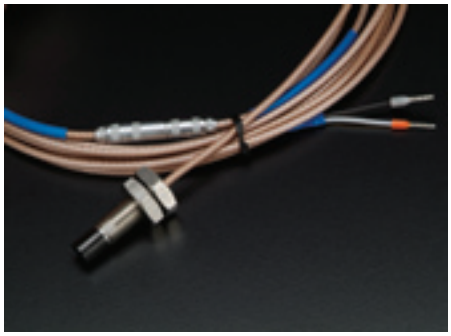
Eddy Current Displacement Transducer Specifications

The PR6423 003-0D1 is a radioactive radiation resistant non-contact eddy current transducer. The construction and design allows this sensor to be used in nuclear radiation zone 1 applications on turbomachinery, reactor coolant pumps and other motors, pumps, fans or blowers.

The purpose of a displacement probe is to measure position or shaft movement without contacting the measured surface – the rotor. In the case of sleeve bearing machines, the shaft is separated from the bearing material by a thin film of oil. The oil acts as a dampener and therefore the vibration and position of the shaft are not transmitted through the bearing to the bearing case. The use of case vibration sensors is discouraged for monitoring sleeve bearing machines since the vibration produced by shaft motion or position is greatly attenuated through the bearing oil film. The ideal method of monitoring shaft position and motion is by mounting a non-contact eddy sensor through the bearing, or inside the bearing, measuring the shaft motion and position directly.

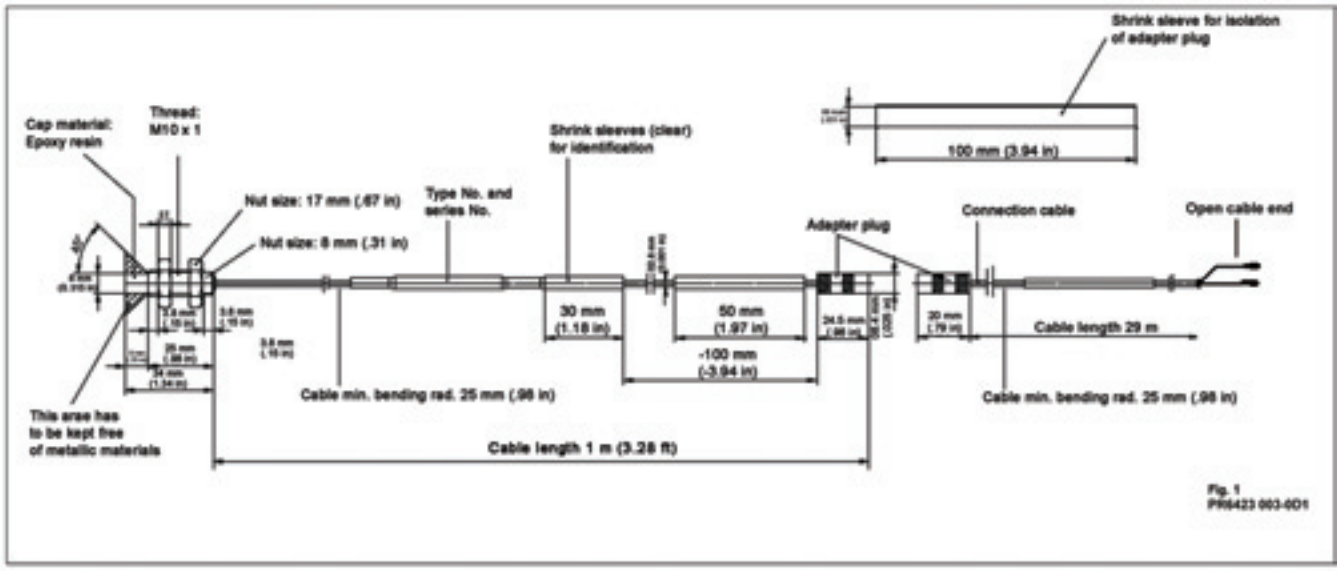
The PR 6423 is commonly used to measure vibration of machine shafts, eccentricity, thrust (axial displacement), differential expansion, valve position, and air gaps.



- Radioactive radiation resistant, zone 1
- Non-contact measurement of static and dynamic shaft displacement
  - Axial and radial shaft displacement (position)
  - Shaft eccentricity
  - Shaft vibration (motion)
- Meets international standards, DIN 45670, ISO 10817-1 and API 670
- Select converter for sensor such as CON 011/91, 021/91, 041/91, and cable for complete transducer system

Technical Data	
Measuring range	Static: ±1.0 mm (.04 in) Dynamic: 0 to 500µm (0 to 20 mil) Best suited for 50 to 500µm (2 to 20 mil)
Sensitivity	8 V/mm
Target	Electrically conducting steel Cylindrical shaft ■ On measuring collars, if target surface is less than 25 mm (.98 in) diameter, then error may be 1% or greater. ■ Error negligible when target surface is greater than 25 mm (.98 in) diameter Peripheral speed of shaft: 0 to 2500 m/s Shaft diameter > 25 mm (.98 in) Nominal gap (center of measuring range): 1.5 mm (.06 in)
Measuring error after calibration	< ±1% linearity error
Temperature error	Zero point: 200 mV / 100˚ K Sensitivity: < 2% / 100˚ K
Long term drift	0.3% max.
Influence of supply voltage	< 20 mV/V
Operating temperature range	-35 to +180˚ C (-31 to 365˚ F) (short term, up to 5 hours, up to +200˚ C / 392˚ F)
Temperature range for storage	-40 to +70˚ C (-40 to 158˚ F)
Thread of sensor	M10 x 1 or 3/8” – 24 – UNF – 2A Available only in M10 x 1 threads (off the shelf).
Sensor material	Stainless steel with special EPDM o-ring sealing and cable isolation with PVC The non-electrical part of the adapter plug is constructed with PEEK.
Pressure resistance to sensor head	10,000 hPa
Pressure and differential pressure resistance at cable outlet	on request
Vibration and shock nominal values at 25˚ C (77˚ F)	5 g at 60 Hz
Cable length	1m at the tranducer plus 29m extension cable
Maximum cable temperature	+80˚ C (+176˚ F)
Connection of transducer to converters	Blunt cut cable ends for screw terminals
Cable protection	Severe and high performance insulation, PTFE
Net weight without armored cable	0.1 kg (.22 lbs)
Net weight with armored cable	0.3 kg (.66 lbs)
Gross weight without armored cable	0.2 kg (.44 lbs)
Gross weight with armored cable	0.5 kg (1.1 lbs)

Dimensions:


Shrink sleeve for isolation of adapter plug
100 mm (3.94 in)
Cap material: Epoxy resin
Thread: M10 x 1
Nut size: 17 mm (.67 in)
Nut size: 8 mm (.31 in)
Type No. and series No.
Shrink sleeves (clear) for identification
Adapter plug
Connection cable
Open cable end
30 mm (1.18 in)
50 mm (1.97 in)
~100 mm (~3.94 in)
Cable length 29 m
Cable min. bending rad. 25 mm (.98 in)
Cable min. bending rad. 25 mm (.98 in)
This area has to be kept free of metallic materials
Cable length 1 m (3.28 ft)
Fig. 1
PR6423 003-601

Static Output Characteristics:

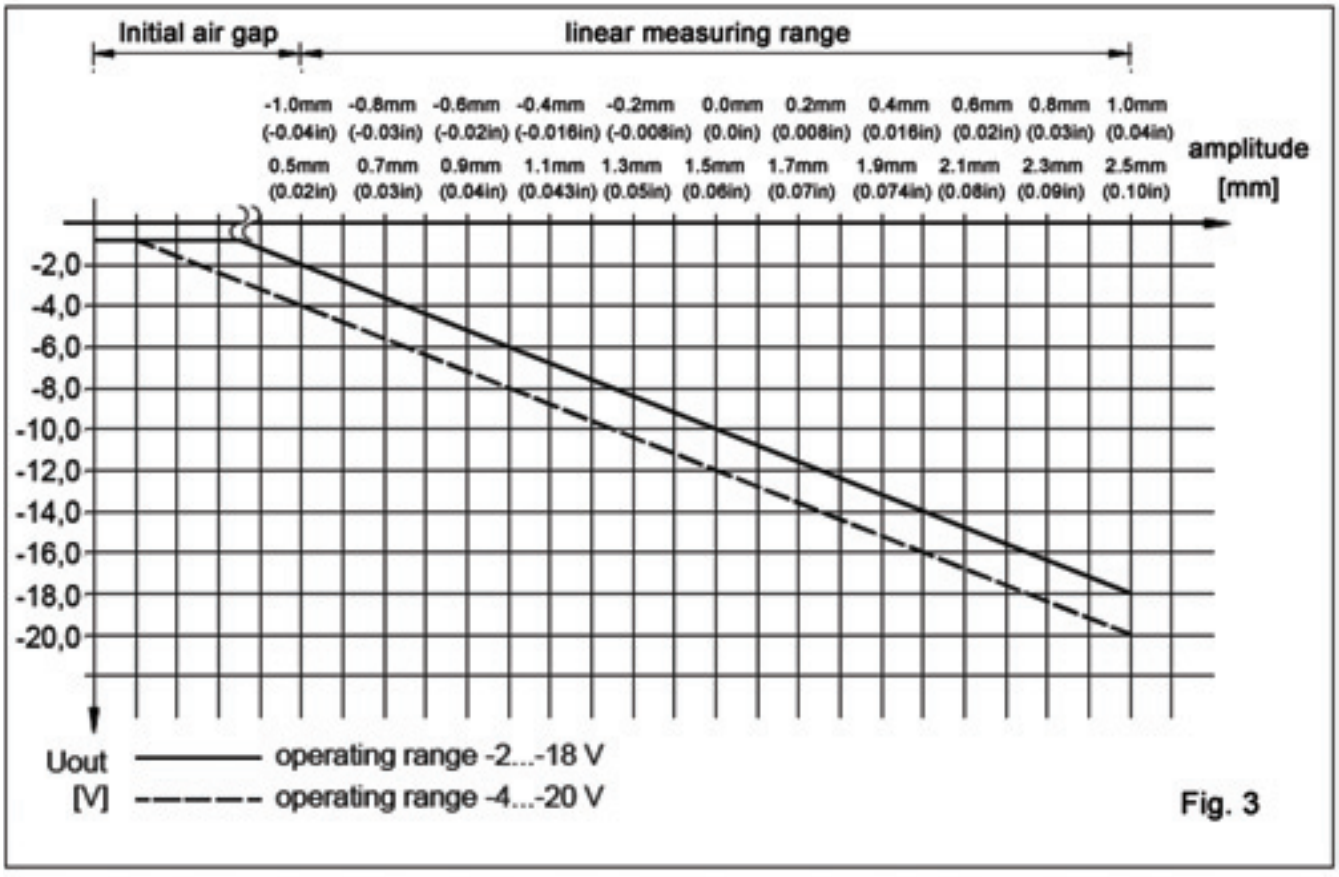


Fig. 3

Specifications Sheet
March 2013

CSI 6500 Machinery Health™ Monitor

Ordering Information, PR 6423

PR6423 Sleeve thread M10 x 1, sleeve length 55mm, adapter plug at 1 m, total cable length 30 m, open end cable

PR 6423	x	x	x	-	x	x	x
Sleeve Thread:							
M10 x 1	0						
3/8" – 24 –UNF – 2A	1			-			
Armored cable:							
Without		0		-			
With		1					
Sleeve length (+9.0 mm (.35 in) = total length):							
25 mm (.98 in)			0				
35 mm (1.38 in)			1				
45 mm (1.77 in)			2				
55 mm (2.17 in)			3				
65 mm (2.56 in)			4				
75 mm (2.95 in)			5				
85 mm (3.35 in)			6				
95 mm (3.74 in)			7				
105 mm (4.13 in)			8				
115 mm (4.53 in) (max. length)			9				
Adapter plug at 1 m (3.28 ft):							
With					0		
Without					1		
Total cable length:							
4 m (13.1 ft)						0	
5 m (16.4 ft)						1	
6 m (19.7 ft)						2	
8 m (26.2 ft)						3	
10 m (32.8 ft)						4	
Cable end:							
Lemo connector for converter							0
Blunt cut cable end for converter							1
PR 6423				-			

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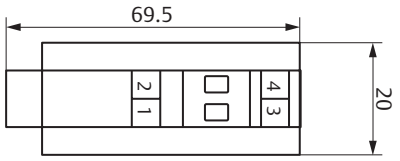
EMERSON™
Process Management

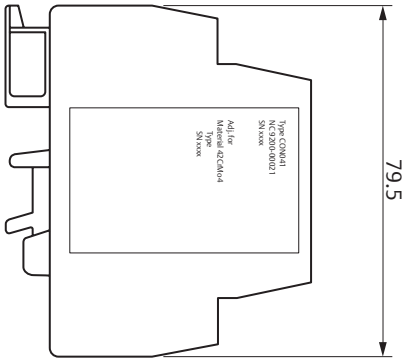
Eddy Current Signal Converter

Sensor Signal Converter designed for critical turbo machinery applications such as steam, gas and hydro turbines, compressors, pumps and fans to measure radial and axial shaft displacement, position, eccentricity and speed/key.

Dynamic Performance	
Frequency Range (-3 dB)	0 to 20,000 Hz
Rise Time	<15µs
NOTE: Designed for PR6422, PR6423, PR6424, PR6425, PR6426 For Extended Range Use: CON041/91x-xxx PR6425 Requires Extended Range Converter	
Environmental	
Operating Temperature Range	-30 to 100°C (-22 to 212°F)
Shock and Vibration	5g @ 60Hz @ 25°C (77°F)
Protection Class	IP20
Power & Electrical	
Supply Voltage Range	-23V to -32V (Output Range -4V to -20V)
	-21V to -32V (Output Range -2V to -18V)
Physical	
Housing Material / Weight	PA 6.6 / ~60 grams (2.12 oz)
Mounting	Din Rail
Connections	Screw Terminal (Max. 1.5mm2, Wire-end Sleeves)







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Compliance and Certifications	
CE	2014/30/EU 2014/34/EU 2011/65/EU EN61326-1 DIN EN 50581
ATEX	EN 60079-0:2009 EN 60079-11:2012
IEC-Ex	IEC 60079-0:2007-10; Edition 5 IEC 60079-11:2011; Edition: 6.0 IEC 60079-26:2006; Edition: 2
CSA	CAN/CSA-C22.2 NO. 0-M91 CAN/CSA-C22.2 NO. 157-92 CAN/CSA-C22.2 NO. 213-M1987 CAN/CSA-E60079-15-02 (R2006) CAN/CSA-C22.2 NO. 25-1966 CAN/CSA-C22.2 NO. 61010-1-04 ANSI/UL Standard 913-2004 ANSI/UL Standard 1604-1995 UL 60079-15 2002 UL 61010-1

Hazardous Area Approvals

Intrinsic Safety (iA)	
ATEX	II 2 G Ex ia IIC T4 Gb, -20°C ≤ Ta ≤ 80°C (Use with current limiting, e.g.: safety barrier)
IEC-Ex	Ex ia IIC T4 Gb, -20°C ≤ Ta ≤ 80°C (Use with current limiting, e.g.: safety barrier)
CSA	Class I Division 1, Groups A, B, C, D, T4 T4: -25°C ≤ Ta ≤ 80°C (Use with current limiting, e.g.: safety barrier)
Non-sparking (nA)	
CSA	Class I Division 2, Groups A, B, C, D Ex nA II T3..T4 AEx nA II T3..T4 T4: -25°C ≤ Ta ≤ 80°C

Ordering Information

Model Number	Sensor Type	Measuring Range	Linearity Error
CON041	PR6422 PR6423 PR6424 PR6426	1.0mm (Standard Range) 2.0mm (Standard Range) 4.0mm (Standard Range) 8.0mm (Standard Range)	≤ 1.5% ≤ 1.0% ≤ 1.5% ≤ 1.5%
CON041/912-015	PR6422	1.5mm (Extended Range)	≤ 2.0%
CON041/913-030	PR6423	3.0mm (Extended Range)	≤ 1.5%
CON041/913-040	PR6423	4.0mm (Extended Range)	≤ 2.0%
CON041/914-060	PR6424	6.0mm (Extended Range)	≤ 1.0%
CON041/914-080	PR6424	8.0mm (Extended Range)	≤ 1.5%
CON041/914-100	PR6424	10.0mm (Extended Range)	≤ 2.0%
CON041/915-040	PR6425	4.0mm (Standard Range)	≤ 1.5%
CON041/915-060	PR6425	6.0mm (Extended Range)	≤ 2.0%
CON041/915-080	PR6425	8.0mm (Extended Range)	≤ 3.0%
CON041/915-100	PR6425	10.0mm (Extended Range)	≤ 4.0%
CON041/916-120	PR6426	12.0mm (Extended Range)	≤ 1.5%
CON041/916-160	PR6426	16.0mm (Extended Range)	≤ 2.0%
CON041/916-200	PR6426	20.0mm (Extended Range)	≤ 2.5%
CON041/916-240	PR6426	24.0mm (Extended Range)	≤ 3.5%

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