

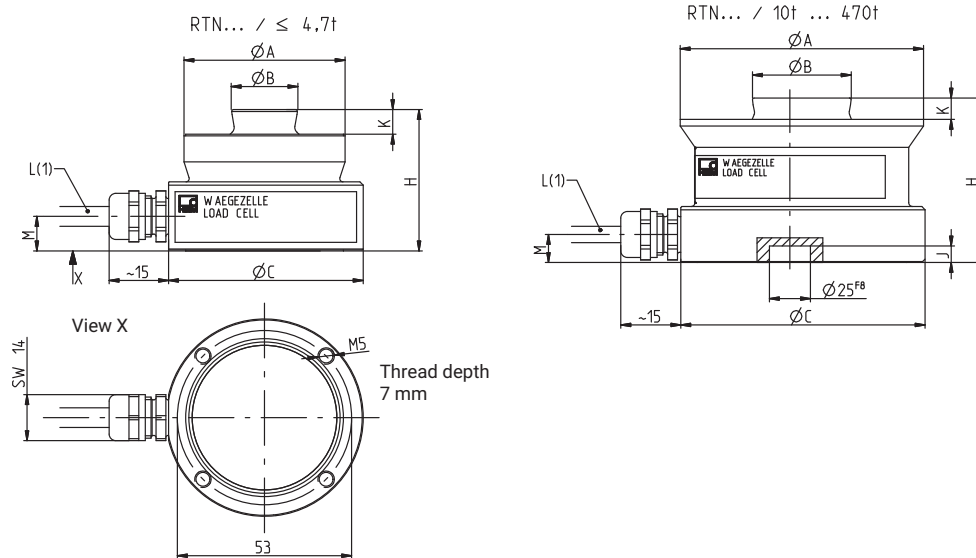
## RTN... Load cell

### SPECIAL FEATURES

- Low height of construction
- Maximum capacities 1 t ...470 t
- Legal for trade in accordance with OIML
- 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			< 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 1.4545 <sup>4)</sup> Brass (optionally stainless steel) Thermoplast. Elastomer, RAL 7000 (gray), $\varnothing$ 6.5 mm															
Measuring body																
Cable entry																
Cable sheath																

1) Mechanical fittings can be used to set limits.

2) Test condition water resistant 1 m/100h

3) As per EN 60 529

4) As per EN 10088-1

Type	RTN C3										
Accuracy class <sup>5)</sup>	C3										
Number of load cell verification intervals	$n_{LC}$	3000									
Maximum capacity	$E_{max}$	d	1	2.2	4.7	10	15				
Minimum load cell verification interval	$V_{min}$	g	50	110	235	500	750				
Maximum capacity	$E_{max}$	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>	$d_{lin}$	% of $C_n$	$\pm 0.02$								
Dead load output return	MDLOR		$\pm 0.0167$								
Output resistance	$R_O$	$\Omega$	4010 $\pm 0.5$								

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

<sup>6)</sup> The values for the temperature coefficient of sensitivity (TCS), relative reversibility error (dhy), and linearity deviation (dlin) are recommended values. The sum of these values is within the accumulated error limit specified by OIML R60.

## STATIC LIMIT LATERAL LOADING

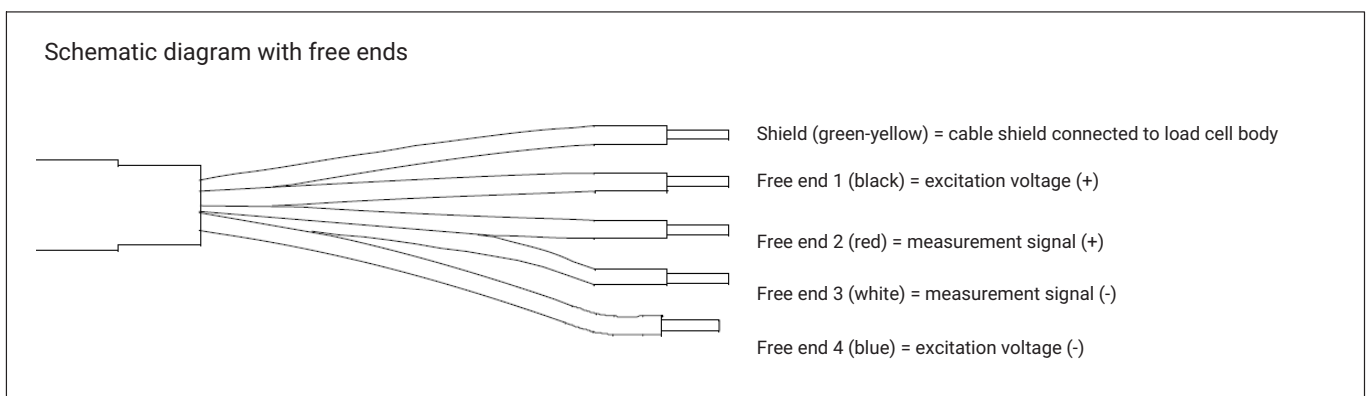
If the load cell is subjected to normal load, friction on the dedendum flank can allow for the transmission of greater lateral forces, depending on the normal load. The values for maximum allowed lateral force (static), when the load cell is not loaded with a normal load, are shown in this table:

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

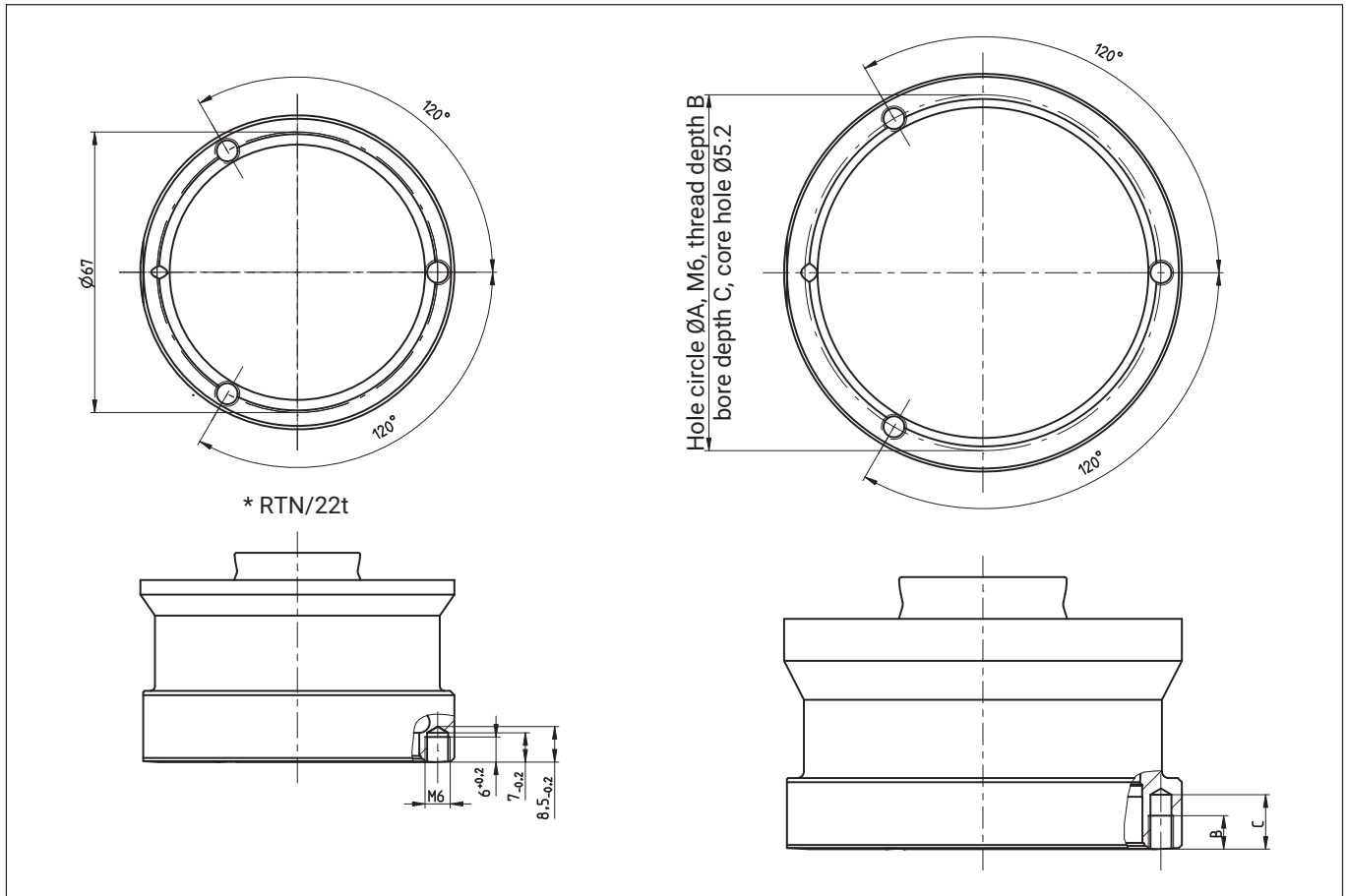
If high lateral forces are to be expected during application, it is advisable to use the pendulum bearing offered by HBM in order to minimize the lateral force depending on the normal force applied to the load cell.

## CABLE ASSIGNMENT RTN...

Connection with 4-wire cable with TPE cable sheath

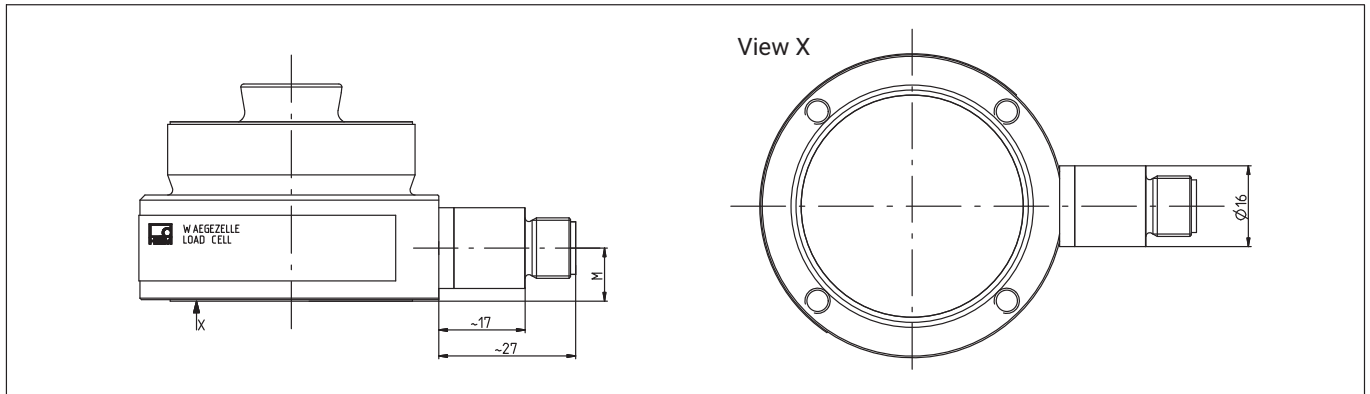


**DIMENSIONS RTN WITH TAPPED HOLES IN MEASURING BODY BASE (OPTIONAL)**



Type RTN/...	Hole circle ØA ±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
<b>M</b>	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	
<b>Accuracy class</b>	0.05 C3 (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 Cable length 5 m
15	1-RTN0.05/15T	1-RTNC3/15T Cable length 5 m
22	1-RTN0.05/22T	1-RTNC3/22T Cable length 15 m
33	1-RTN0.05/33T	1-RTNC3/33T Cable length 15 m
47	1-RTN0.05/47T	1-RTNC3/47T Cable length 15 m
68	1-RTN0.05/68T	1-RTNC3/68T 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

Ordering number					
<b>K-RTN</b>					
Code	Option 1: Mechanical design				
<b>S</b>	Standard				
<b>M</b>	RTN 3xM6 (3 tapped holes in measuring body base)				[not with option 3 = 1, 2.2, 4.7]
Code	Option 2: Accuracy class				
<b>5</b>	0.05				
<b>C3</b>	C3 (OIML)				
Code	Option 3: Maximum capacity		Code	Option 3: Maximum capacity	
<b>1</b>	1 t [only with option 1=S]		<b>22</b>	22 t	
<b>2.2</b>	2.2 t [only with option 1=S]		<b>33</b>	33 t	
<b>4.7</b>	4.7 t [only with option 1=S]		<b>47</b>	47 t	
<b>10</b>	10 t		<b>68</b>	68 t	
<b>15</b>	15 t		<b>100</b>	100 t	
Code	Option 4: Explosion protection				
<b>N</b>	No explosion protection				
<b>A11/21</b>	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 and option 10 = N]				
<b>A12/21</b>	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]				
Code	Option 5: Cable length				
<b>N</b>	Plug [only for option 4 = N and option 2 = 5], [not for option 3 = 220, 330, 470]				
<b>S5</b>	5 m Standard [only with option 3 = 1, 2.2, 4.7, 10, 15, 150, 220, 330, 470]				
<b>S15</b>	15 m Standard [only with option 3 = 22, 33, 47, 68, 100]				
<b>15</b>	15 m [only with option 3 = 1, 2.2, 4.7, 10, 15, 150, 220, 330, 470]				
<b>25</b>	25 m				
<b>50</b>	50 m				
<b>15R</b>	15 m, stainless braided wire cable				
Code	Option 6: Other				
<b>N</b>	Without				
<b>110</b>	Application temperature 110 °C				[not with option 5 = plug]
<b>IP</b>	IP68/IP69K with screwed cable gland made of stainless steel				
Code	Option 8: Country/Customer				
<b>S</b>	Standard				
<b>AU</b>	Australia				
Code	Option 9: Test record				
<b>N</b>	No protocol				
<b>C</b>	Protocol with parameter measurement				
<b>T</b>	Protocol with stepped envelope curve [only with option 2 = C3]				
Code	Option 10: Overvoltage protection				
<b>N</b>	No overvoltage protection				


<sup>1)</sup> With EC type examination certificate/Certificate of Conformity BVS 13 ATEX E 108 X/IECEX BVS 13.0109 X

## ACCESSORIES

### Couplings for option 5: Plug


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/4.7TVEN	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)

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