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sartorius
mechatronics

PR 6201 (500 kg... 50 t) Precision Compression Load Cell



500 kg... 50 t Type LA | L | D1 | C3

- Easy to install
- Well-proven rockerpin design
- Easy corner adjustment by matched load cell output
- Full stainless steel housing
- Wide temperature range
- High overload capacity
- Resistant against vibrations
- Hermetically sealed, IP68 (depth of 1.5 m for 10,000 hrs.), IP69K
- 4 to 20 mA output signal as option (LA version)
- Optimum overvoltage protection
- Ex-version available (PR 6201/..E)
- W&M approval (OIML R60, NTEP)

Product Profile

The PR 6201 range of load cells is specially designed for weighing silos, tanks and process vessels.

The unique design principle, in combination with the FlexLock installation kits, makes it possible to balance out movements arising from mechanical or thermal expansion or contraction of the vessel or its supporting construction.

A particular design characteristic is that the overall height and shape of the load cell remain unchanged, from 500 kg up to 50 t. Alongside this, the unit has an especially high overload capacity of up to 200%.

At the same time, this range distinguishes itself – in addition to its high measurement accuracy and repeatability – above all for its unmatched reliability, robustness and stability, which offer trouble-free operation without adjustment, year after year.

The pendulum support principle, combined with patented measuring element geometry, ensures that force transmission into the sensor is always at the optimum level and, in this way, the effect on measurement accuracy is minimized. At the same time, the load cell offers a particularly high overload range, high repeatability and perfect linearity.

There is an especially wide working temperature range attributable to sophisticated resistance strain gauge technology. The hermetically sealed enclosure and special TPE cable allow the unit to be used even under extreme operating conditions in harsh production environments.

The entire measurement chain can be calibrated without the use of reference weights. Due to "matched output" technology, a damaged load cell can be exchanged without the need for re-calibration. This saves a tremendous amount of time during commissioning.

An explosion-proof (Ex) version of this range of load cells is also available, as an option, for use in intrinsically safe environments.

Restoring force

For each mm of movement that the top of the load cell shifts from the vertical axis, a horizontal restoring force is generated of:
 max. capacity ≤ 10 t: 0.65 %
 max. capacity ≥ 20 t: 1.55 %
 of the vertical load on the load cell

Load cell housing

Full stainless steel housing, membrane and measuring element hermetically sealed, welded, filled with inert gas.
 Material-No.1.4301 (DIN 17440), equivalent to 304 S11/S15 (B.S.)

Ingress Protection

IP68, IEC 529 (equivalent to NEMA 6). The load cell can be submerged in water to a depth of 1.5 m for 10,000 hours, IP69k

Cable

Robust, flexible, screened
 Sheath: TPE Thermopl. Elastomere, grey (for PR 6201/..E: blue)
 Diameter: 5 mm, wires 4×0.35 mm²
 Length: 5 m (500 kg – 10 t), 12 m (20 t – 50 t)

Bending radius

Fixed installation: ≥ 50 mm
 Flexible installation: ≥ 150 mm

Certificate of conformity

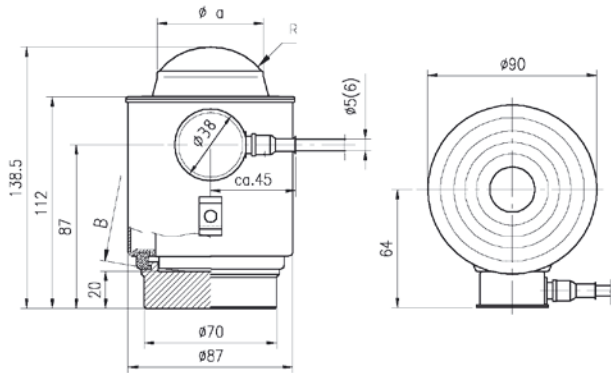
Valid for: PR 6201/..E
 Feature:
 II 1 G EEx ia IIC T6, II 1D IP65 T 85 °C
 Registration number:
 PTB 02 ATEX 2059, TÜV 03 ATEX 2301X

Technical Data		LA	L	D1 N	C3	
Accuracy class		0.25	0.25	0.04	0.015	% E _{max}
Minimum dead load	lowest limit of specified measuring range	E _{min} 0	0	0	0	% E _{max}
Maximum capacity	highest limit of specified measuring range	E _{max} s. table	s. table	s. table	s. table	
Minimum LC verification	minimum load cell verification interval, v _{min} = E _{max} /Y interval for E _{max} = 1,000 kg for E _{max} = 500 kg	Y		5,000	14,000	
		Y		4,000		
		Y		2,000		
Rated output	relative output at nominal load for E _{max} = 50 t (LA = 4...20 mA)	C _n 16 mA	1	1	1	mV/V
		C _n 16 mA	2	2	2	mV/V
Tolerance on rated output	permissible deviation from rated output	d _c < 1.0	< 1.0	< 0.25	< 0.07	% C _n
Zero output signal	load cell output signal under unloaded condition	S _{min} 4 mA*	< 2.0	< 1.0	< 1.0	% C _n
Repeatability error	max. change in load cell output for repeated loading	ε _R < 0.02	< 0.02	< 0.01	< 0.005	% C _n
Creep, during 30 min.	max. change in load cell output under nominal load	d _{cr} < 0.05	< 0.05	< 0.03	< 0.015	% C _n
Non-linearity	max. deviation from best straight line through zero	d _{lin} < 0.25	< 0.25	< 0.03	< 0.01	% C _n
Hysteresis	max. difference in load cell output between loading and unloading	d _{hy} < 0.25	< 0.25	< 0.04	< 0.015	% C _n
Temperature effect on S _{min}	max. change of S _{min} /10 K over B _T referred to C _n	TK _{Smin} < 0.15	< 0.15	< 0.028	< 0.01	% C _n /10K
Temperature effect on C	max. change of C/10 K over B _T referred to C _n	TK _c < 0.1	< 0.1	< 0.03	< 0.01	% C _n /10K
Input impedance	between supply terminals	R _{LC} –	650 + 50	650 ± 6	650 ± 6	Ω
Output impedance	between measuring terminals	R _O –	610 ± 3	610 ± 1	610 ± 0.5	Ω
Insulation impedance	between measuring circuit and housing at 100 V _{DC}	R _{IS} –	> 5,000 × 10 ⁶	> 5,000 × 10 ⁶	> 5,000 × 10 ⁶	Ω
Insulation voltage	between circuit and housing, PR 6201/..E only	–	500	500	500	V
Recommended supply voltage	to hold the specified performance	B _u 20... 28	4... 24	4... 24	4... 24	V
Max. supply voltage	permissible for continuous operation without damage	U _{max} 28	32	32	32	V
Nominal ambient temp. range	to hold the specified performance	B _T -10... +55	-10... +55	-10... +55	-10... +55	°C
Usable ambient temp. range	permissible for continuous operation without damage	B _{Tu} -30... +55	-40... +95	-40... +95	-40... +95	°C
Storage temperature range	transportation and storage	B _{Tl} -40... +70	-40... +95	-40... +95	-40... +95	°C
Permissible eccentricity	permissible displacement from nominal load line	S _{ex} 10	10	10	10	mm
Vibration resistance	resistance against oscillation (IEC 68-2-6 Fc)	–	20 g, 100 h, 10... 150 Hz	20 g, 100 h, 10... 150 Hz	20 g, 100 h, 10... 150 Hz	20 g, 100 h, 10... 150 Hz
Air pressure effect	influence of ambient air pressure on S _{min} up to 2 t 3 t to 10 t from 20 t	PK _{Smin}				
		250	250	250	250	g/kPa
		320	320	320	320	g/kPa
Nominal deflection	max. elastic deformation under nominal load up to 30 t 50 t	S _{nom}				
		< 0.5	< 0.5	< 0.5	< 0.5	mm
		< 0.8	< 0.8	< 0.8	< 0.8	mm

* Tolerance on zero output signal: $\pm 2\%$ C_n

Definitions acc. to VDI/VDE 2637

Data for LA version are typical values. The technical data given here serve only as a product description and must not be interpreted as guaranteed characteristics in the legal sense.



Dimensions in mm

PR 6201/52.../23	a = 24	R = 15	B = 150
PR 6201/33.../14	a = 34	R = 15	B = 150
PR 6201/24.../54	a = 56	R = 35	B = 220

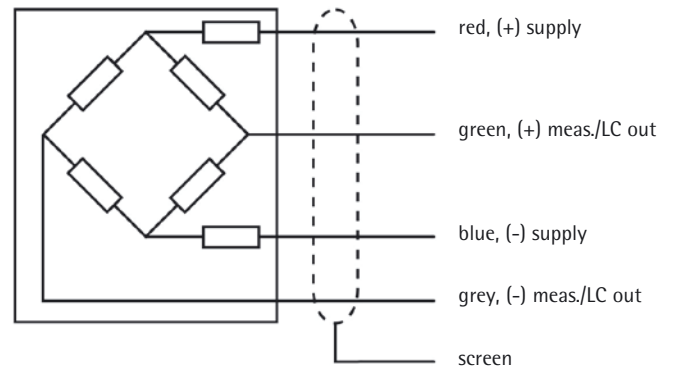
Order information

Type	Rated Capacity E_{max}	Version	Max. usable load (in % of E_{max})	Destructive load (in % of E_{max})	Packing	Weight gross net
PR 6201/52	500 kg	LA L D1 D1E	200 (LA:120)	> 500	240 × 240 × 155 mm	2.8 kg 1.9 kg
PR 6201/13	1 t	LA L D1 D1E	200 (LA:120)	> 500	240 × 240 × 155 mm	2.8 kg 1.9 kg
PR 6201/23	2 t	LA L D1 C3 D1E C3E	200 (LA:120)	> 500	240 × 240 × 155 mm	2.8 kg 1.9 kg
PR 6201/33	3 t	LA L D1 C3 D1E C3E	200 (LA:120)	> 500	240 × 240 × 155 mm	2.9 kg 2.0 kg
PR 6201/53	5 t	LA L D1 C3 D1E C3E	200 (LA:120)	> 500	240 × 240 × 155 mm	2.9 kg 2.0 kg
PR 6201/14	10 t	LA L D1 C3 D1E C3E	200 (LA:120)	> 500	240 × 240 × 155 mm	3.4 kg 2.5 kg
PR 6201/24	20 t	LA L D1 C3 D1E C3E	200 (LA:120)	> 500	240 × 240 × 155 mm	5.1 kg 4.2 kg
PR 6201/34	30 t	LA D1 C3 D1E C3E	200 (LA:120)	> 500	240 × 240 × 155 mm	5.5 kg 4.6 kg
PR 6201/54	50 t	LA L D1 C3 D1E C3E	150 (LA:120)	> 300	240 × 240 × 155 mm	5.1 kg 4.2 kg

For professional applications further options and a high number of additional mounting kits are available:

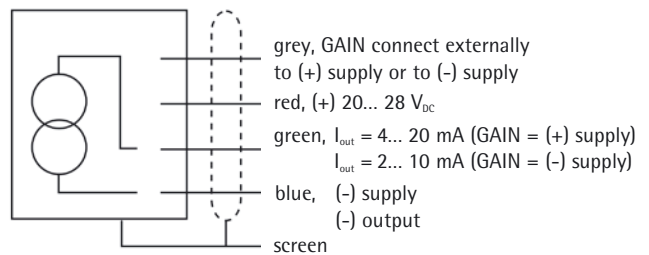
Table PR 6001

Type	Description	Weight net	tare	Order number
PR 6001/00N	Universal vessel support	500 kg... 10 t	10.1 kg	9405 360 01001
PR 6001/00S	Universal vessel support, stainless steel	500 kg... 10 t	10.9 kg	9405 360 01002
PR 6001/01N	Universal vessel support	20 t... 50 t	10.1 kg	9405 360 01011
PR 6001/01S	Universal vessel support, stainless steel	20 t... 50 t	10.9 kg	9405 360 01012
PR 6001/10N	25 kN MaxiFLEXLOCK	500 kg... 10 t	15.9 kg	9405 360 01101
PR 6001/10S	25 kN MaxiFLEXLOCK, stainless steel	500 kg... 10 t	16.7 kg	9405 360 01102
PR 6001/11N	25 kN MaxiFLEXLOCK	20 t... 50 t	15.9 kg	9405 360 01111
PR 6001/11S	25 kN MaxiFLEXLOCK, stainless steel	20 t... 50 t	16.7 kg	9405 360 01112
PR 6001/20N	50 kN MaxiFLEXLOCK	500 kg... 10 t	25.0 kg	9405 360 01201
PR 6001/20S	50 kN MaxiFLEXLOCK, stainless steel	500 kg... 10 t	25.8 kg	9405 360 01202
PR 6001/21N	50 kN MaxiFLEXLOCK	20 t ... 50 t	25.0 kg	9405 360 01211
PR 6001/21S	50 kN MaxiFLEXLOCK, stainless steel	20 t... 50 t	25.8 kg	9405 360 01212
PR 6001/30N	200 kN MaxiFLEXLOCK	500 kg... 10 t	138 kg	9405 360 01301
PR 6001/31N	200 kN MaxiFLEXLOCK	20 t... 50 t	138 kg	9405 360 01311



Connection diagrams

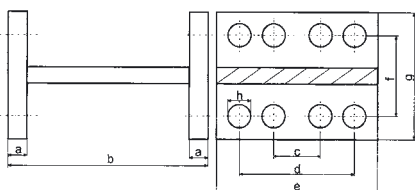
PR 6201/ ...LA



Further options

Type	Description		Dimensions	Order number
PR 6130/08	Plastic cable junction box	for all industrial applications, max. 8 load cells	200×120×75 mm	9405 361 30081
PR 6130/04N	Cable junction box	Aluminium, grey varnished, IP67, for all industrial applications, max. 4 load cells	175×80×57 mm	9405 361 30041
PR 6130/64Sa	Stainless steel cable junction box	material stainless steel 1.4301, IP68, IP69K, for all industrial, intrinsically safe and W&M applications, max. 4 load cells	190×160×60 mm	9405 361 30642
PR 6130/65S	Cable junction box	Material 1.4301, Protection class IP68 IP69K, for all industrial, intrinsically safe and W&M applications, max. 4 load cells	172 × 105 × 55 mm	9405 361 30652
PR 6130/68S	Stainless steel cable junction box	material stainless steel 1.4404, IP68, IP69K, for all industrial, intrinsically safe and W&M applications, max. 8 load cells	240×170×70 mm	9405 361 30682
PR 6135	Extension cable	for all applications, grey	D = 9 mm	9405 361 35..2
PR 6135/...A	Extension cable, armoured	for all applications, grey	D = 13 mm	9405 361 35..9
PR 6136	Extension cable	for intrinsically safe applications, blue	D = 11 mm	9405 361 36..2
PR 6136/...A	Extension cable, armoured	for intrinsically safe applications, blue	D = 13 mm	9405 361 36..9
PR 6143/50N	Loaddisk	normal version for 0.5 t up to 50 t		9405 361 43501
PR 6143/50S	Stainless steel loaddisk	material 1.4542 (DIN 17440) for 0.5 t up to 50 t		9405 361 43502
PR 6143/24S	Stainless steel bottomdisk	material 1.4542 (DIN 17440) for PR 6201 up to 10 t nominal load		9405 361 43242
PR 6143/54S	Stainless steel bottomdisk	material 1.4542 (DIN 17440) for PR 6201 20 t, 30 t or 50 t nominal load		9405 361 43542
PR 6145/00N	Mounting kit	steel plates to mount all PR 6201 up to 50 t nominal load		9405 361 45001
PR 6145/00S	Stainless steel Mounting kit	material 1.4301, for 20 t up to 50 t nominal load order PR 6143/54S separately		9405 361 45002
PR 6143/00N	Mini Flexlock	mounting plate kit with built in constrainer up to 25 kN horizontal forces		9405 361 43001
PR 6143/00S	Stainless steel Mini Flexlock	material 1.4301, up to 25 kN horizontal forces		9405 361 43002
PR 6143/10N	Mini Flexlock	stronger version with built in constrainer up to 50 kN horizontal forces		9405 361 43101
PR 6143/10S	Stainless steel Flexlock	material 1.4301, up to 50 t nominal load and up to 50 kN horizontal forces		9405 361 43102
PR 6152/02	Horizontal constrainer	withstands horizontal forces up to 200 kN		9405 361 52021

PR 6101/... Pivot



Type	Dimensions in mm							
	a	b	c	d	e	f	g	h
PR 6101/53	15	190.5	-	115	150	65	100	14 (4x)
PR 6101/24	15	190.5	-	115	150	65	100	14 (4x)
PR 6101/54	15	190.5	115	199	250	65	100	14 (8x)

Table for the possible pivots to use together with PR 6201 load cell

Type	Description	Order number
PR 6101/53N	normal steel up to 5 t Rated capacity	9405 561 01531
PR 6101/53S	stainless steel	9405 561 01532
PR 6101/24N	normal steel up to 20 t Rated capacity	9405 561 01241
PR 6101/24S	stainless steel	9405 561 01242
PR 6101/54N	normal steel up to 50 t Rated capacity	9405 561 01541
PR 6101/54S	stainless steel	9405 561 01542

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