GYDAD INTERNATIONAL



MetallicContamination Sensor MCS 1000 1xxx/-T005

Description

The MetallicContamination Sensor MCS 1000 is used for monitoring metallic wear particles in fluids. An inductive measuring method is used to detect and count the particles and classify them according to their size and metallic properties (ferromagnetic/nonferromagnetic).

The MCS 1000 is therefore an ideal tool for the continuous condition monitoring of large industrial gear units, pumps or bearing systems and provides early information on any early-stage damage. The sensor can be used on its own or in combination with other condition monitoring devices such as vibration measurement systems.

The MCS 1000 can therefore be easily integrated into condition-based or predictive maintenance applications and it also helps to prevent unscheduled system downtimes.

Applications

- Lubrication systems in the fields of wind power, marine, paper, steel, cement etc.
- Industrial gear units and drive systems
 Pumps
- Pumps
- Gearing systems and roller bearings and plain bearings

Advantages

- Early detection of coming damage
- Prevention of costly, unscheduled system downtimes
- Determination of the degree of wear and localisation of wear sources based on the classification of the measured wear particles with regard to their size and metallic origin
- Easy integration into systems and plants due to standardised data interfaces and a large range of hydraulic accessories
- An ideal tool for the implementation of modern maintenance strategies and as an extension for existing machine conditionbased monitoring devices such as vibration measurement systems

Technical data

Measured variables & measurement ranges	MCS 15xx	MCS 14xx	MCS 13xx	
Ferromagnetic (Fe) particles	> 200 µm	> 100 µm	> 70 µm	
Non-ferromagnetic (nFe) particles	> 550 µm	> 300 µm	> 200 µm	
·	(particle with volume equivalent to that of a sphere of given Ø)			
Particle classification	Size classification in accordance with ISO 16232 (6 size classes; 3 Fe, 3 nFe; class assignment depends on the sensor cross section)			
Sensor cross section (Ø)	1" (25 mm)	½" (13 mm)	1⁄4" (6 mm)	
Max. particle rate @ min max flow rate	8 160 1/s	9 180 1/s	10 200 1/s	
Hydraulic specifications				
Flow rate, min max	10 200 l/min	2 40 l/min	0.4 8 l/min	
Operating pressure		20 bar max		
Fluid temperature range		-40 85 °C		
Permitted fluids	Hydraulic and lub as synthe	Hydraulic and lubrication fluids based on mineral oil as well as synthetic oils (e. g. poly-α-olefins – PAO)		
Inlet/outlet (flange connection acc. to ISO 6162-1)	 SAE 1" SAE 1 ½" SAE 2" SAE 4" 	SAE ¾"	SAE ½"	
Electrical data			ļ	
Nominal supply voltage (Vs)	24 V DC, residual ripple < 10%			
Supply voltage, min max	18 30 V DC, residual ripple < 10%			
Power consumption		Max. 5 W		
Control signal interfaces:				
2 binary switching outputs, 0V/Vs, function configurable	 1 x particle ferromagnetic (Fe) 1 x particle, non-ferromagnetic (nFe) or 1 x particle ferromagnetic (Fe) + non-ferromagnetic (nFe) 1 x Device Ready or 			
	● 1 x Alarm	eady		
Switching logic	Active	Active Low or Active High (adjustable)		
Length of switching pulse of particle signal		configurable 5 200 ms		
Length of switching pulse of alarm signal	30 s			
Device Ready	Active Low or Active High (adjustable)			
Loading capacity of the switching outputs	 Active Low: 35 Active High: 6 (Active Low: 350 mA Active High: 6 mA 		

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Scope of delivery

- Sensor MCS 1000
- O-rings (NBR and FKM)
- User manual

Accessories (hydraulic)

Designation	Part no.	
Flange adapter		
SAE 4" flange adapter set for pipe or hose connection, 42L acc. to ISO 8431-1, comprising:		
2x flange adapter	3435426	
- 2x O-rings (NBR)		
- 8x cheese-head screws		
- 8x washer		
- 8x spring washer		
SAE ½" flange adapter set for pipe or hose connection, ½" acc. to ISO 8431-1, comprising: 2x flange adapter	3788271	
- 2x O-rings (NBR)		
- 8x cheese-head screws		
SAE ³ / ₄ " flange adapter set for pipe or hose connection, 1/ ₂ " acc. to ISO 8431-1, comprising:	3588249	
2x flange adapter		
- 2x O-rings (NBR)		
- 8x cheese-head screws		
Flange adapter plate, SAE 4" – SAE 1 ½"	3442518	

Accessories (electrical)

Designation	Part no.			
Single-ended cordset				
ZBE42S-05 Single-ended cordset, mating connector 8-pin. with cable, open cable end, length = 5 m	3281239			
ZBE44 mating connector with screw clamp, 8-pin, M12x1	3281243			
Double-ended cordset				
ZBE43 – 05 Double-ended cordset, male/female 8-pin, length = 5 m	3281240			
ZBE43-10 Double-ended cordset, male/female 8-pin, length = 10 m	3519768			
ZBE30-02 Double-ended cordset, male/female 5-pin, length = 2 m	6040851			
ZBE30-05 Double-ended cordset, male/female 5-pin, length = 5 m	6040852			

Technical data

	MCS 15xx	MCS 14xx	MCS 13xx	
Data interfaces	·	· · · · · ·		
HSI (HYDAC Sensor	Physical: 1 wire, half duplex			
Interface)	Protocol: HSI			
RS485 interface	Physical: 2 wire, half duplex			
	Protocols: HSI, Modbus RTU			
Electrical data				
Ethomot interfoce	Physical: 10Base-T / 100Base-TX			
Ethemet Intenace	 Protocols: HSI TCP/IP, Modbus TCP 			
General data				
Self diagnostics	Continuous, with signalling via Device Ready switching output			
Ambient temperature	-40 70 °C			
Protection class (DIN 40050)	IP 67			
Weight	≈ 3.5 kg	≈ 2.5 kg	≈ 3 kg	
Conformity & approvals:				
C marking	• EN61000-6-4 / -6-2 / -6-9			
Approvals	Marine: DNV type approval			

Model code

IVIC	ue	i code
		<u>MCS 1 5 1 0 - 5 - 0 / T005</u>
Tvp	е	
MC	S = 1	MetallicContamination Sensor
<u>Ser</u>	ies	
1	=	1000 series
0		
Cor	itan	nination / sensor cross section
3	=	Fe particles > $70 \mu\text{m} / \frac{1}{4}$
4	=	Fe particles > 100 μ m / $\frac{1}{2}$ "
5	=	Fe particles > 200 μm / 1"
Flo	ctric	ninterfaces
1		2x switch outputs & RS/85 (HSI protocol)
2	_	2x switch outputs & RS495 (Modbus DTLI)
4	_	2x switch outputs & R3403 (Modubus R10)
1	=	2X switch outputs & R5485 / Ethernet (HSTTCP/IP protocol, Modbus TCP)
Med	dia	
0	=	mineral and synthetic oils
		(particularly those used in wind energy sector)
Hyc	Irau	lic connection
1	=	flange connection, SAE 1/2" acc. to ISO 6162-1
2	_	flange connection SAE 3/" acc to ISO 6162.1

- flange connection, SAE ³/₄" acc. to ISO 6162-1
 flange connection, SAE 4" acc. to ISO 6162-1
 flange connection, SAE 1¹/₂" acc. to ISO 6162-1 5 6

Electrical connection 0

 male connector M12x1, 8-pin
 male connector M12x1, 8-pin and Ethernet M12x1, 4-pin, 1 coding D to IEC61076-2-101

Modification number T005 = improved air intake resistance and integrated pull-up resistors TTV = external O-rings in low-temperature – FKM (Viton®)

Accessories (electrical)

Designation	Part no.		
Network cable (LAN)			
ZBE 45-05 network cable, female connector, 4-pin, D-coded / male connector RJ45, length = 5 m	3346100		
ZBE 45-10 network cable, female connector, 4-pin, D-coded / male connector RJ45, length = 10 m	4571668		

System integration

HYDAC has a large number of solutions for the hydraulic, mechanical, electrical and data-processing-system integration for the sensors of the MCS 1000 series, such as:

- Selected flange adapters for hydraulic system integration through piping or hoses
- System integration kits specially tailored to the product and the specific application (HYDAC ConditionMonitoring Kit CMK)
- Universal complete solutions for fluid condition monitoring (HYDAC ConditionMonitoring Package CMP)

Please contact us for further detailed information.

Dimensions for MCS 15xx (in mm)

Flange connection, SAE 4" to ISO 6162-1





MCS with accessory flange adapter for pipe or hose connection 42L to ISO 8431-1



Mounting hole pattern



Dimensions for MCS 14xx (in mm)

Flange connection, SAE 3/4" to ISO 6162-1





MCS with accessory flange adapter for pipe or hose connection $1\!\!/ _2"$ to ISO 8431-1



Mounting hole pattern



Dimensions for MCS 13xx (in mm)

Flange connection, SAE 1/2" to ISO 6162-1





MCS with accessory flange adapter for pipe or hose connection $\frac{1}{2}"$ to ISO 8431-1



Mounting hole pattern



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.

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