



## FluidAqua Mobil FAM 3000 series

### Description

The FluidAqua Mobil 3000 series works on the principle of vacuum dewatering to remove free and dissolved water as well as free and dissolved gases from hydraulic and lubrication fluids.

By using HYDAC bypass filter element technology, with its high contamination retention capacity and filtration efficiency, the unit is able to be extremely cost-effective.

All units have an AquaSensor AS to continuously monitor the water content and to control the unit. A particle sensor CS for simultaneous monitoring of the solid contamination can also be integrated as an option. To increase the dewatering performance, for high-viscosity fluids and for low temperatures, an optional heater can be integrated. The programmable logic control (PLC) from the Siemens S7 series combined with a Siemens touch control panel enables straightforward and reliable handling in a large number of languages. Integration into IT and OT systems by means of Ethernet interface or Modbus TCP/IP, HYDAC CMX Connect Cloud or simple remote monitoring via the integrated web server is possible.

### Advantages

Very low residual water content, gas content and particle contamination in the operating fluids lead to:

- Longer oil change intervals
- Improved components service life
- Increased machine availability
- Reduced life cycle cost (LCC)

### Technical data

	FAM 3025	FAM 3045	FAM 3075	FAM 3095
Flow rates at 50Hz	≈ 25 l/min	≈ 45 l/min	≈ 75 l/min	≈ 95 l/min
Flow rates at 60Hz	≈ 30 l/min	≈ 54 l/min	≈ 90 l/min	≈ 114 l/min
Permitted fluids **	<ul style="list-style-type: none"> <li>■ Hydraulics oils acc. to DIN 51524</li> <li>■ Lubrication oils acc. to DIN 51517</li> <li>■ Synthetic esters (HEES) DIN 15380</li> <li>■ Vegetable oils (HETG, HTG) acc. to ISO 15380 – triglycerides</li> <li>■ HFD-R fluids (not for pure phosphate esters requiring EPDM seals)</li> </ul>			
Sealing material	FKM (FPM, Viton®)			
Filter size, fine filter	18 = MVH-F-118		34 = MVH-F-134	
Filter elements, fine filter	N50DMxxx		N100DMxxx	
Clogging indicator	VM 2 C.0			
Pump type, vacuum pump	Rotary vane, vacuum pump			
Pump type, other	Gear pumps			
Operating pressure	Max. 9 bar			
Permitted pressure at suction port (without suction hose)	-0.2 to 1 bar			
Permitted pressure at outlet (without return hose)**	0 to 3.5 bar			
Operating viscosity range**	15 to 800 mm <sup>2</sup> /sec		15 to 550 mm <sup>2</sup> /sec	
Without integrated heater	15 to 1100 mm <sup>2</sup> /sec		15 to 800 mm <sup>2</sup> /sec	
With integrated heater				
Operating viscosity range for measurement operation with Contamination Sensor AC1, AC2, AC3**	15 to 1000 mm <sup>2</sup> /sec		15 to 800 mm <sup>2</sup> /sec	
Fluid temperature range**	10 to 80 °C			
Ambient temperature**	0 to 45 °C (0 to 50°C optional)			
Storage temperature range**	0 to 50 °C			
Relative humidity (amb.)**	Max. 90 %, non-condensing			
Electrical power consumption (50 Hz)*				
Without heater	≈ 3.5 kW	≈ 4.5 kW	≈ 7.5 kW	≈ 7.5 kW
With heater	≈ 10.5 kW	≈ 13.5 kW	≈ 25.5 kW	≈ 25.5 kW
Heating output (optional)	≈ 6.75 kW	≈ 6.75 kW	≈ 18 kW	≈ 18 kW
Protection class**	IP 54 (IP55 optional)		IP 55	
Length of electric cable / connector	10 m / CEE, dependent on rated voltage – see model code (only mobile FAMs)			
Length of hoses	5 m (only mobile FAMs)			
Material, hoses	See model code			
Connections inlet/outlet	See connection overview table			
Weight when empty	≈ 400 kg	≈ 405 kg	≈ 465 kg	≈ 485 kg
Achievable residual water content	<ul style="list-style-type: none"> <li>&lt; 100 ppm – hydraulic and lubrication oils</li> <li>&lt; 50 ppm – turbine oils (ISO VG 32/46)</li> <li>&lt; 10 ppm – transformer oils***</li> </ul>			
Fulfilled requirements				

\* Maximum values, as dependent on equipment

\*\* 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 – 3045 – M – 2 – A – 18 – R – H – C1 – A – 0 /-17**

### Basic type

FAM = FluidAqua Mobil

### Size

3000 series

3025 ≈ 25 l/min (50Hz), 3045 ≈ 45 l/min (50Hz),  
3075 ≈ 75 l/min (50 Hz), 3095 ≈ 95 l/min (50Hz)

### Operating medium

M = mineral oil – FKM seals, NBR hoses, tested with mineral oil\*  
I = insulating oil – FKM seals, NBR hoses,  
tested with insulating oil (e.g. Shell Diala)\*\*  
X = HFD-R fluids – FKM seals, UPE hoses,  
tested with HFD-R fluid (Fyrequell)\*  
B = rapidly biodegradable (ester-based) – FKM seals, NBR hoses,  
tested with rapidly biodegradable fluid on ester basis (fully saturated)\*

### Mechanical type

1 = stationary (with legs)  
2 = mobile (with castors and hoses)

### Voltage/frequency/grid

A = 400 V, 50 Hz, 3-ph	F = 230 V, 60 Hz, 3-ph	L = 220 V, 50 Hz, 3-ph
B = 415 V, 50 Hz, 3-ph	G = 380 V, 60 Hz, 3-ph	N = 575 V, 60 Hz, 3-ph <sup>1)</sup>
C = 200 V, 50 Hz, 3-ph <sup>1)</sup>	H = 440 V, 60 Hz, 3-ph <sup>1)</sup>	O = 460 V, 60 Hz, 3-ph <sup>1)</sup>
D = 200 V, 60 Hz, 3-ph <sup>1)</sup>	I = 500 V, 50 Hz, 3-ph	S = 380 V, 50 Hz, 3-ph
E = 220 V, 60 Hz, 3-ph	K = 480 V, 60 Hz, 3-ph <sup>1)</sup>	X = Other voltages on request

### Filter size, fine filter

18 = N50 (FAM 3025/3045)  
34 = N100 (FAM 3075/3095)

### Type of vacuum pump

R = rotary vane vacuum pump

### Heater

H = heater suitable for size (see technical data),  
For available voltages, see following pages

### Control concept

C1 = Comfort, control panel language de/en/fr/es/pt/it/nl/da/fi/sv  
C2 = Comfort, control panel language de/en/bg/hu/ru/pl/zh (Other languages on request)

### Measurement equipment

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

### Modification number

0 = the latest version is always supplied

### Supplementary details

No detail = series

17 = integrated Ethernet router (RJ45), web server for remote monitoring, Modbus TCP/IP,  
HYDAC CMXconnect cloud-enabled  
20 = integrated dual-SIM 4G mobile network Ethernet router (RJ45) with WLAN, web server for remote monitoring,  
Modbus TCP/IP, HYDAC CMXconnect cloud-enabled  
T50 = extended temperature range 0 to 50°C (fan in switch cabinet, motors with adjusted output, vacuum pump  
with special design)  
IP55 = IP55 for FAM-3025/3045 (vacuum pump with special design)

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

\* Residual amounts of test fluid remain in unit after test.

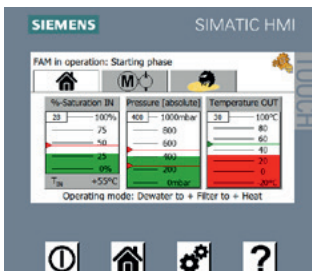
\*\* Units not suitable for “online” and “onload” operation (transformer in operation and connected to grid).

## Control concept

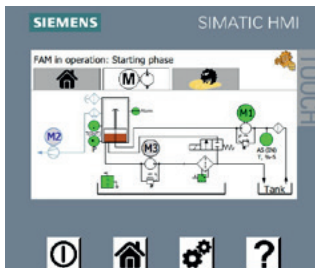
- Siemens S7-1200 with 4" KTP400 TFT colour display with touch and key operation



- Display of water content (% saturation), pressure in vacuum column and fluid temperature in numerical and graphic form with graphical progress display of measured values



- Automatic, condition-based and therefore energy-saving operation as unit can be controlled via integrated or external AquaSensor or optionally integrated ContaminationSensor on basis of MIN/MAX values
- Display of hydraulic diagram with display of active or faulty components such as motors/pumps, level transmitter and heater



- Error messages as plain text display and operator-guided troubleshooting
- Up to 10 selectable languages integrated

## Remote monitoring and remote control

### Relay interfaces

The controlled has external interfaces for remote control of the power unit as standard:

- Start/stop external (relay)
- Device ready – no faults, unit ready for operation (potential-free contact)
- Operating state – power unit ON/OFF (potential-free contact)

### IoT interfaces

With the integratable router options FAM-/ -17 and /- 20, the FAM can be integrated into IT and OT systems. The following interfaces are available:

#### Modbus TCP/IP

Provides measured values and operating states via Ethernet Modbus TCP/IP thanks to integration into networks, higher-level condition monitoring systems or control systems

#### Web server

Access to web server via internal company network or internet for example via PC or smartphone on a standard web browser, e.g. IE, Mozilla Firefox or Google Chrome.

The web server is available in English, German and French and displays:

- the unit's operating state
- the operating state of the individual components
- selected operating mode
- pending errors
- current measured values
- stopping of the unit



## HYDAC CMXconnect Cloud

- Device-specific cloud access via the internet providing all important device information on a clear dashboard
- Current and historic measured values (graphic, error messages)
- Statistical data, dewatering process (operating hours, energy consumption, amount of oil treated, etc.)
- E-mail alert of limit values being exceeded, malfunctions and pending maintenance requirements
- For access to CMXconnect Cloud, online registration and activation on the FAM by the operator required.



## Type of vacuum pump

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

The air exiting from the vacuum pump may contain parts of the fluid that is cleaned and gas content in the fluid as well as the removed water.

Ensure that the room in which the FAM is operated is adequately ventilated.

## Standard types (with shorter delivery times)

Part no.	Model code
4808858	FAM-3025-M-2-A-18-R-H-C1-A-0
4809035	FAM-3045-M-2-A-18-R-H-C1-A-0
4809130	FAM-3075-M-2-A-34-R-H-C1-A-0
4809134	FAM-3095-M-2-A-34-R-H-C1-A-0

## Heater option

The integrated heater makes it possible to increase the dewatering performance particularly for high-viscosity fluids or low fluid temperatures.

Increasing the temperature of the fluids by 10 °C can improve the dewater performance by up to 50 %.

The ideal dewatering temperature is  $\approx 50$  to  $60$  °C.

In general, the optional heater is chosen for operating viscosities between 800 and 1100 mm<sup>2</sup>/sec

(FAM-3095: 550 to 800 mm<sup>2</sup>/sec).

The heater must be in operation.

## Measurement equipment

The integrated AquaSensor AS enables continuous display of the water content relative to the saturation concentration (saturation level) and temperature of the fluid.

The optional ContaminationSensor (ACx) measures the solid particle contamination and displays it on the control panel.

In addition, fully automatic control of the units is possible on the basis of the two sensors, for condition-based and therefore energy-saving operation.

## Sizing

As a rough guideline, the FluidAqua Mobil can be dimensioned on the basis of the system's tank volume.

Tank volume in litres	FAM
< 2,000	FAM 5*
< 7,000	FAM 10/15** / 10**
< 15,000	FAM 3025
< 25,000	FAM 3045
< 45,000	FAM 3075
> 45,000	FAM 3095

\* See brochure no. 7.639. FAM 5

\*\* See brochure no. 7.949. FAM 10

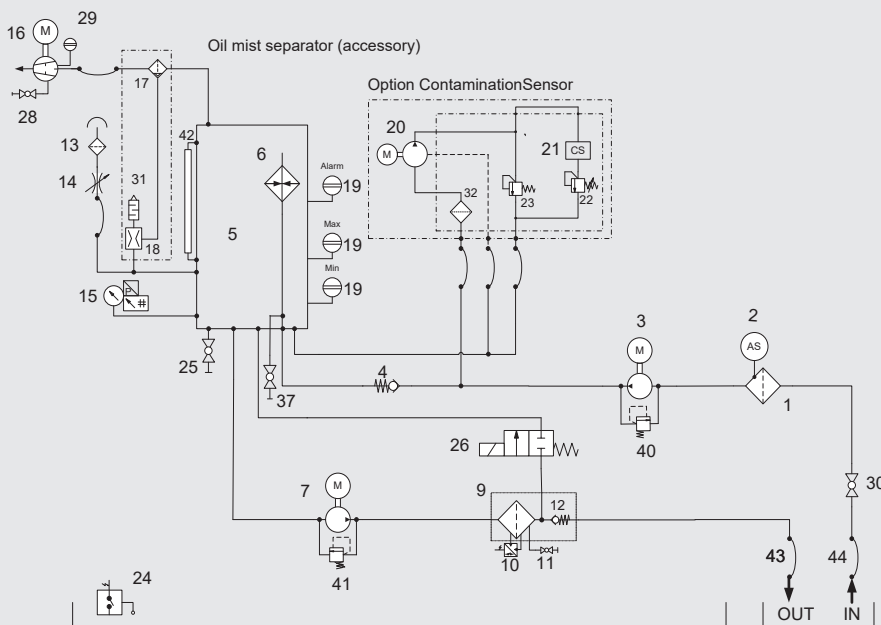
- For systems with processes that result in very high and continuous water ingress, choose a larger size.
- In contrast, for systems with little moisture ingress via the tank breathing, one size smaller can be chosen.
- Ideally, the water content will be measured periodically and used as a basis to calculate the water ingress per hour/day. With knowledge of the oil type, oil temperature, operating viscosity, system size, ambient conditions and target water content, our sales specialists can determine the appropriate size.

In general, however, it must be borne in mind that the dimensioning is dependent on the application, the fluid, the fluid and ambient temperature, and fluid volume and in particular the water ingress into the system. These factors have a major impact on the dewatering performance. The values provided can therefore only serve as rough indications.

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

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

## Hydraulic diagram












- |   |                                       |
|---|---------------------------------------|
| 1 Suction filter                                    | 20 Pump for CS*                       |
| 2 AquaSensor AS                                     | 21 Contamination Sensor CS*           |
| 3 Filling pump                                      | 22/23 Pressure relief valve for CS*   |
| 4 Check valve                                       | 24 Leakage detector, drip tray        |
| 5 Vacuum column                                     | 25 Drain, vacuum column               |
| 6 Heater*   | 26 Return valve                       |
| 7 Drain pump  | 28 Drain, vacuum pump                 |
| 9 Fine filter for solid particle separation         | 29 Level transmitter, vacuum pump     |
| 10 Differential pressure switch (filter monitoring) | 30 Ball valve                         |
| 11 Drain, fine filter                               | 31 Filter for vacuum suction nozzle** |
| 12 Check valve                                      | 32 Suction screen CS pump*            |
| 13 Air filter                                       | 37 Drain, heater                      |
| 14 Throttle valve for vacuum adjustment             | 40 Pressure relief valve filling pump |
| 15 Pressure sensor to measure set vacuum            | 41 Pressure relief valve drain pump   |
| 16 Vacuum pump                                      | 42 Visual fluid level gauge           |
| 17 Oil mist separator**                             | 43 Return hose (mobile version)       |
| 18 Vacuum suction nozzle for oil mist separator**   | 44 Suction hose (mobile version)      |
| 19 Level transmitter, vacuum column                 |                                       |

\* Optional

\*\* See accessories

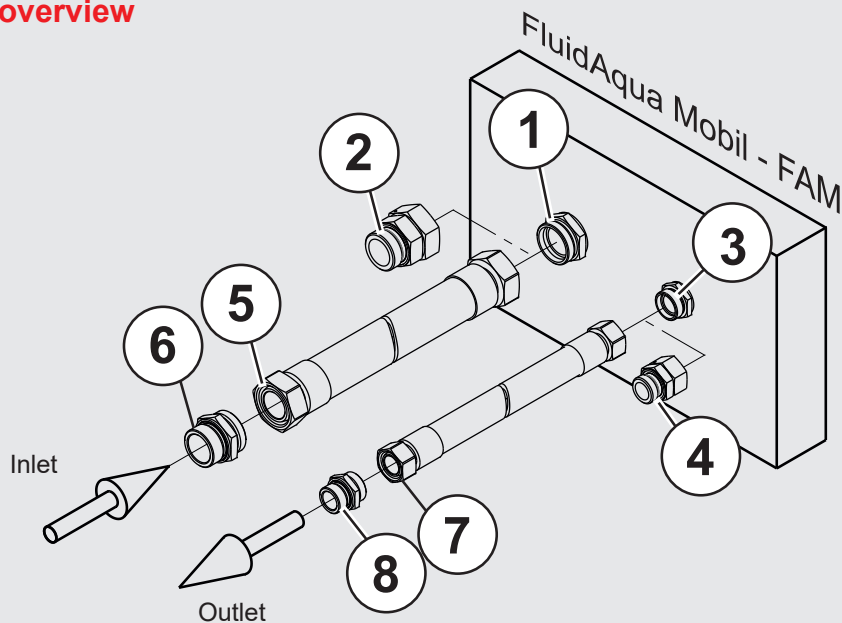
## Available voltages and required external circuit protection

Only applicable to circuit protection on basis of circuit breakers with triggering characteristic C.

FAM size \ Voltages	FAM 3025		FAM 3045		FAM 3075		FAM 3095	
	FAM 3025	FAM 3025 With heater	FAM 3045	FAM 3045 With heater	FAM 3075	FAM 3075 With heater	FAM 3095	FAM 3095 With heater
A = 400 V, 50 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
B = 415 V, 50 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
C = 200 V, 50 Hz, 3-ph	32A	63 A	63A		63 A		63 A	
D = 200 V, 60 Hz, 3-ph	32A	63 A	63A		63 A		63 A	
E = 220 V, 60 Hz, 3-ph	32A	63 A	32A	63 A	63 A		63 A	
F = 230 V, 60 Hz, 3-ph	32A	63 A	32A	63 A	63 A		63 A	
G = 380 V, 60 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
H = 440 V, 60 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
I = 500 V, 50 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
K = 480 V, 60 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
L = 220 V, 50 Hz, 3-ph	32A	63 A	32A	63 A	63 A		63 A	
N = 575 V, 60 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A
O = 460 V, 60 Hz, 3-ph	16A	32 A	16A	32 A	32 A	63 A	32 A	63 A

 Custom version, only on request.

## FAM connection overview



Item	FAM 3025 / 3045 / 3075 / 3095
1. Connection FAM inlet	42L / M52x2 male thread*
2. Adapter	Adapter G1½ male thread**
3. Connection FAM outlet	42L / M52x2 male thread*
4. Adapter	Adapter G1½ male thread**
5. Connection, suction hose	42L / M52x2 female thread***
6. Adapter	Adapter G1½ male thread**
7. Connection, return hose	42L / M52x2 female thread***
8. Adapter	Adapter G1½ male thread**

\*) Connection form D in acc. with ISO 8434-1 series L (corresponding to ISO 12151, form S, series L)

\*\*) Stud end in acc. with ISO 1179-2 (form E)

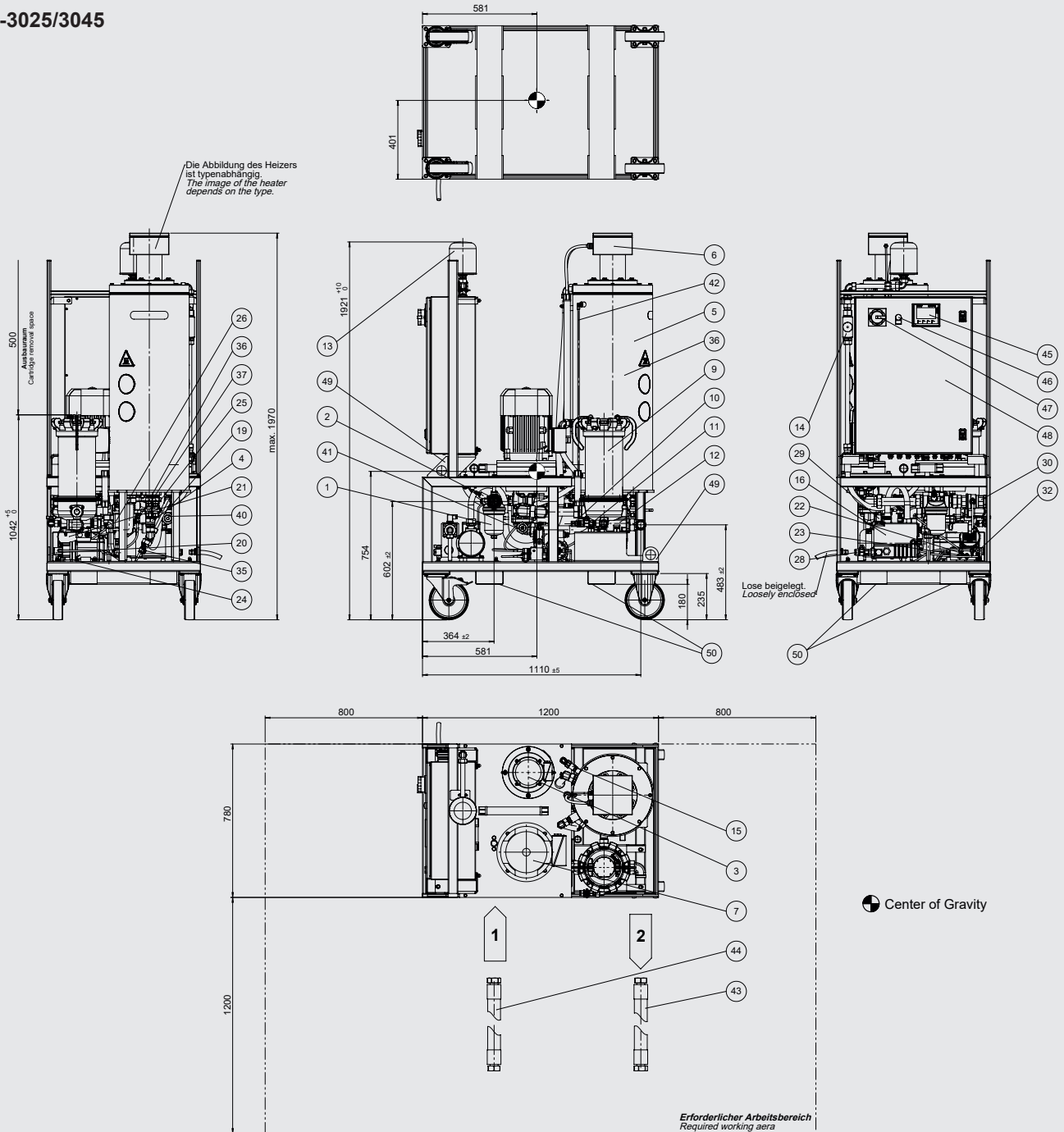
\*\*\*) Connection form N in acc. with ISO 8434-4 series L (corresponding to ISO 12151, form SWS, series L)

The scope of supply of the stationary FAM includes items 1 to 4.

In the scope of supply of the mobile FAM, you will also receive items 6 and 8 with the connection hoses 5 and 7.

# Dimensions

## FAM-3025/3045



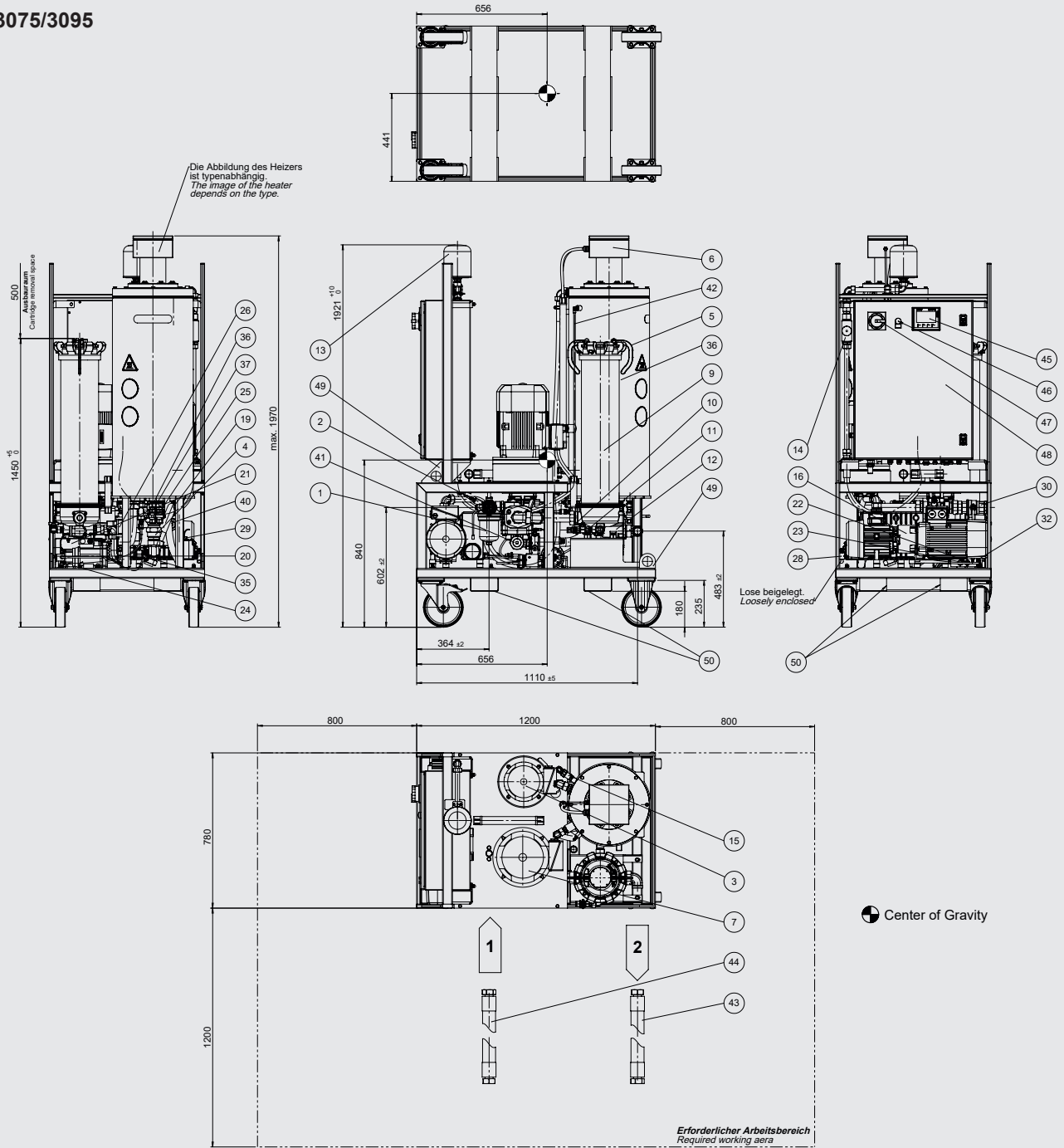
- |    |  |       |                                      |    |  |
|----|--|-------|--------------------------------------|----|--|
| 1  | Suction line filter                                | 16    | Vacuum pump                          | 37 | Drain, heater                          |
| 2  | AquaSensor AS                                      | 19    | Level transmitter, vacuum column     | 40 | Pressure relief valve, filling pump    |
| 3  | Filling pump                                       | 20    | Pump for CS*                         | 41 | Pressure relief valve drain pump       |
| 4  | Check valve  | 21    | Contamination Sensor CS*             | 42 | Visual fluid level gauge vacuum column |
| 5  | Vacuum column                                      | 22/23 | Pressure relief valve for CS*        | 43 | Return hose (only mobile version)      |
| 6  | Heater   | 24    | Leakage detector, drip tray          | 44 | Suction hose (only mobile version)     |
| 7  | Drain pump   | 25    | Drain, vacuum column                 | 45 | Control panel                          |
| 9  | Fine filter for solid particle separation          | 26    | Return valve                         | 46 | Fault signalling light                 |
| 10 | Differential pressure switch for filter monitoring | 28    | Drain, vacuum pump                   | 47 | Main switch                            |
| 11 | Drain, fine filter                                 | 29    | Level transmitter, vacuum pump       | 48 | Switch cabinet                         |
| 12 | Check valve  | 30    | Ball valve                           | 49 | Crane eyelets                          |
| 13 | Air filter   | 32    | Suction screen, CS pump              | 50 | Forklift recesses                      |
| 14 | Throttle valve for vacuum adjustment               | 35    | Suction port FCU 1000 (without CS)** |    |  |
| 15 | Pressure sensor for vacuum adjustment              | 36    | Return port FCU 1000 (without CS)**  |    |  |

\*Optional

\*\* See accessories

# Dimensions

FAM-3075/3095



- |    |  |       |                                      |    |  |
|----|--|-------|--------------------------------------|----|--|
| 1  | Suction line filter                                | 16    | Vacuum pump                          | 37 | Drain, heater                          |
| 2  | AquaSensor AS                                      | 19    | Level transmitter, vacuum column     | 40 | Pressure relief valve, filling pump    |
| 3  | Filling pump                                       | 20    | Pump for CS*                         | 41 | Pressure relief valve drain pump       |
| 4  | Check valve  | 21    | Contamination Sensor CS*             | 42 | Visual fluid level gauge vacuum column |
| 5  | Vacuum column                                      | 22/23 | Pressure relief valve for CS*        | 43 | Return hose (only mobile version)      |
| 6  | Heater   | 24    | Leakage detector, drip tray          | 44 | Suction hose (only mobile version)     |
| 7  | Drain pump   | 25    | Drain, vacuum column                 | 45 | Control panel                          |
| 9  | Fine filter for solid particle separation          | 26    | Return valve                         | 46 | Fault signalling light                 |
| 10 | Differential pressure switch for filter monitoring | 28    | Drain, vacuum pump                   | 47 | Main switch                            |
| 11 | Drain, fine filter                                 | 29    | Level transmitter, vacuum pump       | 48 | Switch cabinet                         |
| 12 | Check valve  | 30    | Ball valve                           | 49 | Crane eyelets                          |
| 13 | Air filter   | 32    | Suction screen, CS pump              | 50 | Forklift recesses                      |
| 14 | Throttle valve for vacuum adjustment               | 35    | Suction port FCU 1000 (without CS)** |    |  |
| 15 | Pressure sensor for vacuum adjustment              | 36    | Return port FCU 1000 (without CS)**  |    |  |

\*Optional

\*\* See accessories

## Scope of supply

- FluidAqua Mobil, ready for connection
- With suction and return hose for mobile version
- Vacuum pump oil (1 litre) for initial filling of rotary vane vacuum pump
- Key for switch cabinet
- Connection, adapter (see FAM connection overview)
- Technical documentation, consisting of:
  - Operating and maintenance manual
  - Electrical circuit diagram
  - Test report
  - CE declaration of conformity

## Filter elements, suction filter

The suction filter is equipped with a filter element on delivery.

### FAM 3025/3045/3075/3095

One filter element of type 0160 D 200 W/HC is required.

Part number	Designation	Filtration rating	Seal
1265447	0160 D 200 W/HC/-V	200 µm	FKM

## Filter elements, fine filter

Filter elements for the fine filter must be ordered separately and installed before operation on site.

### FAM 3025 / 3045

**MVH-F-118:** One filter element of type N50DMxxx is required.

Recommended operating viscosity range 50Hz (60 Hz)

Part number	Designation	Filtration rating*	Seal	FAM 3025	FAM 3045
3944985	N50DM002	2 µm	FKM	15 to 570 (480) mm <sup>2</sup> /s	15 to 360 (300) mm <sup>2</sup> /s
3944987	N50DM005	5 µm	FKM	15 to 900 (750) mm <sup>2</sup> /s	15 to 570 (480) mm <sup>2</sup> /s
3944988	N50DM010	10 µm	FKM	15 to 940 (790) mm <sup>2</sup> /s	15 to 890 (500) mm <sup>2</sup> /s
3944989	N50DM020	20 µm	FKM	15 to 1100 (1100) mm <sup>2</sup> /s	15 to 1100 (930) mm <sup>2</sup> /s

### FAM 3075 / 3095

**MVH-F-134:** One filter element of type N100DMxxx is required.

Recommended operating viscosity range 50Hz (60 Hz)

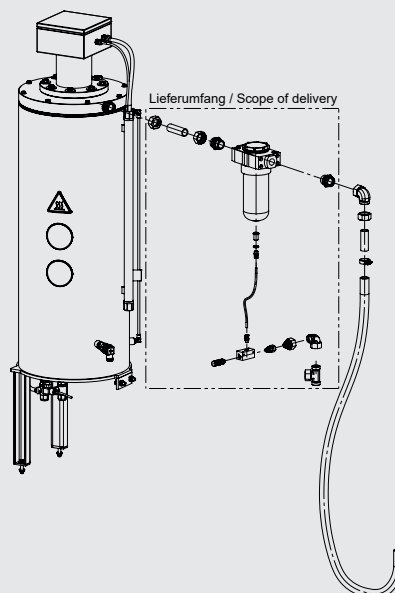
Part number	Designation	Filtration rating*	Seal	FAM 3075	FAM 3095
3944991	N100DM002	2 µm	FKM	15 to 420 (340) mm <sup>2</sup> /s	15 to 340 (280) mm <sup>2</sup> /s
3944992	N100DM005	5 µm	FKM	15 to 770 (590) mm <sup>2</sup> /s	15 to 630 (520) mm <sup>2</sup> /s
3944993	N100DM010	10 µm	FKM	15 to 830 (640) mm <sup>2</sup> /s	15 to 680 (570) mm <sup>2</sup> /s
3944994	N100DM020	20 µm	FKM	15 to 1100 (980) mm <sup>2</sup> /s	15 to 800 (800) mm <sup>2</sup> /s

\*The selection of the filtration rating is dependent on the operating viscosity

## Accessories

- **FCU 1000** for temporary measurement of the solid particle contamination. See brochure DE 7.607.6 FCU 1000 series
  - Connection only possible for FAMs without integrated Contamination Sensor (FAM-xxxx-x-x-x-xx-x-xx-A-..)
  - Connection kit for suction and return port required: Part no.: 4832029
- Oil mist separator, part number 4822182  
If excess oil discharge as the result of the vacuum pump being overfilled is observed within a few days, the oil mist separator can easily be retrofitted. As oil separation is already integrated into the vacuum column, an oil mist separator is not normally needed. Possible oil discharge is largely dependent on the application, e.g. the oil type, oil age, water content, air content and oil temperature.

## Scope of supply, oil mist separator



## Note

The information in this brochure relates to the operating conditions and fields of application described.

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

Subject to technical modifications.

**HYDAC FILTER SYSTEMS GMBH**  
Industriegebiet  
**66280 Sulzbach/Saar, Germany**  
Phone: +49 6897 509-01  
Internet: [www.hydac.com](http://www.hydac.com)  
E-mail: [filtersystems@hydac.com](mailto:filtersystems@hydac.com)