

# Absolute rotary encoder CD\_582+FS for PROFINET / PROFI-safe

Functional safety – as small as 58 mm



**Safety  
Integrated**

---

## CD\_582+FS – functional safety in standard industrial form factor



CDH 582+FS  
radial connection



CDV 582+FS  
axial connection

### Technology

- \_ Efficient design
- \_ DIN EN 61508 / DIN EN 62061 (SIL)  
DIN EN ISO 13849 (PL)
- \_ safety validated process data

Everything the application needs – reduce to the max.

CD\_582+FS are developed and certified according the two leading standards for devices providing integrated safety. Most application standards refer to these basic standards and thus CD\_582+FS fits into these applications.

CD582+FS provides safety evaluated process data as absolute position values for connected F-Hosts. The safety protected data channel completely supports the concept of integrated safety. Received and verified input data may be used in a functional safe applications without addl. plausibility check.

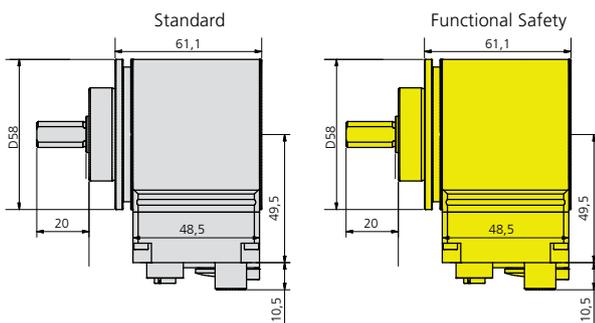


- \_ SIL2/PLd, cat3;
- \_ SIL3/PLe, cat4

- \_ architecture according category 4
- \_ "two encoders in one"

## Mechanics

- \_ Mounting space



- \_ Robust magnetic/optic multiturn rotary encoder CD\_582M+FS

- \_ rugged double magnetic multiturn rotary encoder CD\_582MM+FS



SIL 2 or SIL 3 – use the same mechanical and electrical features with precise the safety level your application needs.

CD\_58+FS was designed with category 4 architecture in focus. That means that you can replace existing solutions with two separate encoders on a common shaft by this one-piece-solution.

CD582+FS uses the same installation space as standard encoders in size 58mm would use. Installation situation can be used as before.

- \_ 13 bit resolution within one revolution (singleturn)
- \_ 16 bit revolutions (multiturn)
- Option, additional interfaces**
- \_ SSI (programmable)
- \_ INC (programmable)
- \_ SIN/COS (1024 steps per turn, non-programmable)

- \_ 13 bit resolution within one revolution (singleturn)
- \_ 16 bit revolutions (multiturn)
- Option, additional interfaces**
- \_ SSI (programmable)

Solid shaft

Blind shaft

Hollow shaft



# C\_\_582 – the next generation: Standard form factor with so many possibilities

- \_ Solid shaft, clamping flange
- Slip-on hollow shaft up to 15 mm
- Hollow-through-shaft up to 15 mm

Safety integrated multiturn rotary encoders are available with solid shaft, blind shaft and hollow through shaft up to 15 mm. Plenty of available flange geometries adapt the encoders perfect into the specific application.

- \_ Shafts with form closure

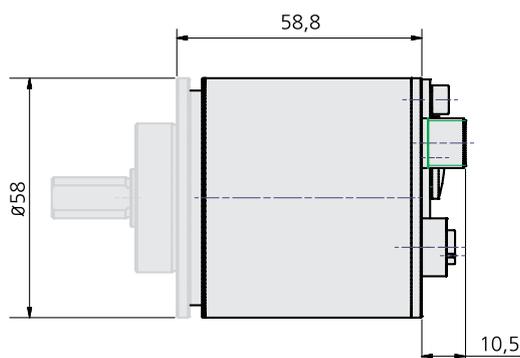
Solid shaft, blind shaft or hollow shafts are connected by form closure (keyway) to the driving shaft.



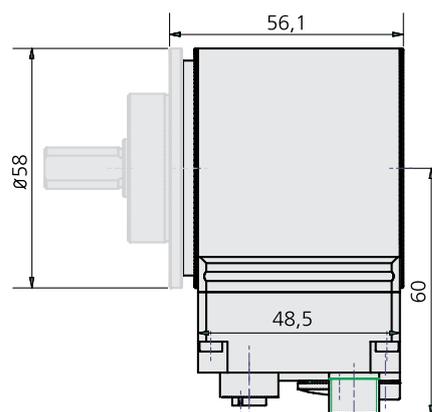
- \_ Connectors axial or radial

Mounting space is valuable. Do not let cabling interfere with other parts and components. For solid and slip-on shafts (blind shaft), you can choose between connectors axial (at the side opposite to the shaft) or radial (at the side of the encoder housing).

Connectors axial



Connectors radial



### \_ protective bearing



CD\_582+FS can be equipped with a rugged bearing unit. This bearing unit handle big forces on the shaft. Application with driving chains or belts are possible.

## Interface

### \_ Parameterizable gearbox

Fractional gearbox parameters (numerator / denominator) for almost any reproduction of gearbox factors. Also for exact detection of closed rotary axes.

### \_ Easy installation with open configuration options

TR absolute rotary encoders fulfill the standards of the respective user organizations for parameterization. Users can thus navigate the standard parameters without difficulty. The free configuration also offers easy access to all functions which are available in addition to the standard functions.

### \_ Speed output with adjustable averaging

The time base for the speed evaluation can be freely set within a range of one millisecond to one second and can also be scaled in any units.

### \_ Alarms and diagnostics

How's about my machine? To know that at any time is one of the core aspects of industry 4.0. Be it capacity utilisation or upcoming services: C\_\_582 provides all necessary alarms and diagnostic messages for long term machine and plant surveillance.

### \_ Latest communication standards for Industry 4.0

The new C\_\_582 generation of industrial standard rotary encoders is rigorously equipped with state-of-the-art chip families.

### \_ Reset switch

CD\_582+FS is equipped with a hardware reset switch. This resets the encoder to delivery state (factory settings) without the use of an engineering system or programming device.

# CD\_582+FS – PROFINET / PROFISafe

## PROFINET / PROFISafe



\_ Update time <1 ms (grey channel),  
<3 ms (safety channel)

Suitable for quick position control with less than 1 ms encoder actual value updating for the bus output.

\_ TCI implementation

TR-Electronic provides a manufacturer specific device tool that links into the TCI-Interface of Siemens engineering systems (e.g. TIA Portal)

\_ Legacy-Mode

CD\_582+FS behaves identically to successful series CD\_75 by setting up in legacy mode. Function blocks that are already in use in existing safety programmes may be re-used without big changes into new projects.

\_ Encoder Profile 4.2

CD\_582+FS EPN fulfils the Profinet Encoder Profile issued by Profibus-International user organisation for both, the grey and the secured data channel.

\_ 32 bit data words

Full resolution in a single telegram – the full bandwidth for position or speed value can be transmitted in a single data word with 32 bit payload.

\_ PROFINET with IRT

PROFINET version uses the most recent standards and technology with long term availability. It is compliant with the current standards of PI user organisation. Synchronisation to the bus clock (IRT) allows precise positioning of multiple axes.

\_ Shared device / grey and safe world

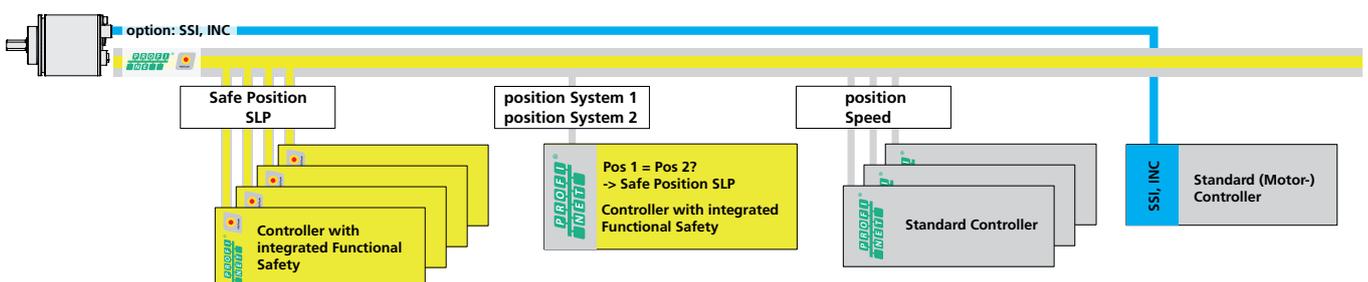
„Grey“ (non safe) position and speed values can be shared independently from one another. CD\_58+FS can provide values the same time to a high speed controller and a safety control system.

\_ Shared Device / up to 4 safety instances

Up to 4 safety controls can establish a secured communication channel to CD\_582+FS. No more need to hand over secured position values from one to the other safety control.

\_ Direct readout of the two encoder channels by bus

For non secured applications, the two detection channels can be read out directly via PROFINET IO. With this technology, you can realize installations with high availability.



\_ PROFISAFE V2.6.1

\_ extended "F-Dest"-address

\_ Reintegration after passivation

\_ "On the fly" preset for adjustment during the process

\_ Neighborhood detection

\_ Fast Startup for quick system availability

\_ Media-Redundancy Protocol for highest reliability

\_ Bus synchronized

CD\_582M+FS implements the basic protocol (BP) and extended Protocol (XP) according to PROFIsafe standard V2.6.1.

Via TC-Integrated application, the user can choose „F-Dest-Addresses (PROFIsafe addressing) in range 1...65536 via software.

After a protocol failure, safety encoders enter a passive state. CD\_582+FS can be reintegrated into safety control mechanism without a global system restart.

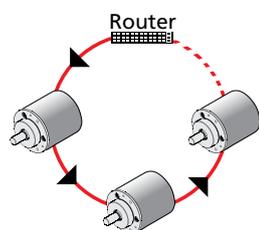
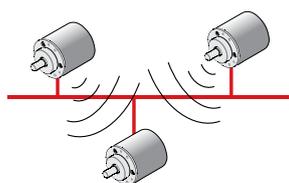
Preset values are transmitted via the real-time capable process image area. This means that absolute adjustments (also called "preset" or "offset adjustment") can be performed synchronously with the control cycle even while the system is in operation. No more axis stops necessary.

With neighborhood detection, you exchange devices without the use of an engineering tool. An encoder that is connected newly to the network can determine his position and function in the network by help of his physical neighbours and then requests the parameter data for this function from the master control.

The new CD\_582M+FS PROFINET starts faster than any other bus rotary encoder. Once configured, a stable, valid absolute position value is available in the PROFINET control just a few instants after restoration of supply. System startup is greatly accelerated and modular machine concepts in particular (with periodically decoupled modules) benefit directly from this technology.\*

One ring for reliability. The PROFINET interface of the CD\_582M+FS supports the innovative Media Redundancy Protocol MRP. Normally PROFINET only supports a linear/tree structure. A redundant connection is not primarily provided as standard. MRP significantly increases availability with one simple device! Branches are connected to a ring with an additional line from the last node to the next switch. The appropriately configured nodes detect this. One of the nodes now disconnects this ring, by "ignoring" the second connection. If a connection fails (due to cable breakage or failure of a node), the nodes detect this and attempt to find another way to the rest of the system. The previously opened connection is now closed and all nodes are reconnected to the network.\*

Position detection of CD\_582M+FS can be synchronized with bus clock. Unwanted dead times and jitter can be reduced to a minimum for perfect position control.



\*CD 582+FS EPN can be set up either for fast startup or media redundancy protocol.

# Configuration

## Safety

- \_ SIL 3 / PL<sub>e</sub> / Kat 4  
Highest achievable safety level for components.
- \_ SIL 2 / PL<sub>d</sub> / Kat 3  
Adapted version for lower safety requirements.

## Detection

- \_ optical / magnetic detection  
13 bit resolution within one revolution (singleturn)  
16 bit revolutions (multiturn)
- \_ magnetic / magnetic detection  
13 bit resolution within one revolution (singleturn)  
16 bit revolutions (multiturn)

## Shaft type

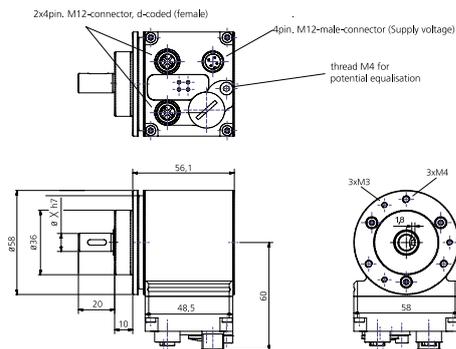
- \_ solid shaft: 10, 12, 14 mm  
with keyway  
Connectors at the side of the encoder  
or at the back side.
- \_ blind shaft: 10, 12, 14, 15 mm  
with partial keyway  
Connectors at the side of the encoder  
or at the back side.
- \_ hollow shaft: 10, 12, 14, 15 mm  
with partial keyway  
Connectors at the back side  
of the encoder.



# Dimensional Drawings

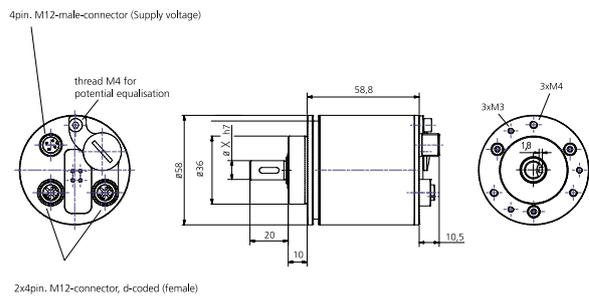
## CDV582+FS RADIAL

Absolute-Encoder CDV582M+FS, CDV582MM+FS



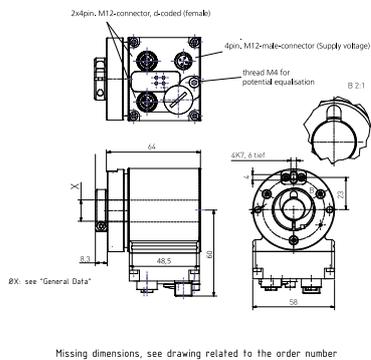
## CDV582+FS AXIAL

Absolute-Encoder CDV582M+FS, CDV582MM+FS



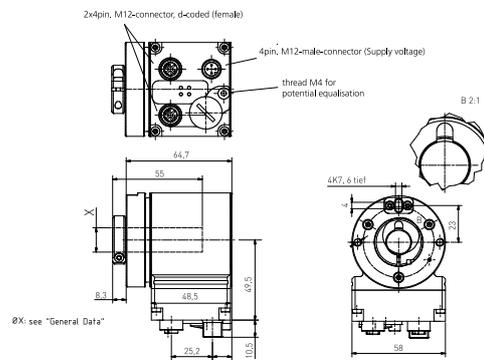
## CDH582+FS RADIAL

Absolute-Encoder CDH582M+FS, CDH582MM+FS



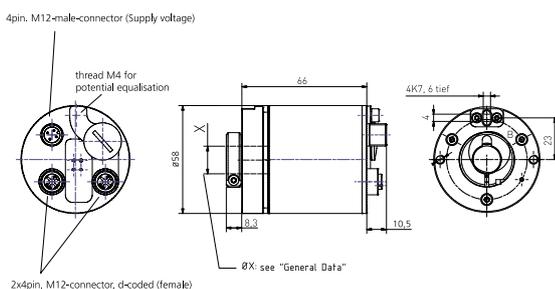
## CDS582+FS RADIAL

Absolute-Encoder CDS582M+FS, CDS582MM+FS



## CDS582+FS AXIAL

Absolute-Encoder CDS582M+FS, CDS582MM+FS



# TR-Electronic – your partner in automation

## Rotary encoders

### Absolute encoder, incremental rotary encoder, wire-actuated encoder

Rotary encoders with optical and magnetic scanning function register the precise position in a wide variety of applications and industries. In medical engineering, miniature versions ensure correct positioning while SIL3-approved absolute rotary encoders provide the necessary safety. We offer not only high-quality rotary encoders (from Ø 22 to 160 mm) for almost any application but also comprehensive accessories.

## Linear encoders

### Linear absolute measuring systems, laser displacement measurement

Linear encoders register linear motions in machines, tools and systems according to specific requirements using different technologies. Linear encoders allow measuring distances of max. 20 m almost without any wear. This value is max. 240 m for laser measuring systems. Machines and systems can be precisely controlled to reach their desired positions.

## Motion

### Compact actuating and positioning drives

Intelligent encoTRive drives are available with the current field bus systems, such as PROFIBUS, PROFINET and CANopen, within a power range of up to 300 watts. The drives are configured to meet customer requirements and can be freely combined with precision gear, holding brake and I/O. Values of up to 4,350 rpm and powerful 200 Nm are available to cope with demanding applications.



## Components

**Industrial PC, field bus I/O,  
PLC, HMI controller**

Industrial PCs are available in numerous variants and offer customized calculation power for PC-assisted automation. Programmable logic controllers (PLC) are the traditional means for automation. HMI controllers establish the interface to the user. Field bus nodes, I/O modules and cam controllers complete the range of automation components.

## Automation

**Consulting and implementation  
for new machines and retrofit**

You want to set up a largely automated new machine or retrofit and modernize your existing machine with automation systems? Then you just need our extensive expert knowledge and the more than 20 years of our experience.

## Unidor

**Blanking and forming,  
systems, controls and sensors**

Trendsetting blanking and forming technology for more than 30 years. We are your reliable partner in the world of blanking and pressing and can prove this with thousands of machines which we have successfully installed all over the world. Sensors, controls and systems ensure optimal results in machines, tools and retrofit projects.



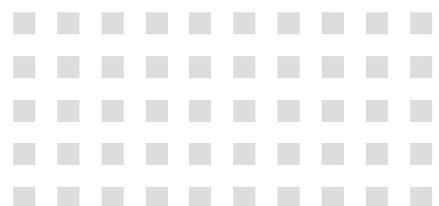
photo background:  
© kraas99/Fotolia.com

**TR-Electronic GmbH**

Eglishalde 6  
D - 78647 Trossingen

Tel. +49 7425 228-0  
Fax +49 7425 228-33

info@tr-electronic.de  
[www.tr-electronic.de](http://www.tr-electronic.de)



Last update: 02/2022

68-105-133 · TR-V-PR-GB-0038-02

Subject to technology and design modifications.

Cover photo background: ©kras99-fotolia.com