HYDAC INTERNATIONAL

ConditionMonitoring Package
CMP

Description

The ConditionMonitoring Package CMP is an online measuring system which is used to determine solid particle contamination,
water saturation and the fluid state in hydraulic and lubricating fluids depending on the sensor equipment.

Depending on the version, the ConditionMonitoring Package CMP comprises motor, pump and sensor connection block and can therefore easily be integrated hydraulically into fluid circulation systems of existing systems. The optional CSI-C-11 data storage and network communication interface also facilitates optimal transmission of the measured values to data acquisition and evaluation systems.

The CMP thus presents itself as a compact and easy-to-retrofit condition monitoring solution for fluids.

Applications

- Monitoring of hydraulic and lubrication systems in the marine, paper, steel, cement, and energy industries
- Component cleanliness monitoring in test benches
- Monitoring of oil purity in tanks (depressurised) and pressure lines

Advantages

- System for flexible combination with different fluid sensors
  - ContaminationSensor CS1000 for measuring the solid particle contamination
  - AquaSensor AS1000 or AS3000 for measuring the water saturation
  - MetallicContamination Sensor MCS1000 for determination of the metallic wear
  - HYDACLab HLB1400 for determination of the fluid state
- Approved solution for measurement tasks with low system pressure
- Also available for pumps with high inlet pressures
- The perfect tool for implementing modern maintenance strategies

Technical data

Hydraulic data	**CMPxxxx-1**	**CMPxxxx-2**	**CMPxxxx-4**	**CMPxxxx-5**
Operating pressure, maximum P_{IN} (IN)	-0.4 to 0.5 bar	-0.4 to 120 bar	-0.4 to 80 bar	-0.4 to 4 bar
P_{OUT} (OUT)	5 bar	5 bar	5 bar	0.5 bar
Leakage oil (LEAKAGE)	-	0.5 bar	-	-
Hydraulic connections P_{IN} (IN) acc. to ISO 228-1	G ¼	G ¼	G ¼	G ¾
P_{OUT} (OUT) acc. to ISO 228-1	G ¼	G ¼	G ¼	G ½
Leakage oil (LEAKAGE) acc. to ISO 228-1	-	G ¼	-	-
Permissible viscosity range for operation	10 to 3,000 mm²/s	10 to 3,000 mm²/s	2 to 1,000 mm²/s	12 to 20,000 mm²/s
Permissible viscosity range for measurement operation	10 to 1,000 mm²/s	10 to 1,000 mm²/s	2 to 800 mm²/s	12 to 20,000 mm²/s
Flow rate	≈ 130 ml/min @50 Hz ≈ 160 ml/min @60 Hz	≈ 180 ml/min @50 Hz ≈ 215 ml/min @60 Hz	≈ 280 ml/min @50 Hz ≈ 340 ml/min @60 Hz	≈ 6 l/min @50 Hz ≈ 7 l/min @60 Hz
Permitted fluids	Hydraulic and lubrication fluids based on mineral oil			
	-	-	Diesel fuel	-
Pump type	Gear pump			
Permitted fluid temperature range	0 to 70 °C			0 to 85 °C
Electrical data				
Power consumption (depending on motor type and operating conditions)	≤ 180 W @ 50 Hz / ≤ 210 W @ 60 Hz			≤ 370 W @ 50 Hz / ≤ 440 W @ 60 Hz
Protection type	IP55			
General data				
DIMENSIONS	See corresponding version/drawing			
Weight when empty	See corresponding version			
Permissible ambient temperature range	0 to 40 °C			
Permissible storage temperature range	-40 to 80 °C			
Relative humidity	Maximum 90%, non-condensing			
Environmental conditions				
Emission sound pressure level LPA	< 70 dB(A)			

Model code

CMP - 100 0 - 4 - X W/N/X60/O60 - AS1C / -000

Type
CMP = ConditionMonitoring Package

Size
121 = CS1000 → ISO / SAE without display, 4 – 20 mA
122 = CS1000 → ISO / SAE with display, 4 – 20 mA
131 = CS1000 → ISO / SAE / NAS without display, 4 – 20 mA
132 = CS1000 → ISO / SAE / NAS with display, 4 – 20 mA
431 = MCS1000 → 70µm/ ¼", RS485
432 = MCS1000 → 70µm/ ¼", RS485 (Modbus RTU)
437 = MCS1000 → 70µm/ ¼", RS485, Ethernet (Modbus TCP)

Fluid
0 = mineral oil
1 = phosphate ester (only CS and AS)

Pump type / conditioning
Z = without pump (only MCS)
ZP = without pump, operating pressure 5 - 300 bar, (only CS)
1 = gear pump, standard (only CS)
2 = gear pump, inlet pressure-stability with drain line (only CS)
4 = gear pump, magnetically coupled, inlet pressure-stability without drain line (only CS)
5 = gear pump, P(IN) = max. 4 bar, Q = 6 l/min (only MCS1000 → 70µm)
Other types of pump on request

Electrical interface
Z = defined via standard interface(s) of the installed sensors (male connector, pin assignment)
X = on request (customer-specific)
C11 = data logger and network interface CSI-C-11 (sensor connections: 2x HSI SMART)
C111 = data logger and network interface CSI-C-11 (sensor connections: 2x HSI SMART, 4x analogue)

Supply voltage, pump
W/N/X60/O60 = 230V, 50 Hz, 3 Ph. / 265V, 60 Hz, 3 Ph.
400V, 50 Hz, 3 Ph. / 460V, 60 Hz, 3 Ph.
M = 230V, 50 Hz, 1 Ph.
Z = without pump
Other supply voltages on request

Additional sensor
AS1C = AquaSensor AS1000 with 2x analogue output 4 to 20 mA
AS12 = AquaSensor AS1000 with 2x switching output (configurable)
AS35 = AquaSensor AS3000 with 2x switching output (configurable) and 1x analogue output (configurable); no interface and not compatible with C11 and C111
HLB10 = HydacLab HLB1400 with 2x OUT (switching output/analogue output – can be freely selected/configured)
HLB11 = HydacLab HLB1400 with RS485 (2-wire)
HLB12 = HydacLab HLB1400 with 2x OUT (switching output/analogue output – can be freely selected/configured) and RS485 (2-wire)
Z(AS) = without additional sensor, prepared for AS
Z(HL) = without additional sensor, prepared for HLB

Modification number
000 = standard

Scope of delivery

– CMP, ready for connection
– Installation and Maintenance Instructions

Note:

– Re CMP4xxx-Z-x-x/-xxx
Please note that for the CMP4xxx with inductive metal particle counter MCS 1000 and without integrated pump, the flow rate conditioning is carried out using metering orifices. These are not part of the scope of delivery and must be designed dependent on the predominant operating conditions in the respective application field.

Accessories

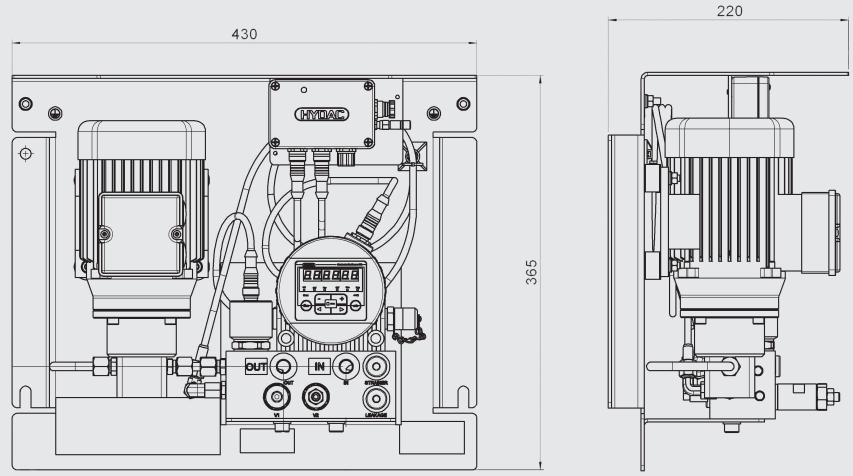
Designation	Part no.
Supply voltage (for sensors and data logger)	
PS5 power supply unit 100 – 240 V AC, 50–60 Hz, 1.1 A, IP40; male connector M12, 5-pole, female Power supply unit recommended for data logger CSI-C-11	3399939
ZBE47S-05 single-ended cordset, mating connector 5-pole with cable, open cable end, length = 5 m	3527626
ZBE42S-05 single-ended cordset, mating connector 8-pole with cable, open cable end, length = 5 m	3281239
Connection cable, sensors	
ZBE43-05 double-ended cordset, male/female connector 8-pole, length = 5 m	3281240
ZBE30-05 double-ended cordset, male/female connector 5-pole, length = 5 m	6040852
Network cable (LAN)	
ZBE 45-05 network cable (patch), mating connector, 4-pole, D-coded / RJ45 male connector, length = 5 m	3346100
ZBE 45-10 network cable (patch), mating connector, 4-pole, D-coded / RJ45 male connector, length = 10 m	3346101

Dimensions in mm (models that are selected)

CMP with magnetically coupled gear pump (inlet pressure-stability), fluid sensors CS1000 and HLB1400 and data logger / network interface CSI-C-11

Model code: CMP1220-4-C11-W/N/X60/O60-HLB10/-000

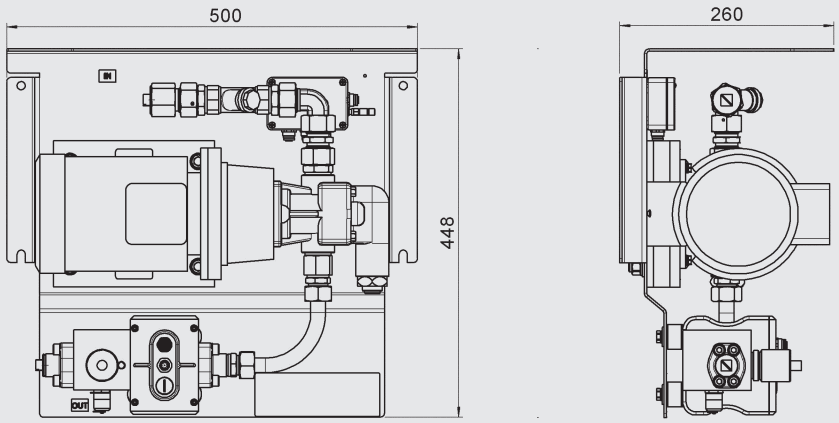
Weight: ~ 22 kg



CMP with gear pump, fluid sensors MCS1310 and HLB1400 and data logger / network interface CSI-C-11

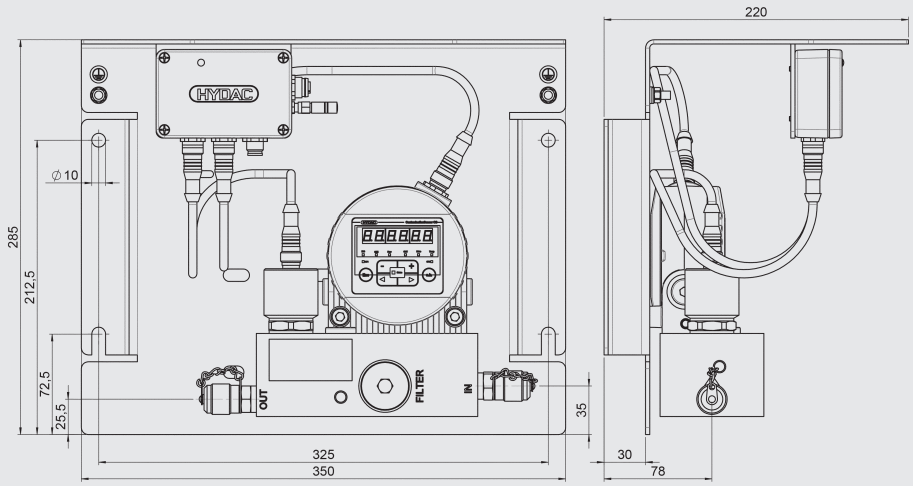
Model code: CMP4310-5-C11-W/N/X60/O60-HLB10/-000

Weight: ~ 27 kg



CMP without motor pump assembly, fluid sensors CS1220 and HLB1400 and data logger / network interface CSI-C-11

Model code: CMP1220-ZP-C11-Z-HLB10/-000



Preferred models

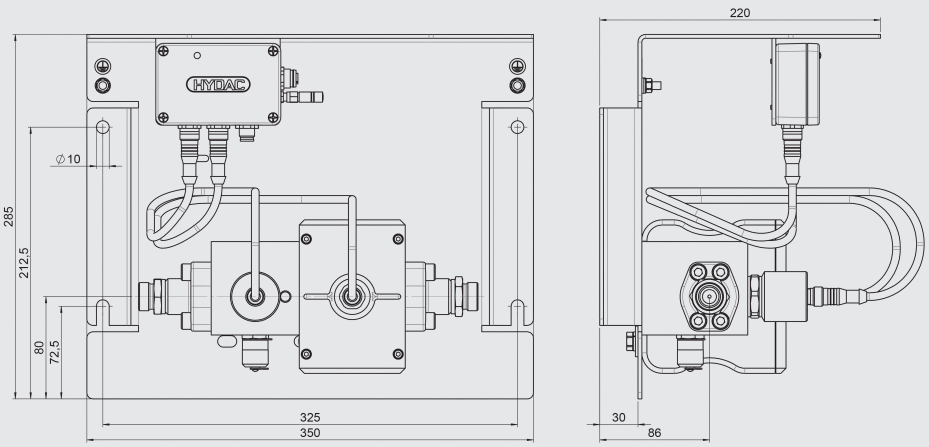
Designation	Part no.
CMP1220-4-C11-W/N/ X60/O60-HLB10/ -000 with sensors CS1220 (display) and HLB1400, pump with inlet pressure-stability, 3-phase motor, data logger CSI-C-11	4512707
CMP1220-4-C11-M-HLB10/-000 with sensors CS1220 (display) and HLB1400, pump with inlet pressure-stability, 1-phase motor, data logger CSI-C-11	4512706
CMP4310-5-C11-W/N/ X60/O60-HLB10/-000 with sensors MCS1310 and HLB1400, pump, 3-phase motor, data logger CSI-C-11	4581692
CMP4310-Z-C11-Z-HLB10/-000 with sensors MCS1310 and HLB1400, without pump, data logger CSI-C-11	4581987
CMP1220-ZP-C11-Z-HLB10/-000 with sensors CS 1220 and HLB1400, without pump, data logger CSI-C-11	4654795

Dimensions in mm (models that are selected)

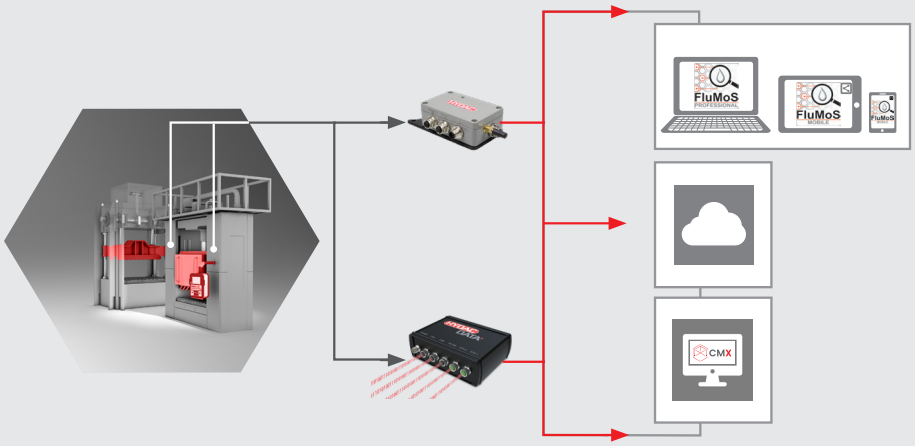
CMP without motor pump assembly, fluid sensors MCS1310 and HLB1400 and data logger / network interface CSI-C-11

Model code: CMP4310-Z-C11-Z-HLB10/-000

Weight: ~ 12 kg



IT technical system connection (connectivity)



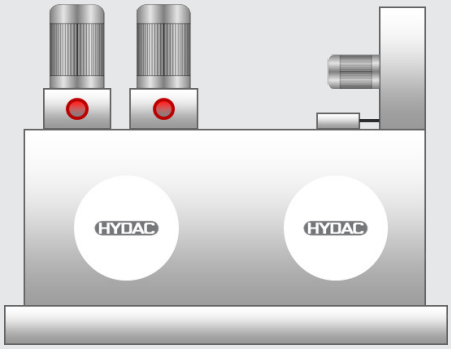
Configuration examples

Designation	Part no.
CMP1220-4-Z-W/N/X60/O60-HLB12/-000 with sensors CS1220 (display) and HLB1400, pump with inlet pressure-stability, 3-phase motor	4512711
CMP1220-4-Z-M-HLB12/-000 with sensors CS1220 (display) and HLB1400, pump with inlet pressure-stability, 1-phase motor	4512709
CMP1220-4-C111-W/N/X60/O60-HLB10/ -000 with sensors CS1220 (display) and HLB1400, pump with inlet pressure-stability, 3-phase motor, data logger CSI-C-11 (with analogue inputs)	4582211
CMP4310-5-C111-W/N/X60/O60-HLB10/ -000 with sensors MCS1310 and HLB1400, pump, 3-phase motor, data logger CSI-C-11 (with analogue inputs)	4582441
CMP4310-5-C11-M-HLB10/-000 with sensors MCS1310 and HLB1400, pump, 1-phase motor, data logger CSI-C-11	4512712
CMP4310-5-Z-W/N/X60/O60-HLB12/-000 with sensors MCS1310 and HLB1400, pump, 3-phase motor	4512795
CMP4310-5-Z-M-HLB12/-000 with sensors MCS1310 and HLB1400, pump, 1-phase motor	4512714
CMP4310-Z-Z-Z-HLB12/-000 with sensors MCS1310 and HLB1400, without pump	4512797

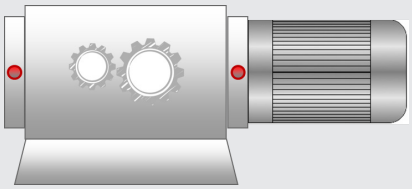
Condition monitoring packages (application examples)

In the following application examples, typical sensor configurations based on the HYDAC ConditionMonitoring Package CMP for a fluid-based system condition monitoring solution are shown. It should however be noted that the sensor selection must always be tailored to the respective application field or condition monitoring task and that it may deviate from the examples listed below.

Hydraulic & lubrication power units



Industrial gearbox systems (lubrication)



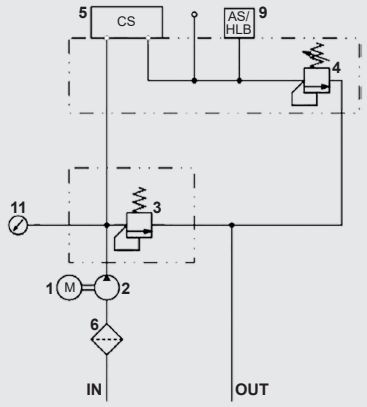
Economy	
CMP1220-4-C11-W/N/X60/O60-HLB10/-000 (4512707)	CMP4310-5-C11-W/N/X60/O60-HLB10/-000 (4512713)
Fluid conditioning unit with pump (inlet pressure-stability) as well as optical particle counter CS1220, fluid condition sensor HLB1400 and data logger CSI-C-11	Fluid conditioning unit with pump as well as inductive particle counter MCS1310, fluid condition sensor HLB1400 and data logger CSI-C-11
Standard	
CMP1220-4-C111-W/N/X60/O60-HLB10/-000 (4582211)	CMP4310-5-C111-W/N/X60/O60-HLB10/-000 (4582441)
Fluid conditioning unit with pump (inlet pressure-stability) as well as optical particle counter CS1220, fluid condition sensor HLB1400 and data logger CSI-C-11 (with analogue inputs)	Fluid conditioning unit with pump as well as inductive particle counter MCS1310, fluid condition sensor HLB1400 and data logger CSI-C-11 (with analogue inputs)
ZBE CSI 60 (4420372)	ZBE CSI 60 (4420372)
Sensor connection adapter to connect max. 4 analogue sensors to the CSI-C-11-0-0-1/-000	Sensor connection adapter to connect max. 4 analogue sensors to the CSI-C-11-0-0-1/-000
HPT 506-C-05.0-A-000 (925317)	HPT 506-C-05.0-A-000 (925317)
Filter differential pressure measurement	Filter differential pressure measurement
EVS 3106-A-0300-000 (909812)	Current consumption / power of connected drive
Measurement of flow rate (pump)	→ no sensor (measured variable processed as 4 – 20 mA signal)
HDA 4846-A-400-000 (922154)	
System pressure measurement	
ENS 3216-3-0520-000-P (908671)	
Level measurement	

Storage of measurement data and analysis:

In the above examples, the measurement data can be stored both locally on the data logger HYDAC CSI-C-11 and in the higher-level data acquisition systems or on a cloud portal – for example HYDAC CMX. Using the optionally available HYDAC CMX, measurement data can not only be stored and visualised, but also analysed, processed and made accessible to different user groups in an action-oriented way.

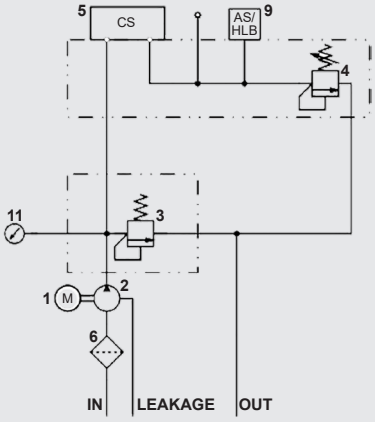
Hydraulic diagram (example)

CMP1xxx-1-Z-W/N/X60/O60-x/-000 and CMP1xxx-4-Z-W/N/X60/O60-x/-000



Pos.	Designation
IN	Inlet
OUT	Outlet
1	Electric motor
2	Gear pump
3	Pressure relief valve
4	Counter-balance valve
5	Sensor 1 (ContaminationSensor)
6	Strainer
9	Sensor 2 (AquaSensor or HYDACLab)
11	Pressure gauge

CMP1xxx-2-Z-W/N/X60/O60-x/-000



Pos.	Designation
IN	Inlet
OUT	Outlet
LEAK	Outlet (drain line)
1	Electric motor
2	Gear pump
3	Pressure relief valve
4	Counter-balance valve
5	Sensor 1 (ContaminationSensor)
6	Strainer
9	Sensor 2 (AquaSensor or HYDACLab)
11	Pressure gauge

Comment

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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