

DATA SHEET



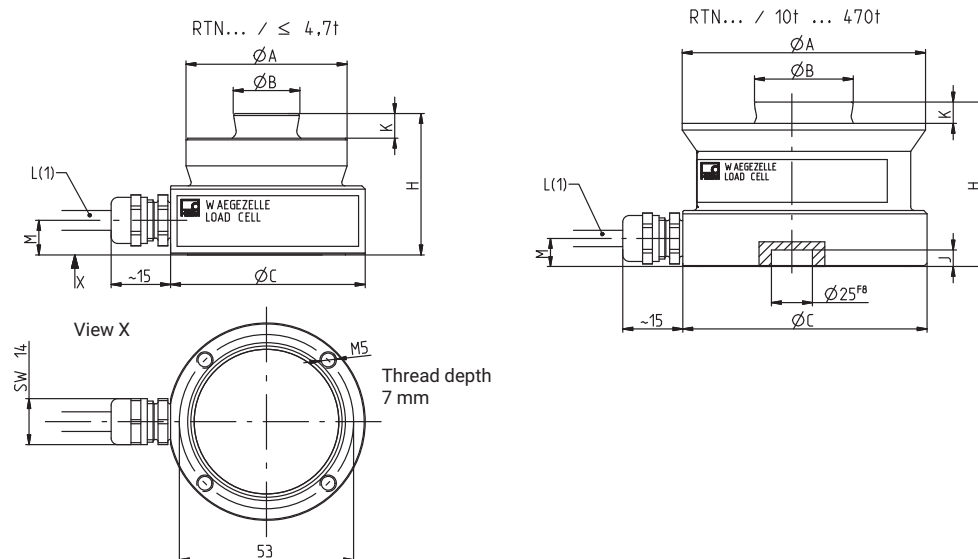
# RTN... Load cell

## SPECIAL FEATURES

- Low height of construction
- Maximum capacities 1 t ...470 t
- Legal for trade in accordance with OIML C3 and C5
- Stainless materials
- Hermetically encapsulated, equipment protection level IP68 (optional: IP68/IP69K)
- Options facilitate adaptation to a wide variety of environmental conditions
- Explosion protection (optional)



## DIMENSIONS (MM)



RTN...	1 t	2.2 t	4.7 t	10 t	15 t	22 t	33 t	47 t	68 t	100 t	150 t	220 t	330 t	470 t
ØA	49	49	49	74	75	75	95	130	130	150	150	225	225	270
ØB	20	20	20	30	30	30	40	60	60	70	70	100	100	100
ØC	60	60	60	75	75	75	95	130	130	150	150	225	225	270
H	43	43	43	50	50	50	65	75	85	90	100	130	144	170
J	-	-	-	7	7	7	7	7	7	7	7	10	10	10
K	7.5	7.5	7.5	6.5	6.5	6.5	10	14	14	16	16	24	24	28
L	5 m	5 m	5 m	5 m	5 m	15 m	15 m	15 m	15 m	15 m	5 m	5 m	5 m	5 m
M	10.5	10.5	10.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	11	11	11

## SPECIFICATIONS

Type			RTN 0.05														
Accuracy class			0.05														
Number of load cell verification intervals	$n_{LC}$		-														
Maximum capacity	$E_{max}$	d	1	2.2	4.7	10	15	22	33	47	68	100	150	220	330	470	
Minimum load cell verification interval	$V_{min}$	g	-														
Temperature coefficient of zero signal	$TC_0$	% of $C_n / 10K$	$\pm 0.3$														
Rated output (nominal)	$C_n$	mV/V	$2.85 \pm 0.00285$														
Temperature coefficient of sensitivity	$TC_S$	% of $C_n / 10K$	$\pm 0.05$														
Relative reversibility error	$d_{hy}$	% of $C_n$	$\pm 0.05$														
Non-linearity	$d_{lin}$		$\pm 0.05$														
Dead load output return	MDLOR		$\pm 0.03$														
Input resistance	$R_{LC}$	$\Omega$	$4450 \pm 100$														
Output resistance	$R_O$		$4010 \pm 2$														
Reference excitation voltage	$U_{ref}$	V	5														
Nominal (rated) range of the excitation voltage	$B_U$		5 ... 30														
Carrier frequency of excitation voltage		Hz	< 600														
Maximum excitation voltage		V	60														
Insulation resistance	$R_{is}$	G $\Omega$	>20														
Nominal (rated) range of the ambient temperature	$B_T$	$^{\circ}C$	-10 ... +40														
Operating temperature range	$B_{tu}$		-30 ... +80 (option: up to +110) <sup>1)</sup> (Option 5: Plug: -25...+80)														
Storage temperature range	$B_{tl}$		-50...+85 <sup>1)</sup> (option 5: Plug: -25...+85)														
Breaking load	$E_d$		4	9	19	40	60	88	130	190	270	400	600	770	1100	1500	
Relative permissible oscillatory stress oscillation width (peak-to-peak) as per DIN 50100 with 10,000,000 loading cycles	$F_{srel}$	% of $E_{max}$	70														
Rated displacement at $E_{max}$ , approx.	$s_{nom}$	mm	0.13	0.12	0.12	0.17	0.18	0.21	0.25	0.33	0.35	0.45	0.57	0.67	0.80	1.00	
Weight, approx.	m	kg	0.6	0.6	0.7	1.0	1.1	1.9	2.8	5.0	5.6	8.2	8.9	23.5	28.2	49.4	
IP rating			IP68 <sup>2)</sup> (Option 6: IP68/ IP69K) <sup>3)</sup>														
Material			Stainless steel 1.4542 <sup>4)</sup> Brass (optionally stainless steel) Thermoplast. Elastomer, RAL 7000 (gray), Ø 6.5 mm														
Measuring body																	
Cable entry																	
Cable sheath																	

<sup>1)</sup> Mechanical fittings can be used to set limits.

<sup>2)</sup> Test condition water resistant 1 m/100h

<sup>3)</sup> As per EN 60 529

<sup>4)</sup> As per EN 10088-3

Type			RTN C3									
Accuracy class <sup>5)</sup>			C3									
Number of load cell verification intervals	$n_{LC}$		3000									
Maximum capacity (1 ... 15 t)	$E_{max}$	t	1	2.2	4.7	10	15					
Minimum load cell verification interval	$V_{min}$	g	50	110	235	500	750					
Maximum capacity (22 ... 470 t)	$E_{max}$	d	22	33	47	68	100	150	220	330	470	
Minimum load cell verification interval	$V_{min}$	kg	1.1	1.65	2.35	3.4	5	7.5	11	16.5	23.5	
Temperature coefficient of zero signal	$TC_0$	% of $C_n$	$\pm 0.007$									
Temperature coefficient of sensitivity <sup>6)</sup>	$TC_S$	10K	$\pm 0.008$									
Relative reversibility error <sup>6)</sup>	$d_{hy}$	% of $C_n$	$\pm 0.02$									
Non-linearity <sup>6)</sup>	$d_{lin}$		$\pm 0.02$									
Dead load output return	MDLOR		$\pm 0.0167$									
Output resistance	$R_0$	$\Omega$	4010 $\pm 0.5$									

Type			RTN C5					
Accuracy class <sup>5)</sup>			C5					
Number of load cell verification intervals	n <sub>LC</sub>		5000					
Maximum capacity	E <sub>max</sub>	t	10	15	22	33	47	68
Minimum load cell verification interval	V <sub>min</sub>	kg	0.5	0.75	1	1.65	2.35	3.4
Temperature coefficient of zero signal	TC <sub>0</sub>	% of C <sub>n</sub> /10K	±0.0070		±0.0064	±0.0070		
Rated output (nominal)	C <sub>n</sub>	mV/V	2.85					
Temperature coefficient of rated output <sup>6)</sup>	TC <sub>S</sub>	% of C <sub>n</sub> /10K	±0.0062					
Relative reversibility error <sup>6)</sup>	d <sub>hy</sub>	% of C <sub>n</sub>	±0.012					
Non-linearity <sup>6)</sup>	d <sub>lin</sub>		±0.012					
Dead load output return	MDLOR		±0.01					
Input resistance	R <sub>LC</sub>	Ω	4450 ±100					
Output resistance	R <sub>O</sub>	Ω	4010 ±0.5					

<sup>5)</sup> As per OIML R60

<sup>6)</sup> The values for the temperature coefficient of sensitivity ( $TC_S$ ), relative reversibility error ( $d_{hy}$ ), and linearity deviation ( $d_{lin}$ ) are recommended values. The sum of these values is within the accumulated error limit specified by OIML R60.

## STATIC LIMIT LATERAL LOADING

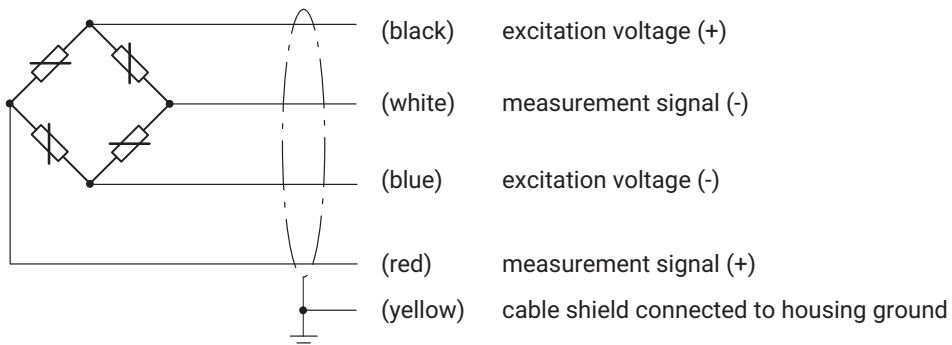
If the load cell is subjected to normal load, friction on the dedendum flank can allow for the transmission of greater lateral forces, depending on the normal load. The values for maximum allowed lateral force (static), when the load cell is not loaded with a normal load, are shown in this table:

Maximum capacity	[t]	1	2.2	4.7	10	15	22	33	47	68	100	150	220	330	470
Limit lateral loading (static)	[kN]	1	1	1	10	10	10	12	20	20	26	26	50	50	90

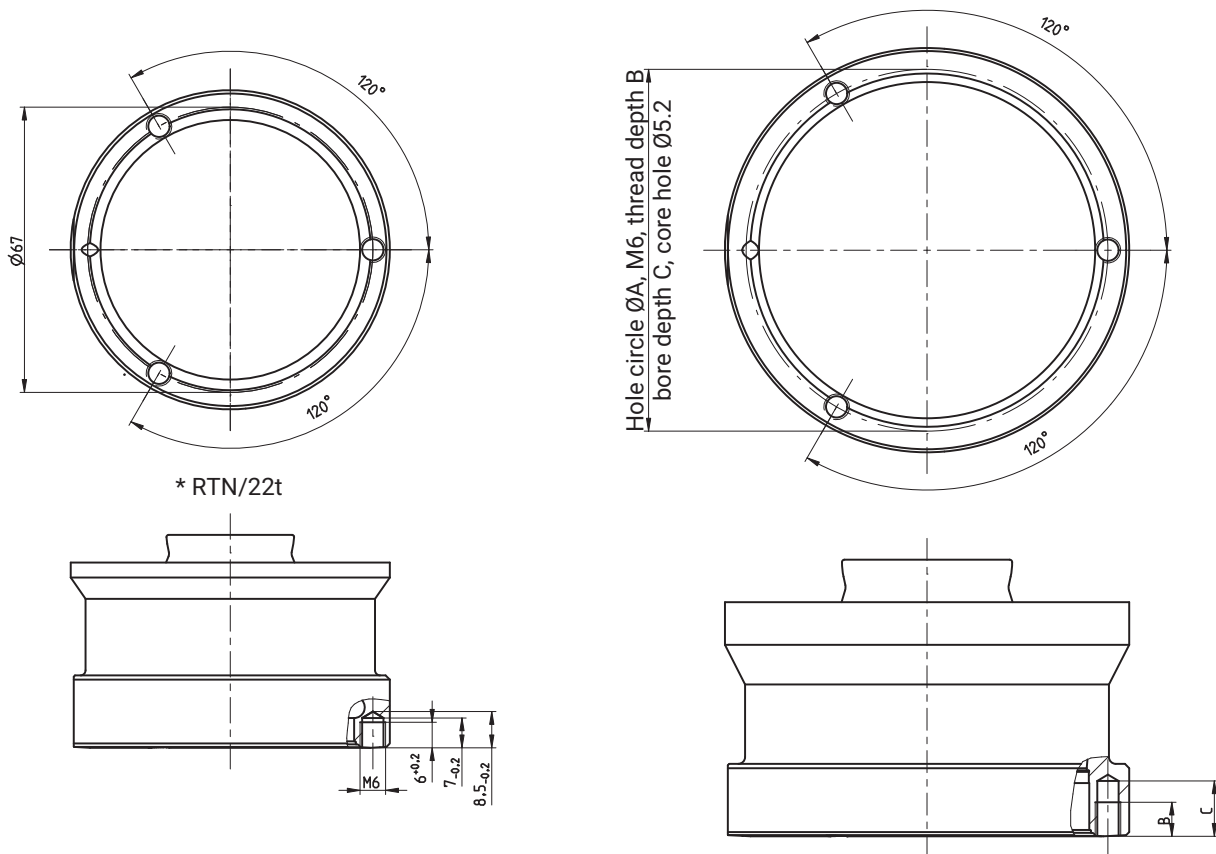
If high lateral forces are to be expected during application, it is advisable to use the pendulum bearing offered by HBM in order to minimize the lateral force depending on the normal force applied to the load cell.

## CABLE ASSIGNMENT RTN...

Connection with 4-wire cable with TPE cable sheath

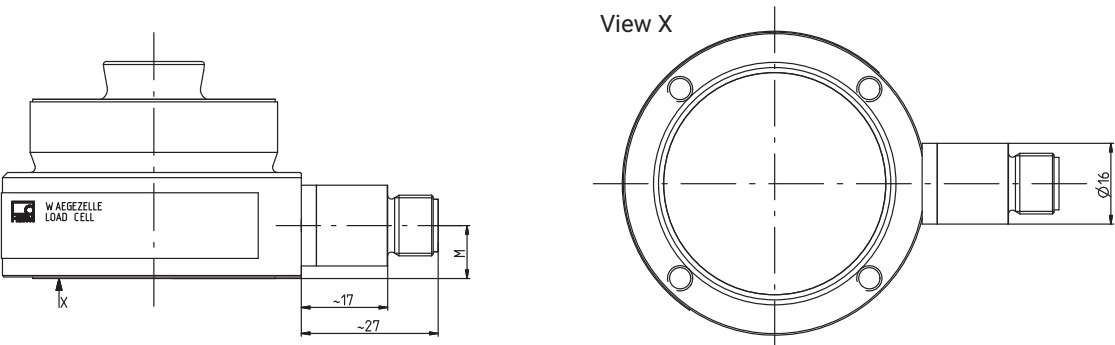


## DIMENSIONS RTN WITH TAPPED HOLES IN MEASURING BODY BASE (OPTIONAL)



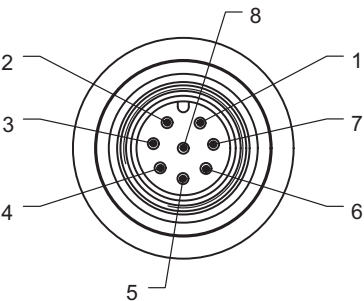
Type RTN/...	Hole circle $\varnothing A \pm 0.2$	Bore depth C -0.2	Thread depth B +0.2
10 t ... 15 t	67	13	8
22 t	67	7	6
33 t	85	13	8
47 t ... 68 t	119	13	8
100 t ... 150 t	142	13	8
220 t ... 330 t	210	13	8
470 t	251	13	8

DIMENSIONS RTN WITH PLUG (OPTIONAL)



RTN...	[t]	1	2.2	4.7	10	15	22	33	47	68	100	150
M	mm	10.5	10.5	10.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5

CABLE ASSIGNMENT (OPTIONAL) RTN...



- Plug-in contact 1 = measurement signal (-)
- Plug-in contact 2 = not in use
- Plug-in contact 3 = sense lead (-)
- Plug-in contact 4 = not in use
- Plug-in contact 5 = sense lead (+)
- Plug-in contact 6 = excitation voltage (+)
- Plug-in contact 7 = excitation voltage (-)
- Plug-in contact 8 = measurement signal (+)

Equipment protection level IP68/IP69K is automatically achieved if the cable 1-KAB175-X-1 is used (see page 7 Accessories).

PRODUCT NUMBERS (OVERVIEW)

Type	RTN			
Accuracy class	0.05	C3 (OIML R60)	C5 (OIML R60)	
Maximum capacity [t]	Ordering number			Comment
1	1-RTN0.05/1T	1-RTNC3/1T		Cable length 5 m
2.2	1-RTN0.05/2.2T	1-RTNC3/2.2T		Cable length 5 m
4.7	1-RTN0.05/4.7T	1-RTNC3/4.7T		Cable length 5 m
10	1-RTN0.05/10T	1-RTNC3/10T	1-RTNC5/10T	Cable length 5 m
15	1-RTN0.05/15T	1-RTNC3/15T	1-RTNC5/15T	Cable length 5 m
22	1-RTN0.05/22T	1-RTNC3/22T	1-RTNC5/22T	Cable length 15 m
33	1-RTN0.05/33T	1-RTNC3/33T	1-RTNC5/33T	Cable length 15 m
47	1-RTN0.05/47T	1-RTNC3/47T	1-RTNC5/47T	Cable length 15 m
68	1-RTN0.05/68T	1-RTNC3/68T	1-RTNC5/68T	Cable length 15 m
100	1-RTN0.05/100T	1-RTNC3/100T		Cable length 15 m
150	1-RTN0.05/150T	1-RTNC3/150T		Cable length 5 m
220	1-RTN0.05/220T	1-RTNC3/220T		Cable length 5 m
330	1-RTN0.05/330T	1-RTNC3/330T		Cable length 5 m
470	1-RTN0.05/470T	1-RTNC3/470T		Cable length 5 m

## ORDERING OPTIONS

K-RTN						
1	Code	Option 1: Mechanical design				
	S	Standard				
	M	RTN 3xM6 (3 tapped holes in measuring body base)			[not with option 3 = 1, 2.2, 4.7] [not with option 2 = C5]	
2	Code	Option 2: Accuracy class				
	5	0.05				
	C3	C3 (OIML)				
	C5	C5 (OIML) [only with option 3 = 10, 15, 22, 33, 47, 68]				
3		Option 3: Maximum capacity				
	Code		Code		Code	
	1	1 t [only with option 1 = S]	22	22 t	150	150 t
	2.2	2.2 t [only with option 1 = S]	33	33 t	220	220 t
	4.7	4.7 t [only with option 1 = S]	47	47 t	330	330 t
	10	10 t	68	68 t	470	470 t
	15	15 t	100	100 t		
4	Code	Option 4: Explosion protection				
	N	No explosion protection				
	AI1/21	ATEX+IECEX+FM Zone 1/21, intrinsically safe; ATEX/IECEX: II 2G Ex ia IIC T6/T4 Gb + II 2D Ex ia IIIC T125°C Db; FM(US/CA): Class I Zone 1 AEx/Ex ia IIC T4 Gb + Zone 21 AEx/Ex ia IIIC T125°C Db; FM(US): Class I, II, III Division 1, Groups A, B, C, D, E, F, G T4 <sup>1)</sup>				[only with option 6 = N]
	AI2/21	ATEX+IECEX Zone 2/21, not intrinsically safe; ATEX/IECEX: II 3G Ex ec IIC T6/T4 Gc + II 2D Ex tb IIIC T125°C Db <sup>1)</sup>				[only with option 6 = N]
5	Code	Option 5: Cable length				
	N	Male connector M12			[only for option 4 = N and option 2 = 5] [not with option 3 = 220, 330, 470 and not with option 2 = C5]	
	S5	5 m Standard			[only with option 3 = 1, 2.2, 4.7, 10, 15, 150, 220, 330, 470]	
	S15	15 m Standard			[only with option 3 = 22, 33, 47, 68, 100]	
	15	15 m [only with option 3 = 1, 2.2, 4.7, 10, 15, 150, 220, 330, 470], [not with option 2 = C5]				
	25	25 m			[not with option 2 = C5]	
	50	50 m			[not with option 2 = C5]	
	15R	15 m, stainless steel braided wire			[not with option 2 = C5]	
6	Code	Option 6: Other				
	N	Without				
	110	Operating temperature 110 °C			[not with option 2 = C5 and not with option 5 = connector]	
	IP	IP68/IP69K with stainless steel cable gland			[not with option 2 = C5]	
8	Code	Option 8: Country/Customer				
	S	Standard				
	AU	Australia				
9	Code	Option 9 test record				
	N	No record				
	C	Record with rated output measurement			[not with option 2 = C5]	
	T	Record with stepped envelope curve			[only with option 2 = C3, C5]	
10	Code	Option 10: Surge protection				
	N	No surge protection				

K-RTN -  -  -  -  -  -  -  -  -  -  -

1 2 3 4 5 6 8 9 10


<sup>1)</sup> With EU-Type Examination Certificate/Certificate of Conformity BVS 13 ATEX E 108 X/IECEX BVS 13.0109 X

## ACCESSORIES

### Connection cable for option 5: Connector


Ordering number	Comment
1-KAB168-5	Cable length 5 m, equipment protection level IP67, halogen-free
1-KAB168-20	Cable length 20 m, equipment protection level IP67, halogen-free
1-KAB175-3-1	Cable length 3 m, equipment protection level IP68/IP69K, halogen-free
1-KAB175-6-1	Cable length 6 m, equipment protection level IP68/IP69K, halogen-free
1-KAB175-12-1	Cable length 12 m, equipment protection level IP68/IP69K, halogen-free

### Pendulum bearing VPN

	Ordering number	Comment
	1-RTN/2.2T/VPN	Pendulum bearing, 1 t and 2.2 t
	1-RTN/4.7T/VPN	Pendulum bearing, 4.7 t
	1-RTN/10T/VPN	Pendulum bearing, 10 t
	1-RTN/15T/VPN	Pendulum bearing, 15 t
	1-RTN/22T/VPN	Pendulum bearing, 22 t
	1-RTN/33T/VPN	Pendulum bearing, 33 t
	1-RTN/47T/VPN	Pendulum bearing, 47 t
	1-RTN/68T/VPN	Pendulum bearing, 68 t
	1-RTN/100T/VPN	Pendulum bearing, 100 t
	1-RTN/220T/VPN	Pendulum bearing, 220 t
	1-RTN/330T/VPN	Pendulum bearing, 330 t
	1-RTN/470T/VPN	Pendulum bearing, 470 t

For more detailed information, see Technical Drawings B04957 (1-100t) and B04956 (150-470t)

### Rubber-metal bearing VEN

	Ordering number	Comment
	1-RTN/2.2T/VEN	Rubber-metal bearing, 1 t...2.2 t
	1-RTN/4.7T/VEN	Rubber-metal bearing, 4.7 t
	1-RTN/22T/VENR	Rubber-metal bearing, 10 t ... 22 t, stainless
	1-RTN/33T/VEN	Rubber-metal bearing, 33 t
	1-RTN/47T/VEN	Rubber-metal bearing, 47 t
	1-RTN/68T/VEN	Rubber-metal bearing, 68 t
	1-RTN/100T/VEN	Rubber-metal bearing, 100 t
	1-RTN/220T/VEN	Rubber-metal bearing, 220 t
	1-RTN/330T/VEN	Rubber-metal bearing, 330 t
	1-RTN/470T/VEN	Rubber-metal bearing, 470 t

For more detailed information, see Technical Drawings B04958 (1-100t) and B04955 (150-470t)