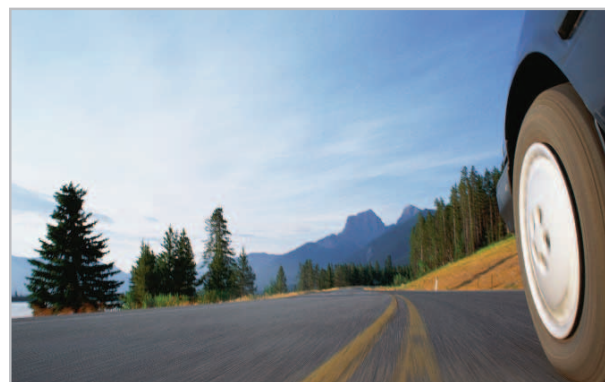


Temposonics®

Absolute, Non-Contact Position Sensors



THE APPLICATIONS

Unrivalled robustness in mobile machinery

In the mobile hydraulics field of application, the power of innovation is unbroken and the improvement of machinery is of increasing interest. The trend towards automation and design of intelligent control loops promotes a considerable improvement of the economy, quality and ease of operation to get the job done. Machine damage due to operator errors is prevented actively and detected automatically by measuring the process parameters for quality assurance.

To make use of the advantages of electrohydraulic control systems for mobile equipment, adequate sensors are a must. Temposonics sensors provide reliable operation even under difficult local circumstances including shock and vibration, adverse climatic conditions and electrical or magnetic interference. Integrated in the hydraulic cylinder, the sensors solve the positioning problem whatever it may be, e.g. in agricultural machines, for material handling or in the automotive industry. Innumerable satisfied mobile hydraulics manufacturers are already making use of the advantages of the contactless MTS sensor measurement principle.

www.mtssensor.com
www.temposonics-shop.de



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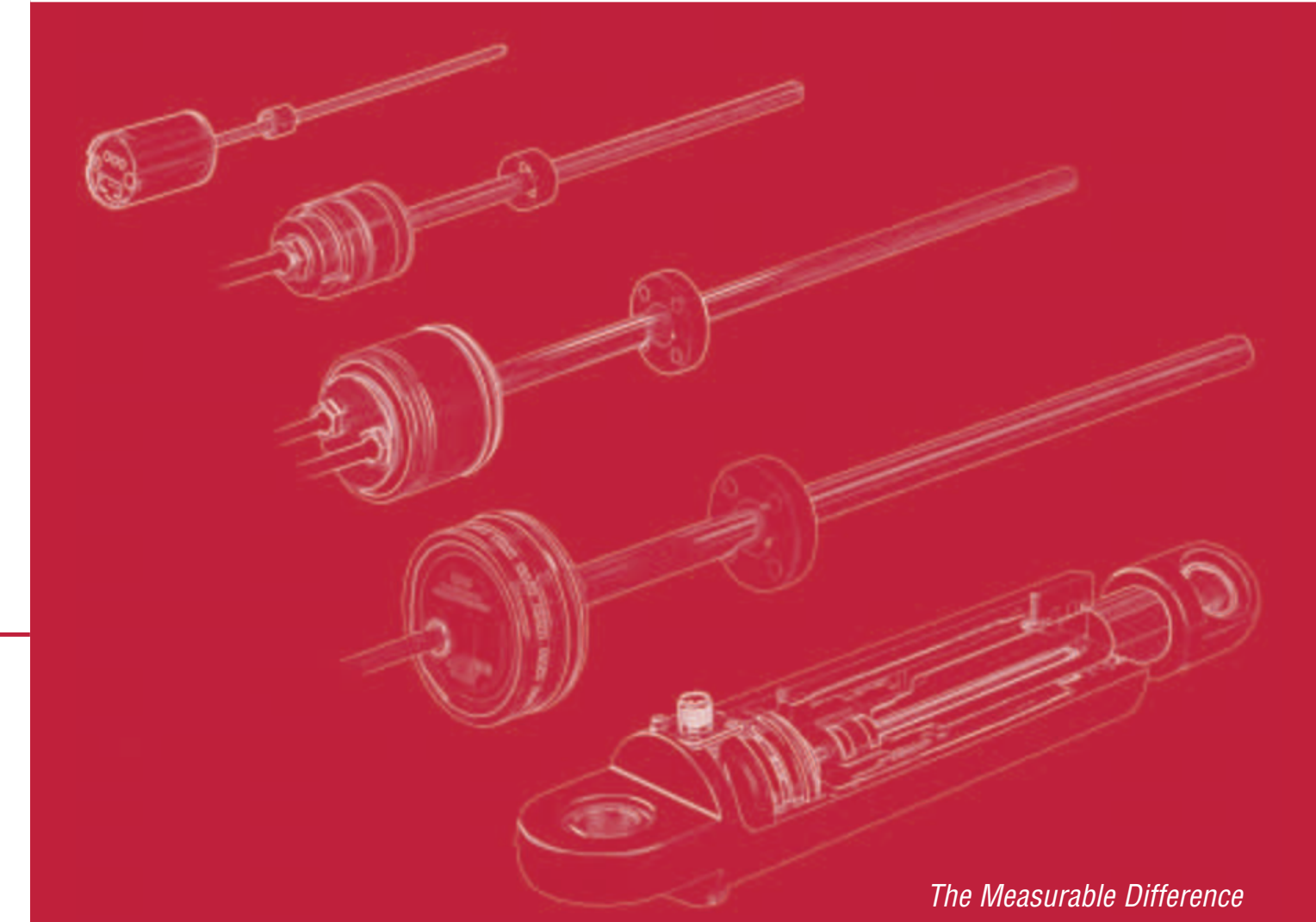


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Product Overview Mobile Hydraulics



The Measurable Difference

THE COMPANY



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MTS Systems Corporation, Minneapolis, USA



MTS Sensor Technologie
Lüdenscheid, Deutschland



MTS Sensors Division
Cary (North Carolina), USA



MTS Sensors Technology Corp.
Tokyo, Japan



The World of MTS - Precision and Reliability

Following the founding of **MTS Systems Corporation** in 1951, the company rapidly developed into a leading supplier of intelligent hardware and software products in the fields of test and simulation systems and in measuring and automation technology. Today MTS Systems Corporation has over **2.000 employees** worldwide – **280** of whom are employed by **MTS Sensors** at three sites in the **USA (Cary, N.C.)**, **Germany (Lüdenscheid)** and **Japan (Tokyo)**. At MTS, intensive basic research is efficiently merged with a consistent focus on practical requirements. The results are innovative solutions for a wide range of potential industrial and non-industrial applications.

THE PRINCIPLE

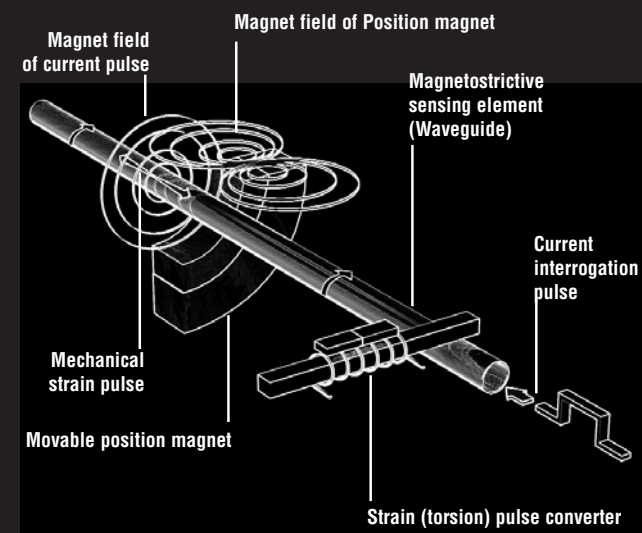
Magnetostriction - A Milestone in Measurement Technology

The heart of MTS sensors is the ferromagnetic measuring element, also known as the waveguide, and a movable position magnet that generates a direct-axis magnetic field in the waveguide.

When a current or interrogation pulse passes through the waveguide, a second magnetic field is created radially around the waveguide.

The interaction between the magnetic field in the waveguide and the magnetic field produced by the position magnet generates a strain pulse which travels at a constant ultrasonic speed from its point of generation, the measurement point, to the end of the waveguide where it is transformed into an electric pulse in the sensor element.

The resulting signal is processed by the specialized electronics of the Temposonics sensor. With our extensive know-how of ferromagnetic materials, magnetic effects and ultrasonic processes, MTS remains unrivalled in performance standards for non-contacting position measurement of the highest precision.



RUGGEDNESS AND COMPACT CONSTRUCTION, SUITABLE FOR MOBILE APPLICATIONS

Temposonics® sensors provide optimum measuring results even under harsh environmental conditions. Integrated into the hydraulic cylinder of off-road vehicles, Temposonics® sensors detect the slightest bit of movement.

	M-SERIES The rugged Sensor for Mobile Hydraulics				C-SERIES The flexible Miniatur Sensor	
Model	MH Analogue Position sensor to integrate in hydraulic cylinder	MH CAN Sensor with CANopen and J1939 interface	MS Compact position sensor for smallest installation space	MT Double redundant rod sensor for maximum safety	CM Cost-effective miniature sensor	CM H2 Compact level sensor with float
Measuring Range - Position - Velocity	50-2500 mm -	50-2500 mm ± 500 mm/s	50-2000 mm -	50-1500 mm -	72 - 250 mm -	
Output Signals	Voltage: 0,25...4,75 V, 0,5...4,5 V 5 V ratiometric Current: 4...20 mA PWM	CANopen, J1939	Voltage: 0,25...4,75 V, 0,5...4,5 V Current: 4...20 mA	Voltage: 0,25...4,75 V, 0,5...4,5 V Current: 4...20 mA	Voltage: 0,1...4,9 V PWM	
Resolution	Measuring range in 4096 steps (12 bit) PWM: ± 0,1 mm	± 0,1 mm	Measuring range in 4096 steps (12 bit)	Measuring range in 4096 steps (12 bit)	Analogue + PWM: infinite	
Linearity	< ± 0,04 % F.S. (Minimum ± 0,100 mm)	± 0,1 mm	< ± 0,04 % F.S. (Minimum ± 0,100 mm)	< ± 0,04 % F.S. (Minimum ± 0,100 mm)	± 0,15 mm	
Hysteresis	± 0,100 mm				± 25 µm	
Resistance to Shock (IEC 68-2-27)	100 g (11 ms) single shock 50 g (11 ms) 1.000 Schocks pro Achse		100 g (11 ms) single shock	100 g (11 ms) single shock	100 g (11 ms) single shock	
Resistance to Vibrations (IEC 68-2-26)	25 g (20...2.000 Hz)	25 g (20...2.000 Hz)	15 g (20...2.000 Hz)	10 g (20...2.000 Hz)	5 g	
Operating Pressure	450 bar		300 bar	350 bar		24 bar
Protection	IP 67 (housing), IP 69K with M12 connector system			IP 67 (housing)	IP 50	IP 67
Operating Temperature	-40°C...+105°C				-40°C...+105°C	
EMC	ISO 11452-5: 200 V/m, CE ISO 14982 Agricultural and forest machinery ISO 7637-1/2/3 Road vehicles DIN EN 50121-3-2 Railway vehicles		ISO 11452-5: 200 V/m, CE	ISO 11452-5: 100 V/m ISO 14982 Agricultural and forest machinery IEC 61000-4-6	EN ISO 14 982: 100 V/m, CE EN 60068-2-6 EN 60068-2-27 IEC 61000-4-6	
Operating Voltage	5 V / 12/24 V Reverse voltage protection	12/24 V Reverse voltage protection	12 V Reverse voltage protection	12 V Reverse voltage protection	2 V ± 25 % Reverse voltage protection	
Special Features	also available as SIL2 model (IEC 61508, ISO 13849) optional with M12 connector system		optional with M12 connector system	2 signal outputs (reversible)	Flexible sensor stroke	

INSTALLATION AND ACCESSORIES

(Product information see data sheet)

