ARGO HYTOS

Oil Service Units

Cleanline portable

FA 016/FAPC 016

- Easy filling and cleaning
- Compact design, comfortable handling
- High filtration efficiency
- Option: with oil cleanliness monitor
- FAPC 016 with data storage

80.65-4e

Oil service – simple, quick and compact

Cleanline portable – FA 016

With the Cleanline portable, hydraulic or 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. Cleanline portable comes ready to connect with hose packages. The suction hose and the pressure hose can be wound around the hose fixtures. Residual oil from the hoses is collected in the oil pan. The ultra-fine elements can be quickly changed without special auxiliary tools.

Protection of components through ultra-fine filtration
The EXAPOR®MAX 2 ultra-fine elements are the heart of the ARGO-HYTOS filter units Cleanline portable. High separation efficiency guarantees excellent cleanliness levels and thereby highest protection of components. The high dirt holding capacity of the EXAPOR®MAX 2 ultra-fine elements allow economic operation of the Cleanline portable.

Oil service – simple, quick and compact

Cleanline portable with OPCom II – FAPC 016

2 in 1: Cleanline portable with Oil Cleanliness Monitor OPCom II
The Cleanline portable can be equipped with a Oil Cleanliness Monitor. The ARGO-HYTOS OPCom II permanently monitors the current cleanliness class during the cleaning or filling process.

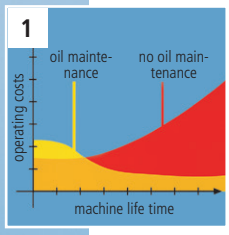
When monitoring the cleanliness classes a ball valve is used to select "behind filter" (e.g. when filling systems) or "before filter" (e.g. when cleaning filled oil). At the display of the OPCom II the ordinal numbers of the particle sizes 4, 6, 14 and 21 µm are shown according to ISO 4406:1999.

FAPC 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 RS232 interface so that the progression can be visualized and followed graphically or in table form.

Easy Transport

For easy transportation for FA 016 and FAPC 016 a trolley can be hooked onto the standing unit. Also, trouble-free transportation is possible for long distances.

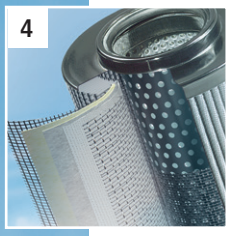
Advantages at a glance



1. Economical
Efficiency through ARGO-HYTOS Fluid Management systems. Fast return on investment by extended service intervals and increased machine availability.

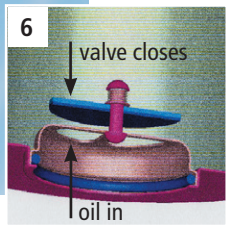
2. Portable in any position
Thanks to the compact design the Cleanline portable can be easily carried and also be used in difficult areas of hydraulic systems. Hoses and electric cables can be fixed at the service unit. The Cleanline portable can be operated and transported in both up-right and horizontal positions.

3. User-friendly filter element change
Optimal operator handling has been a key feature in the development of Cleanline portable. No extra tools are needed to open the housing and the filter element can be pulled out with the cover.



4. Quality in detail
The EXAPOR®MAX 2 ultra-fine element is the heart of the Cleanline portable. High separation efficiency and dirt holding capacities guarantee maximum cleanliness levels and service intervals in line with practical needs.

5. Controlled cleaning by
Oil Cleanliness Monitor OPCom II
The Cleanline portable can also be equipped with the ARGO-HYTOS Oil Cleanliness Monitor OPCom II 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 transferred by the provided RS232-interface.



6. Maintenance-free filter housing thanks to a unique filter element technique
On the bottom of the from inside to outside flown through filter elements there is a dirt retention valve. If the filter element is pulled out of the filter housing with the cover, the dirt retention valve will close. Sedimented dirt is removed from the housing with the filter element.

Characteristics

Hydraulic connection
Hoses:
Suction hose NG 20, length 1,8 m, with suction strainer 300 µm, Ø ca. 49 mm pressure hose NG 20, length 2 m, pressure or supply lance Ø ca. 20 mm (extensions on request)

Electrical connection / Electric motor
Electric motor, air cooled fan type

Cable:	length 2,5 m
Electro motor types:	1~ 110 V / 60 Hz
	1~ 230 V / 50...60 Hz
Protection type:	IP 55

Vessel volume
approx. 2,4 l

Pump design
Internal gear pump

Operating and transportation position
Upright or horizontal

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

Temperature range of fluids
0 °C ... +60 °C

Ambient temperature range
0 °C ... +50 °C

Accessories
Water-absorbing filter elements EXAPOR® AQUA
These can be used for short-term water absorption in all standard units (on request).

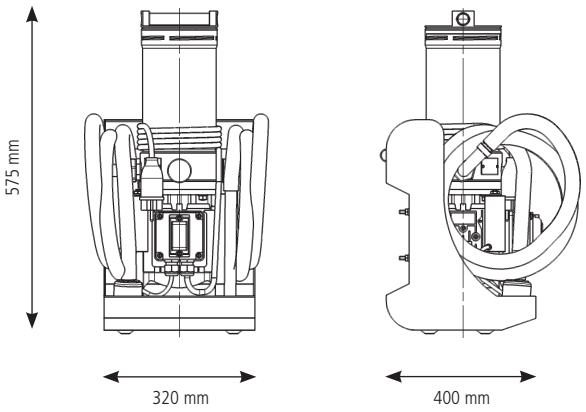
Trolley
Easy transportation for long transport ways.

Viscosity range

Type	Continuous operation min.	Continuous operation max.	Short-term operation max.
FA 016-1100	15 mm²/s	250 mm²/s	400 mm²/s
FA 016-1110	15 mm²/s	200 mm²/s	400 mm²/s
FA 016-1300	15 mm²/s	250 mm²/s	400 mm²/s
FA 016-1600	15 mm²/s	250 mm²/s	400 mm²/s
FAPC 016-2175	15 mm²/s	150 mm²/s	150 mm²/s*

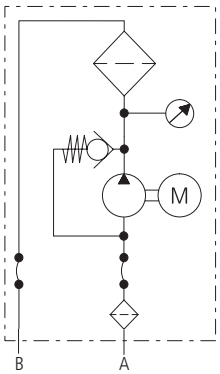
* An exact measurement of the oil cleanliness class is only possible within a viscosity range from 15 mm²/s to 150 mm²/s

Dimensions

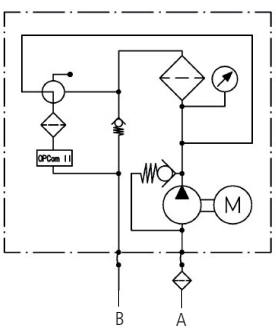


Symbols

Symbol 1



Symbol 2



Cleaning speed

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 (cleanliness information according to ISO 4406:1999). The values are recorded by laboratory methods and they 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** and a **nominal volume flow of 15 l/min**.

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

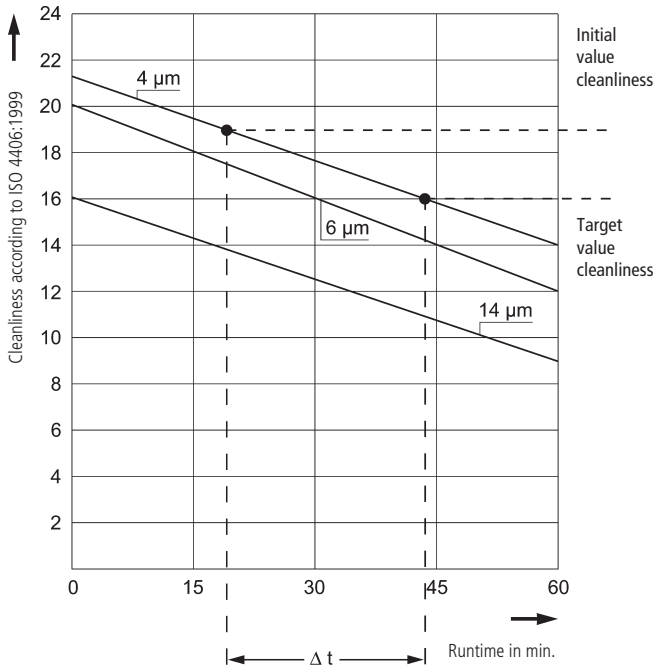
Δt = cleaning speed for oil volume of 180 l

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 PODS ***Pro*** (Portable Oil Diagnostic System) particle counter.

Determining the cleaning time



1. Determine the initial cleanliness class and enter it on the graph, e. g. 19/17/14 according to ISO 4406:1999
2. Enter the target cleanliness class on the graph, e.g. 16/14/11 according to ISO 4406:1999
3. Determine Δt, in this case $\Delta t = 25$ min
4. Insert the value in the formula, where $V_{actual} = 350$ l and $Q_{nominal} = 16$ l/min

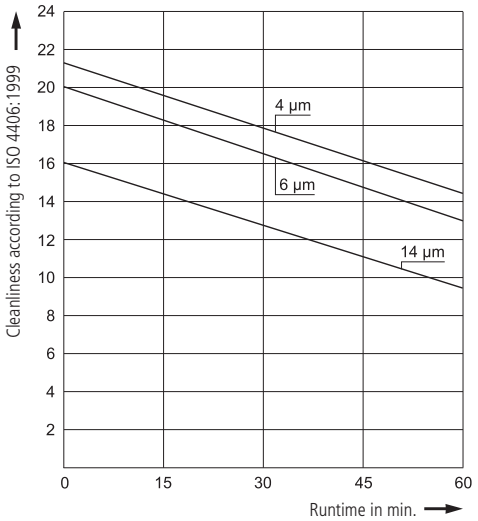
$$t_{actual} = \frac{V_{actual} \cdot \Delta t}{12 \cdot Q_{nominal}}$$

$$= \frac{350 \cdot 25}{12 \cdot 16} \approx 46 \text{ min}$$

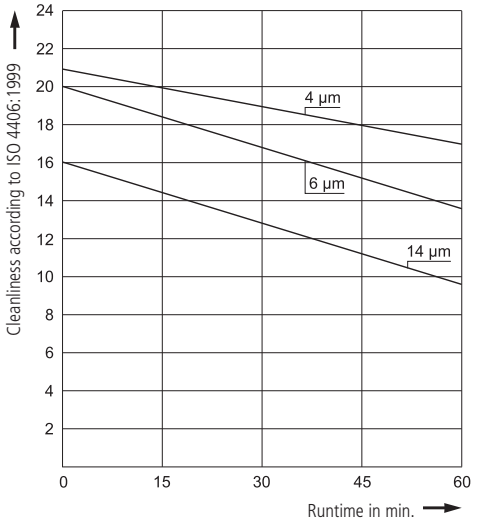
Diagrams

Curves for cleaning time as a function of the filter fineness

D1 FA 016 with 3EN2 and 5EN2 EXAPOR®MAX 2 filter elements

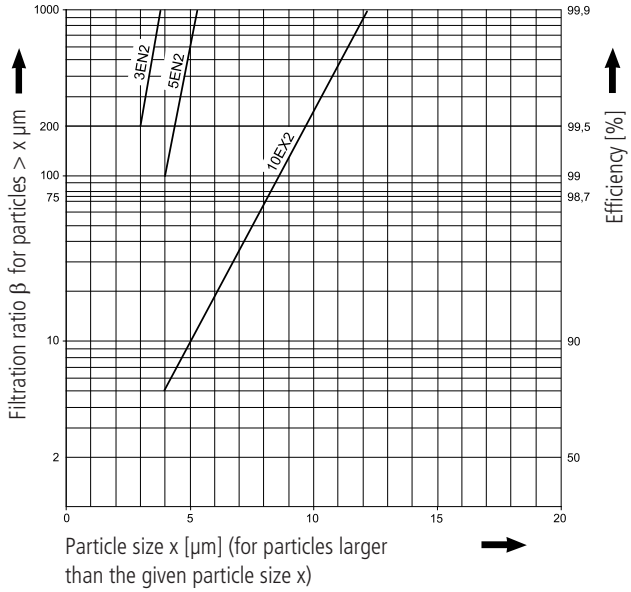


D2 FA 016 with 10EX2 EXAPOR®MAX 2 filter elements



Filter fineness curves in selection chart

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



The abbreviations represent the following β-values resp. finenesses:

For EXAPOR®MAX 2 elements:

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

Selection Chart

	Order no. FA 016-1100	Order no. FA 016-1300	Order no. FA 016-1600	Order no. FA 016-1110	Order no. FAPC 016-2175
Nominal flow rate	16 l/min*	16 l/min*	16 l/min*	19 l/min	16 l/min*
Filter fineness see diagram Dx	3EN2	5EN2	10EX2	3EN2	3EN2
Dirt capacity Mi at Q	280 g	270 g	210 g	280 g	280 g
E-Motor operating voltage	1 ~ 230 V	1 ~ 230 V	1 ~ 230 V	1 ~ 110 V	1 ~ 110 V
E-Motor operating frequency	50/60 Hz	50/60 Hz	50/60 Hz	60 Hz	50/60 Hz
E-Motor power	0,45 kW*	0,45 kW*	0,45 kW*	0,3 kW	0,45 kW*
Length suction hose	1,8 m	1,8 m	1,8 m	1,8 m	1,8 m
Length pressure hose	2 m	2 m	2 m	2 m	2 m
Viscosity max.	400 mm^2/s	400 mm^2/s	400 mm^2/s	400 mm^2/s	150 mm^2/s
Suction height max.	1,5 m	1,5 m	1,5 m	1,5 m	1,5 m
Operating pressure PRV max.	4 bar	4 bar	4 bar	4 bar	4 bar
Symbol	1	1	1	1	2
Replacement element order no.	V7.1220-113	V7.1220-13	V7.1220-06	V7.1220-113	V7.1220-113
Weight	18,9 kg	18,9 kg	18,9 kg	18,9 kg	24 kg
Clogging indicator	Manometer	Manometer	Manometer	Manometer	Manometer
Particle monitor	-	-	-	-	OPCom II

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

Other versions on request.

Filter elements: see selection chart.
Water-absorbing filter elements order no. Y7.1220-05 on request.

Accessories:
- Hose extensions on request.
- For the appropriate clogging indicators see datasheet 60.20.
- Trolley for FA 016 and FAPC 016 order no. FA 016-1760.
- Suction strainer set FA 016.1775 for tank openings on request in case the existing suction strainer can't be used.

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Subject to change
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