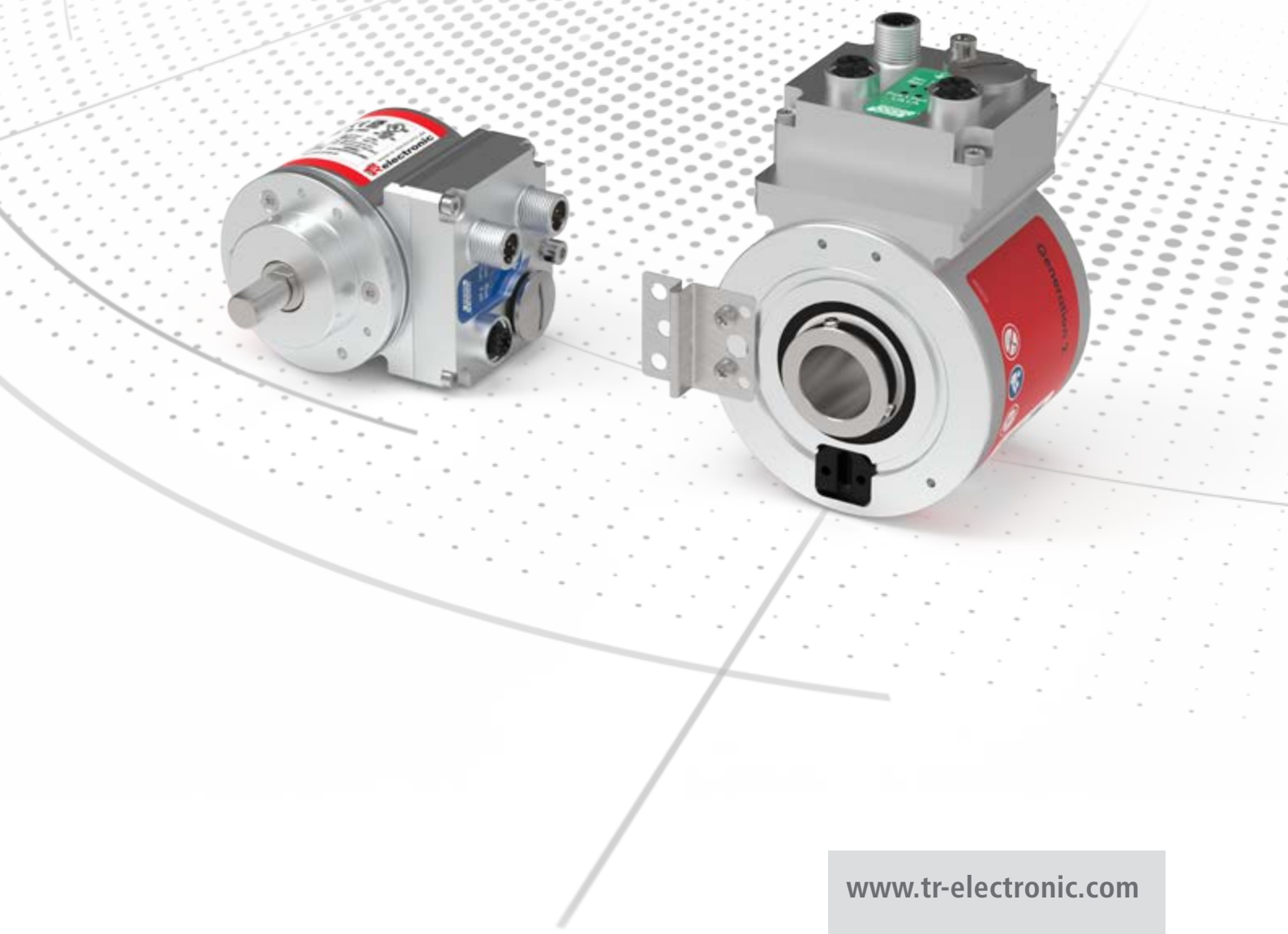
Absolute Rotary Encoders
Overview



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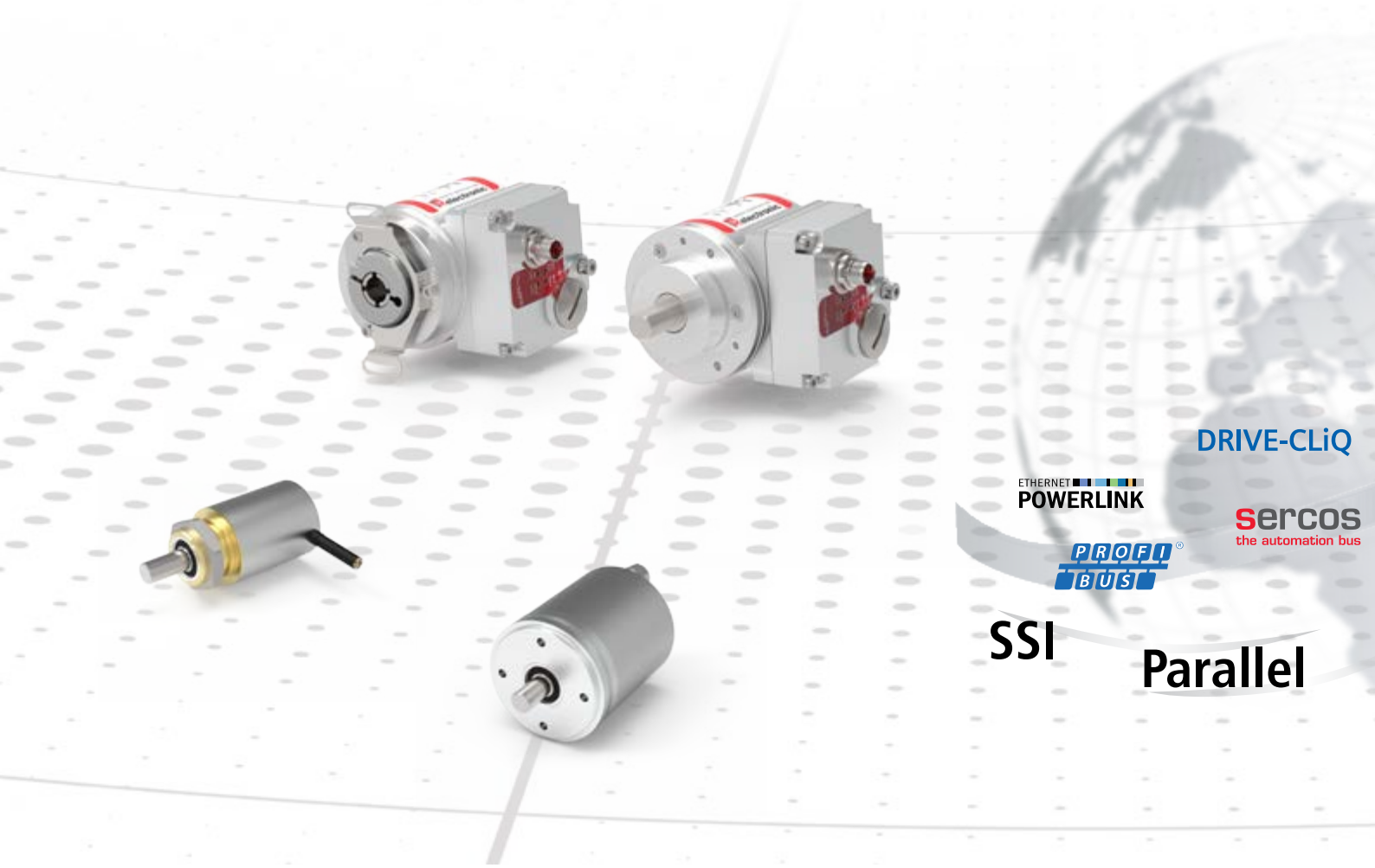
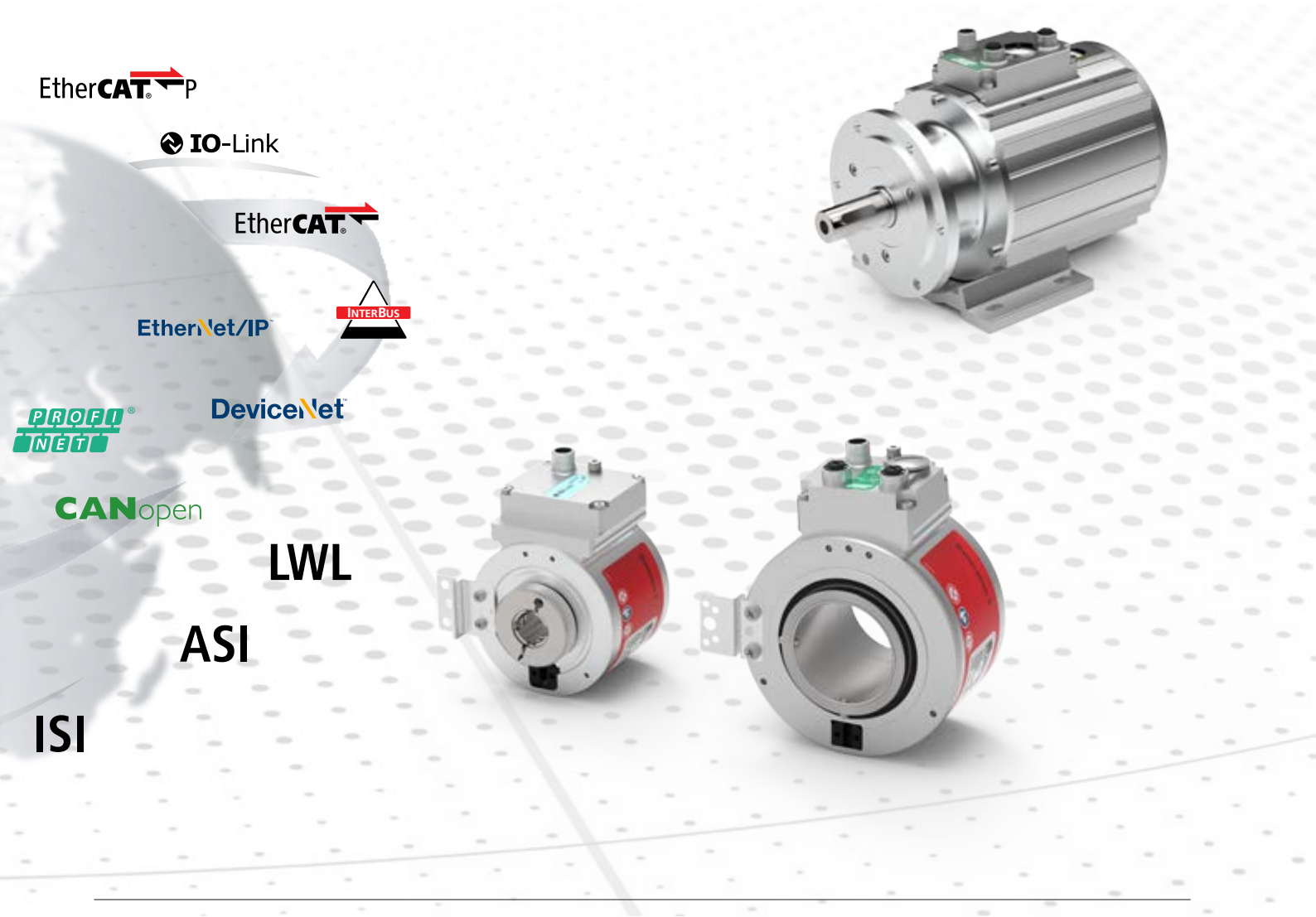
Absolute Rotary Encoders



Rotary encoders for industrial applications

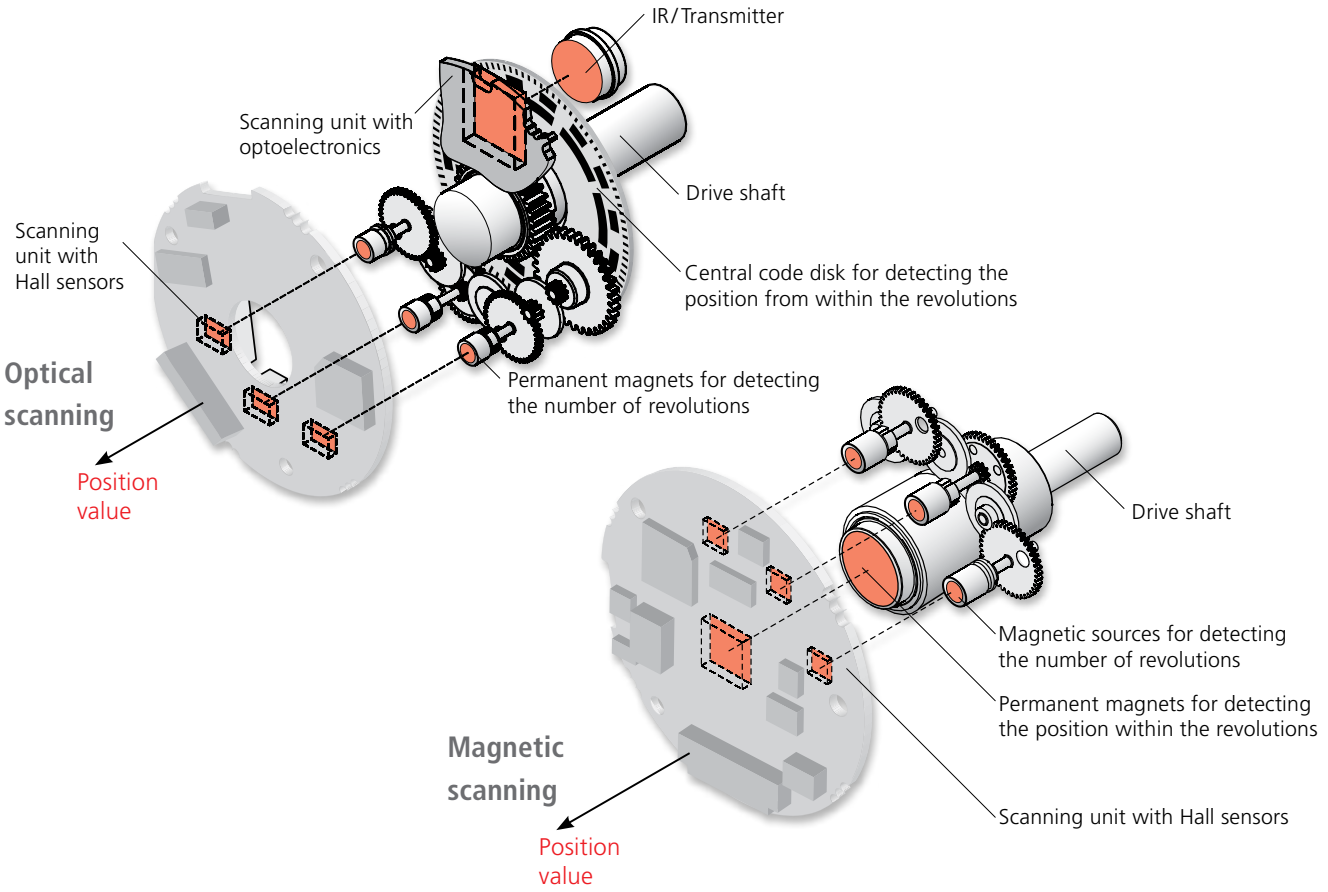
TR-Electronic rotary encoders with optical or magnetic scanning precisely acquire position in steel production, wind power plants, cranes and ships as well as in explosion-proof versions in painting lines. Miniature versions ensure the correct position in medical technology and SIL-approved absolute rotary encoders ensure the necessary safety.

In addition to high-quality rotary encoders for almost every application, we also offer extensive accessories such as programming tools, displays and assembly components for quick and simple implementation and seamless integration into your processes.



Content

Scanning – Optical and magnetic



Three detections for perfect cost-benefit ratio

O High-resolution optical scanning

Thanks to modern Opto-Asic technology, up to 18 bits (262,144 steps) can be generated within a single revolution. This is supplemented with up to 4,096 absolute scanned revolutions. Signal processing occurs at FPGA speed. This type of scanning is always used whenever position values need to be captured very quickly and with high resolution. This type of scanning is denoted by the letter "O" in the type designation.

E Optical scanning for standard applications

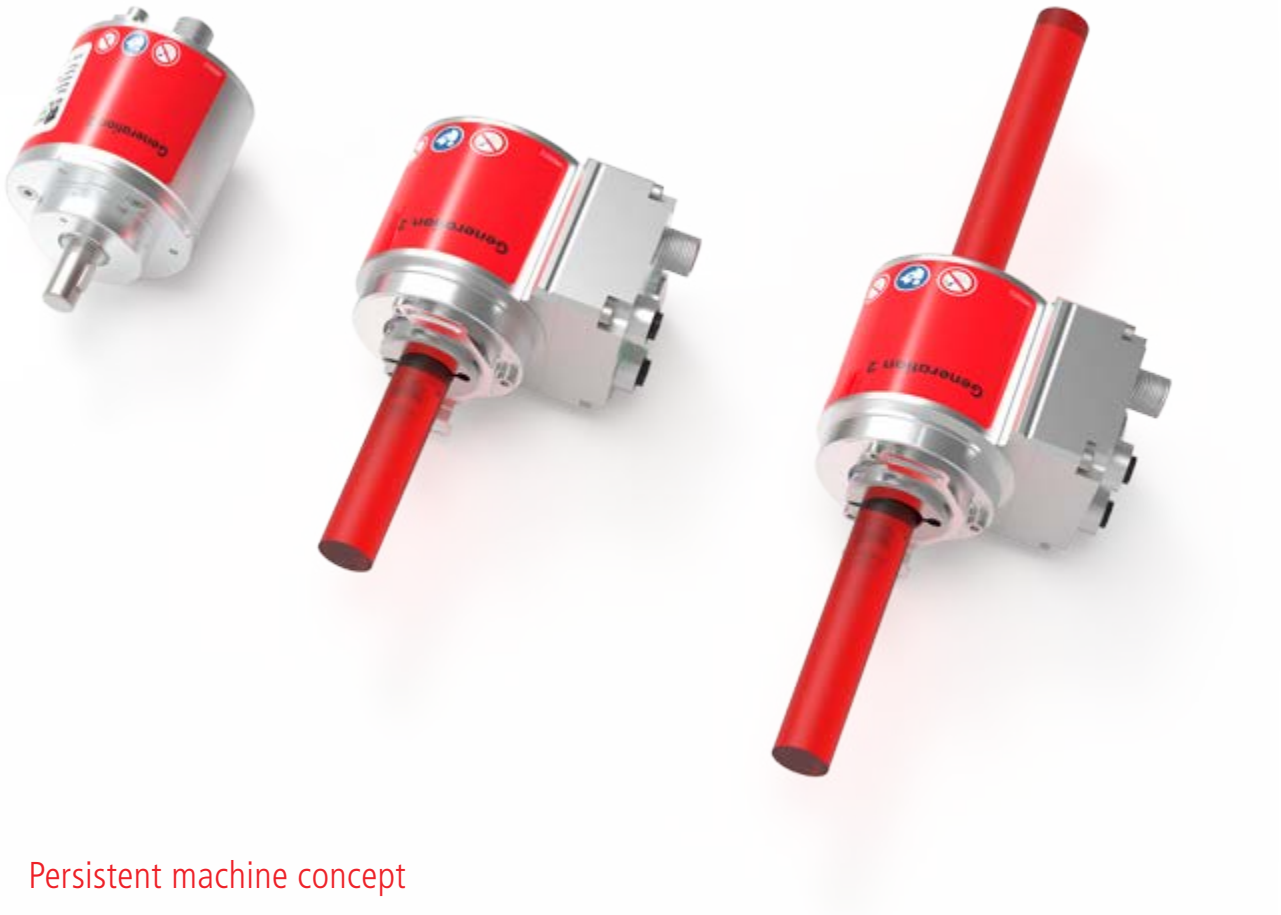
The majority of industrial applications use rotary encoders with a resolution of up to 15 bits per revolution and up to 4,096/256,000 scanned revolutions. Signal processing within the processor enables multiple evaluation functions and optimal adjustment to new requirements. Signals such as limit switches and speed monitoring can also be generated. This type of scanning is denoted by the letter "E" in the type designation.

M Magnetic scanning for price-sensitive applications

Price-conscious, magnetic rotary encoders are the first choice for applications with lesser requirements in terms of accuracy, resolution and timing. The resolution of a revolution is 11 bits and this is supplemented with 4,096 absolute scanned revolutions. There is no extended signal processing, though the resolution of this device is programmable. This type of scanning is denoted by the letter "M" in the type designation.

Shaft types

Solid shaft **Blind shaft** **Hollow shaft**

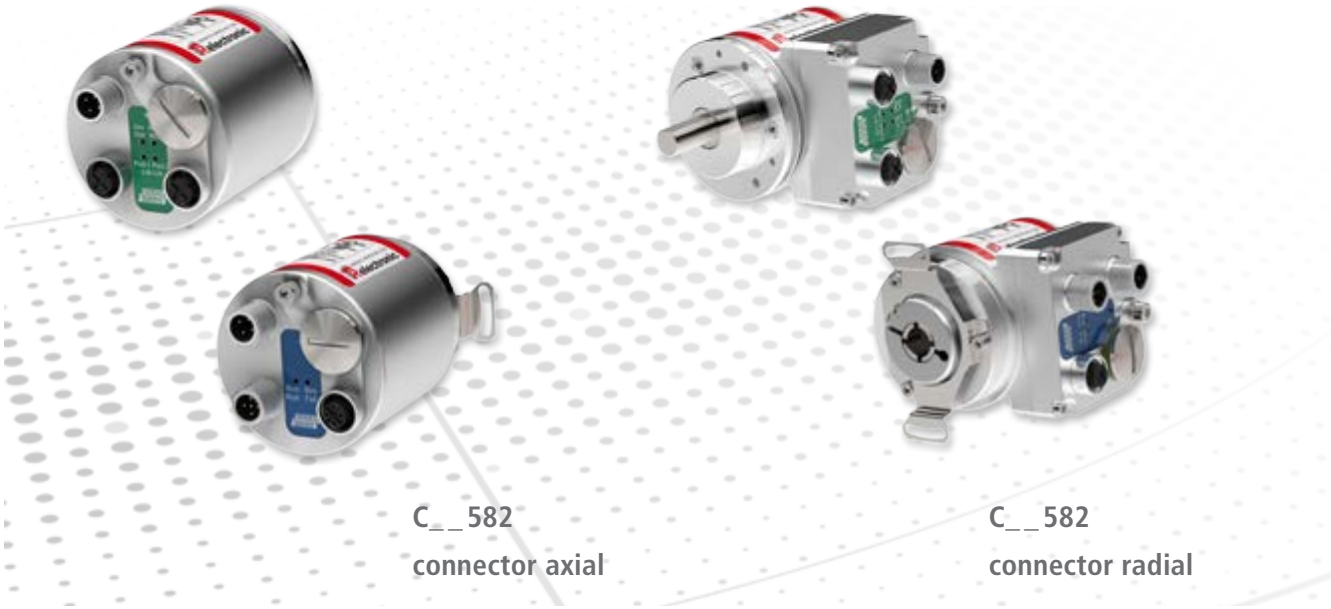


Persistent machine concept

The 58 mm series of the compact rotary encoder was developed for diverse mounting variations. Therefore, there will always be a fitting device for any installation situation that should arise. Functions that you need with a solid shaft, are also available with a hollow shaft. Our rotary encoders with solid shaft are available with many coupling options for easy integration.

The variety of mechanical solutions enhances your room for innovative constructions. You will find a sample of the numerous mounting possibilities in the following overview.
Important: not all possible combinations will be shown.

C__582 – the next generation:
Standard size with outstanding features



C__582
connector axial

C__582
connector radial

_Efficient design

Everything the application needs – reduce to the max.

_Robust magnetic multiturn rotary encoder CM_582

13 bit resolution within one revolution (singleturn)
12 bit revolutions (multiturn), optionally 16 bit.
Output up to 256,000 revolutions.

_Servo flange, clamping flange Slip-on hollow shaft up to 15 mm

Plenty of shaft diameters, flanges and torque supports make the magnetic encoders CM_582 fit into the mechanic surroundings of many applications.

_Precise optical multiturn encoder CE_582, CO_582

15 or 18 bit resolution in one revolution (singleturn)
12 bit revolutions (multiturn), optionally 16 bit.
Output of up to 256,000 revolutions."

_Servo flange, clamping flange Slip-on hollow shaft up to 15 mm Hollow-through-shaft up to 15 mm

CE_582 and CO_582 add hollow-through shafts with diameters up to 15 mm to the standard range of solid and slip-on blind shafts and flanges.

_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).

PROFINET® EtherCAT® EtherNet/IP™

_Parameterizable gearbox

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

_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.

_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.

_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.

_"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.

_Update time <1 ms

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

_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.

EtherCAT®

_Free mapping of process data in Ethernet Telegram

For EtherCAT, the transmitted telegram can be freely designed to meet the programmers needs. Choose free from current reading position, speed, warnings, alarms, software-cams … what is needed for your process / your control architecture.

_Software-Cams

Since industrial revolution, cams were a propriate way to control automated processes. At first with mechanical camshafts and then with electromechanic cam switches. Now, cam signals are calculated in the central conrol - or, even more comfortable – directly in C__582 ETC. Cam signals are mapped arbitrarily into the process data channel and are available to other bus nodes.

_Distributed Clocks down to 100 µs cycle time

For precise position and path control of moving axes, all sensors and actors involved must be synchonized. With EtherCAT, this is achieved by distributed clocks. The smallest possible cycle time in C__582 is 100 µs.

EtherNet/IP™

_Firmware Update via TCP/IP

Computer and smartphones are the role model: New functionality by new firmware. New firmware for C__582 EIP can be loaded via the asynchronous TCP/IP-cannel. Existing hardware is future-proof and can be equipped even for new applications.

_Device Level Ring DLR

A ring makes the network safe. Similar to MRP with PROFINET, DLR provides higher availability to machines and plants with Ethernet/IP. With one additional connection from the last encoder in a branch back to the switch, connection is closed to a ring with much higher reliability. Break in signal transmission is detected at once and bypassed. A single cable break this does not lead to failure of all nodes behind the break in a branch.

PROFINET®

_Encoderprofile

C__582 EPN consequently supports the EPN-Encoder profile of Profibus International standardisation organisation.

_Profinet with IRT

The PROFINET variant therefore uses cutting-edge technology with long-term availability and is absolutely compliant with the latest standards of the PI User Organization. Real-time synchronization (IRT) enables precisely synchronized positioning of several axes.

_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

C__582 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 C__582 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.*

*An encoder can either be configured for Fast Startup or for MRP.

_ Low connection costs:
M12, 4-pin, A-coded, without shield, supply and data in one cable.

An IO-Link master is often already present in a machine, usually to read in and parameterize initiators. TR-Electronic rotary encoders with IO-Link use exactly this infrastructure to communicate with the control.

_ Cyclical transfer:
Position, speed, 2 independent position limit switches, speed monitor.

If a machine or system already has IO-Link integrated as a bus system, the obvious approach is to also control absolute rotary encoders with this bus system. The actual value communication uses a star distribution system between rotary encoder and the next distribution node and is compatible with normal, digital initiator communication.

_ Transferred parameters can be configured.

The zero position of the rotary encoder is conveniently adjusted via IO-Link and the usual bus parameterization tools – without turning the encoder itself.
This makes installation child's play. The transferred parameters can also be selected at the same time.

_ Cycle time for cyclical transfer >= 1 ms.

_ Acyclical transfer:
Error messages, operating hours.

Machine condition monitoring made easy: Important status information is transferred via the acyclical services.

_ Hardware switching output programmable:
Either speed monitor, limit switches …

C_ _582 with IO-Link enables internal states to be converted into programmable switching states of the digital output. This enables simple implementation of e.g. speed monitoring, position limit value monitoring, limit switches and much more. The rotary encoder reacts to exceeding of a speed range, for example, through a digital signal like a normal initiator and can also send status messages to a very simple electronic analysis module.

_The direct route for mounted encoders to SINAMICS© drives.

DRIVE-CLiQ is the open system interface for position sensors for the SINAMICS© drive family from Siemens AG for motion control. This fast absolute encoder interface connects the converter centrally installed in the switch cabinet to the rotary encoders and position sensors directly on the respective axes.

_Direct position measurement without gear backlash

For increased reliability and precision, it may be desirable not only to use the encoder in the motor for position control. Encoders mounted directly on the axis to be measured eliminate the uncertainties caused by gear backlash.

_Reliability through redundancy

Mounted encoders used in conjunction with motor-integrated systems can reliably detect slipping of connections or even shaft/gear breakage.

_All mechanical variants of Generation 2

The C_ _582s from TR-Electronic are available with the DRIVE-CLiQ interface.
The design engineers thus have access to the entire mechanical diversity of the modular system with full integration into the SINAMICS© drive technology family.

Absolute encoder with completely encapsulated electronics IM_36, CM_36S, CD_36S

_completely encapsulated single-turn encoder
_extremely robust and extremely tight (IP 69 K)
_for areas where the temperature fluctuates (thawing)
_compact design, only 36 mm in diameter
_professional solution for your outdoor applications
_optional double scanning for redundancy (2 × SSI)
_optionally as incremental rotary encoder
_optional separate bearing (completely free from wear and tear)
_magnetic scanning

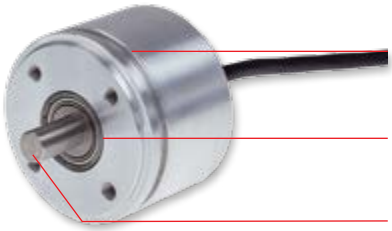
Area of application

This standard applies to the IP protection classes for electrical fittings in road vehicles.

Purpose of application – the following has been defined

Name and definition of IP protection classes and degrees through the housing around the electrical fittings in road vehicles to protect the electrical fittings inside the housing against the ingress of water and foreign bodies. There is also a regulation in place for the protection of people.

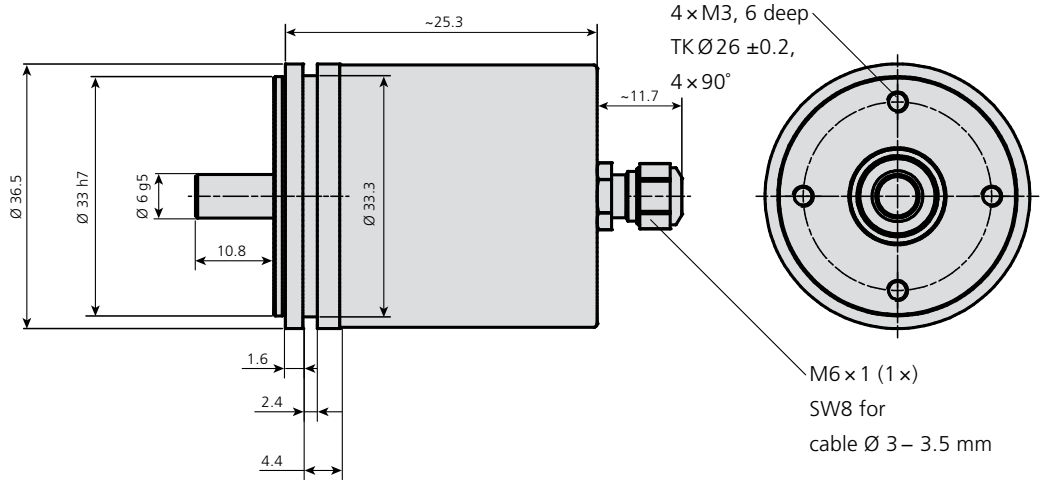
stainless steel-housing (IP 69 K)



Laser welded gas tight
Stainless steel flange
Stainless steel shaft

Stainless steel cover
Stainless steel gland

Avaiable for incremental and absolute single-turn variants



Safety rotary encoders

Possible application areas

_ crane technology
_ event and stage technology
_ drive technology
_ conveying systems and logistics
_ machinery and plant engineering
_ automation technology
_ wind energy plant

Cranes with overlapping work areas or with obstacles within the working area
Through measurement of rope positions and rotation angles, collisions can be avoided. Numerous travelling cranes on a common track – through safe measurement of each position, collision can be avoided.

Common work areas of men and machines –
Through safe position detection in the various areas of safety, safe work areas can be differentiated from each other.

Processes with minimal or maximum speed – Through safe speed sensing, it is assured that the drive never oversteps a maximum speed or that it safely achieves a required speed before starting a process.

Synchronous run monitoring[1] – An unsafe electrical axial synchronization can be made safe by using a certified SIL 3 / PL e rotary encoder with an externally attached safety system.

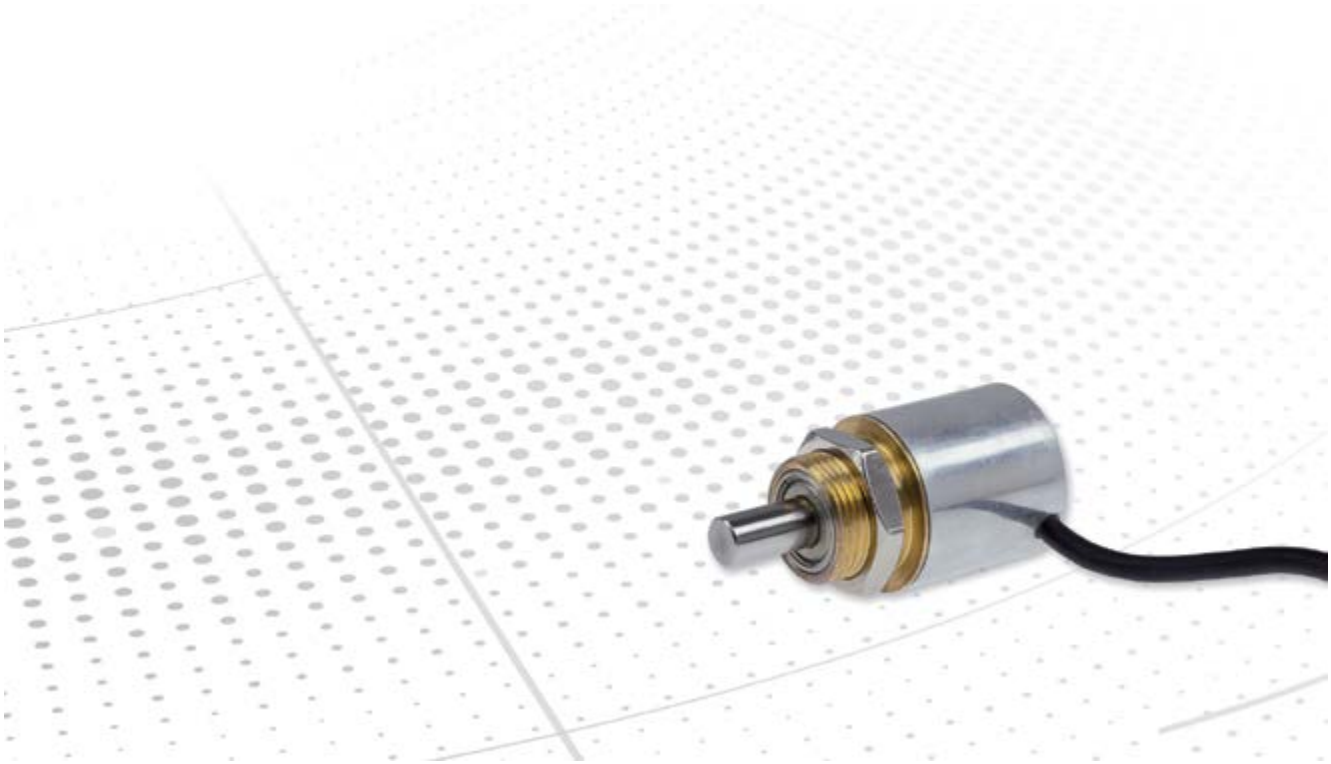
Shaft control[1] **–** Rotation through overload or a twist-off will be detected through a SIL 3 / PL e rotary encoder with an external safety system.

Advantage of certified components

The basic safety standard IEC 61508[2] differentiates between measures to eliminate errors and measures to control errors. The measures to eliminate errors embrace the entire design and development process. These are required for the development of individual components and they serve to avoid systematic errors.
Important for error control are quantifiable characteristics of the considered components and of the complete system. The probability of a dangerous failure of the safety function has priority. The calculation results in the rated failure probability of all individual components for the entire safety chain. It is checked and documented how systematic errors can be avoided or controlled for certified components.
If non-certified components are chosen to be used solely based on their mathematical safety value, the responsibility is laid upon the person who undertook the construction. The producer of components with certification makes a clear statement: "Yes, ideal for safety-oriented applications". As a user of certified components you can rely on this – after all, the certification according to SIL 3 or PL e has been given by independent specialists.

[1]on request [2]test regulations category 4 / PL e according to EN ISO 13849-1, SIL CL 3 according to EN 61800-5-2 / EN 62061 and IEC 61508.

Encoder - Family C__22 - Housing 22 mm



Tiny but an absolutely real encoder!

Within the CMV 22 M we have combined our innovative ideas of rotary encoder technology and the experience gained over the years and placed it into a miniature rotary encoder. With a 22 mm diameter, it is the smallest absolute multi-turn rotary encoder of its kind. Amazingly compact, it can be easily mounted in the most confined machine spaces. The contact-free detection guarantees shock and vibration resistance which combined with its low mass make it perfect for use in demanding environments.

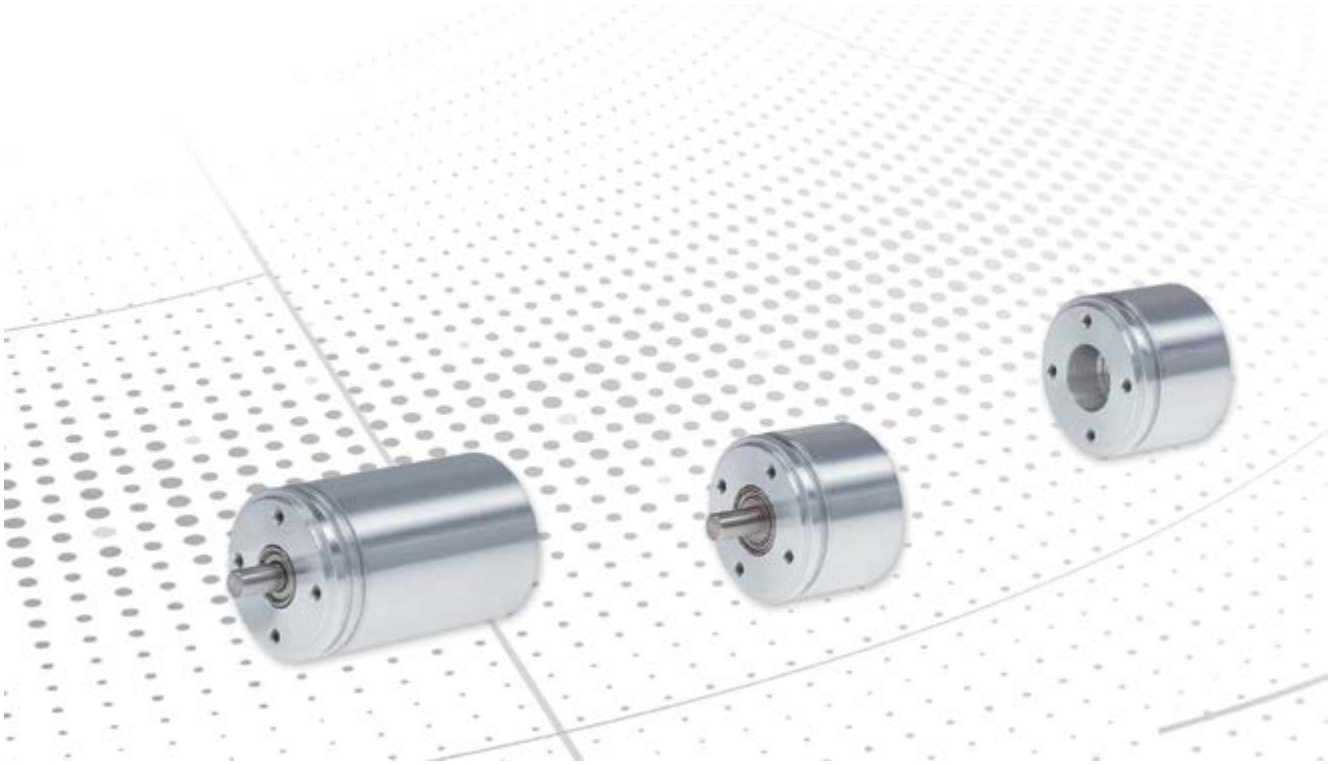
Application
Direct installation into servo drives for wear-free, absolute position detection over several revolutions. The small size of 22 mm enables real multi-turn position measuring without battery back-up in fields such as apparatus construction and medical engineering, where up till now only incremental rotary encoders or multiple-ganged potentiometers were used.

Magnet detection (M)

Products	CMV22M 	CMV22M 
Detection	Magnet detection (M)	Magnet detection (M)
Single / multi	(M) Multi	(M) Multi
Supply	7...26 VDC	14…30 VDC
Steps per turn	4096	4096
Number of turns	265	4096
Presicion	± 1,0 °	± 1,0 °
Shaft diameters available	3mm, 6mm, 1/4“	3mm, 6mm, 1/4“
Connectors	Cable outlet radial	Cable outlet radial
Ambient temperature	0…+60 °C	0…+60 °C
Protection class	IP64	IP64
Interface	***SSI*** ***ASI***	***Analog***
Weblink	www.tr-electronic.com/s/S007235	www.tr-electronic.com/s/S007234
QR-Code		

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

Rotary Encoder - Family C__36 - Housing 36 mm



Compact absolute rotary encoder family - also washdown safe (IP69K)

A new design size is taking the market by storm: with a diameter of 36 mm, advanced encoder technology is moving in where there is no room for typical industrial design sizes. And there is absolutely no need for the 36 mm series of encoders from TR to hide behind the bigger design sizes. The series is made up of incremental, single and real multi-turn rotary encoders, some with single-scan, some with double-scan functionality, and implemented according to the redundancy concept from the gears to the scan, power supply and interface.
Compact encoders C__36 are available with magnetic and optic detection with up to 18 bit resolution per revolution.

Magnet detection (M)

Products	CMV36-S	CMV36-S+FS	CMV36-M
			
Detection	Magnet detection (M)	Magnet detection (M)	Magnet detection (M)
Single / multi	(S) Single	(S) Single	(M) Multi
Supply	11...27 VDC	11...27 VDC	11...27 VDC
Steps per turn	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*	4096	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*
Number of turns	1	1	4,096 (option: 16,777,216)
Shaft diameters available	6mm	6mm	6mm
Connectors	Cable gland axial	Cable gland axial	Cable gland axial, M12 axial (DRIVE CLiQ)
Maximum SIL/PL		SIL2/PLd	
Ambient temperature	-25…+70°C	-25…+70°C	-25…+70°C
Protection class	IP65 (option IP69k)	IP65 (option IP69k)	IP54 (option IP65)
Interface	***SSI*** ***ASI*** ***Analog*** ***CAN***	***Analog***	***SSI*** DRIVE-CLiQ ***ASI*** ***CAN***
Option, additional interfaces (on request)	***INC***	***INC***	***INC***
Weblink	www.tr-electronic.com/s/S007174		www.tr-electronic.com/s/S007175
QR-Code			

*Factory set

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

Magnet detection (M)

Products	CMS36-M	CMF36-S	CDV36-S	
				
Detection	Magnet detection (M)	Magnet detection (M)	Magnet detection (M)	
Single / multi	(M) Multi	(S) Single	(S) Single	
Supply	11...27 VDC	11...27 VDC	11...27 VDC	
Steps per turn	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*	
Number of turns	4,096 (option: 16,777,216)	1	1	
Shaft diameters available	8mm blind shaft	See drawings section	6mm	
Connectors	Cable gland axial, M12 axial (DRIVE CLiQ)	Cable gland axial	2x cable gland axial	
Maximum SIL/PL				
Ambient temperature	-25…+70°C	-25…+70°C	-25…+70°C	
Protection class	IP54 (option IP65)	IP65 (option IP69k)	IP65 (option IP69k)	
Interface	***SSI*** DRIVE-CLiQ ***ASI*** ***CAN***	***SSI*** ***ASI*** ***Analog*** ***CAN***	***SSI***	
Option, additional interfaces (on request)	***INC***	***INC***	***SSI***	
Weblink	www.tr-electronic.com/s/S007176	www.tr-electronic.com/s/S007177	www.tr-electronic.com/s/S007178	
QR-Code				

*Factory set

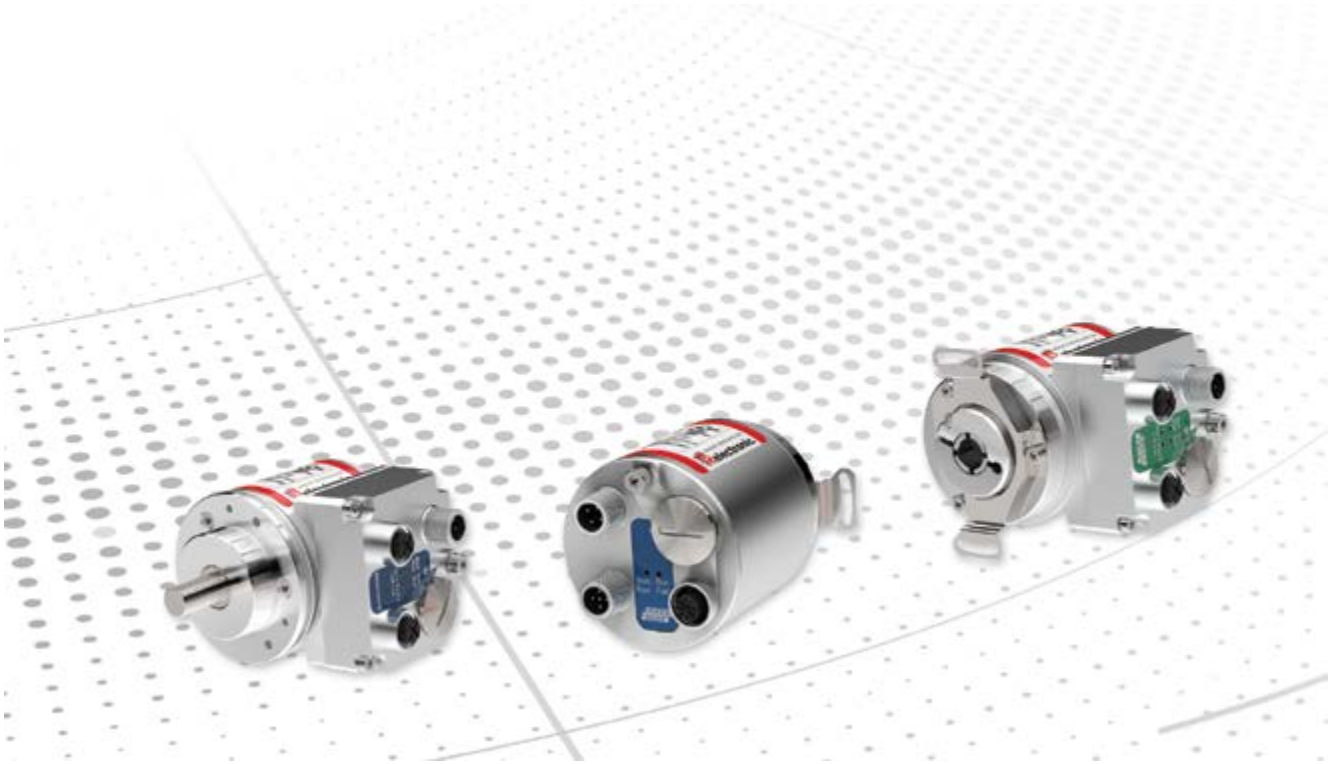
Magnet detection (M)
Optical 15 bit (E)
Optical 18 bit (O)

	CDV36-M	CDF36-S	CEV36-M	COV36-M
				
	Magnet detection (M)	Magnet detection (M)	Optical 15 bit (E)	Optical 18 bit (O)
	(M) Multi	(S) Single	(M) Multi	(M) Multi
	11...27 VDC	11...27 VDC	5...27 VDC	5...27 VDC
	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*	32, 40, 64, 80, 100, 128, 160, 200, 256, 320, 400, 500, 512, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192*	1.. .32,768*	1…262,144*
	4.096	1	65.536	65.536
	6mm	See drawings section	6mm	6mm
	2x cable gland axial	2x cable gland axial	M12 axial	M12 axial
	-25…+70°C	-25…+70°C	-25…+70°C	-25…+70°C
	IP54 (option IP65)	IP65 (option IP69k)	IP54 (option IP65)	IP54 (option IP65)
	SSI	***SSI***	***SSI***	***SSI***
	SSI	***SSI***		
	www.tr-electronic.com/s/S007179	www.tr-electronic.com/s/S007180	www.tr-electronic.com/s/S007293	www.tr-electronic.com/s/S007294

*Factory set

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

Absolute Rotary Encoders - Family C__58 - Housing 58 mm



58 mm housing for standard industrial applications

Encoders with size 58 mm have been established as the industrial standard for absolute and incremental encoders. With TR-Electronic, you get as a standard what is special with other manufacturers. Absolute encoders of Series 58 are modular. Your demands can be realized precisely and in most cases without any special development.

_ Industrial standard size 58 mm
_ Cost optimized by different resolution ranges
_ Compatible with a vast number of control systems
_ Shaft-, flange - and assembly versions
_ Same mechanics - plenty of interfaces
_ Compact Connector System - perfect for machines produced in series
_ Can be adaptedto singular applications via parametrization done by user
_ Available with customer-specific connector systems
_ UL approval for most types

Magnet detection (M)
Magnet detection (P)

Product	CMV582	CMS582	CPV582
			
Detection	Magnet detection (M)	Magnet detection (M)	Magnet detection (P)
Single / multi	(M) Multi (S) single	(M) Multi (S) single	(M) Multi (S) single
Supply	11…27 VDC*	11…27 VDC*	11…27 VDC*
Full resolution	<= 25 bit *	<= 25 bit *	<= 28 bit *
Steps per turn	<= 8192 *	<= 8192 *	<= 65536 *
Number of turns	<= 4096 *	<= 4096 *	<= 4096 *
Precision	± 0,5 °	± 0,5 °	± 0,5 °
Shaft diameters available	6, 8, 10, 12, 14, 1/4“, 3/8“, 1/2“	6, 8, 10, 12, 14, 15, 1/4“, 3/8“, 1/2“	6, 8, 10, 12, 14, 1/4“, 3/8“, 1/2“
Connectors	Connector axial or radial *	Connector axial or radial *	Connector axial or radial *
Ambient temperature	-20…+75 °C	-20…+75 °C	-20…+75 °C
Protection class	IP65	IP65	IP65
ATEX-zone	Option 2/22	Option 2/22	Option 2/22
Interface	SSI, Analog, DRIVE-CLiQ, PROFIBUS, CANopen, EtherCAT P, INTERBUS, PROFINET, EtherCAT, EtherNet/IP, ETHERNET POWERLINK, IO-Link	SSI, Analog, DRIVE-CLiQ, PROFIBUS, CANopen, EtherCAT P, INTERBUS, PROFINET, EtherCAT, EtherNet/IP, ETHERNET POWERLINK, IO-Link	SSI, Analog, DRIVE-CLiQ, PROFIBUS, CANopen, EtherCAT P, INTERBUS, PROFINET, EtherCAT, EtherNet/IP, ETHERNET POWERLINK, IO-Link
Option, additional interfaces (on request)			
Weblink	www.tr-electronic.com/s/S013306	www.tr-electronic.com/s/S013307	www.tr-electronic.com/s/S022328
QR-Code			

* depending on the interface

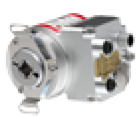
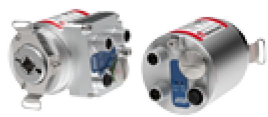
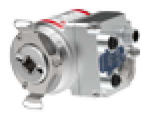
Can’t find the right variant? Please contact us (info@tr-electronic.de)

Magnet detection (P)
Optical 15 bit (E)

Product	CPS582	CEV582	CEH582	
				
Detection	Magnet detection (P)	Optical 15 bit (E)	Optical 15 bit (E)	
Single / multi	(M) Multi (S) single	(M) Multi (S) single	(M) Multi (S) single	
Supply	11…27 VDC*	11…27 VDC*	11…27 VDC*	
Full resolution	<= 28 bit *	<= 33 bit *	<= 33 bit *	
Steps per turn	<= 65536 *	<= 32768 *	<= 32768 *	
Number of turns	<= 4096 *	<= 256000 *	<= 256000 *	
Precision	± 0,5 °	± 1 digit	± 1 digit	
Shaft diameters available	6, 8, 10, 12, 14, 15, 1/4", 3/8", 1/2"	6, 8, 10, 12, 14, 1/4", 3/8", 1/2"	6, 8, 10, 12, 14, 15, 1/4", 3/8", 1/2"	
Connectors	Connector axial or radial *	Connector axial or radial *	Connector radial	
Ambient temperature	-20…+75 °C	-20…+75 °C	-20…+75 °C	
Protection class	IP65	IP65	IP54, option 65	
ATEX-zone	Option 2/22	Option 2/22	Option 2/22	
Interface	SSI, Analog, DRIVE-CLiQ, PROFIBUS, CANopen, EtherCAT P, INTERBUS, PROFINET, EtherCAT, EtherNet/IP, POWERLINK, IO-Link	SSI, Analog, DRIVE-CLiQ, PROFIBUS, CANopen, EtherCAT P, INTERBUS, PROFINET, EtherCAT, EtherNet/IP, POWERLINK, IO-Link	SSI, Analog, DRIVE-CLiQ, PROFIBUS, CANopen, EtherCAT P, INTERBUS, PROFINET, EtherCAT, EtherNet/IP, POWERLINK, IO-Link	
Option, additional interfaces (on request)				
Weblink	www.tr-electronic.com/s/S022330	www.tr-electronic.com/s/S013308	www.tr-electronic.com/s/S013312	
QR-Code				

* depending on the interface

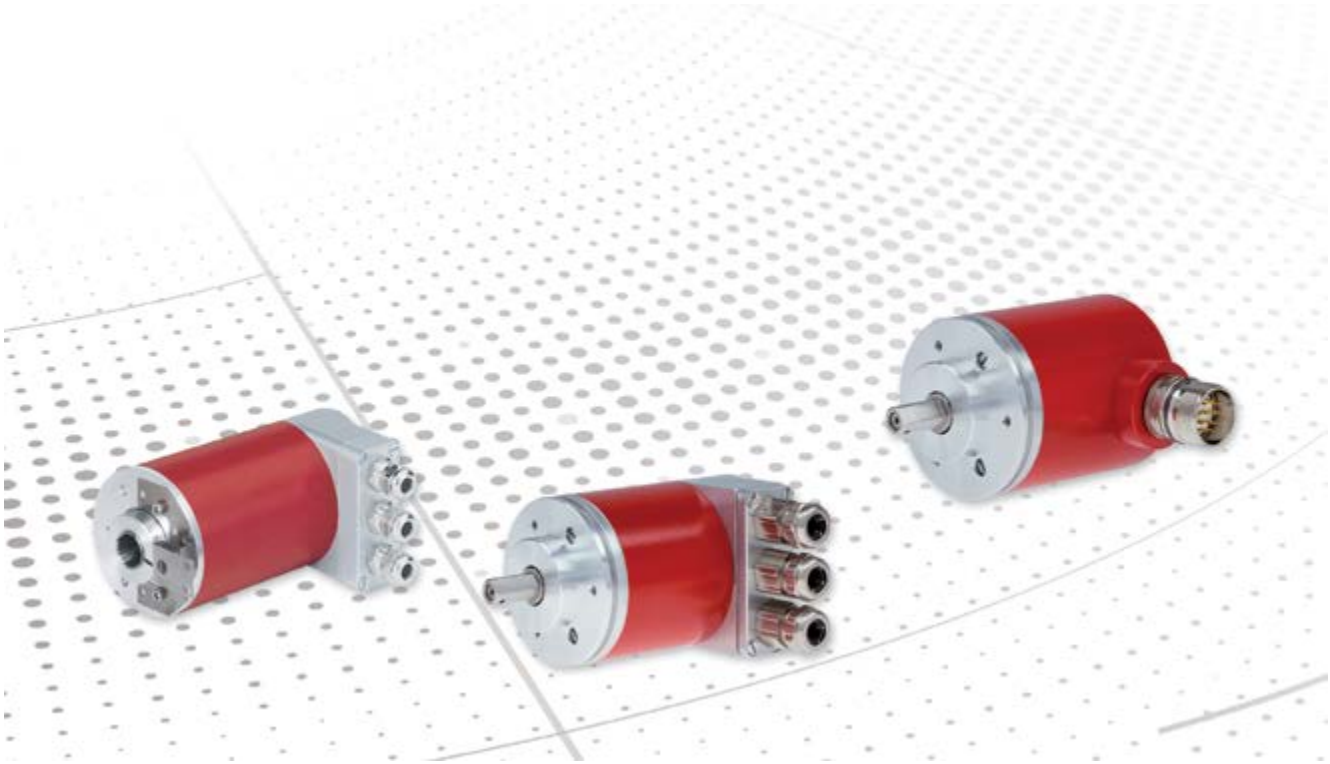
Optical 15 bit (E)
Optical 18 bit (O)

	CES582	COV582	COH582	COS582
				
	Optical 15 bit (E)	Optical 18 bit (O)	Optical 18 bit (O)	Optical 18 bit (O)
	(M) Multi (S) single	(M) Multi (S) single	(M) Multi (S) single	(M) Multi (S) single
	11…27 VDC*	11…27 VDC*	11…27 VDC*	11…27 VDC*
	<= 33 bit *	<= 36 bit *	<= 36 bit *	<= 36 bit *
	<= 32768 *	<= 262144 *	<= 262144 *	<= 262144 *
	<= 256000 *	<= 262144 *	<= 262144 *	<= 262144 *
	± 1 digit	± 1 digit	± 1 digit	± 1 digit
	6, 8, 10, 12, 14, 15, 1/4“, 3/8“, 1/2“	6, 8, 10, 12, 14, 1/4“, 3/8“, 1/2“	6, 8, 10, 12, 14, 15, 1/4“, 3/8“, 1/2“	6, 8, 10, 12, 14, 15, 1/4“, 3/8“, 1/2“
	Connector axial or radial *	Connector axial or radial *	Connector radial	Connector axial or radial *
	-20…+75 °C	-20…+75 °C	-20…+75 °C	-20…+75 °C
	IP65	IP65	IP54, option 65	IP65
	Option 2/22	Option 2/22	Option 2/22	Option 2/22
	SSI, INTERBUS, Analog, PROFINET, DRIVE-CLiQ, EtherCAT, PROFIBUS, EtherNet/IP, CANopen, ETHERNET POWERLINK, EtherCAT P, IO-Link	SSI, INTERBUS, Analog, PROFINET, DRIVE-CLiQ, EtherCAT, PROFIBUS, EtherNet/IP, CANopen, ETHERNET POWERLINK, EtherCAT P, IO-Link	SSI, INTERBUS, Analog, PROFINET, DRIVE-CLiQ, EtherCAT, PROFIBUS, EtherNet/IP, CANopen, ETHERNET POWERLINK, EtherCAT P, IO-Link	SSI, INTERBUS, Analog, PROFINET, DRIVE-CLiQ, EtherCAT, PROFIBUS, EtherNet/IP, CANopen, ETHERNET POWERLINK, EtherCAT P, IO-Link
	www.tr-electronic.com/s/S013313	www.tr-electronic.com/s/S013314	www.tr-electronic.com/s/S013315	www.tr-electronic.com/s/S013316

* depending on the interface

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

Rotary Encoder - Family C__65 - Housing 65 mm



The 65 mm housing with room for more options

Encoders size 65 have been established in the marketplace for some times. Comfortable room for wiring in the rugged fieldbus hood makes them attractive when encoder cabling is done directly onthe construction site, e.g. in facility automation and special machines. Even unusal interface combinations are possible directly "out of the box", without special development. Due to changeable shafts and flanges, a vast number of shaft/flange combinations are available in short order.

_ Size 65 mm
_ many flange/shaft combinations
_ ample wiring room for fieldbusses - perfect for special machines and big facilities
_ User programmable, suited to special applications even in small quantities
_ Room for customer-specific connection systems
_ Option: Atex Zone 2/22

Magnet detection (M)
Optical 15 bit (E)

Product	CMV65	CEV65	CES65
			
Detection	Magnet detection (M)	Optical 15 bit (E)	Optical 15 bit (E)
Single / multi	(M) Multi (S) Single	(M) Multi (S) Single	(M) Multi (S) Single
Supply	11...27 VDC	11...27 VDC (A: 18…27VDC)	11...27 VDC (A: 18…27VDC)
Full resolution	<= 23 .. 24 bit	<= 25 … 33 bit	<= 25 … 33 bit
Steps per turn	2048 /2096	8192 / 32768	8192 / 32768
Number of turns	4096	32768 / 25600	32768 / 25600
Precision	± 1,0 °	± 1 digit	± 1 digit
Shaft diameters available	6…12mm	6…12mm	8, 10, 12mm
Connectors	Connectors axial or radial *	Cable gland or connector, radial or axial, fieldbus hood radial *	Cable gland or connector, radial or axial, fieldbus hood radial *
Ambient temperature	-20…+70 °C	-20…+70 °C	-20…+70 °C
Protection class	IP65	IP65	IP65
ATEX-zone			
Interface	***SSI*** PROFIBUS	***SSI*** ***Nocken*** ***Analog*** PROFIBUS ***ASI*** CANopen ***Parallel*** DeviceNet	***SSI*** PROFIBUS ***Analog*** EtherNet/IP ***Parallel***
Option, additional interfaces (on request)		***SSI*** ***Nocken*** ***Analog*** ***INC*** ***Parallel*** ***SIN / COS***	***SSI*** ***Nocken*** ***Analog*** ***INC*** ***Parallel*** ***SIN / COS***
Weblink	www.tr-electronic.com/s/S007147	www.tr-electronic.com/s/S007148	www.tr-electronic.com/s/S007149
QR-Code			

* depending on the interface

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

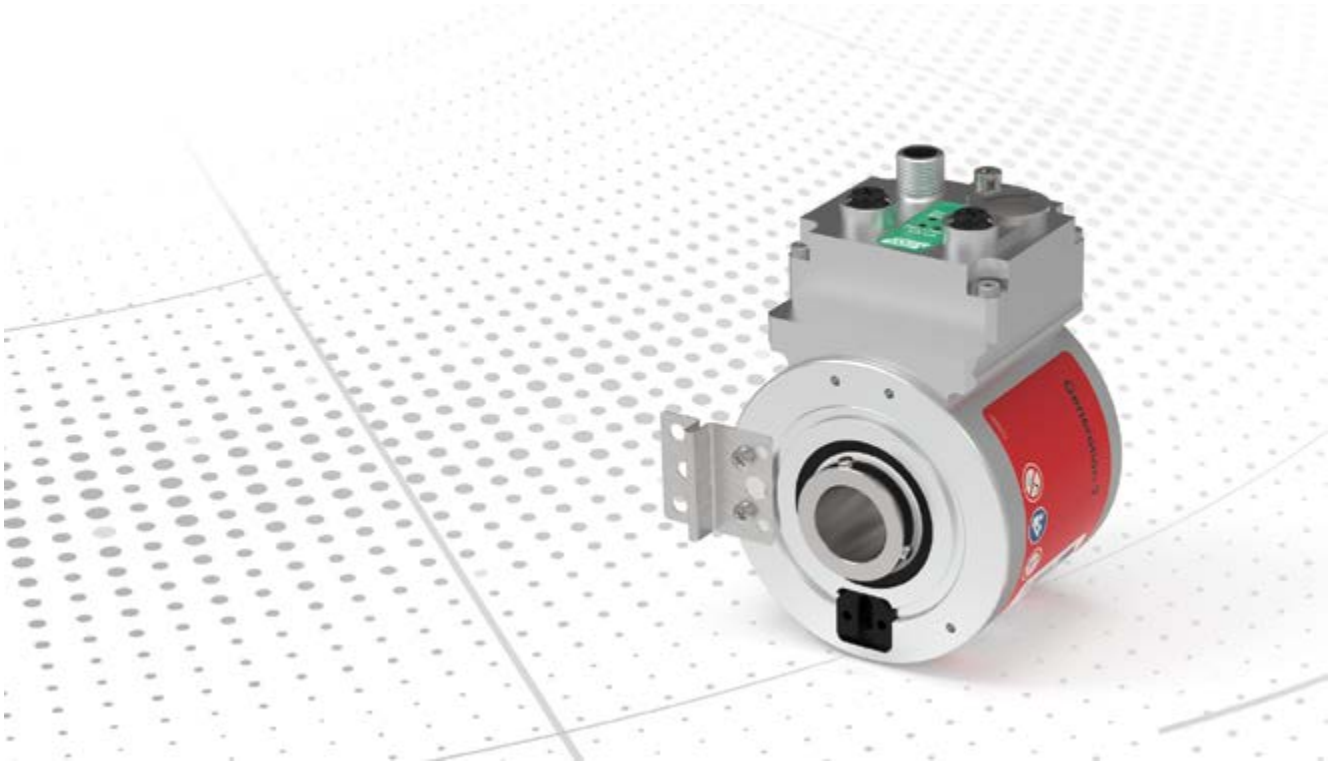
Optical 18 bit (O)
Optical 15 bit (E)

Product	COV65	AEV65
		
Detection	Optical 18 bit (O)	Optical 15 bit (E)
Single / multi	(M) Multi (S) Single	(M) Multi (S) Single
Supply	11...27 VDC (A: 18…27VDC)	11...27 VDC (A: 18…27VDC)
Full resolution	<= 36 bit	<= 33 bit
Steps per turn	262144	32768
Number of turns	25600	25600
Precision	± 1 digit	± 1 digit
Shaft diameters available	6…12mm	6…12mm
Connectors	Cable gland or connector, radial or axial, fieldbus hood radial *	Connectors axial or radial *
Ambient temperature	-20…+70 °C	-20…+60 °C
Protection class	IP65	IP64
ATEX-zone		2/22
Interface	SSI PROFIBUS ASI	SSI Analog
Option, additional interfaces (on request)	SSI ASI	
Weblink	www.tr-electronic.com/s/S007150	www.tr-electronic.com/s/S007151
QR-Code		

* depending on the interface

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

Encoder - Family C_H80 - Housing 80 mm



Hollow shaft encoder for shafts up to 27 mm

Hollow shaft encoders made by TR-Electronic provide a current absolute position reading value immediately after power up without any referencing, counters or batteries. The enncoder is supported mechanically by the passing shaft. To prevent the encoder from turning with the shaft, a compact torque support spring can be used or a pin/groove connection in the flange of the encoder. Family 80 covers shaft diameters from 10 to 27 mm with an extensive choice of industrial interfaces as you´ve come to expect from TR-Electronic. Two resolution classes meet your demands perfectly: CEH measures up to 15 bits per turn, COH up to 18 bits per turn. Both detections measure up to 256,000 absolute turns. C_H80 is available for ATEX Zones 2/22 named A_H80. See chapter "Absolute rotary encoders - ATEX - Zone 2/22".

Optical 15 bit (E)
Optical 18 bit (O)

Produkt	CEH80	CEH802	COH80
			
Abtastung	Optisch 15 Bit (E)	Optisch 15 Bit (E)	Optisch 18 Bit (O)
Single / Multi	(M) Multi (S) Single	(M) Multi (S) Single	(M) Multi (S) Single
Versorgung	24 VDC (11…27)	24 VDC (11…27)	24 VDC (11…27)
Schrittzahl pro Umdrehung	32768	32768	262144
Anzahl Umdrehungen	256000	256000	262144
verfügbarer Wellendurchmesser	10, 14, 16, 20, 24, 25, 27	10, 14, 16, 20, 24, 25, 27	10, 14, 16, 20, 24, 25, 27
Steckerausführung	Stecker radial (Option Kabel*)	3x M12	Stecker radial (Option Kabel*)
Arbeitstemperatur	0…+60 °C (Option -20…+70 °C)	-20..+70°C	0…+60 °C (Option -20…+70 °C)
Schutzart	IP54	IP54	IP54
Schnittstellen	***SSI***	DRIVE-CLiQ, PROFINET, PROFIBUS, EtherCAT, CANopen, EtherNet/IP, CAN, ETHERNET POWERLINK, INTERBUS, IO-Link, EtherCAT P	***SSI***
Optionale Zusatzschnittstellen (auf Anfrage)	***INC***		***INC***
Weblink	www.tr-electronic.de/s/S008496	www.tr-electronic.de/s/S019339	www.tr-electronic.de/s/S008497
QR-Code			

* depending on the interface

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

Optical 18 bit (O)

Produkt	COH802 
Abtastung	Optisch 18 Bit (O)
Single / Multi	(M) Multi (S) Single
Versorgung	24 VDC (11…27)
Schrittzahl pro Umdrehung	262144
Anzahl Umdrehungen	262144
verfügbarer Wellendurchmesser	10, 14, 16, 20, 24, 25, 27
Steckerausführung	3x M12
Arbeitstemperatur	-20..+70°C
Schutzart	IP54
Schnittstellen	DRIVE-CLiQ, PROFINET, PROFIBUS, EtherCAT, CANopen, EtherNet/IP, CAN, ETHERNET POWERLINK, INTERBUS, IO-Link, EtherCAT P
Optionale Zusatzschnittstellen (auf Anfrage)	
Weblink	www.tr-electronic.de/s/S019339
QR-Code	

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

Rotary Encoder - Family Q_H80/81 - Housing 80 mm

Hollow shaft encoder for shafts up to 25 mm

Hollow shaft encoders made by TR-Electronic provide a current absolute position reading value immediately after power up without any referencing, counters or batteries. The encoder is supported mechanically by the passing shaft. The larger housing (compared with C_H80) offers more room and possibilities for interfaces and interface combinations. Special highlight: The same encoder contains more interfaces and only the clamps used in the spacious connection hood decide which interface is to be used in your application.

Combination of multi-turn with an independent single-turn detection can be used for a simple cross-check of the encoder position (single-turn is used to monitor the multi-turn-detection in a separte monitoring unit) or to provide special feedback systems for commutation (also with SIN/COS).

Optical 15 bit (E)
Double detection (D)

Products	QEH80	QEH81	QDH80
			
Detection	Optical 15 bit (E)	Optical 15 bit (E)	Double detection (D)
Single / multi	(M) Multi (S) Single	(M) Multi (S) Single	(M) Multi (S) Single (2nd detection: Single)
Supply	24 VDC (11..27)	24 VDC (11..27)	24 VDC (11..27)
Steps per turn	<= 8192	<= 8192	<= 8192
Number of turns	<= 256000	<= 256000	<= 256000
Shaft diameters available	16, 20, 24, 25	16, 20, 22, 24, 25	12, 14, 16, 20, 22, 24, 25
Connectors	Connector radial, connection hood with cable glands	Connector radial, connection hood with cable glands	Connector radial, connection hood with cable glands
Ambient temperature	0…+60 °C (option -20…+70 °C)	0…+60 °C (option -20…+70 °C)	0…+60 °C (option -20…+70 °C)
Protection class	IP54	IP54	IP54
Interface	SSI PROFIBUS INC	SSI PROFIBUS INC	SSI PROFIBUS INC
Option, additional interfaces (on request)	INC	INC	INC
Weblink	www.tr-electronic.com/s/S008515	www.tr-electronic.com/s/S008518	www.tr-electronic.com/s/S008516
QR-Code			

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

Double detection (D)

Products	QDH81 
Detection	Double detection (D)
Single / multi	(M) Multi (S) Single (2nd detection: Single)
Supply	24 VDC (11..27)
Steps per turn	<= 8192
Number of turns	<= 256000
Shaft diameters available	16, 20, 22, 24, 25
Connectors	Connector radial, connection hood with cable glands
Ambient temperature	0…+60 °C (option -20…+70 °C)
Protection class	IP54
Interface	SSI PROFIBUS INC
Option, additional interfaces (on request)	INC
Weblink	www.tr-electronic.com/s/S008517
QR-Code	

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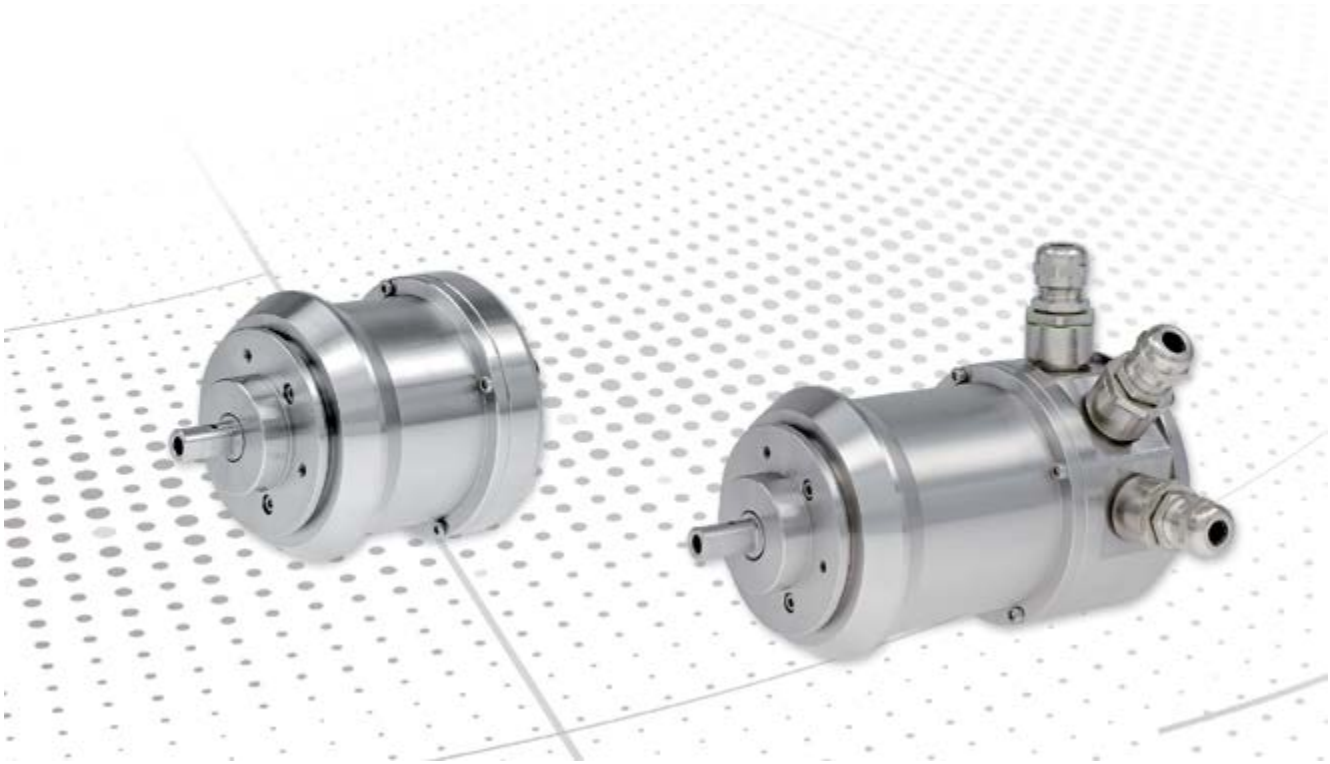
Rotary Encoders - Stainless Steel Housing - C__84



Protective housing for aggressive surroundings

In paper processing it is groundwood pulp, in process technology it is acids and lyes, in food processing technology it is hot cleaning solutions under high pressure. Rotary encoders constantly come into contact with corrosive media. Compact rotary encoders are suitably equipped for an aggressive environment: Encased in the proven protective housing, the CEV84Ms can withstand everything that an ordinary stainless steel can tolerate. At the same time they can be cleaned with water under high pressure and are therefore also suitable for use in food processing machines and plants. For industrial Ethernet, installation and activation is considerably simplified. The encoder is integrated into the network by watertight connectors located at the rear side of the encoder. CEV84M brings the world of cutting-edge industrial networks to paper machines, process plants and to the pharmaceutical and food industries.

Stainless steel housings of series 84 provides perfect protection in aggressive surroundings even for the most recent Generation 582 with all its interface features.

Stainless steel

Product	CEV84	CEV84 Field Bus	CEV84 Industrial Ethernet
			
Material	1.4305 (X12 Cr NiS 18 08 / 18 9)	1.4305 (X12 Cr NiS 18 08 / 18 9)	1.4305 (X12 Cr NiS 18 08 / 18 9)
Detection, Resolution choose from	C__58, I__58	C__58, I__58	C__58, I__58
Supply	11…27 VDC	11…27 VDC	11…27 VDC
Maximum rpm	3000 1/min	3000 1/min	3000 1/min
Mass (typical)	1,5..2,5 kg	1,5..2,5 kg	1,5..2,5 kg
Shaft diameters available	6, 10, 12 mm	6, 10, 12 mm	6, 10, 12 mm
Connectors	M23 axial / radial	Fieldbus hood / cable glands radial	3 x M12 axial
Ambient temperature	-20…+70 °C (option -40…+85 °C)	-20…+70 °C (option -40…+85 °C)	-20…+70 °C (option -40…+85 °C)
Protection class	IP68	IP68	IP68
ATEX			
Interface	***SSI*** ***Parallel*** ***Analog***	PROFIBUS DeviceNet CANopen	PROFINET POWERLINK EtherCAT sercos the automation bus EtherNet/IP
Option, additional interfaces (on request)	***Analog*** ***INC*** ***Parallel***	***SSI*** ***Parallel*** ***Analog*** ***INC***	
Weblink	www.tr-electronic.com/s/S007190	www.tr-electronic.com/s/S007190	www.tr-electronic.com/s/S007190
QR-Code			

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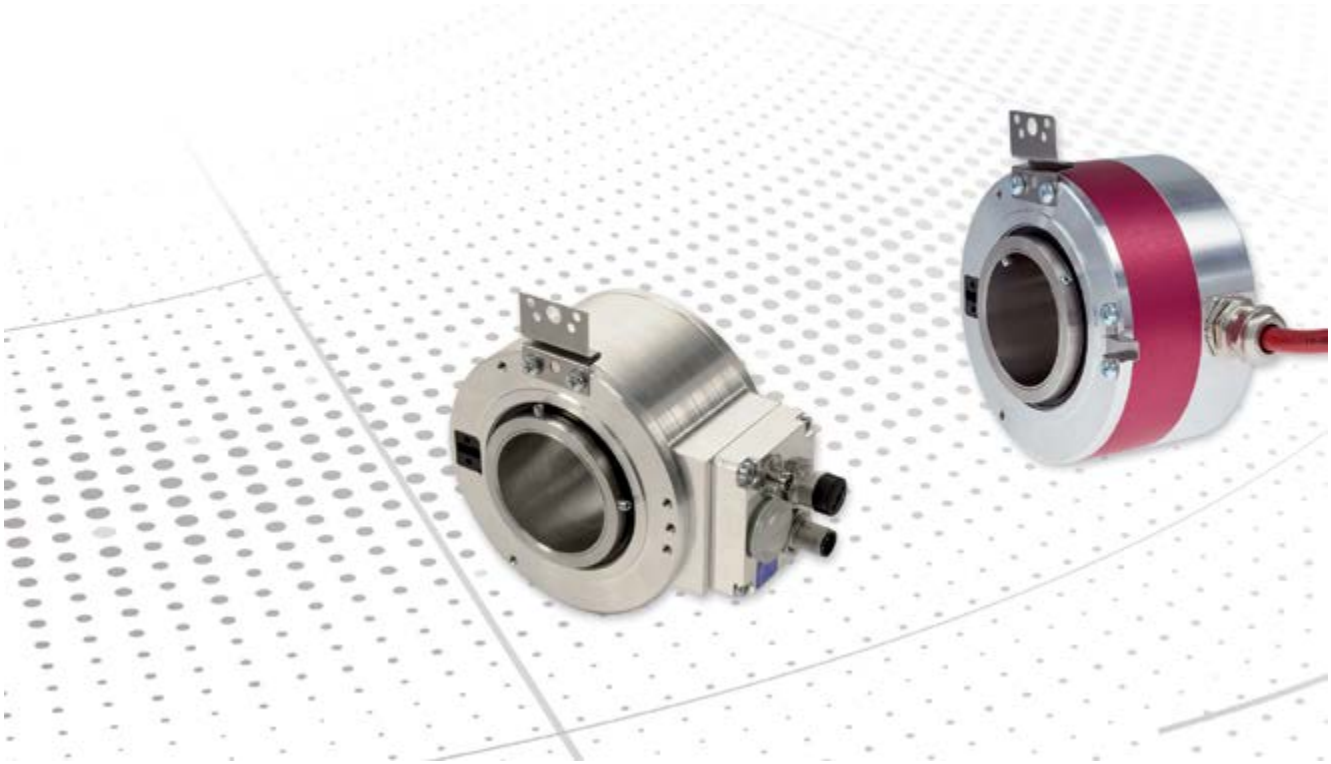
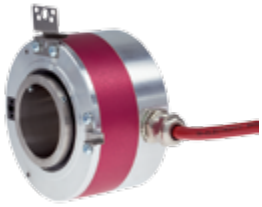
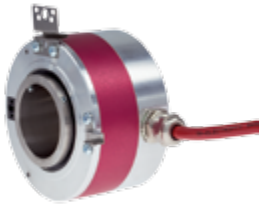
Rotary Encoders - Family C_H110(2) - Housing 110 mm



Hollow shaft encoder for shafts up to 50 mm

Hollow shaft encoders made by TR-Electronic provide a current absolute position reading value immediately after power up without any referencing, counters or batteries. The encoder is supported mechanically by the passing shaft. To prevent the encoder from turning with the shaft, a compact torque support spring can be used or a pin/groove connection in the flange of the encoder. Family 110 covers shaft diameters from 15 up to 20 mm with an extensive choice of industrial interfaces as you´ve come to expect from TR-Electronic. Two resolution classes fit your demands perfectly: CEH measures up to 15 bits per turn, COH up to 18 bits per turn. Both detections measure up to 262,144 absolute turns.

Optical 15 bit (E)
Optical 18 bit (O)

Product	CEH110	CEH1102	COH110
			
Detection	Optical 15 bit (E)	Optical 15 bit (E)	Optical 18 bit (O)
Single / multi	(M) Multi (S) Single	(M) Multi (S) Single	(M) Multi (S) Single
Supply	24 VDC (11…27)	24 VDC (11…27)	24 VDC (11…27)
Steps per turn	32768	32768	262144
Number of turns	256000	256000	262144*
Shaft diameters available	15, 28, 30, 35, 38, 40, 45, 50	15, 28, 30, 35, 38, 40, 45, 50	15, 28, 30, 35, 38, 40, 45, 50
Connectors	connector radial	connector radial	connector radial
Ambient temperature	0…+60 °C (option -20…+70 °C)	0…+60 °C (option -20…+70 °C)	0…+60 °C (option -20…+70 °C)
Protection class	IP54	IP54	IP54
Interface	***SSI***	DRIVE-CLiQ, PROFINET, PROFIBUS, EtherCAT, CANopen, EtherNet/IP, CAN, ETHERNET POWERLINK, INTERBUS, IO-Link, EtherCAT P	***SSI***
Option, additional interfaces (on request)	***INC***	***INC***	***INC***
Weblink	www.tr-electronic.com/s/S008519	www.tr-electronic.com/s/S008519	www.tr-electronic.com/s/S008520
QR-Code			

* depending on the interface

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

Optical 15 bit (E)
Optical 18 bit (O)

Product	COH1102 
Detection	Optical 18 bit (O)
Single / multi	(M) Multi (S) Single
Supply	24 VDC (11…27)
Steps per turn	262144
Number of turns	262144*
Shaft diameters available	15, 28, 30, 35, 38, 40, 45, 50
Connectors	connector radial
Ambient temperature	0…+60 °C (option -20…+70 °C)
Protection class	IP54
Interface	DRIVE-CLiQ, PROFINET, PROFIBUS, EtherCAT, CANopen, EtherNet/IP, CAN, ETHERNET POWERLINK, INTERBUS, IO-Link, EtherCAT P
Option, additional interfaces (on request)	INC
Weblink	www.tr-electronic.com/s/S008520
QR-Code	

* depending on the interface

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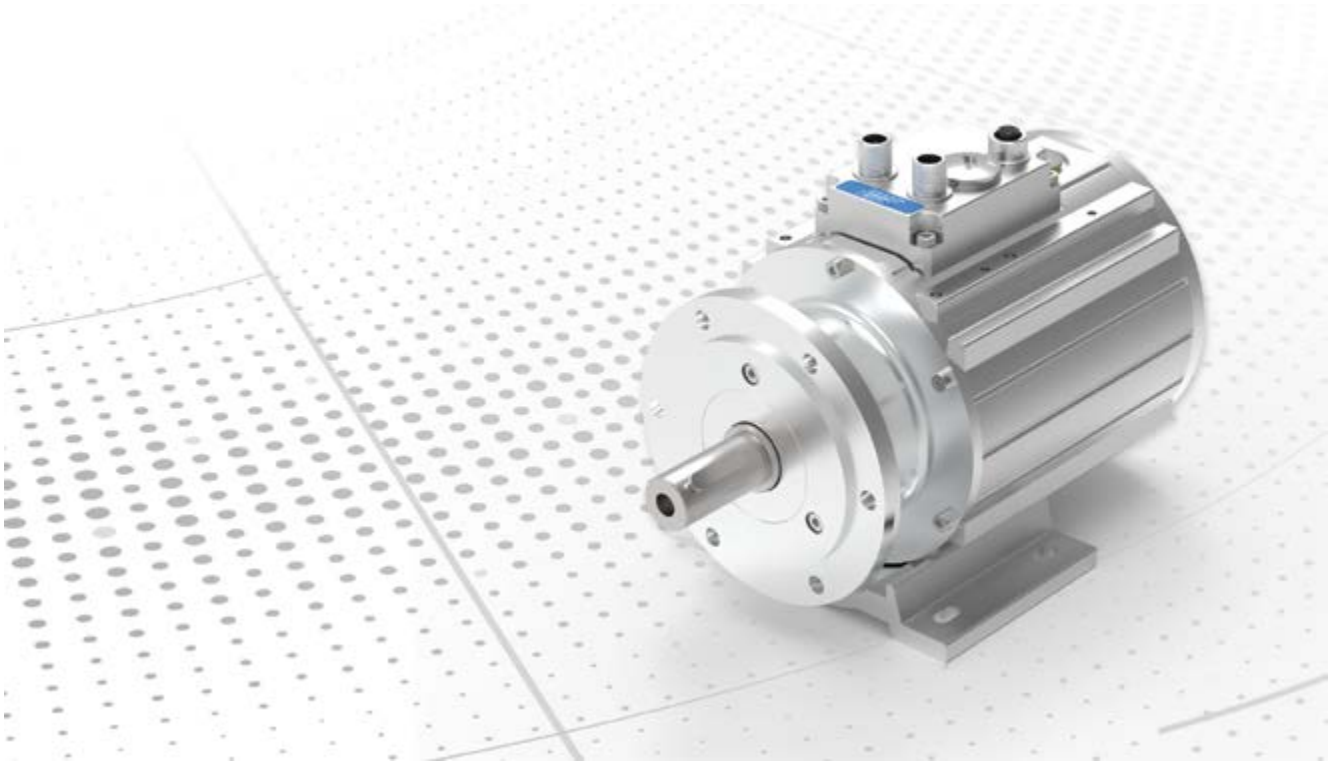
Rotary Encoders - Family C_V115 - Housing 115 mm



Heavy-duty protective housing for rotary encoders families C__58, C__65 and I__58

In crane installations, mining, oil and gas production, steelworks or in wind power plants rotary encoders must perform their tasks reliably even under the most demanding environmental conditions and extreme mechanical influences. This demands particularly intelligent and robust design, as well as durable technology. Heavy-duty absolute rotary encoders family C_V115 from TR-Electronic offer thick-walled housings made of aluminium and are equipped with heating or cooling elements if required. Internally, the detection and interface technology of the C__58, C__65, CD_75 (SIL) and I__58 series are used. With same mechanics, types for explosive atmospheres for Zones 2/22 are available.

Housing option for rotary encoders
Encoder with protective housing
Double encoder with protective housing

Product	C_V115	AEV115	ADV115
			
Type	Housing option for rotary encoders	Encoder with protective housing	Double encoder with protective housing
Technical data encoder	See rotary encoders C__58 / C__65 / I__58	8192 / 256000	8192 / 256000
Shaft diameters available	12, 14, 20	12, 14, 20	12, 14, 20
Connectors	Cable gland / connector	Cable gland	Cable gland
Ambient temperature	-20…+60 °C	0…+40 °C	0…+40 °C
Protection class	IP65 (option IP67)	IP65	IP65
ATEX zone	Option 22	22	22
Interface	SSI, DeviceNet, Analog, PROFINET, Parallel, EtherCAT, Nocken, EtherNet/IP, PROFIBUS, ETHERNET POWERLINK, CANopen	PROFIBUS	SSI, PROFIBUS
Option, additional interfaces (on request)		SSI	SSI, INC
Weblink	www.tr-electronic.com/s/S008524	www.tr-electronic.com/s/S008524	www.tr-electronic.com/s/S008525
QR-Code			

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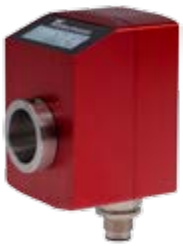
Encoder - Family M__Display - Position Indicators

When information is needed directyl in the applications

Position indicator encoders MG provide absolute multiturn position information directly where the movement happens. Manual adjustments can be observed with high precision and reliability.
MG48 is available as position indicator encoder, driven by the solid shaft inserted into the encoders hollow shaft. The modern, graphic capable display provides best legibility. Due to flexible programming, the display orientation fits different integration situations. For programmation, USB interface is integrated. The mini-USB-connector is protected by a threaded plug.

The bus-version MG48 BUS and MG75 adds the possibility to connect the encoder to a central control. With this feature, all manual adjustments can be documented by the control and even parametrized by sending new target values from the control to the encoder.
Number of steps per turn and number of turns can be programmed with both systems. MG48 BUS communicates via industrial standard bus systems with a master control.

Magnet detection (M)

Product	MG48	MG48 BUS	MG75
			
Detection	Magnet detection (M)	Magnet detection (M)	Magnet detection (M)
Single / multi	(M) Multi	(M) Multi	(M) Multi
Application	Electronic Position Indicator	Electronic Position Indicator with Industrial Ethernet	Electronic Position Indicator with Control Communication
Supply	11…27VDC	11…27VDC	11…27VDC
Steps per turn	4096	4096	64
Number of turns	4096	4096	65536
Shaft diameters available	20H7	20H7	20H7
Connectors	M12 connector	M12 connector	2 M12 connectors
Ambient temperature	0…+60 °C	0…+60 °C	0…+60 °C
Protection class	IP50	IP50	IP50
Interface		PROFINET EtherNet/IP EtherCAT	ASI
Weblink	http://www.tr-electronic.com/s/S016505	http://www.tr-electronic.com/s/S016505	
QR-Code			

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

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