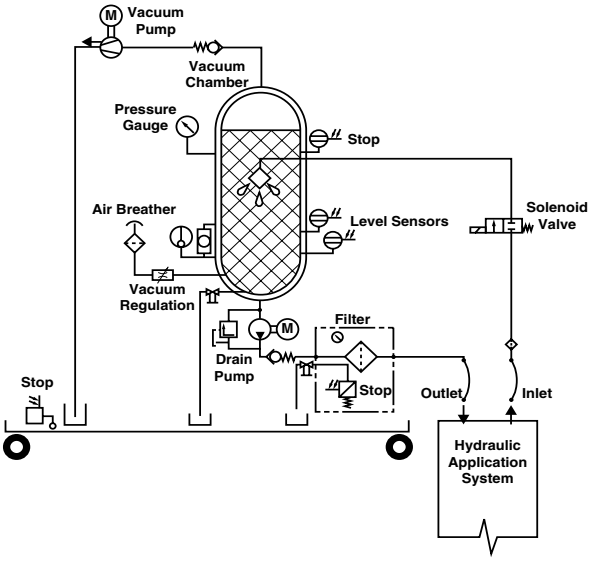
FAMH Series
Vacuum Dehydrator - Water & Solid Removal

Hydraulic Symbol



Description

The dewatering and filtration unit FAMH is a bypass unit which has been specially designed for the conditioning of lubrication and hydraulic fluids. Use of HYDAC's Dimicron® filter element technology provides a high contamination retention capacity.

The FAMH has been redesigned to include a touch screen menu for ease of diagnostics.

Advantages

- Nema 12 Standard
- Separation of 100% free and 90% dissolved water through vacuum dehydration
- Removal of 100% free and 95% dissolved gases
- Separation of particles with high contamination retention capacity
- Easy handling and automatic supervision of the PLC controlled process
- User friendly touch screen diagnostics
- Standard aquasensor provides % water saturation
- JIC connections

Applications

- Steel and rolling mills
- Pulp and paper plants
- Power generation plants
- Tool machines / Plastic machines
- Hydraulic operated presses
- Oil conditioning

Options

- Nema 4 Enclosure

HYDAC FAMH vs Other

- Water removal below saturation point
- Static flow through the filter
- Optimal particle removal efficiency
- Removed water is used to seal the vacuum pump *(Vacuum Pump type S, SW only)*
- The special vacuum pump concept avoids any dangerous chemical reaction products *(Vacuum Pump type S, SW only)*
- No corrosion within the vacuum pump
- No oil mist with standard watering / vacuum pump
- Serviceable vacuum chamber
- Low operating costs
- User friendly on screen operational and maintenance instructions

The contamination of hydraulic fluids with water can either be caused by condensation or by ingression. Variations in temperature of the hydraulic tank lead to condensation. The ingression of water can be caused by defective cooler hoses, defective seals or external leakages into the system.

In lubrication and hydraulic fluids water can occur in two different forms:

- free water *(visible)*
- dissolved water *(not visible)*

Aquamicron® elements, centrifuges and condensation methods normally only separate free water, the FAMH separates both forms of water from the oil. While dewatering the fluid, dissolved gases are also removed. Thereby the lubricating properties are improved which extends oil life, reduces component wear rates, and eliminates production losses caused by breakdowns.

Model Code

FAMH 30 M 2 O / 2700 030 DM 02 S A 1*

Series
FAMH = Fluid Aqua Mobile

Flow Rate
15 = 5 gpm
30 = 10 gpm
50 = 16 gpm
70 = 23 gpm

Operating Fluid
M = Mineral Oils *(including Oils with max. viscosity as identified in Technical Data)*
I = Transformer Oil *(heater required)*
X = Synthetic & Fire Resistant Oil *(please specify exact fluid type)* - FPM seals

Type
1 = Stationary
2 = Mobile

Voltage/Frequency
F = 230 V / 60 Hz / 3Ph+PE
O = 460 V / 60 Hz / 3Ph+PE
N = 575 V / 60 Hz / 3Ph+PE

Power

without heater		**with heater**	
1900	= 1900 W *(FAMH 15)*	8650	= 8650 W *(FAMH 15)*
2700	= 2700 W *(FAMH 30)*	19200	= 19200 W *(FAMH 30)*
3200	= 3200 W *(FAMH 50)*	21200	= 21200 W *(FAMH 50)*
5100	= 5100 W *(FAMH 70)*	26100	= 26100 W *(FAMH 70)*

Filter Size *(microns)* **& Number of Elements**
015 = 1 x N15DMxx *(FAMH 15 only)*
030 = 2 x N15DMxx *(FAMH 15 and 30 only)*
045 = 3 x N15DMxx *(FAMH 15, 30 and 50 only)*
060 = 4 x N15DMxx *(FAMH 15, 30 and 50 only)*
075 = 5 x N15DMxx *(FAMH 70 only)*

Filter Material
DM = Dimicron®

Absolute Filtration Rating *(micron)*
02 = 2 µm (DM)
10 = 10 µm (DM)
20 = 20 µm (DM)
30 = 30 µm (DM)

Vacuum Pump Type/Size
D = Rotary vane pump (operating fluid I, X)
S = Standard watering / vacuum pump

Measuring Equipment
A = AquaSensor *(standard)*

Modification Number *(latest version always supplied)*
1
SW = Automatic Water Fill

Note: Please consult factory for NEMA4 enclosure.

Model Codes Containing RED are non-standard items – Minimum quantities and longer lead times may apply - Contact HYDAC for information and availablity.

***Sample Model Code** *(top of the page)* **is a standard version.**
FAMH 30 M 2 O / 2700 030 DM 02 S A 1 - Standard FAMH without a heater
FAMH 30 M 2 O / 19200 030 DM 02 S A 1 - Standard FAMH with a heater
All other models have a 4 week delivery.

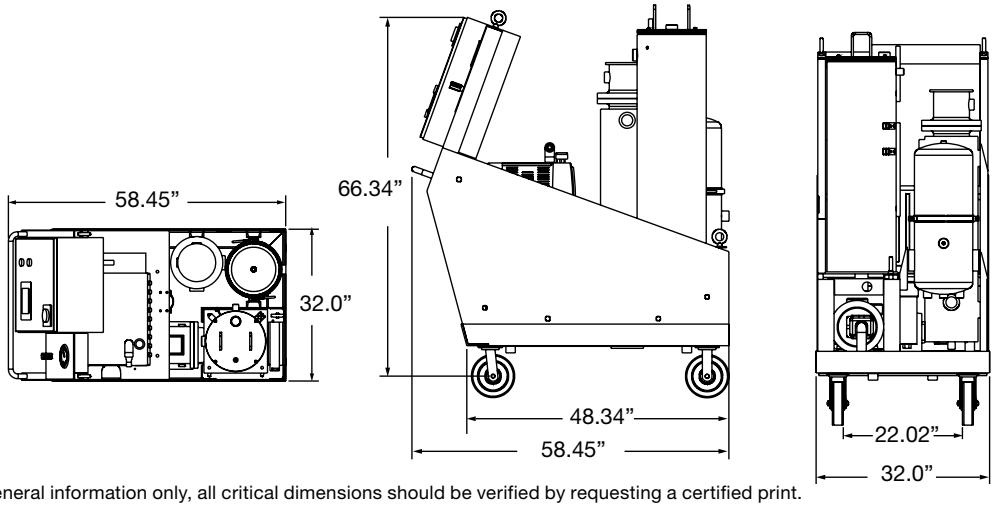
For replacement element part numbers, please see page 69 of this catalog.

For special models, please contact our sales/technical department *See next page for factors that affect water removal rate

Technical Details

Series	FAMH 15	FAMH 30	FAMH 50	FAMH 70
Filter Size	OLF-15	OLF-30	OLF-45	OLF-70
Filter Element	N15DMxxx(1x)	N15DMxxx(2x)	N15DMxxx(3x)	N15DMxxx(5x)
Capacity of Pressure Vessel gal (liters)	5.25 (20)	10.5 (40)	20.5 (78)	26.25 (100)
Approx. Solid Contamination removal to ISO 4572 lbs (g)	1.1 (500)	2.2 (1000)	3.3 (1500)	5.5 (2500)
Electric Clogging Indicator	VM 2C.x			
Bypass Cracking Pressure psi (bar)	29 (2)			
Pump Type	Gear pump			
Flow rate gpm	5	10	16	23
Maximum Operating Pressure psi (bar)	87 (4.5)			
Viscosity Range (without) SUS (cst)	75-2500 (15-500)			
Electrical Cable Length ft (m)	32 (10)			
Hose Length ft (m)	16 (5)			
Hose Material	NBR			
Inlet - Outlet	JIC 20 (1 1/4") - JIC 16 (1")			
Seal Material (FPM for operating fluid B, X)	NBR			
Dry Weight (lbs.)	940	970	1100	1145
Fluid Temperature	50° to 175°F			
Ambient Temperature	5° to 105°F			
Approx. Max. Free Water Removal Rate* (gallons/hour)	0.75	1	1.5	2
Attainable water content (ppm)	< 100 ppm			
Power Requirements	60 AMP Circuit Required			

Dimensions



Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.

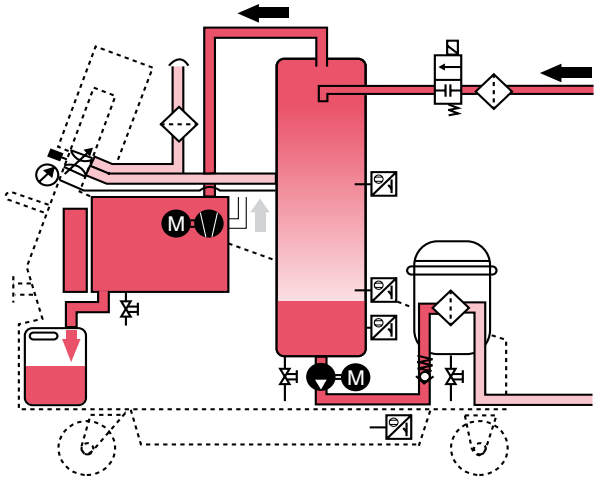
Water Extraction Process

(for FAMH 15 - 70 without heater only)

The operating fluid is drawn from the oil reservoir by the vacuum in the reactor through the suction strainer and the shut-off valve. The oil trickles down slowly and from there is fed back into the oil reservoir by the gear pump through the filter. When Dimicron filter element technology is used the unit is especially economical.

Water is removed from the fluid in the reactor. The vacuum present has the effect of reducing the boiling point of the water.

The water vapor is released into the atmosphere or the water reservoir through the vacuum pump.



Negative Effects of Water on Oils

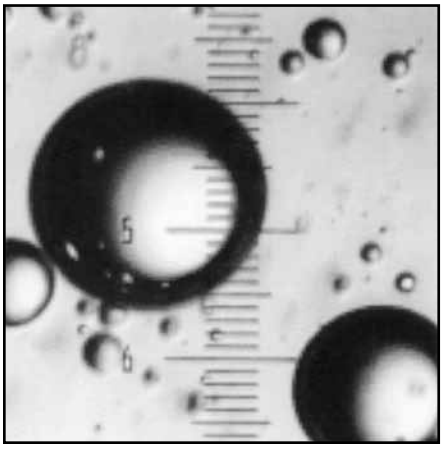
It is almost certain that there is water in a hydraulic system. The most frequent causes are: ambient humidity, splash water, and new oil. Mineral based oils show a faster aging process, if there is water in the oil. This aging process is accelerated through contamination particles by a catalytic effect. The additives are quickly used up and the lifetime of the operating fluid is much shorter than that of “dry” oil.

Water in Mineral Oil causes

- Ageing of the fluid
- Fluid deterioration
  - Reduced air separating — results in: Cavitation
  - Increased foaming — results in: Cavitation
  - Reduced lubrication — results in: Vibration & Wear
  - Erratic operation — results in: Inaccuracy
- Depletes additives
- Clogged filters
- Corrosion

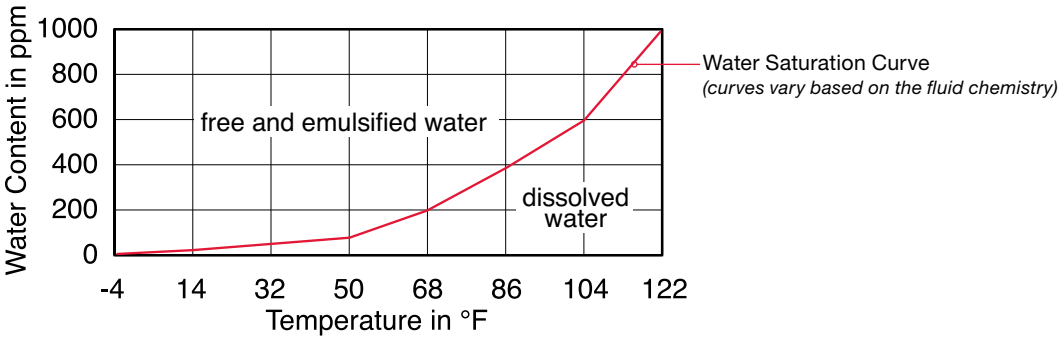
Water in Ester Oils causes:

- Hydrolysis
- Seal deterioration
- Leakage



Tiny water droplets in hydraulics fluid
(i unit equals 10 micron)

Typical Saturation Limit of Hydraulic Oil for Water



FAMH Sizing

Sizing of the FAMH is normally done through periodic measuring of the water content which will determine the hourly ingression of water. The typical dewatering speed of the FAMH is listed in the technical data table. If there is a continuous ingression of water the recommended flow rate of the FAMH can be determined by the system size *(total gallons)*. It should circulate 3 or 4 times through the FAMH every day.

Sizing Chart Limits

(continuous water ingression)

Tank Volume (gallons)	FAMH Model
1000 to 2000	FAMH 15
2000 to 4000	FAMH 30
4000 to 7000	FAMH 50
7000 and up	FAMH 70

*Please note that the fluid temperature should be a minimum of 20°F warmer than the ambient air temperature to enable efficient dewatering. An inline heater is available for reclaim applications. Please contact our sales/technical department.

Factors That Affect Water Removal Rate

	Factor (increasing/decreasing)	Dewatering Speed
Water Content	↑	↑
Fluid Temperature*	↑	↑
Detergent Additives		↓
Absolute Pressure in Vacuum Chamber	↓	↑
Humidity	↓	↑
FAM Flow Rate	↑	↑
Ester Oils		↘