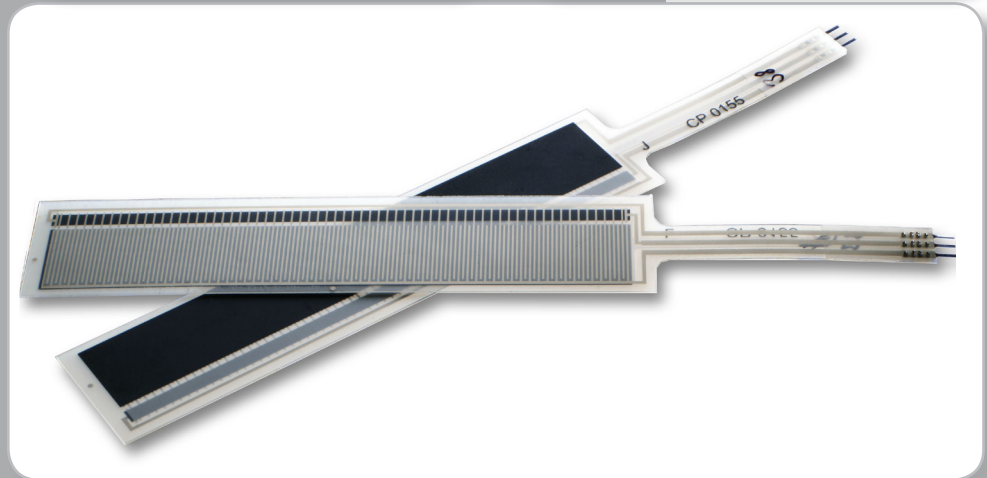


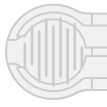
Customized Input Sensing - CIS Solutions



Standard Single Sensors

Linear Potentiometer (Linpot) Sensors

High Dynamic Force Sensing Resistor Sensors



Flexible, Intelligent and Tailor-made Solutions for your Smart Input Systems

IEE develops Customized Input Sensing (CIS) solutions for a variety of automotive, consumer and medical applications, such as Human-Machine Interfaces (HMI) in cars, pressure sensors in shoes, or press buttons for consumer electronics such as cell phones.

Thanks to our Force Sensing Resistor (FSR) foil-type contact technology, we can create slim, pressure-activated sensors. The shape of each sensor can be adapted to suit any geometrical environment. In addition, different sensor functionalities can be combined in the one device, providing a wider range of functions for the end-consumer.

By adapting substrates, spacer, cell form, inks and print geometry, this technology can be ideally adapted for a range of uses where space is limited and complex functionality is required.

Standard Sensors for Testing

IEE produces standard, off-the-shelf sensors that can be used for testing (both the technology and the business solution) without the need for made-to-order development. These allow you to quickly create initial mock-ups or demonstrators.

FSR Technology

FSR uses variable resistance to detect pressure applied to a sensor cell. This technology is very reliable and can be incorporated into thin and flexible applications. FSR also allows a high degree of design freedom and adapts to a simple electronic interface.

All of our FSR Sensors:

- Are simple and easy to integrate
- Have a highly repeatable force reading
- Are cost-effective
- Are ultra thin

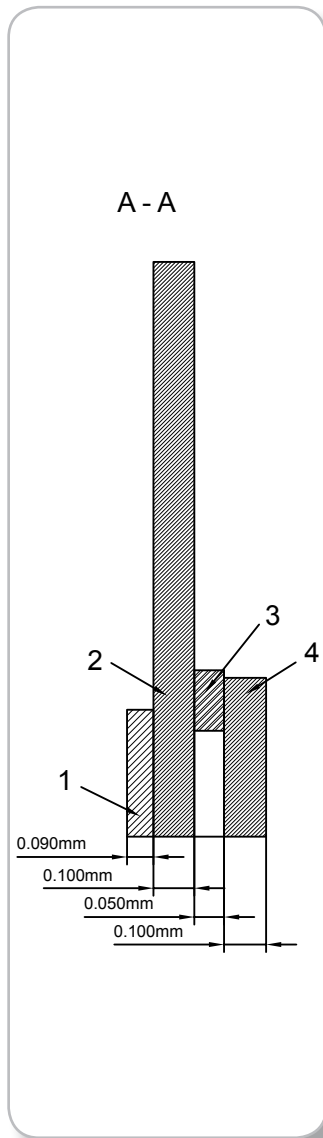
In this data sheet, you will find key information, as well as scale diagrams, for the following standard CIS sensors:

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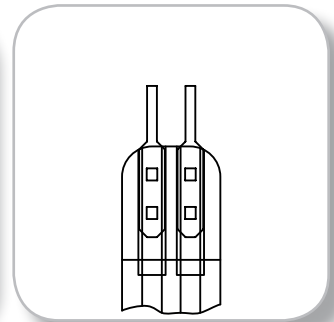
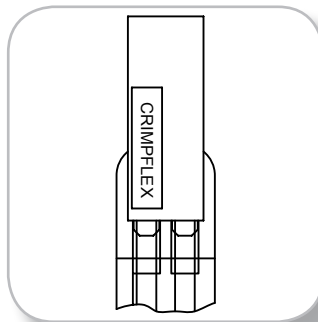
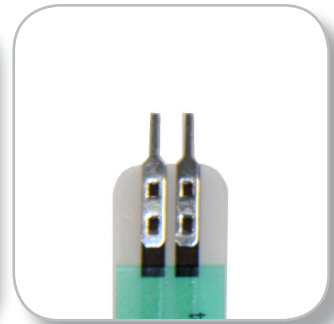
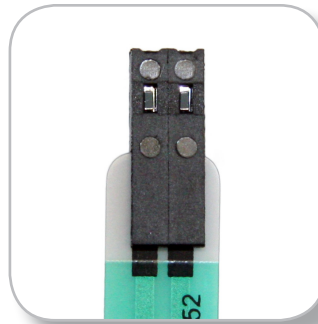
With our pressure sensing technology, we can create tailor-made solutions in almost any shape and size, on a relatively short time frame. If you require something other than our standard sensors for your project, please e-mail consumer@iee.lu.



Options for Single Sensors



- 1 Top substrate male crimp (optional)
- 2 Spacer substrate
- 3 Bottom substrate
- 4 Backing adhesive (optional)



Housing (optional)

Male crimp (optional)

Standard Single Sensors



CP 149
CP 150
CP 151
CP 152
CP 153
CP 154
CP 174



Our standard FSR sensors:

- Have an actuation force as low as 0.1 N
- Have a sensitivity range to 10 N
- Are robust; up to 10 M actuations



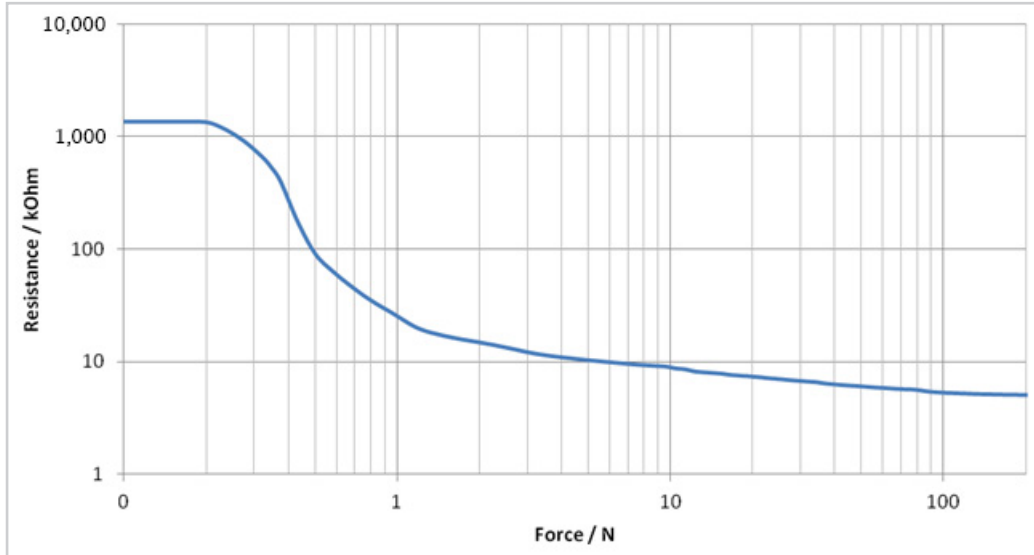
Force Sensing Resistor (FSR)

Our standard CP sensors are available in different configurations, depending on the connection method and whether or not backing adhesive is present.

| Sensor Type | Detection Area Dimension | Force Probe Diameter | Test Weight Load | Typical Resistance at Test Load |
|-------------|--------------------------|----------------------|------------------|---------------------------------|
| CP 149 | circular, Ø 6 mm | 4 mm | 500 g | 30 kΩ > RL > 3 kΩ |
| CP 150 | 8.1 × 7.5 mm | 6 mm | 1,100 g | 15 kΩ > RL > 5 kΩ |
| CP 151 | circular, Ø 12 mm | 6 mm | 1,100 g | 15 kΩ > RL > 5 kΩ |
| CP 152 | circular, Ø 15.2 mm | 6 mm | 1,100 g | 15 kΩ > RL > 5 kΩ |
| CP 153 | 22.3 × 21.6 mm | 6 mm | 1,100 g | 15 kΩ > RL > 5 kΩ |
| CP 154 | 40.6 × 40.3 mm | 6 mm | 1,100 g | 15 kΩ > RL > 5 kΩ |
| CP 174 | circular, Ø 24.8 mm | 6 mm | 1,100 g | 15 kΩ > RL > 5 kΩ |

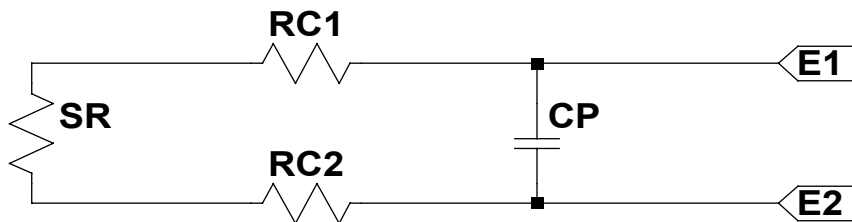
Typical Response Curve

Example curve for one CP 149 sensor



Response curve depends on actuator shape, material and design
 Measurements performed with a 4 mm probe diameter covered with a 2 mm thick rubber of 65 Shore A

Simplified Sensor Equivalent Circuit



Use an ohmmeter with PC interface option for dynamic data recording. An ordinary ohmmeter will be sufficient if you do not intend to record data.

- E1 Electrode 1 pad
- E2 Electrode 2 pad
- CP Parasitic parallel capacitance of the sensor sandwich
- RC1 Conductor resistance of electrode 1 side
- RC2 Conductor resistance of electrode 2 side
- SR Sensor resistance



Sensor Characteristics

| Sensor Description | |
|--|--|
| Sensor type | Pressure Sensitive Single Sensor |
| Typical applications/devices | Infinitely variable resistive user interface |
| Number of active areas/cells | 1 |
| Dimensions and available connectors | See layout drawings on the following pages |
| Manufacturing Tolerances | |
| Length and width tolerances | According DIN 7151 IT 14 |
| Thickness | Nominal value +/- 12 % |
| Total manufacturing tolerance | +/- 0.8 mm |
| Base Materials | |
| Topside substrate | PET film |
| Laminating adhesive | Acrylic |
| Backside substrate | PET film |
| Backing adhesive | (upon request) Acrylic |
| Operating Parameters | |
| Standby resistance (no load) | RNL > 1 MΩ |
| Typical activation resistance range | 1 MΩ > RL > 2 kΩ |
| for a pressure range of | 0.5-100 N/cm ² (i.e. per cm ² of activated area) |
| Typical conductor lead resistance | ≤ 25 Ω |
| Typical lifetime when used according to application advice | > 1,000,000 cycles @ 1 kg/cm ² and 1 Hz |
| Typical sensor response time on single activation | 2-3 ms (mechanical) |
| Current density | < 1 mA/cm ² (of activated area) |
| Parasitic capacitance | < 1 nF |
| Power dissipation | < 1 mW/cm ² (of activated area) |
| Operating Conditions | |
| Nominal operating voltage | 1.5 V. Use pulsed voltage (duty cycle < 2 %) for extended lifetime and heavy duty conditions |
| Operating temperature range | -40 to +85 °C (-40 to 185 °F) |
| Operating humidity range | ≤ 95 % R.H. |
| Standard Test Criteria at Time of Delivery | |
| Standby resistance | RNL > 1 MW @ RT and 5 V DC |
| Measuring device | IEE load applicator (see table on page 5 for load values) |
| Force probe surface material | Rubber pad |
| Thickness of pad | 2 mm +/- 0.2 mm |
| Rubber hardness | 65 Shore A (+/- 10 Shore A) |



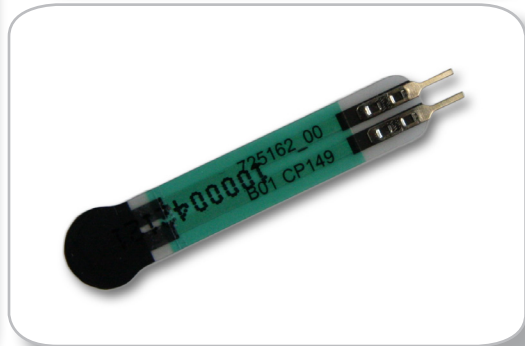
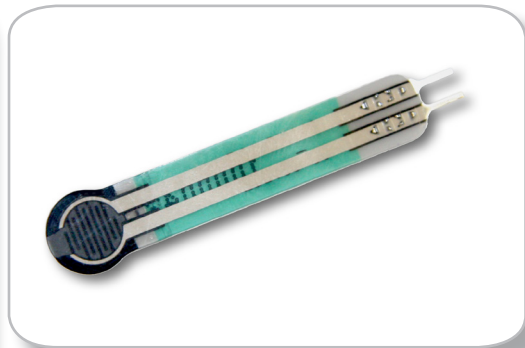
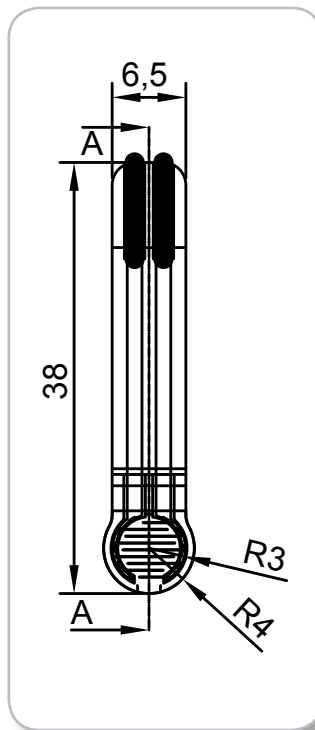
Important Application Information

Typically, you should mount the sensor onto an even, smooth, and hard support surface, for example a plastic, glass or metal plate.

- Always place the actuator perpendicular to the sensor surface in the centre of the active area. You should avoid offset mounting. Ensure that the actuator is smaller than the active area of the sensor. If this is not feasible, use a soft activator for force transmission and distribution, for example a soft rubber with hardness ≤ 25 Shore A.
- To avoid possible signal drift, do not expose the sensor to permanent load.
- To avoid mechanical pre-load and false signals, never bend the sensor in the active area.
- To avoid broken conductor lines, do not bend the connection tail to a radius of < 5 mm.
- All sensors feature an air vent. Take care not to block it and to avoid liquids from penetrating through it.

Single Sensor CP 149

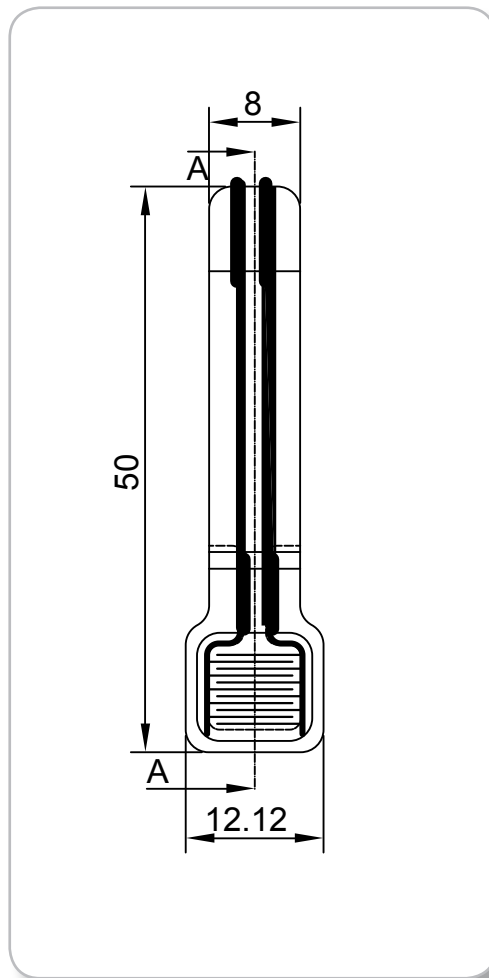
| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 149 NN | No | No crimps | No |
| CP 149 NS | No | Male | No |
| CP 149 NH | No | Female | Yes |
| CP 149 AN | Yes | No crimps | No |
| CP 149 AS | Yes | Male | No |
| CP 149 AH | Yes | Female | Yes |



Active area = Radius 3 mm

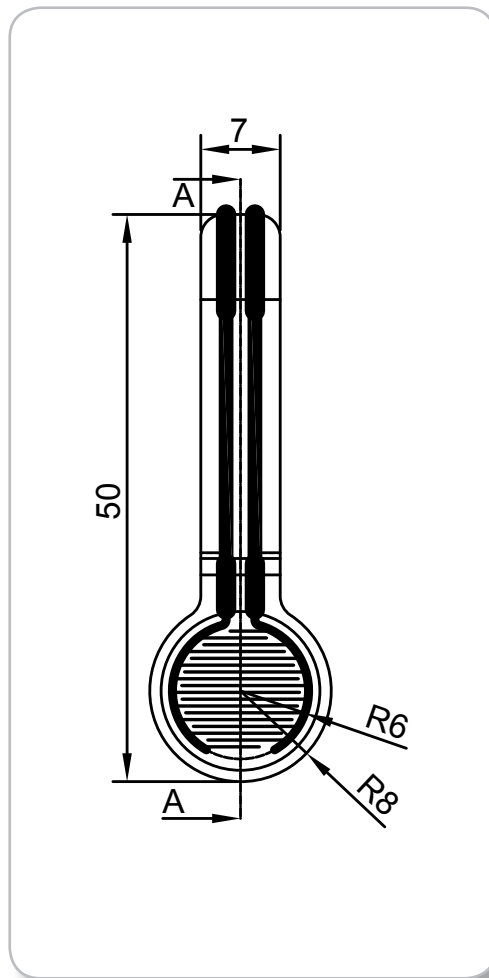
Single Sensor CP 150

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 150 NN | No | No crimps | No |
| CP 150 NS | No | Male | No |
| CP 150 NH | No | Female | Yes |
| CP 150 AN | Yes | No crimps | No |
| CP 150 AS | Yes | Male | No |
| CP 150 AH | Yes | Female | Yes |

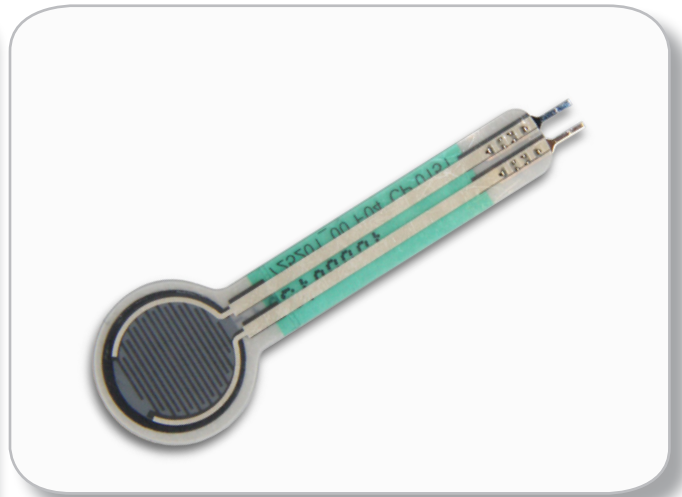


Single Sensor CP 151

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 151 NN | No | No crimps | No |
| CP 151 NS | No | Male | No |
| CP 151 NH | No | Female | Yes |
| CP 151 AN | Yes | No crimps | No |
| CP 151 AS | Yes | Male | No |
| CP 151 AH | Yes | Female | Yes |

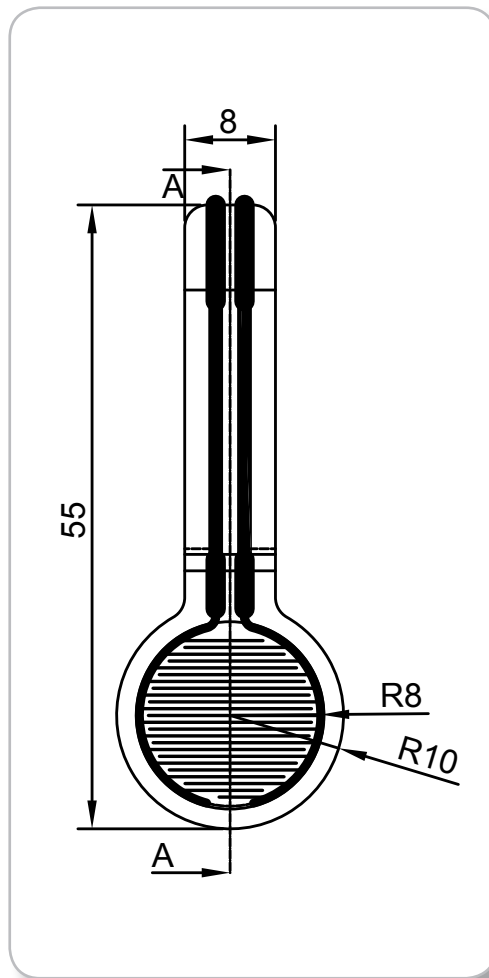


Active area = Radius 6 mm

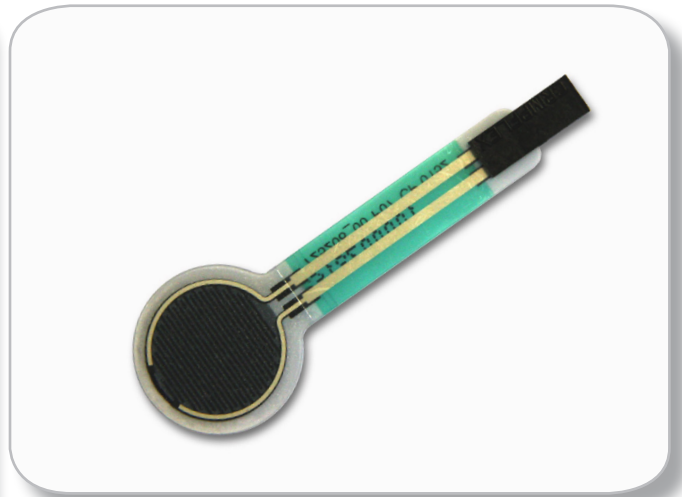


Single Sensor CP 152

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 152 NN | No | No crimps | No |
| CP 152 NS | No | Male | No |
| CP 152 NH | No | Female | Yes |
| CP 152 NF | No | Female | No |
| CP 152 AN | Yes | No crimps | No |
| CP 152 AS | Yes | Male | No |
| CP 152 AH | Yes | Female | Yes |
| CP 152 AF | Yes | Female | No |

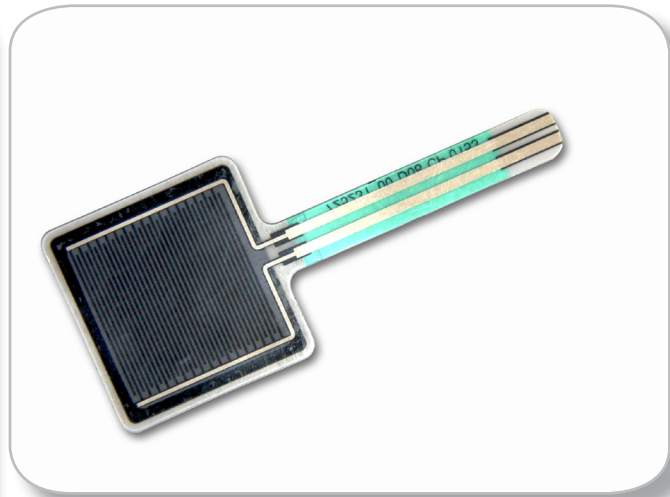
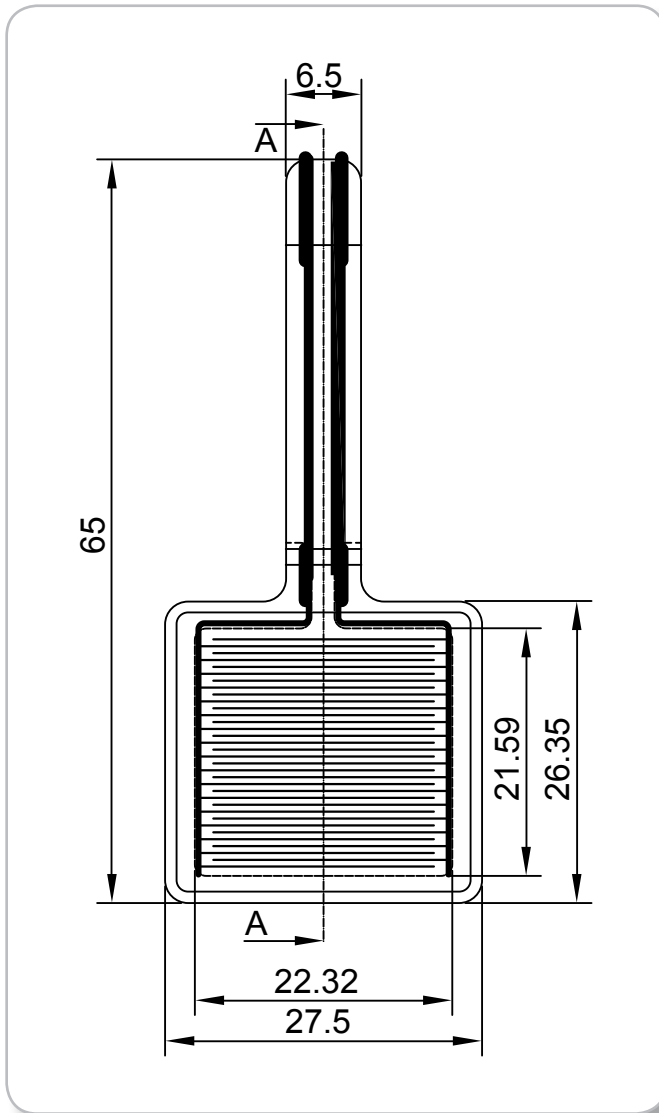


Active area = Radius 8 mm



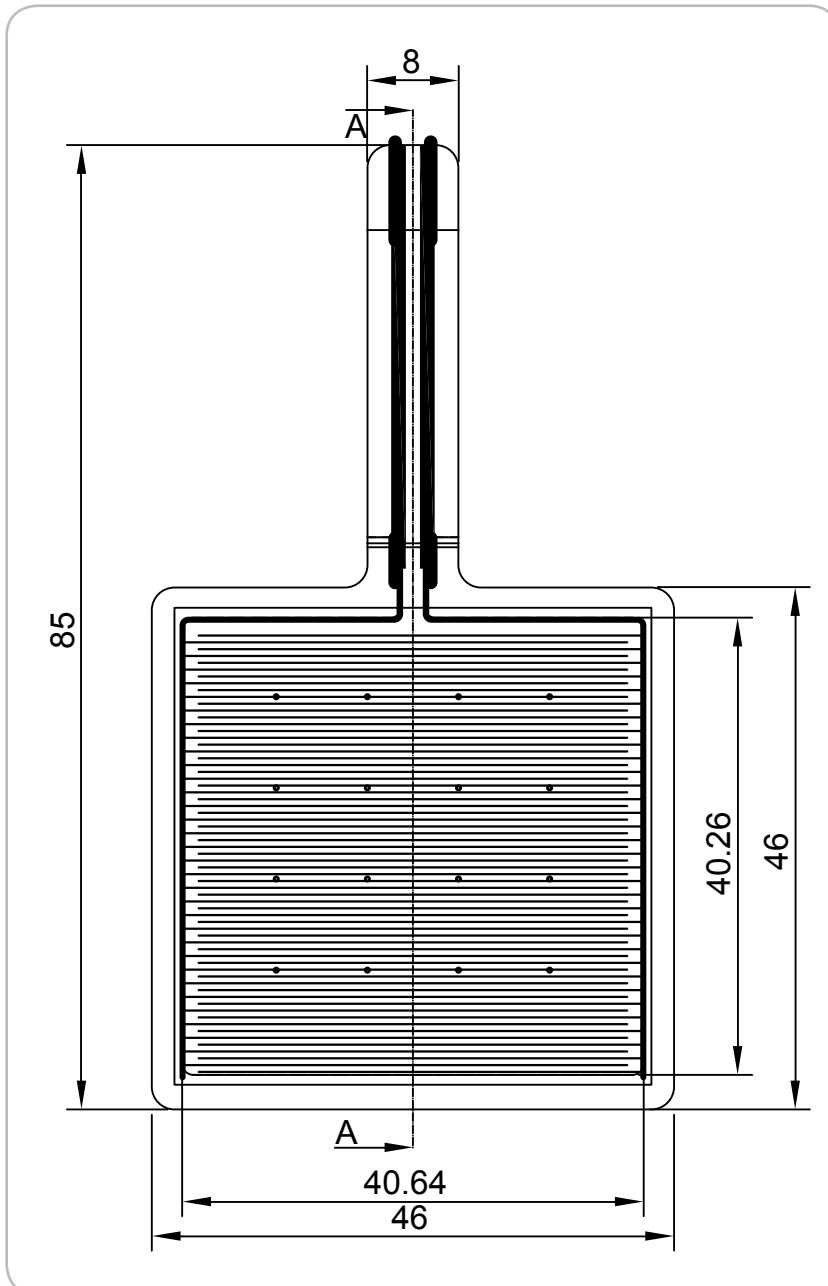
Single Sensor CP 153

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 153 NN | No | No crimps | No |
| CP 153 NS | No | Male | No |
| CP 153 NH | No | Female | Yes |
| CP 153 AN | Yes | No crimps | No |
| CP 153 AS | Yes | Male | No |
| CP 153 AH | Yes | Female | Yes |



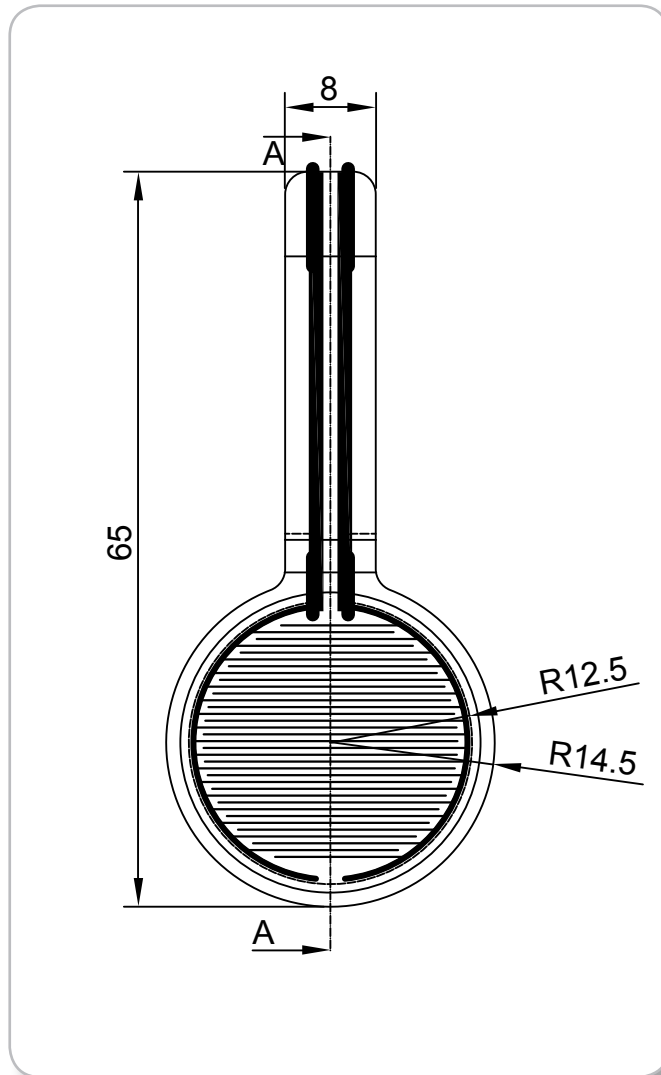
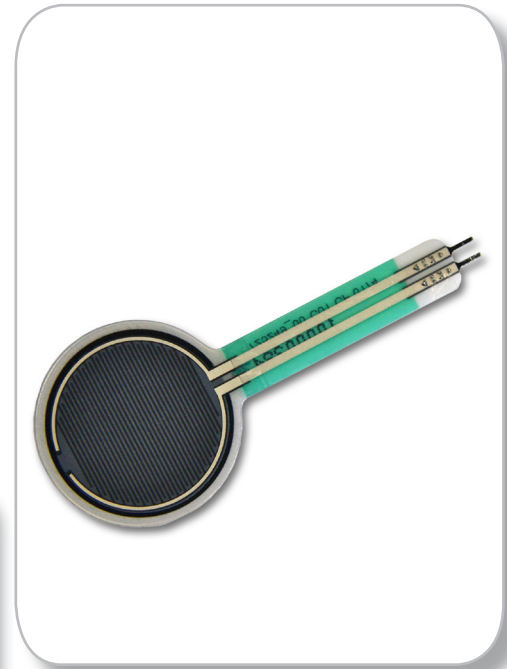
Single Sensor CP 154

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 154 NN | No | No crimps | No |
| CP 154 NS | No | Male | No |
| CP 154 NH | No | Female | Yes |
| CP 154 AN | Yes | No crimps | No |
| CP 154 AS | Yes | Male | No |
| CP 154 AH | Yes | Female | Yes |



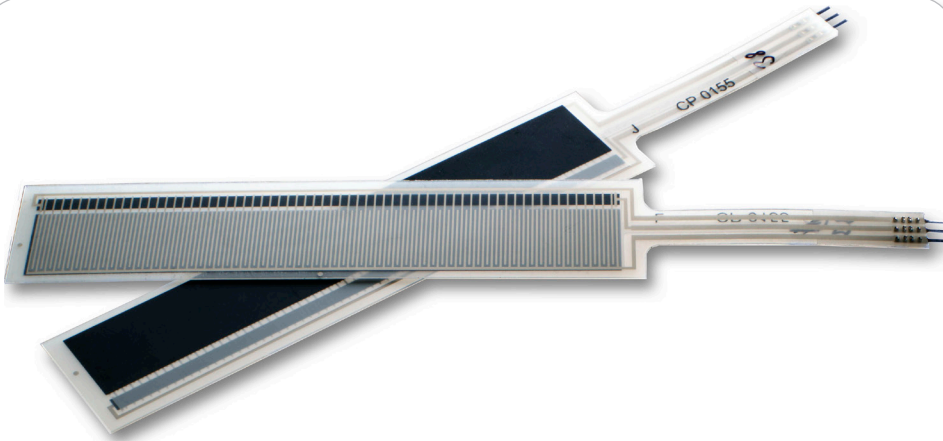
Single Sensor CP 174

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 174 NN | No | No crimps | No |
| CP 174 NS | No | Male | No |
| CP 174 NH | No | Female | Yes |
| CP 174 AN | Yes | No crimps | No |
| CP 174 AS | Yes | Male | No |
| CP 174 AH | Yes | Female | Yes |



Active area = Radius 12.5 mm

Linear Potentiometer (Linpot)



CP 155



Our Linpot sensors:

- Have an actuation force as low as 0.1 N
 - Have a sensitivity range to 10 N
 - Are robust; up to 10 M actuations
 - Can detect position and activation force
-



Linear Potentiometer (Linpot)

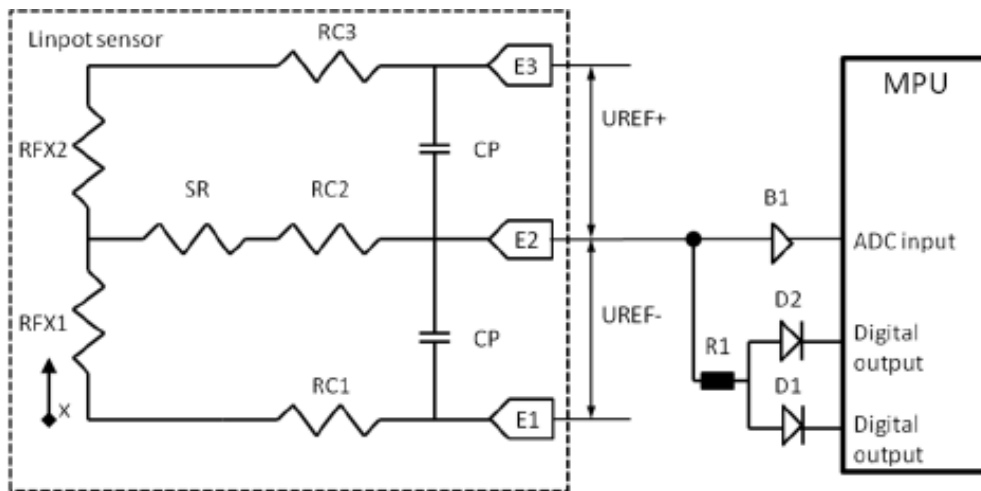
IEE also offers a standard FSR-based linear potentiometer.

With this sensor, you can detect the activation pressure as well as the position of a single activation point along the length of the sensor.

| Sensor Type | Detection Area Dimension | Force Probe Diameter | Test Weight Load | Typical Resistance at Test Load |
|-------------|--------------------------|----------------------|------------------|---------------------------------|
| CP 155 | 105 × 15 mm | 6 mm | 1100 g | 30 kW > R _t > 10 kW |



Simplified Sensor Equivalent Circuit



Linpot Sensor:

- E1 Electrode 1 pad
- E2 Electrode 2 pad
- E3 Electrode 3 pad
- CP Parasitic parallel capacitance of the sensor sandwich
- RC1 Conductor resistance of electrode 1 side
- RC2 Conductor resistance of electrode 2 side
- RC3 Conductor resistance of Electrode 3 side
- SR Sensor resistance
- RFX1 Resistance X1 of printed fixed resistor
- RFX2 Resistance X2 of printed fixed resistor
- RFIX Resistance of printed fixed resistor with $RFIX = RFX1 + RFX2$

Recommended sensor read out:

- UREF+ High reference voltage
- UREF- Low reference voltage
- B1 High impedance buffer
- R1 Resistor
- D1 Diode 1
- D2 Diode 2

1. R1 not connected for position measurement
2. Positive current injection for SR (pressure) measurement
3. R1 not connected for position measurement (optional, could be omitted)
4. Negative current injection for SR (pressure) measurement

The fix resistor ($RFIX = RFX1 + RFX2$) is connected to a high ($VREF+$) and a low ($VREF-$) reference voltage that is identical to the reference voltages of the AD-converter (ADC). The wiper is connected to the ADC input of the microprocessor (MPU) through the high-impedance buffer (B1). The voltage readings of the ADC are proportional to the position of the center of gravity of the force field applied to the device.

In order to measure the wiper resistance (SR) value, which is dependent on the pressure applied to the active area, the wiper is first connected to a high and then to a low voltage for current injection through a resistor (R1). This current causes a voltage change at the wiper that is proportional to the SR value. The two diodes (D1 and D2) make sure that no leakage current from the digital outputs of the microprocessor is flowing during the position measurement.

The digital output state sequence is divided into three or four steps:

The voltage measured at the end of state (2) is temporarily stored in order to subtract the voltage from state (4) at the end of this cycle. This voltage difference is proportional to the FSR-wiper resistance and inversely proportional to the applied force.

The time delay between output state switching and ADC sampling must be long enough for voltage settling in the circuit capacitors. This delay should be $4 \times R1 \times CP$ for the resistance measurement during states (2) and (4), typically 0.01 to 0.1 ms, where CP is the total capacitance of the sensor and the circuit. During the remaining time, typically 10 ms, the wiper carries no current (1) and the voltage stabilizes to a good accuracy for position reading. The $R1 \times CP$ time constant can easily be determined from the buffer (B1) output signal, displayed on an oscilloscope. The update frequency is a function of the reaction time, required for the application. Over-sampling can be considered for noise suppression by numerical low-pass filters.



Sensor Characteristics

| Sensor Description | |
|--|--|
| Sensor type | Co-ordinate & Pressure Sensing Sensor |
| Typical applications/devices | Proportional input controls/software definable keypads |
| Number of active areas/cells | 1 |
| Dimensions and available connectors | See layout drawings on the following pages |
| Manufacturing Tolerances | |
| Length and width tolerances | According to DIN 7151 IT 14 |
| Thickness | Nominal value +/- 12 % |
| Total manufacturing tolerance | +/- 0.8 mm |
| Base Materials | |
| Topside substrate | PET film |
| Laminating adhesive | Acrylic |
| Backside substrate | PET film |
| Backing adhesive | (upon request) Acrylic |
| Operating Parameters | |
| Standby resistance (no load) | RNL > 1 MΩ |
| Typical activation resistance range | 1 MΩ > RL > 5 kΩ |
| for a pressure range of | 0.5-100 N/cm ² (i.e. per cm ² of activated area) |
| Typical Fix resistor value | 5 – 10 kΩ |
| Typical conductor lead resistance | ≤ 25 Ω |
| Typical lifetime when used according to application advice | > 1,000,000 cycles @ 1 kg/cm ² and 1 Hz |
| Typical sensor response time on single activation | 2-3 ms (mechanical) |
| Current density | < 1 mA/cm ² (of activated area) |
| Parasitic capacitance | < 1 nF |
| Power dissipation | < 1 mW/cm ² (of activated area) |
| Geometrical resolution | < 0.1 mm (depending on actuator) |
| Linearity | Better than 5% FS (depending on actuator) |
| Operating Conditions | |
| Nominal operating voltage | 5 V, other driving voltages on demand |
| Operating temperature range | -40 to +70 °C (-40 to 158 °F) |
| Operating humidity range | ≤ 55 % R.H. (high humidity grades on demand) |
| Standard Test Criteria at Time of Delivery | |
| Standby resistance | RNL > 1 MW @ RT and 5 V DC |
| Measuring device | IEE load applicator (see table on page 17 for load values) |
| Force probe surface material | Rubber pad |
| Thickness of pad | 2 mm +/- 0.2 mm |
| Rubber hardness | 65 Shore A (+/- 10 Shore A) |
| Force test position | Centre of detection area |
| Fix resistor | 10 kΩ > RFIX > 5 kΩ |



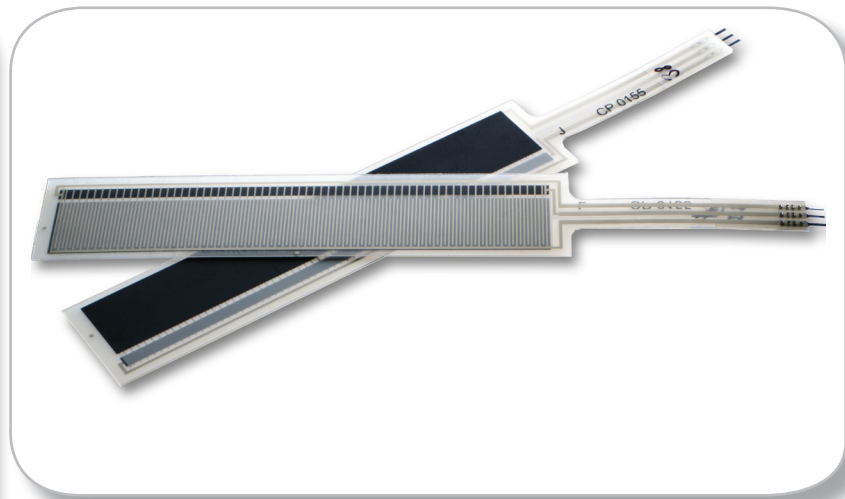
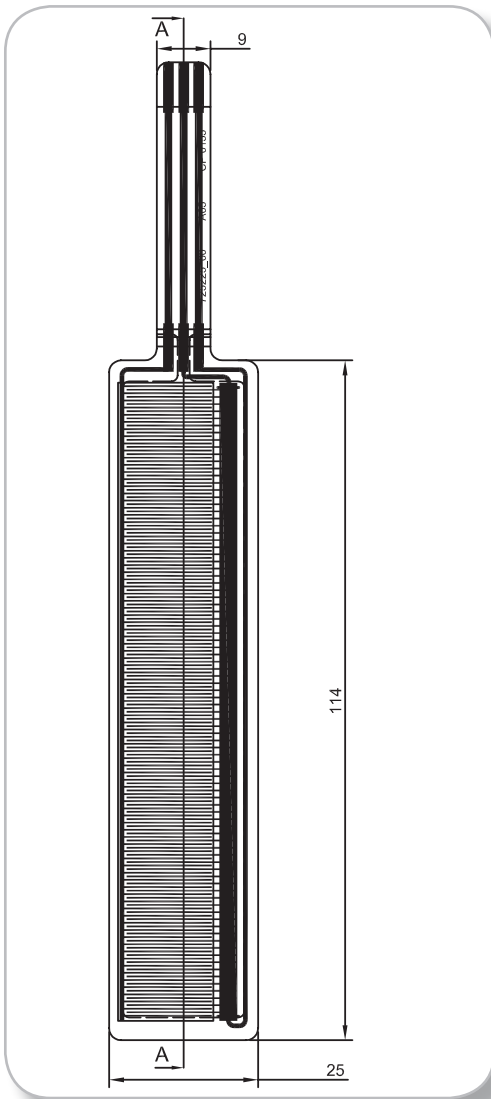
Important Application Information

Typically, you should mount the sensor onto an even, smooth, and hard support surface, for example a plastic, glass or metal plate.

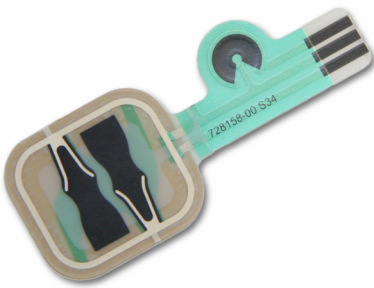
- Always place the actuator perpendicular to the sensor surface in the centre of the active area. You should avoid offset mounting. Ensure that the actuator is smaller than the active area of the sensor. If this is not feasible, use a soft activator for force transmission and distribution, for example a soft rubber with hardness ≤ 25 Shore A.
- To avoid possible signal drift, do not expose the sensor to permanent load.
- To avoid mechanical pre-load and false signals, never bend the sensor in the active area.
- To avoid broken conductor lines, do not bend the connection tail to a radius of < 5 mm.
- All sensors feature an air vent. Take care not to block it and to avoid liquids from penetrating through it.

Linear Potentiometer CP 155

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| CP 155 NN | No | No crimps | No |
| CP 155 NS | No | Male | No |
| CP 155 NH | No | Female | Yes |
| CP 155 AN | Yes | No crimps | No |
| CP 155 AS | Yes | Male | No |
| CP 155 AH | Yes | Female | Yes |



High Dynamic Force Sensing Resistor (HD-FSR)



HD 001
HD 002

A graphic of a sensor component with the text 'Key Features' overlaid in a purple font.

Key Features

IEE's high-dynamic FSR sensors are the newest generation of cells, and have an improved FSR cell performance. Several sensor cells can be combined in a number of variants.

This technology can be ideally adapted for a range of uses where high sensor dynamic over a wide pressure range (from 100 mbar up to 7 bar) is required. The staggering of individual cell segments allows us to create a homogeneous repeatable cell response along the axis of staggering.

Two IEE high-dynamic standard sensor shapes can be used for testing. With the help of a standard printed fixed resistor you can also compensate variation, due to environmental influences, on the cell output.

A graphic of a sensor component with the text 'Technology' overlaid in a purple font.

Technology

HD-FSR incorporates the FSR pressure detecting technology with an individual triangular cell segmentation. This allows you to measure a change in resistance over a wide pressure range (from 100 mbar to 7 bar).

Each triangular segment can be seen as an independent, fully-functioning part of the whole cell. This allows a high degree of design freedom and segment interconnection.

Our HD-FSR sensors:

- Have an actuation force as low as 100 mbar
- Have a sensitivity range of up to 7 bar
- Are robust; up to 1 M actuations under highest humidity conditions (lifetime variation < 15%)

- Can be used in a slightly bent position
- Can be individually calibrated using a three-point interpolation of the pressure response curve
- Have a very low hysteresis compared with our standard sensors

With IEE's foil-type contact technology, we can create slim, pressure-activated sensors. The shape of each sensor can be adapted to suit numerous geometrical environments, and different sensor segment interconnections can be combined in one device.

Sensor Configurations

High Dynamic Force Sensing Resistor (HD-FSR)

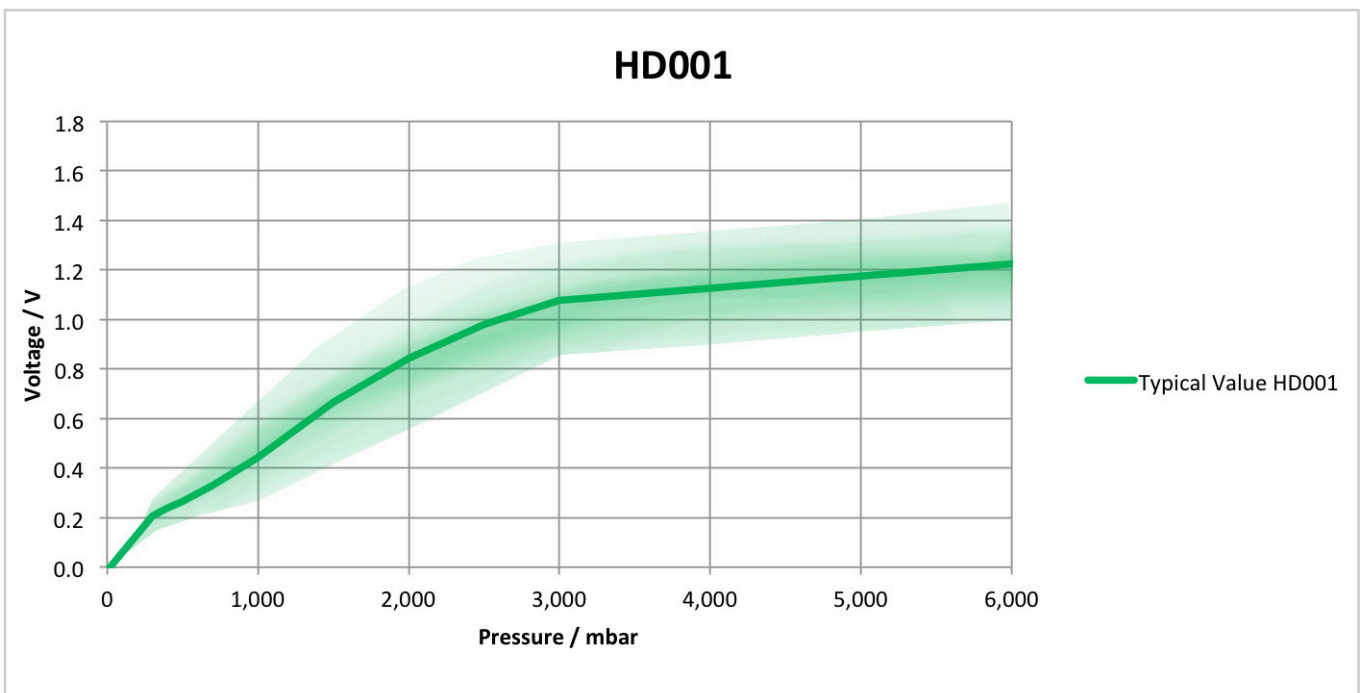
Depending on the cell dimension, HD-FSR sensors are available in different configurations:

| Sensor Type | Detection Area Dimension | Pressure Load | Rfix | Typical Resistance Value | Typical Value in Voltage Divider |
|-------------|------------------------------|---------------|--|--|--|
| HD 001 | rectangular, 18.1 x 14.75 mm | 500 mbar | $3 \text{ k}\Omega < R_{\text{fix}} < 7 \text{ k}\Omega$ | $20 \text{ k}\Omega < R_L < 120 \text{ k}\Omega$ | $0.16 \text{ V} < V_{\text{fsr}} < 0.39 \text{ V}$ |
| | | 2,000 mbar | | $5 \text{ k}\Omega < R_L < 30 \text{ k}\Omega$ | $0.56 \text{ V} < V_{\text{fsr}} < 1.13 \text{ V}$ |
| HD 002 | rectangular, 31 x 14.75 mm | 500 mbar | $2 \text{ k}\Omega < R_{\text{fix}} < 4 \text{ k}\Omega$ | $9 \text{ k}\Omega < R_L < 45 \text{ k}\Omega$ | $0.26 \text{ V} < V_{\text{fsr}} < 0.53 \text{ V}$ |
| | | 2,000 mbar | | $2 \text{ k}\Omega < R_L < 15 \text{ k}\Omega$ | $0.67 \text{ V} < V_{\text{fsr}} < 1.40 \text{ V}$ |

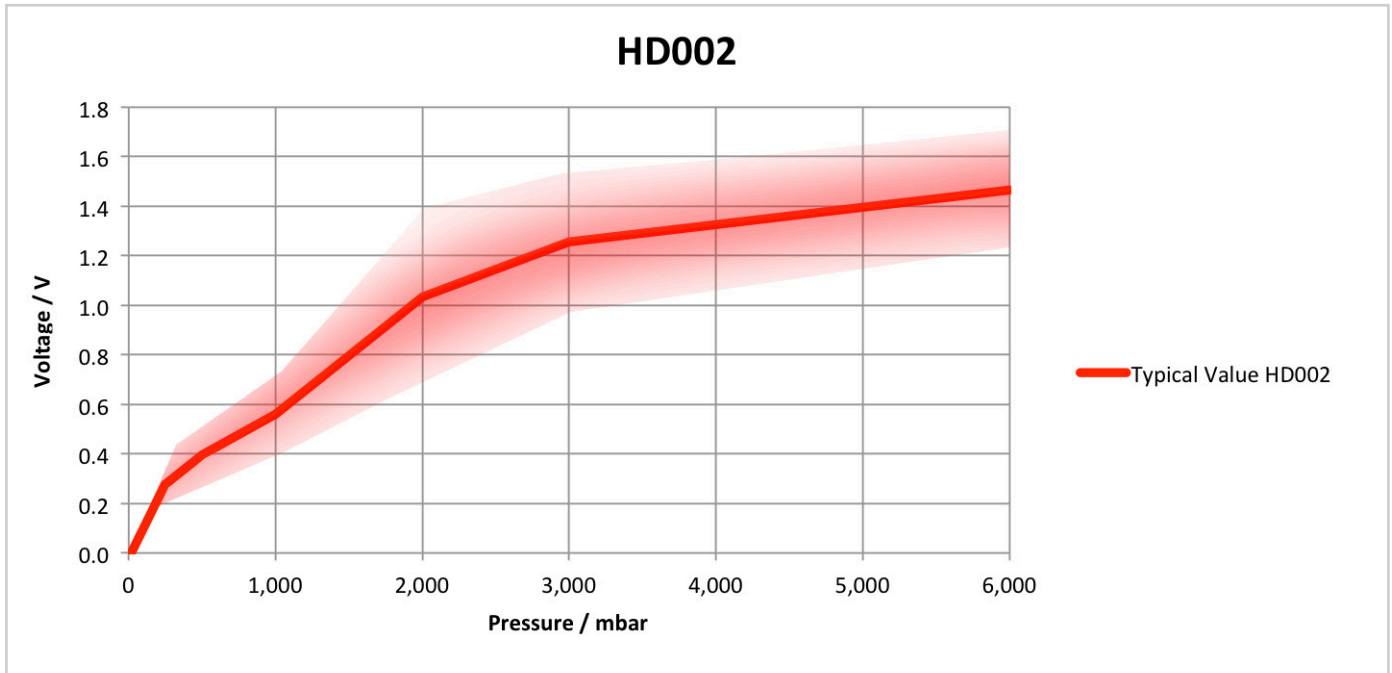
Typical Response Curve

The typical response curve is based on the sensor equivalent circuit with a 3 V supply voltage (UBAT). The measurement voltage (UM) is shown in dependency of the applied pressure on

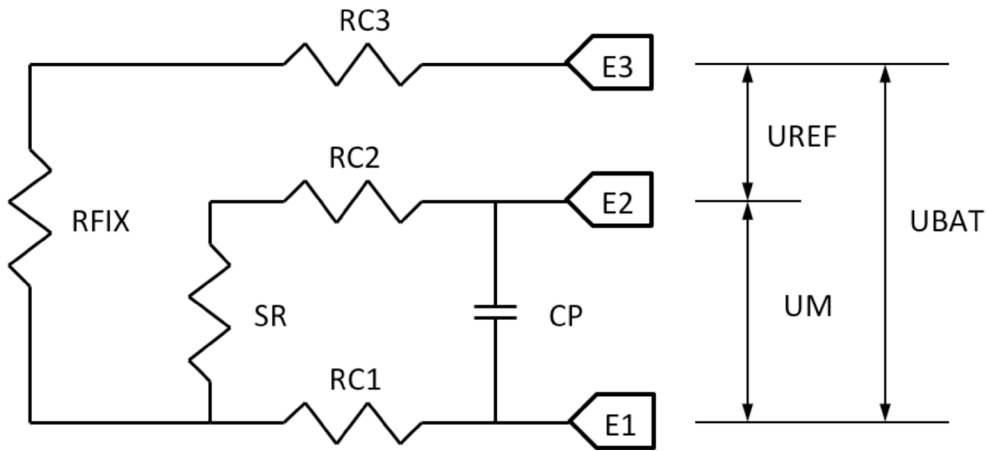
the sensor cell. Here the sensor cell is placed on a steel plate with the backing adhesive facing downwards. The overpressure is applied by a latex membrane bladder from the top.



Typical Response Curve



Simplified Sensor Equivalent Circuit



Use an ohmmeter with PC interface option for dynamic data recording. An ordinary ohmmeter will be sufficient if you do not intend to record data.

- E1 Electrode 1 pad
- E2 Electrode 2 pad
- E3 Electrode 3 pad
- CP Parasitic parallel capacitance of the sensor sandwich
- RC1 Conductor resistance of electrode 1 side

- RC2 Conductor resistance of electrode 2 side
- RC3 Conductor resistance of electrode 3 side
- SR Sensor resistance
- RFIX Resistance of printed fixed resistor
- UBAT Supply Voltage
- UREF Reference Voltage
- UM Measurement Voltage

The measurement voltage U_M can be calculated with the following formula:

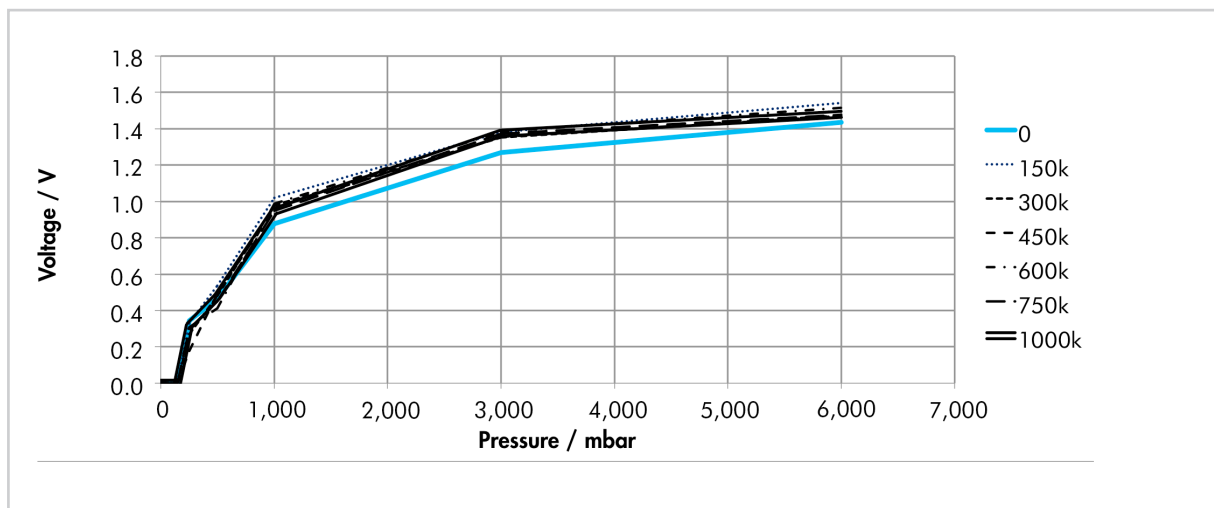
$$U_M = U_{BAT} \times R_{FIX} / (R_{FIX} + S_R)$$

Typical: $U_{BAT} = 3 \text{ V}$

Typical Sensor Robustness

The typical cell response during its life-time under the described conditions

(1,000,000 cycles @ 7 bar, 1 Hz and 95% r.H.) is shown below:





Sensor Characteristics

| Sensor Description | |
|--|---|
| Sensor type | Pressure Sensitive High Dynamic Single Sensor |
| Typical applications/devices | Dynamic user interface devices and high-dynamic pressure sensors for in-shoe measurements |
| Number of active areas/cells | 1 |
| Dimensions and available connectors | See layout drawings on the following pages |
| Manufacturing Tolerances | |
| Length and width tolerances | According to DIN 7151 IT 14 |
| Thickness | Nominal value +/- 12 % |
| Total manufacturing tolerance | +/- 0.8 mm |
| Base Materials | |
| Topside substrate | PET film |
| Laminating adhesive | Acrylic |
| Backside substrate | PET film |
| Backing adhesive | Acrylic |
| Operating Parameters | |
| Standby resistance (no load) | RNL > 1 MΩ (between E1 and E2) |
| Typical activation resistance range | 1 MΩ > RL > 2 kΩ |
| for a pressure range of | 20 mbar - 7 bar. See Typical Response Curve on page 24 |
| Typical conductor lead resistance | ≤ 25 Ω |
| Typical lifetime when used according to application advice | > 1,000,000 cycles @ 7 bar, 1 Hz and 95% r.H. |
| Typical sensor response time on single activation | 2-3 ms (mechanical) |
| Current density | < 1 mA/cm ² (of activated area) |
| Parasitic capacitance | < 1 nF |
| Power dissipation | < 1 mW/cm ² (of activated area) |
| Operating Conditions | |
| Nominal operating voltage | 3V according to simplified sensor equivalent circuit |
| Operating temperature range | -40 to +85 °C (-40 to 185 °F) |
| Operating humidity range | ≤ 95 % R.H. |
| Standard Test Criteria at Time of Delivery | |
| Standby resistance | RNL > 1 MW @ RT (between E1 and E2) |
| Measuring device | IEE overpressure membrane tester |



Important Application Information

Typically, you should mount the sensor onto an even and smooth support surface, for example a plastic, glass or metal plate. Unlike the standard cells, the HD-FSR can also be mounted on slightly bent rubber or foam layers.

- To avoid mechanical pre-load and false signals, do not bend the sensor in the active area to a radius of < 120 mm.
- To avoid broken conductor lines, do not bend the connection tail to a radius of < 5 mm.
- All sensors feature an air vent. Take care not to block it and to avoid liquids from penetrating through it.
- All sensors feature a backing adhesive with a release liner. If you need to remove the liner, take care that surface and material properties match the backing adhesive.

The sensor can be read out with or without calibration, depending on the type of use and the accuracy required:

- To avoid additional process costs for individual cell calibration, all sensors can be read out without calibration by using the typical response curves shown on pages 24 and 25. This may be useful if you have a high volume market.
- To ensure high sensor accuracy and repeatability, all sensors can be calibrated by three-point pressure response curve interpolation. Thanks to the very high environmental and mechanical robustness of the new HD sensor, no recalibration is needed during the sensor's lifetime.

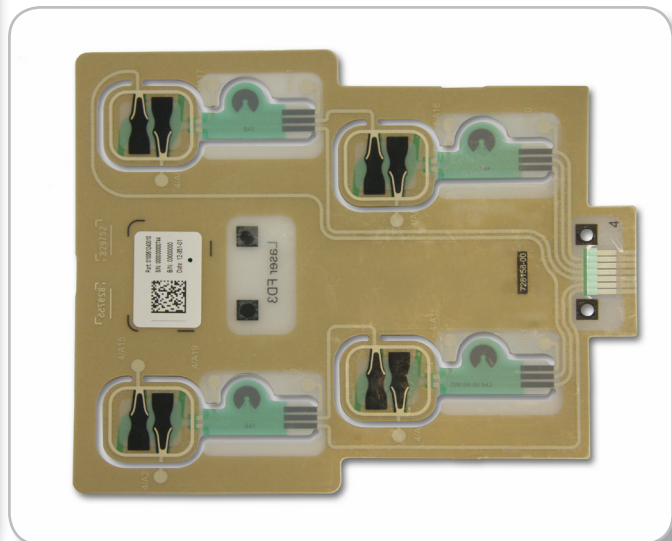
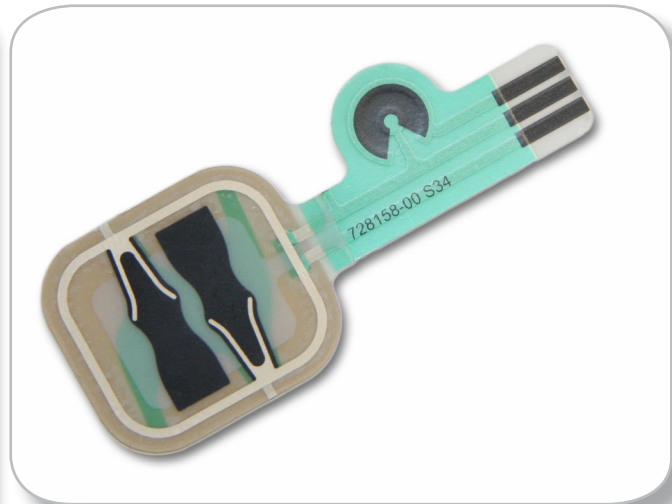
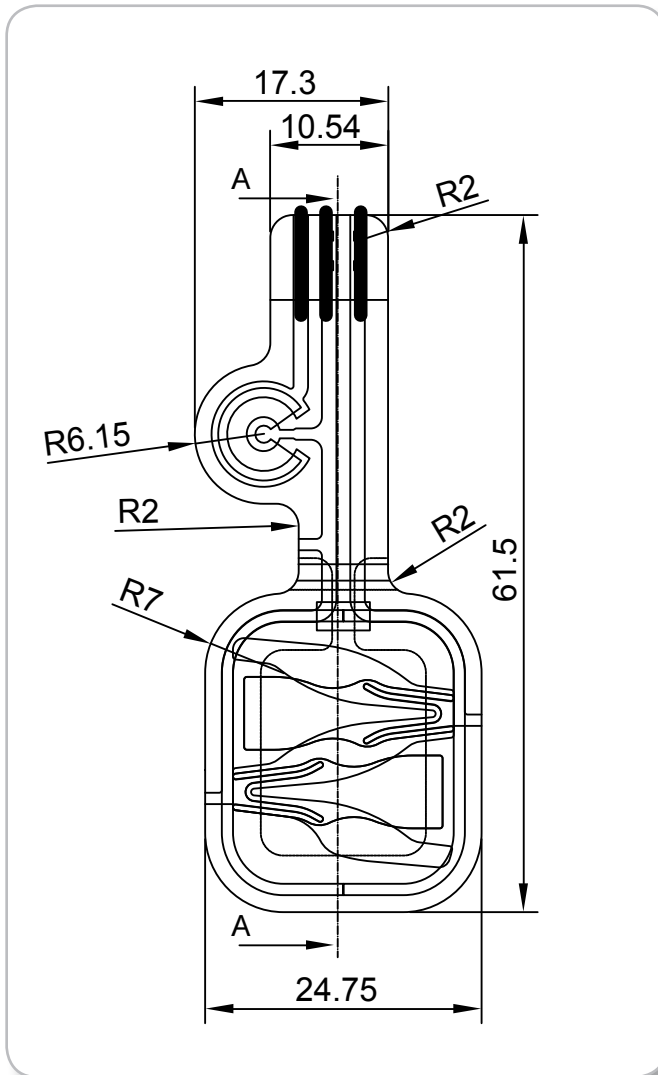
The sensor shows a very low hysteresis in the pressure response curve compared with the standard single cells described on pages 4 - 15 (about 20 %):

- Hysteresis for HD 001: 3 %
- Hysteresis for HD 002: 8 %

This is a significant advantage for applications where the pressure changes need to be monitored in a high frequency (e.g. monitoring of movements, impacts).

Single Sensor HD 001

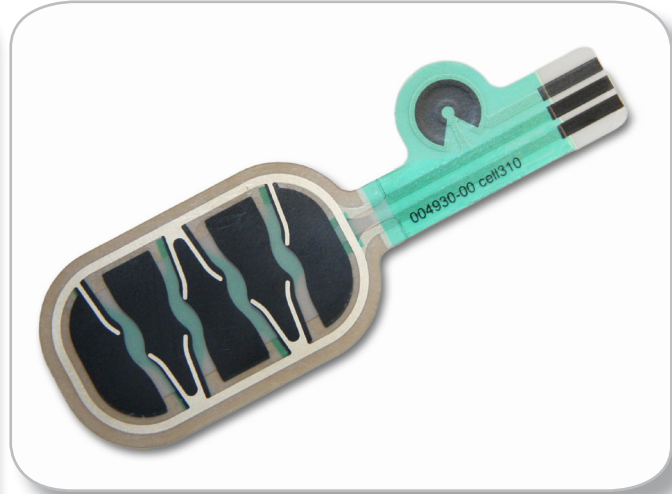
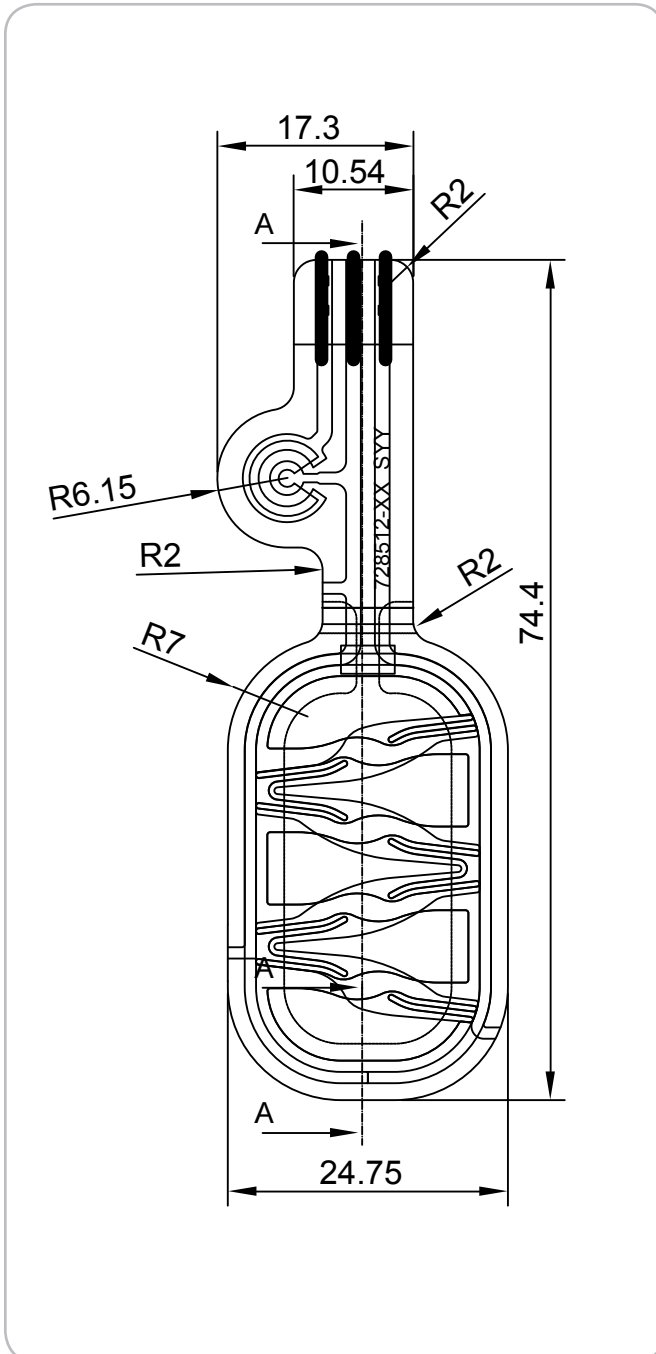
| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| HD 001 AN | Yes | No crimps | No |
| HD 001 AS | Yes | Male | No |



HD 001 AN-4

Single Sensor HD 002

| Sensor Reference | Backing Adhesive | Crimp Type | Housing |
|------------------|------------------|------------|---------|
| HD 002 AN | Yes | No crimps | No |
| HD 002 AS | Yes | Male | No |



For an indication of the construction of HD 002 AN-4, please refer to the image of HD 001 AN-4 on the previous page.

Customized Input Sensing - CIS Solutions



Contact

Want to learn more about our CIS solutions?

- Send an e-mail to consumer@iee.lu
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