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Display and Operating Systems

PXT 5 SER
Hardware Description
Item No. 19 560

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This hardware description is for the display system **PXT 5 SER**.

Before commissioning the device, please read this hardware description and observe the safety instructions contained therein.

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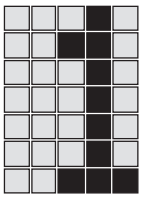
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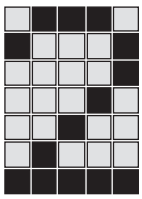
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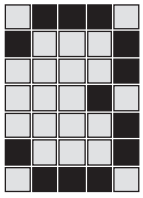
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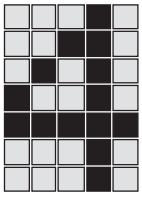


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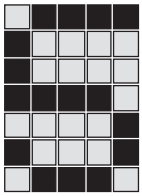
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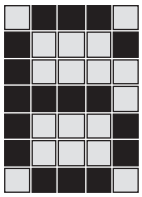


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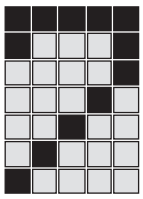
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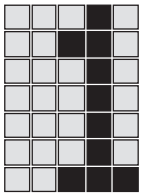
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Introduction



PXT 5 SER is a display system for direct connection with a PLC.

This hardware description of this unit contains information such as

- Technical features
- Functional units/hardware components
- Interfaces and cables
- Mounting
- Commissioning
- Technical data

The description of the display system PXT 5 SER with respect to its functionality and programming, and its drive and operator control in on-line operation, is contained in the documentation “PXT 5 SER / Configuration Manual”.

Chapter 1 explains the contents and structure of this operating manual.

Chapter 2 specifies the intended function of this unit and contains important safety guideline.

Chapter 3 contains technical features and describes the equipment hardware.

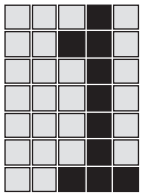
Chapter 4 contains information regarding connection and programming cables.

Chapter 5 contains drawings with dimensions for mounting.

Chapter 6 describes the connection of the unit and the procedure after power-up.

Chapter 7 summarises the technical details of the PXT 5 SER unit.

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Safety Guidelines

General Application

pilz display systems in the PX(T) SER/PAR family have been devised for communicaton via the RS 232 interface of a PLC according to the Pilz protocol or via parallel I/O.

It can be used wherever plant conditions must be recognised and current process data displayed.

Furthermore, the operator control terminal provides the user with the facilities for operator control of the PLC.

This device is designed for operation under industrial conditions.

General Safety Guidelines

- The electrical connections must be made by a qualified electrical engineer who is familiar with the operating instructions and the valid regulations for safety in the workplace. The VDE regulations and local stipulations must thereby be observed, in particular with respect to safety.
- It is important to keep within the permitted operating temperature range.
- Do not open the unit, otherwise all warranty becomes void. Repairs should be carried out only by **pilz.**
- The correct function of the device is guaranteed only for the operating modes specified in the operating instructions. Incorrect connections can damage or destroy the unit or your machines.

Unit-Specific Safety Guidelines

Compliance with and observation of the following safety guidelines is a necessary prerequisite condition for correct functioning.

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Safety Guidelines

- When selecting where to mount your display, please remember to keep as large a distance as possible between the unit and any electromagnetic fields. This is especially important when frequency converters are nearby. We also recomend you use a bulkhead tp separate the display from the source of the interference.

- Inductive components built into the surrounding fields (eg. contactor, relay and solenoid valve coils), must be wired with an RC-network, especially if they are fed from the same source.

- Data and power lines should be installed separately to avoid capacitive and inductive transmission (recommended minimum distance =10 cm)!

- To avoid the build-up of heat, a distance of 10 cm should be maintained all round the unit.

- Interferences voltages accessing the unit via supply and signal lines, and electrostatic voltages passed on through contact, are diverted to the earth point (spade terminal on the rear of the unit).
  Connect the earth point ⏚ to the earth conductor PE using as short a copper conductor as possible (≥6 mm^2 diameter)!

- The earth conductor (1,5 mm^2 diameter) should be connected to the terminal marked ⏚ on the supply voltage connector.

- On operator terminals the power supply connections for the text display and keyboard must be at the same potential. The two grounding terminals (⊥;0 V) on the two connectors must therefore be connected.

- Before applying voltage always check that the voltage information given on the unit matches your supply.

- Shielded, twisted pair cable must be used for connections to the interfaces.

- Always use metallic or metallised synthetic connectors with the connection cable.

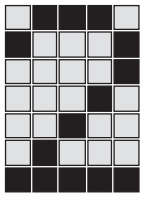
- The shielded connection on the RS 232 (V.24) cable must be used on one side of the connector housing [PX(T)-side].

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- Please ensure that the mounting screws on the connector are frimly attached.
- The power supply for the display system must be designed for a peak switching current of 15 x $\mathbf{I}_{N.}$
- Do not disconnect cables or units during running operation! First make sure that the plant is switched off!
- Do not change the memory chip while power is appied to the unit.

Furthermore, before commissioning check and observe the mounting instructions which the manufacturer of the control system has given for safe operation.

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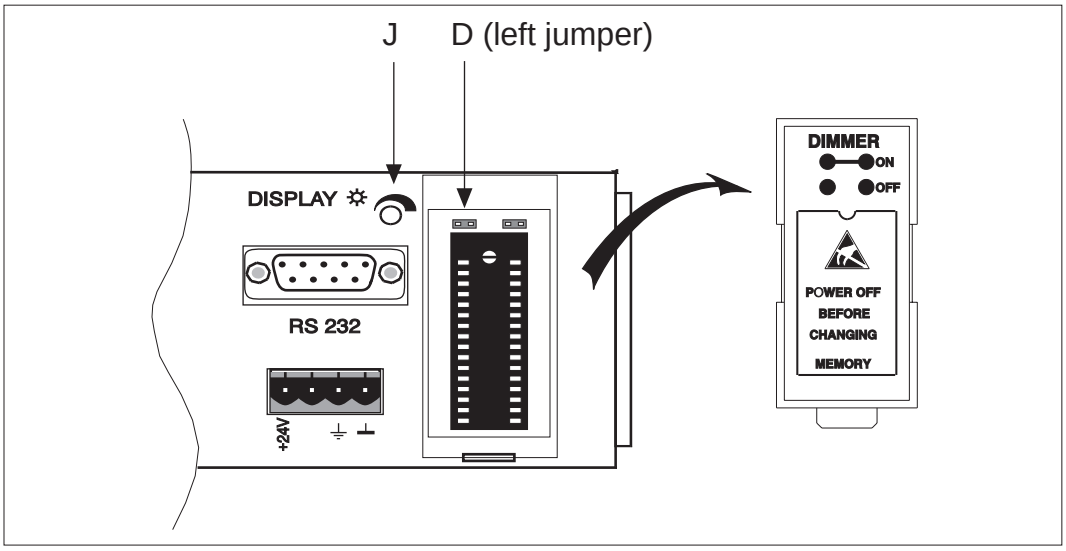
Unit Description

Technical Features

- Programming/PLC interface (RS 232; 9-pin)
- 2-line vacuum fluorescent display (VF display)
- Automatic display intensity control (dimmer function) and dimmer adjustment
- Text memory: Flash EPROM, 64 kilobytes (factory standard; 32 Kbytes optional), can be programmed in the device
- Character set: IBM (No. 437) and Cyrillic; selectable
- Specific keys
- On the rear: sixteen 24 V inputs (for additional buttons), one 24 V output for a LED

Dimmer Function

A sensor measures the ambient illumination on the front of the unit.
The intensity of the display is matched accordingly.
This dimmer function is activated by inserting a jumper (D) on the rear of the unit under the text memory cover. For this purpose, the text memory cover must be taken off by pressing it together at the side.



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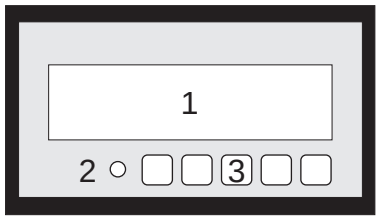
As delivered from the factory, the jumper is not plugged-in, therefore the dimmer function is switched off. Consequently the display always has maximum intensity during operation.

When the dimmer function is activated (jumper plugged-in), it is advisable to adjust the basic intensity as follows:

1. Completely cover (darken) the sensor on the front of the unit (e.g. with a finger).
2. Using a screwdriver, turn the dimmer adjustment control (J) on the rear of the unit to give the minimum display intensity with which the display does not flicker.

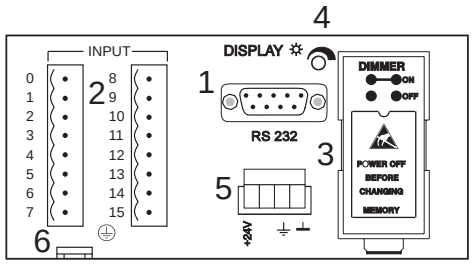
Equipment Hardware

Front view



1. VF-Display: - 2 lines of 20 characters
   - 5 mm character height
   - 5 x 7 dot matrix
2. Dimmer
3. 5 function keys (F1 ... F5)

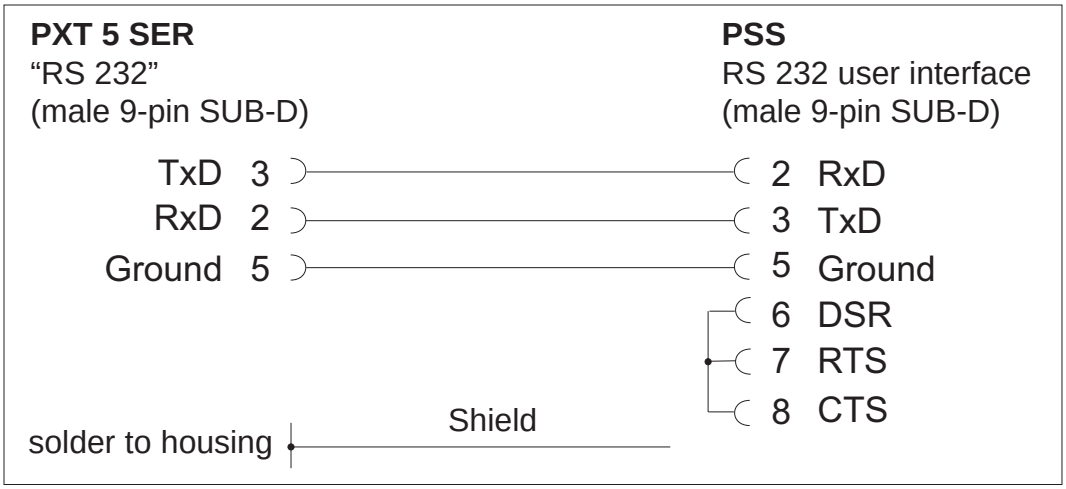
Rear view



1. PLC/Programming interface (RS 232)
2. 24 V Inputs
3. Text memory: Flash EPROM
4. Dimmer adjustment
5. Power supply voltage connector
6. Grounding point (spade terminal)

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PLC Connection (Pilz PSS-Range / RS 232)



PC Connection (RS 232)

Connection to the RS 232 (V.24) interface is required for programming the flash EPROM text memory directly in the display system using a PC. This connection can be made by using:

- the AKSET available as an accessory (Order Number 307 426), consisting of a null modem cable (9 to 9-pin) and a mouse adapter (9 to 25-pin) or

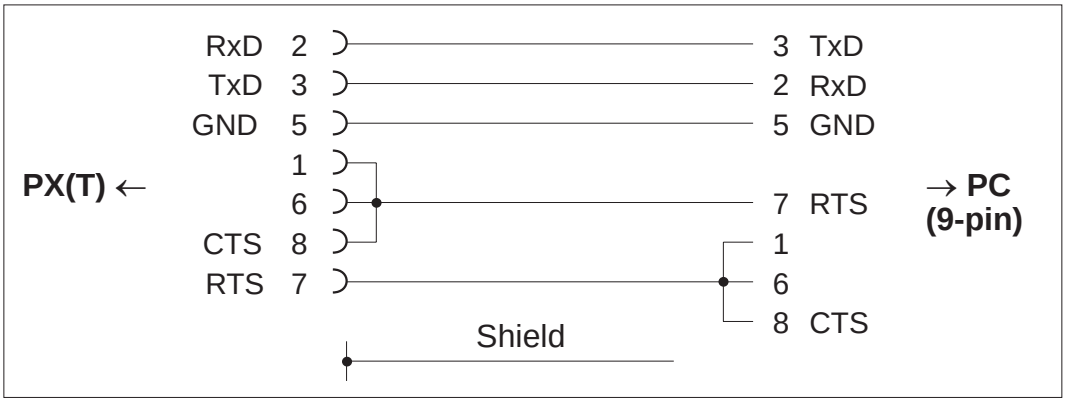
- a cable assembled in accordance with one of the following two diagrams.

(Continued overleaf)

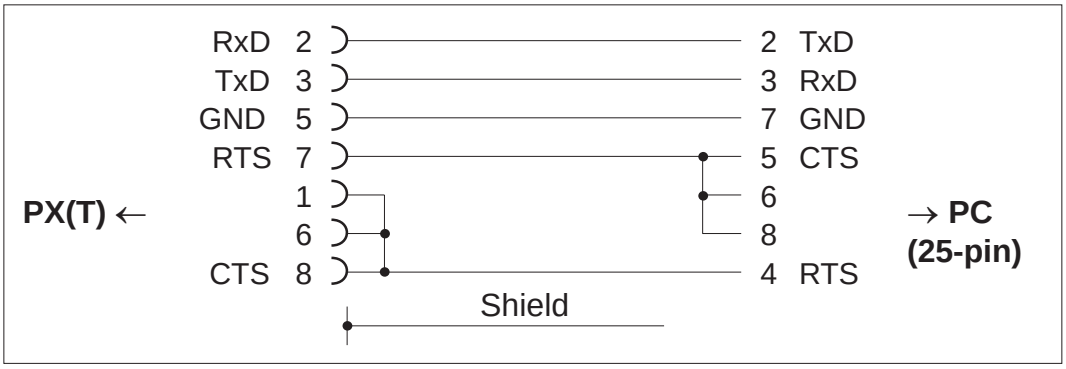
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Note that the RS 232 interface of the PXT 5 SER is designed as a male 9-pin SUB-D connector!

RS 232 connection cable 9 to 9-pin



RS 232 connection cable 9 to 25-pin



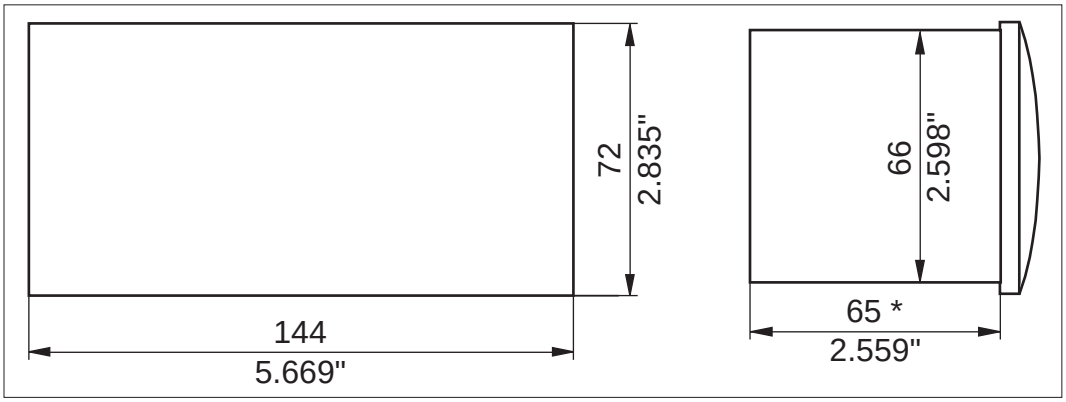
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Installation

IMPORTANT!
When mounting and installing the display system, always keep to the guidlines given in the chapter headed "General Appication" and "Safety Guidelines".

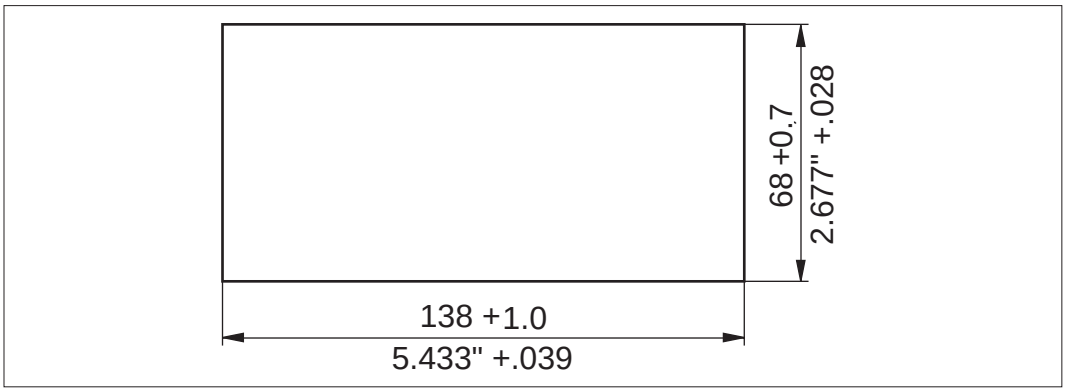
Nominal and Cut-Out Dimensions (in mm)

Nominal dimensions

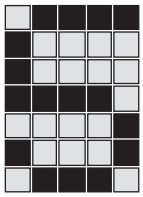


* Allow extra for D-Sub connector

Cut-out dimensions



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Commissioning

Connections

Connect the spade terminal marked with the symbol ⏚ on the rear of the device to the mains grounding line (the conductor cross section must be at least 6 mm^2)!

Procedure after Power-Up

When the unit is powered up, it may take a few seconds before it is ready for operation.

The display system indicates that it is ready for operation

either

- with the factory-set **default message** containing the following information:
  - unit description
  - version number

or

- with a user-defined **base message** (see “PXT 5 SER/Configuration Manual” → Chapter 5: Section headed “Unit Configuration (PX-PRO Defaults)”).

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Technical Details

Operating voltage range	18 ... 32 V DC
Rated operating voltage	24 V DC
Power consumption	Typically 4.0 W
Display	Fluorescent display, 2 lines of 20 characters alphanumeric, 5 x 7 dot matrix
Character height	5 mm
Interface	RS 232 (V.24), 9-pin SUB-D connector
Inputs	16 conforming to VDI 2880 Sheet 2, 24 V DC, no electrical isolation
Outputs	1 conforming to VDI 2880 Sheet 2, protected against short circuit, and overload, 30 mA
Text memory	64 kByte Flash-EPROM 28F512 (optional: 32 kByte Flash-EPROM 28F256)
Tolerated disturbance Noise resistance	Interruptions to supply voltage interruptions: up to 20 ms; electrostatic discharge: IEC 801-2/Class 3 (VDE 0843 Part 2/Class 3); Interference voltage on supply and signal lines: IEC 801-4/Class 3 (VDE 0843 Part 4/Class 3)
Operating temperature	0 ... +55 °C
Storage temperature	-20 ... +70 °C
Climatic conditions	DIN 40040 Class F
Housing and Terminal Protection	Front IP 65, when installed without sealing ring IP 50, when installed with sealing ring IP 64, rear IP 20
Drop height	80 cm (in original packaging)
Vibration Resistance	5g/33 Hz on three axes
Weight	approx. 0.7 kg

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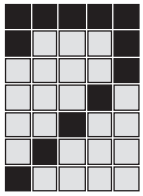
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