

# Pressure and Temperature Modules for PTE, ST-2H calibrators, Ranges for the PM digital indicator

## Accuracy

- HQS-1: 0,06 % (0,07 %) or 0,1 % F.S.
- HQS-2: 0,025 %, 0,05 % or 0,1 % F.S.
- HQS-RT:  $\pm 0,15$  K or  $\pm 0,2$  K
- HQS-TC1:  $\geq \pm 0,3$  K

## Features

- Local calibration firmware
- Quick-Select modules for PTE and ST-2H
- Fixed mounted on PM

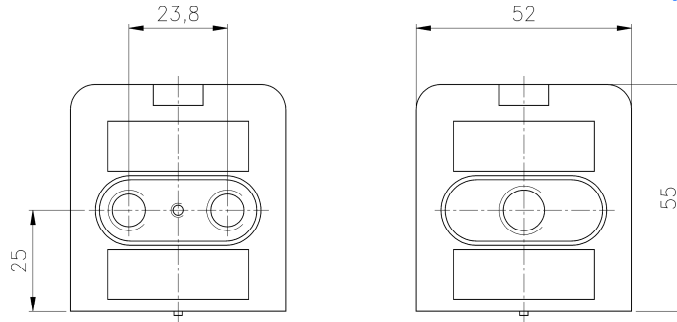
## Ranges

- 0 ... 0,6 mbar to 0 ... 700 bar
- 0 ... 0,25 in. H<sub>2</sub>O to 0 ... 10.000 psi
- 200 °C to 850 °C for resistance thermometers
- 250 °C to 1820 °C for thermocouples



| Technical specification          | HQS-1  | HQS-2  | HQS-RT1 or HQS-RT2   | HQS-TC1   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|--|--|--|---|---------------|---------|--------------------|---------------------|-------------------------|---|-------------------------|---|-----------|-------------|---------|-----|----------------|-------------------------|---|------------|-----------|---------|-----------|---------|---------|----------|----------|----------|----------|-----------|-----------|-----------|--------------|------|-----|-----|---|-----|-----|---|---|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----------------|-------|------|------|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|------------|-----------|-----------|---------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Measuring principle              | Capacitive sensor with micromachined diaphragm   | Piezoresistive sensor, > 500 bar thinfilm sensor   | Measurement of resistance of Pt-100, Pt-1000, Ni-120 and Cu-10 probes  | Voltage generated by thermocouples with internal or external reference                |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Overpressure limits              | -1 bar/3,45 bar  | 5-times < 0,4 bar<br>2-times $\geq 0,4 \leq 60$ bar<br>1,5-times > 60 bar  | Depending on sensitive element   |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Measurement type                 | Differential pressure  | Compound, gauge, vacuum and absolute pressure  | Resistance, Temperature  | Voltage, Temperature  |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Accuracy                         | 0,06 % (0,07 % < 2,5 mbar) or 0,1 % F.S.   | 0,025 % <sup>1)2)</sup> , 0,05 % <sup>1)</sup> or 0,1 % F.S.<br><sup>1)</sup> not for range > 500 bar<br><sup>2)</sup> not for range < 0,6 bar | Pt-100: $\pm 0,15$ K (-200 ... 550 °C)<br>$\pm 0,2$ K (550 ... 850 °C) | Thermocouple Type J: $\pm 0,7$ K (-210 ... -151 °C)<br>$\pm 0,3$ K (-151 ... 1200 °C) |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Process connection               | 1/8 NPT, G 1/8 female, (optional with flushing port)   |  | Plug Type TA4F   | Plug Type SMP   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Material wetted parts            | Silicon, Glass, Aluminum, Stainless steel  | Stainless steel 316 (1.4401) (ranges < 0,6 bar 316 (1.4401) and Silicon), optional cleaned for Oxygen  | Depending on sensitive element   |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Approvals                        | Intrinsically safe according to FM (not for CE version and PM), CE (not for FM and PM)   |  | Intrinsically safe according to FM (not for CE version and PM)         |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ranges of Pressure               | <table border="0"> <tr> <td>HQS-1 in mbar</td> <td>0,6</td><td>1</td><td>2,5</td><td>4</td><td>6</td><td>10</td><td>25</td><td>40</td><td>60</td><td>100</td><td>250</td><td>400</td><td>600</td> </tr> <tr> <td></td> <td><math>\pm 0,25</math></td><td><math>\pm 0,6</math></td><td><math>\pm 1</math></td><td><math>\pm 2,5</math></td><td><math>\pm 4</math></td><td><math>\pm 6</math></td><td><math>\pm 10</math></td><td><math>\pm 16</math></td><td><math>\pm 25</math></td><td><math>\pm 60</math></td><td><math>\pm 100</math></td><td><math>\pm 160</math></td><td><math>\pm 250</math></td> </tr> <tr> <td>HQS-2 in bar</td> <td>0,25</td><td>0,4</td><td>0,6</td><td>1</td><td>1,6</td><td>2,5</td><td>4</td><td>6</td><td>10</td><td>16</td><td>25</td><td>40</td><td>60</td><td>100</td><td>160</td><td>250</td><td>400</td><td>500</td><td>600</td><td>700</td> </tr> <tr> <td>Gauge, absolute</td> <td>-0,25</td><td>-0,4</td><td>-0,6</td><td>-1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Vacuum</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Compound</td> <td><math>\pm 0,25</math></td><td><math>\pm 0,4</math></td><td><math>\pm 0,6</math></td><td><math>\pm 1</math></td><td>-1/2</td><td>-1/4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td> <td colspan="20">psi or other engineering units on request</td> </tr> </table> |  |  |   | HQS-1 in mbar | 0,6     | 1                  | 2,5                 | 4                       | 6   | 10                      | 25  | 40        | 60          | 100     | 250 | 400            | 600                     |   | $\pm 0,25$ | $\pm 0,6$ | $\pm 1$ | $\pm 2,5$ | $\pm 4$ | $\pm 6$ | $\pm 10$ | $\pm 16$ | $\pm 25$ | $\pm 60$ | $\pm 100$ | $\pm 160$ | $\pm 250$ | HQS-2 in bar | 0,25 | 0,4 | 0,6 | 1 | 1,6 | 2,5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 500 | 600 | 700 | Gauge, absolute | -0,25 | -0,4 | -0,6 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Vacuum |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Compound | $\pm 0,25$ | $\pm 0,4$ | $\pm 0,6$ | $\pm 1$ | -1/2 | -1/4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | psi or other engineering units on request |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HQS-1 in mbar                    | 0,6  | 1  | 2,5  | 4   | 6             | 10      | 25                 | 40                  | 60                      | 100   | 250                     | 400   | 600       |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                  | $\pm 0,25$   | $\pm 0,6$  | $\pm 1$  | $\pm 2,5$   | $\pm 4$       | $\pm 6$ | $\pm 10$           | $\pm 16$            | $\pm 25$                | $\pm 60$  | $\pm 100$               | $\pm 160$   | $\pm 250$ |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HQS-2 in bar                     | 0,25   | 0,4  | 0,6  | 1   | 1,6           | 2,5     | 4                  | 6                   | 10                      | 16  | 25                      | 40  | 60        | 100         | 160     | 250 | 400            | 500                     | 600   | 700        |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gauge, absolute                  | -0,25  | -0,4   | -0,6   | -1  |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Vacuum                           |  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Compound                         | $\pm 0,25$   | $\pm 0,4$  | $\pm 0,6$  | $\pm 1$   | -1/2          | -1/4    |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                  | psi or other engineering units on request  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ranges of Temperature            | <table border="0"> <tr> <td>Input range</td> <td>HQS-RT1</td> <td>HQS-RT2</td> </tr> <tr> <td></td> <td>0 ... 400 <math>\Omega</math></td> <td>0 ... 4000 <math>\Omega</math></td> </tr> <tr> <td>Probe/Temperature range</td> <td>Pt-100 -200 ... 850 °C<br/>Ni-120 -80 ... 260 °C<br/>Cu-10 -70 ... 150 °C</td> <td>Pt-1000 -184 ... 275 °C</td> </tr> </table>  |  | Input range  | HQS-RT1   | HQS-RT2       |         | 0 ... 400 $\Omega$ | 0 ... 4000 $\Omega$ | Probe/Temperature range | Pt-100 -200 ... 850 °C<br>Ni-120 -80 ... 260 °C<br>Cu-10 -70 ... 150 °C | Pt-1000 -184 ... 275 °C | <table border="0"> <tr> <td>Input range</td> <td>HQS-TC1</td> </tr> <tr> <td></td> <td>-10 ... 100 mV</td> </tr> <tr> <td>Probe/Temperature range</td> <td>J -210 ... 1200 °C<br/>K -240 ... 999 °C<br/>T -250 ... 400 °C<br/>E -250 ... 400 °C</td> </tr> </table> |           | Input range | HQS-TC1 |     | -10 ... 100 mV | Probe/Temperature range | J -210 ... 1200 °C<br>K -240 ... 999 °C<br>T -250 ... 400 °C<br>E -250 ... 400 °C |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Input range                      | HQS-RT1  | HQS-RT2  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                  | 0 ... 400 $\Omega$   | 0 ... 4000 $\Omega$  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Probe/Temperature range          | Pt-100 -200 ... 850 °C<br>Ni-120 -80 ... 260 °C<br>Cu-10 -70 ... 150 °C  | Pt-1000 -184 ... 275 °C  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Input range                      | HQS-TC1  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                  | -10 ... 100 mV   |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Probe/Temperature range          | J -210 ... 1200 °C<br>K -240 ... 999 °C<br>T -250 ... 400 °C<br>E -250 ... 400 °C  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Operation temperature            | 0 ... 49 °C  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Extended operation temperature   | -7 ... 49 °C (only for HQS-2)  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Storage temperature              | -10 ... 70 °C  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Temperature influence (module)   | $\pm 0,07$ % / 10 K from -7 ... 49 °C (ref. 20 °C), optional for HQS-2 enhanced temperature performance without any additional error due to temperature over the compensated range   |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Warm up time                     | 5 minutes to rated accuracy, 30 minutes to complete stability  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Material housing                 | ABS-plastic  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CE-mark/EMC                      | Emission according EN 50011 (1995)<br>Immunity according EN 50082-2 (1995) (not for FM)  |  | In development   |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Protection acc. EN 60529/IEC 529 | IP45, when installed in PTE base unit, special protection cases available  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Weight in kg                     | approx. 0,3  |  |  |   |               |         |                    |                     |                         |   |                         |   |           |             |         |     |                |                         |   |            |           |         |           |         |         |          |          |          |          |           |           |           |              |      |     |     |   |     |     |   |   |    |    |    |    |    |     |     |     |     |     |     |     |                 |       |      |      |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |            |           |           |         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

### General dimensions in mm



Rev. B

## Order information

### Pressure module

| Type   | Sensor type                                    | Accuracy                                      | Wetted parts  | Pressure type                 | Range            |                 | Engineering unit         | Process connection   |
|--|--|---|---|-------------------------------|------------------|-----------------|--------------------------|--|
|  |  |   |   |                               | HQS(F)-1 in mbar | HQS(F)-2 in bar |                          |  |
| <b>For use with PTE and ST-2H:</b><br><br><b>(HQS)</b> Standard<br><br><b>(HQSC)</b> Standard (CE)<br><br><b>(HQSF)</b> FM approved (non CE) | (1) Capacitive                                 | (B) 0,1 %                                     | (A) Non-isolated (HQS-1 and HQS-2 < 0,6 bar)                                | (D) Differential (only HQS-1) | 0,6              | 0,25            | (MBar) (HQS-1)           | (A) 1/8 NPT female   |
|  | (2) Piezoresistive (ranges > 500 bar thinfilm) | (C) Sensor type 1 0,06/0,07 % <sup>3)</sup>   |   | (G) Gauge (only HQS-2)        | 1                | 0,4             | (BAR) (HQS-2)            | (B) 1/8 NPT female with flush port (only isolated sensors) |
|  |  | Sensor type 2 0,05 % <sup>1)</sup>            | (I) Isolated stainless steel 316 (1.4401) <sup>1)</sup>                     | 2,5                           | 0,6              |                 |                          |  |
|  |  | (D) Sensor type 2 0,025 % <sup>1) 2)</sup>    | (V) Vacuum (only HQS-2)   | 4                             | 1                |                 |                          |  |
|  |  | (F) Sensor type 2 0,1 % <sup>4)</sup>         | (O) Isolated stainless steel 316 (1.4401), for Oxygen service <sup>1)</sup> | 6                             | 1,6              |                 |                          |  |
|  |  | (G) Sensor type 2 0,05 % <sup>1) 4)</sup>     |   | 10                            | 2,5              |                 |                          |  |
|  |  | (H) Sensor type 2 0,025 % <sup>1) 2) 4)</sup> |   | 25                            | 4                |                 |                          |  |
|  |  |   |   | 40                            | 6                |                 |                          |  |
|  |  |   |   | 60                            | 10               |                 |                          |  |
|  |  |   |   | 100                           | 16               |                 |                          |  |
| <b>For use with PM:</b><br><br><b>(PPM)</b> Standard (fix mounted)   |  |   |   | (C) Compound (only HQS-2)     | 250              | 25              |                          | (C) G 1/8 female (only HQS-2)                              |
|  |  |   |   |                               | 400              | 40              |                          | (D) G 1/8 female with flush port (only isolated sensors)   |
|  |  |   |   |                               | 600              | 60              |                          |  |
|  |  |   |   |                               | ±0,25            | 100             |                          |  |
|  |  |   |   |                               | ±0,4             | 160             |                          |  |
|  |  |   |   |                               | ±0,6             | 250             |                          |  |
|  |  |   |   |                               | ±1               | 400             |                          |  |
|  |  |   |   |                               | ±2,5             | 500             |                          |  |
|  |  |   |   |                               | ±4               | 600             |                          |  |
|  |  |   |   |                               | ±6               | 700             |                          |  |
|  |  |   |   | ±10                           | -0,25            |                 |                          |  |
|  |  |   |   | ±16                           | -0,4             |                 |                          |  |
|  |  |   |   | ±25                           | -0,6             |                 |                          |  |
|  |  |   |   | ±60                           | -1               |                 |                          |  |
|  |  |   |   | ±100                          | -1/2             |                 |                          |  |
|  |  |   |   | ±160                          | -1/4             |                 |                          |  |
|  |  |   |   | ±250                          | ±0,25            |                 |                          |  |
|  |  |   |   |                               | ±0,4             |                 |                          |  |
|  |  |   |   |                               | ±0,6             |                 |                          |  |
|  |  |   |   |                               | ±1               |                 |                          |  |
|  |  |   |   |                               |                  |                 | psi or others on request |  |

### Order example pressure module

|      |             |          |              |               |       |                  |                    |
|------|-------------|----------|--------------|---------------|-------|------------------|--------------------|
| Type | Sensor type | Accuracy | Wetted parts | Pressure type | Range | Engineering unit | Process connection |
| HQSC | 2           | C        | I            | G             | 60    | BAR              | A                  |

### Temperature module

| Type                  | Sensor type         | Range          | Temperature probe      | Options  |
|-----------------------|---------------------|----------------|------------------------|--|
| (HQS) Standard        | (RT1)               | 0 ... 400 Ω    | Pt-100, Ni-120, Cu-10  | (TA4F) Connector TA4F for RT-modules             |
| (HQSF) FM approved    | (RT2)               | 0 ... 4000 Ω   | Pt-1000                | (CAL) Software for calibration of RT-modules     |
| (PPM) Standard for PM | (TC1) <sup>1)</sup> | -10 ... 100 mV | J, K, T, E, R, S, B, N | (SMP) Connector SMP (state type of thermocouple) |

<sup>1)</sup> not for digital indicator PM

### RTD-Probes Pt-100 (DIN Class A)

| Model | Description   |
|-------|---|
| PT1   | diameter 3 mm, length 300 mm, handle and 1,5 meter coiled cable |
| PT2   | diameter 6 mm, length 300 mm, handle and 1,5 meter coiled cable |
| PT5   | diameter 3 mm, length 150 mm, handle and 1,5 meter coiled cable |
| PT6   | diameter 6 mm, length 150 mm, handle and 1,5 meter coiled cable |
| PT3   | diameter 3 mm, length 300 mm, 3 meter standard cable            |
| PT4   | diameter 6 mm, length 300 mm, 3 meter standard cable            |
| TA4F  | TA4F mating connector for use with own RTD-probes               |

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