Yaw Pitot-V4

Yaw Pitot Pressure and temperature sensor
CAN bus interface

SN: P########

Texense sensors are designed for data logging. Should the users want to include this sensor in a closed loop system, they must undertake total responsibility from doing so.

Yaw angle			
Range		-40 to +40	°
Typical accuracy at 1Hz		±2 (from -25° to +25°) ±4 (from ±25° to ±40°)	°
Min pressure required		400	µbar
Static (atmospheric) pressure			
Range		600 to 1200	mbarA
Accuracy		± 3	mbar
Resolution		0.01	mbar
Sampling frequency		200	Hz
Output frequency		1, 5, 10, 50, 100 or 200	Hz
Proof pressure		10	BarA
Calibrator		Mensor CPC4000	
Differential pressures			
Range		-50…+50 or -76…+76	mbar
Sensitive element		Piezo-resistive cells	
Resolution		0.01	mbar
Max offset error (from 5°C to 105°C)		±0.15	mbar
Max hysteresis and non-repeatability error (from 5°C to 105°C)		±0.25	mbar
Max non-linearity error		±0.1	% FS
Noise	At 10Hz	3	µbar
	At 200Hz	10	
Sampling frequency		200	Hz
Output frequency		1, 5, 10, 50, 100 or 200	Hz
Proof pressure		700	mbar
Calibrator		Mensor CPC4000	

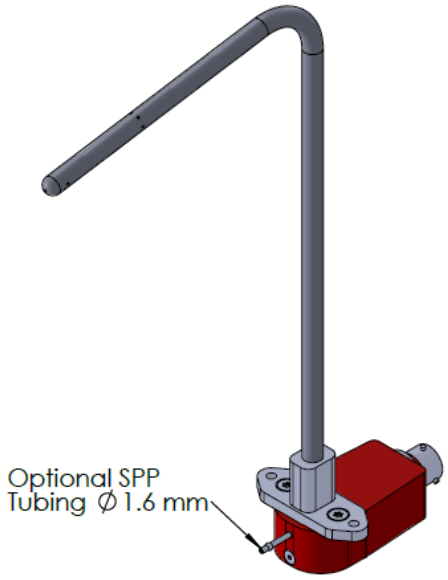
Date		Operator	
Customer			
Order			
Product Ref	Yaw Pitot V4-##-###-##-###		
SW version	V#.##		

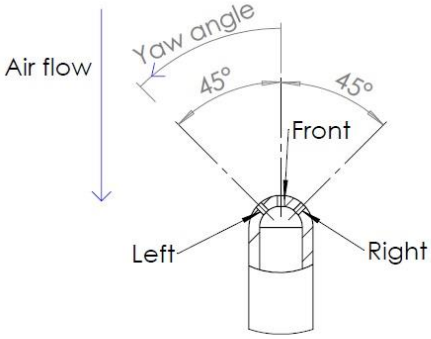
Sensor Readings		
	Reference	Reading
Air Temperature	At 0°C	…°C
	At 150°C	…°C
Front Differential Pressure	At 0.00 mbar	… mbar
	At 35.00 mbar	… mbar
	At 70.00 mbar	… mbar
Yaw Differential Pressure	At - 70.00 mbar	… mbar
	At - 35.00 mbar	… mbar
	At 0.00 mbar	… mbar
	At 35.00 mbar	… mbar
	At 70.00 mbar	… mbar
Static Pressure	At 700.00 mbarA	… mbarA
	At 1100.00 mbarA	… mbarA

Connector	
Connector ref: AS4H06-05PN-HE Mating connector ref: ASL606-05SN-HE	
Pin	**Function**
1	Supply
2	0V
3	CAN Low
4	CAN High
5	Reserved (do not connect)

Technical features

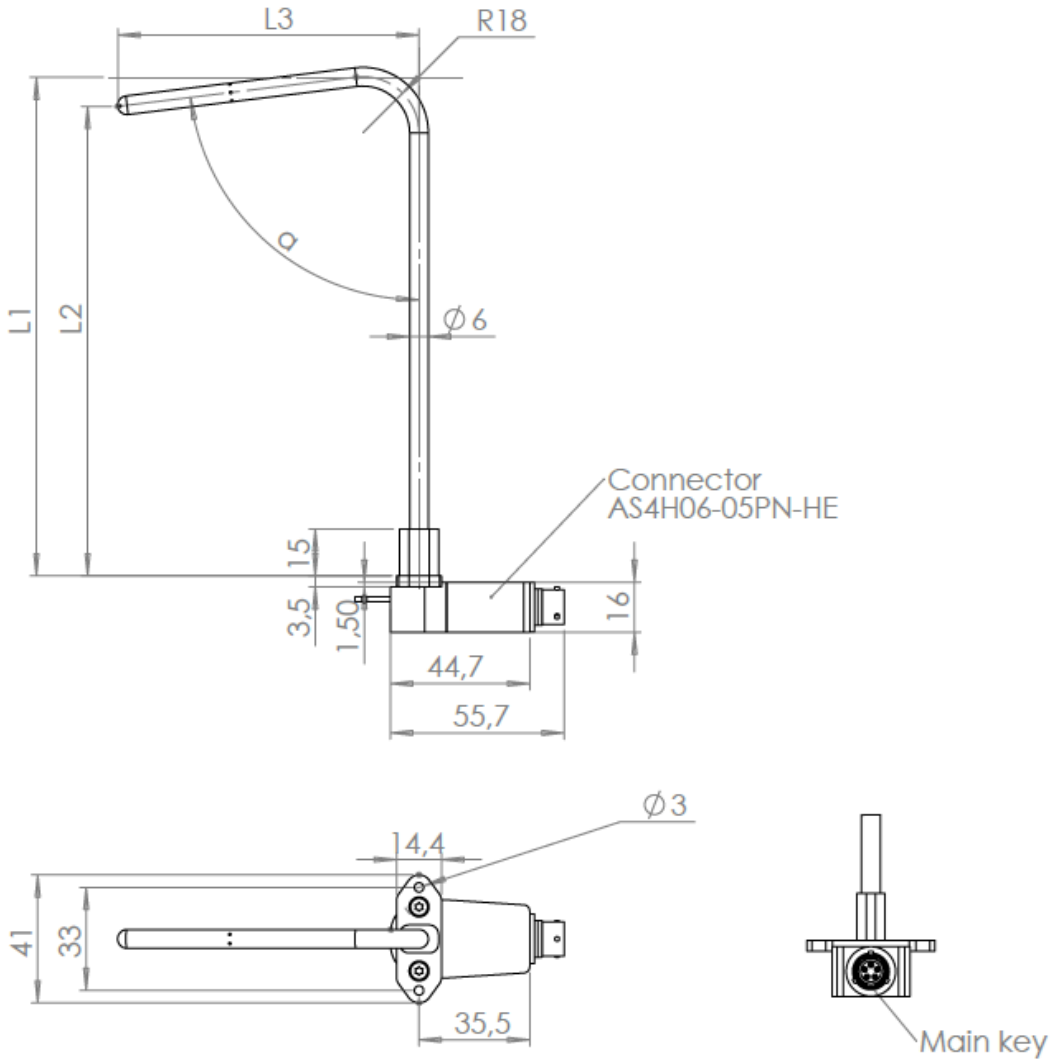
Air temperature		
Range	+5 to +105	°C
Accuracy	±1	°C
Resolution	0.1	°C
Sampling frequency	10	Hz
Output frequency	10	Hz
Calibrator	FLUKE 753	
Board temperature		
Range	+5 to +105	°C
Accuracy	± 0.3	°C
Resolution	0.1	°C
Sampling frequency	10	Hz
Output frequency	10	Hz
CAN bus features		
CAN type	2.0A or 2.0B	
Termination resistor	Software switchable 120Ω	
Baud rate	250k to 1Mbps	
Electrical features		
Supply Voltage (reverse polarity protection)	7 to 25	V
Typical Supply Current at 12V	24	mA
Mechanical features		
Dimension	See drawing	
Material	Aluminum and stainless steel	
Weight	74 (for 150mm tube) 83 (for 300mm tube)	g
Environment		
Box protection	IP64	
Vibration test	20Gpp5'	
Shock	500	G
Operating Temp	+5 to +105	°C
Storage Temp	-40 to +125	°C





Yaw angle=f((P_left - P_right)/(P_front - P_static))

Mechanical drawing



L (mm) ordering	α (°) ordering	L1 (mm)	L2 (mm)	L3 (mm)
150.0	90.0	150.0	150	93
150.0	80.0	150.0	134	92
150.0	70.0	150.0	117	87
200.0	90.0	200.0	200	93
200.0	80.0	200.0	184	92
200.0	70.0	200.0	167	87
300.0	90.0	300.0	300	93
300.0	80.0	300.0	284	92
300.0	70.0	300.0	267	87

Accuracy: Length: ±2mm / Angle: ±1°

CAN paramaters

CAN parameters		
CAN type	2.0A	-
Baudrate	1M	bps
Frequency	50	Hz
Rx trig ID	7F0	Hex
Tx01 frame ID	3F0	Hex
Tx02 frame ID	3F4	Hex
Tx03 frame ID	0x0000 (disabled)	Hex
CAN 120 Ω termination	☐ yes ☒ no	-
Temperature Unit	☒ °C ☐ °F	-
Enable Auto-Zero command	☒ yes ☐ no	-

CAN data

Data output

Tx Frame #1 (1Hz to 200Hz output rate)

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x03F0 (default)	Front Pressure MSB	Front Pressure LSB	Yaw Pressure MSB	Yaw Pressure LSB	Yaw Angle MSB	Yaw Angle LSB	Absolute static pressure MSB	Absolute static pressure LSB
	Front Differential Pressure 0.01 mbar/bit (signed integer 16bits)		Yaw Differential Pressure 0.01 mbar/bit (signed integer 16bits)		Estimated Yaw Angle (0.1deg/bit) (signed integer 16bits)		Absolute static pressure 600mbar + 0.01 mbar/bit (unsigned integer 16bits)	

Tx Frame #2 (10Hz output rate)

ID	Byte 0	Byte 1	Byte 2	Byte 3
0x03F4 (default)	Air Temperature MSB	Air Temperature LSB	Board Temperature MSB	Board Temperature LSB
	Air Temperature 0.1°C/bit or 0.1°F/bit (signed integer 16bits)		Board Temperature 0.1°C/bit or 0.1°F/bit (signed integer 16bits)	

Tx Frame #3 (1Hz output rate, disabled by default)

ID	Byte 0	Byte 1	Byte 2	Byte 3
Tx03 Frame ID	Unsigned int 32bits MSB first			
	Serial number			

Auto-Zero command

Command input frame

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x07F1	0xFF	-	-	-	-	-	0x00 or 0x01	0x01

0x00: volatile autozero
0x01: non-volatile autozero

Acknowledge output frame

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x07F3	0xFF	Serial Number				0x00	0x00	0x01

This command can be used to reset the 2 pressure sensors channels. This mechanism can be enabled or disabled (please refer to "Enable Auto-Zero command" of the CAN parameters tab). Each time the sensor will receive the above CAN frame, the autozero function will be launched (except during first second after power-on). When autozero function is launched, a "customer offset" is set up and added for each channel on top of factory calibration.

If Byte 6 value is 0x00:
Those "Customer offsets" will be stored in volatile memory. Therefore, they will be lost when switching OFF the sensor and they will be initialized to 0 when switching ON the sensor.

If Byte 6 value is 0x01:
Those "Customer offsets" will be stored in non-volatile memory. Therefore, they will be saved in memory when switching OFF the sensor.

Absolute pressure offset adjustment

Command input frame

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x07F1	0xFF	-	MSB	LSB	-		-	0x02
			Desired absolute static pressure 600mbar + 0.01mbar/bit (unsigned integer 16bits)					

Acknowledge output frame

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x07F3	0xFF	Serial Number				0x00	0x00	0x02

This command can be used to adjust the offset on absolute pressure static channel. This mechanism can be enabled or disabled (please refer to "Enable Auto-Zero command" of the CAN parameters tab). Each time the sensor will receive the above CAN frame, the offset adjustment function will be launched (except during first second after power-on). When offset adjustment function is launched, a "customer offset" is set up and added for each channel on top of factory calibration. This "Customer offset" will be stored in non-volatile memory. Therefore, they will be kept in memory when switching OFF the sensor.

Changing parameters

Must be setup according to Texense CAN protocol, or by using the tWist® software (texense Windows software tool) with the tSIB (texense Smart Interface Box).

Address	Parameter	Raw values	values	Comments	
0x00	CAN type A or B (11 or 29bits ID)	0x00	CAN2.0**A** (standard)	default	
		0x10	CAN2.0**B** (extended)		
0x01	CAN baudrate	0x00	1Mbps	default	
		0x01	500 Kbps		
		0x02	250 Kbps		
0x02	CAN output frequency	0x00	Rx frame trig	Request mode - 20Hz max.	
		0x01	1 Hz		
		0x02	5 Hz		
		0x03	10 Hz		
		0x04	50 Hz	default	
		0x05	100 Hz		
		0x06	200 Hz		
0x03	Rx trig frame ID	if CAN2.0A: 0 to 0x7F0 if CAN2.0B: 0 to 0xFFFF (except 0x7F1 and 0x7F3)		MSB	Default 0x07F0
0x04				LSB	
0x05	Tx01 frame ID	if CAN2.0A: 0 to 0x7F0 if CAN2.0B: 0 to 0xFFFF (except 0x7F1 and 0x7F3)		MSB	Default 0x03F0
0x06				LSB	
0x07	Tx02 frame ID	if CAN2.0A: 0 to 0x7F0 if CAN2.0B: 0 to 0xFFFF (except 0x7F1 and 0x7F3)		MSB	Default 0x03F4
0x08				LSB	
0x09	CAN termination 120Ω resistor	0	Not connected	default	
		1	Connected		
0x0A	Enable Auto-Zero command	0	Disable		
		1	Enable	default	
0x0B	Temperature Unit	0	Fahrenheit (0.1°F / bit)		
		1	Celsius (0.1°C / bit)	default	
0x0C	Tx03 frame ID	if CAN2.0A: 1 to 0x7F0 if CAN2.0B: 1 to 0xFFFF (except 0x7F1 and 0x7F3) Frame disabled if 0x0000.		Default: 0x0000 (disabled)	
0x0D					

For complete information, contact us at info@texense.com

Ordering information

Ordering ref:

Yaw Pitot V4 – *Range* – *Length* – *Angle* – *SPP(option)*

50: 50 mbar
76: 76mbar

Tube length in mm
standard 150mm or 300mm

Tube angle in °: standard 90°

SPP: Static Pressure Port output

ex: Yaw Pitot V4–76–150-90