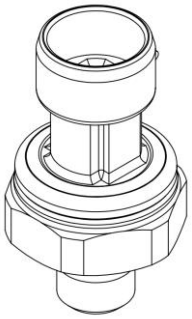
Fuel Cell Pressure Transmitter

Hydrogen & coolant pressure sensing for fuel-cell systems

Pressure and pressure-temperature transmitters built for fuel-cell power systems — low-pressure hydrogen lines, mid-pressure supply and the coolant circuit. Ceramic sensing elements, hydrogen-compatible wetted materials and ISO 26262-ready variants for on-board use.



32CP42-02 · 30CP02-01

Product family

Application	Hydrogen supply & coolant circuits
Low pressure	30CP02-01 · 0.5 – 4 barA
Mid pressure	32CP42-02 / -03 · 0.1 – 2.0 / 2.5 MPaA
High pressure	500 / 900 barA bottle & supply
Technology	APT ceramic · MSG · MEMS
Manufacturer	Sensata · Changzhou, China

Key features

- Hydrogen-compatible wetted parts — 316L stainless steel, no oil or fuel contact
- APT ceramic sensing element: good media compatibility, no fatigue, no hysteresis
- Anti-freeze design on low-pressure types — hydrophobic coating, larger cavity, elastic element
- V-0 flame-retardant housing and 1,000 VDC insulation resistance on functional-safety variants
- ISO 26262 functional safety — SENT output available, prevents pressure-control failure
- Factory-calibrated in China (Changzhou) with traceable date and location code

Where it fits in the fuel-cell system

Position	Nominal pressure	Measured medium	Sensor technology
P0	500 / 900 bar	High-pressure bottle & supply	MSG strain-gauge, metal-to-metal seal
P1 / P2	20 / 25 / 35 bar	Mid-pressure hydrogen supply	APT ceramic, 316L wetted parts
P3	3 / 4 bar	Low-pressure hydrogen circuit	Anti-freeze design, plug-in mount
P4 / P5	3 / 4 bar	Air circuit pressure	MEMS / APT, IP-rated housing
P6	7 bar	Coolant circuit pressure & temperature	Combined P+T, fast temperature response

Sensing technology by pressure range

MEMS

< 3 bar

Silicon strain gauge on a diaphragm bridge. Fast, sensitive, for low-pressure and differential measurement.

APT

3 – 80 bar

Ceramic capacitive element. No fatigue, no plastic deformation, no hysteresis — the standard for hydrogen service.

MSG

30 – 3500 bar

Fused glass strain gauge on a hermetically sealed metal diaphragm, for 500 / 900 bar bottle pressure.

Model selection and specifications

Selection table

Model	Application	Pressure range	Supply / output	Output span	Thread	Wetted mat.	Temp. range
30CP02-01	Coolant P+T	0.5 – 4 barA	5.0 ± 0.25 VDC	10 – 90 %Vcc	M14 × 1.5	316L SS	−40 ~ +110 °C
32CP42-02	Mid-pressure H_2	0.1 – 2.0 MPaA	5.0 VDC / 0.5 VDC	10 – 90 %Vcc	7/16-20 UNF-2B	316L SS	−40 ~ +125 °C
32CP42-03	Mid-pressure H_2	0.1 – 2.5 MPaA	5.0 VDC / 0.5 VDC	10 – 90 %Vcc	7/16-20 UNF-2B	316L SS	−40 ~ +125 °C

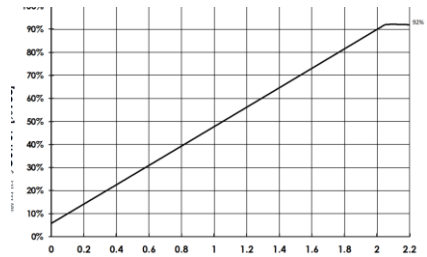
30CP02-01 — coolant P + T

Supply voltage	5.0 ± 0.25 VDC
Supply current	10 mA max
Operating pressure	50 kPa – 400 kPaA
Proof / burst pressure	600 kPaA / 1200 kPaA
Pressure error band	±1.5 %Vcc (−20…85 °C)
Temperature error band	±1.5 °C (−40…95 °C)
Insulation resistance	> 20 MΩ @ 1000 VDC
Protection rating	IP69K
Weight	30 ± 5 g
Connector	TYCO 1-1456426-5
Mounting	M6 hex flange, 8 Nm ± 15 %
Application medium	Coolant — no icing in service

32CP42-02 / -03 — mid-pressure H_2

Supply voltage	5.0 VDC
Supply current	10 mA max
Pressure range	0.1 – 2.0 / 2.5 MPaA
Proof / burst pressure	4 / 5 MPaA (10 min) / 6 MPaA
Total error band	1 %Vcc initial, 2 %Vcc life
Operating temperature	−40 ~ +125 °C
Medium temperature	−40 ~ +125 °C
Output voltage	10 – 90 %Vcc
Wetted material	316L stainless steel
Connector	Delphi Packard 13602480
Sensor element	APT ceramic, A/D output
Application medium	Hydrogen — no oil or fuel

Output characteristics



32CP42-02 · 0.1 – 2.0 MPaA

Transfer functions

32CP42-02

`Vout/Vcc × 100 = 42.105 × P + 5.789`

P in MPaA · Vout in VDC

32CP42-03

`Vout/Vcc × 100 = 33.333 × P + 6.667`

P in MPaA · Vout in VDC

30CP02-01

`Vout/Vcc × 100 = 0.2286 × P − 1.428`

P in kPaA · Vout in VDC

Why it matters on-board

Anti-freeze

Hydrophobic coating, larger cavity ID and an elastic element keep the ceramic diaphragm undeformed even with ice present — the failure mode that ends sensor life.

Functional safety

FUSA-rated variants prevent a sensor failure from cascading into loss of pressure control, with SENT digital output and V-0 flame-retardant housing.

Media compatibility

APT ceramic gives no fatigue, no plastic deformation and no hysteresis, with 316L stainless wetted parts for hydrogen service.

Handling notes

The application medium is hydrogen and must not contain oil or other fuel; external O-rings must not contact oil or fuel. Freezing is not allowed during application. The exposed temperature sensor must not be pushed, pulled or twisted. Parts shown are subject to change without notice.