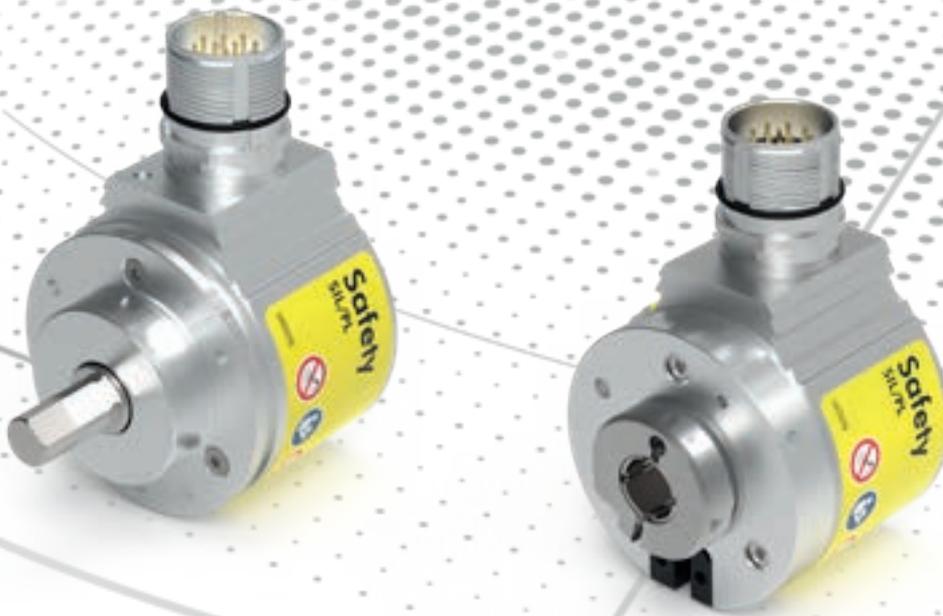
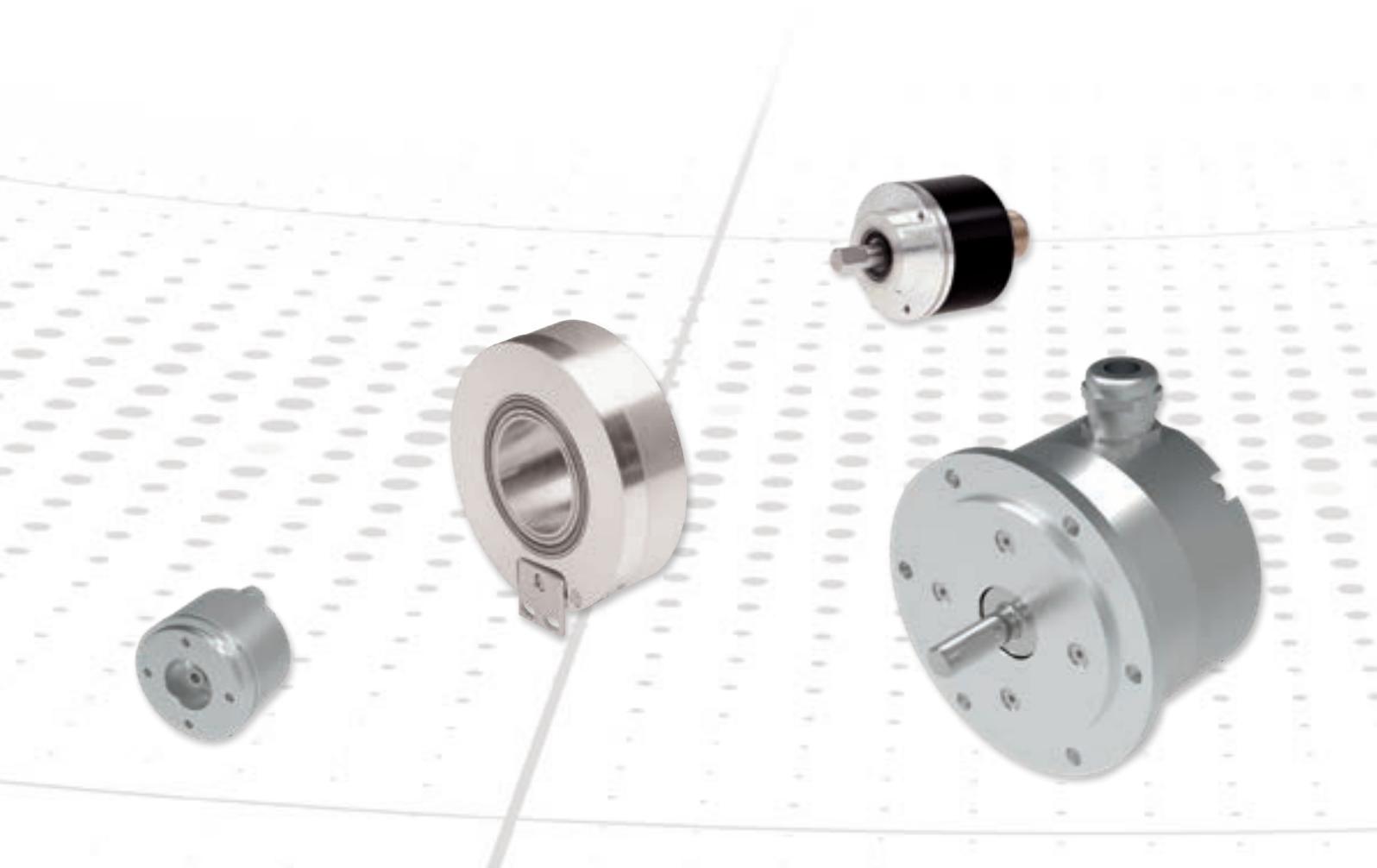


Incremental rotary encoders IE58+FS



Incremental Rotary Encoders



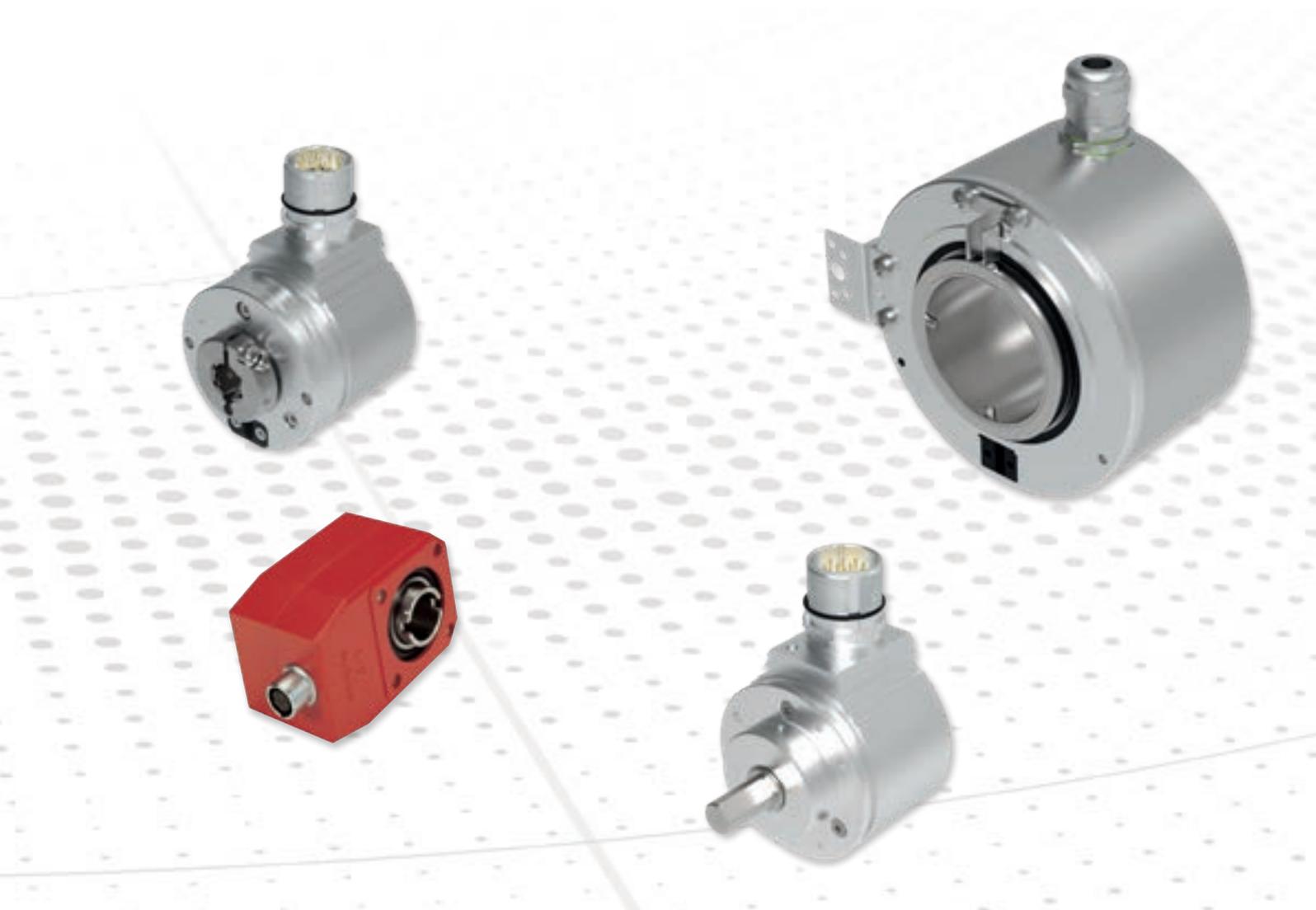
Programmable, extremely resilient and more

Incremental rotary encoders are used in machines and installations in different resolutions. Thanks to their simple design, incremental rotary encoders are more economical to manufacture than absolute rotary encoders. On the other hand, they only indicate position changes and cannot detect movements without a power supply.

In addition to our programmable all-rounder with 58 mm housing for almost all resolutions, our product portfolio

also includes a wide range of different sizes. In combination with hollow shafts, solid shafts of different diameters and a selection of flanges, you will find the right incremental rotary encoder for your machine's installation situation.

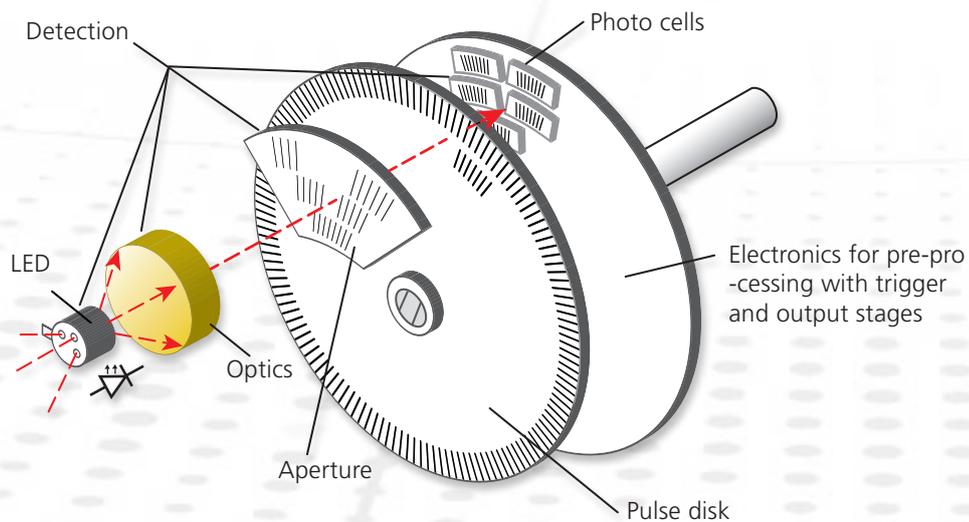
You will also find a multitude of housing options, e.g. ATEX-compliant housings and housings for use in aggressive media or for heavy mechanical stress (heavy-duty).



Contents

Theory of Operation	4
Fixed Resolution, Functional Safety	8
- I_58+FS	8

Pulse Encoder mode of operation

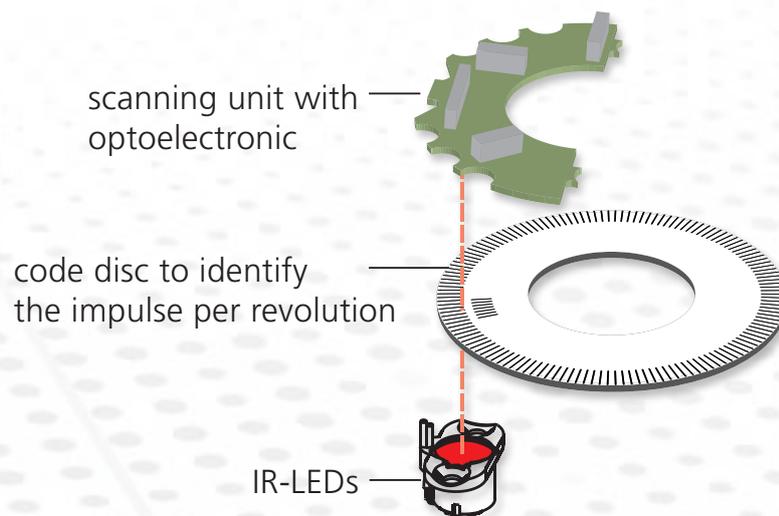


Consistent mechanical concept

A rotary movement is processed in the incremental rotary encoder (also called a pulse encoder) and output in the form of an electrical signal. Angular increments are recorded via a pulse wheel with a fixed number of cycles per revolution. A scanning unit with integrated optoelectronics generates electrical signals and outputs pulses (measuring increments).

The resolution of the measuring system is defined by the number of light/dark segments (number of graduation marks per revolution) on the pulse wheel. For example, in the case of a pulse encoder with 1,000 graduation marks, a signal sequence of 1,000 pulses is output during one revolution. To evaluate the counting direction, a second signal sequence with a 90° phase offset is generated. A rev counter can be controlled with an additional zero pulse.

- _ Programmable rotary encoders
- _ Non-programmable incremental rotary encoders
- _ Solid shaft, hollow shaft, blind shaft design and type with integrated coupling
- _ For __ F36 with separate bearing



Programmable incremental encoders The all-rounder in a 58 mm housing

Our programmable incremental rotary encoders offer the optimal basis for every requirement and are available with solid shaft, continuous hollow shaft, blind shaft or integrated coupling. You can adapt the resolution of our programmable incremental encoders to your requirements using software.

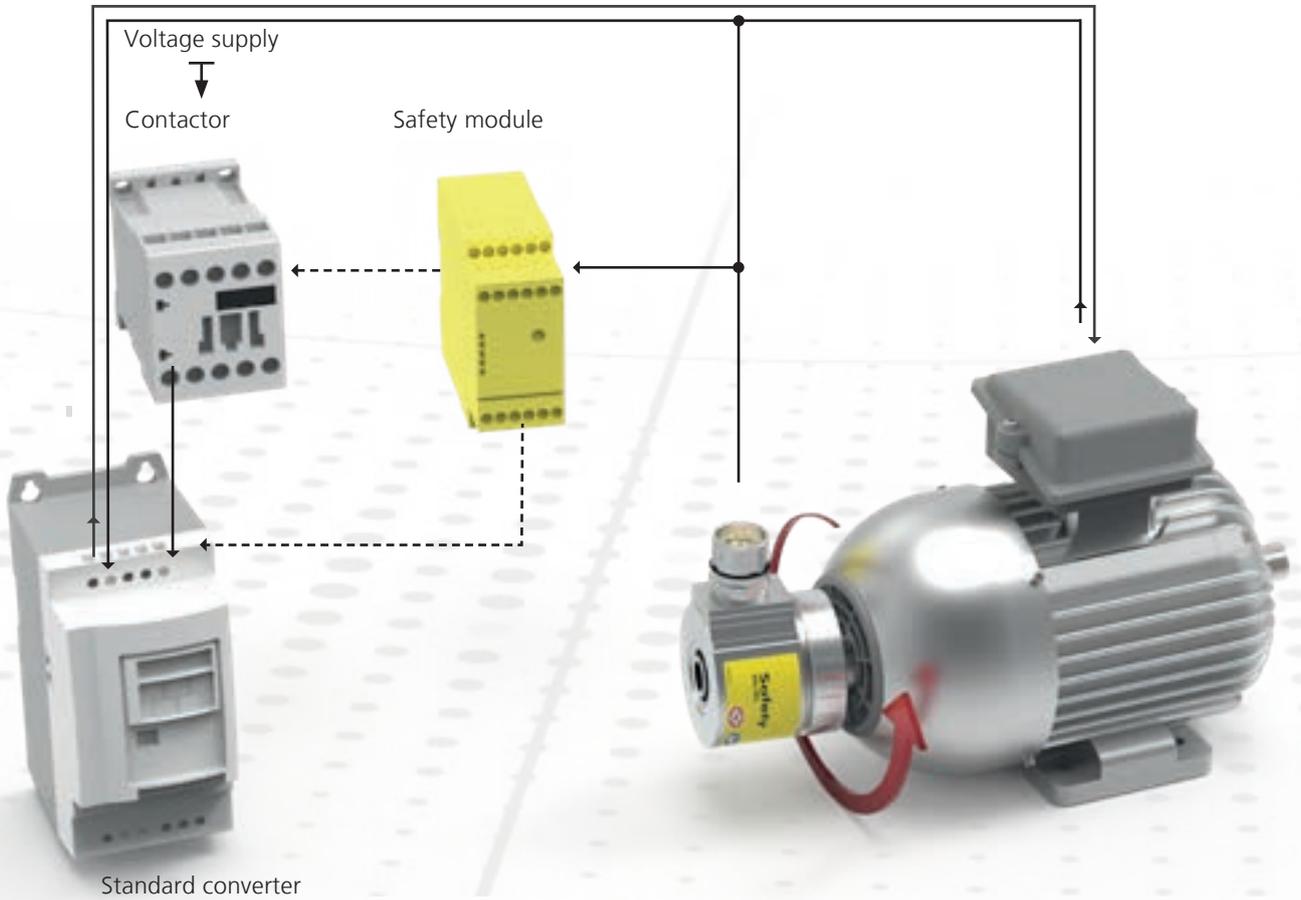
The new generation I_₅₈:2 offers wide range input of 4.5 ... 32 V DC and number of graduation marks up to 62,450 increments per revolution as well as a hollow shaft diameter up to 15 mm or ½".

Non-programmable incremental rotary encoders with resolution determined at the factory

Our incremental rotary encoders with resolution preconfigured in the factory can also be used in all applications which require the basic functions of incremental position detection.

The resolution of these incremental rotary encoders is defined ex-factory by fitting a code disc with a defined number of graduation marks or the scanning electronics is configured for the required number of graduation marks. These incremental rotary encoders are available in different sizes from 24 mm to 120 mm. Naturally they are also available with different mechanical connections such as solid shaft, continuous hollow shaft, blind shaft or integrated coupling.

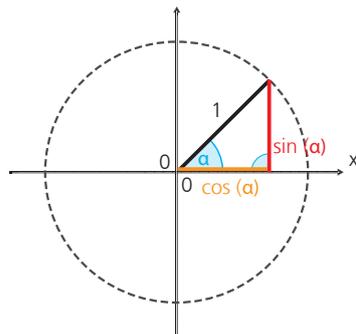
Safe incremental rotary encoders



Safe incremental rotary encoders

The solution doesn't always have to be a big one. An incremental rotary encoder is sufficient for the safe detection of speed, direction of rotation or standstill. The use of certified components considerably facilitates the validation of the complete application. TR-Electronic therefore offers the safety-certified incremental rotary encoder IE58+FS.

SIN/COS



With sine-cosine interface, SIL3 or PLe is possible for specific safety functions. One of the reasons for this is that the transmission channel can be checked by means of a simple calculation from the signal: The following must apply at any time: $\sin^2(t) + \cos^2(t) = 1$. If the calculated value differs, the safety module can go into a safe status. With the TTL or HTL interface applications with SIL 2 or PLd are possible. The calculated value differs, the safety module can go into a safe status.

TTL / HTL

With the TTL or HTL interface

Proven technology with fully differential electronics

A further element of this high safety classification is the simple design with proven optical scanning with fixed resolution on the glass disk.

The signal paths are designed differentially. As a result the signal is immune to disturbance and failure of a driver can be reliably detected.

Fixed resolutions ex-works

1.024, 2.048 and 4.096 periods per revolution,
1 zero pulse, + differential (inverse) signals

Solid shaft, blind shaft and continuous hollow shaft

IV-58+FS: 6 ... 12 mm, ¼', ½'

IH-58+FS; IS-58+FS: 8, 10, 12 mm, ¼', ½'

Continuous form closure for the shaft connection

The form closure necessary for reliable measurement is produced by means of a groove in the shaft – with solid shaft rotary encoders the appropriate spring is included with delivery.

Possible safety functions*

- _SS1 (safe stop 1)
- _SS2 (safe stop 2)
- _SOS (safe operating stop)
- _SLS (safely-limited speed)
- _SLS (safely-limited speed)
- _SSR (safe speed range)
- _SSM (safe speed monitor)
- _SDI (safe direction)
- _SLA (safely limited acceleration)
- _SLP (safely limited position)

Can be combined with a variety of commercially available safety modules

Depending on the required safety function, various commercially available safety modules can be used for the evaluation of TTL / HTL / sine-cosine signals.

Perfect solution for both new systems and retrofits

Whether a new concept or an upgrade – thanks to the modular design with freely selectable safety modules, TR functionally safe rotary encoders can be used in the design of new systems or to upgrade existing machines and systems for current safety regulations.

Full integration into the TR product range

Especially for simpler, speed-based safety functions, IE-58+FS perfectly complement TR's range of absolute safety rotary encoders. Technically and commercially optimal solutions are thus available for almost all applications, from simple incremental rotary encoders through to efficient Industrial Ethernet Safety Encoders – from one source, in a cohesive design.

ATEX Zone 2 / 22

IE-58+FS are optionally also available in the same design for application in potentially explosive atmospheres of Zones 2 and 22: AV-582+FS, AS-58+FS, AH-58+FS.

*Depending on the safety module used

Incremental rotary encoders – I_58+FS - Housing 58 mm



Safety-oriented incremental rotary encoder

For applications that require a safety classification according to SIL / PL, TR-Electronic provides the safety certified incremental encoder IE58-FS. The user can choose between square-wave signals (with TTL or HTL level) and sine-cosine interface. The rotary encoder is certified for applications with SIL 3 or PLe (depending on used safety module). The rotary encoder permits the operating modes SLS, SOS SSR, SDI and SSM in conjunction with an appropriate safety module. The encoders are not programmable; the resolution is provided safely and long term stable by the coded glass disk. 1024,

2048 and 4096 periods per revolution and a zero pulse may be selected. The signal paths are designed differentially. As a result the signal is immune to disturbance and failure of a driver can be reliably detected. The incremental rotary encoder is connected to the driving axis either with a solid shaft, blind shaft (IS58+FS) or a hollow shaft (IH58+FS). The form closure necessary for reliable measurement is implemented through a groove in the shaft - in the case of solid-shaft rotary encoders the appropriate spring is included in the scope of supply.

Contents

Products.....	9
Suggested Products.....	10
Dimensional Drawings.....	11

Solid shaft

Product	IE58+FS 	IH58+FS 	IS58+FS 
Detection	Optical	Optical	Optical
Supply	10...30 Vdc (SELV/PELV)	10...30 Vdc (SELV/PELV)	10...30 Vdc (SELV/PELV)
Steps per turn	1.024, 2.048, 4.096	1.024, 2.048, 4.096	1.024, 2.048, 4.096
Shafts available	10 mm Solid shaft with keyway/Groove	12 mm hollow shaft with keyway	12 mm blind shaft with keyway
Connectors	M23 12-pin, M12 8-pin, cable, radial or axial	M23 12-pin, M12 8-pin, cable, radial	M23 12-pin, M12 8-pin, cable, radial or axial
Ambient temperature	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Protection class	IP65	IP65	IP65
possible Safety functions*	SS1, SS2, SLS, SOS SSR, SDI, SSM, SLA	SS1, SS2, SLS, SOS SSR, SDI, SSM, SLA	SS1, SS2, SLS, SOS SSR, SDI, SSM, SLA
maximum SIL/PL*	SIL3, PLe	SIL3, PLe	SIL3, PLe
Interface	Sinus/Cosinus Inkremental	Sinus/Cosinus Inkremental	Sinus/Cosinus Inkremental
Weblink	www.tr-electronic.com/s/S011005	www.tr-electronic.com/s/S011007	www.tr-electronic.com/s/S011008
QR-Code			

*depending on safety box used

Can't find the right variant? Please contact us (info@tr-electronic.de)

Suggested Products

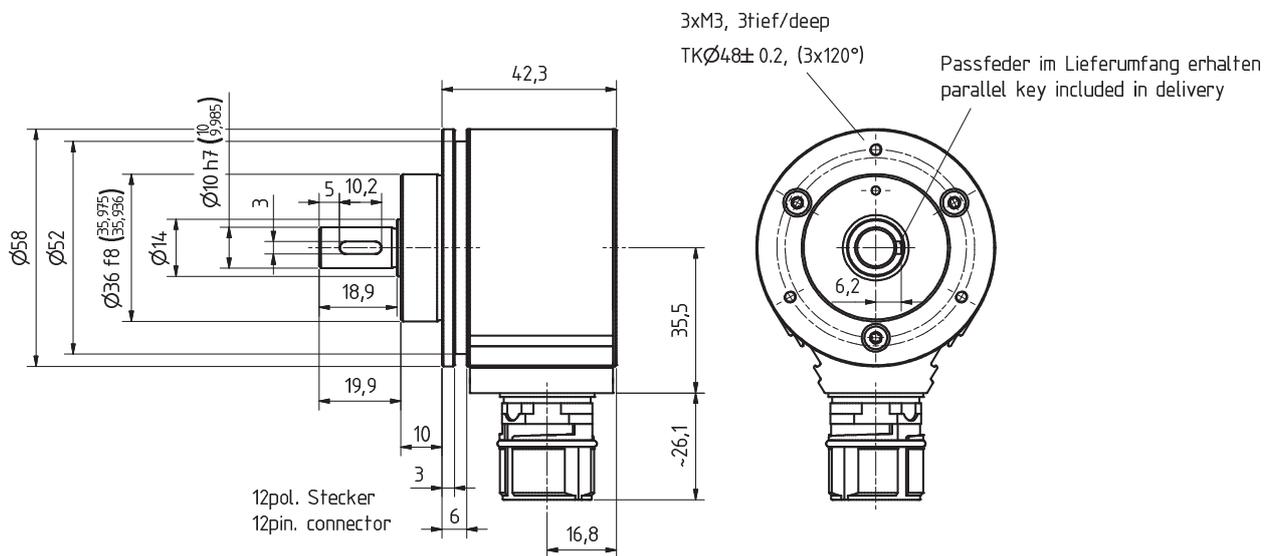
Order code	Steps per turn	Channels	Shaft / Flange	Connector position	Cable length	Remark
IH58+FS						
IH58-00001	1024	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		HTL
IH58-00002	1024	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		SIN/COS
IH58-00003	1024	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		TTL
IH58-00004	2048	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		SIN/COS
IH58-00005	2048	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		TTL
IH58-00006	2048	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		HTL
IH58-00007	4096	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		SIN/COS
IH58-00008	4096	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		TTL
IH58-00009	4096	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M23 12 pin, radial		HTL
IV58+FS						
IV58-00001	1024	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		HTL
IV58-00002	1024	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		SIN/COS
IV58-00003	1024	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		TTL
IV58-00004	2048	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		SIN/COS
IV58-00005	2048	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		TTL
IV58-00006	2048	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		HTL
IV58-00007	4096	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		SIN/COS
IV58-00008	4096	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		TTL
IV58-00009	4096	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M23 12 pin, radial		HTL

For further product information simply enter the order number in the search field at www.tr-electronic.com.

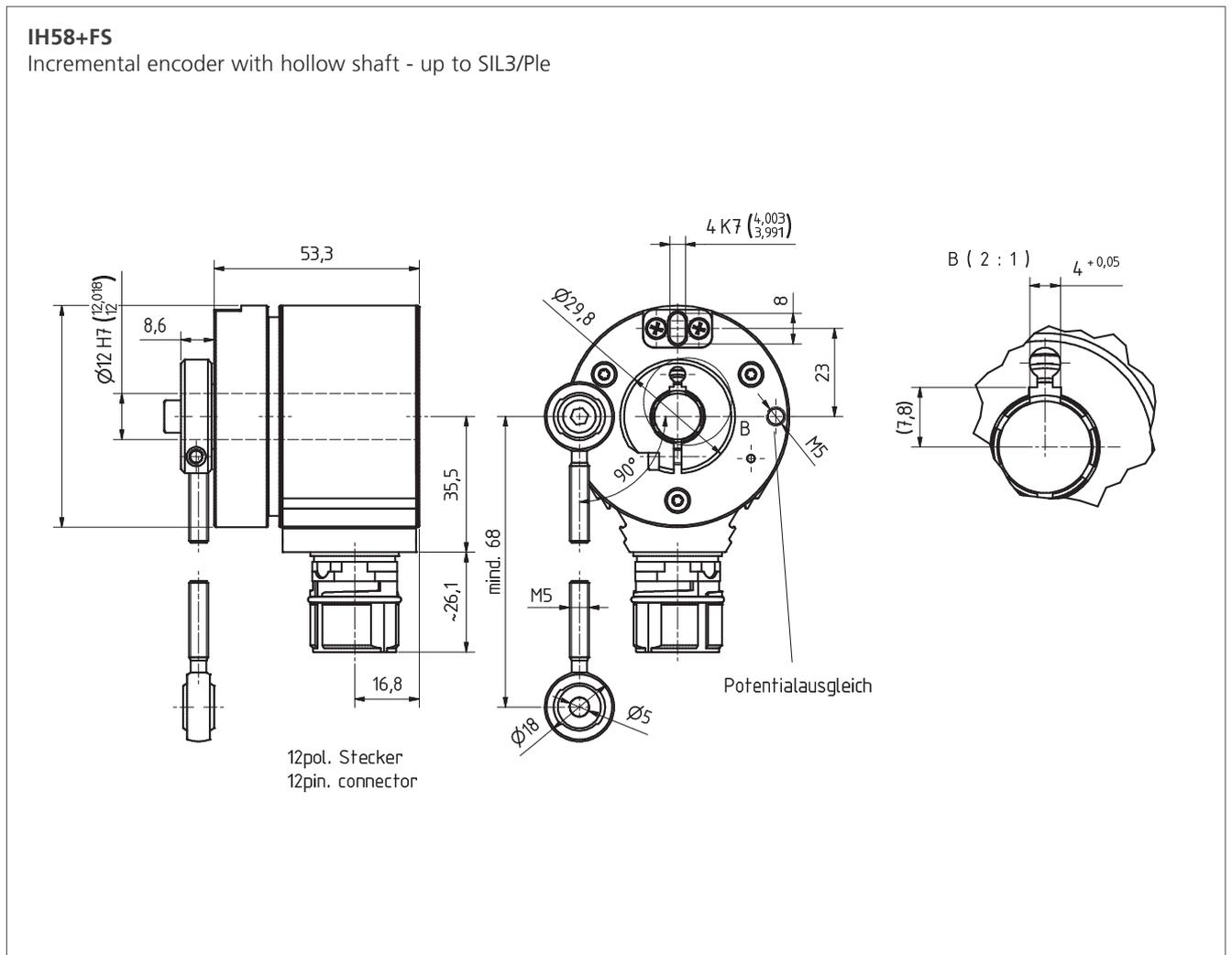
Dimensional Drawings

IE58+FS

Incremental encoder with solid shaft - up to SIL3/Plc



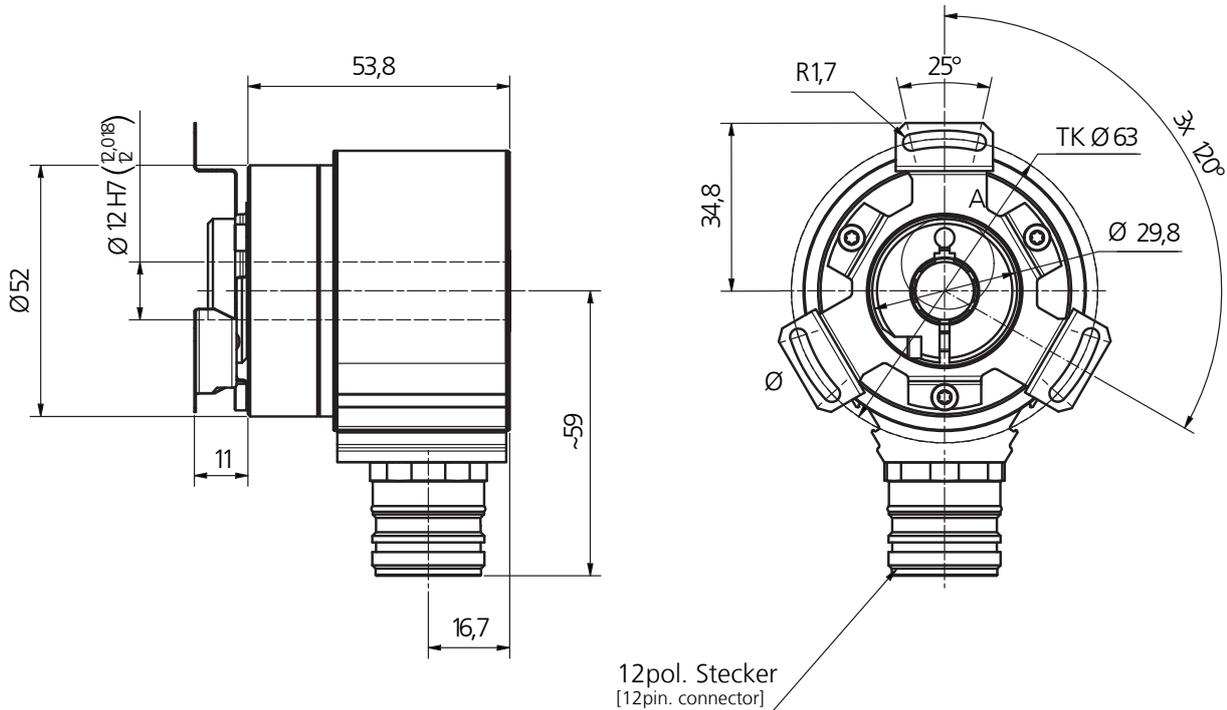
Dimensional Drawings



Dimensional Drawings

IS58+FS

Incremental encoder with blind shaft - up to SIL3/PLd



TR Electronic – your partner in automation

Rotary encoders

Absolute encoder, incremental rotary encoder, wire-actuated encoder

Rotary encoders precisely measure position in a wide variety of applications and industries. Our range extends from miniature versions for medical technology to SIL3-certified rotary encoders, including those with the necessary OT safety. Naturally, we also offer a comprehensive range of accessories for our rotary encoders.

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

EncoTRive compact drives offer decentralised solutions in the power range from 50 to 400 watts. The combination of flexibly selectable gear motors and integrated positioning controllers saves space in the control cabinet and simplifies cabling. The integrated absolute encoder provides the current position at any time without referencing. Uniform control of all variants enables easy integration into all common fieldbus systems.



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.

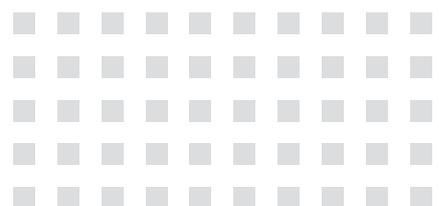


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Subject to technology and design modifications.

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