Mounting Instructions | Montageanleitung | Notice de montage

English | Deutsch | Français

PW29P

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1 Safety instructions

Appropriate use

Load cells of the PW29P… type series are designed for technical weighing applications within the load limits stipulated in the specifications. Any other use is not appropriate.

Load cells may only be installed by qualified personnel in compliance with the specifications and with the safety requirements and regulations of these mounting instructions. It is also essential to observe the applicable legal and safety regulations for the application concerned. The same applies to the use of accessories.

Load cells are not intended for use as safety components. Please also follow the instructions in the “Additional safety precautions" section. Proper and safe operation of the load cells requires proper transportation, correct storage, siting and mounting, and careful operation.

Load carrying capacity limits

The data in the technical data sheets must be complied with when using the load cells. In particular, the respective maximum loads specified must never be exceeded. The values stated in the technical data sheets must not be exceeded, for example, for

- Limit load
- Limit load at max. eccentricity
- Limit lateral loading
- Breaking loads
- Temperature limits
- Limits of electrical loading capacity

Note, that when several load cells are installed in a scale, there is not always an even distribution of load on the individual load cells.

Use as a machine element

The load cells can be used as machine elements. When used in this manner, it must be noted that, to favor greater sensitivity, the load cell is not designed with the safety factors usual in mechanical engineering. Please refer here to the section “Load carrying capacity limits" and to the specifications.

Accident prevention

The prevailing accident prevention regulations must be taken into account, even though the maximum capacity values in the destructive range are well in excess of the full scale value.

Additional safety precautions

Load cells cannot (as passive transducers) implement any (safety-relevant) cutoffs. This requires additional components and constructive measures for which the installer and operator of the plant is responsible.

In cases where a breakage or malfunction of the load cells would cause injury to persons or damage to equipment, the user must take appropriate additional safety measures that meet at least the requirements of applicable safety and accident prevention regulations (e.g. automatic emergency shutdown, overload protection, catch straps or chains, or other fall protection).

The electronics conditioning the measurement signal should be designed so that measurement signal failure does not cause damage.

General dangers of failing to follow the safety instructions

Load cells are state-of-the-art and reliable. There may be risks involved if the transducers are mounted, sited, installed and operated inappropriately, or by untrained personnel. Everyone involved with siting, starting up, operating or repairing a load cell must have read and understood the mounting instructions and in particular the technical safety instructions. The load cells can be damaged or destroyed by non-designated use of the load cells or by non-compliance with the mounting and operating instructions, these safety instructions or any other applicable safety regulations (BG safety and accident prevention regulations) when using the load cells. Load cells can break, particularly in the case of overloading. The breakage of a load cell can also cause damage to property or injury to persons in the vicinity of the load cell.

If load cells are not used according to their designated use, or if the safety instructions or specifications in the mounting and operating instructions are ignored, it is also possible that the load cells may fail or malfunction, with the result that persons or property may be affected (due to the loads acting on or being monitored by the load cells).

The scope of supply and performance of the transducer covers only a small area of weighing technology, as measurements with (resistive) strain gauge sensors presuppose the use of electronic signal conditioning. In addition, equipment planners, installers and operators should plan, implement and respond to the safety engineering considerations of the weighing technology in such a way as to minimize residual dangers. Pertinent national and local regulations must be complied with.

Conversions and modifications

The transducer must not be modified from the design or safety engineering point of view except with our express agreement. Any modification shall exclude all liability on our part for any damage resulting therefrom.

Maintenance

PW29P… load cells are maintenance free.

Selling on

If the load cell is sold on, these mounting instructions must be included with the load cell.

Environmental protection, disposal

In accordance with national and local environmental protection, material recovery and recycling regulations, old transducers that can no longer be used must be disposed of separately and not with normal household waste.

If you need more information about disposal, please contact your local authorities or the dealer from whom you purchased the product.

Qualified personnel

Qualified personnel means persons entrusted with siting, mounting, starting up and operating the product, who possess the appropriate qualifications for their function.

This includes people who meet at least one of the three following requirements:

1. Knowledge of the safety concepts of automation technology is a requirement and as project personnel, you must be familiar with these concepts.
2. As automation plant operating personnel, you have been instructed how to handle the machinery. You are familiar with the operation of the equipment and technologies described in this documentation.
3. As system startup engineers or service engineers, you have successfully completed the training to qualify you to repair the automation systems. You are also authorized to ground and label circuits and equipment and place them in operation in accordance with safety engineering standards.

2 Markings used

2.1 The markings used in this document

Important instructions for your safety are specifically identified. It is essential to follow these instructions in order to prevent accidents and damage to property.

Symbol	Significance
 **WARNING**	This marking warns of a *potentially* dangerous situation in which failure to comply with safety requirements *can* result in death or serious physical injury.
 **CAUTION**	This marking warns of a *potentially* dangerous situation in which failure to comply with safety requirements *can* result in slight or moderate physical injury.
Notice	This marking draws your attention to a situation in which failure to comply with safety requirements *can* lead to damage to property.
 **Important**	This marking draws your attention to *important* information about the product or about handling the product.
 **Tip**	This marking indicates application tips or other information that is useful to you.
 **Information**	This marking draws your attention to information about the product or about handling the product.
Emphasis *See….*	Italics are used to emphasize and highlight text and references to other chapters and external documents.

2.2 Symbols on the product

CE mark

The CE mark enables the manufacturer to guarantee that the product complies with the requirements of the relevant EC directives (the declaration of conformity is available at http://www.hbm.com/HBMdoc).

3 Conditions on site

Series PW29P load cells are hermetically encapsulated and are therefore not at all sensitive to the influence of moisture and humidity. The transducers attain protection class IP68 (test conditions: 100 hours under 1m water column) and IP69K (water at high pressure, steam cleaner), as per DIN EN60529. Nevertheless, the load cells must be protected against constant humidity and moisture.

3.1 Protection against corrosion

The load cell must be protected against chemicals that could attack the transducer body steel, or the cable.

Notice

Acids and all substances that release ions also attack stainless steels and their welded seams.
Should there be any corrosion, this could cause the transducer to fail. If this is the case, you must provide appropriate means of protection.

3.2 Deposits

Dust, dirt and other foreign matter must not be allowed to accumulate sufficiently to divert some of the measuring force onto the housing, thus invalidating the measured value (force shunt).

4 Mechanical installation

4.1 Important precautions during installation

- Handle the transducer with care.
- Welding currents must not be allowed to flow over the transducer. If there is a risk that this might happen, you must provide a suitable low-ohm connection to electrically bypass the transducer. HBM provides the highly flexible EEK ground cable for this purpose, for example, that is screwed on above and below the transducer.
- Make sure that the transducer cannot be overloaded.

WARNING

There is a danger of the transducer breaking if it is overloaded. This can cause danger for the operating personnel of the system in which the transducer is installed.

Implement appropriate safety measures to avoid overloads or to protect against the resulting dangers.

Notice

Load cells are precision measuring elements and need to be handled carefully. Dropping or knocking the transducer may cause permanent damage. Make sure that the transducer cannot be overloaded, including while it is being mounted.

4.2 Mounting

Attach the load cells at the mounting holes and apply load to the other end. The screws and tightening torques to be used are given in the following table:

Maximum capacity	Thread	Min. property class	Tightening torque[1)]
100 … 250 kg	M8	10.9	35 N·m
500 … 1000 kg	M12	10.9	110 N·m

1) Recommended value for the specified property class. Please comply with the screw manufacturer's instructions with regard to screw dimensions

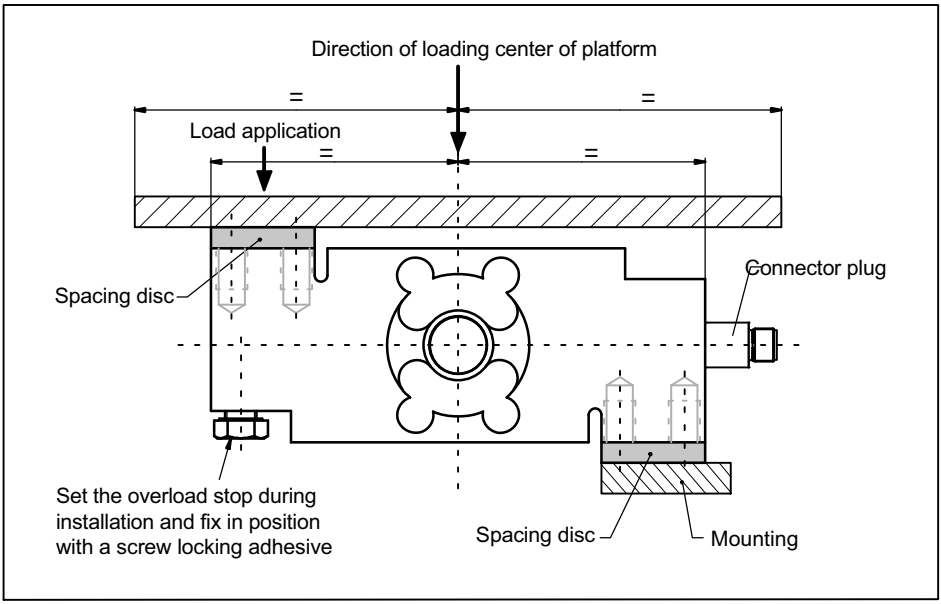


Fig. 4.1 Load application and installation

Important

Load must not be applied to the side where the cable connection is located, as this would cause a force shunt.

Setting the overload stop

Type PW29P load cells are fitted with an adjustable overload stop. Set this overload stop before starting up the load cell.

To do this, load the installed load cell with approx. 120% of the service load, at the maximum eccentricity for the particular application. The maximum permissible loadings stated in the specifications must not be exceeded. Note in particular the “Limit load at max. 100 mm eccentricity" specification, and take into consideration the moment produced by the eccentricity in your individual application. Then adjust the screw of the overload stop and fix it in position with a screw locking adhesive, such as Loctite.

5 Electrical connection

The following can be connected for measurement signal conditioning:

- Carrier-frequency amplifiers
- DC amplifiers

designed for strain gauge measurement systems.

The load cells are supplied in the standard version with an 8-pin plug in a six-wire configuration. The load cells are optionally available with different cable lengths and with a hygienic design connection cable.

5.1 Connection in a six-wire configuration

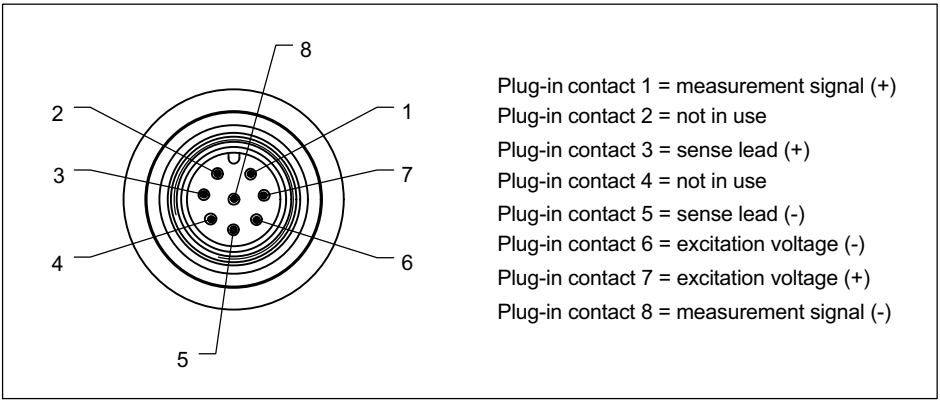


Fig. 5.1 Connector pin assignment

With this connector pin assignment, the output voltage at the measuring amplifier is positive when the transducer is loaded (*see Fig. 4.1*). The pin assignment for the cables available as accessories can be found in Section 8 on page 18.

5.2 Connection in a four-wire configuration

When transducers in a six-wire configuration are connected to amplifiers in a four-wire configuration, the sense leads of the transducer must be connected to the corresponding excitation voltage leads: Marking (+) with (+) and marking (-) with (-), *see Fig. 5.1*. This measure also reduces the cable resistance of the excitation voltage leads. However, there will be a voltage loss on the supply leads due to the cable resistance that is still present and not compensated for by the six-wire configuration. A large part of this loss can be eliminated by a calibration, however, the temperature-dependent part remains.

Important

The TK_c value given in the specifications for the transducer therefore does not apply for the cable and transducer combination when connection is in a four-wire configuration, where the cable percentage must be added.

5.3 Shortening the cable

If the transducer is connected to an amplifier in a six-wire configuration, the transducer cable can be shortened as required, without adversely affecting the measurement accuracy.

5.4 Extension cable

Only use shielded, low-capacitance measurement cables for extending. Ensure that connection is perfect, with a low contact resistance.

The cable of a six-wire transducer can be extended with a cable of the same type.

5.5 EMC protection

Important

The load cells with shielded, round cables are EMC-tested in accordance with EC directives and identified by CE certification. However, you must connect the shield of the connection cable on the shielding electronics enclosure in order to achieve EMC protection for the measuring chain.

Electrical and magnetic fields often induce interference voltages in the measuring circuit. Therefore:

- Use shielded, low-capacitance measurement cables only (HBM cables fulfill both conditions).
- Do not route the measurement cables parallel to power lines and control circuits. If this is not possible, protect the measurement cable with steel conduits, for example.
- Avoid stray fields from transformers, motors and contact switches.
- Do not ground the transducer, amplifier and indicator more than once.
- Connect all devices in the measuring chain to the same protective earth conductor.

To ensure the best EMC protection, the load cell, together with the connection cable and the subsequent electronics, should be placed in a shielded housing.

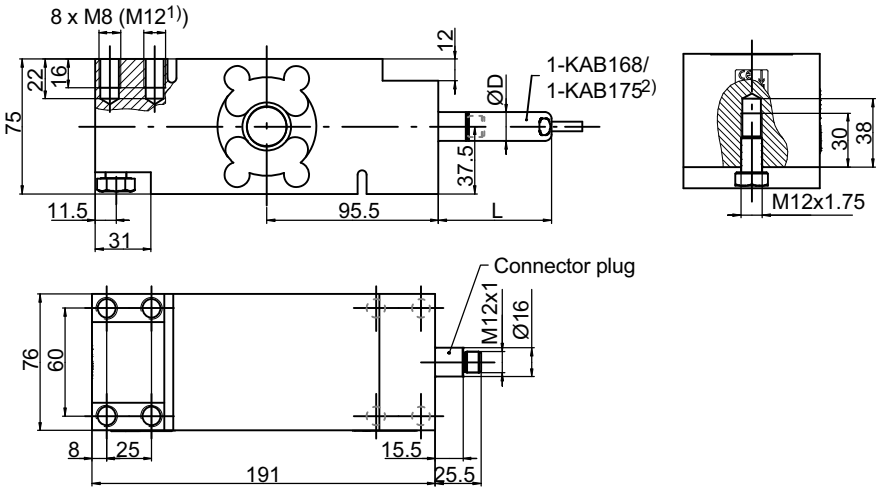
6 Specifications

Information

Further product information can be found at www.hbm.com/pw.

7 Dimensions

Dimensions (in mm; 1 mm = 0.03937 inches)



1) M12 for maximum capacities 500 kg to 1000 kg

2) 1-KAB168: ØD = 14.5; L = 62
1-KAB175: ØD = 16; L = 62

8 Accessories

Connection cable	
Connection cable with M12 F connector, 8-pin, TPU IP67, PUR cable sheath, 5 m long	1-KAB168-5
Connection cable with M12 F connector, 8-pin, TPU IP67, PUR cable sheath, 20 m long	1-KAB168-20
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 3 m long	1-KAB175-3-1
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 6 m long	1-KAB175-6-1

For connection cable specifications, see separate data sheet B3643.

Pin assignment 1-KAB168

Color code	Connection
White	Measurement signal (+)
Red	Measurement signal (-)
Blue	Excitation voltage (+)
Pink	Excitation voltage (-)
Green	Sense lead (+)
Gray	Sense lead (-)
Yellow	Not in use
Brown	Not in use

Pin assignment 1-KAB175

Color code	Connection
White	Measurement signal (+)
Red	Measurement signal (-)
Blue	Excitation voltage (+)
Black	Excitation voltage (-)
Green	Sense lead (+)
Gray	Sense lead (-)