

## Ring-Torsion Load Cells RTN



- 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
- 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

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 ringtorsion 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, even under very harsh environmental conditions (e.g. aggressive media, interfering forces, or extreme temperatures)

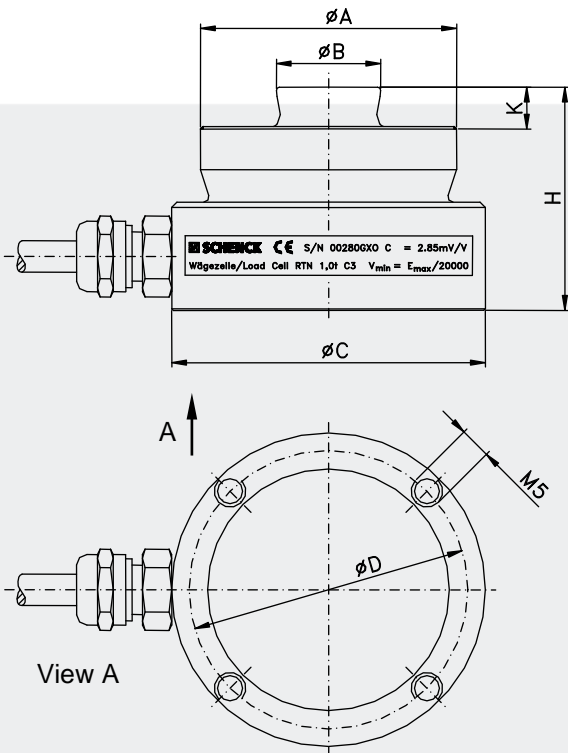
### Construction

- Hermetically sealed due to laser welding; protection class IP68
- 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

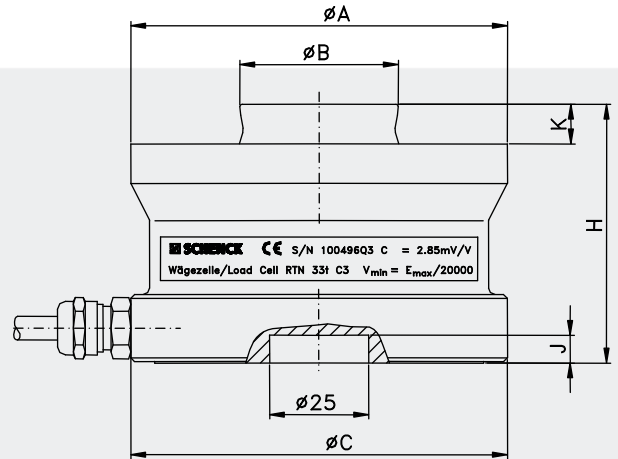
### Functions

- 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



### RTN 10 t - 470 t



#### Technical Data

Rated Capacity $E_{max}$ t	Safe-Load-Limit $L_l$ t	Breaking 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	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)						
RTN	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	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 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

Admissible dynamic load to DIN 50100: 70 %  $E_{max}$ . Dynamic load value must not exceed  $E_{max}$ .

## Technical Data

Rated capacity	$E_{max}$	1 t – 470 t		1 t – 100 t	
Accuracy class		0.05	C3	C5 / C4 Mi 7.5	Reference
Sensitivity	$C_n$	2.85 mV/V $\pm$ 2.85 $\mu$ V/V			
Combined error	$F_{comb}$	0.05 %	0.02 %	0.01 %	$C_n$
Minimum dead load output return	$F_{dr}$	$\pm$ 0.03 %	$\pm$ 0.016 %	$\pm$ 0.006 %	$C_n$
Creep (30 m)	$F_{cr}$	$\pm$ 0.04 %	$\pm$ 0.024 %	$\pm$ 0.009 %	$C_n$
Temperature effect on zero sensitivity 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 effect on sensitivity per 10 K	$TK_c$	$\pm$ 0.05 % $\pm$ 0.07 %	$\pm$ 0.008 % $\pm$ 0.02 %	$\pm$ 0.0062 % $\pm$ 0.02 %	$C_n, B_{tn}$ $C_n, B_{tu}$
Maximum number of scale intervalls	$n_{LC}$		3000	5000	
For multi-divisional scales	Z			7500	
Minimum load cell verification intervall	$V_{min}$		$E_{max}/20000$	$E_{max}/24000$	
Max. utilisation range	$B_{amax}$	$B_{amax} = E_{max}$			
Input resistance	$R_e$	4450 $\Omega$ $\pm$ 100 $\Omega$			$T_r$
Output resistance	$R_a$	4010 $\Omega$ $\pm$ 2 $\Omega$	4010 $\Omega$ $\pm$ 0.5 $\Omega$		$T_r$
Zero signal	$S_0$	$\pm$ 1 %			$C_n$
Max. supply voltage	$U_{smax}$	60 V			
Nominal temperature range	$B_{tn}$	-10 °C ... +40 °C			
Service temperature range Explosion-proof design	$B_{tu}$	-40 °C ... +80 °C, Option to +110 °C *) -30 °C ... +70 °C			
Reference temperature	$T_r$	22 °C			
Storage temperature range	$B_{ts}$	-50 °C ... +85 °C			
Protection class Explosion-proof design		IP68, 1 m / 100 h; (Option 110 °C: IP66) IP67			
Cable specification		TPE (grey) $\varnothing$ 6.5 mm, silicone and halogen free, -30 °C to +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			
Colour code		Black: input + / Red: output + / Yellow: screening	blue: input - white: output -		
Material		Stainless steel			
Corrosion protection		see Spec Sheet DDP8483 "Chemical resistance of RT Load Cells"			

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

**Order No.**

Variants	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 ATEX explosion-proof design 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)

Warning: The verification of intrinsically safe circuit must be verified. New barriers are provided in particular for new systems. The 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
Variant .82	Variant .81	Variant .83

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

Non intrinsically safe ATEX explosion-proof design 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
Variant .86	Variant .85	Variant .87

**Example for ordering:** 47 t, accuracy class C3, ATEX category 2D, 3G. Typ RTN 47 t C3 2D, 3G ...;  
Order No. D724782.85

Option	Accessories
<ul style="list-style-type: none"> <li>■ Variant for service temperature range of up to 110 °C</li> <li>■ Customized cable length</li> <li>■ Special corrosion protection</li> <li>■ Protection class IP69K</li> <li>■ Cable resistant to gnawing rodents</li> <li>■ Mounting holes</li> </ul>	<ul style="list-style-type: none"> <li>SENSiQ™ Elastomer Mount (SEM)</li> <li>SENSiQ™ Secure Mount (SSM)</li> <li>SENSiQ™ Pendulum Mount (SPM)</li> <li>SENSiQ™ Fixed Mount (SFM)</li> </ul>

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