



TRICAN HTD2800P1B11C6

Digital RH/T/P Combination Sensor Module

SPECIFICATIONS

- Combination sensor for specific humidity, temperature and pressure measurement
- 3 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 highly rugged and reliable automotive-grade design of the TRICAN HTD2800P1B11C6, is a digital combination sensor that provides output signals for relative humidity, temperature and pressure. Our cost-effective combination sensor is suited for automotive, truck/bus and fuel cell applications where performance is key. Measurements are delivered as a digital output on a CAN bus for improved signal reliability. The TRICAN HTD2800P1B11C6 is optimized to provide accurate measurements and fast response times for systems where repeated long-term immersion high humidity and high temperature environments is required.

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

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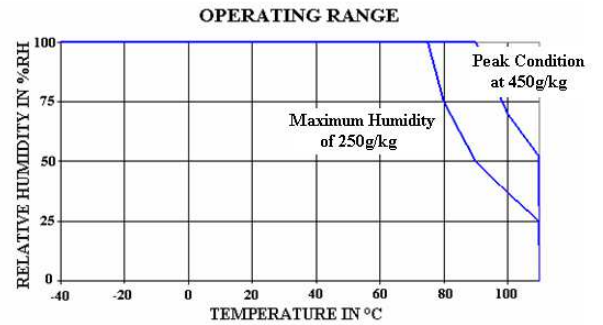
Combination Humidity, Temperature and Pressure Sensor

PERFORMANCE SPECS

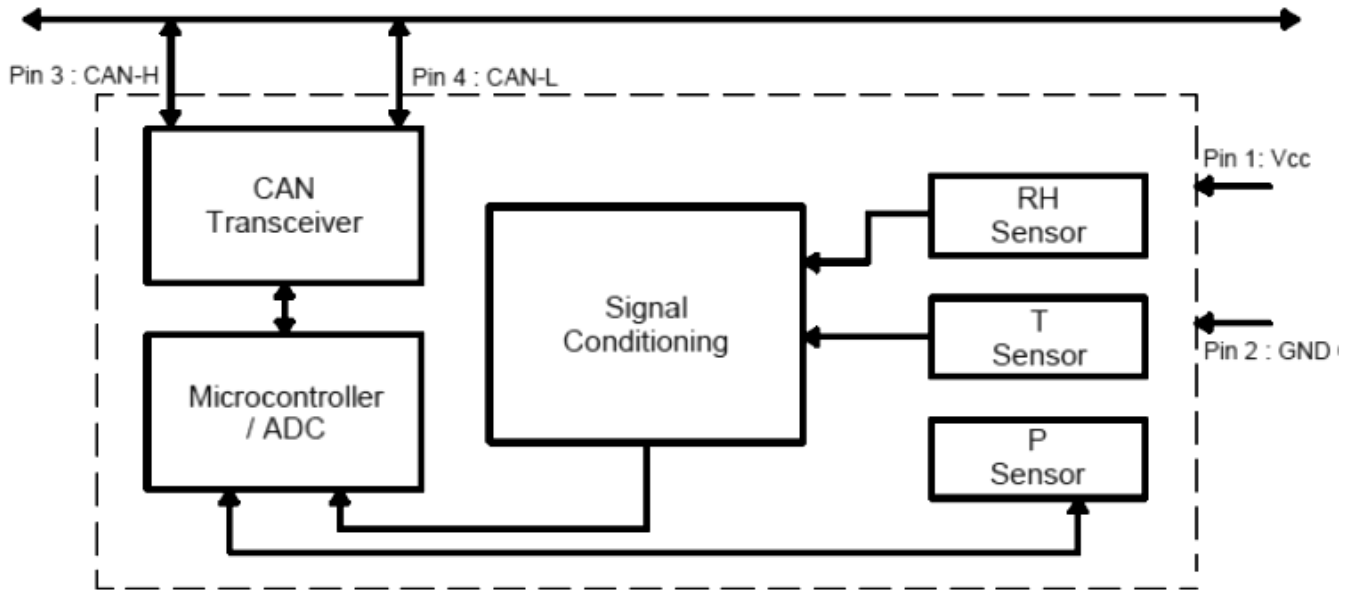
MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Storage Temperature	Tstg	-40 to +125	°C
Supply Voltage (Peak)	Vcc	32	Vdc
Humidity Operating Range	RH	0 to 100	%RH
Temperature Operating Range*	Ta	-40 to +105	°C
Max Pressure (Overpressure)	Pabs	1000	kPa

* At the tip of the sensor



Peak conditions: less than 10% of the operating



BLOCK DIAGRAM

CHARACTERISTICS

(@T=23°C)

Electrical Characteristics	Symbol	Min	Typ	Max	Unit
Voltage supply (Vbatt) 3 versions available : 5V, 12V, 24V	V	4.5 8 8	5 12 24	5.5 32 32	VDC
Current consumption	mA	-	10 (At 5V) 15 (At 12V) 20 (At 24V)	130 (At 5V) 100 (At 12V) 104 (At 24V)	mA
Sink current capability	mA	-	150	-	mA

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Combination Humidity, Temperature and Pressure Sensor

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

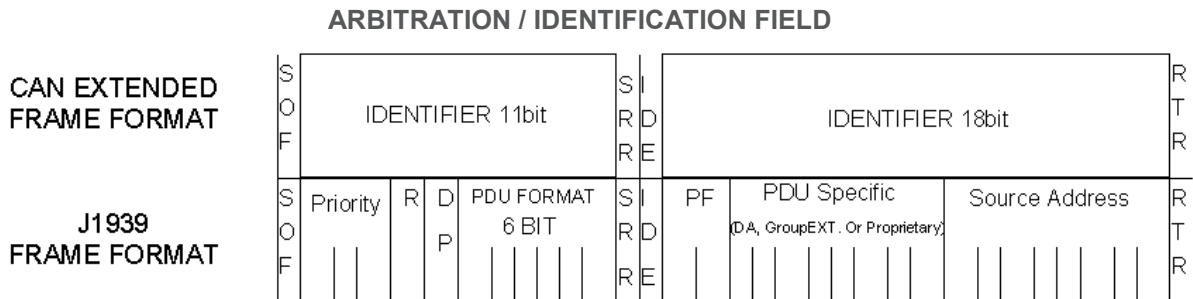
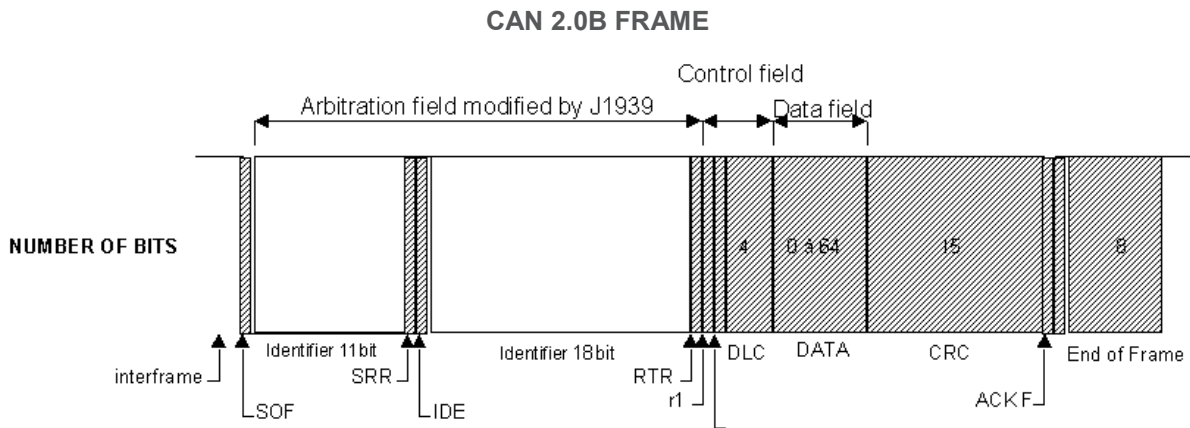
⁽¹⁾ At 2m/s air flow

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



TRICAN HTD2800P1B11C6 STANDARD SPN

Inlet pressure	SPN 1176	Data length	2 byte
		Resolution	1/128KPa/bit gain, -250 KPa offset
		Data range	-250kPa to 261,99 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	0.01g/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

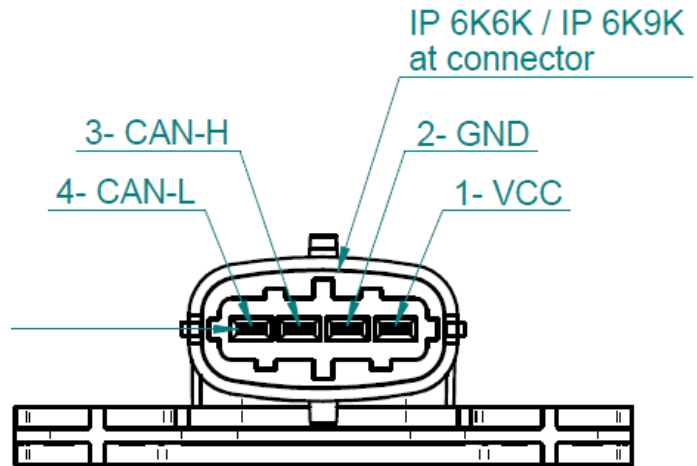
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Connector Type: Customizable upon request

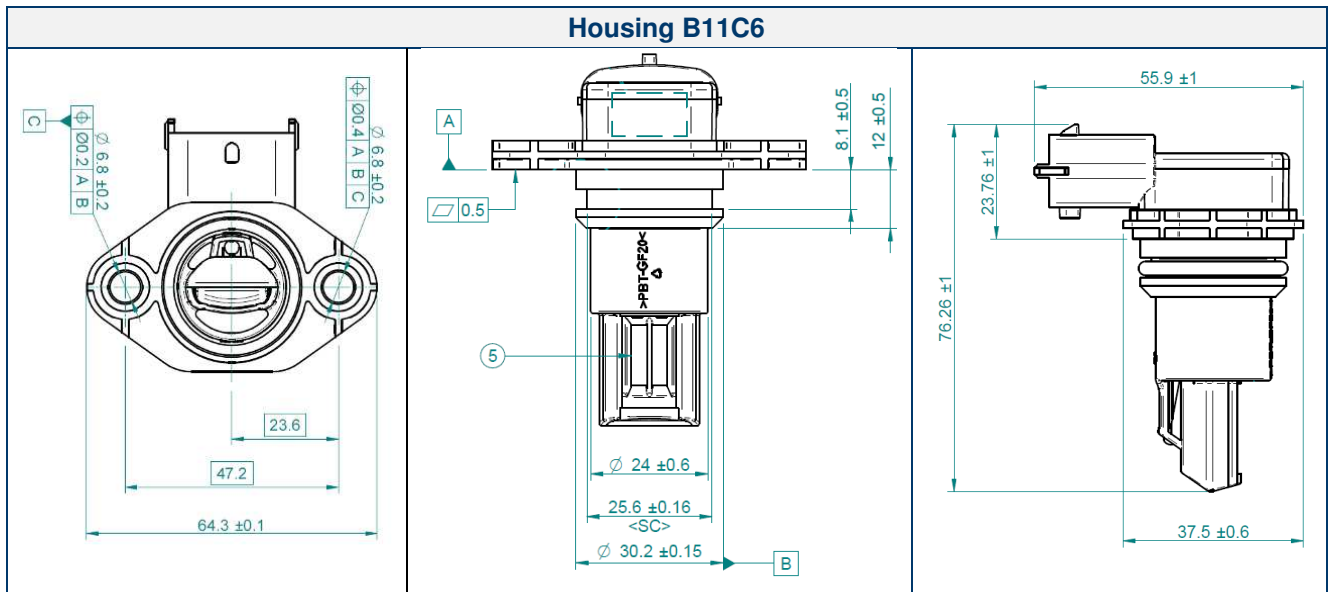
Bosch mating connector: 1 928 403 736
 Recommended contacts: 1 928 498 054

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