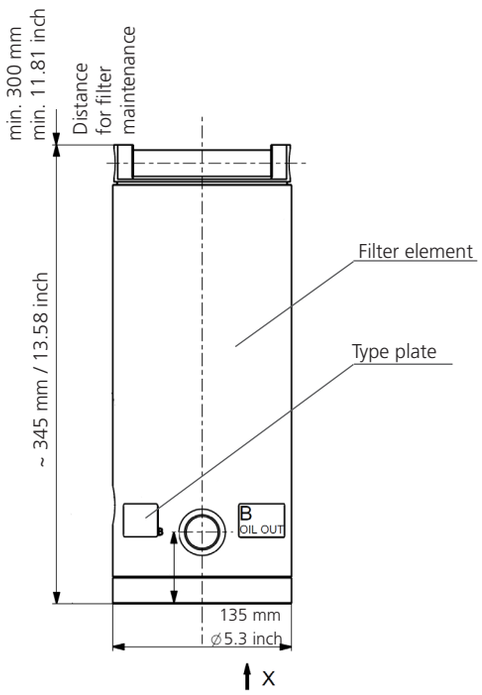


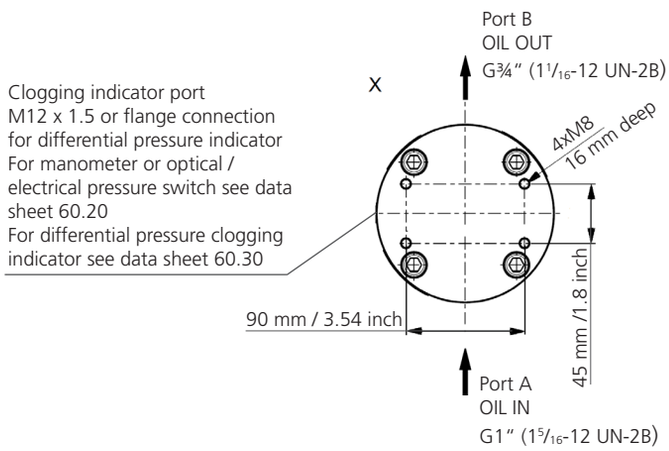
0 = housing empty
1 = with EXAPOR®AQUA filter element 7 µm
2 = with EXAPOR®AQUA filter element 3 µm

FN1 040 with **EXAPOR®AQUA** filter element
Pressure drop as a function of the **kinematic viscosity**
at nominal flow

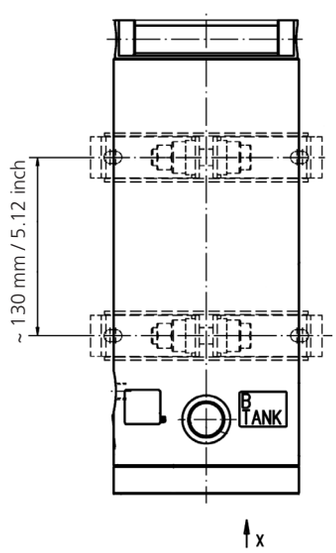


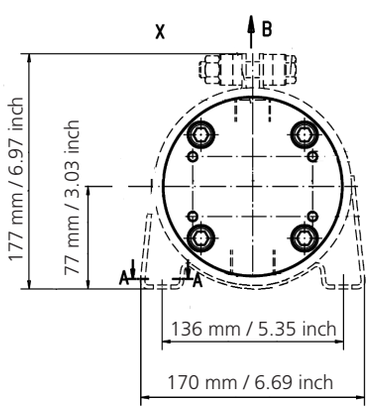
Dimensions

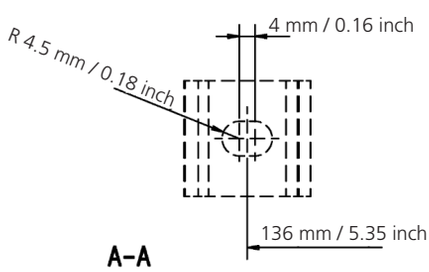




Version with mounting clamps (order code M)



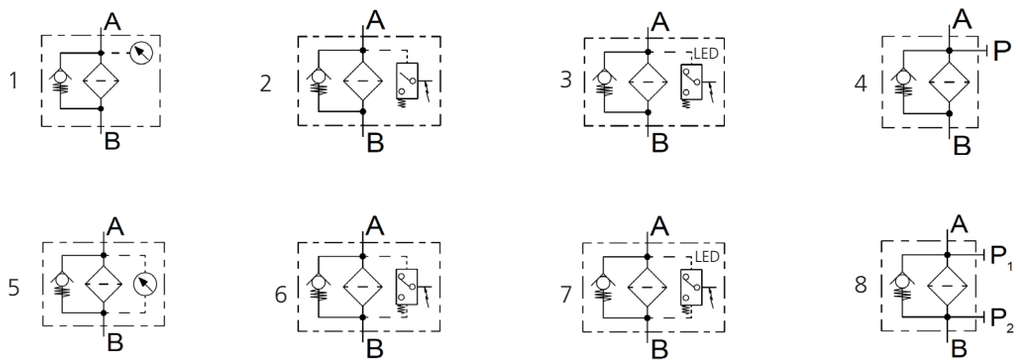




Preferred types

Order code	Port A	Port B	Filter fineness (β=200)	Dirt-holding capacity	Water capacity	Replacement filter element	Hydraulic symbol	SAP number
FN1 040G-V003-X	G1	G¾	3 µm	190 g	-	V7.1220-113	4	42496500
FN1 040G-V003-XD	G1	G¾	3 µm	190 g	-	V7.1220-113	8	42496700
FN1 040G-Y003-X	G1	G¾	3 µm	80.5 g	300 ml	Y7.1220-113	4	42496200
FN1 040G-Y003-XD	G1	G¾	3 µm	80.5 g	300 ml	Y7.1220-113	8	42496300
FN1 040U-V003-X	1 5/16-12 UN-2B	1 1/16-12 UN-2B	3 µm	190 g	-	V7.1220-113	4	42496400
FN1 040U-V003-XD	1 5/16-12 UN-2B	1 1/16-12 UN-2B	3 µm	190 g	-	V7.1220-113	8	42496600

Hydraulic symbols



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.

FN 060 · FN 300

In-line mounting · Operating pressure up to 12 bar / 174 psi · Nominal flow rate up to 650 l/min / 172 gpm

Off-line Filter FN 060

Off-line Filter FN 300

Description

Application

Return-flow filter or off-line filter in 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 $\nu \leq 200$ mm²/s / 930 SUS (cold start condition) within specified operating parameters.

Special design features

Housing cover:
The cover of the FN 060 can be opened without special auxiliary tools. Fold-out handle parts at the cover of the FN 300 facilitate the opening.

Automatic ventilation valve (only FN 300):
The quick automatic de-aeration after commissioning not only prevents components from consequential damage due to an excessive air content, but also avoids errors in the monitoring with optical particle counters.

Dirt retention valve:
At the bottom of the filter element, flown 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:

Filter head:	Aluminum alloy
Filter housing:	Steel (FN 060) Aluminum alloy (FN 300)
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.
For FN 060 there is a bleeder screw, and with Part No. FNS 060.1720 a fastening kit 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 see catalog sheet 60.30.

Characteristics

Operating pressure

Max. 12 bar / 174 psi (FN 060)
Max. 10 bar / 145 psi (FN 300)

Nominal flow rate

Up to 650 l/min / 172 gpm (see Selection Chart, column 2)
The nominal flow rates indicated by ARGO-HYTOS are based on the following features:

- closed by-pass valve at $\nu \leq 200$ mm²/s / 930 SUS
- element service life > 1000 operating hours at an average fluid contamination of 0.07 g per l/min / 0.27 g per gpm flow volume
- flow velocity in the connection lines:
  up to 10 bar ≤ 4.5 m/s / 145 psi ≤ 14.8 ft/s

Filter fineness

3 µm(c) ... 10 µm(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 5).

Hydraulic fluids

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

Temperature range

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

Viscosity at nominal flow rate

- at operating temperature: $\nu < 35$ mm²/s / 162 SUS
- as starting viscosity: $\nu_{max} = 1200$ mm²/s / 5560 SUS
- at initial operation:
  The recommended starting viscosity can be read from the diagram D (pressure drop as a function of the kinematic viscosity) as follows: Find the 70% Δp of the cracking pressure of the by-pass valve on the vertical axis. Draw a horizontal line so that it intersects the Δp curve at a point. Read this point on the horizontal axis for the viscosity.

Mounting position

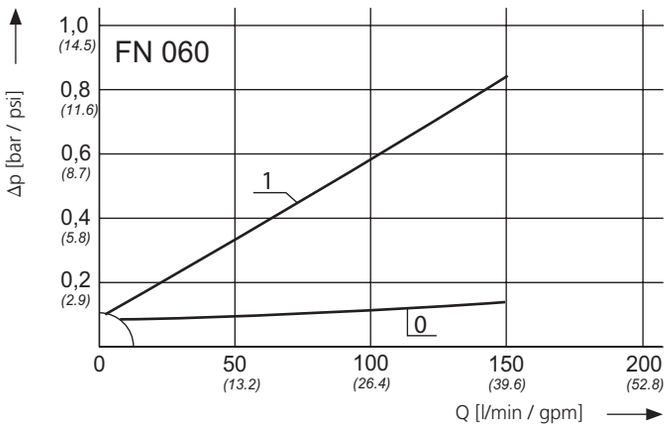
Vertical, connection port at the bottom

Connection

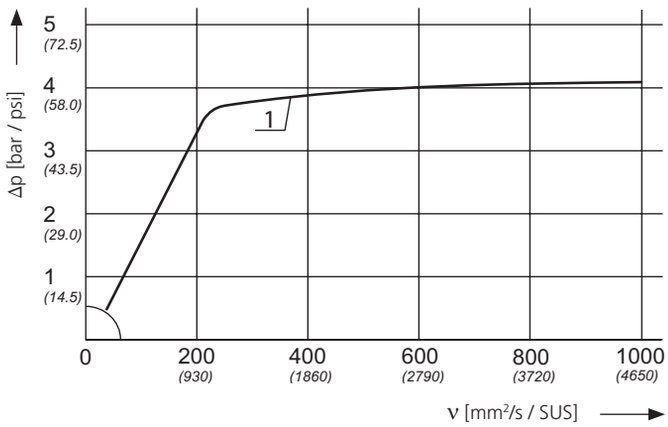
Threaded ports according to ISO 228 or DIN 13 (FN 060) or flange mounting according to SAE-J518 (FN 300).
For sizes see Selection Chart, column 6 (other port threads on request).

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

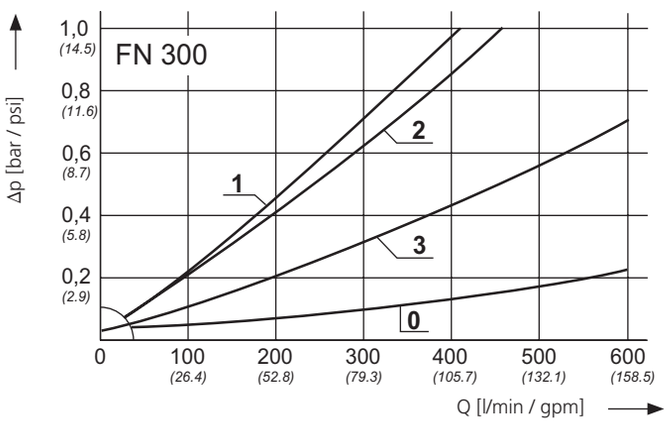
D1 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s / 162 SUS (0 = casing empty)



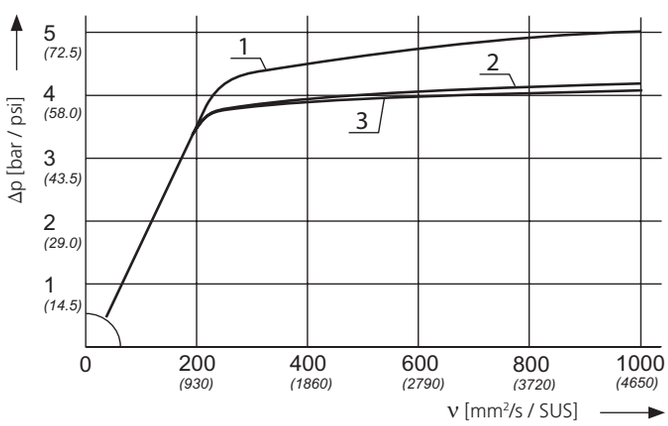
Pressure drop as a function of the **kinematic viscosity** at nominal flow



D2 Pressure drop as a function of the **flow volume** at ν = 35 mm²/s / 162 SUS (0 = casing empty)

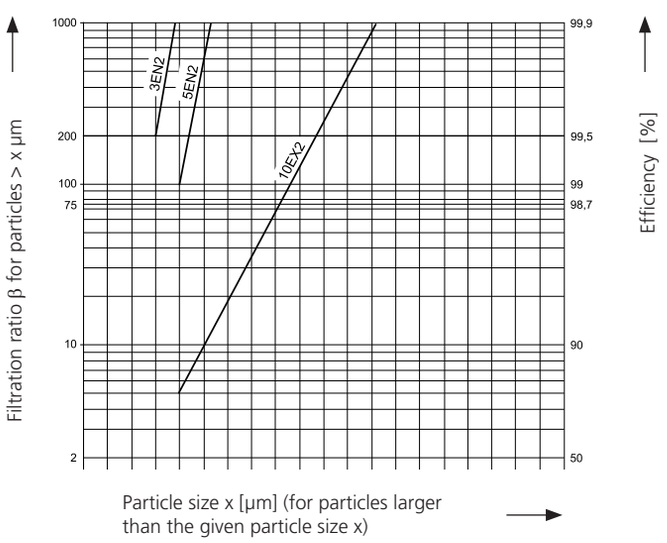


Pressure drop as a function of the **kinematic viscosity** at nominal flow



Filter fineness curves in Selection Chart, column 4

Dx Filtration ratio 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 and paper elements:

3EN2	=	$\overline{\beta}_3$ (c)	= 200	EXAPOR®MAX 2
5EN2	=	$\overline{\beta}_5$ (c)	= 200	EXAPOR®MAX 2
10EX2	=	β_{10} (c)	= 200	EXAPOR®MAX 2

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

Selection Chart

Part No.	Nominal flow rate		Pressure drop see diagram **D**/curve no.	Filter fineness s. diagram **Dx**	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass		Symbol	Replacement filter element Part No.	Weight		Clogging indicator	Remarks
	l/min	gpm			g		bar	psi			kg	lbs		
1	2		3	4	5	6	7		8	9	10		11	12
FN 060-193	60	15.9	**D1**/1	3EN2	290	G1	3.5	51	1	V7.1230-153	5	11.0	DG 041-32	–
FN 060-273	115	30.4	**D1**/1	5EN2	220	G1	3.5	51	2	V7.1230-53	5	11.0	optional	–
FN 300-163	250	66.0	**D2**/1	3EN2	740	SAE2½	3.5	51	2	V7.1560-103	20	44.1	optional	*
FN 300-153	300	79.3	**D2**/2	5EN2	600	SAE2½	3.5	51	2	V7.1560-03	20	44.1	optional	*
FN 300-156	650	171.7	**D2**/3	10EX2	400	SAE2½	3.5	51	2	V7.1560-06	20	44.1	optional	*

* with automatic ventilation valve

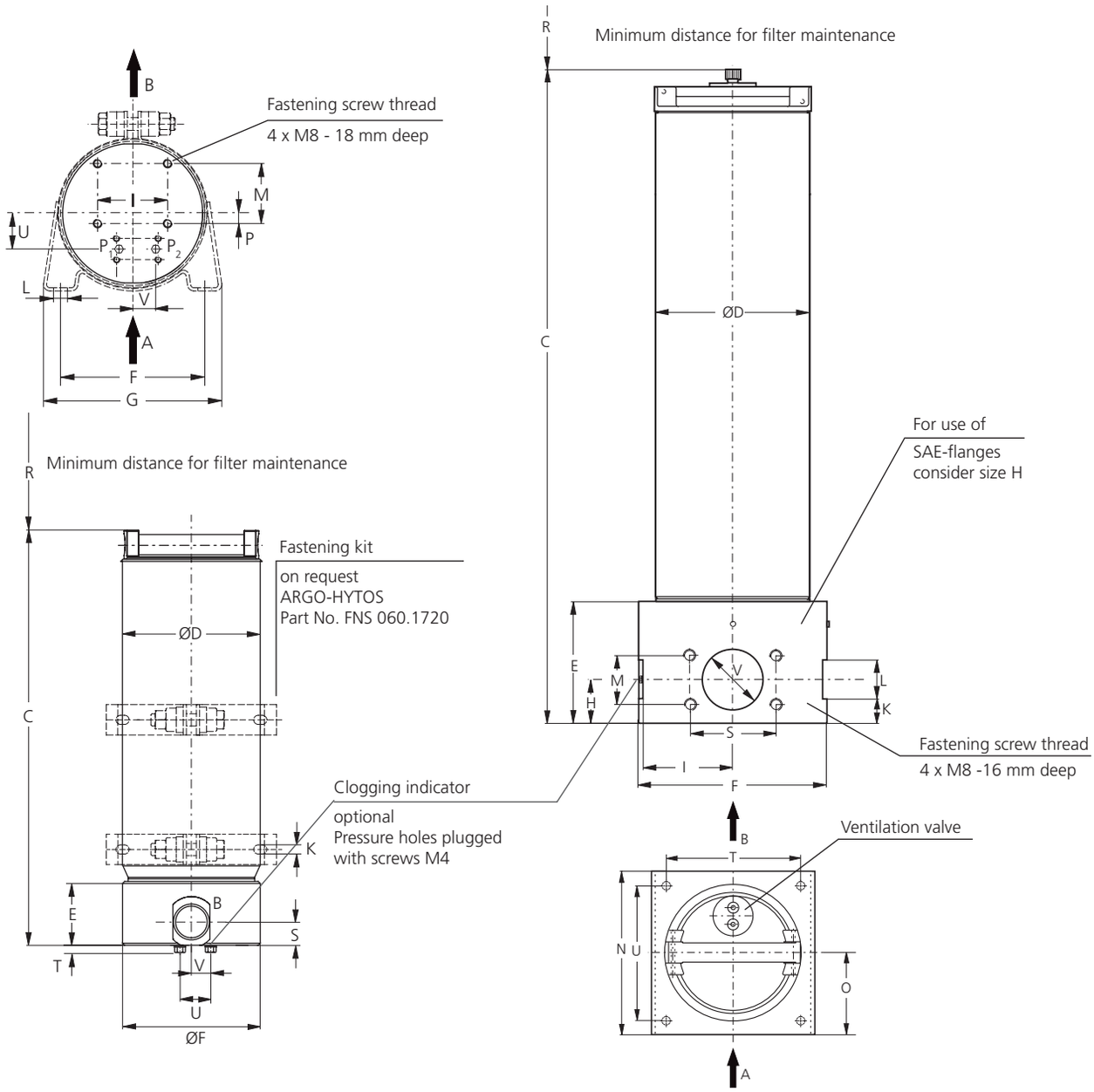
Optical or electrical indicators are available to monitor the clogging condition of the element.

For appropriate clogging indicators, please refer to catalog sheet 60.30.

Remarks:

- The response / switching pressure of the clogging indicator must be lower than the cracking pressure of the by-pass valve (see Selection Chart, column 7).
- Clogging indicators are optionally available and will be supplied separately if ordered.
- The filter units listed in this chart are standard units. If modifications are required, e.g. with water-absorbing filter elements or with mounting set, we kindly ask for your request.

Dimensions



Measurements in mm

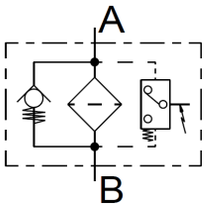
Type	A / B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V
FN 060	G1	410	140	63	136	170	–	66	9	12	56.5	–	–	9.5	300	23	4	34	21
FN 300	SAE 2½	775	160	126	200	–	45	96	25	40	50.8	195	97.5	–	700	88.9	170	165	63

Measurements in inch

Type	A / B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V
FN 060	G1	16.14	5.51	2.48	5.35	6.69	-	2.60	0.35	0.47	2.22	-	-	0.37	11.81	0.91	0.16	1.34	0.83
FN 300	SAE 2½	30.51	6.30	4.96	7.87	-	1.77	3.78	0.98	1.57	2.00	7.68	3.84	-	27.56	3.50	6.69	6.50	2.48

Symbol

1



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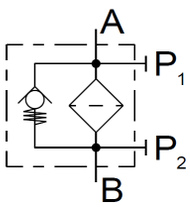


Quality Assurance

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:

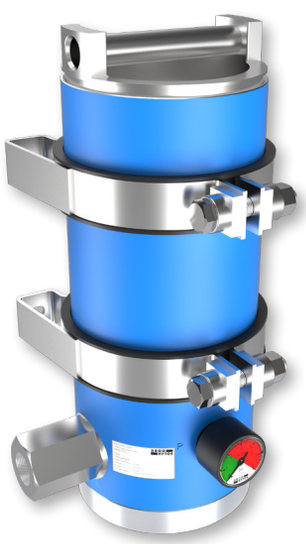
ISO 2941	Verification of collapse / burst pressure rating
ISO 2942	Verification of fabrication integrity (Bubble Point Test)
ISO 2943	Verification of material compatibility with fluids
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-Pass-Test (evaluation of filter fineness 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.

FNS1 040

Operating pressure up to 320 bar / 4640 psi · Flow rate up to 6 l/min / 1.6 gpm · Water capacity up to 370 ml / 0.09 gal

FNS1 040 without mounting clamps



FNS1 040 with mounting clamps

Description

Application

Off-line filter in hydraulic and lubrication systems.
Ideal for mobile machines equipped with large working cylinders and mechanical drive chain. In such applications the hydraulic system is not filtered except moments of cylinders movement and the drain oil in the pumps. By adding small but constant flow through the FNS1 040 filter the oil cleanliness could be improved significantly. Additionally, EXAPOR®AQUA filter media provides excellent water absorption irrespectively of temperature in the system.

Performance features

The EXAPOR®MAX and EXAPOR®AQUA ultra-fine elements are the heart of the ARGO-HYTOS off-line filters.
High separation efficiencies guarantee excellent cleanliness levels and thereby highest protection of components. The high dirt and water capacity of the EXAPOR®MAX and EXAPOR®AQUA elements allows economical operation of the machine.

Special design features

User-friendly filter element change:
The cover of the FNS1 040 can be opened without special auxiliary tools. The filter element can be removed from the housing together with the cover.

Dirt retention valve:
The element is flown through from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the 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

Operating pressure

Max. 320 bar / 4640 psi
(max. 12 bar / 174 psi without pressure compensated flow control valve)
Minimum inlet pressure at the pressure compensated flow control valve: 10 bar / 145 psi

Cracking pressure of by-pass

3.5 bar / 51 psi

Nominal flow rate

Max. 6 l/min / 1.6 gpm (see Ordering Code, table Nominal Flow)
(max 60 l/min / 15 gpm without pressure compensated flow control valve)

Filter fineness

- 3 µm(c) ... 10 µm(c) for EXAPOR®MAX separating solid particles
- 3 µm(c) ... 7 µm(c) for EXAPOR®AQUA separating water and solid particles

β-values according to ISO 16889
(see Ordering Code, table Filter Element)

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 Ordering Code, table Filter Element).

Materials

Filter housing:	Aluminum alloy powder painted RAL 5015
Filter end plate:	Aluminum alloy
Cover:	Aluminum alloy
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic, multi-layer microfiber web EXAPOR®AQUA - combination of water absorbing filter layers and inorganic, multi-layer microfiber web

Hydraulic fluids

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

Temperature range

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

Viscosity at nominal flow rate

- at operating temperature: $\nu < 35$ mm²/s / 162 SUS
- as starting viscosity: $\nu_{max} = 400$ mm²/s / 5560 SUS

Mounting position

Vertical, connection port at the bottom

Weight

Without mounting clamps: 6.7 kg / 14.77 lbs
With mounting clamps: 8.3 kg / 18.3 lbs

Connection

Threaded ISO 228 or UNF ports
(see Ordering Code and Dimensions Drawing)

Accessories

A mounting kit (2 pcs of mounting clamps) may be ordered together with the off-line filter (M in the order code) or separately (order code FNS 060.1730).
Electrical and / or optical clogging indicators may be ordered together with the off-line filter. For choosing the proper clogging indicator, see table Clogging Indicator in the Ordering Code. The clogging indicator can be ordered separately.
For dimensions and technical data of the clogging indicators, see catalog sheets 60.20 and 60.30.

Remarks

Other colors of the filter housing are available on request. Special versions, not shown in this catalog, are also available on request.

Ordering Code

FNS1 040 /___ ___ - ___ - ___ ___

Type of filter	Code
Off-line filter with flow control valve	FNS1

Nominal size	
040	

Flow setting Defined by the pressure compensated flow control valve (Inlet pressure min. 10 bar / 145 psi, max. 320 bar / 4640 psi)		Code
Flow control valve	Flow setting	
FNS 060.1520	1 l/min / 0.26 gpm	001
FNS 060.1530	2 l/min / 0.53 gpm	002
FNS 060.1540	4 l/min / 1.06 gpm	004
FNS 060.1550	6 l/min / 1.6 gpm	006

Connection port	Code
In: G1 Out: G¾	G
In: $1^{5}/_{16}$-12 UN-2B Out: $1^{1}/_{16}$-12 UN-2B	U

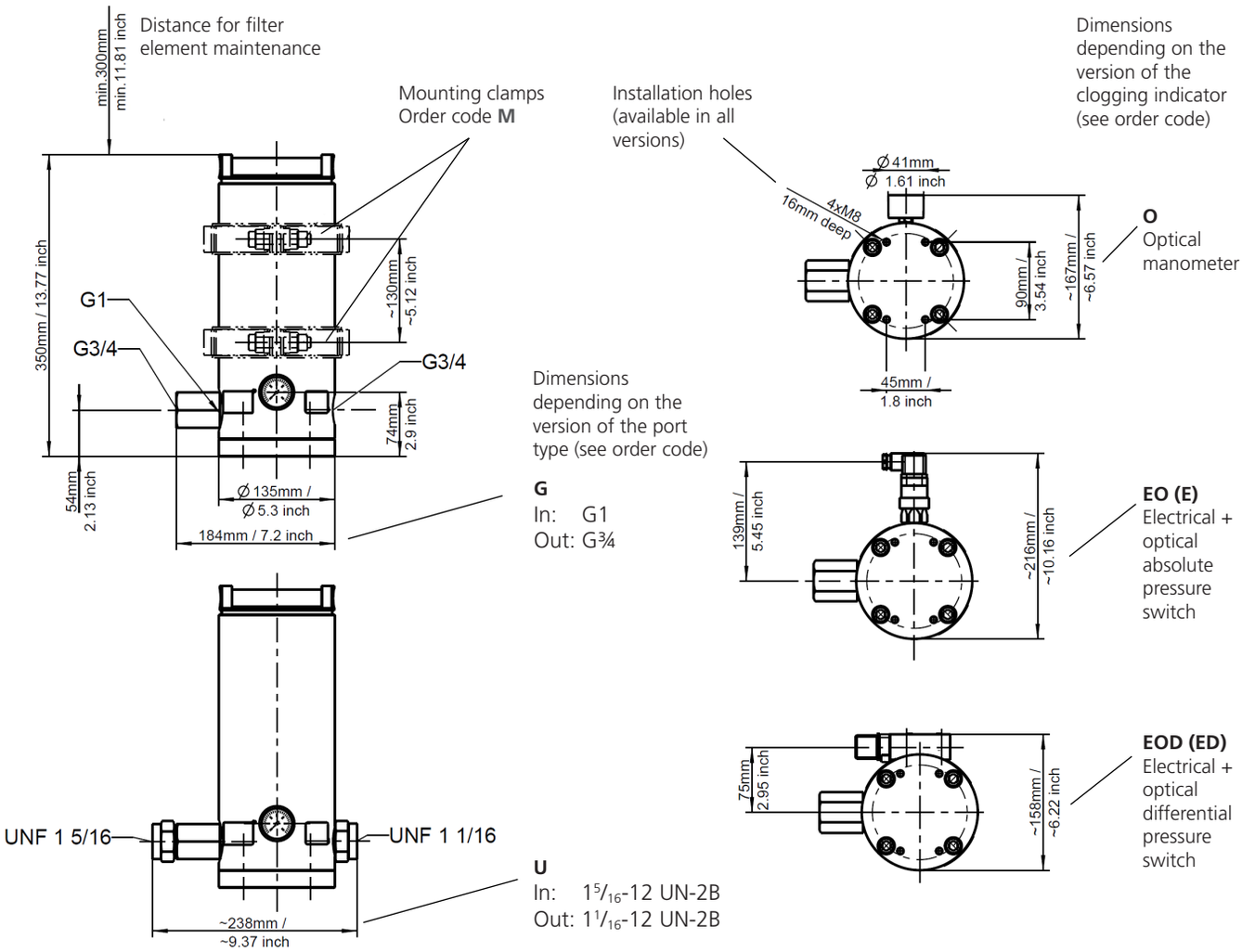
Filter element									Code
	Fineness (β=200) Dirt-holding capacity in grams (dependent on flow setting)					Water capacity in ml	Cracking pressure of by-pass	Spare filter element code	
		6 l/min	4 l/min	2 l/min	1 l/min				
EXAPOR®MAX	3 µm	620	895	1720	3370	-	3.5 bar / 51 psi	V7.1220-113	V003
EXAPOR®MAX	5 µm	580	830	1580	3080	-	3.5 bar / 51 psi	V7.1220-13	V005
EXAPOR®MAX	10 µm	435	620	1170	2270	-	3.5 bar / 51 psi	V7.1220-06	V010
EXAPOR®AQUA	3 µm	200	280	515	980	340	3.5 bar / 51 psi	Y7.1220-113	Y003
EXAPOR®AQUA	7 µm	180	260	495	960	370	3.5 bar / 51 psi	Y7.1220-05	Y007

Clogging indicator					Code
Type		Code of indicator	Connection	Hydraulic symbol	
Manometer	optical	DG 200-16	M12 x 1.5	1	O
Pressure switch	electrical	DG 813-21	M12 x 1.5	2	E
Pressure switch	optical + electrical	DG 815-12	M12 x 1.5	3	EO
without indicator			M12 x 1.5	4	X
Differential pressure clogging indicator	optical	DG 042-01	Flange	5	OD
	electrical	DG 041-31	Flange	6	ED
	optical + electrical	DG 041-44	Flange	7	EOD
without indicator			Flange	8	XD

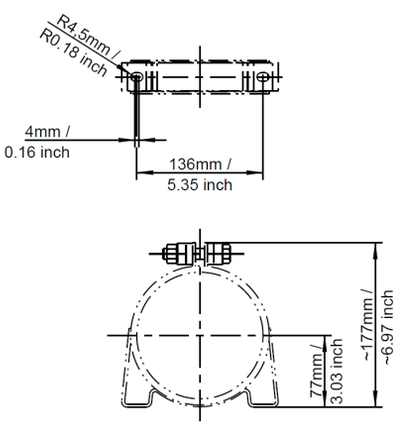
Mounting clamps	Code
No	
Yes	M

Order example:

FNS1 040/006U-Y003-ED off-line filter with nominal flow 6 l/min (1.6 gpm) with UNF ports, EXAPOR®AQUA filter element 3 µm, electrical differential pressure clogging indicator, without mounting clamps.

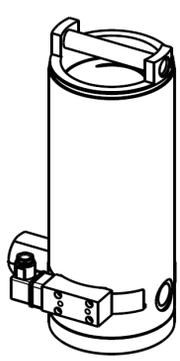


Version with mounting clamps:
Order code **M**



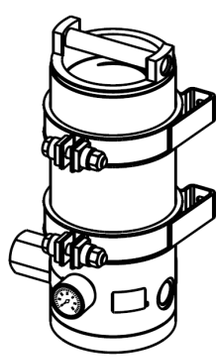
Isometric views for selected versions

Example 1



Order code*:
FNS1 040/xxxG-xxxx-ED

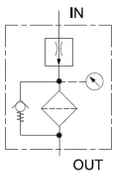
Example 2



Order code*:
FNS1 040/xxxG-xxxx-OM

*x should be replaced by correct code according to Ordering Code

Hydraulic symbols

1


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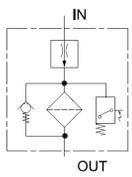

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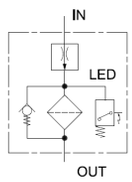

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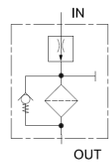

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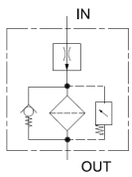

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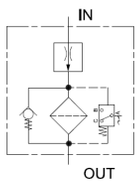

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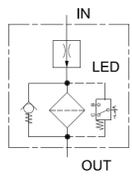

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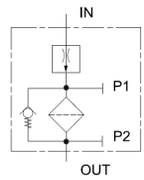


Quality Assurance

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.

FNS 060

With flow control valve · Operating pressure up to 320 bar / 4640 psi · Nominal flow rate up to 4 l/min / 1.1 gpm

Off-line Filter FNS 060

Description

Application

Suitable for high-pressure circuits in 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 $\nu \leq 200$ mm²/s / 930 SUS (cold start condition) within specified operating parameters.

Special design features

Housing cover:
The cover can be opened without special auxiliary tools.

Flow control valve:
Through a pressure compensated flow control valve, the FNS off-line filters are directly connected to the high pressure pipe. The surplus volume (e.g. in circuits with fixed displacement pumps) from the high-pressure circuit is cleaned by the ultra-fine filter element.

Dirt retention valve:
At the bottom of the filter element, flown 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

Filter head:	Aluminum alloy
Filter housing:	Steel
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.
For dimensions and technical data see catalog sheet 60.20.

Characteristics

Nominal flow rate

Up to 4 l/min / 1.1 gpm (see Selection Chart, column 2)
Refers to the medium flow rate of the flow control valve. With selection of the flow control valve, a sufficient surplus volume from the high-pressure circuit has to be guaranteed. If necessary, the machine manufacturer should be consulted.

Connection

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

Filter fineness

3 µm(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 5).

Hydraulic fluids

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

Temperature range

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

Viscosity at nominal flow rate

- at operating temperature: $\nu < 35$ mm²/s / 162 SUS
- as starting viscosity: $\nu_{max} = 400$ mm²/s / 5560 SUS

Operating pressure

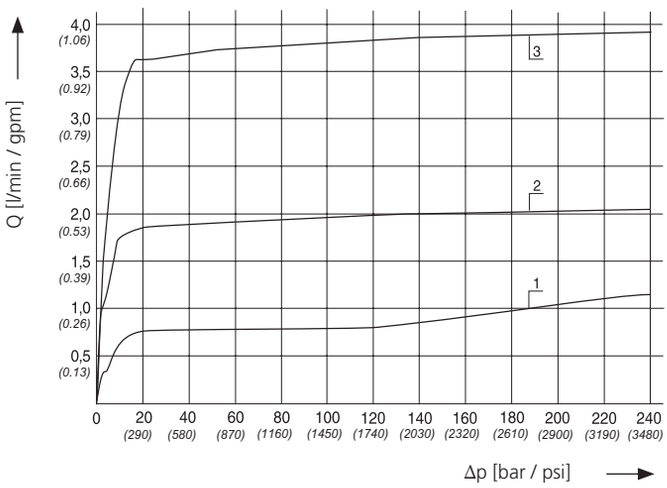
Max. 320 bar / 4640 psi
(max. 5 bar / 73 psi without pressure compensated flow control valve)
Minimum inlet pressure at the pressure compensated flow control valve: 10 bar / 145 psi

Mounting position

Vertical, connection port at the bottom

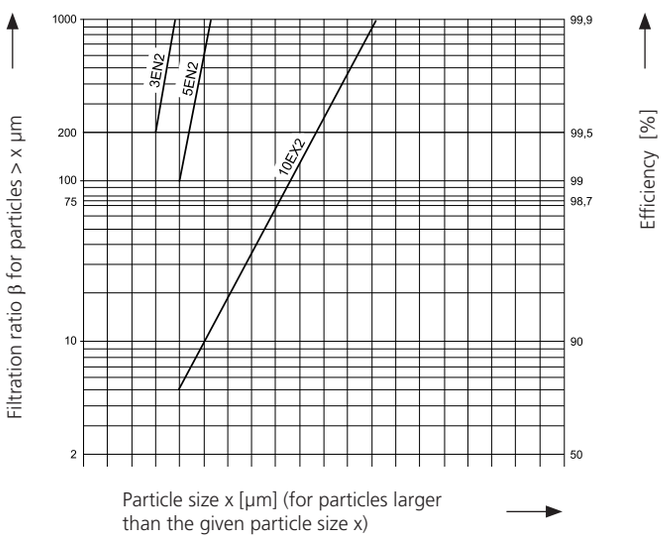
Δp-curves for complete filters in Selection Chart, column 3

D1 Flow volume as a function of the **differential pressure** at the flow control valve at ν = 35 mm²/s / 162 SUS



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:

With EXAPOR®MAX2 and paper elements:

3EN2	=	$\overline{\beta}_3$ (c) = 200	EXAPOR®MAX 2
5EN2	=	$\overline{\beta}_5$ (c) = 200	EXAPOR®MAX 2
10EX2	=	β_{10} (c) = 200	EXAPOR®MAX 2

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

Selection Chart

Part No.	Nominal flow rate		Pressure drop see diagram **D**/curve no.	Filter fineness s. diagram **Dx**	Dirt-holding capacity	Connection A/B	Cracking pressure of by-pass		Symbol	Replacement filter element Part No.	Weight		Clogging indicator	Flow control valve	Remarks
	l/min	gpm			g		bar	psi			kg	lbs			
1	2		3	4	5	6	7		8	9	10		11	12	13
FNS 060-163	*	*	**D1**/*	3EN2	1450	G1/G1	3.5	51	1	V7.1230-153	5.2	11.5	option	option	basic unit
FNS 060-183	4	1.06	**D1**/3	3E-A	130	G1/G1	3.5	51	2	Y7.1230-153	5.3	11.7	option	FNS 060.1540	
Pressure compensated flow control valve - inlet pressure min. 10 bar / 145 psi, max. 320 bar / 4640 psi:															
FNS 060.1520	1	0.26	**D1**/1			G1/G¾									–
FNS 060.1530	2	0.53	**D1**/2			G1/G¾									–
FNS 060.1540	4	1.06	**D1**/3			G1/G¾									–

* see nominal flow rate of the flow control valves

The housing of the off-line filter is designed for a max. operating pressure of 5 bar / 73 psi. To avoid back pressures, no components such as ball valves must be inserted at the housing outlet and in the continuative circuit.

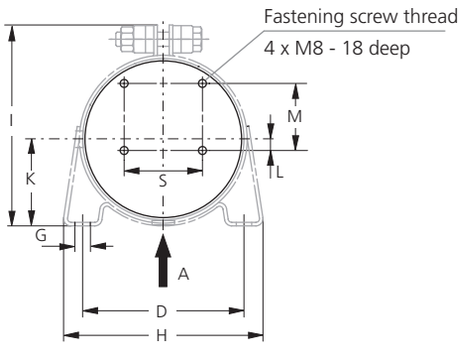
For contamination monitoring, manometers or electrical pressure switches can be used.

For appropriate clogging indicators, please refer to catalog sheet 60.20.

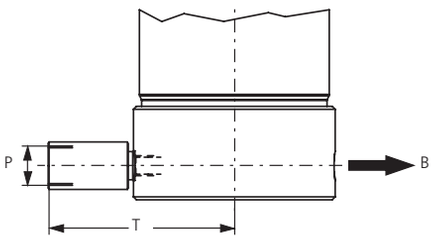
Remarks:

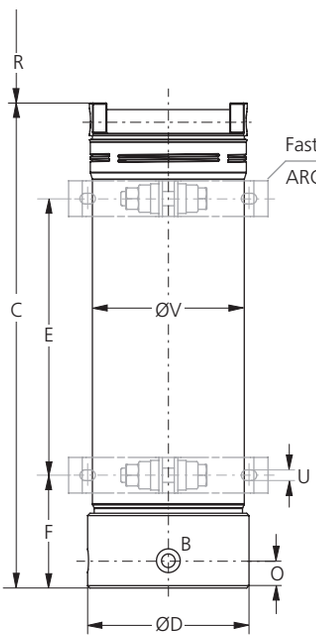
- The cut-in pressure of the pressure switch must be lower than the cracking pressure of the by-pass valve (see Selection Chart, column 7).
- Clogging indicators and flow control valves are optionally available and will be supplied separately if ordered.
- The off-line filters listed in this chart are standard units. If modifications are required, e.g. with water-absorbing filter elements, we kindly ask for your request.

Dimensions



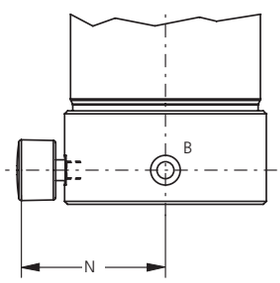
Version with flow control valve





Fastening kit on request
ARGO-HYTOS Part No. FNS 060.1700

Version with manometer



Measurements in mm

Type	A/B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V
FNS 060	G1	410	136	233	95	12	170	169	73	9.5	56.5	103	23	G¾	300	66	119	9	128

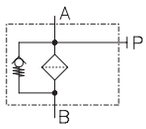
Measurements in inch

Type	A/B	C	D	E	F	G	H	I	K	L	M	N	O	P	R
FNS 060	G1	16.14	5.35	9.17	3.74	0.47	6.69	6.65	2.87	0.37	2.22	4.06	0.91	G¾	11.81

Type	S	T	U	V
FNS 060	2.60	4.69	0.35	5.04

Symbols

1



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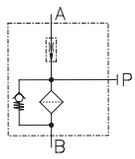
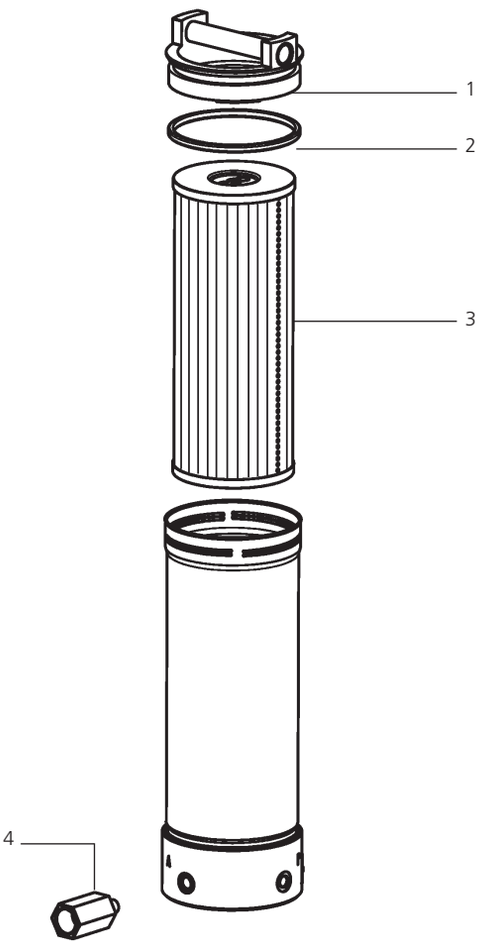


Spare Parts



Pos.	Designation	Part No.
1	Cover	FNA 008.1250
2	O-ring	N007.1175
3	Filter element	s. Selection Chart
4	Flow control valve	s. Selection Chart

The functions of the complete filters as well as the outstanding features of the filter elements assured by ARGO-HYTOS can only be guaranteed if original ARGO-HYTOS spare parts are used.

Quality Assurance

Quality management according to DIN EN ISO 9001

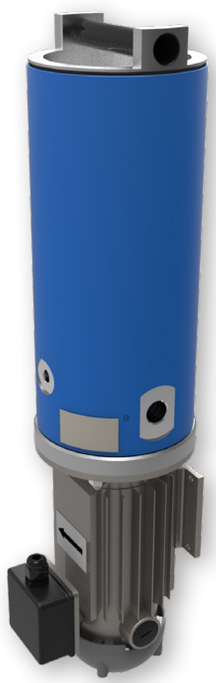
To ensure constant quality in production and operation, ARGO-HYTOS filter elements undergo strict controls and tests according to the following ISO standards:

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

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

FNA 014

Operating pressure up to 4 bar / 58 psi · Nominal flow rate up to 14 l/min / 4.2 gpm · 24 VDC electric motor S1 duty cycle



FNA 014 Off-line Filtration Unit

EXAPOR®MAX 2 Filter Elements

Description

The FNA 014 is an off-line filter unit designed for installation in hydraulic or lubrications systems. The unit can be equipped with a 24 or 12 VDC electric motor.
The EXAPOR®MAX 2 ultra-fine filter element is the heart of the FNA 014. A high separation efficiency guarantees excellent fluid cleanliness levels and thereby maximum protection of the machine. Optionally, the unit can be equipped with EXAPOR® AQUA elements which remove both water and solid particles. The high dirt holding capacity of the filter elements makes the FNA 014 an economical choice for our customers.

Characteristics

Pump design
Gerotor pump

Hydraulic fluids
Mineral oil and biodegradable fluids (HEES and HETG, see info service sheet 00.20). Other fluids on request.

Temperature range of fluids
0 °C ... +65 °C / +32 °F ... +149 °F

Ambient temperature range
0 °C ... +50 °C / +32 °F ... +122 °F

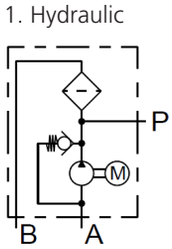
Viscosity range
15 - 200 mm^2/s - continuous operation
15 - 400 mm^2/s - short-term operation

Operating position
Vertical, motor at the bottom

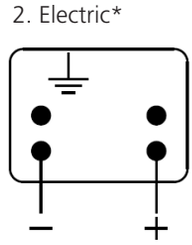
Recommended tank capacities
100 l ... 1500 l / 25 ... 400 gal

Symbols / Connections

1. Hydraulic



2. Electric*



* Current consumption (tested with oil VG 46, temp. +20 °C / +68 °F):
- free flow, no. filter element: 5 A
- closed flow (by-pass valve opened): 10 A

Technical data	
Nominal flow rate	up to 14 l/min / 3.7 gpm
Operating pressure	max. 4 bar / 58 psi
Filter fineness (Bx(c) = 200 according to ISO 16889:1999)	3 µm EXAPOR®AQUA 7 µm
Dirt-holding capacity	up to 280 g
Water capacity	up to 340 ml
Electric motor*	24 VDC; 280 W; S1
Suction port (inlet)**	G¾
Pressure port (outlet)**	G½
Suction height max.	1.5 m / 4.9 ft
Weight	approx. 11 kg / 24.3 lbs
Recommended clogging indicator	DG 200-16 Others: see data sheet 60.20

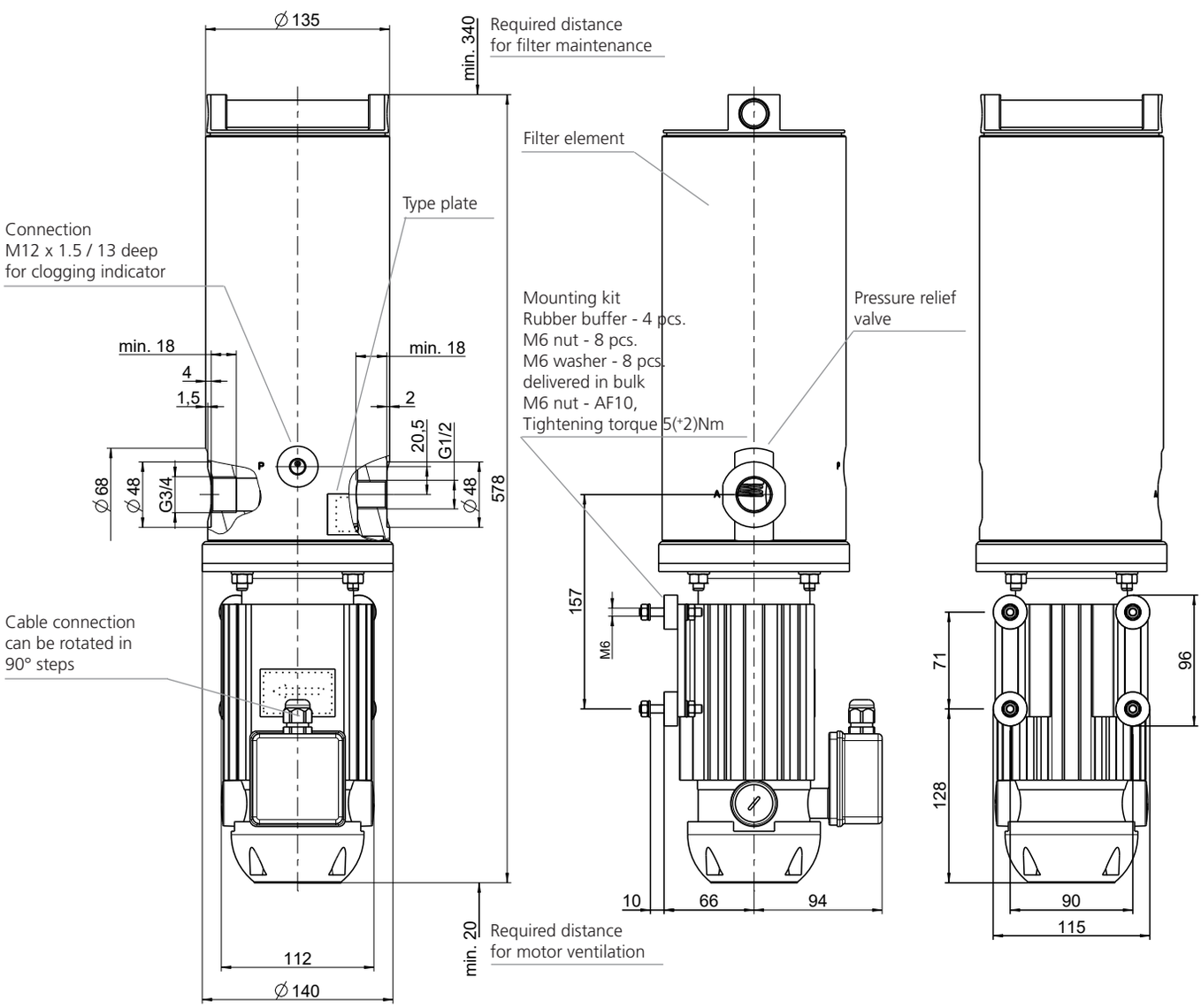
* Version with 12 VDC motor available on request.
** Versions with UNF ports available on request.

Order code	
FNA 014-16553	3 µm EXAPOR®MAX 2 element
FNA 014-16555	7 µm EXAPOR®AQUA element

Other versions available on request.

Spare filter element code	Fineness Bx(c) = 200	Dirt / water capacity at 14 l/min / 3.7 gpm
V7.1220-113	3 µm	280 g
V7.1220-13	5 µm	270 g
V7.1220-06	10 µm	240 g
EXAPOR®AQUA for filtration combined with dewatering		
Y7.1220-05	7 µm	120 g / 340 ml
Y7.1220-113	3 µm	190 g / 300 ml

Dimensions



FNA1 008 / 016

Operating pressure up to 4 bar / 58 psi · Nominal flow rate up to 19 l/min / 5.0 gpm

Off-line Filter Unit FNA1

Description

Application

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

Performance features

Protection against wear:
By means of filter elements that meet the highest demands regarding cleanliness class and dirt-holding capacity.

Protection against failure:
By means of continuous partial filtration, excellent cleanliness classes can be achieved. Machine failures, due to contamination, are reduced, maintenance and oil change intervals are extended.

Special design features

Housing cover:
The cover can be opened without special auxiliary tools.

Compact:
The unique cover design allows that the filter element can be changed without losing any oil.
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, flown 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 housing:	Aluminum alloy
Filter housing:	Steel
Cover:	Aluminum alloy
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic, multi-layer microfiber web

Accessories

With Part No. FNA 008.1700, a mounting set is available, that facilitates the fitting of incoming and outgoing pipes onto an existing filling / venting connection.

Electrical and / or optical clogging indicators may be ordered together with the off-line filter unit. For choosing the proper clogging indicator see table Clogging Indicator in the Ordering Code. A separate order of the clogging indicator is possible. For dimensions and technical data of the clogging indicators - see catalog sheet 60.30.

Hydraulic fittings and hoses for installation of the unit in the system are available on request.

For installation in filter cooling circuits, a version with by-pass valve is available on request.

Characteristics

Nominal flow rate

Up to 19 l/min at ν = 35 mm²/s /
up to 5 gpm at ν = 162 SUS

Viscosity range

15 - 250 mm²/s / 70 - 1160 SUS - continuous operation
15 - 400 mm²/s / 70 - 1860 SUS - short term operation

Off-line filter units for higher viscosities
(up to 1500 mm²/s / 6950 SUS)
see catalog sheet FNA1HV 008 / 016 no. 80.41

Connection

Threaded port according to ISO 228
(see Ordering Code and Dimension Drawing)

Filter fineness

3 µm(c) ... 10 µm(c) for EXAPOR®MAX 2
separating solid particles
3 µm(c) ... 7 µm(c) for EXAPOR®AQUA
separating water and solid particles

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 Ordering Code, table Filter Element).

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

Suction height

max. 1 m / 3.28 ft (unfilled)
max. 6 m / 19.69 ft (in operating condition)

Operating pressure

Max. 4 bar / 58 psi, pressure protection with pressure relief valve

Operating position

Vertical, motor at the bottom

Recommended tank capacities

FNA1 008: up to 800 l / 200 gal
FNA1 016: up to 1500 l / 400 gal

Off-line filter units for tank capacities exceeding
1500 l / 400 gal see catalog sheet FNA 045 no. 80.50.

Ordering code

FNA1 ____ ____ - ____ / ____ - ____

Type of filter unit	Code
Off-line filter unit	FNA1

Nominal flow rate*	Code
8 l/min / 2.11 gpm	008
16 l/min / 4.23 gpm	016

Connection port		Code
Size	Dimensions type no.	
In: G¾ Out: G½	1 or 2	G
In: $1^{1}/_{16}$-12 UN-2B Out: $^{3}/_{4}$-16 UN-2B	3 or 4	U

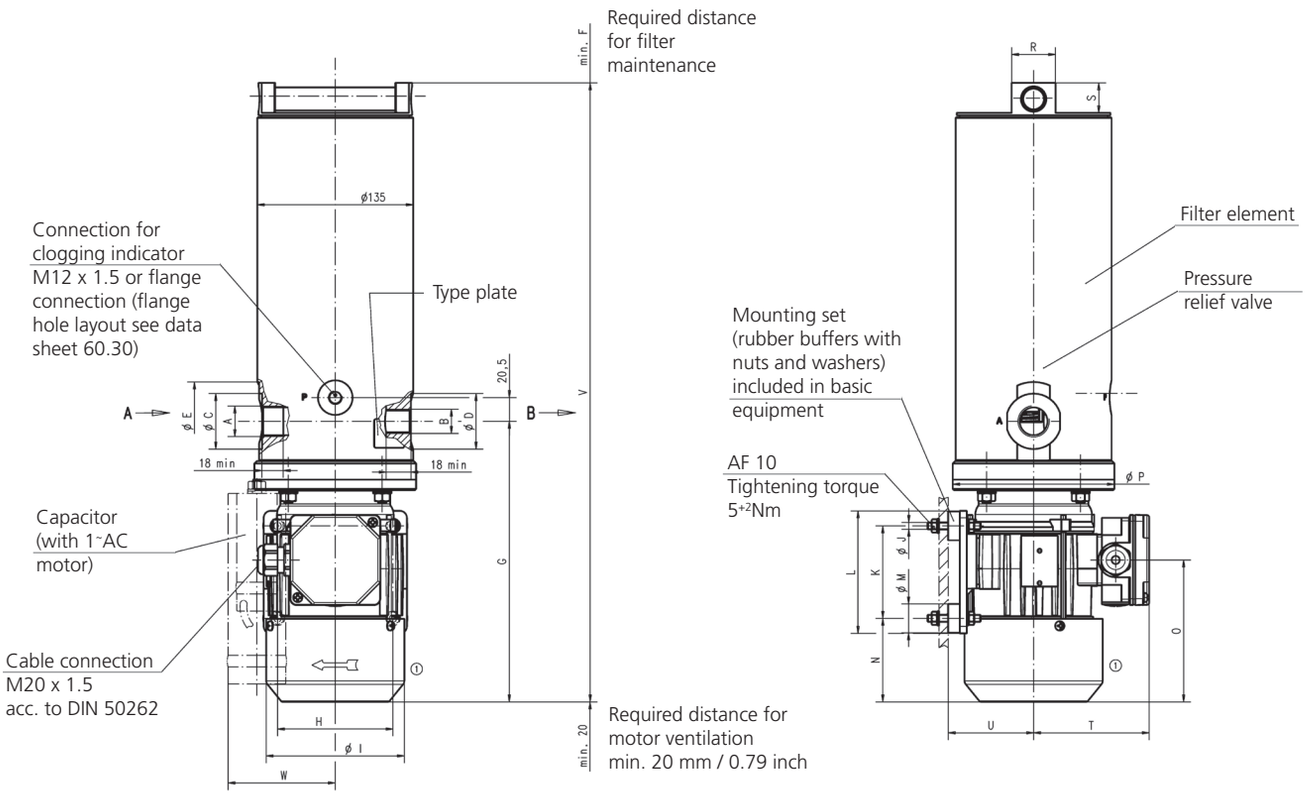
Filter element					Code
	Fineness (β=200) Dirt-holding capacity according to ISO 16889 / water capacity			Filter element	
		FNA1 008	FNA1 016		
EXAPOR®MAX 2	3 µm	490 g	280 g	V7.1220-113	V003
EXAPOR®MAX 2	5 µm	460 g	270 g	V7.1220-13	V005
EXAPOR®MAX 2	10 µm	340 g	190 g	V7.1220-06	V010
EXAPOR®AQUA	7 µm	145 g / 320 ml	85 g / 190 ml	Y7.1220-05	Y007
EXAPOR®AQUA	3 µm	165 g / 340 ml	105 g / 205 ml	Y7.1220-113	Y003

Electric motor* (other motor on request)					Code
Phase(s), voltage	Frequency	Power FNA 1 008 / 016	Electric connection	Dimensions type no.	
3~400/460 VAC	50/60 Hz	0.25 / 0.45 kW	1	1 or 3	40050
1~230 VAC	50/60 Hz	0.25 / 0.45 kW	2	2 or 4	23050
1~110 VAC	50/60 Hz	0.25 / 0.45 kW	2	2 or 4	11050

Clogging indicator						Code
Type		Code of indicator	Data sheet no.	Connection	Hydraulic symbol	
Manometer	optical	DG 200-16	60.20	M12 x 1.5	1	O
Pressure switch	electrical	DG 813-21	60.20	M12 x 1.5	2	E
Pressure switch	optical / electrical	DG 815-12	60.20	M12 x 1.5	3	EO
without indicator				M12 x 1.5	4	X
Differential pressure clogging indicator	optical	DG 042-01	60.30	Flange	5	OD
	electrical	DG 041-31	60.30	Flange	6	ED
	electrical + optical	DG 041-44	60.30	Flange	7	EOD
without indicator				Flange	8	XD

* Indications at 50 Hz. At 60 Hz, the value increases by approx. 20%.
For version with DC motor, 24 or 12 V see data sheet FNA 014 no. 80.35

Dimensions



Weight approx. 11 kg / 24.3 lbs

Measurements in mm

Type*	A	B	C	D	E	F	G	H	I	J	K	L	M
1	G 3/4	G 1/2	48	48	68	340	243	100	120	M6	80	106	25
2	G 3/4	G 1/2	48	48	68	340	243	100	120	M6	80	106	25
3	11/16-12 UN-2B	3/4-16 UNF-2B	41	30	68	340	243	100	120	M6	80	106	25
4	11/16-12 UN-2B	3/4-16 UNF-2B	41	30	68	340	243	100	120	M6	80	106	25

Type*	N	O	P	R	S	T	U	V	W
1	72	123	140	38	26	101	74	535	-
2	72	123	140	38	26	101	74	535	100
3	72	123	140	38	26	101	74	535	-
4	72	123	140	38	26	101	74	535	100

Measurements in inch

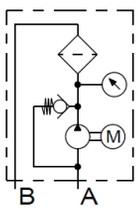
Type*	A	B	C	D	E	F	G	H	I	J	K	L	M
1	G 3/4	G 1/2	1.89	1.89	2.68	13.39	9.57	3.94	4.72	M6	3.15	4.17	0.98
2	G 3/4	G 1/2	1.89	1.89	2.68	13.39	9.57	3.94	4.72	M6	3.15	4.17	0.98
3	11/16-12 UN-2B	3/4-16 UNF-2B	1.61	1.18	2.68	13.39	9.57	3.94	4.72	M6	3.15	4.17	0.98
4	11/16-12 UN-2B	3/4-16 UNF-2B	1.61	1.18	2.68	13.39	9.57	3.94	4.72	M6	3.15	4.17	0.98

Type*	N	O	P	R	S	T	U	V	W
1	2.83	4.84	5.51	1.50	1.02	3.98	2.91	21.06	-
2	2.83	4.84	5.51	1.50	1.02	3.98	2.91	21.06	3.94
3	2.83	4.84	5.51	1.50	1.02	3.98	2.91	21.06	-
4	2.83	4.84	5.51	1.50	1.02	3.98	2.91	21.06	3.94

*Type see Ordering Code (Dimensions Type no.)

Hydraulic symbols

1



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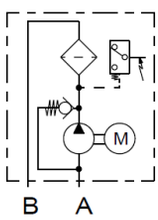

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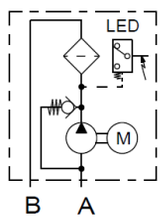

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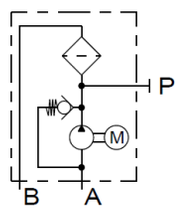

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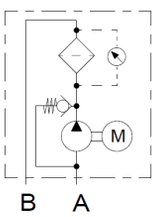

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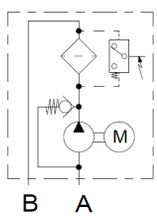

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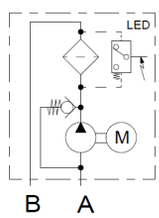

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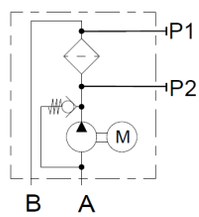
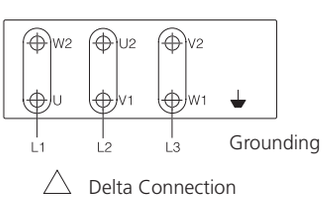


Electric connections

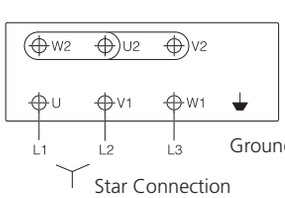
1

Delta connection



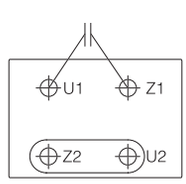
Delta Connection

Star connection



Star Connection

2



Order example

FNA1 016G-V003/23050-E

Off-line filter unit with nominal flow rate 16 l/min / 4.23 gpm, inlet port G¾, outlet port G½, EXAPOR®MAX 2 filter element, fineness 3 µm, electric motor 1~230 VAC and electric clogging indicator

Dimensions type: 2

Remarks:

Combinations listed in this data sheet are standard units. If modifications are required, we kindly ask for your request.

FNA1HV 008 / 016

Viscosity range 15-1500 mm²/s / 70-6950 SUS · Operating pressure up to 6 bar / 87 psi · Nominal flow rate up to 16 l/min / 4.23 gpm

FNA1HV Off-line Filter Unit

Description

Application

In the by-pass flow of hydraulic and lubrication systems.
The unit is designed to operate with viscosities between 15 and 1500 mm²/s / 70 and 6950 SUS. This allows, for example, the filtration of transmission fluids and high viscosity oils even at low temperatures.

Performance features

Protection against wear:
By means of filter elements that meet the highest demands regarding cleanliness class and dirt-holding capacity.

Protection against failure:
By means of continuous partial filtration, excellent cleanliness classes can be achieved. Machine failures, due to contamination, are reduced, maintenance and oil change intervals are extended.

Special design features

Housing cover:
The cover can be opened without special auxiliary tools.

Compact:
The unique cover design allows that the filter element can be changed without losing any oil.
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, flown 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 housing:	Aluminum alloy
Filter housing:	Aluminum alloy, powder painted RAL 5015
Cover:	Aluminum alloy
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic, multi-layer microfiber web EXAPOR®AQUA - combination of water absorbing filter layers and inorganic, multi-layer microfiber web

Remarks

Other colors of the filter housing are available on request.

Accessories

With Part No. FNA 008.1700, a mounting set is available, that facilitates the fitting of incoming and outgoing pipes onto an existing filling / venting connection.

Electrical and / or optical clogging indicators may be ordered together with the off-line filter unit. For choosing the proper clogging indicator see table Clogging Indicator in the Ordering Code. A separate order of the clogging indicator is possible. For dimensions and technical data of the clogging indicators see catalog sheet 60.30.

Hydraulic fittings and hoses for installation of the unit in the system are available on request.

Characteristics

Nominal flow rate

Up to 16 l/min / 4.23 gpm

Viscosity range

FNA1HV 008:
Motor 3~400/460 VAC: 15 - 2400 mm²/s / 70 - 11100 SUS
Motor 1~230 VAC: 15 - 1800 mm²/s / 70 - 8325 SUS

FNA1HV 016:
Motor 3~400/460 VAC: 15 - 1400 mm²/s / 70 - 6487 SUS
Motor 1~230 VAC: 15 - 1200 mm²/s / 70 - 5560 SUS

Connection

Threaded port according to ISO 228
(see Dimension Drawing)

Filter fineness

3 µm(c) ... 10 µm(c) for EXAPOR®MAX 2
separating solid particles
3 µm(c) ... 7 µm(c) for EXAPOR®AQUA
separating water and solid particles

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 Ordering Code, table Filter Element).

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

Maximum suction height

1.5 m / 4.9 ft

Operating pressure

Max. 6 bar / 87 psi, pressure protection with pressure relief valve

Operating position

Vertical, motor at the bottom

Weight

Approx. 11 kg / 24.3 lbs

Recommended tank capacities

Up to 1500 l / 400 gal

Ordering code

FNA1HV ___ ___ - ___ / ___ - ___

Type of filter unit	Code
Off-line filter unit, high viscosity version	FNA1HV

Nominal flow rate*	Code
8 l/min / 2.11 gpm	008
16 l/min / 4.23 gpm	016

Connection ports	Code
In: G1 Out: G¾	G
In: $1^{5}/_{16}$-12 UN-2B Out: $1^{1}/_{16}$-12 UN-2B	U

Filter element					Code
	Fineness (β=200) Dirt-holding capacity according to ISO 16889 / water capacity			Spare filter element code	
		FNA1HV 008	FNA1HV 016		
EXAPOR®MAX 2	3 µm	490 g	280 g	V7.1220-113	V003
EXAPOR®MAX 2	5 µm	460 g	270 g	V7.1220-13	V005
EXAPOR®MAX 2	10 µm	340 g	190 g	V7.1220-06	V010
EXAPOR®AQUA	7 µm	145 g / 320 ml	85 g / 190 ml	Y7.1220-05	Y007
EXAPOR®AQUA	3 µm	165 g / 340 ml	105 g / 205 ml	Y7.1220-113	Y003

Electric motor* (other motor on request)				Code
Phase(s), voltage	Frequency	Power FNA1HV 008 / 016	Elec. connection	
3~400/460 VAC	50/60 Hz	0.37 / 0.55 kW	1	40050
1~230 VAC	50/60 Hz	0.25 / 0.45 kW	2	23050

Clogging indicator						Code
Type		Code of indicator	Connection	Datasheet number	Hydraulic symbol	
Differential pressure clogging indicator	optical	DG 042-01	Flange	60.30	1	OD
	electrical	DG 041-31	Flange	60.30	2	ED
	electrical + optical	DG 041-44	Flange	60.30	3	EOD
Without clogging indicator					4	XD

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

Order example:

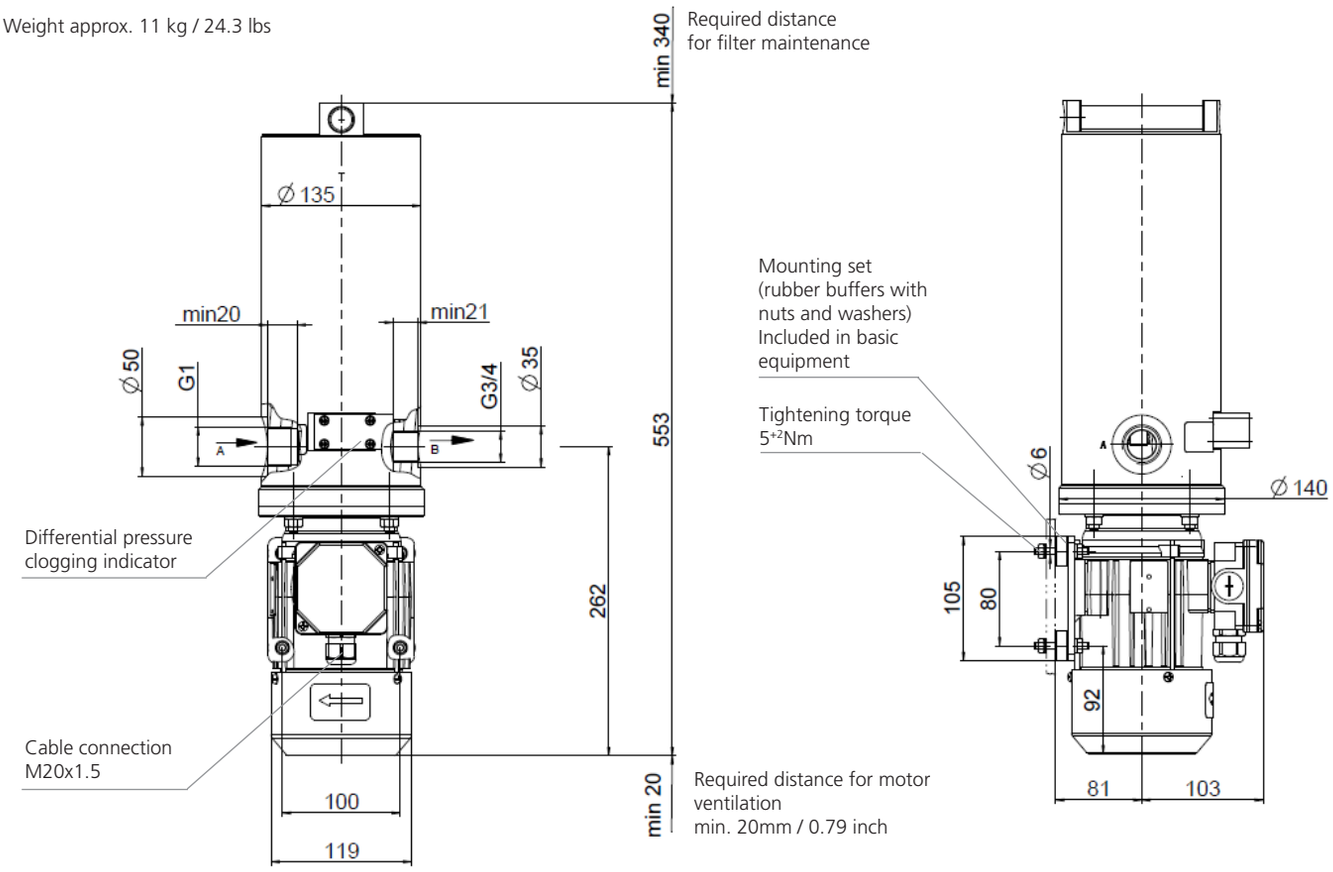
FNA1HV 008G-V003/40050ED off-line filter unit, high viscosity version, nominal flow rate 8 l/min / 2.11gpm, with inlet port G1, outlet port G¾, equipped with 3 µm filter element, 3~phase electric motor and electrical differential pressure clogging indicator.

Remarks:

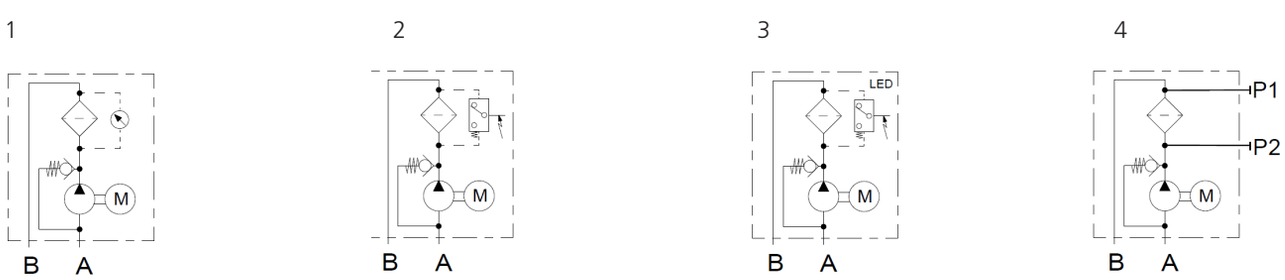
Combinations listed in this ordering code are standard units. If modifications are required, we kindly ask for your request.

Dimensions

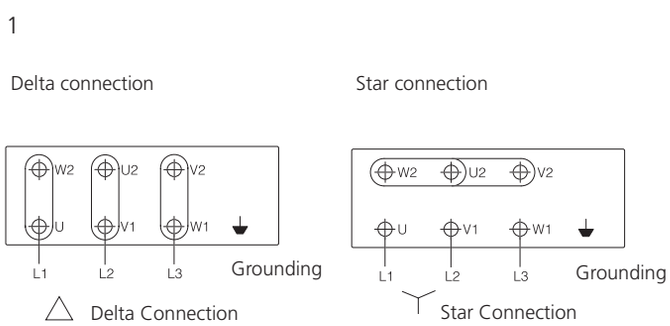
Weight approx. 11 kg / 24.3 lbs



Hydraulic symbol



Electric connections



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

FNA 040-553

Nominal flow rate up to 40 l/min / 10.6 gpm · Operating pressure up to 8 bar / 116 psi

Off-line Filter Unit FNA 040-553

Description

FNA 040-553

The FNA 040-553 can be used as an additional off-line filter unit or as a self-contained system filter for continuous improvement of the oil cleanliness. The operation of the unit is independent of the working cycles of the machine. Thus, the filter element can be changed without interrupting the working process.

Compact and efficient

The compact design allows installation in restricted spaces. With 40 l/min / 10.6 gpm, the oil is continuously pumped over a fine filter, allowing the highest cleanliness levels to be reached, even with larger tank volumes.

Dirt-holding capacity

The dirt-holding capacity values in grams from the ISO MTD test dust are in accordance with the ISO 16889 requirements.

Hydraulic fluids

Mineral oil and biodegradable fluids
(HEES and HETG, see info sheet 00.20).
Other fluids on request.

Technical data	
Nominal flow rate	40 l/min / 10.6 gpm
Filter fineness	$\overline{\beta}_{3(c)}$ = 200*
Dirt-holding capacity	380 g*
Electric drive	3~400 V, 0.75 KW, n = 1400 min^{-1} at 50 Hz, n = 1700 min^{-1} at 60 Hz
Weight	approx. 30 kg / 66 lbs
Temperature range of fluids / viscosity range	0 °C ... +60 °C +32 °F ... +140 °F
Continuous operation min.	15 mm^2/s / 70 SUS
Continuous operation max.	400 mm^2/s / 1860 SUS
Ambient temperature range	0 °C ... +50 °C +32 °F ... +122 °F
Operating pressure	Max. 8 bar / 116 psi
Clogging indicator	Electrical differential pressure indicator

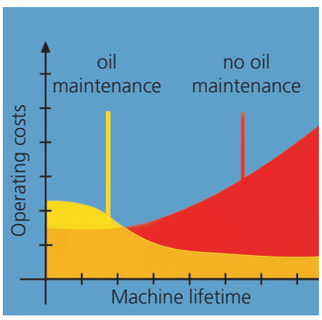
*test dust ISO MTD according to ISO 16889

Order No.
FNA 040-553

Replacement filter element Order No.
V7.1230-153

Compact and ready to connect

The FNA 040-553 comes ready to connect, with filter element.

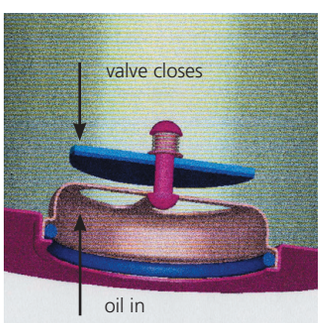


Economical

Das FNA 040-553 Off-line Filter Unit offers protection that can extend the lifetime of machinery. This protection gives a direct return on investment through extended service intervals and increased machine availability.

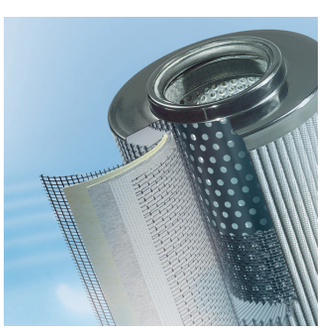
User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.



Maintenance-free filter housing thanks to a unique filter element technique

Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the element.

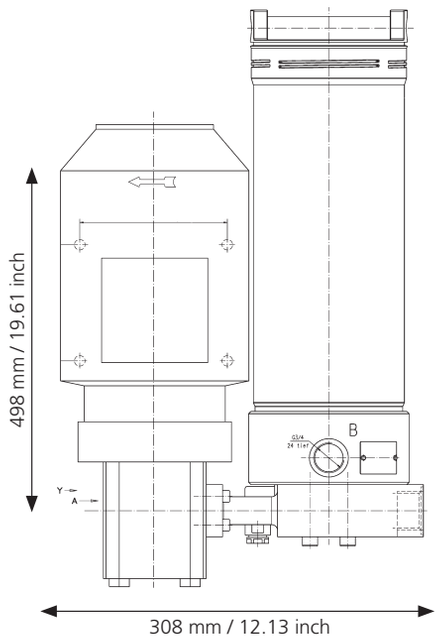


Quality in detail

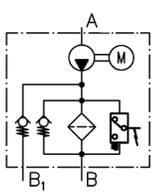
The EXAPOR®MAX 2 ultra-fine element is the heart of the FNA 040.
High cleanliness levels protect the system from contamination when filling with oil.

The tubing of the pressure control valve to the tank is effected by the user!

Dimensions



Hydraulic symbol



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 $\nu \leq 200$ mm²/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, flown 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 ν = 35 mm²/s /
up to 12 gpm at ν = 162 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 µm(c) ... 10 µm(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 mm²/s / 70 SUS	600 mm²/s / 2790 SUS	800 mm²/s / 3720 SUS
1 ~ 230 V	15 mm²/s / 70 SUS	600 mm²/s 2790 SUS	800 mm²/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

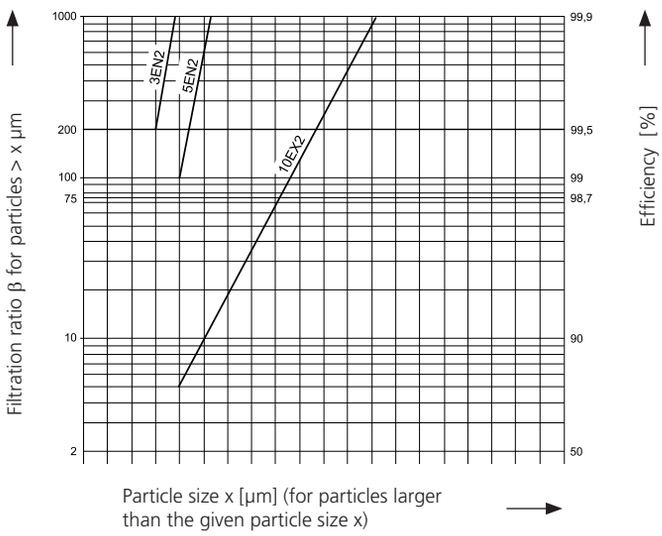
Vertical, pump block at the bottom

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®MAX 2 elements:

3EN2	=	$\overline{\beta}_{3\,(c)}$	= 200	EXAPOR®MAX 2
5EN2	=	$\overline{\beta}_{5\,(c)}$	= 200	EXAPOR®MAX 2
10EX2	=	$\overline{\beta}_{10\,(c)}$	= 200	EXAPOR®MAX 2

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		g	V	Hz	kW	min[1]
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

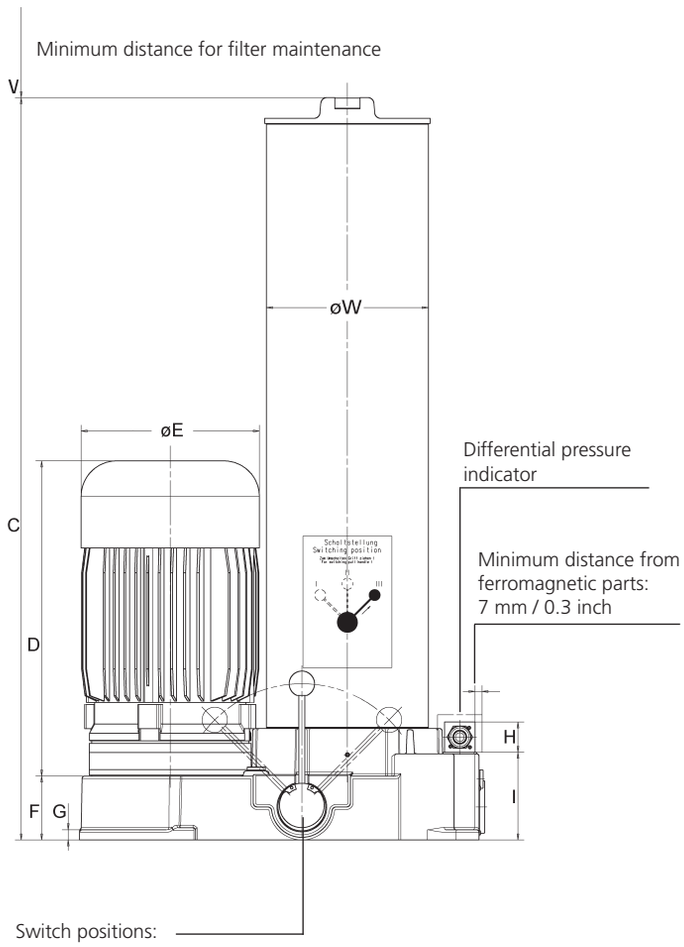
For appropriate clogging indicators see catalog sheet 60.30.

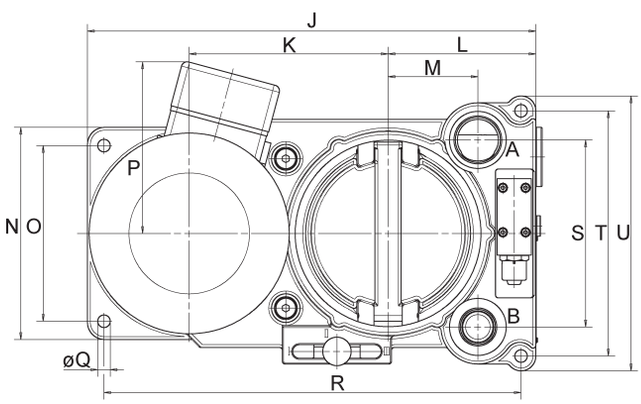
Remarks:

› 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





Weight approx. 37 kg / 81.6 lbs

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							

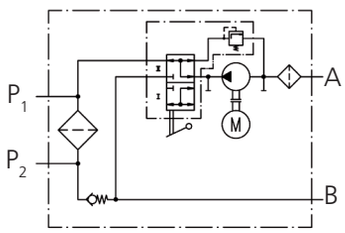
Measurements in inch

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

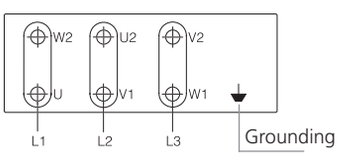
1



Electric connections

1

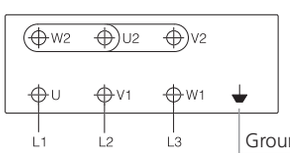
Connections



Delta Connection

2

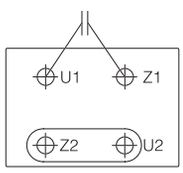
Connections



Star Connection

3

Connections



Alternating Current

Quality Assurance

Quality management according to DIN EN ISO 9001

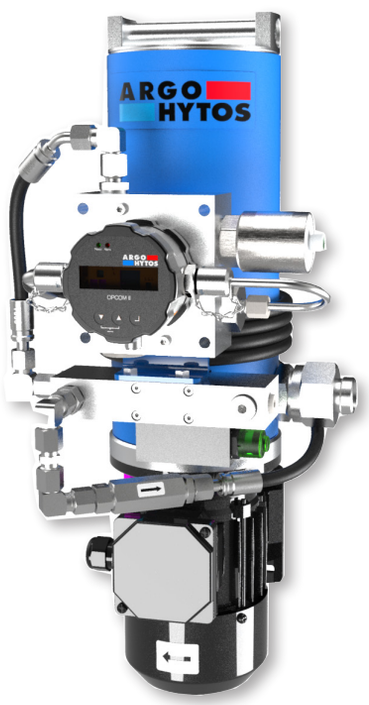
To ensure constant quality in production and operation, ARGO-HYTOS filter elements undergo strict controls and tests according to the following ISO standards:

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.

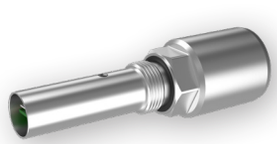
FNAPC1 016

With oil condition monitoring · Nominal flow rate up to 16 l/min / 4.2 gpm · Operating pressure up to 5 bar / 72 psi



Off-line Filter Unit FNAPC1 016

OPCom Particle Monitor



LubCos Humidity / Oil Condition Sensor

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. A high separation efficiency and excellent dirt holding capacity guarantee maximum protection of the machine and make the FNAPC1 016 an economical choice for our customers.

Filtration with oil condition monitoring:
In addition to efficient filtration, the FNAPC1 016 provides continuous oil condition monitoring. This functionality significantly increases the reliability and productivity of the hydraulic system.
The unit can be equipped with one or two sensors:
The OPCom particle sensor permanently monitors the current oil cleanliness class.
The second sensor can be supplied in two versions.
The humidity sensor LubCos H_20 measures the temperature and the relative humidity of the oil.
In the version with LubCos H_2O+ II, the relative humidity, temperature, permittivity and conductivity are issued. This sensor is prepared for continuous determination of the oil condition. Thereby damages can be detected early or avoided completely. This offers the opportunity to prevent machine failures and to extend maintenance and oil change intervals.

Special design features

Housing cover:
The ergonomic design of the cover facilitates the opening.

Compact:
The filter housing, the internal gear pump and the electric motor are screwed together to form one unit. Apart from the connecting lines to the sensor block and the suction/pressure hose, no pipes are needed.

Dirt retention valve:
At the bottom of the filter element, flown 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

Materials

Pump housing:	Aluminum alloy
Filter housing:	Aluminum alloy, painted RAL 5015
Cover:	Aluminum alloy
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic, multi-layer microfiber web EXAPOR®AQUA - combination of water absorbing filter layers and inorganic, multi-layer microfiber web

Remarks

Other colors of the filter housing are available on request.

Accessories

Electrical and / or optical clogging indicators may be ordered together with the off-line filter unit. For choosing the proper clogging indicator see table "Clogging Indicator" in the Ordering Code.
A separate ordering of the clogging indicator is possible.
For dimensions and technical data of the clogging indicator, please refer to catalog sheets 60.20 and 60.30.

Characteristics

Nominal flow rate

Up to 16 l/min at ν = 35 mm²/s /
up to 4.2 gpm at ν = 162 SUS

Connection

see Dimensions - drawing

Filter fineness

3 µm(c) ... 10 µm(c) with EXAPOR®MAX 2
separating solid particles
3 µm(c) ...7 µm(c) with EXAPOR®AQUA
separating water and solid particles

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 Ordering Code, table Filter Element).

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*

Continuous operation min.	For cleanlines monitoring max.	Continuous operation max.	Short-term operation max.
15 mm²/s / 70 SUS	150 mm²/s / 695 SUS	250 mm²/s / 1160 SUS	400 mm²/s / 1860 SUS

* The maximum continuous viscosity for the filter unit itself is 250 mm²/s / 1160 SUS; an exact measurement of the oil cleanliness class is possible within a viscosity range from 15 mm²/s / 70 SUS to 150 mm²/s / 695 SUS.

Maximum suction height

1 m / 3.3 ft - first use / unfilled
6 m / 20 ft - in operating conditions

Operating pressure

Max. 5 bar / 72 psi,
pressure protection with pressure relief valve

Operating position

Vertical, electric motor at the bottom

Recommended tank capacities

Up to 1500 l
For units dedicated for bigger tank capacities see catalog sheet FNAPC 045 No. 8051.

Ordering Code

**FNAPC1 016 / - - **

Type of filter unit	Code
Off-line filter unit with OPCom particle monitor*	FNAPC1

Nominal flow rate	Code
16 l/min / 4.2 gpm**	016

Filter element					Code
	Fineness (β=200) Dirt-holding capacity for nom. flow 16 l/min / 4.2 gpm		Water capacity	Spare filter element code	
EXAPOR®MAX 2	3 µm	280 g	-	V7.1220-113	V003
EXAPOR®MAX 2	5 µm	270 g	-	V7.1220-13	V005
EXAPOR®MAX 3	10 µm	210 g	-	V7.1220-06	V010
EXAPOR®AQUA	7 µm	85 g	190 ml	Y7.1220-05	Y007
EXAPOR®AQUA	3 µm	105 g	205 ml	Y7.1220-113	Y003

Electric motor					Code
Phase(s), voltage	Frequency	Power	Rated current	Electrical connection	
3~400/460 VAC	50/60 Hz	0.45 kW**	2.25/1.30 A T/Y	1	40050
1~230 VAC	50/60 Hz	0.45 kW**	2.8 A	2	23050
1~110 VAC	50/60 Hz	0.45 kW**	5.9 A	2	11050
24 VDC	-	0.3 kW	15.6 A	3	02400

Clogging indicator					Code
Type		Code of indicator	Connection	Datasheet no.	
Differential pressure clogging indicator	optical	DG 042-01	Flange	60.30	OD
	electrical	DG 041-31	Flange	60.30	ED
	electrical + optical	DG 041-44	Flange	60.30	EOD

Oil condition sensor			Code
Measured parameter	Code of sensor	Datasheet number	
Relative humidity Temperature	LubCos H_2O	100.00	H
Relative humidity Temperature Relative dielectric number Conductivity	LubCos H_2O+ II	100.05	HC
Without oil condition sensor			X

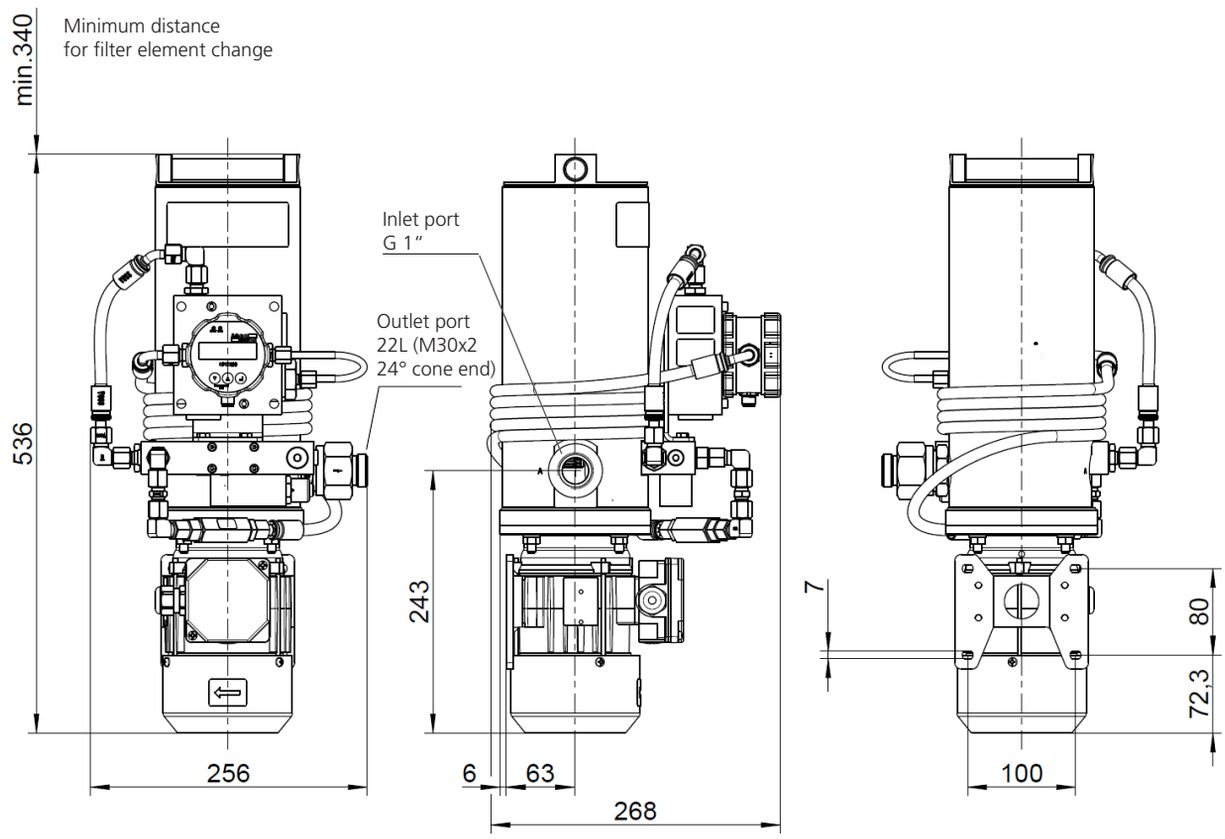
Type of monitoring	Hydraulic symbol	Code
Upstream (before filter)	1	
Downstream (after filter)	2	D

* The OPCom particle monitor is factory fitted in each version of the filter unit. If necessary, the customer can additionally encode the condition sensor.
** Indications at 50 Hz. At 60 Hz, the value increases by approx. 20 %.

Order example:
FNAPC1 016V005/40050-OD-H off-line filter unit with OPCom particle monitor, 5 µm filter element, 3~phase electric motor, optical differential pressure clogging indicator, humidity sensor LubCos H_2O. Monitoring type: before filter.

Remarks:
Combinations listed in this ordering code are standard units. If modifications are required, we kindly ask for your request.

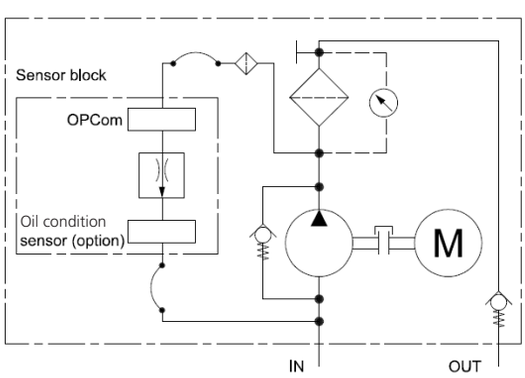
Dimensions



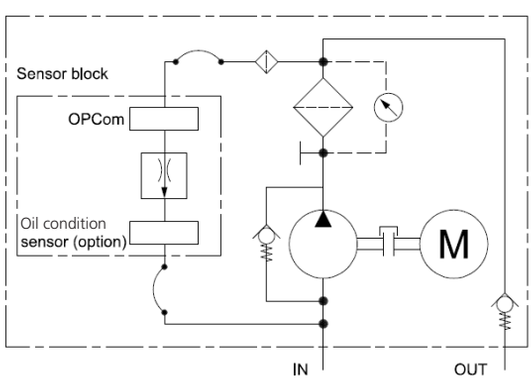
Weight approx. 17 kg / 37.5 lbs

Hydraulic symbols

1 - Measurement before filter



2 - Measurement after filter

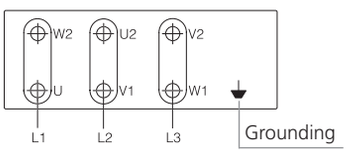


Electric connections

1

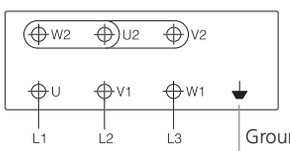
400/460 VAC, 3~phase motor

Delta connection



△ Delta Connection

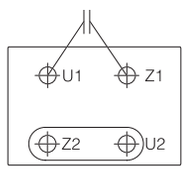
Star connection



Star Connection

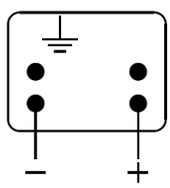
2

230 VAC,
110 VAC, 1~phase motor



3

24 V, DC motor



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.

FNAPC1 045

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

Off-line Filter Unit FNAPC1 045

OPCom Particle Monitor

LubCos Humidity / Oil Condition Sensor

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. A high separation efficiency and excellent dirt holding capacity guarantee maximum protection of the machine and make the FNAPC1 045 an economical choice for our customers.

Filtration with oil condition monitoring:
In addition to efficient filtration, the FNAPC1 045 provides continuous oil condition monitoring. This functionality significantly increases the reliability and productivity of the hydraulic system.
The unit can be equipped with one or two sensors:
The OPCom particle sensor permanently monitors the current oil cleanliness class.
The second sensor can be supplied in two versions.
The humidity sensor LubCos H_20 measures the temperature and the relative humidity of the oil.
In the version with LubCos H_2O+ II, the relative humidity, temperature, permittivity and conductivity are issued. This sensor is prepared for continuous determination of the oil condition. Thereby damages can be detected early or avoided completely. This offers the opportunity to prevent machine failures and to extend maintenance and oil change intervals.

Special design features

Housing cover:
Fold-out handles at the cover facilitate the opening.

Compact:
The filter housing, the internal gear pump and the electric motor are screwed together to form one unit. Apart from the connecting lines to the sensor block and the suction/pressure hose, no pipes are needed.

Dirt retention valve:
At the bottom of the filter element, flown 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.

Switching valve:
The switching valve is used to switch between the basic modes of operation: "filtering" and "pumping without filtering".

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

Materials

Pump:	Cast iron, steel
Filter housing:	Aluminum alloy, painted RAL 5015
Cover:	Aluminum alloy
Seals:	NBR (FPM on request)
Filter media:	EXAPOR®MAX 2 - inorganic, multi-layer microfiber web EXAPOR®AQUA - combination of water absorbing filter layers and inorganic, multi-layer microfiber web

Remarks

Other colors of the filter housing are available on request.

Accessories

Electrical and / or optical clogging indicators may be ordered together with the off-line filter unit. For choosing the proper clogging indicator see table "Clogging Indicator" in the Ordering Code. A separate ordering of the clogging indicator is possible.
For dimensions and technical data of the clogging indicator, please refer to catalog sheets 60.20 and 60.30.

Characteristics

Nominal flow rate

Up to 45 l/min at ν = 35 mm²/s /
up to 12 gpm at ν = 162 SUS

Connection

Threaded port according to ISO 228
(see Dimensions - drawing)

Filter fineness

3 µm(c) ... 10 µm(c) with EXAPOR®MAX 2
separating solid particles
7 µm(c) with EXAPOR®AQUA
separating water and solid particles

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 Ordering Code, table Filter Element).

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*

15 - 600 mm²/s - unit with motor 230 or 400 VAC
15 - 450 mm²/s - unit with motor 110 - 120 VAC

* Exact measurement of the oil cleanliness class is possible within a viscosity range from 15 mm²/s to 250 mm²/s / 70 SUS to 1160 SUS.

Maximum suction height

2 m / 6.6 ft - first use / unfilled
6 m / 20 ft - operating status

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.

Ordering Code

FNAPC1 045 ___/___-___-___ ___

Type of filter unit	Code
Off-line filter unit with OPCom particle monitor*	FNAPC1

Nominal flow rate	Code
45 l/min / 11.9 gpm**	045

Filter element					Code
	Fineness (β=200) Dirt-holding capacity for nom. flow 45 l/min / 11.9 gpm		Water capacity	Spare filter element code	
EXAPOR®MAX 2	3 µm	1950 g	-	V7.1560-103	V003
EXAPOR®MAX 2	5 µm	1980 g	-	V7.1560-03	V005
EXAPOR®MAX 2	10 µm	2020 g	-	V7.1560-06	V010
EXAPOR®AQUA	7 µm	590 g	1520 ml	Y7.1560-05	Y007

Electric motor**					Code
Phase(s), voltage	Frequency	Electrical Connection (see on last page)	Power	Rated current	
3~ 400/460 VAC 3~ 230/265 VAC	50/60 Hz 50/60 Hz	1: Y star (default) 1: Δ delta	1.1 kW (1,5hp) 1.1 kW (1,5hp)	2.8 A 4.8 A	40050
1~220-240 VAC	50/60 Hz	2	1.1 kW (1,5hp)	7.2 A	23050
1~110-120 VAC	50/60 Hz	2	0.75 kW (1hp)	10.5 A	11050

Clogging indicator					Code
Type		Code of indicator	Connection	Datasheet no.	
Differential pressure clogging indicator	optical	DG 042-04	Flange	60.30	OD
	electrical	DG 041-31	Flange	60.30	ED
	electrical+ optical	DG041-44	Flange	60.30	EOD

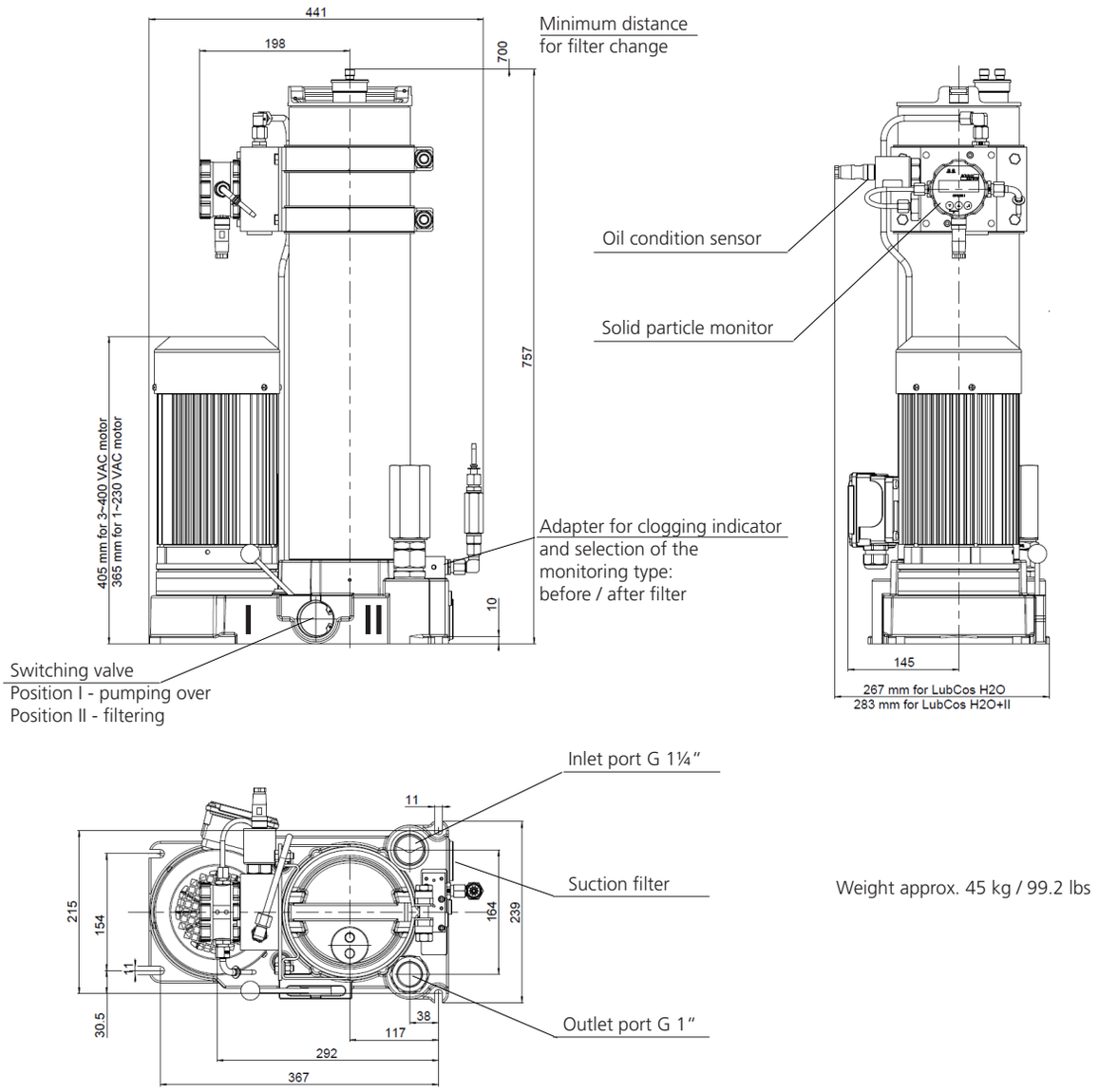
Oil condition sensor			Code
Measured parameter	Code of sensor	Datasheet number	
Relative humidity Temperature	LubCos H_2O	100.00	H
Relative humidity Temperature Relative dielectric number Conductivity	LubCos H_2O+ II	100.05	HC
Without oil condition sensor			x

Type of monitoring	Hydraulic symbol	Code
Upstream (before filter)	1	
Downstream (after filter)	2	D

* The OPCom particle monitor is factory fitted in each version of the filter unit. T
Version of the oil condiiton sensor has to be coded by the customer - see table above.
** Indications at 50 Hz. At 60 Hz, the value increases by approx. 20 %.

Order example:
FNAPC1 045V003/40050-ED-H off-line filter unit with OPCom particle monitor, 3 µm filter element, 3~phase electric motor, electrical differential pressure clogging indicator, humidity sensor LubCos H_2O. Monitoring type: before filter.

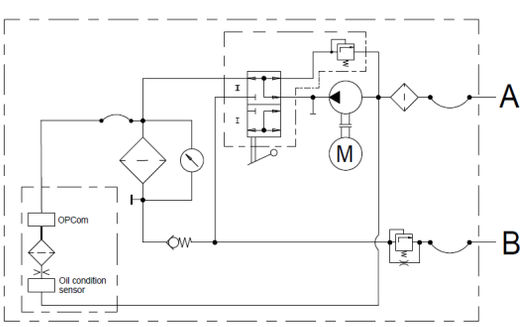
Dimensions



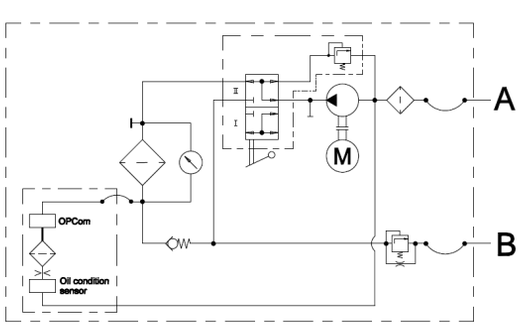
Weight approx. 45 kg / 99.2 lbs

Hydraulic symbols

1 - Measurement before filter



2 - Measurement after filter

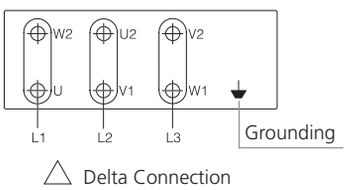


Electric connections

1:
3~phase motor
230/400V 50Hz T/Y
265/460V 60Hz T/Y

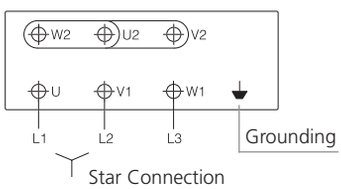
2:
1~phase moto
110 - 120 VAC, 50/60Hz
220 - 240 VAC, 50/60Hz

Delta connection

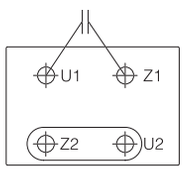


Delta Connection

Star connection (default)



Star Connection



Quality Assurance

Quality management according to DIN EN ISO 9001

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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.

Compact Filter Pack CFP 03

Ultra-light and compact · Multi-purpose system · Ergonomic design · Simplifies servicing of small power packs

Oil Service Unit CFP

Suction-return Adapter

- **Exclusive solution for small tanks**
- **Perfect device for maintenance services**
- **Weight only 7.8 kg / 17.3 lbs**
- **Filter elements EXAPOR®MAX 2**
- **Electric motor with switch**
- **Smart suction-return adapter**

Description

Maintenance of small power packs

The CFP is a multi-purpose off-line filter unit, designed for servicing small power packs on a daily basis, not only to be used during start-up or a breakdown.
Thanks to its characteristics, the CFP fills the gap in the market as a first unit designed not only for filling but also for cleaning of hydraulic systems.

Ideal service equipment

The compact size and low weight make the device easily transportable from machine to machine without needing any extra transport aids.
The CFP can be used in systems where other devices are not applicable: in machines with difficult access to the oil tank or when working at height.

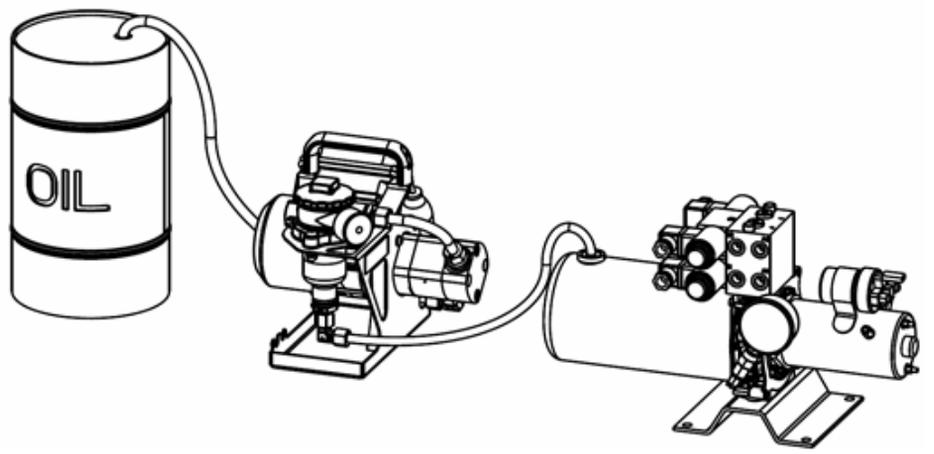
Dirt-holding capacity

The dirt-holding capacity values in grams from the ISO MTD test dust are in accordance with the ISO 16889 requirements.

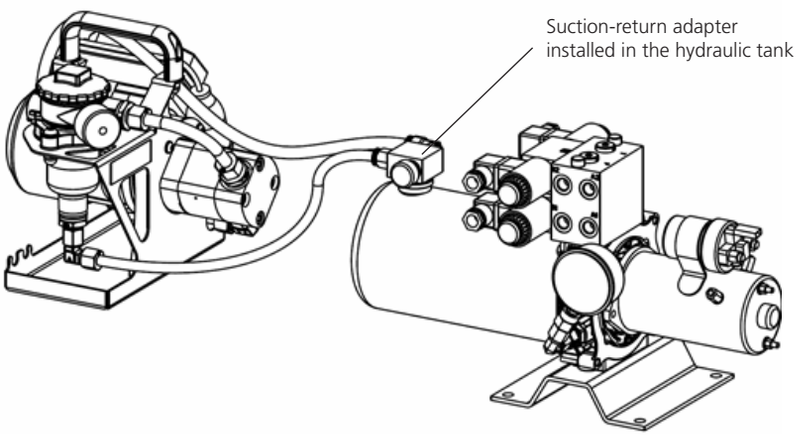
Multi-purpose system

The CFP unit can be used for transferring oils, filling of systems with filtered oil or for off-line filtration. Off-line filtration is possible even in systems where only one connection port is available. The special suction-return adapter allows both the suction and the pressure hose to be connected to the tank (for example via the ventilating filter port).

Application examples



Application example 1:
Oil transfer, filling of the small power pack with fresh oil.



Application example 2:
Service of hydraulic systems. Off-line filtration at small power packs with only one available connection port.
Suction-return adapter installed in the ventilating filter port.

Characteristics

Hydraulic connection

Hoses:
Suction hose DN12, length 2 m / 6.6 ft
Pressure hose DN8, length 2 m / 6.6 ft
Free end of hoses closed by protective caps

Electrical connection

Electric motor, air cooled fan with ON/OFF switch

Cable:	length 2.5 m / 8.2 ft
Voltages:	1 ~ 230 V AC / 50/60 Hz
	1 ~ 110 V AC / 50/60 Hz
Protection class:	IP 54

Pump design

External gear pump with suction strainer installed in the suction port

Operating and transport position

Upright

Hydraulic fluids

Mineral oil and biodegradable fluids
Motor oils (see info sheet 00.20)
Other fluids on request

Temperature range of fluids

0 °C ... +60 °C / +32 °F ... +140 °F

Ambient temperature range

0 °C ... +50 °C / +32 °F ... +122 °F

Viscosity range

10 - 300 mm^2/s - continuous operation without adapter
10 - 170 mm^2/s - continuous operation with adapter

Selection Chart

	Order No.	Order No.	Order No.	Order No.
	CFP 03-13	**CFP 03-16**	**CFP 03-18**	**CFP 03-131**
Nominal flow rate at v = 35 mm²/s / 162 SUS	3 l/min* / 0.79 gpm*	3 l/min* / 0.79 gpm*	3 l/min* / 0.79 gpm*	3 l/min* / 0.79 gpm*
Filter fineness (Bx(c) = 200 according to ISO 16889:1999)	5 µm	10 µm	16 µm	5 µm
Dirt holding capacity	15 g	15 g	11 g	15 g
E-Motor operating voltage	1 ~ 230 V AC	1 ~ 230 V AC	1 ~ 230 V AC	1 ~ 110 V AC
E-Motor operating frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
E-Motor power	0.06 kW*	0.06 kW*	0.06 kW	0.06 kW*
Electric plug	Type E/F	Type E/F	Type E/F	NEMA 5-15 (type B)
Length of suction hose	2 m / 6.6 ft	2 m / 6.6 ft	2 m / 6.6 ft	2 m / 6.6 ft
Length of pressure hose	2 m / 6.6 ft	2 m / 6.6 ft	2 m / 6.6 ft	2 m / 6.6 ft
Suction height max.	2.5 m / 8.2 ft	2.5 m / 8.2 ft	2.5 m / 8.2 ft	2.5 m / 8.2 ft
Operating pressure max.	3.5 bar / 50.8 psi	3.5 bar / 50.8 psi	3.5 bar / 50.8 psi	3.5 bar / 50.8 psi
Hydraulic symbol	1	1	1	1
Replacement element Order no.	V3.0510-53	V3.0510-56	V3.0510-58	V3.0510-53
Cracking pressure of by-pass	2.5 bar / 36.3 psi	2.5 bar / 36.3 psi	2.5 bar / 36.3 psi	2.5 bar / 36.3 psi
Clogging indicator	Manometer	Manometer	Manometer	Manometer
Weight	7.8 kg / 17.3 lbs	7.8 kg / 17.3 lbs	7.8 kg / 17.3 lbs	7.8 kg / 17.3 lbs

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

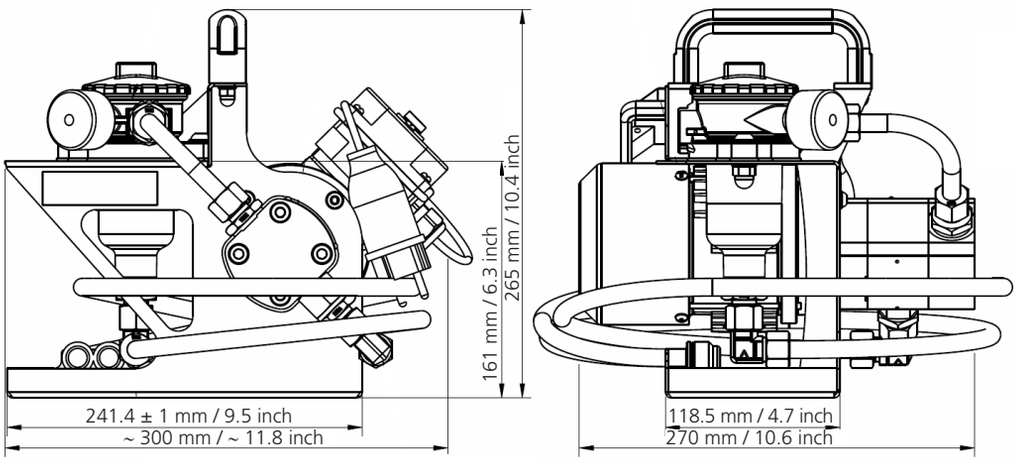
Accessories:

› Suction-return adapter CFP-A-09/05

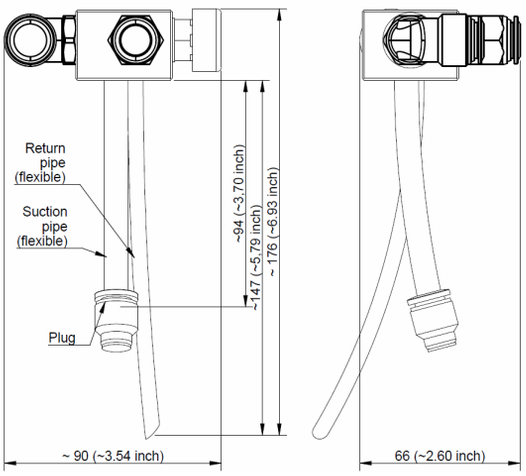
On request:

› Customized versions
› Other electric plugs
› Hose extensions
› Filter elements with other finenesses
› Adapter with other length of suction and return hose
› Connecting fitting G½", M22 x 1.5 (or other customized threads) for installation of the suction-return adapter in plastic tanks

Dimensions



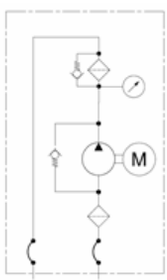
Basic device



Suction-return adapter

Hydraulic Symbol

1



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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.

FA1 008

Easy filling and cleaning · Compact design · Comfortable handling · Great filtration efficiency

Oil Service Unit FA1 008

Description

FA1 008 – quick, simple and compact

With the Oil Service Unit FA 008, hydraulic and lubricating systems can be easily filled or cleaned.

Protection of components through ultra-fine filtration

The EXAPOR®MAX 2 ultra-fine elements are the heart of the ARGO-HYTOS filtering units FA1 008. High separation efficiencies guarantee excellent cleanliness levels and thereby highest protection of components. The high dirt holding capacity of the EXAPOR®MAX 2 ultra-fine elements allows economic operation of the FA1 008.

Characteristics

Nominal flow rate

Up to 8 l/min / 2.11 gpm

Viscosity range * (continuous operation)

15 mm^2/s / 70 SUS up to 250 mm^2/s / 1175 SUS

* for units with extended viscosity range see datasheet of the FA1HV 008/016 devices

Operating pressure

max. 4 bar / 58 psi

Hydraulic fluids

Mineral and biodegradable oils. Other fluids on request.

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

Maximum suction height

1.5 m / 4.9 ft

Operating position

Vertical, motor at the bottom

Weight

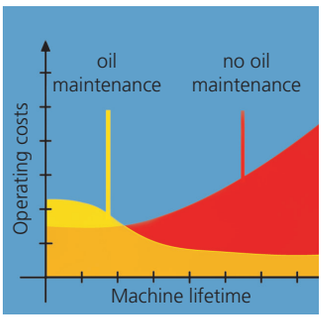
approx. 18 kg / 39.7 lbs

Recommended tank capacities

Up to 800 l / 200 gal

Compact design

The compact design allows easy access to the oil tank.
The FA1 008 comes ready to connect, with hose packages.

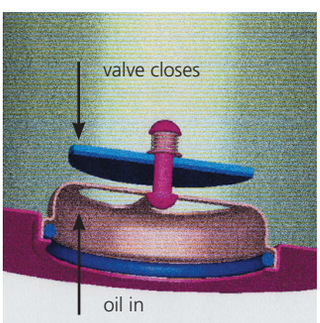


Economical

The FA1 008 Oil Service Unit offers protection that can extend the lifetime of machinery. This protection gives a direct return on investment through extended service intervals and increased machine availability.

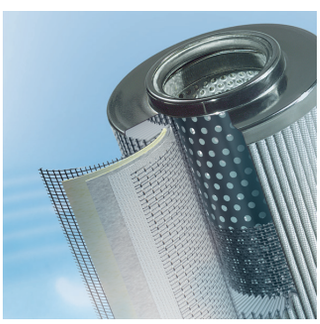
User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.



Maintenance-free filter housing due to a clever filter element technique

Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing with the element.



Quality in detail

The EXAPOR®MAX 2 fine element is the heart of the FA1 008. High cleanliness levels protect the hydraulic system against contamination during the oil filling process.

Ordering code

FA1 008 / -

Type of unit	Code
Oil service unit - standard version	FA1

Nominal flow rate	Code
8 l/min / 2.11 gpm*	008

Filter element					Code
	Fineness (β=200) Dirt-holding capacity according to ISO 16889		Water capacity	Spare filter element	
EXAPOR®MAX 2	3 µm	490 g	-	V7.1220-113	V003
EXAPOR®MAX 2	5 µm	460 g	-	V7.1220-13	V005
EXAPOR®MAX 2	10 µm	340 g	-	V7.1220-06	V010
EXAPOR®AQUA	7 µm	145 g	320 ml	Y7.1220-05	Y007
EXAPOR®AQUA	3 µm	165 g	340 ml	Y7.1220-113	Y003

Electric motor				Code
Phase(s), voltage	Frequency	Power	Electric plug	
1~220-240 VAC	50/60 Hz	0.25 kW*	1	23050
3~400/460 VAC	50/60 Hz	0.25 kW*	2	40050

Clogging indicator				Code
Type	Code of indicator	Datasheet number	Hydraulic symbol	
Optical - manometer	DG 200-16	60.20	1	O
Optical - differential pressure indicator	DG 042-01	60.30	2	OD

Pressure hose extension **	
Customized length of the pressure hose (max. 5 m / 16.4 ft) Example of order **P4.5** - pressure hose length 4.5 m / 14.8 ft	Px.x

Electric cable extension ***	
Customized length of the electric cable Example of order **C8.5** - electric cable length 8.5 m / 27.8 ft equipped with electric plug	Cx.x

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

****** As standard, the unit is equipped with the following hoses
Suction hose: DN 19, length 1.8 m / 5.9 ft with suction filter 300 µm, Ø approx. 49 mm / 1.9 inch (installed at the free end of the hose)
Pressure hose: DN 19, length 2.0 m / 6.6 ft with aluminum lance length 25 cm (installed at the free end of the hose)

******* As standard, the unit is equipped with an electric cable, length 2.5 m / 8.2 ft.

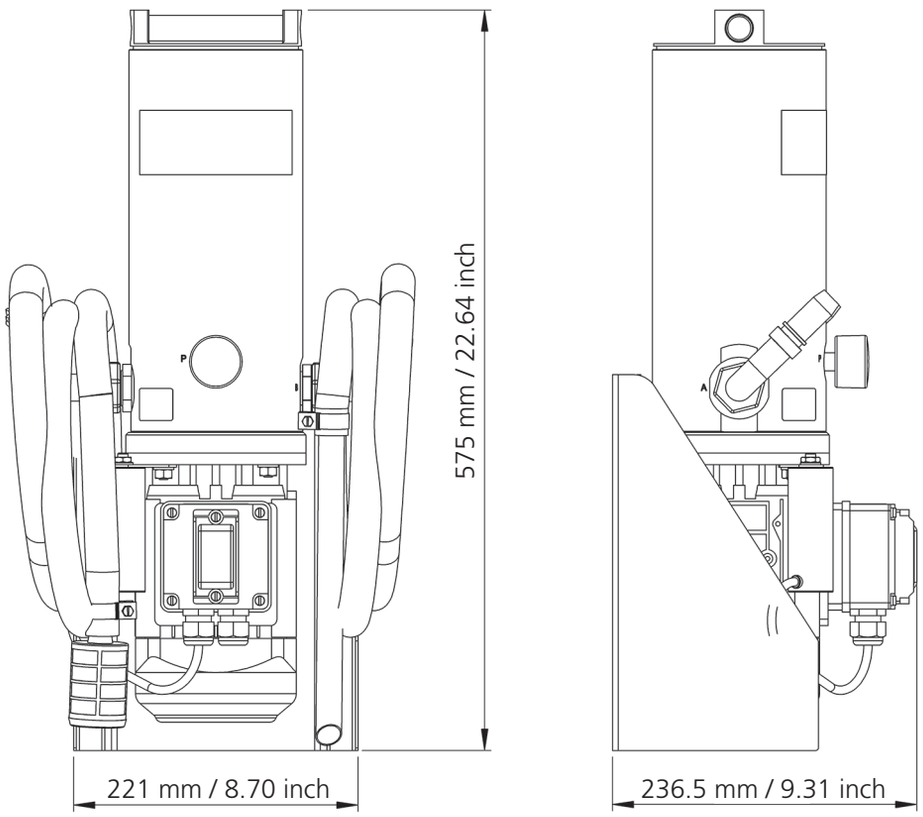
Accessories:

- Suction strainer set FA 016.1775 for tank openings on request, in case the existing suction strainer cannot be used.
- Mounting set FA 008.1700 for tank openings with ventilating filter, e.g. as service connection on request.

Order example:

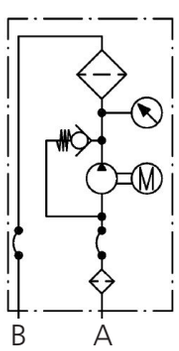
FA1 008V005/23050-OP3.5 - oil service unit, nominal flow 8 l/min / 2.11 gpm, filter element 5 µm, motor 1~230 VAC, optical manometer, standard suction hose, customized pressure hose, length 3.5 m / 11.5 ft, standard electric cable.

Dimensions

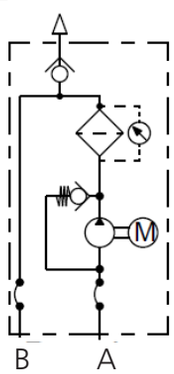


Hydraulic symbols

1

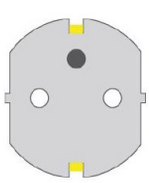


2

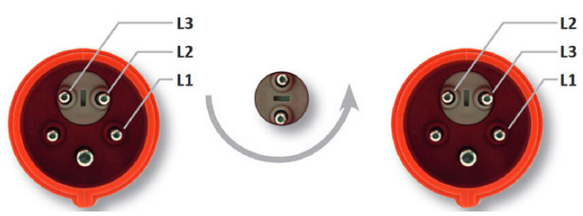


Electric plug*

1: Type E/F (CEE7/7 Unischuko)



2: With phase crossover, 5-pins (3P+N+PE), IEC 60309



***** other plugs on request

FA2 016 · FAPC2 016

- Easy filling and cleaning
- Compact design, comfortable handling
- High filtration efficiency
- Option: with oil cleanliness monitor and data storage

Oil Service Unit FA2 016

Oil Service Unit FAPC2 016

Description

FA2 016

With the FA2 016, hydraulic and lubricating systems can be easily filled or cleaned with off-line filtration.

Compact design and comfortable handling

The compact design allows easy access to the oil tank. The unit comes ready to connect with hose packages. The ultra-fine elements can quickly be changed without special auxiliary tools. Residual oil from the hoses is collected in the oil pan.

Protection of components through ultra-fine filtration

The ultra-fine filter element is the heart of the FA2 / FAPC2 oil service unit. High separation efficiencies guarantee excellent cleanliness levels and thereby highest protection of components. The high dirt holding capacity of the filter elements allows economic operation of the device.

FAPC2 016: filtration & oil cleanliness monitoring

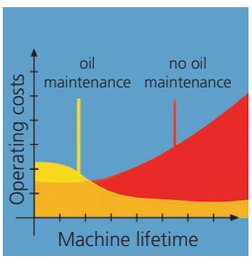
The FA2 016 can be equipped with an oil cleanliness monitor. The ARGO-HYTOS OPCom Particle Monitor permanently monitors the current cleanliness class during the cleaning or filling process.

When monitoring the cleanliness class, a ball valve is used to select “behind filter” (e.g. when filling systems) or “before filter” (e.g. when cleaning filled oil). At the display of the OPCom Particle Monitor, the result is shown according to ISO 4406:1999, NAS 1638, SAE AS 4059 or GOST 17216.

The FAPC2 016 can store up to 3000 data sets. A PC-software for data recording and representation of the measured values can be downloaded for free at www.argo-hytos.com. The data can be transmitted to a computer via an USB port so that the cleaning trend can be visualized and followed graphically or in table form.

Easy Transport

For easy transportation of the FA2 016 and FAPC2 016, an optional trolley can be hooked onto the standing unit - for more information see chapter Accessories.



Economical

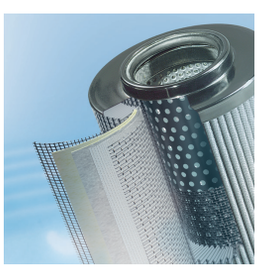
The FA2 016 · FAPC2 016 Oil Service Unit offers protection that can extend the lifetime of machinery. This protection gives a direct return on investment through extended service intervals and increased machine availability.

Portable in any position

Thanks to the compact design, the FA2 016 · FAPC2 016 can be easily carried and also be used in inaccessible areas of hydraulic systems. Hoses and electric cables can be fixed at the service unit. The device can be operated and transported in both upright and horizontal positions.

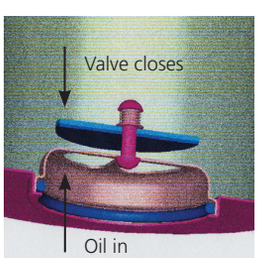
User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.



Quality in detail

The ultra-fine element is the heart of the FA2 016 · FAPC2 016. A high separation efficiency and dirt holding capacity guarantee maximum cleanliness levels and service intervals in line with practical needs.



Maintenance-free filter housing thanks to a unique filter element technique

Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the element.

Controlled cleaning with Oil Cleanliness Monitor OPCom

The FA2 016 can optionally be equipped with the Oil Particle Monitor OPCom which allows to monitor the oil cleanliness during the cleaning or filling process. The current cleanliness classes are indicated on the display or can be queried via the USB port.

Characteristics

Flow rate
up to 16 l/min / 4.2 gpm

Operating pressure
FA2 016: max. 4 bar / 58 psi
FAPC2 016: max. 5 bar / 72 psi

Viscosity range
15 - 250 mm²/s - continuous operation
15 - 400 mm²/s - short term operation
15 - 150 mm²/s - continuous operation of the FAPC2 to assure exact measurement of the oil cleanliness class

Temperature range of fluids
0 °C ... +65 °C / +32 °F ... +149 °F

Ambient temperature range
0 °C ... +50 °C / +32 °F ... +122 °F

Applicable filter elements

EXAPOR® MAX — for efficient separation of solid particles

EXAPOR® Spark Protect — for separation of solid particles and protection against electrostatic discharges (oils with low electrical conductivity < 500 pS/m at 20 °C)

EXAPOR® AQUA — for separation of free water and solid particles

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 Ordering Code, table Filter Element).

Clogging indicator
FA2 016: optical, manometer DG200-16
(see data sheet 60.20)
FAPC2 016: optical, differential pressure switch DG 042-01
(see data sheet 60.30)

Hydraulic fluids
Mineral oil and biodegradable fluids
(HEES and HETG, see info service sheet 00.20).
Other fluids on request.

Electrical connection*
Cable length 2.5 m / 8.2 ft with the electric plug.
To select the required electric plug see order code.

Electrical motor
Single or three phase version:
1~ 110-120 V / 50 / 60 Hz
1~ 220-240 V / 50 / 60 Hz
3~ 380-480V / 50 / 60 Hz
Other motors on request

Hydraulic connections
(see also in the table below)

Suction side:

› **Standard version (no extra coding):**
Hose DN 20, length 1,8 m / 5.9 ft with with suction strainer 600 µm, Ø approx. 44 mm / 1.7 inch mounted at the free end of the hose

› **On request (letter H in the ordering code):**
Hose DN 25, length 1,8 m / 5.9 ft with with suction strainer 200 µm mounted directly in the filter housing. Lance Ø approx. 25 mm / 0.98 inch mounted at free end of hose.

Standard suction strainer	Suction strainer, type H
	
Mounted at the end of the suction hose. Lance mounted at the end of the pressure hose	Mounted in the filter housing Lances mounted at the end of both hoses.

Pressure side**:

› Hose DN 20, length 2 m / 6.6 ft with lance Ø approx. 20 mm / 0.8 inch

Permitted suction heights
max. 1,5 m (unfilled)
max. 6 m (in operating condition)

Weight
FA2 approx. 17 kg / 37.5 lbs
FAPC2 approx. 21 kg / 46 lbs

Operating and transport position
Operating position: upright
Transport position: upright or horizontal

* For electric cable extension - see order code
** Pressure hose extension - see order code

Ordering code

FA 2 016 /

Type of unit	Code
Oil service unit	FA

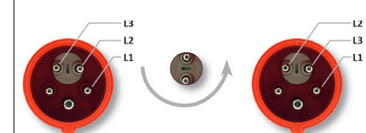
Product version	Code
Without oil cleanliness monitor	
With oil cleanliness monitor	PC

Nominal flow rate 16 l/min / 4.23 gpm	016

Filter element				Code
	Fineness (β=200) Dirt-holding capacity according to ISO 16889 / water capacity		Code of spare filter element	
EXAPOR®MAX	3 µm	280 g	V7.1220-113	V003
EXAPOR®MAX	5 µm	270 g	V7.1220-13	V005
EXAPOR®MAX	10 µm	210 g	V7.1220-06	V010
EXAPOR®AQUA	7 µm	85 g / 190 ml	Y7.1220-05	Y007
EXAPOR®AQUA	3 µm	105 g / 205 ml	Y7.1220-113	Y003
EXAPOR®SPARK PROTECT	3 µm	280 g	Z7.1220-113	Z003

Electric motor*			Code
Phase(s), voltage	Frequency	Power	
1~220-240 VAC	50/60 Hz	0.45 kW	23050
1~110-120 VAC	50/60 Hz	0.45 kW	11050
3~380-480 VAC	50/60 Hz	0.45 kW	40050

Electric plug - code and description below *
Other types - on request

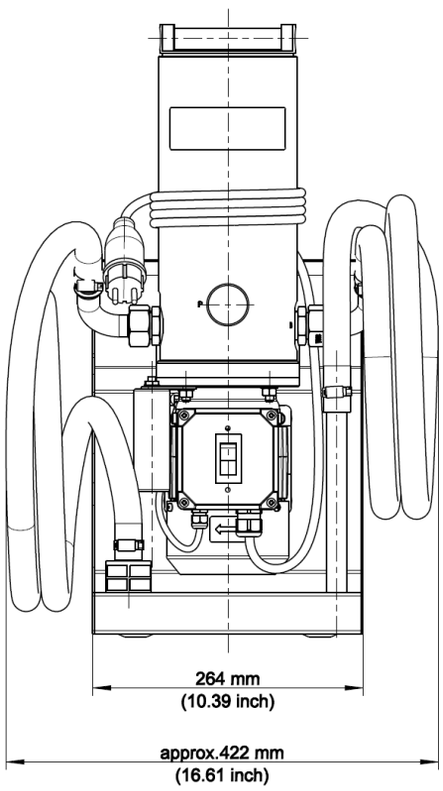
No code Default for code 23050	**G**	**J**	**No code** Default for code 11050	**I6**	**I4**	**No code** Default for code 40050
220-250 VAC 15 A TYPE E/F (CEE7/7 Unischuko)	**220-250 VAC** 13 A TYPE G (BS 1363)	**220-240 VAC** 10 A TYPE J (T12**)**	**100-127 VAC** 15 A TYPE B (NEMA 5-15P)	**200-250 VAC INDUSTRIAL** Type 013-6 16A-6h 3-pins (2P+PE)	**110-130 VAC INDUSTRIAL** Type 013-4 16A-4h 3-pins (2P+PE)	**380-480 VAC INDUSTRIAL** Type 715-6 16A-6h 5-pins (3P+N+PE), IEC 60309 With phase crossover
						

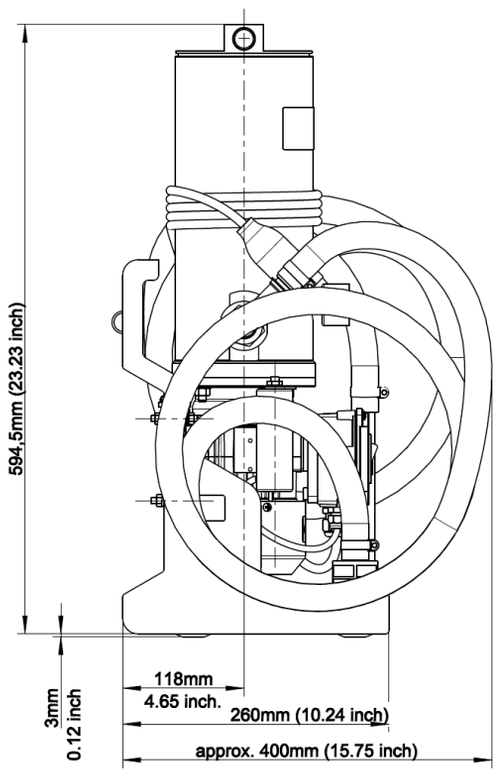
Suction strainer (options described on previous page)	Code
Standard - mounted at the free end of the hose, Ø approx. 44 mm / 1.7 inch	
Optional - mounted in the filter housing + hose with lance Ø approx. 25 mm / 0.98 inch	H

Optional pressure hose extension (maximum 5 m / 16.4 ft)	
Example of order: **P4.5** - pressure hose length 4.5 m / 14.8 ft	P_._

Optional electric cable extension **	
Example of order: **C8.5** - cable length 8.5 m / 27.8 ft	C_._

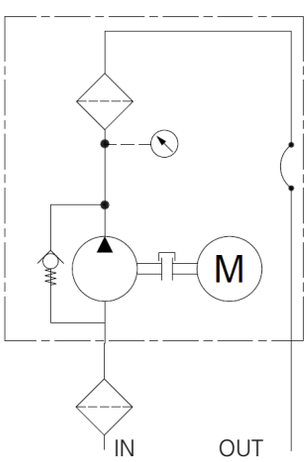
Dimensions



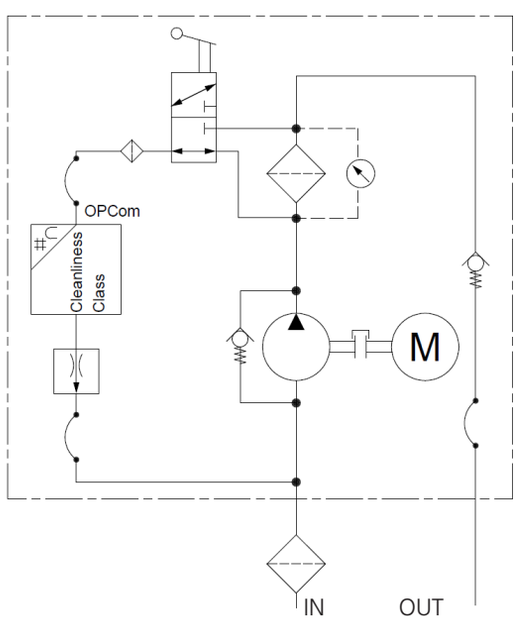


Hydraulic symbols

FA2 016



FAPC2 016



How to calculate cleaning time for unit without Particle Monitor?

The cleaning speed depends on the efficiency of the filter elements ($\beta_{x\,(c)}$), the nominal volume flow ($Q_{nominal}$) and the oil volume (V_{actual}).

In graph D1-D2, the cleaning time is shown in relation to the filter fineness (indication of cleanliness classes according to ISO 4406:1999). The values are recorded by laboratory methods and may be influenced by environmental conditions (such as continuous additional introduction of dirt on running systems, high water content, etc.).

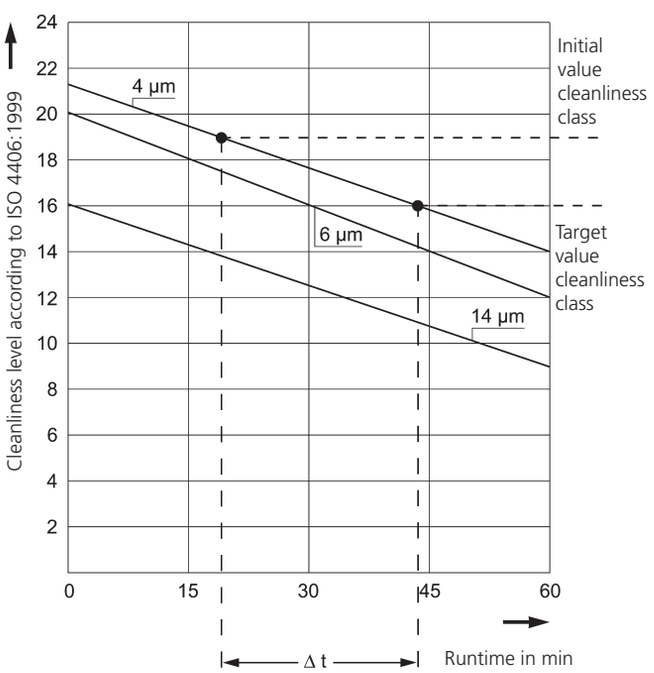
All characteristic curves (see graphs D1-D2) relate to a **reference oil volume of 180 l / 47.5 gal** and a **nominal volume flow of 15 l/min / 4 gpm.**

The following formula should be used to convert to the actual oil volume:

$$t_{actual} = \frac{V_{actual} \cdot \Delta t}{12 \cdot Q_{nominal}}$$

t_{actual} = actual cleaning speed
Δt = cleaning speed for oil volume of 180 l / 47.5 gal
V_{actual} = volume of oil to be cleaned
$Q_{nominal}$ = nominal volume flow, see selection chart

Determining the cleaning time



› Determine the initial cleanliness class and enter it on the graph, e.g. 19/17/14 according to ISO 4406:1999

› Enter the target cleanliness class on the graph, e.g. 16/14/11 according to ISO 4406:1999

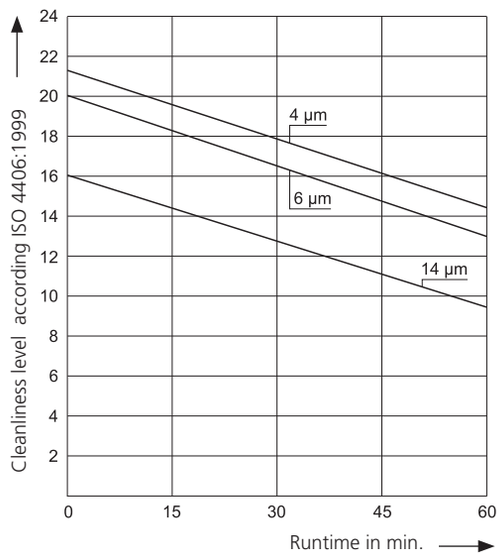
› Determine Δt, in this case Δt = 25 min

› Insert the value in the formula, where V_{actual} = 350 l / 92.5 gal and $Q_{nominal}$ = 16 l/min / 4.2 gpm

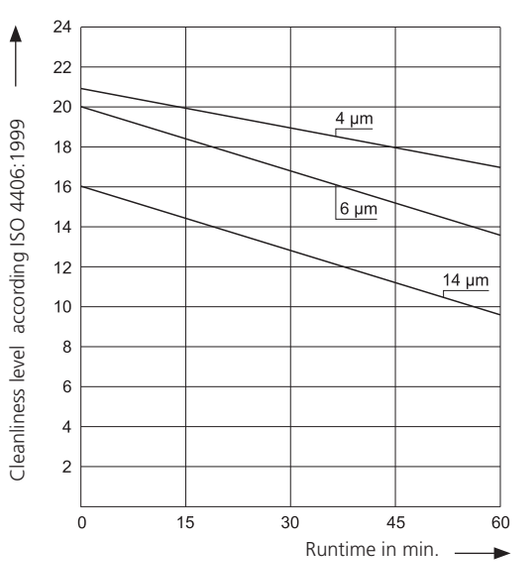
$$t_{actual} = \frac{V_{actual} \cdot \Delta t}{12 \cdot Q_{nominal}} = \frac{350 \cdot 25}{12 \cdot 16} \approx \mathbf{46\ min}$$

Curves for the cleaning time as a function of the fineness

D1: FA2 016 with 3 and 5 µm EXAPOR®MAX filter element



D2: FA2 016 with10 µm EXAPOR®MAX filter element



Trolley for easy transportation

- Compatible with all versions of FA2 016 and FAPC2 016.
- Order code. **FA-T**

FA-T trolley

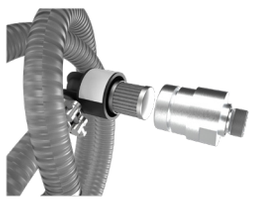
FA-T trolley attached to the filter unit

Suction strainer for direct installation in the filter housing

- Used in case when standard strainer mounted at the end of the suction hose cannot be used
- When ordered separately: use code **FA-SH/18/025 (**strainer + hose DN25 length 1,8 m + lance Ø 25 mm, length 0,25m)
- When ordered together with the FA2 / FAPC2 unit: put **H** in the Ordering code, table Suction Strainer.

FA-SH/18/025 suction strainer set

Strainer set mounted in the filter housing



Suction strainer set - exploded view

Suction-return set

- For easy connection of the suction and return hose to the tank, provided that there is a connection for a ventilating filter (e.g. LE.0716 or LE.0817… 0827) at the tank cover. For more information see data sheet no. 80.920.
- Order code **FNA 008.1700**

FNA 008.1700 suction return adapter

FNA 008.1700 - example of installation

FA1HV 008 / 016

Easy filling and cleaning · Compact design · Comfortable handling

Oil Service Unit FA1HV

Description

FA1HV – quick, simple and compact

With the Oil Service Unit FA1HV, hydraulic and lubricating systems can be easily filled or cleaned.

Extended viscosity range

The unit is designed to operate with a wide viscosity range. This allows, for example, the filtration of transmission fluids and high viscosity oils even at low temperatures.

Protection of components through ultra-fine filtration

The high separation efficiency of EXAPOR®MAX ultra-fine filter elements guarantees excellent cleanliness levels and therefore highest protection of components. An excellent dirt holding capacity allows economic operation of the system.

Characteristics

Nominal flow rate

FA1HV 008: 8 l/min / 2.11 gpm
FA1HV 016: 16 l/min / 4.23 gpm

Viscosity range (continuous operation)

FA1HV 008 15 up to 2400 mm²/s / 70 up to 11100 SUS
FA1HV 016 15 up to 1200 mm²/s / 70 up to 5560 SUS

Operating pressure

Max. 5 bar / 73 psi

Hydraulic fluids

Mineral oils and biodegradable fluids (HEES and HETG).
Other fluids on request.

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

Maximum suction height

1.5 m / 4.9 ft

Filter clogging indicator

Optical, differential pressure switch DG 042-01

Operating position

Vertical, motor at the bottom

Weight

approx. 20 kg / 44.1 lbs

Compact design

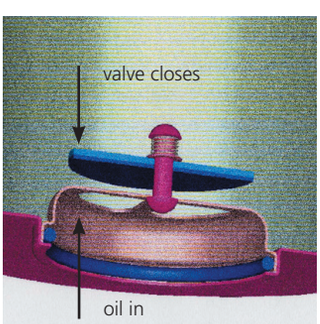
The compact design allows easy access to the oil tank.
The FA1HV comes ready to connect, with hose packages.

Mobile transport aid / trolley

For easy transport of the filter unit FA1HV 016, it is possible to hook a transport trolley onto the standing device. This allows effortless transport even over long distances. The transport trolley must be ordered separately - see accessories section.

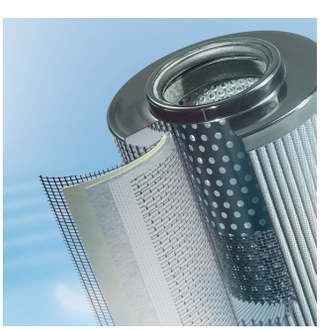
User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.



Maintenance-free filter housing due to a clever filter element technique

Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing with the element.



Quality in detail

The EXAPOR®MAX fine element is the heart of the FA1HV. High cleanliness levels protect the hydraulic system against contamination during the oil filling process.

Ordering code

FA1HV ____ ____ / ____ ____ ____ ____

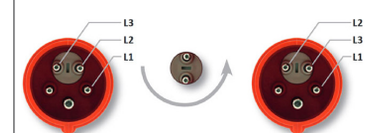
Type of unit	Code
Oil service unit for wide viscosity ranges	FA1HV

Nominal flow rate*	Code
8 l/min / 2.11 gpm	008
16 l/min / 4.23 gpm	016

Filter element					Code
	Fineness (β=200) Dirt-holding capacity according to ISO 16889 / water capacity			Code of spare filter element	
		FA1HV 008	FA1HV 016		
EXAPOR®MAX 2	3 µm	490 g	280 g	V7.1220-113	V003
EXAPOR®MAX 2	5 µm	460 g	270 g	V7.1220-13	V005
EXAPOR®MAX 3	10 µm	340 g	190 g	V7.1220-06	V010
EXAPOR®AQUA	7 µm	145 g / 320 ml	85 g / 190 ml	Y7.1220-05	Y007
EXAPOR®AQUA	3 µm	165 g / 340 ml	105 g / 205 ml	Y7.1220-113	Y003

Electric motor* (other motor on request)				Code
Phase(s), voltage	Frequency	Power FNA1HV 008 / 016	Electric plug	
1~230 VAC	50/60 Hz	0.37 / 0.55 kW	1	23050
3~400/460 VAC	50/60 Hz	0.37 / 0.55 kW	2	40050

Electric plug - code and description below *
Other types - on request

No code Default for code 23050	**G**	**J**	**No code** Default for code 11050	**I6**	**I4**	**No code** Default for code 40050
220-250 VAC 15 A TYPE E/F (CEE7/7 Unischuko)	**220-250 VAC** 13 A TYPE G (BS 1363)	**220-240 VAC** 10 A TYPE J (T12**)**	**100-127 VAC** 15 A TYPE B (NEMA 5-15P)	**200-250 VAC INDUSTRIAL** Type 013-6 16A-6h 3-pins (2P+PE)	**110-130 VAC INDUSTRIAL** Type 013-4 16A-4h 3-pins (2P+PE)	**380-480 VAC INDUSTRIAL** Type 715-6 16A-6h 5-pins (3P+N+PE), IEC 60309 With phase crossover
						

Optional pressure hose extension **	
Customized length of the pressure hose (maximum 5 m / 16.4 ft) Example of order **P4.5** - pressure hose length 4.5 m / 14.8 ft	Px.x

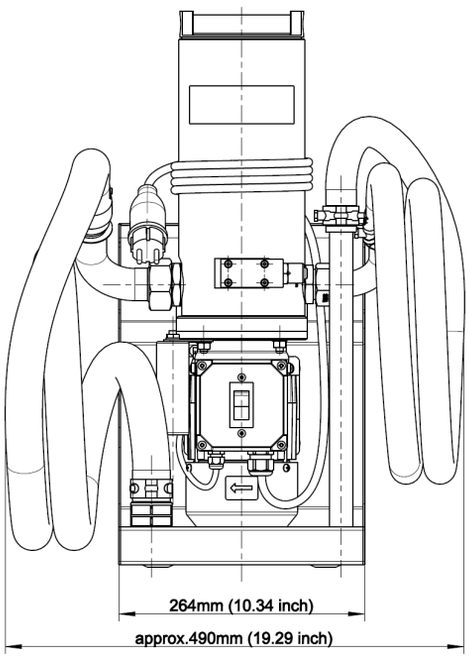
Optional electric cable extension ***	
Customized length of the electric cable Example of order **C8.5** - electric cable length 8.5 m / 27.8 ft equipped with electric plug	Cx.x

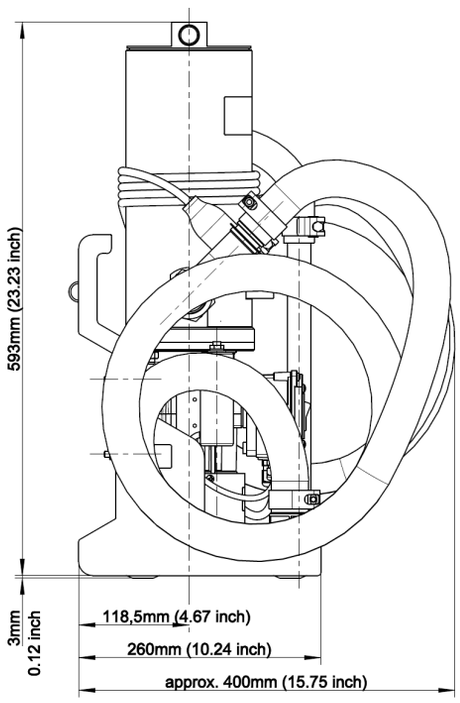
***** Indications at 50 Hz. At 60 Hz the value increases by approx. 20%

****** As standard, the unit is equipped with the following hoses
Suction hose: DN 32, length 1.5 m / 4.9 ft with suction strainer 600 µm (installed at the free end of the hose)
Pressure hose: DN 25, length 2.0 m / 6.6 ft with aluminum lance length 25 cm / 9.8 inch (installed at the free end of the hose)

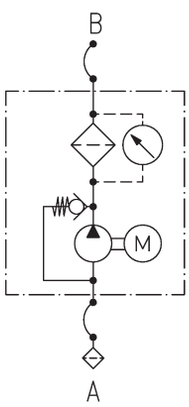
******* As standard, the unit is equipped with an electric cable, length 2.5 m / 8.2 ft.

Dimensions





Hydraulic symbol



Accessories

Trolley for easy transportation, order code: **FA-T**

FA-T trolley

FA-T trolley attached to the filter unit

UM2 045

Oil service - simple, quick and compact ·

UM2 045 - front

UM2 045 - back

- **Nominal flow 45 l/min / 11.9 gpm**
- **Easy filling, cleaning and pumping over**
- **Unbeatable ergonomics, comfortable handling**
- **High filtration efficiency**
- **Huge dirt holding capacity up to 4 kg**
- **Switching valve for bypassing the filter**
- **Optionally with variable flow range**

Description

Oil service units

Easy, compact and ergonomic

With the oil service unit UM2 045 hydraulic or lubrication systems can simply be filled, cleaned or fluid can be transferred without using the filter function. The compact size and ergonomic design allows for easy handling in minimal work spaces. The UM2 045 comes ready to connect, equipped with hoses. For easy transport, the electrical cables, as well as the suction and return hose, are fixed with support fixtures onto the trolley.

Protection of components through ultra-fine filtration

The EXAPOR®MAX ultra-fine element is the heart of the UM2 oil service unit. A huge separation efficiency (up to 4 kg) guarantees excellent cleanliness levels and thereby maximum protection of components. The high dirt holding capacity of the EXAPOR®MAX elements makes the UM2 045 units an economical choice for our customers.

Flexible and universal

Optionally, the unit can be equipped with frequency inverter and potentiometer for adjusting the flow rate in the range of 20 - 70 l/min / 5.3 -18.5 gpm. This additional feature makes the UM2 unit even more universal and extends its use to smaller and larger systems. The flow rate can be adapted to the actual need depending on the tank size and / or required speed of the filtration / oil transfer.

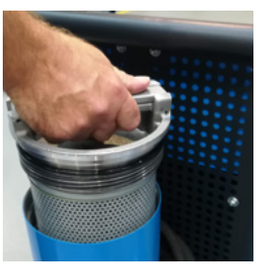
Switching Valve for changing operating modes

Each versions of UM2 unit is delivered with switching valve.
The selector valve installed in the pump block is used to switch between two basic modes of operation: "filtering" (e.g. when cleaning the hydraulic system) and "pumping over without filtering" (e.g. when removing waste fluid from the machine).

Extremely efficient and capacious filter element

The high separation efficiency of the EXAPOR®MAX filter elements guarantees maximum protection of the components. The large DIRT HOLDING CAPACITY (up to 4 kg) makes the UM2 unrivaled in its class of devices. Apart from the EXAPOR®MAX technology, the customer can use the following:

- EXAPOR®SPARK PROTECT elements for hydraulic oils with low electrical conductivity (< 500 pS/m at 20 °C)
- EXAPOR®AQUA elements for filtration combined with dewatering



Maintenance-free filter housing

The filter element can be removed from the housing together with the cover without any extra tools. Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the element.

Unbeatable ergonomics

Superior technology and excellent design are of no use if the operator can only move the service equipment with great physical effort. Therefore, ergonomics were of primary importance when designing the UM2 units.
Owing to its optimized weight distribution, the UM2 can be tilted from the standing position with minimum effort. In the tilted position, the UM2 can be moved walking upright, removing strain from the back.

Leakage-free transport

Transporting the UM2 in horizontal position, e.g. in the cargo area of a service vehicle, is facilitated by the wheels and the curved design of the frame. The drip tray prevents oil leakage during both vertical and horizontal transport.

Characteristics

Flow rate

UM2 045F: 45 l/min / 11.9 gpm

UM2 045A: 20 up to 70 l/min / 5.3 up to 18.5 gpm

Operating pressure

max. 7 bar / 101 psi

Viscosity range

UM2 045F -fixed flow 45 l/min / 11.9 gpm:

15 - 600 mm²/s - unit with motor 230 or 400 VAC
15 - 450 mm²/s - unit with motor 110-120 VAC

UM2 045A - adjustable flow rate:

15 - 1100 mm²/s - at flow 20 l/min / 5.3 gpm
15 - 600 mm²/s - at flow 45 l/min / 11.9 gpm
15 - 400 mm²/s - at flow 70 l/min / 18.5 gpm

Temperature range of fluids

0 °C ... +75 °C / +32 °F ... +149 °F

Ambient temperature range

0 °C ... +50 °C / +32 °F ... +122 °F

Applicable filter elements

- EXAPOR®MAX - for solid particles
- EXAPOR®SPARK PROTECT - for solid particles and protection against electrostatic discharges (oils with low electrical conductivity < 500 pS/m at 20 °C)
- EXAPOR®AQUA - for free water and solid particles

Dirt holding capacity

The dirt holding capacity depends on the flow rate. The table below shows the dirt holding capacity values according to ISO16889 for different filter elements and various flow ranges.

Filter element	Fineness (β=200) Dirt-holding capacity according to ISO 16889		Water capacity	Flow rate
EXAPOR® MAX2 V7.1560-103	3 µm	4000g	-	20 l/min
		1950g	-	45 l/min
		1360g	-	70 l/min
EXAPOR® MAX2 V7.1560-03	5 µm	4000	-	20 l/min
		1980 g	-	45 l/min
		1400g	-	70 l/min
EXAPOR® MAX3 V7.1560-06	10 µm	4000g	-	20 l/min
		1980 g	-	45 l/min
		1440g	-	70 l/min
EXAPOR® Spark Protect Z7.1560-103	3 µm	4000g	-	20 l/min
		1950g	-	45 l/min
		1360g	-	70 l/min
EXAPOR® AQUA Y7.1560-05	7 µm	1190 g	1520 ml	20 l/min
		590 g	1520 ml	45 l/min
		420 g	1520 ml	70 l/min

Clogging indicator

optical clogging indication DG 042-04

(all types) Δp = 3.5 ±0.5 bar

Hydraulic connections

- Suction side:
  Hose DN 32, length 2.7 m / 8.9 ft with suction lance 0,4 m
- Suction strainer:
  Screen element 280 µm, ordering code **S9.0417-13**
- Pressure side*:
  Hose DN 25, length 2.7 m / 8.9 ft with pressure lance 0,4 m

Permitted suction heights

max. 2 m (unfilled)
max. 6 m (in operating condition)

Hydraulic fluids

Mineral oil and biodegradable fluids
(HEES and HETG, see info service sheet 00.20).
Other fluids on request.

Weight

approx. 76.5 kg / 169 lbs

Operating and transport position

Operating position: upright
Transport position: upright or horizontal

Electrical motor types (see also order code)

UM2 045F:

3 ~ 400/460 V 50/60 Hz, 1.1 kW / 1.5 hp
1 ~ 220-240 VAC 50/60 Hz, 1.1 kW / 1.5 hp
1 ~110 -120 VAC 50/60 Hz, 0.75 kW / 1hp

UM2 045A:

3 ~ 400/460 V / 50/60 Hz, 1.1 kW / 1,5hp

Electrical connection**

Cable length 6 m / 19.7 ft with the electric plug.

To select the required electric plug see order code.

Accessories (ordered separately)

* Pressure hose extension (max. 5 m) - see order code
** Electric cable extension - see order code

Long suction lance DN32x1000 mm, order code LA 32X1000
Long pressure lance DN25x1000 mm, order code LA 25X1000
Other lances on request.

UM2 045 - /

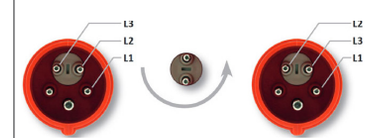
Type of unit	Code
Oil service unit with integrated particle monitor	UM2 045

Nominal flow	Hydraulic symbol	Code
Fixed nominal flow 45 l/min / 11.9 gpm	1	F
Adjustable flow range 20-70 l/min / 5.3-18.5 gpm	2	A

Filter element					Code
	Fineness (β=200) Dirt-holding capacity according to ISO 16889 and nominal flow 45 l/min / 11.9 gpm		Water capacity	Spare filter element	
EXAPOR®MAX 2	3 µm	1950 g	-	V7.1560-103	V003
EXAPOR®MAX 2	5 µm	1980 g	-	V7.1560-03	V005
EXAPOR®MAX 2	10 µm	1980 g	-	V7.1560-06	V010
EXAPOR®SPARK PROTECT	3 µm	1950 g	-	Z7.1560-103	Z003
EXAPOR®AQUA	7 µm	590 g	1520 ml	Y7.1560-05	Y007

Power supply voltage	Code
1 ~ 220 - 240 VAC 50/60Hz	23050
3 ~ 400 - 460 VAC 50/60Hz	40050
1 ~ 110 - 120 VAC 50/60Hz	11050

Electric plug - code and description below *
Other types - on request

No code Default for code 23050	**G**	**J**	**No code** Default for code 11050	**I6**	**I4**	**No code** Default for code 40050
220-250 VAC 15 A TYPE E/F (CEE7/7 Unischuko)	**220-250 VAC** 13 A TYPE G (BS 1363)	**220-240 VAC** 10 A TYPE J (T12)	**100-127 VAC** 15 A TYPE B (NEMA 5-15P)	**200-250 VAC INDUSTRIAL** Type 013-6 16A-6h 3-pins (2P+PE)	**110-130 VAC INDUSTRIAL** Type 013-4 16A-4h 3-pins (2P+PE)	**380-480 VAC INDUSTRIAL** Type 715-6 16A-6h 5-pins (3P+N+PE), IEC 60309 With phase crossover
						

Optional pressure hose extension (maximum 5 m / 16.4 ft)	
Example of order: **P4.5** - pressure hose length 4.5 m / 14.8 ft	P_._

**Optional electric cable extension ** **	
Example of order: **C8.5** - cable length 8.5 m / 27.8 ft	C_._

Order example:

UM2 045F-V010/40050

Service unit UM2 with fixed flow 45 l/min / 11.9 gpm, filter element 10 µm, input voltage 3~400 VAC and electric plug type 715-6

How to calculate cleaning time for unit without Particle Monitor?

The cleaning speed depends on the efficiency of the filter elements ($\beta_{x\,(c)}$), the nominal volume flow ($Q_{nominal}$) and the oil volume (V_{actual}).

In graph D1-D2, the cleaning time is shown in relation to the filter fineness (indication of cleanliness classes according to ISO 4406:1999). The values are recorded by laboratory methods and may be influenced by environmental conditions (e.g. compared to the laboratory test dust ISO MTD considerably deviating particle constellations, continuous additional introduction of dirt on running systems, high water content, etc.).
All characteristic curves (see graphs D1-D2) relate to a **reference oil volume of 180 l / 47.5 gal** and a **nominal volume flow of 15 l/min / 4 gpm.**

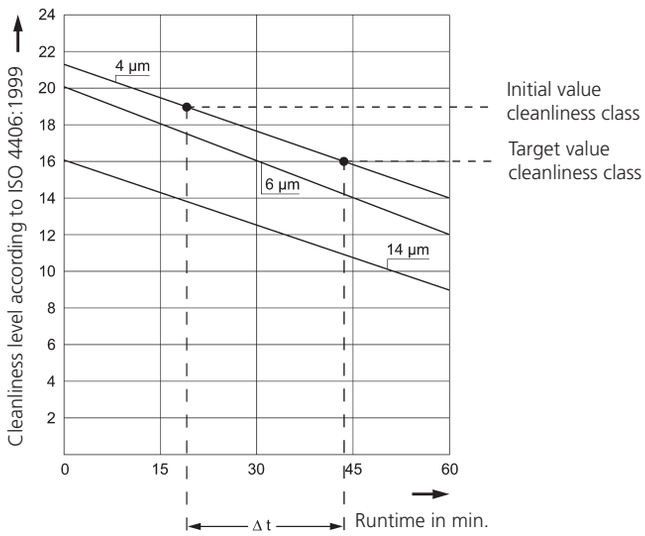
The following formula should be used to convert to the actual oil volume:

$$t_{actual} = \frac{V_{actual} \cdot \Delta t}{12 \cdot Q_{nominal}}$$

t_{actual} = actual cleaning speed
Δt = cleaning speed for oil volume of 180 l / 47.5 gal
V_{actual} = volume of oil to be cleaned
$Q_{nominal}$ = nominal volume flow, see Selection Chart

For monitoring purposes, we recommend the OPCom from ARGO-HYTOS, integrated in the version FAPC 016 or the OPCount Particle Counter.

Determining the cleaning time

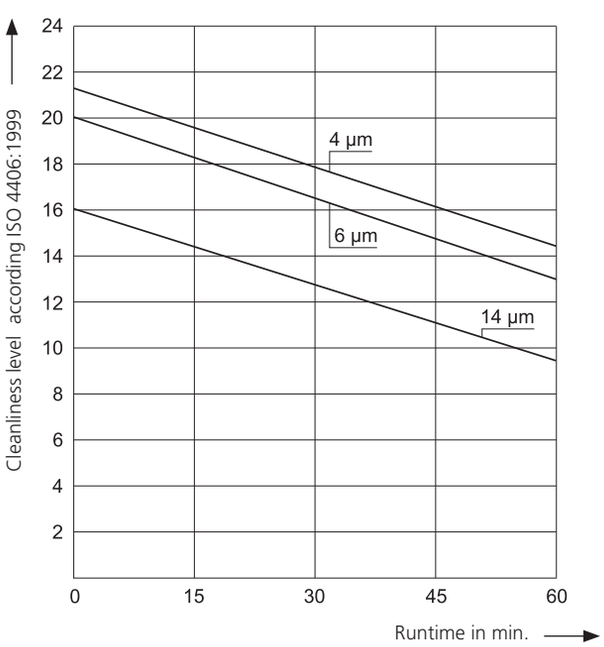


- Determine the initial cleanliness class and enter it on the graph, e. g. 19/17/14 according to ISO 4406:1999
- Enter the target cleanliness class on the graph, e.g. 16/14/11 according to ISO 4406:1999
- Determine Δt, in this case Δt = 25 min
- Insert the value in the formula, where V_{actual} = 350 l / 92.5 gal and $Q_{nominal}$ = 45 l/min / 11.9 gpm

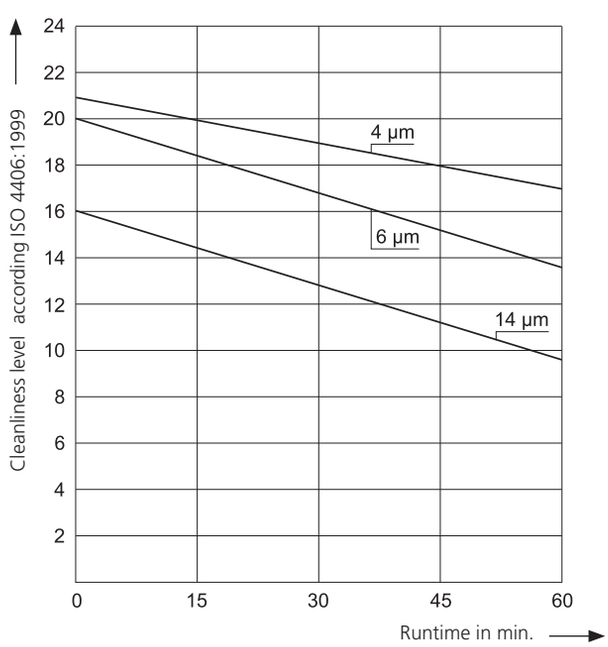
$$t_{actual} = \frac{V_{actual} \cdot \Delta t}{12 \cdot Q_{nominal}} = \frac{350 \cdot 25}{12 \cdot 45} \approx 16 \text{ min}$$

Curves for the cleaning time as a function of the filter fineness

D1 3EN2 and 5EN2 EXAPOR®MAX 2 filter element
Reference oil volume with $Q_{Off\text{-}line\ filter}$ =15 l/min / 4 gpm.

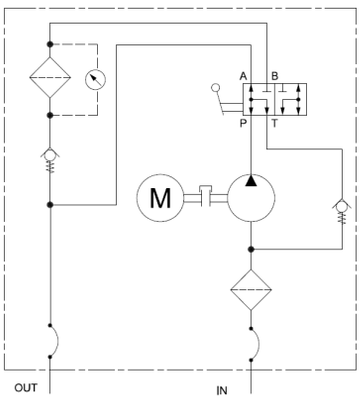


D2 10EX2 EXAPOR®MAX 2 filter element
Reference oil volume with $Q_{Off\text{-}line\ filter}$ =15 l/min / 4 gpm.

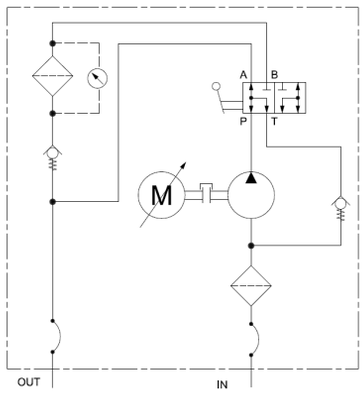


Hydraulic symbol

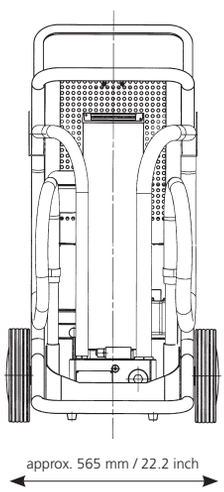
1 (UM2 045F...)

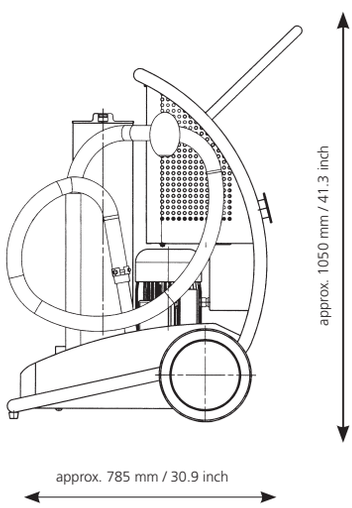


2 (UM2 045A...)



Dimensions





Other types of mobile oil service units

In the portfolio of ARGO-HYTOS you can find, other types of mobile filtration systems:

UMPCL2 045

Mobile service unit with integrated particle monitor

For more details, see data sheet on
www.argo-hytos.com or click here

UMPC2 045

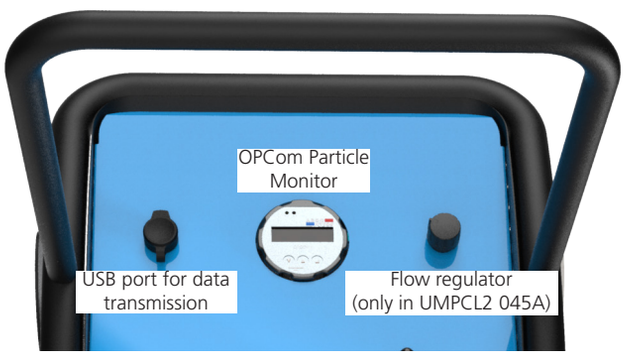
Mobile service unit with integrated particle monitor, oil condition sensor touch display and printer

For more details, see data sheet on
www.argo-hytos.com or click here

UMPCL2 045

With integrated particle monitor · Optionally with adjustable flow range 20 - 70 l/min / 5.3 - 18.5 gpm

UMPCL2 045



Front panel of the UMPCL2 045

Switching valve 1

Switching valve 2

Description

The UMPCL2 045 is an oil service unit designed for filling and cleaning of hydraulic or lubrication systems and for transferring of fluids.
Its compact size and ergonomic design allow easy handling in minimal work spaces.

Protection of systems through ultra-fine filtration

The EXAPOR®MAX ultra-fine filter element is the heart of the UMPCL2. A high separation efficiency and a large dirt-holding capacity of the filter elements (up to 4000 g) make the UMPCL2 an economical choice for our customers.

Monitored filtration

The unit is equipped with the OPCom Particle Monitor which permanently measures fluid cleanliness class during the cleaning or filling process.
The data stored in the internal memory can be transmitted to a computer via USB port installed in the front panel.

Flexible and universal device

Optionally, the unit can be equipped with frequency inverter and potentiometer for adjusting the flow rate in the range of 20 - 70 l/min / 5.3 -18.5 gpm. This additional feature makes the UMPCL2 even more universal device and extends its use to smaller and larger systems. The flow rate can be adapted to the actual need depending on the tank size and / or required speed of the filtration / oil transfer.
Operation of the unit at a smaller flow allows you to extend the life of the filter element by increasing its capacity even up to 4000g

Switching valve 1 for changing operating modes

Installed in the pump block - to switch between two modes: “filtering“ and “pumping without filtering“.

Switching valve 2 for selecting the sampling point

Installed in the front panel - for cleanliness measurement: “behind filter” (e.g. when filling systems) or “before filter” (e.g. for tank cleaning).

Flow rate
UMPCL2 045F: 45 l/min / 11.9 gpm
UMPCL2 045A: 20 up to 70 l/min / 5.3 up to 18.5 gpm

Operating pressure
max. 7 bar / 101 psi

Viscosity range*
15 - 1100 mm²/s - continuous operation, flow 20 l/min / 5.3 gpm
15 - 600 mm²/s - continuous operation, flow 45 l/min / 11.9 gpm
15 - 400 mm²/s - continuous operation, flow 70 l/min / 18.5 gpm

* An exact measurement of the oil cleanliness class is only possible within a viscosity range from 15 mm²/s to 300 mm²/s / 70 SUS to 1160 SUS

Temperature range of fluids
0 °C ... +65 °C / +32 °F ... +149 °F
(also see table Viscosity Range)

Ambient temperature range
0 °C ... +50 °C / +32 °F ... +122 °F

Applicable filter elements
› EXAPOR®MAX - for solid particles
› EXAPOR®SPARK PROTECT - for solid particles and protection against electrostatic discharges (oils with low electrical conductivity < 500 pS/m at 20 °C)
› EXAPOR®AQUA - for free water and solid particles

Dirt holding capacity
The dirt holding capacity depends on the flow rate. The table below shows the dirt holding capacity values according to ISO16889 for different filter elements and various flow ranges.

Filter element	Fineness (β=200)	Dirt-holding capacity according to ISO 16889	Water capacity	Flow rate
EXAPOR® MAX2 V7.1560-103	3 µm	4000g	-	20 l/min
		1950g	-	45 l/min
		1360g	-	70 l/min
EXAPOR® MAX2 V7.1560-03	5 µm	4000	-	20 l/min
		1980 g	-	45 l/min
		1400g	-	70 l/min
EXAPOR® MAX3 V7.1560-06	10 µm	4000g	-	20 l/min
		1980 g	-	45 l/min
		1440g	-	70 l/min
EXAPOR® Spark Protect Z7.1560-103	3 µm	4000g	-	20 l/min
		1950g	-	45 l/min
		1360g	-	70 l/min
EXAPOR® AQUA Y7.1560-05	7 µm	1190 g	1520 ml	20 l/min
		590 g	1520 ml	45 l/min
		420 g	1520 ml	70 l/min

Clogging indicator
optical clogging indication DG 042-04
(all types) Δp = 3,5 ±0,5 bar

Hydraulic connection
Suction side:
Hose DN 32, length 2.7 m / 8.9 ft with suction lance 0.4 m

Suction strainer:
Screen element 280 µm, ordering code S9.0417-13

Pressure side**
Hose DN 25, length 2.7 m / 8.9 ft with pressure lance 0.4 m

Permitted suction heights
max. 2 m (unfilled)
max. 6 m (in operating condition)

Hydraulic fluids
Mineral oil and biodegradable fluids
(HEES and HETG, see info service sheet 00.20).
Other fluids on request.

Weight
approx. 85 kg / 187.4 lbs

Operating and transport position
Operating position: upright
Transport position: upright or horizontal

Electrical motor types (see also order code)
UMPCL2 045F:
3 ~ 400 / 460 V 50/60 Hz, 1.1 kW / 1.5hp
1 ~ 220 - 240VAC 50/60 Hz, 1.1 kW / 1.5hp
1 ~ 110 -120VAC 50/60 Hz, 0,75 kW / 1hp
UMPCL2 045A:
3 ~ 400/460 V 50/60 Hz, 1.1 kW / 1.5hp

Electrical connection***
Cable length 6 m / 19.7 ft with the electric plug.
To select the required electric plug see order code.

Accessories

** Pressure hose extension (max. 5 m) - see order code
*** Electric cable extension - see order code

Long suction lance DN32x1000mm, order code LA 32X1000
Long pressure lance DN25x1000mm, order code LA 25X1000
Other lances on request.

Ordering code

UMPCL2 045 - /

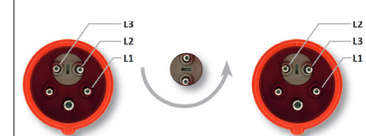
Type of unit	Code
Oil service unit with integrated particle monitor	UMPCL2 045

Nominal flow	Hydr. symbol	Code
Fixed nominal flow 45 l/min / 11.9 gpm	1	F
Adjustable flow range 20-70 l/min / 5.3-18.5 gpm	2	A

Filter element	Fineness (β=200) Dirt-holding capacity according to ISO 16889 and nominal flow 45 l/min / 11.9 gpm		Water capacity	Spare filter element	Code
EXAPOR®MAX 2	3 µm	1950 g	-	V7.1560-103	V003
EXAPOR®MAX 2	5 µm	1980 g	-	V7.1560-03	V005
EXAPOR®MAX 2	10 µm	1980 g	-	V7.1560-06	V010
EXAPOR®SPARK PROTECT	3 µm	1950 g	-	Z7.1560-103	Z003
EXAPOR®AQUA	7 µm	590 g	1520 ml	Y7.1560-05	Y007

Power supply voltage	Code
1~220-240 VAC 50/60Hz	23050
3~400-460 VAC 50/60Hz	40050
1~110-120 VAC 50/60Hz	11050

Electric plug - code and description below *
Other types - on request

No code Default for code 23050	**G**	**J**	**No code** Default for code 11050	**I6**	**I4**	**No code** Default for code 40050
220-250 VAC 15 A TYPE E/F (CEE7/7 Unischuko)	**220-250 VAC** 13 A TYPE G (BS 1363)	**220-240 VAC** 10 A TYPE J (T12)	**100-127 VAC** 15 A TYPE B (NEMA 5-15P)	**200-250 VAC INDUSTRIAL** Type 013-6 16A-6h 3-pins (2P+PE)	**110-130 VAC INDUSTRIAL** Type 013-4 16A-4h 3-pins (2P+PE)	**380-480 VAC INDUSTRIAL** Type 715-6 16A-6h 5-pins (3P+N+PE), IEC 60309 With phase crossover
						

Optional pressure hose extension (maximum 5 m / 16.4 ft)	
Example of order: **P4.5** - pressure hose length 4.5 m / 14.8 ft	P_._

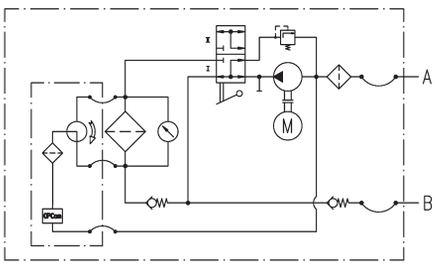
**Optional electric cable extension ** **	
Example of order: **C8.5** - cable length 8.5 m / 27.8 ft	C_._

Order example:

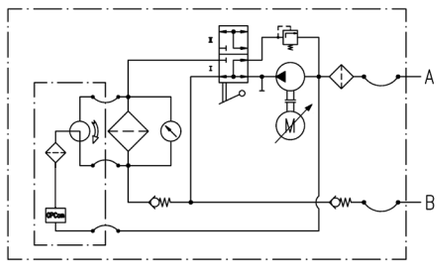
UMPCL2 045A-V003/23050C9.5 - oil service unit with integrated particle monitor, version with adjustable flow range 20 - 70 l/min / 5.3 - 18.5 gpm filter element 3 µm, input voltage 1~230 VAC and customized length of electric cable 9.5 m / 31 ft

Hydraulic symbol

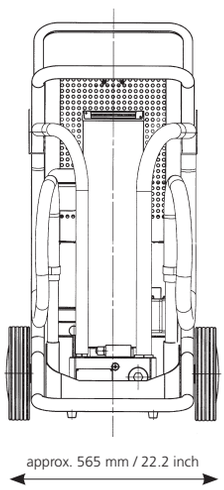
1: (UMPCL2 045F...)

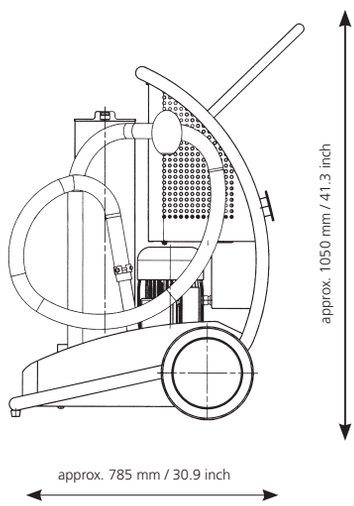


2: (UMCL2 045A...)



Dimensions





Other types of mobile oil service units

In the portfolio of ARGO-HYTOS you can find, other types of mobile filtration systems:

UM2 045

Basic mobile service unit

For more details, see data sheet on
www.argo-hytos.com or click this **Link**

UMPC2 045

Mobile service unit with integrated particle monitor, oil condition sensor touch display and printer

For more details, see data sheet on
www.argo-hytos.com or click this **Link**

UMPC2 045

Mobile device for the filtration of hydraulic and lubrication fluids

UMPC2 Oil Service Unit

Key features

- **Variable flow range 20 - 70 l/min / 5.3 - 18.5 gpm**
- **Intuitively operated touch panel**
- **Unbeatable ergonomics, comfortable handling**
- **High filtration efficiency**
- **Large dirt holding capacity (up to 4 kg)**
- **With integrated particle monitor and humidity sensor**
- **Dosing function**
- **Automatic switch-off function**
- **Built-in printer**

Description

The UMPC2 045 sets new trends in the field of Fluid Management. Unbeatable ergonomic and multifunctionality make this device an excellent filtration tool.
The mobile oil service unit UMPC2 045 can be used for:

- filling the machine with filtered oil
- disposal of used oil from machines
- off-line filtration in hydraulic or lubrication systems
- oil transfer

The EXAPOR®MAX ultra-fine filter element is the heart of the UMPC2 045. The flow direction from the inside to the outside and the innovative star-shaped pleating of the filter material guarantee excellent oil cleanliness and provide increased machine availability, longer maintenance intervals and lower operating costs.

During the filtration process, the oil condition is constantly monitored. Integrated sensors measure fluid parameters like contamination with solid particles, humidity and temperature. When the target cleanliness class is reached, the unit can be switched off automatically. The data from the sensors are stored in individual measurement profiles.

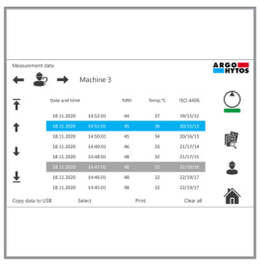
Intuitively operated touch panel

What does Fluid Management mean? Click on the button below and see the possibilities of our UMPC2 unit!

YouTube

Self-explanatory

The operating touch panel is clearly and simply designed. All settings and indications can be realized intuitively. Additional functions as for example DOSING, AUTO SWITCH-OFF, AUTO-FLOW enrich the UMPC2 unit, making it a multifunctional and extremely flexible device.



Convenient data management

The measuring data are stored in the internal memory of the UMPC2.
By assigning the results to individual PROFILES, it is possible to manage only selected data (e.g. selected customers or machines) conveniently and transparently.

Quick reporting

Selected results can be easily and quickly converted into reports that can be immediately printed or stored in a separate memory thanks to the built-in printer (optional accessory).

Data transfer

Data can be easily copied to a USB stick at any time. The XML format allows for their easy processing in external devices.

Extremely efficient and capacious filter element

The high separation efficiency of the EXAPOR®MAX filter elements guarantees maximum protection of the components. The large DIRT HOLDING CAPACITY (up to 4 kg) makes the UMPC2 unrivaled in its class of devices. Apart from the EXAPOR®MAX technology, the customer can use the following:

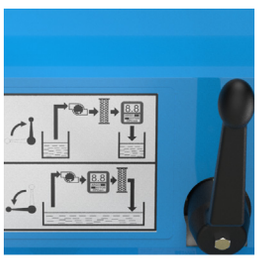
- EXAPOR®SPARK PROTECT elements for hydraulic oils with low electrical conductivity (< 500 pS/m at 20 °C)
- EXAPOR®AQUA elements for filtration combined with dewatering

Maintenance-free filter housing

The filter element can be removed from the housing together with the cover without any extra tools. Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the element.

Switching Valve 1 for changing operating modes

The selector valve installed in the pump block is used to switch between two basic modes of operation: “filtering” (e.g. when cleaning the hydraulic system) and “pumping over without filtering” (e.g. when removing waste fluid from the machine).



Switching Valve 2 for selecting the sampling point

The selector valve installed in the front panel is used for switching between two measurement modes: “behind filter” (e.g. when filling systems) or “before filter” (e.g. for monitoring the oil cleanliness inside a filtered system).

Unbeatable ergonomics

Superior technology and excellent design are of no use if the operator can only move the service equipment with great physical effort. Therefore, ergonomics were of primary importance when designing the UMPC2 units.
Owing to its optimized weight distribution, the UMPC2 can be tilted from the standing position with minimum effort. In the tilted position, the UMPC2 can be moved walking upright, removing strain from the back.

Leakage-free transport

Transporting the UMPC2 in horizontal position, e.g. in the cargo area of a service vehicle, is facilitated by the wheels and the curved design of the frame. The drip tray prevents oil leakage during both vertical and horizontal transport.

Variable flow rate
20 up to 70 l/min / 5.3 up to 18.5 gpm

Operating pressure
max. 7 bar / 101 psi

Viscosity range*
15 - 1100 mm²/s - continuous operation, flow 20 l/min / 5.3 gpm
15 - 600 mm²/s - continuous operation, flow 45 l/min / 11.9 gpm
15 - 400 mm²/s - continuous operation, flow 70 l/min / 18.5 gpm

* An exact measurement of the oil cleanliness class is only possible within a viscosity range from 15 mm²/s to 300 mm²/s / 70 SUS to 1160 SUS

Temperature range of fluids
0 °C ... +65 °C / +32 °F ... +149 °F

Ambient temperature range
0 °C ... +50 °C / +32 °F ... +122 °F

Applicable filter elements
› EXAPOR®MAX - for separation of solid particles
› EXAPOR®SPARK PROTECT - for separation of solid particles and protection against electrostatic discharges (oils with low electrical conductivity < 500 pS/m at 20 °C)
› EXAPOR®AQUA - for separation of free water and solid particles

Dirt holding capacity
The dirt holding capacity depends on the flow rate. The table below shows the dirt holding capacity values according to ISO16889 for different filter elements and various flow ranges.

Filter element	Fineness (β=200) Dirt-holding capacity according to ISO 16889		Water capacity	Flow rate
EXAPOR® MAX2 V7.1560-103	3 µm	4000g	-	20 l/min
		1950g	-	45 l/min
		1360g	-	70 l/min
EXAPOR® MAX2 V7.1560-03	5 µm	4000	-	20 l/min
		1980 g	-	45 l/min
		1400g	-	70 l/min
EXAPOR® MAX3 V7.1560-06	10 µm	4000g	-	20 l/min
		1980 g	-	45 l/min
		1440g	-	70 l/min
EXAPOR® Spark Protect Z7.1560-103	3 µm	4000g	-	20 l/min
		1950g	-	45 l/min
		1360g	-	70 l/min
EXAPOR® AQUA Y7.1560-05	7 µm	1190 g	1520 ml	20 l/min
		590 g	1520 ml	45 l/min
		420 g	1520 ml	70 l/min

Clogging indicator
Electrical clogging indicator with additional optical indication in the form of:
› transparent socket with 2 built-in LEDs
› additional icon in the main screen which changes the color from green into red when the filter element is contaminated

Hydraulic connection
› Suction side:
Hose DN 32, length 2.7 m / 8.9 ft with suction lance 0.4 m
› Suction strainer:
Screen element 280 µm, ordering code **S9.0417-13**
› Pressure side**:
Hose DN 25, length 2.7 m / 8.9 ft with pressure lance 0.4 m

Permitted suction heights
max. 2 m (unfilled)
max. 6 m (in operating condition)

Compatible fluids
Mineral oil and biodegradable fluids
(HEES and HETG, see info service sheet 00.20).
Other fluids on request.

Weight
approx. 95 kg / 209 lbs

Operating and transport position
Operating position: upright
Transport position: upright or horizontal

Electrical motor
3 ~ 400/460 V / 50/60 Hz, 1.1kW, protection type: IP 54

Electrical connection***
Cable length 6 m / 19.7 ft with the electric plug.
To select required electric plug see order code.

Accessories
** Pressure hose extension (max. 5 m) - on request
*** Electric cable extension - on request

Long suction lance DN32x1000mm, order code LA 32X1000
Long pressure lance DN25x1000mm, order code LA 25X1000
Other lances on request.

Ordering Code

UMPC2 045 A - / P

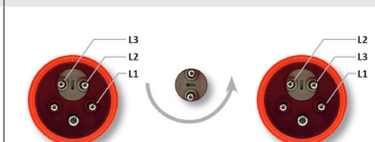
Type of unit	Code
Oil service unit with integrated particle monitor	UMPC2 045

Nominal flow	Code
Adjustable flow range 20-70 l/min / 5.3-18.5 gpm	A

Filter element	Fineness (β=200) Dirt-holding capacity according to ISO 16889 and nominal flow 45 l/min / 11.9 gpm		Water capacity	Spare filter element	Code
EXAPOR®MAX 2	3 µm	1950 g	-	V7.1560-103	V003
EXAPOR®MAX 2	5 µm	1980 g	-	V7.1560-03	V005
EXAPOR®MAX 2	10 µm	1980 g	-	V7.1560-06	V010
EXAPOR®SPARK PROTECT	3 µm	1950 g	-	Z7.1560-103	Z003
EXAPOR®AQUA	7 µm	590 g	1520 ml	Y7.1560-05	Y007

Input voltage		Code
Connection	**Motor power**	
1~220-240 VAC	1.1 kW	23050
3~400-460 VAC	1.1 kW	40050
1~110-120 VAC	1.1 kW	11050

Electric plug - code and description below *
Other types - on request

No code Default for code 23050	**G**	**J**	**No code** Default for code 11050	**I6**	**I4**	**No code** Default for code 40050
220-250 VAC 15 A TYPE E/F (CEE7/7 Unischuko)	**220-250 VAC** 13 A TYPE G (BS 1363)	**220-240 VAC** 10 A TYPE J (T12)	**100-127 VAC** 15 A TYPE B (NEMA 5-15P)	**200-250 VAC INDUSTRIAL** Type 013-6 16A-6h 3-pins (2P+PE)	**110-130 VAC INDUSTRIAL** Type 013-4 16A-4h 3-pins (2P+PE)	**380-480 VAC INDUSTRIAL** Type 715-6 16A-6h 5-pins (3P+N+PE), IEC 60309 With phase crossover
						

Built-in printer	P

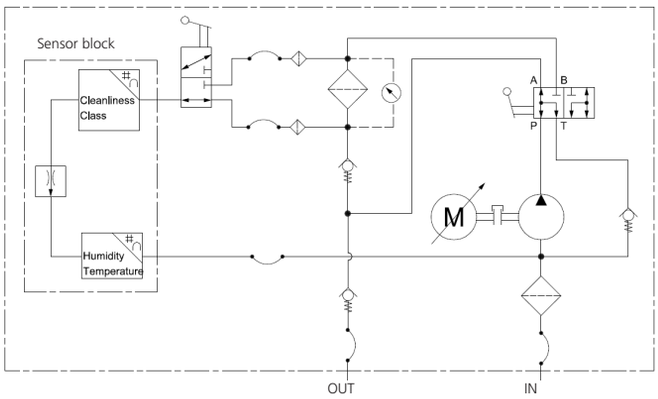
Customization	Code
No	
Yes Put letter C in the ordering code and describe requested individual changes for example other color, customer logo, length of hoses, electric cable etc.	C/

Order example:

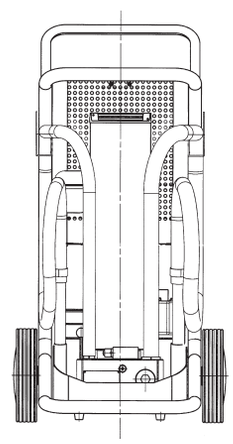
UMPC2 045A-V010/40050PC/electric cable 9.5 m / 31 ft

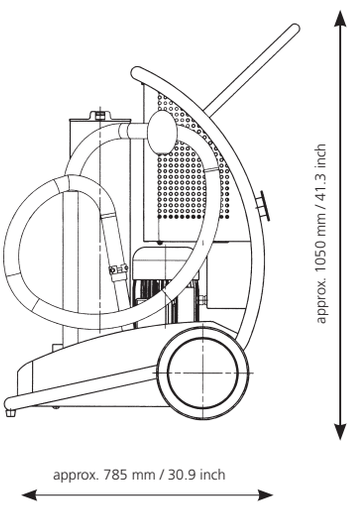
Oil service unit UMPC2 with adjustable flow range 20 - 70 l/min / 5.3 - 18.5 gpm, filter element 10 µm, input voltage 3~400 VAC, integrated printer and customized length of electric cable 9.5 m / 31 ft

Hydraulic symbol



Dimensions





Other types of mobile oil service units

In the portfolio of ARGO-HYTOS you can find, among others, other types of mobile filtration systems:

UM2 045

Basic mobile service unit

For more details, see data sheet on **www.argo-hytos.com** or click this **Link**

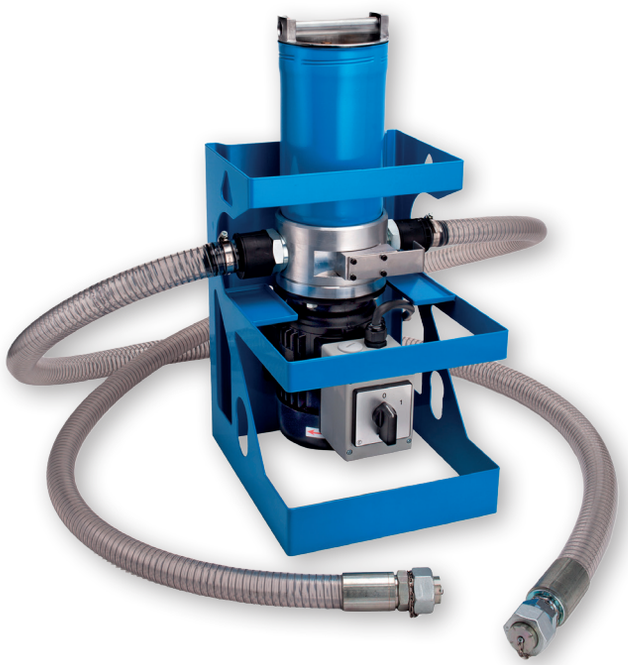
UMPCL2 045

Mobile service unit with integrated particle monitor

For more details, see data sheet on **www.argo-hytos.com** or click this **Link**

FA 003-2341

Easy filling and cleaning · Nominal flow rate up to 3 l/min / 0.8 gpm · Viscosity up to 5.000 mm²/s / 23,000 SUS



Oil Service Unit FA 003-2341

Description

FA 003-2341

The FA 003-2341 Oil Service Unit allows easy filling and cleaning of hydraulic and lubricating systems.

Suitable for up to 5000 mm²/s / 23,000 SUS

The unit is designed to operate with viscosities between 15 and 5,000 mm²/s / 70 and 23,000 SUS. This allows, for example, transmission fluids to be cleaned or filtered while filling, even at low temperatures.

Hydraulic connection

Suction hose DN 32 mm x 1.5 m / 4.9 ft length CEL28 (connection M36 x 2, external thread with sealing cone 24°)
Pressure hose DN 25 mm x 1.5 m / 4.9 ft length CEL28 (connection M36 x 2, external thread with sealing cone 24°)
Suction and pressure hoses can be removed or mounted on quickly with special ARGO-HYTOS fast locking couplings.

Hydraulic fluids

Mineral oil and biodegradable fluids
(HEES and HETG, see info sheet 00.20).
Other fluids on request.

Technical data	
Nominal flow rate	3 l/min / 0.8 gpm
Filter fineness	$\beta_{5(c)}$ = 200*
Dirt-holding capacity	460 g*
Electric drive	3 ~ 400 V, 50 Hz; 0.25 kW
Weight	approx. 22 kg / 48.5 lbs
Temperature range of fluids / viscosity range	0 °C ... +60 °C +32 °F ... +140 °F
Continuous operation min.	15 mm²/s / 70 SUS
Continuous operation max.	5,000 mm²/s / 23,000 SUS
Ambient temperature range	0 °C ... +50 °C +32 °F ... +122 °F
Operating pressure	Maximum 6 bar / 87 psi
Clogging indicator	optical

*according to ISO 16889 at 8 l/min and Δp 3 bar / 2.1 gpm and Δp 43.5 psi

Order No.

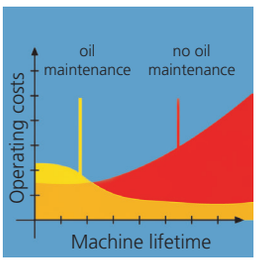
FA 003-2341

Replacement filter element Order No.

V7.1220-13

Compact and ready to connect

The FA 003-2341 comes ready to connect, with hose packages and filter element.

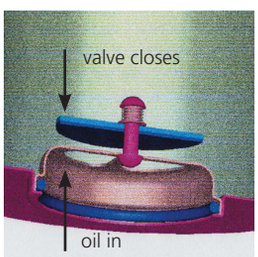


Economical

The FA 003-2341 oil service unit offers protection that can extend the lifetime of machinery.
This protection gives a direct return on investment through extended service intervals and increased machine availability.

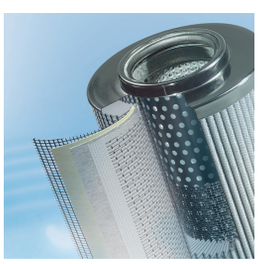
User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.



Maintenance-free filter housing thanks to a unique filter element technique

Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the element.



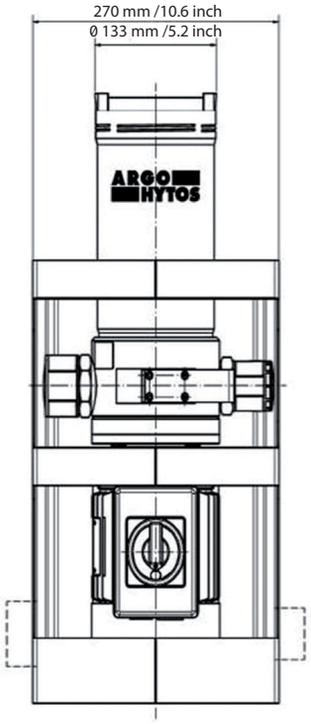
Quality in detail

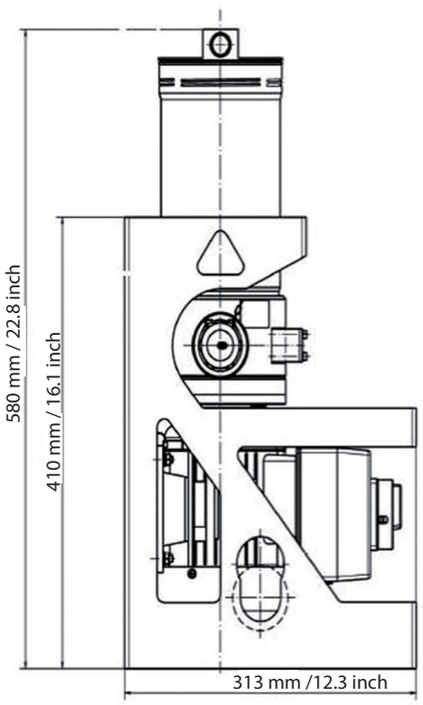
The EXAPOR®MAX 2 ultra-fine element is the heart of the FA 003.
High cleanliness levels protect the system from contamination when filling with oil.

For high oil viscosity

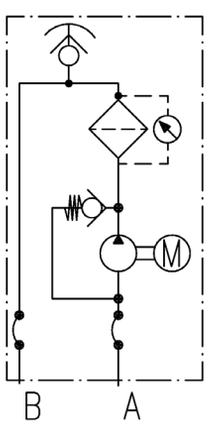
Specifically designed for high viscosity fluids, the FA 003 is highly suited for cleaning and filling oil in gear applications, even at low temperatures- for example: transmission fluid in azimuth gears of wind turbines.

Dimensions





Hydraulic symbol



FA 016-1160

Easy filling and cleaning · Nominal flow rate up to 16 l/min / 4.2 gpm · Operating pressure up to 30 bar / 435 psi

Oil Service Unit FA 016-1160

Description

FA 016-1160

With the oil service unit FA 016-1160, hydraulic or lubricating systems can be easily filled or cleaned.

Suitable for up to 30 bar / 435 psi

The unit is designed to operate up to 30 bar / 435 psi filling or system pressure. This allows e.g. filling and filtering of transmission fluids over valve blocks.

Dirt-holding capacity

The dirt-holding capacity values in grams from the ISO MTD test dust are in accordance with the ISO 16889 requirements.

Hydraulic fluids

Mineral oil and biodegradable fluids
(HEES and HETG, see info sheet 00.20).
Other fluids on request.

Technical data	
Nominal flow rate	16 l/min** / 4.2 gpm**
Filter fineness	$\bar{\beta}_{3(c)} = 200$*
Dirt-holding capacity	280 g*
Electric drive	1 ~ 230 V / 50 Hz; 1.5 kW, n = 3,000 min^{-1}
Weight	approx. 30 kg / 66 lbs
Temperature range of fluids / viscosity range	0 °C ... +60 °C +32 °F ... +140 °F
Continuous operation min.	15 mm^2/s / 70 SUS
Continuous operation max.	400 mm^2/s / 1,860 SUS
Ambient temperature range	0 °C ... +50 °C +32 °F ... +122 °F
Operating pressure	Max. 30 bar / 435 psi
Clogging indicator	Optical differential pressure indicator

* with test dust ISO MTD according to ISO 16889
** Indications at 50 Hz. At 60 Hz, the value increases by approx. 20%.

Order No.

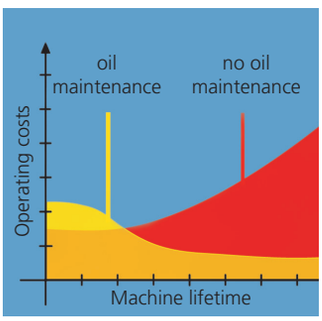
FA 016-1160

Replacement filter element Order No.

V7.1220-163

Compact and ready to connect

The FA 016-1160 comes ready to connect, with hose packages and filter element.

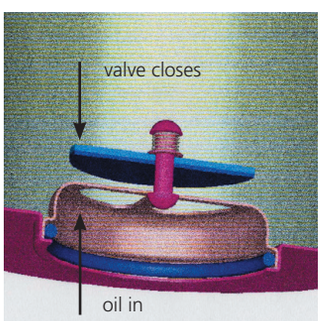


Economical

Das FA 016-1160 oil service unit offers protection that can extend the lifetime of machinery. This protection gives a direct return on investment through extended service intervals and increased machine availability.

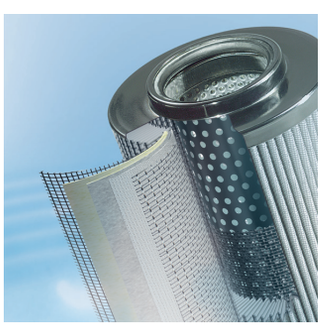
User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.



Maintenance-free filter housing thanks to a unique filter element technique

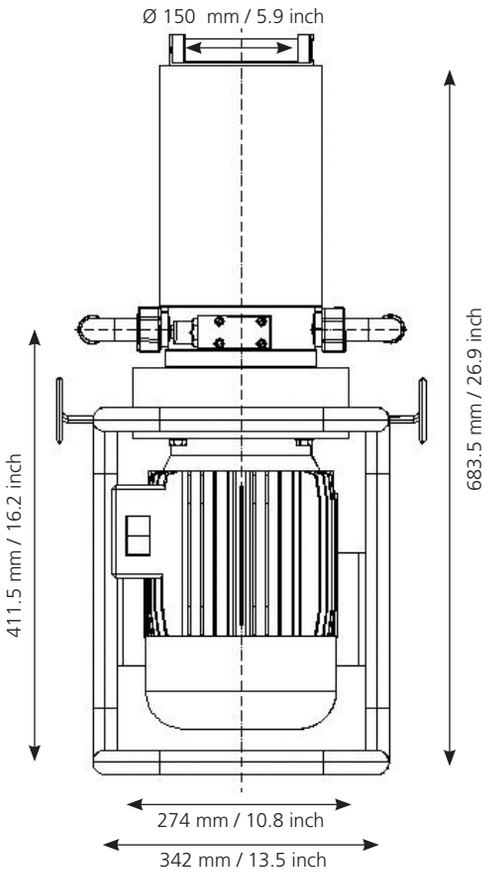
Fluid flows through the element from the inside to the outside. The built-in dirt retention valve closes automatically when the element is removed, ensuring that all dirt is removed from the housing together with the element.



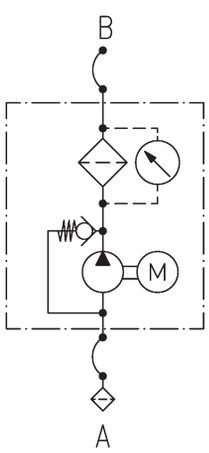
Quality in detail

The EXAPOR®MAX 2 ultra-fine element is the heart of the FA 016-1160.
High cleanliness levels protect the system from contamination when filling with oil.

Dimensions



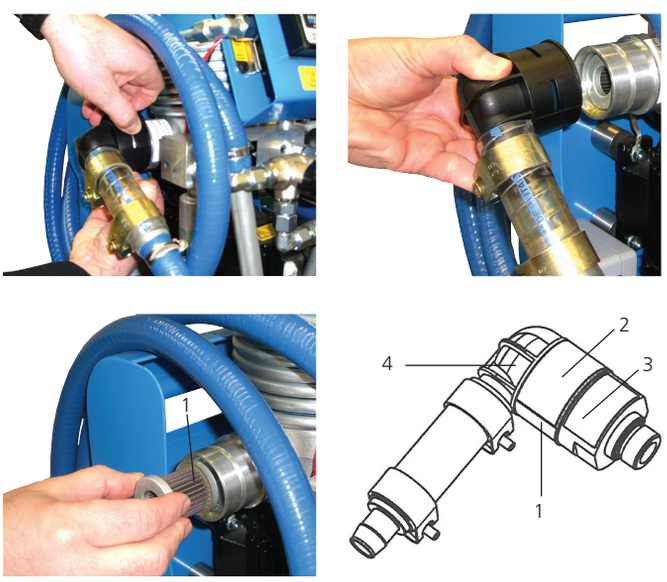
Hydraulic symbol



Suction Strainer Set FA 016.1775

FA 014 · FA 016 · FAPC 016 · FNA 008 · FNA 016

FA 016 with screwed-in suction strainer set FA 016.1775



Suction strainer set FA 016.1775

Description

The suction strainer set FA 016.1775 guarantees pump protection, when the existing suction strainer at the suction pipe of the oil service units FA 014, FA 016 and FAPC 016 cannot be used. This is the case, when the oil service units have to be mounted to the hydraulic unit by quick fitting coupling or ball valve, or the opening of the tank is not sufficiently dimensioned.
The suction strainer set FA 016.1775 also serves as an alternative for the off-line filter units FNA 008 or FNA 016, if they are mounted to hydraulic units afterwards and installation of a suction strainer within the tank is impossible.

The suction strainer set FA 016.1775 consists of a suction strainer element 200 µm (1), a clip (2), a connection part with O-ring (3) and a connection piece (4).

Installation of the suction strainer set

- The suction pipe with suction strainer, mounted to the ARGO-HYTOS oil service unit, has to be removed.
- The suction strainer set FA 016.1775 is directly screwed into the filter housing.
- A suction pipe with DN 25 is connected (can be locked by hose clip).

The suction strainer set FA 016.1775 is designed in a way, so that the DN 25 hose connection can be rotated by 360° and thus be adapted to the position of the pipe inlet.

Caution:

With application of the FA 016.1775 strainer set in the version of FA 016-1160, an additional male end fitting has to be used!

Maintenance

The suction strainer (1) should be checked once a month with oil service units and every 12 months with off-line filter units.

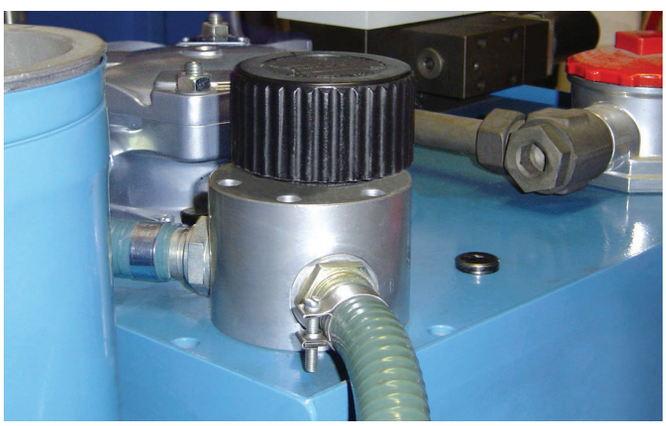
- Remove the clip (2) and pull the connection piece (4) from the housing (3).
- Remove the suction strainer element from the connection piece and clean it with cleaning solvent.
- Replace the suction strainer element (1), if damaged, by a new one S3.0405-02.
- Mount cleaned or new suction strainer element (1) S3.0405-02 onto the housing and secure it with the plastic clip (2).

Order-No.:

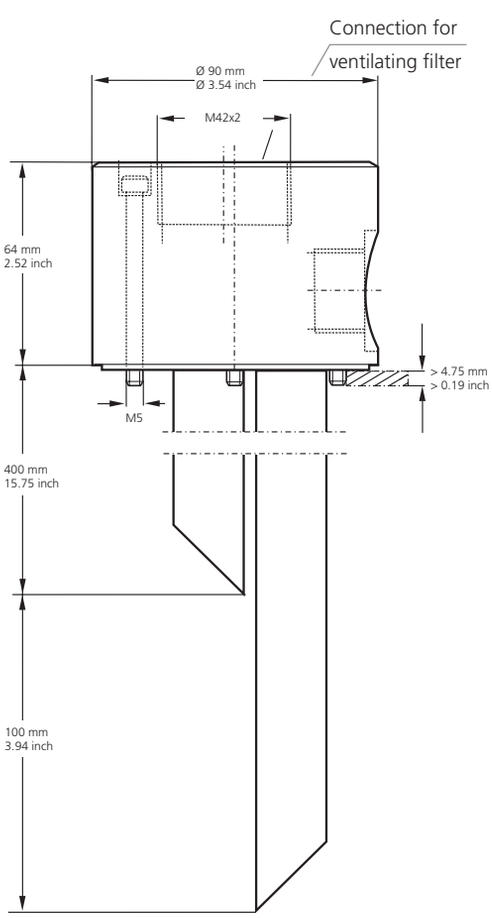
Suction strainer set complete:	FA 016.1775
Suction strainer element filter fineness 200 µm (1):	S3.0405-02

Mounting Set FNA 008.1700

FNA 008 · FNA 016 · (FA 014 · FA 016 · FAPC 016)



Mounting set attached to the tank



Description

Operating mode and mounting

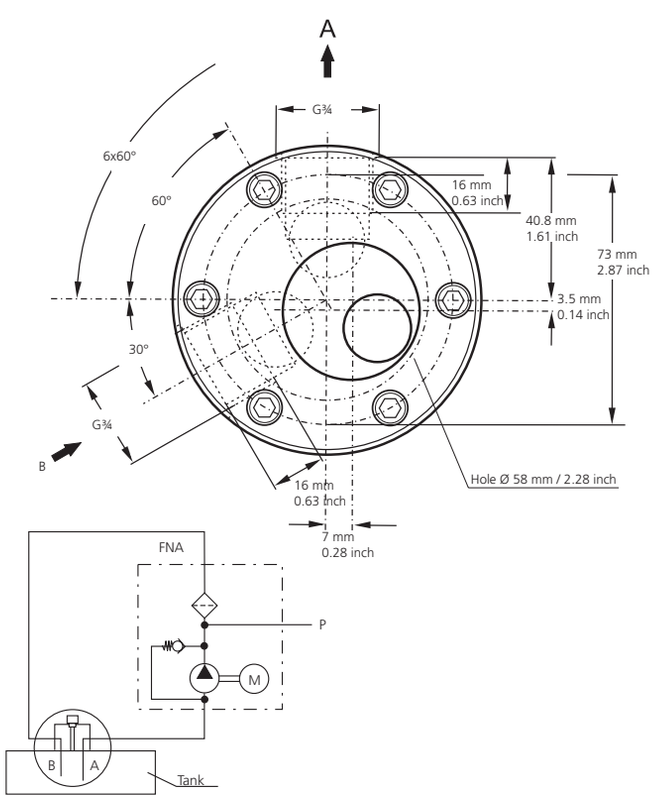
The mounting set FNA 008.1700 allows easy connection of the supply and discharge pipe to the tank of the ARGO-HYTOS off-line filter units, provided that there is a connection for a ventilating filter at the tank according to the displayed connection scheme (e. g. for ARGO-HYTOS filling and ventilating filter LE.0716 and LE.0817… 0827).
The mounting set can also be used as service connection for ARGO-HYTOS oil service units, e. g. if hydraulic systems require regular oil cleaning. For this purpose, the mounting set is additionally equipped with adequate hose nipples so that the ARGO-HYTOS oil service units can be easily and quickly connected (in this case we recommend to use the suction strainer set FA 016.1775 for pump protection).

Installation of the mounting set

- Instead of the filling filter, the mounting set FNA 008.1700 is attached to the tank.
- The off-line filter unit is tubed or piped to the mounting set.
- The ventilating filter is directly screwed onto the mounting set.

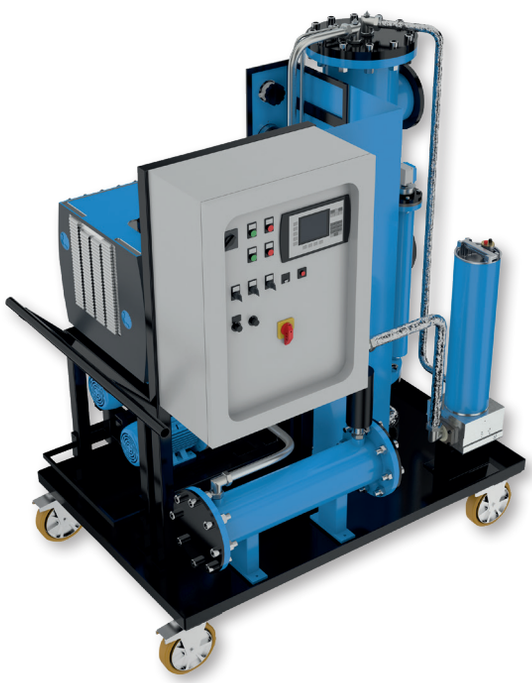
Order No:

Mounting set FNA 008.1700



OPS 010 · OPS 550

Dewatering Unit OPS 010



Dewatering Unit OPS 550

Why OPS?

Due to increased demands placed on hydraulic and lubrication systems with respect to lifetime and availability, the importance of the fluid being used, is constantly growing.

Even the smallest amount of free water in oil can cause acidification and thus lead to corrosion of component surfaces.

An increased water content can dramatically alter the characteristics of the oil. The consequences include: reduced load capacity, lower temperature resistance and, ultimately, rapid oil oxidation (aging), which all results in equipment damage and costly repairs.

Some of the causes of water in hydraulic and lubricating oil are: Ambient moisture, splash water and cooler breakage.
With the new OPS mobile dewatering unit, large quantities of free water can be removed efficiently. The oil is heated, if necessary, and channeled into a vacuum chamber.
The water is removed, long before the saturation limit is reached, thanks to the reduced steam pressure.
A fine filter is installed downstream from the drying process to ensure that the oil is dry and filtered when it flows back into the machine or tank.

The water content is constantly monitored with the ARGO-HYTOS LubCos H_2O water sensor. Thus, the user is always up-to-date.

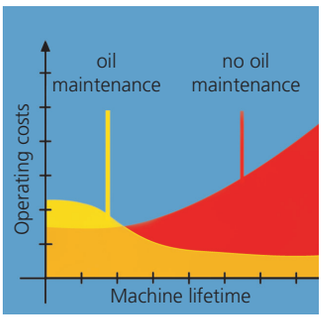
Thanks to the available combinations of the device, the OPS is always perfectly equipped.

Functionality

The unit separates free and dissolved water from hydraulic and lubricating oils. By means of a vacuum pump, low pressure is produced within the reactor and oil is sucked in via the oil inlet. A heater warms up the oil to the adjusted temperature.

Inside the reactor, the water evaporates far below the saturation limit. The steam is cooled down and condensed. The condensed water conglomerates in a collection tray. The dried oil conglomerates within the reactor. Herein, level switches are found for switching on and off the outlet pump. As soon as the filling level has been reached, the outlet pump will operate and deliver the dewatered oil to the oil outlet.

On site, the cooled oil sample can be inspected visually. As long as the cooled oil is clouded, the water content is inadmissible high. If the cooled oil sample appears to be clear, the water content lies within the permitted range. An exact examination of the water content is carried out by an oil sample analysis in the laboratory (e.g. determination of the water using the Karl-Fischer-Method according to DIN 51777).



Economical

The OPS 10 · OPS 550 Dewatering Units offer protection that can extend the lifetime of machinery. This protection gives a direct return on investment through extended service intervals and increased machine availability.

Easy handling

The operating panel is clearly and easily arranged. All operating elements and indications can be realized at a glance.

User-friendly filter element change

The filter element can be removed from the housing together with the cover. The dirt retention valve ensures that solid particle sediment is completely removed with the filter element.

Efficient dewatering

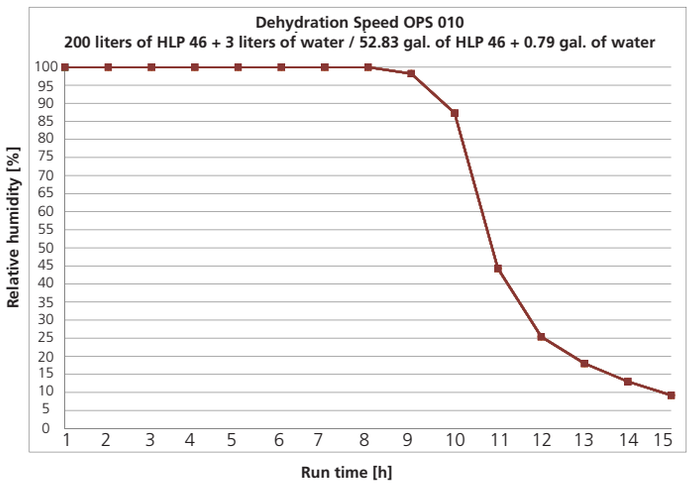
The vacuum chamber and tempering of the oil allow dewatering far below the saturation limit.

Monitored dewatering

With the humidity sensor LubCos H_2O, the relative humidity is monitored during the dewatering process.

Diagrams

OPS 010



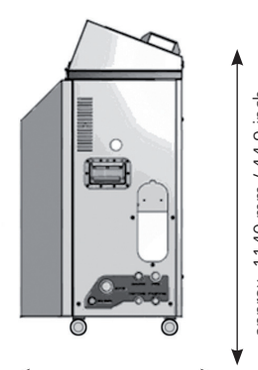
Technical data

	OPS 010
Nominal flow rate	10 l/min / 2.6 gpm
Filter fineness	5 µm
Operating voltage	3 ~ 400 V
Operating frequency	50 / 60 HZ
Nominal current	16 A
Power	max. 7.4 kW
Viscosity min.	10 mm²/s / 46 SUS
Viscosity max.	700 mm²/s / 3244 SUS
Dewatering rate	0.9 l/h* / 0.2 gal/h*
Connection A	¾" BSP
Connection B	1" BSP
Replacement filter element	V7.1230-53
Dirt-holding capacity	220 g
Weight	160 kg / 353 lbs (without accessories)
Dimensions (length x width x height)	600 x 565 x 1200 mm / 23.6 x 22.2 x 47.2 inch

* typical dewatering rate with
200 liters /
52.83 gallons of oil
at > 10,000 ppm water content

Dimensions

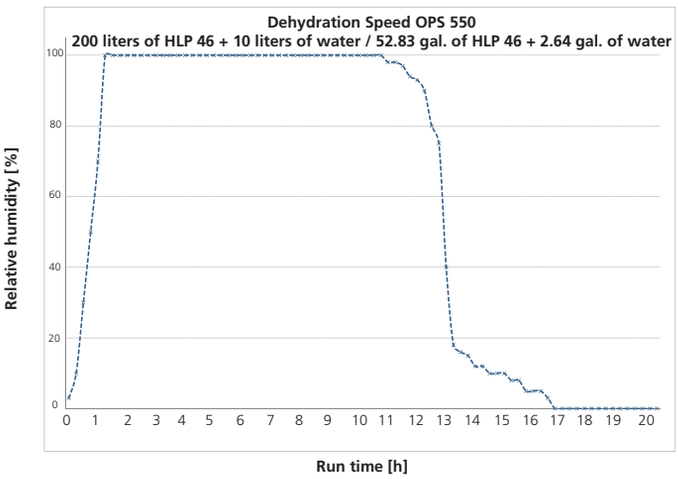
approx. 600 mm / 23.6 inch



approx. 530 mm / 20.9 inch

Diagrams

OPS 550

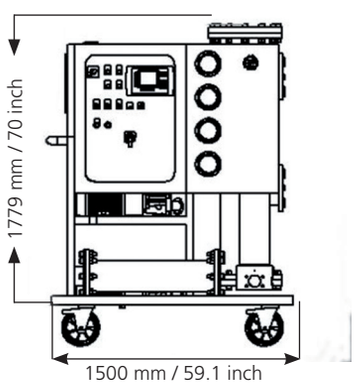


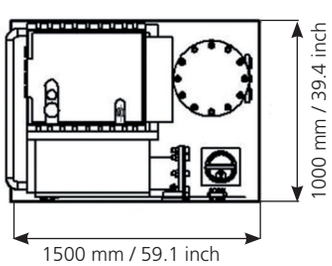
Technical data

	OPS 550
Nominal flow rate	50 l/min / 13.2 gpm
Filter fineness	5 µm
Operating voltage	3 ~ 400 V
Operating frequency	50 / 60 HZ
Nominal current	32 A
Power	max. 13 kW
Viscosity min.	15 mm²/s / 69 SUS
Viscosity max.	500 mm²/s / 2317 SUS
Dewatering rate	1.65 l/h* / 0.4 gal/h*
Connection A	1¼" BSP
Connection B	1" BSP
Replacement filter element	V7.1560-03
Dirt-holding capacity	600 g
Weight	730 kg / 1609 lbs (without accessories)
Dimensions (length x width x height)	1500 x 1000 x 1780 mm / 59.1 x 39.4 x 70.1 inch

* typical dewatering rate with
200 liters /
52.83 gallons of oil
at > 10,000 ppm water content

Dimensions

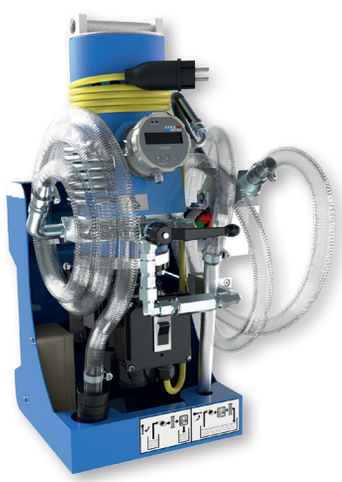




EXAPOR®AQUA

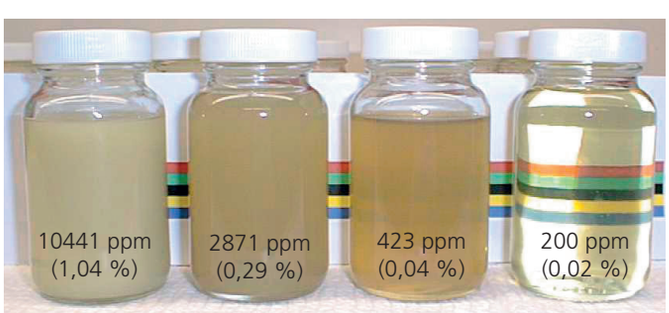
For water separation

EXAPOR®AQUA Filter Elements



Oil Service Unit FAPC 016

Off-line Filter Unit FNA 008/016



Oil samples with varying water content

Description

Application

Quick and efficient dewatering of hydraulic and lubrication oils.

Water in hydraulic and lubrication oils may have the following causes:

- Cooler breakage
- Environment humidity
- Spray-water
- Fresh oil

Already small quantities of free water in oil can lead to acidification. Corrosion of surfaces at components can be the result. Due to free water, the oil characteristics change, e.g. decreased load-carrying capacity, reduced temperature resistance. In order to avoid economic damage, the oil must be protected against free water or existing water must be withdrawn as fast as possible.

Large water quantities can be withdrawn by oil change, flushing of the system or with dewatering units.
At systems with hygroscopic oils (materials that absorb water are described as hygroscopic) or with permanent water entry through seals (e.g. hydraulic excavator used in water constructions), ARGO-HYTOS off-line filters and filter units with EXAPOR®AQUA filter elements can be permanently installed in the system, in order to withdraw water. To withdraw remaining water quantities, e.g. after new filling, the ARGO-HYTOS EXAPOR®AQUA elements in portable off-line filter units also can be used during operation of the system.

EXAPOR®AQUA filter elements are applicable in different ARGO-HYTOS filter units. Depending on the operating situation, the water absorption amounts to approx. 350 ml / element. The combination of water absorbing filter layers with micro-filter material also allows the use of EXAPOR®AQUA in hydraulic and lubrication systems with high requirements to the oil cleanliness.

The efficiency of the EXAPOR®AQUA filter elements can be analyzed on-site. As long as a turbidity is visible in the cooled down oil, the water content is, in most cases, unacceptably high. If the cooled down oil sample appears clear, the water content usually lies in the permissible range. An exact measurement of the water content is made by an oil sample analysis in the laboratory (e.g. water content regulation with the Karl Fischer method in accordance to DIN 51777).

Selection chart

EXAPOR®AQUA Filter element designation	Water capacity per element at ν = 30 mm²/s / 140 SUS		Filter fineness	Dirt-holding capacity (values in g test dust ISO MTD according to ISO 16889)			Applicable in ARGO-HYTOS filter units
	ml	gal			l/min	gpm	
Y7.1560-05	1520	0.40	7 µm	590 g at	45	11.9	FNA 045, UM 045, UMPC 045
Y7.1220-113	340	0.09	3 µm	64 g at	60	15.9	FA 008, FA 016, FAPC 016, FNA 008, FNA 016 (with filter element size V7.1220)
Y7.1220-05	370	0.10	7 µm	44 g at	60	15.9	FA 008, FA 016, FAPC 016, FNA 008, FNA 016 (with filter element size V7.1220)
Y7.1230-153	520	0.14	3 µm	130 g at	60	15.9	FN 060, FNS 060, FNA 040

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International

ARGO-HYTOS worldwide

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China	ARGO-HYTOS Fluid Power Systems	info.cn@argo-hytos.com
Czech Republic	ARGO-HYTOS s.r.o	info.cz@argo-hytos.com
	ARGO-HYTOS Protech s.r.o	info.protech@argo-hytos.com
France	ARGO-HYTOS SAS	info.fr@argo-hytos.com
Germany	ARGO-HYTOS GMBH	info.de@argo-hytos.com
Great Britain	ARGO-HYTOS Ltd.	info.uk@argo-hytos.com
Hong Kong	ARGO-HYTOS Hong Kong Ltd.	info.hk@argo-hytos.com
India	ARGO-HYTOS PVT. LTD.	info.in@argo-hytos.com
Italy	ARGO-HYTOS S.r.l.	info.it@argo-hytos.com
Poland	ARGO-HYTOS Polska spz o.o.	info.pl@argo-hytos.com
Sweden	ARGO-HYTOS Nordic AB	info.se@argo-hytos.com
Turkey	ARGO-HYTOS Hidrolik Ekip. San. ve Tic. Ltd. Şti.	info.tr@argo-hytos.com
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