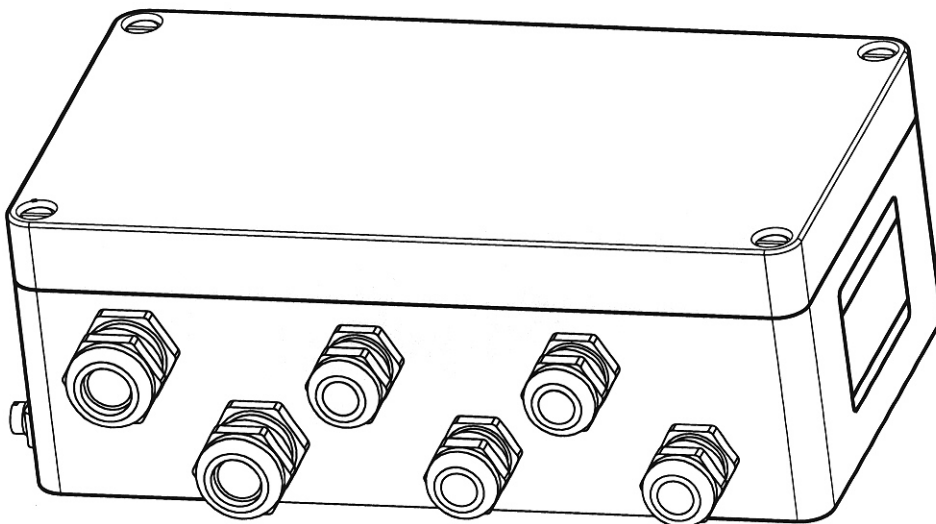


# SIEMENS

## SIWAREX JB Aluminum Housing

Instruction Manual

Edition 03/2006



# Table of Contents

<b>Table of Contents</b> .....	<b>2</b>
<b>Warning and Safety Terms</b> .....	<b>3</b>
<b>General</b> .....	<b>4</b>
<b>1 Technical Description</b> .....	<b>5</b>
1.1 Area of Application .....	5
1.2 Structure .....	5
1.3 System Configuration.....	6
<b>2 Installation/Assembly</b> .....	<b>7</b>
2.1 Installation.....	7
2.2 Connection.....	7
2.3 Installation.....	11
2.4 Spring Terminal Connection Technique .....	13
<b>3 Commissioning</b> .....	<b>14</b>
<b>4 Technical Data</b> .....	<b>15</b>
4.1 Functional Data.....	15
4.2 Device Version.....	15
4.3 Explosion Protection .....	15
4.4 Electromagnetic Compatibility .....	16
4.5 Dimensions .....	16
<b>5. Care and Maintenance</b> .....	<b>17</b>
<b>6. Ordering Data</b> .....	<b>18</b>

# Warning and Safety Terms



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## DANGER

Means, that death, severe injury to persons or damage to equipment **will** be caused if the respective safety measures have not been taken.

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## WARNING

Means, that death or severe injury **can** be caused if the respective safety measures are not taken.

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## CAUTION

With a warning triangle means that failure to take the necessary precautions may lead to minor injury.

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## CAUTION

Without a warning triangle means that failure to take the necessary precautions may lead to property damage.

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## IMPORTANT

Means that failure to observe the appropriate instructions may lead to an undesirable result or condition.

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## NOTE

Means a note of a possible benefit if recommendations are followed.

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**Qualified personnel** as referred to in the safety instructions in this manual and on the product itself are individuals who are familiar with the installation, assembly, initial start-up and operation of this product. They must be authorized and qualified to install, start and maintain devices, systems and circuits in accordance with national safety rules and regulations.

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### Disclaimer

We have tested the contents of this document for compatibility with the hardware and software described. This does not exclude the possibility of discrepancies, in which case we do not guarantee the complete compatibility of this document. The information in this document is assessed regularly and any necessary corrections are included in the next revision. We are grateful for any suggestions for improvement.

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# General

## Intended Utilization

Intended utilization means that this product is only to be utilized within the limitations defined in the technical specifications and purposes of use in this operating manual.

There are no dangers associated with this device when conforming with the safety notes and the intended utilization.

The fail-safe and secure operation of this device depends on proper transportation, storage, installation and assembly as well as on careful operation and commissioning.

Proper operation of this device can only be ensured if the specifications provided in the technical data are observed.

Improper handling can cause death, bodily harm and damage to equipment.

## Notes on Product Liability

We expressly point out that the nature of the product is described exclusively and conclusively in the sales contract. The content of this product documentation is not part of an earlier or existing agreement, promise or legal relationship and neither shall it change any of these. All Siemens obligations ensue from the respective contract of sale which also contains the full and exclusively valid liability regulation. The provisions about product liability specified in the contract of purchase are not extended or limited by the information provided in this document.

## Delivery Notes

The respective scope of delivery is listed on the enclosed shipping documents according to the valid contract of sale.

Please observe the instructions printed on the packaging when opening. Check that the delivered goods are complete and undamaged. In particular, compare the order number on the type plate with the order data.

Please read this manual before starting work! It contains important instructions and data which guarantee the general safety and functionality of this device when observed. This considerably simplifies handling of this product and leads to reliable measuring results.

# 1 Technical Description

## 1.1 Area of Application

The SIWAREX JB junction box made of die-cast aluminum serves for connecting load cells with the weigh module. Up to four load cells can be connected in parallel in one junction box (fig. 1-1). Another junction box must be connected in parallel by a cross connection in case of more than 4 load cells (fig. 1-2).

Load cells with wire strain gages in 4 and 6-wire technology can be connected in parallel.

The cable connection from the junction box to the weigh module and between two junction boxes must be made in 6-wire technique.

The SIWAREX JB junction box may only be used with low voltages of  $\leq 30$  V.

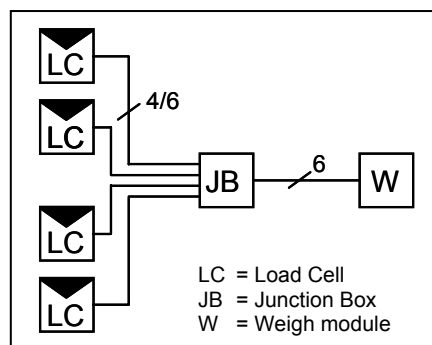


Fig. 1-1 Connection principle of 4 load cells

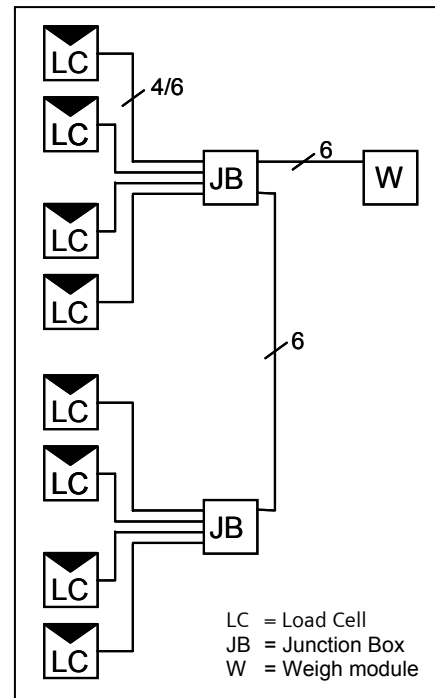


Fig. 1-2 Connection principle of 8 load cells

## 1.2 Structure

The housing is made of a heavy duty, powder-coated die-cast aluminum AISi12. It consists of bottom part and lid. It is dustproof and splash proof according to the IP 66 degree of protection. The cables are fed into the housing through screw cable glands. High electromagnetic compatibility (EMC) is only achieved by the large area of the shield in the screw cable gland. The screw cable glands are made of nickel-plated brass.

The electrical conductors are wired by spring terminals. The spring terminal technology guarantees vibration-free, maintenance-free connections. The contact reliability is permanently guaranteed.

A potential equalization line can be connected via a PAL terminal.

### 1.3 System Configuration

The SIWAREX JB junction box is used in technical weighing systems for parallel connection of up to four wire strain gage load cells. If more than four load cells are to be connected to a weigh module, several junction boxes can be connected to each other by cross connections. Load cells can be connected in 4 and 6-wire technology.

The technical data of the weigh module and load cells used must be observed with the maximum number of load cells. The total resistance of the parallel switched load cells must be in the range of the permissible load resistance of the weigh module.

The junction box is connected with the weigh module with a signal cable. A shielded cable with six wires must be used as the signal connection. We recommend the SIWAREX cable Li2Y2x0,75St+2x(2x0,34St)-CY:

- 7MH4 702-8AG, orange coated, for standard applications or
- 7MH4 702-8AF, blue coating, for Ex-applications.

The maximum cable length between load cells and weigh module can be found in the technical data of the weigh module. Intermediate elements such as Ex disconnectors must be taken into account.

## 2 Installation/Assembly

### 2.1 Installation

The SIWAREX JB junction box may only be installed and connected by qualified personnel.

### 2.2 Connection

The connection of load cells with 4 or 6-wire technique to a weigh module must be made according to the wiring diagrams in fig. 2-1 or fig. 2-2, page 8. Analogously, several load cells are also connected in parallel.

The pinout of the terminals is shown in fig. 2-3, page 9. Four terminals are connected in signal blocks with a plug-in bridge.

The cable shields in the EMC screw cable glands should cover a large area (fig. 2-4, page 9). EMC cable glands and sealing plugs are delivered with the junction box. They should be mounted according to the number of load cells. Unused openings in the housing should be sealed with sealing plugs.

The pinout of the screw cable glands is shown in fig. 2-5, page 10.

When connecting load cells using 4 wires, two bridges are absolutely necessary:

Bridge 1: EXC- to SENSE-  
Bridge 2: EXC+ to SENSE+

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#### **IMPORTANT**

If the two bridges EXC-/SENSE- and EXC+/SENSE+ are missing in load cells in 4-wire technology, this can be signaled by the weigh module as a wire break.

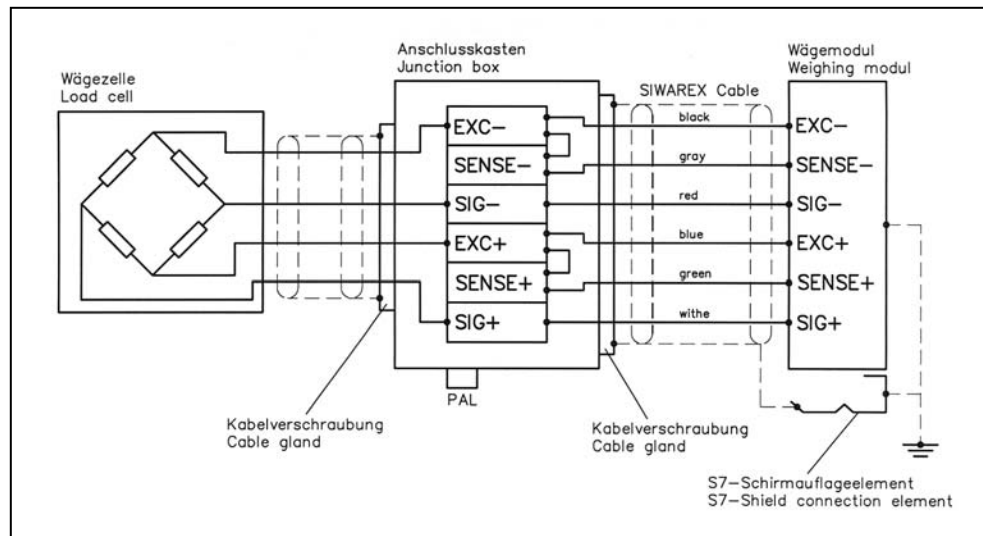


Fig. 2-1 Load cell connection by 4-wire technique

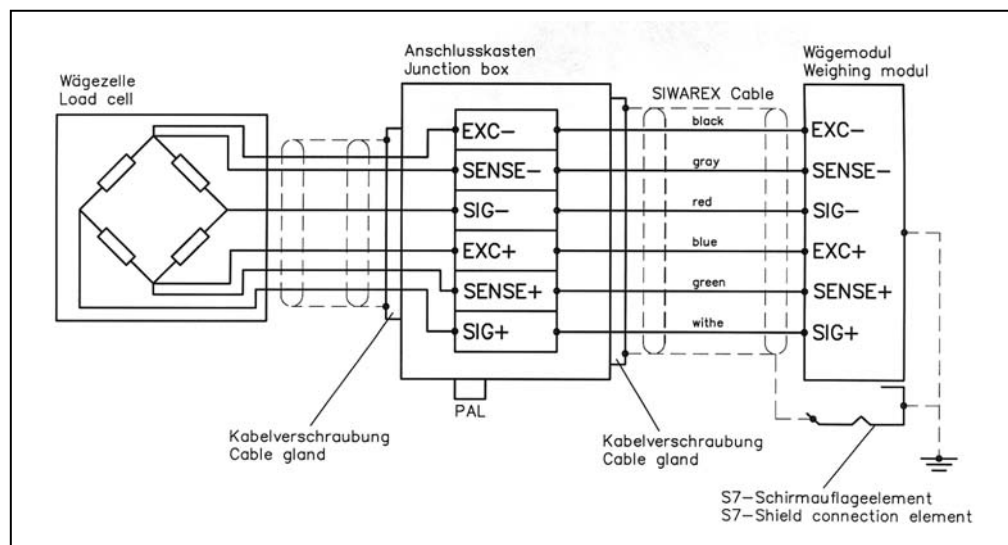


Fig. 2-2 Load cell connection by 6-wire technique



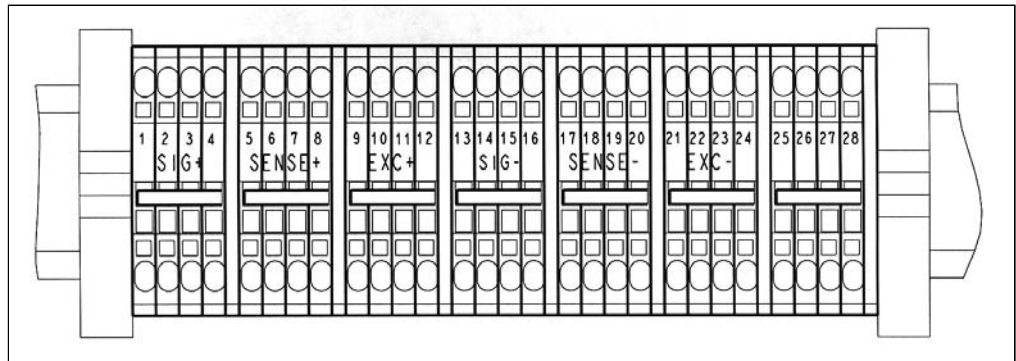


Fig. 2-3 Terminal block

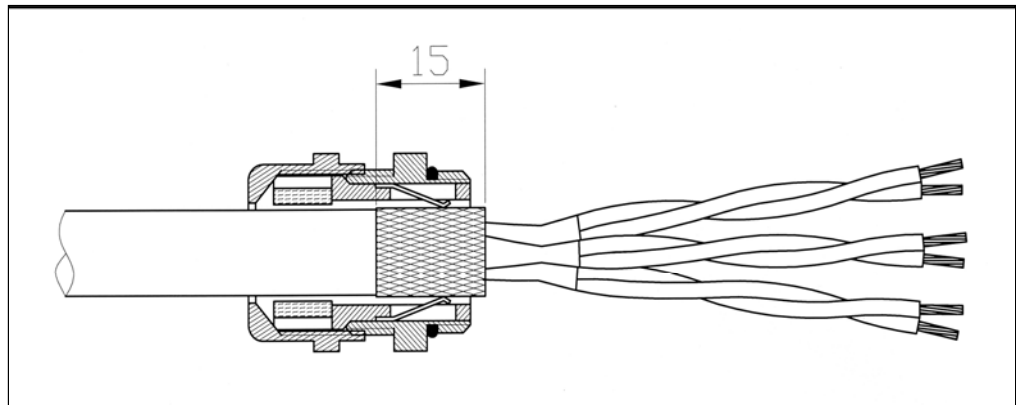


Fig. 2-4 Shield in the screw cable gland

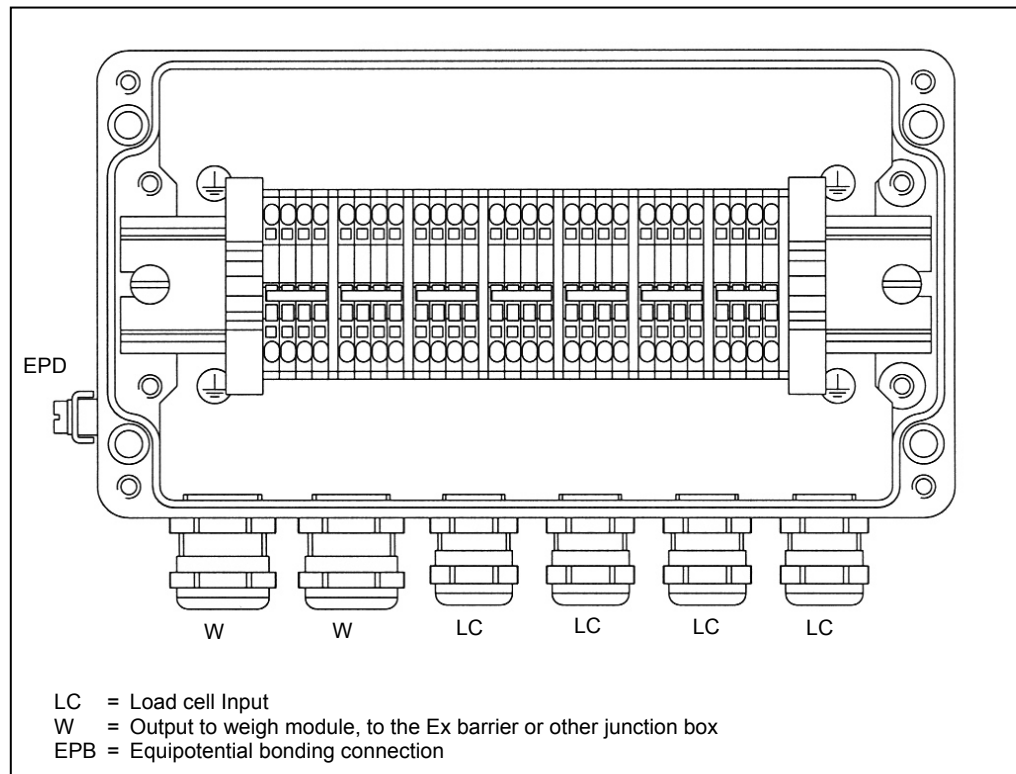


Fig. 2-5 Pinout of the screw cable glands

## 2.3 Installation

The SIWAREX JB junction box can be mounted in any position. It should preferably be mounted horizontally. It is fixed with four M6 cylinder head screws. The dimensions of the fastening holes are shown in fig. 2-6, page 12.

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### CAUTION

Please check before closing the cover that there is no dirt or cable scraps in the housing that could cause malfunctions or short circuits.

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### CAUTION

The device protection degree is only guaranteed when the housing is closed. The lid must be mounted, necessary cable glands must be mounted and tightened. Unused openings for screw cable glands must be sealed with the sealing plugs provided. Please check that the sealing surfaces are clean and the o-rings are correctly in place on screw cable glands and sealing plugs.

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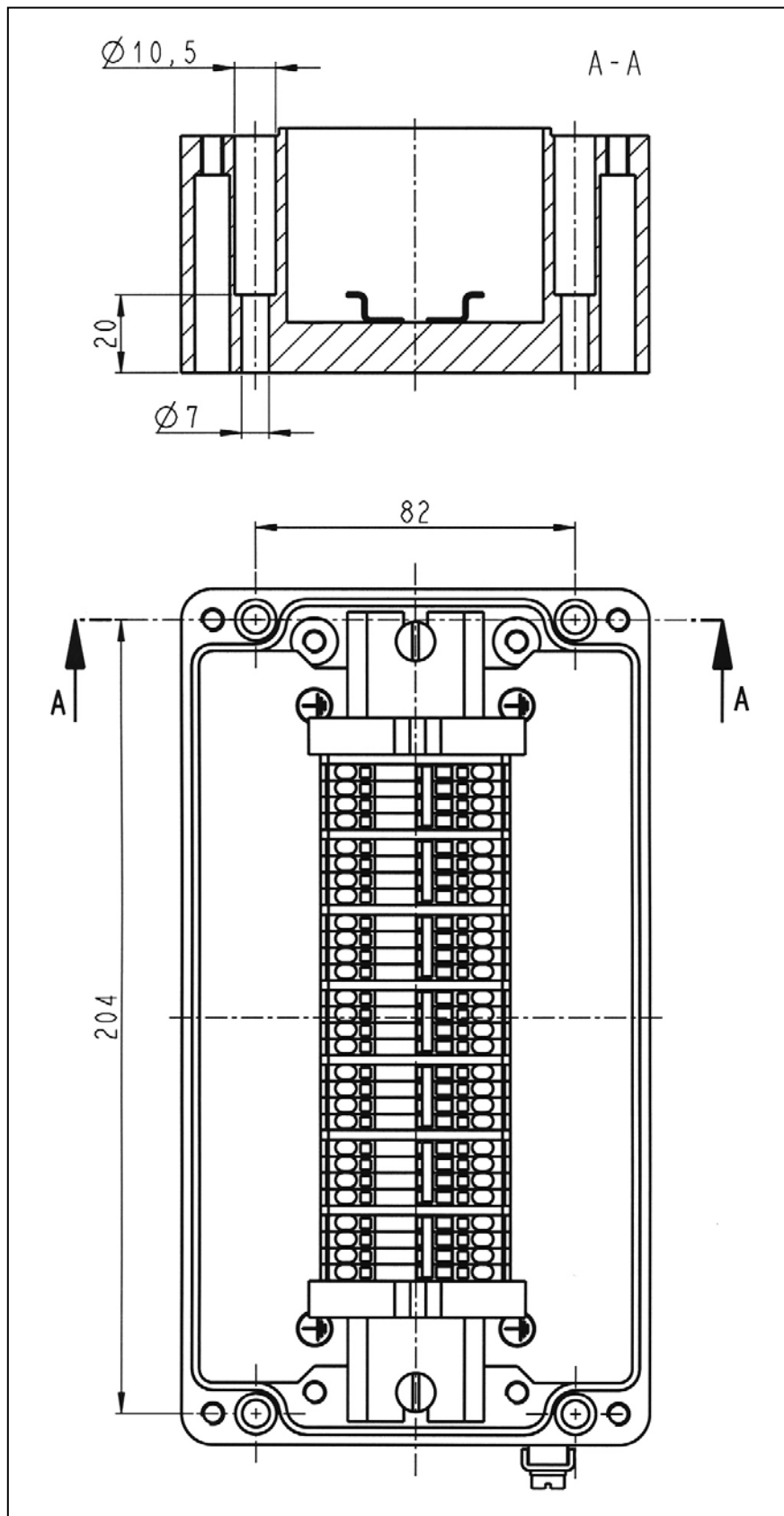


Fig. 2-6 Dimensions of the fastening holes

## 2.4 Spring Terminal Connection Technique

A screwdriver with a maximum blade width of 2.5 mm is required to connect the cables. It is pressed into the rectangular opening (1). This opens the spring bracket. The stripped cable is pushed through the round opening to the stop (2). The cable is contacted tightly in the spring bracket by pulling out the screwdriver (3). (Fig. 2-7)

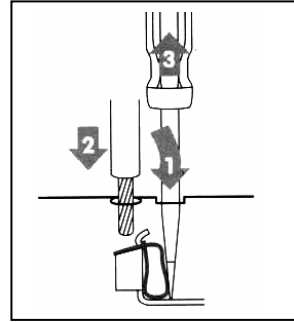


Fig. 2-7 Connection of spring terminals

The cables are stripped 8 to 9 mm. (Fig. 2-8)

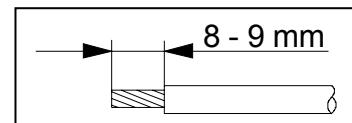


Fig. 2-8 Stripping length

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### IMPORTANT

With smaller cable cross sections there is a danger of the stripped wire being snapped off when inserting in the terminal. The line is then connected to the insulation. The result is contact problems. Crimp-on sleeves prevent these problems.

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The following cables can be connected.

0.08 to 1.5 mm<sup>2</sup> / AWG 28 to 16:

Single-wire, multi-wire, fine-wire – also with tinned single wires, fine-wire – stranded wire compressed and fine wire with gas-tight crimp-on pin cable shoe.

0.08 to 1 mm<sup>2</sup> / AWG 28 to 18:

Fine wire with gas-tight crimped on end sleeves.

### **3 Commissioning**

Since the junction box is a passive component the instruction manual of the weigh module should be observed primarily for commissioning.

## 4 Technical Data

### 4.1 Functional Data

Environmental temperature:	-30 °C to +85 °C
Storage temperature:	-40 °C to +90 °C
Protection:	IP 66, DIN 60529
Freedom of vibration of the terminals:	Conforming with DIN VDE 0611 11/77: 12 Hz and 50 Hz, Amplitude 1 mm
Insulation resistance of the terminals:	10 <sup>12</sup> Ohm cm

### 4.2 Device Version

Housing dimensions (LxWxH):	220 x 120 x 81 mm <sup>3</sup>
Housing material:	aluminum AlSi12
Weight:	approx. 2 kg
Color:	anthracite, Siemens color 614
Electrical connection:	Spring terminal connection 1.5/1 mm <sup>2</sup>
Screw cable glands:	
Load cells:	4x M16 x 1.5    5 to 10 mm
Signal cable:	2x M20 x 1.5    7 to 12 mm

### 4.3 Explosion Protection

The junction box is simple electrical equipment in accordance with EN 60079-14 or EN 50020. It may be used in hazardous areas also for connecting intrinsically safe circuits.

The terminals meet the requirement for separating intrinsically safe circuits – creep and air gap > 6 mm.



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#### WARNING

##### To be observed when using in hazardous areas:

- The regulations governing the installation and operation of devices in explosive areas that are in force in the country of use.
- In EU countries, the laws passed in the relevant country to enforce EU Directive 1999/92/EC
- The regulations for erecting electrical installations in areas with a risk of explosion DIN EN 60079-14 (VDE0165) or DIN EN1127-1.
- EC Type Examination Certificate

All work on electrical circuits for systems where there is a risk of explosion must be performed by qualified personnel.

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## 4.4 Electromagnetic Compatibility

The SIWAREX JB junction box meets the following EMC requirements:

- EN 61326: 1999
- EN 45501: 1992
- NAMUR NE21: 2004

To maintain EMC, e.g.

- an EMC-compatible laying of cables (also inside cabinets!) must be observed.
- the signal cable must be laid separately from cables with voltages > 60 V or high currents.
- the vicinity of large electrical installations must be avoided.

## 4.5 Dimensions

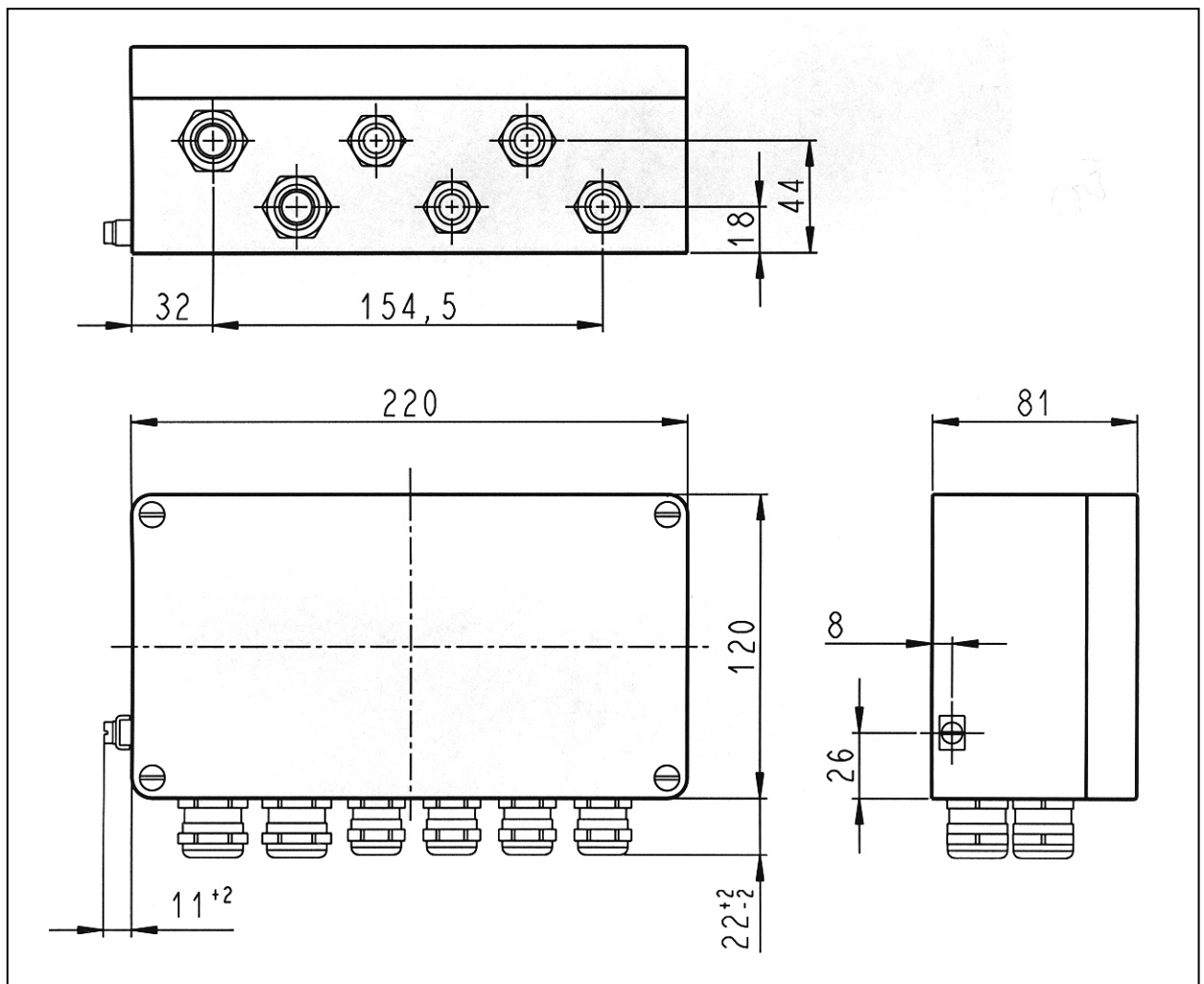


Fig. 4-1 Dimensions



## 5. Care and Maintenance

The junction box is maintenance-free. The clamping force of the spring terminals always remains constant.

---

### CAUTION

Do not apply the jet of a high-pressure cleaner directly to the junction box.

---

## 6. Ordering Data

**Name:**

SIWAREX JB junction box – aluminum housing

**Order number:**

7MH4 710-1BA