



HIRSCHMANN

A Belden Company

Controls

Consoles

SLIs

Sensors

Service

FORCE SENSORS fSENS



Force sensors from Hirschmann Automation & Control are used for the measurement of static and dynamic loads, to register shearing force and to capture data in the area of tensile and pressure forces.

Areas of application include force measurements in cranes and winches, traction force measurements in vehicles and ships as well as pressure force measurements in fork lift trucks, shelf conveyors, overhead cranes and gantry cranes.

The case is made of rust-proof special steel. It is available with both 4...20 mA and CANopen interfaces.

The force sensor features:

- ▶ Extremely high overload capacity and fatigue limit
- ▶ Simple direct installation
- ▶ High levels of precision
- ▶ Integrated or external measuring amplifier
- ▶ Optimal cost/benefit ratio

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www.j2.dk

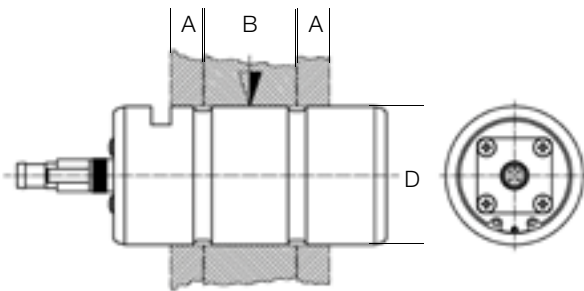


fSENS MA –

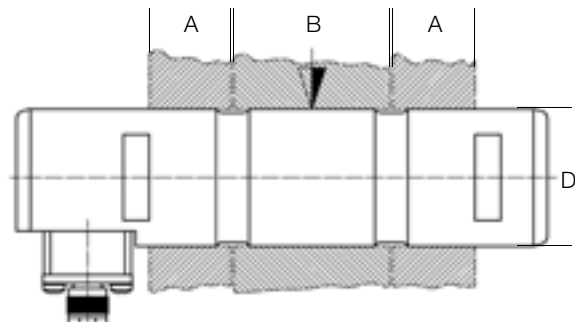
Load pins to measure shearing force



Dimensions

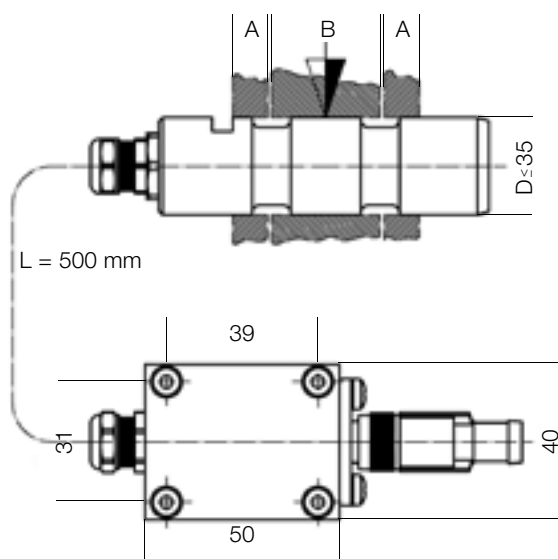


Load pins with integrated amplifier and straight plug

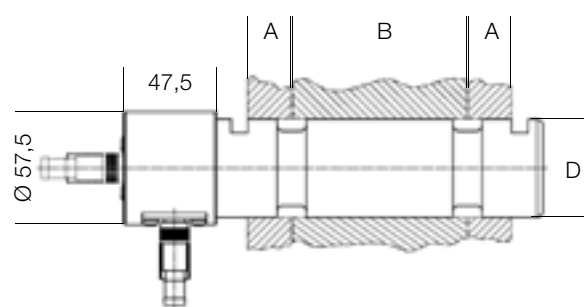


Load pins with integrated amplifier and offset plug

From an external diameter of < 35 mm the load pins are fitted with an external plug, which is either flanged or connected via a 500 mm cable



Connected with an external amplifier via cable

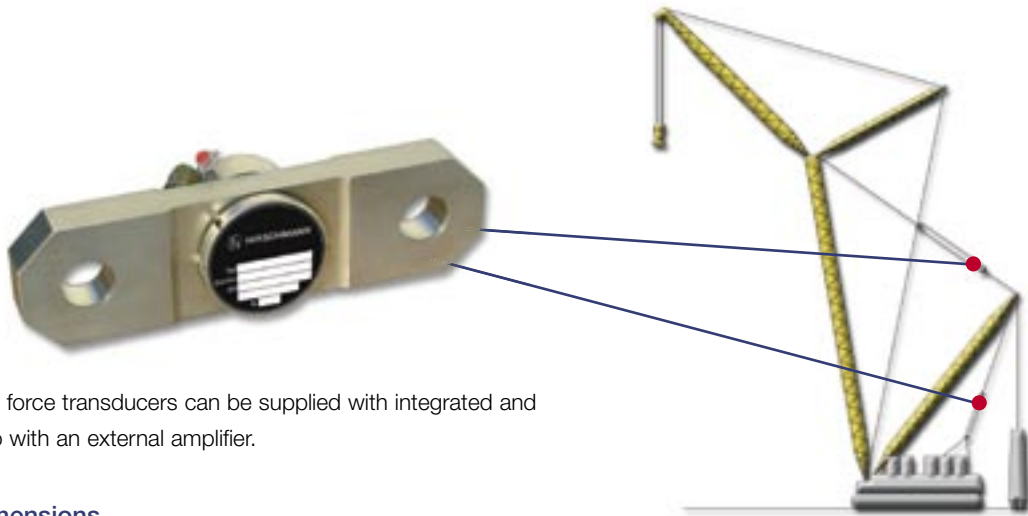


With flanged external amplifier

Load	A (mm)	B (mm)	D (mm)
from 1,0 t ...	12	30	25
... to 300 t	55	160	240

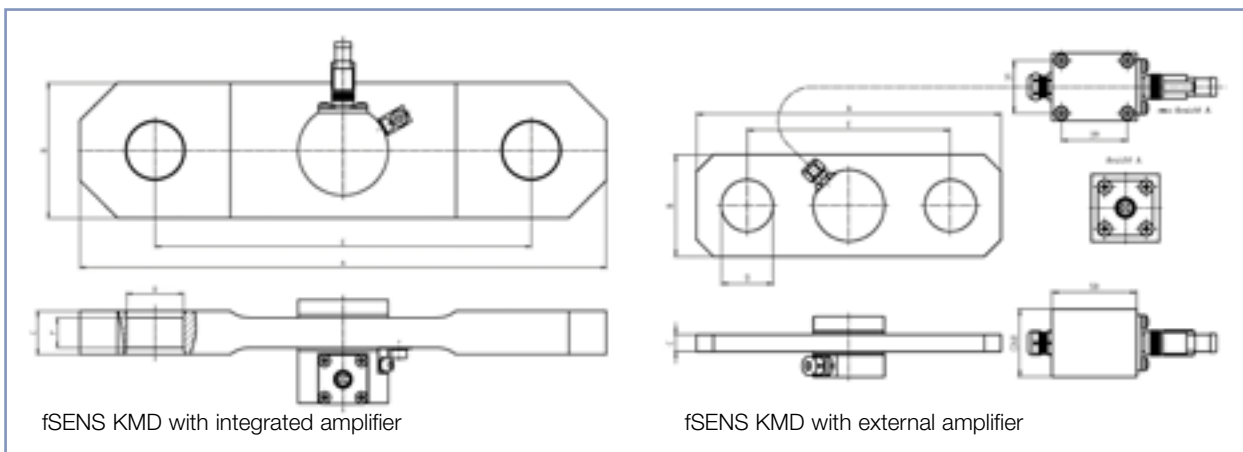
Other dimensions and load ranges on request

fSENS KMD – Force transducers for the measurement of static and dynamic tensile forces in various areas of application.



The force transducers can be supplied with integrated and also with an external amplifier.

Dimensions



Order-No.	Nominal Load		Dimensions (mm)						Weight (kg)
	[Mp/t]	[kN]	A	B	C	D	E	F	
601 847	1	9,8	150	45	10	30	100	–	0,9
515 647	3	29,4	240	60	17	30	170	–	2,5
513 667	5	49,1	280	68	30	36	200	17	4,2
513 704	10	98,1	350	90	35	47	250	20	6,9
513 735	15	147,2	410	110	40	44	300	32	14,2
513 763	20	196,2	420	120	50	57	300	35	17,0
513 789	25	245,3	420	120	53	45,5	300	45	19,3
513 805	30	294,3	470	130	60	50,5	340	45	24,8
513 831	40	392,4	480	140	67	60,5	340	60	29,2
602 135	50	490,5	480	140	77	60,5	340	60	33,0
602 146	60	588,6	520	160	87	70,5	360	60	43,8
602 166	100	981,0	740	200	110	100,5	500	70	92,2
602 181	120	1177,2	740	210	110	110,5	500	70	93,5
602 189	150	1471,5	740	200	122	91	500	90	108,3

The force transducers can be supplied with different bore diameters, as required. Pin-play should be no greater than 2% of the bore diameter. Special models from 0.5 t to 1000 t are possible. Please enquire.

For the measurement range 3 to 20 t light special shackles made of forged steel are available.

For higher levels of precision as class 0.5, service-free spherical plain bearings can be installed in force transducers of this measurement range.

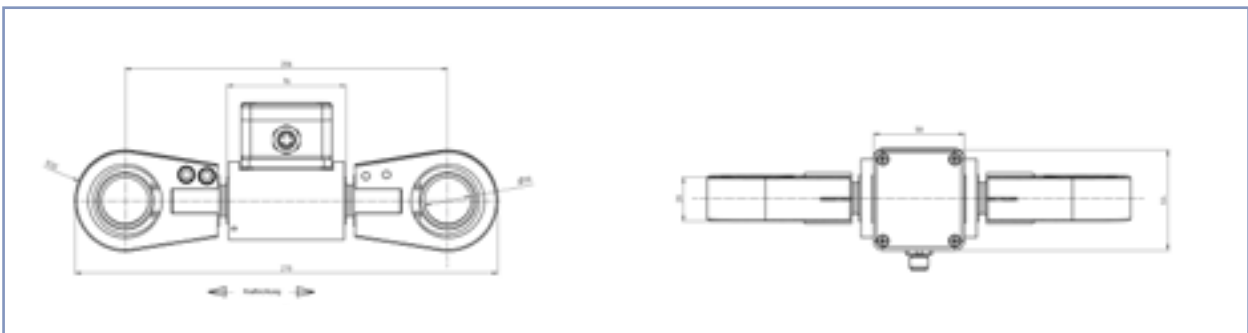
fSENS ZKA –

Tension / Compression Force Transducer

fSENS ZKA

Tension/compression force transducers of the ZKA series are used to measure static and dynamic traction and pressure forces. In an everyday industrial setting this force transducer is distinguished by its compact construction.

An output signal, 4 ... 20 mA, proportional to the charge is supplied. Other output signals are available on request.



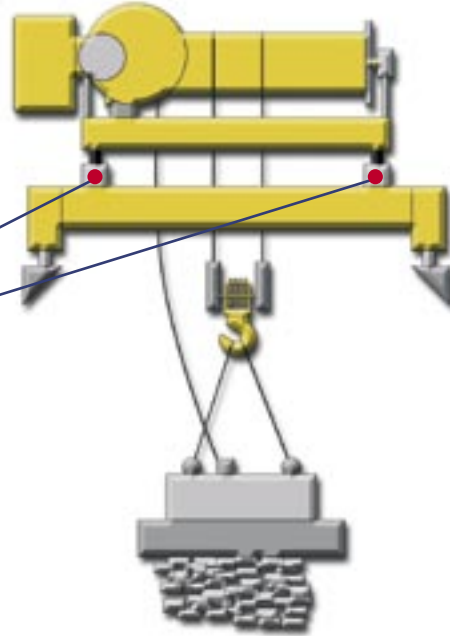
Dimensions for a standard fSENS ZKA

Charge (t)	Dimensions (mm)							Articulated head	Weight (kg)
	D	F	G	H	J	K	L		
1,5	45	176	232	56	25	23	20	GHR-K 25 DO	2,10
2,5	45	176	232	56	25	23	20	GHR-K 25 DO	2,11
4,0	50	230	308	78	30	30	25	GHR-K 35 DO	3,08
6,3	56	262	356	94	40	35	28	GHR-K 40 DO	6,10
10,0	71	310	426	116	50	40	35	GHR-K 50 DO	11,18
16,0	90	420	584	154	70	55	49	GHR-K 70 DO	24,39
25,0	125	554	780	206	90	65	60	GHR-K 90 DO	62,24
40,0	150	630	880	230	100	70	70	GHR-K 100 DO	82,44
63,0	150	802	1162	340	120	90	85	GHR-K 120 DO	185,38

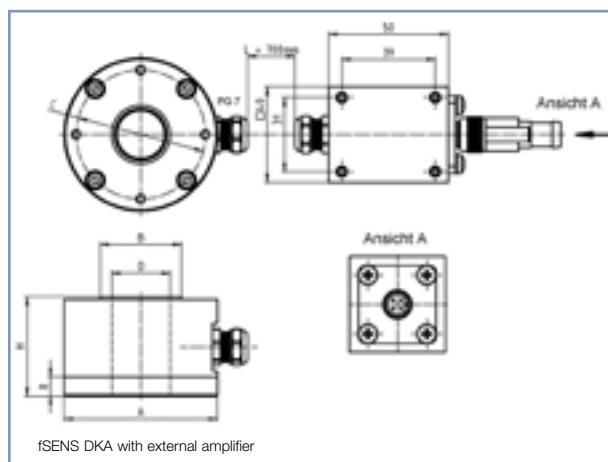
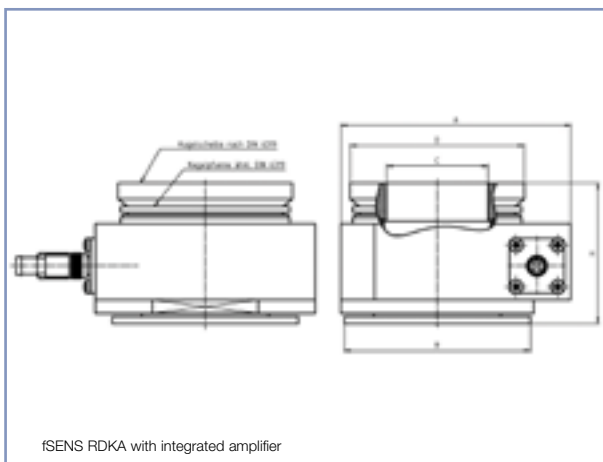
fSENS DKA and fSENS RDKA

fSENS DKA and fSENS RDKA

Compression force transducers of the series fSENS RDKA are used where, for structural reasons, only sensors with an absolutely minimal structural height can be used.



Sensors of the series fSENS DKA and fSENS RDKA can be supplied either with external or integrated amplifier.



Dimensions for a standard fSENS DKA (further dimensions on request)

Charge								Dimensions (mm)			
1t	1,6t	2t	2,5t	4t	7t	10t	16t	External Ø A	Support Ø B	Internal Ø D	Total height
x								45	26	12,6	34,0
	x							45	26	11,5	34,0
		x						45	26	10,6	34,0
			x					64	34	28,0	41,5
				x				64	34	24,5	41,5
					x			64	34	20,0	41,5
						x		64	34	13,0	41,5
				x				86	52	45,5	41,5
					x			102	69	56,0	53,0
						x		82	52	30,5	43,0
							x	82	52	35,0	43,0

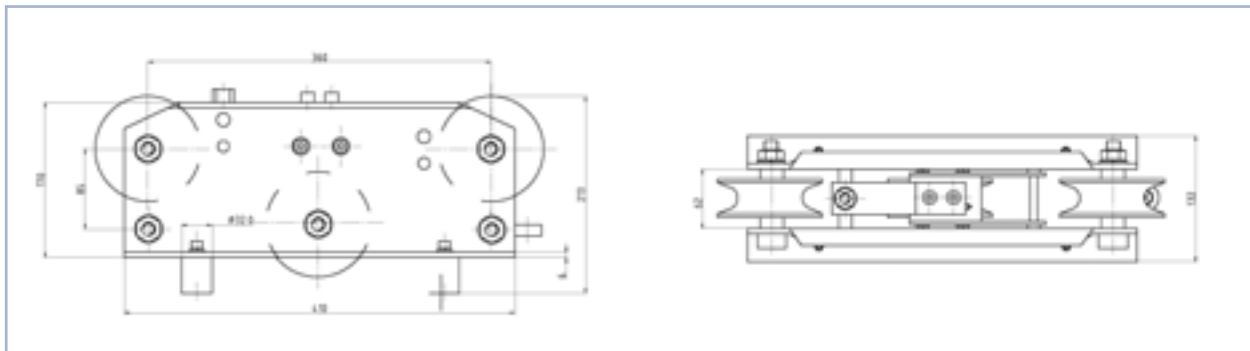
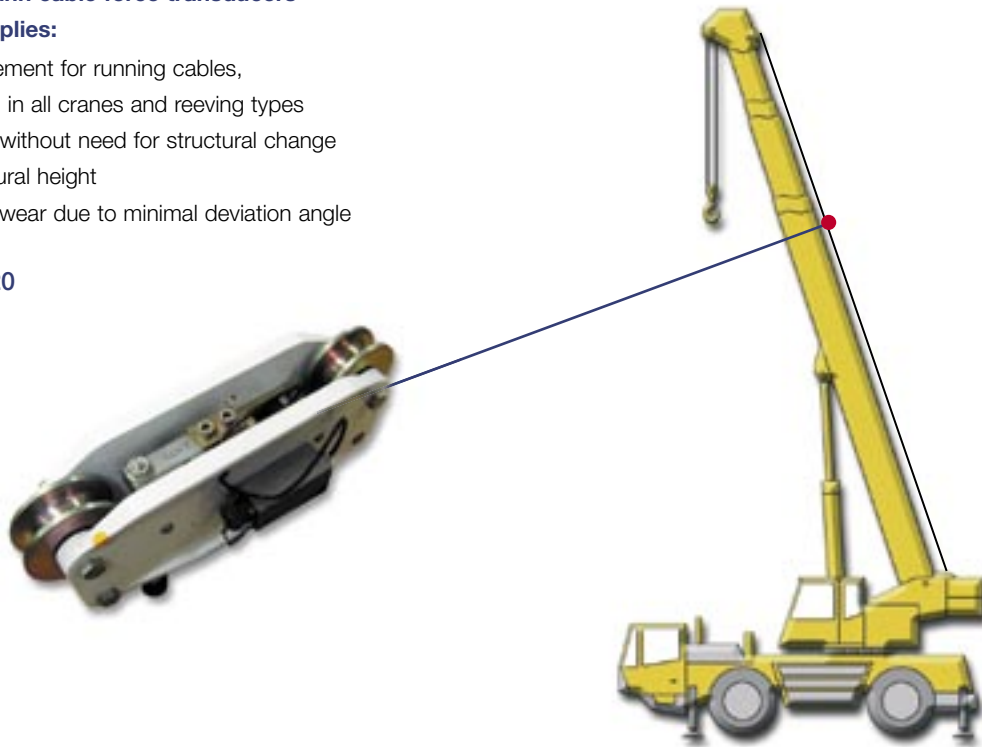
fSENS SKM –

Wire rope/cable force transducer

**For all Hirschmann cable force transducers
the following applies:**

- ▶ Force measurement for running cables,
thus functional in all cranes and reeving types
- ▶ Simple retrofit without need for structural change
- ▶ Minimal structural height
- ▶ Minimal cable wear due to minimal deviation angle

fSENS SKM 320



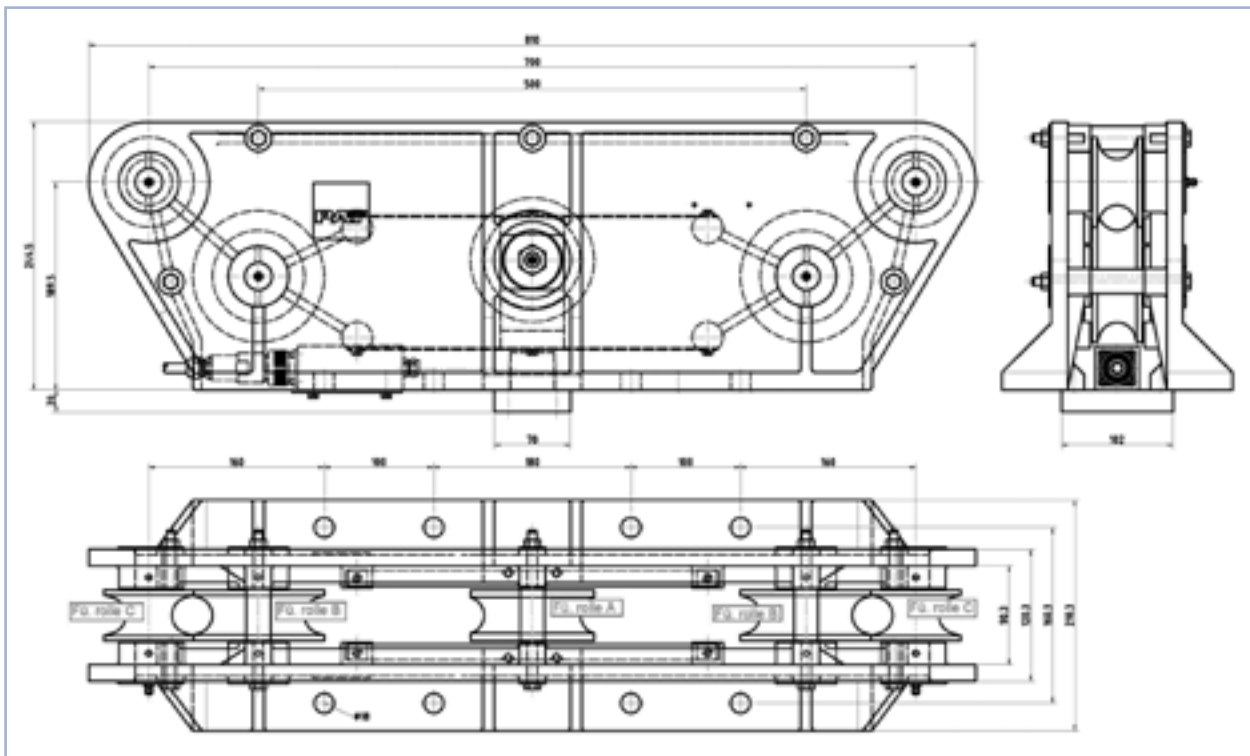
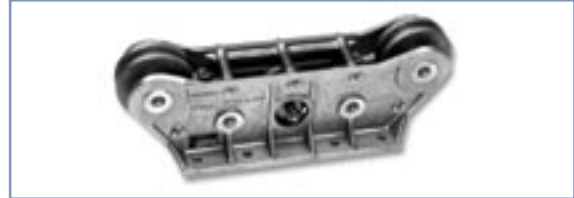
Design types

Description	Order-No.	Roller set	Cable Roller Ø	Cable Ø	Max. force in tons
fSENS SKM 320/11	606391	531769	10-13 mm	12,7 mm	3,5
fSENS SKM 320/12	606392	531770	13-16 mm	15,8 mm	5,0
fSENS SKM 320/13	606383	531771	16-18 mm	16,9 mm	6,5
fSENS SKM 320/14	606388	531772	19-21 mm	19,1 mm	8,0
fSENS SKM 320/15	606384	531773	22-24 mm	22,2 mm	11,0
fSENS SKM 320/16	606385	531774	25-27 mm	25,4 mm	13,0
fSENS SKM 320/17	606386	531775	28-30 mm	28,5 mm	15,0

fSENS SKM 500

- ▶ Cable rollers for cable diameter 13 – 32 mm
- ▶ Cable load up to 30 t
- ▶ Dimensions: (Length) 265 x (Width) 810 x (Depth) 210 mm
- ▶ Weight: 30 kg

Special options available on request



Design types

Description	Order-No.	Roller set	Cable Roller Ø	Cable Ø	Max. force in tons
fSENS SKM 500/0034	605363	514065	A = 58 mm B = 52 mm C = 92 mm	18 - 20 mm	7,5 t
fSENS SKM 500/0035	605233	514066	A = 52 mm B = 52 mm C = 80 mm	21 - 23 mm	11,5 t

Technical Data

Description	Operating temperature	Storage temperature	Protection type	Operating voltage	Output signal
fSENS SKM	- 25°C ... +85°C	- 40°C ... +85°C	IP 65	15 V ... 30 VDC	4 ... 20 mA



TECHNICAL DATA


Description	fSENS MA	fSENS KMD	fSENS DKA / fSENS RDKA	fSENS ZKA
				
Nominal load range	10 - 3000 kN	10 - 3000 kN	10 - 3000 kN	10 - 3000 kN
Class precision	1	Up to 0,3	Up to 0,3	1
Charge of measuring body	200 %	200 %	200 %	150 %
Charge of measuring body up to flow limit	300 %	300 %	300 %	-
Safe to breaking point	500 %	500 %	500 %	300 %
Operating temperature	-40°C ... +70°C	-40°C ... +70°C	-40°C ... +80°C	-30°C ... +85°C
Protection type IEC60529	IP 65 (IP 67 possible)	IP 65 (IP 67 possible)	IP 67 (IP 69K with screwed on reverse plug)	-
Operating voltage	10 V...30 V DC	10 V...30 V DC	10 V...30 V DC	-
Impedance	4 x 700 Ohm	4 x 350 Ohm	n/a	-
Output signal	4...20 mA CANopen 2,5 ... 7,5 VDC 0 ... -1V	4...20 mA CANopen 2,5 ... 7,5 VDC 0 ... -1V	4...20 mA CANopen 2,5 ... 7,5 VDC 0 ... -1V	4...20 mA CANopen 2,5 ... 7,5 VDC 0 ... -1V
Drawing current	≤ 45 mA	≤ 45 mA	≤ 45 mA	-
Temperature drift	0,1 % / 10° K	0,1 % / 10° K	0,1 % / 10° K	0,1 % / 10° K
Linearity	< 1 %	< 0,30 %	< 0,30 %	< 0,30 %
Hysteresis	< 1 %	< 0,15 %	< 0,15 %	< 0,15 %
Housing	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Electrical connection	M12x1	M12x1	M12x1	M12x2
Climate test	EN60068-2-30, DB 55°C / 100 %	EN60068-2-30, DB 55°C / 100 %	EN60068-2-30, DB 55°C / 100 %	-
Vibration resistance	EN60068-2-6, 5-500 Hz, 50 g, 10 mm	EN60068-2-6, 5-500 Hz, 50 g, 10 mm	EN60068-2-6, 5-500 Hz, 50 g, 10 mm	-
Shock resistance	EN60068-2-27 (half sine) 50g, 11 ms, 1000 shocks 1000 g, 1 ms, 50 shocks	EN60068-2-27 (half sine) 50g, 11 ms, 1000 shocks 1000 g, 1 ms, 50 shocks	EN60068-2-27 (half sine) 50g, 11 ms, 1000 shocks 1000 g, 1 ms, 50 shocks	-

Connector pin assignment M12x1

CANopen options

pin 1	shielding
pin 2	+ Ub
pin 3	0 V
pin 4	CAN high
pin 5	CAN low

Options 4 ... 20 mA

pin 1	+Ub
pin 2	***  do not use
pin 3	0 V
Pin 4	signal (4 ...20mA)

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