



TRICAN HTD2800PXB11C6

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
- Optional output for NOx humidity correction factor

The TRICAN HTD2800 sensor provides output signals for relative humidity, temperature and pressure from a single device. Robust design for applications that require a rugged, digital combination sensor for accurate monitoring and diagnosis in harsh vehicle environments. Primarily designed for engines air intake monitoring. Also suitable for fuel cell applications.

FEATURES

- Power supply 5V, 12V or 24V
- CAN baudrate 250kbps, 500kbps
- Pressure range 130kPa, 250kPa
- 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 HTD2800P1B11C6

Combination Humidity, Temperature and Pressure Sensor

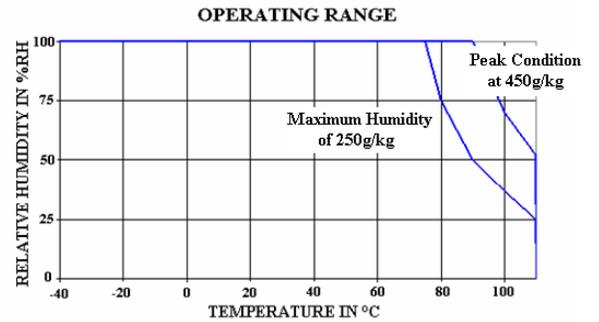
PERFORMANCE SPECS

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 Operating Pressure	Pabs	130	kPa
		250	

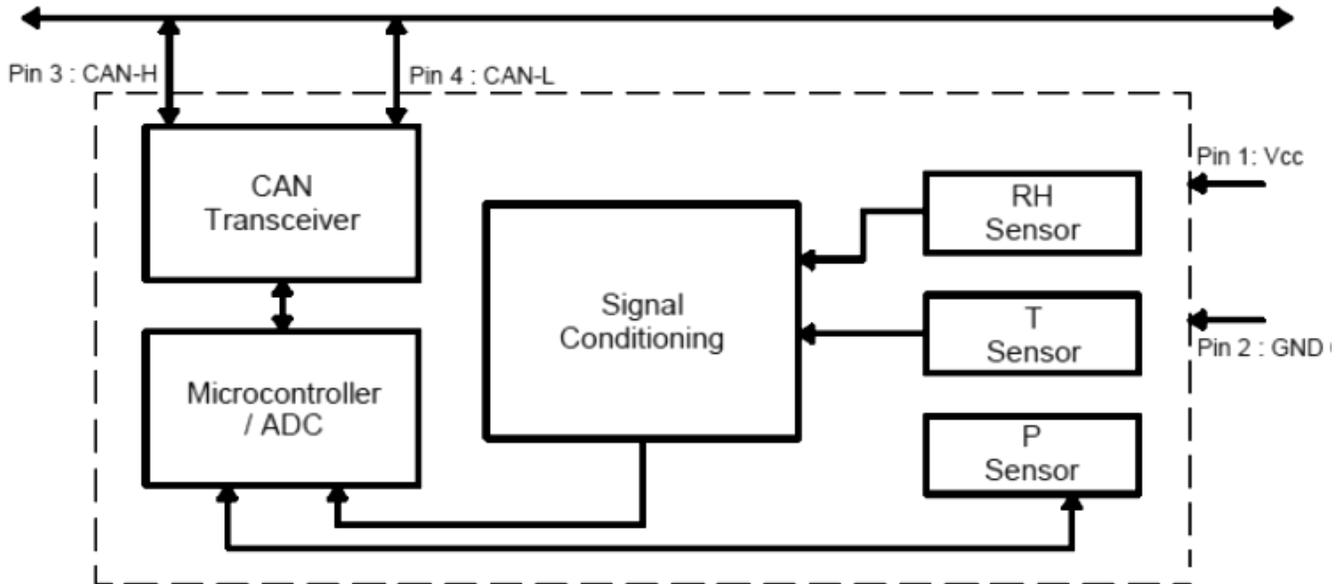
* At the connector side

** 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)	V	4.5	5	5.5	VDC
		8	12	32	
		8	24	32	
Current Consumption	mA	-	10	-	mA
		-	15	-	
		-	20	-	
In-rush Current	mA	-	-	350 (<500µs)	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 (5V/12V/24V versions)	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
Long term stability			±0.5		%RH /Yr

Pressure	Symbol	Min	Typ	Max	Unit
Absolute pressure measuring range for 250kPa versions for 130kPa versions	kPa	1	-	250 130	kPa
Pressure accuracy			±1.8		%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 (at 63% signal) *	τ	-	10	-	S
Long term stability		-	±0.3	-	°C/Yr

* At 2m/s air flow

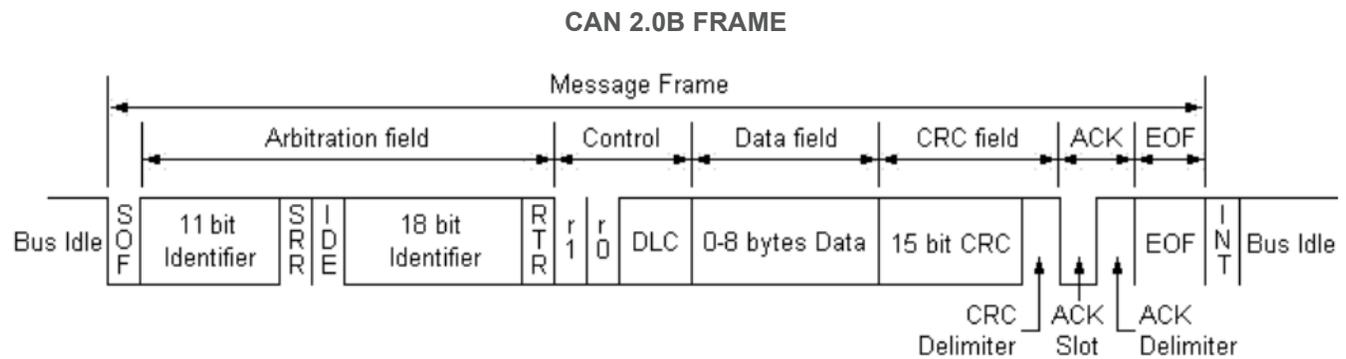
CAN BUS INTERFACE FOR CAN2.0B VERSION

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.

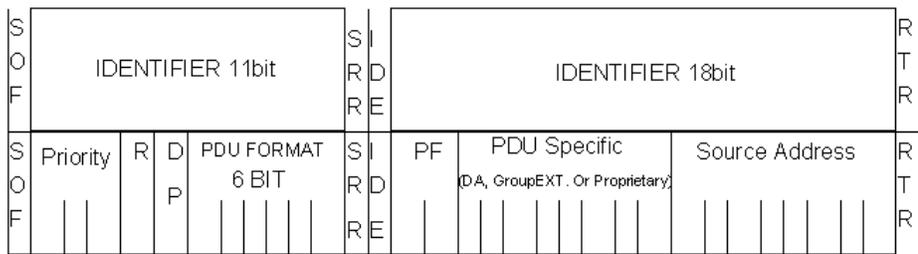
Optional and customizable output for Dew point through internal calculation in accordance with EPA methodology is also available (only on demand before part production).

CAN 2.0B/J1939 FRAME DESCRIPTION



ARBITRATION / IDENTIFICATION FIELD

**CAN EXTENDED
FRAME FORMAT**



**J1939
FRAME FORMAT**

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TRICAN HTD2800P1B11C6 STANDARD SPN

Inlet pressure	SPN 1176	Data length	2 byte
		Resolution	1/128kPa/bit gain, -250 kPa offset
Relative humidity	SPN 354	Data length	1 byte
		Resolution	0.4%RH/bit gain, 0%RH offset
Specific humidity	SPN 4490	Data length	2 byte
		Resolution	0.01 g/kg gain, 0 g/kg offset
Air inlet temperature	SPN 1172	Data length	2 byte
		Resolution	0.03125°C/bit gain, -273°C offset

SELF DIAGNOSTIC CAPABILITES

Optional and customizable diagnostic byte can be implemented

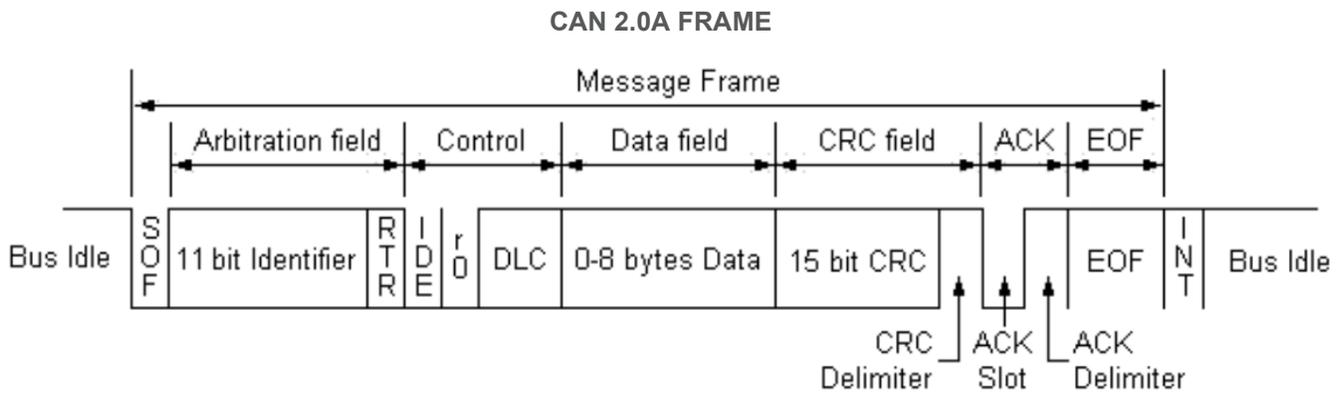
- Pressure failure sensor (no communication or internal CRC issues)
- Pressure failure sensor (out of range issue)
- Temperature sensor circuit - voltage above normal
- Temperature sensor circuit - voltage below normal
- Humidity sensor circuit - voltage above normal
- Humidity sensor circuit - voltage 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 (only on demand before part production)

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

CAN BUS INTERFACE FOR CAN2.0A VERSION



TRICAN HTD2800P2.5B11C6 STANDARD SPN

Inlet pressure	Data length	1 byte
	Resolution	1kPa/bit gain, 0 KPa offset
Relative humidity	Data length	1 byte
	Resolution	0.4%RH/bit gain, 0%RH offset
Dew point	Data length	1 byte
	Resolution	1°C/bit gain, -40°C offset
Specific humidity	Data length	2 byte
	Resolution	0.01 g/kg, 0 g/kg offset
Air inlet temperature	Data length	1 byte
	Resolution	1°C/bit gain, -40°C offset

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CONNECTOR CHARACTERISTICS

HTD2800PXB11C6

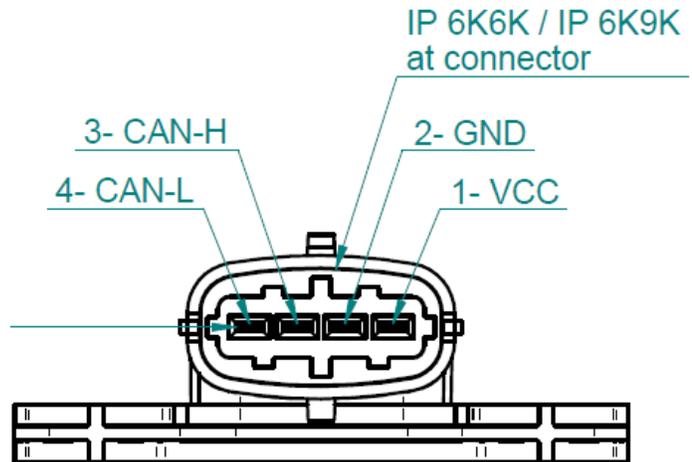
Compatible connector:

TE mating connector: 2050052-1

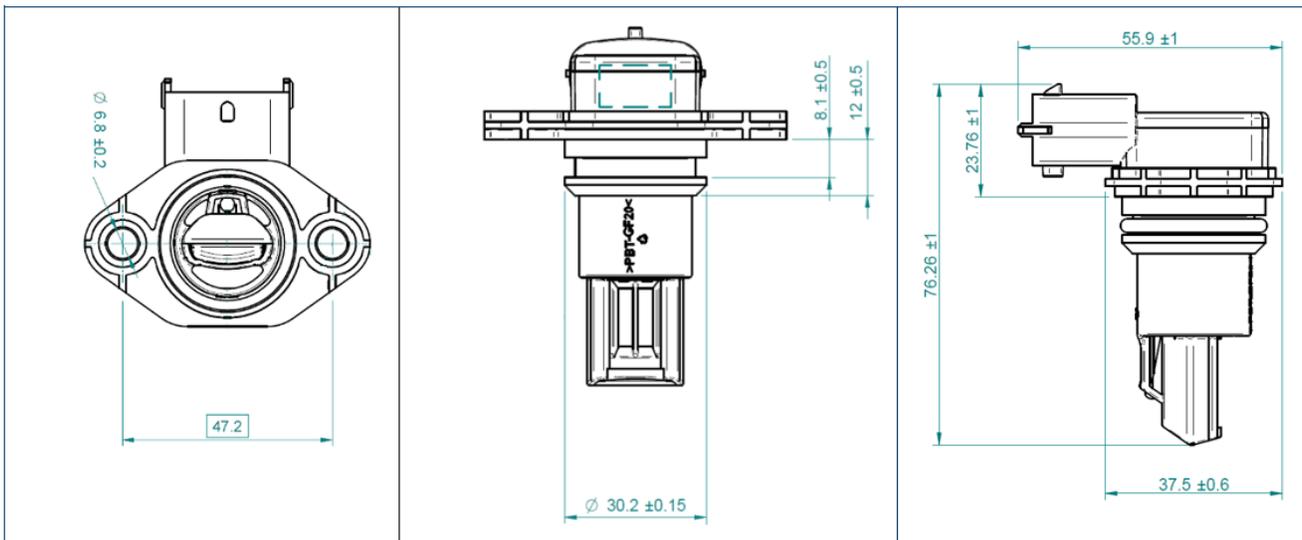
TE recommended contact: 967542-2

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

RESISTANCE TO PHYSICAL AND THERMAL STRESSES

- TRICAN HTD2800PXB11C6 meets rigorous internal testing requirements around vibration, mechanical and thermal shock, storage, high and low temperature, humidity and pressure, ESD and EMC.

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ORDERING INFORMATION

Part Number	Description	Baudrate	CAN format	Supply Voltage
10142032-01	TRICAN 5V HTD2800P1B11C6 (130kPa version)	250kBps	CAN2.0B	5V
HPP816E031	TRICAN 12V HTD2800P1B11C6 (130kPa version)	250kBps	CAN2.0B	12V
HPP816E056	TRICAN 24V HTD2800P1B11C6 (130kPa version)	250kBps	CAN2.0B	24V
10142032-03	TRICAN 5V HTD2800P2.5B11C6 (250Pa version)	250kBps	CAN2.0B	5V
10142062-00	TRICAN 12V HTD2800P2.5B11C6 (250kPa version)	250kBps	CAN2.0A	12V
10142062-01	TRICAN 12V HTD2800P2.5B11C6 (250kPa version)	500kBps	CAN2.0A	12V
10142061-00	TRICAN 24V HTD2800P2.5B11C6 (250kPa version)	250kBps	CAN2.0A	24V

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