TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel



Version AC 59 with cable outlet



Version AC 61 with bus cover

- Compact design
- Protection class IP67
- High corrosion resistance
- Robust design
- Resolution up to 26 Bit (14 Bit ST, 12 Bit MT)
- Gray or Binary code
- Encoder monitoring
- Output Tristate short circuit-proof
- Applications: packaging machine for food and beverage, ship equipment (e.g. cranes, winches, cable laying ships), offshore applications

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GENERAL INFORMATION

The absolute stainless steel encoders with parallel interface are available in the Versions AC 59 and AC 61.

- AC 59: drawn stainless steel housing, only together with Singleturn
- AC 61: machined housing

TECHNICAL DATA
mechanical

Housing diameter	AC 59: 58 mm AC 61: 61.5 mm
Shaft diameter	9.52 mm / 10 mm (Solid shaft)
Flange (Mounting of housing)	Square flange 63.5 mm
Protection class shaft input (EN 60529)	IP67
Protection class housing (EN 60529)	IP67
Shaft load axial / radial	40 N / 60 N
Max. speed	max. 6000 rpm (continuous), max. 10 000 rpm (short term)
Torque	≤ 1 Ncm
Moment of inertia	approx. 20 gcm²
Vibration resistance (DIN EN 60068-2-6)	100 m/s² (10 ... 500 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s² (6 ms)
Operating temperature	-40 °C ... +100 °C
Storage temperature	-40 °C ... +85 °C
Material shaft	Stainless Steel
Material housing	Stainless Steel
Weight	AC 59: approx. 700 g with 1.5 m cable AC 61: approx. 980 g with 1.5 m cable

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TECHNICAL DATA mechanical (continued)

Connection	Cable, axial or radial

TECHNICAL DATA electrical

Supply voltage	DC 10-30 V On request: DC 5 V
Max. current w/o load	200 mA (ST), 300 mA (MT)
Resolution singleturn	10 - 14 Bit Gray Excess: 360, 720 increments
Resolution multiturn	12 Bit
Output code	Binary, Gray, Gray Excess
Linearity	± ½ LSB
Output current	30 mA per Bit, short-circuit-proof
Control inputs	$\overline{\text{Latch}}$, $\overline{\text{Direction}}$, $\overline{\text{Tristate}}$ with ST, Tristate with MT
Alarm output	NPN-O.C., max. 5 mA
Status LED	Green = ok, red = alarm

Note: preset key only with MT (IP64), preset value = 0

Data output level

Supply voltage U_B	DC 5 V - 5 % +10 % [1]	DC 10 - 30 V
Output level High	≥ 3.5 V (30 mA) ≥ 3.9 V (10 mA)	≥ U_B -2.2 V (30 mA) ≥ U_B -1.8 V (10 mA)
Output level Low	≤ 1.6 V (30 mA) ≤ 1.2 V (10 mA)	≤ 1.6 V (30 mA) ≤ 1.2 V (10 mA)
Rise time (1.5 m Cable)	≤ 0.1 µs	≤ 0.2 µs
Drop time (1.5 m Cable)	≤ 0.05 µs	≤ 0.1 µs

[1] on request

Control inputs

Input	Level logical (physical)	Function
$\overline{\text{Direction}}$	1 (+ U_B or open) 0 (0 V)	ascending code values when turning clockwise (cw) descending code values when turning clockwise (cw)
$\overline{\text{Latch}}$	1 (+ U_B or open) 0 (0 V)	encoder data continuously changing at output encoder data stored and constant at output
$\overline{\text{Tristate}}$ (with singleturn)	1 (+ U_B or open) 0 (0 V)	outputs active outputs at high impedance (Tristate mode)
Tristate (with multiturn)	1 (+ U_B) 0 (0 V or open)	outputs at high impedance (Tristate mode) outputs active

Typical actuating delay time 10 µs with push-pull selection; when selected via O.C., an external pull-down resistor (1 KΩ) is required

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Stainless Steel Encoders AC 59 / 61 - Parallel

ELECTRICAL CONNECTIONS
Singleturn, cable

Colour (PVC)	9 Bit / 360 incr.	10 Bit / 720 incr.	12 Bit	13 Bit	14 Bit
grey/pink	N.C.	N.C.	N.C.	N.C.	S0 (LSB)
brown/yellow	N.C.	N.C.	N.C.	S0 (LSB)	S1
brown/grey	N.C.	N.C.	S0 (LSB)	S1	S2
red/blue	N.C.	N.C.	S1	S2	S3
violet	N.C.	S0 (LSB)	S2	S3	S4
white/brown	S0 (LSB)	S1	S3	S4	S5
white/green	S1	S2	S4	S5	S6
white/yellow	S2	S3	S5	S6	S7
white/grey	S3	S4	S6	S7	S8
white/pink	S4	S5	S7	S8	S9
white/blue	S5	S6	S8	S9	S10
white/red	S6	S7	S9	S10	S11
white/black	S7	S8	S10	S11	S12
brown/green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
yellow	$\overline{\text{Tristate}}$ S0...S8	$\overline{\text{Tristate}}$ S0...S9	$\overline{\text{Tristate}}$ S0...S11	$\overline{\text{Tristate}}$ S0...S12	$\overline{\text{Tristate}}$ S0...S13
pink	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$
green	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$
black	0 V	0 V	0 V	0 V	0 V
red	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V
brown	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

ELECTRICAL CONNECTIONS
Multiturn, cable (only AC 61 - Parallel)

Cable (TPE)	10 cm cable with Sub-D connector, 37 pole			Cable (TPE)	10 cm cable with Sub-D connector, 37 pole	
Colour	**Pin**	**Connection**		**Colour**	**Pin**	**Connection**
brown	2	S0		white/blue	14	M4 [1]
green	21	S1		brown/blue	33	M5 [1]
yellow	3	S2		white/red	15	M6 [1]
grey	22	S3		brown/red	34	M7 [1]
pink	4	S4		white/black	16	M8 [2]
violet	23	S5		brown/black	35	M9 [2]
grey/pink	5	S6		grey/green	17	M10 [2]
red/blue	24	S7		yellow/grey	36	M11 [2]
white/green	6	S8		pink/green	18	$\overline{\text{Alarm}}$
brown/green	25	S9		yellow/pink	10	$\overline{\text{Direction}}$
white/yellow	7	S10		green/blue	30	$\overline{\text{Latch}}$
yellow/brown	26	S11		yellow/blue	12	Tristate
white/grey	8	M0		red (0.5mm ^{2})	13	DC 10-30 V
grey/brown	27	M1		white (0.5mm ^{2})	31	DC 10-30 V
white/pink	9	M2		blue (0.5mm ^{2})	1	0 V
pink/brown	28	M3		black (0.5mm ^{2})	20	0 V

[1] N. C. with resolution 16 Bit (4 Bit MT)

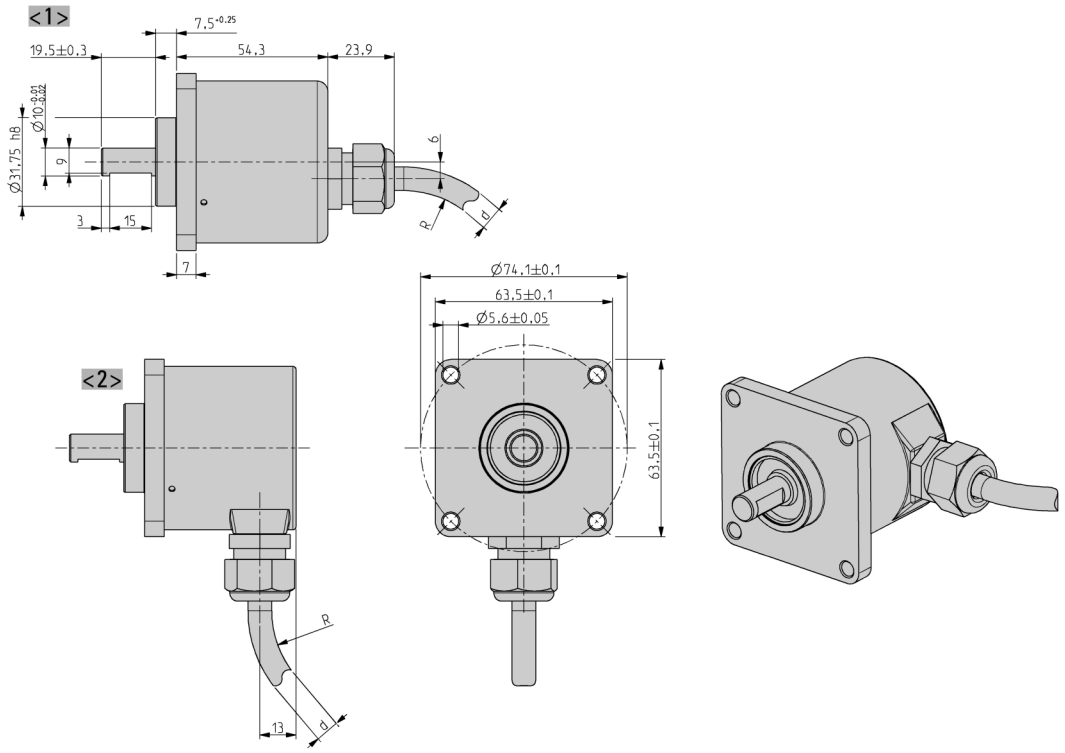
[2] N. C. with resolution 16 Bit or 20 Bit (4 or 8 Bit MT)

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

DIMENSIONED DRAWINGS

AC 59 Connection cable "A"/ "B"
Dimensions in mm



<1> Connection cable "A"
<2> Connection cable "B"
Cable bending radius R for flexible installation ≥ 15 x cable diameter

Cable bending radius R for fixed installation ≥ 7.5 x cable diameter
Cable Ø d BiSS/SSI/SSI-P: 7,1 +1,2
Cable Ø d ST-P: 7,8 +0,9

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

ORDERING INFORMATION

Type	Resolution [1,2,3]	Supply voltage	Flange, Protection, Shaft	Interface	Connection
☐	☐	☐	☐	☐	☐
AC59 **AC61**	**0010** 10 Bit ST **0012** 12 Bit ST **0013** 13 Bit ST **0014** 14 Bit ST **0017** 17 Bit ST **0360** 360 increments ST **0720** 720 increments ST **0412** 4 Bit MT + 12 Bit ST (AC 61) **0812** 8 Bit MT + 12 Bit ST (AC 61) **1212** 12 Bit MT + 12 Bit ST (AC 61)	**A** DC 5 V **E** DC 10 - 30 V	**Q.76** Square, IP67, 9.52 mm **Q.72** Square, IP67, 10 mm	**PB** Parallel binary **PG** Parallel Gray	**A** Cable, axial **B** Cable, radial

[1] Resolution 360 increments ST with Offset 76 (value range 76...435)
[2] Resolution 720 increments ST with Offset 152 (value range 152...871)
[3] AC59 only with ST (only AC 59)

ORDERING INFORMATION
Selection of cable length

Versions with cable outlet (connection A, B, E or F) 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. Further cable lengths on request.

Code	Cable length
without code	1.5 m
-D0	3 m
-F0	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel Accessories

FLEXIBLE COUPLINGS



Bellows coupling



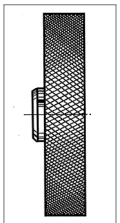
Helical coupling



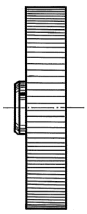
Isolated disk coupling

		Ordering code
Bellows coupling	10 mm / 10 mm	3 520 037
Bellows coupling	8 mm / 10 mm	3 520 077
Helical coupling 25/32	6 mm / 10 mm	3 520 066
Helical coupling 25/32	10 mm / 12 mm	3 520 065
Helical coupling 25/32	10 mm / 10 mm	3 520 074
Isolated disk coupling	6 mm / 10 mm	3 520 082
Isolated disk coupling	10 mm / 10 mm	3 520 088

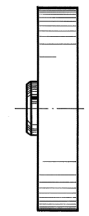
MEASURING WHEELS



Tread 2 + 3



Tread 4



Tread 6

Tread 2 B
with glued-on rubber profile B = low-wear rubber surface with good grip (white)
Applications such as paper and cardboard, measuring cables, nongreasy metals, fleece, undressed or surface-treated wood, soft and hard plastics

Tread 3
vulcanized rubber surface with parallel knurl
Applications such as rubber, leather, fabrics, flooring and glass

Tread 4
Aluminum with parallel knurl
Applications such as rubber, soft plastics, wood with rough surface, and to a limited extent for fabrics

Tread 6
plastic surface
Applications such as wire, greasy metals and steel sections

Material	Bore diameter (mm) fitting to encoder shaft	Circumference	Tread	Width of bearing surface	Ordering code
Aluminum	10 mm	0.2 m	2 B	12 mm	0 601 049
Aluminum	10 mm	0.5 m	2 B	25 mm	0 601 151
Aluminum	10 mm	0.5 m	3	25 mm	0 601 156
Aluminum	12 mm	0.5 m	3	25 mm	0 601 159
Aluminum	10 mm	0.5 m	6	25 mm	0 601 163
Aluminum	10 mm	0.5 yd	4	25 mm	0 601 157

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