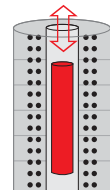




# More Precision.

**indu**SENSOR

Linear inductive displacement sensors



## Sensor in plastic housing with integrated ASIC electronics VIP-30-ISC-HRW1



**Excellent ratio of installed length to measurement range**

**Rugged and wear-free**

**High dynamic response**

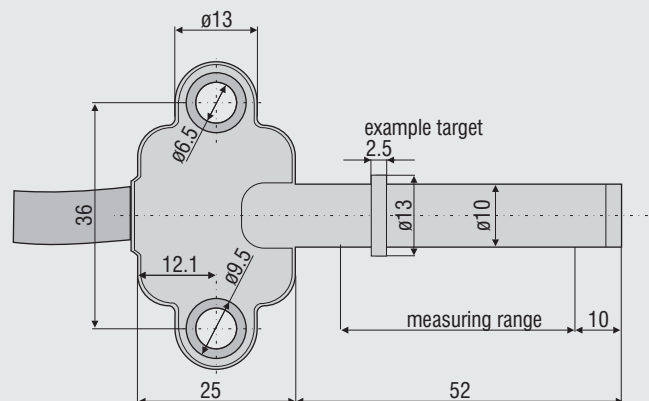
**No magnet**

**Large-scale production system for industrial applications**

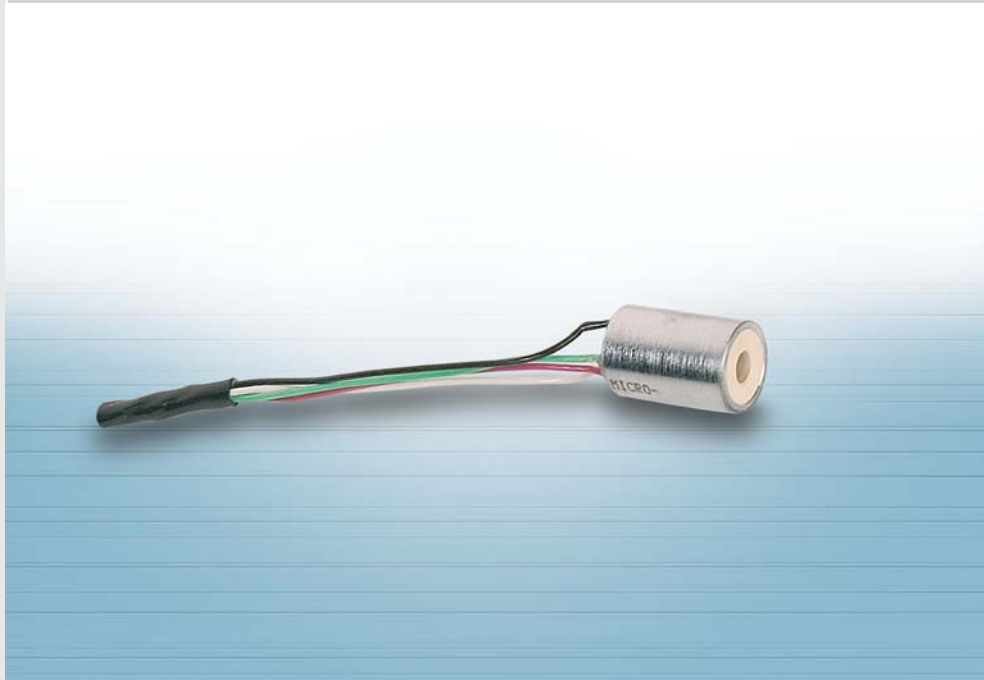
With the increasing deployment of electronic equipment in vehicles, inductive sensors are finding numerous fields of application. Ruggedness, compact design and favorable prices are regarded as basic requirements for applications in the automotive sector. It was against this backdrop that this innovative displacement sensor was developed, which is employed non-contacting and wear-free for applications particularly in the engine and gearbox, but which can also be used for industrial applications. The sensor is characterized particularly by its excellent ratio of installed length to measurement range. Further plus points are the integrated electronics, the high dynamic response and the measurement principle which does not need a magnet. These advantages take effect particularly with displacement and position measurements on the transmission, such as for example with the measurement of the clutch disengagement, shift rail or selector lever position.

Model	VIP-30-ISC-HRW1
Article	2617015
Measuring principle	VIP (page 10-11)
Measuring range	30 mm
Target (included)	aluminium ring $\varnothing 13 \times 1$ mm, 2.5 mm long
Linearity	$\pm 0.5\%$ FSO (0.15 mm)
Resolution	10 Bit
Frequency response	1000 Hz (-3 dB)
Housing	thermosetting plastic
Temperature stability	200 ppm / °C
Output	UART (TTL-level Rx/D/TxD) option 0.5...4.5 VDC
Power supply	+ 5 VDC (4.9 ... 5.1 VDC) stabilized
Temperature range sensor	-40 °C ... +100 °C / temporary up to 125 °C
Protection class	IP 67, without connector

FSO = Full Scale Output



## Sensor system with miniature sensor and on-board electronics KRS719(01)

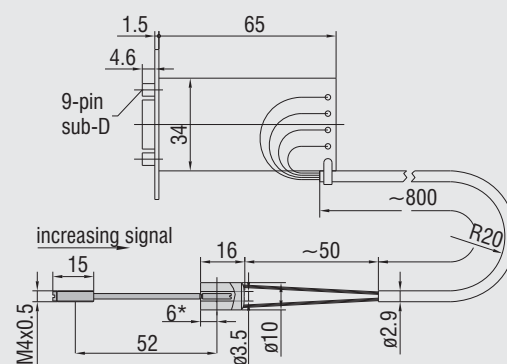


**Compact design**  
**Calibrated system**  
**On-board electronics**

<b>Model</b>	<b>KRS719(01)</b>	
Article	4350026.01	
Measuring principle	LVDT (page 12)	
Measuring range	$\pm 1$ mm	
Target (included)	plunger 0800080 ( $\varnothing 2 \times 62$ long) with thread M4x0.5 (15 mm long)	
Linearity	$\pm 0.15$ % FSO ( $3 \mu\text{m}$ )	
Resolution	0.07% FSO ( $1.4 \mu\text{m}$ )	
Frequency response	100 Hz (-3dB)	
Housing	nickel-plated steel	
Temperature stability	zero $\pm 50$ ppm / $^{\circ}\text{C}$	
Output	4 ... 20 mA options: 2 ... 20 mA / $\pm 3.9$ VDC	
Power supply	22.8 ... 25.2 VDC	
Temperature range	sensor	$-20^{\circ}\text{C}$ ... $+80^{\circ}\text{C}$
	electronics	$0^{\circ}\text{C}$ ... $+50^{\circ}\text{C}$
Adjustment	zero, gain	
Protection class	IP 67	
Electronics	incl. circuit board BSC719(02)-I, article 2208078.02	

FSO = Full Scale Output

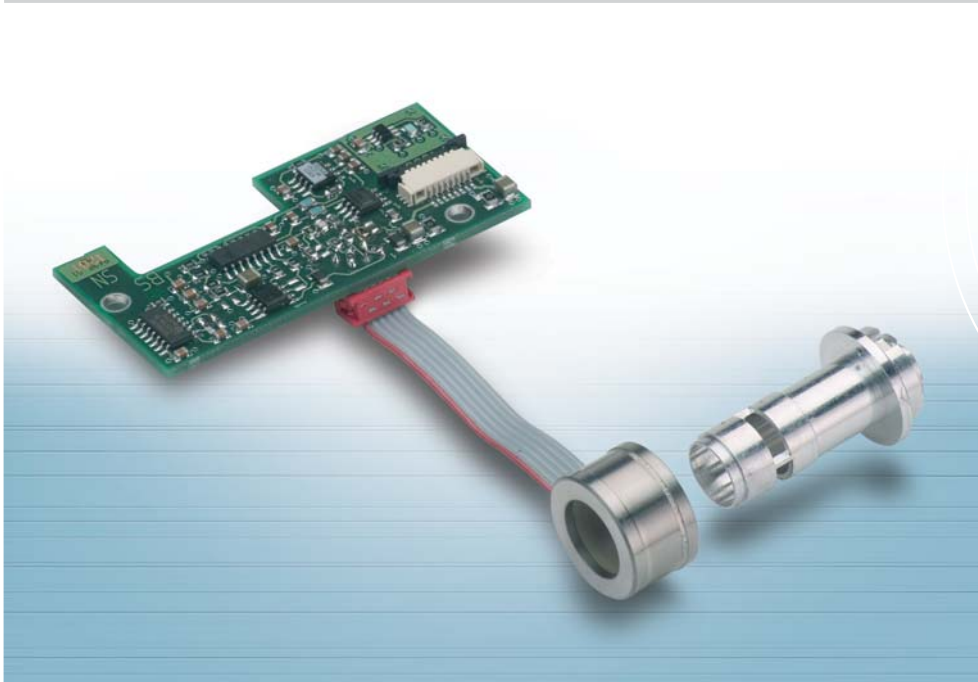
The KRS719 sensor system is used for monitoring the yarn thickness in textile machines. The miniaturized sensor and the board-mounted electronics can be cost-effectively integrated into the available installation spaces and machine controllers. The system is characterized by high stability and repeatability.



\* plunger in midrange

The plunger can be introduced into the sensor from both ends.

## Sensor system with on-board electronics LVP-0,3-Z20-2-CR-AC



**Excellent ratio of installed length to measurement range**

**On-board electronics**

**Rugged and wear-free**

**High dynamic**

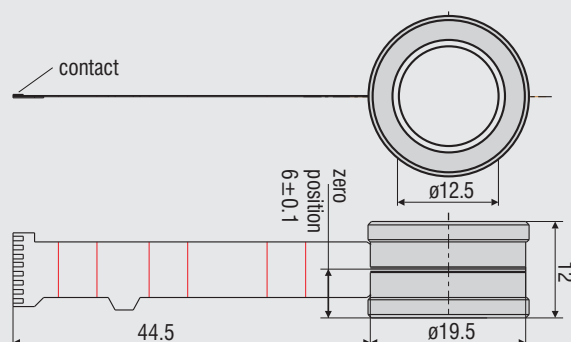
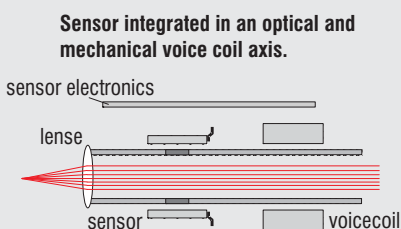
**Functional target**

Voice coil actuators are used for positioning with small displacements, with a high dynamic response, high repeatability and positioning accuracy as well as with strong accelerations. In conjunction with a servo system the voice coil actuator and the displacement sensor are operated in a closed circuit. These systems are used in applications in the optical industry, such as for optical scanning, focusing, tracking and stabilizing. Through the use of the sensor the optical beam path and the mechanical system can be set up on one axis. The optical path is combined with the line of center of gravity for the motor and the measurement object.

This produces a simpler mechanical construction, higher stability and a smaller installation space.

Model	LVP-0,3-Z20-2-CR-AC	
Article	2617009	
Measuring principle	LVP (page 10-11)	
Measuring range	0.3 mm	
Target	customer specific, not included	
Linearity	0.25 % FSO (0.75 $\mu\text{m}$ )	
Resolution	0.025 % FSO (0.1 $\mu\text{m}$ )	
Frequency response	3 kHz	
Housing	stainless steel	
Temperature stability	$\pm 200$ ppm / $^{\circ}\text{C}$	
Output	digital, TTL	
Power supply	+ 3.3 VDC	
Temperature range	sensor	-10 $^{\circ}\text{C}$ ... +40 $^{\circ}\text{C}$
	electronics	-10 $^{\circ}\text{C}$ ... +65 $^{\circ}\text{C}$
Protection class	IP 65	
Electronics	including PCB electronics 4111006.03, MSC739/CRF-AD	

FSO = Full Scale Output



## Sensor module with ASIC electronics LVPxx-P-LP-I/D



### Market leading technology

Stroke measurement in hydraulic and solenoid valves

Measurement ranges from 1 to 10 mm with only one sensor module

Customer specific target

Model	LVPxx-P-LP-I/D				
Article	2616079				
Measuring principle	LVP (page 10-11)				
Measuring range	±1 mm	±2 mm	±3 mm	±4 mm	±5 mm
Target, plunger length	10.5 mm	8.5 mm	8 mm	7 mm	5 mm
Linearity	0.2 % FSO			0.5 % FSO	1 % FSO
Resolution	2 μm	4 μm	6 μm	8 μm	10 μm
	10 bit				
Frequency response	200 Hz ... 1 kHz (-3dB)				
Temperature stability	± 100 ppm / °C (zero)				
	± 150 ppm / °C (sensitivity)				
Output	0.5 ... 4.5 VDC and 4 ... 20 mA				
	option: PWM, digital (serial)				
Power supply	+ 8 ... 35 VDC				
Temperature range	-40 °C ... +85 °C				
Storage temperature	-40 °C ... +100 °C				
Circuit dimensions	41 x 52 mm				
Alu tube dimensions	ø7 x 0.5 mm, 35 mm long				

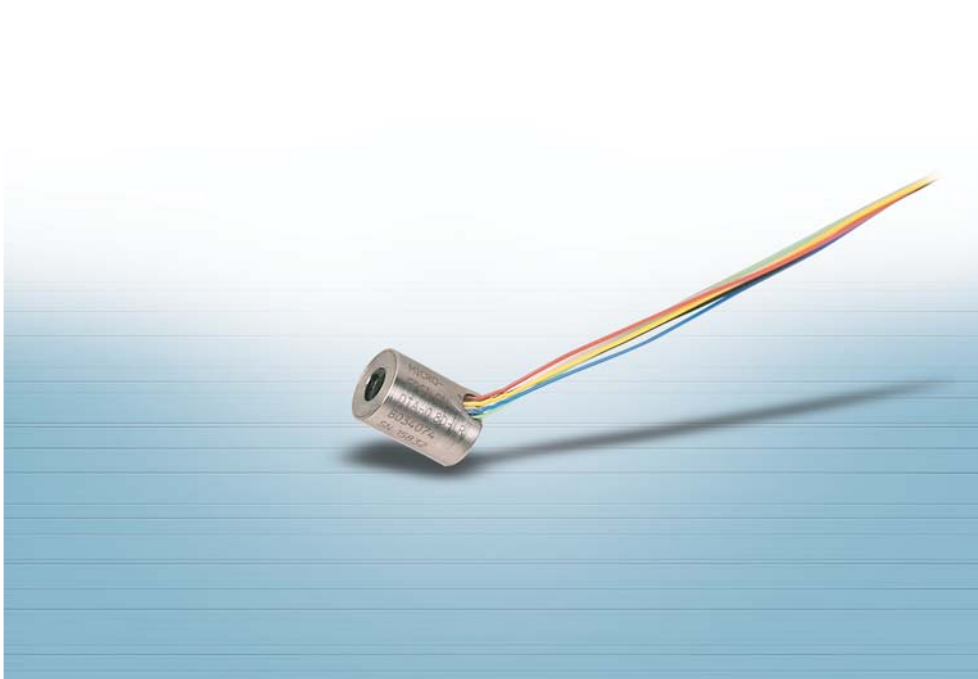
FSO = Full Scale Output

The sensor system LVP-xx-P-LP-I/D is used as a testing system for the verification and inspection of the functionality of the system in electro-hydraulic servo valves.

The modular sensor construction facilitates a fast and simple adaptation to the specific application for use in large-scale production. The sensor and electronic system can be constructed as one unit or with a sensor cable. The LVP principle enables matching of the measurement ranges in a span from ±1 to ±5 mm by simply changing the target length.

The sensor element is mounted in the pressure-free space and is protected by a pressure pipe. The acquisition of the target position occurs through the pressure pipe.

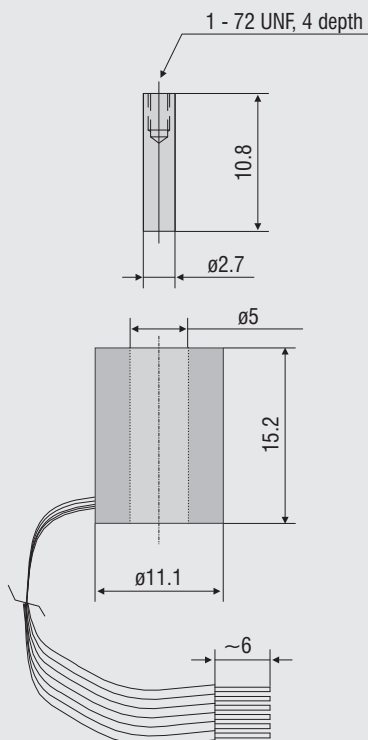
## Miniature sensor with radial cable output DTA-0,8D-2,5-LR



**OEM sensor for large-scale applications**  
**Miniaturized design**  
**Radial cable output**  
**High accuracy**

The miniature sensor DTA-0,8D-2,5-LR was designed and developed for use where the installation space is restricted. In addition, due to the low core weight the dynamic response of the measurement object is retained and mechanical loads are minimized.

Due to the radial cable output, the installation space behind the sensor can be fully exploited. With a linearity of  $<0.25\%$  this sensor model is also suitable for measurements with high accuracy requirements.



Model	DTA-0,8D-2,5-LR
Article	2611045
Measuring principle	LVDT (page 12)
Measuring range	$\pm 0.8$ mm
Linearity	$<0.25\%$ FSO at $5 V_{\text{eff}} / 12.5$ kHz ( $4 \mu\text{m}$ )
Excitation frequency	1 - 20 kHz
Excitation amplitude	up to $10 V_{\text{eff}}$
Target (included)	core 0304028 ( $\varnothing 2.7 \times 10.8$ long) with thread 1-72UNF (4 depth)
Housing	nickel-plated steel
Temperature stability sensor	zero: $\pm 50$ ppm / $^{\circ}\text{C}$
Temperature range sensor	$-20^{\circ}\text{C} \dots +80^{\circ}\text{C}$
Protection class sensor	IP 65
Electronics	ISC7001

FSO = Full Scale Output

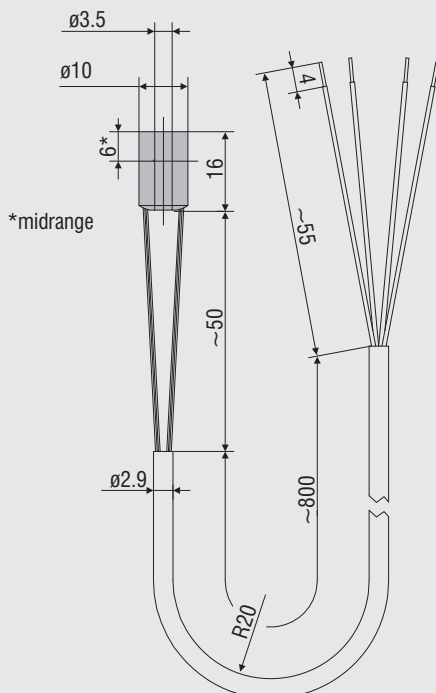
## Miniature sensor with axial cable output DTA-1D-CA-U



**OEM sensor for large-scale applications**  
**Miniaturized design**  
**Axial cable output**

As the sensor DTA-0,8D-2,5-LR, the miniature sensor DTA-1D-CA-U was designed and developed especially for used in restricted installation space. Due to the low core weight, the measurement object dynamic response is retained and mechanical loads are minimized.

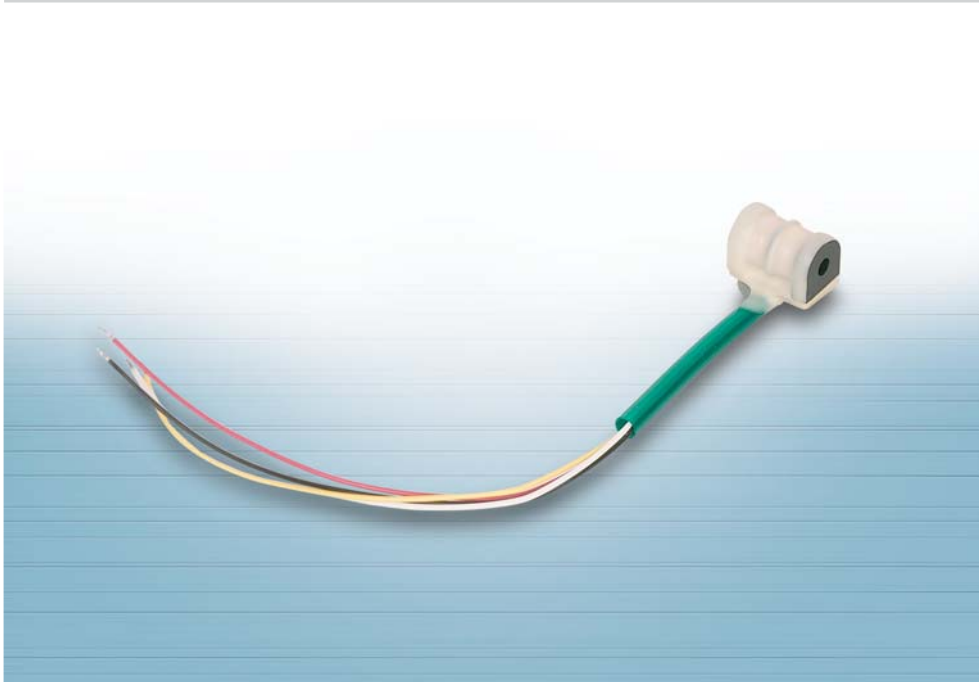
With this configuration the cable output is brought out axially so that the installation space surrounding the sensor can be fully exploited. This means, for example, that the sensor can be installed sunk into a hole.



Model	DTA-1D-CA-U
Article	2611037
Measuring principle	LVDT (page 12)
Measuring range	$\pm 1$ mm
Linearity	$< 0.5$ % FSO at $2.5 V_{\text{eff}} / 5$ kHz (0.01 mm)
Excitation frequency	1 - 20 kHz
Excitation amplitude	up to $10 V_{\text{eff}}$
Target (not included)	plunger 0800080 ( $\varnothing 2 \times 62$ long) with thread M4 x 0.5 (15 long)
Sensitivity	155mV / Vmm at $2.5 V_{\text{eff}} / 5$ kHz
Housing	nickel-plated steel
Temperature stability sensor	zero: $\pm 50$ ppm / °C
Temperature range sensor	- 20° C ... + 80° C
Protection class sensor	IP 67
Electronics	MSC710 ISC7001

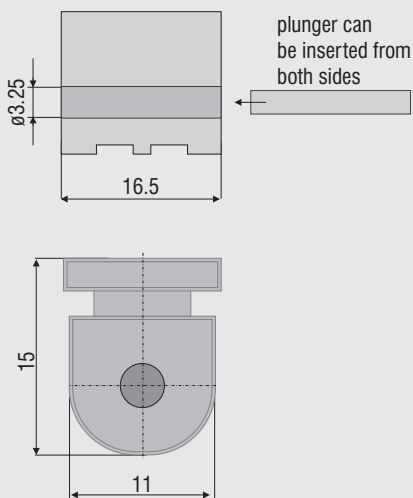
FSO = Full Scale Output

## Sensor with coated coil DTA-1D-20-DDV.02



**Proven OEM sensor**  
**Miniature design**  
**Low cost sensor**

Taking into account economic boundary conditions, with the sensor line DTA-1D-20-DDV the external, mechanical sensor housing has been omitted. To protect the measurement coils the sensor has been fully coated with a protective epoxy.



Model	DTA-1D-20-DDV.02
Article	2611011
Measuring principle	LVDT (page 12)
Measuring range	$\pm 1$ mm
Excitation frequency	0.5 ... 10 kHz
Excitation amplitude	up to $10 V_{\text{eff}}$
Target	customer specific
Linearity	$< 1\%$ FSO (0.02 mm)
Housing	protective epoxy
Temperature stability sensor	zero: $\pm 50$ ppm / °C
Temperature range sensor	$-20^\circ \text{C} \dots + 85^\circ \text{C}$
Protection class sensor	IP 64
Electronics	MSC710
	ISC7001

FSO = Full Scale Output

## Sensor for valve stroke measurements DTA-6D-20 (07)



**Sensor for large-scale use for valve stroke measurements**

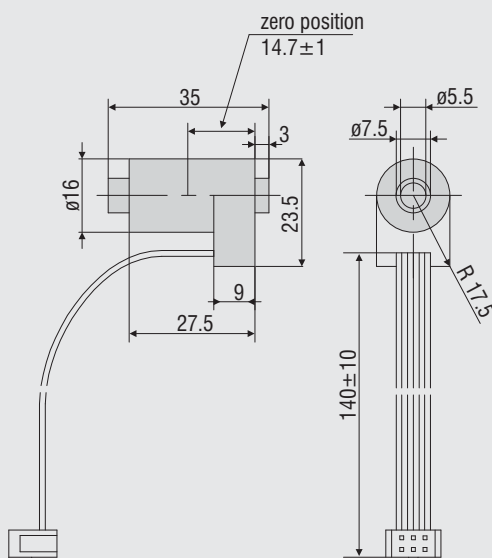
**Well-proven OEM sensor**

**Plastic housing**

Due to the use of a plastic housing, the sensor DTA-6D-20(07) can be offered at a very reasonable price. The configuration of the sensor facilitates, depending on the plunger used, a useful measurement range of  $\pm 2$  mm to  $\pm 8$  mm.

In a typical application this sensor is used for the measurement of the piston position in hydraulic valves. To facilitate exact dosage and therefore also a controlled movement, displacement sensors of the product line DTA-6D-20 are integrated into these valves.

The sensors acquire the position of the control plunger, controlling the volume flow. To do this, an accurate, non-contacting and primarily dynamic position acquisition is required. The sensor is mounted here outside of the pressurized area on a pressure pipe.

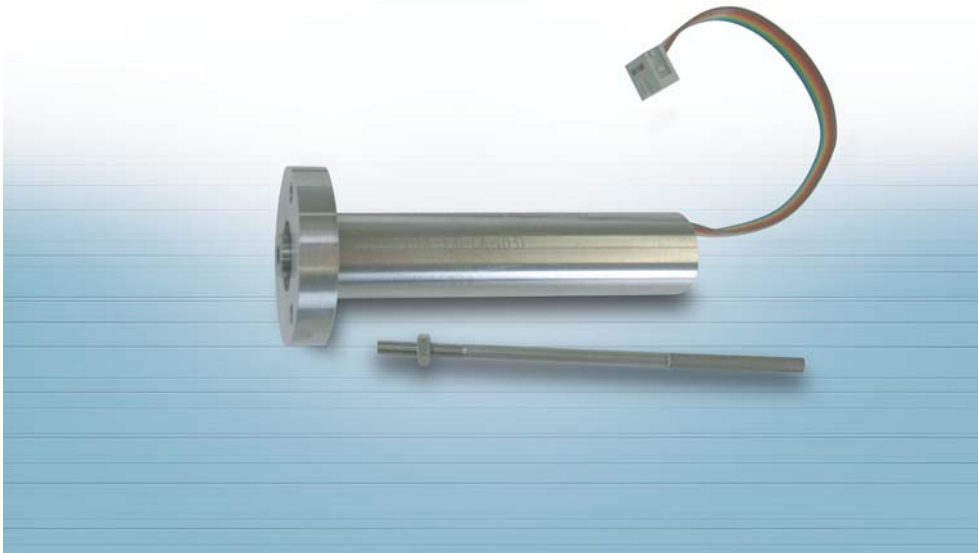


Model	DTA-6D-20(07)
Article	2611043
Measuring principle	LVDT (page 12)
Measuring range	$\pm 2 \dots \pm 8$ mm
Linearity	$< 0.5$ % FSO at $2.5 V_{\text{eff}} / 5 \text{ kHz}^*$
Frequency	1 - 20 kHz
Input voltage	up to $10 V_{\text{eff}}$
Target (not included)	core 0304034 ( $\varnothing 2 \times 28$ ) pressure tube 0483331 ( $\varnothing 5 \times 0.2$ )
Housing	plastics
Temperature stability sensor	zero: $\pm 50$ ppm / $^{\circ}\text{C}$
Operating temperature sensor	$-20^{\circ}\text{C} \dots + 80^{\circ}\text{C}$
Protection class sensor	IP 67
Electronics	MSC710 ISC7001

FSO = Full Scale Output

\* measuring range  $\pm 6$  mm

## Pressure resistant sensor with welded flange DTA-15D-5-CA-(03)

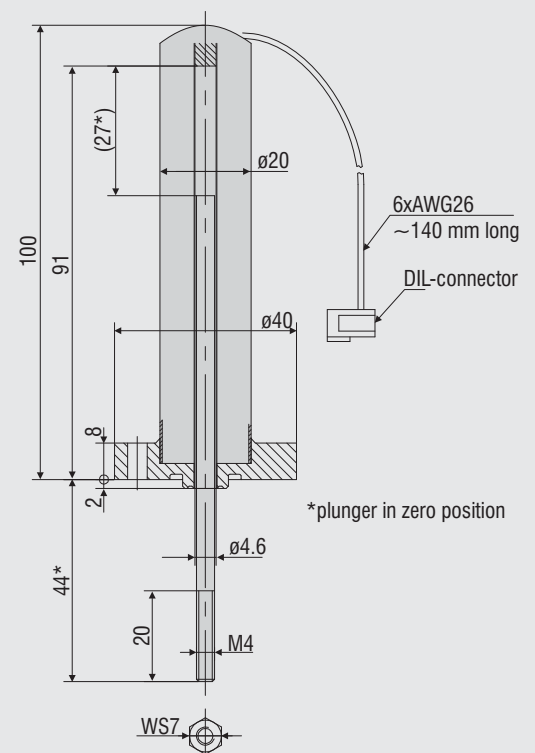


**Pressure resistant version**  
**Laser-welded stainless steel housing**  
**Integrated flange**  
**External electronics**

For displacement measurements in applications with a very high ambient pressure, sensors of the series LVDT are integrated into a laser-welded, pressure resistant housing with an O-ring seal. The integrated flange facilitates simple sensor mounting.

<b>Model</b>	<b>DTA-15D-5-CA-(03)</b>
Article	2607026.03
Measuring principle	LVDT (page 12)
Measuring range	$\pm 15$ mm
Linearity	$\pm 0.5$ % FSO
Excitation frequency	1 kHz
Excitation amplitude	$2.5 V_{\text{eff}}$
Target (not included)	plunger 0800062 ( $\varnothing 4$ mm, 108 mm long) thread M4 (20 mm long)
Housing	stainless steel
Temperature stability sensor	zero: $\pm 50$ ppm / °C
Temperature range sensor	$-20^\circ \text{C} \dots + 85^\circ \text{C}$
Pressure resistance	150 bar
Electronics	MSC710
	ISC7001

FSO = Full Scale Output



## Half-bridge sensor with plastic housing DRA-25D-20-SR-02

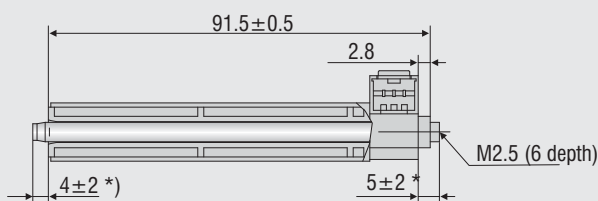


Plastic housing  
Integrated Rast 2.5 plug  
Extrusion coated core

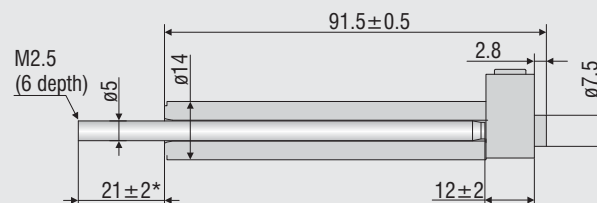
The displacement sensor DRA-25D-20-SR(02) has been derived from the well-proven large-scale applications system for loading and unbalance detection in washing machines. The sensor is particularly well suited for applications in which displacements of up to 50 mm must be acquired economically and reliably. The sensor is integrated and protected within the machine or equipment. The integral 3-pole plug corresponds to the standardized Rast 2.5 dimensions.

Model	DRA-25D-20-SR
Article	2611031
Measuring principle	half-bridge
Measuring range	50 mm ( $\pm 25$ mm)
Linearity	$\pm 1$ % FSO (0.5 mm)
Excitation frequency	500 Hz
Excitation amplitude	5 V <sub>eff</sub>
Target (not included)	plunger 0800077 ( $\varnothing 4.76 \times 98$ long) with inner thread M2.5 (6 depth)
Housing	plastic
Temperature stability sensor	$\pm 0.01$ % / °C (core in midrange)
Temperature range sensor	-20° C ... +70° C
Protection class sensor	IP 40
Electronics	MSC7210
	ISC7001

FSO = Full Scale Output



\*) midrange



## Sensor for needle stroke movements LVP-3-Z13-5-CA



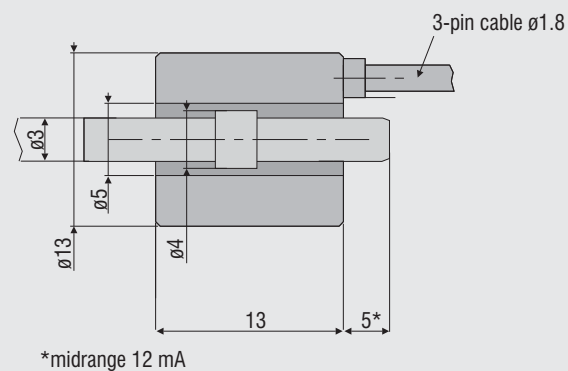
### Compact design

Measurement object and sensor on one axis

No extension of the overall installed length due to sensor

<b>Model</b>	<b>LVP-3-Z13-CA</b>
Article	2617014
Measuring principle	LVP (page 10-11)
Measuring range	3 mm
Target (not included)	ø3 x 30 long with thread M3 and alu sleeve ø4 x 3.3
Linearity	typisch 0.3 % FSO (9 µm)
Housing	stainless steel
Temperature stability sensor	± 100 pmm / °C
Temperature range sensor	-40 °C ... +150 °C
Protection class sensor	IP 67
Electronics	series MSC7210
	series ISC7001

FSO = Full Scale Output



The compact displacement sensor LVP-3-Z13-5-CA is suitable for acquiring small measurement ranges with high accuracy. The large free hole for the passage of the core also facilitates large excessive strokes. The measurement object, realized as a simple aluminum ring, is mounted on the rod, plunger, pin, needle or other similar part to be measured. In a typical application the displacement sensor LVP-3-Z13-5-CA is used in automatic glue application guns. The continuously measuring sensor monitors the switching point, also for wear of the needle seating. Additionally, the continuous measurement offers the option of checking the needle for the correct stroke position. The small, compact sensor is easy to integrate even in tight installation spaces.

## Valve stroke sensor in stainless steel housing LVP-14-F-5-CR

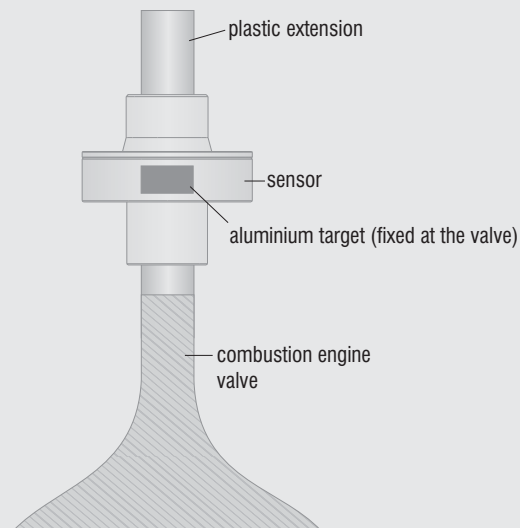
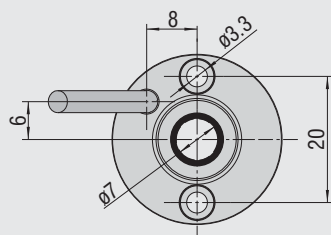
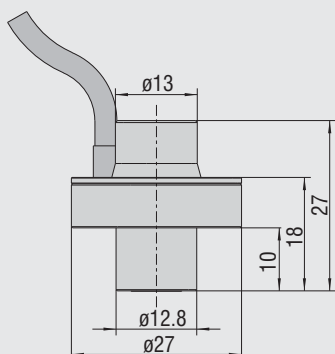


**High temperature range**  
**Calibrated system with electronics**  
**High temperature stability**  
**Integrable sensor design, adaptable to large-scale production**  
**High cut-off frequency up to 20 kHz**

Future generations of engines will be able to dispense with mechanical camshafts. The displacement of the electromechanically or electrohydraulically driven inlet and outlet valves of internal combustion engines is acquired by the displacement sensor of the product line LVP-14-F-5-CR and fed into the control circuit. In this way a variable inlet and outlet control of the valves can be realized. Ultimately, the fuel consumption is reduced, emission values are improved and the engine power characteristic is matched to the individual driving situation.

Model	LVP-14-F-5-CR
Article	2616078
Measuring principle	LVP (page 10-11)
Measuring range	14 mm
Target	customer specific
Linearity	0.5 % FSO (0.07 mm)
Housing	stainless steel
Temperature stability sensor	$\pm 100$ pmm / °C
Temperature range sensor	-30 °C ... +150 °C
Protection class sensor	IP 67
Electronics	MSC739VS-U (article 4111009)

FSO = Full Scale Output



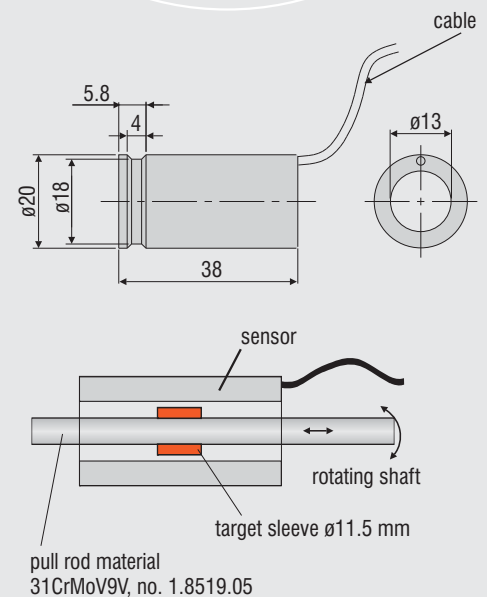
## Sensor for the acquisition of displacement on rotating shafts LVP-25-Z20-5-CA-AC



**Compact sensor for easy integration**  
**High resolution**  
**Shaft and sensor on one axis**  
**No extension of the overall installed length due to sensor**

With modern machine tools the critical moment is the change of tool. Deviations from the intended tool position can lead to severe cases of faulty production. Previously proximity sensors and connector rings were used for monitoring the clamped position, but they had to be adjusted and set, thereby incurring costs. Analog sensors from the series LVP offer a significant improvement. The sensor is integrated into the chuck and directly measures the clamping stroke of the drawbar. It can be universally used with the most varied types of tool due to an extremely compact design. The sensor supplies an analog signal according to the stroke motion of the drawbar when clamping the tool. Consequently, continuous monitoring is possible without the switching point having to be laboriously set mechanically.

The miniaturized sensor electronic unit is supplied with 24 VDC and can either be accommodated at the point of measurement or in the control cabinet. Due to its high accuracy, the sensor provides a significant contribution in satisfying the continually increasing demands on the precision and availability of machine tools.



Model	LVP-25-Z20-5-CA-AC
Article	2617008
Measuring principle	LVP (page 10-11)
Measuring range	25 mm
Target (not included)	article 0482218 for shaft diameter 8 mm article 0482219 for shaft diameter 10 mm
Resolution	0.01 mm
Linearity	typical $\pm 1$ % FSO (0.25 mm)
Dynamics	150 Hz (-3dB)
Housing	stainless steel
Temperature stability sensor	$< \pm 0.01$ % FSO / °C
Temperature range sensor	-40 °C ... +150 °C
Protection class sensor	IP 67
Medium	air, oil
Electronics	MSC7210

FSO = Full Scale Output

## Integrable load and unbalance sensor ILU-50-0-10-SR

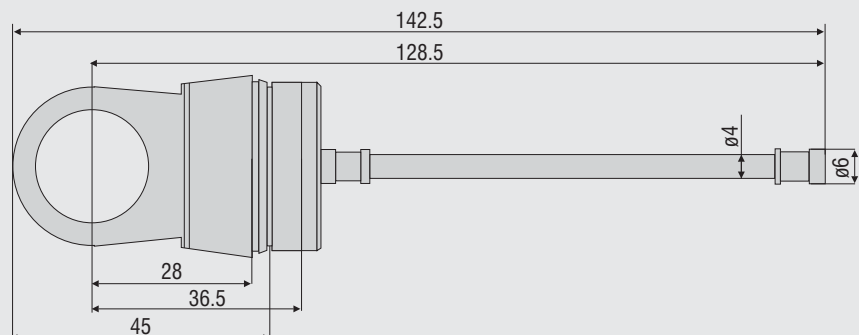


Sensor integrated into damper  
Integrated Rast 2.5 standard plug  
Integral damper flange

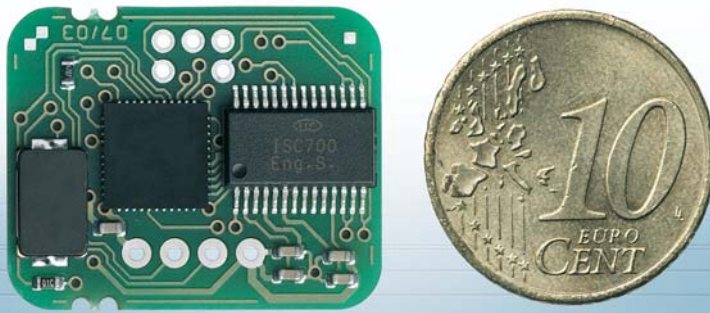
The displacement sensor ILU-50-O-10-SR (Integrated Load and Unbalance sensor) measures the depression of the suds container when the washing machine is loaded and its deviation during the spinning stage. Due to the inductive measurement principle, the sensor provides an absolute position acquisition for static and dynamic processes. The short installed length of the patented VIP principle enables the sensor to be integrated into a compact friction damper. The displacement sensor supplies an output signal proportional to the weight of washing. Apart from the present version, the geometry of the flange can be customized for large-scale applications.

Model	ILU-50
Article	2611051
Measuring principle	VIP (page 10-11)
Measuring range	50 mm
Target (included)	aluminium ring
Linearity	3 % FSO
Temperature range sensor	+5 °C ... +80 °C
Electronics	MSC ILU50 (article 2208111)

FSO = Full Scale Output



## ISC7001 subminiature sensor controller



**Subminiature ASIC design**

**Flexible OEM-system**

**Freely definable digital interface**

**Programmable sensor parameters**

**Integrated temperature measurement**

### **Integrable subminiature sensor controller for OEM applications**

The sensor ASIC, ISC700 has been designed for the control and evaluation of inductive sensors. The implemented two-chip technology with ASIC and micro-controller facilitates versatile adaptation to the measurement task in hand. An oscillator drives the sensor and the output signal is digitally conditioned by the ASIC. The signals are processed further by the micro-controller and output as a standardized signal. In line with the performance capability of the micro-controller, trouble-free migration of calibration and linearization of the sensor characteristics, together with filtering and averaging of the signals is possible. For control systems and monitoring tasks, the output of limits and switching points is programmed in the sensor electronics. The sensor becomes "intelligent".

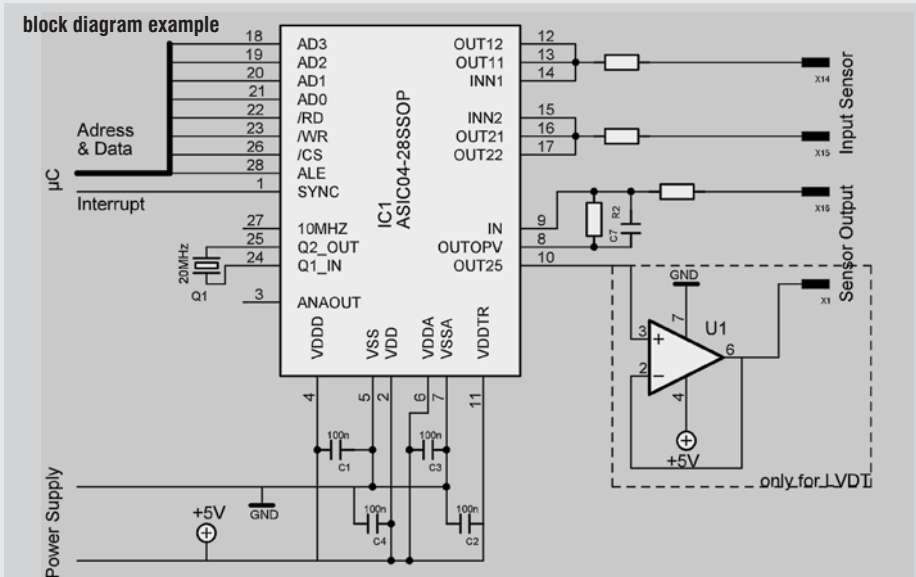
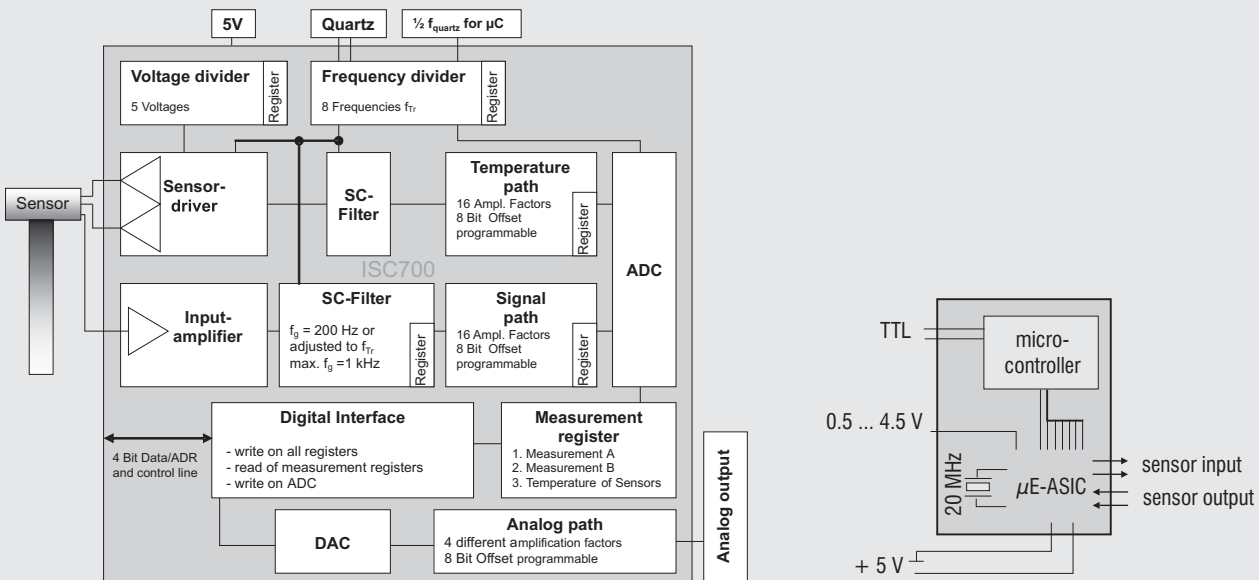
Increasing demands are being made on modern sensor systems in terms of miniaturization, flexibility, economy and digital interfaces. This is particularly true in the case of displacement and position sensors for applications involving medium to large quantities in automation, automotive production and household appliances.

CAN-Bus, Profibus DP and industrial Ethernet, I<sup>2</sup>C and Lin-Bus are examples of present bus systems for data transfer between sensors and their controllers. In a continually increasing number of applications decentralized data acquisition, conditioning and processing of sensor signals is demanded.

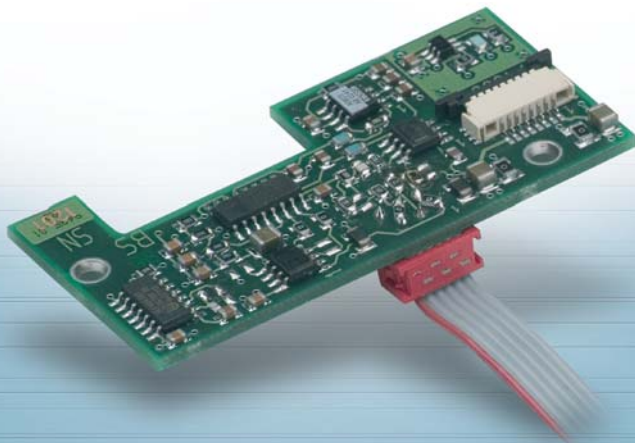
Sensor-specific parameters such as frequency selection, cut-off frequency, signal gain and offset are defined and programmed in the actual sensor ASIC. Temperature compensation of the measurement is possible through an additional integrated temperature measurement. The remaining signal conditioning occurs in a normal commercially available micro-controller. This concept ensures optimum adaptation and suitability of the computing power. Furthermore, all digital interfaces, available now and in the future, for controllers can be integrated into the system. Another advantage is the possible relief of main boards and data channels by moving the supervisory and control functions into the sensor system.

Model		ISC 7001
Dimensions		length: 25 mm, width: 20 mm, height: 5 mm
Operating temperature		-40° C ... 85° C
		option: up to 125° C
Supply voltage		5 V regulated, stabilized
Supply current		appr. 45 mA
Output (standard)	digital	serial output with TTL level (UART Rx/D and Tx/D)
	digital	free definable bus-interface
Output (optional)	analog	from 0.5 V to 4.5 V (voltage output $R_L > 100 \text{ k}\Omega$ ) at 10 bit DA-converter or 10 bit PWM
Frequency response		up to 1 kHz
Resolution (bit)		up to 11 Bit

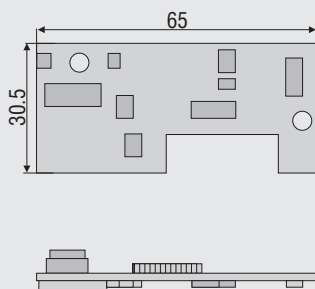
Note: all data have to be verified after the definition of the individual specifications



## MSC739/CRF-AD sensor controller



On-board electronics for displacement sensor LVP-0,3-Z20-2-CR-AC with integral A/D converter and 8-pole FPC plug



<b>Model</b>	<b>MSC739/CRF-AD</b>
Article	4111006.03
Power supply	+ 5 V
Sensor	LVP-0.3-Z20-2-CR-AC
Output signal	digital TTL level
Resolution	0.025 % FSO
Frequency response	3 kHz (-3dB)
Temperature range	+10 °C ... +40 °C

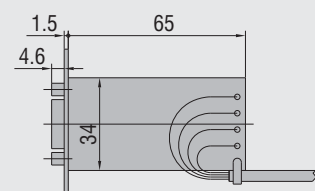
FSO = Full Scale Output

## BSC719(02)-I sensor controller

<b>Model</b>	<b>BSC719(02)-I</b>
Article	2208078.02
Power supply	24 VDC
Sensor	DTA-1D-CA-U
Output signal	4 ... 20 mA
Resolution	0.07 % FSO
Frequency response	100 Hz (-3 dB)
Temperature range	0 °C ... +50 °C

FSO = Full Scale Output

On-board electronics for displacement sensor DTA-1D-CA-U with trimmers for setting the sensitivity and zero point  
Connection via 9-pole Sub-D



**Accessories****LVDT series****Sensor cable**

2902003	C700-3	sensor cable, 3 m, with connector
2902005	C700-6	sensor cable, 6 m, with connector
2902004	C701-3	sensor cable, 3 m, with connector and tin-plated free ends
2902013	C701-6	sensor cable, 6 m, with connector and tin-plated free ends
2902009	C701/90-3	sensor cable, 3 m, with 90° connector and tin-plated free ends
2966002		MSC710 connector set for supply/output cable
2981010		connector mounting and calibration of MSC710

**Connection cable**

2901087	PC710-6/4	supply/output cable, 6 m
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**Plunger**

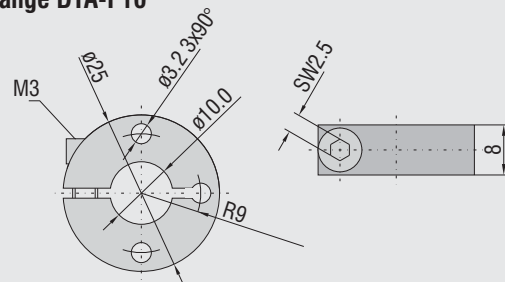
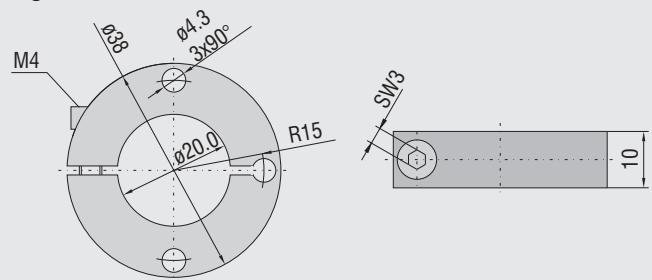
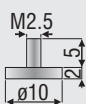
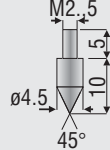
0800001	DTA-1D	plunger
0800002	DTA-3D	plunger
0800003	DTA-5D	plunger
0800004	DTA-10D	plunger
0800005	DTA-15D	plunger
0800006	DTA-25D	plunger

**Flange**

0483090.01	DTA-F10	mounting flange, slotted for DTA-1, DTA-3, DTA-5, DTA-10
0483083.02	DTA-F20	mounting flange, slotted for DTA-15, DTA-25

**Probe tips**

0459002	Typ 2
0459001	Typ 2 hard metall
0459003	Typ 11
0459004	Typ 13

**Flange DTA-F10****Flange DTA-F20****standard probe tip: type 2****option: type 11****option: type 13**

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### Sensors and systems

for displacement, position and dimension

### Sensors and measurement devices

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### Measurement systems

for online/offline quality control

#### **MICRO-EPSILON Headquarters**

Koenigbacher Str. 15 · 94496 Ortenburg / Germany

Tel. +49 (0) 8542 / 168-0 · Fax +49 (0) 8542 / 168-90

[info@micro-epsilon.com](mailto:info@micro-epsilon.com)

#### **MICRO-EPSILON UK Ltd.**

Dorset House, West Derby Road · Liverpool, L6 4BR

Phone +44 (0) 151 260 9800 · Fax +44 (0) 151 261 2480

[info@micro-epsilon.co.uk](mailto:info@micro-epsilon.co.uk)

#### **MICRO-EPSILON USA**

8120 Brownleigh Dr. · Raleigh, NC 27617 / USA

Phone +1/919/787-9707 · Fax +1/919/787-9706

[info@micro-epsilon.us](mailto:info@micro-epsilon.us)



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