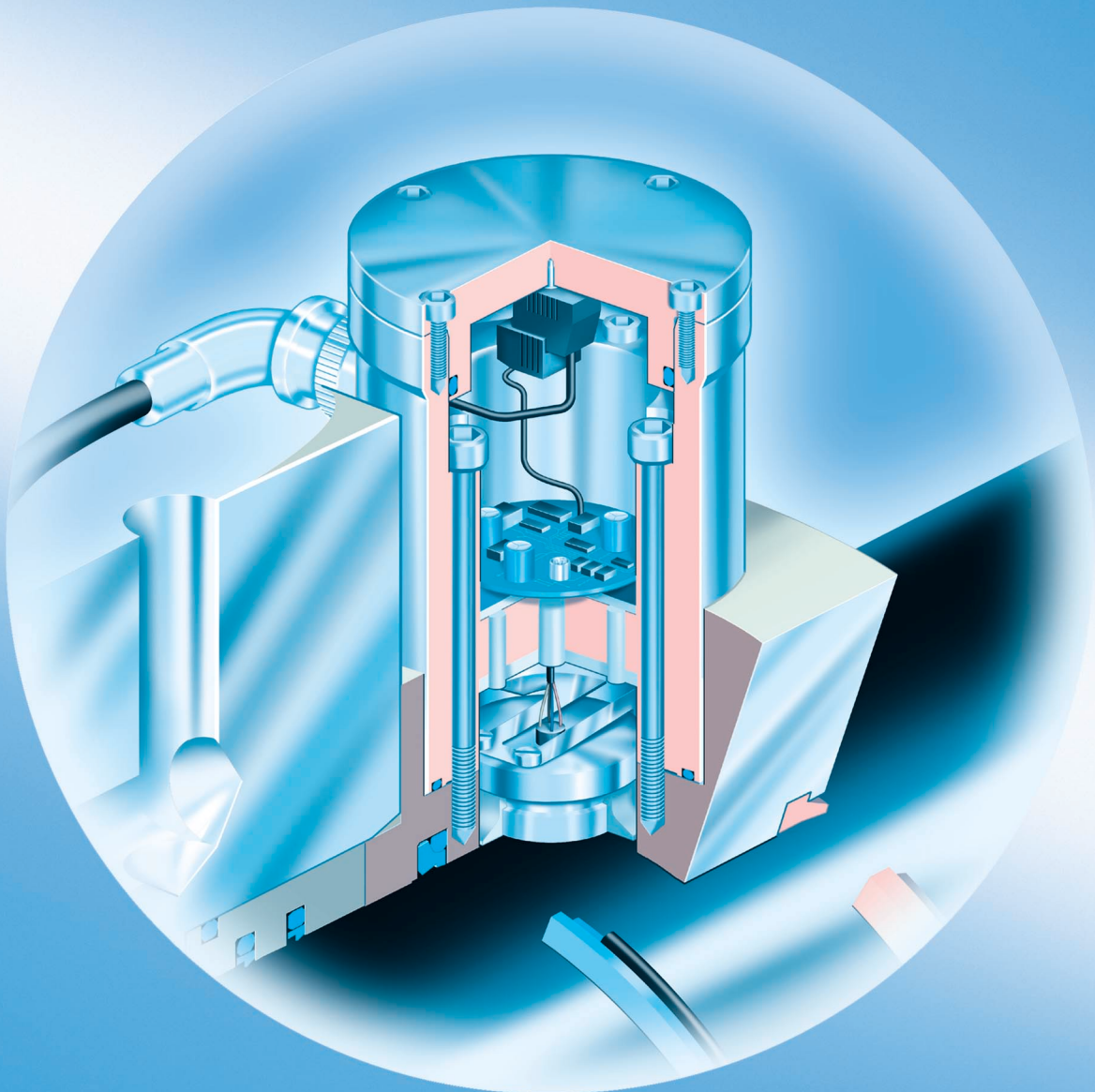
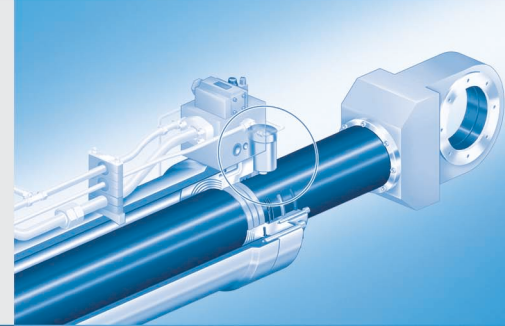


CIMS (Ceramax Integrated Measuring System)

The Drive & Control Company



Introduction

Extremely high demands are often placed on the continuous use of hydraulic cylinders, commonly in extreme ambient conditions. These cylinders are often employed in capital goods such as continuous casting machines in heavy industry, dredging vessels, offshore platforms, ship loading and unloading systems, tunneling machines, as well as bridges and sluices. Against this background the market demands extremely durable products, fully capable to withstand corrosive and abrasive conditions.



Ceramax and CIMS in a hostile offshore environment

The Company

Since 1953, Rexroth Hydraudyne B.V. has been gaining expertise in the sale, design and manufacture of engineered to order hydraulic cylinders. Piston diameters range up to 1,450 mm and stroke lengths can be as long as 45,000 mm.

We are a solid basis for a business partnership.

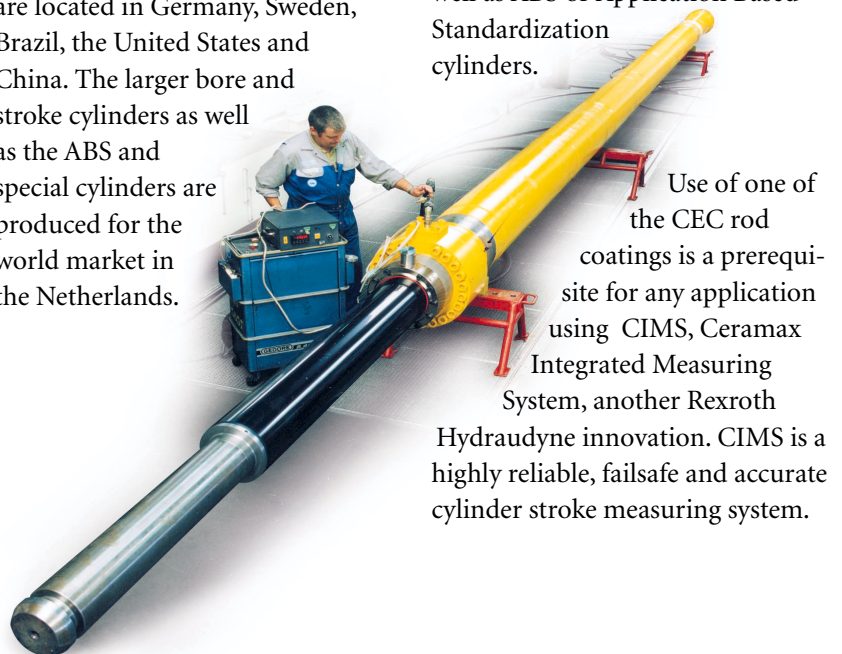
Bosch Rexroth is a group of companies specializing in the field of drive and control technology, with locations in all important industrial areas in more than 80 countries. The Bosch Rexroth Hydro Cylinder range is unique in the world thanks to the product scope, and the geographical distribution of both production and sales locations. Cylinder production facilities for standard cylinders, tie-rod and mill type up to 320 mm bore and 3 meter stroke are located in Germany, Sweden, Brazil, the United States and China. The larger bore and stroke cylinders as well as the ABS and special cylinders are produced for the world market in the Netherlands.

Ceramax Engineered Coatings (CEC), the basis for CIMS

With its revolutionary Ceramax Engineered Coatings, Rexroth Hydraudyne developed a new internationally recognized range of piston rod coatings. Every cylinder in its specific application can have its own optimized engineered cylinder rod coating, created for special circumstances and applications.

Each layer is applied with advanced processes like plasma spraying and HVOF spraying. Several different mixes of ceramic or metal matrix materials can be applied, depending on requirements for wear, corrosion and service life.

CEC can be applied to both our Bosch Rexroth standard cylinder ranges CDL (light), CDM (medium), and CDH (heavy) as well as ABS or Application Based Standardization cylinders.



Use of one of the CEC rod coatings is a prerequisite for any application using CIMS, Ceramax Integrated Measuring System, another Rexroth

Hydraudyne innovation. CIMS is a highly reliable, failsafe and accurate cylinder stroke measuring system.



CIMS MKII Operation principal

A magnetic field is created and shaped between a permanent magnet and a grooved piston rod, covered with Ceramax coating. Two half bridged magneto-resistive elements, located in this magnetic field, produce sine and cosine signals which are the input for a tracking phase resolver. The outputs of this resolver are quadrature incremental counting pulses. For long distance transmission these pulses are converted to RS422A differential output pulses. With appropriate cabling, shielding, impedance and counting equipment, the result is a simple, high quality, accurate and reliable displacement measuring system.

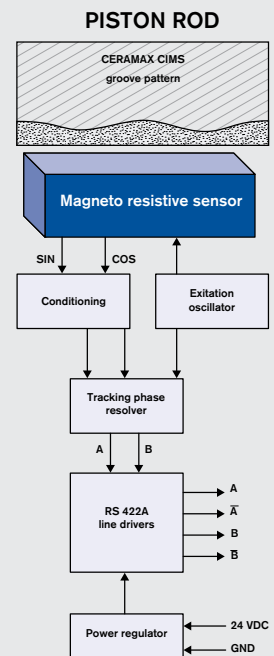
Implementation

CIMS MKII cylinders can easily be implemented in customer controls. The RS422A differential counting pulses are protected against and insensitive to electrical noise. The pulses can be accepted by a variety of counters with differential line receivers.

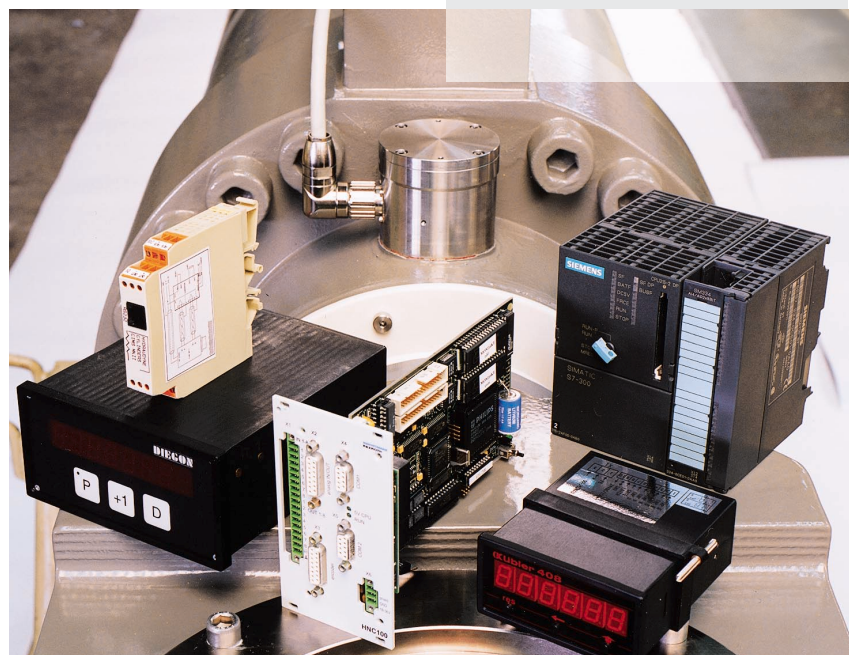
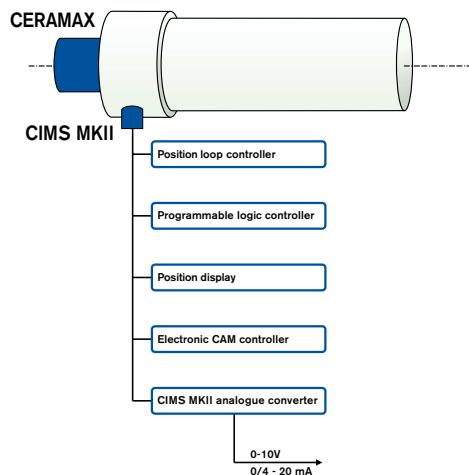
CIMS MKII in combination with these devices can be used for:

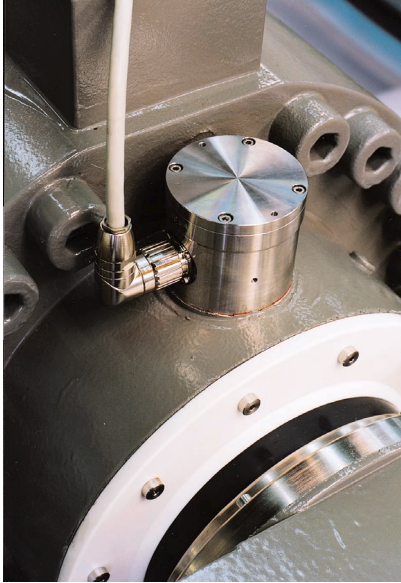
- Control of position
- Read-out of position
- Safeguarding / limiting of position
- Triggering of external actions

Production of CIMS MKII



Standard CIMS MKII customer interfaces

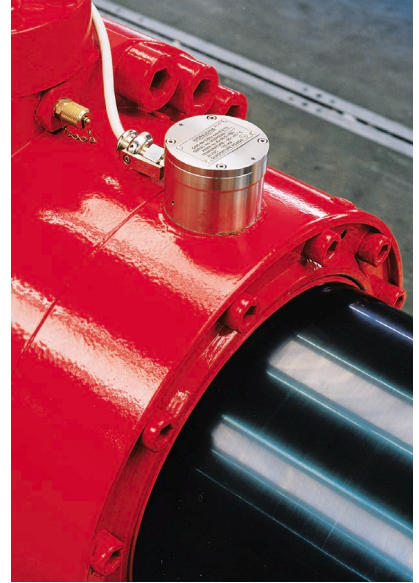




Standard IP 67 connector



IP 68 cable outlet



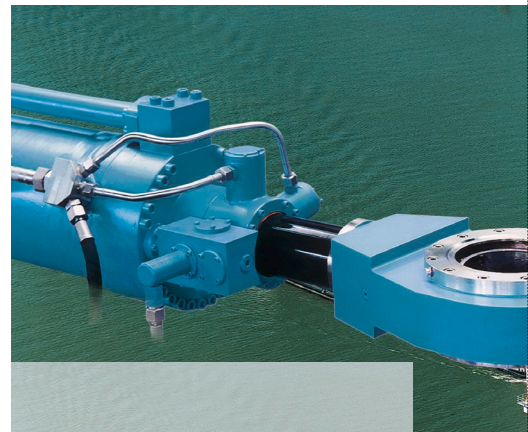
EEx version of CIMS MKII

Mechanical Lay Out

The CIMS MKII sensor and electronics are integrated in the cylinder head in a solid stainless steel housing outside the high pressure zone. They are fully protected against all environmental impacts. This construction also ensures easy serviceability and the possibility of offering redundant measurement solutions.

A variety of electro-mechanical cable outputs from a high performance IP67 connector up to IP68 high pressure protection is available. Also a certified EEx-version of CIMS MKII system is optional.

Specification		
CIMS MKII		
Electronics	Supply	24 VDC \pm 20%, 250 mA max
	Position output	incremental encoder 1024 x (A+B) pulses / 10 mm (quadrature)
	Output drivers	RS422A differential line drivers
Mechanical	EMC	IEC801 level 1
	Cable output	IP67 connector – IP68 hose/pipe
	Protection class housing	IP68 (10 bar)
	Stroke length	unlimited
	Max. velocity	1500 mm/s
Performance	Position accuracy	Linearity better than 1 mm Temperature coef. \pm 0.025 mm/°C
	Long distance data transmission	up to 400 m possible
	Temperature range	-25 °C up to 70 °C
CIMS MKII converter		
	Supply	24 VDC \pm 20%
	Power	1 W max.
	Input	– Quadrature incremental A and B pulses in RS422A format (100 kHz max.) Input impedance 10 k Ω
	Output	– Reset 5–24 VDC
	Accuracy	0..10 V, 0..20 mA, 4..20 mA Resolution \pm 0,03% fs Linearity \pm 0,15% fs Temp. coeff. \pm 60 ppm/°C (typical)
	Programmable	over RS232 input: – Stroke length – Output voltage or mA – Preset value
	Mounting	DIN rail mounting RS32/TS33



Redundant CIMS MKII solution

Advantages

- Unlimited stroke length
- Basic accuracy better than 1 mm for all stroke length
- No calibration needed (1024 pulses/10 mm)
- Data transmission over hundreds of meters (RS422A)
- Standard incremental counting pulses (quadrature)
- Easy interfacing to customer electronics for measuring, safeguarding and control
- Explosion safe (EEx) optional
- Redundancy solutions possible
- Stainless steel housing (IP68)
- Easy serviceability without oil spillage
- All fragile parts protected against all impacts
- Extremely robust shock resistant
- Cable outputs fit for all environments
- Thousands of CIMS units in the field
- MTBF over 100,000 hours



Hartel barrier, Rotterdam

CIMS MKII offers fully digital signals for direct digital operation without any loss of accuracy and need for calibration. For less demanding applications conversion to analogue current or voltage is possible. This will add an additional inaccuracy of approximately 0.2% full stroke.



Split hopper dredger

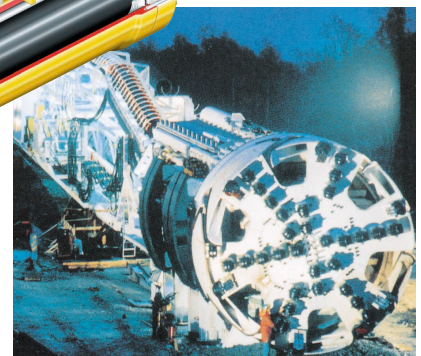
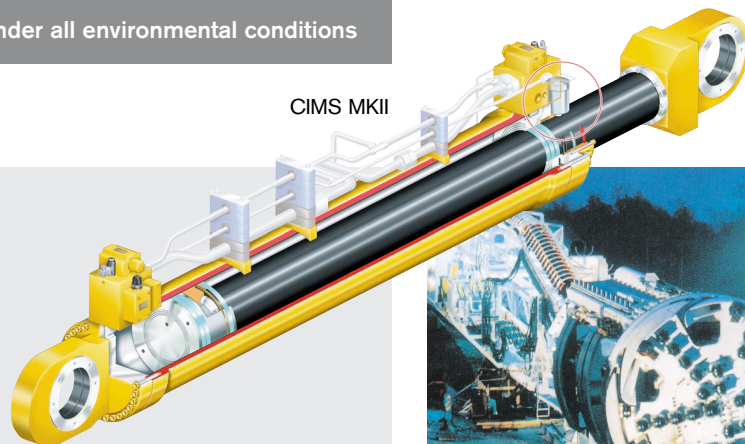
CIMS MKII is the solution for all applications

- Heavy Industry
- Offshore, Marine, Dredging
- Civil Engineering
- Mining and Material Handling
- Presses
- Servo/Simulation

CIMS MKII – functional and reliable under all environmental conditions



Roll change system



Hard rock drilling machine

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