



TRICAN HTD2800

Digital Combination Sensor Module

- Combination sensor for relative humidity, temperature and pressure measurement
- Three different power supplies available: 5V, 12V, or 24V
- Optimized design for high RH, high T°C environment
- Digital output as per J1939, CAN2.0
- Rugged, automotive-grade sensor
- High resistance to chemicals
- Customizable CAN frame
- Optional output for NOx humidity correction factor

The TRICAN HTD2800 digital combination sensor provides output signals for relative humidity, temperature and pressure from a single device. The highly rugged and reliable automotive-grade design of the TRICAN is suited for automotive, truck/bus and fuel cell applications where performance is key.

The TRICAN is optimized to provide accurate measurements and fast response times for systems where repeated long-term immersion in high humidity and high temperature environments is required. With measurements delivered as a digital output on a CAN bus, the TRICAN sensor provides exceptional value, proven reliability and accurate performance from a brand you can trust.

FEATURES

- Power supply 5V, 12V or 24V
- Digital output on a CAN bus
- Rugged construction for harsh environments with proven reliability and accurate performance
- Fast response time even in saturated humidity environment

APPLICATIONS

- Low power engine and fuel cell monitoring
- High humidity and high temperature environments
- Applications with signal noise and interference

TRICAN HTD2800

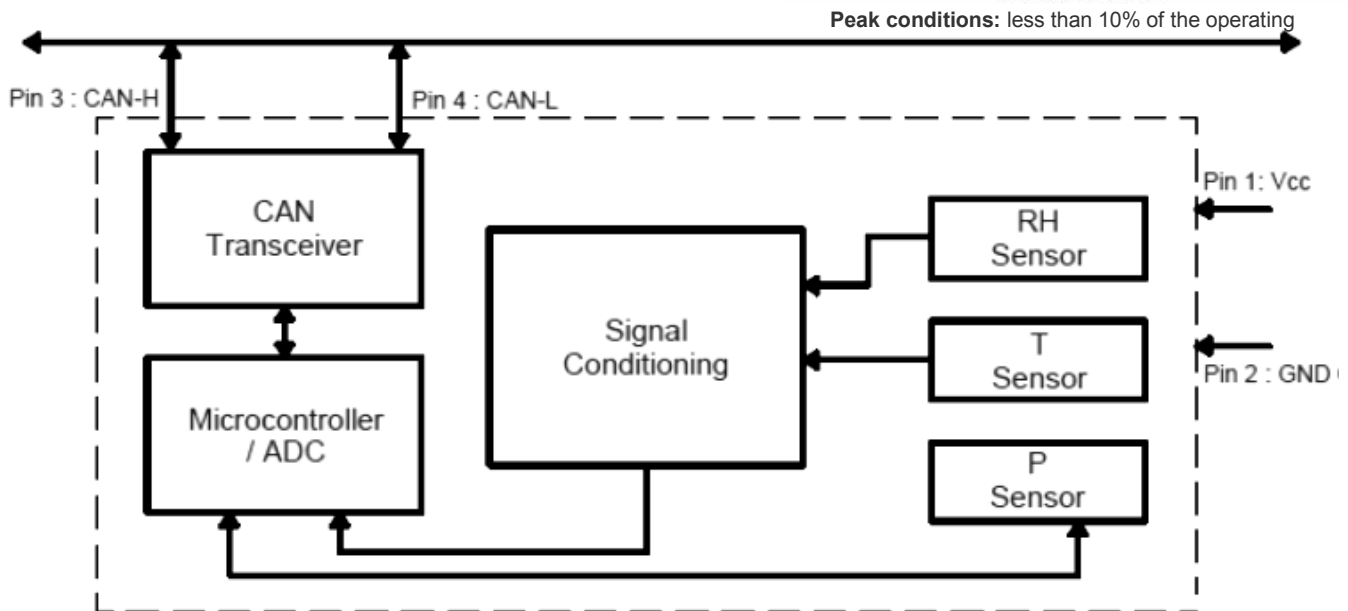
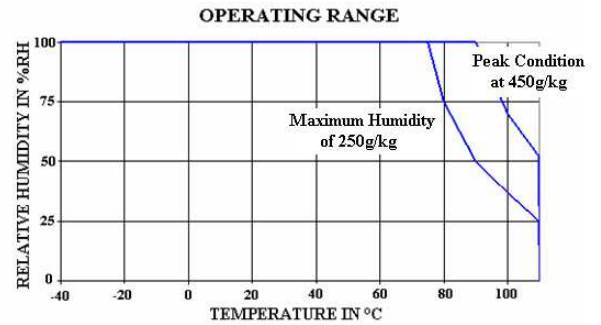
Combination Humidity, Temperature and Pressure Sensor

PERFORMANCE SPECS

MAXIMUM RATINGS

| Ratings | Symbol | Value | Unit |
|------------------------------|--------|-------------|------|
| Storage Temperature | Tstg | -40 to +125 | °C |
| Humidity Operating Range | RH | 0 to 100 | %RH |
| Temperature Operating Range* | Ta | -40 to +105 | °C |
| Max Pressure (Burst) | Pabs | 130 | kPa |

* At the tip of the sensor



BLOCK DIAGRAM

CHARACTERISTICS

(@T=23°C)

| Electrical Characteristics | Symbol | Min | Typ | Max | Unit |
|----------------------------|--------|-----|-------------|-----|------|
| Voltage supply (Vbatt) | V | 4.5 | 5 (At 5V) | 5.5 | VDC |
| | | 8 | 12 (At 12V) | 32 | |
| | | 8 | 24 (At 24V) | 32 | |
| Current consumption | mA | - | 10 (At 5V) | 130 | mA |
| | | - | 15 (At 12V) | 100 | |
| | | - | 20 (At 24V) | 104 | |
| Sink current capability | mA | - | 150 | - | mA |

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| CAN Bus Timing | Symbol | Min | Typ | Max | Unit |
|-----------------------|---------------|------------|------------|------------|-------------|
| Bit time | μs | 3.999 | 4 | 4.001 | μs |
| CAN_H CAN_L slew rate | V/μs | | 7 | | V/μs |

| CAN_H & CANL limiting values | Symbol | Min | Typ | Max | Unit |
|-----------------------------------------|---------------|------------|------------|------------|-------------|
| DC voltage at CAN_L | | -36 | | +36 | V |
| DC voltage at CAN_H | | -36 | | +36 | V |
| Transient voltage on CAN_H & CAN_L | | -200 | | +200 | V |

| DC Bus Receiver* | Symbol | Min | Typ | Max | Unit |
|----------------------------------------|---------------|------------|------------|------------|-------------|
| Differential input voltage (recessive) | | -1.0 | | +0.5 | V |
| Differential input voltage (dominant) | | 0.9 | | 5.0 | V |
| Differential input hysteresis | | - | 150 | - | mV |
| CAN_H, CAN_L input resistance | | 5 | | 25 | Kohm |
| Differential input resistance | | 20 | | 100 | Kohm |

* (Transceiver Vcc 4,5 to 5,5V ; RL = 60 ohm)

| Humidity Characteristics | Symbol | Min | Typ | Max | Unit |
|----------------------------------------------------------------|---------------|------------|------------|------------|-------------|
| Humidity Measuring Range | RH | 0 | | 100 | %RH |
| Relative Humidity Accuracy (10% to 95%RH) | | | ±3 | ±5 | %RH |
| Relative humidity Resolution | | | 0.4 | | %RH |
| Time Constant (at 63% of signal) 33%RH to 75%RH ⁽¹⁾ | τ | | 5 | 10 | s |
| Humidity hysteresis | | | ±1 | | %RH |
| Time Constant (at 63% of signal) 33%RH to 75%RH ⁽¹⁾ | τ | | 5 | 10 | s |
| Long term stability | | | ±0.5 | | %RH /Yr |

| Pressure | Symbol | Min | Typ | Max | Unit |
|--------------------------------------------------------|---------------|------------|------------|------------|-------------|
| Absolute pressure measuring range | kPa | 1 | - | 250 | kPa |
| Pressure measuring range with full accuracy guaranteed | kPa | 30 | | 130 | kPa |
| Pressure accuracy | | | ±1 | ±1.5 | %FS |
| Pressure resolution | | | ±0.5 | | kPa |
| Time Constant | τ | | 1 | | s |
| Long term stability | | | ±0.5 | | kPa /Yr |

| Temperature Characteristics | Symbol | Min | Typ | Max | Unit |
|------------------------------------|----------------|------------|------------|------------|-------------|
| Temperature measuring range | T _a | -40 | | 105 | °C |
| Temperature accuracy | | | ±0.5 | ±1.5 | °C |
| Time Constant ⁽¹⁾ | τ | | 10 | | S |
| Long term stability | | | ±0.3 | | °C/Yr |

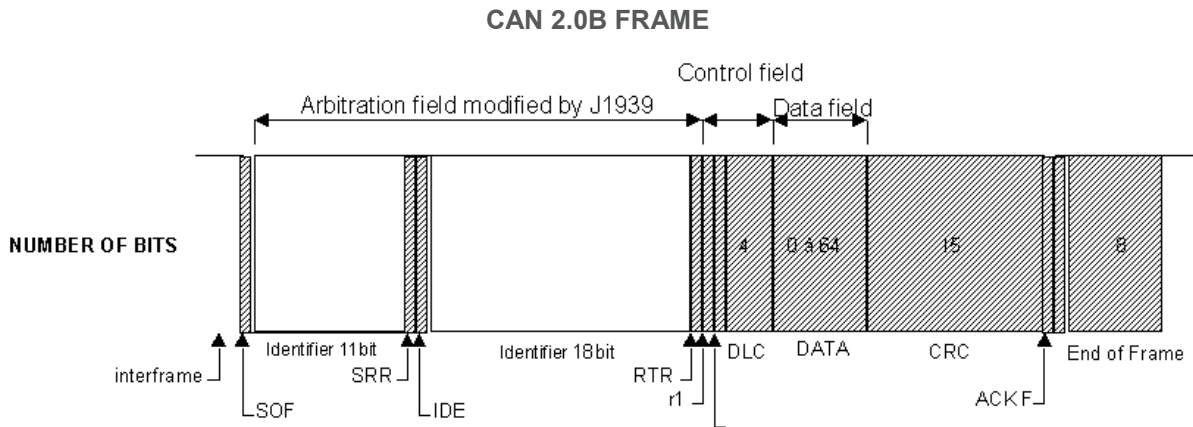
(1) At 2m/s air flow

CAN BUS INTERFACE

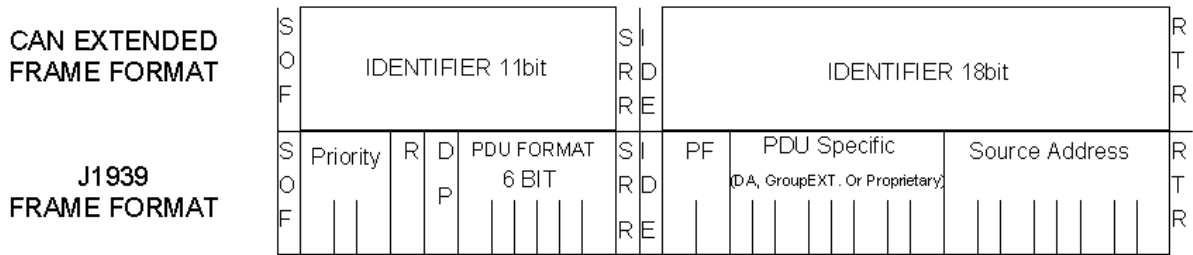
The system is J1939 Standard compliant. The system delivers temperature (SPN 1172), inlet pressure (SPN 1176), relative humidity (SPN 354) and Specific Humidity (SPN4490).

Identifier, transmission repetition rate, data length, ranges, and resolutions are defined by J1939 or specified by customer. Optional and customizable output for Dew point through internal calculation in accordance with EPA methodology is also available.

CAN 2.0B/J1939 FRAME DESCRIPTION



ARBITRATION / IDENTIFICATION FIELD



TRICAN HTD2800P1B11C6 STANDARD SPN

| | | | |
|-----------------------|----------|-------------|-----------------------------------|
| Inlet pressure | SPN 1176 | Data length | 2 byte |
| | | Resolution | 0,1KPa/bit gain, -250 KPa offset |
| | | Data range | -250kPa to 251,99 kPa |
| Relative humidity | SPN 354 | Data length | 1 byte |
| | | Resolution | 0.4%RH/bit gain, 0%RH offset |
| | | Data range | 0 to 100%RH |
| Specific humidity | SPN 4490 | Data length | 2 byte |
| | | Resolution | 0.01 g/kg, 0 g/kg offset |
| | | Data range | 0 to 642.55 g/kg |
| Air inlet temperature | SPN 1172 | Data length | 2 byte |
| | | Resolution | 0,03125°C/bit gain, -273°C offset |
| | | Data range | -273 to1735°C |

SELF DIAGNOSTIC CAPABILITES

Optional and customizable diagnostic byte can be implemented

- Pressure failure sensor (no communication or internal CRC issues)
- Pressure failure sensor (out of range issue)
- Temperature sensor circuit - voltage above normal
- Temperature sensor circuit - voltage below normal
- Humidity sensor circuit - voltage above normal
- Humidity sensor circuit - voltage below normal
- Sensor controller over temperature conditions (105°C)
- SH internal computation / calculation out of range or wrong CRC value

SAE J1939-21 REQUEST

Optional and customizable answers to SAE J1939-21 request can be implemented

- Address claim (PGN 60928)
- Software identification (PGN 65242)
- Calibration information DM19 (PGN 54016)
- Status code message (PGN TBD)

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CONNECTOR CHARACTERISTICS

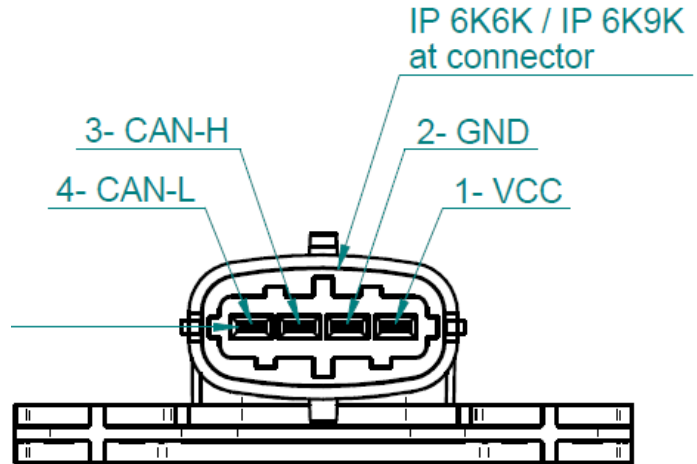
HTD2800P1B11C6

Connector Type: Customizable upon request

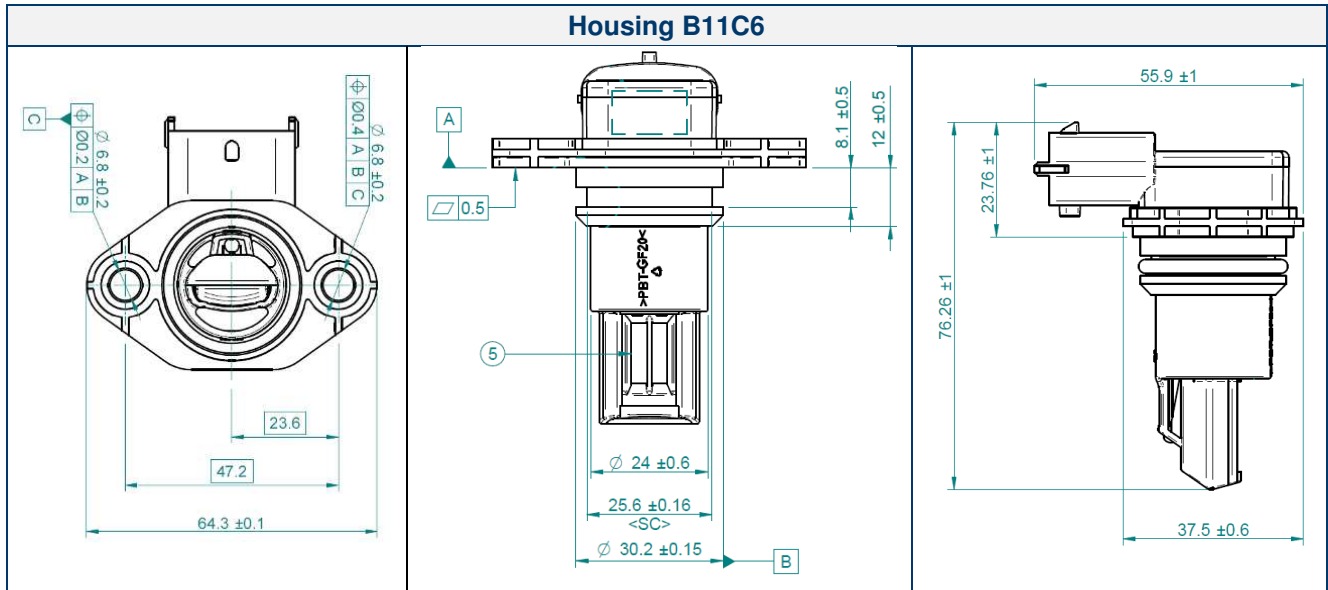
Bosch mating connector: 1 928 403 736
 Recommended contacts: 1 928 498 054

| Signal | Pin |
|--------|-----|
| VCC | 1 |
| GND | 2 |
| CANH | 3 |
| CANL | 4 |

Pin contact



MECHANICAL CHARACTERISTICS



Recommended Screw Mounting: M6; Typical tightening torque: 12 N.m ; Maximum tightening torque: 17 N.m

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RESISTANCE TO PHYSICAL AND CHEMICAL STRESSES

- TRICAN HTD2800P1B11C6 meets rigorous internal testing requirements around vibration, mechanical and thermal shock, storage, high and low temperature, humidity and pressure, ESD and EMC.
- Additional tests under harsh chemical conditions demonstrate good operation in presence of salt atmosphere, SO₂ (0.5%), H₂S (0.5%), O₃, NO_x, NO, CO, CO₂, Softener, Soap, Toluene, acids (H₂SO₄, HNO₃, HCl), HMDS, Insecticide, Cigarette smoke
- TRICAN HTD2800P1B11C6 is not light sensitive

ORDERING INFORMATION

| Part Number | Description | Supply Voltage | Typical Current Consumption | Max Current Consumption |
|-------------|---------------------------|----------------|-----------------------------|-------------------------|
| 10142032-01 | TRICAN 5V HTD2800P1B11C6 | 5V | 10mA (at 5V) | 130mA (at 5V) |
| HPP816E031 | TRICAN 12V HTD2800P1B11C6 | 12V | 15mA (at 12V) | 100mA (at 12V) |
| HPP816E056 | TRICAN 24V HTD2800P1B11C6 | 24V | 20mA (at 24V) | 104mA (at 24V) |

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