



MetallicContamination Sensor MCS 1000 Serie

(MCS 1x80 and MCS 1x90, only)

Description

The MetallicContamination Sensor MCS 1000 is used for recording 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 metallurgical properties (ferromagnetic/non-ferromagnetic). The MCS 1000 is therefore an ideal tool for the continuous condition monitoring of large industrial gearboxes, 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 monitoring systems.

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

Fields of application

- Lubrication systems in the fields of wind power, marine, paper, steel, cement etc.
- Industrial gearboxes and drive systems
- Pumps
- Gear tooth systems, roller bearings and plain bearings

Your benefits

- Early detection of imminent damage
- Prevention of costly and unscheduled system downtimes
- Determination of the degree of wear and localization of wear sources based on the classification of the measured wear particles with regard to their size and metallurgy
- Easy integration into systems and plants due to standardized 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 monitoring systems

Measured variables	MCS 15xx	MCS 14xx	MCS 13xx			
ferromagnetic (Fe) particles	> 200 µm	> 100 µm	> 70 µm			
non-ferromagnetic (nFe) particles	> 550 µm	> 200 µm				
	(particle with volume	equivalent to that of	a sphere of given Ø)			
Particle classification	Size classifica (6 s class assignm	ation in accordance w size classes; 3 Fe, 3 r ent depends on the s	ith ISO 16232 IFe; ensor section)			
max. particle rate @ min max flow rate	8 160 1/s	9 180 1/s	10 200 1/s			
Hydraulic data						
Flow rate	10 200 l/min	2 40 l/min	0,4 8 l/min			
Operating pressure		maximum 20 bar				
Fluid temperature range		-40 85 °C				
Permissible fluids	Hydraulic and lubrication fluids based on mineral oil as we synthetic oils (e. g. poly-α-olefins – PAO) SAE 1"					
Inlet/outlet (flange connection according to ISO 6162-1)	 SAE 1" SAE 1 1/2" SAE 2" SAE 4" 	SAE ¾"	SAE ½"			
Electrical data						
Supply voltage	Supply voltage 18 30 V DC, residual ripple < 10 %					
Power consumption	5 W max.					
Electrical signal outputs						
2 configurable switching outputs (active, normally open)	 1 x particle ferromagnetic (Fe) 1 x particle non-ferromagnetic (nFe) or 1 x particle ferromagnetic (Fe) + non-ferromagnetic (nFe) 1 x Status signal or 1 x Alarm signal 					
Switching log	I X Status signa	l ouv or Active High (od	iuotoblo)			
Length of switching pulse of particle signal	Active Low or Active High (adjustable) adjustable, 5 200 ms					
Length of switching pulse of alarm output	adjustable, 30 86,400 s, or continuously on to Reset					
Loading capacity of the switching outputs	1.5 A maximal					
HSI (HYDAC Sensor Interface)	 physical: 1 wire, protocol: HSI 	half duplex				
RS485 interface	 physical, 2 wire, half duplex protocols: HSI, Modbus RTU 					

Scope of delivery

- Sensor MCS 1000 series
- O-rings (NBR and FPM)
- Installation and Maintenance Instructions

Accessories (hydraulic)

Description	Part no.
Flange adapter	
SAE 4" flange adapters (set) to pipe/hose connection, 42L according to ISO 8431-1 consisting of: - 2x Flange adapters - 2x O-Rings (NBR) - 8x Cheese-head screws - 8x Washers - 8x Spring washers	3435426
SAE ½" Flange adapters (set) to pipe/hose connection, ½" according to ISO 8431-1 consisting of: - 2x Flange adapters - 2x O-Rings (NBR) - 8x Cheese-head screws	3788271
SAE ³ ⁄ ₄ " Flange adapters (set) for pipe/hose connection, ¹ ⁄ ₂ " according to ISO 8431-1 consisting of: - 2x Flange adapters - 2x O-Rings (NBR) - 8x Cheese-head screws	3588249
Flange adapter plate, SAE 4" – SAE 1 ½"	3442518

Accessories (electrical)

Description	Part no.					
Connection cable						
ZBE42S-05						
Connection cable, socket	3281239					
plug 8 pin with cable, open						
ZDE44 mating connector with	3281243					
screw clamp, 8-pin, M12x1	0201210					
Connection cable						
ZBE43-05						
Connection cable, coupling/	3281240					
plug 8 pin, length = 5 m						
ZBE43-10						
Connection cable, coupling/	3519768					
plug 8 pln, length = 10 m						
ZBE30-02	6040954					
plug 5 pin, length = 2 m	0040651					
ZBE30-05						
Connection cable, coupling/	6040852					
plug 5 pin, length = 5 m						
Network cable (LAN)						
ZBE 45-05						
Network cable (patch),	2246400					
male connector R 1/5	3340100					
length = 5 m						
7BE 45-10						
Network cable (patch),						
Socket plug 4 pin,d-coded/	4571668					
male connector RJ45,						
length = 10 m						

| Technical Data

	MCS 15xx	MCS 14xx	MCS 13xx				
Electrical data							
Ethernet interface	 physical: 10Base-T / 100Base-TX 						
	 protocols: HSI TCP/IP, Modbus TCP 						
CAN interface	● physical: CAN						
	protocol: CANopen						
USB interface	● physical: mini USB						
(only for service purposes)	 protocol: proprie 	etary					
General data							
Self diagnostics	Continuous, with error indication via Status LED and general operational readiness via Device-Ready-LED						
Ambient temperature		-40 70 °C					
Sensor section (Ø)	1" (25 mm)	½" (13 mm)	1⁄4" (6 mm)				
Protection class (DIN 40050)							
Weight	≈ 3.5 kg	≈ 2.5 kg	≈ 3 kg				
Conformity & Certifications							
CE mark	• EN61000-6-4 / -6-2 / -6-9 (pulse magnetic field immunity) / -4-29 (voltage dips)						
FC mark	• FCC – Title 47 CFR Part 15						
	Vibration test/Shock test:						
	 EN60068-2-2 / -2-64 (vibration) 						
	• EN60068-2-27 / -2-31 (shock)						
Environmental tests	Climate test:						
	 EN60068-2-52 (salt mist sevrity) 						
	 EN60068-2-1 / -2-2 / -2-14 / -2-30 / -2-38 / 2-78 (termperature and humidity) 						
Cortifications	Wind power: DNV – Renewables Certification						
Certifications	 Marine: DNV – Type Approval 						

Model code

<u>MCS 1 5 8 0 - 0 - 5 - 2 / -000</u>						
Тур						
MCS = MetallicContamination Sensor						
Serie						
1 = 1000 Serie						
Detection limit / sensor cross-section						
3 = Fe particles > 70 µm / ¼"						
4 = Fe particles > 100 μ m / $\frac{1}{2}$ "						
$5 = \text{Fe particles} > 200 \mu\text{m} / 1$						
Signal output / electrical interface						
8 = 2X Switching output / R5485 (HSI, Modbus RTU) /						
9 = 2x switching output / CAN (CANonen) / Ethernet						
(HSI TCP/IP, Modbus TCP)						
Signal input / electrical interface						
0 = Without						
Media / fluids						
0 = Mineral and synthetic oils						
Hydraulic connection						
1 = Flange connection, SAE ½" according to ISO 6162-1						
2 = Flange connection, SAE ³ / ⁴ according to ISO 6162-1						
= Flange connection, SAE 1" according to ISO 6162-1						
5 = Flange connection, SAE 4 according to ISO 6162-1						
2 = M12x1 male connection 8-pin / Ethernet M12x1 4-pin D encoded						
according to IEC61076-2-101 / mini USB						
Modification number						
000 = standard						

EN 7.690.0/04.21

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 that is specially matched to the product and the respective application (HYDAC ConditionMonitoring Kit CMK)
- Universal complete solutions for fluid condition monitoring (HYDAC CondtionMonitoring Package CMP)

Please contact us for further detailed information.

Preferred models

Description	Part no.
MCS1380-0-1-2/-000	4560144
MCS1580-0-5-2/-000	4560339















MCS	а	b	С	d	е	f	g	h	i	j
13xx-x-1	120	113	83	53	38.1	17.5	Ø 8	70	60	M8
14xx-x-2	120	113	83	53	47.6	22.2	Ø 11.5	70	60	M8
15xx-x-3	162	106	83	38.5	52.4	26.2	Ø 11.5	80	55	M8
15xx-x-5	162	132	83	62	130	77.8	Ø 17.5	95	60	M8
15xx-x-6	120	106	83	38.5	69.9	35.7	Ø 13.5	90	35	M8

All dimensions in mm

Note

The information in this brochure relates to the operating conditions and applications described.

applications described. In the event of deviating application and/or operating conditions, please contact the department concerned. Subject to technical modifications. In the event of deviating applications and/or operating conditions, please contact the department concerned.

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