

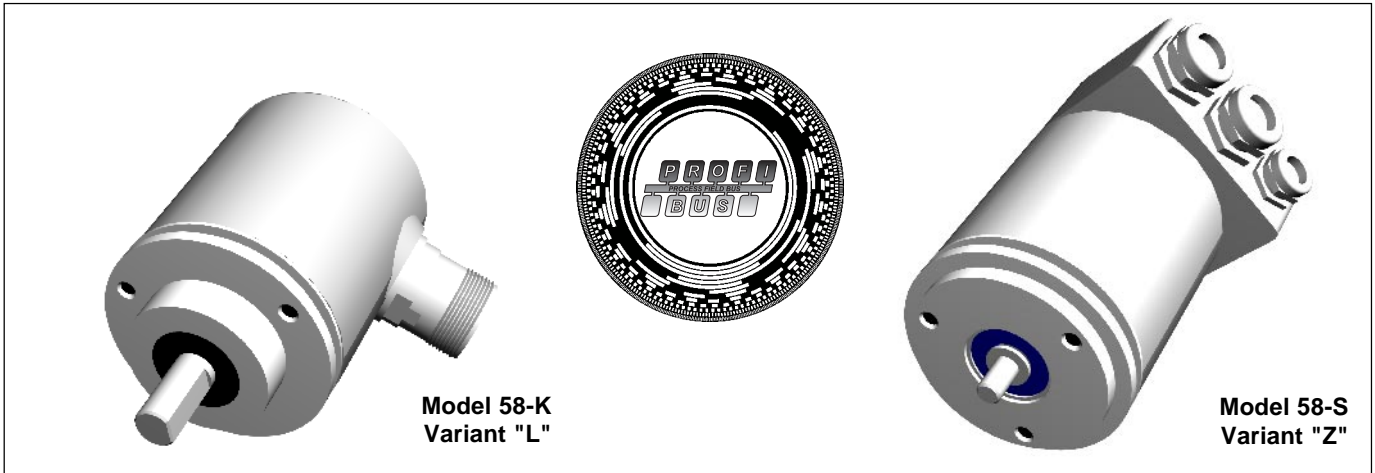
Electro-Optical Absolute Encoders with PROFIBUS-DP-Interface

KRD 10941 FE

KBD 58 and KRD 58 series

01 / 2005

- **Series KBD 58: Singleturn**
Measuring range 360° ✕
- **Series KRD 58: Multiturn**
Measuring range 4096 revolutions
- **Resolutions: 12 to 16 Bits / 360° ✕**
(4096 to 65.536 positions / 360° ✕)
- **Total capacity: 2²⁸ (28 Bits)**
- **Transmission rate: 12 MBaud max.**
- **Option: Preset function**
- **Model 58-S with synchro flange**
Model 58-K with clamping flange
- **Variant "L" with round connector**
Variant "Z" with connecting cap
- **Protection grades: IP 65 or IP 66**



Construction

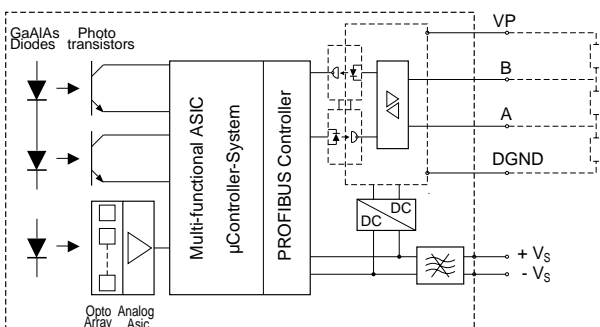
Flange and housing of aluminium - shaft of stainless steel - 12 mm ball-bearings with Nilos ring seal or radial packing ring seal - code disk of deformation resistant plastic - GaAlAs diodes - photo-transistor array with comparator and trigger circuits for long-term stabilization of the sensor systems gate array - SMD technology.

General features and modes of connection

The CRD encoders are designed for connecting directly to PROFIBUS-DP buses as slave stations. The interface is realized with the SPC3 Siemens PROFIBUS controller. The protocol is executed in accordance with *DP-slave class 2* functionality as laid down in *Profibus-Profile for Encoders, No. 3.062* and is described in detail in the user manual KRD 11109.

Compared to the CRD series KBD and KRD items provide additional optional functions, i.e. a 32-Bits velocity signal and short diagnostic functionality.
(For details ref. to table page 4).

Block diagram



Variant L with RS 25 round connector:

- The encoder is connected to the bus with a cable (connector arrangement in accordance with profile description for encoders).
- The default address is changed via the service for changing the station address of a DP slave, namely DDLM_Set_Slave_Add. The bus-termination resistors have to be installed externally.
- For stub connection refer to PROFIBUS-DP / FMS instruction (PNO-order no. 2.111)

Variant Z with connecting cap

(T-coupler functionality with integrated addressing)

This variant is designed for the following connection cables and provides the following functions:

- DIP - switches to set the station address and the termination resistances
- Diagnosis LED's showing ON, SRD, Class and Error
- Preset touch button
- 1 cable for the supply voltage (+ V_s = 24 VDC, - V_s = 0 VDC), PG 7 cable gland
- 1 cable for Bus In (A, B), PG 9 cable gland
- 1 cable for Bus Out (A', B'), PG 9 cable gland
- The station address and bus-termination resistors are set with DIP switches in the connecting cap.

Electrical data

- Sensor system: GaAlAs diodes, photo-transistor array
- Resolution: 65536 positions / 360° max.
- Measuring range: 4096 revolutions
- Total number of positions: KBD: 2¹⁶ (16 Bits)
KRD: 2²⁸ (16 + 12 Bits)
- Output code: Natural binary
- Max. position variance: ≤ 2' 38" at 4096 positions/360°
≤ ±1'59 at 8192 positions/360°
- Code sense: CW or CCW; (programmable)
- Supply voltage range: + 13,5 VDC to + 30 VDC
- Power consumption: P_D ≤ 3,5 W
(Inrush current ≤ 300 mA)
- Interface: Line driver in acc. with RS 485; galvanic separation is achieved with an opto-coupler (data lines A, B). Supply voltage galvanic separation is achieved with DC/DC-converter

- Electromagnetic compatibility (EMC): EN 50081-2, EN 50082-2

Mechanical data

- Operating speed: 6000 rpm max.
- Angular acceleration: 10⁵ rad/s² max.
- Moment of inertia (rotor): 45 gcm²
- Operating torque: ≤ 5 Ncm (8 Ncm - KBD-K, KRD-K)
(at 1000 rpm)
- Starting torque: ≤ 1 Ncm (4 Ncm - KBD-K, KRD-K)
- Permissible shaft load: 40 N axially, 60 N radially
- Bearing life expectancy: 10⁹ revolutions *
- Mass: 0.5 kg with round connector
0.7 kg with connecting cap

* At max. shaft load and working temperature between - 20 °C and + 60 °C. Higher values are permissible with lower shaft loads.

Bus data

- Specification: PROFIBUS-DP, Slave stations SPC3 Siemens PROFIBUS controller
- Data transmission rate: 9.6 kBaud to 12 MBaud
- Station address: 1 to 126, default value: 123; with variant Z the station address is set with DIP switches; with variant L the station address can be changed with the DDLM_Set_Slave_Add service (see README-File on 3.5" - Disc)
- GSD File: in acc. with DIN 19245-3, PROFIBUS-DP
- Diagnosis LEDs¹⁾: U_B (green) - V_s Supply voltage
SRD (green) - SRD
C (green) - Class
Err (red) - Error
- Freeze mode: being supported
- Sync. mode: being supported
- Automatic baud rate search: being supported
- Diagnosis bytes
Class 2: 63 Diagnosis bytes²⁾
Class 1: 16 Diagnosis bytes
- User-Parameter bytes:
Class 2: 22 bytes
Class 1: 2 bytes
- Configuration options: Ref. to table below

¹⁾ True table according connector arrangement supplied with each item.

²⁾ Reduced diagnosis (16 bytes) can be adjusted

Configuration function (DDLM_Chk_Cfg)

Selection	Class	Data	Identifier byte	Comment	Assignment Octet-No. and MSB/LSB
32 Bit In/ Out and 32 Bit Velocity	2	64 Bit In/Output data	F3	KRD, Velocity signal optional	Octet 1/Bit 63: MSB Octet 4/Bit 32: LSB Position value Octet 5/Bit 31: MSB Octet 8/Bit 0: LSB Velocity signal
Class 2 32 Bit In/ Out	2	32 Bit In/ Output data	F1	KRD	Octet 1/Bit 7: MSB Octet 4/Bit 0: LSB
Class 2 16 Bit In/ Out	2	16 Bit In/ Output data	F0	KRD/ KBD	Octet 1/Bit 7: MSB Octet 2/Bit 0: LSB
Class 1 32 Bit In	1	32 Bit Input data	D1	KRD	Octet 1/Bit 7: MSB Octet 4/Bit 0: LSB
Class 1 16 Bit In	1	16 Bit Input data	D0	KRD/ KBD	Octet 1/Bit 7: MSB Octet 2/Bit 0: LSB

Electro-Optical Absolute Encoders **KBD / KRD 58 - S/K**

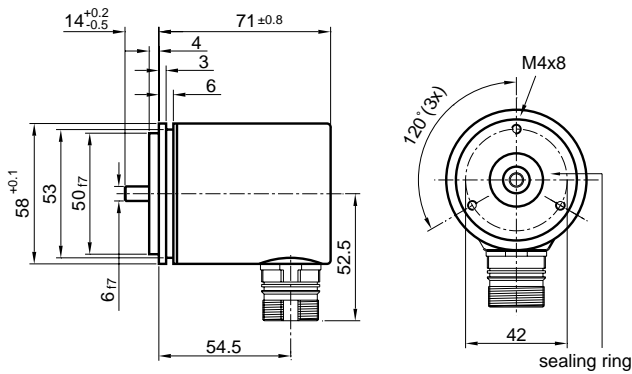
Parameters which can be programmed (via DDLM_Set_Prm / DDLM_Data_Exchange / DDLM_Set_Slave_Add)

	Value range	Description of parameter
Code sense	CW, CCW	Direction of rotation when looking towards the shaft: CW (clockwise), CCW (counter clockwise)
Class 2 functionality	enable / disable	Enable for class 2 functionality
Diagnosis routine	yes / no	Diagnosis routine for the encoder (not supported)
Scaling function	enable / disable	Enable for programming the parameters <i>Resolution and Total number of positions</i>
Velocity signal	unsigned 32	Time base for calculation: 1 ms or 10 ms Velocity signal: steps / 10 ms or steps / 100 ms
Short diagnostic	yes / no	Number of diagnostic bytes: 16 Byte
Resolution: positions per revolution	1 to 65.536 positions per revolution	Resolution (number of positions per revolution)
Total number of positions	1 to 268.435.456	Total number of positions encoder is physically capable of acquiring (28 Bit)
Reference value (DDLMM-Data_Exchange)	0 to (Total number of positions -1)	Value displayed at the reference point
Station address	1 to 126	Identification of the station within the bus network (can only be programmed with variant L via RS 25 connector)

Dimensions in mm (KBD 58 and KRD 58)

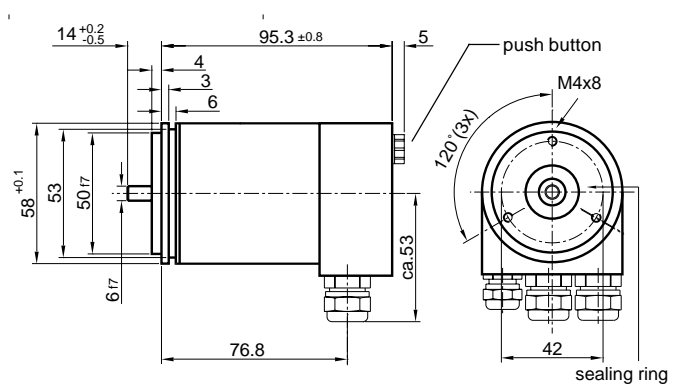
Variante "L" with round connector (12-polig)

Model 58-S with synchro flange

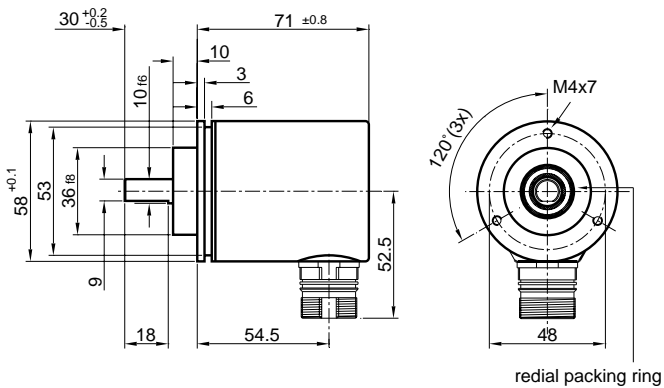


Variant "Z" with connecting cap ZKD

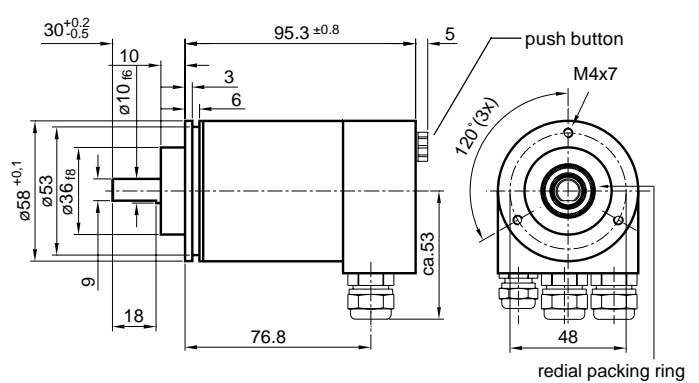
Model 58-S with synchro flange



Model 58-K with clamping flange



Model 58-K with clamping flange



Counter plug STR12GP07 to be ordered separately.

Cap ZKD to be order separately and supplied as a separate item.