FluidMonitoring Module
FMM

Description

The FluidMonitoring Module FMM series combines two of HYDAC's condition monitoring products in one system, the ContaminationSensor CS 1000 and the AquaSensor AS 1000 or HYDACLab 1400.

It provides the user with a robust and stationary system for online measurement of:

- Solid particle contamination
- Water content (e.g. to detect leakage) in hydraulic and lubrication fluids.
- Oil condition (e.g. relative change in electrical conductivity and dielectric constant)

The FMM series of blocks have all the necessary connections and are therefore easy to install in existing hydraulic circuits.

Various models are available for use in filtration & cooler/heater circuits, pressure and high pressure applications.

Advantages

- Cost-optimised installation solution
- Early detection of critical machine conditions
- Continuous monitoring of oil conditions
- Condition-based scheduled maintenance

Technical Data

General data	
FMM - O - M - ...	Offline circuits 6 to 15 bar
FMM - P - S - ...	Pressure circuits 5 to 300 bar
FMM - P - M - ...	Pressure circuits 5 to 300 bar

Model code

FMM - O - M - 0 - CS 1 2 2 0 - A - AS1C - 0 - 0 - 0 / -000

Type
FMM = Fluid Monitoring Module

Hydraulic application
O = offline (bypass flow circuit, <15 bar) only sensor combination M
P = pressure line (pressure circuit, >5 bar)

Sensor combination
S = CS1000
M = CS1000 + AS1000 or CS1000 + AS3000 or CS1000 + HYDACLab

Seal
0 = FKM (FPM/Viton®)
1 = EPDM (not for hydraulic accumulator and only with CS1000 + AS1000 or CS1000 + AS3000)

Contamination Sensor CS1000 series
CS 1210 = ISO / SAE, without display (FKM)
CS 1220 = ISO / SAE, with display (FKM)
CS 1310 = ISO / SAE / NAS, without display (FKM)
CS 1320 = ISO / SAE / NAS, with display (FKM)
CS 1211 = ISO / SAE, without display (EPDM)
CS 1221 = ISO / SAE, with display (EPDM)
CS 1311 = ISO / SAE / NAS, without display (EPDM)
CS 1321 = ISO / SAE / NAS, with display (EPDM)

Analogue interface of the CS1000
A = 4 to 20 mA
B = 2 to 10 vDC

Additional sensor
AS1C = AquaSensor AS1000 with 2x analogue output 4 to 20 mA
AS12 = AquaSensor AS1000 with 2x switching output (can be configured)
AS35 = AquaSensor AS3000 with 2x switching output (can be configured) and 1x analogue output (can be configured); no interface and not compatible with C11 and C111
HLB10 = HydacLab HLB1400 with 2x output (switching output/analogue output – freely selectable / configurable)
HLB11 = HydacLab HLB1400 with RS485 (2 wire)
HLB12 = HydacLab HLB1400 with 2x output (switching output/analogue output – freely selectable / configurable) and RS485 (2 wire)
Z = without additional sensor (FMM-P-S only)
Z(AS) = without additional sensor, prepared for AS
Z(HL) = without additional sensor, prepared for HLB

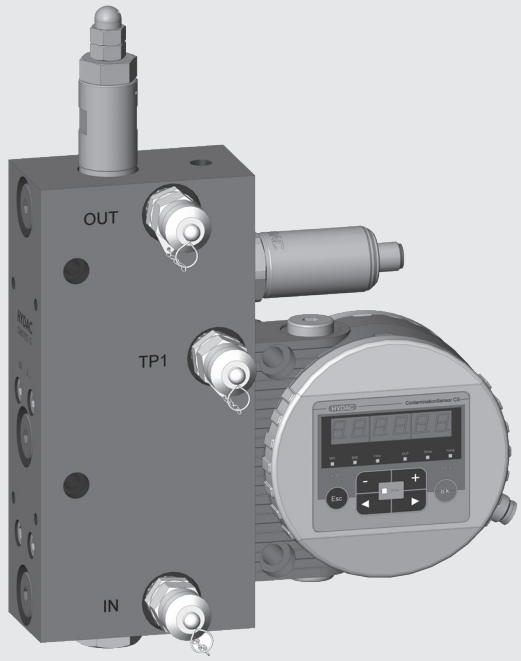
Hydraulic accumulator
0 = without hydraulic accumulator

Filter
0 = without filter (only for FMM-O)
1 = protective filter (25µm) (for FMM-P)

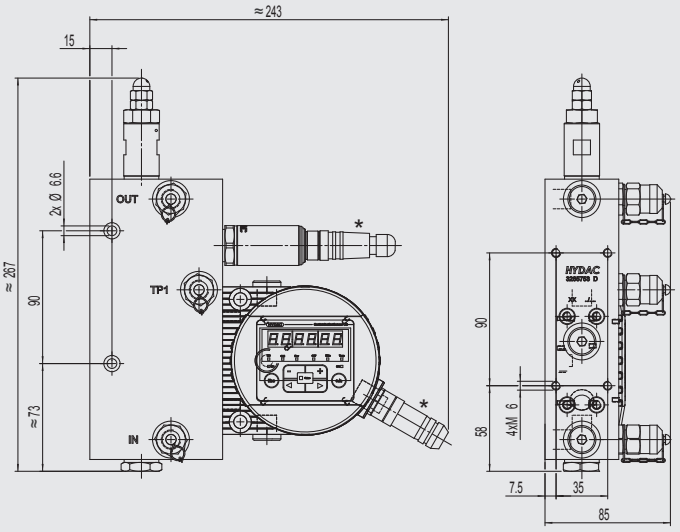
Options
0 = no options

Modification number
000 = modification number

FMM - O - M - ...
(previously known as: FMM)

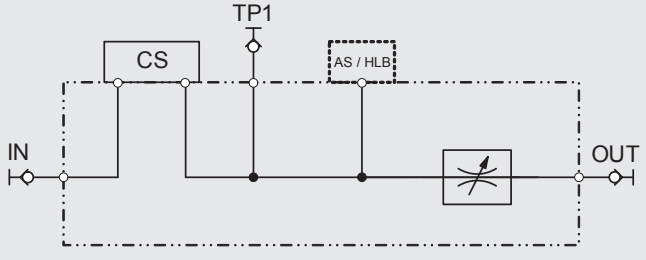


Dimensions in mm



* not included in scope of delivery

Hydraulic circuit diagram



Technical Data

Mounting position	Vertical (flow from bottom to top)
Max. operating pressure	6 to 15 bar / 87 to 217 psi
Minimum differential pressure	6 bar / 87 psi (recommended)
Permitted viscosity range	1 to 350 mm²/s
Hydr. connection (IN, OUT)	Test point type 1604 or G 1/4“ (ISO 228)
Sealing material	FKM / EPDM
Fluid temperature range	0 to 85 °C / 32 ... 185 °F
Ambient temperature range	-30 to 80 °C / -22 ... 176 °F
Storage temperature range	-40 to 80 °C / -40 ... 176 °F
Relative humidity	Max. 95%, non-condensing
Weight	4.3 kg

Model code

See previous page

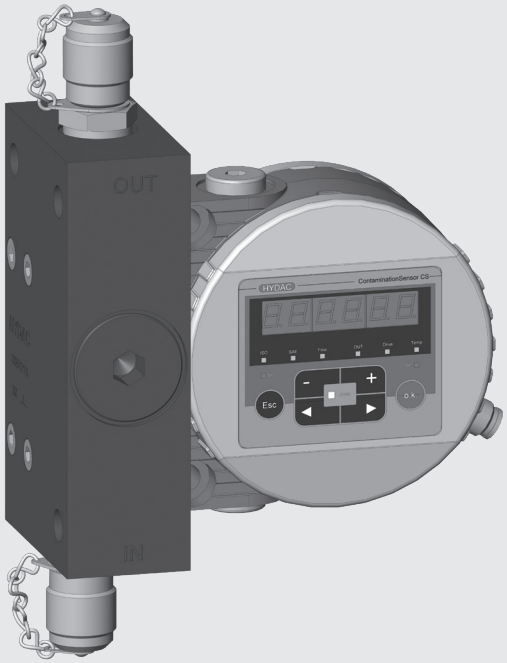
Scope of delivery

– 1 FMM - O - M - ...
– 1 Installation and Maintenance Instructions for FMM-O-M
– 1 manual for additional sensor (optional)
– 1 CD with Operation and Maintenance Instructions for CS 1000 in different languages (PDF viewer software required)
– 1 CD with FluMoS light (fluid monitoring software to operate and parameterise the sensor)

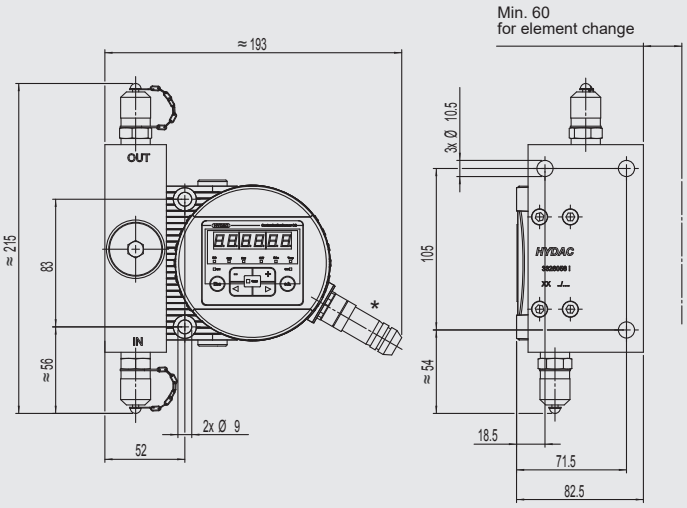
Zubehör

A wide range of accessories can be found in the brochure “Filter Systems Accessories” (D 7.623...).

FMM - P - S - ...
(previously known as: FMMP)

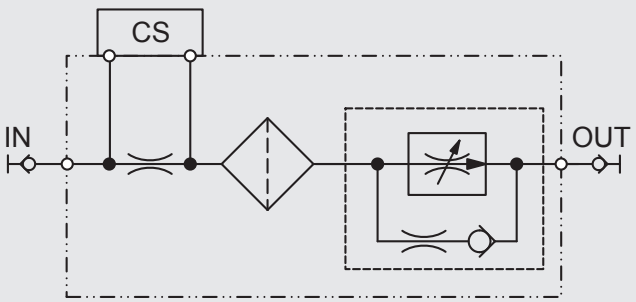


Dimensions in mm



* not included in scope of delivery

Hydraulic circuit diagram



Technical Data

Mounting position	Vertical (flow from bottom to top)
Max. operating pressure	5 to 300 bar / 73 to 4350 psi
Minimum differential pressure	5 bar / 73 psi
Permitted viscosity range	1 to 350 mm²/s
Hydr. connection (IN, OUT)	Test point type 1604 or G 1/4“ (ISO 228)
Sealing material	FKM / EPDM
Fluid temperature range	0 to 85 °C / 32 ... 185 °F
Ambient temperature range	-30 to 80 °C / -22 ... 176 °F
Storage temperature range	-40 to 80 °C / -40 ... 176 °F
Relative humidity	Max. 95%, non-condensing
Weight	4.3 kg

Model code

See second page

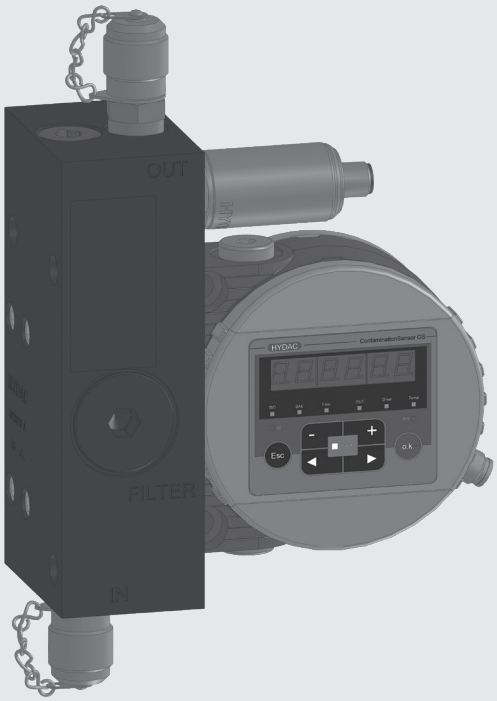
Scope of delivery

– 1 FMM - P - S - ...
– 1 Installation and Maintenance Instructions for FMM-P-S
– 1 CD with Operation and Maintenance Instructions for CS 1000 in different languages (PDF viewer software required)
– 1 CD with FluMoS light (fluid monitoring software to operate and parameterise the sensor)

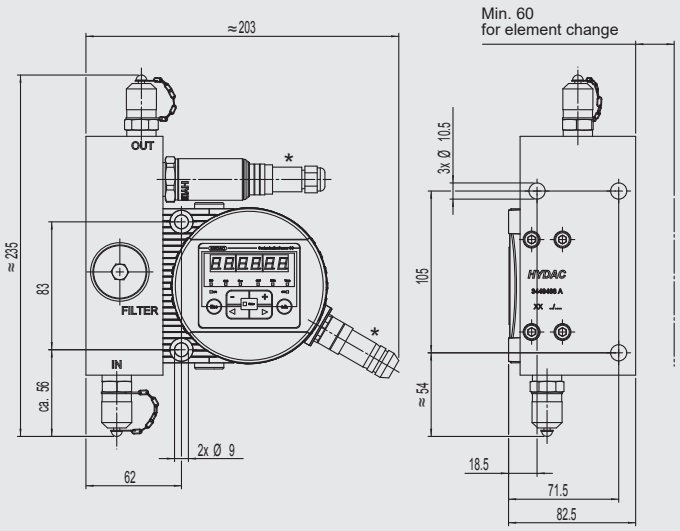
Accessories

A wide range of accessories can be found in the brochure “Filter Systems Accessories” (DE 7.623...).

FMM - P - M - ...

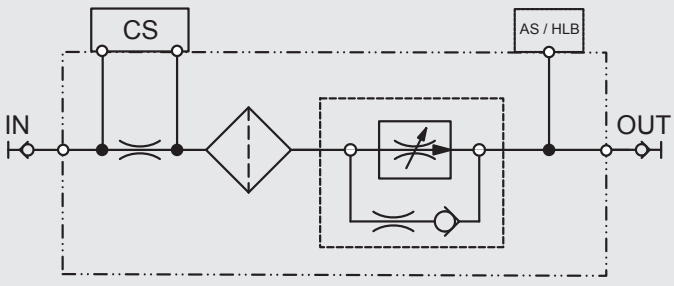


Dimensions in mm



* not included in scope of delivery

Hydraulic circuit diagram



Technical Data

Mounting position	Vertical (flow from bottom to top)
Max. operating pressure	5 to 300 bar / 73 to 4350 psi
Minimum differential pressure	5 bar / 73 psi
Permitted viscosity range	1 to 350 mm²/s
Hydr. connection (IN, OUT)	Test point type 1604 or G 1/4" (ISO 228)
Sealing material	FKM / EPDM
Fluid temperature range	0 to 85 °C / 32 ... 185 °F
Ambient temperature range	-30 to 80 °C / -22 ... 176 °F
Storage temperature range	-40 to 80 °C / -40 ... 176 °F
Relative humidity	Max. 95%, non-condensing
Weight	6.5 kg

Model code

See second page

Scope of delivery

– 1 FMM - P - M - ...
– 1 Installation and Maintenance Instructions FMM-P-M
– 1 manual for additional sensor (optional)
– 1 CD with Operation and Maintenance Instructions for CS 1000 in different languages (PDF viewer software required)
– 1 CD with FluMoS light (fluid monitoring software to operate and parameterise the sensor)

Accessories

A wide range of accessories can be found in the brochure “Filter Systems Accessories” (DE 7.623...).

Note

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

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

Subject to technical modifications.

HYDAC FILTER SYSTEMS GMBH
Industriegebiet
D-66280 Sulzbach / Saar
Phone:+49 (0) 6897/509-01
Fax:+49 (0) 6897/509-9046
Internet: www.HYDAC.com
E-mail: filtersystems@HYDAC.com