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: • Mineral oils to DIN 51524 • Gear oils to DIN 51517, 51524 Fluids compatible with FKM (FPM,Viton®) seals: • Synthetic esters (HEES) DIN 51524/2 • Vegetable oils (HETG, HTG) • HFD-R fluids (not for pure phosphate ester which require EPDM seals)
Sealing material	NBR or FKM (FPM,Viton®) see model code "Operating fluid"
Filter size of fluid filter	OLF 5
Filter element for fluid filter (xxx = filtration rating)	N5DMxxx 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 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 / 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 < 50 ppm – turbine oils (ISO VG 32/46) < 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).

EN 7.639.3/06.18

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.

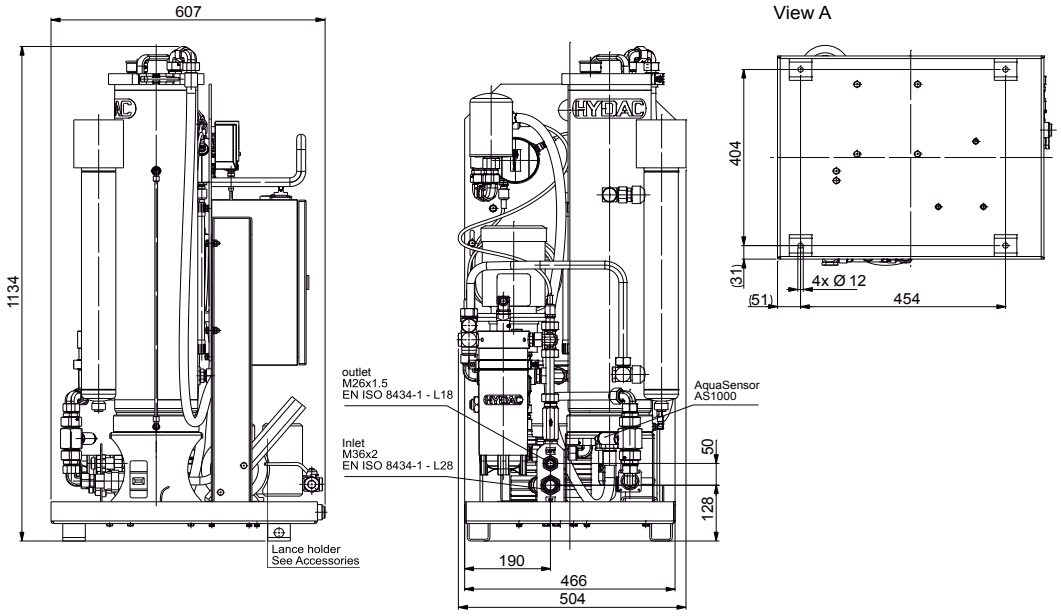
The measured data is stored in the SensorMonitoring Unit with a date and time stamp and can be easily transferred using a USB memory stick.

Preferred models (with shorter delivery times)

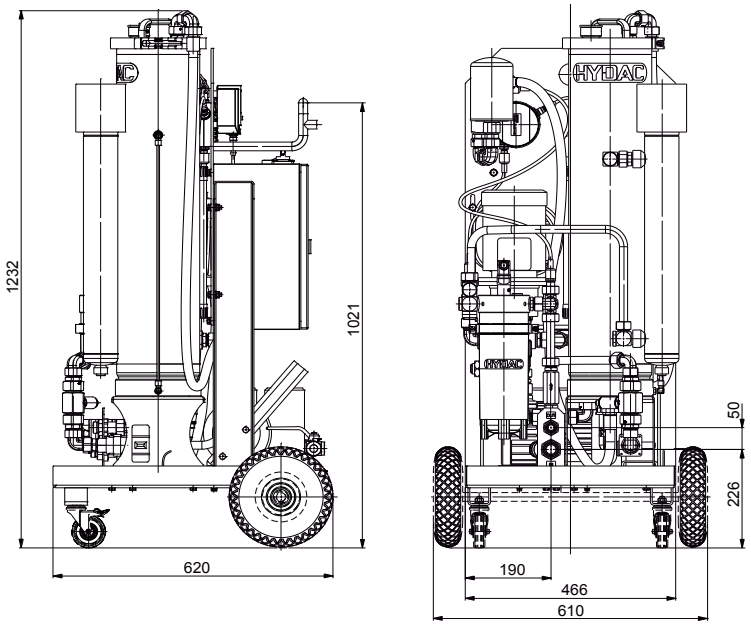
Part no.	Model code
3820052	FAM-5-M-2-A-05-R-H-S-A-2

Measurements

FAM Stationary

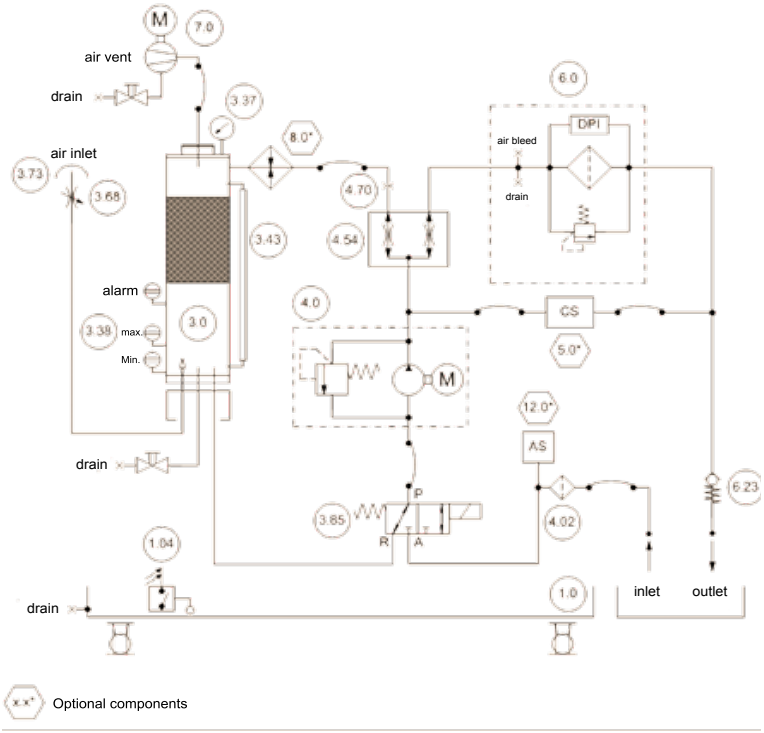


FAM Mobile



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

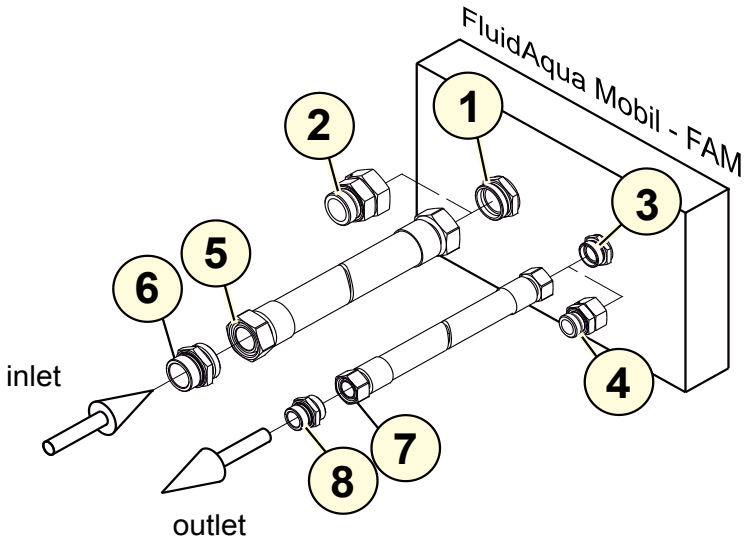
- Select a larger size for systems with very high and continuous process-related water entry
- In contrast, for systems with just a small amount of moisture entry via tank breathing, one size smaller can be selected
- Ideally the water content will be measured periodically to determine the water entry 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: 2x lance Ø18 mm, length = 0.5 m 1x lance holder incl. mounting material	FKM	3685146
Connection, adapter set, metric/inch comprising: 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.