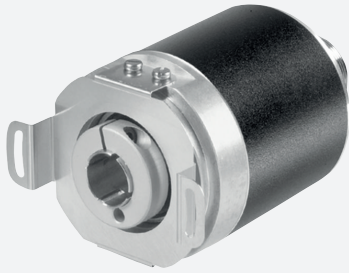


Multiturn absolute encoder

FSM58



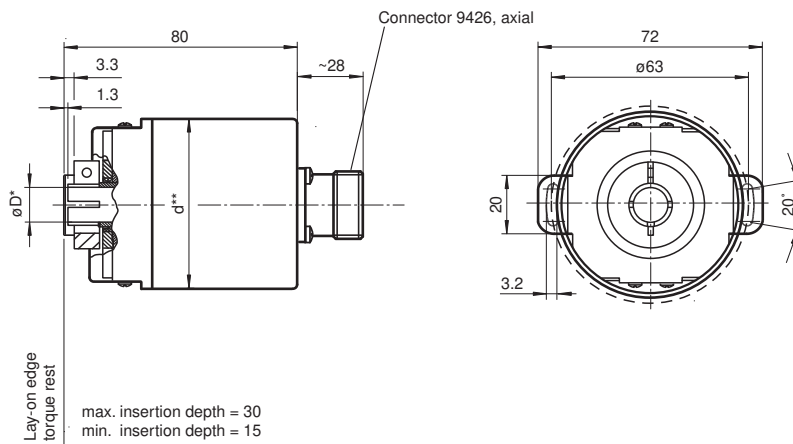
- Industrial standard housing $\varnothing 58$ mm
- 25-bit multiturn
- Output code: gray and binary
- Short-circuit proof push-pull output
- Inputs for selecting counting direction, LATCH, and PRESET
- Code change frequency up to 400 kHz
- Recessed hollow shaft



Function

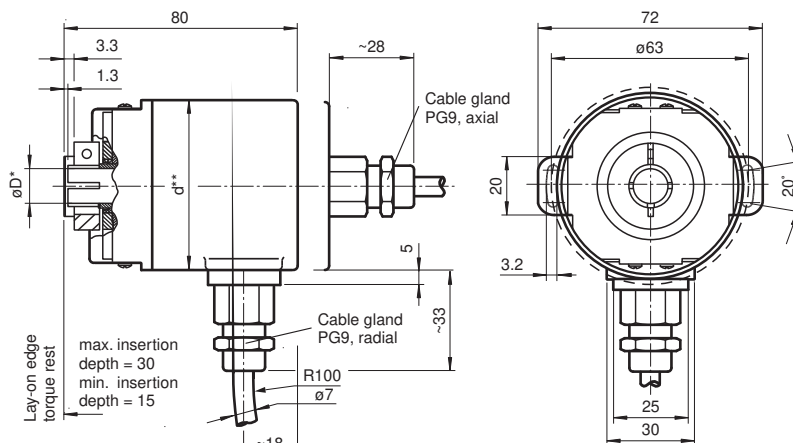
The emphasis for this series is on rapid data transfer. Position data are read directly out of the Gray code disc. The high code switching frequency of 400 kHz is achieved by consciously avoiding the use of a microcontroller. The FSM58 multiturn absolute encoder is equipped with a recessed hollow shaft. The encoder housing has a diameter of 58 mm. The recessed hollow shaft is available with diameters of 10 mm, 12 mm and 15 mm. This version in particular represents a simple and cost-effective mounting solution. The shaft hub connection is already integrated into the rotary encoder. The rotary encoder is held in place by a torque rest.

Dimensions



Recessed hollow shaft

* D = shaft diameter, according to type code
** Aluminium: d = 59, stainless steel: d = 61



Recessed hollow shaft

* D = shaft diameter according to type code
** Aluminium: d = 59, stainless steel: d = 61

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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PEPPERL+FUCHS

Technical Data

| Electrical specifications | | |
|----------------------------------|-------|--|
| Operating voltage | U_B | 10 ... 30 V DC |
| No-load supply current | I_0 | max. 140 mA |
| Power consumption | P_0 | ≤ 2.5 W , without output drivers |
| Linearity | | ± 0.5 LSB |
| Output code | | Gray code, binary code |
| Code course (counting direction) | | cw ascending (clockwise rotation, code course ascending) |
| Code preparation time | | 0.3 ms |
| Interface | | |
| Interface type | | Push-pull, parallel , short-circuit protected |
| Resolution | | |
| Multiturn | | 25 Bit |
| Load current | | 20 mA |
| Voltage drop | | ≤ 2.5 V |
| Signal voltage | | |
| High | | operating voltage minus voltage drop |
| Low | | ≤ 2.8 V |
| Rise time | | 300 ns |
| De-energized delay | | 300 ns |
| Code change frequency | | 400 kHz |
| Input 1 | | |
| Input type | | Selection of counting direction (cw/ccw) |
| Signal voltage | | |
| High | | 10 ... 30 V |
| Low | | 0 ... 2 V |
| Input current | | < 6 mA |
| Signal duration | | min. 10 ms |
| Switch-on delay | | ≥ 1 ms |
| Switch-off delay | | ≥ 1 ms |
| Input 2 | | |
| Input type | | Temporary storage (LATCH) |
| Signal voltage | | |
| High | | 10 ... 30 V |
| Low | | 0 ... 2 V |
| Input current | | < 6 mA |
| Signal duration | | min. 100 μs |
| Switch-on delay | | < 0.1 ms |
| Switch-off delay | | < 0.1 ms |
| Input 3 | | |
| Input type | | zero-set (PRESET) |
| Signal voltage | | |
| High | | 10 ... 30 V |
| Low | | 0 ... 2 V |
| Input current | | < 6 mA |
| Signal duration | | min. 10 ms |
| Switch-on delay | | < 1 ms |
| Connection | | |
| Connector | | type 9426, 26-pin |
| Cable | | Ø9 mm, 15 x 2 x 0.14 mm ² , 2 m |
| Standard conformity | | |
| Degree of protection | | DIN EN 60529, IP65 |
| Climatic testing | | DIN EN 60068-2-3, no moisture condensation |
| Emitted interference | | EN 61000-6-4:2007 |

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 PEPPERL+FUCHS

Technical Data

| | |
|-----------------------------------|---|
| 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) cable models: -30 ... 70 °C (rigid wiring) -5 ... 70 °C (flexible wiring) |
| Storage temperature | -40 ... 85 °C (-40 ... 185 °F) (cable models: -5 ... 70 °C) |
| 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. 400 g (combination 1) approx. 800 g (combination 2) |
| Rotational speed | max. 12000 min ⁻¹ |
| Moment of inertia | 30 gcm ² |
| Starting torque | ≤ 5 Ncm |

Accessories

| | | |
|---|-----------------------------------|---|
|  | 9426 | Female cordset |
|  | ACC-PACK-ABS-_S_58 ø15 | Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 15 mm |
|  | 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 |

Connection

| Signal | Cable Ø9 mm, 30-core | Connector 9426, 26-pin | Explanation |
|---------------------------------|----------------------|------------------------|---|
| GND (rotary encoder) | White | 1 | Power supply |
| U _b (rotary encoder) | Brown | 2 | Power supply |
| Bit 1 | Green | 3 | Data output |
| Bit 2 | Yellow | 4 | Data output |
| Bit 3 | Grey | 5 | Data output |
| Bit 4 | Pink | 6 | Data output |
| Bit 5 | Blue | 7 | Data output |
| Bit 6 | Red | 8 | Data output |
| Bit 7 | Black | 9 | Data output |
| Bit 8 | Violet | 10 | Data output |
| Bit 9 | Grey/Pink | 11 | Data output |
| Bit 10 | Red/Blue | 12 | Data output |
| Bit 11 | White/Green | 13 | Data output |
| Bit 12 | Brown/Green | 14 | Data output |
| Bit 13 | White/Yellow | 15 | Data output |
| Bit 14 | Yellow/Brown | 16 | Data output |
| Bit 15 | White/Grey | 17 | Data output |
| Bit 16 | Grey/Brown | 18 | Data output |
| Bit 17 | White/Pink | 19 | Data output |
| Bit 18 | Pink/Brown | 20 | Data output |
| Bit 19 | White/Blue | 21 | Data output |
| Bit 20 | Brown/Blue | 22 | Data output |
| Bit 21 | White/Red | 23 | Data output |
| Bit 22 | Brown/Red | - | Data output |
| Bit 23 | White/Black | - | Data output |
| Bit 24 | Brown/Black | - | Data output |
| Bit 25 | Pink/Green | - | Data output |
| V/R | Grey/Green | 25 | Input for selection of counting direction |
| Latch | Yellow/Grey | 24 | Temporary storage input |
| PRESET | Yellow/Pink | 26 | Zero setting |
| | | | |

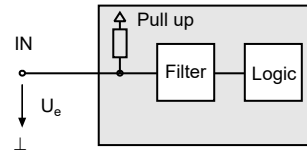
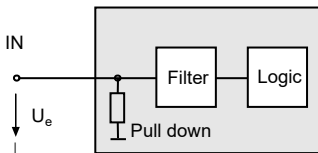
Interface

Inputs

Input for temporary storage (LATCH)
Input zero setting (PRESET)

Input level: "0" 0 V ... 2 V,
"1" 10 V ... 30 V,
I_e < 6 mA

Input for selection of counting direction (V/R)



Input for selection of counting direction (V/R)

The counting direction for the absolute value rotary encoder as seen looking on the shaft is defined as right rotating (cw) rising or descending. The counting direction can be reversed with the V/R input. If the input is not used, the counting direction is defined as rising (standard), the level is at "1". Pulse duration T > 10 ms.

Input level: "1" or unused = rising code value with direction of rotation cw.

Input level: "0" = descending code value for direction of rotation cw.

Input for temporary storage (LATCH)

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With LATCH input "active", the position data on the parallel interface are "frozen". This makes it possible to accept position data without errors (especially for binary position data), since any change in the data during the read procedure is prevented. If this input is unused, its value is "0". Pulse duration $T > 100 \mu s$.

Input level: "1" = position data saved and stable at the output.

Input level: "0" or unused = position data free running at the output.

Input zero setting (PRESET)

By means of the PRESET input, the absolute value rotary encoder can be adjusted electronically to position value 0. Pulse duration $T > 10 ms$.

Input level: "0" or unused = inactive.

Input level: "1" = Data output word is set to 0.

Type Code

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|--|--|--|--|---|---|---|--|--|--|
| F | S | M | 5 | 8 | - | | | | | 3 | N | - | | | |
|---|---|---|---|---|---|--|--|--|--|---|---|---|--|--|--|

Number of bits singleturn*) (resolution)
13 8192

Number of bits multiturn*) (revolutions)
12 4096 (only connection type K2)
08 256

Temperature range
N normal

Output code
B Binary
G Gray

Option 1
3 V/R, LATCH, PRESET

Exit position
A Axial
R Radial

Connection type
K2 Cable Ø9 mm, 15 x 2 x 0.14 mm², 2 m*
AE Plug connector type 9426, 26-pin (only axial)

Shaft dimension/flange version
F1A Recessed hollow shaft Ø10 mm x 30 mm
F2A Recessed hollow shaft Ø12 mm x 30 mm
F3A Recessed hollow shaft Ø15 mm x 30 mm

Housing material
N Aluminium, powder coated
I Inox

Principle of operation
M Multiturn

Shaft version
S Recessed hollow shaft

Data format
F Fast parallel

*) total number of bits (singleturn + multiturn) = 25 (cable version)
total number of bits (singleturn + multiturn) = 21 (plug connector version)

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