Multiturn absolute encoder

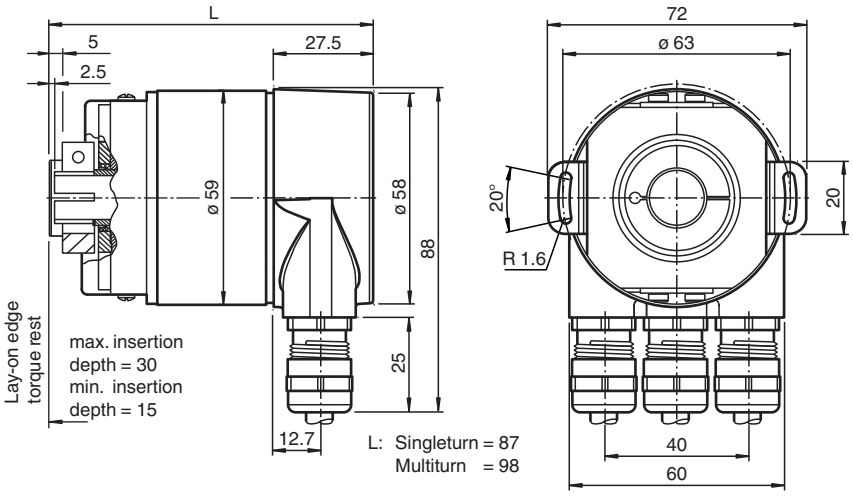
PSM58

- Industrial standard housing Ø58 mm
- PROFIBUS interface
- 30 Bit multiturn
- Speed transfer
- Extended scaling functions
- Programmable limit switches
- Commissioning mode
- Recessed hollow shaft

Function

This series of PROFIBUS rotary encoders is based on the modern fast technology of singleturn sampling and the mechanical gear box of the multiturn unit. The absolute encoder corresponds to the PROFIBUS profile for encoders, order no. 3.062. Operation is supported based on Class 1 and Class 2.
For operation based on Class 1, position data and diagnostic data bytes 1 ... 16 are available. In addition, the direction of the code can be selected as either cw ascending (clockwise rotation, code course ascending) or cw descending (clockwise rotation, code course descending).
If the rotary encoder is operated according to Class 2, additional functions to those from Class 1 are available. These include scaling of the resolution per revolution and the overall resolution, as well as the preset function. In addition, expanded diagnostic reporting is supported.
Besides, the rotary encoder offers extended functionalities such as speed transfer, extended scaling functions, programmable limit switches and a commissioning mode.
The removable connecting hood contains a slide switch for setting the terminating resistor and the rotary switches for setting the address. Assign a fixed address and bus termination to the encoder with this switches.
The absolute encoder is mounted directly onto the application shaft, without any coupling. Rotation of the absolute encoder is prevented by a torque rest.

Dimensions



Technical Data

General specifications		
Detection type		photoelectric sampling
Device type		Multiturn absolute encoder
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
No-load supply current	I_0	max. 230 mA at 10 V DC max. 100 mA at 24 V DC

Release date: 2023-02-14 Date of issue: 2023-02-14 Filename: t49155_eng.pdf

Technical Data

Power consumption	P_0	max. 2.5 W
Time delay before availability	t_v	< 1000 ms
Linearity		± 2 LSB at 16 Bit, ± 1 LSB at 13 Bit, ± 0,5 LSB at 12 Bit
Output code		binary code
Code course (counting direction)		programmable, cw ascending (clockwise rotation, code course ascending) cw descending (clockwise rotation, code course descending)
Interface		
Interface type		PROFIBUS
Resolution		
Single turn		up to 16 Bit
Multiturn		14 Bit
Overall resolution		up to 30 Bit
Transfer rate		0.0096 ... 12 MBit/s
Standard conformity		PNO profile 3.062, RS-485
Connection		
Terminal compartment		in removable housing cover
Standard conformity		
Degree of protection		DIN EN 60529, IP65 IP66 (with shaft seal)
Climatic testing		DIN EN 60068-2-30 , no moisture condensation
Emitted interference		EN 61000-6-4:2007
Noise immunity		EN 61000-6-2:2005
Shock resistance		DIN EN 60068-2-27, 100 *g*, 6 ms
Vibration resistance		DIN EN 60068-2-6, 10 *g*, 10 ... 2000 Hz
Approvals and certificates		
UL approval		cULus Listed, General Purpose, Class 2 Power Source
Ambient conditions		
Operating temperature		-40 ... 85 °C (-40 ... 185 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Material		
Combination 1		housing: powder coated aluminum flange: aluminum shaft: stainless steel
Combination 2 (Inox)		housing: stainless steel flange: stainless steel shaft: stainless steel
Mass		approx. 600 g (combination 1) approx. 1200 g (combination 2)
Rotational speed		max. 12000 min^{-1}
Moment of inertia		30 gcm^2
Starting torque		≤ 3 Ncm (version without shaft seal)
Tightening torque, fastening screws		max. 1.8 Nm
Shaft load		
Angle offset		± 0.9 °
Axial offset		static: ± 0.3 mm, dynamic: ± 0.1 mm
Radial offset		static: ± 0.5 mm, dynamic: ± 0.2 mm

Accessories

	**AH 58-B1CA-2BW**	Connection cover
	**ACC-PACK-ABS-_S_58 ø15**	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 15 mm

Release date: 2023-02-14 Date of issue: 2023-02-14 Filename: t49155_eng.pdf

Accessories

	**ACC-PACK-ABS-_S_58 ø14**	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 14 mm
	**ACC-PACK-ABS-_S_58 ø12**	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 12 mm
	**ACC-PACK-ABS-_S_58 ø10**	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 10 mm

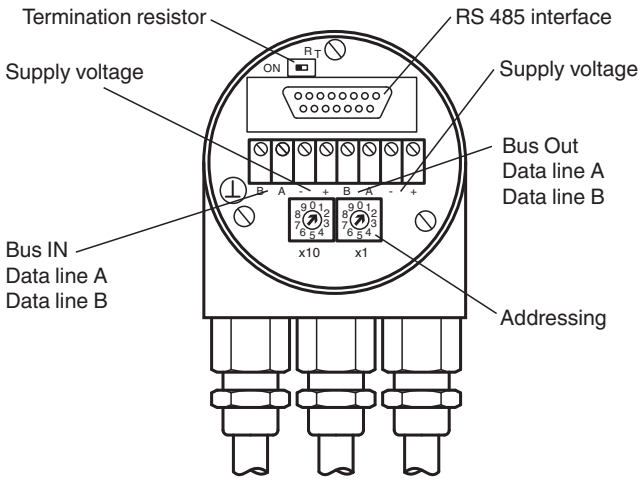
Release date: 2023-02-14 Date of issue: 2023-02-14 Filename: t49155_eng.pdf

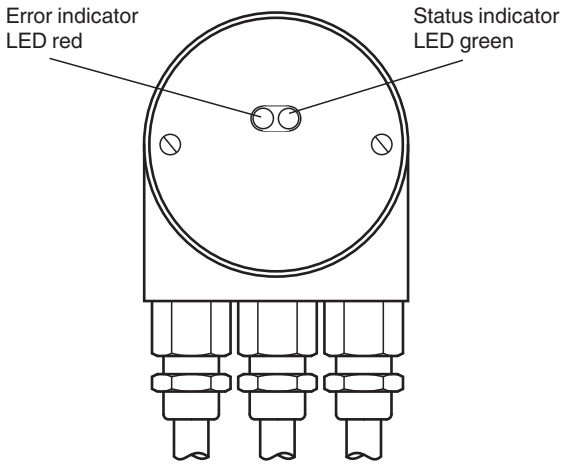
Connection

Terminal	Explanation
⊥	Ground connection for power supply
B (left)	Data line B (pair 1), Bus In
A (left)	Data line A (pair 1), Bus In
(-)	0 V
(+)	10 V ... 30 V
B (right)	Data line B (pair 2), Bus Out
A (right)	Data line A (pair 2), Bus Out
(-)	0 V
(+)	10 V ... 30 V
	The supply lines only have to be connected once (regardless to which terminal). The outgoing bus is being uncoupled while the terminal resistor is on.

The arrangement of the terminals is shown in the section commissioning.

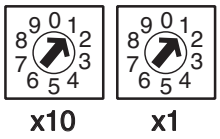
Configuration





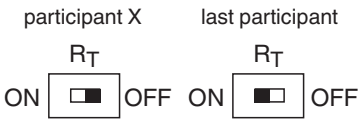
Adjusting the participant address

The participant address can be adjusted with the rotary switches. The address can be defined between 1 and 99, and may only be assigned once.



Adjusting the termination resistor

The terminating resistor R_T (220 Ω) can be connected to the circuit by means of the switch:



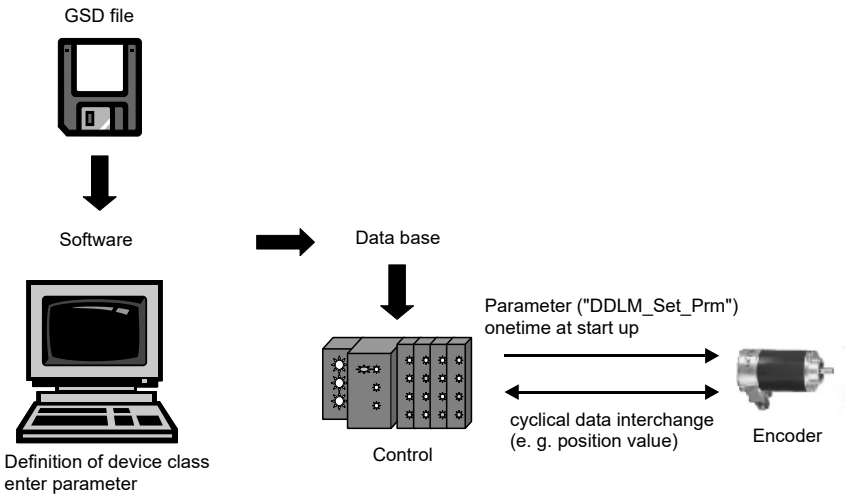
Release date: 2023-02-14 Date of issue: 2023-02-14 Filename: t49155_eng.pdf

ALED-indicators

LED red	LED green	Meaning
off	off	No voltage supply
on	on	Encoder ready, no configuration data received. possible reasons: - wrong address adjusted - wrong bus wiring
on	flashing	Parameterising or configuration error. Encoder receives data of incorrect length or inconsistant data. possible reason: - adjusted encoder resolution exceeds
flashing	on	Encoder ready, no communication with master (i.e. wrong address setting)
on	off	Data timeout (> 40 s). (i.e. data lines interrupted)
off	on	Normal operation, Data Exchange Mode
off	flashing	Installation Mode in Data Exchange Mode.

Function Principle

Principle of data transmission



Parameterization

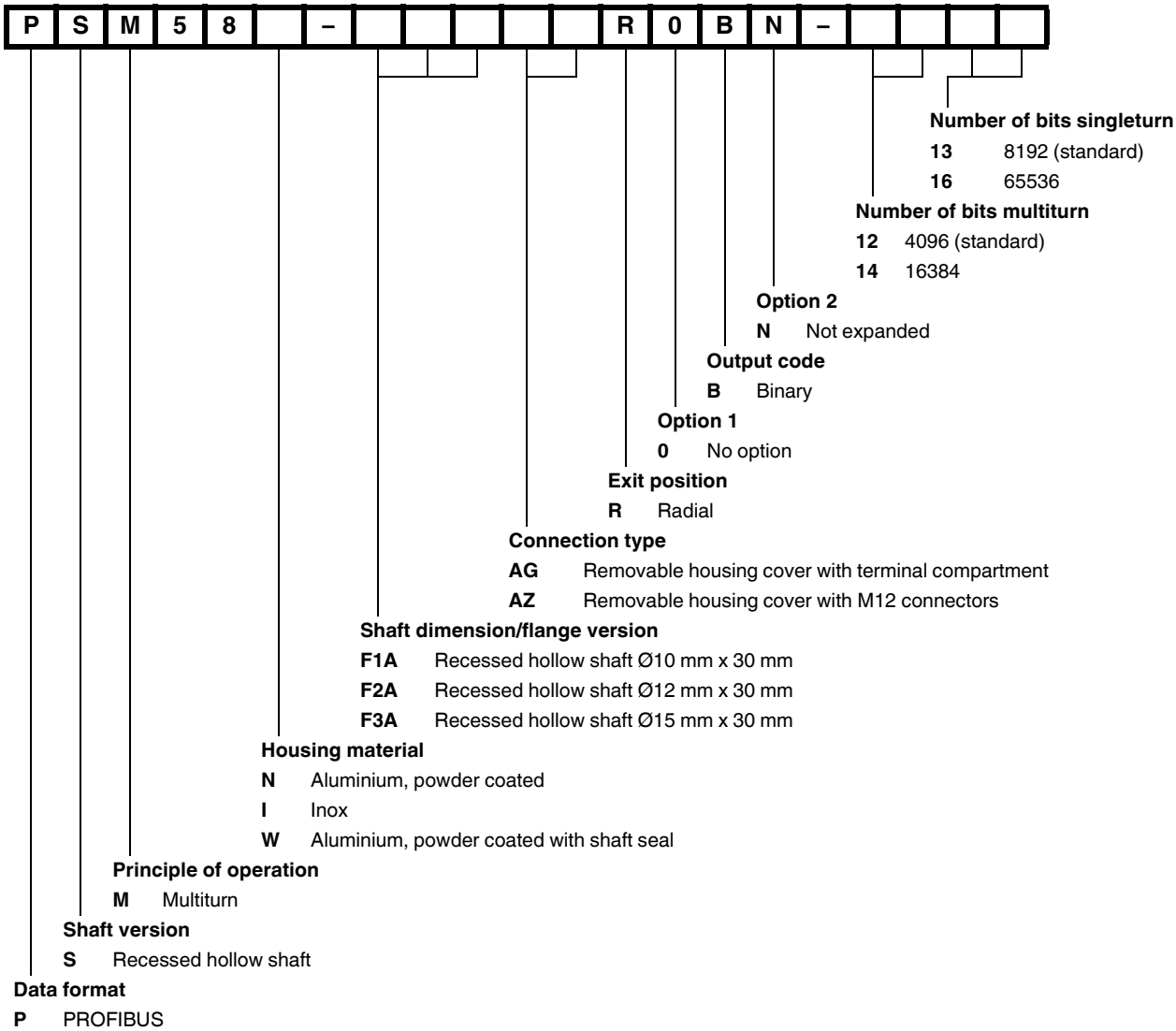
Parameter table encoder classes P+F 2.1 and P+F 2.2

Octet number (Byte)	Parameter	Bit number
1...8	PROFIBUS standard parameters	
9	Direction of rotation	0
	Class 2 functionality	1
	Commissioning Diagnostics	2
	Scaling function	3
	Reserved	4
	Reserved	5
	Activate manufacturer specific parameters (Octet 26)	6
	Reserved	7
10 ... 13	Desired measuring steps (reference: Octet 26, Bit 0 and 1)	
14 ... 17	Overall resolution	
18 ... 25	Reserved	
26	Reference for desired measuring steps	0
		1
	Activate commissioning mode	2
	Reduced diagnosis	3
	Reserved	4
	Activate lower software limit switch	5
	Activate upper software limit switch	6

Release date: 2023-02-14 Date of issue: 2023-02-14 Filename: t49155_eng.pdf

	Activation of the parameters from Octet 27	7
27 ... 30	Lower limit switch	
31 ... 34	Upper limit switch	
35 ... 38	Physical measuring steps	
39	Reserved	0
	Rotary encoder type (singleturn or multiturn)	1
	Reserved	2
	Reserved	3
	Selection of the unit for speed transfer	4
		5
	Reserved	6
	Reserved	7

Type Code



Release date: 2023-02-14 Date of issue: 2023-02-14 Filename: t49155_eng.pdf