

MHT5200 Contactless Series

The **MHT5200** tilt position sensor is a high performance design, with a robust aluminium case for applications where it is necessary to monitor the angle of inclination during operation.

Available with five different measurement ranges between ±10° and ±90, they are specified in industrial and automotive control measurement systems, such as road construction equipment, cranes and booms, scissor lifts, agricultural vehicles, container handling and hydraulic lifts.

With an advantage of fully encapsulated electronics, they operate in a variety of fluid conditions and are environmentally protected against the ingress of dust and water to IP68/IP69K.

The sensor will operate with either a 5VDC regulated or 8 to 30VDC unregulated supply and provide an analogue voltage output. The maximum operational temperature is 125°C (257°F).

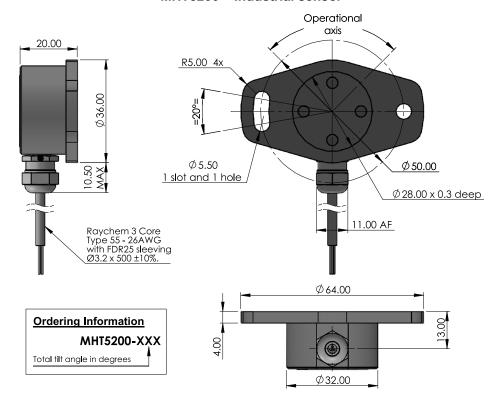
Key features and benefits

- Robust aluminium case
- Measurement ranges ±10°, ±20°, ±30°, ±60° and ±90°
- Resolution ±0.07°
- · Easy set-up slot and hole mounting
- Maximum operating temperature 125°C (257°F)
- Suitable for vibration and fluid applications
- Sensor operates from either 5 VDC or 8 to 30 VDC
- Sealed to IP68/IP69K



Doc. Ref: WS-MHT5200-2 Page 1 of 3

MHT5200 - Industrial sensor



Electrical and mechanical specification for MHT5200

Input Specification Supply voltage (Vs) 5.0±10% regulated 8 to 30 unregulated	
Over voltage protection Supply current Reverse polarity protection Power on settlement time Output Specification Output type Voltage output Voltage voltage Voltage output Voltage output Voltage voltage Voltage output Voltage Volta	VDC
Supply current Supp	VDC
Reverse polarity protection Power on settlement time Output Specification Output type Voltage output Voltage output Voltage arc sin(Vout-Vmid/s) Sensor angle = arc sin(Vout-Vmid/s) Line regulation Load resistance Output noise Performance Specification Measurement range (±) Xesolution Non-Linearity (see note 3) Temperature coefficient (Vout) Each of Sensor with the sensitivity = 0.04 Analogue voltage Analogue voltage Analogue voltage VMID = Vs/2 VMID = Vs/2 VMID = 2.5 S for ±10 = 11.51756 S for ±10 = 11.51756 S for ±20 = 5.8476 S for ±20 = 5.8476 S for ±20 = 5.8476 S for ±30 = 4 S for ±30 = 0.001 Analogue voltage VMID = Vs/2 VMID =	mA
Power on settlement time Output Specification Output type Voltage output S for ±10 = 11.51756 S for ±10 = 11.51756 S for ±20 = 5.8476 S for ±20 = 5.8476 S for ±30 = 4 S for ±	VDC
Output Specification Output type Voltage output (Vout) 10-90% Vin 0.5-4.5 VDC VMID = 2.5 Linearisation function Sensor angle = arc sin(Vout-Vmid/S) Sign ± 10 = 11.51756 Sign ± 20 = 5.8476 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30 = 4 Sign ± 30 = 1 Sign ± 30	ms
Output type Analogue voltage Voltage output (Vout) 10-90% Vin 0.5 -4.5 VDC VMID = Vs/2 VMID = 2.5 S for ±10 = 11.51756 S for ±10 = 11.51756 S for ±20 = 5.8476 S for ±30 = 4 S for ±	1113
Voltage output (Vout) 10-90% Vin 0.5-4.5 VDC VMID = Vs/2 VMID = 2.5 VMID = 2.5 S for ±10 = 11.5175 Sensor angle = arc sin(Vout-Vmid/S) S for ±20 = 5.8476 S for ±20 = 5.8476 S for ±30 = 4 S for ±30	
VMID = Vs/2 VMID = 2.5	
Sensor angle = arc sin(Vout-Vmid/S) S for ±20 = 5.8476 S for ±20 = 5.8476 S for ±30 = 4	_
Line regulation Ratiometric with Vs <0.01 Load resistance >10K Output noise <1	
Output noise <1 Performance Specification ±10, 20 and 30 Measurement range (±) ±10 = 0.0072 Resolution ±20 = 0.0037 Non-Linearity (see note 3) Temperature coefficient (Vout) -25 to 85 offset = 0.023 Sensitivity = 0.04 +40 to 125 offset = X Sensitivity = X.XXX sensitivity = X.XXX Bandwidth 2 (-3dB) Cross axis sensitivity 4% General Specification Weight (approx.) Weight (approx.) 50.0 Protection/sealing IP68 and IP69K Operational temperature -40 to +105 See de-rating graph	%FS
Performance Specification Measurement range (±) ±10, 20 and 30 Resolution ±10 = 0.0072 Non-Linearity ±20 = 0.0037 Non-Linearity (see note 3) -25 to 85 offset = 0.023 sensitivity = 0.04 +40 to 125 offset = X sensitivity = X.XXX Bandwidth 2 (-3dB) Cross axis sensitivity 4% General Specification Weight (approx.) 50.0 Protection/sealing IP68 and IP69K Operational temperature -40 to +105 See de-rating graph	Ohms
Measurement range (±)	mV RMS
Resolution	
Resolution	۰
+30 = 0.0025	•
Non-Linearity (see note 3) C±0.5%	
-25 to 85 offset = 0.023 sensitivity = 0.04 +40 to 125 offset = X sensitivity = X.XXX Bandwidth 2 (-3dB) Cross axis sensitivity 4% General Specification Weight (approx.) 50.0 Protection/sealing IP68 and IP69K Operational temperature -40 to +105 See de-rating graph	%FS
Cross axis sensitivity General Specification Weight (approx.) Protection/sealing Operational temperature 4% 50.0 IP68 and IP69K See de-rating graph	%F\$/°C
General Specification Weight (approx.) 50.0 Protection/sealing IP68 and IP69K Operational temperature -40 to +105 See de-rating graph	Hz
Weight (approx.) Protection/sealing Department of the protection	Max
Profection/sealing IP68 and IP69K Operational temperature -40 to +105 See de-rating graph	
Operational temperature -40 to +105 See de-rating graph	grams
Storage temperature -55 to +105	°C
	°C
Shock 1 metre on to concrete (Max 20,000g)	
Case - Anodised aluminium 6082 T6 Materials Module - Thermoplastic Cable gland - Nickel plated brass	

Doc. Ref: WS-MHT5200-2 Page 2 of 3

Electrical and Mech	anical Specification	on +60 and +90°	
Input Specification		200 ana 270	
Supply voltage (V	s) 5.0±10% regulated	8 to 30 unregulated	VDC
Over voltage protection	Up	to 50	VDC
Supply current	·	<7	mA
Reverse polarity protection	Up	to -10	VDC
Power on settlement time	<	<500	ms
Output Specification			•
Output type	Analog	ue voltage	
Voltage output (Vout		0.5 - 4.5 VDC	
Linearisation function Sensor angle = arc sin(Vout-Vmid/S)	VMID = Vs/2 S for ±60 = 2,3094 S for ±90 = 2	VMID = 2.5 S for ±60 = 2.3094 S for ±90 = 2	
Line regulation	Ratiometric with Vs	<0.01	%FS
Load resistance	>	>10K	
Output noise		<1	
Performance Specification			•
Measurement range	±60 and ±90		۰
Resolution		±60 = 0.0029 ±90 = 0.0025	
Non-Linearity (see note	3) <=	±1.0%	%FS
Temperature coefficient (Vou	it) TBD	TBD	%FS/°C
Bandwidth	2 (-3dB)		Hz
Cross axis sensitivity	4%		Max
General Specification			
Weight (approx.)	50.0		grams
Protection/sealing	IP68 and IP69K		
Operational temperature	-40 to +105	See de-rating graph	℃
Storage temperature	-55 to +105		°C
Shock	1 metre on to concrete (Max 20,000g)		
Materials	Cap - Th	Case - Anodised aluminium 6082 T6 Cap - Thermoplastic Cable gland - Nickel plated brass	

Notes:

- Incorrect wiring may cause internal damage.
- Do not operate between 5.5V and 8V.

 Non-linearity is calculated from least squares best fit method over the Linear Range after linearisation.

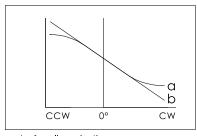
 When positioned as shown sensor is mid travel.

 General dimension tolerance is ±0.25mm.

Electrical Connection (see note 1)

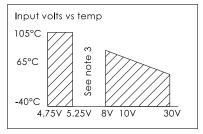
Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

Typical output when viewed on top (label) with slot on right.



- a before linearisation b after linearisation

Input voltage de-rating graph



Doc. Ref: WS-MHT5200-2 Page 3 of 3