



## Contamination Sensor CS 1000 Series

### Description

The Contamination Sensor CS 1000 series is an online fluid sensor for permanent monitoring of particle contamination in fluids.

The cleanliness results can either be given according to ISO/SAE or ISO/NAS classifications.

This instrument combines the latest materials and technologies with proven engineering and provides the user with a compact and robust stationary sensor.

The attractive price/performance ratio makes it particularly advantageous for OEM applications for Condition Monitoring.

### Applications

- Industrial hydraulic and lubrication systems
- Mobile hydraulics

### Advantages

- As an option, can be switched between ISO 4406:1999 / SAE AS 4059 and ISO 4406:1987 / NAS 1638
- Critical machine conditions are identified in early stages
- Continuous monitoring of oil conditions
- Condition-based maintenance planning

### Technical specifications

<b>General data</b>	
Self diagnosis	Continuous with error display via status LED and display
Display (only with CS 1x2x)	LED, 6 digits, in 17 segment format
Measured variables	ISO 99 (ISO 4406:1999) SAE (SAE AS 4059 (D)) or ISO 87 (ISO4406:1987) NAS (NAS 1638)
Service parameters	Flow (status) Out (mA) or (VDC) Drive (%) Temp (°C) and (°F)
Installation position	Optional (Recommended: Vertical direction of flow)
Ambient temperature range	-30 °C to +80 °C / -22 °F to 176 °F
Storage temperature range	-40 °C to +80 °C / -40 °F to 176 °F
Relative humidity	max. 95%, non-condensing
Seal material	FPM for CS1xx0 / EPDM for CS1xx1
Protection class	III (safety extra-low voltage)
IP class	IP 67 (provided it is correctly connected)
Weight	1.3 kg
<b>Hydraulic data</b>	
Measuring range	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
Accuracy	+/- ½ ISO class in the calibrated range
Operating pressure	max. 350 bar / 5075 psi
Hydraulic connection	Inline or hose connection (A,B): thread G1/4, ISO 228 or flange connection (C,D): DN 4
Permitted measurement flow rate	30 to 500 ml/min
Permitted viscosity range	1 to 1000 mm <sup>2</sup> /s
Fluid temperature range	0 to +85°C, +32 to +185°F
<b>Electrical data</b>	
Connection, male	M12x1, 8-pole, to DIN VDE 0627 or IEC61984
Supply voltage	9 to 36 VDC, residual ripple < 10%
Power consumption	3 watts max.
Analogue output (4 conductor technique)	4 to 20 mA output (active): Max. ohmic resistance 330Ω or 2 to 10 V output (active): Min. load resistance 820Ω Calibration ± 1 % FS
Switch output	passive, n-switching Power MOSFET: max. current 1.5 A; normally open
RS485 interface	2-wire, half duplex to transfer the HSI protocol in conjunction with a PC
HSI (HYDAC Sensor Interface)	1 wire, half duplex

## Model code

**CS** 1 2 2 0 - A - 0 - 0 - 0 - 0 / - 000

### Type

CS = ContaminationSensor

### Series

1 = 1000 series,  
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;  
> 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  $\mu\text{m}$   
can be changed  
ISO 4406 : 1999;  
SAE AS 4059 (D) / >4  $\mu\text{m}_{(c)}$   
>6  $\mu\text{m}_{(c)}$  >14  $\mu\text{m}_{(c)}$   
>21  $\mu\text{m}_{(c)}$  can be changed

### Options

1 = without display  
2 = with display (display can  
be rotated through 270°)

### Media

0 = based on mineral oil  
1 = phosphate ester

### Analogue interfaces

A = 4 to 20 mA  
B = 2 to 10 V

### Switching output

0 = Switching output threshold

### Digital interface

0 = RS485

### Electrical connection type

0 = male M12x1, 8-pole, pin,  
to VDE0627 or IEC61984

### Hydraulic connection (see page 3)

0 = Inline or hose connection  
1 = Flange connection

### Modification number

000 = Standard

## Items supplied

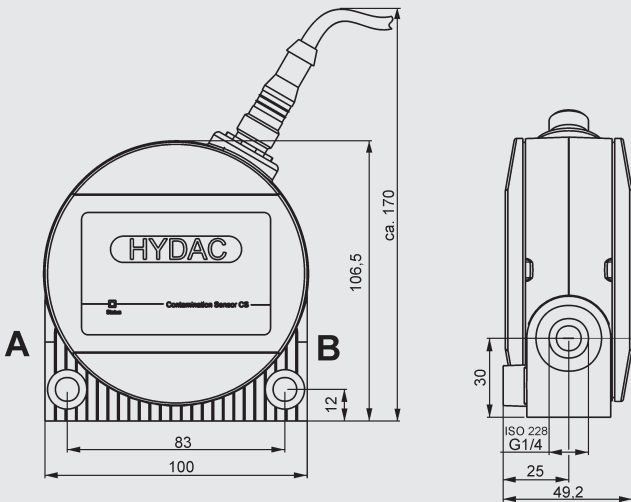
- ContaminationSensor
- Calibration certificate
- Quick start manual  
(German / English / French)
- CD with FluMoS light  
(fluid monitoring software to operate  
and parameterize the sensor)
- CD with detailed operating and  
maintenance instructions in different  
languages (PDF viewer software  
required)
- 2 x O-ring  
(only for flange connection version)

## Accessories

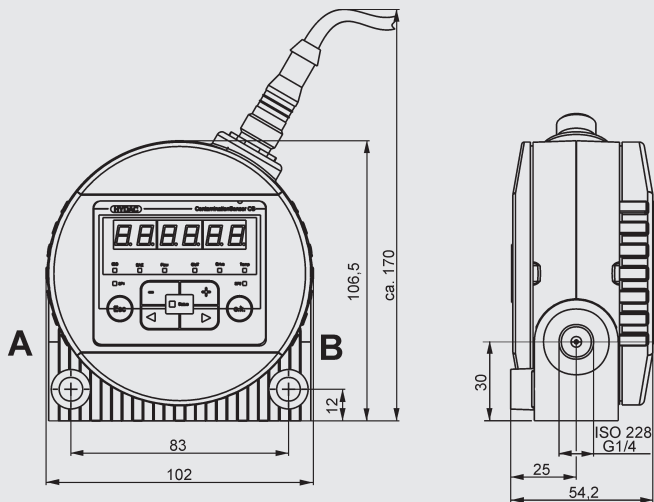
- Female connector with 2 m cable,  
screened, 8-pole, M12x1,  
Part No.: 3281220
- Female connector with 5 m cable,  
screened, 8-pole, M12x1,  
Part No.: 3281239
- Extension cable 5 m,  
female connector 8-pole, M12x1 /  
Male connector 8-pole, M12x1,  
Part No.: 3281240
- Female connector with screw  
terminal,  
8-pole, M12x1,  
Part No.: 3281243

## Dimensions

### CS1x1x without display

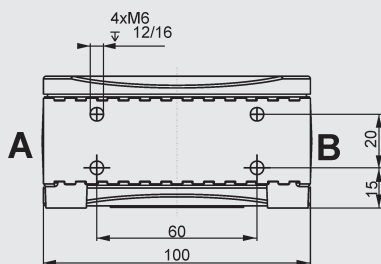


### CS1x2x with display

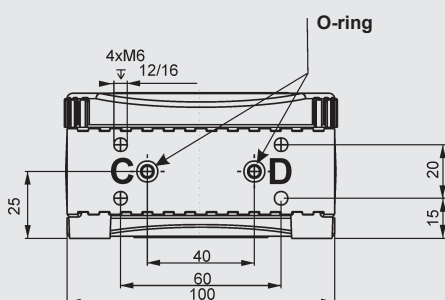


## View of underside

### Pipe or hose connection

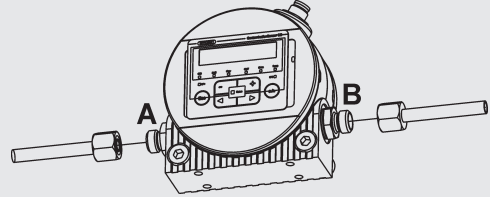


### Flange connection

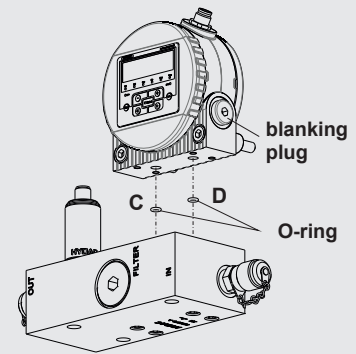


## Hydraulic connection types

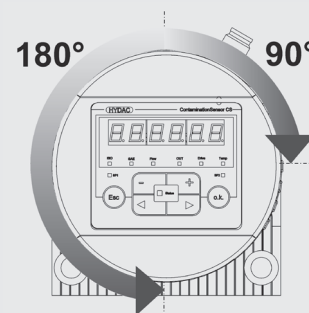
### Pipe or hose connection



### Flange connection



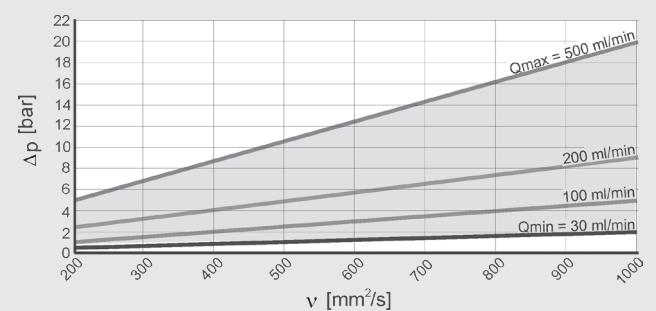
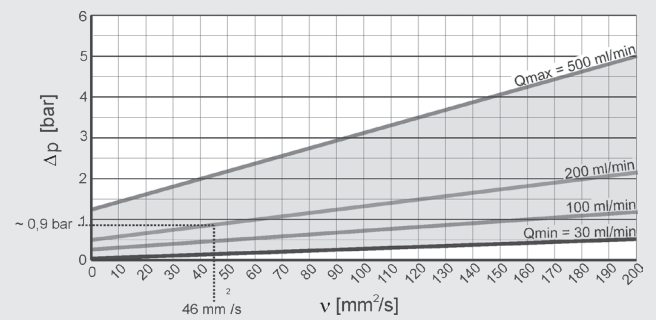
### Display rotation



## Pressure viscosity range

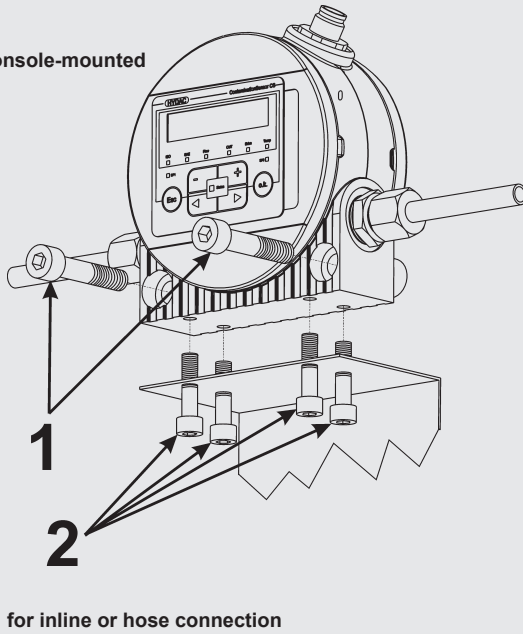
$\Delta p$  : pressure

$v$  : viscosity

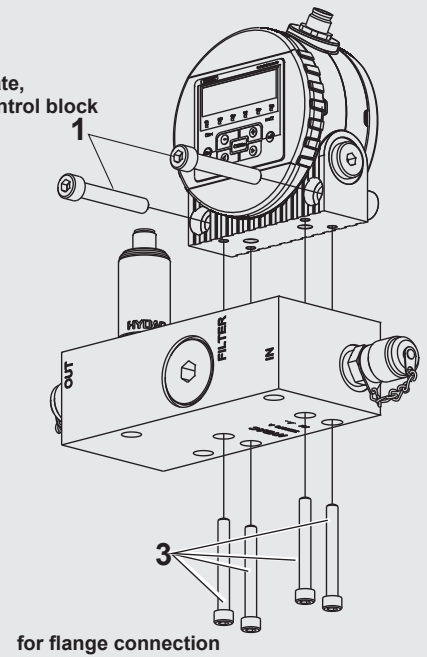


## Types of installation (examples)

Wall-mounted or console-mounted



Mounting on flange plate,  
connection plate or control block



1 : with 2 x M8 (ISO 4762) or  
2, 3 : with 4 x M6

### 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.

**HYDAC FILTER SYSTEMS GMBH**  
Industriegebiet  
**D-66280 Sulzbach / Saar**  
Tel.: +49 (0) 6897/509-01  
Fax: +49 (0) 6897/509-9046  
Internet: [www.hydac.com](http://www.hydac.com)  
E-Mail: [filtersystems@hydac.com](mailto:filtersystems@hydac.com)