

## Dewatering and Filtration Unit FluidAqua Mobil

### FAM 10

#### Description

The FluidAqua Mobil FAM 10 series operates on the principle of vacuum dewatering to eliminate free and dissolved water as well as free and dissolved gases from hydraulic and lubrication fluids.

Since it uses HYDAC offline filter element technology with its high contamination retention capacity and filtration efficiency, the unit is extremely economical.

All units have an AquaSensor AS1000 for continuous monitoring of the water content and for controlling the unit. A particle sensor CS1000 can also be supplied as an option for simultaneous monitoring of solid particle contamination.

To increase the dewatering capacity, for high viscosity fluids or for low fluid temperatures, an integrated heater is provided.

The Siemens S7 series of programmable logic control (PLC) in combination with a Siemens control panel guarantees simple and reliable operation in many languages.

#### Advantages

Extremely low residual water levels, gas levels and particle contamination in the operating fluids make for:

- Longer oil change intervals
- Improved component service life
- Greater machine availability
- Reduction in the LifeCycle Cost (LCC)

#### Technical specifications

Flow rates at 50 Hz	≈ 10 l/min (FAM-10), ≈ 15 l/min (FAM-10/15)
Flow rates at 60 Hz	≈ 12 l/min (FAM-10), ≈ 18 l/min (FAM-10/15)
Permitted fluids**	Fluids compatible with NBR seals: <ul style="list-style-type: none"> <li>● Mineral oils to DIN 51524</li> <li>● Gear oils to DIN 51517, 51524</li> </ul> Fluids compatible with FKM (Viton®) seals: <ul style="list-style-type: none"> <li>● Synthetic esters (HEES) DIN 51524/2</li> <li>● Vegetable oils (HETG, HTG)</li> <li>● HFD-R fluids (not for pure phosphate ester which requires EPDM seals).</li> </ul> Fluids compatible with EPDM seals: <ul style="list-style-type: none"> <li>● Aviation phosphoric acid esters e. g. Skydrol® or Hyjet®</li> </ul>
Viscosity range	15 to 800 mm <sup>2</sup> /s
Sealing material	see model code
Filter size of fine filter	OLF-5
Filter elements of fine filter xxx= Filtration rating	N5DMxxx (please order separately.)
Contamination retention capacity to ISO 4572	200 g
Clogging indicator	VM 2 C.0
Setting pressure of differential pressure clogging indicator	2 bar
Pump type, filtration unit	Vane pump
Pump type, drainage pump	Gear pump
Pump type, vacuum pump	Rotary vane vacuum pump
Operating pressure	max. 4.5 bar
Max. permitted pressure at suction port (without suction hose)	-0.2 to +1 bar
Fluid temperature range**	10 to 80°C
Ambient temperature **	10 to 40°C
Electrical power consumption FAM 10 / 10/15 *	standard: ≈ 1800/2000 W with heater: ≈ 4700/4900 W
External fuse required	16 A or 32 A (see Model code) for circuit breakers with trip characteristics type C
Heating output (optional)	≈ 2900 W only for 3 phase version
Protection class	IP 54
Power cable, length	10 m
Hoses, length	5 m
Material of hoses	see model code
INLET connection	see "FAM Connection summary"
OUTLET connection	see "FAM Connection summary"
Weight when empty	≈ 300 kg
Achievable residual water content	< 100 ppm – hydraulic and lubrication oils < 50 ppm – turbine oils (ISO VG 32/46) < 10 ppm – transformer oils ***

Special models on request.

\* Maximum specifications given, equipment-dependent

\*\* For other fluids, viscosities or temperature ranges, please contact us.

\*\*\* Units not suitable for "Online" and "Onload" operation (transformer in operation and connected to grid).

## Model code

**FAM - 10 - M - 1 - A - 05 - R - H - B - AC1 - 00 - /-V**

### Basic model

FAM = FluidAqua Mobil

### Size and nominal flow rate

10 ≈ 10 l/min (for 50 Hz operation), ≈ 12 l/min (of 60 Hz operation)  
10/15 ≈ 15 l/min (for 50 Hz operation), ≈ 18 l/min (for 60 Hz operation)

### Operating fluid

M = Mineral oil - NBR seals, NBR hoses, tested using mineral oil \*  
I = Insulating oil - NBR seals, NBR hoses, tested using insulating oil \*\*  
X = HFD-R phosphoric acid ester fluids - FKM seals,  
UPE hoses tested using HFD-R fluid \*  
P = Aviation phosphoric acid ester fluid e.g. Skydrol® or Hyjet IV-A\*,  
EPDM seals tested using Hyjet®  
B = Biodegradable oils (based on esters) - FKM seals,  
NBR hoses, tested using rapidly biodegradable fluid  
(based on esters) \*

### Mechanical type

1 = Stationary (with feet)  
2 = Mobile (with castors and hose attachment)

### Voltage / frequency / power supply

A = 400 V/50 Hz/3Ph+PE  
B = 415 V/50 Hz/3Ph+PE  
C = 200 V/50 Hz/3Ph+PE <sup>1)</sup>\*\*\*  
D = 200 V/60 Hz/3Ph+PE <sup>1)</sup>\*\*\*  
E = 220 V/60 Hz/3Ph+PE  
F = 230 V/60 Hz/3Ph+PE \*\*\*  
G = 380 V/60 Hz/3Ph+PE  
H = 440 V/60 Hz/3Ph+PE <sup>1)</sup>  
J = 230 V/50 Hz/3Ph+PE \*\*\*  
K = 480 V/60 Hz/3Ph+PE <sup>1)</sup>  
L = 220 V/50 Hz/3Ph+PE \*\*\*  
M = 230 V/50 Hz/1Ph+PE (heater not possible)  
N = 575 V/60 Hz/3Ph+PE <sup>1)</sup>  
O = 460 V/60 Hz/3Ph+PE <sup>1)</sup>  
X = other voltage on request

### Filter size of fine filter

05 = OLF-5

### Type of vacuum pump

R = Rotary vane vacuum pump

### Heater

H = heater (only for 3-phase version)  
Z = without heater

### Control design

B = Basic, operator panel language in German/English/French/Spanish/Portuguese  
B1 = Basic, operator panel language in German/English/Finnish/Swedish/Bulgarian  
B2 = Basic, operator panel language in German/English/Russian/Polish/Hungarian  
B3 = Basic, operator panel language in German/English/Italian/Dutch/Danish  
(Other languages on request)

### Monitoring sensors

A = AquaSensor  
AC1 = AquaSensor + ContaminationSensor ISO4406:1999  
AC2 = AquaSensor + ContaminationSensor SAE AS 4059(D)  
AC3 = AquaSensor + ContaminationSensor NAS 1638

### Modification number

00 = the latest version is always supplied

### Supplementary details

No details = standard

V = FKM seals for **operating fluid "M" and "I"** (if non-standard seal required for the particular **operating fluid**)  
(see Model Code under "Operating fluid") : Example: FAM-10-M....-V)

<sup>1)</sup> Supplied without plug

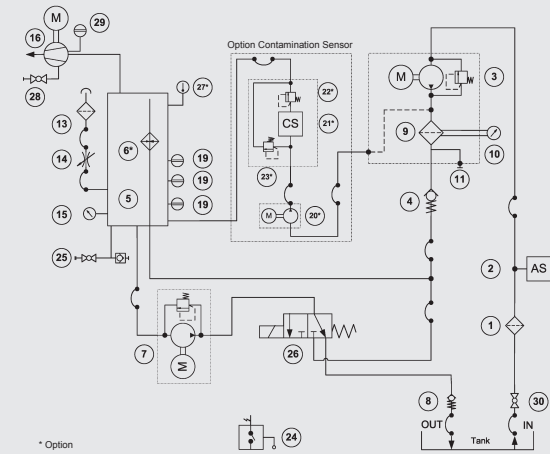
\* Residues of test fluid will remain in the unit after testing.

\*\* Units not suitable for "Online" and "Onload" operation (transformer in operation and connected to grid).

\*\*\* For heater option, 32A plug and fuse required.

**Preferred models with a shorter delivery time can be found in the brochure "HFS Preferred Models 7.960"**

## Hydraulic circuit diagram



- |   |   |
|---|---|
| 1 Suction filter  | 15 Pressure sensor for measuring the pre-set vacuum |
| 2 AquaSensor AS 1000                                      | 16 Vacuum pump                                      |
| 3 Filling pump  | 19 Level sensor for vacuum column                   |
| 4 Check valve   | 20 Pump for ContaminationSensor CS1000 (optional)   |
| 5 Vacuum column   | 21 ContaminationSensor CS1000 (optional)            |
| 6 Heater (optional)                                       | 22 Pressure relief valve for CS1000 (optional)      |
| 7 Drain pump  | 23 Pressure relief valve for CS1000 (optional)      |
| 8 Check valve   | 24 Leakage indicator for oil drip tray              |
| 9 Fluid filter for eliminating solid particles            | 25 Drain for vacuum column                          |
| 10 Differential pressure switch for monitoring the filter | 26 Return valve                                     |
| 11 Drain for fluid filter                                 | 27 Temperature sensor (for the heater (6) option)   |
| 13 Air filter and dryer                                   | 28 Drain for vacuum pump                            |
| 14 Needle valve for vacuum setting                        | 29 Level sensor for vacuum pump                     |
|   | 30 Ball valve                                       |

## Sizing

As a rough guide, the FluidAqua Mobil can be sized according to the tank volume of the system. If the water ingress per hour is known, then a unit can be selected according to the typical dewatering capacities of the various sizes.

Tank volume in litres	FAM
< 2,000	FAM 5 *
1,000 – 7,000	FAM 10/15 / 10
7,000 – 15,000	FAM 25 **
15,000 – 25,000	FAM 45 ** FAM 45E***
25,000 – 35,000	FAM 60 **
35,000 – 45,000	FAM 75 ** / FAM 75E ***
> 45,000	FAM 95 **

\* see Brochure no. 7.639. FAM 5

\*\* see Brochure no. 7.613. FAM 25/45/60/75/95

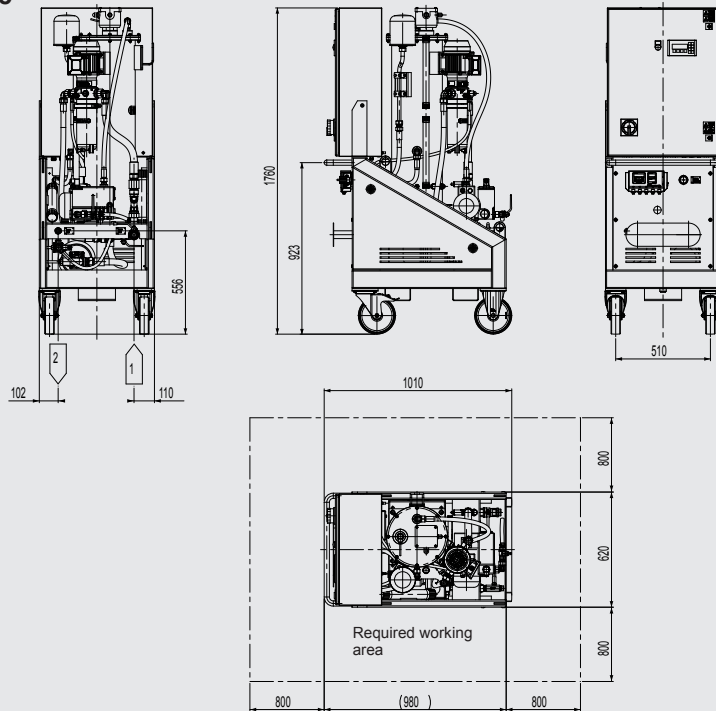
\*\*\* see Brochure no. 7.654. FAM Economy Series

In general, it must however be noted that sizing will depend on the application, the fluid, the temperature of the fluid and the ambient temperature, the fluid quantity and the water ingress into the system. These have a great affect on the dewatering efficiency. Therefore the specifications can only serve as an indication.

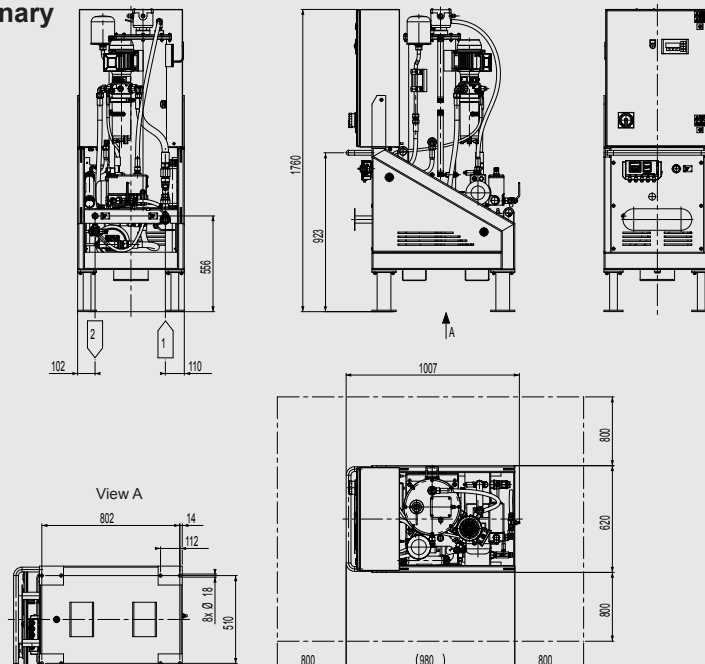
	Dewatering rate	
Water content	↑	↑
Fluid temperature	↑	↑
Detergent additives	↑	↓
Flow rate of the FAM	↑	↑

## Measurements

### mobile



### stationary



## Items supplied

- FluidAqua Mobil, ready-for-connection
- Suction and pressure hoses supplied with mobile version
- Key, square 8 mm (for cover panel)
- Pass key for switch cabinet
- Vacuum pump oil (1 litre) for initial filling of vacuum pump
- Technical documentation consisting of:
  - Operating and Maintenance Manual
  - Electrical circuit diagram
  - Test certificate
  - CE conformity declaration

## Heater option

By using the built-in heater, the dewatering capacity can be increased, particularly in the case of high viscosity fluids or fluids at low temperatures.

If the temperature of the fluid is raised by 10 °C then the dewatering capacity increases by up to 50 %. The ideal temperature for dewatering is between ≈ 50 ... 60 °C.

Generally speaking, for operating viscosities of between 350 ... 800 mm<sup>2</sup>/sec the heater option must be selected and the heater must be in operation.

## Filter elements for fine filter

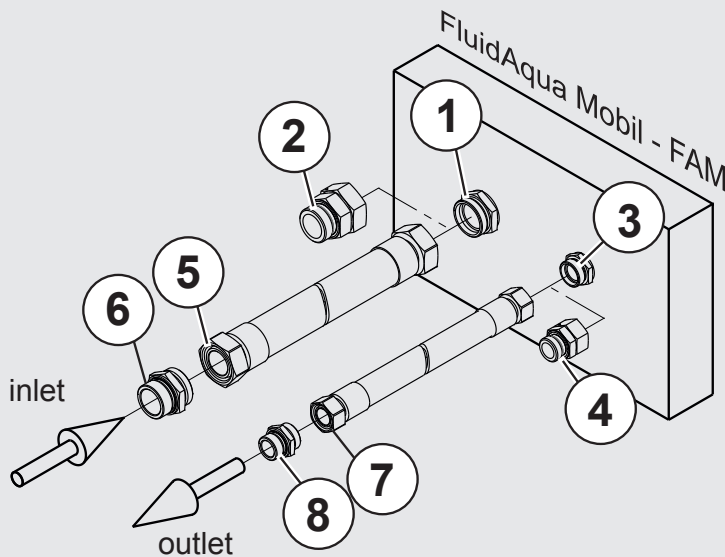
Filter elements for the fine filter must be ordered separately and must be fitted before commissioning on site.

### FAM-10

**OLF 5:** 1 filter element of the type N5DMxxx is required. For operating fluid "P": N5DMxxx-EPDM required.

Part number	Description	Filtration rating	Seal
349494 (3203901)	N5DM002 (-EPDM)	2 µm	FKM (EPDM)
3068101 (3832764)	N5DM005 (-EPDM)	5 µm	FKM (EPDM)
3102924 (4093756)	N5DM010 (-EPDM)	10 µm	FKM (EPDM)
3023508 (4093759)	N5DM020 (-EPDM)	20 µm	FKM (EPDM)

## FAM connection summary



Item	FAM 10
1 - FAM inlet connection	28L / M36x2 (male thread)*
2 - Adapter	Adapter G1 A (male thread)**
3 - FAM outlet connection	18L / M26x1.5 (male thread)*
4 - Adapter	Adapter G½ A (male thread)**
5 - Suction hose connection	28L / M36x2 (female thread)***
6 - Adapter	Adapter G1 A (male thread)**
7 - Pressure hose connection	18L / M26x1.5 (female thread)***
8 - Adapter	Adapter G½ A (male thread)**

\*) Connection Form D to ISO 8434-1 Series L (corresponds to ISO 12151, Form S, Series L)

\*\*\*) Screw-in spigot to ISO 1179-2 (Form E)

\*\*\*) Connection Form N to ISO 8434-4 Series L (corresponds to ISO 12151, Form SWS, Series L)

Items 1 ... 4 are supplied with the stationary FAM.  
Items 1 ... 8 are supplied with the mobile FAM, in addition to the connection hoses.

## Note

The information in this brochure relates to the operating conditions and applications described.

For applications and operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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