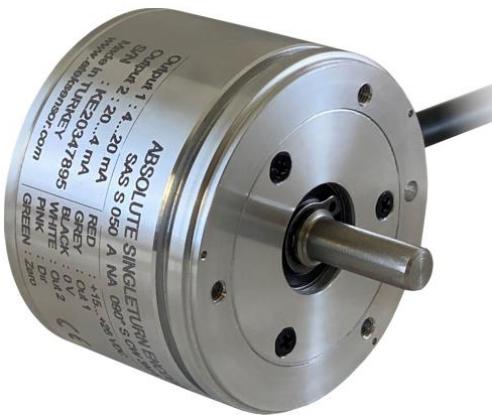


# PROGRAMMABLE ABSOLUTE ROTARY ENCODER

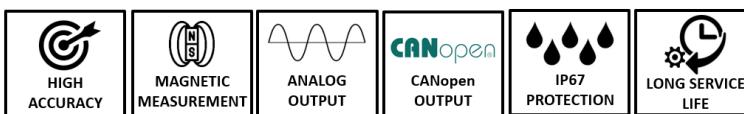
“Single Turn Absolute Encoder, Magnetic Measurement”

SAS S 51



## GENERAL FEATURES

- Absolute measurement with magnetic principle
- 50 mm body diameter
- 6 mm or 8 mm shaft diameter
- 14 bit angular resolution
- Analog or CANopen output options
- Redundant output
- Analogue output signal forms can be selected according to 3 selected points
- High sensitivity
- IP67 Protection class



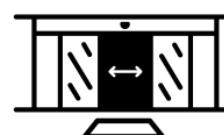
The SAS series encoders operate absolute. In other words, unlike the incremental systems, they do not lose their positions in power outages and continue to measure from where they left off.

The SAS series single turn absolute rotary encoders offer highly flexible solutions in use, with different output signals, shaft diameters and user-adjustable measuring range. The SAS single turn absolute rotary encoder with integrated reference provides high quality feedback. With its IP67 high protection class, it is resistant to harsh environmental conditions.

## APPLICATION AREAS

Speed and position accuracy in one application; If it is more important than fault tolerance and system simplicity, absolute encoders should be used. Absolute encoders provide precise operation in applications.

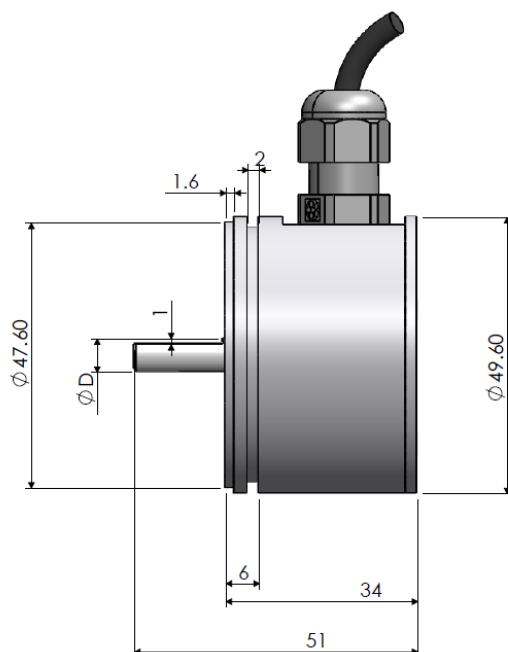
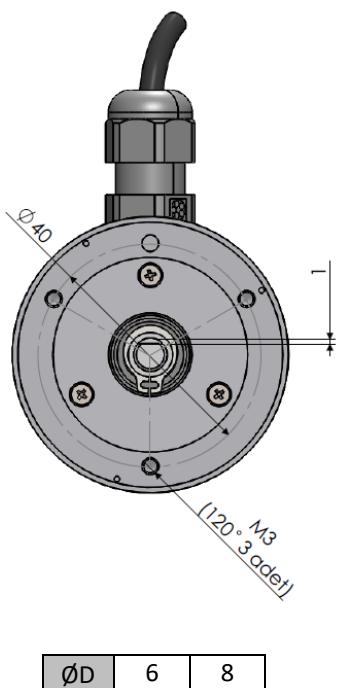
- Identifying multi-axis orientation in CNC machines used in component manufacturing
- Automatically determine the height of the scissor bearings used in hospitals
- Correct placement of multiple stabilizers for large vehicles such as cranes or air lifts
- Automatic doors or slots to move without limiting key
- Continue robotic movement even after a power failure



## MECHANICAL SPECIFICATIONS

<b>Maximum Speed</b>	3000 rpm
<b>Body Diameter</b>	50 mm
<b>Shaft Diameter</b>	6 mm, 8 mm
<b>Weight</b>	~350 gr
<b>Protection Class</b>	IP 67
<b>Operating Temperature</b>	-20°C ... +85°C
<b>Relative Humidity</b>	%10 ... %90
<b>Material</b>	Shaft: Stainless Steel
	Body: Aluminium

## MECHANICAL DIMENSIONS (mm)



ØD | 6 | 8

## ANALOG VERSION

### Electrical Specifications

<b>Working Principle</b>	Hall Effect
<b>Supply Voltage</b>	15 ... 26 VDC
<b>Current Consumption</b>	40 mA
<b>Reverse Polarity Protection</b>	Yes
<b>Measuring Range</b>	0° ... 360°
<b>Accuracy</b>	±0,1°
<b>Repeatability</b>	0,1°
<b>Angular Resolution</b>	14 Bit
<b>Response Frequency</b>	333 Hz
<b>Electrical Interface</b>	4-20 mA, 0-10 V, 0.5- 4.5 V, 0-5 V 20-4 mA, 10-0 V, 4.5-0.5 V, 5-0 V
<b>Electrical Connection</b>	8 x 0,14 mm <sup>2</sup> shielded cable
<b>Output Load</b>	For current output model; min 250 Ω For voltage output model; min 1 KΩ

## ELECTRICAL CONNECTION

Signal	Cable
U+ (+15...+26 VDC)	Red
Output 1: 0.5-4.5 / 0-10VDC / 0-5VDC / 4-20mA	Gray
GND (0V)	Black
Output 2: 0.5-4.5 / 0-10VDC / 0-5VDC / 4-20mA (optional)	White
Direction Change <b>(This end should not be left idle. It should be connected to the supply end after the process is completed)</b>	Pink
Reset <b>(This end should not be left idle. It should be connected to the supply end after the process is completed)</b>	Green
Programming Tips <b>(These ends should not touch each other and should not be connected anywhere)</b>	Yellow, Blue
	-

**RESET:** With the reset function you can set the desired location to 0. The reset terminal and GND are short-circuited for about 5 seconds and then disconnected. The sensor then accepts the current position as zero.

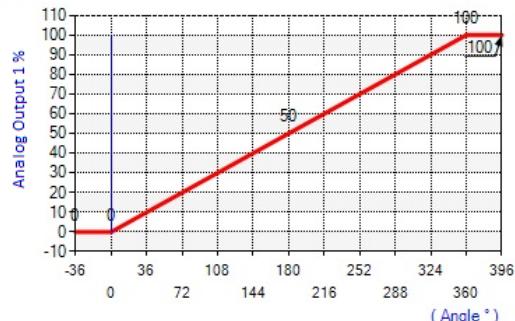
**DIRECTION CHANGE:** You can change the angle increase direction with the direction change function. The direction changing terminal and GND are short-circuited for about 5 seconds and then disconnected. Thus, the sensor reverses the angle direction (CW is CCW and CCW is CW).

## DETERMINATION OF OUTPUT SIGNAL FORM

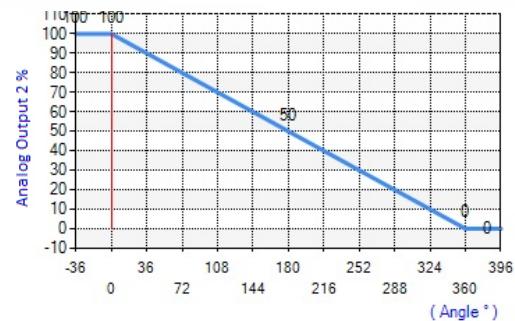
Analog output signal forms can be specified according to request for 3 points as low point, middle point and high point. The requested signal form must be specified at the order stage. Examples of output signal forms are shown below.

**Note:** The diagrams shown below are for illustrative purposes. Scale value can be selected between 0 ° - 360 ° and Output value between 0% and 100%.

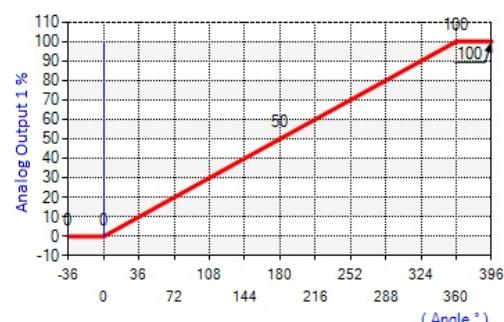
Analog Output 1		
Point	Scale	Output
Low Point	0°	%0
Middle Point	180°	%50
High Point	360°	%100



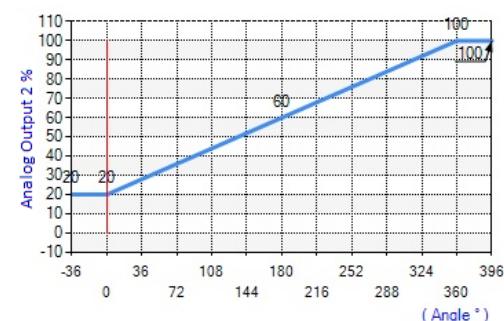
Analog Output 2		
Point	Scale	Output
Low Point	360°	%0
Middle Point	180°	%50
High Point	0°	%100



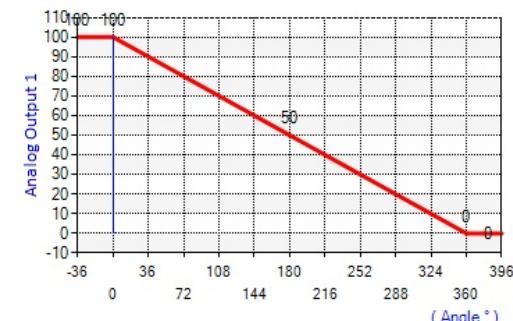
Analog Output 1		
Point	Scale	Output
Low Point	0°	%0
Middle Point	180°	%50
High Point	360°	%100



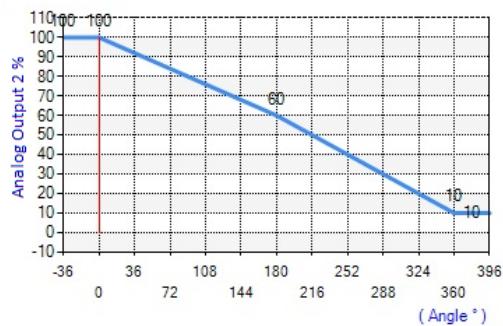
Analog Output 2		
Point	Scale	Output
Low Point	0°	%20
Middle Point	180°	%60
High Point	360°	%100



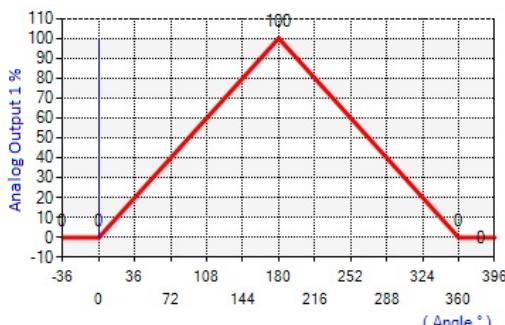
Analog Output 1		
Point	Scale	Output
Low Point	0°	%100
Middle Point	180°	%50
High Point	360°	%0



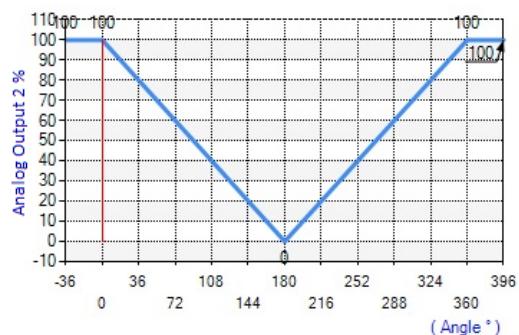
Analog Output 2		
Point	Scale	Output
Low Point	0°	%100
Middle Point	180°	%60
High Point	360°	%10



Analog Output 1		
Point	Scale	Output
Low Point	0°	%0
Middle Point	180°	%100
High Point	360°	%0



Analog Output 2		
Point	Scale	Output
Low Point	0°	%100
Middle Point	180°	%0
High Point	360°	%100



## ORDER CODE FOR ANALOG VERSIONS

Model	Body Diameter	Output Signal 2 (Optional) <sup>(1)</sup>		Reference Point <sup>(2)</sup>	Electrical Connection <sup>(3)</sup>	Cable Direction	
		Shaft Type	Output Signal 1 <sup>(1)</sup>				
SAS	- X - XX - XX - XXX - XXX - X - XXX - XXX - X - X	51 : 50 mm	V : 0-10 VDC V1 : 0-5 VDC A : 4-20 mA V3 : 0.5-4.5 VDC NV : 10-0 VDC NV1 : 5-0 VDC NA : 20-4 mA NV3 : 4.5-0.5 VDC	S : Shaft	S : Start M : Middle E : End	1.5M : 1.5m cable (std.)	Y : From side

(1) The direction of the output signals can be changed optionally. In the coding, when 'N' is placed at the beginning of the normal signal, it refers to the opposite. For example; in case of V: 0-10 VDC, then NV: 10-0 VDC  
The Output 2 is optional. If not requested, the code part is left blank.

(2) Reference point; refers to the selection of one of the starting, middle, or end points used for the scale of the analog outputs.

(3) Optionally different cable lengths can be requested.

## CANOPEN VERSION

### Electrical Specifications

<b>Working Principle</b>	Hall Effect
<b>Supply Voltage</b>	12 ... 30 VDC
<b>Current Consumption</b>	40 mA
<b>Reverse Polarity Protection</b>	Yes
<b>Measuring Range</b>	0° ... 360°
<b>Accuracy</b>	±0,1°
<b>Repeatability</b>	0,1°
<b>Angular Resolution</b>	14 Bit
<b>Response Frequency</b>	333 Hz
<b>Electrical Interface</b>	CANopen
<b>Electrical Connection</b>	6x0,34 mm <sup>2</sup> twisted shielded cable

### CANopen Specifications

<b>Communication Profile</b>	CiA 301
<b>Device Type</b>	CANopen, CiA DS406
<b>Node ID</b>	Between 1 and 127, configurable via LSS or SDO.
<b>Baud Rate</b>	10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 Mbit/s
<b>PDO Data Rate</b>	100 ms
<b>Error Check</b>	Heartbeat, Emergency Message
<b>PDO</b>	3 Tx PDO
<b>PDO Modes</b>	Event/Time triggered, Synch/Asynch
<b>SDO</b>	1 server
<b>Position data</b>	Object Dictionary 0x6020
<b>Terminating Resistor</b>	Optional

## ELECTRICAL CONNECTION

Signal	Cable
CAN SHIELD	Shield
V+ (12...30 VDC)	Red
GND (0V)	Black
CAN H	Yellow
CAN L	Green

## ORDER CODE FOR CANOPEN VERSIONS

<b>Model</b>	<b>Body Diameter</b>	<b>Supply Voltage</b>	<b>Angle Increasing Direction</b>	<b>Shaft Dia.</b>
SAS	51 : 50 mm	PP : 12...30VDC	CW : Clockwise CCW : Counter clockwise	6 : 6 mm 8 : 8 mm
- X - XX - XX - XX - X - XXX - XXX - X - X	Resolution Max 14 bit	Output Signal C : CANopen	Electrical Connection <sup>(1)</sup> 1.5M : 1.5m cable (std)	Cable Direction Y : From side
Shaft Type S : Shaft				

(1) Optionally different cable lengths can be requested.

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