

Pluto

Safe Encoder

Use:

Safe position and speed determination of machine movements.

Features:

- High resolution
- Selectable resolution
- Connected directly to the Pluto safety bus
- Ready-made function blocks

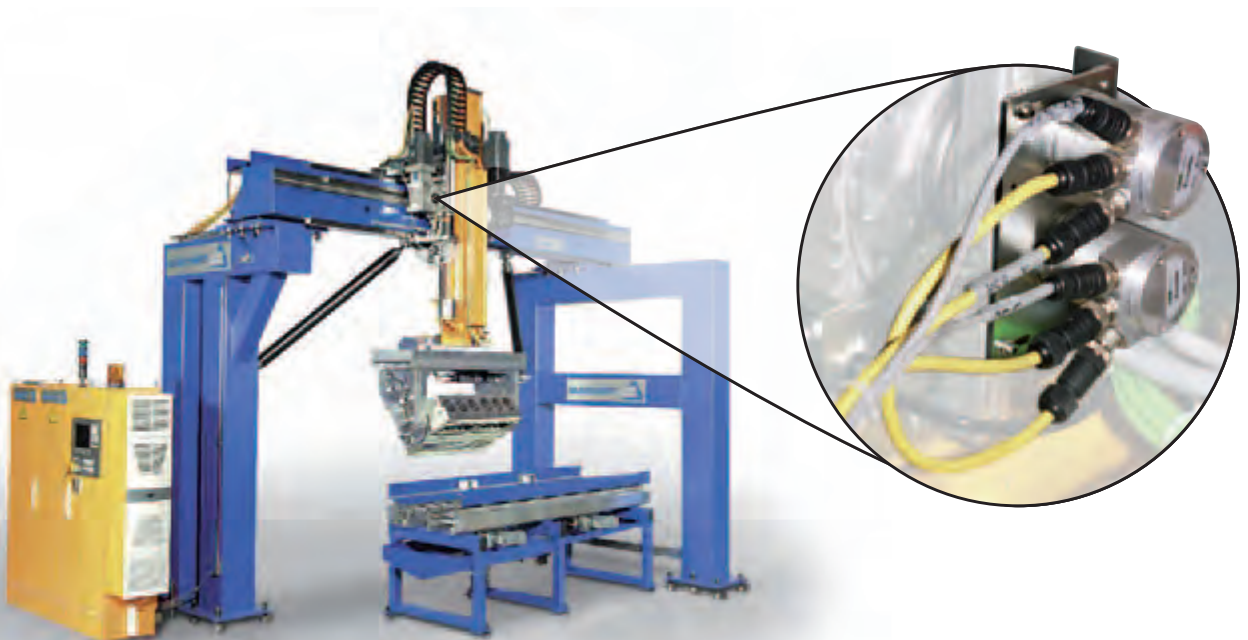


Rotational absolute value sensor for safe positioning

Together with a Pluto safety PLC, this rotational absolute encoder can be used for safe position determination. This is particularly useful in the case of such equipment as gantry robots, industrial robots, etc. Also in eccentric shaft presses, existing cam mechanisms can be replaced by absolute value position sensors for safe positioning. The sensors are available in single and multi-turn versions.

Up to 16 absolute encoders can be connected to a Pluto CAN databus. A Pluto on the databus reads the sensor values, which are evaluated. With a special function block in the PLC code, it is possible to design two-channel solutions with the sensors. The user can obtain safe values for position and speed from these values. This enables supervision of stationary and overspeed conditions.

The absolute value sensors are standard sensors with modified software to meet the safety requirements.

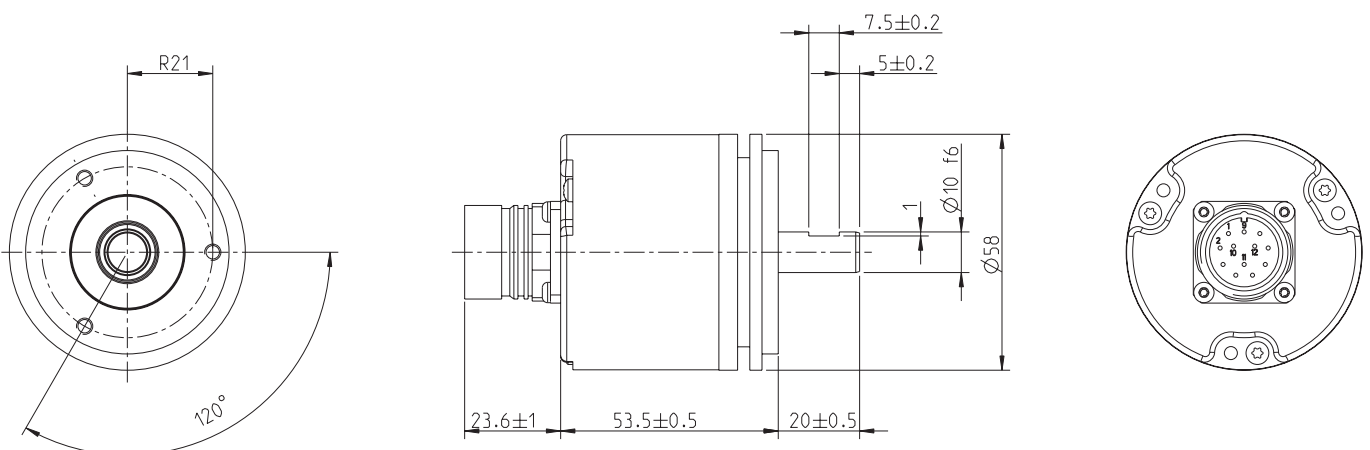


Example of an application where 2 sensors provide safe position determination in a gantry robot.

Technical data – Safe Encoder RSA 597	
Manufacturer	ABB AB/Jokab Safety, Sweden
Article number/ordering data:	2TLA020070R3600 RSA 597
Ambient temperature	-40°C .. +70°C
Temperature, transport and storage	-30°C .. +70°C
Ingress protection class	IP-67 in accordance with IEC 60529
At shaft inlet	IP-66 in accordance with IEC 60529
Vibration (55 to 2000 Hz)	< 300 m/s ² in accordance with IEC 60068-2-6
Shock (6ms)	< 2,000 m/s ² in accordance with IEC 60068-2-27
Material, enclosure	Aluminium
Surface treatment	Painted and chromed or anodised
Weight	Approx. 300 g
Accuracy and resolution	
Resolution	13 bits, 8192 positions per rotation
Accuracy	± ½ LSB (Least Significant Bit)
Operating voltage	9-36 V dc
Polarity-protected	Yes
Short-circuit protected	Yes
Databus speed	5 kbit/s - 1 Mbit/s, preset at 500kbit/s
Address input	Active low
Code type	Binary
Programmable functions	Resolution, 0 position Direction, Databus speed
Current consumption	50 mA at 24V dc
Max current consumption	100 mA



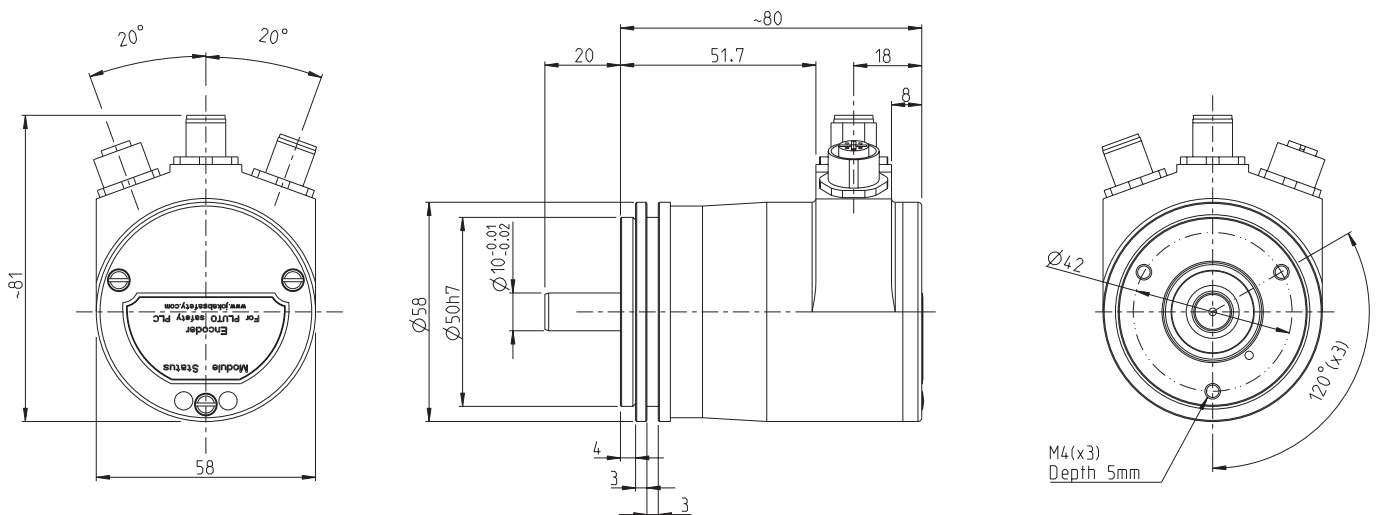
Safe Encoder RSA 597 – single turn



Technical data – Safe Encoder RSA 698	
Manufacturer	ABB AB/Jokab Safety, Sweden
Article number/ordering data:	2TLA020070R3700 RSA 698
Ambient temperature	-40°C .. +70°C
Temperature, transport and storage	-30°C .. +70°C
Ingress protection class	IP-67 in accordance with IEC 60529
At shaft inlet	IP-66 in accordance with IEC 60529
Vibration (55 to 2000 Hz)	< 100 m/s ² in accordance with IEC 60068-2-6
Shock (6ms)	< 2,000 m/s ² in accordance with IEC 60068-2-27
Material, enclosure	Aluminium
Surface treatment	Anodised
Weight	Approx. 400g
Accuracy and resolution	
Resolution, total	25 bit 13 bits, 8192 positions per rotation 12 bits, 4096 rotations
Accuracy	± 1 LSB (Least Significant Bit)
Operating voltage	9-36 V dc
Polarity-protected	Yes
Short-circuit protected	Yes
Databus speed	10 kbit/s - 1 Mbit/s
Code type	Binary
Programmable functions	Resolution, 0 position
Current consumption	50 mA at 24V dc
Max current consumption	100 mA



Safe Encoder RSA 698 – multi turn



Safe Encoder

Function block for a single-turn encoder that generates safe position and speed values from two absolute encoders.

Function

The block reads and evaluates one absolute encoders. The position value is sent to the 'Position' output. The 'Speed' output is the average value for the speed, at the rate of pulses/10 ms. If an error occurs, the 'OK' output is set to zero. In certain applications the values of 'Position' and 'Speed' are used in conjunction with the 'OK' output.



Descriptions of inputs and outputs

- AdrEncoderA: Encoder A node address
- AdrEncoderB: Encoder B node address
- MaxDiff: Max allowed deviation between the encoders (max 2% of Range)
- Range: Number of increments per revolution
- OK: Set when encoders are working OK and the position values are within the margin set by 'MaxDiff'
- Position: Position value
- Speed: Speed value as increments/10ms
- A: Encoder A position. Must not be used in PLC program!
- B: Encoder B position. Must not be used in PLC program!

NOTE! Position values from single encoders are only available for adjustment purposes and must NOT be used for safety.

NOTE! When error occurs 'Position' = -1, 'Speed' = -32768 and the OK output will be reset.

Safe Encoder Multiturn

Function block for a multi-turn encoder that generates safe position and speed values from two absolute encoders. Operative system 2.4.4 or higher is required.

Function

The block reads and evaluates two absolute encoders. The average value for the two sensors is calculated and sent to the 'Position' output. The 'Speed' output is the average value for the speed, at the rate of pulses/10 ms. The block monitors that the encoder position values do not differ by more than the input value set by 'MaxDiff'. If an error occurs, the 'OK' output is set to zero. In certain applications the values of 'Position' and 'Speed' are used in conjunction with the 'OK' output.



Descriptions of inputs and outputs

- AdrEncoderA: Encoder A node address
- AdrEncoderB: Encoder B node address
- MaxDiff: Max allowed deviation between the encoders (max 2% of IncrPerRev)
- IncrPerRev: Number of increments per revolution
- OK: Set when encoders are working OK and the position values are within the margin set by 'MaxDiff'
- Position: Position value
- Speed: Speed value as increments/10ms
- A: Encoder A position. Must not be used in PLC program!
- B: Encoder B position. Must not be used in PLC program!

NOTE! Position values from single encoders are only available for adjustment purposes and must NOT be used for safety.

NOTE! When error occurs 'Position' = -1, 'Speed' = -32768 and the OK output will be reset.

Encoder Cam

Function block for electronic cam gear.

Function

Output Q is activated if the value of the input register 'PosReg' is within the limits for 'MinPos' and 'MaxPos'.

NOTE! It is possible to specify a value that defines the sensor's zero position. Position < 0 is not permitted.

Example: If MinPos = 3000 and MaxPos = 200, Q is activated when the position is greater than 2999 or less than 201.



Descriptions of inputs and outputs

- PosReg: Input for the position value
- MinPos: Minimum limit value
- MaxPos: Maximum limit value