ABB MEASUREMENT & ANALYTICS | DATA SHEET

9QGPS2960

Low profile (pancake) load cells



Measurement made easy

Universal tension and compression load cells for industrial force measurements

Flat design

High stiffness and fatigue resistant

Highly resistant to transverse forces

IP rating IP 66

Complete range of mounting accessories available

Material

- Stainless steel, Aluminium, Alloy steel

Available options (non exhaustive list)

- ATEX intrinsic safety
- High service temperature 180 °C (356 °F)
- Amplified output (V or mA) and digital output signal (RS-232C, RS-485, USB)

Applications

The load cells 2960-2962-2965 are perfectly designed to the following applications:

- Force measurement on machines,
- Industrial process control,
- Hydraulic cylinders monitoring,
- Fatigue tests

Capacities

Model 2962
(3) - 5 - 7.5 kN

Model 2960, Model 2965
10 - (15) - 20 - (30) - 50 - (75) - 100 - 150 - 200 - 300 - 500 - (750) - 1.000 - 2.000 - 3.000 kN

Materials

Model 2960	Model 2962	Model 2965
Stainless steel	Aluminium	Alloy steel

Explosion protection (Option)

ATEX intrinsic safety:

- Ex II 1GD Ex ia IIC T6 or T4 Ga Ex ia IIIC T80°C Da

Specification

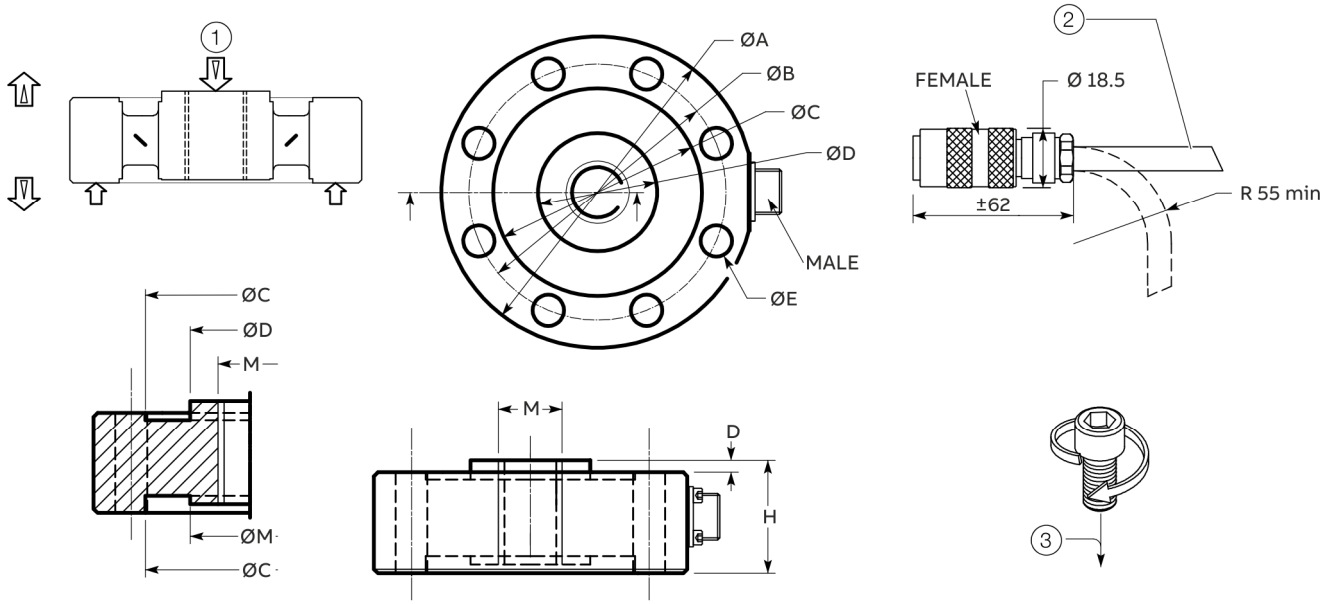
	0.25	0.1	0.03
Measuring accuracy			
Accuracy class	0.25 % F.S	0.1 % F.S	0.03 % F.S
Combined error (non linearity + hysteresis)	< ±0.25 % F.S.	< ±0.1 % F.S.	< ±0.03 % F.S
Repeatability error	< ±0.1 % F.S.	< ±0.03 % F.S.	< ±0.015 % F.S
Creep error over 30 min.	< ±0.1 % F.S.	< ±0.06 % F.S.	< ±0.025 % F.S
Sensitivity tolerance	< ±0.3 %	< ±0.3 %	< ±0.2 %
Temperature coefficient of the sensitivity	< ±0.05 % F.S./10 °C	< ±0.05 % F.S./10 °C	< ±0.015 % F.S./10 °C
Temperature coefficient of zero signal	< ±0.035 % F.S./10 °C	< ±0.035 % F.S./10 °C	< ±0.023 % F.S./10 °C
Reference temperature	23 °C (73.4 °F)	23 °C (73.4 °F)	23 °C (73.4 °F)
Temperature data			
Compensated temperature range	−10 to 45 °C (14 to 113 °F)	−10 to 45 °C (14 to 113 °F)	−10 to 45 °C (14 to 113 °F)
Service temperature range	−25 to 70 °C (−13 to 158 °F)	−25 to 70 °C (−13 to 158 °F)	−25 to 70 °C (−13 to 158 °F)
Storage temperature range	−50 to 85 °C (−58 to 185 °F)	−50 to 85 °C (−58 to 185 °F)	−50 to 85 °C (−58 to 185 °F)
Electrical Data			
Input resistance	700 Ω ±2 Ω	700 Ω ±2 Ω	700 Ω ±2 Ω
Output resistance	700 Ω ±2 Ω	700 Ω ±2 Ω	700 Ω ±2 Ω
Insulation resistance (50 V)	> 5000 MΩ	> 5000 MΩ	> 5000 MΩ
Reference excitation voltage	10 V DC	10 V DC	10 V DC
Permissible nominal range of excitation voltage	3 to 12 V DC	3 to 12 V DC	3 to 12 V DC
Nominal sensitivity	2 mV/V	2 mV/V	2 mV/V
Load limits			
Safe load limit	150 % F.S.	150 % F.S.	150 % F.S.
Breaking load	> 300 % F.S.	> 300 % F.S.	> 300 % F.S.
Static lateral force limit	50 % F.S.	50 % F.S.	50 % F.S.
Permissible dynamic loading	70 % F.S.	70 % F.S.	70 % F.S.

F.S.: Full scale

Dimensions

Load cells model 2960, model 2962, model 2965

Tension – Compression, Range 3 kN to 3 MN
All dimensions in mm (in)



(1) Force direction
(2) Cable length (CL): see table below
(3) Fastener quality 10.9 or 12.9, torque see table below

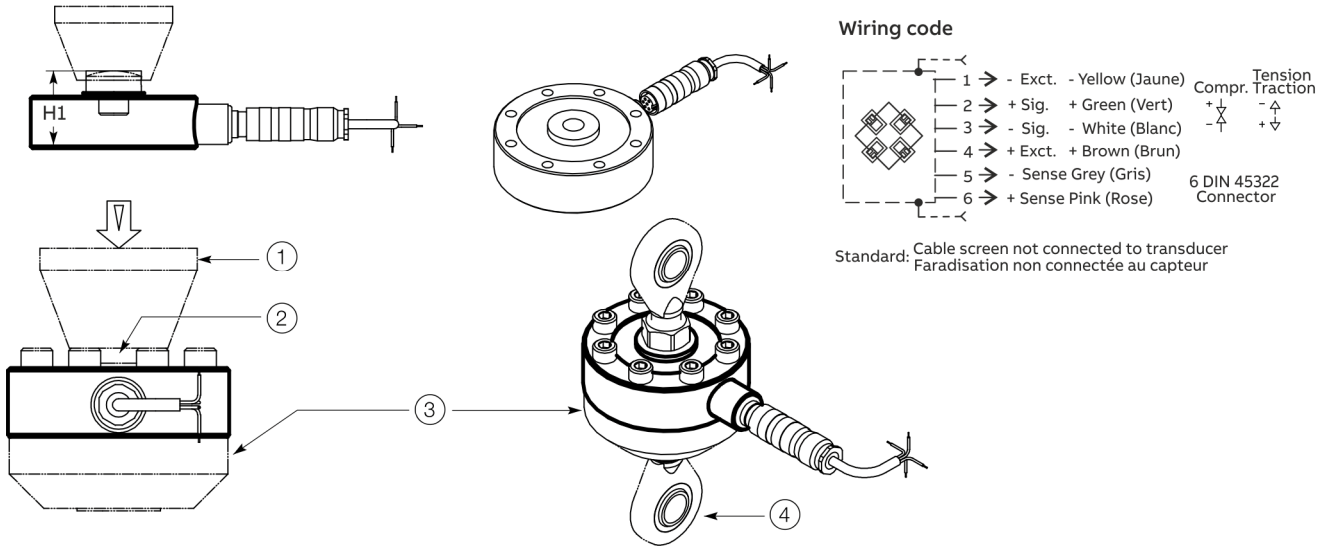
Figure 1 Dimensions

Model	Capacities kN	Ø A	Ø B	Ø C	Ø D	Ø E	M	H	D	CL m (ft)	H1	Max deflection	Torque (Nm)	Weight Kg (lb)
2962	3 to 7.5	89 (3.50)	72 (2.83)	59 (2.32)	33 (1.30)	8 × Ø 8.2 (0.31 × 0.32)	M16	28 (1.10)	2 (0.08)	3 (9.84)	40 (1.58)	0.05 (0.002)	15 (M8)	0.3 (0.66)
2960 2965	10 to 50						M20 × 1.5					0.04 (0.002)	40 (M8)	0.9 (1.98)
	75 to 100	149 (5.86)	125 (4.92)	106 (4.17)	46 (1.81)	8 × Ø 12.5 (0.31 × 0.49)	M30 × 2	38.5 (1.52)		6 (19.68)	53.5 (2.11)	0.05 (0.002)	130 (M12)	3.5 (7.71)
	150 to 200	178 (7.00)	145 (5.71)	115 (4.53)	69 (2.72)	8 × Ø 16.5 (0.31 × 0.65)	M36 × 3	50 (1.97)			70 (2.76)	0.06 (0.002)	320 (M16)	7 (15.43)
	300 to 500	198 (7.80)	172 (6.77)	140 (5.51)	90 (3.54)	16 × Ø 16.5 (0.63 × 0.65)	M60 × 4	65 (2.56)	3 (0.12)	12 (39.37)	92 (3.62)	0.07 (0.002)	320 (M16)	12 (26.45)
	0.75 to 1 MN	279 (10.98)	229 (9.02)	180 (7.09)	120 (4.72)	16 × Ø 24.5 (0.63 × 0.96)	M90 × 4	70 (2.76)			97 (3.82)	0.08 (0.003)	1000 (M24)	28 (61.72)
	1.5 to 2 MN	345 (13.58)	290 (11.42)	240 (9.45)	156 (6.14)	16 × Ø 32 (0.63 × 1.26)	M110 × 4	115 (4.53)	15 (0.59)		—	0.10 (0.004)	1300 (M30)	50 (110.23)
	3 MN	390 (15.35)	335 (13.19)	280 (11.02)	195 (7,68)	24 × Ø 24.5 (0.94 × 0.96)	M125 × 4 *	130 (5.12)	7 (0.28)		—	0.15 (0.006)	1000 (M24)	86 (189.59)

Capacities kN	Accessories		
	Appui	**Supor**	**Embom**
3 to 7.5	Appui-16B	Supor-36	Embom-M16-BA
10 to 50	Appui-20	Supor-36	Embom-M20 × 1.5-BA
75 to 100	Appui-30	Supo-45	Embom-M30 × 2-BA
150 to 200	Appui-36	Supor-69	Embom-M36 × 3-BA*
300 to 500	Appui-60	Supor-90	Embom-M60 × 4-PTFE*
0.75 to 1 MN	Appui-90	Supor-125A	Embom-M64 × 4-PTFE*
1.5 to 2 MN	According to customer's design specifications		—
3 MN			—

* See Embom data sheet (accessories section)

Mounting details and load application accessories



1. Suppor
2. Appui (Load button)
3. Base T296x (see **Bases for Tension - Compression, model T2960, model T2962, model T2965** on page 6)
4. Embom

Figure 2: Mounting details

Note

Bases are recommended mainly if mating surface is of poor quality.
For direct mounting, surface should be: Ra 0.8 ▱ 0.02

… Dimensions

Bases for Tension - Compression, model T2960, model T2962, model T2965

Range 3 kN to 1 MN
All dimensions in mm (in)

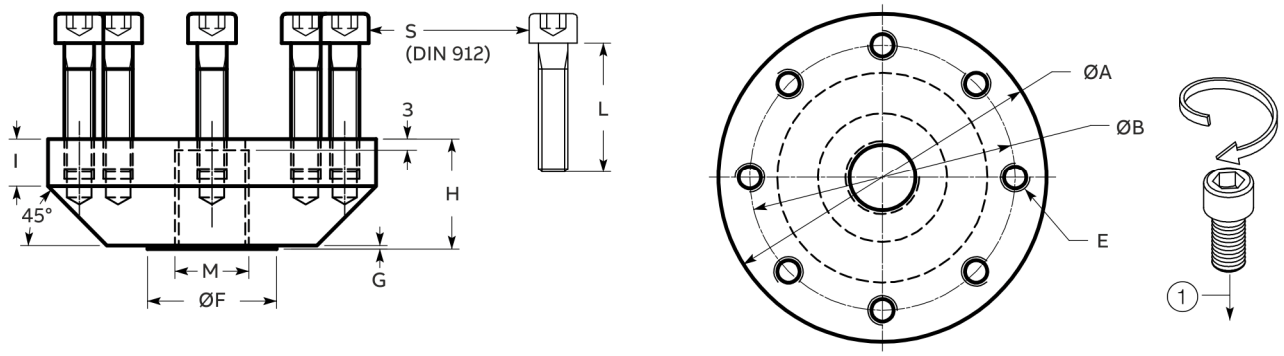
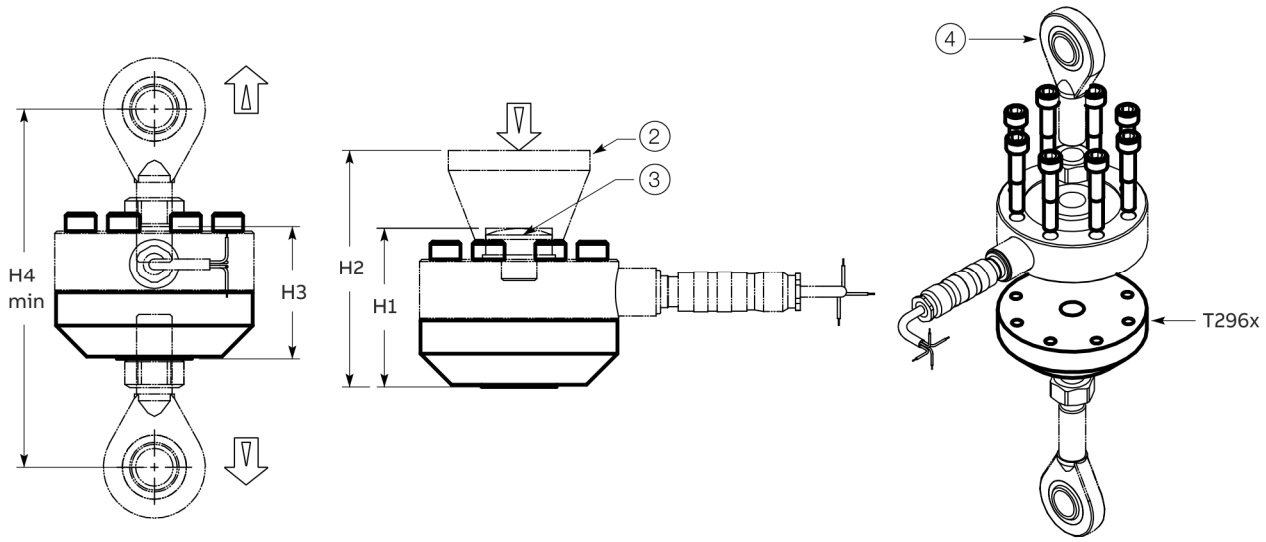


Figure 3: Dimensions model T2960, model T2962, model T2965

Model	Capacities kN	Ø A	Ø B	E	Ø F	G	I	S	M	H	H1	H2	H3	H4	Torque (Nm)	Weight kg (lb)
2962	3 to 7.5	89 (3.50)	72 (2.83)	8 × M8	25 (0.98)	1	13 (0.51)	8 × M8 L=35	M16	30 (1.18)	70 (2.76)	105 (4.13)	58 (2.28)	143 (5.63)	15 (M8)	0.57 (1.26)
2960 2965	10 to 50				35 (1.38)				M20 × 1. 5			109 (4.29)		160 (6.30)	40 (M8)	1.19 (2.62)
	75 to 100	149 (5.86)	125 (4.92)	8 × M12	52 (2.05)		20 (0.79)	8 × M12 L=50	M30 × 2	46 (1.81)	99.5 (3.92)	140.5 (5.53)	84.5 (3.33)	225 (8.86)	130 (M12)	5.25 (11.57)
	150 to 200	178 (7.00)	145 (5.71)	8 × M16	70 (2.76)		23 (0.91)	8 × M16 L=70	M36 × 3	50 (1.97)	120 (4.72)	160 (6.30)	100 (3.94)	285 (11.22)	320 (M16)	8.7 (19.18)
	300 to 500	198 (7.80)	172 (6.77)	16 × M16	115 (4.53)		35 (1.38)	16 × M16 L=80	M60 × 4	65 (2.56)	157 (6.18)	219 (8.62)	130 (5.12)	455 (17.91)	320 (M16)	14.5 (31.97)
	0.75 to 1 MN	279 (10.98)	229 (9.02)	16 × M24	162 (6.38)		36 (1.42)	16 × M24 L=100	M64 × 4	75 (2.95)	172 (6.77)	247 (9.72)	145 (5.71)	550 (21.65)	1000 (M24)	35.5 (78.26)
	1.5 to 2 MN 3 MN	According to customer's design specifications														



1. Fastener quality 10.9 or 12.9, torque see table above
2. Suppor
3. Appui
4. Embom (Ma×. capacity 0.75 MN)

Figure 4: Other views

Load buttons – Appui

All dimensions in mm (in)

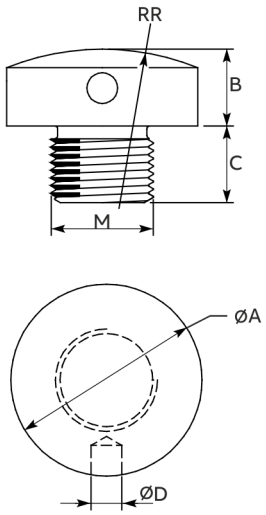
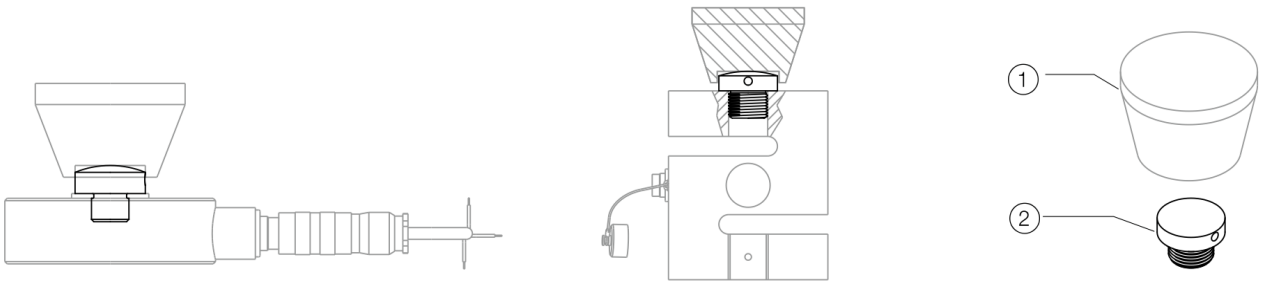


Figure 5: Dimensions load buttons

M	ØA	B	C	ØD	RR	Weight kg (lb)
M6	12 (0.47)	7 (0.28)	8 (0.31)	3 (0.12) (1×)	16 (0.36)	0.02 (0.04)
M8	20 (0.79)	7 (0.28)	8 (0.31)	3 (0.12) (1×)	25 (0.98)	0.02 (0.04)
M10	20 (0.79)	7 (0.28)	10 (0.39)	3 (0.12) (1×)	25 (0.98)	0.02 (0.04)
M12	20 (0.79)	10 (0.39)	10 (0.39)	3 (0.12) (1×)	35 (1.38)	0.03 (0.07)
M16	30 (1.18)	12 (0.47)	12 (0.47)	4 (0.16) (1×)	50 (1.97)	0.08 (0.18)
M16	36 (1.42)	12 (0.47)	12 (0.47)	5 (0.20) (1×)	100 (3.94)	0.11 (0.24)
M20 × 1.5	36 (1.42)	12 (0.47)	15 (0.59)	5 (0.20) (1×)	70 (2.76)	0.12 (0.26)
M24 × 2	36 (1.42)	12 (0.47)	18 (0.71)	5 (0.20) (1×)	60 (2.36)	0.15 (0.33)
M30 × 2	45 (1.77)	15 (0.59)	20 (0.79)	6 (0.24) (2×)	100 (3.94)	0.28 (0.62)
M36 × 3	56 (2.20)	20 (0.79)	24 (0.94)	6 (0.24) (2×)	150 (5.91)	0.55 (1.21)
M36 × 3	69 (2.72)	20 (0.79)	35 (1.38)	6 (0.24) (2×)	250 (9.84)	0.84 (1.85)
M45 × 3	64 (2.52)	20 (0.79)	30 (1.18)	6 (0.24) (2×)	200 (7.87)	0.84 (1.85)
M56 × 4	90 (3.54)	24 (0.94)	35 (1.38)	8 (0.31) (2×)	300 (11.81)	1.8 (3.97)
M60 × 4	90 (3.54)	27 (1.06)	40 (1.57)	10 (0.39) (2×)	350 (13.78)	2.14 (4.72)
M90 × 4	125 (4.92)	33 (1.30)	50 (1.97)	12 (0.47) (2×)	450 (17.72)	5.46 (12.04)



① Supor ② Appui

Figure 6: Other views

… Dimensions

Rod end bearings with male thread – Embom

All dimensions in mm (in)

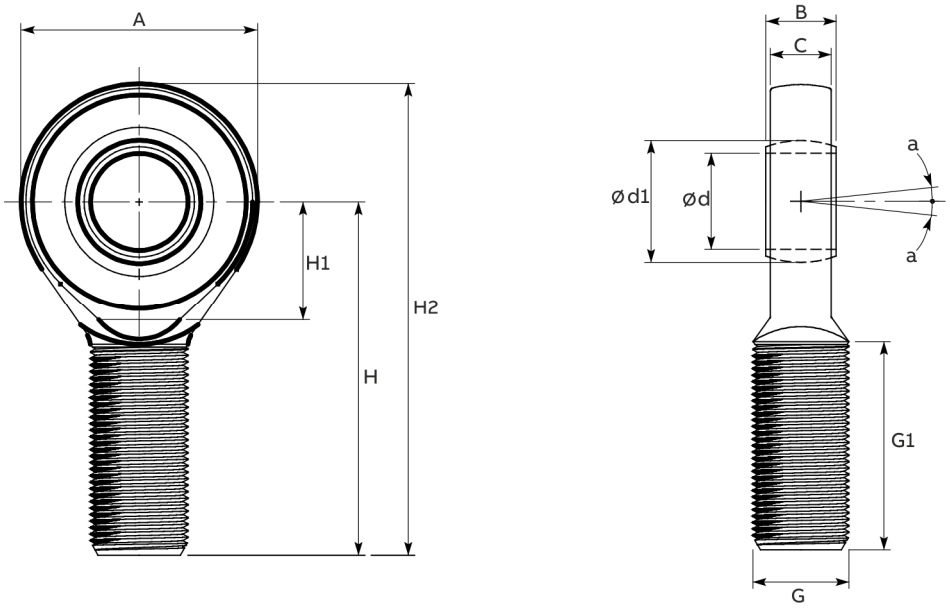


Figure 7: Dimensions embom

Material*	Dimension G	Capacities (N) Dynamic	Capacities (N) Static	Ø d	A	B	C	H	a (degree)	Ø d1	G1	H1	H2	Weight kg (lb)
BA	M6	3600	9000	6 (0.24)	21 (0.83)	6 (0.24)	4.3 (0.17)	36 (1.42)	13 (0.51)	10 (0.39)	16 (0.63)	14 (0.55)	46.5 (1.83)	0.013 (0.03)
BA	M8	5850	14600	8 (0.31)	24 (0.94)	8 (0.31)	6 (0.24)	42 (1.65)	15 (0.59)	13 (0.51)	21 (0.83)	14 (0.55)	54 (2.13)	0.025 (0.06)
BA	M10	8560	21600	10 (0.39)	29 (1.14)	9 (0.35)	7 (0.28)	48 (1.89)	12 (0.47)	16 (0.63)	26 (1.02)	17 (0.67)	62.5 (2.46)	0.043 (0.09)
BA	M12	11400	28500	12 (0.47)	34 (1.34)	10 (0.39)	8 (0.31)	54 (2.13)	10 (0.39)	18 (0.71)	28 (1.10)	18 (0.71)	71 (2.80)	0.065 (0.14)
BA	M16	22400	52000	17 (0.67)	46 (1.81)	14 (0.55)	11 (0.43)	69 (2.72)	10 (0.39)	25 (0.98)	36 (1.42)	23 (0.91)	92 (3.62)	0.17 (0.37)
BA	M20 × 1.5	31500	70000	20 (0.79)	53 (2.09)	16 (0.63)	13 (0.51)	78 (3.07)	9 (0.35)	29 (1.14)	43 (1.69)	25 (0.98)	104.5 (4.11)	0.28 (0.62)
BA	M24 × 2	51000	102000	25 (0.98)	64 (2.52)	20 (0.79)	17 (0.67)	94 (3.70)	7 (0.28)	35.5 (1.40)	53 (2.09)	32 (1.26)	126 (4.96)	0.5 (1.10)
BA	M30 × 2	65500	134000	30 (1.18)	73 (2.87)	22 (0.87)	19 (0.75)	110 (4.33)	6 (0.24)	40.7 (1.60)	65 (2.56)	33 (1.30)	146.5 (5.77)	0.83 (1.83)
PTFE	M36 × 3	112000	143000	35 (1.38)	82 (3.23)	25 (0.98)	21 (0.83)	140 (5.51)	6 (0.24)	47 (1.85)	82 (3.23)	42 (1.65)	181 (7.13)	1.4 (3.09)
PTFE	M45 × 3	220000	280000	50 (1.97)	112 (4.41)	35 (1.38)	30 (1.18)	185 (7.28)	6 (0.24)	66 (2.60)	104 (4.09)	60 (2.36)	241 (9.49)	3.55 (7.83)
PTFE	M56 × 4	440000	630000	70 (2.76)	160 (6.30)	49 (1.93)	42 (1.65)	235 (9.25)	6 (0.24)	92 (3.62)	125 (4.92)	87 (3.43)	315 (12.40)	7.9 (17.42)
PTFE	M60 × 4	345000	440000	60 (2.36)	135 (5.31)	44 (1.73)	38 (1.50)	225 (8.86)	6 (0.24)	80 (3.15)	120 (4.72)	70 (2.76)	292.5 (11.52)	6.25 (13.78)
PTFE	M64 × 4	570000	780000	80 (3.15)	180 (7.09)	55 (2.17)	47 (1.85)	270 (10.63)	6 (0.24)	105 (4.13)	140 (5.51)	100 (3.94)	360 (14.71)	12 (26.46)

* BA – Bronze-auto lubricated; PTFE – polytertafluoroethylene

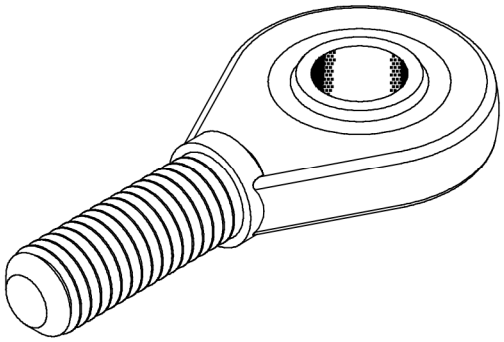


Figure 8: Other view

… Dimensions

Upper loading pads for standard reference load cells– Supor

All dimensions in mm (in)

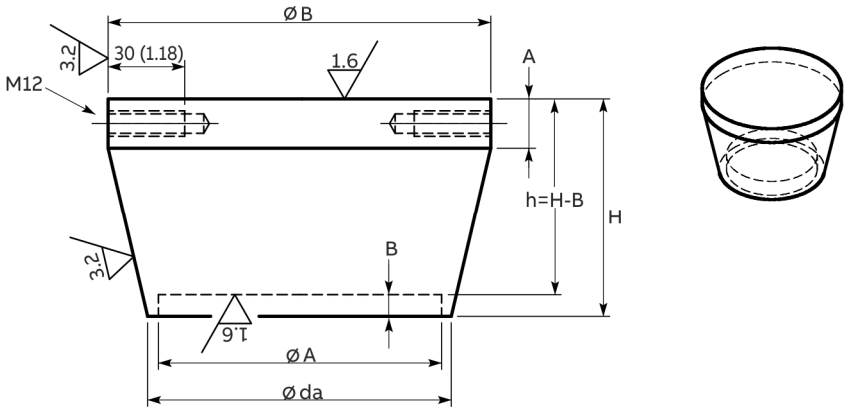
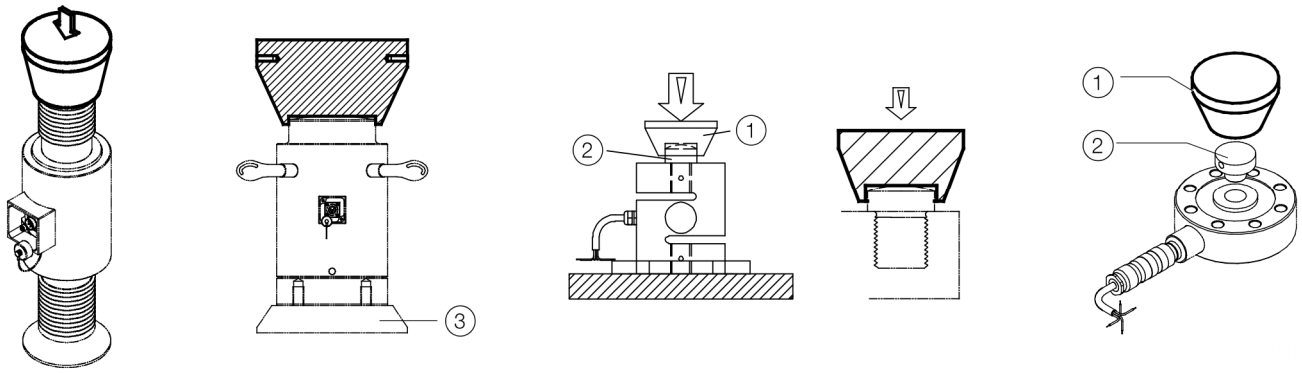


Figure 9: Dimensions supor

Types	Ø A	Ø B	Ø da	A	B	H	h	M12 L=30 (degree)	Weight kg (lb)
12	12 (4.47)	34 (1.34)	20 (0.79)	7 (0.28)	4 (0.16)	23 (0.91)	19 (0.75)	NO	0.12 (0.26)
20	20 (0.79)	49 (1.93)	30 (1.18)	8 (0.31)	5 (0.20)	31 (1.22)	26 (1.02)	NO	0.33 (0.73)
30	30 (1.18)	64 (2.52)	40 (1.57)	9 (0.35)	6 (0.24)	41 (1.61)	35 (1.38)	NO	0.74 (1.63)
36	36 (1.42)	69 (2.72)	46 (1.81)	10 (0.39)	7 (0.28)	46 (.181)	39 (1.54)	NO	0.98 (2.16)
45	45 (1.77)	79 (3.11)	56 (2.20)	11 (0.43)	12 (0.47)	53 (2.09)	41 (1.61)	NO	1.5 (3.31)
56	56 (2.20)	79 (3.11)	66 (2.60)	12 (0.47)	8 (0.31)	48 (1.89)	40 (1.57)	NO	1.5 (3.31)
64	64 (2.52)	99 (3.90)	75 (2.95)	12 (0.47)	17 (0.67)	64 (2.52)	47 (1.85)	NO	2.8 (6.17)
64E	64 (2.52)	114 (4.49)	75 (2.95)	12 (0.47)	17 (0.67)	75 (2.95)	58 (2.28)	NO	4.14 (9.13)
69	69 (2.72)	79 (3.11)	75 (2.95)	12 (0.47)	12 (0.47)	52 (2.05)	40 (1.57)	NO	1.6 (3.53)
90	90 (3.54)	129 (5.08)	100 (3.94)	15 (0.59)	17 (0.67)	79 (3.11)	62 (2.44)	NO	6 (13.23)
90B	90 (3.54)	164 (6.46)	100 (3.94)	15 (0.59)	17 (0.67)	109 (4.29)	92 (3.62)	NO	12.2 (26.90)
110	110 (4.33)	195 (7.68)	135 (5.31)	20 (0.79)	19 (0.75)	109 (4.29)	90 (3.54)	2× to 180	18.7 (41.23)
125A	125 (4.92)	158 (6.22)	135 (5.31)	20 (0.79)	19 (0.75)	94 (3.70)	75 (2.95)	2× to 180	11.3 (24.91)
125B	125 (4.92)	195 (7.68)	135 (5.31)	20 (0.79)	19 (0.75)	109 (4.29)	90 (3.54)	2× to 180	18.3 (40.34)
160	160 (6.30)	248 (9.76)	±170 (6.69)	30 (1.18)	20 (0.79)	146 (5.75)	126 (4.96)	2× to 180	40 (88.18)
200A	200 (7.87)	308 (12.13)	±210 (8.27)	30 (1.18)	20 (0.79)	175 (6.89)	155 (6.10)	2× to 180	73 (160.94)
200B	200 (7.87)	353 (13.90)	±210 (8.27)	30 (1.18)	20 (0.79)	200 (7.87)	180 (7.09)	4× to 90	103 (227.08)
230	230 (9.09)	353 (13.90)	±270 (10.63)	50 (1.97)	35 (1.38)	211.5 (8.33)	176.5 (6.95)	4× to 90	125 (275.58)
250A	250 (9.84)	438 (17.24)	±290 (11.42)	40 (1.57)	30 (1.18)	250 (9.84)	220 (8.66)	6× to 60	209 (460.77)
250B	250 (9.84)	503 (19.80)	±290 (11.42)	40 (1.57)	30 (1.18)	285 (11.22)	255 (10.04)	6× to 60	294 (648.16)
300A	300 (11.81)	594 (23.39)	±340 (13.39)	50 (1.57)	40 (1.57)	337 (13.27)	297 (11.69)	6× to 60	481 (1060.42)
330A	330 (12.99)	503 (19.80)	±370 (14.57)	50 (1.57)	50 (1.97)	301.5 (11.87)	251.5 (9.90)	6× to 60	341 (751.78)
360A	360 (14.17)	694 (27.32)	±401 (15.79)	100 (3.94)	50 (1.57)	397 (15.63)	347 (13.66)	6× M24 / 360	818 (1803.38)
400A	400 (15.75)	594 (23.39)	±440 (17.32)	50 (1.57)	55 (2.17)	352 (13.86)	297 (11.69)	6× to 60	555 (1223.56)
430A	430 (16.93)	795 (31.30)	±470 (18.50)	±100 (3.94)	50 (1.57)	448 (17.64)	398 (15.67)	6× M30 / 360	1209 (2665.39)



1 Supor
2 Appui
3 Padin

Figure 10: Other views

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