HOTTINGER BALDWIN MESSTECHNIK
HBM Wägetechnik GmbH

HBM
△ spectris group

Compact Ring-Torsion Load Cells RTN

- **PTB & OIML approved as suitable for trade use (up to 5000 d and 7500 d in case of multi-divisional scales)**
- **High accuracy, even for very small utilisation ranges (down to 15 % in case of trade use according to OIML)**
- **High output signal and, thus, high-resolution of useful signal range**
- **Low power consumption allows realisation of multi-scale systems with simple evaluation electronics**
- **Protection to EEx ib IIC T 6 for use in explosion hazardous areas**
- **Protection class IP 68**

Application

Acting as a transducer, the load cell converts the mechanical input signal, the load, proportionally into the electrical output voltage.

The consistent optimization of the ring-torsion load cells offers additional advantages:

- The extremely low headroom simplifies the use in almost all weighing applications.
- The sturdy design enables easy transport, installation and operation.

Construction

- Hermetically sealed due to laser welding; protection class IP 68
- High corrosion protection due to the use of electrolytically polished stainless steel
- All electrical components are inside the load cell and are thus optimally protected
- The high-quality, sturdy connection cable is lead radially into the load cell
- The RTN load cells are compatible with earlier ring-torsion load cells if our adapter kits are used

Functions

- High measuring sensitivity
- High repeatability
- High long-term stability and, thus, continuing and consistently high accuracy
- Minimal effect on accuracy by side forces
- High reliability and availability, even in case of unavoidable shock loads, constraining forces or electrical interferences
- Integral excessive voltage protection
- Moment-free load input/output due to direct, vertical force flow

RTN 1 t - 4,7 t

View A
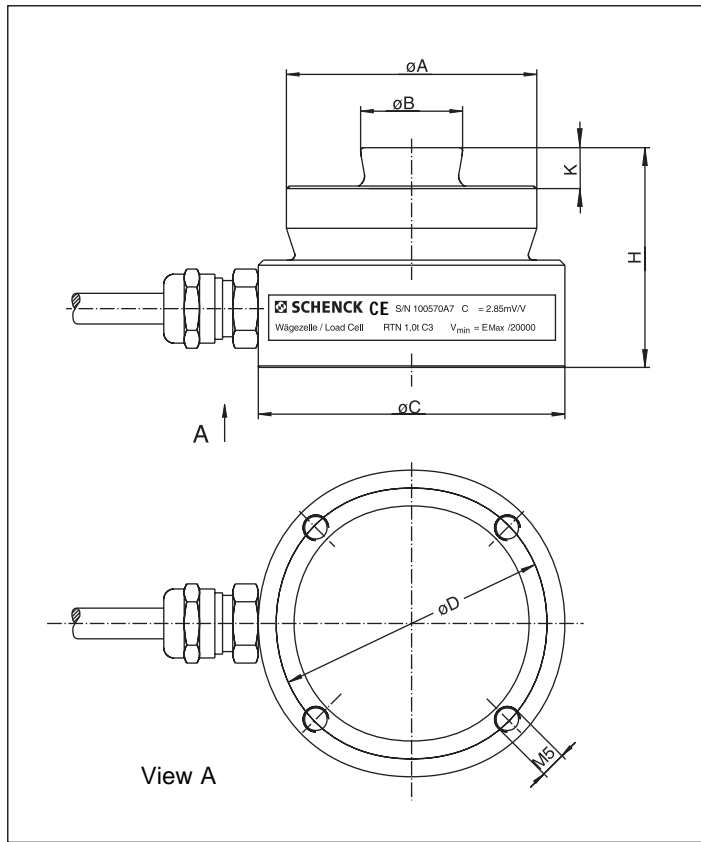
RTN 10 t - 470 t
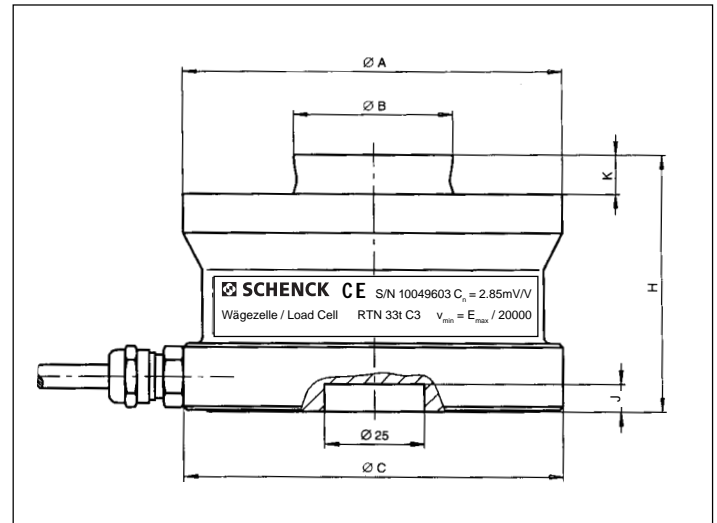
Technical Data

Rated Capacity E_{max} t	Limit Load L_l t	Rupture Load L_d t	Nominal displacement h_n mm	Dead 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	25	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 RTN	Dimensions (mm)						
	A	B	C	D	H	K	J
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	75	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 side load $L_q = 0.5 (E_{max} - 0.8 L_z)$, but no higher than $L_{qmax} = 0.3 E_{max}$; E_{max} = rated capacity; L_z = load in measuring direction

Technical Data

Rated capacity	E_{max}	1 t - 470 t			1 t - 100 t				
Accuracy class		0.1	0.05	C3	C4	C5	C3 Mi 7.5	C4 Mi 7.5	Reference
Sensitivity	C_n	2.85 mV/V ± 8,5 µV/V	2.85 mV/V ± 2.85 µV/V						
Combined error	F_{comb}	0.1 %	0.05 %	0.02 %	0.015 %	0.01 %	0.013 %	0.013 %	C_n
Minimum dead load output return	F_{dr}	± 0.05 %	± 0.03 %	± 0.016 %	± 0.012 %	± 0.01 %	± 0.006 %	± 0.006 %	C_n, B_{tn}
Creep (30 min)	F_{cr}	± 0.06 %	± 0.04 %	± 0.024 %	± 0.018 %	± 0.014 %	± 0.009 %	±0.009%	C_n, B_{tn}
Temperature effect on zero signal	TK_0	± 0.1 % ± 0.1 %	± 0.03 % ± 0.05 %	± 0.007 % ± 0.02 %	± 0.0058 % ± 0.02 %	± 0.0058 % ± 0.02 %	± 0.0058 % ± 0.02 %	± 0.0058 % ± 0.02 %	C_n, B_{tn} C_n, B_{tu}
Temperature effect on sensitivity	TK_c	± 0.1 % ± 0.1 %	± 0.05 % ± 0.07 %	± 0.008 % ± 0.02 %	± 0.007 % ± 0.02 %	± 0.0062 % ± 0.02 %	± 0.007 % ± 0.02 %	± 0.007 % ± 0.02 %	C_n, B_{tn} C_n, B_{tu}
Maximum number of load cell intervalls	n_{LC}			3000	4000	5000	3000	4000	
For multi-divisional scales:	Z						7500	7500	
Minimum load cell verification intervall	v_{min}			$E_{max}/20000$	$E_{max}/24000$				
Min. utilisation range	B_{amin}			15%	16.7%	20.8%	12.5% 31.2%	16.7% 31.2%	E_{max}
Max. utilisation range	B_{amax}	$B_{amax} = E_{max}$							
Input resistance	R_e	4480 Ω ± 50 Ω							t_r
Output resistance	R_a	4010Ω±10Ω	4010Ω±2Ω	4010 Ω ± 0,5 Ω					t_r
Zero signal	S_0	±2%	±1%						C_n
Max. supply voltage	U_{smax}	100V	60V						
Nominal temperature range	B_{tn}	-10°C to +40°C							
Service temperature range	B_{tu}	-40°C to +80°C, Option to +110°C							
Reference temperature	t_r	22°C							
Storage temperature range	B_{ts}	-50°C to +85°C							
Protection class		IP 68 (Option 100°C : IP 66)							
Cable specification		Special silicone RAL 7000 (grey) ⌀ 6.5, -30°C to +150°C, Length 5 m for RTN 1-15 t and RTN 150-470 t Length 12 m for RTN 22-100 t							
Colour code		black : input + / blue : input – red : output + / white : output – green-yellow : screening							
Corrosion protection		Stainless steel							

Order-No.

Type	RTN 0.1	RTN 0.05	RTN C3	
Accuracy	0.1	0.05	C3 (OIML)	
Remarks	EEx ib IIC T6 ¹⁾	EEx ib IIC T6 ¹⁾	EEx ib IIC T6 ¹⁾	
Max. Capacity	*Order-No.*	*Order-No.*	*Order-No.*	
1 t	K-RTN0.1/1T	K-RTN0.05/1T	K-RTNC3/1T	
2.2 t	K-RTN0.1/2.2T	K-RTN0.05/2.2T	K-RTNC3/2.2T	
4.7 t	K-RTN0.1/4.7T	K-RTN0.05/4.7T	K-RTNC3/4.7T	
10 t	K-RTN0.1/10T	K-RTN0.05/10T	K-RTNC3/10T	
15 t	K-RTN0.1/15T	K-RTN0.05/15T	K-RTNC3/15T	
22 t	K-RTN0.1/22T	K-RTN0.05/22T	K-RTNC3/22T	
33 t	K-RTN0.1/33T	K-RTN0.05/33T	K-RTNC3/33T	
47 t	K-RTN0.1/47T	K-RTN0.05/47T	K-RTNC3/47T	
68 t	K-RTN0.1/68T	K-RTN0.05/68T	K-RTNC3/68T	
100 t	K-RTN0.1/100T	K-RTN0.05/100T	K-RTNC3/100T	
150 t	K-RTN0.1/150T	K-RTN0.05/150T	K-RTNC3/150T	
220 t	K-RTN0.1/220T	K-RTN0.05/220T	K-RTNC3/220T	
330 t	K-RTN0.1/330T	K-RTN0.05/330T	K-RTNC3/330T	
470 t	K-RTN0.1/470T	K-RTN0.05/470T	K-RTNC3/470T	

Type	RTN C4	RTN C5	RTN C3 MI 7.5	
Accuracy	C4 (OIML)	C5 (OIML)	C3 MI 7.5 (OIML)	
Remarks	EEx ib IIC T6 ¹⁾	EEx ib IIC T6 ¹⁾	EEx ib IIC T6 ¹⁾	
Max. Capacity	*Order-No.*	*Order-No.*	*Order-No.*	
1 t	K-RTNC4/1T	K-RTNC5/1T	K-RTNC3MI7.5/1T	
2.2 t	K-RTNC4/2.2T	K-RTNC5/2.2T	K-RTNC3MI7.5/2.2T	
4.7 t	K-RTNC4/4.7T	K-RTNC5/4.7T	K-RTNC3MI7.5/4.7T	
10 t	K-RTNC4/10T	K-RTNC5/10T	K-RTNC3MI7.5/10T	
15 t	K-RTNC4/15T	K-RTNC5/15T	K-RTNC3MI7.5/15T	
22 t	K-RTNC4/22T	K-RTNC5/22T	K-RTNC3MI7.5/22T	
33 t	K-RTNC4/33T	K-RTNC5/33T	K-RTNC3MI7.5/33T	
47 t	K-RTNC4/47T	K-RTNC5/47T	K-RTNC3MI7.5/47T	
68 t	K-RTNC4/68T	K-RTNC5/68T	K-RTNC3MI7.5/68T	
100 t	K-RTNC4/100T	K-RTNC5/100T	K-RTNC3MI7.5/100T	

¹⁾ Option EEx ib IIC T6 on request (additional charge)

Available accessories for RTN... (see separate data sheets for details):

Type	VEN Elastomer bearing		VPN Pendle bearing (incl. foot plate)	
Max. Capacity	*Order-No.*		*Order-No.*	
1.0 t	**1-RTN/2.2T/VEN**		**1-RTN/1t/VPN**	
2.2 t	**1-RTN/2.2T/VEN**		**1-RTN/2.2 t/VPN**	
4.7 t	**1-RTN/4.7T/VEN**		**1-RTN/4.7 t/VPN**	
10 t	1-RTN/22T/VEN		**1-RTN/10 t/VPN**	
15 t	1-RTN/22T/VEN		**1-RTN/15 t/VPN**	
22 t	1-RTN/22T/VEN		**1-RTN/22 t/VPN**	
33 t	1-RTN/33T/VEN		**1-RTN/33 t/VPN**	
47 t	1-RTN/47T/VEN		**1-RTN/47 t/VPN**	
68 t	1-RTN/68T/VEN		**1-RTN/68 t/VPN**	
100 t	1-RTN/100T/VEN		**1-RTN/100 t/VPN**	
150 t	1-RTN/150T/VEN		-	
220 t	1-RTN/220T/VEN		-	
330 t	1-RTN/330T/VEN		-	
470 t	1-RTN/470T/VEN		-	

bold = Stainless steel accessory

Modifications reserved.
All details describe our products in general form only. They are not to be understood as express warranty and do not constitute any liability whatsoever.