

**TECHNICAL DATASHEET**

**Absolute + Incremental AC 58-I - SSI**



Clamping flange

- Positioning and Speed feedback in one Encoder
- MT Absolute encoder + Incremental output TTL or HTL
- Broad temperature range: -40 to + 100°C
- Control input: Preset and Direction
- Resolution: Up to 29 Bit; PPR: 512, 1024, 2048
- Compact design: 50 mm length
- High EMC - Resistance
- Appropriate for standard frequency converter and asynchron motors



**TECHNICAL DATA**  
**mechanical**

Housing diameter	58 mm
Shaft diameter	10 mm (Solid shaft) 10 mm / 12 mm (Hubshaft)
Protection class shaft input (EN 60529)	IP64 or IP67
Protection class housing (EN 60529)	IP64 or IP67
Shaft load axial / radial	40 N / 60 N
Axial endplay of mounting shaft (hubshaft)	± 1.5 mm
Radial runout of mating shaft (hubshaft)	± 0.2 mm
Max. speed	max. 10 000 rpm (continuous), max. 12 000 rpm (short term)
Starting torque typ.	0.01 Nm
Moment of inertia	ca. 3.8 x 10 <sup>-6</sup> kgm <sup>2</sup>
Vibration resistance (DIN EN 60068-2-6)	100 m/s <sup>2</sup> (10 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s <sup>2</sup> (6 ms)
Operating temperature	-40 °C ... +100 °C
Storage temperature <sup>1</sup>	-25 °C ... +85 °C
Material shaft	Stainless Steel
Material housing	Aluminum (option: stainless steel)
Weight	approx. 260 g (ST) / 310 g (MT)
Connection	M23 connector (Conin), 12 pole, axial or radial Cable, axial or radial

<sup>1</sup> due to packaging

**TECHNICAL DATA**  
**electrical**

Supply voltage	DC 10-30 V
Max. current w/o load	200 mA
Resolution singleturn	12 -17 Bit
Resolution multiturn	12 Bit
Output code	Gray
Drives	Clock and Data / RS422
Linearity	± ½ LSB
Incremental signals	Push pull, RS422
Number of pulses	512, 1024, 2048
Max. pulse frequency	200 kHz

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#### TECHNICAL DATA electrical (continued)

Absolute accuracy	±36"
Repeatability	±7"
Control inputs <sup>1,2,3</sup>	Preset, Direction

- <sup>1</sup> Preset and Direction high active :  
Signal level high: ≥ 70% Ub; low: ≤ 20% Ub or unconnected
- <sup>2</sup> Bounce time preset: >2s  
Bounce time direction: < 1 ms (dynamic)
- <sup>3</sup> Preset-value: Zero  
Other values on request

#### RECOMMENDED DATA TRANSFER RATE bei SSI

The max. data transfer rate depends on the cable length. For Clock /  $\overline{\text{Clock}}$  and Data /  $\overline{\text{Data}}$  please use twisted pairs. Use shielded cable.

Cable length	Frequency
< 50 m	< 400 kHz
< 100 m	< 300 kHz
< 200 m	< 200 kHz
< 400 m	< 100 kHz

#### DATA FORMAT SSI Multiturn

Resolution	Data bits											
	T1 ... T12	T13 ... T21	T22	T23	T24	T25						
24 Bit <sup>1</sup>	M11 ... M0	S11 ... S1	S0	0	W <sup>2</sup>							
25 Bit <sup>1</sup>	M11 ... M0	S12 ... S2	S1	S0	0	W <sup>2</sup>						
26 Bit <sup>1</sup>	M11 ... M0	S13 ... S3	S2	S1	S0	0	W <sup>2</sup>					
27 Bit <sup>1</sup>	M11 ... M0	S14 ... S4	S3	S2	S1	S0	0	0	0	0	W <sup>2</sup>	
28 Bit <sup>1</sup>	M11 ... M0	S15 ... S5	S4	S3	S2	S1	S0	0	0	0	W <sup>2</sup>	
29 Bit <sup>1</sup>	M11 ... M0	S16 ... S6	S5	S4	S3	S2	S1	S0	0	0	W <sup>2</sup>	

Example for data format 24 Bit with the optional bits alarm and parity

24 Bit + P <sup>3</sup>	M11 ... M0	S11 ... S2	S1	S0	P	0	W <sup>2</sup>				
24 Bit + A <sup>4</sup>	M11 ... M0	S11 ... S2	S1	S0	A	0	W <sup>2</sup>				
24 Bit + P <sup>3</sup> + A <sup>4</sup>	M11 ... M0	S11 ... S2	S1	S0	A	P	0	W <sup>2</sup>			

S0 ... S16 Data bits for resolution per revolution

M0 ... M11 Data bits for number of revolution (only for multiturn)

<sup>1</sup> Optionen (Parity bit, Alarm- and Parity bit, zero bit) on request

<sup>2</sup> W: from this data bit on the data iteration for multiplex starts

<sup>3</sup> Paritybit: Even Parity (Das Paritybit ergänzt die Datenbits auf eine gerade Anzahl von 1-Bits.) (Option)

<sup>4</sup> Alarm bit: is set to "1" when over temperature, under temperature, disc breakage and defect LED

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#### SYNCHRONOUS-SERIAL TRANSFER (SSI)

Synchronous readout of the encoder data is according to the clock rate given by the SSI-counterpart.

The number of clock rates is determined by the type of encoder (singleturn resp. multiturn) and the configuration of the special Bits as defined.

For multiple transactions (the stored value is readout several times successively) a fixed clock rate per transaction must be kept (for singleturn 13 resp. 14 clocks, for multiturn 25 resp. 26 clocks).

- In the rest position, when the last clock brush has passed by more than 30µs, the data output is logically at "1".
- With the first descending clock edge the encoder data and the special bits are loaded in the shift register of the

encoder interface.

- With each ascending clock edge the data bits are serially readout, beginning with the MSB.
- At the end of the data transfer the data output is set to logically "0" for approx. 20µs. If within these 20µs a further clock brush reaches the encoder interface, the already transferred data is readout once again. This multiple transfer of the same data makes it possible to recognize transfer errors.
- After the 20µs the data output goes to its rest position, logically "1". Subsequently new encoder data can be readout.

#### ELECTRICAL CONNECTIONS

Cable / Cable with M23 connector (Conin), 12 pole

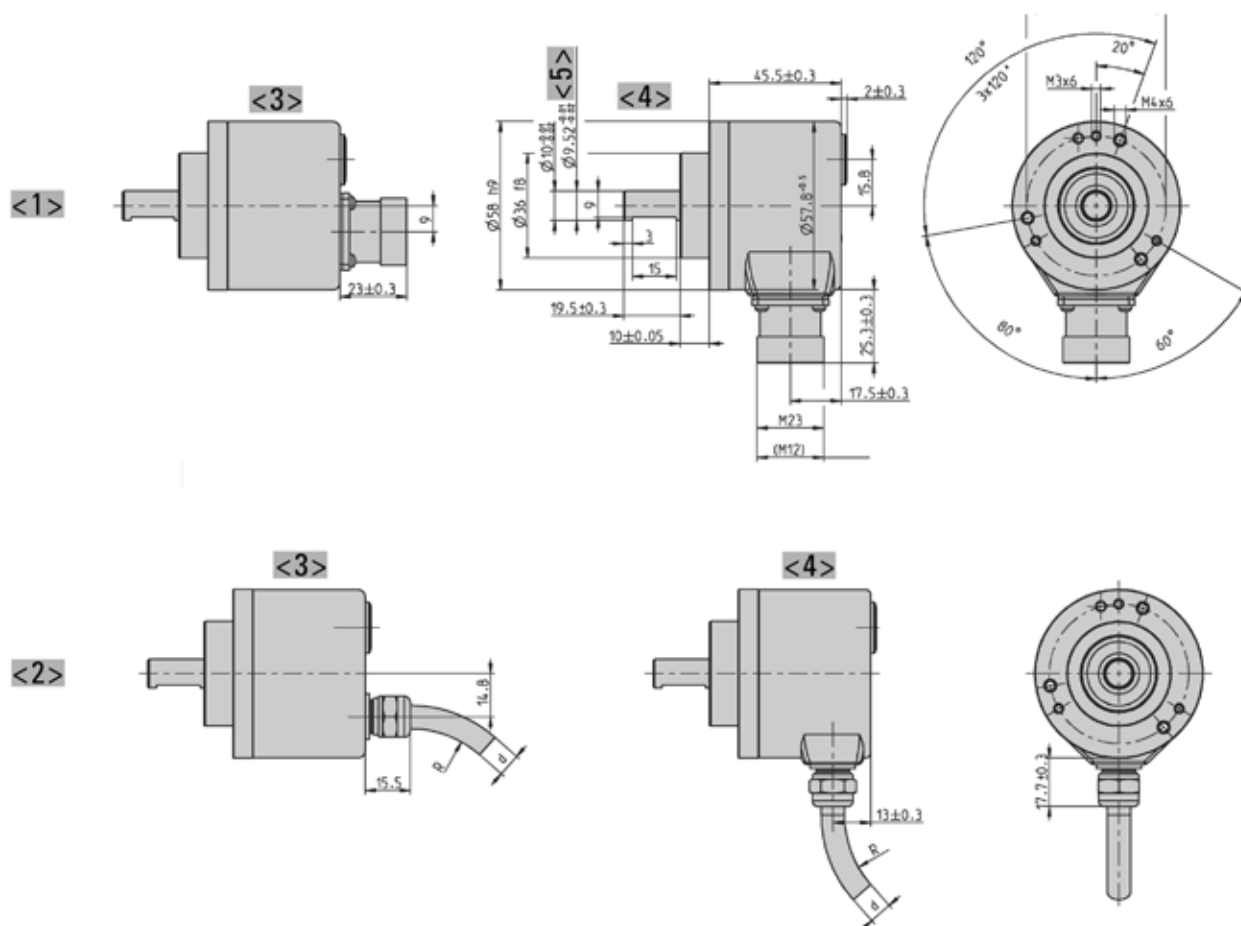
PIN	Color	Signal
1	brown	0 V (supply)
2	pink	data
3	yellow	clock
4	white/ green	A+
5	blue	direction
6	red/ blue	B+
7	brown/ green	A-
8	white	DC 5/ 10-30 V
9	grey/ pink	B-
10	grey	$\overline{\text{data}}$
11	green	$\overline{\text{clock}}$
12	red	preset
screen	screen	screen

## TECHNICAL DATASHEET

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#### DIMENSIONED DRAWINGS

##### Clampina flange "K"



- <1> Connection M23 (Conin)
- <2> Connection cable
- <3> axial
- <4> radial

- <5> alternative
- Cable bending radius R for flexible installation  $\geq 15 \times$  cable diameter
- Cable bending radius R for fixed installation  $\geq 7.5 \times$  cable diameter
- Cable  $\varnothing d : 7,1^{+1,2}$
- Dimensions in mm

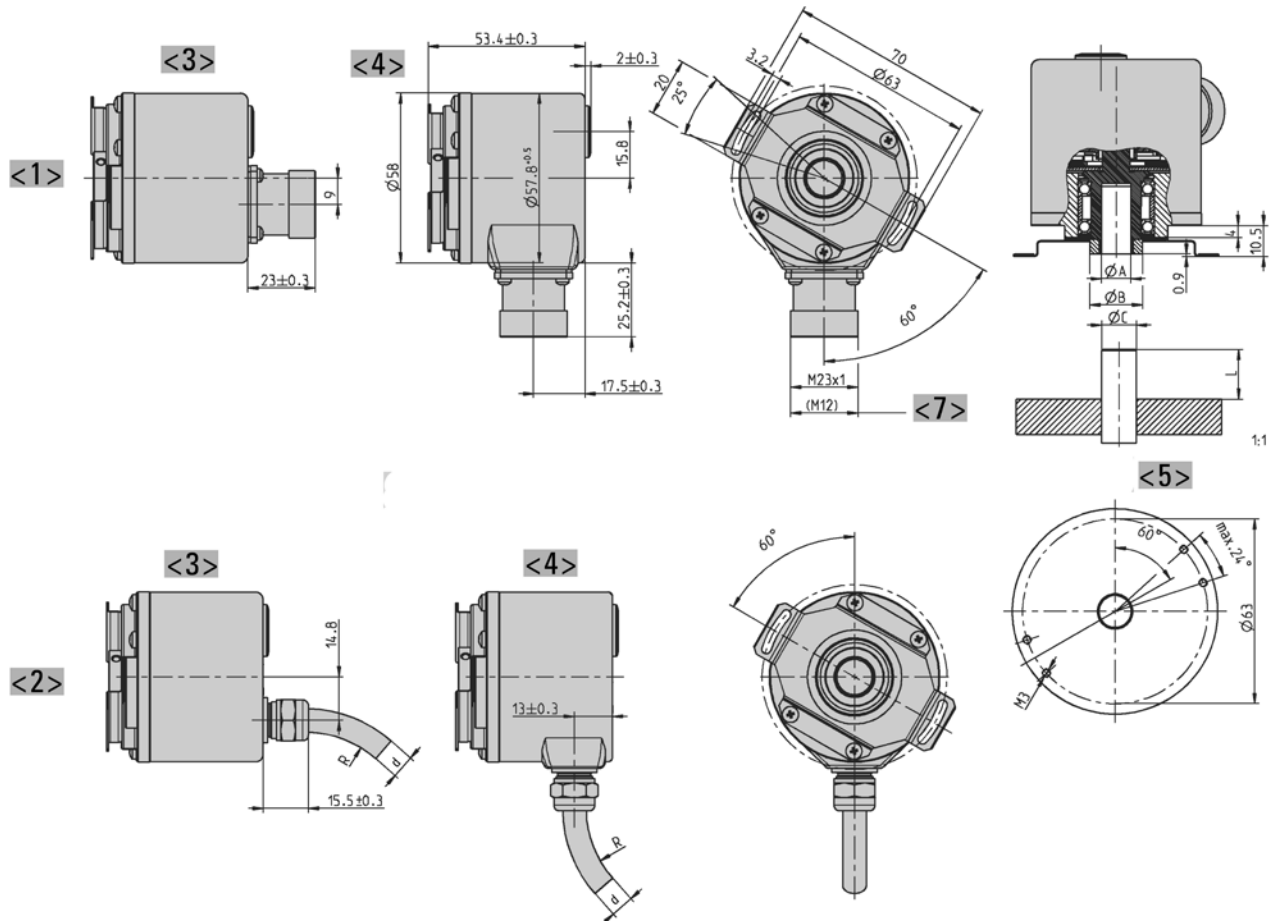
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#### DIMENSIONED DRAWINGS (continued)

##### Hollow shaft "F"



- <1> Connection M23 (Conin)
- <2> Connection cable
- <3> axial
- <4> radial

- <5> Customer side
- Cable bending radius R for flexible installation  $\geq 15 \times$  cable diameter
- Cable bending radius R for fixed installation  $\geq 7.5 \times$  cable diameter
- Cable  $\varnothing d : 7,1^{+1,2}$
- Dimensions in mm

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#### ORDERING INFORMATION

Type	Resolution	Supply voltage	Flange, Protection, Shaft <sup>2</sup>	Interface	Connection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>AC58I</b>	<b>1212</b> 12 Bit MT + 12 Bit ST <b>1213</b> 12 Bit MT + 13 Bit ST <b>1214</b> 12 Bit MT + 14 Bit ST <b>1217</b> 12 Bit MT + 17 Bit ST	<b>E</b> DC 10 - 30 V	<b>K.42</b> Clamping, IP64, 10 mm <b>K.47</b> Clamping, IP64, 12 mm <b>F.42</b> Spring tether, IP64, hubshaft 10 mm, mounting with clamping ring front <b>F.47</b> Spring tether, IP64, hubshaft 12 mm, mounting with clamping ring front	<b>SM</b> SSI Grey + 512 ppr, push pull complementary <b>SN</b> SSI Grey + 1024 ppr, push pull complementary <b>SO</b> SSI Grey + 2048 ppr, push pull complementary	<b>C</b> M23 connector (Conin), 12 pole, axial, cw <b>D</b> M23 connector (Conin), 12 pole, radial, cw <b>G</b> M23 connector (Conin), 12 pole, axial, ccw <b>H</b> M23 connector (Conin), 12 pole, radial, ccw <b>A</b> Cable, axial, 1.5 m <b>B</b> Cable, radial, 1.5m