ContaminationSensor Module
CSM 1000 Series

Description

The ContaminationSensor 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		
ContaminationSensor:			
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 $\mu m_{(c)}$;
           >6 $\mu m_{(c)}$; >14 $\mu m_{(c)}$; >21 $\mu m_{(c)}$
3   =   ISO 4406:1991| > 2 μm; > 5 μm;
           > 15 μm; > 25 μm
           NAS 1638 | 2-5 μm; 5-15 μm;
           15-25 μm; > 25 μm
           switchable:
           ISO 4406:1999 + SAE AS 4059 (D) | >4 $\mu m_{(c)}$;
           >6 $\mu m_{(c)}$; >14 $\mu m_{(c)}$; >21 $\mu m_{(c)}$

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!

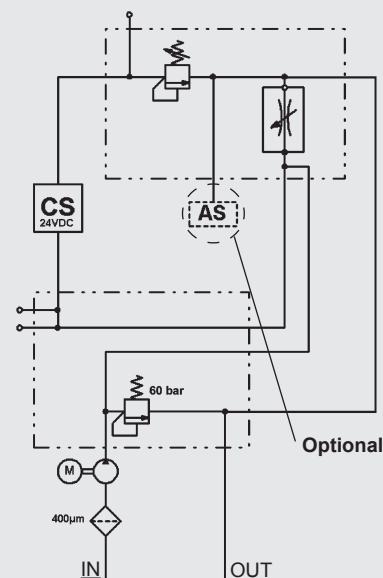**Supplementary details**
no details = standard
AS   =   with AquaSensor AS 1000
PKZ   =   on/off switch with motor protection, 10m cable,
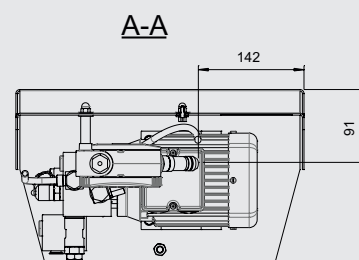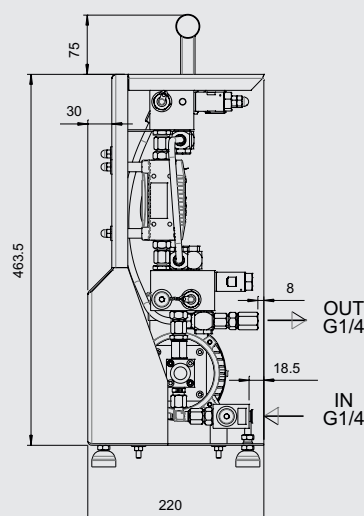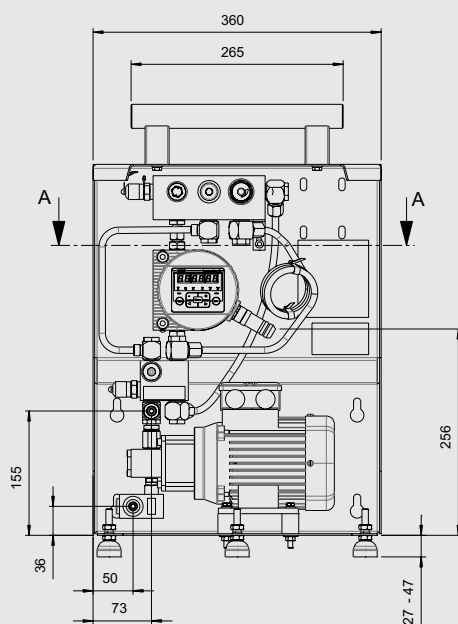   male connector 3 phase 16A

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
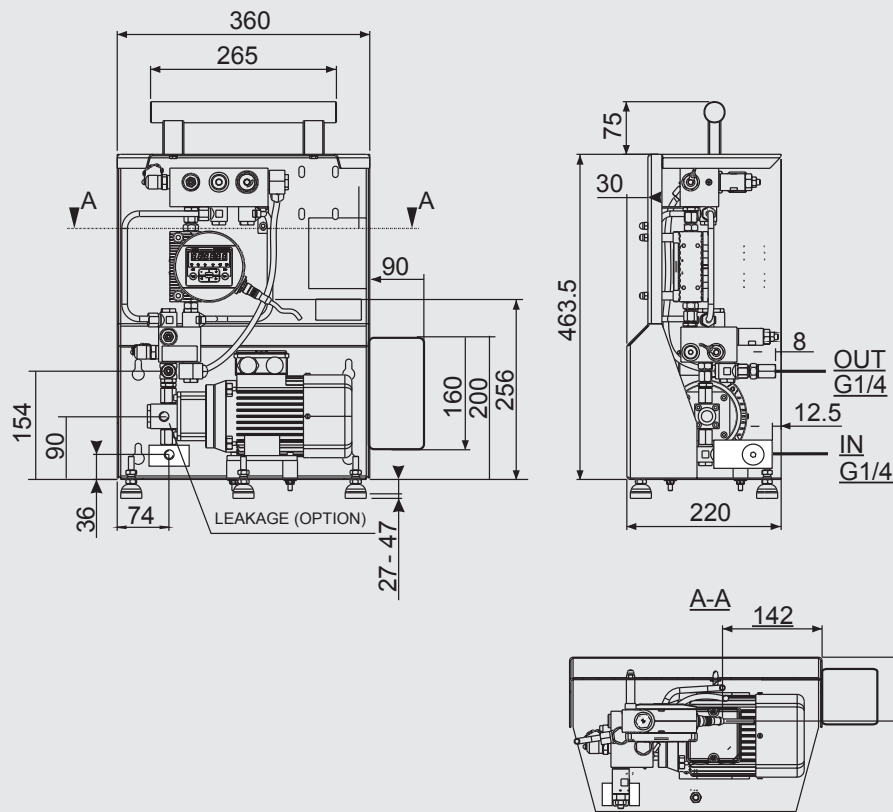 the sensor)
– Software Manual FluMoS

Hydraulic circuit diagram

CS 24VDC

AS

Optional

60 bar

M

400µm

IN   OUT

Dimensions (mm)

360
265
A   A
155
256
36
50
73
27 - 47

75
30
463.5
8   OUT G1/4
18.5   IN G1/4
220

A-A
142
91

Dimensions with on/off switch (mm)

360
265
A A
90
160 200 256
154
90
36 74
LEAKAGE (OPTION)
27 - 47

75
30
463.5
8
OUT G1/4
12.5
IN G1/4
220

A-A 142
91

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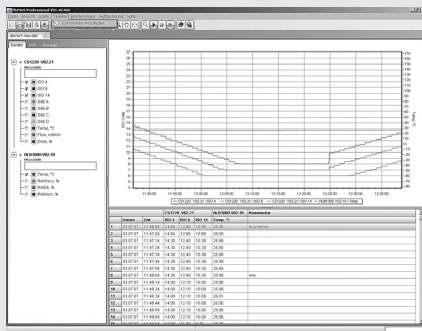
- ContaminationSensor Interface CSI-D-5,
  Part No.: 3249563
- Female connector with 2 m cable,
  screened, 8-pole, M12x1,
  Part No.: 3281220
- Female connector with 5 m cable,
  screened, 8-pole, M12x1,
  Part No.: 3281239
- Extension cable 5 m,
  female connector, 8-pole, M12x1 /
  male connector,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

Ø 17
Ø 9
120
30
300
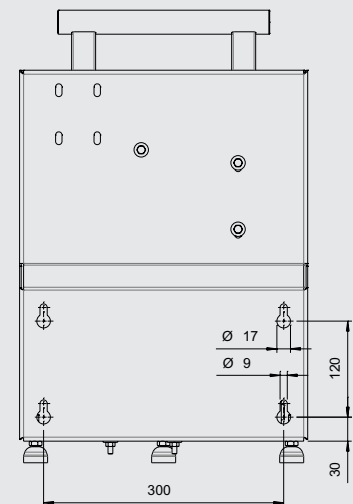
Note

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.