



**Sensata**  
Technologies

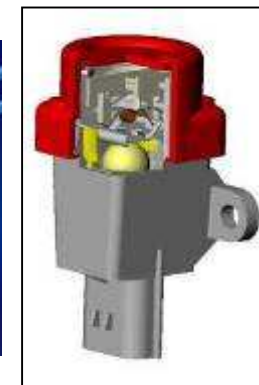
# Sensor Technology Presentation

Sensata Technologies Holland B.V

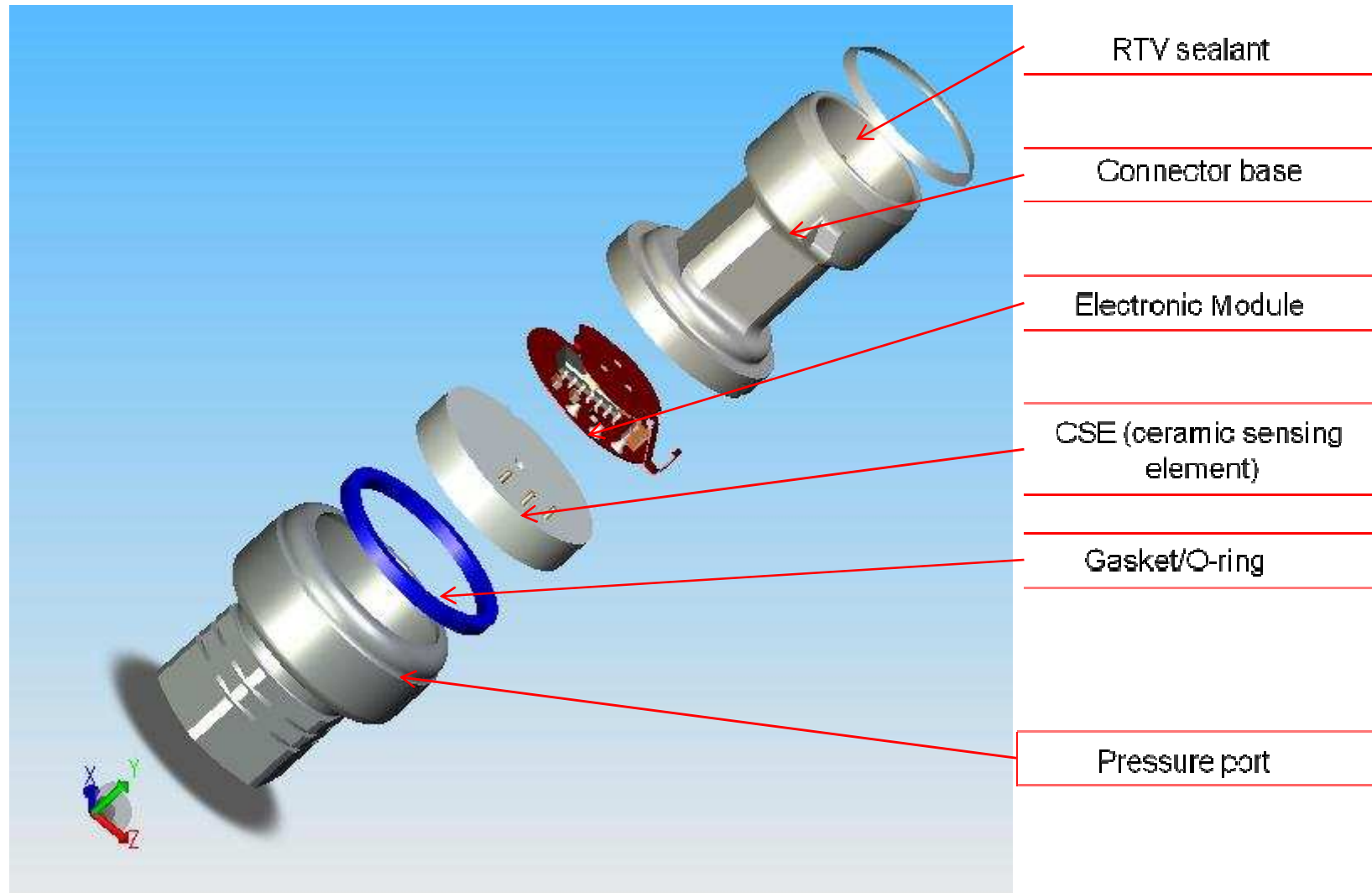
The World Depends on Sensors and Controls

## Contents

- Ceramic Pressure Transducer CP
- Micro-fused Strain Gauge PP
- Differential Pressure Sensor MPP
- Pressure Switches PS
- Inertia switches FCS



## Ceramic Capacitive Pressure Transducer (CP)



## CP Generic Specification

### Electrical

Supply Voltage	5 Vdc +/-10%
Supply Current	8 mA max
Output Voltage @ 5 Vdc	0.5 - 4.5 Vdc
Output Current	2.5 mA max
Output Load	10k ohms
Response Time	10 ms max
Overvoltage Protection	16 Vdc
Reverse Voltage Protect	14 VDC
EMC (512 MHz-1GHz)	100 V/m
EMC (10 MHz-512 MHz)	50 V/m

### Physical

Operating Pressure	0-1 to 50 bar
Proof Pressure	2-3 x Full Scale
Burst Pressure	3-5 x Full Scale
Minimum Cycle Life	10M FS Cycles
Random Vibration	11 g (50-2000 Hz)

### Environmental

Operating Temp	-40 to +135°C
Storage Temp	-40 to +145°C

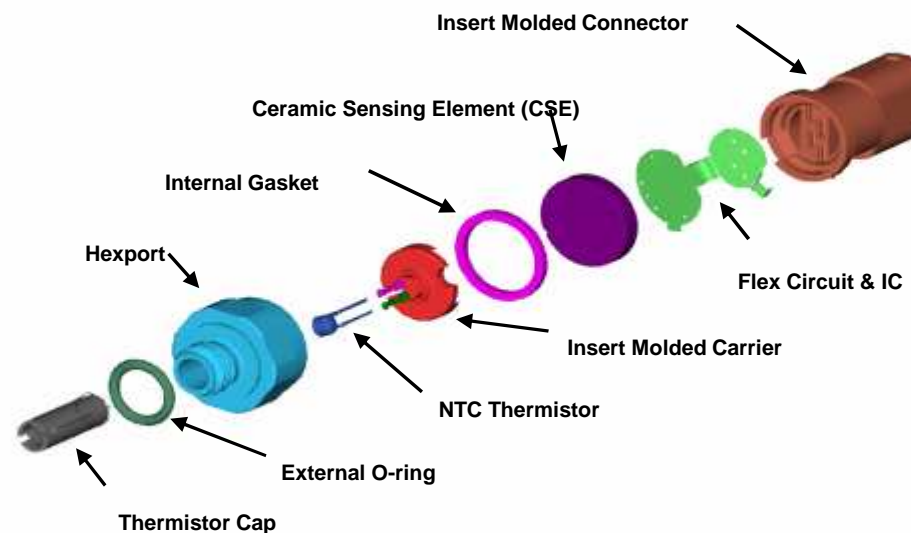
### Performance

<b>Accuracy @ 25°C</b>	<b>+/- 0.75 to 1.2% Span*</b> (non-linearity, hysteresis, repeatability, calibration)
<b>Total Error Band</b>	<b>+/- 2% Span* (-20 to 85°C)</b>
	<b>+/- 3% Span* (-40 to 135°C)</b>

***\*In this accuracy a 3x standard deviation correction is included.***

## Combined Pressure/Temperature CP sensor

- Ceramic capacitive pressure sensing element, with in-stream NTC thermistor
- Lower cost than two discrete sensors
- Airco, Heatpump (<40 bar) and CNG/LPG (<12 bar)
- Output: ratiometric to 5V for pressure; Ohms for temp.
- Plated steel (M12) or brass (1/4" NPT) port
- AMP Tyco Micro Quadlock System 4 pins connector.



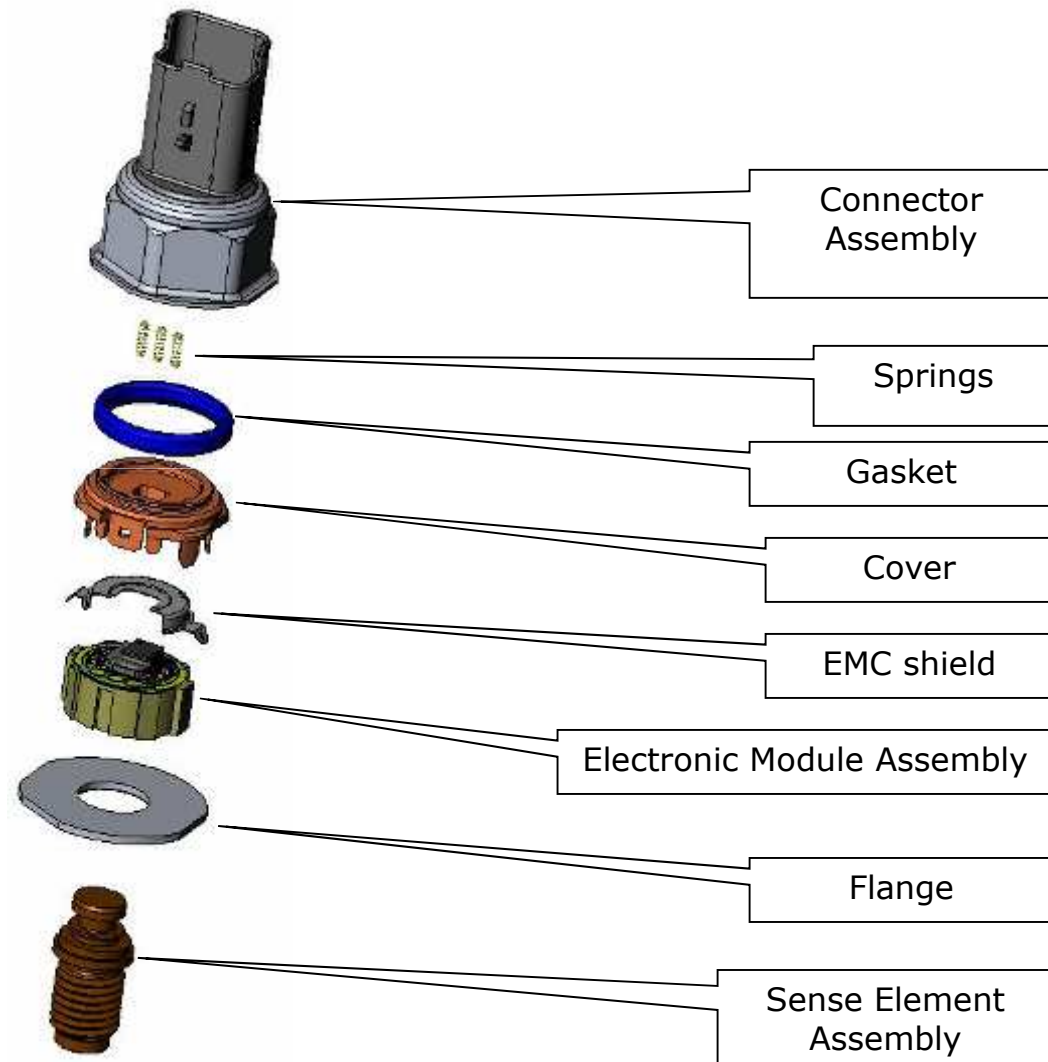
## Micro-fused Strain Gauge (PP)



- **Sensing Structure**
  - Silicon MEMs Strain Gage Elements Glass Bonded to Stainless Steel Diaphragm
  - Hermetic
  - All Media Compatible
- **Custom ASIC Signal Conditioner**
  - Calibrated Output
  - Temperature Compensation
  - Diagnostics



## PP Sensor Assembly



## Generic Specification PP Sensor

### Electrical

Supply Voltage	5 Vdc +/-10%
Supply Current	15 mA max
Output Voltage @ 5 Vdc	0.5 - 4.5 Vdc
Response Time	10 ms max
Overvoltage Protection	16 Vdc
Reverse Voltage Protect	14 VDC
EMC (1 MHz-4GHz)	200 V/m
ESD (ISO 10605)	8 kV

### Physical

Operating Pressure	0-35 to 3000 bar
Proof Pressure	2 x Full Scale
Burst Pressure	3 x Full Scale
Minimum Cycle Life	10M FS Cycles
Vibration (50-2000 Hz)	20 to 60 g sine

### Environmental

Operating Temp	-40 to +135°C
Storage Temp	-40 to +145°C

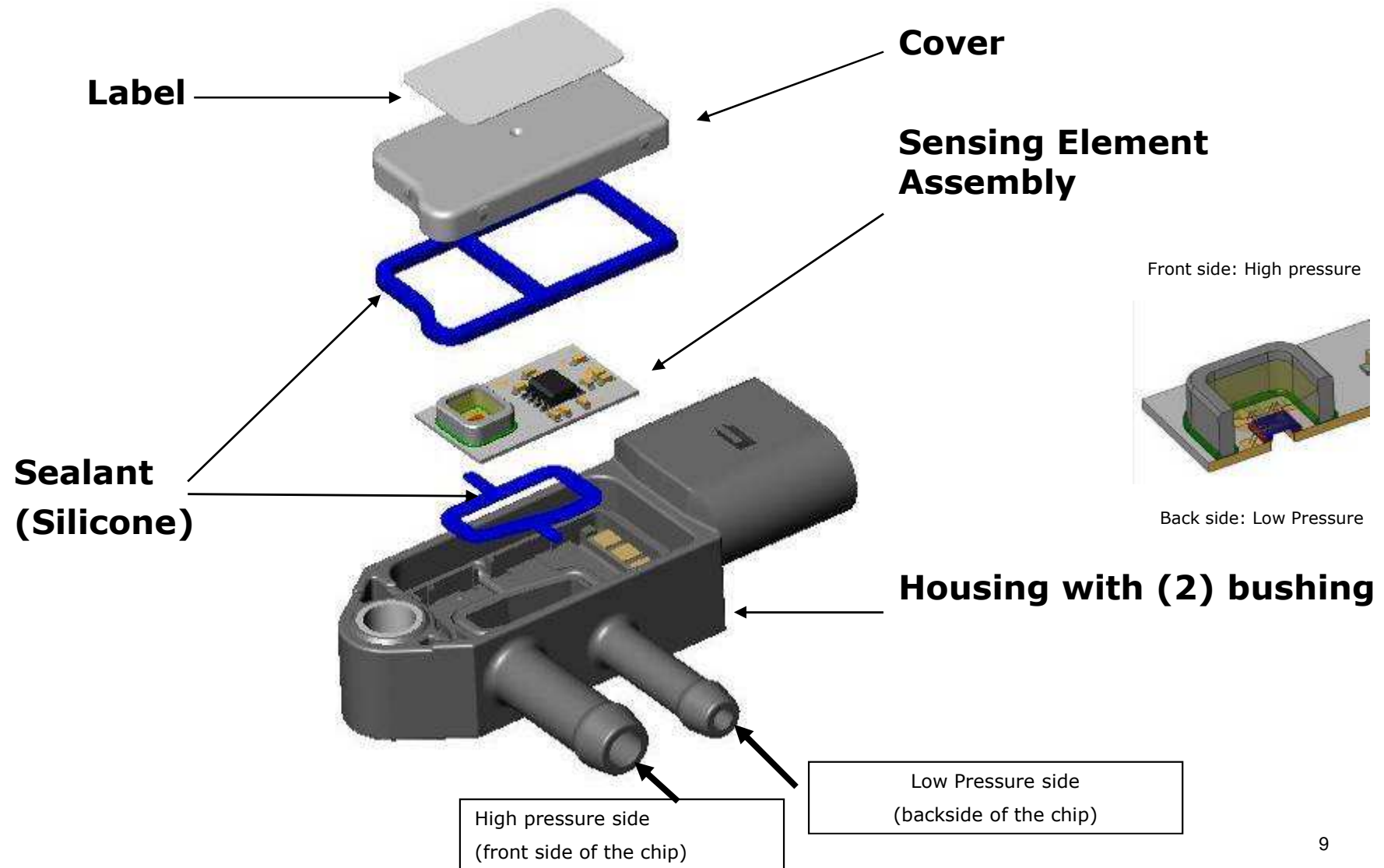
### Performance

<b>Accuracy @ 25°C</b>	<b>+/- 1.1 to 1.3% <i>Span</i>*</b> (non-linearity, hysteresis, repeatability, calibration)
<b>Total Error Band</b>	<b>+/- 2.2% <i>Span</i>* (-40 to 135°C)</b>

***\*In this accuracy a 3x standard deviation correction is included.***



## Differential Pressure Sensor (MPP)



## Generic Specification MPP

### Electrical

Supply Voltage	5 Vdc +/-0.25V
Supply Current	15 mA
Output Voltage @ 5 Vdc	0.25 - 4.5 Vdc
Response Time	5 ms
Connector	AMP Tyco 1813271-1

### Physical

Operating Pressure	0-0.35 bar, 0-1 bar (diff)
Burst Pressure (diff.)	3 bar
CM pressure	3 bar
CM proof	4.5 bar
Random Vibration	18 g(rms)

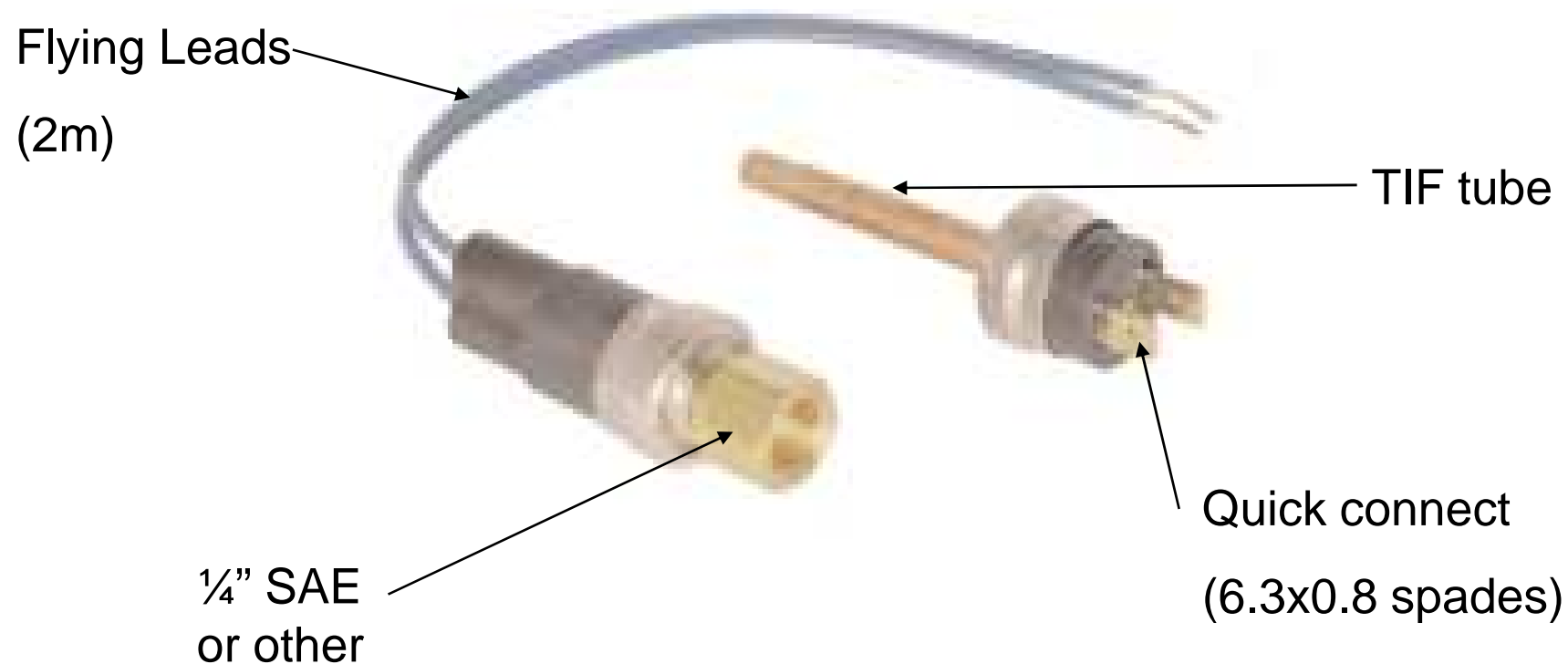
### Environmental

Operating Temp	-40 to +135°C
Storage Temp	-40 to +140°C

### Performance

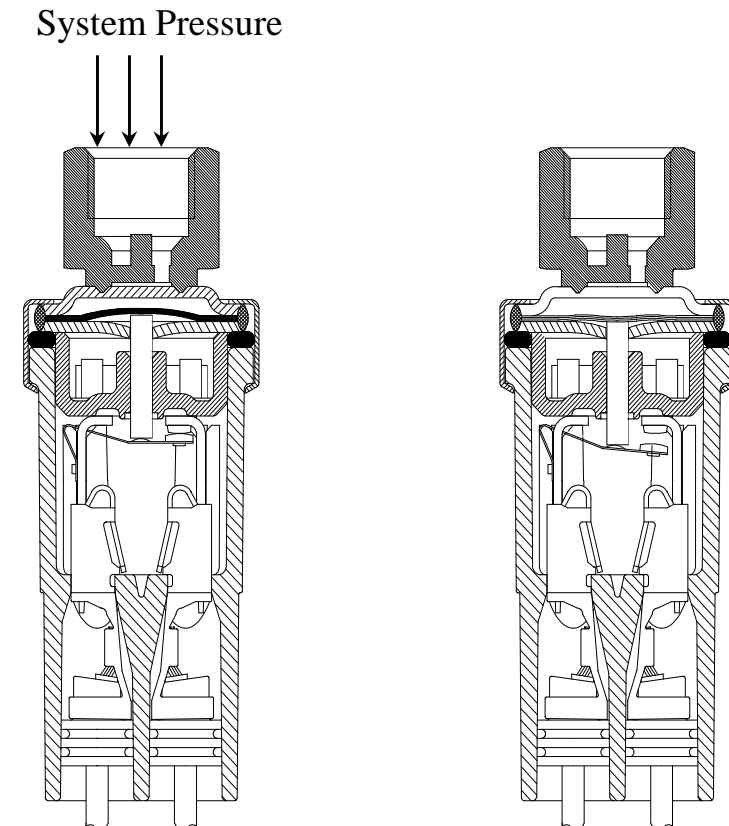
<b>Total Error Band</b>	<b>&lt;+/- 2% Span (-40 to 135°C)</b>
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## Pressure switch PS (on/off)

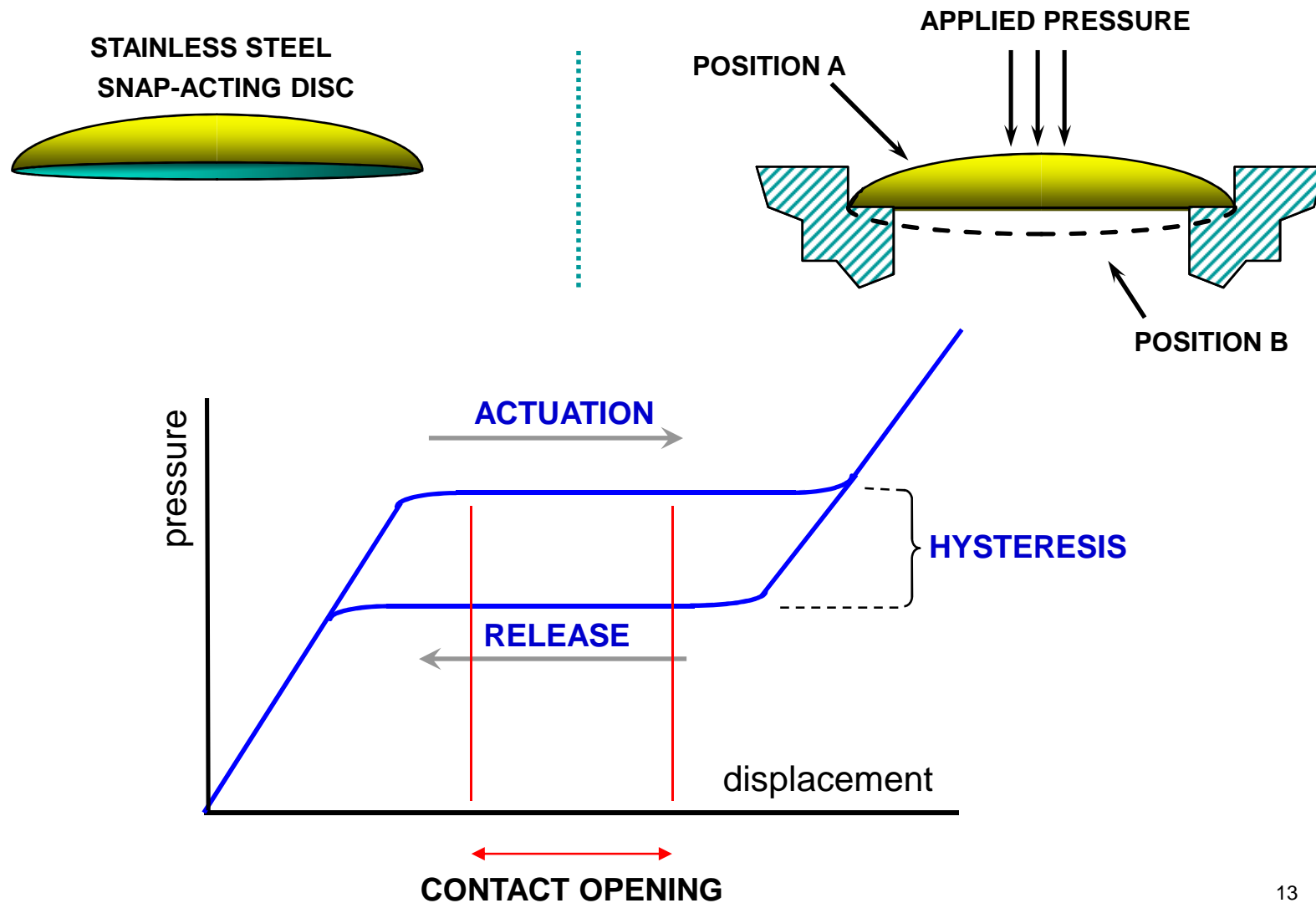


## Pressure switch operation

- Electromechanical device which opens or closes an electrical circuit by responding to a change in pressure.
- Hermetically sealed stainless steel sensor, employing snap acting pressure disc(s) with fixed pressure settings.



## Cut in/Cut out Profile PS



## Pressure Switches Portfolio Examples

- **PS80 – Automatic reset**

- 0 to 150 bar
- 6A @ 240 Vac max.
- Cycle life 100k
- Low cost, for static applications



- **20PS family – Low current**

- 0 to 50 bar
- 5.8 A @ 120 Vac, 2.9 A @ 240 Vac max.
- Cycle life 100k to 250k
- Versatile, multipurpose, robust, hermetic



- **25PS family – High current**

- 0 to 50 bar
- 13 A @ 120 Vac, 10 A @ 240 Vac, 15 A @ 28 VDC max., 3.2 A @ 600 Vac max.
- Cycle life 100k to 250k
- Single pole/double throw, environmentally sealed



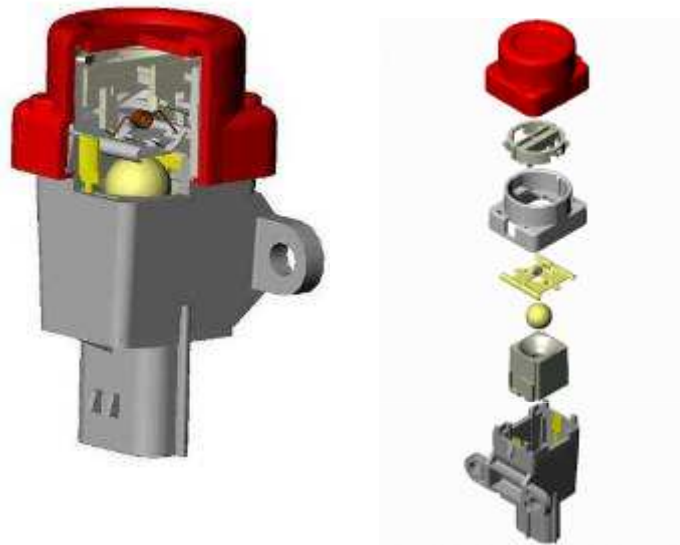
- **29PS – Manual reset**

- 14 to 50 bar
- 5.8 A @ 120 Vac, 2.9 A @ 240 Vac max.
- Cycle life 10k
- Manual reset, hermetic





## Inertia switches: Cut off switch FCS



### Fuel cut off

- Intrinsic function
- Mechanical switch
- For fuel pump disconnection
- 360° activation
- 8g-14g shock response
- Manual reset
- AMP Econoseal III 3 terminal Connector

### Mini crash sensors

- PCB mounted
- Mechanical switch
- For door lock release
- 5g-7g (2 axis) or 6g-10g (3 axis)
- Automatic reset



## Generic Specification FCS

### Electrical

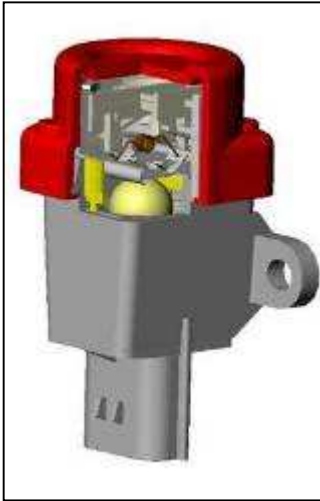
Voltage	9 -16 Vdc
Current	Max. 10A
Connector	AMP Tyco 1813271-1

### Physical

Operating	8g-14g
Contact life	50 cycles

### Environmental

Operating Temp	-30 to +120°C
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**Thank you  
for your attention**

