HySense FO 110

Force sensor according to the deflecting beam principle

The deflecting beam principle (shear force sensor)

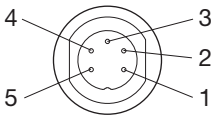
Since a force and the deflection of a beam is proportional, this sensor is able to determine a force by measuring its elongation or change in length.

Due to its compact design, these traction-pressure force sensors can be used in the laboratory, as well as in industrial environments. Made with corrosion-proof steel, the sensors have a standardized nominal characteristic value. They can be mounted easily allowing simple integration into existing structures.

Measuring / collection of

- moulding and insertion forces
- spring forces
- cutting forces
- force and force control during assembly
- pressing forces in drilling machines

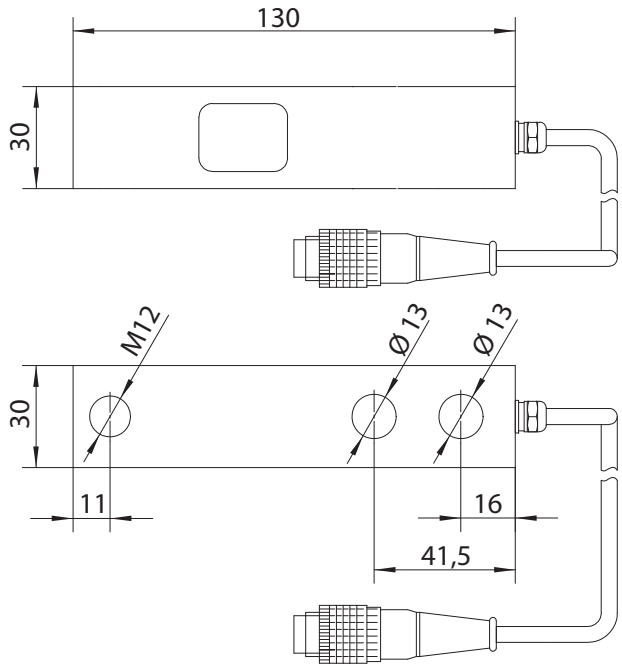
Qualities	
Measuring principle	flexural beam
Output signal	4 ... 20 mA
Electrical measuring connector	5 pole device connector, M16 x 0.75
Protection type (EN 60529 / IEC 529)	IP 65
Material casing	steel
Signal type	three wires
Supply voltage Ub	10 ... 24 VDC
Current consumption	max. 40 mA
Error limit	< 0.5 % of final value
Temperature error NP	< ± 0.04 % of final value / K
Temperature error receiver	< ± 0.04 % of measuring range / K
Non-linearity	< ± 0.15 % of final value
Hysterese	max. 0.1 % of final value
Calibration in	N
Calibration tolerance	< 0.25 % of final value
Environmental temperature	-15 ... +85 °C
Storage temperature	-15 ... +85 °C

Pin assignment	4 ... 20 mA
	Pin 1 = signal +
	Pin 2 = – Ub / signal –
	Pin 3 = + Ub
	Pin 4 = free
	Pin 5 = shield

HySense FO 110

Dimensions and order data

FO 110



Measuring range	Overload capability	Breaking load	Material	Weight	Order number
kN	of nominal value	of nominal value		g	
0 ... 1.0	100 %	600 %	aluminium	~ 350	3183-4G-01.37
0 ... 1.5	50 %	400 %			3183-4G-02.37
0 ... 2.0	50 %	400 %			3183-4G-03.37
0 ... 5.0	100 %	600 %	steel	~ 750	3183-4G-04.37
0 ... 10.0	50 %	400 %			3183-4G-05.37
0 ... 20.0	50 %	400 %			3183-4G-06.37

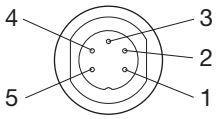
HySense FO 210

Traction force sensor

The force sensor works to the principle of center-line force measurement. You can record traction forces at lifts, cranes and housings, or twistings of masts, towers or platforms.

The force sensor is a threaded rod. This allows easy and universal fastening. The application chamber for the resistance strain gauge is protected from mechanical and chemical damage by an aluminium tube, cast with a highly elastic compound. Full bridges of resistance strain gauges measure the elongation and lateral expansion caused by traction forces.

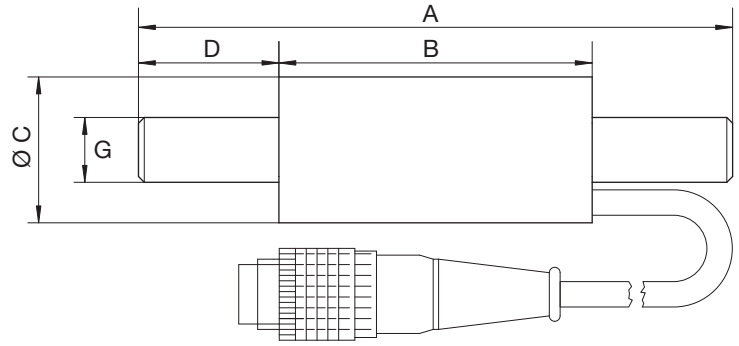
Qualities	
Measuring principle	center-line force measurement
Output signal	4 ... 20 mA
Electrical measuring connector	5 pole device connector, M16 x 0.75
Protection type (EN 60529 / IEC 529)	IP 65
Material casing	steel
Signal type	three wires
Supply voltage Ub	10 ... 24 VDC
Current consumption	max. 40 mA
Error limit	< 0.5 % of final value
Temperature error NP	< ± 0.04 % of final value / K
Temperature error receiver	< ± 0.04 % of measuring range / K
Non-linearity	< ± 0.25 % of final value
Hysterese	< ± 0.15 % of final value
Calibration in	N
Calibration tolerance	< 0.5 % of final value
Environmental temperature	-15 ... +85 °C
Storage temperature	-15 ... +85 °C

Pin assignment	4 ... 20 mA
	Pin 1 = signal +
	Pin 2 = – Ub / signal –
	Pin 3 = + Ub
	Pin 4 = free
	Pin 5 = shield

HySense FO 210

Dimensions and order data

Dimensions



Measuring range	A	B	Ø C	D	G	Weight
kN	mm	mm	mm	mm		g
5	110	58	27	26	M12	170
10						170
20						180
50	100	40	40	30	M16 x 1.5	310
100	100	40	50	30	M24 x 2	500
150	130	60	50	35	M30 x 2	1,000
250	140	56	60	40	M36 x 2	1,380

Measuring range	Overload capability	Break load	Order number
kN	of nominal value	of nominal value	
0 ... 5	100 %	500 %	3183-41-01.37
0 ... 10	50 %	500 %	3183-41-02.37
0 ... 20	50 %	400 %	3183-41-03.37
0 ... 50	50 %	400 %	3183-41-04.37
0 ... 100	50 %	400 %	3183-41-05.37
0 ... 150	50 %	400 %	3183-41-07.37
0 ... 250	50 %	400 %	3183-41-06.37

HySense FO 310

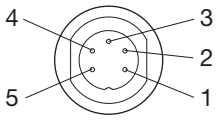
Force sensors according to pressure force principle

Very small pressure force sensor for measuring ranges up to 100 kN that can be used to check moulding force (for example). It is manufactured with corrosion-free high-grade steel and protected in accordance to IP 65. It can be equipped with an overload protection on request.

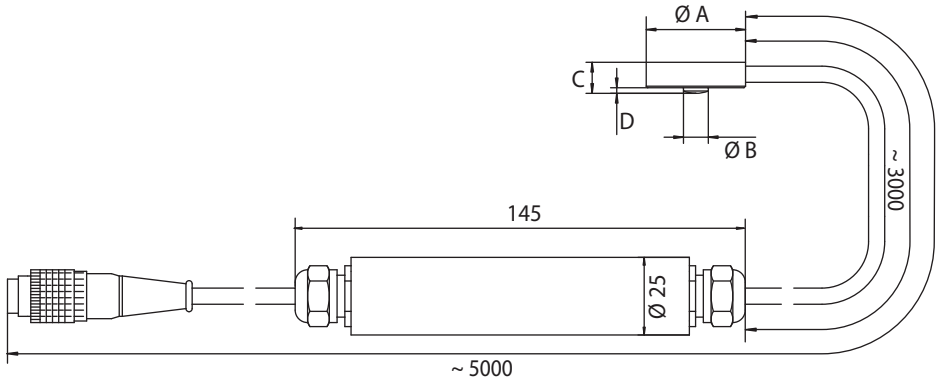
Qualities	
Measuring principle	pressure force
Output signal	4 ... 20 mA
Electrical measuring connector	5 pole device connector, M16 x 0.75
Protection type (EN 60529 / IEC 529)	IP 65
Material casing	steel
Signal type	three wires
Supply voltage Ub	10 ... 30 VDC
Current consumption	< 50 mA
Error limit (23 °C)	< 0.5 % of final value
Working load	130 % of final value
Limit load	150 % of final value
Breaking load	300 % of final value
Max. dynamic load	70 % (acc. to DIN 50100)
Nominal measurement range	0.1 mm
Temperature coefficient	0.2 % / 10 K
Calibration in	N
Calibration tolerance	< 0.5 % of final value
Environmental temperature	0 ... +60 °C (Sensor -30 ... +80 °C)
Storage temperature	0 ... +60 °C
EMC test	IEC 801-2/4/5, EN 55011, EN 55022

HySense FO 310

Pin assignment, dimensions and order data

Pin assignment	4 ... 20 mA
	Pin 1 = signal +
	Pin 2 = – Ub / signal –
	Pin 3 = + Ub
	Pin 4 = free
	Pin 5 = shield

FO 310



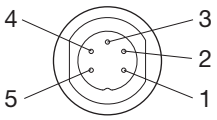
Measuring range	Ø A	Ø B	C	D	Weight	Order number
kN	mm	mm	mm	mm	g	
0 ... 1	32	8	10	1.8	~ 380	3183-42-01.37
0 ... 5	32	8	10	1.8	~ 380	3183-42-04.37
0 ... 10	32	8	10	1.8	~ 380	3183-42-08.37
0 ... 20	39	11	16	2.0	~ 450	3183-42-07.37
0 ... 50	52	15	25	3.0	~ 750	3183-42-06.37
0 ... 100	79	20	39	5.0	~ 1,500	3183-42-05.37

HySense TQ 110

Rotating torque sensors with friction ring

Highly accurate torque sensor, equipped with a cylindric shaft with feather keys on both ends. It is available for several measurement ranges and is designed for continuous rotational speed of 1,500 to 2,000 rpm.

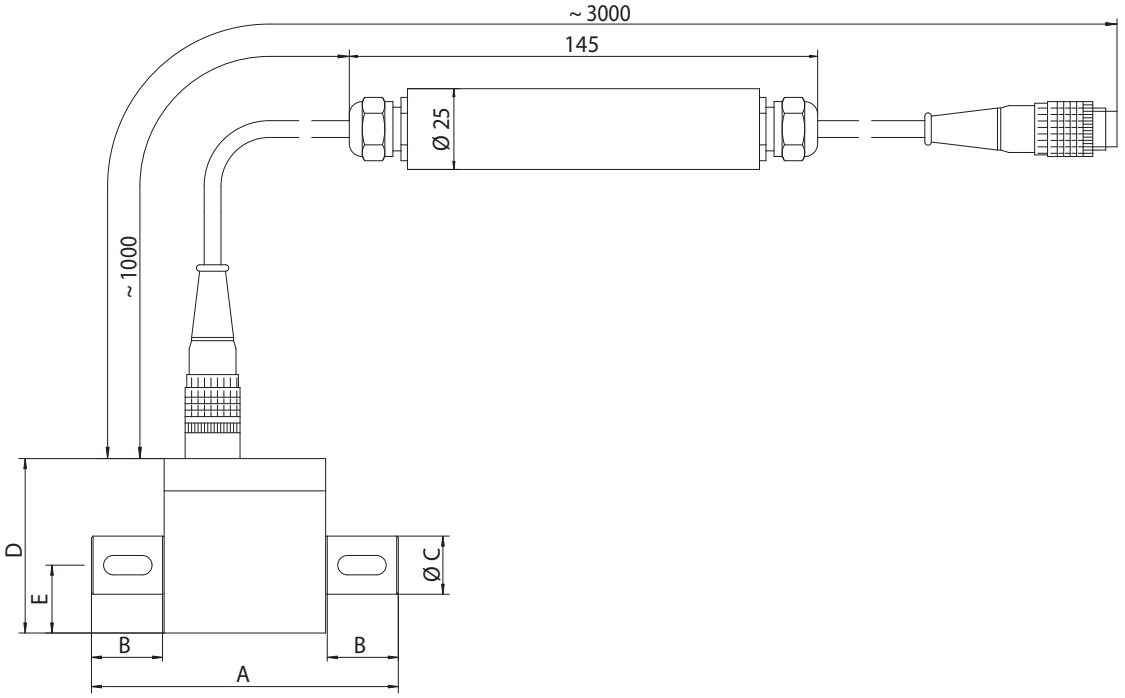
Qualities	
Measuring principle	rotating sensor with friction ring
Output signal	4 ... 20 mA
Nominal characteristic value	2 mV/V
Electrical measuring connector	5 pole device connector, M16 x 0.75
Mechanical measuring connector	cylindric shaft with feather keys
Protection type (EN 60529 / IEC 529)	IP 50
Signal type	three wires
Supply voltage Ub	8 ... 24 VDC
Current consumption	< 50 mA
Error limit	0.1 % of final value
Working torque	120 % of final value
Limit torque	130 % of final value
Breaking torque	250 % of final value
Factor range DIN 50100	70 % (peak – peak)
Maximal rotational speed	2,000 U/min
Twisting angle	0.5 ° at nominal torque
Reproducability	± 0.05 %
Lifetime of brushes	5 x 10^8 rotations
Nominal value tolerance	± 0.1 %
Environmental temperature	-10 ... + 60 °C
Storage temperature	-10 ... + 60 °C
EMC test	IEC 801-2/4/5, EN 55011, EN 55022

Pin assignment	4 ... 20 mA
	Pin 1 = signal +
	Pin 2 = – Ub / signal –
	Pin 3 = + Ub
	Pin 4 = free
	Pin 5 = shield

HySense TQ 110

Dimensions and order data

TQ 110



Measuring range	Max. cont. rot. speed	Spring constant	Max. radial load	Inertia*	A	B	C	D	E	Weight	Order number
Nm	min^{-1}	Nm/rad	N	kg m^2	mm	mm	mm	mm	mm	g	
0 ... 50	1,500	4.82×10^3	28	1.17×10^{-5}	90	20	15	54	21	380	3183-21-0A.37
0 ... 63		9.85×10^3	65	1.25×10^{-6}						420	3183-21-06.37
0 ... 160	1,000	2.80×10^4	80	9.15×10^{-5}	95	22	18	54	21	900	3183-21-07.37
0 ... 500		6.33×10^4	200	9.42×10^{-5}	140	40	32	68	30		3183-21-08.37

* inertia J in [kg m^2] on the motor side

HySense VB 110

Vibration sensor

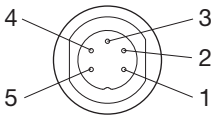
The vibration sensor comprises a capacitive acceleration sensor for data collection with short response time under serious environmental conditions. It is mounted on a magnetic foot that can be used to attach the sensor to any metallic surfaces. It reports vibrations by frequency and therefore can be connected to all Hydrotechnik measuring instruments.

NEW

Calibration values

Enter calibration value „1“ when used with MultiSystem 5060 and „1,000“ when used with MultiHandy 3010.

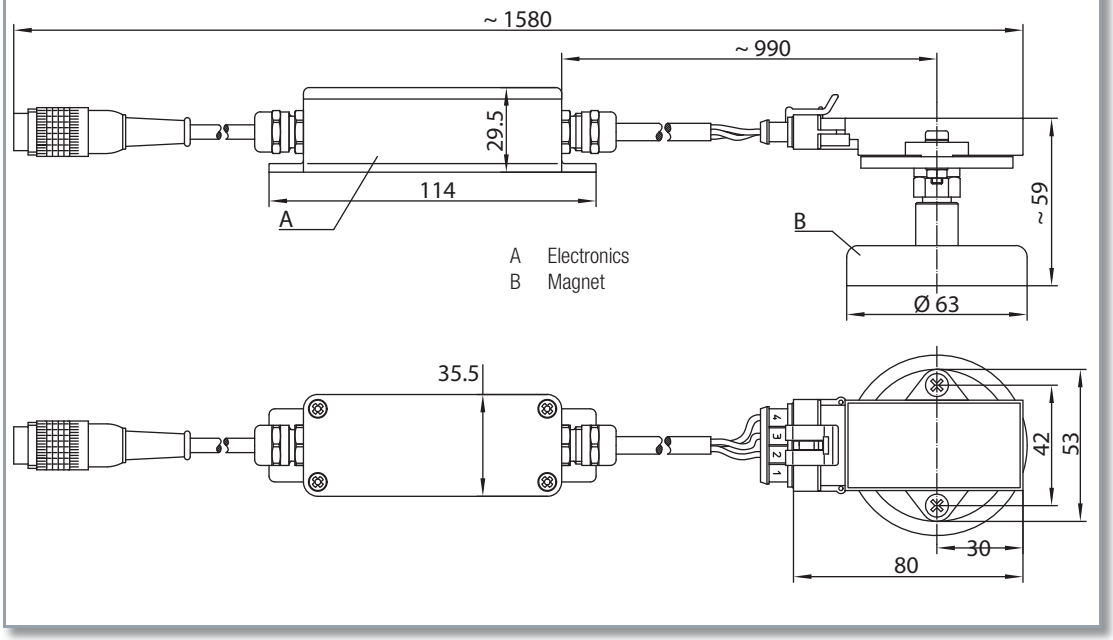
Qualities	
Measuring principle	capacitive acceleration sensor
Output signal	frequency (rectangular signal)
Signal height	U_b -2 V
Frequency range	1 ... 100 Hz
Electrical measuring connector	5 pole device connector, M16 x 0.75
Mechanical connection	magnetic foot
Protection type (EN 60529 / IEC 529)	IP 66 (sensor element)
Material casing	plastic, resistant against petrol, oil, salt and certain chemicals (listing on request)
Signal type	three wires
Supply voltage Ub	8.5 ... 30 VDC
Current consumption	< 15 mA
Error limit	< ± 2 %
Resolution	< 1 mg
Non-linearity	< ± 2 % of final value
Hysterese	cannot be measured
Environmental temperature	-20 ... +85 °C
Storage temperature	-20 ... +85 °C
EMC test	on request
Shock stability	> 1,000 g

Pin assignment	Frequency
	Pin 1 = signal +
	Pin 2 = – Ub / signal – GND
	Pin 3 = + Ub
	Pin 4 = free
	Pin 5 = free

HySense VB 110

Dimensions and order data

VB 110



Measuring range	Weight	Order number
g	g	
± 50	547	3183-71-01.00