Minebea intec
The true measure

Truck scale load cell PR 6221

Precise, fail-safe and extremely durable

Your benefits

- Maximum reliability thanks to ‘German Quality’
- Precise measurement results for exact load billing
- Maximum reliability thanks to excellent lightning protection
- Optimal protection against water-logging, frost and de-icing salt

The analogue load cell PR 6221 has been specifically designed for use in truck scales. Its unique precision and outstanding longevity reduce service and calibration costs, helping to minimise downtime.

For precise, reliable use of your truck scale

The truck scale load cell PR 6221 is produced in Germany, with the highest level of accuracy and care. Its high quality guarantees **accurate results, durability** and **a medium-term cost reduction**.

The load cell guarantees **extremely accurate measurement results** thanks to its patented measuring element geometry.

Maximum lightning protection: For reliable surge protection and potential equalisation, the PR 6221 can withstand voltages of at least 1000 kV, and currents of up to 100 kA, without damage.

Developed for the harshest ambient conditions the truck scale load cell PR 6221 can withstand water immersion of up to 1.5 m for more than 10,000 hours.

Higher level of safety, lower costs: true ‘German Quality’ that you can trust

The truck scale load cell PR 6221 is synonymous with quality, precision and has a lifespan of at least 15 years. Its reliability reduces service and calibration costs for the long term. This makes the PR 6221 a viable vehicle weighing solution.

The analogue truck scale load cell PR 6221 in detail

- High overload capacity of up to 200% E_{max}
- Housing made from stainless steel
- Inert gas filling in the housing protects strain gauges against corrosion
- Low construction height (ideal for retrofits)
- Also available as an Ex version
- Low risk of twisting due to rubber support ring and optimised radius ratios
- Proven pendulum principle with high restoring forces for fast weighing processes
- Hermetically sealed casing
- Protection classes IP68 and IP69
- Suitable for ambient temperatures of up to +55°C without restricting the technical data
- A special TPE cable protects against heat, sun and chemical stress
- ‘Matched output’ technology eliminates electrical corner correction
- Excellent surge protection

GERMAN QUALITY
German Quality

Explosion protection

Lightning Protection

Easy Installation

High restoring force

When driving onto the truck scale, the forces exerted cause the deflection of the load cell. The restoring force ensures that the load cell returns to its centred rest position as quickly as possible.

Maximum lightning protection

The truck scale load cells PR 6221 meet the requirements

- **Lightning surge (I_{max} = 100 kA) 10 µs/350 µs (lightning protection class III) according to DIN EN 62475**
- **Lightning impulse voltage (U_{max} = 1000 kV) 1.2 µs/50 µs according to DIN EN/IEC 60060-1**

For reliable surge protection, potential equalisation and protection of measuring cables, these analogue load cells – in conjunction with Minebea Intec cable boxes and indicators – can withstand voltages of at least 1000 kV and currents of up to 100 kA without damage.

Matched output ensures time saving

Output impedance (R_o) and parameters (C_n) of the load cells are arranged individually, and in conjunction with a narrow tolerance band (= matched output). This eliminates the need for electrical corner correction and only a mechanical height adjustment is necessary.

Highest IP protection class and regional explosion protection certifications

All truck scale load cells have IP68 and IP69, in accordance with DIN EN 60529. The load cells can be submerged in water with a depth of up to 1.5 m for 10,000 hours, and are protected against pressure/steam jet cleaning.
As an Ex version, it is suitable for the explosion subgroups IIC and IIIC.

Zone	Labelling	Certificate number	Load cell*
0 and 1	II 1G Ex ia IIC T6 Ga Ex ia IIC T6 Ga	BVS 16 ATEX E 005 IECEx BVS 16.0005	PR 6221/..E
20 and 21	II 1D Ex ta IIIC T 160°C Da Ex ta IIIC T 160°C Da	TÜV 03 ATEX 2301X IECEx TUN 17.0025X	PR 6221 with extension for ATEX Zone 20/21
2	II 3G Ex nA IIC T6 Gc	Manufacturer's declaration	PR 6221 with extension for ATEX Zone 2/22
22	II 3D Ex tc IIIC T 85°C Dc	Manufacturer's declaration	PR 6221 with extension for ATEX Zone 2/22
Class I, II, III Div. 1 and 2	IS CL I, II, III, DIV 1, GP A,B,C,D,E,F,G Entity – 4012 101 5688 NI CL I, II, III, DIV 2, GP A,B,C,D,E,F,G NIFW – 4012 101 5688 T4A Ta= -30°C to 70°C; T5 Ta= -30°C to 55°C	FM17US0276	PR 6221 with extension for FM
Class I, II, III Div. 1 and 2	IS CL I, II, III, DIV 1, GP A,B,C,D,E,F,G Entity – 4012 101 5688 NI CL I, II, III, DIV 2, GP A,B,C,D,E,F,G NIFW – 4012 101 5688 T4A Ta= -30°C to 70°C; T5 Ta= -30°C to 55°C	FM17CA0138	PR 6221 with extension for FM

* Please specify the required explosion protection when ordering!

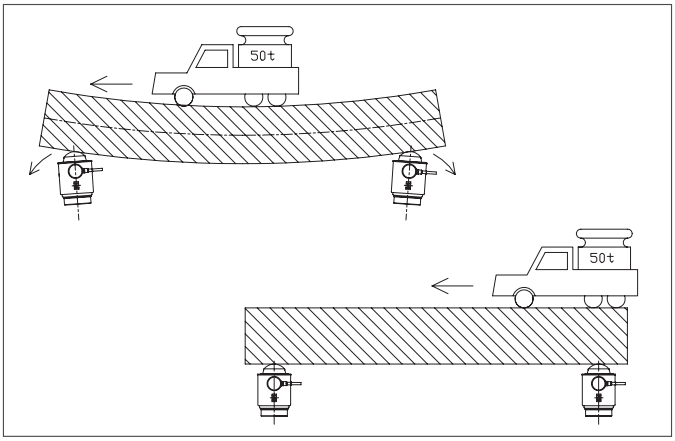
Reduction of displacement errors

With a structurally good scale design, the force transmission point of the load cell is placed on the so-called ‘neutral axis’, i.e. where the force application point does not shift horizontally due to the pressure-induced deflection of the scales.

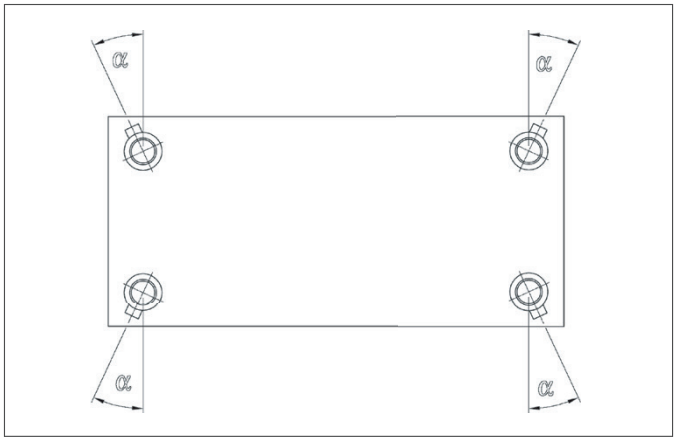
If the force application point is well above/below the neutral axis, the deflection of the scale will cause the force application point to shift away from the centre/towards the centre of the scale. The resulting incline can lead to parameter changes, and therefore to a change in the weight display. This is known as a displacement error.

The Minebea Intec truck scale load cell PR 6221 therefore has a patented displacement error reduction mechanism. The prerequisites for this are:

- **to reduce displacement errors, the adjustment chambers of the load cell must be positioned at an angle of α = 20 to 30°**
- **for scales with more than 4 load cells, those located in the corners of the scales must be aligned accordingly**



Load-induced deflection of the scales can result in inaccurate measurements. The PR 6221 therefore has a patented displacement error reduction mechanism.

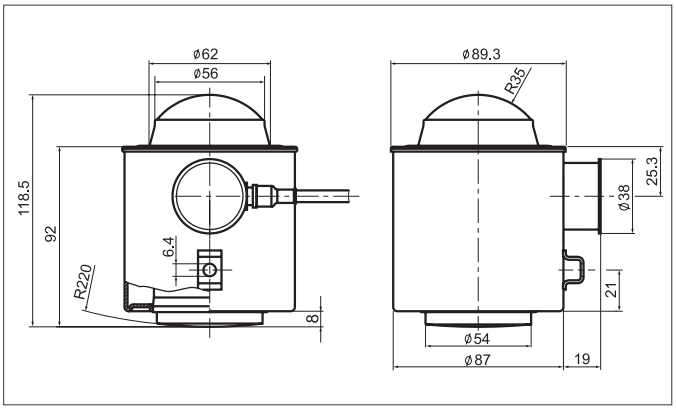


To reduce the number of displacement errors, the adjustment chambers of the load cell must be positioned at an angle of α = 20 to 30°.

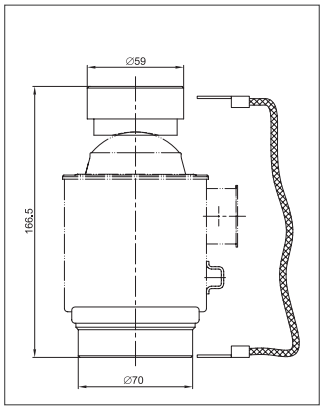
Dimensional drawings of load cells, mounting kits and cable boxes

Here you can select the right components for your truck scale load cell PR 6221. As well as cable boxes and mounting kits, Minebea Intec offers a large portfolio of weighing electronics. Ask us for an individually tailored complete solution!

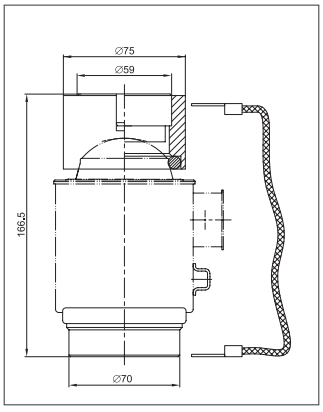
Dimensions* of truck scale load cell PR 6221



Truck scale load cell PR 6221

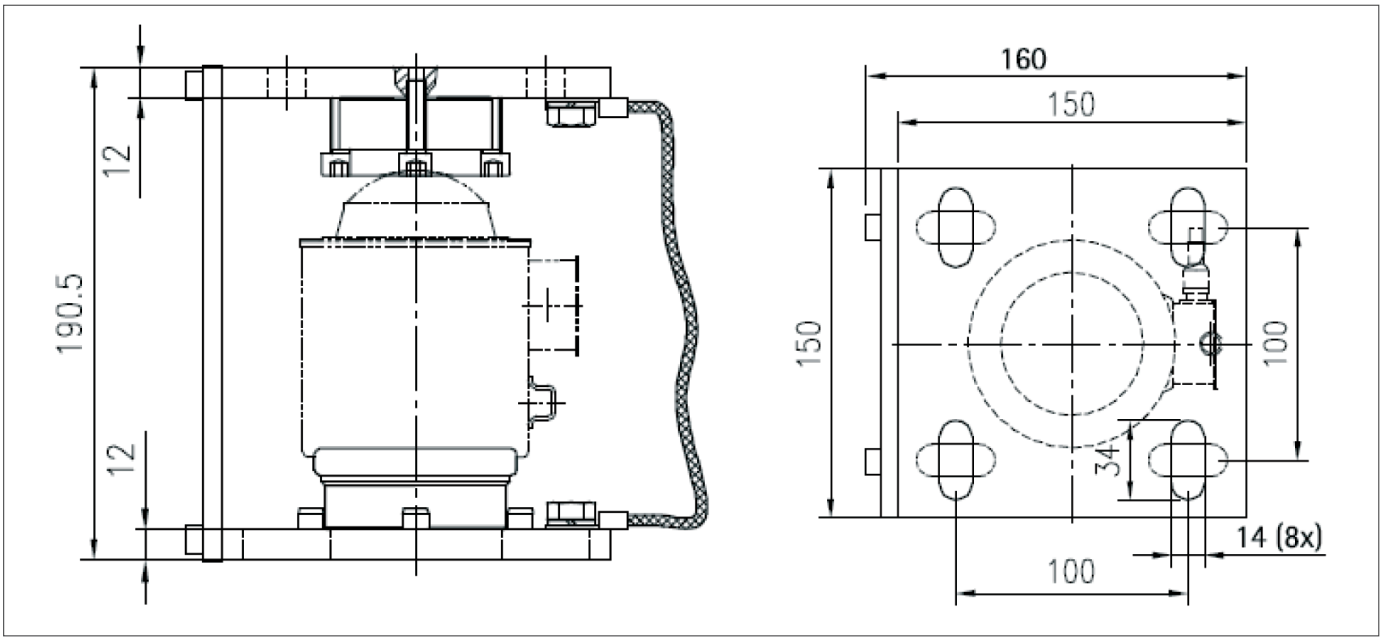


Truck scale load cell PR 6221
with standard load disc kit PR 6021/00N

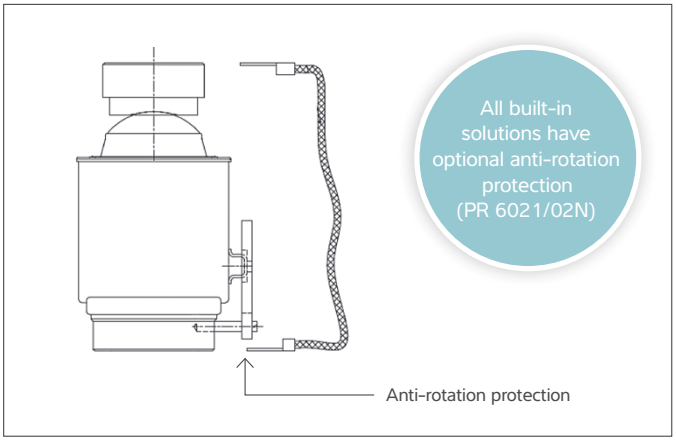


Truck scale load cell PR 6221
with turbo load disc ../04N*

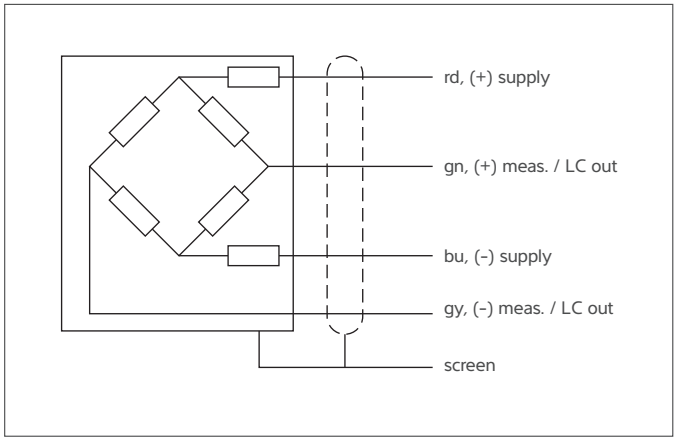
Dimensions* of mounting kit PR 6021/01N, ../03N, ../05N and ../07N



Truck scale load cell PR 6221 in mounting kit PR 6021/01N



Anti-rotation protection



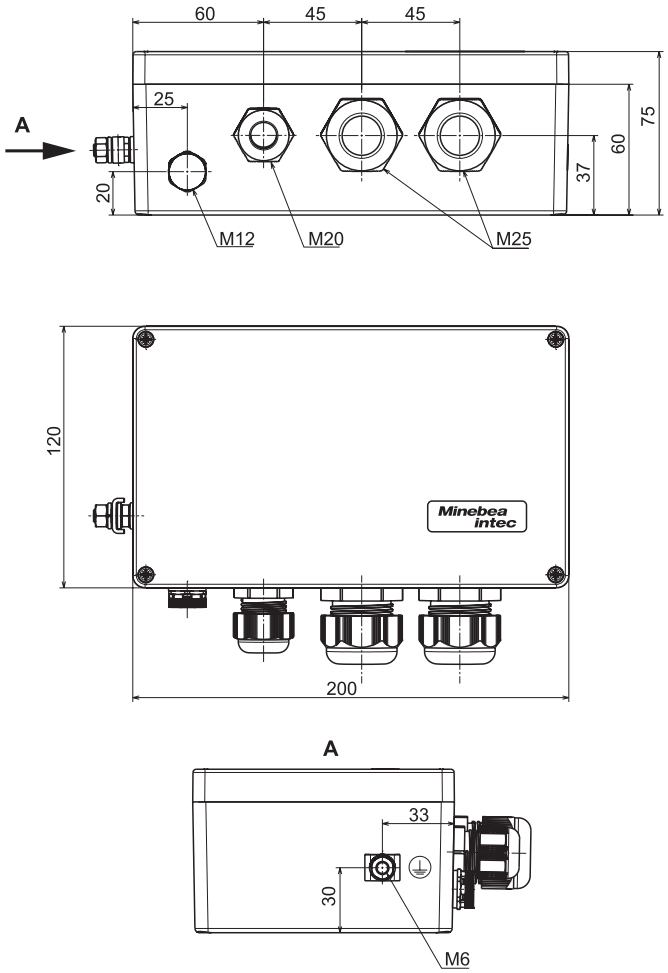
Connection diagram

Mounting kit

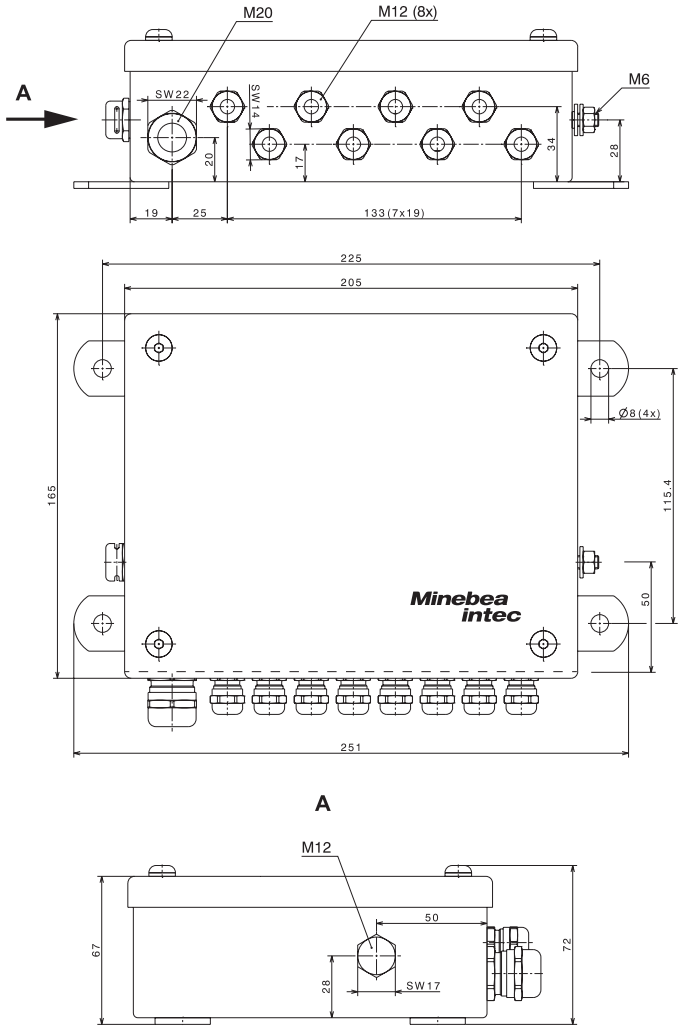
Easy Installation

Dimensions* of cable boxes

Cable boxes PR 6021/08 and PR 6021/18*



Cable box PR 6021/68S*



* All dimensions in mm

Truck scale load cell PR 6221 order information

Type	Maximum capacity	Version according to OIML R60
PR 6221/12.5 t	12.5 t	C3*/C4 C3E/C4E
PR 6221/20 t	20 t	C3*/C4/C5/C6 C3E/C4E/C5E/C6E
PR 6221/25 t	25 t	C3*/C4/C5/C6 C3E/C4E/C5E/C6E
PR 6221/30 t	30 t	C3*/C4/C5/C6 C3E/C4E/C5E/C6E
PR 6221/50 t	50 t	C3*/C4/C5/C6 C3E/C4E/C5E/C6E
PR 6221/60 t	60 t	C3*/C4/C5/C6 C3E/C4E/C5E/C6E
PR 6221/75 t	75 t	C3*/C4/C5/C6 C3E/C4E/C5E/C6E

* NTEP Version (Cl. IIIL 10,000 M) also available

Accessories

Type	Accessories	Description
PR 6021/00N	Load disc and base component	Load disc and base component, ground strap
PR 6021/01N	Mounting kit	Mounting kit (contains PR 6021/00N)
PR 6021/02N	Load disc and base component with anti-rotation protection	Upper and lower load discs with anti-rotation protection
PR 6021/03N	Mounting kit with anti-rotation protection	Mounting kit with upper and lower load discs and anti-rotation protection
PR 6021/04N	Turbo load disc and base component	Upper (turbo) and lower load disc
PR 6021/05N	Mounting kit with turbo load disc	Mounting kit with upper (turbo) and lower load disc
PR 6021/06N	Turbo load disc and base component with anti-rotation protection	Upper (turbo) and lower load disc with anti-rotation protection
PR 6021/07N	Mounting kit with turbo load disc and anti-rotation protection	Mounting kit with upper (turbo) and lower load disc and anti-rotation protection
PR 6021/08	Cable box	Truck scale cable box with up to 8 load cells PR 6221
PR 6021/18	Cable box with potentiometers	Cable box with potentiometers for truck scales with up to 8 load cells PR 6221
PR 6021/68S	Cable box, ex	Cable box for truck scales (Ex version), stainless steel with lightning protection

Technical data – Truck scale load cell PR 6221

Designation	Description	Abbr.	C3*	C4*	C5*	C6*	Unit
Accuracy class			0.015	0.012	0.010	0.008	% E_{max}
Minimum dead load	lowest limit of specified measuring range	E_{min}	0				% E_{max}
Maximum capacity	highest limit of specified measuring range	E_{max}	12.5 to 75				t
Safe load limit	maximum load possible without irreversible damage for E_{max} = 12.5 and 25 t for E_{max} = 20 t for E_{max} = 30 t for E_{max} ≥ 50 t	E_{lim}	 37.5 40 60 75	 37.5 40 60 75	 ... 40 60 75	 ... 40 60 75	t
Destructive load	danger of mechanical destruction for E_{max} = 12.5 and 25 t for E_{max} = 20 t for E_{max} = 30 t for E_{max} ≥ 50 t	E_d	 >75 >100 >150 >150	 >75 >100 >150 >150	 ... >100 >150 >150	 ... >100 >150 >150	t
Minimum LC verification	minimum load cell scale interval $v_{min} = E_{max}/Y$ E_{max} = 12.5 t	Y	 14,000 14,000	 20,000 18,000	 20,000 ...	 20,000 ...	
Deadload output return	Factor for dead load output return after load (DR = ½* E_{max}/Z) for E_{max} ≥ 50 t	Z	 6000 6000	 8000 (1) 6000	 8000 (1) 6000	 8000 (1) ...	
Rated output	relative output signal at maximum capacity for E_{max} = 12.5 t for E_{max} = 20 t, 30 t for E_{max} = 25 t for E_{max} = 50 t for E_{max} = 60 t for E_{max} = 75 t	C_n	 1.0 1.0 2.0 2.0 2.4 3.0	 1.0 1.0 2.0 2.0 1.5 1.5	 ... 1.0 2.0 1.5 1.5 1.5	 ... 1.0 2.0 1.5 1.5 1.5	mV/V
Tolerance on rated output	permissible deviation from rated output C_n	d_c	<0.07				% C_n
Zero output signal	load cell output signal under unloaded condition	S_{min}	<1.0				% C_n
Reproducibility	max. change in load cell output for repeated loading	ε_R	<0.005				% C_n
Creep	max. change of output signal at E_{max} during 30 minutes	d_{cr}	<0.015	<0.0125	<0.010	<0.008	% C_n

Table continues on the next page

Technical data – Truck scale load cell PR 6221

Designation	Description	Abbr.	C3*	C4*	C5*	C6*	Unit
Accuracy class			0.015	0.012	0.010	0.008	% E_{max}
Linearity deviation	deviation from best straight line through zero	d_{Lin}	<0.01				% C_n
Hysteresis	max. difference 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} per 10 K over B_t referred to C_n	TK_{Smin}	<0.01	<0.007	<0.007	<0.007	% C_n /10 K
Temperature effect on C	max. change of C per 10 K 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}	1080 ± 10				Ω
Output impedance	between measuring terminals for E_{max} ≤ 30 t for E_{max} = 50 t for E_{max} = 60 t for E_{max} = 75 t	R_O	 1010 ± 1 1010 ± 1 1010 ± 1 1010 ± 1	 1010 ± 1 1010 ± 1 635 ± 1 510 ± 1	 1010 ± 1 760 ± 1 635 ± 1 510 ± 1	 1010 ± 1 760 ± 1 635 ± 1 510 ± 1	Ω
Insulation impedance	between measuring circuit and housing at 100 V_{DC}	R_{IS}	>5000				MΩ
Insulation voltage	between circuit and housing (for PR 6221/ ..E only)		500				V
Recommended supply voltage	to hold the specified performance	B_u	4 to 24				V
Max. supply voltage	permissible for continuous operation without damage for PR 6221/ ..E	U_{max}	32 25				V
Nominal ambient temp. range	to hold the specified performance	B_T	-10 to +55				°C
Service temperature range	permissible for continuous operation without damage	B_{Tu}	-40 to +95				°C
Storage temperature range	without electrical and mechanical stress	B_{Ti}	-40 to +95				°C
Marginal eccentricity	accepted distance from measuring axis	S_{ex}	10				mm
Vibration resistance	resistance against oscillations (IEC 68-2-6 Fc)		20 g, 100 h, 10 to 150 Hz				
Ambient pressure impact	influence of ambient air pressure on S_{min}	PK_{Smin}	420				g/kPa
Nominal deflection	max. elastic deforming under maximum capacity for E_{max} = 12.5 t for E_{max} = 20 t for E_{max} = 25 t for E_{max} = 30 t for E_{max} = 50 t for E_{max} = 60 t for E_{max} = 75 t	S_{nom}	 0.2 0.4 0.5 0.5 0.8 0.9 1.1	 0.2 0.4 0.5 0.5 0.8 0.9 1.1	 ... 0.4 0.5 0.5 0.8 0.9 1.1	 ... 0.4 0.5 0.5 0.8 0.9 1.1	mm
Material (housing)			1.4301 (DIN EN 10088-3)				
Protection class			IP68 + IP69				
Cables			TPE colour: green, ø 5 mm, lead: 4 × 0.35 mm^2, length: 16 m PR 6221/ ..E TPE colour: blue, ø 5 mm, lead: 4 × 0.35 mm^2, length: 20 m				
Bending radius			≥ 25 mm in case of fixed installation ≥ 75 mm in case of flexible installation				

* Accordingto OIML R60
(1) Z = 8000 for -10°C to +40°C, over +40°C Z = 6000

The technical data given serves as a product description only and should not be understood as guaranteed properties in the legal sense.

Specifications subject to change without notice.

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