
ABB MEASUREMENT & ANALYTICS | DATA SHEET

9QGPS5100

Tension and compression load cells
(very high capacities)



Measurement made easy

Universal load cells combining accuracy, sturdiness and easiness to install

Wide range of capacities: 10 kN (1 t) up to 50 MN (5000 t)

Easy to install, compact design

IP rating IP 66

Material

- Stainless steel (5100L)
- Nickel plated steel (5105L)

Available options (non exhaustive list)

- ATEX intrinsic safety
- High service temperature (up to 180 °C [356 °F])
- 0 to 10 V or 4 to 20 mA output signal

Also available as standard reference load cells following ISO 376 (EN 10002/3) (Class '0.5' and '00'), see specific data sheet

Applications

The load cells 5100-5105 are perfectly designed to the following applications:

- Industrial force measurement
- Force measuring on test bench
- Weighing of hanging load
- Reference transducer for universal testing machine

Materials

Model 5100	Model 5105
Stainless steel	Nickel plated alloy steel

Capacities

(10) - (15) - 20 - 30 - 50 - (75) - 100 - (150) - 200 - 300 - 500 kN
(0.75) - 1 - 1.5 - 2 - 3 - 5 - 7.5 - 10 - 15 - 20 - 30 - 40 - 50 MN

Explosion protection (Option)

ATEX intrinsic safety:

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

Electrical connections

Input resistance

Capacities	R Input (Ω)
10 to 50 kN	$\pm 350 \Omega$
75 to 100 kN	$\pm 350 \Omega$ (0.25, 0.1 %)
150 to 200 kN	
300 to 500 kN	$\pm 700 \Omega$ (0.05 %, 0.03 %) or
0.75 to 1.5 MN	cl 1, cl 0.5, cl 00 to ISO 376
2 to 3 MN	$\pm 700 \Omega$
5 MN	
7.5 to 10 MN	
15 MN	
20 MN	
30 MN	
40 MN	
50 MN	

Specification

	0.25	0.1	0.05	0.03
Measuring accuracy				
Accuracy class	0.25 % F.S.	0.10 % F.S.	0.05 % F.S.	0.03 % F.S.
Combined error	< ±0.25 % F.S.	< ±0.10 % F.S.	< ±0.05 % F.S.	< ±0.03 % F.S.
Linearity error	< ±0.25 % F.S.	< ±0.10 % F.S.	< ±0.04 % F.S.	< ±0.025 % F.S.
Repeatability error	< ±0.1 % F.S.	< ±0.03 % F.S.	< ±0.02 % F.S.	< ±0.015 % F.S.
Creep error over 30 min.	< ±0.1 % F.S.	< ±0.06 % F.S.	< ±0.04 % F.S.	< ±0.025 % F.S.
Zero shift after loading	< ±0.025 % F.S.	< ±0.015 % F.S.	< ±0.01 % F.S.	< ±0.0075 % F.S.
Safe load limit	150 % F.S.	150 % F.S.	150 % F.S.	150 % F.S.
Breaking load	> 300 % F.S.	> 300 % F.S.	> 300 % F.S.	> 300 % F.S.
Sensitivity tolerance	< ±0.3 %	< ±0.3 %	< ±0.3 %	< ±0.2 %
Temperature coefficient of the sensitivity	< ±0.05 % F.S./10 °C	< ±0.05 % F.S./10 °C	< ±0.035 % 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	< ±0.03 % 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)	23 °C (73.4 °F)
Temperature data				
Nominal 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)	−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)	−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)	−50 to 85 °C (−58 to 185 °F)
Electrical Data				
Input resistance	350 to 700 Ω ±2 Ω	350 to 700 Ω ±2 Ω	350 to 700 Ω ±2 Ω	350 to 700 Ω ±2 Ω
Output resistance	350 to 700 Ω ±2 Ω	350 to 700 Ω ±2 Ω	350 to 700 Ω ±2 Ω	350 to 700 Ω ±2 Ω
Insulation resistance (50 V)	> 5000 MΩ	> 5000 MΩ	> 5000 MΩ	> 5000 MΩ
Reference excitation voltage	10 V DC	10 V DC	10 V DC	10 V DC
Nominal range of excitation voltage	3 to 12 V DC	3 to 12 V DC	3 to 12 V DC	3 to 12 V DC
Nominal sensitivity	1 to 2 mV/V	1 to 2 mV/V	1 to 2 mV/V	1 to 2 mV/V
Zero balance	±0.02 mV/V	±0.02 mV/V	±0.02 mV/V	±0.02 mV/V

F.S.: Full scale

... Dimensions

All dimensions in mm (in)

Capacities	H1	H2	Max. Deflexion mm (in)	Weight kg (lb)	Accessories		
					Embof	Padin	Supor
10 to 50 kN	245 (9.64)	307	0.02 to 0.08 (0.0008 to 0.0031)	0.8 (1.76)	Embof-M24 × 2-BA	Padin-24 *	Supor-24
75 to 100 kN	320 (12.59)	402 (15.82)	0.13 to 0.15 (0.0051 to 0.0059)	1.9 (4.19)	Embof-M30 × 2-BA	Padin-30	Supor-30
150 to 200 kN	398 (15.66)	510 (20.07)	0.14 to 0.16 (0.0055 to 0.0063)	3.65 (8.05)	Embof-45 × 3-PTFE	Padin-45	Supor-45
300 to 500 kN	560 (22.04)	740 (29.13)	0.19 to 0.25 (0.0075 to 0.0098)	9.8 (21.61)	Embof-64 × 4-PTFE	Padin-64	Supor-64
0.75 to 1.5 MN	—	—	0.30 to 0.42 (0.0118 to 0.0165)	21 (46.30)	—	Padin-100A	Supor-90
2 MN	—	—	0.35 to 0.65 (0.0138 to 0.0256)	38 (83.78)	—	Padin-125A	Supor-125A
3 MN	—	—			—	Padin-125B	Supor-125B
5 MN	—	—	0.73 (0.0287)	87 (191.80)	—	Padin-160	Supor-160
7.5 MN	—	—	0.83 (0.0327)	170 (374.79)	—	Padin-200A	Supor-200A
10 MN	—	—			—	Padin-200B	Supor-200B
15 MN	—	—	1 (0.0394)	292 (643.75)	—	Padin-250	Supor-250A
20 MN	—	—	1.7 (0.0669)	700 (1543.23)	—	Padin-330A	Supor-330A
30 MN	—	—	2.26 (0.0890)	1420 (3130.56)	—	Padin-400A	Supor-400A
40 to 50 MN	According to customer's design specifications						

* Only for 50 kN, PADIN not necessary for < 50 kN load cells

Accessories

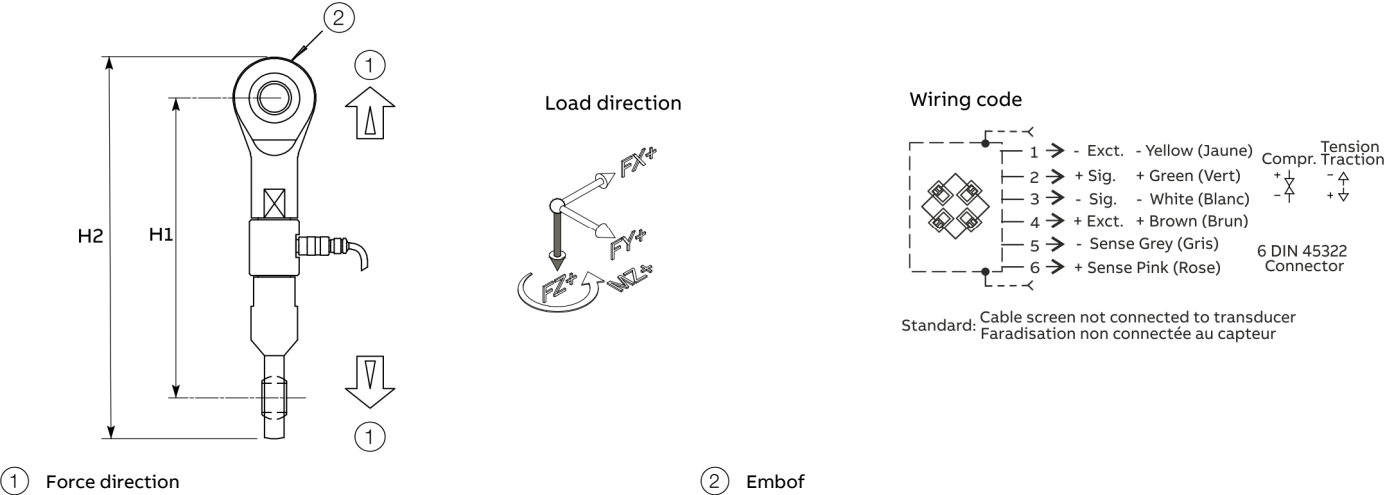


Figure 2: Accessories

Rod end bearings with female thread – Embof

All dimensions in mm (in)

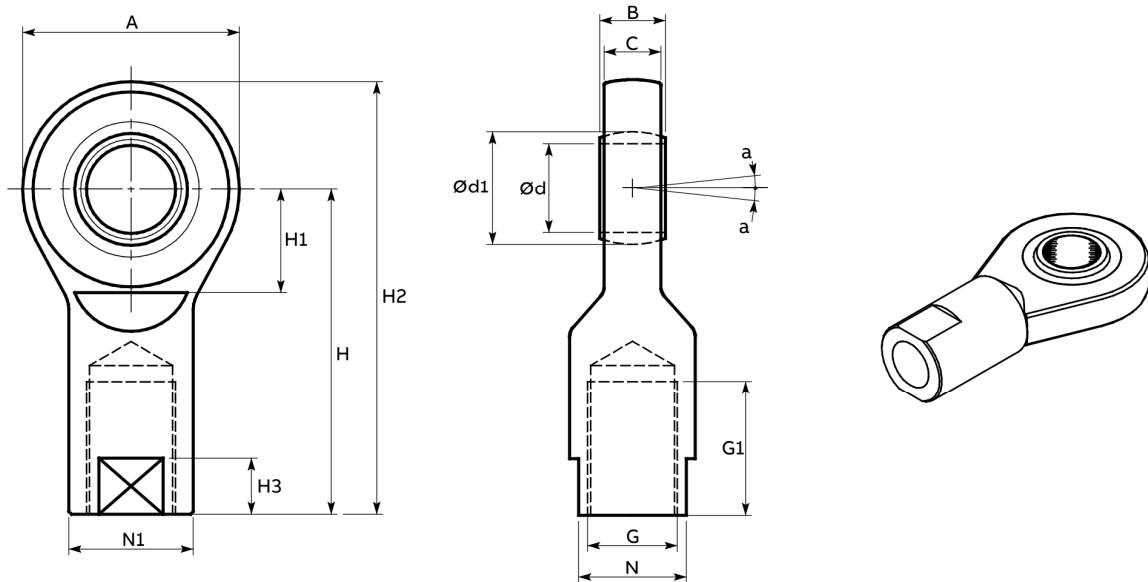


Figure 3: Standard dimensions embof

Dimensio n (G)	Capacities (N)		Ød	A	B	C	H	Ød1	G1	H1	H2	H3	N	N1	Weight kg (lb)	a degree
	Dynamic	Static														
M6	3600	9000	6 (0.23)	21 (0.82)	6 (0.23)	4.3 (0.16)	30 (1.18)	10 (0.39)	11 (0.43)	10.5 (0.41)	40.5 (1.59)	8 (0.31)	9 (0.35)	11 (0.43)	0.017 (0.04)	13
M8	5850	14600	8 (0.31)	24 (0.94)	8 (0.31)	6 (0.23)	36 (1.42)	13 (0.51)	15 (0.59)	12 (0.47)	48 (1.89)	10 (0.39)	11 (0.43)	13 (0.51)	0.034 (0.07)	15
M10	8560	21600	10 (0.39)	29 (1.14)	9 (0.35)	7 (0.27)	43 (1.69)	16 (0.63)		14 (0.55)	57.5 (2.26)	11 (0.43)	14 (0.55)	16 (0.63)	0.060 (0.13)	12
M12	11400	28500	12 (0.47)	34 (1.33)	10 (0.39)	8 (0.31)	50 (1.96)	18 (0.71)	18 (0.71)	17.5 (0.69)	67 (2.64)	12 (0.47)	17 (0.67)	19 (0.75)	0.095 (0.21)	10
M16	22400	52000	17 (0.66)	46 (1.81)	14 (0.55)	11 (0.43)	67 (2.64)	25 (0.98)	24 (0.94)	23 (0.90)	90 (3.54)	15 (0.59)	22 (0.86)	25 (0.98)	0.23 (0.51)	
M24 × 2	51000	102000	25 (0.98)	64 (2.52)	20 (0.78)	17 (0.67)	94 (3.70)	35.5 (1.39)	36 (1.42)	32 (1.26)	126 (4.96)	18 (0.71)	30 (1.18)	35 (1.37)	0.62 (1.37)	7
M30 × 2	65500	134000	30 (1.18)	73 (2.87)	22 (0.86)	19 (0.75)	110 (4.33)	40.7 (1.60)	45 (1.77)	35 (1.38)	146.5 (5.77)	19 (0.75)	36 (1.42)	42 (1.65)	0.97 (2.14)	6
M36 × 3	112000	143000	35 (1.37)	82 (3.22)	25 (0.98)	21 (0.83)	125 (4.92)	47 (1.85)	60 (2.36)	42 (1.65)	166 (6.53)	15 (0.59)	50 (1.96)	47 (1.85)	1.4 (3.08)	
M45 × 3	220000	280000	50 (1.96)	112 (4.40)	35 (1.37)	30 (1.18)	160 (6.29)	66 (2.59)	68 (2.68)	60 (2.36)	216 (8.50)	20 (0.78)	65 (2.56)	62 (2.44)	3.55 (7.82)	
M56 × 4	440000	630000	70 (2.75)	160 (6.29)	49 (1.92)	42 (1.65)	200 (7.87)	92 (3.62)	80 (3.15)	84 (3.31)	280 (11.02)		85 (3.34)	80 (3.15)	8.3 (18.3)	
M64 × 4	570000	780000	80 (3.15)	180 (7.08)	55 (2.16)	47 (1.85)	230 (9.05)	105 (4.13)	85 (3.34)	100 (3.94)	320 (12.6)	25 (0.98)	100 (3.94)	95 (3.74)	13 (28.66)	

... Dimensions

Lower loading pads for standard reference load cells – Padin

All dimensions in mm (in)

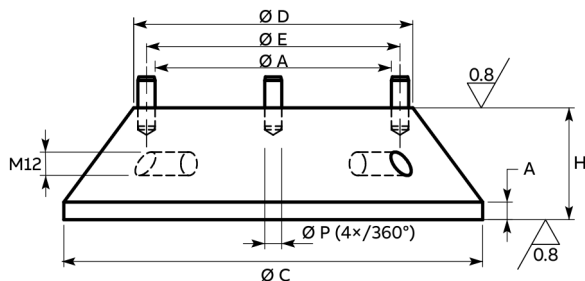
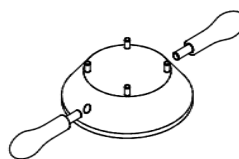
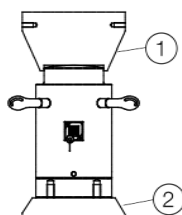


Figure 4: Standard dimensions padin

Types	Ø A	Ø C	Ø D	Ø E	Ø P	A	H	M12	Weight kg (lb)
24	25 (0.98)	59 (2.32)	36 (1.42)	29 (1.14)	4 (0.16)	3 (0.12)	22 (0.86)	—	0.34 (0.75)
30	31 (1.22)	64 (2.52)	40 (1.57)	35 (1.38)					0.4 (0.88)
42	43 (1.69)	74 (2.91)	52 (2.05)	47 (1.85)			20 (0.79)		0.53 (1.17)
45	46 (1.81)	79 (3.11)	56 (2.20)	50 (1.97)			21 (0.83)		0.64 (1.41)
64	65 (2.56)	99 (3.89)	75 (2.95)	69 (2.72)			22 (0.86)		1.1 (2.42)
64E		129 (5.08)				4 (0.16)	25 (0.98)		1.8 (3.97)
100A	91 (3.58)		110 (4.33)	95 (3.74)					2.3 (5.07)
100B	100 (3.94)			104 (4.09)					
110E	111 (4.37)	195 (7.68)	130 (5.12)	119 (4.68)	8 (0.31)	8 (0.31)	51 (2.01)	2 × / 360°	9.4 (20.72)
125AA	120 (4.72)	158 (6.22)	144 (5.67)	128 (5.04)		6 (0.23)	25 (0.98)	—	3.7 (8.16)
125AB	126 (4.96)			134 (5.27)					
125B		195 (7.68)	150 (5.90)			8 (0.31)	45 (1.77)	2 × / 360°	9 (19.84)
160	162 (6.38)	248 (9.76)	180 (7.09)	170 (6.69)		11 (0.43)	60 (2.36)		18.6 (41.01)
200A	202 (7.95)	308 (12.12)	235 (9.25)	214 (8.42)	12 (0.47)	12 (0.47)	67 (2.64)		32.9 (75.53)
200B		353 (13.89)					90 (3.54)	4 × / 360°	52.5 (115.74)
210	207 (8.15)	248 (9.76)	225 (8.86)	215 (8.46)	8 (0.31)	6 (0.23)	30 (1.18)	2 × / 360°	11 (24.25)
230	232 (9.13)	353 (13.89)	262 (10.31)	244 (9.60)	12 (0.47)	8(0.31)	80 (3.15)		50 (110.23)
250	252 (9.92)	438 (17.24)	280 (11.02)	264 (10.39)		10 (0.39)		4 × / 360°	69.75 (153.77)
300	296 (11.65)	353 (13.89)	325 (12.79)	308 (12.12)		6 (0.23)	35 (1.38)	2 × / 360°	25.8 (56.88)
330	333 (13.11)	438 (17.24)	370 (14.58)	349 (13.74)	16 (0.63)	8 (0.31)	60 (2.36)	4 × / 360°	62 (136.68)
330A		503 (19.08)					115 (4.53)		140 (308.65)
365	367 (14.44)		400 (15.75)	379 (14.92)	12 (0.47)		80 (3.15)		105 (231.48)
400A	403 (15.86)	594 (23.38)	448 (17.64)	423 (16.65)	20 (0.79)		120 (4.72)		205 (451.95)
445	448 (17.64)		485 (19.09)	464 (18.27)	16 (0.63)		85 (3.35)		156 (343.92)
495	501 (19.72)	694 (27.23)	548 (21.57)	521 (20.51)	20 (0.79)		110 (4.33)		266 (586.43)
540	546 (21.61)	795 (31.30)	613 (24.13)	576 (22.68)	30 (1.18)		130 (5.12)	4 × M16 / 360°	405 (892.87)



① Supor

② Padin

Figure 5: Other views

Upper loading pads for standard reference load cells– Supor

All dimensions in mm (in)

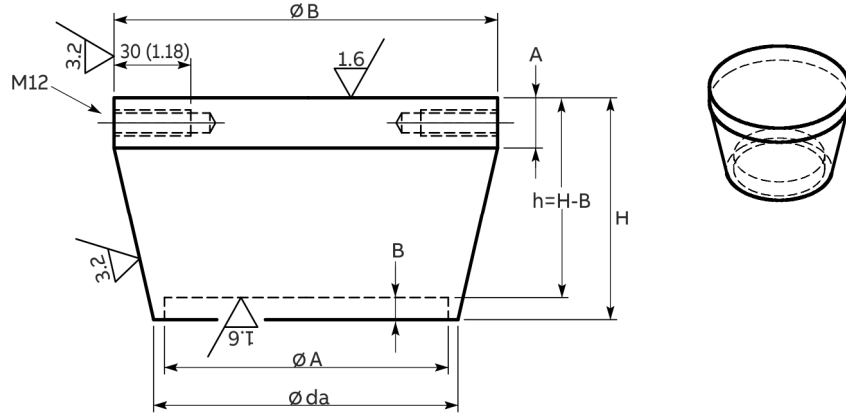


Figure 6: Dimensions supor

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)

... Dimensions

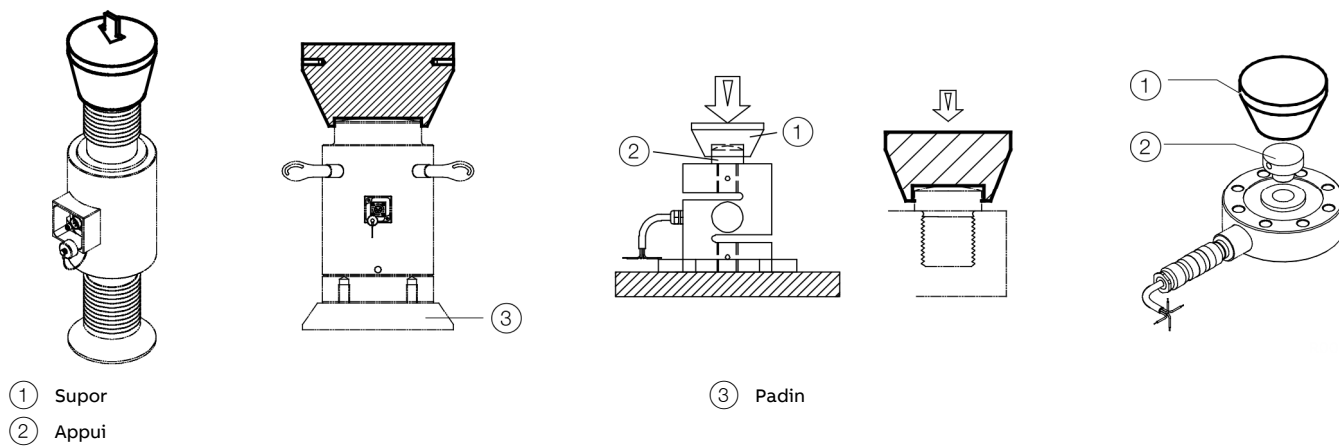


Figure 7: Other views

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