NOTE
All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ±0.13 and angles have a tolerance of ±2°. Figures are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of the SPE T1 Industrial Cable Connector Male IP20 and SPE T1 Industrial RA Board Connector Female IP20.

SPE (Single Pair Ethernet) is a new standard for data transfer. Based on transmission standards in accordance with IEEE 802.3, the new single-pair Ethernet technology SPE can be integrated into new generations of automobiles and can replaces CAN bus systems and finds its way into Industrial Applications. Controls, communication and safety functions are going to run uniformly on Ethernet in the future. This is a basic prerequisite for networked and later also autonomous driving.
SPE is now enabling the transmission of data by Ethernet using only two wires and the simultaneous power supply for terminals via PoDL – Power over Data Line.

The mating interface complies to IEC 63171-6 (formerly IEC 61076-3-125) for industrial and industry-related applications; this mating interface is specially designed for use in up to M3I3C3E3 environmental conditions and is known as variant 2 (industrial style). This SPE connector design can achieve 1 GBit/s for shorter distances and 10 MBit/sec for longer distances. It has mating interfaces that are plug-compatible with each other.

SPE T1 Industrial RA JACK IP20	SPE T1 Industrial PLUG IP20 KIT

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Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, the information contained in the Customer Drawings takes priority.

2. SPECIFICATIONS

Product Specification 108-19502 provides product performance and test information.

3. REQUIREMENTS

3.1 Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2 Limitations

The connectors are designed to operate in a temperature range of -40° to 85°C.

4. TECHNICAL DATA

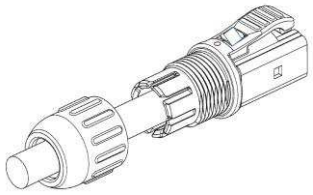
Number of breaths:	2
Wire structure:	1x2xAWG 26/7
Suitable for data:	10BASE-T1 / 10 Mbit/s 100BASE-T1 / 100 Mbit/s 1000BASE-T1 / 1 Gbit/s
Termination:	Crimp; Field attachable
Rated current:	4 A
Rated voltage:	60VDC
Protection class according to IEC 60529:	IP20
Connection cable type:	AWG 28-22
Wire diameter:	Max. 2.0 mm.
Cable diameter:	4.5 … 5.5 mm.
Cable color	Green
Housing material:	Plastic, black
Mating face:	Single Pair Ethernet acc. To IEC 63171-6
Mating cycles:	1000

5. Standards and Approvals

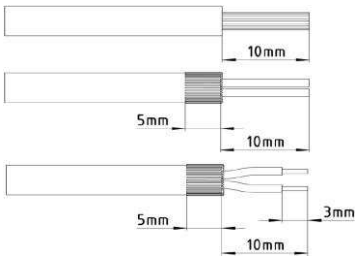
- IEC 63171-6 (previously IEC 61076-3-125)
- IEEE 802.3bu (remote power supply via PoDL = Power over Data Line)
- IEEE 802.3cg (10BASE-T1)
- IEEE 802.3bw (100BASE-T1)
- IEEE 802.3bp (1000BASE-T1)
- IEC 60332-1-2 Flame resistance
- DIN EN 60811-404 Oil resistance

6. ASSEMBLY of the Cable components
(Part number 2364150-1).

6.1 Slide nut and housing over the cable sheath.



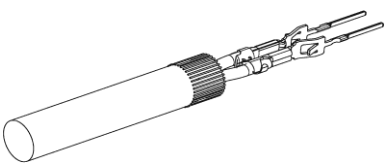
6.2 Strip the cable sheath to a length of 10 mm. Fold the braid back and shorten it to a length of approx. 5 mm. Strip thee individual wires to a length of 3.5 mm.



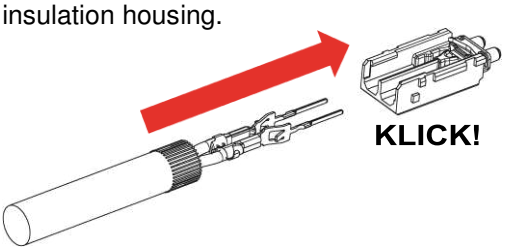
We recommend the use of a tinned copper foil to fix the braided shield.

6.3 Crimp on prescribed contacts with prescribed crimp tool:

Contact
AWG 28-26, P/N 2368258-1
AWG 24-22, P/N 2368258-2
Crimp tooling
AWG 28-26, P/N 2368260-1
AWG 24-22, P/N 2368261-1

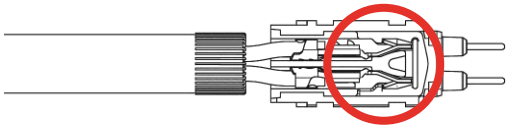


6.4 Push the prepared cable with crimped-on contacts from behind into the insulation housing pre-assembled in the lower shield plate until the contacts lock into the insulation housing with an audible “click”. Align the blue cable (contact 1) and white cable (contact 2) with the cavity number as shown on the insulation housing.

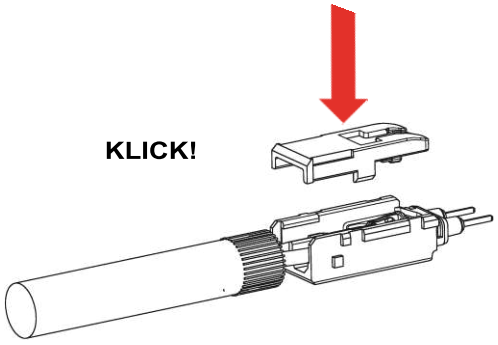


6.5 Check whether the snap-in hooks of the contacts are securely locked in the insulating body. Check window cavity as seen in picture below in circled area.

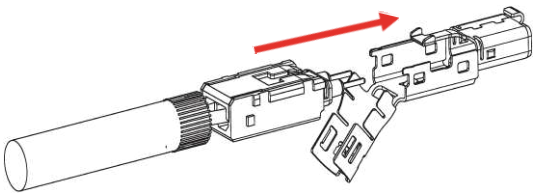
DO NOT check correct position by pulling on the cable!



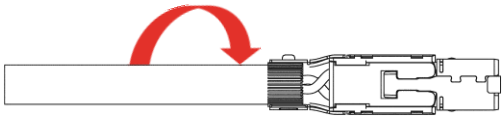
6.6 Mount the cover of the insulating body with an audible “click”.



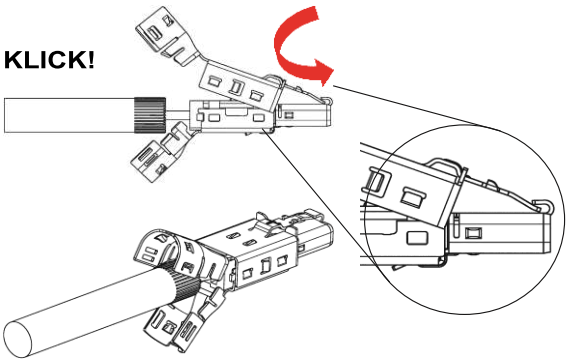
6.7 Mount the insulating body in the bottom shield plate with an audible “click”.



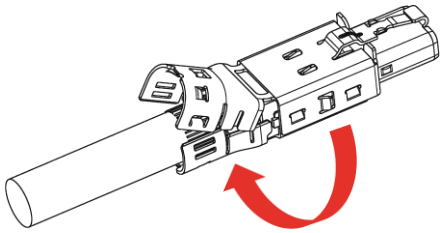
6.8 After the contacts have been mounted in the insulator, the cable must be twisted until a slight resistance is felt.



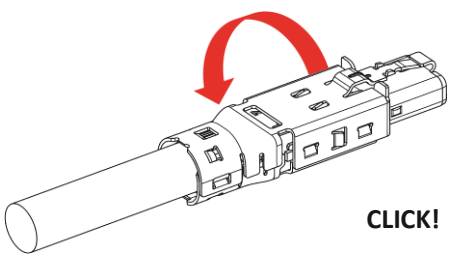
6.9 Lock the upper shielding plate with an audible “click”. Make sure that the locking tab is positioned under the locking hook.



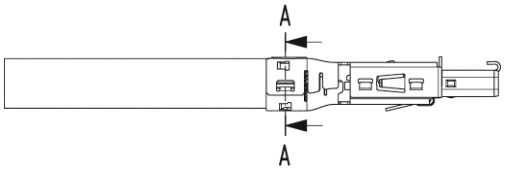
6.10 Bend the lower shielding plate upwards.

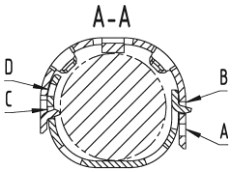


6.11 Bend the upper shielding plate downwards over the lower shielding plate until it locks with an audible “click”. There are two locking levels depending on the cable diameter.



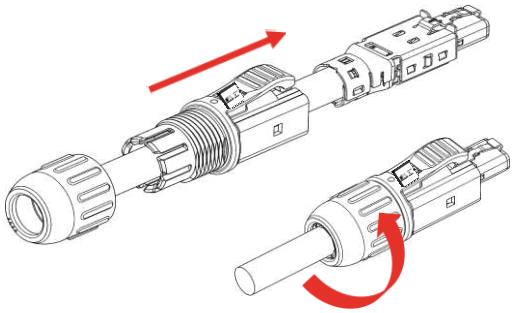
6.12 The detent level of the shield plates must be set according to the diameter as shown in the table.





Cable diameter	Latches snapped into Pos.
4.5 - 4.9	B + D
5.1 - 5.5	B + C

6.13 Slide the connector housing over the mounted data module until it stops. Then tighten the cable gland on block.



Pin assignment

Contact No.	PMA Signal	Wire color
1	BI_DA+	blue
2	BI_DA-	white

7. Board Connector (Jack)

Type:	Part number:
SPE T1 Industrial RA Board Connector Female IP20, fully shielded, 360 ° shield contact, Tape on Reel: sample order 275 pieces. 	1-2364151-1
SPE T1 Industrial RA Board Connector Female IP20, fully shielded, 360 ° shield contact, single piece. Tape on Reel: single piece	2364151-1

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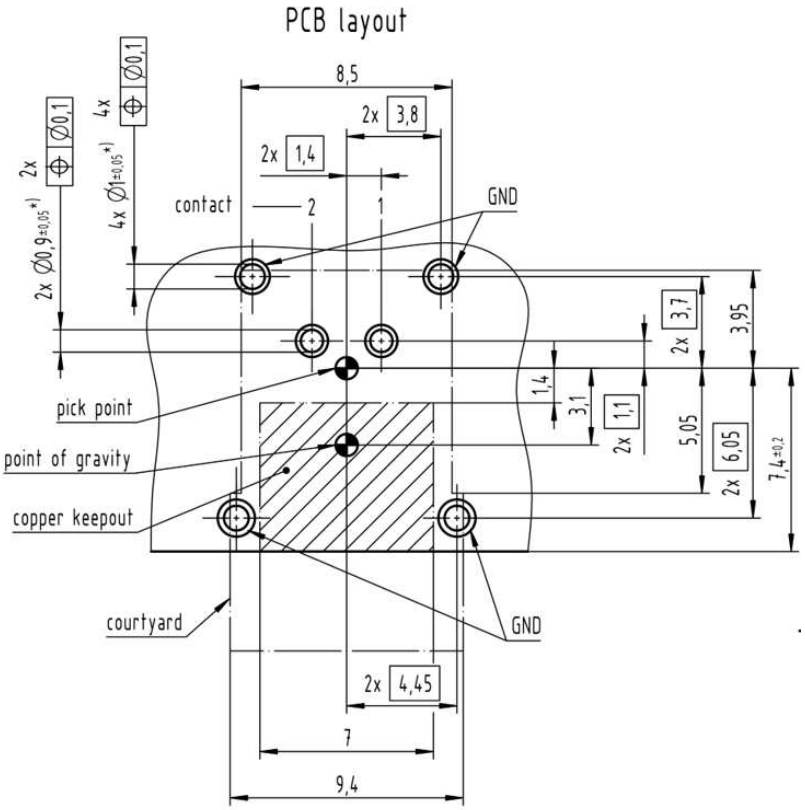
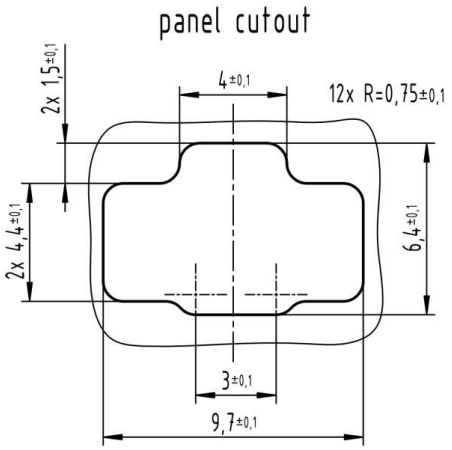
8. Board Layout.



Panel cutout recommended.



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