



Synchro flange

- Compact design: 50 mm length for single or multi turn
- Aids for start up and operation: diagnostic LED, preset key with optical response, status information
- Interfaces: Standard SSI, expanded SSI mode, parallel interface or BiSS
- Use of sine / cosine signals for fast control tasks possible



Hollow shaft

TECHNICAL DATA mechanical

Housing diameter	58 mm
Protection shaft input	IP 64 or IP 67
Protection housing	IP 67
Flange	Synchro flange, clamping flange, spring plate
Shaft diameter	Full shaft 6 mm, 10 mm; hollow shaft 10 mm, 12 mm
Max. speed	Continuous: 10,000 min ⁻¹ , short term: 12,000 min ⁻¹
Starting torque	≤ 0.01 Nm
Inertia of rotor	3.8 x 10 ⁻⁶ kgm ²
Spring tether (hollow shaft)	
Tolerance axial	± 1.5 mm
Tolerance radial	± 0.2 mm
Max. shaft load	axial 40 N, radial 60 N Ø 6 mm axial 60 N (13 lbs), radial 110 N (24 lbs) Ø 10 mm axial 107 N (24 lbs), radial 160 N (35 lbs)
Bearing life	1 x 10 ¹⁰ revolutions (typ.) at 35% of full rated shaft load 1 x 10 ⁹ revolutions (typ.) at 75% of full rated shaft load 1 x 10 ⁸ revolutions (typ.) at 100% of full rated shaft load For example 30,000 h at 6,000 RPM
Shock resistance DIN EN 60068-2-27	1,000 m/s ² (6 ms)
Vibration resistance DIN EN 60068-2-6	100 m/s ² (10 ... 2,000 Hz)
Operating temperature	- 40 ... 100 °C
Storage temperature	- 40 ... 85 °C
Weight ST / MT	approx. 350 g / 400 g

TECHNICAL DATA electrical

Supply voltage	10-30 V
Intrinsic current consumption ST/MT	200 mA / 300 mA
Interface	Parallel
Output code	Binary, Gray, Gray Excess
Resolution single turn	10-14 Bit, depend. on version, max. 12 Bit in MT-version, Gray Excess: 360, 720 steps
Resolution multi turn	12 Bit
Linearity	±1/2 LSB
Output current	30 mA per Bit, short-circuit-proof
Alarm output	NPN o.c., max 5 mA
Control inputs	Latch, Direction, Tristate with ST, Tristate with MT
Connection	Cable or flange connector CONIN 17 pole, axial or radial, Sub-D 37 pole

Note: Preset key only with MT

See chapter "Absolute Encoders - Dimensional drawings"

DIMENSIONAL DRAWING

DATA OUTPUT LEVEL

supply voltage U_B	5 VDC \pm 10 %	10 - 30 VDC
output level high	≥ 3.5 V (30 mA)	$\geq U_B - 2.2$ V (30 mA)
	≥ 3.9 V (10 mA)	$\geq U_B - 1.8$ V (10 mA)
output level low	≤ 1.6 V (30 mA)	≤ 1.6 V (30 mA)
	≤ 1.2 V (10 mA)	≤ 1.2 V (10 mA)
rise time (1.5 m cable)	≤ 0.1 μ s	≤ 0.2 μ s
drop time (1.5 m cable)	≤ 0.05 μ s	≤ 0.1 μ s

Control inputs ¹⁾:

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

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

CONNECTION DIAGRAM SINGLETURN, CABLE

Parallel interface with cable:					
Colour (PVC)	9 Bit/360 pulses	10 Bit/720 pulses	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	$\overline{\text{Latch (only binary)}}$	$\overline{\text{Latch (only binary)}}$	$\overline{\text{Latch (only binary)}}$	$\overline{\text{Latch (only binary)}}$	$\overline{\text{Latch (only binary)}}$
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	5 V/10...30 VDC	5 V/10...30 VDC	5 V/10...30 VDC	5V/10...30 VDC	5 V/10...30 VDC
brown	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$

CONNECTION DIAGRAM SINGLETURN, FLANGE CONNECTOR

Parallel interface with flange connector, 17 pole (Conin):					
Pin	9 Bit/360pulses	10 Bit/720 pulses	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S12 (MSB)	S13 (MSB)
2	S1	S1	S1	S11	S12
3	S2	S2	S2	S10	S11
4	S3	S3	S3	S9	S10
5	S4	S4	S4	S8	S9
6	S5	S5	S5	S7	S8
7	S6	S6	S6	S6	S7
8	S7	S7	S7	S5	S6
9	S8 (MSB)	S8	S8	S4	S5
10	N.C.	S9 (MSB)	S9	S3	S4
11	N.C.	N.C.	S10	S2	S3
12	$\overline{\text{Tristate S0...S8}}$	$\overline{\text{Tristate S0...S9}}$	S11 (MSB)	S1	S2
13	$\overline{\text{Latch (only binary)}}$	$\overline{\text{Latch (only binary)}}$	$\overline{\text{Latch (only binary)}}$	S0 (LSB)	S1
14	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	S0 (LSB)
15	0 V	0 V	0 V	0V	0 V
16	5 V/10...30 VDC	5 V/10...30 VDC	5 V/10...30 VDC	5V/10...30 VDC	5/10...30VDC
17	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Latch/Alarm}}^1$	$\overline{\text{Latch/Alarm}}^1$

¹⁾ $\overline{\text{Latch}}$ with binary code, $\overline{\text{Alarm}}$ wit Gray code

CONNECTION DIAGRAM CABLE, MULTITURN

Parallel interface					
cable (TPE)	10 cm cable with 37pole Sub-D-plug	cable (TPE)	10 cm cable with 37pole	Sub-D-plug	
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	Alarm
brown/green	25	S9	yellow/pink	10	Direction
white/yellow	7	S10	green/blue	30	Latch
yellow/brown	26	S11	yellow/blue	12	Tristate
white/grey	8	M0	red (0.5 mm ²)	13	10...30 VDC
grey/brown	27	M1	white (0.5 mm ²)	31	10...30 VDC
white/pink	9	M2	blue (0.5 mm ²)	1	0 V
pink/brown	28	M3	black (0.5 mm ²)	20	0 V

¹⁾ N. C. with resolution 16 Bit

²⁾ N. C. with resolution 16 Bit or 20 Bit

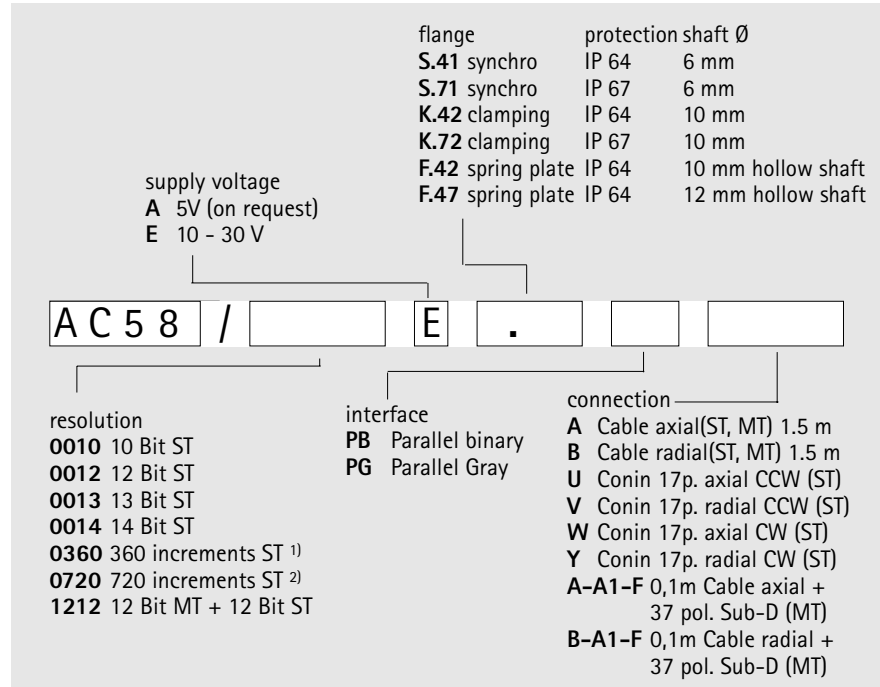
ACCESSORIES

For mounting	Ordering code
Clamping eccentric	0 070 655
Diaphragm coupling (hub diam. 6/6 mm)	3 520 081
Diaphragm coupling (hub diam. 10/10 mm)	3 520 088

DIMENSIONAL DRAWING

ORDERING DATA

See chapter "Absolute Encoders ACURO industry – Dimensional drawings".



Note: max. cable length on encoder=3m. Greater lengths with extension cable.

¹⁾ with Offset 76- or Gray Excess-Code

²⁾ with Offset 152- or Gray Excess-Code