

HYDAC INTERNATIONAL



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.

Furthermore, it is the perfect complete solution for examining a fluid for particulate contamination, independent from the overall 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			
P _{in} (INLET)	-0.4 to 0.5 bar	0.4 to 120 bar	-0.4 to 80 bar
P _{out} (OUTLET)	max. 5 bar	max. 5 bar	max. 5 bar
P _{out} (LEAKAGE)	–	max. 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
Permissible operating viscosity	10 to 3000 mm²/s	10 to 3000 mm²/s	10 to 1000 mm²/s
Permitted operating viscosity range	10 to 1000 mm²/s	10 to 1000 mm²/s	10 to 800 mm²/s
Pump type	Gear pump		
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	0 to +70°C		
Ambient temperature	0 to +40°C		
Storage temperature	-40 to +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)	Sensor measures from Class ISO 9/8/7 (MIN) to Class ISO 25/24/23 (MAX) Calibrated in the range ISO 13/11/10 to 23/21/18		
Supply voltage	9 to 36 VDC, residual ripple < 10%		
Power consumption	3 watts max.		
Electrical data	- Analogue output 4 to 20 mA or 2 to 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 4406:1991 | $>2 \mu\text{m}$; $>5 \mu\text{m}$; $>15 \mu\text{m}$; $>25 \mu\text{m}$
NAS 1638 | $2-5 \mu\text{m}$; $5-15 \mu\text{m}$; $15-25 \mu\text{m}$; $>25 \mu\text{m}$

switchable:

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

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, with increased inlet pressure, no leakage line, magnetic drive

Electrical output of ContaminationSensor

1 = 4 to 20 mA analogue output

2 = 2 to 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

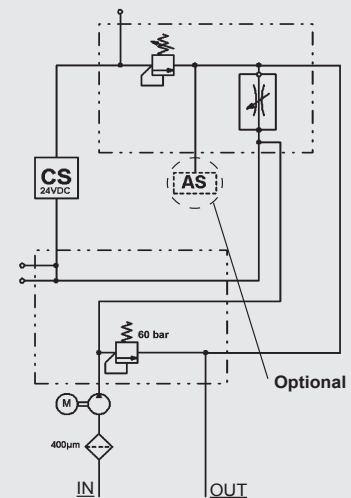
AS = with AquaSensor AS 1000

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

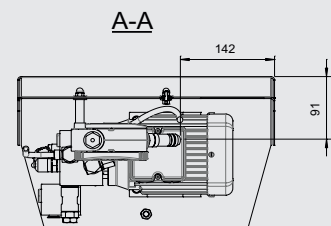
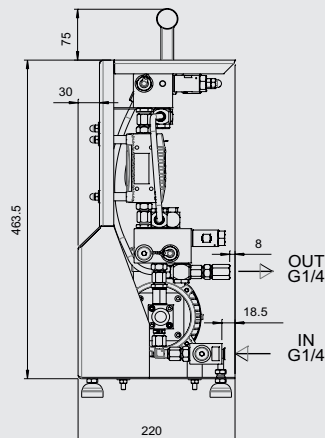
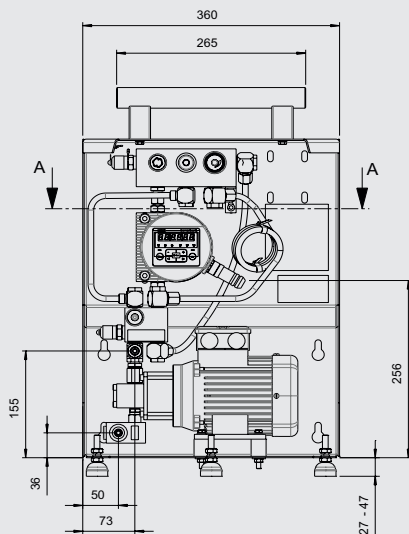
Items supplied

- CSM 1000
- Programming cable
- Pressure gauge with adapter
- Operating and maintenance instructions CSM 1000
- CE conformity or incorporation declaration CSM 1000 (depending on model)
- Operating and maintenance instructions CS 1000
- Calibration certificate CS 1000
- CD with FluMoS light (fluid monitoring software to operate and parameterize the sensor)
- Software Manual FluMoS

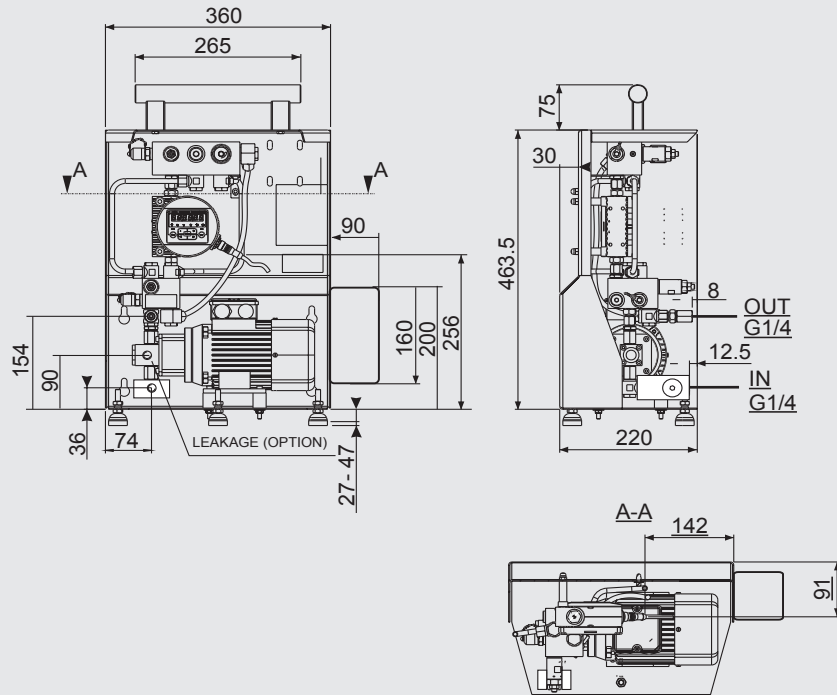
Hydraulic circuit diagram



Dimensions (mm)

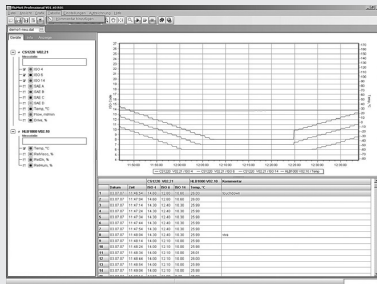


Dimensions with on/off switch (mm)



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

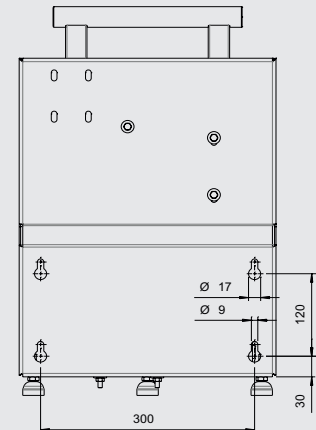


- ContaminationSensor Interface CSI-D-5, Part No.: 3249563
- Female connector with 2 m cable, screened, 8-pole, M12x1, Part No.: 3281220
- Female connector with 5 m cable, screened, 8-pole, M12x1, Part No.: 3281239
- Extension cable 5 m, female connector, 8-pole, M12x1 / male connector, 8-pole, M12x1,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

Accessories for AS 1000 option

- 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

Hole pattern



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.

E 7.615.3/04.16