HYDAC | INTERNATIONAL

ContaminationSensor Module
CSM 2000 Series

Description

The ContaminationSensor Module CSM 2000 is an online condition monitoring system for recording solid 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.

In addition, 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 preventive, pro-active maintenance
● Monitoring of component cleanliness on test rigs
● Monitoring of oil cleanliness in reservoirs

Advantages

● Cost-effective, system solution
● Numerous data interfaces provide, amongst other things, communication via WLAN, intranet or internet
● 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 specifications

	CSM2xxx-1	CSM2xxx-2	CSM2xxx-4
Operating pressure P_{in} (INLET) P_{out} (OUTLET) P_{out} (leakage line)	-0.4 ... 0.5 bar max. 5 bar –	-0.4 ... 120 bar max. 5 bar max. 0.5 bar	-0.4 ... 80 bar max. 5 bar –
Hydraulic connections INLET OUTLET LEAKAGE	G 1/4, ISO 228 G 1/4, ISO 228 –	G 1/4, ISO 228 G 1/4, ISO 228 G 1/4, ISO 228	G 1/4, ISO 228 G 1/4, ISO 228 –
Total flow rate	≈ 100 ml/min	≈ 180 ml/min	≈ 250 ml/min
Permissible operating viscosity	10 ... 3,000 mm²/s	10 ... 3,000 mm²/s	10 ... 1,000 mm²/s
Permitted operating viscosity range	10 ... 1,000 mm²/s	10 ... 1,000 mm²/s	10 ... 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 ... +70°C		
Ambient temperature	0 ... +40°C		
Storage temperature	-40 ... +80°C		
Relative humidity	max. 90%, non-condensing		
IP class	IP55		
Weight when empty	≈ 22 kg		
ContaminationSensor:			
Self diagnostics	Continuous with error display via relays and serial interface		
Measurement range (calibrated)	ISO 13/11/10 ... 23/21/18. Display range is from class ISO 12/10/09 to class ISO 25/23/21.		
Supply voltage	24 V DC ± 25%		
Power consumption	25 Watt max.		
Electrical data	- Output for Contamination Sensor Display - 3 relay outputs: 1 x "ready" relay 2 x "limit" relays - PLC output - Additional electrical output (see model code)		

Model code

Type
CSM   ContaminationSensor Module

Resolution of ContaminationSensor
2   =   4 particle size channels

Contamination codes
0   =   ISO 4406:1987 | >5 µm; >15 µm;
          >25 µm; >50 µm
          NAS 1638 | 5-15 µm; 25-50 µm; 50 µm
1   =   ISO 4406:1991 | >2 µm; >5 µm; >15 µm; >25 µm
          NAS 1638 | 2-5 µm; 5-15 µm; 15-25 µm; >25 µm
2   =   ISO 4406:1999 + SAE AS 4059 (D) | >4 $µm_{(c)}$;
          >6 $µm_{(c)}$; >14 $µm_{(c)}$; >21 $µm_{(c)}$

Housing of ContaminationSensor
3   =   standard

Fluids
0   =   for standard mineral oils

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
0   =   RS232 (DIN 66348 Protocol)
1   =   Analogue output (4-20 mA)
2   =   RS485 (DIN 66348 Protocol)
5   =   Ethernet (IEEE 802.3 TCP/IP)

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 2000
– Programming cable
– Pressure gauge with adapter
– Operating and maintenance instructions
  CSM 2000
– CE conformity or incorporation declaration
  CSM 2000 (depending on model)
– Operating and maintenance instructions
  CS 2000
– Calibration certificate CS 2000
– CD with FluMoS light (fluid monitoring
  software to operate and parameterize the
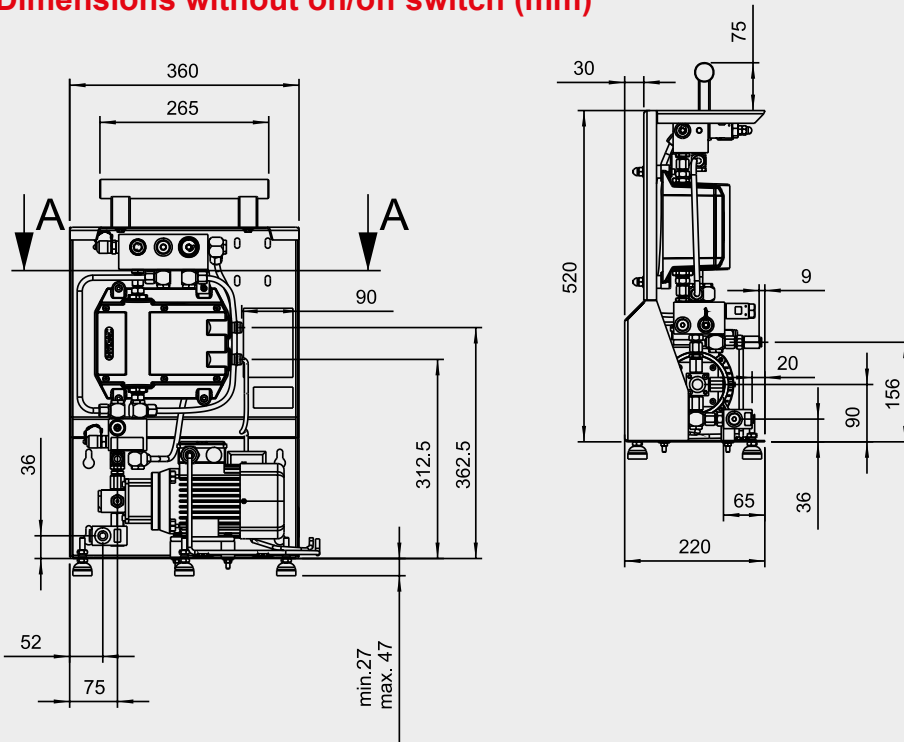 sensor)
– Software Manual FluMoS

Hydraulic circuit diagram
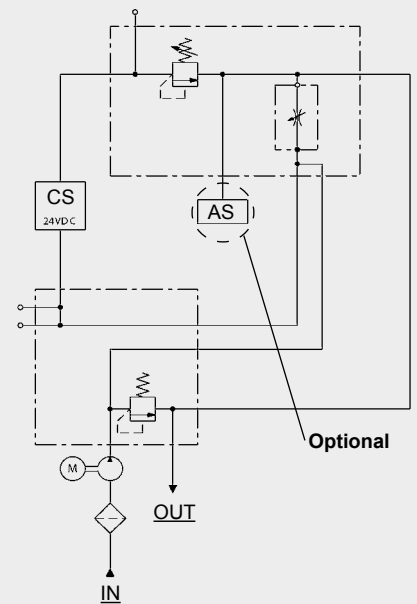
Dimensions with on/off switch (mm)
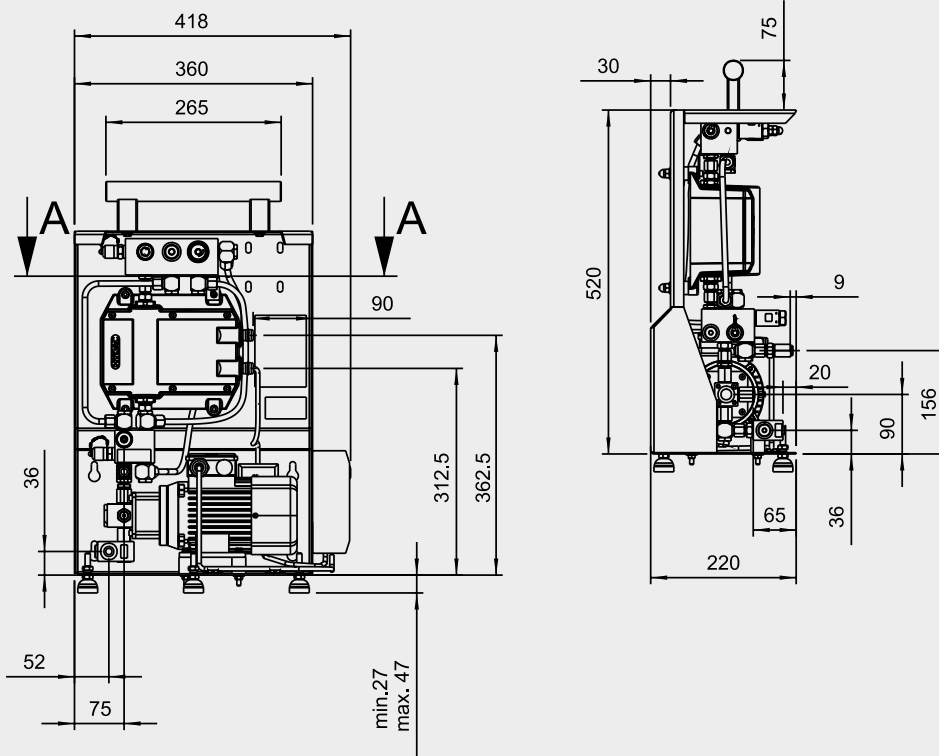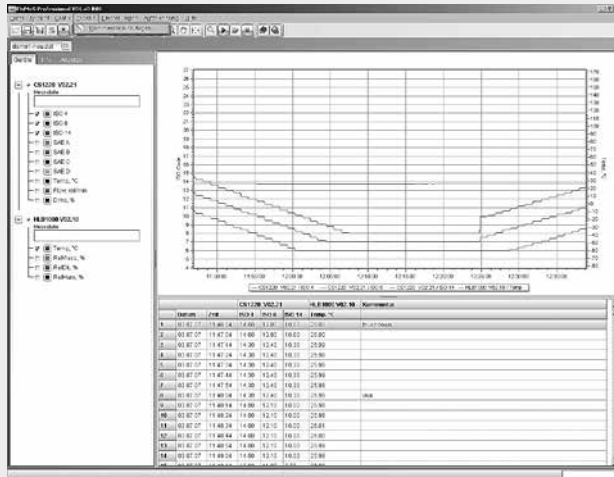
Dimensions without on/off switch (mm)


Accessories for AS 1000 option

- ZBE 08
  Female connector, right-angled, 5-pole, M12x1,
  Part No.: 6006786

- ZBE 08S-02
  Female connector, right-angled, 2 m cable, shielded, 5-pole,
  Part No.: 6019455

- ZBE 08S-05
  Female connector, right-angled, 5 m cable, shielded, 5-pole, M12x1, Part No.: 6019456

- ZBE 08S-10
  Female connector, right-angled, 10 m cable, shielded, 5-pole, M12x1, Part No.: 6023102

Accessories

PC Software Package FluMoS Professional, Part no.: 3141522

PC Software Package FluMoS Light, Part no.: 3355176

PC Driver Package FluMoS, Part no.: 3355177

Hole pattern

A–A

ContaminationSensor Display CSD

CSD - 1 - U

ContaminationSensor Display

Display size
1 14 mm
2 57 mm

Supply voltage
U 24 VDC

	Part no.
CSD-1-U	3078272
CSD-2-U	3078273
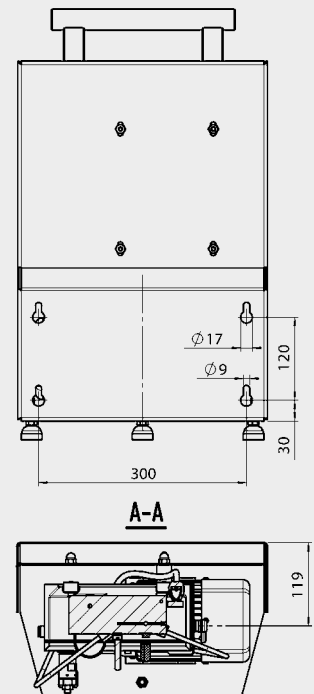
Dimensions (mm)
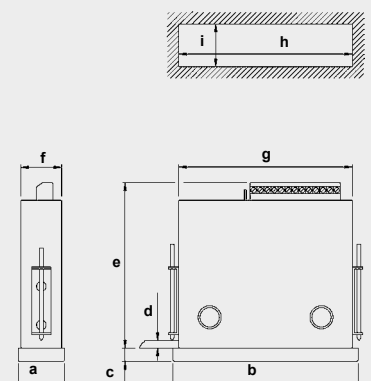
	a	b	c	d	e	f	g	h	i
CSD-1-U	48	96	8	..6	70	44	90	92	45
CSD-2-U	96	336	3	..6	61	88	328	329	89

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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.