



Contamination Sensor Module CSM 1000 Series

Description

The Contamination Sensor Module CSM 1000 is an online condition monitoring system for detecting particle contamination in hydraulic and lubrication fluids containing a high proportion of air bubbles.

Air bubble suppression is used to dissolve the air bubbles so that they are not detected as particles.

Moreover, it is the ideal solution for analyzing the particle content of fluids, independently of the rest of the hydraulic system.

As an option, other condition monitoring sensors such as the Hydac AquaSensor can be incorporated.

Applications

- Lubrication oil system in paper, steel and energy sectors
- For condition-based, pro-active maintenance
- Monitoring of component cleanliness on test rigs
- Monitoring of oil cleanliness in oil reservoirs

Advantages

- Cost-effective, complete solution
- Online monitoring of the oil cleanliness with alarm function to indicate:
 - ingress of and increase in contamination
 - increase in contamination as components start to wear
 - when there are filtration problems
- Verification of cleanliness on test rigs
- Verification of changes in the oil cleanliness as a result of inadequate servicing.

Technical details

	CSM-1xxx-1	CSM-1xxx-2	CSM-1xxx-4
Operating pressure, maximum			
P _{in} (INLET)	-0.4 ... 0.5 bar	0.4 ... 120 bar	-0.4 ... 80 bar
P _{out} (OUTLET)	5 bar	5 bar	5 bar
P _{out} (LEAKAGE)	–	0.5 bar	–
Hydraulic connections			
INLET	G 1/4, ISO 228	G 1/4, ISO 228	G 1/4, ISO 228
OUTLET	G 1/4, ISO 228	G 1/4, ISO 228	G 1/4, ISO 228
LEAKAGE	–	G 1/4, ISO 228	–
Total flow rate	≈ 100 ml/min	≈ 180 ml/min	≈ 250 ml/min
Permitted operating viscosity range	10 ... 3000 mm ² /s	10 ... 3000 mm ² /s	10 ... 1000 mm ² /s
Permitted measurement viscosity range in measuring mode	10 ... 1000 mm ² /s	10 ... 1000 mm ² /s	10 ... 800 mm ² /s
Pump type	Gear pump		
Permitted outlet pressure	5 bar max.		
Permitted fluids	Hydraulic and lubrication fluids based on mineral oil		
Power consumption (motor pump unit)	0.18 kW @ 50 Hz 0.21 kW @ 60 Hz		
Permitted fluid temperature range	0 ... 70 °C		
Ambient temperature range	0 ... 40 °C		
Storage temperature range	-40 ... 80 °C		
Relative humidity	Max. 90%, non-condensing		
Protection class	IP55		
Weight when empty	≈ 18 kg		
Contamination Sensor:			
Self diagnostics	Continuously with error display via status LED		
Measurement range (calibrated)	Display of Class ISO 9/8/7 (MIN) to Class ISO 25/24/23 (MAX) Calibrated in the range ISO 13/11/10 ... 23/21/18		
Supply voltage	9 ... 36 VDC, residual ripple < 10%		
Power consumption	3 Watt max.		
Electrical data	- Analogue output 4 ... 20 mA or 0 ... 10 V - RS485 interface - Switching output		

MODEL CODE

CSM 1 2 2 0 - 1 - 1 W/N/X60/O60 -

Type

CSM ContaminationSensor Module

Resolution of ContaminationSensor

1 = 4 particle size channels

Contamination codes

2 = ISO 4406:1999; SAE AS 4059 (D) /
> 4 $\mu\text{m}_{(c)}$ > 6 $\mu\text{m}_{(c)}$ > 14 $\mu\text{m}_{(c)}$ > 21 $\mu\text{m}_{(c)}$

3 = ISO 4406:1987; NAS 1638 / > 2 μm
> 5 μm > 15 μm > 25 μm
ISO 4406:1999; SAE AS 4059 (D) /
> 4 $\mu\text{m}_{(c)}$ > 6 $\mu\text{m}_{(c)}$ > 14 $\mu\text{m}_{(c)}$ > 21 $\mu\text{m}_{(c)}$
(switchable between standards)

Options

1 = without display

2 = with display (display can be rotated through 270°)

Media

0 = based on mineral oil

Hydraulic version

1 = gear pump, standard

2 = gear pump, with increased inlet pressure, with leakage line

4 = gear pump, magnetic coupled, with increased inlet pressure, no leakage line

Electrical output of ContaminationSensor

1 = 4 ... 20 mA analogue output

2 = 0 ... 10 V analogue output

Supply voltage of motor pump unit

W/N/X60/O60 = 230 V, 50 Hz, 3Ph / 265 V, 60 Hz, 3Ph, delta connection
400 V, 50 Hz, 3Ph / 460 V, 60 Hz, 3Ph, star connection

N/AB/N60/AB60 = 400 V, 50 Hz, 3Ph / 400 V, 60 Hz, 3Ph, delta connection
690 V, 50 Hz, 3Ph / 690 V, 60 Hz, 3Ph, star connection

other voltages on request!

Supplementary details

no details = standard

AS = with AquaSensor AS 1000

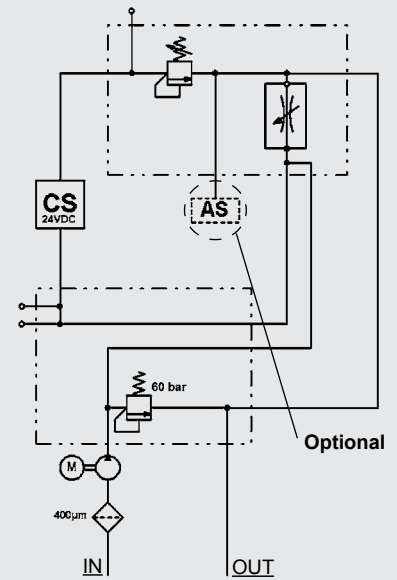
AS3 = with AquaSensor AS 3000

PKZ = on/off switch with motor protection, 10m cable,
male connector 3 phase 16A

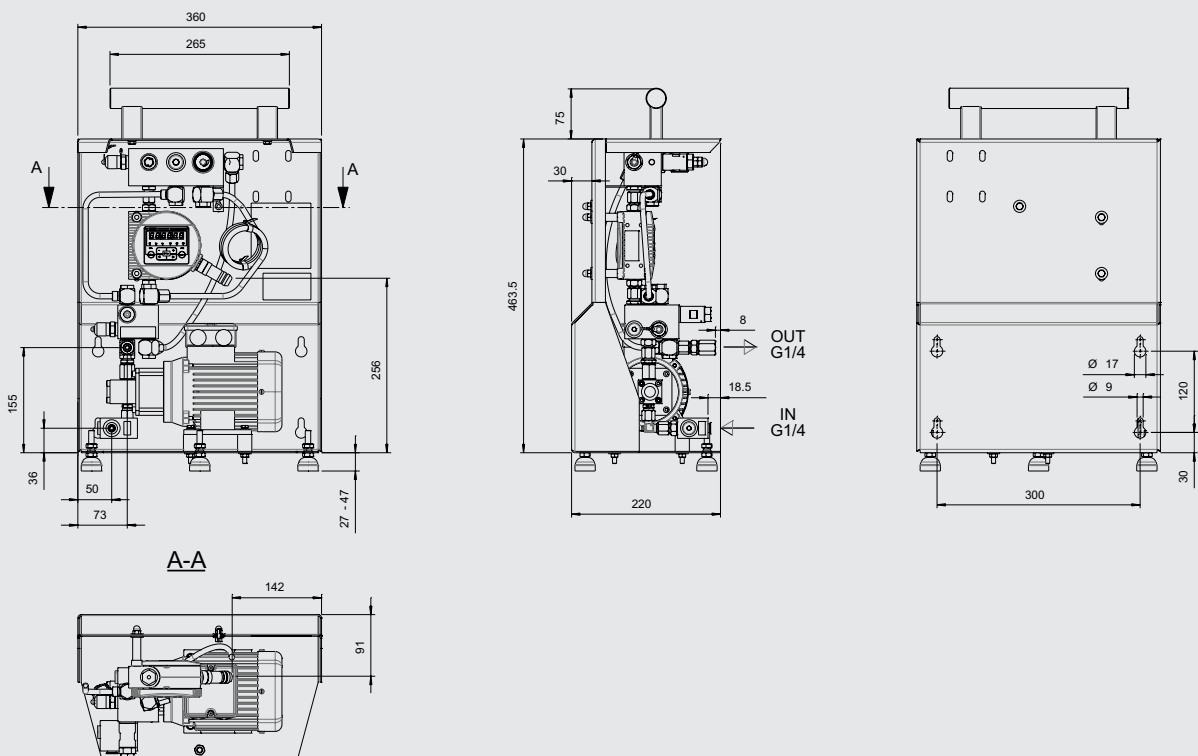
Items supplied

- CSM
- Operating and Maintenance Instructions
- CD with FluMoS light software and operating manual
- Calibration certificate CS 1000

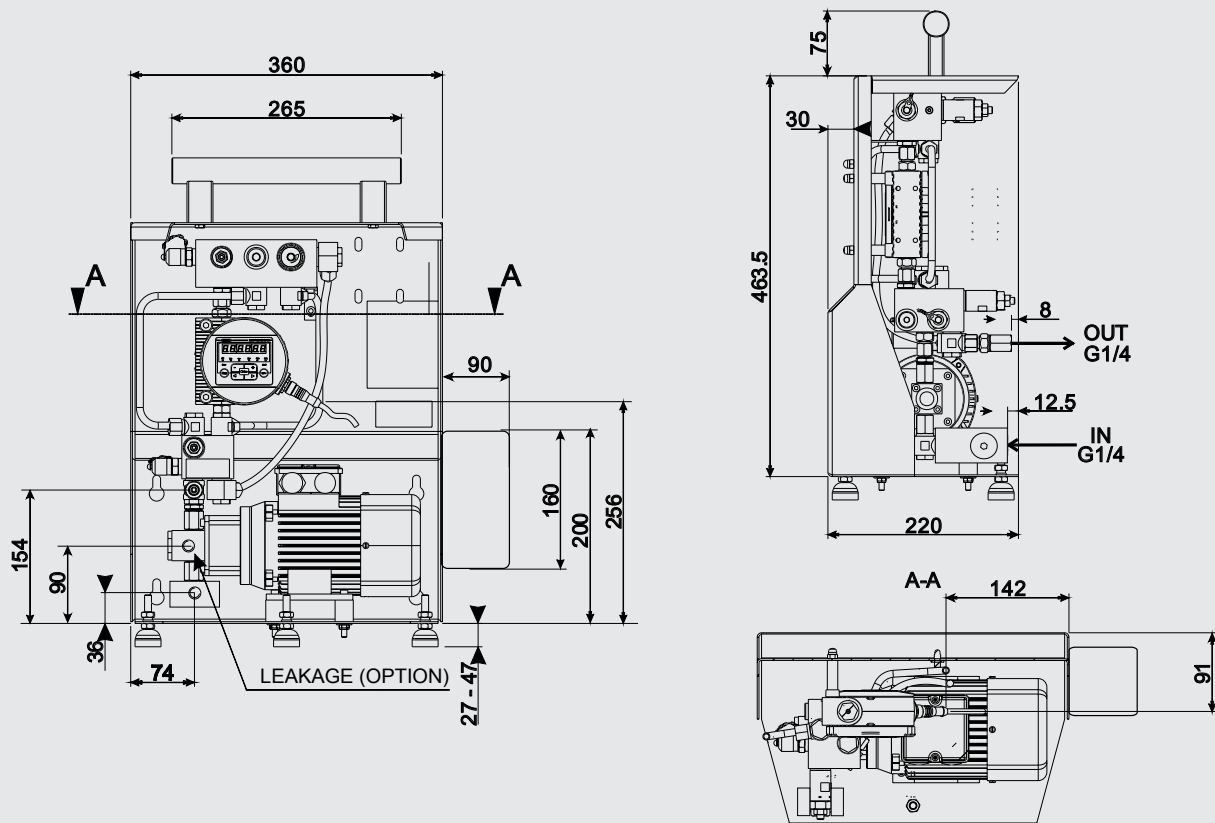
Hydraulic circuit diagram



Dimensions without PKZ (mm)

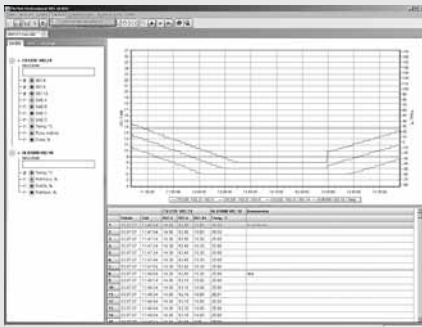


Dimensions with PKZ (mm)



Accessories for CS 1000

- PC Software Package FluMoS Professional, Part No.: 3141522
- PC Software Package FluMoS Light, Part No.: 3355176
- PC Driver Package FluMoS, Part No.: 3355177



- ContaminationSensor Interface CSI-D-5, Part No.: 3249563
- Female connector with 2 m cable, screened, 8-pole, M12x1, Part No.: 3281220
- Female connector with 5 m cable, screened, 8-pole, M12x1, Part No.: 3281239
- Extension cable 5 m, female connector, 8-pole, M12x1 / male connector, 8-pole, M12x1, Part No.: 3281240
- Female connector with screw terminal, screened, 8-pole, M12x1, Part No.: 3281243

Accessories for AS 1000

- ZBE 08
Female connector, right-angled, 5-pole, M12x1, Part No.: 6006786
- ZBE 08S-02
Female connector, right-angled, with 2 m cable, screened, 5-pole, Part No.: 6019455
- ZBE 08S-05
Female connector, right-angled, with 5 m cable, screened, 5-pole, M12x1, Part No.: 6019456
- ZBE 08S-10
Female connector, right-angled, with 10 m cable, screened, 5-pole, M12x1, Part No.: 6023102

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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