FluidAqua Mobil
FAM 25/45/60/75/95 Series

Description

The FluidAqua Mobil FAM 25/45/60/75/95 series operates according to the principle of vacuum dewatering to separate free and dissolved water as well as free and dissolved gases from hydraulic and lubrication fluids.

By using HYDAC bypass filter technology, with its high contamination retention capacity and separation performance, the unit achieves a very high level of cost effectiveness.

All units have an AquaSensor AS 1000 to continuously monitor the water content and to control the unit. A CS 1000 particle sensor for simultaneous monitoring of the solid particle contamination can be integrated optionally.

To increase the dewatering capacity, a heater can be integrated optionally for highly viscous fluids or for low fluid temperatures.

The Siemens S7 series programmable logic controller (PLC) used in combination with a Siemens touch control panel guarantees simple and reliable handling in numerous local 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 life cycle cost (LCC)

Technical specifications

	FAM 25	FAM 45	FAM 60	FAM 75	FAM 95
Flow rates at 50 Hz	≈ 25 l/min	≈ 45 l/min	≈ 60 l/min	≈ 75 l/min	≈ 95 l/min
Flow rates at 60 Hz	≈ 30 l/min	≈ 54 l/min	≈ 72 l/min	≈ 90 l/min	≈ 114 l/min
Permitted fluids**	Fluids compatible with NBR seals: ● Mineral oils to DIN 51524 ● Gear oils to DIN 51517, 51524 Operating fluids compatible with FKM (FPM,Viton®) seals ● Synthetic esters (HEES) DIN 51524/2 ● Vegetable oils (HETG, HTG) ● HFD fluids (not for pure phosphate ester which require EPDM seals).				
Sealing material	see model code				
Filter size of fine filter	OLF-10		2600 MRF 3/11/40		
Filter elements of fine filter xxx= Filtration rating	N10DMxxx		2600RxxxBN4HC/-KB (-V-KB) N40FMxxx		
Clogging indicator	VM 2 C.0	VM 2 C.0	VM 2 C.0	VM 2 C.0	VM 2 C.0
Pump type, vacuum pump	Rotary vane vacuum pump		Rotary vane vacuum pump or Water ring vacuum pump		
Pump type, others	Gear pumps				
Operating pressure	max. 6 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				
Operation viscosity range**	15 ... 350 mm²/sec (without built-in heater) 15 ... 550 mm²/sec (with built-in heater)				
Fluid temperature range **	10 ... 80°C				
Ambient temperature **	10 ... 40°C				
Storage temperature range **	10 to 50°C				
Relative humidity (ambient) **	Max. 90%, non-condensing				
Electrical power consumption (50 Hz)*					
Without heater	≈ 3.5 kW	≈ 4.5 kW	≈ 5.9 kW	≈ 7.5 kW	≈ 7.5 kW
With heater	≈ 10.5 kW	≈ 13.5 kW	≈ 19.5 kW	≈ 25.5 kW	≈ 25.5 kW
Heating output (optional)	≈ 6.75 kW	≈ 9 kW	≈ 13.5 kW	≈ 18 kW	≈ 18 kW
Protection class	IP 54	IP 55	IP 55	IP 55	IP 55
Length of electric cable / plug	10 m / CEE (depending on the nominal voltage, see model code)				
Hoses, length	5 m (mobile FAMs only)				
Material of hoses	see model code				
Connection, inlet/outlet	see table "Connection summary"				
Weight when empty	≈ 410 kg	≈ 430 kg	≈ 550 kg	≈ 590 kg	≈ 620 kg
Achievable residual water content	< 100 ppm – hydraulic and heavy oils < 50 ppm – turbine oils (ISO VG 32/46) < 10 ppm – transformer oils ***				

* Maximum specifications given, depends 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 – 75 – M – 2 – A – 40 – R – H – C1 – AC1 – 00 – /-V

Basic model
FAM = FluidAqua Mobil

Size
25 ≈ 25 l/min 45 ≈ 45 l/min 60 ≈ 60 l/min
75 ≈ 75 l/min 95 ≈ 95 l/min (50 Hz)

Operating medium
M = Mineral oil - NBR seals, NBR hoses, tested with mineral oil*
I = Insulating oil - NBR seals, NBR hoses, tested with insulating oil (Shell Diala)**
X = HFD-R fluids - FKM seals, UPE hoses, tested with HFD-R fluid (Fyrquel)*
B = Biodegradable oils (based on esters) - FKM seals, NBR hoses, tested with biodegradable oils 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, 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 Ph1)
C	= 200 V, 50 Hz, 3 Ph1)	H	= 440 V, 60 Hz, 3 Ph1)	O	= 460 V, 60 Hz, 3 Ph1)
D	= 200 V, 60 Hz, 3 Ph1)	I	= 500 V, 50 Hz, 3 Ph	X	= other voltages
E	= 220 V, 60 Hz, 3 Ph	K	= 480 V, 60 Hz, 3 Ph1)		on request

Filter size of fine filter
10 = OLF 10 Toploader (FAM 25/45 only)
26 = OFU 2600 (FAM 60/75/95 only)
40 = MRF 3/11/40 (FAM 60/75/95 only)

Vacuum pump type
R = rotary vane vacuum pump
W = water ring vacuum pump (for FAM 60/75/95 only)
WA = water ring vacuum pump with automatic water supply (for FAM 60/75/95 only)

Heater
H = Heater appropriate for the size (see technical data) for available voltages, see following pages
Z = without heater

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)

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

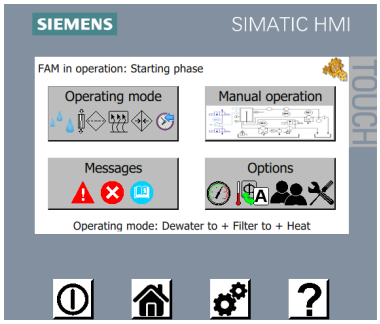
Modification number
00 = the latest version is always supplied

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-25-M....-/V

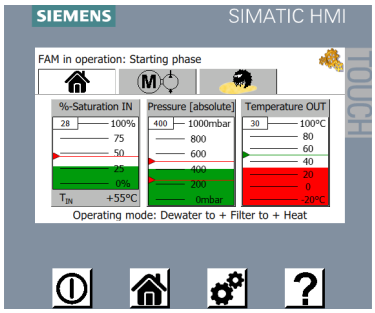
1) Supplied without plug
* Residues of test fluid will remain in the unit after testing.
** Units not suitable for "Online" and "Onload" operation (transformer in operation and connected to grid).

Control concept

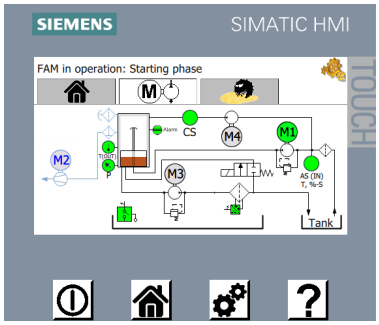
- Siemens S7-1200 with 4" KTP400 TFT colour display with touch and key operation



- Display of water content (% saturation), fluid temperature and optional particle contamination in numerical and graphic form with graphical progress display of measured values



- Automatic, state-based and energy-saving operation through control of the unit via integrated or external AquaSensor or integrated ContaminationSensor
- Display of hydraulic circuit diagram for active or defective components, such as motors/pumps, level sensors and heaters



- Error messages as plain text display and menu-guided troubleshooting
- Up to 10 selectable languages integrated
- Expandable for Ethernet connection and web server for remote monitoring (see accessories)

Heater option

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

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

In general, for operating viscosities between 350 and 550 mm²/s the heater option should be selected and the heater should be used.

Type of vacuum pump

The vacuum pump used for sizes FAM 25/45 is an oil-lubricated rotary vane vacuum pump.

For the sizes FAM 60/75/95 we recommend the tried-and-tested water ring vacuum pump, which only requires tap water as an operating medium rather than any special vacuum pump oil. With its 100% oil-free vacuum generation, it has many advantages: high resistance to steam and condensation, low operating costs and clean and above all low-odour waste air. Furthermore, a portion of the water removed from the oil is recovered within the water ring vacuum pump and fed to the pump's operating water circuit. Depending on the operating conditions, the water ring vacuum pump is then fully self-sufficient in terms of water.

Along with the removed water, the air that emerges from the vacuum pump can, particularly in the case of oil-lubricated rotary vane vacuum pumps, contain components of the operating fluid to be cleaned, which may include gases. Therefore, please ensure that the area in which the FAM is operated is adequately ventilated.

Instrumentation

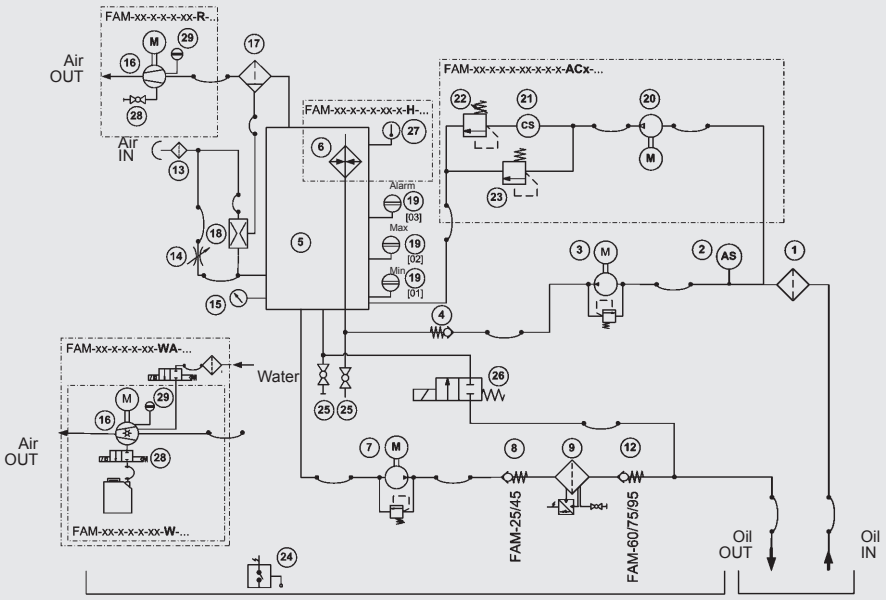
The integrated AquaSensor (AS) enables continuous display of the water content relative to the saturation concentration (saturation level) along with the temperature of the fluid. The optional ContaminationSensor (CS) determines the solid particle contamination of the fluid and displays it in the control panel. The units can also be controlled via both sensors fully automatically for state-based and thus energy-saving operation.

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)

Hydraulic circuit diagram



1	Suction filter	16	Vacuum pump
2	AquaSensor AS 1000	17	Oil mist separator
3	Filling pump	18	Vacuum suction nozzle for the oil mist separator
4	Non-return valve	19	Level sensor for vacuum column
5	Vacuum column	20	Pump for ContaminationSensor CS1000 (optional)
6	Heater (optional)	21	ContaminationSensor CS1000 (optional)
7	Evacuation pump	22	Pressure relief valve for CS1000 (optional)
8	Check valve (FAM-25/45 only)	23	Pressure relief valve for CS1000 (optional)
9	Fluid filter for separating solid particles	24	Leakage indicator for oil drip tray
10	Differential pressure switch for monitoring the filter	25	Drain for vacuum column
11	Drain for fluid filter	26	Return valve
12	Check valve (FAM-60/75/95 only)	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
15	Pressure sensor for measuring the pre-set vacuum		

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 / FAM 45E***
15,000 – 25,000	FAM 45
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. 7.949 FAM 10
*** 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 factors have a major influence on the dewatering performance. The information can thus only serve as a general reference.

		Dewatering rate
Water content	⇧	⇧
Fluid temperature	⇧	⇧
Detergent additives	⇧	⇩
Flow rate of the FAM	⇧	⇧

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

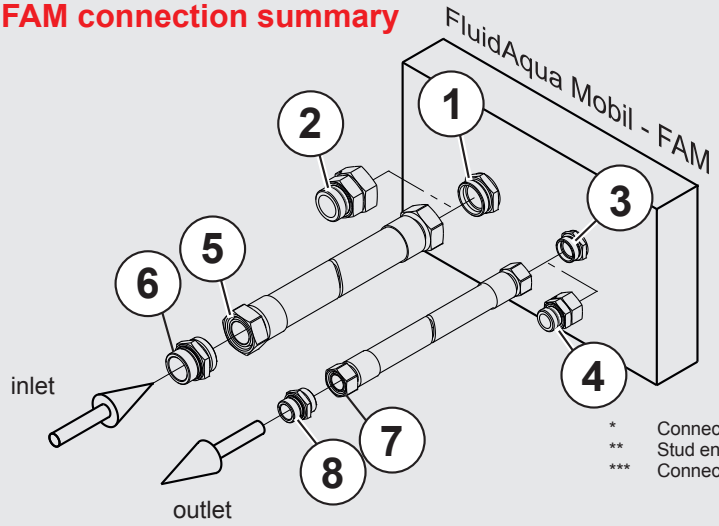
Available voltages and required external fuse

Applicable only when automatic fuses with trip characteristics type C are used.

Voltages \ FAM size	FAM 25	FAM 25 with heater	FAM 45	FAM 45 with heater	FAM 60	FAM 60 with heater	FAM 75	FAM 75 with heater	FAM 95	FAM 95 with heater
A = 400 V, 50 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
B = 415 V, 50 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
C = 200 V, 50 Hz, 3 Ph	32 A	63 A	63 A		63 A		63 A		63 A	
D = 200 V, 60 Hz, 3 Ph	32 A	63 A	63 A		63 A		63 A		63 A	
E = 220 V, 60 Hz, 3 Ph	32 A	63 A	32 A	63 A	63 A		63 A		63 A	
F = 230 V, 60 Hz, 3 Ph	32 A	63 A	32 A	63 A	63 A		63 A		63 A	
G = 380 V, 60 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
H = 440 V, 60 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
I = 500 V, 50 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
K = 480 V, 60 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
L = 220 V, 50 Hz, 3 Ph	32 A	63 A	32 A	63 A	63 A		63 A		63 A	
N = 575 V, 60 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A
O = 460 V, 60 Hz, 3 Ph	16 A	32 A	16 A	32 A	32 A	63 A	32 A	63 A	32 A	63 A

Special version, only on request.

FAM connection summary



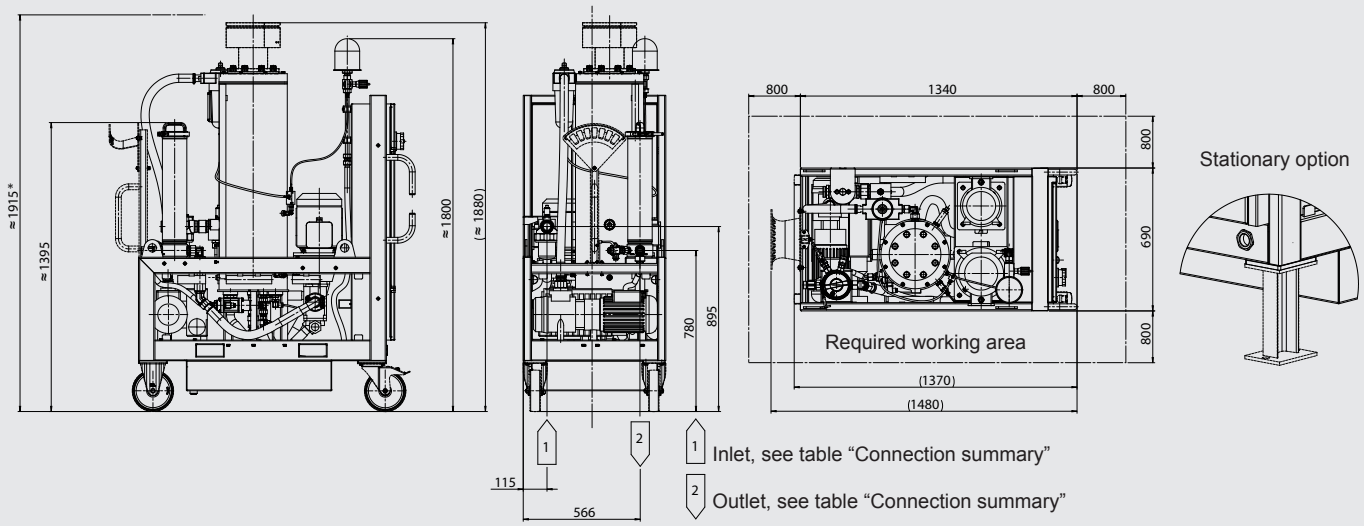
* Connection Form D to ISO 8434-1 Series L (corresponds to ISO 12151, Form S, Series L)
** Stud end to ISO 1179-2 (Form E)
*** Connection Form N to ISO 8434-4 Series L (corresponds to ISO 12151, Form SWS, Series L)

Items 1 to 4 are supplied with the stationary FAM.
Items 5 to 8 are supplied with the mobile FAM, in addition to the connection hoses.

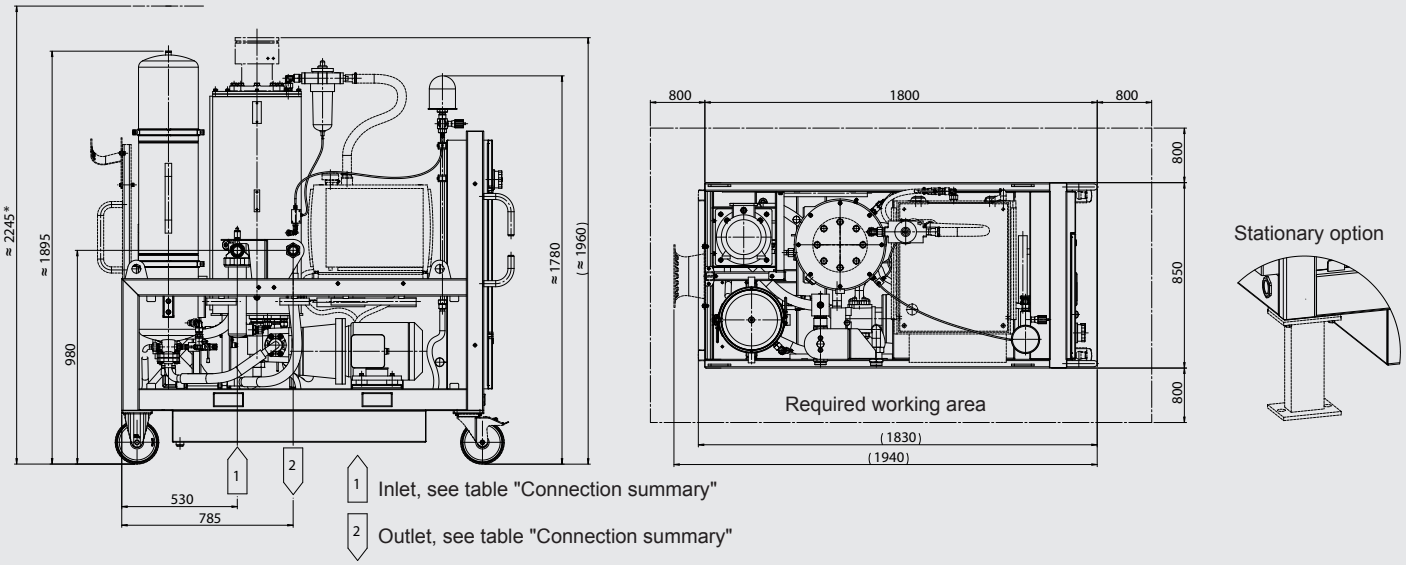
Item	FAM 25	FAM 45	FAM 60	FAM 75	FAM 95
1 - FAM inlet connector	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*
2 - Adapter	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**
3 - FAM outlet connector	28L / M36x2 (male thread)*	28L / M36x2 (male thread)*	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*
4 - Adapter	Adapter G1 A (male thread)**	Adapter G1 A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**
5 - Suction hose connection	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***
6 - Adapter	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**
7 - Pressure hose connection	28L / M36x2 (female thread)***	28L / M36x2 (female thread)***	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***
8 - Adapter	Adapter G1 A (male thread)**	Adapter G1 A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**

Measurements

FAM-25/45



FAM-60/75/95



Items supplied

– FluidAqua Mobil, ready for connection (without cover panel package, see Accessories)
– With suction and return hose on mobile version
– Vacuum pump oil (1 litre) for initial filling of rotary vane vacuum pump (for FAM-x-x-x-x-x-R- ... only)
– Key, square 6 mm (for switch cabinet and cover panel)
– Connection adapter (see FAM connection summary)
– Technical documentation consisting of:
  - Operating and Maintenance Manual
  - Electrical circuit diagram
  - Test certificate
  - CE conformity declaration

Filter elements for suction filter

The suction filter is supplied fitted with a filter element.

FAM 25/45
One filter element of the type 0160 D 200 W/HC is required.

Part number	Description	Filtration rating	Seal
1250304	0160 D 200 W/HC	200µm	NBR
1265447	0160 D 200 W/HC/-V	200µm	FKM

FAM 60/75/95
One filter element of the type 0280 D 200 W/HC is required.

Part number	Description	Filtration rating	Seal
1269748	0280 D 200 W/HC	200µm	NBR
1271978	0280 D 200 W/HC/-V	200µm	FKM

Filter elements for fine filter

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

FAM 25/45

OLF 10: 1 filter element of the type N10DMxxx is required.

Part number	Description	Filtration rating	Seal
3539235	N10DM002	2 µm	FKM
3539237	N10DM005	5 µm	FKM
3539238	N10DM010	10 µm	FKM
3539242	N10DM020	20 µm	FKM

FAM 60/75/95

OFU 2600: 1 filter element of the type 2600RxxxBN4HC/-KB (-V-KB) is required.

Part number	Description	Filtration rating	Seal
1263071 (1263784)	2600R003BN4HC/-KB (-V-KB)	3 µm	NBR (FKM)
1263072 (1263785)	2600R005BN4HC/-KB (-V-KB)	5 µm	NBR (FKM)
1263073 (1263786)	2600R010BN4HC/-KB (-V-KB)	10 µm	NBR (FKM)
1263074 (1263787)	2600R020BN4HC/-KB (-V-KB)	20 µm	NBR (FKM)

MRF 3/11/40: 11 filter elements of the type N40MRxxx-PES1F are required.

Part number	Designation	Filtration rating	Seal
3509897	N40FM-P001-PES1F	1 µm	FKM
3536452	N40FM-P003-PES1F	3 µm	FKM
3506155	N40FM-P005-PES1F	5 µm	FKM
3506053	N40FM-P010-PES1F	10 µm	FKM
3491730	N40FM-P020-PES1F	20 µm	FKM

Accessories

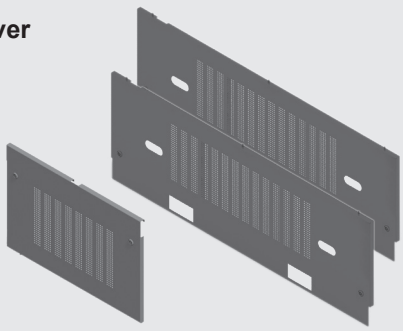
– Cover panel package: 2 x side sections, 1 x rear cover

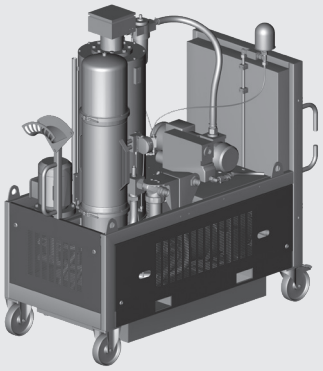
FAM-25/45

Part number	Description
3334212	Cover panel FAM 25/45

FAM-60/75/95

Part number	Description
3334177	Cover panel FAM 60/75/95





– Retrofit kit Ethernet connection for web server

For FAM with SIEMENS S7-1200 controller, PLC program version V1.56 and higher.

Part number 4355412

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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