

Metallux ME511 pressure sensors are made with a ceramic base plate and a flush diaphragm and work following the piezoresistive principle.

The Wheatstone bridge is screen printed on one side of the flush ceramic diaphragm which is, in turn, glued to the sensor's body. The bridge faces the inside where a cavity is made and the diaphragm's opposite side can therefore be exposed directly to the medium to be measured.

Because of the Al₂O₃ ceramic excellent chemical resistance (aggressive gases, most of solvents and acids, etc.), no additional protection is normally required.

Metallux ME511 sensors are thermally compensated by laser-adjustable PTC resistors and the use of ceramic ensures a high linearity across the entire range of measurement, reducing effects of hysteresis to a minimum.

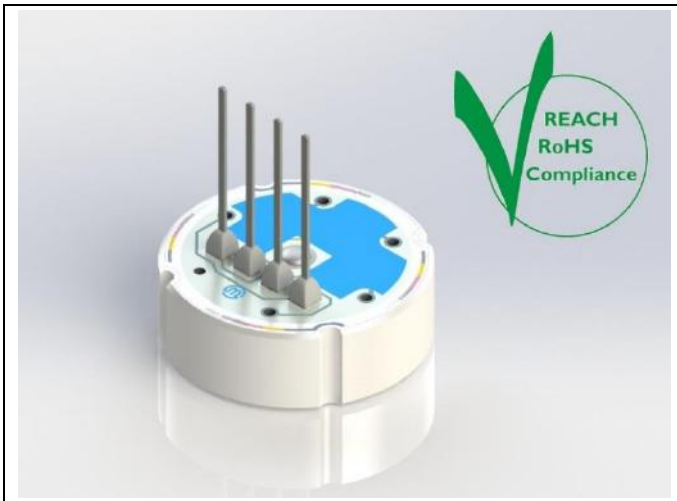
FEATURES

Excellent resistance to corrosion and abrasion

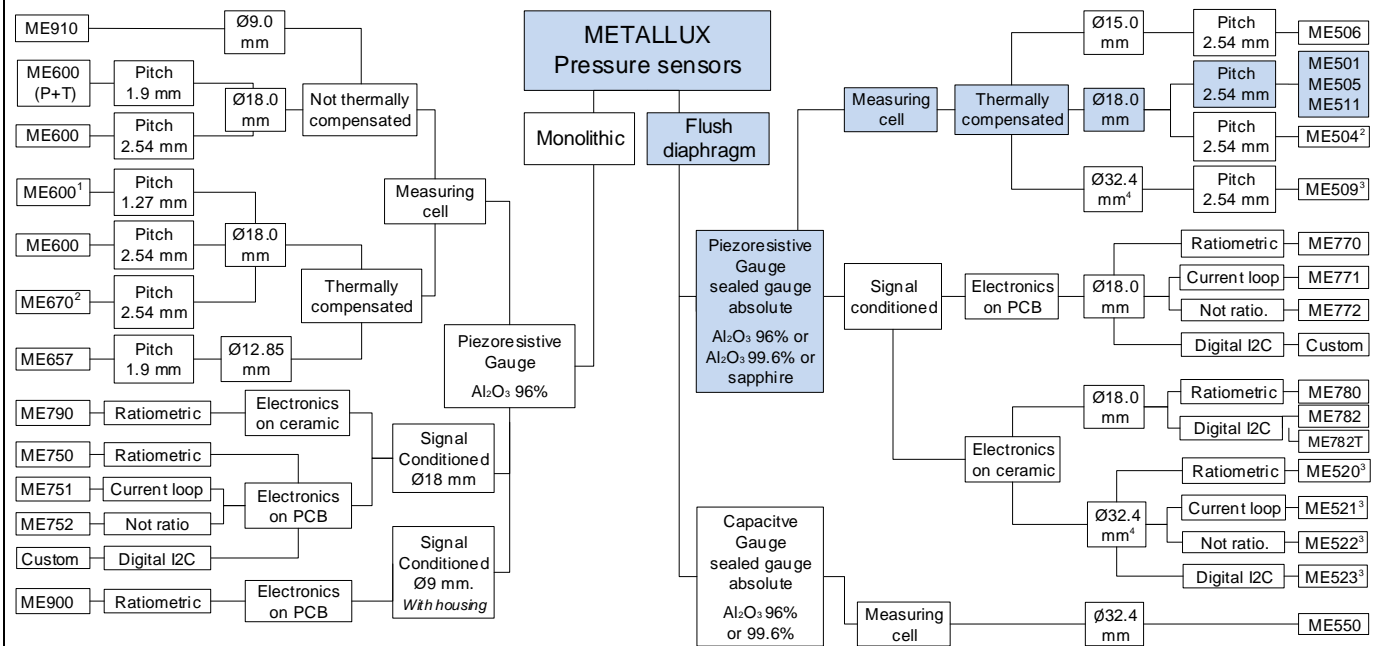
Absolute measurement available

Thermally compensated

Extended choice of measuring ranges



Pressure sensors family tree



¹ Also available in not thermally compensated version

² Digitally trimmed offset, also available not thermally compensated

³ Not available with sapphire diaphragm.

⁴ Suitable for low pressure range (≤1 bar)

Technical characteristics

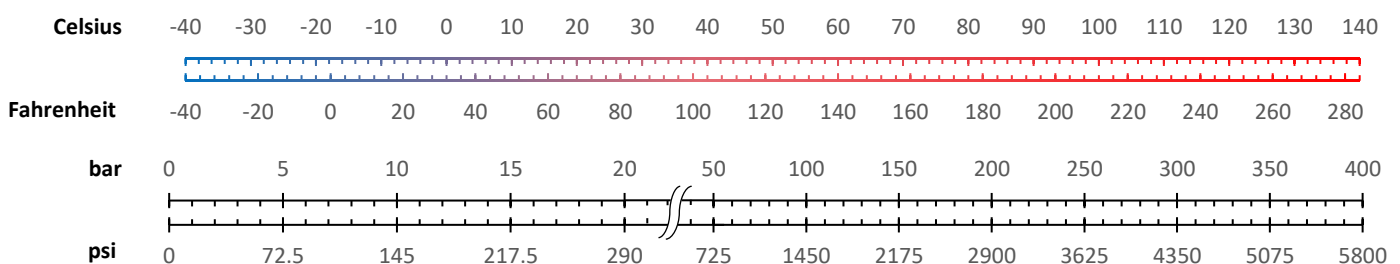
| Parameters | Units | Description |
|-----------------------|-------|---|
| Sensor type | - | Flush diaphragm, absolute (A), gauge (R) or sealed gauge (S) |
| Technology | - | Piezoresistive |
| Diaphragm material | - | Ceramic Al ₂ O ₃ 96%, 99.6% or sapphire |
| Weight | g | ≤ 8 (ceramic cell only) |
| Response time | ms | ≤ 1 |
| Supply voltage | VDC | 2...30 |
| Offset | mV/V | -0.1 ± 0.1 (Other nominal values available on request) |
| Current cons. | mA | ≤ 1.3 @ 10V |
| Operating temperature | °C | -40...+135 (-40 °F...+275 °F) |
| Storage temperature | °C | -40...+150 (-40 °F...+302 °F) |
| Impedance | kΩ | 11 ± 30% |
| Compliant with | - | REACH, RoHS, Conflict Minerals Free |

| | | ME511 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|--|--|--|-----------|-----------|-----------|-----------|--|-----------|-----------|-----------|-----------|-----------------|------------------------------------|------|--|--|--|--|--|--|--|--|--|-----------------|--|---------|--------|---|--|--|--|--|--|--|--|-------------------------------|------------------------------------|--|--|--------|--------|--------------------|--|--|--|--|--|-----------------|--|--|--|--|--|--|--|--|--|--|--|
| Nominal pressure FSO | bar | 0.5 | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 400 | 600 | 800 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | psi ¹ | 7 | 14 | 29 | 73 | 145 | 290 | 725 | 1450 | 2900 | 5800 | 8700 | 11600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Overload pressure | bar | 1 | 2 | 4 | 10 | 20 | 35 | 100 | 150 | 350 | 500 | 750 | 1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | psi ¹ | 14 | 29 | 58 | 145 | 217 | 507 | 1450 | 2175 | 5075 | 7250 | 10875 | 14500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Burst pressure | bar | 2 | 3 | 6 | 15 | 25 | 65 | 120 | 200 | 500 | 650 | 950 | 1250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | psi ¹ | 29 | 43 | 87 | 217 | 362 | 942 | 1740 | 2900 | 7250 | 9425 | 13775 | 18125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vacuum capability | bar | -0.1 | -0.5 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | psi ¹ | -1.4 | -7 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure type | - | R | A / R | A / R | A / R | A / R | A / R | A / R | S | S | S | S | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total thickness | mm | 6.15 | 6.17 | 6.23 | 6.30 | 6.35 | 6.55 | 6.70 | 6.70 | 7.05 | 7.32 | 7.55 | 8.05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | in | 0.242 | 0.243 | 0.245 | 0.248 | 0.250 | 0.258 | 0.263 | 0.263 | 0.278 | 0.288 | 0.297 | 0.317 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sensitivity ² | mV/V | 1.4...2.4 | 2.0...3.6 | 2.0...3.5 | 2.3...4.0 | 3.1...5.5 | 2.4...4.0 | 4.0...6.0 | 3.0...4.8 | 2.5...3.9 | 3.1...4.8 | 3.1...4.8 | 2.0...3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Accuracy ³ (typ./max.) | %FS | 0.4/0.9 | 0.3/0.9 | 0.3/0.6 | 0.2/0.4 | 0.2/0.5 | 0.2/0.5 | 0.2/0.5 | 0.2/0.5 | 0.4/0.8 | 0.5/1.0 | 0.5/1.0 | 0.5/1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thermal offset shift (typ./max.) | %FS/K | <table border="0"> <tr> <td>± 0.02 / ± 0.06</td> <td colspan="11">+25 °C...+85 °C (+77 °F...+185 °F)</td> </tr> <tr> <td>± 0.05 / ± 0.15</td> <td colspan="11">-40°C...+25°C (-40 °F...+77°F)/ +85°C...+135°C (+185°F...+275°F)</td> </tr> <tr> <td>± 0.005 / ± 0.02⁵</td> <td colspan="11">+25 °C...+85 °C (+77 °F...+185 °F)</td> </tr> <tr> <td>± 0.03 / ± 0.06</td> <td colspan="11">-40°C...+25°C (-40 °F...+77°F)/ +85°C...+135°C (+185°F...+275°F)</td> </tr> </table> | | | | | | | | | | | ± 0.02 / ± 0.06 | +25 °C...+85 °C (+77 °F...+185 °F) | | | | | | | | | | | ± 0.05 / ± 0.15 | -40°C...+25°C (-40 °F...+77°F)/ +85°C...+135°C (+185°F...+275°F) | | | | | | | | | | | ± 0.005 / ± 0.02 ⁵ | +25 °C...+85 °C (+77 °F...+185 °F) | | | | | | | | | | | ± 0.03 / ± 0.06 | -40°C...+25°C (-40 °F...+77°F)/ +85°C...+135°C (+185°F...+275°F) | | | | | | | | | | |
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| Thermal span shift | %FS/K | <table border="0"> <tr> <td>Min.</td> <td>Typ.</td> <td>Max.</td> <td colspan="11"></td> </tr> <tr> <td>- 0.030</td> <td>-0.016</td> <td>0</td> <td colspan="11"></td> </tr> <tr> <td>-0.040</td> <td>-0.020</td> <td>0 (for FSO ≤ 2bar)</td> <td colspan="11">-40 °C...+135 °C (-40 °F... / ... +275 °F)</td> </tr> </table> | | | | | | | | | | | Min. | Typ. | Max. | | | | | | | | | | | | - 0.030 | -0.016 | 0 | | | | | | | | | | | | -0.040 | -0.020 | 0 (for FSO ≤ 2bar) | -40 °C...+135 °C (-40 °F... / ... +275 °F) | | | | | | | | | | | | | | | | |
| Min. | Typ. | Max. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 0.030 | -0.016 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -0.040 | -0.020 | 0 (for FSO ≤ 2bar) | -40 °C...+135 °C (-40 °F... / ... +275 °F) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reliability tests ⁴ | - | 1000 hours @85 °C (185 °F) & 85 %RH | | | | | | 500 thermal shocks -40°C...+150 °C (-40 °F... +302 °F) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1000 hours burn-in @150 °C (302 °F) | | | | | | 10 million 0 bar to P _{nom} pressure cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

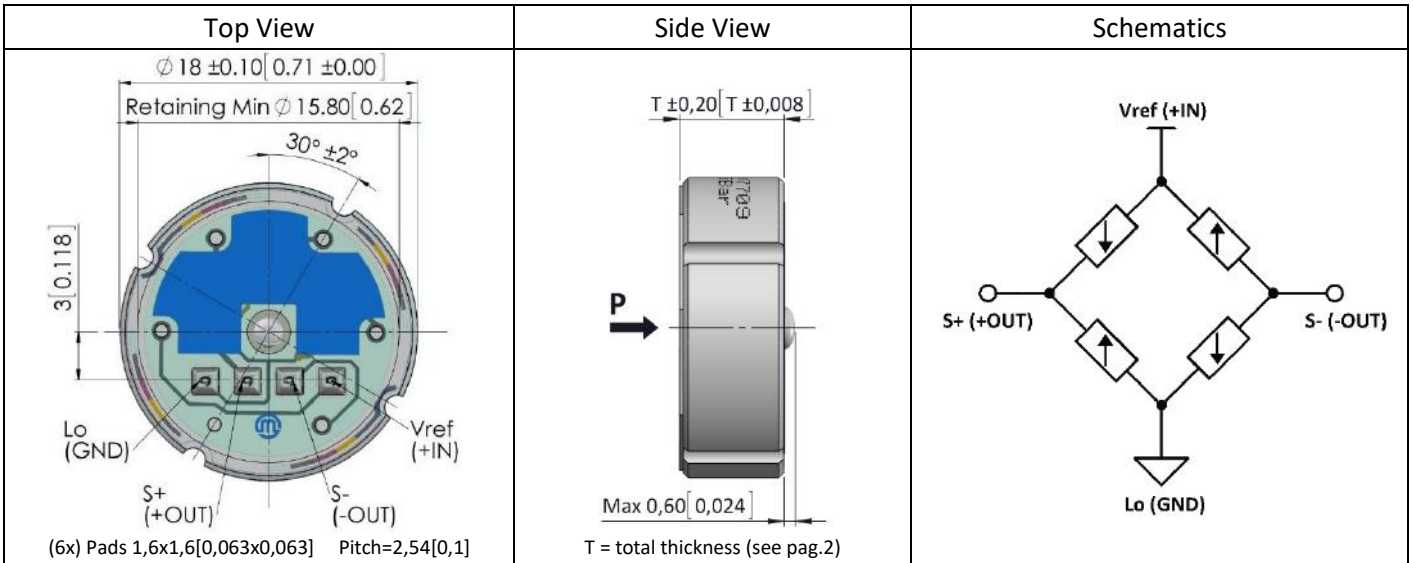
Tests performed at 25°C in Metallux housings, unless otherwise specified. Different housings may affect performances.

1. Psi values for reference only.
2. The sensitivity of each production batch is constant, within the indicated range and with minimal dispersion.
3. Accuracy = $\sqrt{\text{NonLinearity}^2 + \text{Hysteresis}^2 + \text{NonRepeatability}^2}$, terminal based.
4. All technical characteristics will remain within indicated ranges performing the above-mentioned reliability tests.
5. See Ordering Code for compensation level

Conversion tools

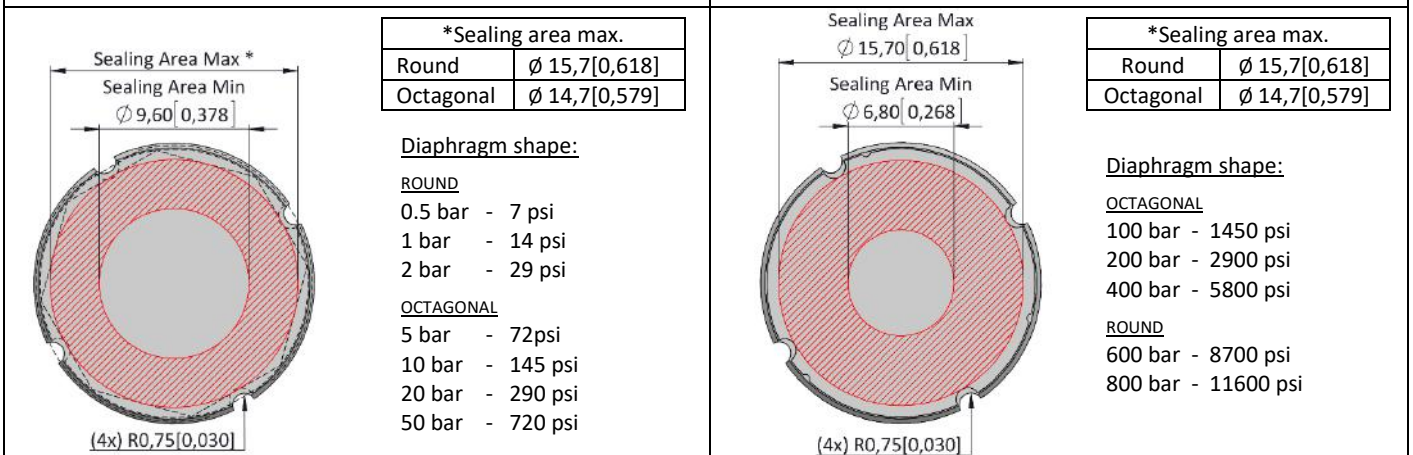


Mechanical drawings and electrical schematics



ME511 0.5...50 bar (0...720 psi) bottom view

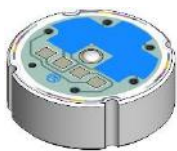
ME511 100...800 bar (1450...11600 psi) bottom view



All quotes are in mm [inch] – General tolerance ISO 2768-1 M

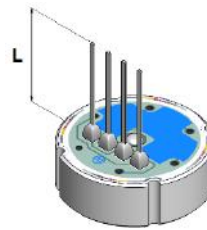
Electrical terminations

Example: type 1, pre-tinned soldering pads



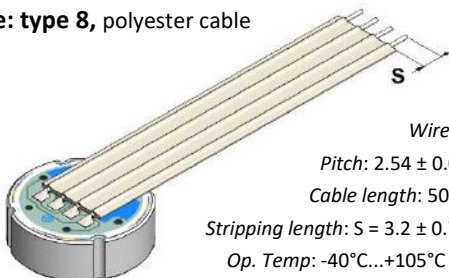
Pitch: $2.54 \pm 0.05 [0.1 \pm 0.002]$
Max. tin thickness: 0.3 [0.01]
Op. Temp: -40°C...+135°C (-40 °F...275 °F)

Example: type 5, 4 pins single line L = 13 ± 0.5 mm [0.39 ± 0.02 in]



Pitch: $2.54 \pm 0.05 [0.1 \pm 0.002]$
Pin section: 0.51x0.25 [0.02 x 0.01]
Pin length: L = 9.0 ± 0.5 [0.35 ± 0.02]
Op. Temp: -40°C...+135°C (-40 °F...275 °F)

Example: type 8, polyester cable



Wire section: AWG24
Pitch: $2.54 \pm 0.05 [0.1 \pm 0.002]$
Cable length: $50.8 \pm 2 [2 \pm 0.08]$
Stripping length: S = 3.2 ± 0.7 [0.13 ± 0.028]
Op. Temp: -40°C...+105°C (-40 °F...221 °F)

Other types available

- Type 2** : 4 single wires 50.8 ± 2.0 mm
- Type 3** : 4 pins on single line, L = 5 ± 0.5 mm [0.20 ± 0.02 in]
- Type 4** : 4 pins on single line, L = 9 ± 0.5 mm [0.51 ± 0.02 in]
- Type 6** : NOMEX™ cable, 50.8 mm, Op. Temp: -40°C...+125°C
- Type 7** : PVC flat cable, 50.8 mm, Op. Temp: -20°C...+105°C

All quotes are in mm [inch] – General tolerance ISO 2768-1 M

Ordering code

| | ME511 | - | --- | - | - | --- | - |
|--|--|-----|-----|---|---|-----|---|
| Sensor type | Absolute | A | | | | | |
| | Gauge | R | | | | | |
| | Sealed Gauge | S | | | | | |
| Pressure range | 0...0.5 bar [0...7 psi] (-/R/-) | 0p5 | | | | | |
| | 0...1 bar [0...14 psi] (A/R/-) | 001 | | | | | |
| | 0...2 bar [0...29 psi] (A/R/-) | 002 | | | | | |
| | 0...5 bar [0...72 psi] (A/R/-) | 005 | | | | | |
| | 0...10 bar [0...145 psi] (A/R/-) | 010 | | | | | |
| | 0...20 bar [0...290 psi] (A/R/-) | 020 | | | | | |
| | 0...50 bar [0...720 psi] (A/R/-) | 050 | | | | | |
| | 0...100 bar [0...1450 psi] (-/-/S) | 100 | | | | | |
| | 0...200 bar [0...2900 psi] (-/-/S) | 200 | | | | | |
| | 0...400 bar [0...5800 psi] (-/-/S) | 400 | | | | | |
| | 0...600 bar [0...8700 psi] (-/-/S) | 600 | | | | | |
| | 0...800 bar [0...11600 psi] (-/-/S) | 800 | | | | | |
| | Others on request (please specify) | 999 | | | | | |
| Thermal offset shift adjustment | ≤ ± 0.06 % FS/K (not thermally compensated) | 0 | | | | | |
| | ≤ ± 0.04 % FS/K | 1 | | | | | |
| | ≤ ± 0.02 % FS/K | 2 | | | | | |
| | Others on request (please specify) | 9 | | | | | |
| Ceramic type | Ceramic Al ₂ O ₃ 96.0% | 0 | | | | | |
| | Ceramic Al ₂ O ₃ 99.6% | 1 | | | | | |
| | Sapphire | 2 | | | | | |
| Additional coating | Without | 0 | | | | | |
| | Parylene | 1 | | | | | |
| | others on request (please specify) | 9 | | | | | |
| Termination type | 4 Pre-tinned soldering pads, pitch 2.54 mm | 1 | | | | | |
| | 4 wires on single line, 50.8 ± 2.0 mm | 2 | | | | | |
| | 4 pins on single line, 5 mm ± 0.5 mm | 3 | | | | | |
| | 4 pins on single line, 9 mm ± 0.5 mm | 4 | | | | | |
| | 4 pins on single line, 13 mm ± 0.5 mm | 5 | | | | | |
| | NOMEX™ cable 50.8 mm - 4 wires, pitch 2.54 mm | 6 | | | | | |
| | PVC flat cable 50.8 mm - 4 wires, pitch 1.27 mm | 7 | | | | | |
| | Polyester cable 50.8 mm - 4 wires, pitch 2.54 mm | 8 | | | | | |
| | Others on request (please specify) | 9 | | | | | |



your distributor

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To be disposed of according to local regulations (OTRif 16 02 97 for Switzerland, CER 16 02 16 for European Union)