

## Miniature Pressure Sensor for Harsh Environment



### Features

- ➔ Available with 0,5-4,5Vdc output
- ➔ Low thermal shifts
- ➔ Miniature pressure sensor
- ➔ Large Bandwidth

### Applications

- ➔ Automotive - on vehicle
- ➔ Military
- ➔ Test benches
- ➔ Automation & Robotics

PHE160 is designed to operate in the harshest environments, including wide operating temperature, mechanical shocks and vibrations. It is well adapted to embedded measurements, on vehicles, aircrafts, satellites, robots or missiles. With pressure ranges available from -1 up to 250 bar, absolute or gage, its all stainless steel construction makes it usable with most fluids used in industry, even corrosive ones. The PHE160 is manufactured with the ruggedized and EFE proprietary sensitive elements. Its manufacturing process, including traceable controls and special burn-in, gives the best insurance of high performance and stability in the most challenging applications. Its small package and low mass make it very adapted to application where space is at a premium.

## Technical specifications

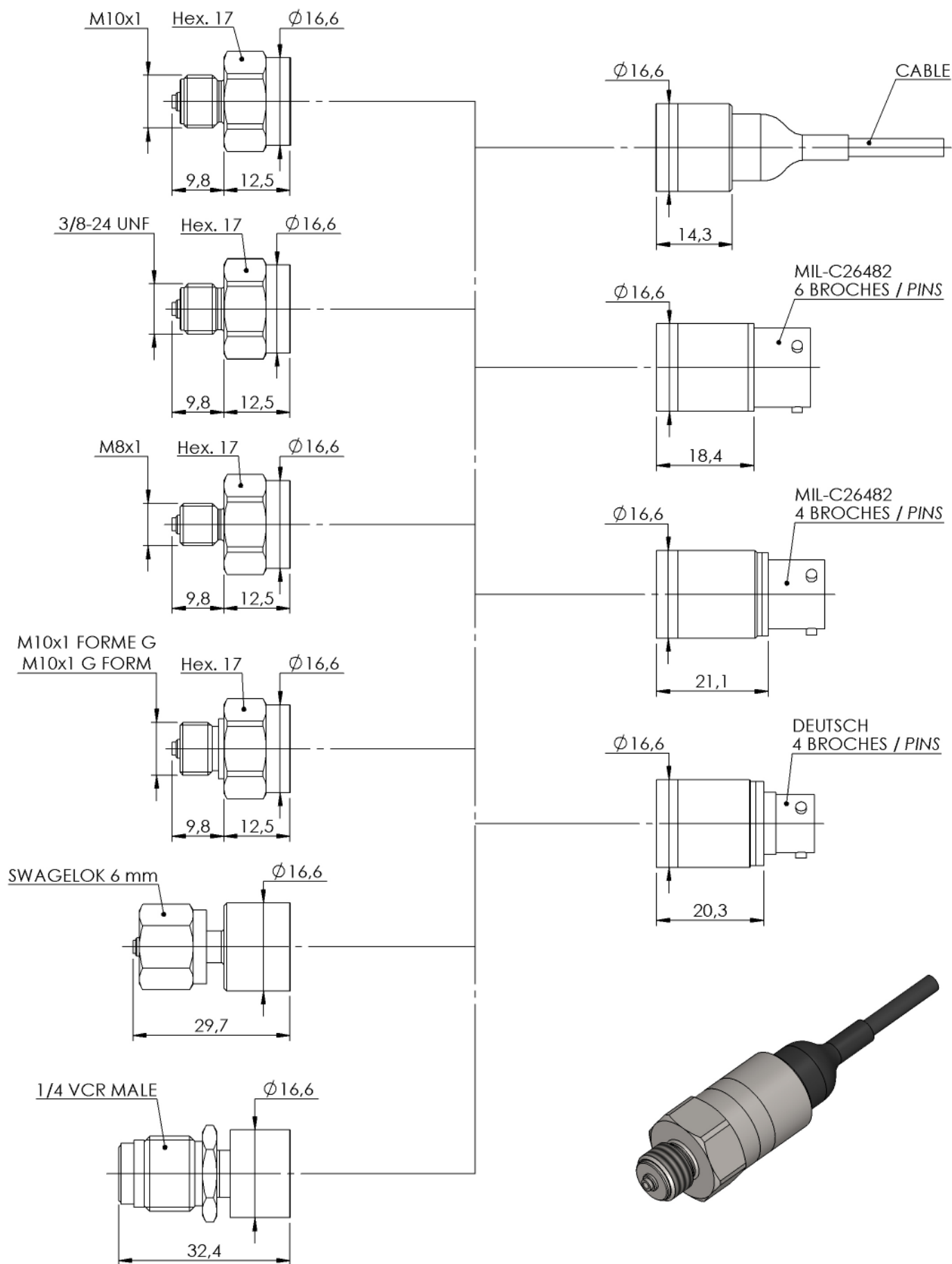
|                                          |                                                                                                                                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pressure ranges (FS)                     | -1/+2bar ; -1/+3bar ; -1/+4bar ;<br>5bar ; 10bar ; 20bar ; 40bar ; 100bar ; 250bar ;<br>-14.5/+30PSI ; -14.5/+40PSI ; -14.5/+60PSI ;<br>70PSI ; 150PSI ; 300PSI ; 500PSI ; 1500PSI ; 3000PSI |
| Type                                     | Absolute ; Gage                                                                                                                                                                              |
| Type (for ranges > 40 bar)               | Sealed Gage                                                                                                                                                                                  |
| Safe overload                            | 150% FS                                                                                                                                                                                      |
| Burst pressure                           | 300% FS                                                                                                                                                                                      |
| Output impedance                         | > 3000 Ohms typ.                                                                                                                                                                             |
| Input impedance                          | > 3500 Ohms typ.                                                                                                                                                                             |
| Power supply                             | 5 to 15Vdc                                                                                                                                                                                   |
| Consumption                              | < 10mA                                                                                                                                                                                       |
| Insulation                               | > 1000 MOhms under 50Vdc at ambient temperature                                                                                                                                              |
| Output at -100%FS (only for $\pm$ range) | Proportional to +100%FS                                                                                                                                                                      |
| Output at 0%FS                           | 0mV/V                                                                                                                                                                                        |

## Technical Specifications

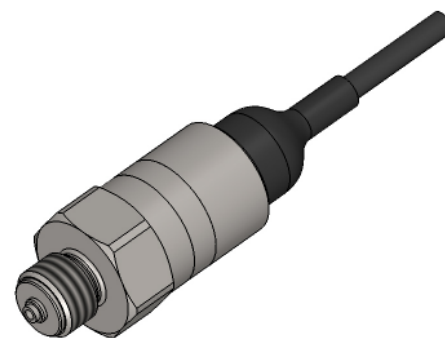
|                                            |                                                                                                                                                                                                     |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output at 100%FS                           | 1.5mV/V nom.                                                                                                                                                                                        |
| Zero and sensitivity settings tolerances   | ±3% FS<br>Option : Special settings                                                                                                                                                                 |
| Non linearity and hysteresis combined      | ±0.25% FS                                                                                                                                                                                           |
| Non repeatability                          | ±0.02% FS typ.                                                                                                                                                                                      |
| Compensated temperature range              | -40 to +125°C                                                                                                                                                                                       |
| Operating temperature range                | -40 to +125°C                                                                                                                                                                                       |
| Combined thermal zero & sensitivity shifts | ±0.02% FS/°C<br>Option : ±0.01% FS/°C                                                                                                                                                               |
| Constant acceleration in linear vibrations | ± 0.02% FS/g (frequency 20-2000Hz, 50g max.)                                                                                                                                                        |
| Mechanical shock                           | 100g ½ sinus 1ms                                                                                                                                                                                    |
| Electrical protection                      | Protected against polarity inversion                                                                                                                                                                |
| EMC protection                             | Compliant to EN61000                                                                                                                                                                                |
| Electrical connection                      | AWG26, Viton Jacketed Shielded Cable Ø3mm, 4 wires<br>Option : Hermetic MIL-C-26482 - 6 pins Receptacle ; Hermetic MIL-C-26482 - 4 pins Receptacle ;<br>DEUTSCH Autosport AS4H06-05-PN-HE connector |
| Mechanical connection                      | 3/8-24 UNF-3A male ; M10x1-4h male<br>Option : 1/4" VCR male ; M10x1 male form G Minimesse® ; M8x1-6g male ; Swagelok nut<br>SS-6M2-1 for OD 6mm pipe                                               |
| Material(s) of wetted parts                | Stainless Steel 316L ; Stainless Steel 17-4PH ; Stainless steel 15-5PH                                                                                                                              |
| Weight                                     | 30g without cable                                                                                                                                                                                   |
| Enclosure protection                       | IP65 for absolute & sealed gage version                                                                                                                                                             |

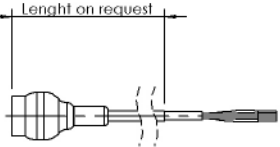
## Codification

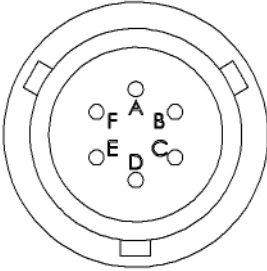
|                                                    |       |   |   |        |    |    |       |   |   |   |   |
|----------------------------------------------------|-------|---|---|--------|----|----|-------|---|---|---|---|
| Miniature Pressure Sensor for Harsh Environment    | PHE16 | 1 | S | 100bar | A  | 02 | 03    | D | 1 | 1 | S |
| Output Signal                                      |       |   |   |        |    |    |       |   |   |   |   |
| mV/V                                               |       | 1 |   |        |    |    |       |   |   |   |   |
| Material                                           |       |   |   |        |    |    |       |   |   |   |   |
| Stainless Steels                                   |       |   | S |        |    |    |       |   |   |   |   |
| Range                                              |       |   |   |        |    |    |       |   |   |   |   |
| Example                                            |       |   |   | 100bar |    |    |       |   |   |   |   |
| Type                                               |       |   |   |        |    |    |       |   |   |   |   |
| Absolute                                           |       |   |   |        | A  |    |       |   |   |   |   |
| Gage                                               |       |   |   |        | G  |    |       |   |   |   |   |
| Sealed Gage                                        |       |   |   |        | SG |    |       |   |   |   |   |
| Mechanical connection                              |       |   |   |        |    |    |       |   |   |   |   |
| M10x1-4h male                                      |       |   |   |        |    | 02 |       |   |   |   |   |
| M8x1-6g male                                       |       |   |   |        |    | 03 |       |   |   |   |   |
| 3/8-24 UNF-3A male                                 |       |   |   |        |    | 11 |       |   |   |   |   |
| Swagelok nut SS-6M2-1 for OD 6mm pipe              |       |   |   |        |    | 15 |       |   |   |   |   |
| M10x1 male form G Minimesse®                       |       |   |   |        |    | 16 |       |   |   |   |   |
| 1/4" VCR male                                      |       |   |   |        |    | 22 |       |   |   |   |   |
| Electrical connection                              |       |   |   |        |    |    |       |   |   |   |   |
| Hermetic MIL-C-26482 - 6 pins Receptacle           |       |   |   |        |    |    | 03    |   |   |   |   |
| DEUTSCH Autosport AS4H06-05-PN-HE connector        |       |   |   |        |    |    | 05    |   |   |   |   |
| AWG26, Viton Jacketed Shielded Cable Ø3mm, 4 wires |       |   |   |        |    |    | 08/1m |   |   |   |   |
| Hermetic MIL-C-26482 - 4 pins Receptacle           |       |   |   |        |    |    | 14    |   |   |   |   |
| Compensated temperature range                      |       |   |   |        |    |    |       |   |   |   |   |
| -40 to +125°C                                      |       |   |   |        |    |    |       | D |   |   |   |
| Non linearity and hysteresis combined              |       |   |   |        |    |    |       |   |   |   |   |
| ±0.25% FS                                          |       |   |   |        |    |    |       |   | 1 |   |   |
| Combined thermal zero & sensitivity shifts         |       |   |   |        |    |    |       |   |   |   |   |
| ±0.02% FS/°C                                       |       |   |   |        |    |    |       |   |   | 1 |   |
| ±0.01% FS/°C                                       |       |   |   |        |    |    |       |   |   | 2 |   |
| Options                                            |       |   |   |        |    |    |       |   |   |   |   |
| Special settings                                   |       |   |   |        |    |    |       |   |   |   | S |

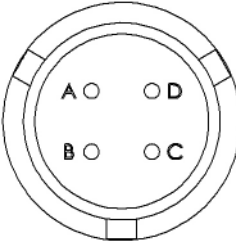


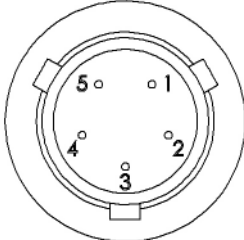
DIMENSIONS : mm



|  | #26 AWG, 4 CONDUCTOR SHIELDED VITON CABLE |                |  |
|----------------------------------------------------------------------------------|-------------------------------------------|----------------|-------------------------------------------------------------------------------------|
|                                                                                  | mV/V OUTPUT                               | CONDUCTOR      |                                                                                     |
|                                                                                  | + EXCITATION                              | RED            |                                                                                     |
|                                                                                  | + SIGNAL                                  | GREEN / YELLOW |                                                                                     |
|                                                                                  | - SIGNAL                                  | WHITE          |                                                                                     |
|                                                                                  | - EXCITATION                              | BLUE / BLACK   |                                                                                     |
|                                                                                  | SENSOR HOUSING                            | SHIELD         |                                                                                     |

|  | MIL-C26482 - 6 PINS |            |  |
|-----------------------------------------------------------------------------------|---------------------|------------|-------------------------------------------------------------------------------------|
|                                                                                   | mV/V OUTPUT         | PIN        |                                                                                     |
|                                                                                   | + EXCITATION        | PIN A      |                                                                                     |
|                                                                                   | + SIGNAL            | PIN B      |                                                                                     |
|                                                                                   | - SIGNAL            | PIN C      |                                                                                     |
|                                                                                   | - EXCITATION        | PIN D      |                                                                                     |
|                                                                                   | SENSOR HOUSING      | PINS E & F |                                                                                     |

|  | MIL-C26482 - 4 PINS |                   |  |
|-------------------------------------------------------------------------------------|---------------------|-------------------|---------------------------------------------------------------------------------------|
|                                                                                     | mV/V OUTPUT         | PIN               |                                                                                       |
|                                                                                     | + EXCITATION        | PIN A             |                                                                                       |
|                                                                                     | + SIGNAL            | PIN C             |                                                                                       |
|                                                                                     | - SIGNAL            | PIN D             |                                                                                       |
|                                                                                     | - EXCITATION        | PIN B             |                                                                                       |
|                                                                                     | SENSOR HOUSING      | CONNECTOR HOUSING |                                                                                       |

|  | DEUTSCH ASH06-05PN-HE - 5 PINS |       |  |
|-------------------------------------------------------------------------------------|--------------------------------|-------|---------------------------------------------------------------------------------------|
|                                                                                     | mV/V OUTPUT                    | PIN   |                                                                                       |
|                                                                                     | + EXCITATION                   | PIN 1 |                                                                                       |
|                                                                                     | + SIGNAL                       | PIN 3 |                                                                                       |
|                                                                                     | - SIGNAL                       | PIN 4 |                                                                                       |
|                                                                                     | - EXCITATION                   | PIN 2 |                                                                                       |
|                                                                                     | SENSOR HOUSING                 | PIN 5 |                                                                                       |



E.F.E.

L'ESSOR FRANCAIS ELECTRONIQUE

16 Rue Porte a Bateaux - 27540 Ivry-la-Bataille - FRANCE

Tel : 33 (0)2 32 22 35 05 - Fax : 33 (0)2 32 36 93 08

[www.efe-sensor.com](http://www.efe-sensor.com) - [infos@efe-sensor.com](mailto:infos@efe-sensor.com)

Agent :