

ABSOLUTE ROTARY ENCODER SSI PROGRAMMABLE



Main Features

- Compact and heavy-duty industrial model
- Interface: Synchronous-serial (RS422/485)
- Housing: 58 mm \varnothing
- Shaft: 6 or 10 mm \varnothing
- Resolution: Max. 25 Bit = 33,554,432 steps over 4,096 revolutions
- Code: Gray / Binary

Programmable Parameters

- Total resolution
- Number of revolutions
- Code output
- Zero-Displacement
- Preset-Value 1
- Preset-Value 2
- Direction of rotation
- Teach In gearing factor

Mechanical Structure

- Flange and housing of Aluminum
- Shaft of stainless steel
- Precision ball bearings with sealing or cover rings
- Code disc made of unbreakable and durable plastic

Electrical Features

- Temperature insensitive IR-opto-receiver-array
- Only one IR-transmitter-diode per opto-array
- Highly integrated circuit in SMD-technology
- Polarity inversion protection
- Over-voltage-peak protection

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Technical Data

Electrical

Clock input	Via opto-couplers
Data input	Line-driver according to RS 485 / RS 422
Clock frequency	100 kHz - 1 MHz
Step frequency LSB	Max. 100 kHz (valid code)
Accuracy of division	$\pm \frac{1}{2}$ LSB
EMC	Certified according to EN 50 081-2, EN 61000-6-2
Supply voltage	10-30 V DC (absolute limits)
Power consumption	Max. 3,8 watt
Electrical lifetime	$> 10^5$ h
Connection	12 pin circular connector

Mechanical Data

Housing	Aluminum	
Lifetime	$> 10^5$ h at 1,000 rpm	
Inertia of rotor	≈ 50 gcm ²	
RPM	Max. 6,000 (continuously)	
Shock (EN 60068-2-27)	≤ 30 g (halfsine, 11 ms)	
Permanent shock (EN 60028-2-29)	≤ 10 g (halfsine, 16 ms)	
Vibration (EN 60068-2-6)	≤ 10 g (10 Hz ... 1,000 Hz)	
Weight, single-turn / multi-turn	≈ 200 g / ≈ 300 g	
Shaft loading	Axial 20 N, radial 110 N	
Friction torque	≤ 5 Ncm	
Flange	Synchro (Y)	Clamp (F), Synchro (Z)
Shaft diameter	6 mm	10 mm
Shaft length	10 mm	20 mm

Environmental Conditions

Operating temperature	0 ... + 70 °C	
Storage temperature	- 40 ... + 85 °C	
Humidity	98 % (without liquid state)	
Protection Class (EN 60529)		
Casing side	IP 65	
Shaft side	IP 65*	* up to 0,5 bar

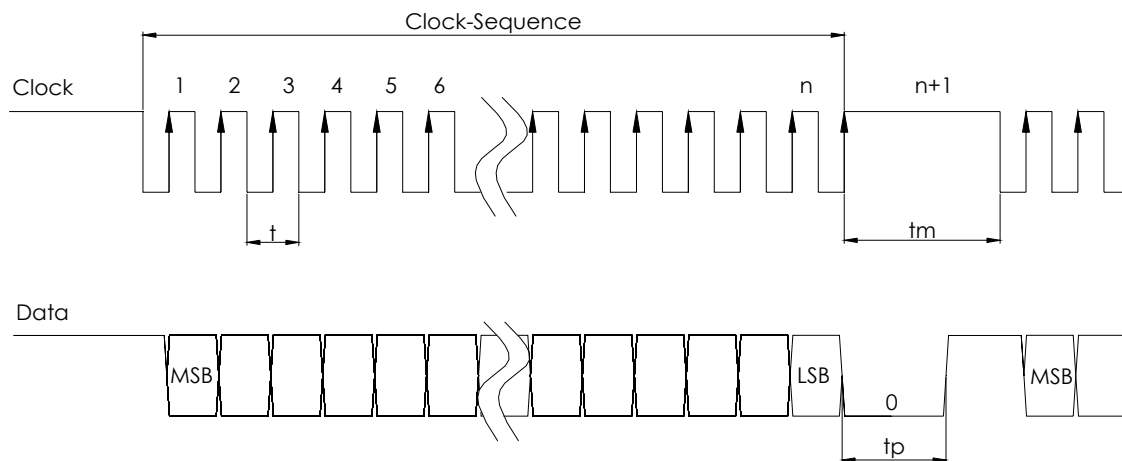
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Interface

Synchronous-Serial Interface (SSI)

Driver	Driver meets EIA standard RS 485 / RS 422; transmission rates up to 10 MBit/s
Transmission	Balanced transmission provides high noise immunity
Twisted pair lines	Shielded and twisted pair lines are essential to attain extremely high noise immunity
Transfer	Transfer distance up to 1,200 m
Interface	For a detailed description of the synchronous-serial interface (SSI) refer to the introduction.
Position value	Position value is right-justified, format for Single-Turn 13Bit/ Multi-Turn 25 Bit

Single Shift

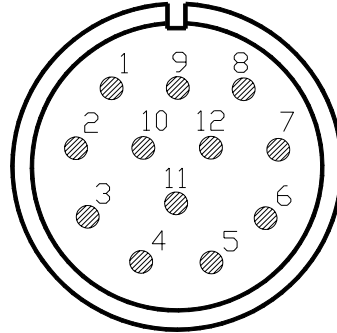


$$t_p < 20\mu s \quad t_m > 20\mu s \quad t < t_m$$

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Electrical Interface

Function	12 pin circular plug Pin	Interface converter
Clock - (Takt -)	1	
Clock + (Takt +)	2	
Data +	3	
Data -	4	
TxD +	5	XMT -
TxD -	6	XMT +
RxD +	7	RCV -
RxD - *1)	8	RCV +
Preset 1	9	
Preset 2 *2)	10	
+ U _p = 10-30 V	11	
GND	12	
Shield	Shielding	



Pinning AWC (Male)

optional: *1) Complement *2) RxD -
Compatible to standard SSI encoder.
No Teach-In mode possible

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Parameter

The programmable encoder AWC 58 can be individually programmed by the user. Thus, the encoder can be quickly adapted to the desired mechanical and electrical requirements. The following parameters can be programmed by the user or optionally pre-programmed by FRABA.

Total Resolution	Number of measuring units over the complete measuring length of the application can be selected to any value between 1 and 33,554,432. Example: Measuring length: 16 meter, desired resolution: millimeters -> parameter input: 16000 measuring units
Resolution per rev.	The resolution per revolution can be selected to any value between 1 and 4,096 (12 Bit) or up to 8,192 (13 bit) steps. Default setting: see encoder label Together with parameter 1 a gearing factor will be calculated in the encoder. This factor is used to deliver the required resolution for the application.
Code	Gray, binary Default setting: Gray, encoder label respectively
Preset 1 and 2	Setting of an arbitrary reference point within the measuring range. By using preset 1 and 2 together it is possible teach the encoder. The gearing factor is calculated automatically.
Direction of rotation	Setting of counting direction at clockwise rotation (as seen on shaft). Default setting: Increasing

The programming of these parameters is done with an ASCII-file. This file is transmitted via the RS 232 interface of a computer (COM1, COM2). Also needed is an interface converter from FRABA. This is connected to pins 5-8 of the encoder.

It is possible to program the encoder with a user interface under MS WINDOWS®. The ASCII file is generated by the user interface

Note: The output of the position value is done right justified!

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Programming

Input of the Programmable Parameters

All with X marked positions have to be replaced by the desired parameters for the application !

All unused positions have to be replaced by the number 0 !

Attention: Only the marked positions (X) may be changed !

This file for programming can be modified with any DOS-editor or programming software to adapt to the individual application !

The programming instructions are written in the user's manual.

```

START                ;Starts programming mode
Project
XXXXXXXXXXXXXXXX      ;Format: 12 ASCII-signs free useable
Date
XX.XX.XX             ;Format: DD.MM.JJ
AXES number
XX                   ;1-99
AXES name
XXXXXXXXXXXXXXXX      ;Format: ASCII signs free useable
Total Resolution
XXXXXXXXXX            ;Input in measuring units
Desired Resolution
XXXXXXXXXX
Physical Resolution
XXXXXXXXXX
Code
X                     ;0=Gray,1=Binary
Preset-Value 1
XXXXXXXXXX            ;Input in measuring units
Preset-Value 2
XXXXXXXXXX            ;Input in measuring units
Direction Of Rotation
X                     ;0=clockwise, 1=counter-clockwise
ParityBit
X                     ;1=EVEN, 0=ODD;2=no output
Position Parity Bit
X                     ;0=beginning;1=end
Offset value
XXXXXXXXXXXXXXXX
END                   ;Finishes programming modus
  
```

*) optional

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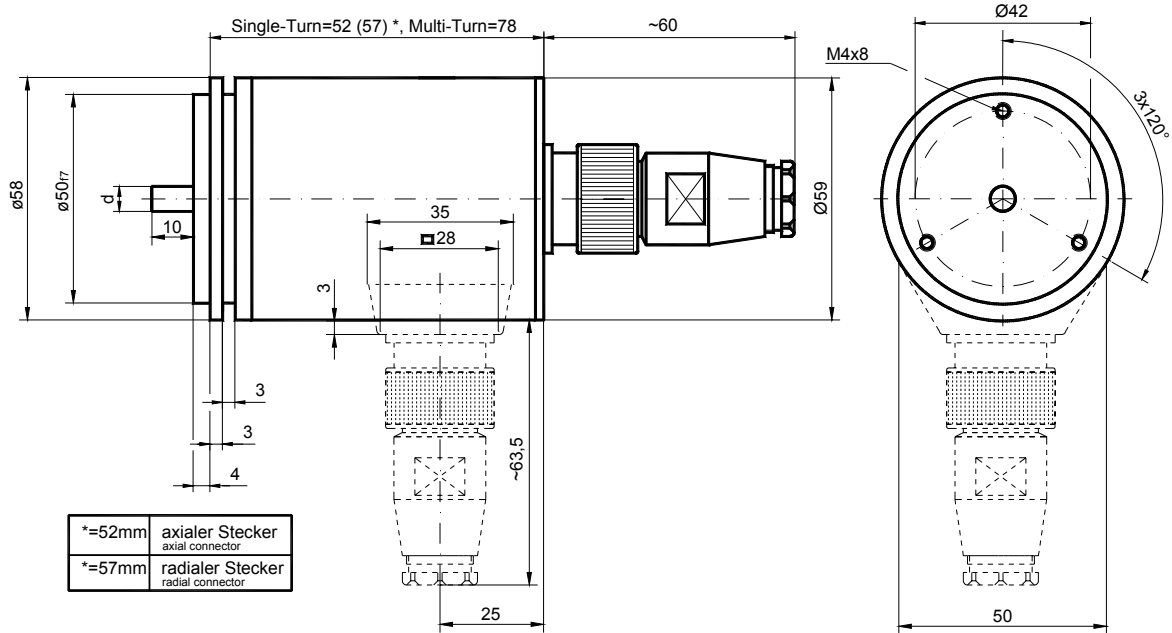
Mechanical Drawings

Synchro Flange (Y,Z)

The only difference between the Y- and Z-Flange is the shaft size (refer to the table besides).

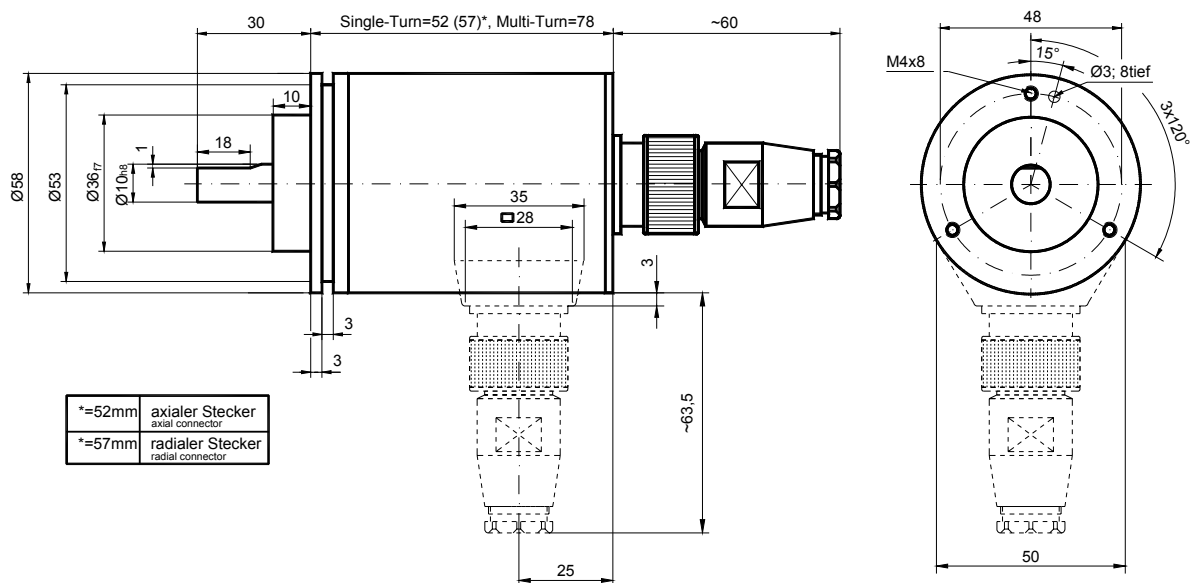
	d [mm]	l [mm]
Y-Flange	6 _{f6}	10
Z-Flange	10 _{h8}	20

12 pin circular connector



Clamp Flange (F)

12 pin circular connector



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Models / Ordering Description

Description	Type Key										
Absolute rotary encoder	AWC 58	G	P	.	SL	
Diameter in mm											
Steps per revolution	4096	12									
	8192	13									
No. of revolutions	1		1								
	4096		4096								
Flange	Clamp (shaft=10 mm)				F						
	Synchro (shaft=6 mm)				Y						
	Synchro (shaft=10 mm)				Z						
Code	Gray				G						
Encoder parameter	Programmable					P					
Programming options	Pre-programmed by FRABA							P			
	Programmable by customer							0			
	Complement input							C			
Interface	Synchronous-serial acc. to RS422/RS485							SL			
Options	Without									0	
	Shaft sealing (not possible for Z-Flange)									W	
	Stainless steel configuration (flange, housing, cap)									Q	
Connection	Connector, axial										1KG
	Connector, radial										1KW

Further models on request.

Accessories and Documentation

Description		Type
Connector, counterpart	Circular connector, 12 pins	1KG
Shaft coupling	Drilling: 10 mm	GS 10
	Drilling: 6 mm	GS 06
Interface converter	Level converter RS232-RS422 to program with PC, 9 pin	WAN 01-9
User software *	Floppy disc with programming software for MS WINDOWS®	DK-SSI
Clamp disc	4 pcs. / AWC	SP 15
Clamp ring	2 pcs. / AWC	SP H
User's manual *	Installation and configuration manual for SSI, English	UME-SSI

* These can be downloaded free of charge at www.posita1.de

We do not assume responsibility for technical inaccuracies or omissions. Specifications are subject to change without notice.