

P-Series Inclinometer



- Single or Dual axis inclinometer
- Measurement range $\pm 5^\circ$, $\pm 15^\circ$ and $\pm 45^\circ$
- High accuracy
- Digital and analogue output signal

DESCRIPTION

The **P-Series** of conductive inclinometers offers modern technology in an environmentally protected and robust aluminium housing in IP class 65. The inclinometer achieves high accuracy over a wide temperature range. All P-type inclinometers are microprocessor controlled transducers capable of producing a linearized RS-232 digital and analog voltage $\pm 1.5V$ or current output $4 \dots 20$ mA signal. The inclinometers are an ideal choice for a variety of industrial, automotive and aerospace applications.

FEATURES

- Measurement range up to $\pm 45^\circ$
- High resolution
- Robust metal housing
- High accuracy
- Rugged M9 female connector
- Programmable zero point, baud rate
- Easy mounting

APPLICATIONS

- Building control
- Road construction machines
- Weighing systems
- Mobile and stationary cranes
- Hydraulic leveling
- Platform leveling
- Drilling machines

P-Series Inclinator

PERFORMANCE SPECIFICATIONS

	Conditions	Min	Type	Max	Unit
Measurement range		-5/ -15/ -45		+5/ +15/ +45	°
Resolution		0.001		0.005	°
Accuracy, digital output	Ta = +25°C		0.02/ 0.03/ 0.4		°
Accuracy, analogue output	Ta = +25°C		0.05/ 0.06/ 0.6		°
Accuracy, digital output	Ta = -25°C ...+85°C		0.2/ 0.4/ 0.7		°
Accuracy, analogue output	Ta = -25°C ...+85°C		0.25/ 0.5/ 0.8		°
Noise RMS			0.002		°
Power supply		+6.5		+24	VDC
Current consumption	Depending on kind of sensor		30	40	mA
Operation temperature range		-25		+85	°C
Storage temperature range		-40		+85	°C
Transmission rate	RS 232 interface		1		Hz
Baud rate, programmable	RS 232 interface	2.4		9.6	kB
Current output (1)	NS-xx/PI	20		4	mA
Voltage output (2)	NS-xx/P	-1.5		+1.5	V
Weight	Depending on kind of sensor	210		340	g
Dimensions	Single axis unit, W x D x H		90 x 40 x 45.5		mm
Dimensions	Dual axis unit, W x D x H		90 x 60 x 45.5		mm

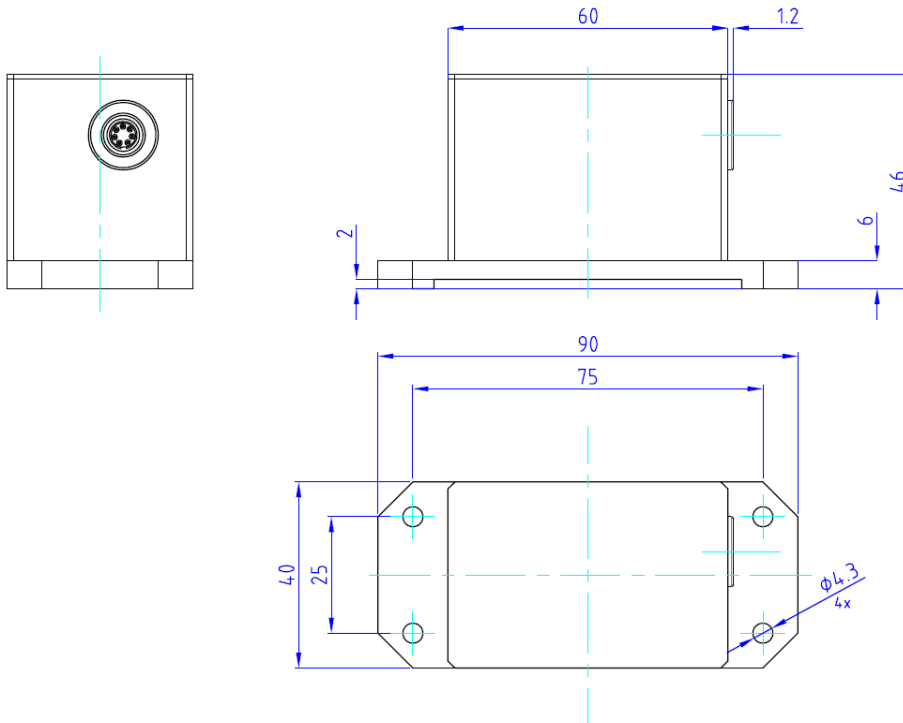
(1) Standard impedance $Z_a < 160 \text{ Ohm}$, special impedance $Z_a < 260 \text{ Ohm}$ on request

(2) Ratiometric to GNDx

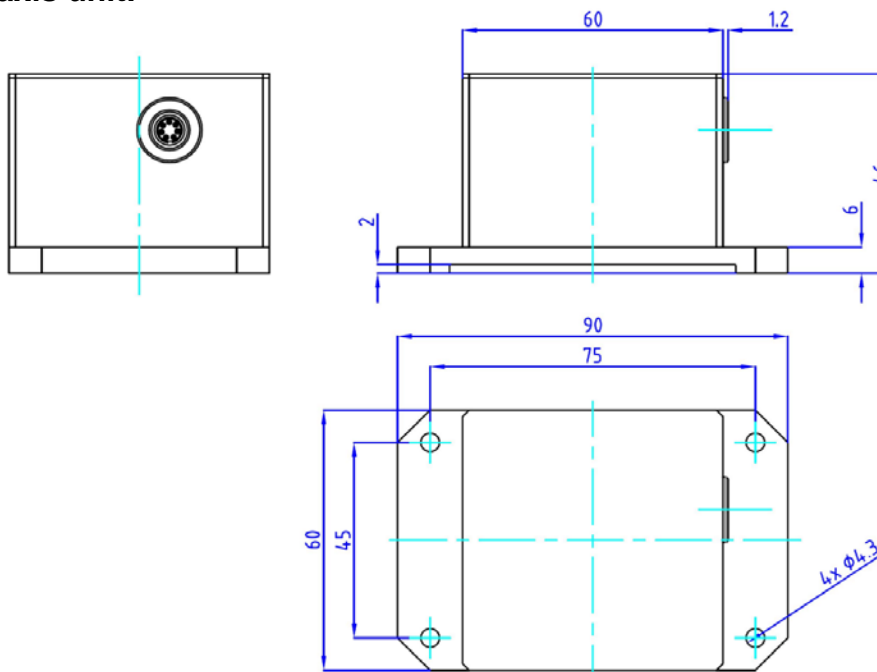
P-Series Inclinometer

DIMENSIONS [MM]

Single axis unit:



Dual axis unit:

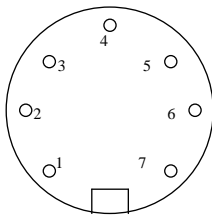


P-Series Inclinator

PINNING – SINGLE AXIS UNIT WITH RS 232 INTERFACE AND CURRENT OUTPUT

Pin	Name	Description	Type	Color schema ⁽¹⁾
1	Vcc	power supply +6.5...+24VDC	supply	white
2	GND	power supply ground, RS 232 ground	supply	brown
3	Earth	earth	supply	green
4	GNDx	signal ground for current output	supply	yellow
5	Out x	x-axis current output 4...20mA	output	grey
6	RxD	input digital signal RS232	input	pink
7	TxD	output digital signal RS 232	output	blue

(1) by using a Measurement Specialties cable



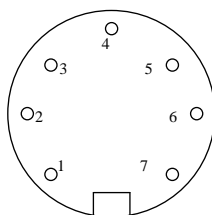
Front view of housing
connector inclinometer

For more details please use the product specification / application note / instruction manual.

PINNING – SINGLE AXIS UNIT WITH RS 232 INTERFACE AND VOLTAGE OUTPUT

Pin	Name	Description	Type	Color schema ⁽¹⁾
1	Vcc	power supply +6.5...+24VDC	supply	white
2	GND	power supply ground, RS 232 ground	supply	brown
3	Earth	earth	supply	green
4	GNDx	signal ground for voltage output	supply	yellow
5	Out x	x-axis voltage output +/-1.5V	output	grey
6	RxD	input digital signal RS232	input	pink
7	TxD	output digital signal RS 232	output	blue

(1) by using a Measurement Specialties cable



Front view of housing
connector inclinometer

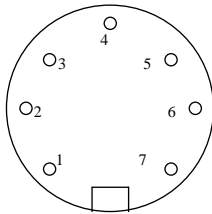
For more details please use the product specification / application note / instruction manual.

P-Series Inclinometer

PINNING – DUAL AXIS UNIT WITH RS 232 INTERFACE

Pin	Name	Description	Type	Color schema ⁽¹⁾
1	Vcc	power supply +6.5...+24VDC	supply	white
2	GND	power supply ground, RS 232 ground	supply	brown
3	Earth	earth	supply	green
4	n.c.	n.c.	-	yellow
5	n.c.	n.c.	-	grey
6	RxD	input digital signal RS232	input	pink
7	TxD	output digital signal RS 232	output	blue

(1) by using a Measurement Specialties cable



Front view of housing
connector inclinometer

For more details please use the product specification / application note / instruction manual.

DESCRIPTION DIGITAL RS 232 INTERFACE

	Single axis unit	Dual axis unit
Baud rate:	2400(*)/9600 baud	2400(*)/9600 baud
Format:	ASCII, 8 data bits, 1 stop bit, no parity	ASCII, 8 data bits, 1 stop bit, no parity
String length:	9 byte	22 byte
Layout:	< D ₀ ,D ₁ ,D ₂ ,D ₃ ,D ₄ ,D ₅ ,D ₆ ,D ₇ ,D ₈ >	< D ₀ ... D ₂₁ >
	D ₀ = sign	D ₀ ... D ₈ = "X"; "=" + (-); "xx.xxx"
	D ₁ ...D ₆ = angle (XX.XXX)	D ₂ = sign (+ or -)
	D ₃ = point	D ₅ = point
	D ₇ =<CR>	D ₉ =<CR>
	D ₈ =<LF>	D ₁₀ =<LF>
		D ₁₁ ... D ₂₁ = "Y"; "=" + (-); "yy.yyy"
		D ₁₃ = sign (+ or -)
		D ₁₆ = point
		D ₂₀ =<CR>
		D ₂₁ =<LF>

(*) default value

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ORDERING INFORMATION

PART NUMBERING	UNIT	SHORT DESCRIPTION
Single axis unit		
G-NSP-001	NS-5/P	single axis, +/-5° angle, Vcc +6.5...24VDC, output +/-1.5V,RS232
G-NSPI-001	NS-5/PI	single axis, +/-5° angle, Vcc +6.5...24VDC, output 4...20 mA,RS232
G-NSP-002	NS-15/P	single axis, +/-15° angle, Vcc +6.5...24VDC, output +/-1.5V,RS232
G-NSPI-002	NS-15/PI	single axis, +/-15° angle, Vcc +6.5...24VDC, output 4...20 mA,RS232
G-NSP-005	NS-45/P	single axis, +/-45° angle, Vcc +6.5...24VDC, output +/-1.5V,RS232
G-NSPI-006	NS-45/PI	single axis, +/-45° angle, Vcc +6.5...24VDC, output 4...20 mA,RS232
Dual axis unit		
G-NSP2-001	NS-5/P2	dual axis, +/-5° angle, Vcc +6.5...24VDC, output RS232
G-NSP2-003	NS-15/P2	dual axis, +/-15° angle, Vcc +6.5...24VDC, output RS232
G-NSP2-006	NS-45/P2	dual axis, +/-45° angle, Vcc +6.5...24VDC, output RS232
Accessories		
G-NSMIS-001	connection	connector, straight, Submin. 712-series
G-NSMIS-015	connection	connector, angle 90°, Submin. 712-series
G-NSMIS-002	connection	2 m cable, straight connector Submin. 702-series
G-NSMIS-003	connection	2 m cable, angle 90° connector Submin. 702-series

Other cable length on request

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