

This document will soon
proudly feature our new
brand & design – Minebea Intec



sartoriusintec
A Minebea Group Company

PR 6221 Weighbridge Load Cell



12.5 t... 75 t, type C3 | C4 | C5 | C6

- No corner adjustment necessary
- High overload capacity
- IP68 (1.5 m/10,000 hrs)
IP69K (high pressure cleaning)
- Proven rocker-pin principle
- Best overvoltage protection
- Highest reliability
- 100% Maintenance free
- Ex-version available
- Patent-protected product features



Product Profile

The PR 6221 range of load cells is designed exclusively for use on road weighbridges. The unique design principle, combined with the installation kits, balance out movements caused by mechanical or thermal expansion or contraction of the weighbridge construction.

The unique combination of the selected geometry and material | surface hardness parameters guarantees perfect rolling characteristics, high restoring forces and long-term maintenance-free operation. A particular design characteristic is that the height and shape of the load cell remain constant over various load stages, whilst there is a particularly high overload range of, in part, 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 enable 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.

The hermetically sealed enclosure and special TPE cable allow the unit to be used even under extreme operating conditions.

Special resistance strain gauge technology, in combination with the PR 6021/.. cable junction boxes, provides for demonstrably improved lightning protection.

The entire measurement chain can be calibrated without the use of a reference weight. Due to "matched output" technology in many cases electrical corner adjustment is not required. 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.

Technical Data

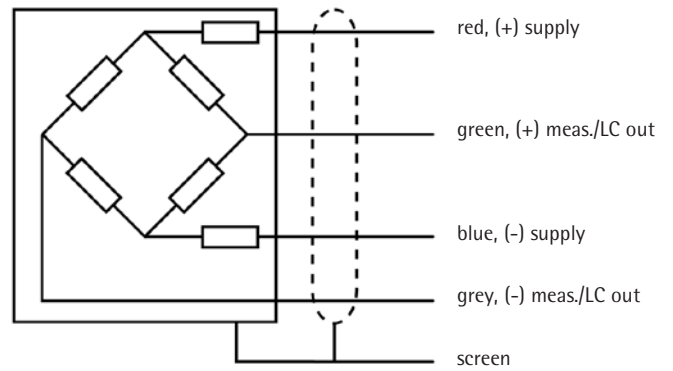
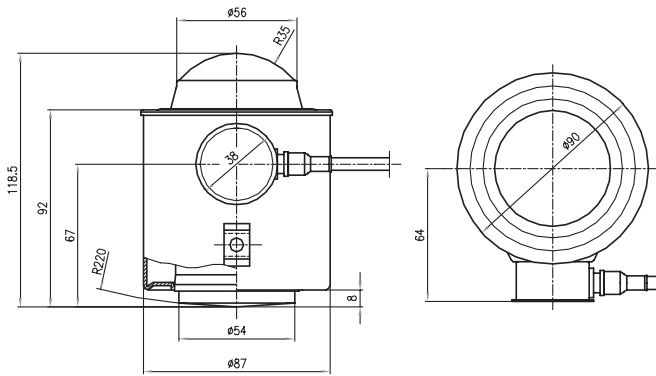
Maximum capacity	highest limit of specified measuring range	E_{max}	12.5	20	25	30	50	60	75	t
Max. usable load	upper limit for measurements	E_u	37.5	40	37.5	60	75	75	75	t
Destructive load	danger of mechanical destruction	E_d	> 75	> 100	> 75	> 150	> 150	> 150	> 150	t
Rated output	relative output signal at max. capacity for accuracy classes C4, C5, C6 at $E_{max} \geq 60$ t C5, C6 at $E_{max} \geq 50$ t	C_n	1	1	2	1	2	2.4	3	mV/V
							1.5	1.5	1.5	1.5
Nominal deflection	max.elastic deformation under nominal load	S_{nom}	0.2	0.4	0.5	0.5	0.8	0.9	1.1	mm
Accuracy class			C3	C4	C5¹⁾	C6¹⁾				
Accuracy class			0.015	0.012	0.010	0.008				% E_{max}
Minimum dead load	lowest limit of specified measuring range	E_{min}	0	0	0	0				% E_{max}
Min.LC verification interval	minimum load cell verification interval ($v_{min} = E_{max}/Y$) for E_{max} 12.5 t:	Y	14,000	20,000	20,000	20,000				
			14,000	18,000	-	-				
Deadload Return	factor for min. dead load output return (DR = $1/2 E_{max}/Z$) for E_{max} 12.5 t:	Z	6,000	8,000 ²⁾	8,000 ²⁾	8,000 ²⁾				
			6,000	6,000	-	-				
Tolerance on rated output	permissible deviation from rated output	d_c	< 0.07	< 0.07	< 0.07	< 0.07				% C_n
Zero output signal	load cell output signal under unloaded condition	S_{min}	< 1.0	< 1.0	< 1.0	< 1.0				% C_n
Repeatability error	max.change in load cell output for repeated loading	ϵ_R	< 0.005	< 0.005	< 0.005	< 0.005				% C_n
Creep, during 30 min	max.change in load cell output under nominal load	d_{cr}	< 0.015	< 0.0125	< 0.010	< 0.008				% C_n
Non-linearity	max. deviation from best straight line through zero	d_{lin}	< 0.01	< 0.01	< 0.01	< 0.01				% C_n
Hysteresis	max. diff.in LC output between loading and unloading	d_{hy}	< 0.0165	< 0.0125	< 0.010	< 0.008				% C_n
Temperature effect on S_{min}	max. change of $S_{min}/10$ K ΔT over B_t referred to C_n	$TK_{S_{min}}$	< 0.01	< 0.007	< 0.007	< 0.007				% $C_n/10$ K
Temperature effect on C_n	max. change of $C_n/10$ K ΔT over B_t referred to C_n	TK_c	< 0.01	< 0.008	< 0.007	< 0.005				% $C_n/10$ K
Input impedance	between supply terminals	R_{LC}	1,080 \pm 10	1,080 \pm 10	1,080 \pm 10	1,080 \pm 10				Ω
Output impedance	between measuring terminals for accuracy classes C5 C6 at $E_{max} = 50$ t C4 C5 C6 at $E_{max} = 60$ t C4 C5 C6 at $E_{max} = 75$ t	R_o	1,010 \pm 1	1,010 \pm 1	1,010 \pm 1	1,010 \pm 1				Ω
			760 \pm 1	760 \pm 1	760 \pm 1	760 \pm 1				Ω
			635 \pm 1	635 \pm 1	635 \pm 1	635 \pm 1				Ω
			510 \pm 1	510 \pm 1	510 \pm 1	510 \pm 1				Ω
Insulation impedance	between measuring circuit and housing at 100 V_{DC}	R_{IS}	> 5,000	> 5,000	> 5,000	> 5,000				M Ω
Insulation voltage	between circuit and housing	E_x	100	100	100	100				V_{DC}
			500	500	500	500				V
Recommended supply voltage	to hold the specified performance	B_u	4...24	4...24	4...24	4...24				V
Max. supply voltage	permissible for continuous operation without damage	U_{max}	32	32	32	32				V
			25	25	25	25				V
Nominal ambient temp. range	to hold the specified performance	B_T	-10...+55	-10...+55	-10...+55	-10...+55				$^{\circ}C$
Usable ambient temp. range	permissible for continuous operation without damage	B_{Tu}	-40...+95	-40...+95	-40...+95	-40...+95				$^{\circ}C$
Storage temperature range	transportation and storage	B_{Ti}	-40...+95	-40...+95	-40...+95	-40...+95				$^{\circ}C$
Permissible eccentricity	permissible displacement from nominal load line	S_{ex}	10	10	10	10				mm
Vibration resistance	resistance against oscillation (IEC68-2-6 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}	$PK_{S_{min}}$	< 420	< 420	< 420	< 420				g/kPa

¹⁾ not for $E_{max} = 12.5$ t

²⁾ for nominal ambient temperature > 40°C is Z = 6,000

Definitions acc. to VDI | VDE 2637.

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

Restoring force

For each mm of movement that the top of the load cell shifts from the vertical axis, a horizontal restoring force of 1.55% of the applied vertical load is generated.

Load cell housing construction

Deep draw pulled housing, membrane and measuring element hermetically sealed, welded, filled with inert gas,

Material-Nr.

1.4301 (DIN 17440), 304 S15 (B.S.)

Ingress Protection

IP68, IEC 529/EN 60529: 1.5 m water column/10,000 h
IP69K, DIN 40 050: water under high pressure, steam cleaning
Sealing equivalent to NEMA 6

Cable

robust, flexible, screened,
sheath: TPE,
colour: green (for PR 6221/..E: colour: blue),
diameter: 5 mm, 4 × AWG22 (0.35 mm²),
length: 16 m

Bending radius

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

Certificate of conformity

II 3G Ex nA II T6, manufacturer certificate
II 3D Ex tD A22 IP65 T85°C, manufacturer certificate

For PR 6221/..E

II 1G Ex ia IIC T6, PTB 02 ATEX 2059
II 1D Ex t IIIC T₅₀₀ 77°C Da IP65,
TÜV 03 ATEX 2301x

Lightning protection

Surge voltage (U_{max} = 1.000kV)
1.2 μs/50 μs acc. to DIN EN/IEC 60060-1
Surge current (I_{max} = 100 kA)
10 μs/350 μs acc. to DIN EN 62475
Lightning protection class III

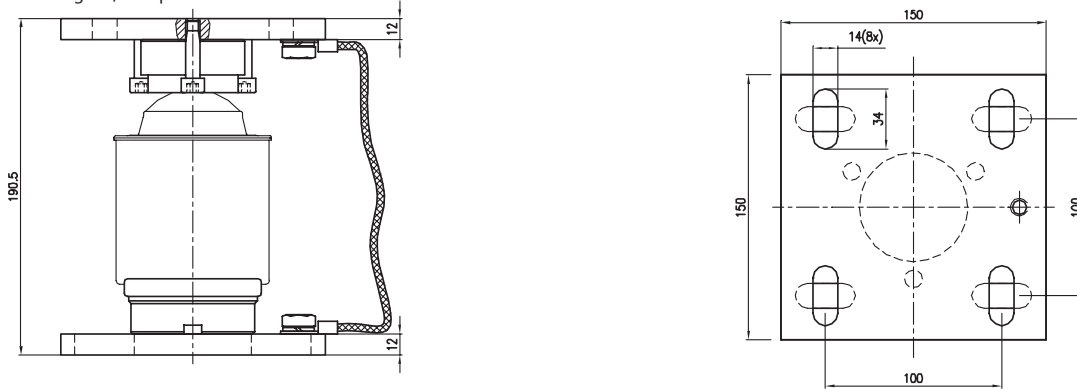
Order information

Type	Nominal load E _{max}	Version	Max. usable load E _{max} (in % of E _{max})	Destructive load (in % of E _{max})
PR 6221/12.5t	12.5 t	C3 C4 C3E C4E	300	> 600
PR 6221/20t	20 t	C3 C4 C5 C6 C3E C4E C5E C6E	200	> 500
PR 6221/25t	25 t	C3 C4 C5 C6 C3E C4E C5E C6E	150	> 300
PR 6221/30t	30 t	C3 C4 C5 C6 C3E C4E C5E C6E	200	> 500
PR 6221/50t	50 t	C3 C4 C5 C6 C3E C4E C5E C6E	150	> 300
PR 6221/60t	60 t	C3 C4 C5 C6 C3E C4E C5E C6E	125	> 250
PR 6221/75t	75 t	C3 C4 C5 C6 C3E C4E C5E C6E	100	> 200

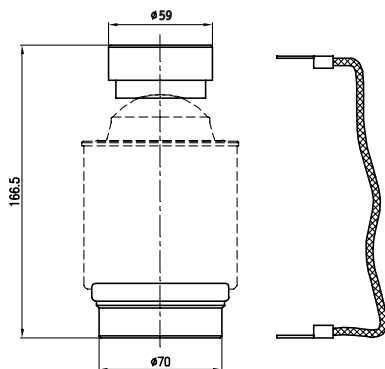
For professional applications further options and a wide range of additional mounting kits are available:

Type	Accessories	Order Number
PR 6021/00N	Load and bottom disc Set of top and bottom load disc, tool steel, zinc plated, chromated	9405 360 21001
PR 6021/01N	Mounting Kit for PR 6221, including top and bottom load disc, zinc plated	9405 360 21011
PR 6021/08	Cable Junction Box Plastic cable junction box for PR 6221, including lightning protection circuit	9405 360 21083
PR 6021/68	Cable Junction Box Ex S/S cable junction box for PR 6221 for the use in EEx i circuits in hazardous area Zone 1, 2 and 0	9405 360 21683

PR 6021/01N, Mounting kit, complete

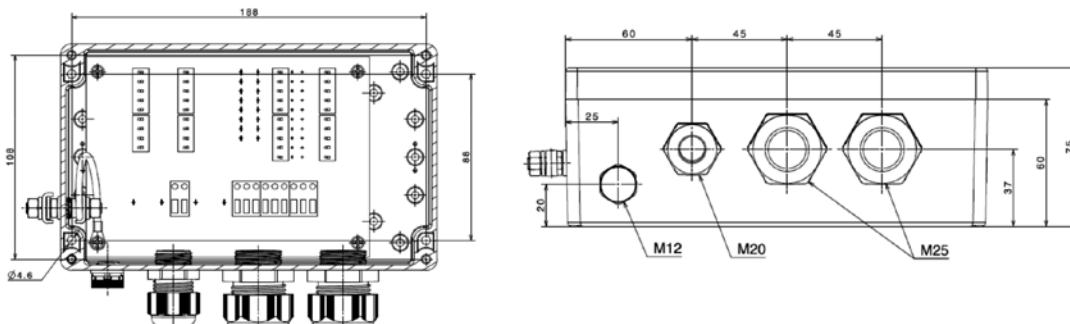


PR 6021/00N, Top and bottom load disc incl. rubber ring and earthing strap

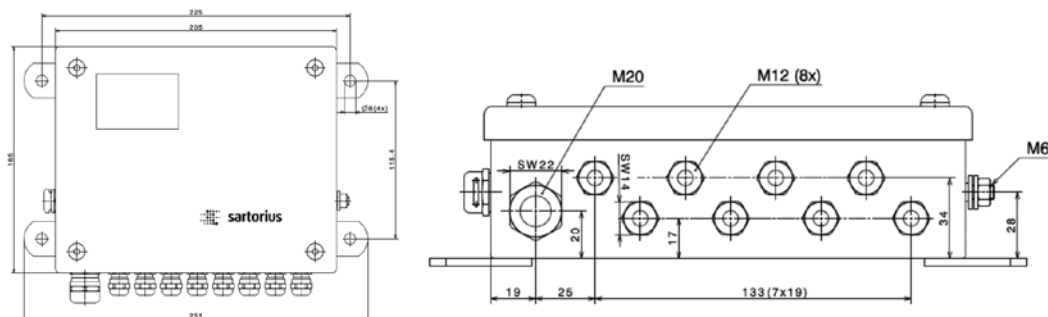


Cable junction box

PR 6021/68



PR 6021/08



* Dimensions in mm