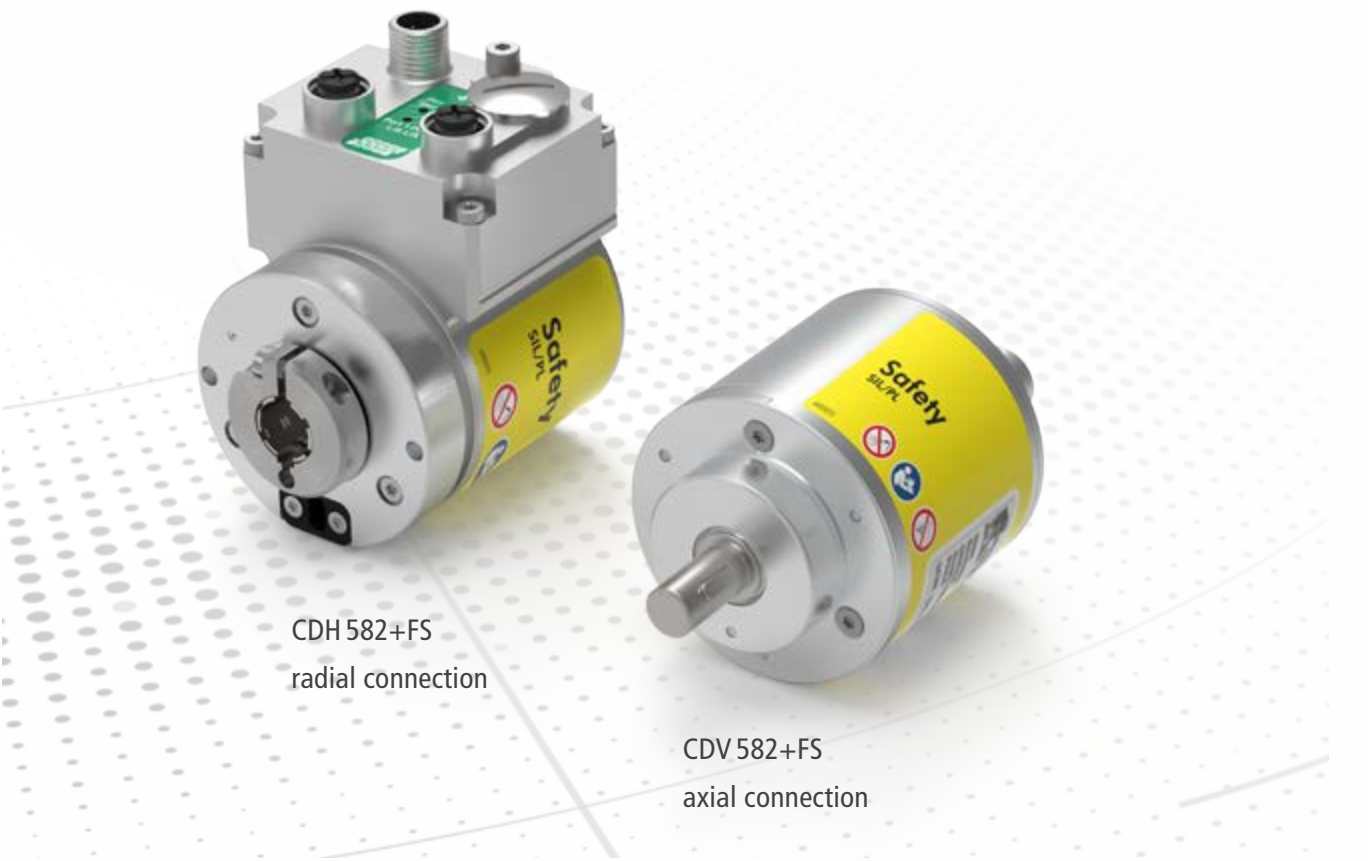
Absolute rotary encoder
Functional Safety SIL2, SIL3

Series 582, 75, 88

Safety Integrated

www.tr-electronic.com

CD_582+FS – functional safety in standard industrial form factor



CDH 582+FS
radial connection

CDV 582+FS
axial connection

Technology

_ Efficient design

_ Certified according to DIN EN 62061 (SIL) and 61508 (PL) by TÜV NRW

_ 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.

Functional Safety
Type Approved
TÜVRheinland®
FS

_SIL2/PLd, cat3;
SIL3/PLe, cat4

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

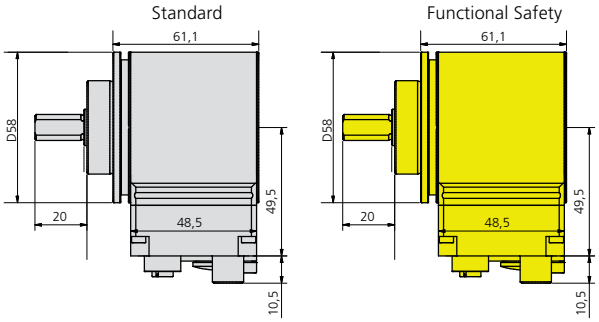
_architecture according category 4
"two encoders in one"

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.

Mechanics

_Mounting space

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



_Robust magnetic/optic multiturn rotary encoder CD_582M+FS

_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)

_rugged double magnetic multiturn rotary encoder CD_582MM+FS

_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 geomeries adapt the encoders perfect into the specific application.

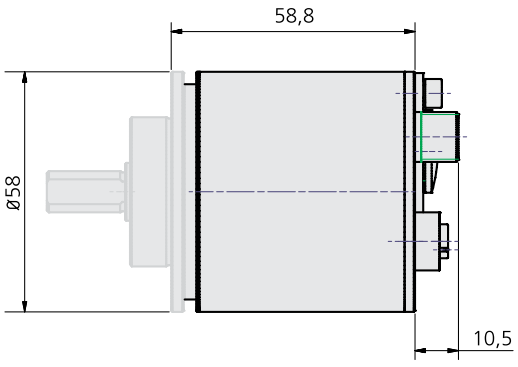
_ Shafts with form closure

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

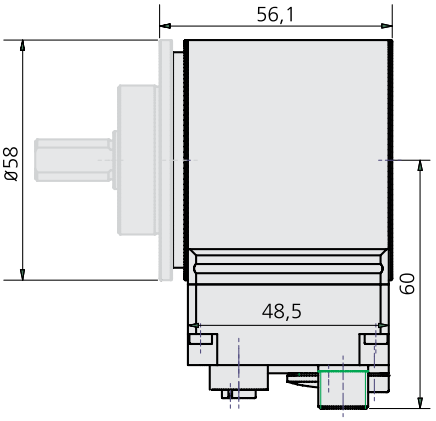
_ Connectors axial or radial

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.

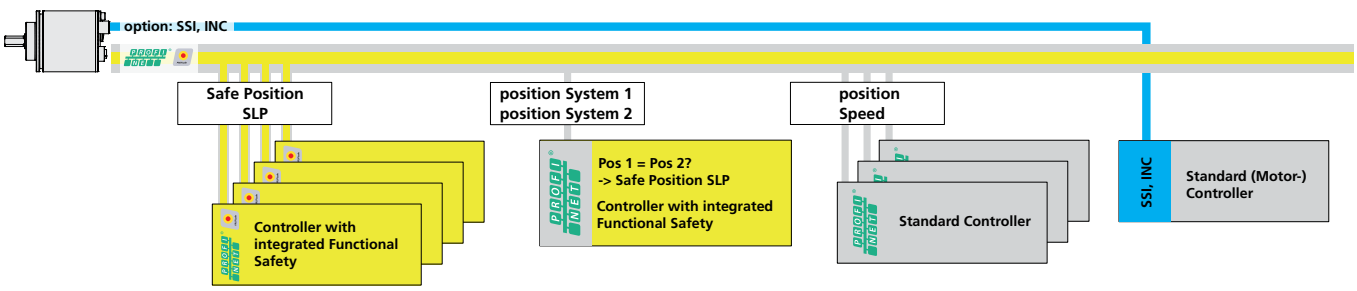
_Reset switch

CD_582+FS is equipped with a hardware reset switch. This resets the encoder to delivery state (factory settings) without the use of an enginerring 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 enginering 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 programms may be re-used without big changes into new projects.
_ Encoder Profile 4.2	CD_582+FS EPN fulfilfs 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 bandwith 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

CD_582M+FS implements the basic protocol (BP) and extended Protocol (XP) according to PROFIsafe standard V2.6.1.

_extended "F-Dest"-address

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

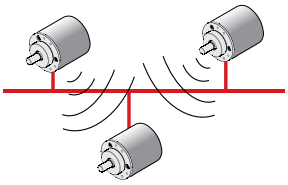
_Reintegration after passivation

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.

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

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.

_Neighborhood detection

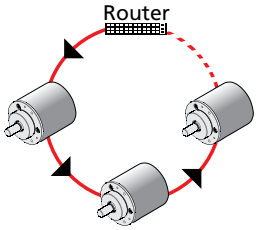


With neighborhood detecion, you exchange devices without the use of an engineering tool. An encoder that is connected newly to the network can determine his position and function in the network by help of his physical neighbours and then requests the parameter data for this function from the master control.

_Fast Startup for quick system availability

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.*

_Media-Redundancy Protocol for highest reliability



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.*

_Bus synchronized

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.

CD_582+FS – EtherNet/IP / CIP Safety

EtherNet/IP / CIP Safety

_SNCT Device Applet	Windows application for setting and saving the encoder parameters via Ethernet / IP. The user has the option of evaluating operating data, evaluating detailed diagnostic information and carrying out firmware updates.
_CIP Encoder Device Profile 0x22	The CD_582 + FS EIP encoders meet the established protocol standard for absolute encoders from ODVA.
_32 bit data words	Full resolution in a single telegram – the full bandwith for position or speed value can be transmitted in a single data word with 32 bit payload.
_Hybrid Device	The CD_582 + FS EIP connects to the safety-related control as a safe device using the CIP safety protocol. At the same time, the encoder value can also be read via the non-safe channel, e.g. can be read out by further controls.
_Direct readout of the two encoder channels by bus	For non secured applications, the two detection channels can be read out directly via Ethernet/IP. With this technology, you can realize installations with high availability.
_The CIP Networks Library - Volume 7 CIP Safety, Ed. 2.16	CD_582 + FS EIP complies with the current CIP safety standard version 2.16 and thus fits seamlessly into the latest safety architecture.
_ACD: Address Collision Detection	CD_582 + FS EIP recognizes duplicate network addresses and thus enables the user to quickly identify incorrect configura-tions during setup.
_DHCP	Ethernet / IP uses mechanisms of TCP / IP for network communication, including DHCP, to distribute the network addresses when a system is started.
_DLR: Device Level Ring	One ring for reliability. The Ethernet/IP interface of the CD_582M+FS supports the innovative Device Level Ring Protocol DLR. Normally Ethernet/IP only supports a linear/tree structure. A redundant connection is not primarily provided as standard. DLR 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.