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

<table>
<thead>
<tr>
<th>General data</th>
<th>Continuous with error display via status LED and display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display (only with CS 1x2x)</td>
<td>LED, 6 digits, in 17 segment format</td>
</tr>
<tr>
<td>Measured variables</td>
<td>ISO 99 (ISO 4406:1999), SAE (SAE AS 4059) or ISO 87 (ISO4406:1987), NAS (NAS 1638)</td>
</tr>
<tr>
<td>Installation position</td>
<td>Recommended: Vertical Orientation with flow south to north</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-30 °C to +80 °C / -22 °F to 176 °F</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-40 °C to +80 °C / -40 °F to 176 °F</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>max. 95%, non-condensing</td>
</tr>
<tr>
<td>Seal material</td>
<td>FPM for CS1xx0 / EPDM for CS1xx1</td>
</tr>
<tr>
<td>Protection class</td>
<td>III (safety extra-low voltage)</td>
</tr>
<tr>
<td>IP class</td>
<td>IP 67 (provided it is correctly connected)</td>
</tr>
<tr>
<td>Weight</td>
<td>2.9 lb (1.3 kg)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic data</th>
<th>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</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>+/- ½ ISO class in the calibrated range</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>max. 5075 psi / 250 bar</td>
</tr>
<tr>
<td>Hydraulic connection</td>
<td>Inline or hose connection (A,B): thread G1/4, ISO 228 or flange connection (C,D): DN 4</td>
</tr>
<tr>
<td>Permitted measurement flow rate</td>
<td>30 to 500 ml/min</td>
</tr>
<tr>
<td>Permitted viscosity range</td>
<td>32 to 4635 SUS (1 to 1000 mm2/s)</td>
</tr>
<tr>
<td>Fluid temperature range</td>
<td>0 to +85°C, +32 to +185°F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical data</th>
<th>M12x1, 8-pole, to DIN VDE 0627 or IEC61984</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>9 to 36 VDC, residual ripple &lt; 10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>3 watts max.</td>
</tr>
<tr>
<td>Analogue output (2 conductor technique)</td>
<td>4 to 20 mA output (active); Max. ohmic resistance 330Ω or 2 to 10 V output (active); Min. load resistance 820Ω Calibration ± 1 % FS</td>
</tr>
<tr>
<td>Switch output</td>
<td>passive, n-switching Power MOSFET: max. current 1.5 A; normally open</td>
</tr>
<tr>
<td>RS485 interface</td>
<td>2-wire, half duplex to transfer the HSI protocol in conjunction with a PC</td>
</tr>
<tr>
<td>HSI (HYDAC Sensor Interface)</td>
<td>1 wire, half duplex</td>
</tr>
</tbody>
</table>

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.
Model Code

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
- Calibration Certificate
- Operation and Instruction manual
- CD with FuMoS 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

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1220-A-0-0-0-0-0-000</td>
<td>03236362</td>
<td>4-20mA display model</td>
</tr>
<tr>
<td>CS1210-A-0-0-0-0-0-000</td>
<td>03240458</td>
<td>4-20mA non-display model</td>
</tr>
<tr>
<td>CS1220-A-0-0-0-1-0-000</td>
<td>02087348</td>
<td>4-20mA display model and CS Block Kit without AS Sensor</td>
</tr>
<tr>
<td>CS1220-A-0-0-0-1-0-000</td>
<td>02086855</td>
<td>4-20mA display model and CS Block Kit with AS Sensor</td>
</tr>
</tbody>
</table>

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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