

CIMS: Cylinder Integrated Measuring System



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CIMS: Cylinder integrated measuring system

The Bosch Cylinder Integrated Measuring System (CIMS) provides a highly reliable solution to measure the position of the piston rod. For over 20 years, from the original system (Mk I) up to the latest generation (Mk IV), CIMS has been accurately and reliably measuring the piston rod's position in thousands of large hydraulic cylinders. The close cooperation between Bosch and Rexroth resulted in the newest version of CIMS. This version is based on the latest automotive measurement technologies. Fully integrated in Rexroth's large hydraulic cylinder, CIMS works in every environmental situation.

Application areas

The Cylinder Integrated Measuring System is used on a wide variety of large hydraulic cylinders. Many industries depend greatly on accurate piston rod positioning. Application areas in which CIMS is often used are:

- ▶ Dredging vessels
- ▶ Offshore platforms
- ▶ Ship loading and unloading systems
- ▶ Tunneling machines
- ▶ Bridges and sluices
- ▶ Metallurgy systems.

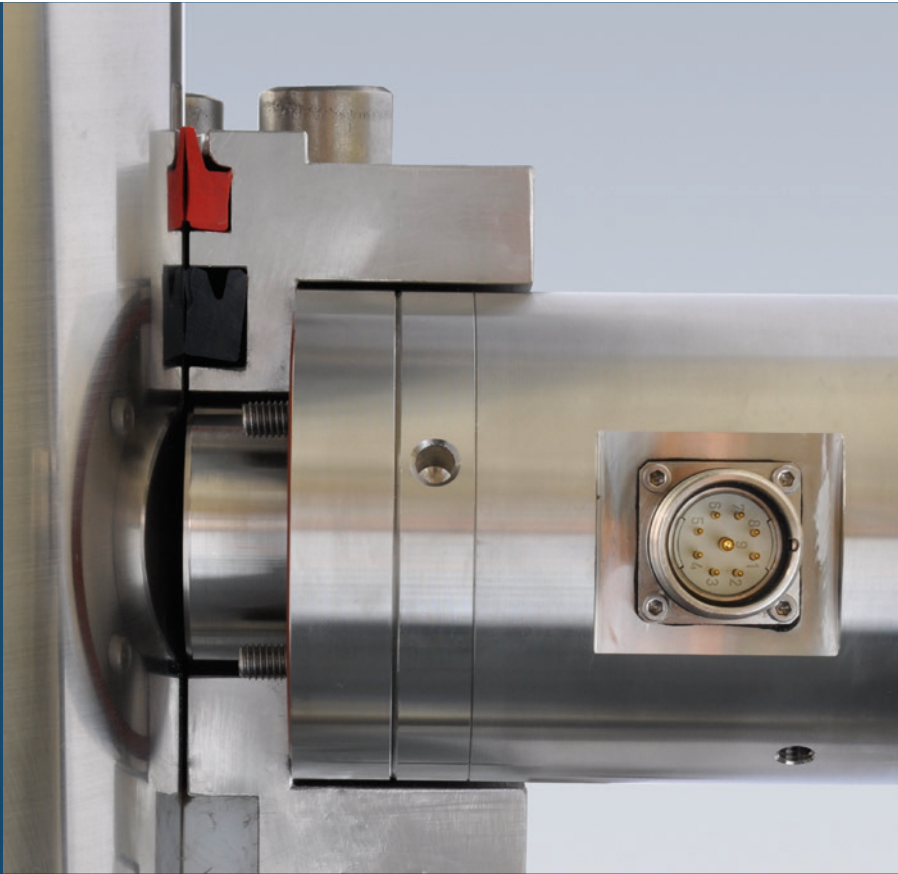
Function and Characteristics

The Cylinder Integrated Measuring System is a highly unified incremental position measuring system for use on hydraulic cylinders with Enduroq 2000 series surface technologies. Grooves underneath the piston rod coating cause a variation in the magnetic field from the permanent magnet inside the CIMS. The CIMS Hall-effect sensor elements measure the magnetic field and its variations resulting in precise measurements with an accuracy of less than

1 millimeter (linearity $\leq \pm 1$ mm). Their signals are fed into a micro controller which calculates the position inside the groove and generates the incremental RS-422 output signal (1024 pulses/com). The sensor and electronics are protected by a robust stainless steel housing, which is installed into the head of the cylinder. CIMS can withstand almost any environment: low (-40°C) to high temperatures (70°C); high pressure when submerged in (sea)water (IP68, 10 bar); and even potentially explosive atmospheres (ATEX zone 1).

New CIMS features

- ▶ Contactless operation, no contact between sensor and cylinder rod: no-wear parts; no-slide pad; and no-rod diameter, depending on components and a completely closed housing.
- ▶ Easy commissioning/easy installation: plug & play and no (manual) calibration necessary; CIMS will automatically compensate for mounting tolerances, magnetic disturbances and temperature effects.
- ▶ Status CIMS can be monitored. Simplified failure analysis possible: diagnostic output, through a PC or PLC, can be retrieved for sensor status, error codes,



The Cylinder Integrated Measuring System accurately and reliably measures the piston rod's position, without any contact between the sensor and cylinder rod. Status monitoring that is based on the latest Bosch diagnosis software can be done by connecting CIMS to a PC or PLC.

sensor identification.

- Increased operating conditions: CIMS withstands tougher environmental conditions, larger temperature range (up to -40 °C), higher speeds.

Backward compatibility

Previous CIMS versions (II & III) can be easily replaced. The system is backward compatible with CIMS II/III, apart from the standard connector which has changed from a 6-pin to a 9-pin connector.

General CIMS features

- High accuracy combined with unlimited stroke lengths.
- Can be used in every large hydraulic cylinder application as the very robust stainless steel housing protects the electronics from almost any environment.
- Easy installation or replacement possible without restricting the hydraulic integrity of the cylinder; sensor integrated in sealing flange, out of the pressure zone of the cylinder.
- Ensures reliable position measurement at all

times, reliable redundancy possible with multiple CIMS sensors per cylinder; CIMS can be used while submerged in (sea) water up to 100 m - Waterproof, IP68 10 bar (depending on output connection type).

- Can be used in Ex zone 1 areas; optionally available for potentially explosive atmospheres; ATEX zone 1 certified.

Diagnostic output

With the CIMS Mk IV diagnostic output, it is possible to monitor statuses; see whether all CIMS in the hydraulic system are working correctly. Through a USB converter the CIMS can be connected to a PC and, with Rexroth diagnosis software, information about the CIMS Mk IV can be analysed. Information like sensor status, sensor identification, error codes, the current position (since last power up), etc. The diagnostic output can also be connected directly to a PLC, for example.

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