

## Fluidic Tilt Sensor – Digital Interface

### ASC TSF-360-CAN

Uniaxial  
 Fluidic, Capacitive  
 Measurement Range: 360°  
 Accuracy: <math><0.15^\circ</math>  
 Resolution: <math><0.01^\circ</math>  
 Aluminum Housing  
**Made in Germany**



CE

#### Fluidic Tilt Sensor

The fluidic tilt sensors are using the physical effect that the surface of liquids is always aligned exactly horizontally due to gravity. By means of a suitable electrode arrangement, the angle between the sensors and the horizontal is capacitively measured with a dielectric liquid.

#### Description

The ASC TSF is based on a proven technology using a fluidic operating principle. The integrated electronic circuitry ensures a flexible power supply voltage from 9 to 32 VDC. The analog measurement data is internally digitized and available via the CAN/CANopen interface. Due to internal compensation, the uniaxial tilt sensor features accuracy of better than  $0.15^\circ$  over complete measurement range of  $360^\circ$  and a temperature range from  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$ , with a resolution of  $0.01^\circ$ .

The tilt sensors feature a robust and reliable aluminum housing with protection class IP67 and a standard 5-pin M12 CAN connector.

The easy integration makes the tilt sensors especially suitable for system monitoring of cranes and construction machines, as well as the orientation of solar collectors and agricultural vehicles in the field.

#### Features

- CAN/CANopen Interface
- DC Response
- Internal Compensation over Operating Range
- Internal Compensation over Temperature Range

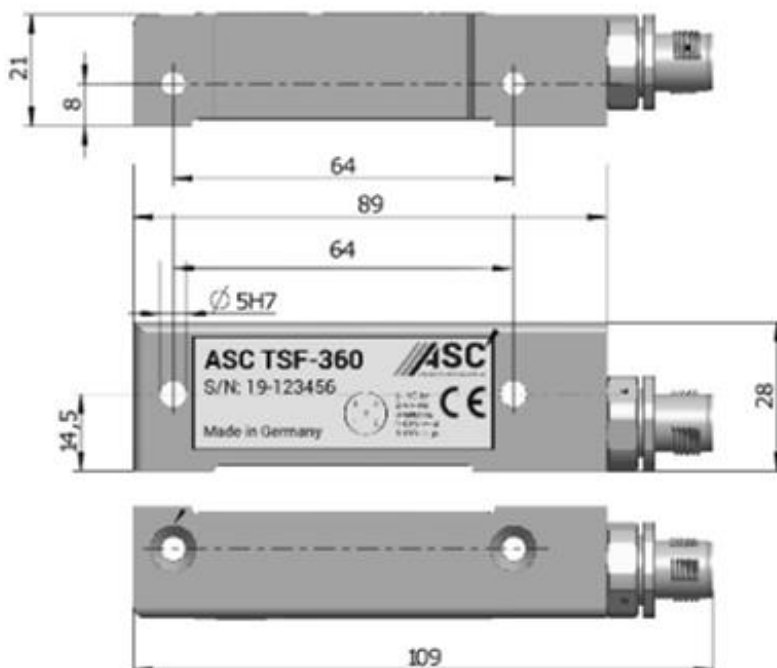
#### Options

- Customized Connector Cable

#### Applications

- Renewable Energies
- Alignment of Machines and Vehicles in Construction and Agriculture Applications

More applications in several markets are figured out on our web page [www.asc-sensors.de](http://www.asc-sensors.de)



## Fluidic Tilt Sensors – Digital Interface

### Typical Specification

#### Dynamic

Measurement Range	°	360
Scale Factor (sensitivity)	mV/g	2000
Accuracy (over temperature range +10 °C to +40 °C)	°	<0.10
Accuracy (over temperature range -40 °C to +85 °C)	°	<0.15
Resolution	°	<0.01
Sample Rate	ms	<180
Settling Time	s	<1

#### Electrical

Power Supply Voltage	V	9 to 32
Operating Current Consumption (at 9 V)	mA	20
Operating Current Consumption (at 32 V)	mA	9
Baud Rate (standard)	kbit/s	250
Baud Rate (options, selectable)	kbit/s	10   20   50   100   125   250   500
Isolation		Case Isolated

#### Environmental

Operating Temperature Range	°C	-40 to +85
Storage Temperature Range	°C	-40 to +85
Protection Class		IP67

#### Physical

Sensing Element		MEMS Fluidic
Case Material		Anodized Aluminum
Connector		5-pin M12 (standard: IEC 61076-2-101)
Mounting		Screw Holes for 2 Mounting Options
Weight	gram	80

### Ordering Information

Series	- Measurement Range [°]	- Interface
ASC TSF	360	CAN

*Example:*

**ASC TSF-360-CAN**

### Safety Precaution for Installing and Operating

This data sheet is a part of the product. Read the data sheet carefully before using the product and keep it available for future operation. Handling, electrical connections, mounting or any other work performed at the sensor must be carried out by authorized experts only. Appropriate safety precautions must be taken to exclude any risk of personal injury and damage to operating equipment as a result of a sensor malfunction.

### Handling

The sensor is packaged in a reliable housing to protect the sensing elements and integrated electronic components from the ambient environment. However, poor handling of the product can lead to damages that may not be visible and cause electrical failure or reliability issues. Handle the component with caution:

- Avoid shocks and impacts on the housing, such as dropping the sensor on hard surface
- Never move the sensor by pulling the cable
- Make sure that the sensor is used within the specified environmental conditions
- Transport and store the sensor in its original or similar packaging
- The sensor should be mounted on a stable flat surface with all screws tightened or other mounting options
- Avoid any deformation during mounting the sensor
- Mounting tolerances may have an influence on the measured result

### Electrical

ASC's inertial sensors are working with many established data acquisition systems. However, make sure that a proper DAQ is used, for the corresponding operation principle of the sensor. Furthermore, suitable precautions shall be employed during all phases of shipment, handling and operating:

- Active sensor pins are susceptible to damage due to electrostatic discharge (ESD)
- Make sure that the sensor is used within the specified electrical conditions
- Check all electrical connections prior to initial setup of the sensor
- Completely shield the sensor and connecting cable
- Do not perform any electrical modifications at the sensor
- Do not perform any adaptations on the wiring or connectors while the device under power
- Never plug or unplug the electrical connection while the sensor is under power
- When a certain pin is not used during operation, make sure that the pin is insulated

### Quality

- We have a quality management system according to ISO 9001:2015.
- The Deutsche Akkreditierungsstelle GmbH (DAkkS) has awarded to our calibration laboratory the DIN EN ISO/IEC 17025:2018 accreditation for calibrations and has confirmed our competence to perform calibrations in the field of mechanical acceleration measurements. The registration number of the certificate is **D-K-18110-01-00**.
- All ASC products are **CE**-compliant.

Made in Germany



analyzing



monitoring



testing



measuring