

RTN ring torsion load cells



- Legal-for-trade design according to OIML (up to 5000 d and 7500 d for multi-interval scales)
- High accuracy, even for very small application areas (for legal-for-trade applications up to at least 15 %)
- Large output signal and this high-resolution useful signal range
- Because of the low power consumption, multi-scale systems can also be realized with simple control electronics
- Use in hazardous zone with protection class Ex ia IIC T4 Gb / Ex ia IIIC T125 °C Db or protection class Ex nA IIC T4 Gc / Ex tb IIIC T125 °C Db
- Protection class IP68

Application

The load cell as transducer converts the mechanical input variable force proportionally into the electrical output variable voltage.

The consistent optimization of the ring torsion load cell offers the user specific advantages:

- The extremely small frame size simplifies the use in almost all weighing device applications
- The robust construction allows problem-free transport, installation and operation, also under very rough ambient conditions (disturbance forces, temperature)

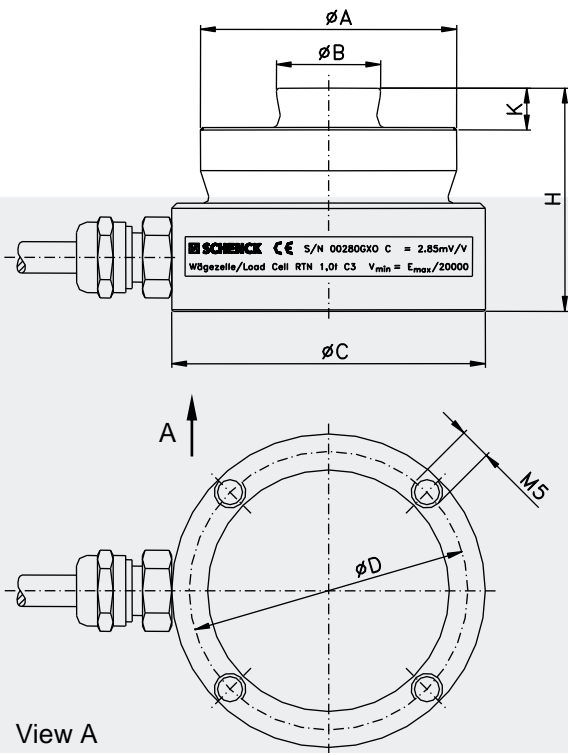
Construction

- Hermetically sealed encapsulation through laser welding (IP68)
- High corrosion protection through electrolytically polished stainless steel
- All electrical components are located inside the load cell and thus are optimally protected
- The high quality and robust connecting cable is guided radially into the load cell
- In connection with adapter kits the RTN load cells are compatible previous designs

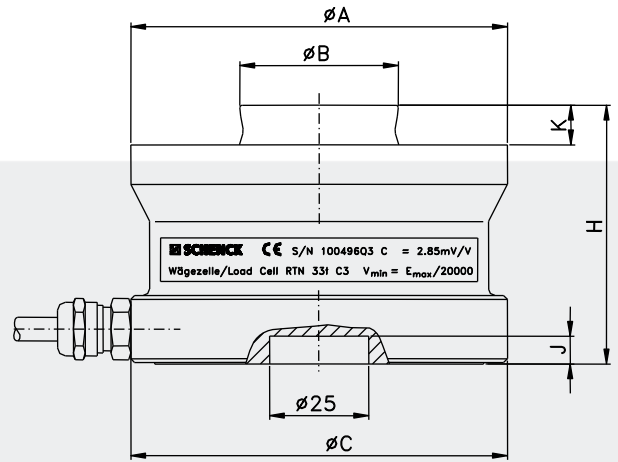
Function

- High measuring sensitivity
- High reproducibility
- High long-term stability and therefore consistently high accuracy permanently
- Extremely small measured value influence as a result of lateral forces
- High functional safety, even with frequently unavoidable impact loads and constraining forces, as well as with electrical interferences
- Integrated overvoltage protection
- Torque-free force input/output as a result of the direct, vertical power train

RTN 1 t - 4.7 t



RTN 10 t - 470 t



Technical Data

Nominal load E_{max} t	Limit load L_l t	Break load L_d t	Nominal measuring path h_n mm	Own weight kg
1	1.7	4	0.13	0.6
2.2	4	9	0.12	0.6
4.7	8	19	0.12	0.7
10	17	40	0.17	1.2
15	28	60	0.18	1.3
22	38	90	0.21	1.3
33	58	130	0.25	2.1
47	80	190	0.33	4.3
68	120	270	0.35	4.8
100	170	400	0.45	7.0
150	250	600	0.57	8.6
220	380	900	0.67	22.0
330	580	1200	0.85	29.0
470	700	1500	1.00	50.0

Dimensions

Type	Dimensions (MM)						
	A	B	C	D	H	K	J
RTN							
1 t	49	20	60	53	43	7.5	-
2.2 t	49	20	60	53	43	7.5	-
4.7 t	49	20	60	53	43	7.5	-
10 t	73	30	75	-	50	6.5	7
15 t	75	30	75	-	50	6.5	7
22 t	75	30	75	-	50	6.5	7
33 t	95	40	95	-	65	10	7
47 t	130	60	130	-	75	14	7
68 t	130	60	130	-	85	14	7
100 t	150	70	150	-	90	16	7
150 t	150	70	150	-	100	16	7
220 t	225	100	225	-	130	24	10
330 t	225	100	225	-	145	24	10
470 t	270	120	270	-	170	28	10

Admissible static transverse loading $L_q = 0.5 (E_{max} - 0.8 L_z)$, but not more than $L_{qmax} = 0.2 L_z$; E_{max} = nominal load; L_z = load in measurement direction Permissible vibrational loading as defined by DIN 50100: 70 % E_{max} . Peak loading values may not exceed E_{max} .

In combination with elastomer bearings, SEM must be observed that the reset force of the elastomer bearings of the self-aligning bearings already represents a transverse force.

Technical Data

Nominal load	E_{max}	1 t – 470 t		1 t – 100 t	
Accuracy class		0.05	C3	C5 / C4 Mi 7.5	Ref
Nominal characteristic value	C_n	2.85 mV/V \pm 2.85 μ V/V			
Combined error	F_{comb}	0.05 %	0.02 %	0.01 %	C_n
Dead load return after load (30 min)	F_{dr}	\pm 0.03 %	\pm 0.016 %	\pm 0.006 %	C_n
Creepage under load (30 min)	F_{cr}	\pm 0.04 %	\pm 0.024 %	\pm 0.009 %	C_n
Temperature coefficient of the zero signal per 10 K	TK_0	\pm 0.03 % \pm 0.05 %	\pm 0.007 % \pm 0.02 %	\pm 0.0058 % \pm 0.02 %	C_n, B_{tn} C_n, B_{tu}
Temperature coefficient of the characteristic value per 10 K	TK_c	\pm 0.05 % \pm 0.07 %	\pm 0.008 % \pm 0.02 %	\pm 0.0062 % \pm 0.02 %	C_n, B_{tn} C_n, B_{tu}
max. admissible no. of legal-for-trade scale intervals	n_{LC}		3000	5000	
For multi-interval scales	Z			7500	
Smallest scale interval	V_{min}		$E_{max}/20000$	$E_{max}/24000$	
max. application range	B_{amax}	$B_{amax} = E_{max}$			
Input resistance	R_e	4450 Ω \pm 100 Ω			T_r
Output resistance	R_a	4010 Ω \pm 2 Ω	4010 Ω \pm 0.5 Ω		T_r
Zero signal	S_0	\pm 1 %			C_n
Max. supply voltage	U_{smax}	60 V			
Nominal temperature	B_{tn}	-10 °C ... +40 °C			
Operating temperature range Ex-model	B_{tu}	-40 °C ... +80 °C, Option to +110 °C *) -30 °C ... +70 °C			
Temperature	T_r	22 °C			
Storage temperature range	B_{ts}	-50 °C ... +85 °C			
Type of protection Explosion-proof design		IP68, 1 m / 100 h; (Option 110 °C: IP66) IP67			
Cable specification		TPE (gray) \varnothing 6.5 mm, silicon and halogen-free, -30 °C ... +150 °C, Length 5 m for RTN 1 t - 15 t and RTN 150 t - 470 t Length 15 m for RTN 22 t - 100 t			
Connection assignment		black: input + / blue: input - red: output + / white: output - Yellow: screening			
Material		Stainless steel			
Corrosion protection		See resistance table DDP8483			

*) Optional feature 110 °C not possible in combination with C5 or ATEX

Order numbers

Design	Accuracy class		
	0.05	C3	C5 / C4 Mi 7.5
RTN 1 t	D726173.04	D726173.02	D726173.10
RTN 2.2 t	D726174.04	D726174.02	D726174.10
RTN 4.7 t	D726175.04	D726175.02	D726175.10
RTN 10 t	D726176.04	D726176.02	D726176.10
RTN 15 t	D726177.04	D726177.02	D726177.10
RTN 22 t	D724781.04	D724781.02	D724781.10
RTN 33 t	D724754.04	D724754.02	D724754.10
RTN 47 t	D724782.04	D724782.02	D724782.10
RTN 68 t	D724783.04	D724783.02	D724783.10
RTN 100 t	D724784.04	D724784.02	D724784.10
RTN 150 t	D726178.04	D726178.02	
RTN 220 t	D726179.04	D726179.02	
RTN 330 t	D726180.04	D726180.02	
RTN 470 t	D726181.04	D726181.02	

Optional feature ATEX/IECEX approval

Intrinsically safe explosion-proof design according to ATEX category 2GD and IECEX EPL Gb, Db:

Gas-Ex II 2G Ex ia IIC T4 Gb (Zone 1)

Dust-Ex II 2D Ex ia IIIC T125 C Db, IP67 (Zone 21)

Attention: The verification of intrinsically safe circuit must be verified. New barriers are provided in particular for new systems. Verifications of intrinsically safe circuit are available for all load cells and barriers.

Accuracy class		
0.05 2GD	C3 2GD	C5 / C4 MI 7.5 2GD
Model .82	Model .81	Model .83

Load cells marked as intrinsically safe - Ex "i" - are also operated intrinsically safely irrespective of the zone.

Not intrinsically safe explosion-proof design according to ATEX category 2D, 3G and IECEX EPL Db, Gc:

Gas-Ex II 3G Ex nA IIC T4 Gc (Zone 2)

Dust-Ex II 2D Ex tb IIIC T125 °C Db, IP67 (Zone 21)

Accuracy class		
0.05 2D3G	C3 2D3G	C5 / C4 MI 7.5 2D3G
Model .86	Model .85	Model .87

Order example: 47 t, Accuracy class C3, ATEX category 2D, 3G. Type RTN 47 t C3 2D, 3G ...;
Order number D724782.85

Options	Installation accessories
<ul style="list-style-type: none"> ■ Model for operating temperatures up to 110°C ■ Additional corrosion protection ■ Other cable lengths ■ Protection class IP69K ■ Cable resistant to gnawing rodents ■ Mounting holes 	<ul style="list-style-type: none"> SENSiQ™ Elastomer Mount (SEM) SENSiQ™ Secure Mount (SSM) SENSiQ™ Pendulum Mount (SPM) SENSiQ™ Fixed Mount (SFM)

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