



More Precision

eddyNCDT // Eddy current sensors for displacement and position





- Miniature sensor design
- Sensor technology can be integrated completely into the sensor
- Miniature, compact controller – can be integrated in the spindle or installed on the housing via a flange
- Suitable for ferro- and non-ferromagnetic materials
- Temperature measurement integrated in the sensor
- Cost-effective design

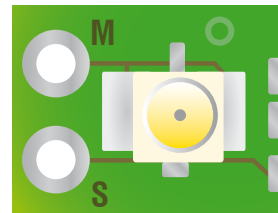
Measuring thermal expansion in spindles

The displacement measurement system SGS 4701 (Spindle Growth System) has been developed specifically for high speed milling machine applications. Due to high machining speeds and the heat generated, the linear thermal expansion of the precision machine tool spindle needs to be compensated for in order to keep the tool in a defined position at all times. The SGS sensor measures the thermal and centrifugal force expansion of the spindle. These measurement values are fed into the CNC machine tool as correction values, compensating for any positioning errors.

The SGS 4701 operates on the eddy current measuring principle. This non-contact measurement is wear-free. Furthermore, the measurement procedure is resistant to disturbances such as heat, dust and oil.

System structure

The SGS 4701 consists of a sensor, a sensor cable and a controller, factory calibrated for ferromagnetic and non-ferromagnetic measurement objects. Two miniature sensors enable it to be installed directly in the spindle, where the measurements take place, typically on the labyrinth-ring of the spindle. As well as measuring linear thermal expansion, the temperature of the sensor is also detected and output. The compact controller can be installed on the spindle housing via a flange or directly in the spindle.

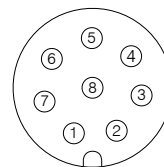


The sensor cable must not be shortened as functionality loss may arise. Removing the connector is only permitted behind the plug-sided crimp when using the solder connections.

S = Signal = inner conductor
M = ground = shield = outer conductor

8-pin. M12 connector

Pin assignment (view on controller)



Pin	Signal
1	Ground
2	+24V
3	Displacement signal
4	Temperature signal
5	not connected
6	do not connect
7	do not connect
8	not connected

Sensor system	SGS4701	
Measuring range	500µm (option 250µm ²⁾)	
Offset	100µm (option 50µm ²⁾)	
Linearity	±2µm	
Resolution ¹⁾	0.5µm	
Bandwidth	2000Hz	
Target	ferromagnetic / non-ferromagnetic	
Minimum target diameter	6 mm (option 3.5 mm ²⁾)	
Operating temperature	sensor	0 ... +90°C
	controller	10 ... +70°C
Temperature stability	sensor	±150ppm FSO/°C (MMR)
	controller	±500ppm FSO/°C (MMR)
Temperature compensation range	sensor	+10 ... +80°C
	controller	+10 ... +70°C
Supply voltage	12 ... 32VDC	
Analog out	displacement	0.5 - 9.5V ± 100 - 600µm (option 50 - 300µm ²⁾)
	temperature	0.5 - 9.5V (± 0 ... +90°C)
Protection class	sensor / controller	IP67 ³⁾
Dimensions	EMU04(102)	12x10x4.5mm ⁴⁾
	EMU04(121)	10x4x4mm ⁴⁾
Sensor cable ³⁾	diameter	Ø 1.13mm
	length	1000mm (400 - 1500mm on request)
	min. bending radius	12mm
	jacket	FEP

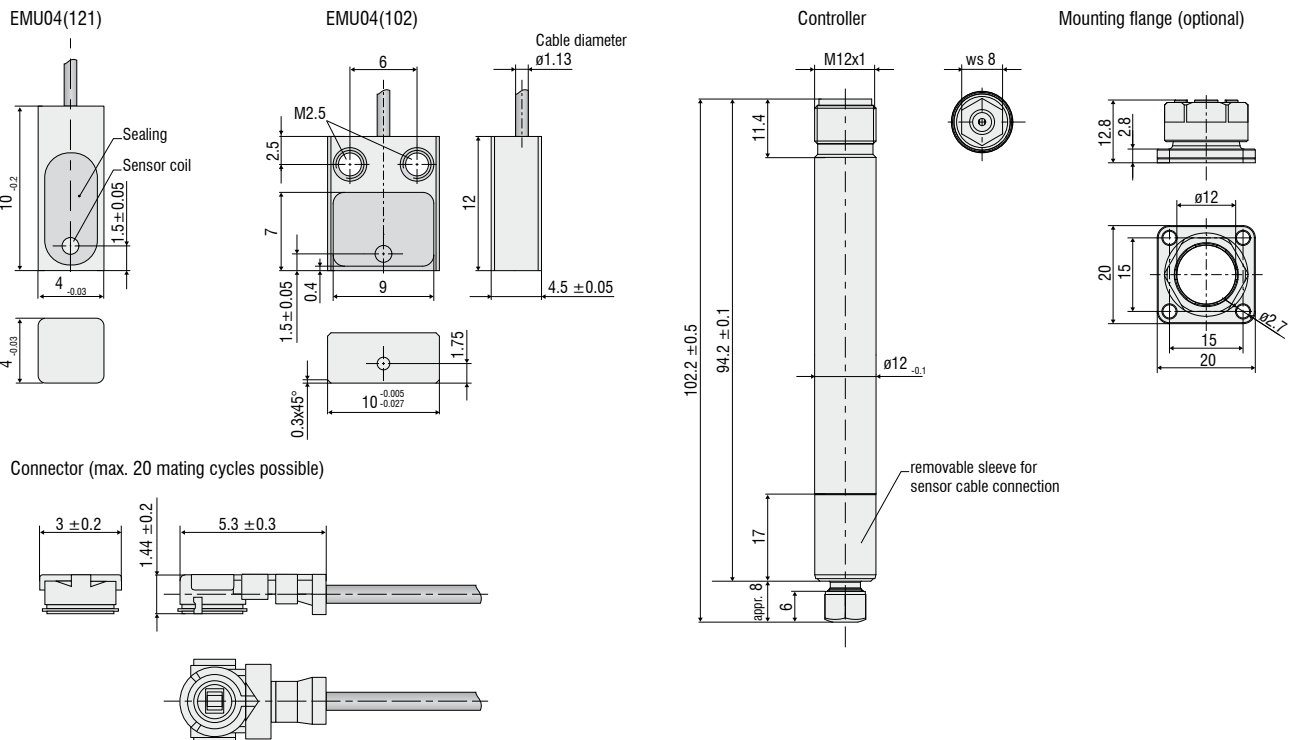
FSO = Full Scale Output; MMR = Midrange

¹⁾ static, MMR

²⁾ For OEM modifications: sensor with measuring range 250µm and offset 50µm

³⁾ In mated condition

⁴⁾ Detailed cable specifications can be found in the operating manual



High performance sensors made by Micro-Epsilon



Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Optical micrometers, fibre optic sensors and fibre optics



Colour recognition sensors, LED analyzers and colour online spectrometer



Measurement and inspection systems