HYDAC INTERNATIONAL

# FluidAqua Mobil
## FAM 5

## Description
The FluidAqua Mobil FAM 5 is designed for dewatering, degassing and filtering hydraulic and lubrication fluids.

It operates on the principle of vacuum dewatering to eliminate free and dissolved water as well as free and dissolved gases. By using HYDAC Dimicron filter technology which has a high contamination retention capacity and filtration efficiency, the FAM 5 is extremely cost effective.

Perfect for service work thanks to its compact and mobile design. In the stationary version it provides perfect continuous protection for applications where operating fluids require optimal care, in which valuable bio-oils or fire-resistant fluids are used, or where water frequently gets into the system.

## Special features
- Small, compact and easy to use unit with Siemens LOGO! controller as well as control panel for quick use during service calls or emergencies
- Reliable and convenient for fixed and permanent use due to extensive monitoring functions
- Optional integrated heater to increase dewatering performance, especially for cold or high viscosity oils
- Optional integrated water content and particle measurement technology with continuous display of the measurements, storage of the values and control of the unit
- Very low residual water content, gas content and particle contamination result in longer oil change intervals, improved life expectancy of components, higher machine availability and as a result, a reduction in the Life Cycle Cost (LCC)

## Technical specifications

| | |
|---|---|
| **Flow rate at 50 Hz** | ≈ 5 l/min |
| **Permitted fluids**** | Fluids compatible with NBR seals:<br>• Mineral oils to DIN 51524<br>• Gear oils to DIN 51517, 51524<br>Fluids compatible with FKM (FPM,Viton®) seals:<br>• Synthetic esters (HEES) DIN 51524/2<br>• Vegetable oils (HETG, HTG)<br>• HFD-R fluids (not for pure phosphate ester which require EPDM seals) |
| **Sealing material** | NBR or FKM (FPM,Viton®)<br>see model code "Operating fluid" |
| **Filter size of fluid filter** | OLF 5 |
| **Filter element for fluid filter (xxx = filtration rating)** | N5DMxxx<br>Filter element must be ordered separately, see table "Filter elements for fluid filters" |
| **Clogging indicator** | Differential pressure switch with cut-off function when filter is clogged |
| **Type of vacuum pump** | Rotary vane vacuum pump |
| **Pump type for filling & draining** | Gear pump |
| **Operating pressure (outlet)** | 0 to 8 bar / 0 to 116 psi |
| **Permitted pressure at suction port (without suction hose)** | -0.2 to 1 bar / -2.9 to 14.5 psi |
| **Permitted operating viscosity range**** | 15 to 350 mm²/s – without integrated heater<br>15 to 550 mm²/s – with integrated heater |
| **Permitted viscosity range for particle measurement** | 15 to 200 mm²/s – with measuring equipment ACS, AC |
| **Fluid temperature range**** | 10 to 80 °C / 50 to 176 °F |
| **Ambient temperature **** | 0 to 40 °C / 32 to 104 °F |
| **Storage temperature range**** | 0 to 40 °C / 32 to 104 °F |
| **Relative ambient humidity **** | maximum 90%, non-condensing |
| **Electrical power consumption (without heater) / required external fuse*** | ≈ 1 kW /<br>16 A for circuit breakers with trip characteristics type C |
| **Heating output (optional)** | max. 2.4 kW (depending on the nominal voltage, see model code) |
| **Protection class** | IP 54 |
| **Length of power cable / plug** | 10 m / CEE (depending on the nominal voltage, see model code) |
| **Length of connection hoses** | 5 m (mobile version only) |
| **Material of hoses** | see model code |
| **Hydraulic connections** | see table "Connection summary" |
| **Weight when empty** | ≈ 120 kg |
| **Achievable residual water content** | < 100 ppm – hydraulic and lubricating oils<br>< 50 ppm – turbine oils (ISO VG 32/46)<br>< 10 ppm – transformer oils *** |

* Maximum specifications given, equipment-dependent
** For other fluids, viscosities or temperature ranges, please contact us
*** Units are not suitable for "Online" and "Onload" operation (transformer in operation and connected to grid).

## Order details

**FAM – 5 – M – 2 – A – 05 – R – H – S – ACS – 00 – / -V**

**Basic model**
FAM = FluidAqua Mobil

**Size**
5 ≈ 5 l/min

**Operating fluid**
M = Mineral oil - NBR seals, NBR hoses, tested with mineral oil*
I = Insulating oil - NBR seals, NBR hoses, tested with insulating oil (e.g. Shell Diala)* / **
X = HFD-R fluids - FKM (FPM,Viton®) seals, UPE/PE-PA hoses, tested with HFD-R fluid (e.g. Fyrquel)*
B = Biodegradable (ester based) - FKM (FPM,Viton®) seals, NBR hoses, tested with biodegradable oils based on esters*

**Mechanical type**
1 = Stationary (with feet)
2 = Mobile (with castors and connection hoses)

**Voltage / Frequency / Power supply**
A = 400 V/50 Hz/3Ph+PE
B = 415 V/50 Hz/3Ph+PE
E = 220 V/60 Hz/3Ph+PE
H = 440 V/60 Hz/3Ph+PE[1)]
K = 480 V/60 Hz/3Ph+PE[1)]
M = 230 V/50 Hz/1Ph+PE
O = 460 V/60 Hz/3Ph+PE[1)]
P = 230 V/60 Hz/1Ph+PE
S = 380 V/50 Hz/3Ph+PE
AD = 220 V/60 Hz/1Ph+PE
X = other voltage on request

**Filter size of fine filter**
05 = OLF5

**Type of vacuum pump**
R = Rotary vane vacuum pump

**Heater**
Z = Without heater
H = Heater (for 200 ... 359 V = 1 kW, for 360 ... 690 V = 2.4 kW, heater only possible from 200 V)

**Control concept**
S = standard, operating language de/en. Included in scope of delivery on USB memory stick for subsequent installation: fr/en, es/en, pt/en, it/en, nl/en, da/en, fi/en, sv/en, zh/en (other languages on request)

**Measurement equipment**
Z = none
A = AquaSensor AS 1000 with control function
AC = AquaSensor AS 1000 + ContaminationSensor CS 1000, with control function
ACS = AquaSensor AS 1000 + ContaminationSensor CS 1000 + SensorMonitoring Unit display and storage of values, with control function

**Modification number**
00 = The latest version is always supplied.

**Supplementary details**
No details = series
V = FKM (FPM, Viton®) seals for fluid “M” and “I”

1) Supplied without connector
* 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)

## Type of vacuum pump

The vacuum pump used is an oil-lubricated rotary vane pump.

The air discharged by the vacuum pump can, in addition to water, contain constituent elements of the operating fluid concerned, as well as any gases it contained.

Therefore, please ensure that the area in which the FAM is operated is adequately ventilated.

## Heater

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 ≈ 50 ... 60 °C.

Generally speaking, for operating viscosities of between 350 … 550 mm²/s the heater option must be selected and the heater must be used.

## Control concept

- Siemens LOGO! controller with 6-line text display (bilingual)


- Automatic, state-based and energy-saving operation through control of the power unit via optionally integrated or external AquaSensor using MIN/MAX values
- Error messages as plain text display
- Manual operation for manual activation of components
- Ethernet connection and web server for remote monitoring

## Instrumentation

If the water and particle measuring options (AquaSensor and ContaminationSensor) are included, it is possible to display the water content relative to the saturation point (saturation level, relative humidity), as well as the particle contamination and temperature of the fluid.

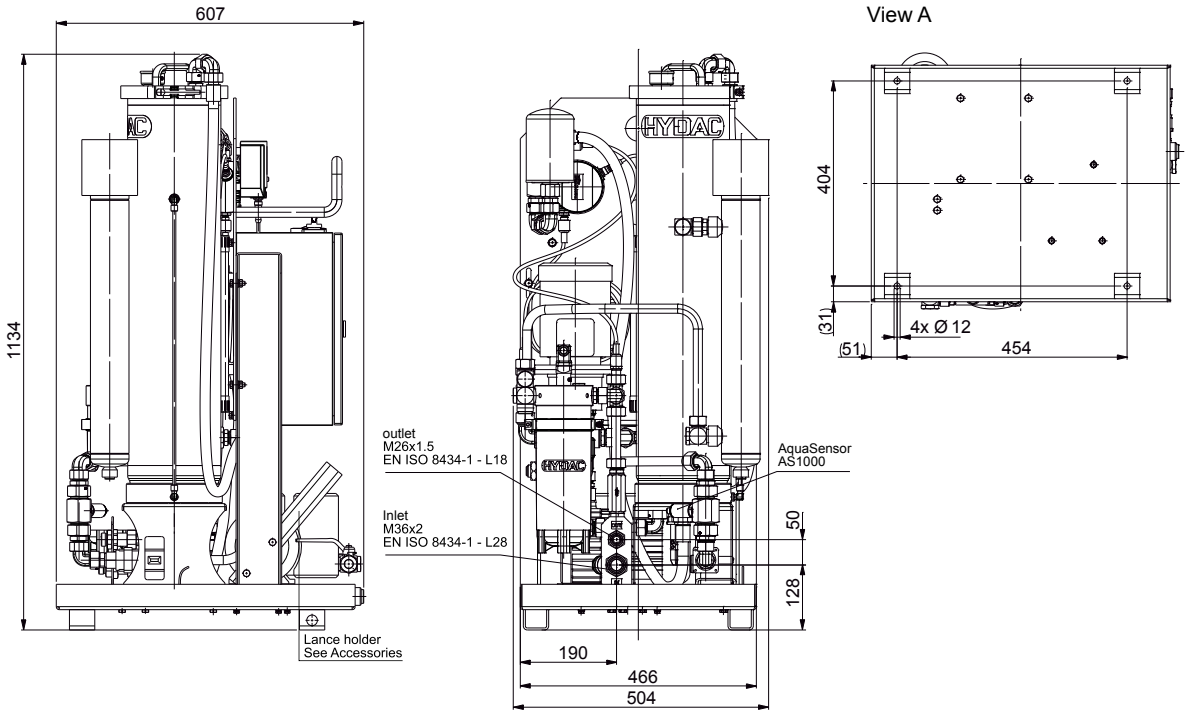
The measured data is stored in the SensorMonitoring Unit with a date and time stamp and can be easily transferred using a USB memory stick.

## Preferred models (with shorter delivery times)

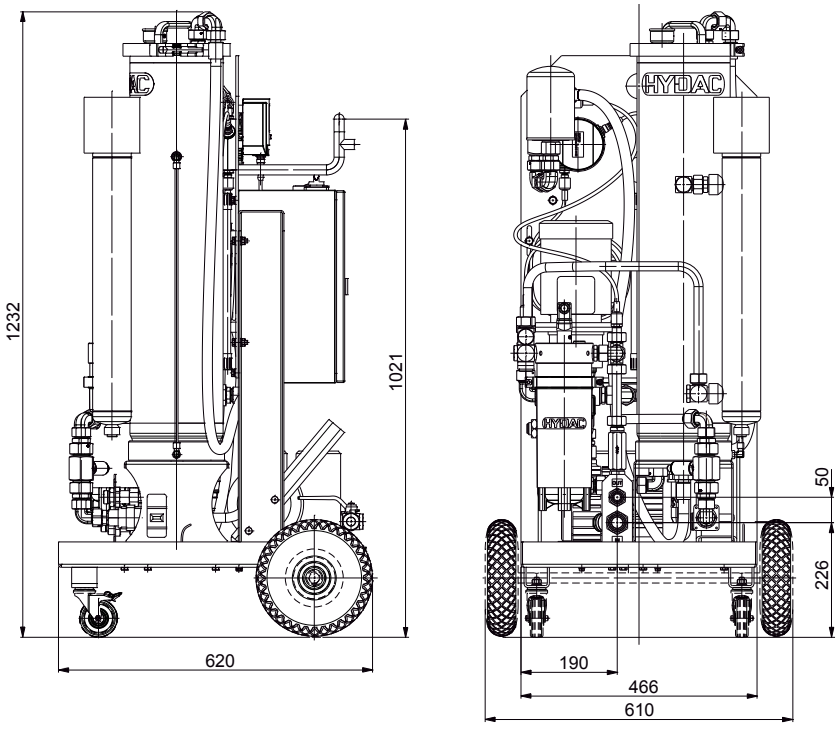
| Part no. | Model code |
|---|---|
| 3820052 | FAM-5-M-2-A-05-R-H-S-A-2 |

## Measurements

FAM Stationary

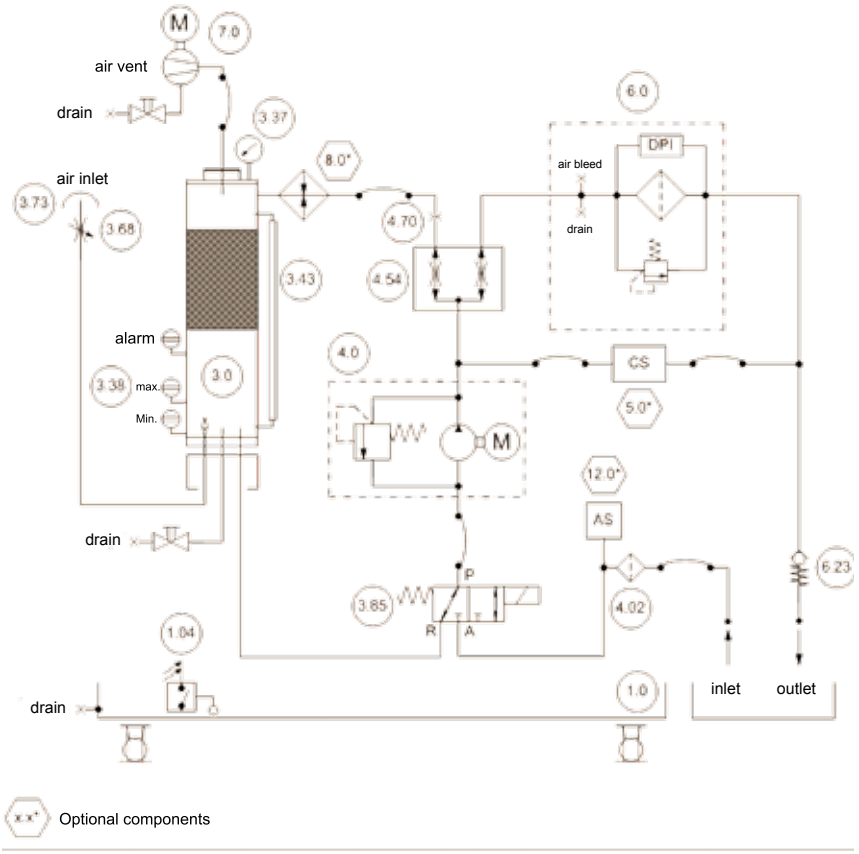



FAM Mobile




Dimensional tolerance ±10mm
Dimensions in mm

## Hydraulic circuit




| Item | Description |
|---|---|
| 1.0 | Drip tray |
| 1.04 | "Drip tray full" float switch |
| 3.0 | Vacuum column |
| 3.38 | Level sensor for vacuum column |
| 3.68 | Needle valve to regulate the necessary vacuum in the vacuum column |
| 3.73 | Breather filter |
| 3.85 | 3/2 directional valve |
| 4.0 | Motor pump assembly |
| 4.02 | Suction screen |
| 4.54 | Flow divider |
| 5.0 | ContaminationSensor CS1000 (optional) |
| 6.0 | Fluid filter for elimination of solid particles, with differential pressure switch for filter monitoring |
| 7.0 | Vacuum pump |
| 8.0 | Heater (optional) |
| 12.0 | AquaSensor AS 1000 (option) |

## Fluid filter element

Please order the filter element for the fluid filter separately and install it before commissioning.

You will need one of the following filter elements for the fluid filter:

| Type | Filtration rating | Seals | Part number |
|---|---|---|---|
| N5DM002 | 2 µm | FKM | 349494 |
| N5DM005 | 5 µm | FKM | 3068101 |
| N5DM010 | 10 µm | FKM | 3102924 |
| N5DM020 | 20 µm | FKM | 3023508 |

## Sizing

As a rough guide, the FluidAqua Mobil can be sized according to the tank volume of the system.

| 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. 7.649. FAM 10
** see Brochure no. 7.613. FAM 25/45/60/75/95
*** see Brochure no. 7.654. FAM Economy

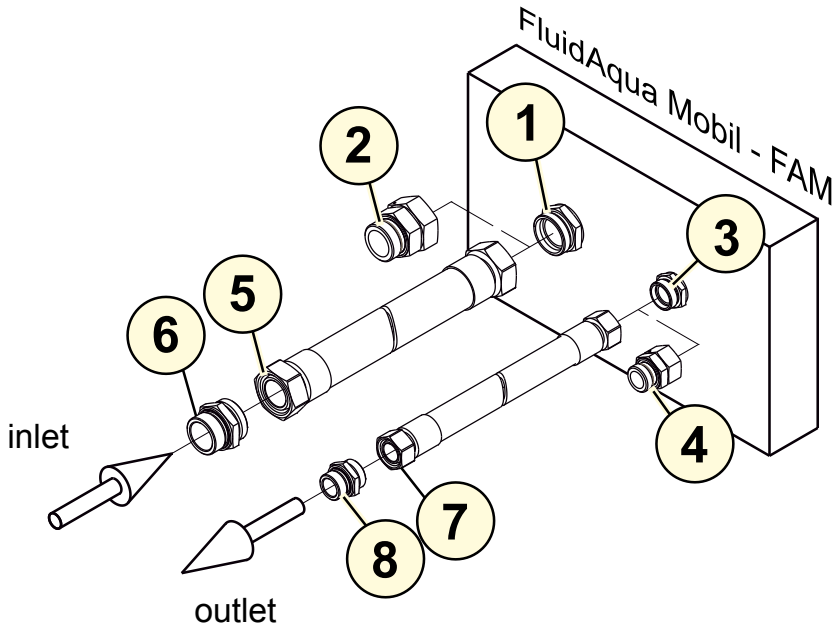
- Select a larger size for systems with very high and continuous process-related water entry
- In contrast, for systems with just a small amount of moisture entry via tank breathing, one size smaller can be selected
- Ideally the water content will be measured periodically to determine the water entry per hour/day. Our sales specialists can then determine the suitable size if they know the oil type, oil temperature, operating viscosity, system dimensions, environmental conditions and target water content

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 | ⇧ | ⇩ |
| FAM flow rate | ⇧ | ⇧ |

For dimensioning and project planning, please use the FAM checklist, doc. no.: 10000495854

## Connection summary




| Item | FAM 5 |
|---|---|
| 1 - FAM inlet connector | 28L / M36x2 (male thread)* |
| 2 - adapter (accessory) | Adapter G1 A (male thread)** |
| 3 - FAM outlet connector | 18L / M26x1.5 (male thread)* |
| 4 - adapter (accessory) | Adapter G ½ A (male thread)** |
| 5 - Suction hose connection | 28L / M36x2 (female thread)*** |
| 6 - adapter (accessory) | Adapter G1 A (male thread)** |
| 7 - connection, return hose | 18L / M26x1.5 (female thread)*** |
| 8 - adapter (accessory) | Adapter G ½ 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 and 3 are supplied with the stationary FAM.
Items 1, 3, 5 and 7 are supplied with the mobile FAM.

## External interfaces

The controller has external interfaces for remote control of the unit:

- Start/stop from external (relay)
- Device ready – no error, unit ready for operation (potential-free contact)
- Operating state – unit ON/OFF (potential-free contact)
- Filter contaminated (potential-free contact)

## Accessories

| Description | Material | Part number |
|---|---|---|
| Lance set for suction and return hose, consisting of:<br>2x lance Ø18 mm, length = 0.5 m<br>1x lance holder incl. mounting material | FKM | 3685146 |
| Connection, adapter set, metric/inch comprising:<br>Items 2, 4, 6 and 8 (see Connection Overview) | FKM | 4337754 |

## Items supplied

- FluidAqua Mobil
- Suction and return hose (only on mobile version)
- 1 litre vacuum pump oil for initial filling of vacuum pump
- Switch cabinet key
- USB memory stick with additional language versions and SD card for installation
- Technical documentation:
  - Operating and Maintenance Manual
  - Electrical wiring diagram
  - Test certificate
  - CE declaration of conformity

## 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.