



FluidAqua Mobil FAM Economy Series

Description

The FluidAqua Mobil FAM Economy 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 are equipped with an AquaSensor AS 1000 for continuous monitoring of the water content and control of the unit. An FCU 1000 (see Accessories) can be connected for temporary measurement of 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 have the following benefits:

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

Technical specifications

FAM	45E	75E
Flow rates IN at 50(60) Hz	≈ 45(54) l/min	≈ 75(90) l/min
Flow rates OUT at 50(60) Hz	Max. ≈ 54(65) l/min	Max. ≈ 90(103) l/min
Permitted fluids**	<ul style="list-style-type: none"> • Mineral oils to DIN 51524 • Gear oils to DIN 51517, 51524 • Synthetic esters (HEES) DIN 51524/2 • Vegetable oils (HETG, HTG) • HFD-R fluids (not for pure phosphate esters for which EPDM seals are required) 	
Sealing material	FKM (FPM, Viton®)	
Filter size of fine filter	OLF-50	OLF-100
Filter elements for fine filter	N50DMxxx	N100DMxxx
... 150 mm²/sec	≥ 2 µm	≥ 2 µm
... 460 mm²/sec	≥ 10 µm	≥ 10 µm
... 1100 mm²/sec	≥ 20 µm	≥ 20 µm
Clogging indicator	VM 2 C.0	VM 2 C.0
Pump type, vacuum pump	Rotary vane vacuum pump	
Operating pressure **	Max. 9 bar	
Permitted pressure at outlet (without return hose)	0 to 3.5 bar	
Permitted pressure at suction port (without suction hose) **	-0.2 ... 1 bar	
Operating viscosity range**	15 ... 800 mm²/sec without built-in heater 15 ... 1100 mm²/s with integrated heater	
Fluid temperature range **	10 ... 80°C	
Ambient temperature **	10 ... 45°C	
Storage temperature range **	10 to 50 °C	
Relative humidity (ambient) **	Max. 90%, non-condensing	
Electrical power consumption *		
without built-in heater	≈ 4.5 kW	≈ 8.3 kW
with built-in heater	≈ 11.25 kW	≈ 26.3 kW
Heating output (optional)	≈ 6.75 kW	≈ 18 kW
Protection class	IP 54	IP 55
Length of electric cable / plug	10 m / CEE (depending on the nominal voltage, see model code)	
Length of hoses	5 m (mobile FAMs only)	
Material of hoses	see model code	
Connection inlet/outlet	see Connection summary table	
Weight when empty	≈ 405 kg	≈ 465 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, 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 - 45E - M - 2 - A - 50 - R - H - C1 - A - 00

Basic model

FAM = FluidAqua Mobil

Size

45E ≈ 45 l/min (50Hz), Economy series

75E ≈ 75 l/min (50 Hz), Economy series

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 (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 casters)

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 S = 380 V, 50 Hz, 3 Ph

E = 220 V, 60 Hz, 3 Ph K = 480 V, 60 Hz, 3 Ph¹⁾ X = other voltage
on request

Filter size of fine filter

OLF 50 (FAM 45E only)

OLF 100 (FAM 75E only)

Type of vacuum pump

R = rotary vane vacuum pump

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

Modification number

00 = the latest version is always supplied

Supplementary details

No details = standard

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) and fluid temperature 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 using MIN/MAX values
- 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)

Type of vacuum pump

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

Along with the removed water, the air that emerges from the vacuum pump can 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.

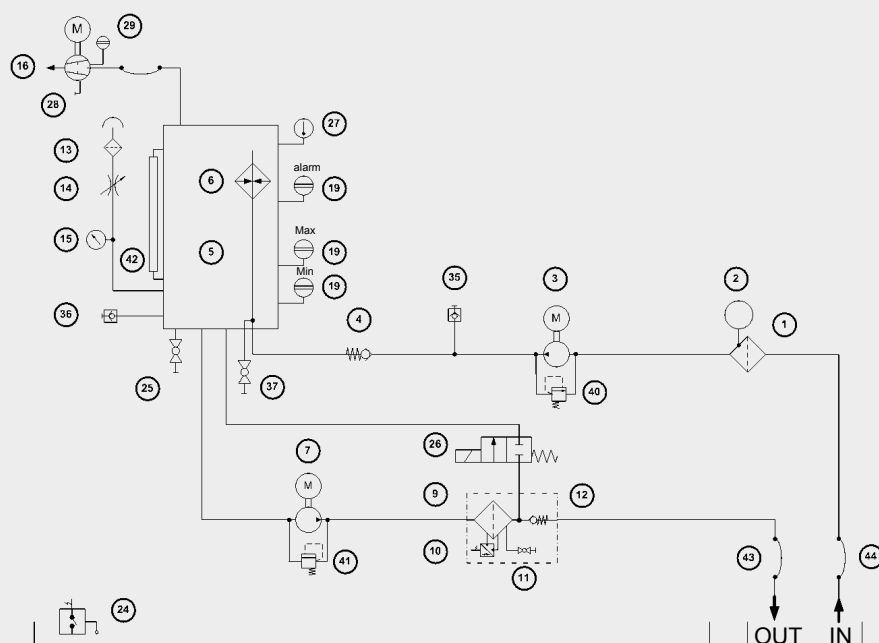
Heater

By using the integrated 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 to 60 °C.

Generally speaking, for operating viscosities of between 800 and 1100 mm²/sec, the heater option must be selected and the heater must be in operation.

Hydraulic circuit diagram



1	Suction filter	19	Level sensor for vacuum column
2	AquaSensor	24	Leakage indicator for oil drip tray
3	Filling pump	25	Drain for vacuum column
4	Check valve	26	Return valve
5	Vacuum column	27	Temperature sensor
6	Heater	28	Drain for vacuum pump
7	Evacuation pump	29	Level sensor for vacuum pump
9	Fine filter for eliminating solid particles	35	Suction port connection for FCU1000
10	Differential pressure switch for monitoring the filter	36	Return line connection for FCU 1000
11	Fine filter drainage	37	Drain for heater
12	Check valve	40/41	Pressure relief valve (integrated in pump)
13	Air filter	42	Visual fluid level gauge
14	Needle valve for vacuum setting	43	Return hose (mobile version only)
15	Pressure gauge for measuring the pre-set vacuum	44	Suction hose (mobile version only)
16	Vacuum pump		

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 and automatic control of the unit on the basis of the saturation level.

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. 7.639. FAM 5

** see Brochure no. 7.949. FAM 10

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

- 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 in particular 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.

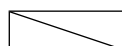
	Dewatering rate	
Water content	↑	↑
Fluid temperature	↑	↑
Detergent additives	↑	↓
Volumetric flow of the FAM	↑	↑

For triggering 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.

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

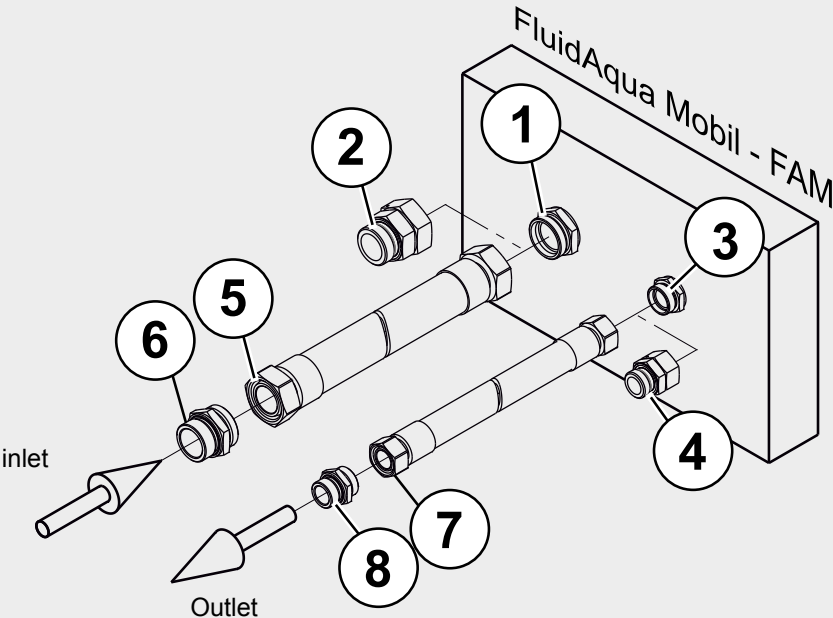


Special model, only on request.

Preferred models (with shorter delivery times)

Part no.	Model code
3772164	FAM-45E-M-2-A-50-R-H-C1-A-00
4292381	FAM-45E-M-2-A-50-R-H-C2-A-00
3772161	FAM-75E-M-2-A-100-R-H-C1-A-00
4292380	FAM-75E-M-2-A-100-R-H-C2-A-00

FAM connection summary



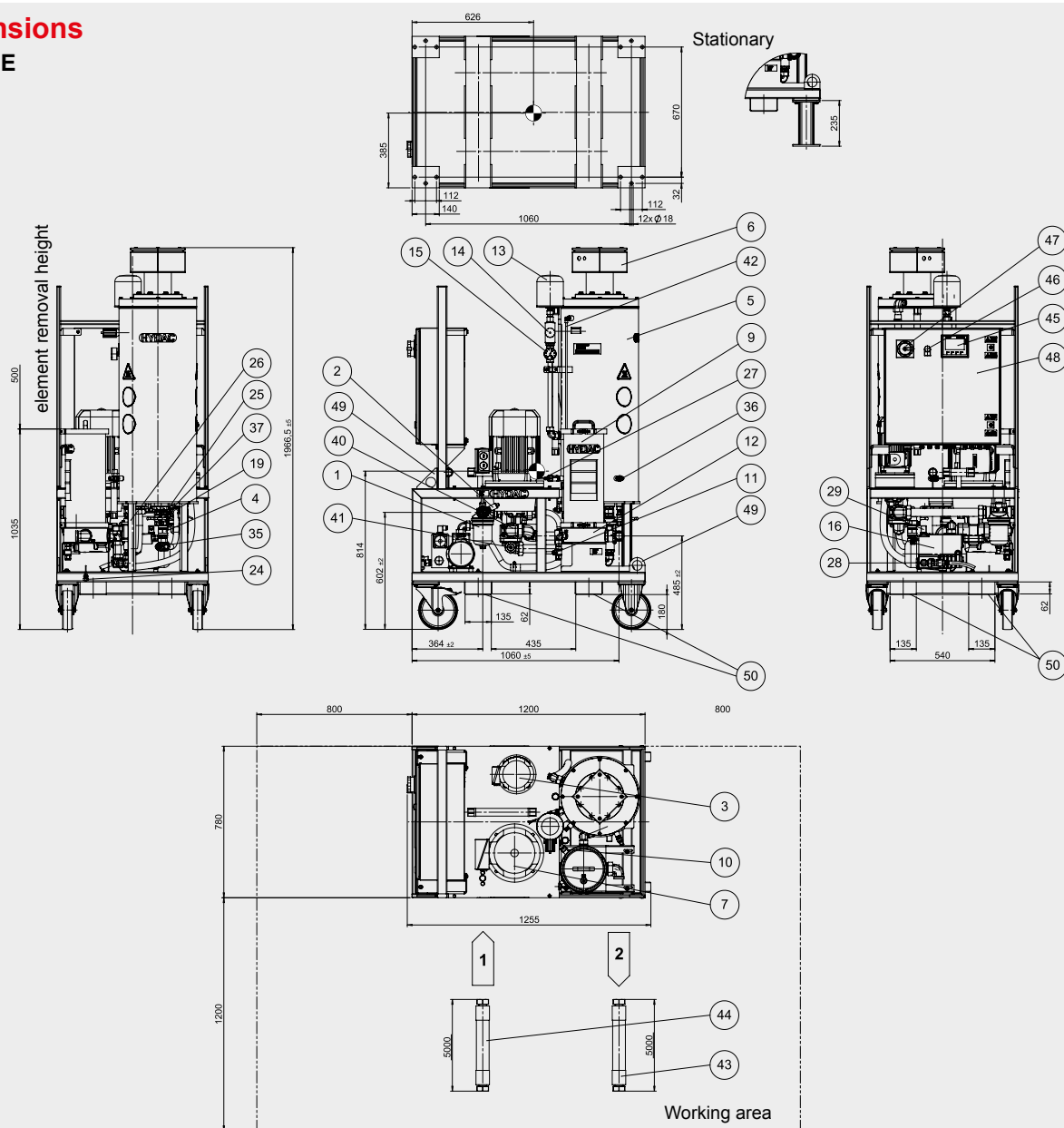
Item	FAM 45E	FAM 75E
1 - FAM inlet connection	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*
2 - Adapter	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**
3 - FAM outlet connection	42L / M52x2 (male thread)*	42L / M52x2 (male thread)*
4 - Adapter	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**
5 - Suction hose connection	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***
6 - Adapter	Adapter G1½ A (male thread)**	Adapter G1½ A (male thread)**
7 - connection, return hose	42L / M52x2 (female thread)***	42L / M52x2 (female thread)***
8 - Adapter	Adapter G1½ A (male thread)**	Adapter G1½ 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 hoses.

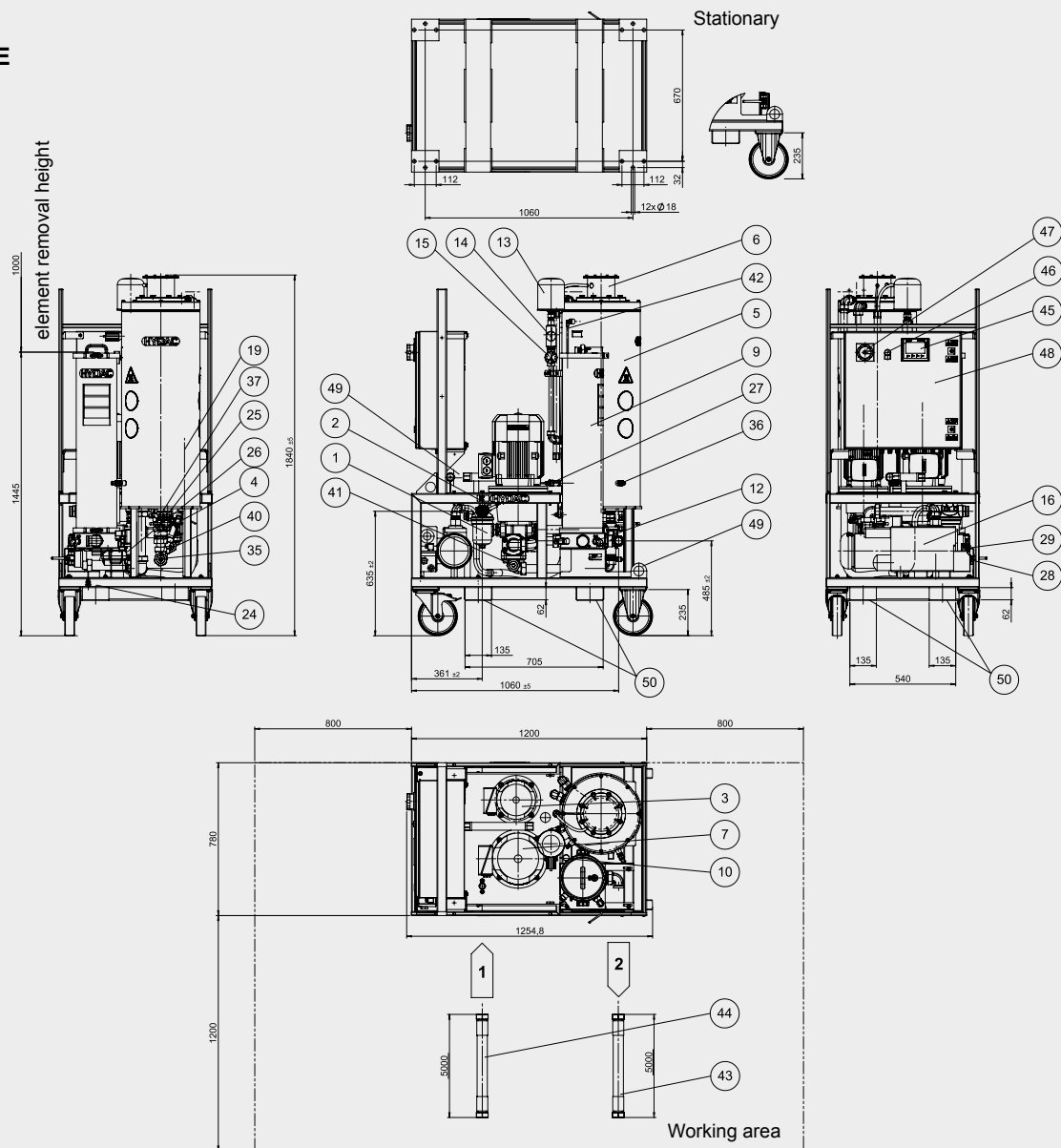
Dimensions

FAM-45E



- | | |
|---|---|
| 1 Suction filter | 27 Temperature sensor |
| 2 AquaSensor | 28 Drain for vacuum pump |
| 3 Filling pump | 29 Level sensor for vacuum pump |
| 4 Check valve | 35 Suction port connection for FCU1000 |
| 5 Vacuum column | 36 Return line connection for FCU 1000 |
| 6 Heater | 37 Drain for heater |
| 7 Evacuation pump | 40 Pressure relief valve for filling pump |
| 9 Fine filter for eliminating solid particles | 41 Pressure relief valve for evacuation pump |
| 10 Differential pressure switch for monitoring the filter | 42 Visual fluid level gauge for vacuum column |
| 11 Fine filter drainage | 43 Return hose (mobile version only) |
| 12 Check valve | 44 Suction hose (mobile version only) |
| 13 Air filter | 45 Control panel |
| 14 Needle valve for vacuum setting | 46 Fault indicator light |
| 15 Pressure gauge for vacuum setting | 47 Main switch |
| 16 Vacuum pump | 48 Switch cabinet |
| 19 Level sensor for vacuum column | 49 Lifting eye |
| 24 Leakage indicator for oil drip tray | 50 Forklift pockets |
| 25 Drain for vacuum column | |
| 26 Return valve | |

FAM-75E



- | | |
|---|---|
| 1 Suction filter | 27 Temperature sensor |
| 2 AquaSensor | 28 Drain for vacuum pump |
| 3 Filling pump | 29 Level sensor for vacuum pump |
| 4 Check valve | 35 Suction port connection for FCU1000 |
| 5 Vacuum column | 36 Return line connection for FCU 1000 |
| 6 Heater | 37 Drain for heater |
| 7 Evacuation pump | 40 Pressure relief valve for filling pump |
| 9 Fine filter for eliminating solid particles | 41 Pressure relief valve for evacuation pump |
| 10 Differential pressure switch for monitoring the filter | 42 Visual fluid level gauge for vacuum column |
| 11 Fine filter drainage | 43 Return hose (mobile version only) |
| 12 Check valve | 44 Suction hose (mobile version only) |
| 13 Air filter | 45 Control panel |
| 14 Needle valve for vacuum setting | 46 Fault indicator light |
| 15 Pressure gauge for vacuum setting | 47 Main switch |
| 16 Vacuum pump | 48 Switch cabinet |
| 19 Level sensor for vacuum column | 49 Lifting eye |
| 24 Leakage indicator for oil drip tray | 50 Forklift pockets |
| 25 Drain for vacuum column | |
| 26 Return valve | |

Items supplied

- FluidAqua Mobil, ready-for-connection
- With suction and return hose on mobile version
- Vacuum pump oil (1 litre) for initial filling of rotary vane vacuum pump
- Key to the control cabinet
- Connection adapter (see FAM connection summary)
- Technical documentation consisting of:
 - Operation and maintenance instructions
 - Electrical wiring diagram
 - Test certificate
 - CE Declaration of Conformity

Filter elements for suction filter

The suction filter is supplied fitted with a filter element.

FAM 45E / 75E

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

Part number	Description	Filtration rating	Seal
1265447	0160 D 200 W/HC/-V	200 µm	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 45E

OLF 50: 1 filter element of the type N50DMxxx is required.

Part number	Designation	Filtration rating*	Seal
3944985	N50DM002	2 µm	FKM
3944987	N50DM005	5 µm	FKM
3944988	N50DM010	10 µm	FKM
3944989	N50DM020	20 µm	FKM

FAM 75E

OLF 100: one filter element of the type N100DMxxx is required.

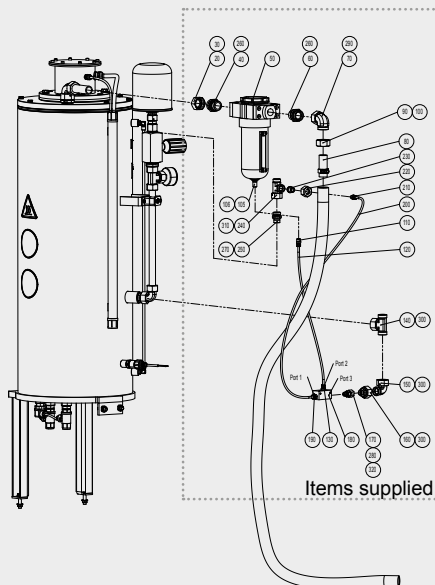
Part number	Designation	Filtration rating*	Seal
3944991	N100DM002	2 µm	FKM
3944992	N100DM005	5 µm	FKM
3944993	N100DM010	10 µm	FKM
3944994	N100DM020	20 µm	FKM

*The selection of the filtration rating is dependent on the operating viscosity – see **Technical data**

Accessories

- FCU 1000 for temporary measurement of the particle contamination. See Brochure no. E 7.607.6 FCU 1000 Series
- Suction hose for connecting the FCU 1000 to the FAM, part number 3992965
- Oil mist separator, part number 3921668
If, after a few days, there is obvious excessive oil carry-over as a result of overfilling the vacuum pump, the oil mist separator can easily be retrofitted. As oil separation is integrated within the vacuum column, the oil mist separator is not normally required. Potential oil carry-over is greatly dependent on the application, e.g. the oil type, oil age, water content, air content and oil temperature
- Retrofit kit Ethernet connection for web server. For FAM with SIEMENS S7-1200 controller, PLC program version V01.56 and higher. Part number 4355412

Items supplied Oil mist separator



Note

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

For fields of application or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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