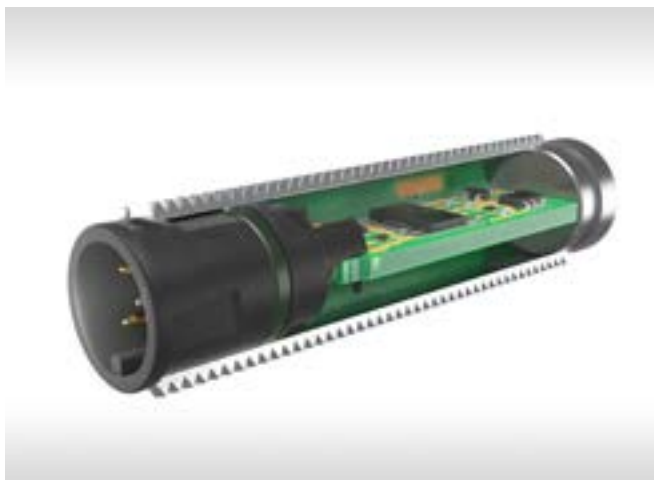


M8/M12

Circular Connectors



M8/M12 - I/O CONNECTORS

Since the 1980s, M8/M12 connectors have been used in sensor technology and industrial automation devices. The connectors were developed for higher protection classes such as IP65 or IP67. The mating face is coded and standardized so that end customers can use cables from different manufacturers.

Due to the high reliability and robustness, more and more applications and connector codings have been added over the years. The high degree of protection allows decentralized use of the devices and trends such as Industry 4.0 or IIoT are making these devices increasingly intelligent.

The communication of the devices is mostly done via serial systems such as fieldbuses or industrial ethernet. Parallel wiring is largely avoided.

Sensors or actors are mostly connected with an A-coded connector. Fieldbuses, for example, use the B coding.

The installation guidelines of the various bus interest groups also provide for the distribution of the connectors. The guidelines recommend certain connectors for the design, e.g. D and X coding for various ethernet protocols or A coding for sensor bus applications.

In order to ensure efficient processing of these connectors, ERNI developed a solution early on that is packaged in tape and reel and can be assembled automatically; among the world's first M12 connector with Surface-Mount Technology (SMT) connections.

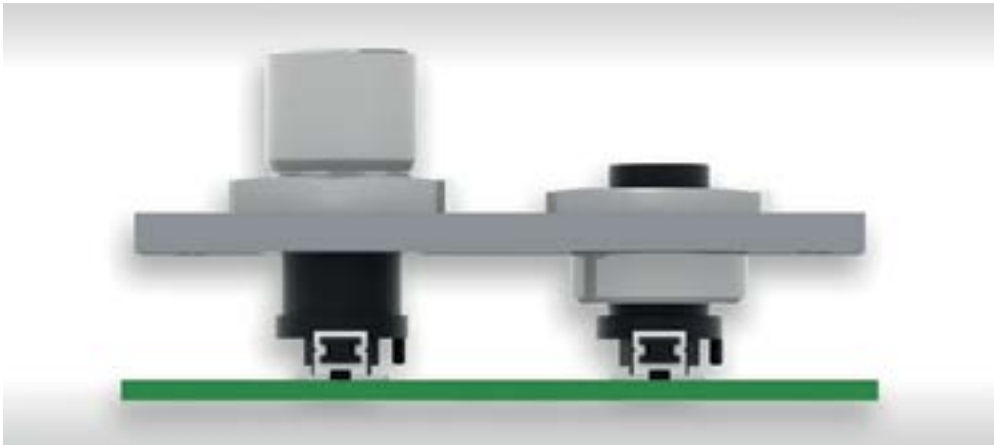


FEATURES

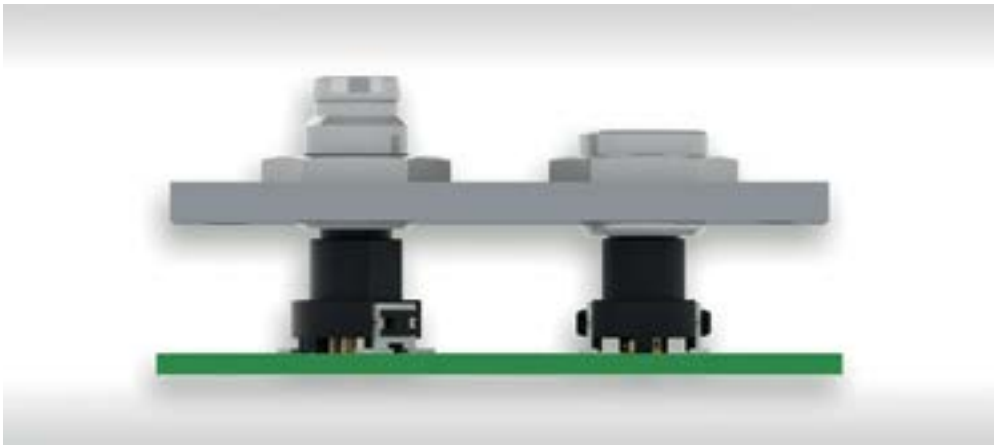
| | |
|------------------------|---|
| Coding | A, B, D, X |
| No. of Pins | 4 - 17 pin |
| Termination technology | SMT (Surface Mount Technology), THR (Through Hole Reflow) |
| Applications | Signal- and data transmission, power supply |
| Connectors | Male and female connectors 180° Male connectors for direct integration |
| Extensions | Cable assemblies, quick termination T-Coupler, adapter Panel feed-through |
| Standards | IEC 61076-2-101 form factor M12, various codings for M12 IEC 61076-2-109 form factor M12, X-coded IEC 61076-2-104 form factor M8, various codings for M8 Profinet- and Profibus-installation instructions Other fieldbus- and Industry ethernet-standards |



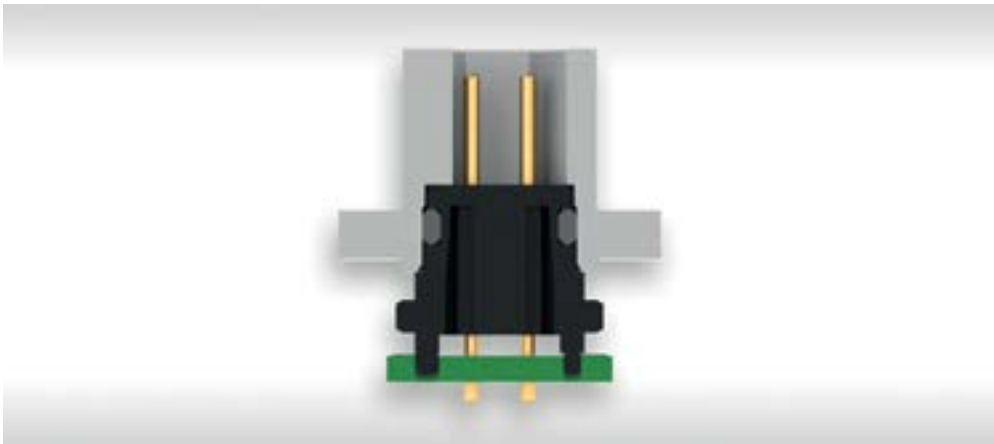
CAPABILITIES



9 and 13 mm heights M12



9 and 13 mm heights M8



DI applications

CAPABILITIES



Standard variants
integrated in customer
housing 13 mm die-cast



Installation of the
connectors with metal
shells in a thin front panel



Cable outlet 90° and 180°

ADVANTAGES

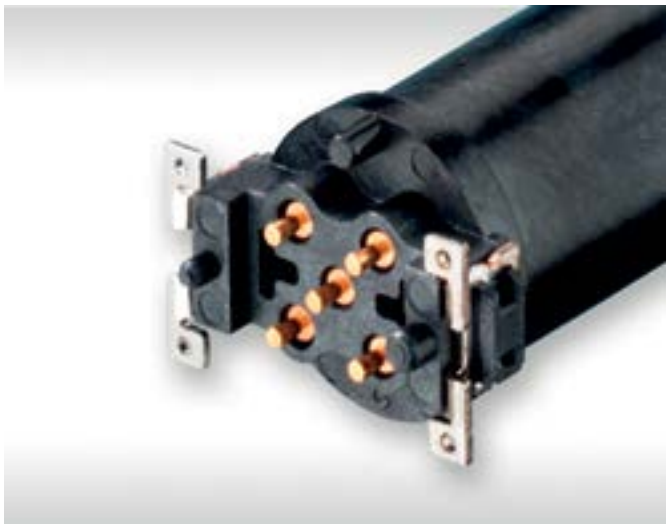
Stamped Female Contacts

- economical stamped female contact
- reliable due to double-sided contacting
- rolled, homogeneous surface, guarantees more secure contact mating
- gold plated mating area
- extremely low surface roughness significantly reduces abrasion
- low contact resistance
- SMT termination



Machined Female Contacts

- reliable due to double-sided contacting
- gold plated mating area
- SMT- or THR-Termination depending on requirements for even more flexibility
- optimized THR solder joints due to short soldering length



Robust Solder Clips

- outstanding retention forces on the circuit board
- soldering brackets absorb mechanical stress and are able to withstand high shock and vibration loads
- high shear and tear-off forces build trust in surface-mounted connectors



ADVANTAGES

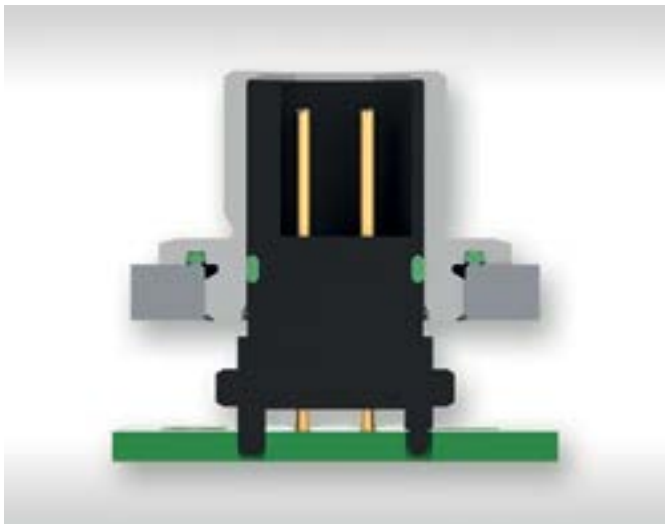
Optional Pad

- with pad for easy assembly with standard nozzles
- without pad cost-optimized for the assembly experts



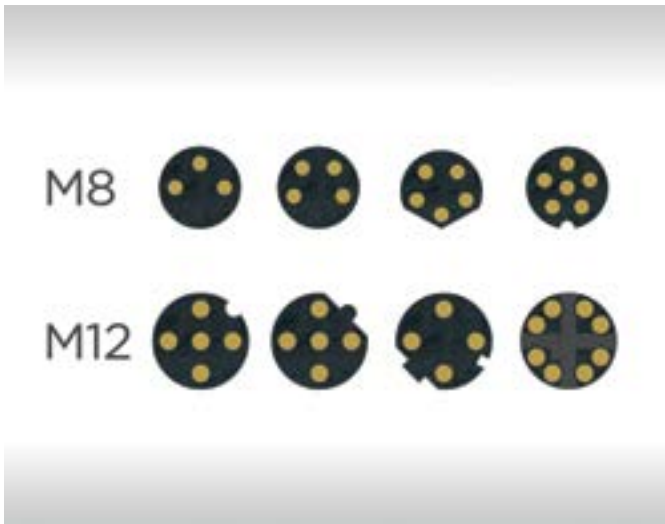
Potting / Additional Sealing Function

- additional sealing point for male connectors
- protection against liquids even when not plugged in
- prevents leakage of potting material when the electronics must be encapsulated



Codings

- coding of the mating face prevents mismating
- different codings enable different interface functions
- pre-alignment of the cable connectors prevents contact damage



PROCESSING

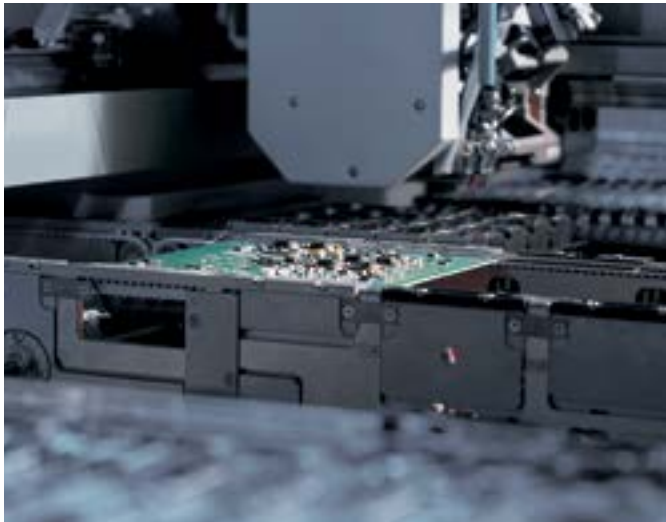
Tape and Reel Packaging

- transport safe packaging
- fully automatic assembly



Fully Automatic Assembly and Reflow Soldering

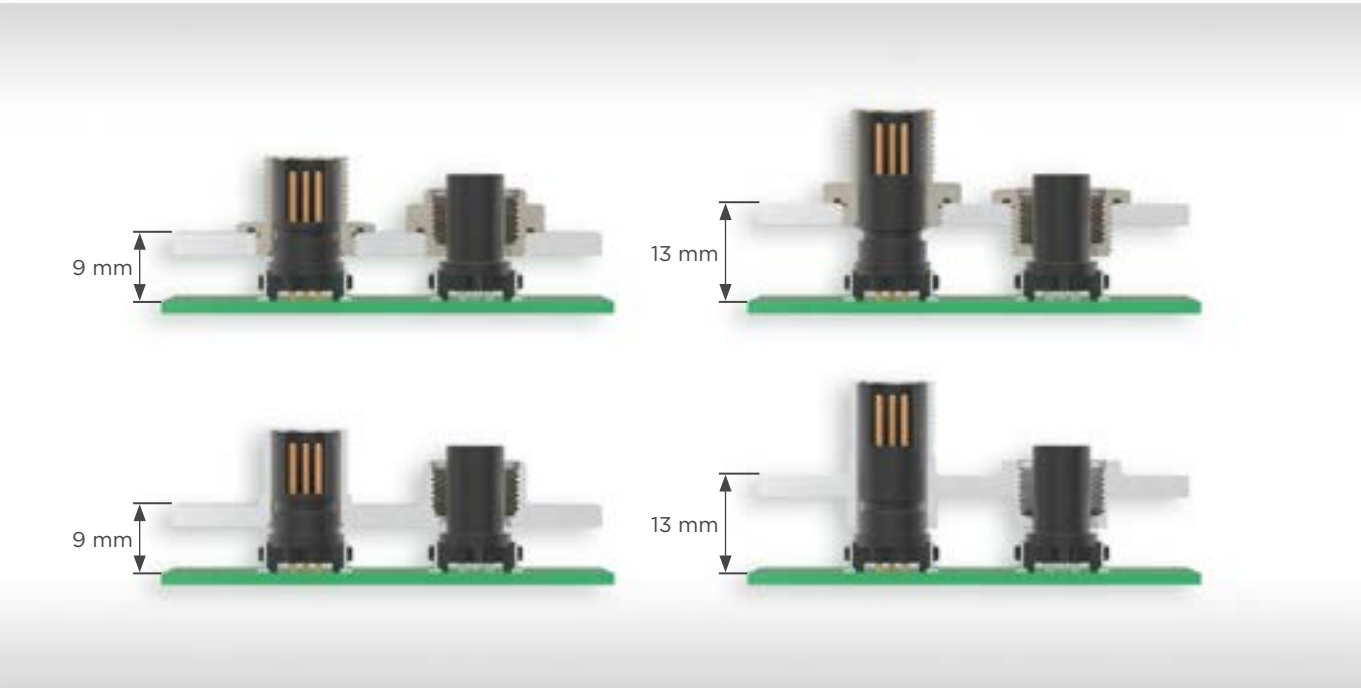
- for efficient processing on modern assembly lines



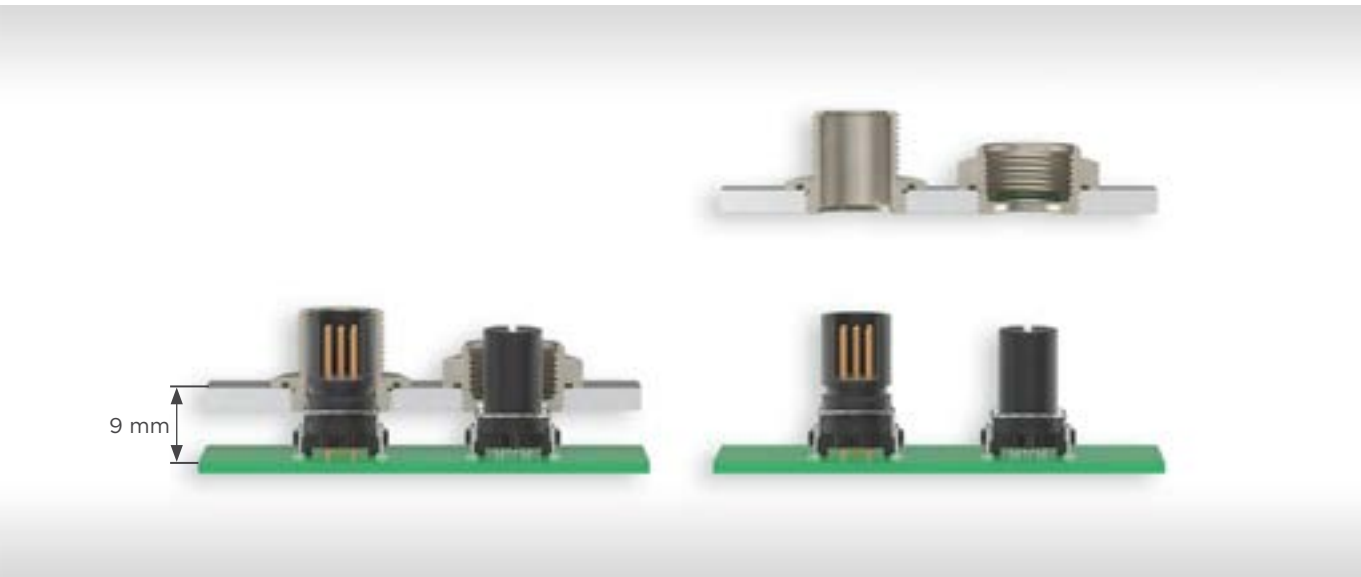
INSTALLATION CONDITIONS

Mounting of the Soldering Board

- Printed circuit board fixed in the customer housing by screws or equivalent fastening elements
- O-ring for sealing the connector after assembly pushed over each female connector



Mounting of the Shielded Version



ELECTRICAL AND MECHANICAL CHARACTERISTICS PRINTED CIRCUIT BOARD (PCB) CONNECTORS

Technical Data

| Description | Standard | M8 | M12 |
|---|--------------------|---|---|
| Temperature range | | -25 / 85°C (derating curves available up to 125 °C) | |
| Current rating per contact | IEC60512 test 5b | 3 A @ 40 °C (4 pin) see respective derating curve | 4 A @ 40 °C (5 pin) see respective derating curve |
| Min. Air- and creepage distance | | 0.8 mm | 1.1 mm (4-, 5 pin male) 1.0 mm (8 pin male) 0.4 mm (8 pin female) |
| Operating voltage | IEC 60664-1 | The permissible operating voltages depend on the customer application and on the applicable or specified safety requirements. Insulation coordination according to IEC 60664-1 has to be re-garded for the complete electrical device. Therefore, the maximum creepage and clearance distances of the mated connectors are specified for consideration as a part of the whole current path. In practice, reductions in creepage or clearance distances may occur due to the conductive pattern of the printed board or the wiring used, and have to be taken into account separately. As a result the creepage and clearance distances for the application may be reduced compared to those of the connector. | |
| Dielectric strength (contact-contact) | IEC 60512 test 4a | 3 pin: 1000 V _{rms} 4-, 6 pin: 650 V _{rms} | 4 pin: 1400 V _{rms} 5 pin: 1000 V _{rms} 8 pin: 650 V _{rms} 8 pin (X): 500 V _{rms} 12-, 17 pin: 500 V _{rms} |
| Contact resistance | IEC 60512 test 2a | < 10 mΩ | |
| Insulation resistance | IEC 60512 test 3a | > 10 ⁹ Ω | |
| Vibration, sine | IEC 60512 test 6d | 10 – 500 Hz 5 g | |
| Contact disturbance (while vibration test) | IEC 60512 test 2e | < 1 μs | |
| Shock halfsine | IEC 60512 test 6c | 50 g 11 ms | |
| Contact disturbance (while shock test) | IEC 60512 test 2e | < 1 μs | |
| Mechanical operation | IEC 60512 test 9a | > 100 mating cycles | |
| Insertion and withdrawal force max. | IEC 60512 test 13b | 23 N (3-8 pin) | 30 N (17-, 8(X) pin) |

ELECTRICAL AND MECHANICAL CHARACTERISTICS PCB CONNECTORS

Technical Data

| Description | Standard | M8 | M12 |
|-----------------------------------|--------------------|---|-----|
| Processing Conditions | | | |
| Hand soldering temperature max. | IEC 60068-2-20 | 3.5 s at 350 °C | |
| Dip soldering temperature max. | IEC 60068-2-20 | 10 s at 260 °C | |
| Reflow soldering temperature max. | JEDEC J-STD-020 | 20 - 40 s at 260 °C | |
| Coplanarity | | < 0.1 mm | |
| Housing Material | | | |
| Insulation body | | LCP / PA | |
| CTI value | IEC 112 | min. 175 | |
| UL flame rating | | UL 94 V-0 | |
| UL file plastic material | | E83005 / E47960 | |
| Contact Material | | | |
| Base material | | Cu alloy | |
| Mating area | | gold plated | |
| Termination area | | Sn (stamped contact) Au (machined contact) | |
| Environment Compatibility | | | |
| Recycling | | no flame-retardent additives, no toxic additives allow easy recycling | |
| Product Approval | | | |
| Protection degree | | IP 65/67 (mated) | |
| UL/CSA | | E84703 | |

M8 - FEMALE

Product Specification



Ordering Information

| Assembly | | Coding | Configuration | Termination | Packaging | Part Number |
|-------------|---------|--------|-------------------------------|-------------|------------------------|-------------|
| No. of Pins | Height | | | | | |
| 3 | 9/13 mm | A | M8, female, stamped contacts | SMT | Tape and reel | 224150 |
| 3 | 9/13 mm | A | M8, female, stamped contacts | SMT | Tape and reel with pad | 484599 |
| 3 | 9/13 mm | A | M8, female, machined contacts | SMT | Tape and reel | 464431 |
| 3 | 9/13 mm | A | M8, female, stamped contacts | SMT | Tape and reel | 464643 |
| 3 | 9/13 mm | A | M8, female, stamped contacts | SMT | Bulk | 234233 |
| 4 | 9/13 mm | A | M8, female, stamped contacts | SMT | Tape and reel | 224151 |
| 4 | 9/13 mm | A | M8, female, stamped contacts | SMT | Tape and reel with pad | 494375 |
| 4 | 9/13 mm | A | M8, female, machined contacts | SMT | Tape and reel | 464432 |
| 4 | 9/13 mm | A | M8, female, stamped contacts | SMT | Bulk | 234234 |
| 4 | 9/13 mm | A | M8, female, machined contacts | THR | Bulk | 474231 |
| 6 | 9/13 mm | A | M8, female, machined contacts | SMT | Tape and reel | 464561 |
| 6 | 9/13 mm | A | M8, female, machined contacts | SMT | Tape and reel with pad | 515814 |

M8 - MALE

Product Specification



Ordering Information

| Assembly | | Coding | Configuration | Termination | Packaging | Part Number |
|-------------|---------|--------|-----------------------------|-------------|------------------------|-------------|
| No. of Pins | Height | | | | | |
| 4 | 9/13 mm | A | M8, male, machined contacts | SMT | Tape and reel with cap | 224152 |
| 4 | 9/13 mm | A | M8, male, machined contacts | SMT | Bulk | 234235 |
| 4 | 9/13 mm | A | M8, male | THR | Tape and reel | 225499 |

M8 - ACCESSORIES

Product Specification



Ordering Information

| Configuration | Material | Color | Assembly Height | Packaging | Part Number |
|---|--------------------|-------|-----------------|-----------|-------------|
| Metal shell, for M8 female connectors | CuZn nickel plated | - | 9 mm | Bulk | 254154 |
| Metal shell, for M8 female connectors | CuZn nickel plated | - | 13 mm | Bulk | 284067 |
| Metal shell, for M8 male connectors | CuZn nickel plated | - | 9 mm | Bulk | 284409 |
| Metal shell, for M8 male connectors | CuZn nickel plated | - | 13 mm | Bulk | 284074 |
| Counternut, M10x1 SW14 | Steel, tin plated | - | - | Bulk | 394905 |
| O-Ring, for M8 female connectors, 5x0.8 | FKM | green | - | Bulk | 494564 |
| O-Ring, for M8 female connectors, 5x0.8 | FKM | black | - | Bulk | 835283 |
| O-Ring, for M8 metal shell, 10x1 | NBR | black | - | Bulk | 834898 |

M8 - ASSEMBLY KIT

Product Specification



Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Termination | Packaging | Part Number |
|-------------|-----------------|--------|-------------------------------------|-------------|-----------|-------------|
| 4 | 13 mm | A | kit, male, metal shell, o-ring 10x1 | SMT | Bag | 294941 |

M8 - QUICK TERMINATION FOR ASSEMBLY

Product Specification



Ordering Information

| No. of Pins | Coding | Configuration | Termination | Packaging | Part Number |
|-------------|--------|---------------|-------------|-----------|-------------|
| 4 | A | M8, female | IDC | Bag | 254764 |

M12 - FEMALE

Product Specification



Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|--------|--------------------------------|--------|-------------|------------------------|-------------|
| 4 | 9/13 mm | A | M12, female | no | SMT | Tape and reel | 454003 |
| 4 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel | 474053 |
| 4 | 9/13 mm | A | M12, female | no | SMT | Bulk | 284322 |
| 4 | 9/13 mm | A | M12, female, machined contacts | no | THR | Tape and reel with pad | 515928 |
| 4 | 9/13 mm | D | M12, female | no | SMT | Bulk | 234040 |
| 4 | 9/13 mm | D | M12, female | no | SMT | Tray | 454466 |
| 4 | 9/13 mm | D | M12, female | no | THR | Tape and reel with pad | 474522 |
| 4 | 9/13 mm | D | M12, female | no | SMT | Tape and reel | 484574 |
| 4 | 9/13 mm | D | M12, female | no | THR | Tape and reel | 494083 |
| 4 | 9/13 mm | D | M12, female | no | SMT | Tape and reel | 534075 |
| 5 | 9/13 mm | A | M12, female | no | SMT | Tape and reel | 224064 |
| 5 | 9/13 mm | A | M12, female | no | SMT | Tape and reel with pad | 454950 |
| 5 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel | 354702 |
| 5 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel with pad | 484896 |
| 5 | 9/13 mm | A | M12, female, machined contacts | no | THR | Tape and reel with pad | 494145 |
| 5 | 9/13 mm | A | M12, female | no | SMT | Bulk | 194781 |
| 5 | 9/13 mm | A | M12, female | no | SMT | Tape and reel | 354098 |
| 5 | 9/13 mm | A | M12, female | no | THR | Tape and reel | 494081 |
| 5 | 9/13 mm | B | M12, female | no | THR | Tape and reel with pad | 534185 |
| 5 | 9/13 mm | B | M12, female | no | THR | Tape and reel | 494562 |
| 5 | 9/13 mm | B | M12, female | no | SMT | Tape and reel | 254206 |
| 5 | 9/13 mm | B | M12, female | no | SMT | Tape and reel with pad | 454951 |
| 5 | 9/13 mm | B | M12, female, machined contacts | no | SMT | Tape and reel | 384891 |

M12 - FEMALE

Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|--------|--------------------------------|--------|-------------|------------------------|-------------|
| 8 | 9/13 mm | A | M12, female | no | SMT | Tape and reel | 354131 |
| 8 | 9/13 mm | A | M12, female | no | SMT | Tape and reel with pad | 454952 |
| 8 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel | 394305 |
| 8 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel with pad | 494166 |
| 8 | 9/13 mm | A | M12, female | no | SMT | Bulk | 254310 |
| 8 | 9/13 mm | A | M12, female | no | THR | Tape and reel | 474681 |
| 12 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel with pad | 484074 |
| 17 | 9/13 mm | A | M12, female, machined contacts | no | SMT | Tape and reel with pad | 484076 |

M12 - MALE

Product Specification



Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|--------|-------------------|--------|-------------|------------------------|-------------|
| 3 | 9 mm | A | M12, male, o-ring | no | SMT | Bulk | 454066 |
| 4 | 9 mm | A | M12, male | no | SMT | Bulk | 254859 |
| 4 | 9 mm | A | M12, male | no | SMT | Tape and reel | 284809 |
| 4 | 9 mm | A | M12, male | no | SMT | Tape and reel with pad | 484790 |
| 4 | 9 mm | A | M12, male, o-ring | no | SMT | Tape and reel | 494167 |
| 4 | 9 mm | A | M12, male, o-ring | no | SMT | Tape and reel with pad | 494013 |
| 4 | 13 mm | A | M12, male | no | SMT | Tape and reel | 494020 |
| 4 | 9 mm | A | M12, male, o-ring | no | SMT | Tape and reel | 534073 |
| 4 | 9 mm | B | M12, male | no | SMT | Tape and reel with pad | 494705 |
| 4 | 9 mm | UNI | M12, male, o-ring | no | THR | Bulk | 384812 |
| 4 | 13 mm | A | M12, male | no | SMT | Bulk | 254188 |
| 4 | 13 mm | A | M12, male | no | SMT | Tray | 454829 |
| 4 | 13 mm | B | M12, male | no | SMT | Tape and reel with pad | 494577 |
| 4 | 13 mm | B | M12, male | no | SMT | Tape and reel with pad | 244798 |
| 4 | 9 mm | A | M12, male, o-ring | no | SMT | Tape and reel | 494520 |
| 4 | 9 mm | T | M12, male | yes | SMT | Tape and reel | 474580 |
| 4 | 9 mm | T | M12, male | no | SMT | Tape and reel with pad | 494729 |
| 5 | 9 mm | A | M12, male, o-ring | no | SMT | Tape and reel | 284740 |
| 5 | 9 mm | A | M12, male | no | SMT | Tape and reel | 494335 |
| 5 | 9 mm | A | M12, male | no | SMT | Tape and reel with pad | 484924 |
| 5 | 9 mm | A | M12, male | yes | SMT | Tape and reel | 464912 |
| 5 | 13 mm | A | M12, male | no | SMT | Tape and reel with pad | 494068 |
| 5 | 13 mm | A | M12, male | no | SMT | Bulk | 244934 |

M12 - MALE

Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|--------|-------------------|--------|-------------|-------------------------|-------------|
| 5 | 9 mm | A | M12, male, o-ring | no | SMT | Bulk | 354132 |
| 5 | 9 mm | UNI | M12, male, o-ring | no | THR | Bulk | 384814 |
| 5 | 9 mm | A | M12, male | no | SMT | Tape and reel with pad | 484719 |
| 5 | 9 mm | UNI | M12, male | no | THR | Tray | 494100 |
| 5 | 9 mm | UNI | M12, male, o-ring | no | SMT | Tape and reel with hood | 494981 |
| 5 | 9 mm | B | M12, male | no | SMT | Tape and reel | 354130 |
| 5 | 9 mm | B | M12, male, o-ring | no | SMT | Tape and reel with pad | 515129 |
| 5 | 9 mm | B | M12, male | no | SMT | Bulk | 254319 |
| 5 | 13 mm | A | M12, male | no | SMT | Bulk | 244790 |
| 5 | 13 mm | A | M12, male | no | SMT | Bulk | 364767 |
| 5 | 13 mm | A | M12, male | no | THR | Bulk | 374352 |
| 5 | 13 mm | A | M12, male | no | SMT | Tray | 454828 |
| 5 | 13 mm | A | M12, male | no | THR | Bulk | 464834 |
| 5 | 13 mm | A | M12, male | no | THR | Tray | 484118 |
| 5 | 13 mm | A | M12, male | no | SMT | Tray | 484967 |
| 5 | 13 mm | B | M12, male | no | SMT | Bulk | 374947 |
| 8 | 9 mm | A | M12, male | no | SMT | Tape and reel | 284810 |
| 8 | 9 mm | A | M12, male | no | SMT | Tape and reel with pad | 464676 |
| 8 | 9 mm | A | M12, male | yes | SMT | Tape and reel | 464800 |
| 8 | 13 mm | A | M12, male | no | SMT | Tape and reel with pad | 494376 |
| 8 | 13 mm | A | M12, male | no | THR | Tray | 484156 |
| 8 | 9 mm | A | M12, male, o-ring | no | SMT | Bulk | 254317 |
| 8 | 9 mm | A | M12, male | no | SMT | Tray | 454464 |
| 8 | 13 mm | A | M12, male | no | SMT | Bulk | 394331 |
| 8 | 9 mm | A | M12, male, o-ring | no | SMT | Tape and reel | 494524 |
| 12 | 9 mm | A | M12, male | no | SMT | Tape and reel | 484784 |
| 12 | 9 mm | A | M12, male | yes | SMT | Tape and reel | 454643 |
| 12 | 9 mm | A | M12, male | yes | SMT | Tape and reel with pad | 494518 |

M12 - MALE FOR DIRECT INTEGRATION

Product Specification



Ordering Information

| No. of Pins | Assembly Height | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|---------------|--------|-------------|------------------------|-------------|
| 4 | 9 mm | M12, male | no | THR | Tray | 364781 |
| 4 | 9 mm | M12, male | no | SMT | Tray | 394339 |
| 4 | 9 mm | M12, male | no | SMT | Tape and reel with cap | 474329 |
| 5 | 9 mm | M12, male | no | THR | Tray | 364779 |
| 5 | 9 mm | M12, male | no | SMT | Tray | 394337 |
| 5 | 9 mm | M12, male | no | SMT | Tape and reel with cap | 474331 |
| 8 | 9 mm | M12, male | no | SMT | Tray | 364777 |
| 8 | 9 mm | M12, male | no | SMT | Tape and reel with cap | 515632 |

M12 - ACCESSORIES

Product Specification



Ordering Information

| Configuration | Material | Color | Assembly Height | Packaging | Part Number |
|--|--------------------|-------|-----------------|-----------|-------------|
| Metal shell, for M12 female connectors | CuZn nickel plated | - | 9 mm | Bulk | 394828 |
| Metal shell, for M12 female connectors | CuZn nickel plated | - | 13 mm | Bulk | 394847 |
| Metal shell, for M12 male connectors | CuZn nickel plated | - | 9 mm | Bulk | 464272 |
| Metal shell, for M12 male connectors | CuZn nickel plated | - | 13 mm | Bulk | 284377 |
| Metal shell, for M12 male connectors, for counternut | CuZn nickel plated | - | 13 mm | Bulk | 394863 |
| Counternut, M14x1 | - | - | - | Bulk | 354003 |
| O-Ring, for M12 male connectors DI, 7x1.5 | NBR | black | - | Bulk | 835243 |
| O-Ring, for M12 male connectors DI, 7x1.5 | FKM | green | - | Bulk | 835299 |
| O-Ring, for M12 metall shell, 14x1 | NBR | black | - | Bulk | 834899 |
| O-Ring, for M12 metall shell, 14x1 | FKM | black | - | Bulk | 835677 |
| O-Ring, for M12 female connectors, 7x1 | FKM | black | - | Bulk | 835284 |
| Protective cap, For female connectors, M12x1 | PE-HD | black | - | Bulk | 225507 |

M12 - ASSEMBLY KIT

Product Specification



Ordering Information

| No. of Pins | Assembly | | Configuration | Termination | Packaging | Part Number |
|-------------|----------|--------|---|-------------|-----------|-------------|
| | Height | Coding | | | | |
| 4 | 13 mm | D | kit, female, metal shell, o-ring 14x1, o-ring 7x1 | SMT | Bag | 225114 |
| 8 | 13 mm | A | kit, female, metal shell, o-ring 14x1, o-ring 7x1 | SMT | Bag | 294937 |

M12 - QUICK TERMINATION

Product Specification



Ordering Information

| No. of Pins | Coding | Configuration | Termination | Packaging | Part Number |
|-------------|--------|---------------|-------------|-----------|-------------|
| 4 | A | M12, female | IDC | Bag | 254770 |

M12 ETHERNET-FEMALE

Product Specification



Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|--------|--------------------------------|--------|-------------|------------------------|-------------|
| 4 | 9/13 mm | D | M12, female | no | SMT | Tape and reel | 234041 |
| 4 | 9/13 mm | D | M12, female | no | SMT | Tape and reel with pad | 454949 |
| 4 | 9/13 mm | D | M12, female, machined contacts | no | SMT | Tape and reel | 364175 |
| 4 | 9/13 mm | D | M12, female, machined contacts | no | SMT | Tape and reel with pad | 474665 |
| 4 | 9/13 mm | D | M12, female, machined contacts | no | THR | Tape and reel with pad | 484944 |
| 4 | 9/13 mm | D | M12, female, machined contacts | yes | SMT | Tape and reel | 484936 |
| 4 | 9/13 mm | D | M12, female, machined contacts | yes | SMT | Tape and reel with pad | 484937 |

M12 ETHERNET-FEMALE, GIGABIT

Product Specification



Ordering Information

| No. of Pins | Assembly Height | Coding | Configuration | Shield | Termination | Packaging | Part Number |
|-------------|-----------------|--------|---------------|--------|-------------|------------------------|-------------|
| 8 | 9/13 mm | X | M12, female | yes | SMT/THR | Tape and reel | 474771 |
| 8 | 9/13 mm | X | M12, female | yes | SMT/THR | Tape and reel with pad | 394811 |

M12 ADAPTER

Product Specification



Ordering Information

| No. of Pins | Coding | Configuration | Packaging | Part Number |
|-------------|--------|-------------------------|------------------|-------------|
| 4 | T | M12, male - M12, female | air cushion foil | 484023 |
| 4 | A | M12, male - M12, female | air cushion foil | 494094 |

M8/M12 T-COUPLER

Product Specification



Ordering Information

| No. of Pins | Coding | Configuration | Packaging | Part Number |
|-------------|--------|--|-----------|-------------|
| 5/5/5 | A | 1 x M12, male, 5 pin - 2 x M12, female, 5 pin, CAN / DeviceNet | Bag | 394892 |

M12 PANEL FEED-THROUGH

Product Specification

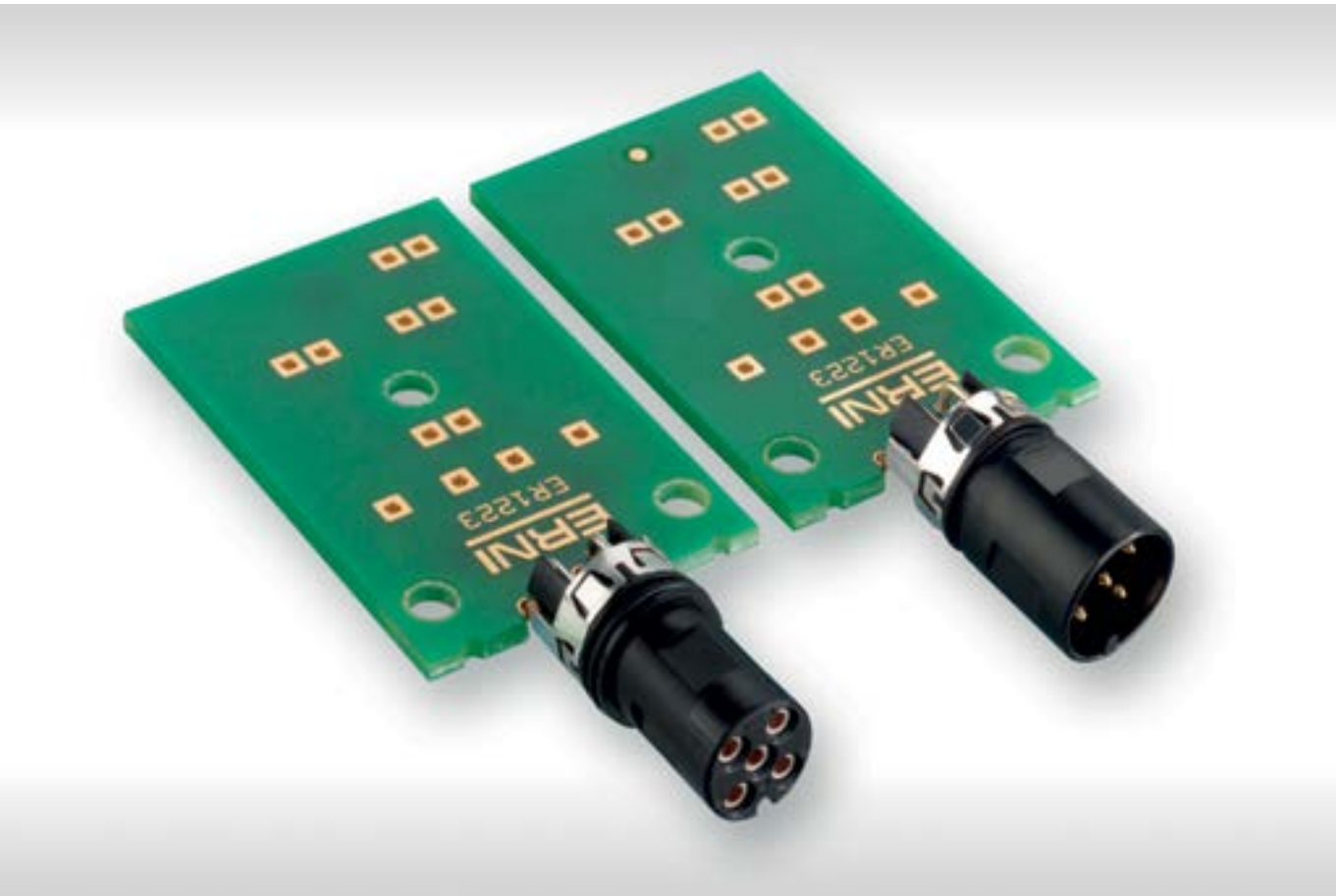


Ordering Information

| No. of Pins | Coding | Configuration | Packaging | Part Number |
|-------------|--------|-------------------------|-----------|-------------|
| 5 | A | M12, male - M12, female | Bag | 254780 |

M8/M12 - RIGHT ANGLE CONNECTORS

- extremely space saving due to its placing on PCB central axis
- identical layout for male and female version
- 4 - 8 pin configuration
- gold plated contacts
- IP 65/67 mated and locked condition
- suitable for potting after assembly due to optional O-ring
- male and female can be used with housings which provide integrated M12 threads
- optional 360° shield ring
- integrated brackets for 3 different frequently-used PCB thicknesses, 1.0 / 1.6 / 2.0 mm
- cylindrical base version, which is also usable for M12 sensor pipes
- high Comparative Tracking Index (CTI) value of 600 for rough environmental applications
- UL listed polymer plastic
- early mate last break option for pin 5
- mating side according IEC 61076 – 2 – 101
- A-, B- and D-Coding
- UL E84703 listed



GENERAL

Standard Solutions

- Processing Features:
- irst M12 90° version which has capability for automated pick and place assembly
 - T&R packaging
 - integrated pick & place area
 - pegs and integrated PCB support areas ensure a secure position while soldering
 - extremely robust due to pins soldered on top and bottom side of the PCB
 - lead-free reflow compatible
 - rear mounting of the final assembled PCB in a housing

For technical data refer to ERNI document 225407

Sensor Pipe Solutions

This new development is a product that has never been existed before. It completes the ERNI M12 connector range with a M12 male connector which targets specifically the sensor industry, where mostly one single male connector is used for a device. To save cost and ensure high quality levels, the connector can be fully handled within a standard SMT assembly line.

Mating side according IEC 61076 – 2 – 101.

- Design Features:
- extremely short version 14 mm length
 - specially designed for M12 sensor pipes
 - front mounting of final assembled PCB into the sensor pipe
 - sealing option with O-ring
 - versions with anti twist protection
 - additional features see standard version



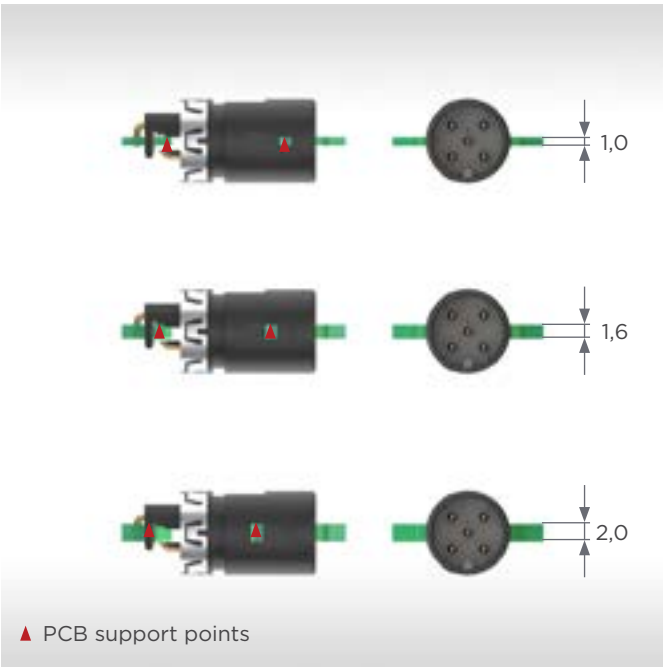
ASSEMBLY AND SOLDER RECOMMENDATIONS

PCB Thickness

The connector has integrated PCB support points, which are able to adapt to the 3 frequently-used PCB thicknesses. The thickest PCB could be 2.0 mm followed by the favorite 1.6 mm and further followed by the thinnest 1.0 mm.

Note: Also other thicknesses in between of the mentioned range can be used, if the non centric position of the connector is taken into account.

The support points have to be considered according to the chosen PCB thickness, see drawing left hand side. The PCB has to be designed to provide those supports. For exact dimensions, mechanical CAD-files can be provided.

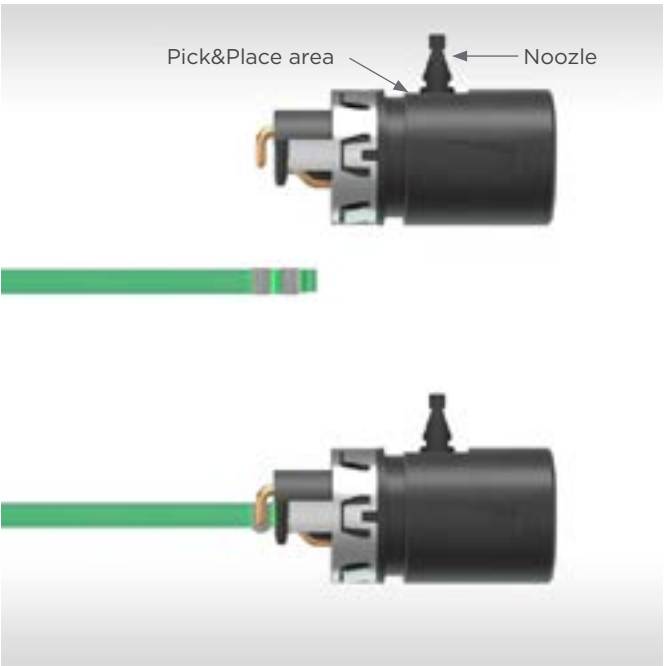


Assembly Process

Printing of solder paste



Automated Assembly

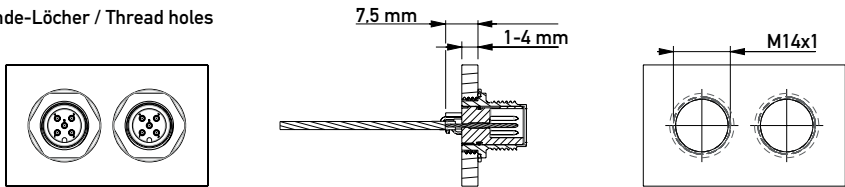


- Comments:
- generally a certain mounting force is required when using the THR solder process
 - special nozzles may be necessary
 - machine capability must be checked upfront

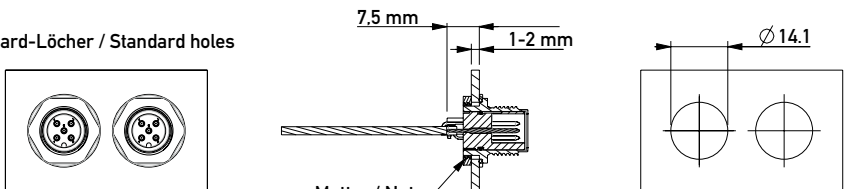
DIMENSIONS AND ASSEMBLY RECOMMENDATION STANDARD

M12 Male (5-Pin) with Erni Locking Shell

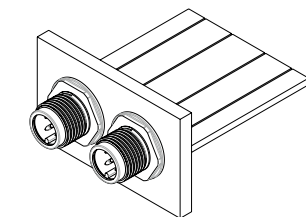
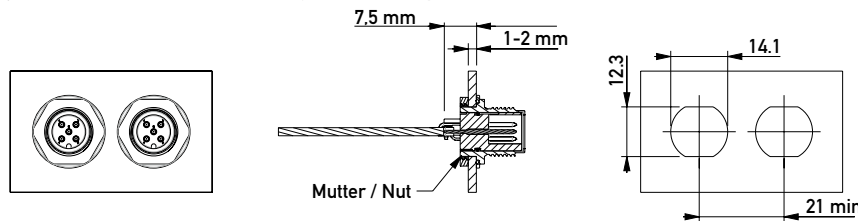
Gewinde-Löcher / Thread holes



Standard-Löcher / Standard holes

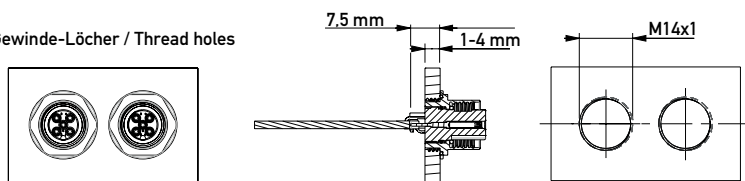


Montageloch für Verdrehschutz / Assembly hole for twist protection

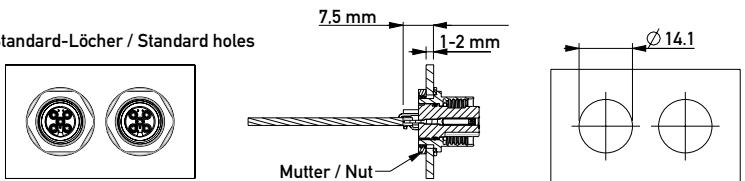


M12 Female (5-Pin) with Erni Locking Shell

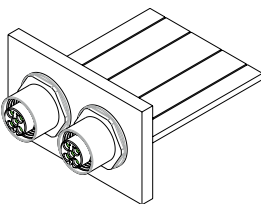
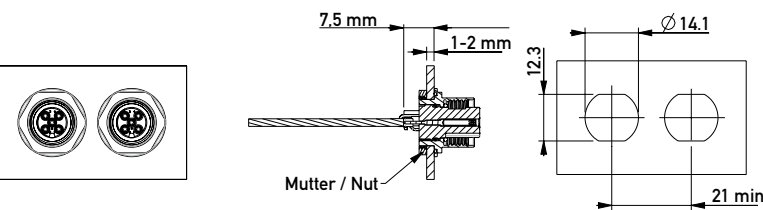
Gewinde-Löcher / Thread holes



Standard-Löcher / Standard holes



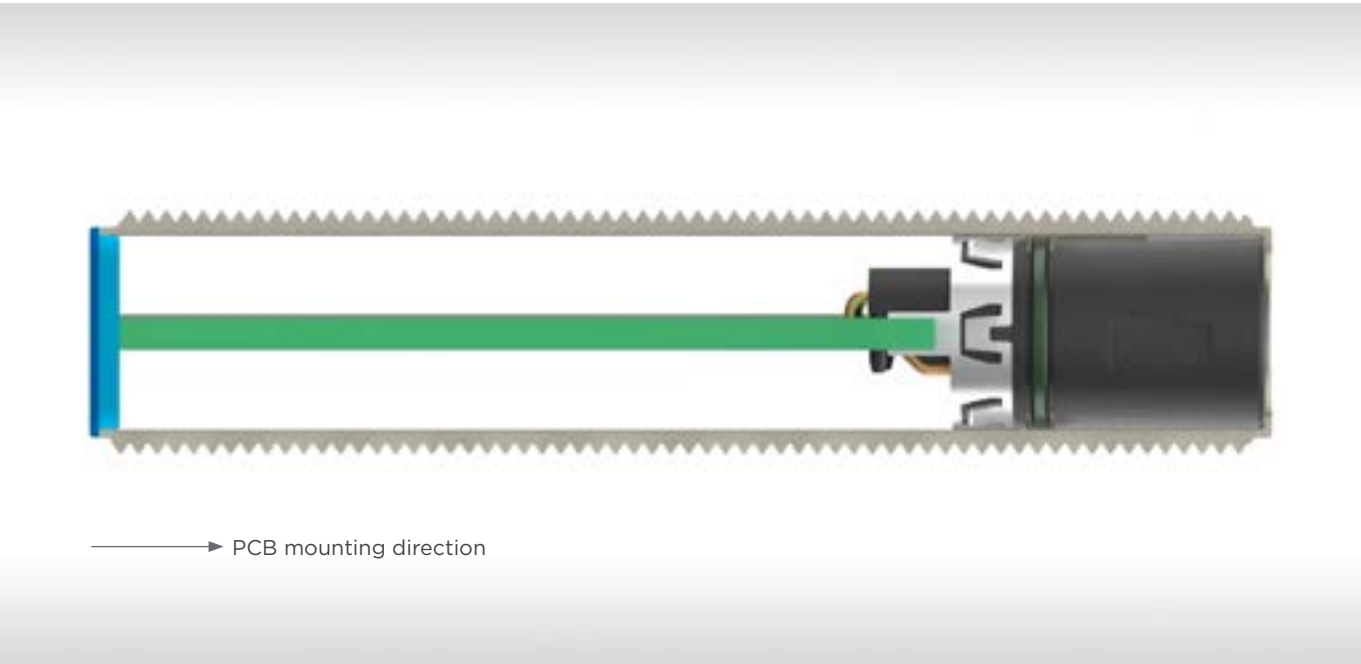
Montageloch für Verdrehschutz / Assembly hole for twist protection



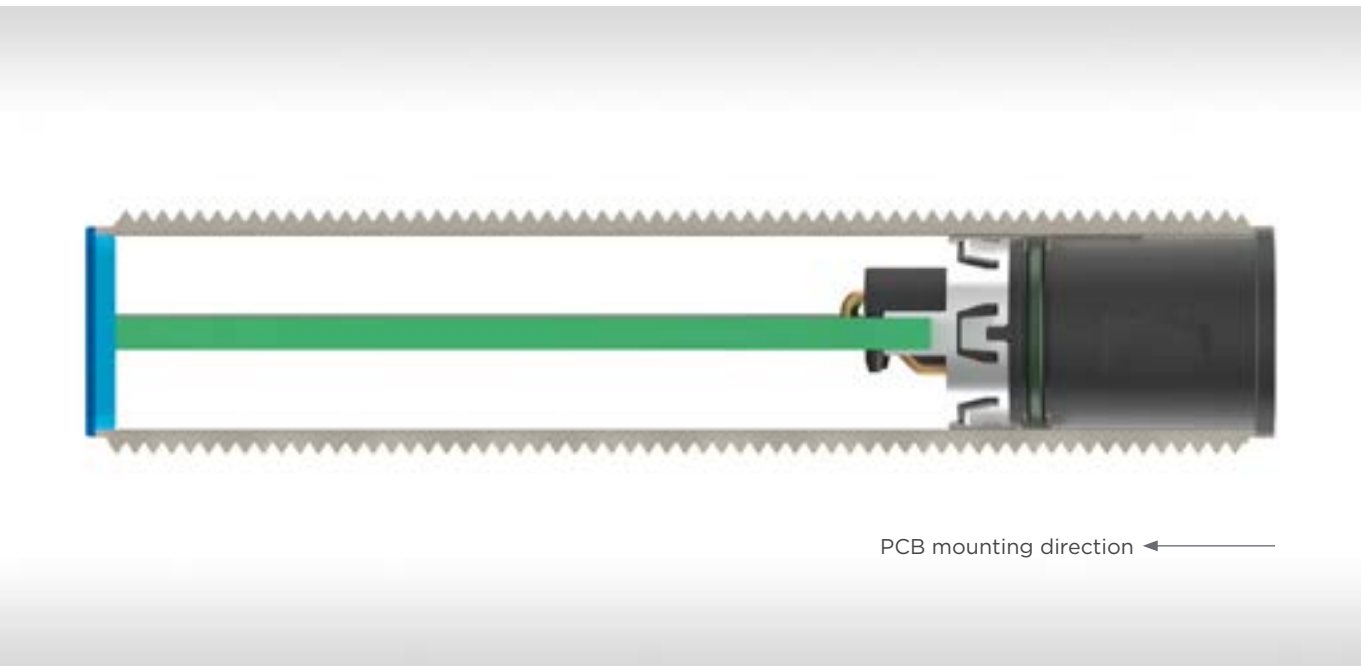
ee product drawing or recommendations for use the M12 90° connectors together with housings which have already an integrated M12 thread (ERNI document 225406).

ASSEMBLY EXAMPLE FOR SENSOR PIPE

Rear Mounting Sensor Pipe



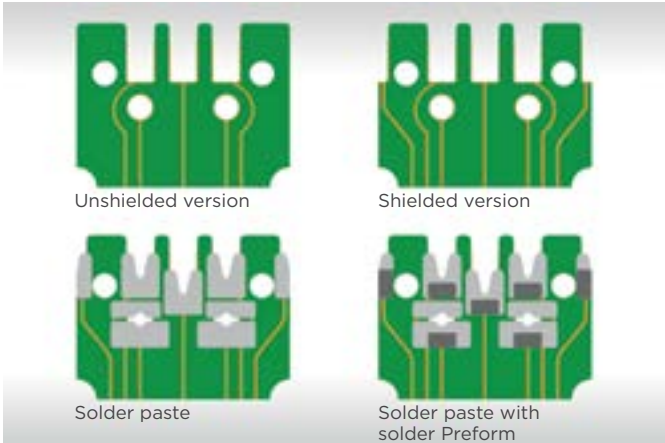
Front Mounting Sensor Pipe



LAYOUT, SHIELDING, PACKAGING AND SEALING OPTIONS

Layout Recommendation

Sensor pipe application



Standard application



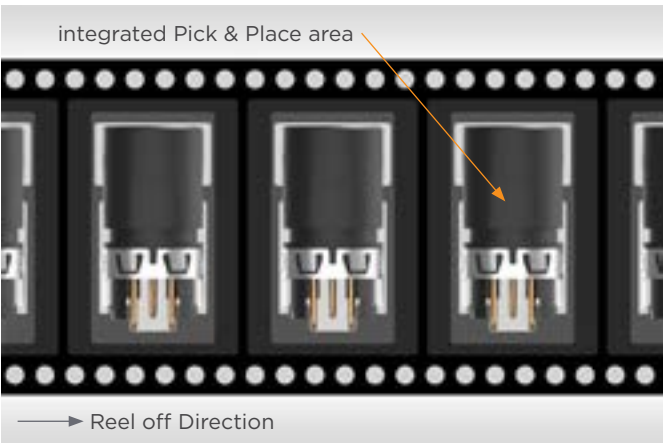
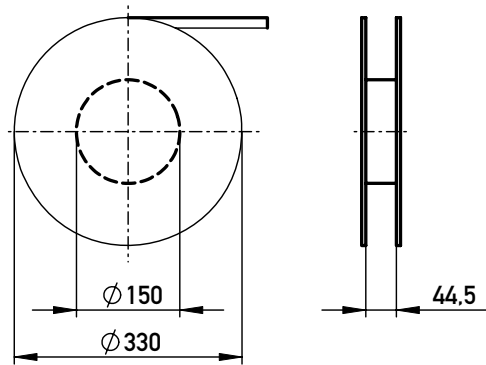
Shielding

The optional shield ring is soldered with two pins to the PCB. Electrical contact to the locking shell is given by three contact tongues placed at the outer contour of the shield ring.



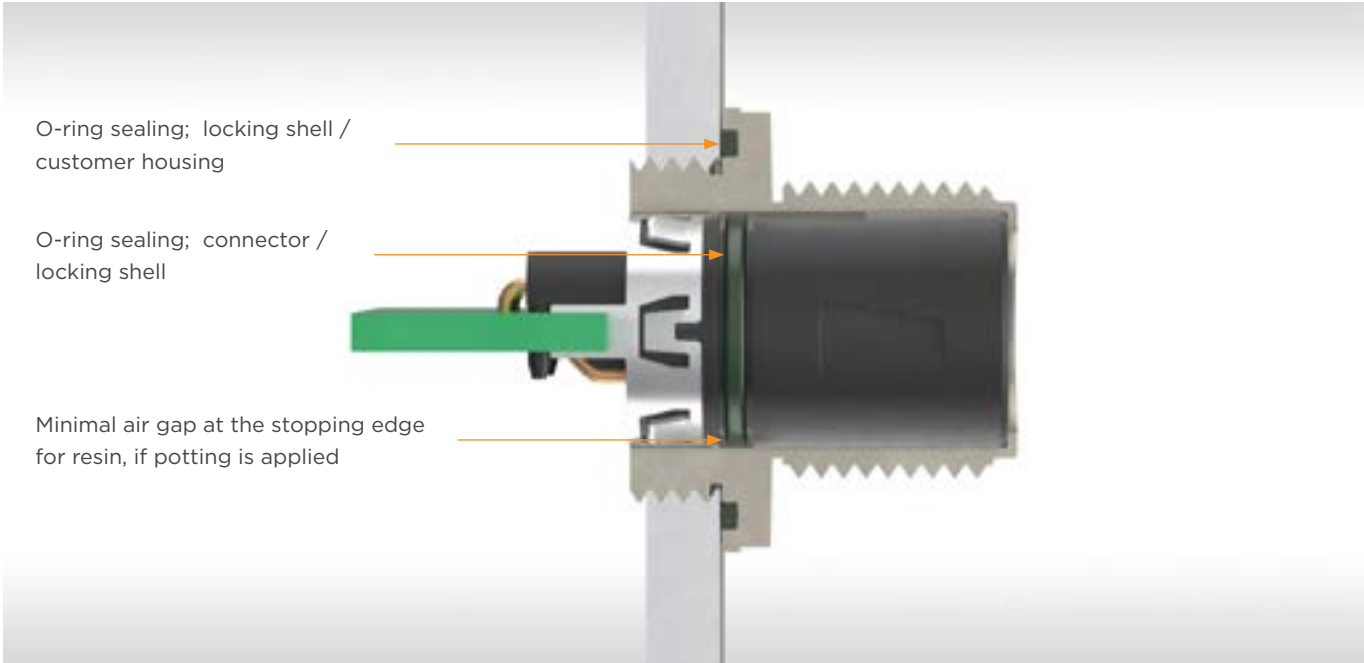
Packaging

Tape on reel packaging. Packaging unit: 250 Pcs.

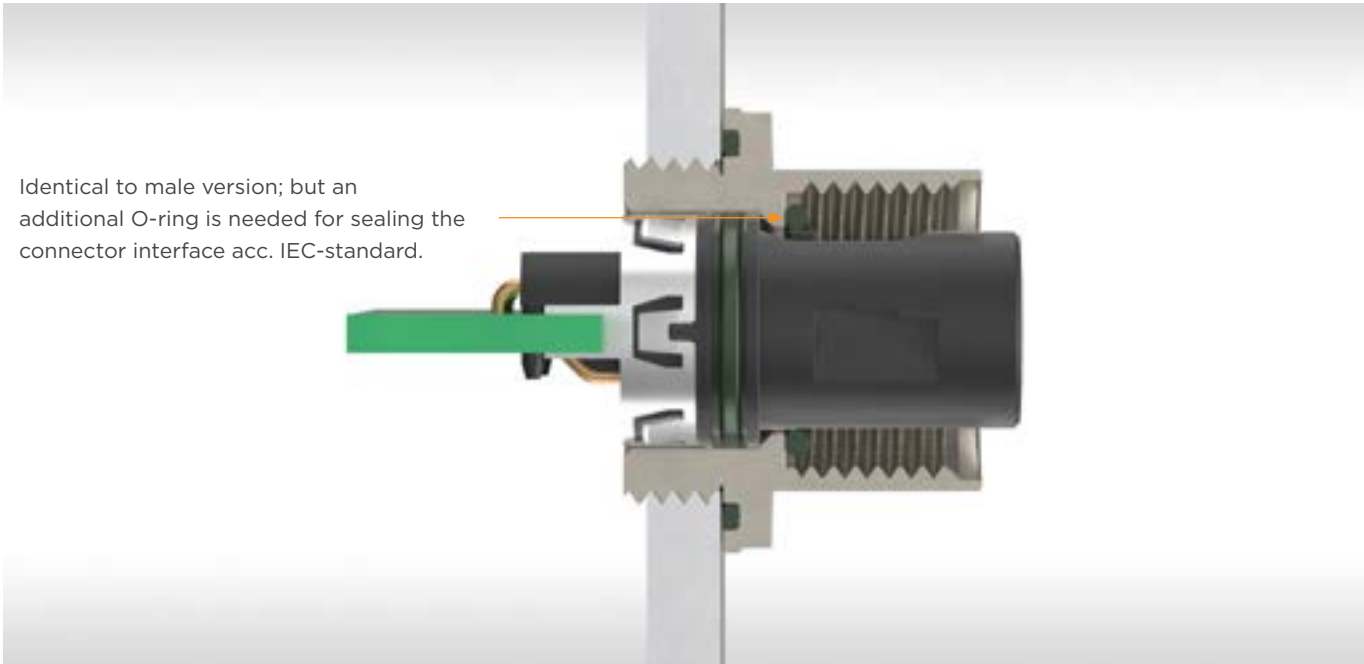


LAYOUT, SHIELDING, PACKAGING AND SEALING OPTIONS

Sealing Options M12 90° Male Connectors



Sealing Options M12 90°Female Connectors



M8 FEMALE CONNECTORS FOR SENSOR PIPE APPLICATIONS

Product Specification

- right angle female
- rear mount



Ordering Information End Assembly Front Mount

| No. of Pins | Coding | O-Ring | Shield | Part Number |
|-------------|--------|--------|--------|-------------|
| 4 | A | no | yes | 235255 |

MALE CONNECTORS FOR STANDARD APPLICATIONS

Product Specification

- right angle male
- rear mount
- with or without O-ring
- 4, 5 and 8-pin
- shielded and unshielded versions



Ordering Information End Assembly Rear Mount

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|------------------------|--------|------------------------|----------------------|
| 4 | A | 1, 2, 3, 4 | no | 225252 | 225255 |
| 4 | A | 1, 2, 3, 4 | yes | 235230 | 235171 |
| 4 | A | 1, 2, 3, 4 | yes | | 235268 |
| 4 | UNI | 1, 2, 3, 4 | yes | 235221 | |
| 5 | A | 1, 2, 3, 4, 5 | no | 225251 | 225254 |
| 5 | A | 1, 2, 3, 4, 5 | yes | 225456 | 235165 |
| 5 | A | 1, 2, 3, 4, 5v | no | | 225256 |
| 5 | B | 1, 2, 3, 4, 5 | no | | 225260 |
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | no | 225294 | 225295 |
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | yes | 225454 | 235045 |

v = early mate last break

Ordering Information End Assembly Rear Mount and Additional Anti Twist Protection

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|------------------------|--------|------------------------|----------------------|
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | yes | 225614 | - |

Used with locking shell 225635.

Optional Accessories

| Description | Usage | Part Number |
|--------------------------|--|-------------|
| O-Ring, 7.2 x 0.8, Viton | sealing option between connector and locking shell | 225360 |
| M12Locking shell | for male connectors | 225361 |
| O-Ring, 14 x 1 | sealing option between housing and locking shell | 834899 |
| Counternut | for locking shell | 354003 |

MALE CONNECTORS FOR STANDARD APPLICATIONS

Product Specification

- right angle male
- rear mount, DI
- with or without O-ring
- 4, 5 and 8-pin



Ordering Information End Assembly Rear Mount, Di Type

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number |
|-------------|-------------|------------------------|--------|-------------|
| 4 | by customer | 1, 2, 3, 4 | no | 225267 |
| 4 | by customer | 1, 2, 3, 4 | yes | 235042 |
| 5 | by customer | 1, 2, 3, 4, 5 | no | 225266 |
| 8 | by customer | 1, 2, 3, 4, 5, 6, 7, 8 | no | 225297 |

v = early mate last break

Optional Accessories

| Description | Usage | Part Number |
|--------------------------|---|-------------|
| O-Ring, 7,2 x 0,8, Viton | sealing option between connector and customer housing | 225360 |

O-Ring can be used in reflow solder process.

MALE CONNECTORS FOR SENSOR PIPE APPLICATIONS

Product Specification

- right angle male
- front mount
- with O-ring
- 4, 5 and 8-pin
- shielded and unshielded versions



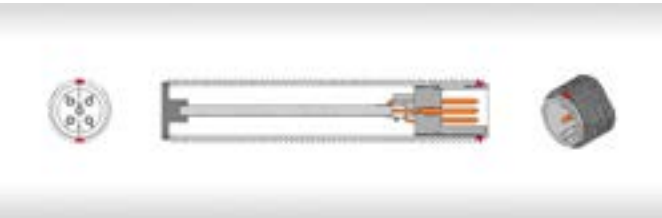
Ordering Information End Assembly Front Mount

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|------------------------|--------|------------------------|----------------------|
| 4 | A | 1, 2, 3, 4 | yes | 225243 | 225247 |
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | yes | 225291 | 225292 |

v = early mate last break

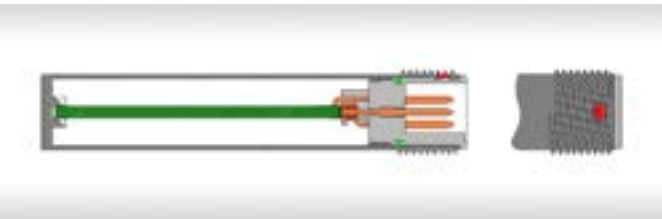
Ordering Information End Assembly Front Mount, Anti Twist Version

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|------------------------|--------|------------------------|----------------------|
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | yes | 225521 | 225522 |



Ordering Information End Assembly Front Mount, Snap-In Version

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|---------------|--------|------------------------|----------------------|
| 4 | A | 1, 2, 3, 4 | yes | 235265 | - |
| 5 | A | 1, 2, 3, 4, 5 | yes | 225459 | - |



FEMALE CONNECTORS FOR STANDARD APPLICATIONS

Product Specification

- right angle female
- rear mount
- with or without O-ring
- 4, 5 and 8-pin
- shielded and unshielded versions



Ordering Information End Assembly Rear Mount

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|------------------------|--------|------------------------|----------------------|
| 4 | A | 1, 2, 3, 4 | yes | 225458 | - |
| 4 | D | 1, 2, 3, 4 | no | - | 225284 |
| 4 | D | 1, 2, 3, 4 | yes | - | 235190 |
| 5 | A | 1, 2, 3, 4, 5 | no | 225273 | 225275 |
| 5 | A | 1, 2, 3, 4, 5 | yes | 225457 | 235164 |
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | no | 225300 | 225301 |
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | yes | 225616 | - |

Ordering Information End Assembly Rear Mount and Additional Anti Twist Protection

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded | Part Number shielded |
|-------------|--------|------------------------|--------|------------------------|----------------------|
| 8 | A | 1, 2, 3, 4, 5, 6, 7, 8 | yes | 225615 | - |

Used with locking shell 225636.

Optional Accessories

| Description | Usage | Part Number |
|--------------------------|--|-------------|
| O-Ring, 7.2 x 0.8, Viton | sealing option between connector and locking shell | 225360 |
| O-Ring, 7 x 1, Viton | sealing option cable side | 835284 |
| M12 Locking shell | for female connectors | 225362 |
| O-Ring, 14 x 1 | sealing option between housing and locking shell | 834899 |
| M12 Protection cap | for female connectors | 374343 |
| Couternut | for locking shell | 354003 |

FEMALE CONNECTORS FOR STANDARD APPLICATIONS

Product Specification

- right angle female
- rear mount, DI
- with or without O-ring
- 4, 5 and 8-pin



Ordering Information End Assembly Rear Mount, Di Typ

| No. of Pins | Coding | Loaded Pins | O-Ring | Part Number unshielded |
|-------------|-------------|---------------|--------|------------------------|
| 4 | by customer | 1, 2, 3, 4 | no | 225287 |
| 5 | by customer | 1, 2, 3, 4, 5 | no | 225286 |

Optional Accessories

| Description | Usage | Part Number |
|--------------------------|---|-------------|
| O-Ring, 7,2 x 0,8, Viton | sealing option between connector and customer housing | 225360 |
| O-Ring, 7 x 1, Viton | sealing option cable side | 835284 |

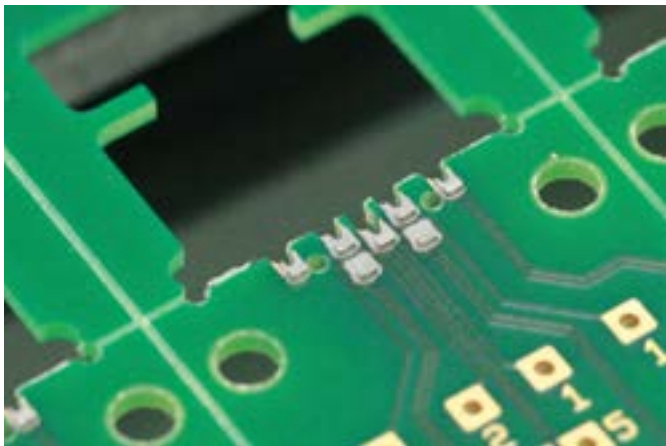
O-Ring 225360 can be used in reflow solder process.

ASSEMBLY

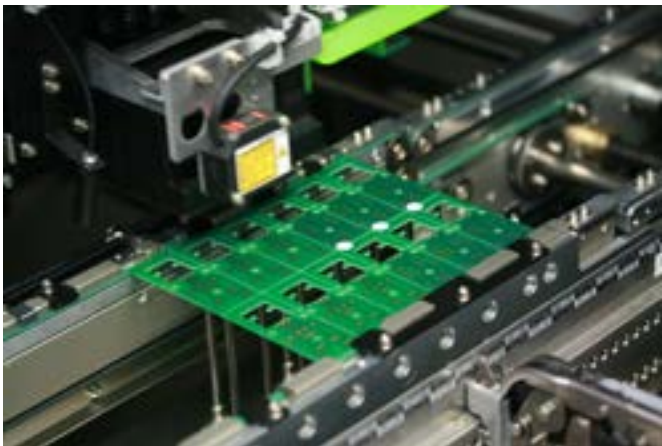
Process Images



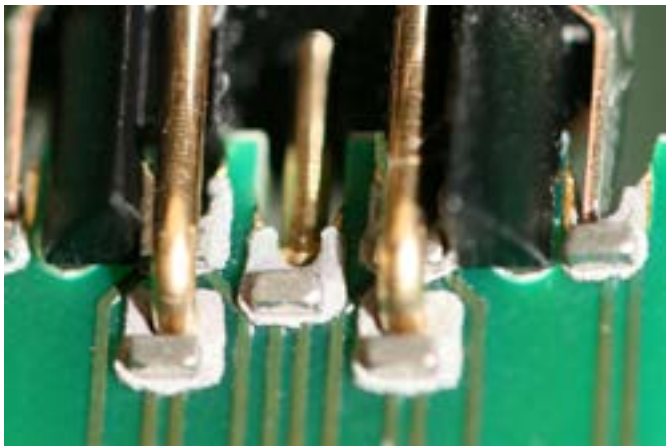
PCB with solder paste



PCB with solder paste and pre-form



Multiple printed pcb in assembly machine



Connector placed into solder paste



Male solder joints

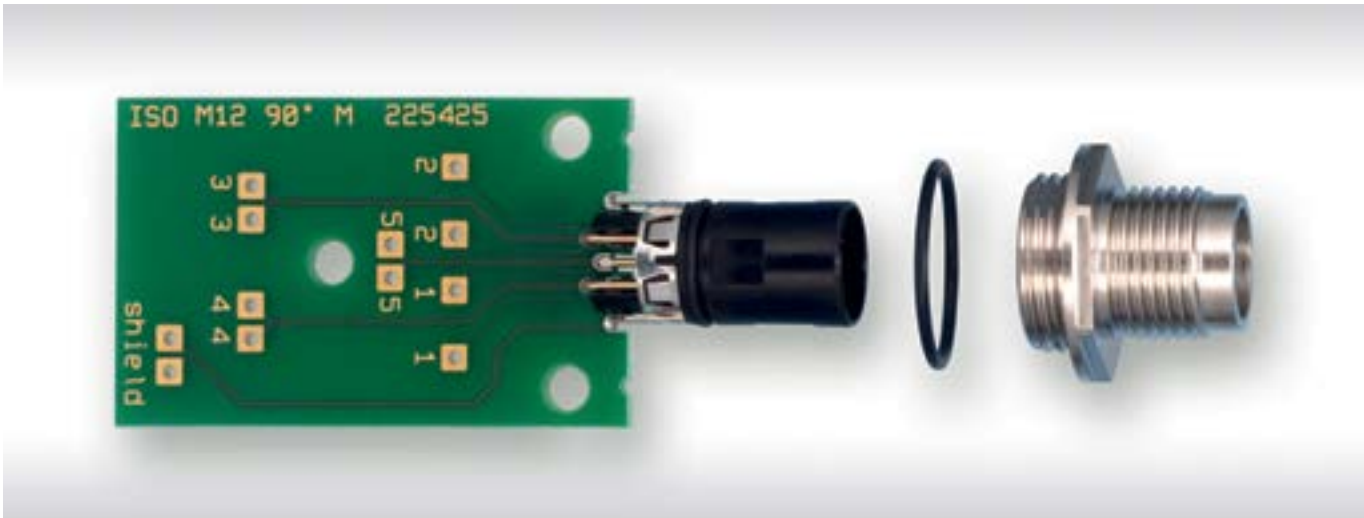


Female solder joints



ASSEMBLY

Product Images



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