B

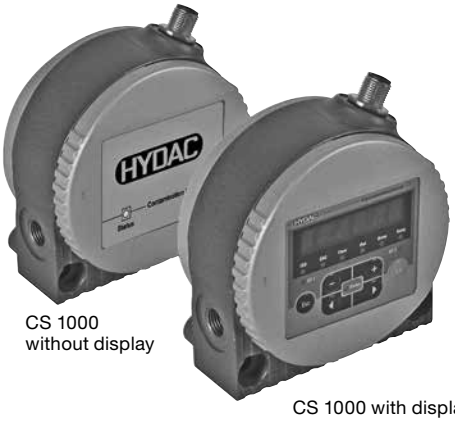
Contamination Management

Contamination management pertains to the analysis and optimization of processes with regard to the cleanliness of components, systems and the purity of the fluids used. Our fluid condition monitoring products include both in-line and offline sensors to measure contamination and/or water saturation levels of the hydraulic system. By implementing fluid condition monitoring equipment in conjunction with the appropriate filtration equipment, a major portion of particulate contamination introduced during manufacturing and assembly can be effectively and efficiently removed. The result is cost savings by virtue of smaller performance deviations on test stands caused by the sudden clogging of particles in sensitive system components, as well as lower costs associated with warranty and non-warranty courtesy work.

CS 1000 Series

Contamination Sensor

CS 1000 with Block Kit



CS 1000
without display

CS 1000 with display

Description

The CS 1000 Contamination Sensor is the latest HYDAC development for continuous measurement of solid contamination of fluids.

Using the latest technology and materials, the CS 1000 is a reliable measuring instrument that is permanently mounted on your mobile or industrial equipment.

The attractive cost-to-performance ratio makes it especially interesting for OEM applications. Online, real-time condition monitoring allows you to have total predictive maintenance.

Applications

Monitoring system on vehicles such as

- Construction equipment
- Agricultural machinery
- Mobile and stationary equipment

Industrial hydraulic systems

- Integration into power unit monitoring systems
- Hydraulic test stands

Combination with filter unit

Features

- Version with or without display
- Display with pivot-function
- Display with 6-digit ISO Code *(optional)*
- Measurement of solid particle contamination in hydraulic and lubricating fluids
- Compact and rugged design
- Type of protection IP67

Technical Specifications

General data	
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) or ISO 87 (ISO4406:1987) NAS (NAS 1638)
Installation position	(Recommended: Vertical Orientation with flow south to north
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	2.9 lb (1.3 kg)
Hydraulic data	
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. 5075 psi / 250 bar
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	32 to 4635 SUS(1 to 1000 mm2/s)
Fluid temperature range	0 to +85°C, +32 to +185°F
Electrical data	
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 (2 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

We do not guarantee the accuracy or completeness of this information. The information is based on average working condition. For exceptional operating conditions please contact our technical department. All details are subject to technical changes.

PN#02075860 / 05.21 / FSP2105-2273

Model Code

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

Series
CS = Contamination Sensor

Resolution
1 = 4 Particle Size Channels

Indicator Code
2 = ISO 4406 : 1999; SAE AS 4059 (D)
>4 µm(c) >6 µm(c) >14 µm(c) >21 µm(c)
3 = ISO 4406 : 1987; NAS 1638
>2 µm >5 µm >15 µm >25 µm
ISO 4406 : 1999; SAE AS 4059 (D)
>4 µm(c) >6 µm(c) >14 µm(c) >21 µm(c)

Options
1 = without Display
2 = with Display *(270° rotation of display)*

Fluids
0 = Hydraulic/Mineral oil
1 = Phosphate Esters

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

Switching Output
0 = Limit Switching Output

Digital Interfaces
0 = RS485

Electrical Connection
0 = Plug M12x1, 8-pole *(connection cable not included)*

Mounting
0 = Inline version
1 = Flanged version

Modification Number
000 = standard
K = CS Block Kit without AS1000 Sensor *(requires Mounting Option 1)*
KAS = CS Block Kit with AS1000 Sensor *(requires Mounting Option 1)*
KASD = CS Block Kit with AS3008 Sensor *(requires Mounting Option 1)*

Scope Of Delivery
- Contamination sensor
- Operation and Instruction manual
- Calibration Certificate
- CD with FluMoS Light software and manuals

Accessories
- **CSI-C-11 Sensor Interface: Part Number 4066011** (for WLAN or LAN Communication)
- Connection cable 6.5 ft. (2 m) with M12x1 connector, screened 8-pole: Part Number 03281220
- Connection cable 16.4 ft. (5 m) with M12x1 connector, screened 8-pole: Part Number 02702459
- Connection cable 9.8 ft. (3 m) with M12x1 connector, 8-pole: Part Number 02091414
- CSI-D-5 Contamination Sensor Interface: Part Number 03249563
- Power Supply-CS1XXX-PS1: Part Number 03376530

Model Codes containing RED are non-standard items – Minimum quantities and longer lead times may apply - Contact HYDAC for information and availability

CS 1000 Block Kit

Includes: CS and AS Sensor Connection Cables, 2 Test Points, 2 Microflex hoses, FluMoS Light software

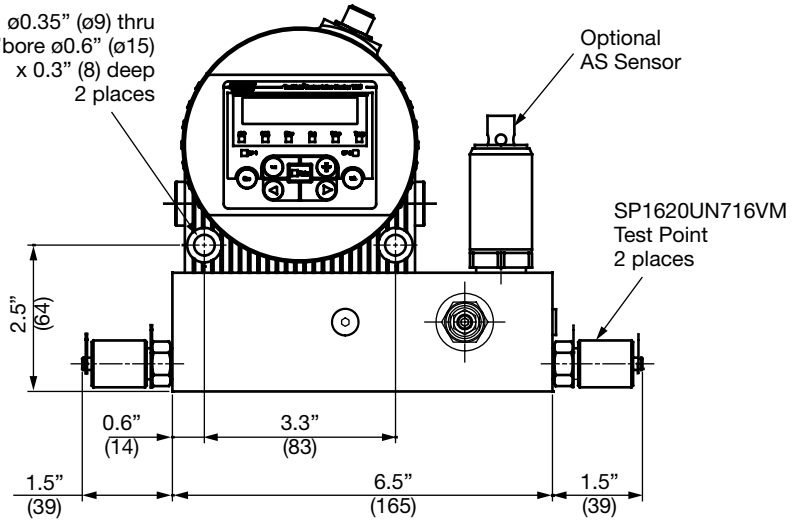
The Contamination Sensor Block KIT *(CS 1000 Block KIT)* combines two condition monitoring products, the CS 1000 series *(Contamination Sensor)* and the AS 1000 series *(Aqua Sensor)* into one plug and play unit. It serves as an on-line measurement of solid contamination and water in hydraulic and lube systems.

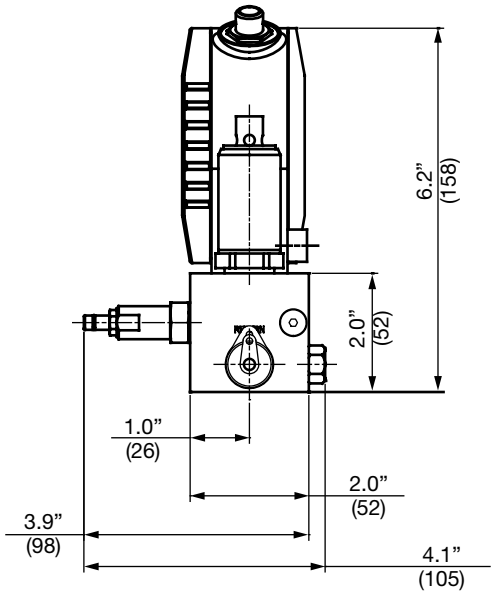
Note: Flow control is necessary when utilizing the CS 1000 sensor. Flow must be maintained through the sensor module to ensure accurate readings. Utilization of the CS Block Kit is required to maintain Sensor flow rate range as described in the Technical Specifications *(at the left)*.

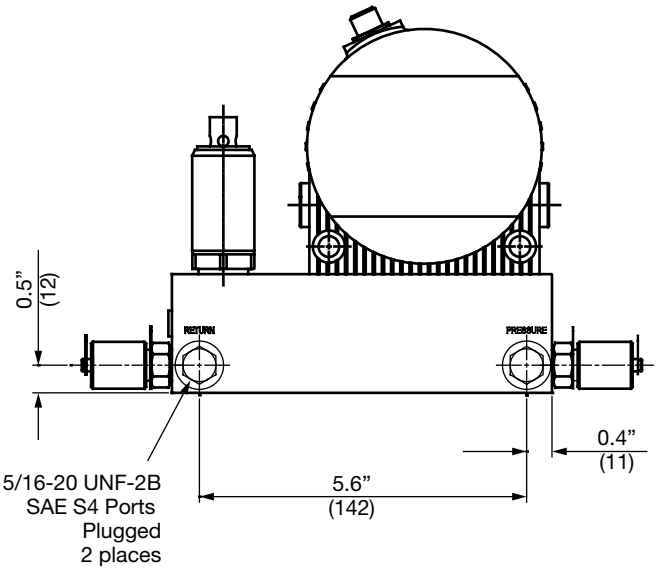
Quick Order Guide

Model Code	Part Number	Description
CS1220-A-0-0-0-0 /-000	03236362	4-20mA display model
CS1210-A-0-0-0-0 /-000	03240458	4-20mA non-display model
CS1220-A-0-0-0-1 /-K	02087348	4-20mA display model and CS Block Kit without AS Sensor
CS1220-A-0-0-0-1 /-KAS	02086855	4-20mA display model and CS Block Kit with AS Sensor

Dimensions
CS 1000 with Block Kit

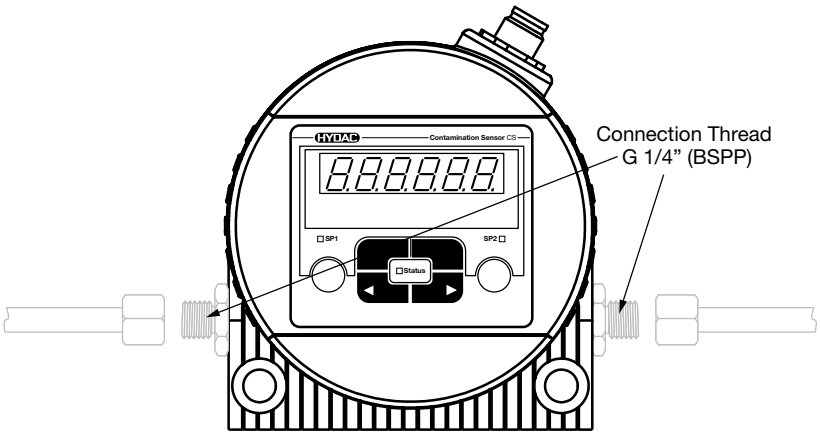


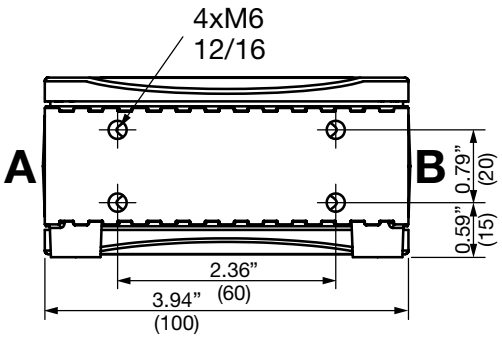




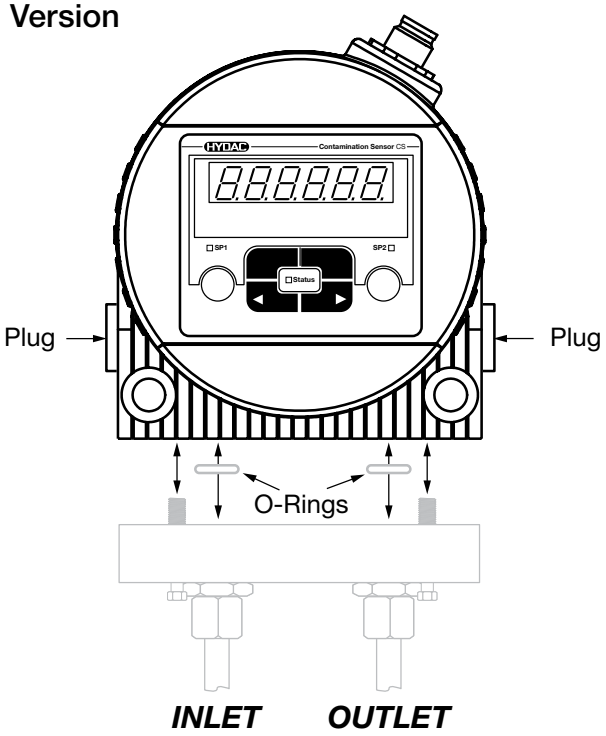
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.

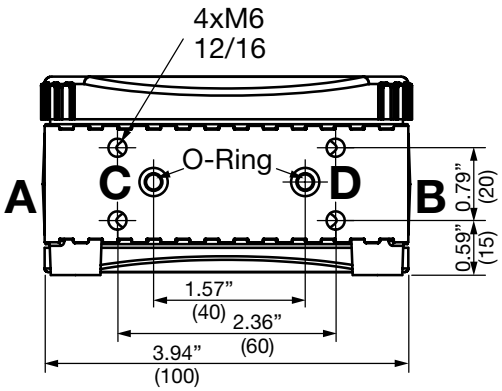
Hydraulic Connections
Inline Version





Flanged Version





Pressure - Viscosity Range