

TECHNICAL DATASHEET

Absolute Encoder AR60



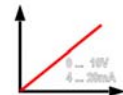
AR 60

- Single- and multi turn: Resolution up to 28 Bit
- Wearless electronic multi turn: contact -and battery less, self-energetic
- 200 g shock resistance/ 20 g vibration resistance
- High temperature range: -40 ... +100°C
- Compact design: 32 mm mounting depth
- Speed up to max. 10.000 rpm (continuous)
- Interfaces: SSI, CANopen, Analog
- CANopen interface with E1 approval for vehicle application
- Analog interface: Measuring range in Degrees or number of Revolutions; Current or voltage output

ACURO[®]
industry

CANopen

SSI



E1 10 R - 036823

GENERAL INFORMATION

Besides the robust magnetic Sensor technology the AR60 offers a wear-free electronic Multi-turn which works without the need of a battery.

Single turn resolution is 12 bit, i.e. one revolution (360°) is resolved into 4096 measuring steps. Standard multi turn resolution is 16 Bit.

The AR60 is electrically compatible with standard industrial drives. Available interfaces are SSI, CANopen and Analog (0 ... 10 V or 4 ... 20 mA).

The robust design allows up to 10.000 rpm within a wide temperature range of -40°C ... +100°C.

With an installed depth of only 32 mm, this encoder is the most compact type in its class. Valuable space has been saved - to the benefit of the overall machinery design.

APPLICATIONS

Fields of application that clearly unfold the benefits of encoder AR60:

- Position Feedback in any kind of general machinery and factory automation
- Construction machinery
- Utility vehicles / trucks
- Gantry cranes
- Food & Beverage Industry
- Filling plants
- Presses
- Your individual application

Specifications subject to change without notice.

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**TECHNICAL DATA
mechanical**

Housing diameter	58 mm
Mounting depth	32 mm
Shaft diameter	10 mm (Solid shaft)
Flange (Mounting of housing)	Synchro clamping flange
Protection class shaft input (EN 60529)	IP64
Protection class housing (EN 60529)	IP67
Shaft load axial / radial	max.: 40N / 110N
Max. speed	max. 10.000 rpm (continuous), max. 12.000 rpm (short term)
Starting torque typ.	≤ 0,01 Nm
Moment of inertia	13 gcm ²
Vibration resistance (DIN EN 60068-2-6)	200 m/s ²
Shock resistance (DIN EN 60068-2-27)	2.000 m/s ² (3 ms)
Operating temperature	SSI: -40 °C ... +100 °C CANopen, Analog -40 °C ... +85 °C
Material housing	Aluminum
Material shaft	Stainless Steel
Connection	Cable, radial M12 connector, radial

**TECHNICAL DATA
electrical**

Supply voltage	DC 10 - 30 V (+10%) Analog: DC 17 - 30 V (+10%)
EMC	EN 61326-1
Resolution singleturn (interface: SG, SB, OL)	12 Bit
Resolution multiturn ¹ (interface: SG, SB, OL)	12 Bit, 13 Bit, 16 Bit
Analog interface ² (Interface: AV, A4)	0 ...10 V (Voltage) 4 ... 20 mA (Current)
Resolution Analog Output ^{2,3} (Interface: AV, A4)	12 bit
Measuring range in degrees ² (Interface: AV, A4)	90°, 180°, 360°, other on request
Measuring range in revolutions ² (Interface: AV, A4)	4, 8, 16 revolutions, other on request
Absolute accuracy	±1°
Repeatability	±0,2°
Control inputs ⁴	Preset, Direction

¹ other on request

² only analog interface

³ based on the total measuring range

⁴ Preset and Direction available for SSI and Analog interface
Preset value; Zero (other on request)

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ELECTRICAL CONNECTIONS SSI

Color	PIN (M12, 8 poles)	Signal
yellow	6	Clock
pink	5	Data
green	4	Clock
grey	8	Data
white	1	UB
brown	2	0 V
red	3	Preset (set to 0) ¹
blue	7	Direction ¹
Screen	Screen	Screen

¹ Preset and Direction high active:

Signal level high: $\geq 66\% U_b$; low: $\leq 15\% U_b$ or unconnected

Bounce time preset: >2s

Bounce time direction: < 1 ms (dynamic)

ELECTRICAL CONNECTIONS CANopen

Color	Signal	PIN (M12, 8 poles)	PIN (M12, 5 poles)
yellow	CAN in+	6	4
green	CAN in-	4	5
pink	CAN out+	5	
grey	CAN out-	8	
blue	CAN GND in	7	1
black*	CAN GND out	3	
white	UB	1	2
brown	0 V	2	3
Screen	Screen	Screen	Screen

*cable color red for extension cable

ELECTRICAL CONNECTIONS Analog

Color	PIN	Signal
pink	5	0 ... 10 V (Voltage) or 4 ... 20 mA (Current)
blue	7	Direction (change value counting)
grey	8	AGND (Analog ground)
red ²	3	Preset (set to 0)
white	1	UB
brown	2	0 V
yellow ¹	6	
green ¹	4	
Screen	Screen	Screen

¹ Diagnostic signals only for service purposes. The cable wires have to be isolated.

² Preset and Direction low active : Signal level high $\leq DC 2 V$

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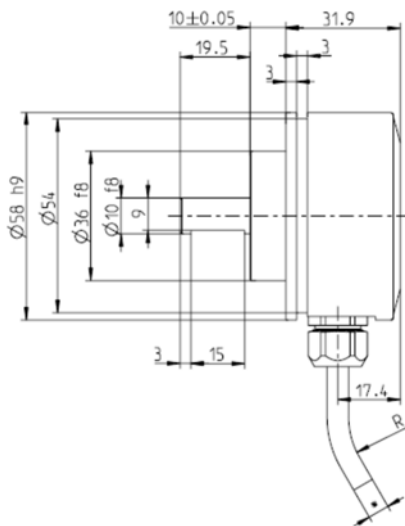
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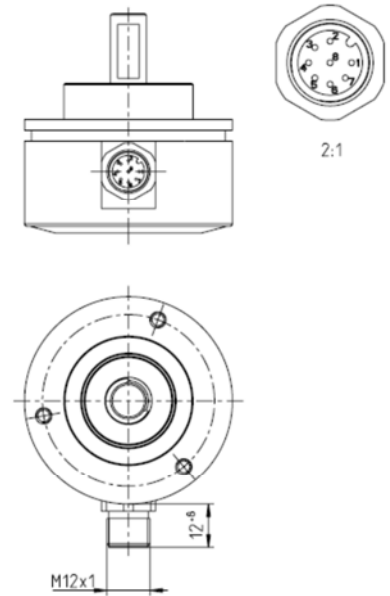
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DIMENSIONED DRAWINGS (continued)

Anschluss: "B" Kabel radial
connection: "B" cable radial



Anschluss: "8" M12 8 polig
connection: "8" M12 8 pole



- SSI/CANopen/Analog: $\varnothing 7.1+1.2$
- R bei bewegtem Einsatz = 15 x Kabeldurchmesser
- R bei fester Verlegung = 7.5 x Kabeldurchmesser
- R for alternating bending = 15 x cable diameter
- R for permanent bending = 7.5 x cable diameter

Dimensions in mm

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ORDERING INFORMATION

SSI, CANopen

Type	Measuring range ¹	Supply voltage	Flange, Protection, Shaft	Interface ^{2,3}	Connection ⁴
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AR60	0012 12 Bit ST 1212 12 Bit MT + 12 Bit ST 1312 13 Bit MT + 12 Bit ST 1612 16 Bit MT + 12 Bit ST	E DC 10 - 30 V	L.42 Synchro clamping, IP64, 10 mm	SG SSI Gray SB SSI Binary OL CANopen	5 M12-connector, 5-pole, radial 8 M12-connector, 8-pole, radial B Cable radial

¹ Other resolution on request.

² Standard setting CANopen: Bus termination not activated. External bus terminal resistor required.

³ E1 approval only with interface "OL" CANopen available.

⁴ Connection "5" M12-connector 5-pole only available with Interface "OL" CANopen.

ORDERING INFORMATION

Analog

Type	Measuring range ^{1,2}	Supply voltage	Flange, Protection, Shaft	Interface	Connection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AR60	measuring range in degree: G090 90° G180 180° G360 360° other on request measuring range in revolutions: U004 4 revolutions U008 8 revolutions U016 16 revolutions other on request	F DC 17 - 30 V	L.42 Synchro clamping, IP64, 10 mm	AV Analog 0 ... 10 V A4 Analog 4 ... 20 mA	B Cable radial 8 M12-connector, 8-pole, radial

¹ Coding of the measuring range in degree or revolutions

² Measuring Range G360 = 360° similar to former definition 0012 = 12 Bit ST

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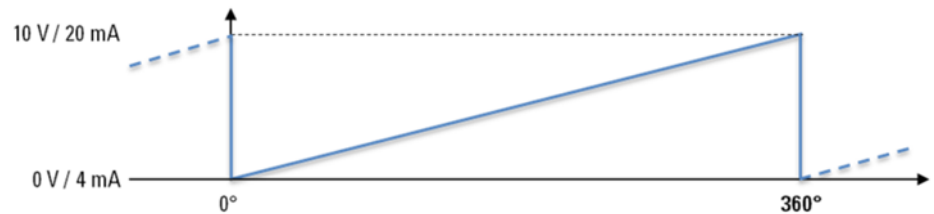
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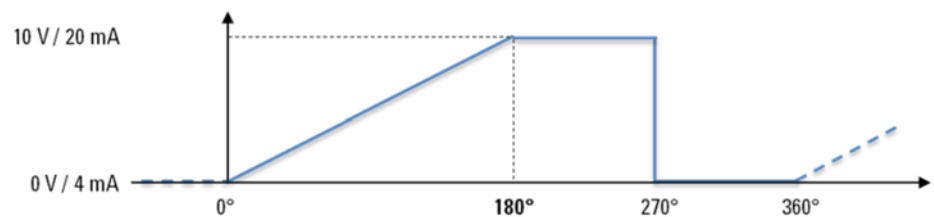
ANALOG OUTPUT SIGNALS

Measuring range in degrees
($>0^\circ$ to 360°)

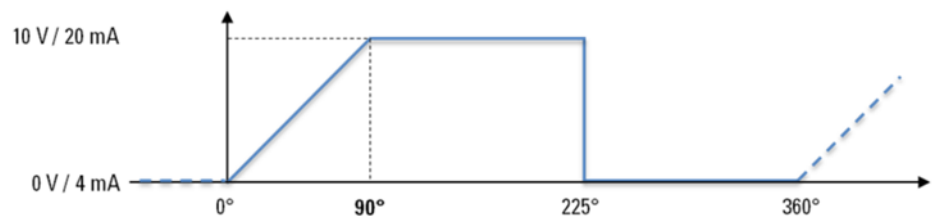
Measuring range 360°



Measuring range 180°

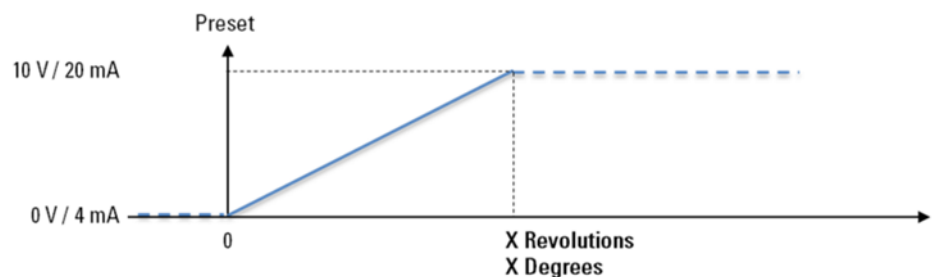


Measuring range 90°



OUTPUT SIGNALS

Measuring range in degrees ($>360^\circ$) or
Measuring range in revolutions



Default Setting: Output signal rotation cw (clockwise) with a view to the shaft.

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ORDERING INFORMATION
Selection of cable length

Versions with cable outlet (connection A or B) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. For variants with connector on cable end please add cable length code in between. Further cable lengths on request.

Code	Cable length
without code	1,5m
-D0	3 m
-F0	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m
-W0	30 m
-X0	40 m
-Y0	50 m

Example:
Cable with 3 m length: ... B - D0
Cable with 3 m length and M23 connector, cw: ... B - D0 - I

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