

### GENERAL INFORMATIONS



INS 120 series angle sensors are the sensors that show the angle of rotation of objects standing perpendicular to the earth. Angle measurement information between 0°-360° can be taken from these sensors. The measurement limits can be set according to the user request. These sensors which can offer both analog output and open collector output, can take measurement with  $\pm 0.15^\circ$  accuracy.

INS 120 angle sensors with high precision, compact design and durable construction; crane and lifting systems, construction machinery and special purpose vehicles, solar energy and photovoltaic systems, wind farms and so on. offers suitable solutions for angle measurement in industrial areas. Thanks to their high IP protection class, they can work easily in outdoor environments.

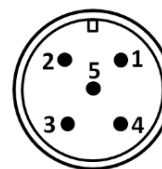
### WARNINGS

- The installation of the product is carried out by the customer who purchases the product, according to the wiring diagrams, installation information, etc. in this manual.
- Maintenance and repair should be done by the technicians authorized by the manufacturer firm.
- There must be minimum distance between the sensor and control unit. Avoid additions except the suitable connector unless it needs.
- Keep away the sensor cable from as high power energy cables, contactor, motor, switched power supplies, inductive and capacitive noisy supplies.
- Not to damage the sensor, supply directions and voltage must be paid attention. Don't energize before all connections completed.
- Transport and storage should be at their original packaging and an ambient temperature of  $-30^\circ\text{C}$  /  $+70^\circ\text{C}$  in such a way that they will not be exposed to dust, humidity, impact, vibration, falling or water.
- Chemicals such as alcohol, thinner etc. should not be used for cleaning the product. The product should be wiped with a damp cloth.
- The product may be damaged and may become unusable if used outside of the specifications in the user manual.
- The product will be out of warranty if used outside of the specifications in the user manual and opened or repaired other than authorized services.

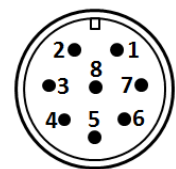
### ELECTRICAL CONNECTIONS

| Signal              | M12-8 Pin Socket | M12-5 Pin Socket | Cable  |
|---------------------|------------------|------------------|--------|
| V+ (12...24VDC)     | Pin 1            | Pin 1            | Red    |
| Transistor Output 1 | Pin 2            | Pin 2            | Yellow |
| GND (0V)            | Pin 3            | Pin 3            | Black  |
| Transistor Output 2 | Pin 4            | Pin 4            | Green  |
| -                   | Pin 5            | -                | Blue   |
| Analog Output 1     | Pin 6            | Pin 5            | Pink   |
| Analog Output 2     | Pin 7            | -                | White  |
| -                   | Pin 8            | -                | Grey   |

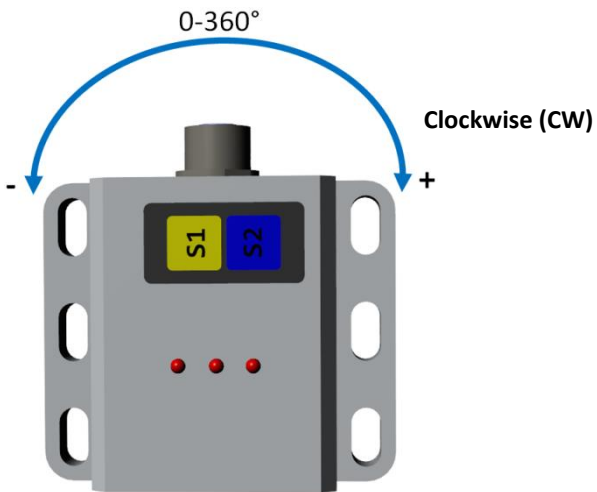
M12 - 5 PIN MALE SOCKET



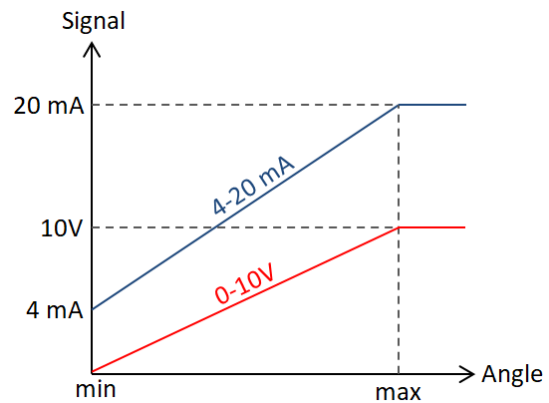
M12 - 8 PIN MALE SOCKET



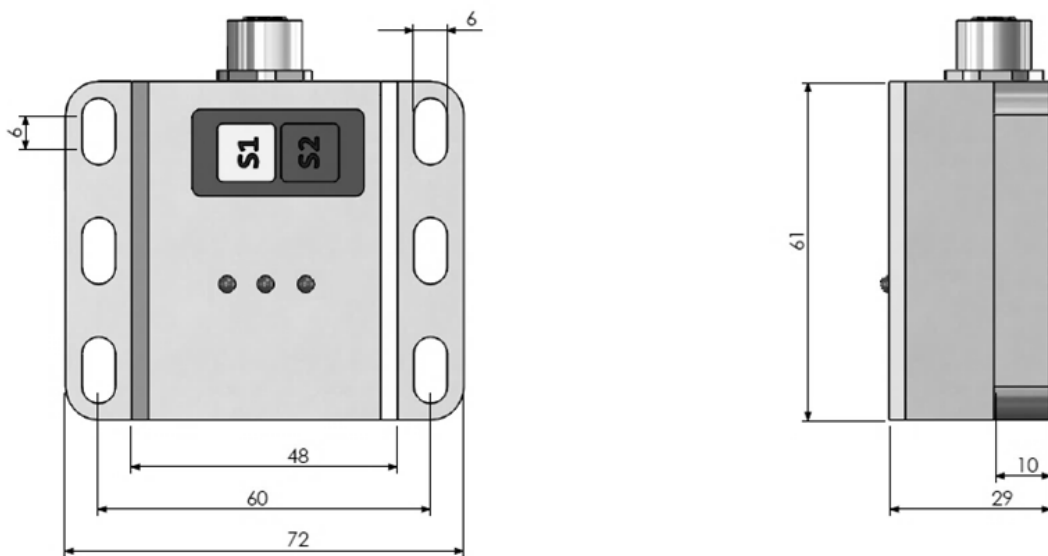
## MEASUREMENT AXIS AND SIGNAL



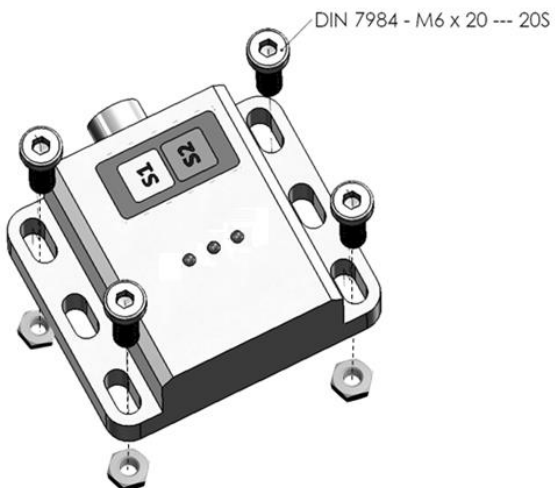
### Analog Signal Output



## MECHANICAL DIMENSIONS (mm)



## MECHANICAL MOUNTING



The product must be fixed to the area to be taken inclination measurement with 4 pcs M6 bolts and nuts.

**Warning:** All welding work in the relevant area must be completed before the product is installed. Otherwise, the device may be damaged during the welding process, and in this case, it will be out of warranty.

## TECHNICAL SPECIFICATIONS

|                                      |  |             |                               |                              |
|--------------------------------------|--|-------------|-------------------------------|------------------------------|
| <b>Supply Voltage (V)</b>            | 12 ... 24 VDC                              |             | <b>Resolution</b>             | ±0,05°                       |
| <b>*Measurement Range</b>            | 0° ... 360°                                |             | <b>Accuracy</b>               | ±0,15°                       |
|                                      |  |             | <b>Protection Class</b>       | IP67                         |
| <b>*Output Type</b>                  | PNP Open Collector or Analog Signal Output |             | <b>Operating Temp.</b>        | - 30°C ... +70°C             |
| <b>Open Collector Specifications</b> | <b>Output Voltage</b>                      | ~(V-1) Volt | <b>Relative Humidity</b>      | %10 ... %90                  |
|                                      | <b>Current Consumption</b>                 | ≤300 mA     | <b>Weight</b>                 | ~200 gr                      |
| <b>Analog Outputs</b>                | 0-10 VDC or 4-20 mA                        |             | <b>Body Material</b>          | Aluminum                     |
| <b>Response Time</b>                 | 10 Hz                                      |             | <b>*Electrical Connection</b> | 3 m cable or M12 male socket |

**Note:** The specifications specified by (\*) vary depending on the model selected. The detailed code table for product selection is shown on page 4.

## SETUP

**Working Principle :** If the sensor angle is within the selected range, switching output goes up to "Supply Voltage" level. Otherwise the output is 0 volts. The sensor has two switching outputs as well as two analog outputs. Analog outputs can be selected from 0,1...10V or 4...20mA. Switching and analogue are akk programmable( adjustable).

For example; In case of the angle range for output 1 is set to "+30°" with "+45°;

Output1 = "Supply Voltage" ( +U )becomes and its LED is constantly ON

Otherwise, the output is 0 volts and "Out 1" LED goes OFF

Analog outputs and switching outputs can be independently programmed(adjustable). For example, if the switching output is operating in this range for the above example, the analog outputs can be programmed to work between different angle values (adjustable).

### Setting of Out 1 :

- 1) S1 button is hold as pressed ,when the "Out 1" LED starts blinking, the button is being left free.
- 2) The sensor is brought to limit position 1.
- 3) S1 button is pressed again. The "Out 1" LED will light continuously 2 seconds and then start flashing again so 1st position is set.
- 4) The sensor is brought to 2nd limit position.
- 5) S1 button is pressed again, so 2nd position is being set.
- 6) Sensor returns to its normal operation

**S1**



The output is always in the active state between the 1st limit position and 2nd limit position.

*Example: In case of position 1 is +30° and the position 2 is +45°, the output is active between +30° and + 45° .*

### Setting of Out 2 :

- 1) S2 button is hold as pressed ,when the "Out 2" LED starts blinking, the button is being left free.
- 2) The sensor is brought to limit position 1.
- 3) S2 button is pressed again. The "Out 2" LED will light continuously 2 seconds and then start flashing again so 1st position is set.
- 4) The sensor is brought to 2nd limit position.
- 5) S2 button is pressed again, so 2nd position is being set.
- 6) Sensor returns to its normal operation

**S2**



The output is always in the active state between the 1st limit position and 2nd limit position.

*Example: In case of position 1 is +30° and the position 2 is +45°, the output is active between +30° and + 45° .*

### Setting Of Analog Output 1 :

- 1) At the same time S1 and S2 buttons are hold as pressed. When the "Out 1 and Out 2" LEDs start blinking the buttons are being left free.
- 2) The sensor is brought to the position to receive the minimum analog signal output.
- 3) S1 button is pressed again, The "Out 1" LED will light continuously 2 seconds and then start flashing again , so that the minimum values point is being set.
- 4) The sensor is brought to the position to receive the maximum analog signal output.
- 5) S1 button is pressed again, The "Out 1" LED will light continuously 2 seconds and then start flashing again , so that the minimum values point is being set.
- 6) Sensor returns to its normal operation

### Setting Of Analog Output 2:

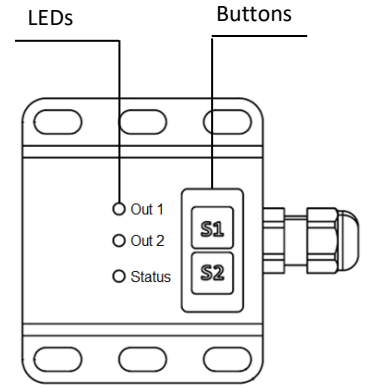
- 1) At the same time S1 and S2 buttons are hold as pressed. When the "Out 1 and Out 2" LEDs start blinking the buttons are being left free.
- 2) The sensor is brought to the position to receive the minimum analog signal output.
- 3) S2 button is pressed again, The "Out 2" LED will light continuously 2 seconds and then start flashing again , so that the minimum values point is being set.
- 4) The sensor is brought to the position to receive the maximum analog signal output.
- 5) S2 button is pressed again, The "Out 2" LED will light continuously 2 seconds and then start flashing again , so that the minimum values point is being set.
- 6) Sensor returns to its normal operation

### Reset to Factory Settings:

- 1) At the same time S1 and S2 buttons are hold as pressed, When the "Status" LED starts blinking, the buttons are being left free.
- 2) The "Status" LED stops blinking after 10 seconds, so the sensor returns to factory settings.

## LED FUNCTIONS

| Working status:   | Blue LED:<br>Status      | Yellow LED:<br>Out 1    | Yellow LED:<br>Out 2    |
|---|--------------------------|-------------------------|-------------------------|
| During setting of switching output for OUT 1  | light goes out           | starts blinking         | light goes out          |
| During setting of switching output for OUT 2  | light goes out           | light goes out          | starts blinking         |
| While switching to analogue setting mode  | light goes out           | starts blinking         | starts blinking         |
| During setting of analogue output for OUT 1   | light goes out           | starts blinking         | light goes out          |
| During setting of analogue output for OUT 2   | light goes out           | light goes out          | starts blinking         |
| During normal operation   | intermittent<br>blinking | switching<br>mod status | switching<br>mod status |
| Reset to factory settings<br>Between 5 seconds--10 seconds  | light goes out           | starts blinking         | starts blinking         |
| >10 seconds the end of the process of<br>returning to factory settings its continue is<br>normal operation mode | starts blinking          | light goes out          | light goes out          |



## BOX CONTENTS

| Product     | Description  |
|-------------|--------------|
| INS 120     | Angle Sensor |
| User Manual | 1 pcs.       |

## PRODUCT CODE TABLE

| Model   | Number of Axis          | Supply Voltage   | Transistor Output Type  | Electrical Connection <sup>(3)</sup>                                |
|---|-------------------------|--|---|---|
| INS 120 - X - XX - XX - XX - XXX - XX - XX - XX | 01: Single Axis         | PP: 12...24VDC   | OCP: PNP Open Collector<br>No Code: No transistor output                                  | 3M: 3m cable(std)<br>S13: M12 5 pin Socket<br>S14: M12 8 pin Socket |
|   | Sensor Type<br>A: Angle | Measurement Range <sup>(1)</sup><br>030: ±30°<br>*It can be produced at desired value up to 360° | Analog Output Type <sup>(2)</sup><br>A: 4-20 mA<br>V: 0-10 V<br>No Code: No analog output | Output Signal Direction<br>CW: Clockwise<br>CCW: Counter clockwise  |

- (1) The angle measurement range can be selected differently for transistor output and analog output. For example, the measuring range can be selected 0-360° for the analog output and 0-50° for the transistor output. You need to specify your different measurement range requirements at the order stage.
- (2) Optionally **Dual Analog Output** can be requested. In this case, it is necessary to add "2" at the beginning of the desired signal output at order coding.
- (3) If dual analog output is desired, the electrical connection must be selected as 3M (cable) or S14 (M12 8 pin Socket).



### Manufacturer Firm's and Authorized Service's Title, Address Details

**Manufacturer Firm:** ATEK SENSÖR SANAYİ VE TİCARET A.Ş.

**Address:** Tuzla KOSB Organize Sanayi Bolgesi Melek Aras Bulvari, No:67 34956 Tuzla-Istanbul / TURKEY

**TEL:** +90 0216 399 44 04 **FAX:** +90 0216 399 44 02

**Web:** [www.ateksensor.com](http://www.ateksensor.com) **E-mail:** info@ateksensor.com



**Disposal of Packagings:** Packaging materials consist of recyclable materials. For providing recycling, please dispose waste packagings to collecting points of authorized recycling facilities.

**Disposal of E-Waste:** This device is in conformity with WEEE Directive and consists of recyclable materials. This product should not be disposed with general waste for preventing negative effects on environment and human health. This product should be disposed to collecting points of authorized recycling facilities. Further information can be reached from authorized unit.



**DISTRIBUTOR / DISTRIBUIDOR**  
Brazil and South America / Brasil e América do Sul



www.metrolog.net



Metrolog Controles de Medição

**Address / Endereço:**

Rua Sete de Setembro, 2656  
13560-181 - São Carlos - SP  
Brazil / Brasil

**Phone / Telefone:**

+55 (16) 3371-0112  
+55 (16) 3372-7800

**Internet:**

www.metrolog.net  
metrolog@metrolog.net

**Atek Sensor Technology A.S.**



Tuzla Kimya Sanayicileri Org. San. Bolg. Melek Aras Bulvari, No:67 34956 Tuzla-Istanbul / TURKEY  
Tel: +90 216 399 44 04 Fax: +90 216 399 44 02  
[www.ateksensor.com](http://www.ateksensor.com) [info@ateksensor.com](mailto:info@ateksensor.com)