



# HDI Series

## Amplified pressure sensors

### FEATURES

- 10 mbar to 5 bar, absolute, gage or differential pressure
- Digital I<sup>2</sup>C-bus and analog output
- Precision ASIC signal conditioning
- Calibrated and temperature compensated
- SMT and DIP housings
- RoHS compliant
- Sensortech PRO services

### MEDIA COMPATIBILITY

To be used with non-corrosive, non-ionic working fluids such as clean dry air, dry gases and the like.



### SPECIFICATIONS

#### Maximum ratings

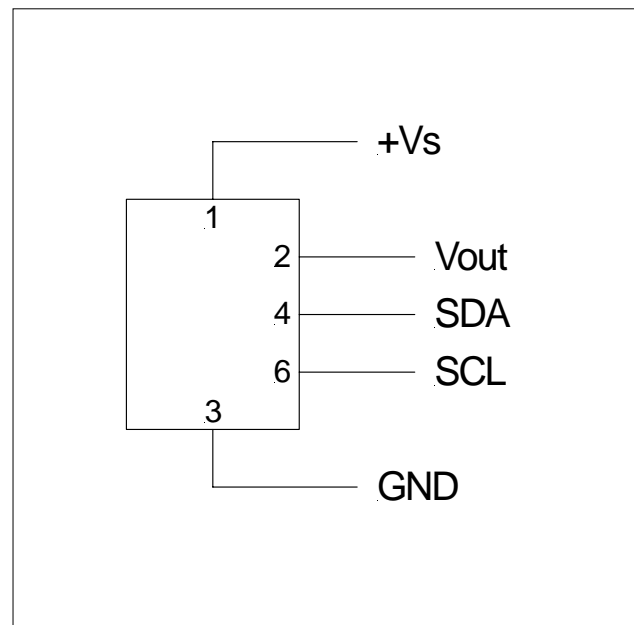
|                      |                             |
|----------------------|-----------------------------|
| Supply voltage $V_s$ |                             |
| HDI...3              | 2.7 ... 3.3 V <sub>DC</sub> |
| HDI...5              | 4.5 ... 5.5 V <sub>DC</sub> |
|                      | max. 6.50 V <sub>DC</sub>   |

|                |      |
|----------------|------|
| Output current |      |
| Sink           | 1 mA |
| Source         | 1 mA |

|   |           |
|---|-----------|
| Lead specifications                     |           |
| Average preheating temperature gradient | 2.5 K/s   |
| Soak time                               | ca. 3 min |
| Time above 217°C                        | 50 s      |
| Time above 230°C                        | 40 s      |
| Time above 250°C                        | 15 s      |
| Peak temperature                        | 260°C     |
| Cooling temperature gradient            | -3.5 K/s  |

|                                 |                 |
|---------------------------------|-----------------|
| Temperature ranges <sup>5</sup> |                 |
| Compensated                     | 0 ... +85 °C    |
| Operating                       | -20 ... +85 °C  |
| Storage                         | -40 ... +125 °C |

### ELECTRICAL CONNECTION





### PRESSURE SENSOR CHARACTERISTICS

(T<sub>A</sub> = 25 °C)

| Part no.       | Operating pressure | Proof pressure <sup>1</sup> | Burst pressure <sup>2</sup> |
|----------------|--------------------|-----------------------------|-----------------------------|
| HDIM010...B... | 0...±10 mbar       | 150 mbar                    | 200 mbar                    |
| HDIM020...B... | 0...±20 mbar       | 150 mbar                    | 200 mbar                    |
| HDIM050...B... | 0...±50 mbar       | 550 mbar                    | 800 mbar                    |
| HDIM100...B... | 0...±100 mbar      | 1 bar                       | 1.5 bar                     |
| HDIM200...B... | 0...±200 mbar      | 1 bar                       | 1.5 bar                     |
| HDIM500...B... | 0...±500 mbar      | 1 bar                       | 1.5 bar                     |
| HDIB001...B... | 0...±1 bar         | 2 bar                       | 3 bar                       |
| HDIM010...U... | 0...10 mbar        | 150 mbar                    | 200 mbar                    |
| HDIM020...U... | 0...20 mbar        | 150 mbar                    | 200 mbar                    |
| HDIM050...U... | 0...50 mbar        | 550 mbar                    | 800 mbar                    |
| HDIM100...U... | 0...100 mbar       | 1 bar                       | 1.5 bar                     |
| HDIM200...U... | 0...200 mbar       | 1 bar                       | 1.5 bar                     |
| HDIM500...U... | 0...500 mbar       | 1 bar                       | 1.5 bar                     |
| HDIB001...U... | 0...1 bar          | 2 bar                       | 3 bar                       |
| HDIB002...U... | 0...2 bar          | 4 bar                       | 6 bar                       |
| HDIB005...U... | 0...5 bar          | 7 bar                       | 7 bar                       |
| HDI0611AR...   | 600...1100 mbar(a) | 2 bara                      | 3 bara                      |
| HDI0811AR...   | 800...1100 mbar(a) | 2 bara                      | 3 bara                      |

**Other pressure ranges are available on request. Please contact Sensortronics.**

#### Specification notes:

1. Proof pressure is the maximum pressure which may be applied without causing durable shifts of the electrical parameters of the sensing element.
2. Burst pressure is the maximum pressure which may be applied without causing damage to the sensing element or leaks to the housing.
3. Full Scale Span (FSS) is the algebraic difference between the output signal for the highest and lowest specified pressure.
4. Total accuracy is the combined error from offset and span calibration, linearity, pressure hysteresis, and temperature effects. Linearity is the measured deviation based on a straight line. Hysteresis is the maximum output difference at any point within the operating pressure range for increasing and decreasing pressure. Calibration errors include the deviation of offset and full scale from nominal values.
5. Extended temperature ranges on request. Please contact Sensortronics.
6. Max. delay time between pressure change at the pressure die and signal change at the output.
7. The response time depends on the adjusted internal A/D resolution of the sensor. For 12 bit it is typ. 0.5 ms. Other A/D resolutions and reponse time are available on request. Please contact Sensortronics for further information.
8. Sensors with lower current consumption are available on request. Please contact Sensortronics for further information.



### PERFORMANCE CHARACTERISTICS

( $V_s = 5.0 V_{DC}$ ,  $T_A = 25^\circ C$ , analog output signal is **ratiometric** to  $V_s$ , digital output signal is **not ratiometric** to  $V_s$ )

#### All HDI...P5 devices (Prime Grade, $V_s = 5.0$ )

| Characteristics                        | Min.                   | Typ. | Max. | Units |
|--|------------------------|------|------|-------|
| Total accuracy (0...85°C) <sup>4</sup> | all barometric devices |      | ±1.0 | %FSS  |
|  | all other devices      |      | ±0.5 |       |
| Response delay <sup>6,7</sup>          |                        | 0.5  |      | ms    |
| A/D resolution <sup>7</sup>            |                        | 12   |      | bit   |
| D/A resolution                         |                        |      | 11   |       |
| Current consumption <sup>8</sup>       |                        | 5    |      | mA    |

#### All HDI...R...P5 (barometric devices)

| Characteristics                     | Min.  | Typ.  | Max.  | Units  |
|-------------------------------------|-------|-------|-------|--------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |       |       |       |        |
| Output at min. specified pressure   | 0.46  | 0.50  | 0.54  | V      |
| Full scale span (FSS) <sup>3</sup>  |       | 4.00  |       |        |
| Full scale output                   | 4.46  | 4.50  | 4.54  |        |
| DIGITAL PERFORMANCE CHARACTERISTIC  |       |       |       |        |
| Output at min. specified pressure   | 3015  | 3277  | 3539  | counts |
| Full scale span (FSS) <sup>3</sup>  |       | 26214 |       |        |
| Full scale output                   | 29228 | 29490 | 29752 |        |

#### All HDI...U...P5 (unidirectional devices)

| Characteristics                     | Min.  | Typ.  | Max.  | Units  |
|-------------------------------------|-------|-------|-------|--------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |       |       |       |        |
| Zero pressure offset                | 0.48  | 0.50  | 0.52  | V      |
| Full scale span (FSS) <sup>3</sup>  |       | 4.00  |       |        |
| Full scale output                   | 4.48  | 4.50  | 4.52  |        |
| DIGITAL PERFORMANCE CHARACTERISTIC  |       |       |       |        |
| Zero pressure offset                | 3146  | 3277  | 3408  | counts |
| Full scale span (FSS) <sup>3</sup>  |       | 26214 |       |        |
| Full scale output                   | 29359 | 29490 | 29621 |        |

#### All HDI...B...P5 (bidirectional devices)

| Characteristics                     | Min.                       | Typ.  | Max.  | Units  |       |
|-------------------------------------|----------------------------|-------|-------|--------|-------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |                            |       |       |        |       |
| Zero pressure offset                | 2.48                       | 2.50  | 2.52  | V      |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 4.00  |       |        |       |
| Output                              | at max. specified pressure | 4.48  | 4.50  |        | 4.52  |
|                                     | at min. specified pressure | 0.48  | 0.50  |        | 0.52  |
| DIGITAL PERFORMANCE CHARACTERISTIC  |                            |       |       |        |       |
| Zero pressure offset                | 16252                      | 16384 | 16515 | counts |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 26214 |       |        |       |
| Output                              | at max. specified pressure | 29359 | 29490 |        | 29621 |
|                                     | at min. specified pressure | 3146  | 3277  |        | 3408  |



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#### All HDI...H5 devices (High Grade, $V_s = 5.0$ )

| Characteristics                        | Min. | Typ. | Max. | Units |
|--|------|------|------|-------|
| Total accuracy (0...85°C) <sup>4</sup> |      |      | ±1.5 | %FSS  |
| Response delay <sup>6,7</sup>          |      | 0.5  |      | ms    |
| A/D resolution <sup>7</sup>            |      | 12   |      | bit   |
| D/A resolution                         |      |      | 11   |       |
| Current consumption <sup>8</sup>       |      | 5    |      | mA    |

#### All HDI...U...H5 (unidirectional devices) and HDI...R...H5 (barometric devices)

| Characteristics                     | Min.  | Typ.  | Max.  | Units  |
|-------------------------------------|-------|-------|-------|--------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |       |       |       |        |
| Output at min. specified pressure   | 0.44  | 0.50  | 0.56  | V      |
| Full scale span (FSS) <sup>3</sup>  |       | 4.00  |       |        |
| Full scale output                   | 4.44  | 4.50  | 4.56  |        |
| DIGITAL PERFORMANCE CHARACTERISTIC  |       |       |       |        |
| Output at min. specified pressure   | 2883  | 3277  | 3670  | counts |
| Full scale span (FSS) <sup>3</sup>  |       | 26214 |       |        |
| Full scale output                   | 29097 | 29490 | 29883 |        |

#### All HDI...B...H5 (bidirectional devices)

| Characteristics                     | Min.                       | Typ.  | Max.  | Units  |       |
|-------------------------------------|----------------------------|-------|-------|--------|-------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |                            |       |       |        |       |
| Zero pressure offset                | 2.44                       | 2.50  | 2.56  | V      |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 4.00  |       |        |       |
| Output                              | at max. specified pressure | 4.44  | 4.50  |        | 4.56  |
|                                     | at min. specified pressure | 0.44  | 0.50  |        | 0.56  |
| DIGITAL PERFORMANCE CHARACTERISTIC  |                            |       |       |        |       |
| Zero pressure offset                | 15990                      | 16384 | 16777 | counts |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 26214 |       |        |       |
| Output                              | at max. specified pressure | 29097 | 29490 |        | 29883 |
|                                     | at min. specified pressure | 2883  | 3277  |        | 3670  |



### PERFORMANCE CHARACTERISTICS

( $V_s = 3.0 V_{DC}$ ,  $T_A = 25^\circ C$ , analog output signal is **ratiometric** to  $V_s$ , digital output signal is **not ratiometric** to  $V_s$ )

#### All HDI...P3 devices (Prime Grade, $V_s = 3.0$ )

| Characteristics                        | Min.                   | Typ. | Max. | Units |
|--|------------------------|------|------|-------|
| Total accuracy (0...85°C) <sup>4</sup> | all barometric devices |      | ±1.0 | %FSS  |
|  | all other devices      |      | ±0.5 |       |
| Response delay <sup>6,7</sup>          |                        | 0.5  |      | ms    |
| A/D resolution <sup>7</sup>            |                        | 12   |      | bit   |
| D/A resolution                         |                        |      | 11   |       |
| Current consumption <sup>8</sup>       |                        | 3    |      | mA    |

#### All HDI...R...P3 (barometric devices)

| Characteristics                     | Min.  | Typ.  | Max.  | Units  |
|-------------------------------------|-------|-------|-------|--------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |       |       |       |        |
| Output at min. specified pressure   | 0.23  | 0.25  | 0.27  | V      |
| Full scale span (FSS) <sup>3</sup>  |       | 2.00  |       |        |
| Full scale output                   | 2.23  | 2.25  | 2.27  |        |
| DIGITAL PERFORMANCE CHARACTERISTIC  |       |       |       |        |
| Output at min. specified pressure   | 2512  | 2731  | 2949  | counts |
| Full scale span (FSS) <sup>3</sup>  |       | 21845 |       |        |
| Full scale output                   | 24357 | 24575 | 24794 |        |

#### All HDI...U...P3 (unidirectional devices)

| Characteristics                     | Min.  | Typ.  | Max.  | Units  |
|-------------------------------------|-------|-------|-------|--------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |       |       |       |        |
| Zero pressure offset                | 0.24  | 0.25  | 0.26  | V      |
| Full scale span (FSS) <sup>3</sup>  |       | 2.00  |       |        |
| Full scale output                   | 2.24  | 2.25  | 2.26  |        |
| DIGITAL PERFORMANCE CHARACTERISTIC  |       |       |       |        |
| Zero pressure offset                | 2621  | 2731  | 2840  | counts |
| Full scale span (FSS) <sup>3</sup>  |       | 21845 |       |        |
| Full scale output                   | 24466 | 24575 | 24684 |        |

#### All HDI...B...P3 (bidirectional devices)

| Characteristics                     | Min.                       | Typ.  | Max.  | Units  |       |
|-------------------------------------|----------------------------|-------|-------|--------|-------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |                            |       |       |        |       |
| Zero pressure offset                | 1.24                       | 1.25  | 1.26  | V      |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 2.00  |       |        |       |
| Output                              | at max. specified pressure | 2.24  | 2.25  |        | 2.26  |
|                                     | at min. specified pressure | 0.24  | 0.25  |        | 0.26  |
| DIGITAL PERFORMANCE CHARACTERISTIC  |                            |       |       |        |       |
| Zero pressure offset                | 13545                      | 13653 | 13762 | counts |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 21845 |       |        |       |
| Output                              | at max. specified pressure | 24466 | 24575 |        | 24684 |
|                                     | at min. specified pressure | 2621  | 2731  |        | 2840  |



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#### All HDI...H3 devices (High Grade, $V_s = 3.0$ )

| Characteristics                        | Min. | Typ. | Max. | Units |
|--|------|------|------|-------|
| Total accuracy (0...85°C) <sup>4</sup> |      |      | ±1.5 | %FSS  |
| Response delay <sup>6,7</sup>          |      | 0.5  |      | ms    |
| A/D resolution <sup>7</sup>            |      | 12   |      | bit   |
| D/A resolution                         |      |      | 11   |       |
| Current consumption <sup>8</sup>       |      | 3    |      | mA    |

#### All HDI...U...H3 (unidirectional devices) and HDI...R...H3 (barometric devices)

| Characteristics                     | Min.  | Typ.  | Max.  | Units  |
|-------------------------------------|-------|-------|-------|--------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |       |       |       |        |
| Output at min. specified pressure   | 0.22  | 0.25  | 0.28  | V      |
| Full scale span (FSS) <sup>3</sup>  |       | 2.00  |       |        |
| Full scale output                   | 2.22  | 2.25  | 2.28  |        |
| DIGITAL PERFORMANCE CHARACTERISTIC  |       |       |       |        |
| Output at min. specified pressure   | 2403  | 2731  | 3058  | counts |
| Full scale span (FSS) <sup>3</sup>  |       | 21845 |       |        |
| Full scale output                   | 24248 | 24575 | 24903 |        |

#### All HDI...B...H3 (bidirectional) devices

| Characteristics                     | Min.                       | Typ.  | Max.  | Units  |       |
|-------------------------------------|----------------------------|-------|-------|--------|-------|
| ANALOGUE PERFORMANCE CHARACTERISTIC |                            |       |       |        |       |
| Zero pressure offset                | 1.22                       | 1.25  | 1.28  | V      |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 2.00  |       |        |       |
| Output                              | at max. specified pressure | 2.22  | 2.25  |        | 2.28  |
|                                     | at min. specified pressure | 0.22  | 0.25  |        | 0.28  |
| DIGITAL PERFORMANCE CHARACTERISTIC  |                            |       |       |        |       |
| Zero pressure offset                | 13325                      | 13653 | 13981 | counts |       |
| Full scale span (FSS) <sup>3</sup>  |                            | 21845 |       |        |       |
| Output                              | at max. specified pressure | 24248 | 24575 |        | 24903 |
|                                     | at min. specified pressure | 2403  | 2731  |        | 3058  |



### I<sup>2</sup>C BUS

#### Introduction

The HDI is capable to generate a digital output signal. The device runs a cyclic program, which will store a corrected pressure value with 12 bit resolution about every 250 μs within the output registers of the internal ASIC. In order to use the sensor for digital signal readout, it should be connected to a bidirectional I<sup>2</sup>C-bus.

According to the I<sup>2</sup>C-bus specification, the bus is controlled by a master device, which generates the clock signal, controls the bus access and generates START and STOP conditions. The HDI is designed to work as a slave, hence it will only respond to requests from a master device.

#### Digital I<sup>2</sup>C interface

The HDI complies with the following protocol (Fig. 1):

**Bus not busy:** During idle periods both data line (SDA) and clock line (SCL) remain HIGH.

**START condition (S):** HIGH to LOW transition of SDA line while clock (SCL) is HIGH is interpreted as START condition. START conditions are always generated by the master. Each initial request for a pressure value has to begin with a START condition.

**STOP condition (P):** LOW to HIGH transition of SDA line while clock (SCL) is HIGH determines STOP condition. STOP conditions are always generated by the master. More than one request for the current pressure value can be transmitted without generation of intermediate STOP condition.

**DATA valid (D):** State of data line represents valid data when, after START condition, data line is stable for duration of HIGH period of clock signal. Data on line must be changed during LOW period of clock signal. There is one clock pulse per bit of data.

**Acknowledge (A):** Data is transferred in pieces of 8 bits (1 byte) on serial bus, MSB first. After each byte receiving device – whether master or slave – is obliged to pull data line LOW as acknowledge for reception of data. Master must generate an extra clock pulse for this purpose. When acknowledge is missed, slave transmitter becomes inactive. It is on master either to send last command again or to generate STOP condition in that case.

**Slave address:** The I<sup>2</sup>C-bus master-slave concept requires a unique address for each device. The HDI has a preconfigured slave address (1111000xb). By factory programming it is possible to define a secondary slave address additional to the general one. According to I<sup>2</sup>C specification 127 different addresses are available. The sensor will then listen to both slave addresses. After generating a START condition the master sends the address byte containing a 7 bit address followed by a data direction bit (R/W). A "0" indicates a transmission from master to slave (WRITE), a "1" indicates a data request (READ).

**DATA operation:** The sensor starts to send 2 data bytes containing the current pressure value as a 15 bit information placed in the output registers.

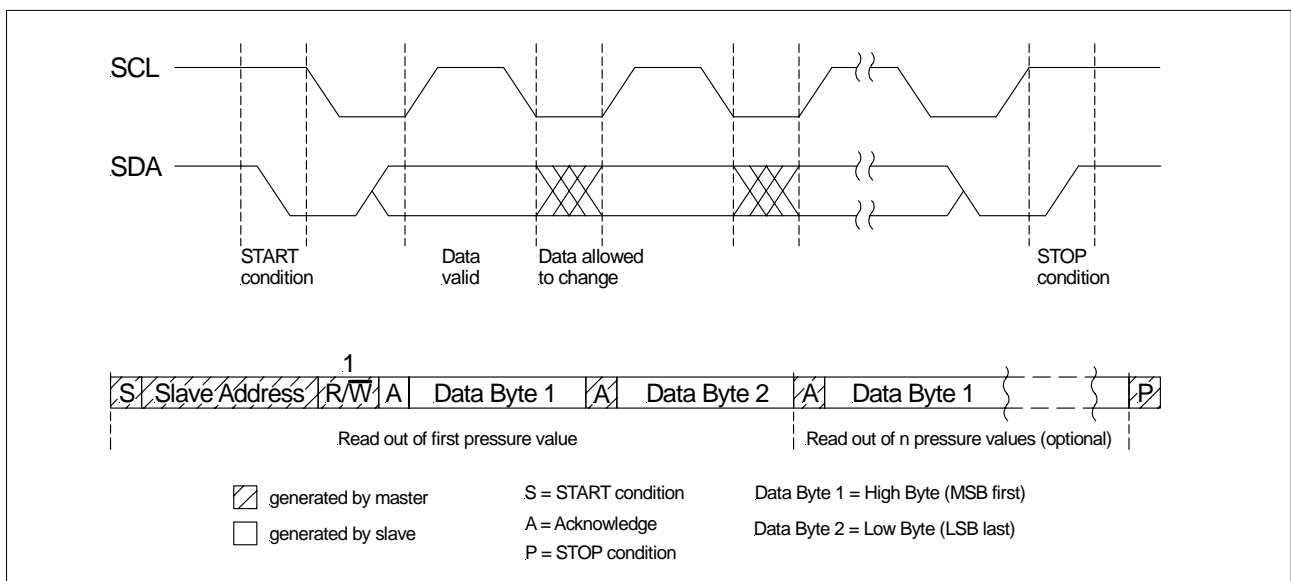


Fig. 1: I<sup>2</sup>C bus protocol



### I<sup>2</sup>C Interface Parameters

| Parameter  | Symbol        | Min. | Typ. | Max. | Unit                |
|--|---------------|------|------|------|---------------------|
| Input high level   |               | 90   |      | 100  | % of V <sub>s</sub> |
| Input low level  |               | 0    |      | 10   |                     |
| Output low level   |               |      |      | 10   |                     |
| Pull-up resistor   |               | 500  |      |      | Ω                   |
| Load capacitance @ SDA                                     | $C_{SDA}$     |      |      | 400  | pF                  |
| Input capacitance @ SDA/SCL                                | $C_{I2C\_IN}$ |      |      | 10   |                     |
| SCL clock frequency  | $F_{SCL}$     | 100* |      | 400  | kHz                 |
| Bus free time between STOP and START condition             | $t_{BUF}$     | 1.3  |      |      | μs                  |
| Hold time (repeated) START condition, to first clock pulse | $t_{HD,STA}$  | 0.8  |      |      |                     |
| LOW period of SCL  | $t_{LOW}$     | 1.3  |      |      |                     |
| HIGH period of SCL   | $t_{HIGH}$    | 0.6  |      |      |                     |
| Setup time repeated START condition                        | $t_{SU,STA}$  | 1    |      |      |                     |
| Data hold time   | $t_{HD,DAT}$  | 0    |      |      |                     |
| Data setup time  | $t_{SU,DAT}$  | 0.2  |      |      |                     |
| Rise time of both SDA and SCL                              | $t_R$         |      |      | 0.3  |                     |
| Fall time of both SDA and SCL                              | $t_F$         |      |      | 0.3  |                     |
| Setup time for STOP condition                              | $t_{SU,STO}$  | 0.6  |      |      |                     |

\* recommended

**Note:** Sensortronics recommends communication speeds of at least 100 kHz (max. 400 kHz). Please contact your nearest Sensortronics sales office for further information.

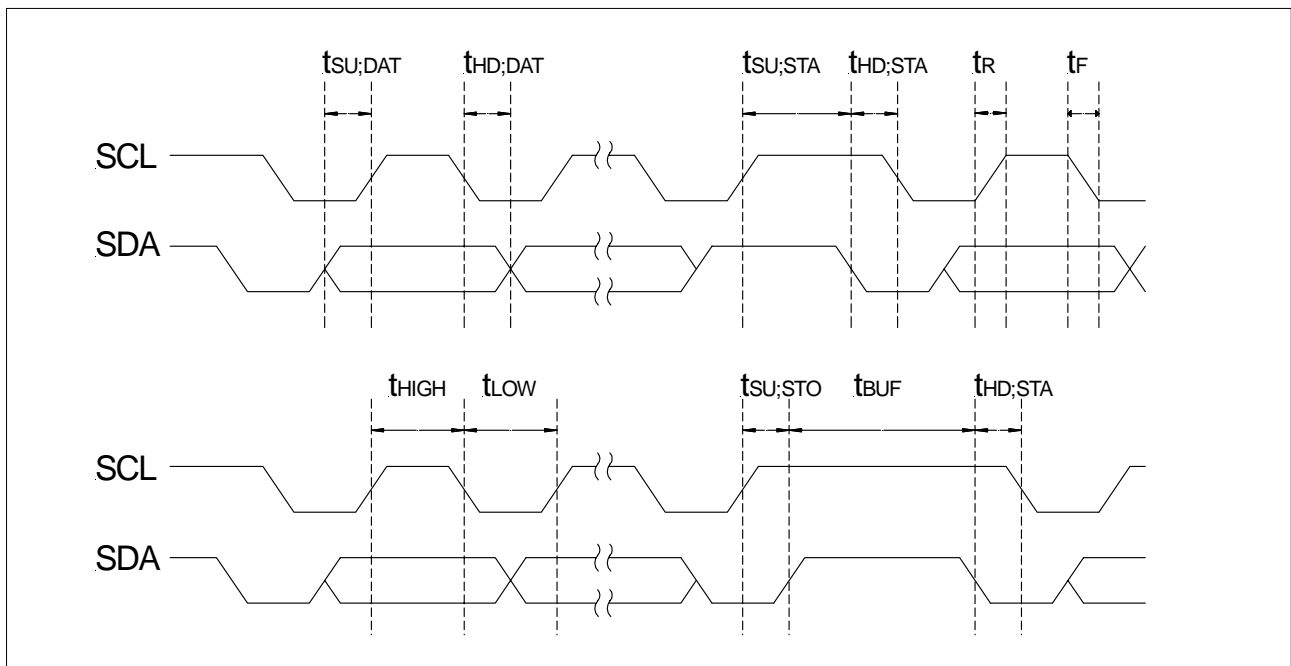


Fig. 2: Timing characteristics



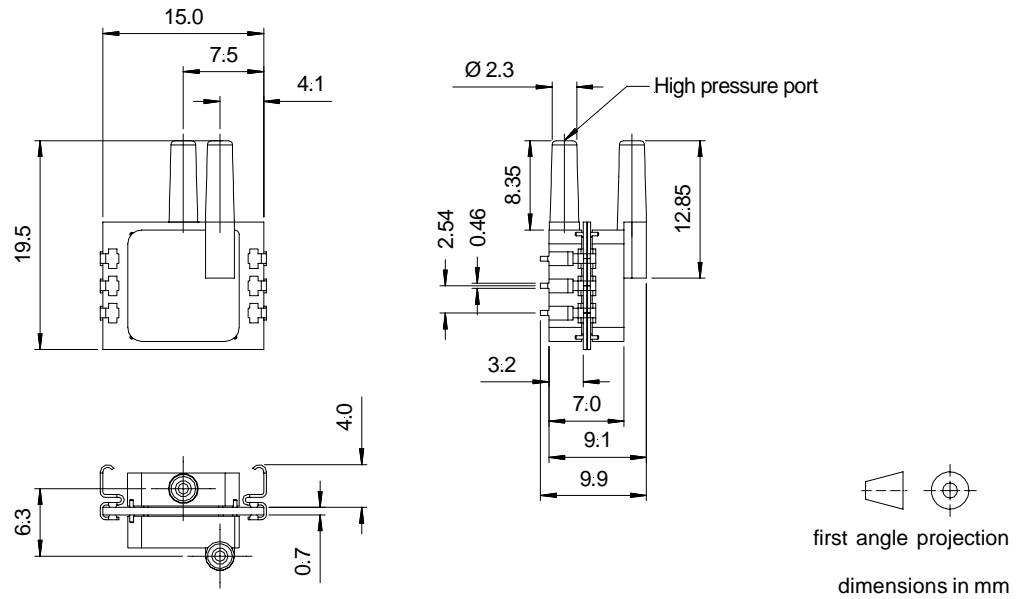
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## Amplified pressure sensors

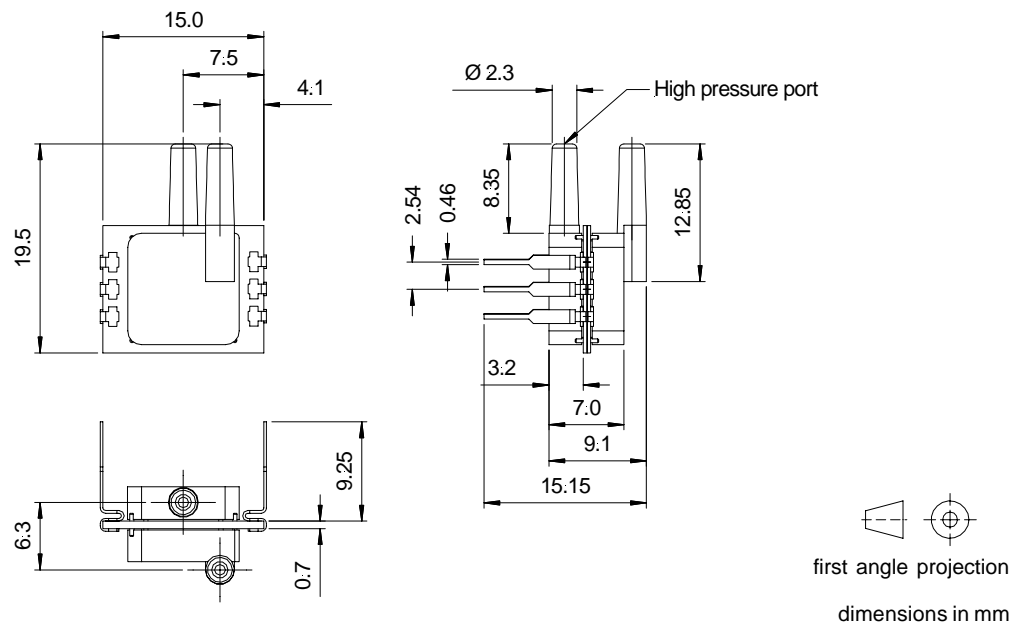
### PHYSICAL DIMENSIONS

Different housing options are available on request. Please contact Sensortech.ics.

#### HDI...E... (SMD, 2 ports same side)



#### HDI...F... (DIP, 2 ports same side)





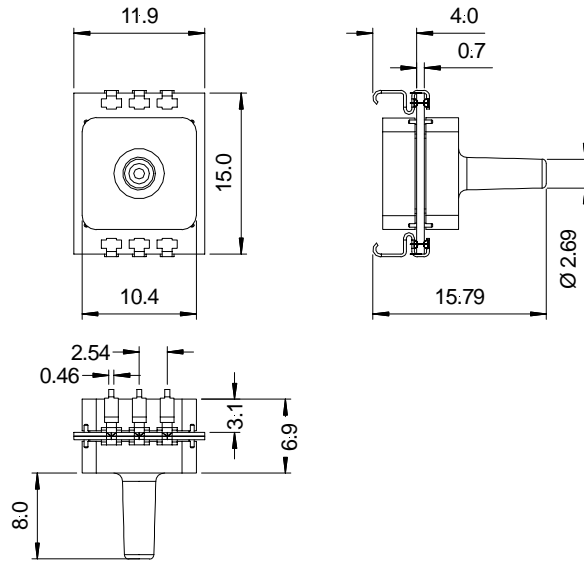
# HDI Series

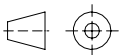
## Amplified pressure sensors

### PHYSICAL DIMENSIONS (cont.)

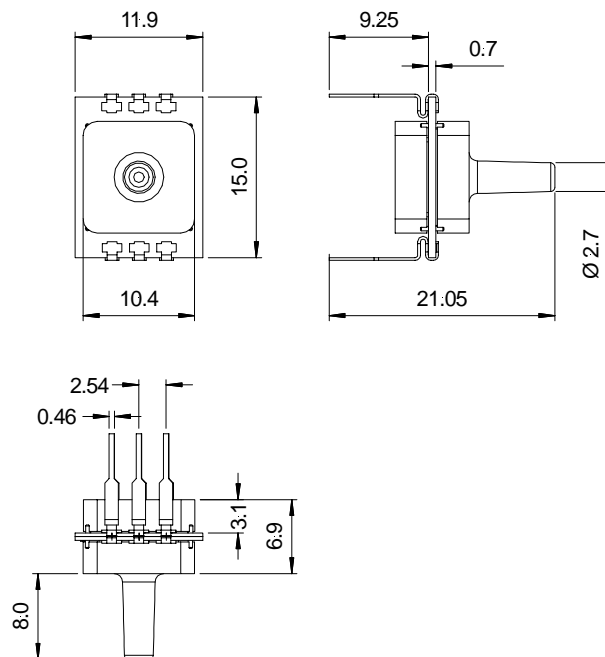
Different housing options are available on request. Please contact Sensortech.ics.

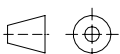
#### HDI...Y... (SMD, 1 port axial)



  
first angle projection  
dimensions in mm

#### HDI...Z... (DIP, 1 port axial)



  
first angle projection  
dimensions in mm

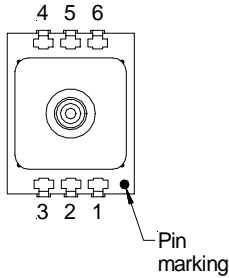


# HDI Series

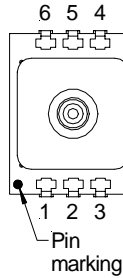
## Amplified pressure sensors

### ELECTRICAL CONNECTION (cont.)

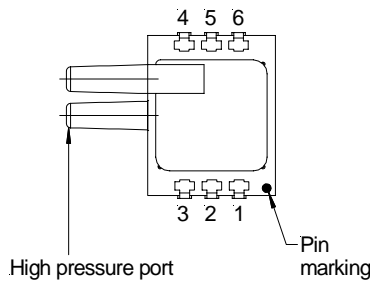
**HDI...A...  
(absolute)**



**HDI...G...  
(gage)**



**HDI...D...  
(differential)**



| Pin | Connection |
|-----|------------|
| 1   | +Vs        |
| 2   | +Vout      |
| 3   | GND        |
| 4   | SDA        |
| 5   | I/C*       |
| 6   | SCL        |

\* Internal connection.  
Do not connect for any reason

### ORDERING INFORMATION

| Options         | Series | Pressure range |                 | Pressure mode               |              | Calibration                      |                | Housing  |                        | Porting |          | Grade |       | Voltage |     |
|-----------------|--------|----------------|-----------------|-----------------------------|--------------|----------------------------------|----------------|--|------------------------|---------|----------|-------|-------|---------|-----|
|                 | HDI    | 0611           | 600...1100 mbar | A*                          | Absolute     | B                                | Bidirectional  | E*   | SMD, 2 ports same side | 8       | Straight | H     | High  | 3       | 3 V |
|                 |        | 0811           | 800...1100 mbar | D                           | Differential | U                                | Unidirectional | F*   | DIP, 2 ports same side |         |          | P     | Prime | 5       | 5 V |
|                 |        | M010           | 10 mbar         | G                           | Gage         | R*                               | Barometric     | F*   | DIP, 2 ports same side |         |          |       |       |         |     |
|                 |        | M020           | 20 mbar         |                             |              |                                  |                | Y**  | SMD, 1 port axial      |         |          |       |       |         |     |
|                 |        | M050           | 50 mbar         |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        | M100           | 100 mbar        |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        | M200           | 200 mbar        |                             |              |                                  |                | Z**  | DIP, 1 port axial      |         |          |       |       |         |     |
|                 |        | M500           | 500 mbar        |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        | B001           | 1 bar           |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        | (B001A)        | 1 bara          |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        | B002           | 2 bar           |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        | B005           | 5 bar           |                             |              |                                  |                |  |                        |         |          |       |       |         |     |
|                 |        |                |                 | * only available from 1 bar |              | * for pressure ranges 0611, 0811 |                | * standard for differential devices, "D"<br>** standard for absolute and gage devices, "A" and "G" |                        |         |          |       |       |         |     |
| <b>Example:</b> | HDI    | M050           |                 | G                           |              | U                                |                | Y  |                        | 8       |          | P     |       | 5       |     |

**Note:** Devices highlighted in grey are preferred stock items

#### Sensortech PRO services:

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- Custom product modifications and adaptations even for small quantities
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