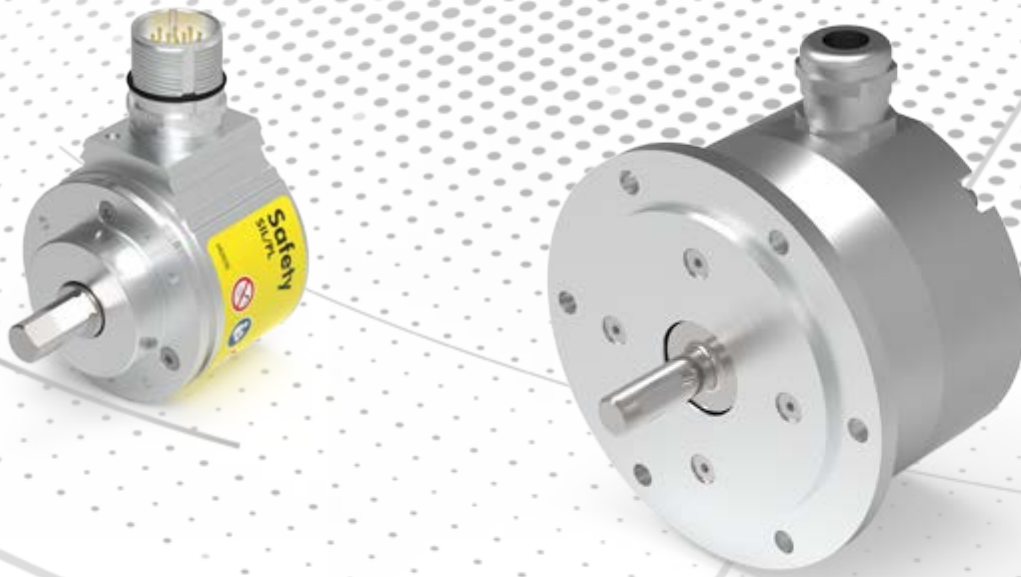
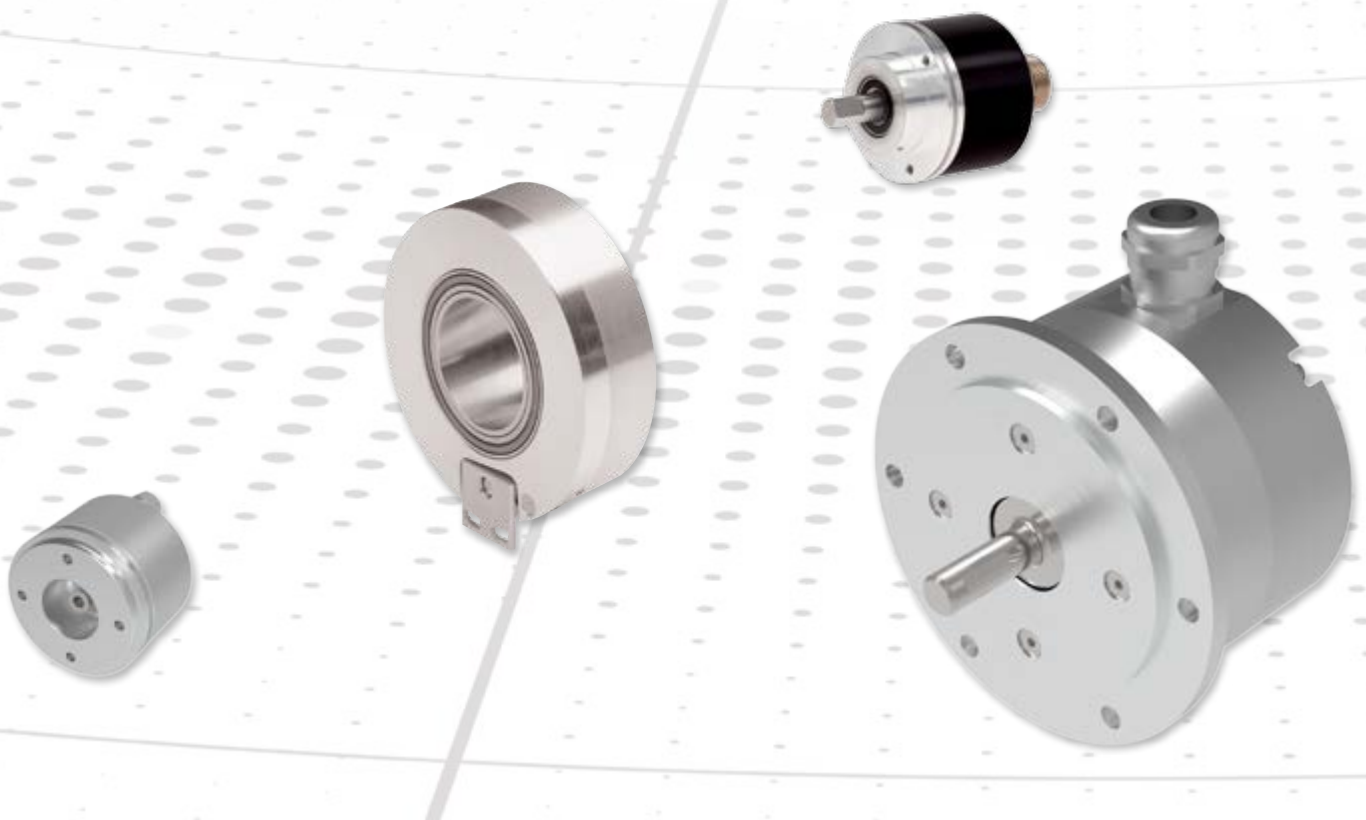


Incremental Rotary Encoders

Overview



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.

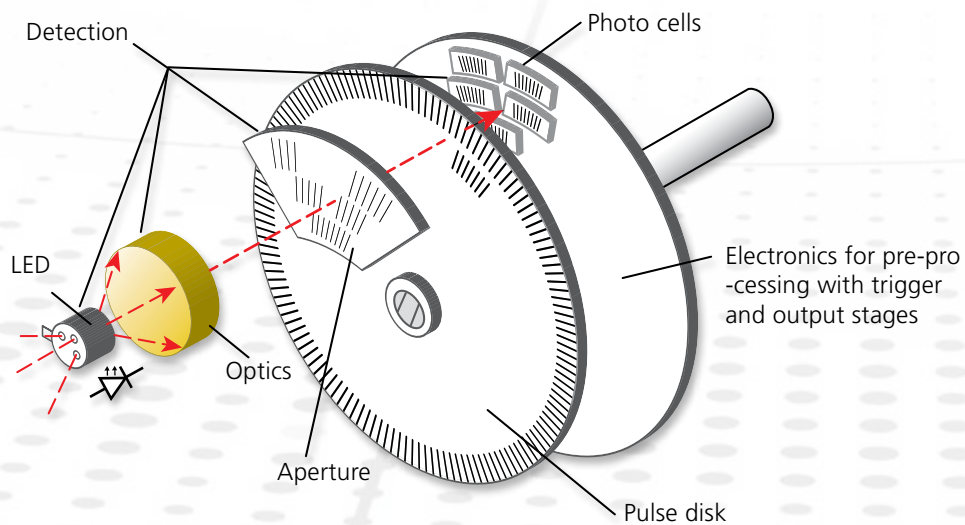
You will also find a multitude of housing options, e.g. ATEX-compliant housings and housings for use in aggressive media or for heavy mechanical stress (heavy-duty).



Contents

Theory of Operation	4	Fixed Resolution	24
Resolution Programmable.....	8	Families by Size	24
- I_58	8	Fixed Resolution, Functional Safety	38
- I_H110.....	20	- I_58+FS	38

Pulse Encoder mode of operation

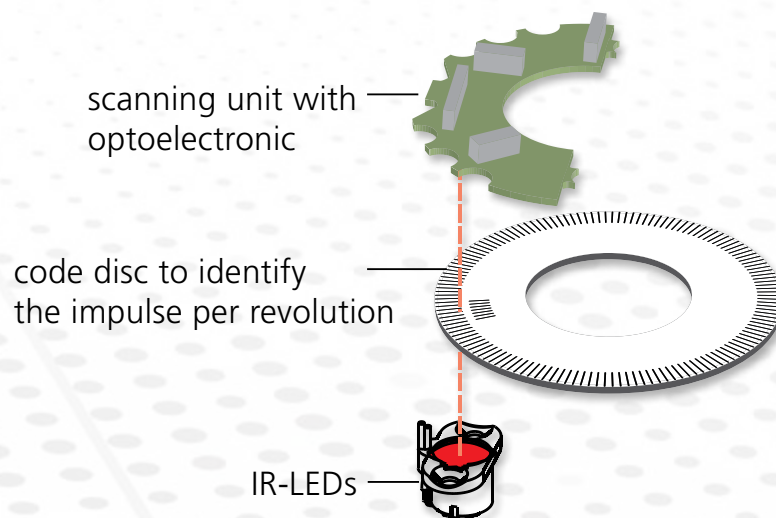


Consistent mechanical concept

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.

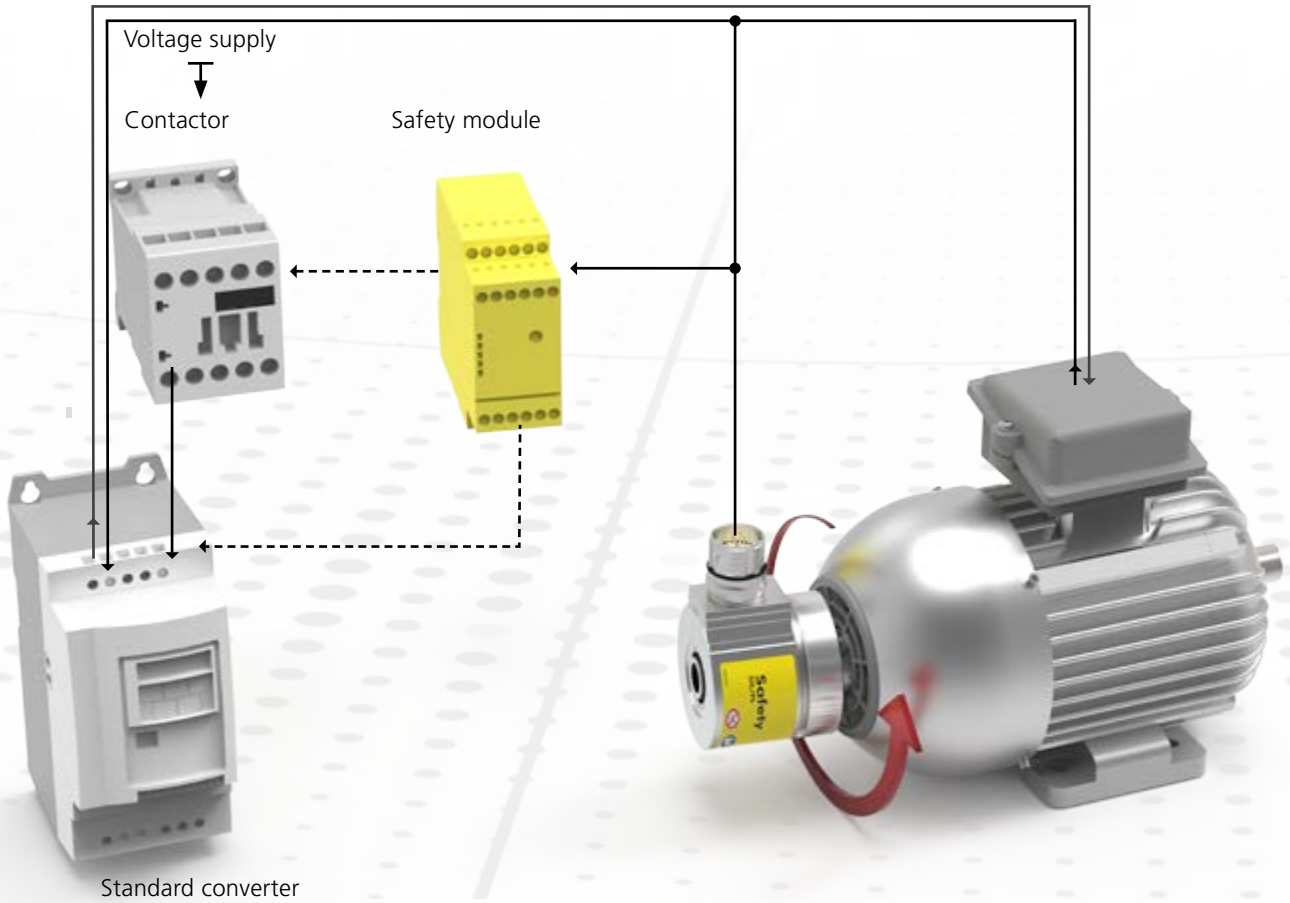
The new generation I_58:2 offers wide range input of 4.5 ... 32 V DC and number of graduation marks up to 62,450 increments per revolution as well as a hollow shaft diameter up to 15 mm or ½".

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 disk 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.

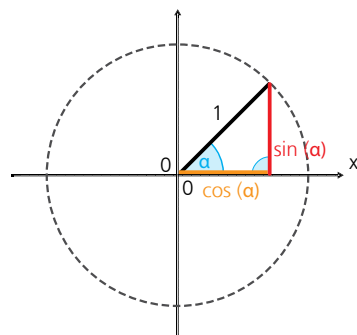
Safe incremental rotary encoders



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: 10 mm

IH-58+FS; IS-58+FS: 12 mm

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

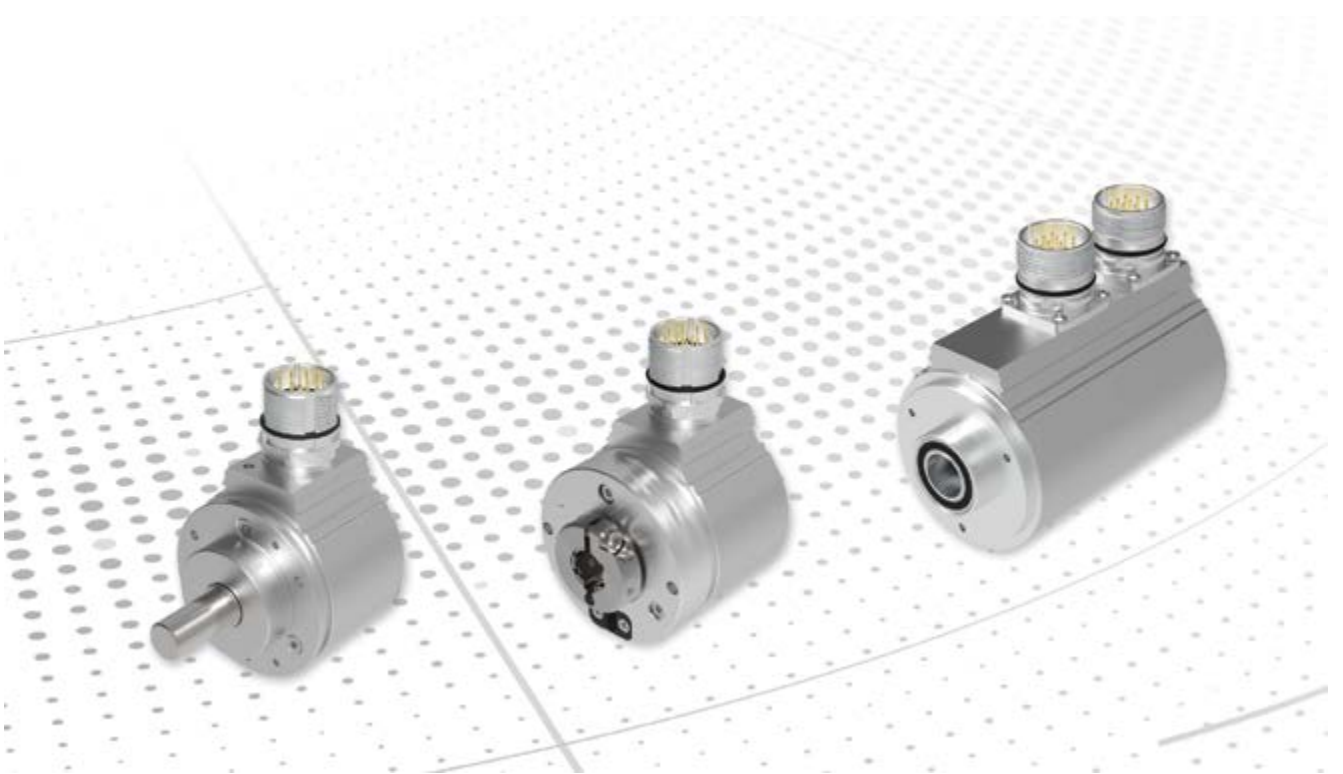
Especially for simpler, speed-based safety functions, IE-58+FS perfectly complement TR's range of absolute safety rotary encoders. Technically and commercially optimal solutions are thus available for almost all applications, from simple incremental rotary encoders through to efficient Industrial Ethernet 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 Encoders - Family I__58 - Housing 58 mm



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 adapt the resolution of our programmable incremental rotary encoders (size 58 mm) via software to meet your demands.

The new generation I__58:2 has wide range input of 4,5..32 V DC and number of periods per turn up to 65,536. Additionally, it provides hollow and blind shaft diameters up to 15 mm resp. 1/2".

Contents

Products.....	9
Suggested Products.....	12
Dimensional Drawings.....	16

Optical (O)







Up to 10,000 pulses

Product	IEV58:2	IES58:2	IEH58:2
			
Detection	Optical (E)	Optical (E)	Optical (E)
Supply	24 VDC (4,5 ... 27)	24 VDC (4,5 ... 27)	24 VDC (4,5 ... 27)
Steps per turn	$\geq 2 \dots \leq 10000$	$\geq 2 \dots \leq 10000$	$\geq 2 \dots \leq 10000$
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, 15, 1/4", 3/8", 1/2"
Connectors	Connector or cable	Connector or cable	Connector or cable
Ambient temperature	-40...+75 °C	-40...+75 °C	-40...+75 °C
ATEX zone			
Interface	Square	Square	Square
Weblink	www.tr-electronic.com/s/S008480	www.tr-electronic.com/s/S008481	www.tr-electronic.com/s/S008482
QR-Code			





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

Optical (O)

Up to 65,536 pulses

Product	IOV58:2 	IOS58:2 	IOH58:2 	
Detection	Optical (O)	Optical (O)	Optical (O)	
Supply	24 VDC (4,5 ... 27)	24 VDC (4,5 ... 27)	24 VDC (4,5 ..27)	
Steps per turn	>= 2...<= 65536	>= 2...<= 65536	>= 2...<= 65536	
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, 15, 1/4", 3/8", 1/2"	
Connectors	Connector or cable	Connector or cable	Connector or cable	
Ambient temperature	-40...+75 °C	-40...+75 °C	-40...+75 °C	
ATEX zone				
Interface	Square	Square	Square	
Weblink	www.tr-electronic.com/s/S008483	www.tr-electronic.com/s/S008484	www.tr-electronic.com/s/S008485	
QR-Code				

Double detection (D)

IDV58		IDS58	
Double detection (D)		Double detection (D)	
24 VDC (11 .. 28), 5V DC (+-5%)		24 VDC (11 ... 28), 5V DC (+-5%)	
$\geq 2 \dots \leq 1024, 2048, 4096, 8192$		$\geq 2 \dots \leq 1024, 2048, 4096, 8192$	
6, 8, 10, 12, 3/8"		8, 10, 11, 12	
Connector or cable		Connector or cable	
0...+60 °C		0...+60 °C	
Square		Square	
www.tr-electronic.com/s/S008486		www.tr-electronic.com/s/S008487	
			

Suggested Products

Order code	Steps per Turn	Channels	Shaft / Flange	Connector Position	Cable length	Remark
IEV58:2						
IEV582-00001	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	10FL/19,5; ZB36 3xM3+3xM4	M23, 12 pin, radial		
IEV582-00002	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	10FL/19,5; ZB36 3xM3+3xM4	M23, 12 pin, axial		
IEV582-00003	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	6GL/10; ZB50	M23, 12 pin, axial		
IEV582-00005	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	10FL/19,5; ZB36 3xM3+3xM4	cable radial, open end	2 m	
IEV582-00077	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	10FL/19,5; ZB36 3xM3+3xM4	M23, 12 pin, radial		
IEV582-00099	50*	HTL (K1/K2)+Inv.; K0+Inv.	10FL/19,5; ZB36 3xM3+3xM4	M23, 12 pin axial		
IEV582-00019	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	10FL/19,5; ZB50	M23, 12 pin, radial		
IEV582-00024	10.000*	HTL (K1/K2)+Inv.;	12NUT/25; ZB50	M12, 8 pin, radial		
IEV582-00023	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	12NUT/25; ZB50	M23, 12 pin, radial		
IEV582-00007	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	3/8" FL/22,3; ZB31,75 Sqr.	cable radial, open end	2 m	
IEV582-00022	10.000*	HTL (K1/K2)+Inv.;	6GL/10; ZB50	M12, 8 pin, radial		
IEV582-00006	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	6GL/10; ZB50	cable radial, open end	2 m	
IEV582-00030	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	6GL/10; ZB50	M23, 12 pin, radial		
IEV582-00093	250*	TTL (K1/K2)+Inv.; K0+Inv.	6GL/10; ZB50	M23, 12 pin, radial		
IEV582-00004	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	8FL/19,5; ZB36 3xM3+3xM4	cable radial, open end	2 m	

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

Suggested Products

Order code	Steps per Turn	Channels	Shaft / Flange	Connector Position	Cable length	Remark
IES58:2						
IES582-00005	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	10H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IES582-00007	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	10H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IES582-00024	2.048*	TTL (K1/K2)+Inv.; KO+Inv.	10H7	cable radial, open end	2 m	Torque support, clamping ring flange side, TTL
IES582-00026	1.024*	TTL (K1/K2)+Inv.; KO+Inv.	11H7	M23, 12 pin, radial		Torque support, clamping ring flange side, TTL
IES582-00006	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	12H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IES582-00018	1.024*	HTL (K1/K2)+Inv.; KO+Inv.	12H7	M12, 8 pin, radial		Torque support, clamping ring flange side, TTL
IES582-00034	1.024*	HTL (K1/K2)+Inv.; KO+Inv.	12H7	M12, 8 pin, radial		Torque support, clamping ring flange side, TTL
IES582-00008	10.000*	TTL (K1/K2)+Inv.; KO+Inv.	12H7	M23, 12 pin, radial		Torque support, clamping ring flange side, TTL
IES582-00027	2.500*	TTL (K1/K2)+Inv.; KO+Inv.	12H7	M23, 12 pin, radial		Torque support, clamping ring flange side, TTL
IES582-00029	4.096*	TTL (K1/K2)+Inv.; KO+Inv.	12H7	M12, 8 pin, radial		Torque support, clamping ring flange side, TTL
IES582-00004	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	14H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IES582-00003	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	14H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IES582-00001	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	15H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IES582-00002	10.000*	HTL (K1/K2)+Inv.; KO+Inv.	15H7	M23, 12 pin, radial		Torque support, clamping ring flange side

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

Suggested Products

Order code	Steps per Turn	Channels	Shaft / Flange	Connector Position	Cable length	Remark
IEH58:2						
IEH582-00006	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	1/2" H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00004	10.000*	HTL(K1/K2)+Inv.; K0+Inv.	10H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00008	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	10H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IEH582-00018	10.000*	HTL (K1/K2)+Inv.;	12H7	M12, 8 pin, radial		Torque support, clamping ring flange side
IEH582-00003	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	12H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00007	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	12H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IEH582-00013	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	12H7	M23, 12 pin, radial		Flange ring with pin, clamping ring flange side
IEH582-00037	4.096*	HTL (K1/K2)+Inv.; K0+Inv.	12H7	M23, 12 pin, radial		clamping ring flange side
IEH582-00045	10.000*	TTL (K1/K2)+Inv.; K0+Inv.	12H7	cable radial, open end	1 m	Torque support, clamping ring flange side
IEH582-00002	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	14H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00009	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	14H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IEH582-00052	4.096*	HTL (K1/K2)+Inv.; K0+Inv.	14H7	cable radial, open end	1 m	Torque support, clamping ring flange side
IEH582-00043	10.000*	TTL (K1/K2)+Inv.; K0+Inv.	14H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00044	4.096*	TTL (K1/K2)+Inv.; K0+Inv.	14H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00001	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	15H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00010	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	15H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IEH582-00005	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	3/8" H7	M23, 12 pin, radial		Torque support, clamping ring flange side
IEH582-00011	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	6H7	cable radial, open end	2 m	Torque support, clamping ring flange side
IEH582-00012	10.000*	HTL (K1/K2)+Inv.; K0+Inv.	8H7	cable radial, open end	2 m	Torque support, clamping ring flange side

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

Suggested Products

Oder code	Steps per Turn	Channels	Shaft / Flange	Connector Position	Cable length	Remark
IOV58:2						
IOV582-00001	65.536*	TTL (K1/K2)+Inv.; K0+Inv.	10 key /19,5; ZB36 3xM3+3xM4	M23, 12 pin, radial		
IOV582-00007	65.536*	HTL (K1/K2)+Inv.;	10FL/19,5; ZB36 3xM3+3xM4	M12, 8 pin, radial		
IOV582-00009	65.536*	HTL (K1/K2)+Inv.;	12 key /25; ZB36 3xM3+3xM4	M12, 8 pin, radial		
IOV582-00005	65.536*	HTL (K1/K2)+Inv.;	6GL/10; ZB50	M12, 8 pin, radial		
IOV582-00046	64.000*	HTL (K1/K2)+Inv.;	6GL/10; ZB50	cable radial, open end	2 m	

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

Further product information

1. Enter order code into ...



2. Searchfield (top right) on www.tr-electronic.com



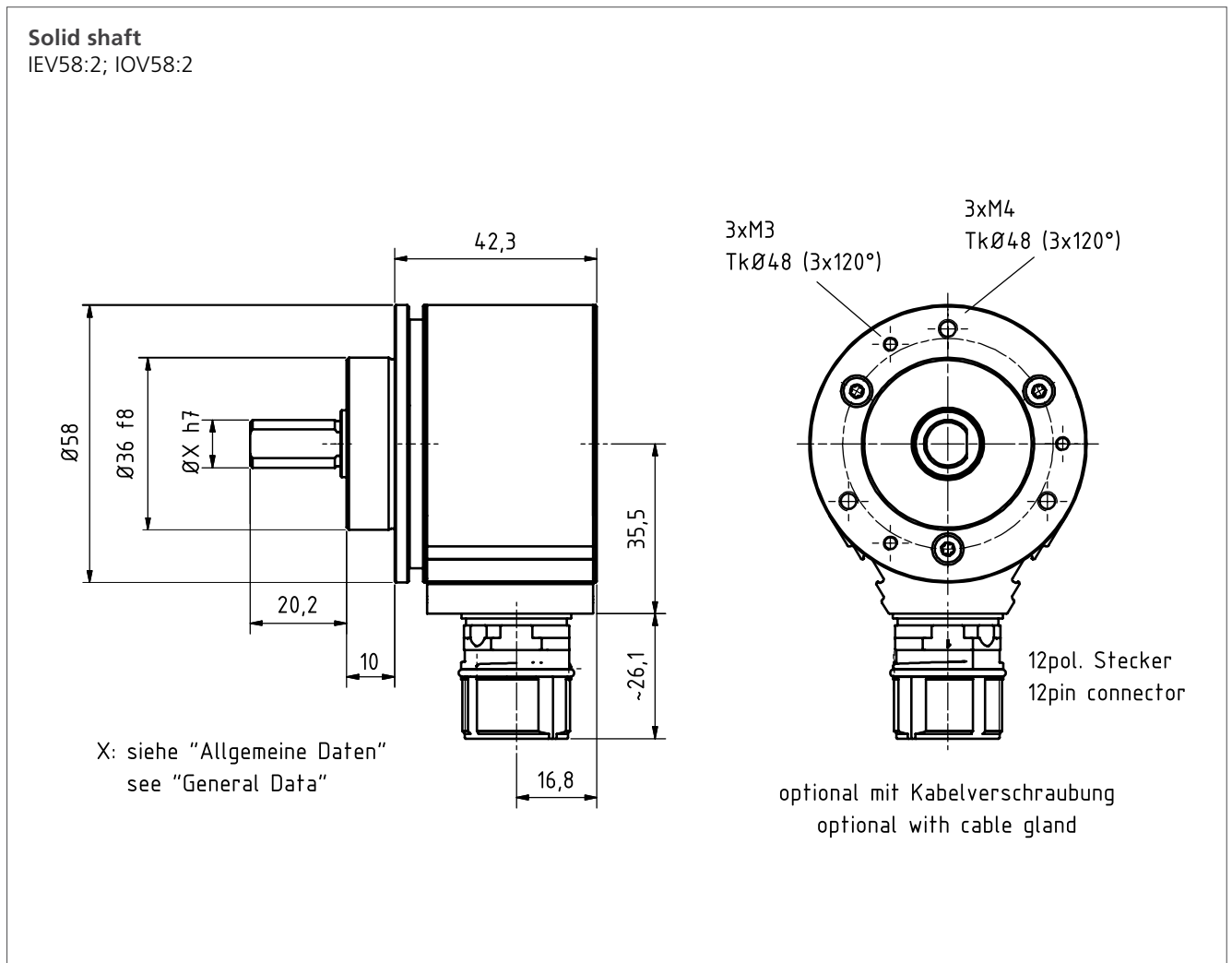
3. Choose desired information



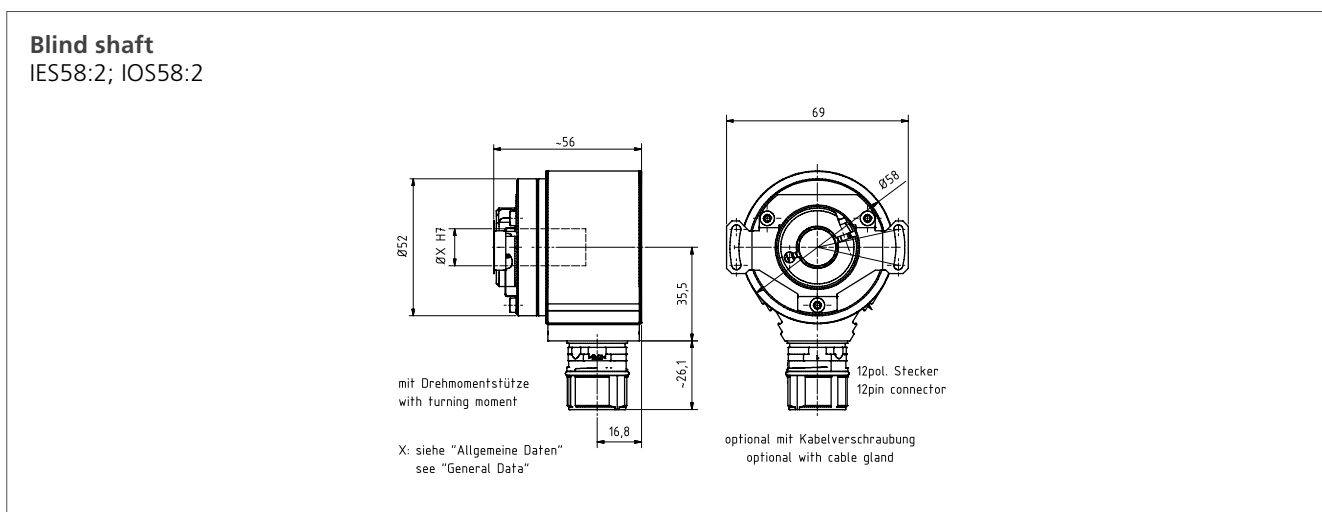
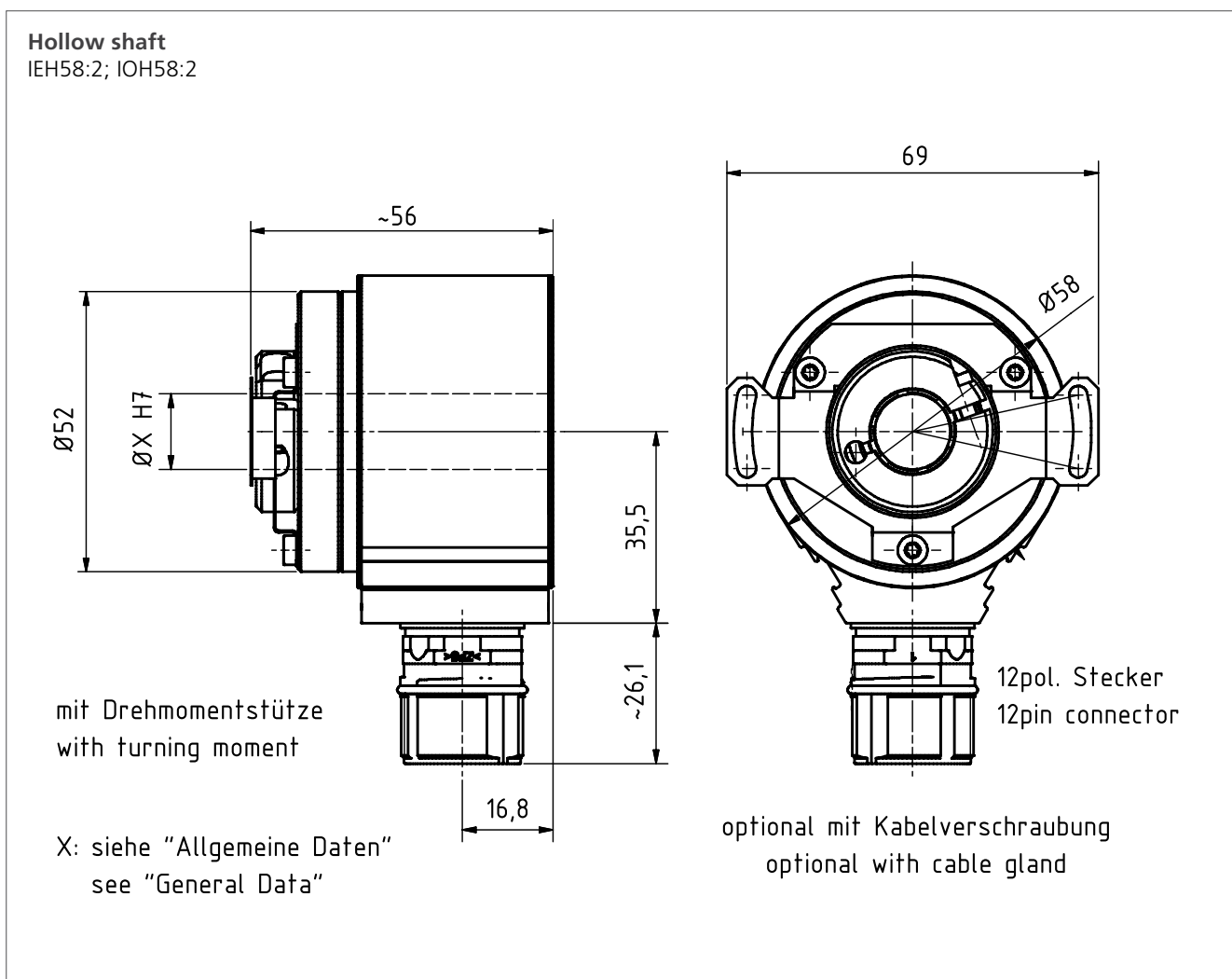
* Programmable, preset

We will help you to select the most suitable products from the complete TR range. Please contact us (info@tr-electronic.de).

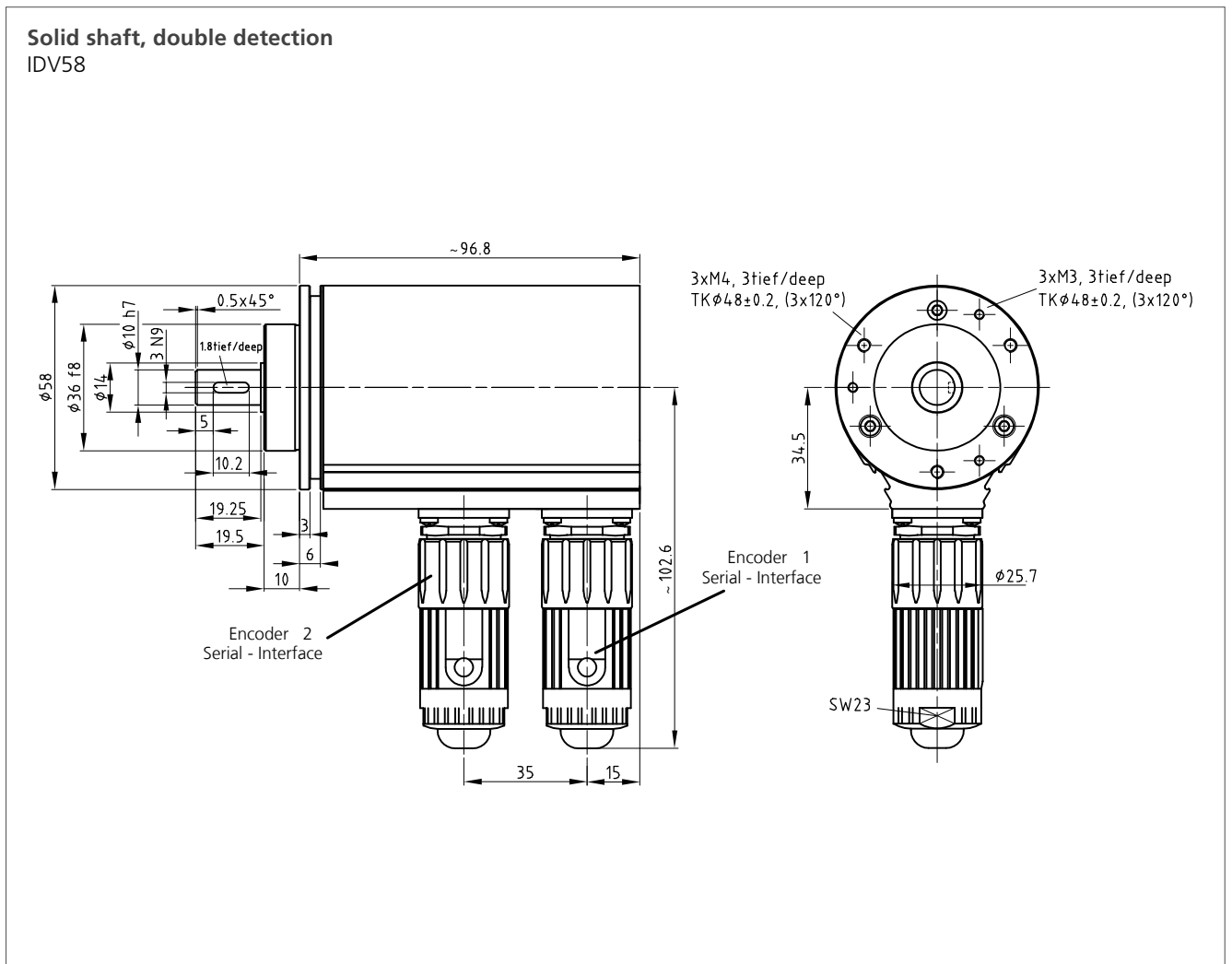
Dimensional Drawings



Dimensional Drawings

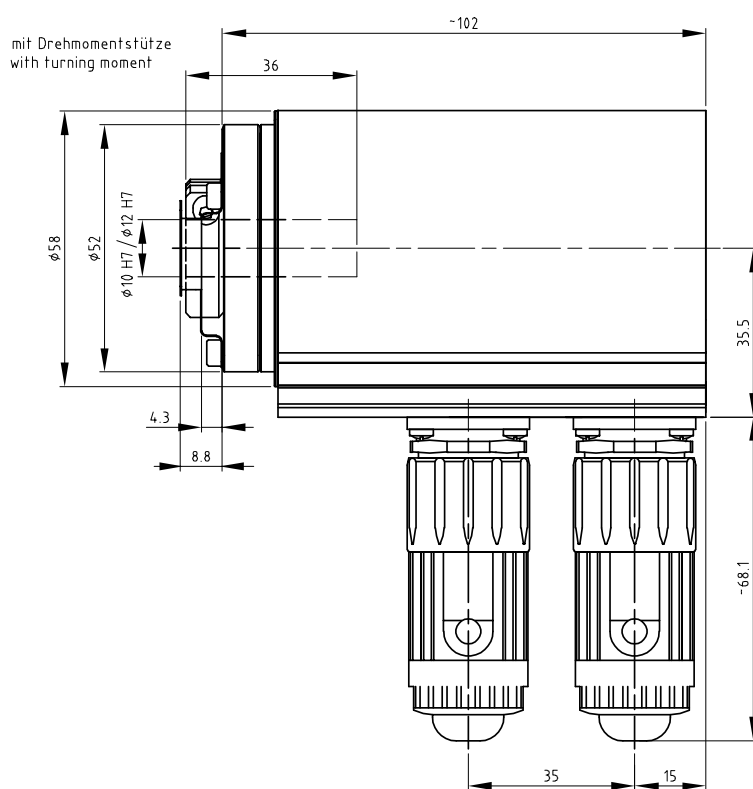


Dimensional Drawings

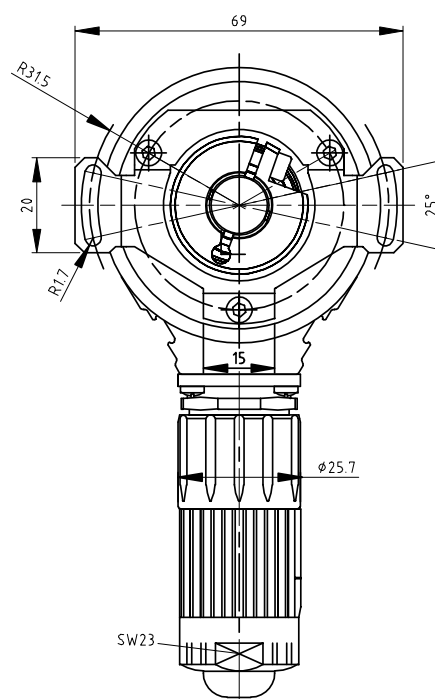


Dimensional Drawings

Blind shaft, double detection IDS58

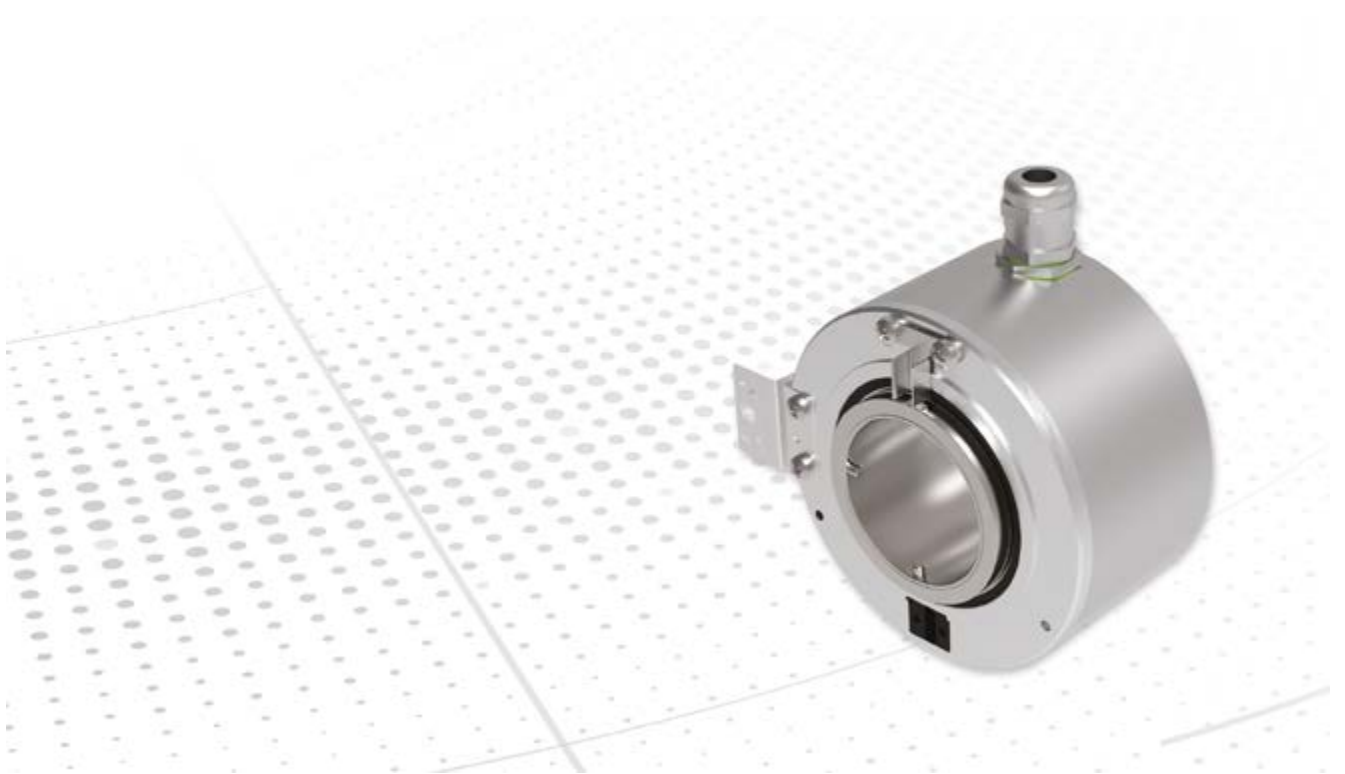


12pol. Contact-Stecker (ENC 2)
12pin. Contact-connector (ENC 2)



12pol. Contact-Stecker (ENC1)
12pin. Contact-connector (ENC1)

Incremental Rotary - Family I_H110 - Housing 110 mm



Programmable resolution with hollow shaft up to 50 mm in diameter





Programmable incremental encoders from family 110 fit big shaft diameters of up to 50 mm. You adapt the resolution of our programmable incremental rotary encoders via software to meet your demands.

Depending on the required resolution, IEH 110 with up to 8192 steps per turn or IOH 110 with up to 36,000 steps per turn fit your needs.

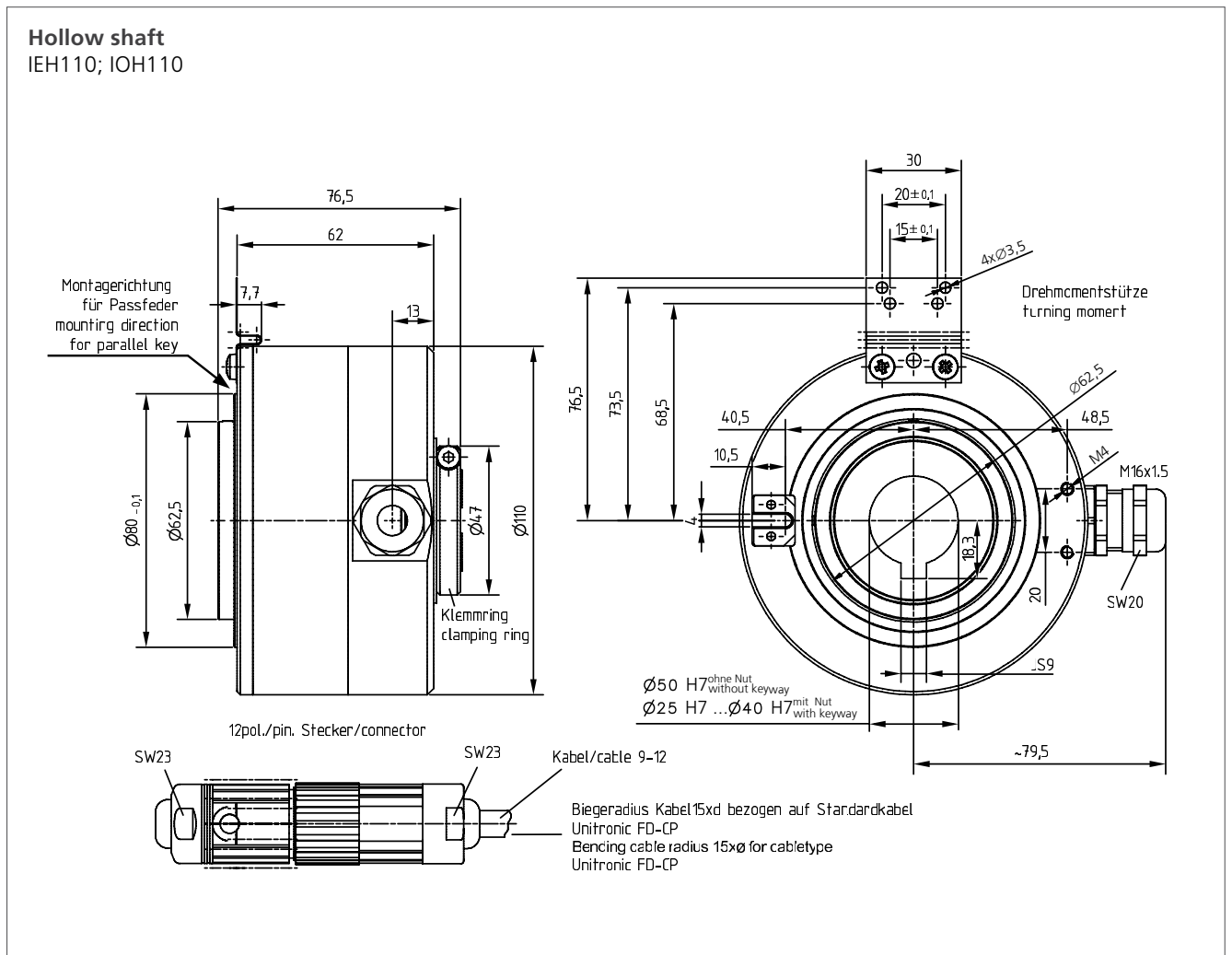
Contents

Products.....	21
Dimensional Drawings.....	22

Up to 8,192 pulses
Up to 36,000 pulses

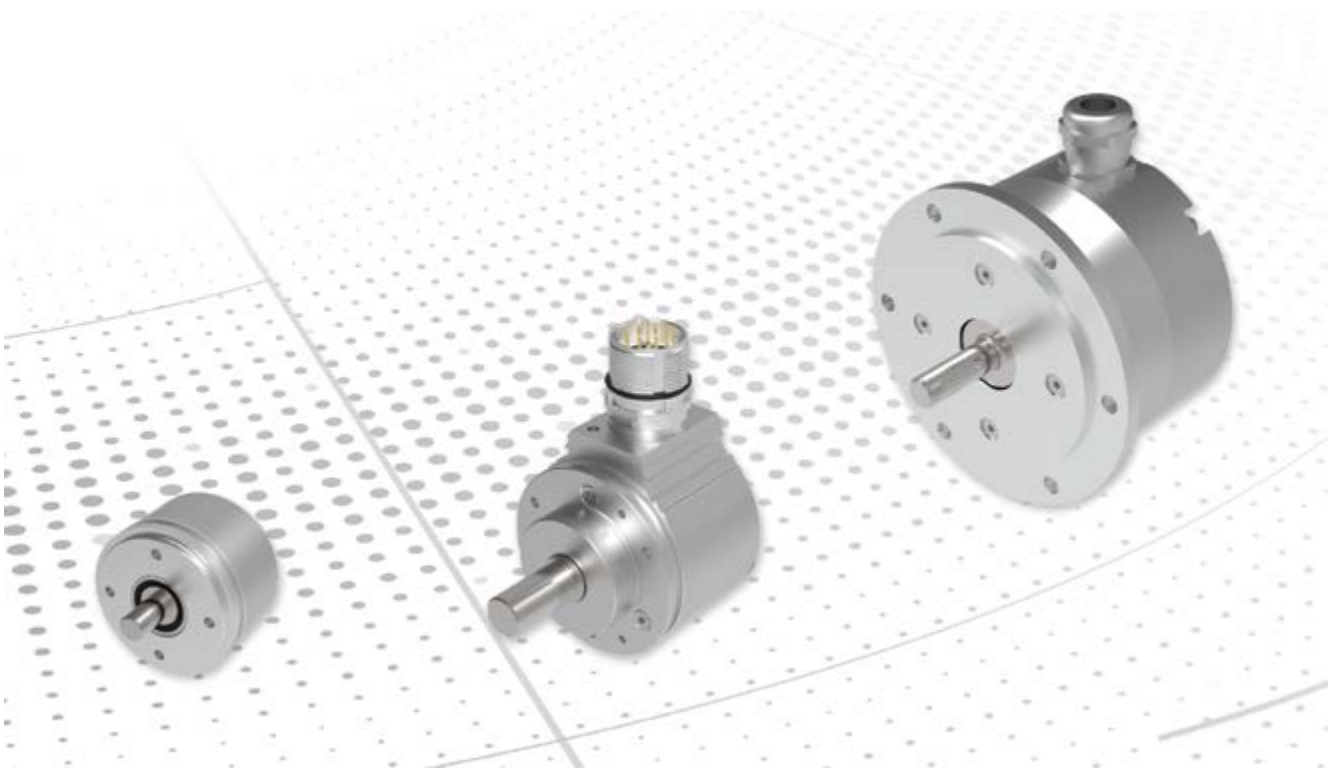
Product	IEH110 	IOH110 
Detection	Optical (E)	Optical (O)
Supply	24 VDC (11...27)	24 VDC (11...27)
Steps per turn	2 ... 8192	2 ... 36 000
Shaft diameters available	15, 28, 30, 35, 38, 40, 45, 50	15, 28, 30, 35, 38, 40, 45, 50
Connectors	Connector or cable	Connector or cable
Ambient temperature	0...+60°C (option -20...+70°C)	0...+60°C (option -20...+70°C)
Protection class	IP54	IP54
ATEX zone		
Interface	Square	Square
Weblink	www.tr-electronic.com/s/S008494	www.tr-electronic.com/s/S008495
QR-Code		

Dimensional Drawings





Incremental Rotary Encoders - Resolution Factory Set



Resolution factory set

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


The resolution of these incremental rotary encoders is set ex-factory by fitting a code disk with a defined number of lines respectively programming the detection electronic with the requested number of lines. These incremental

rotary encoders are available in different sizes from 24 mm - 130 mm. Of course they are also available with different mechanical connections such as solid shaft, continuous hollow shaft, blind shaft or integrated coupling.

Contents

Products.....	25
Suggested Products.....	32
Dimensional Drawings.....	34

Solid shaft

Product	IE24	IE35	IMV36
			
Detection	Optical (E)	Optical (E)	Magnet detection (M)
Supply	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)
Steps per turn	1...2.500	1...3.600	8, 10, 16, 20, 25, 32, 40, 50, 64, 80, 100, 125, 128, 200, 250, 256, 400, 500, 512, 1024, 2048*
Shaft diameters available	3...6	4...6	See drawing
Connectors	Cable	Cable	Cable
Ambient temperature	0...+80 °C	0...+80 °C	-40...+70 °C
Protection class	IP64	IP65	IP65
Interface	Square	Square	Square
Weblink	www.tr-electronic.com/s/S008419	www.tr-electronic.com/s/S008423	www.tr-electronic.com/s/S008422
QR-Code			

*Others on request

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



Solid shaft

Product	IE40	IE58	IE92V	
				
Detection	Optical (E)	Optical (E)	Optical (O)	
Supply	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	
Steps per turn	1...3.600	1...10.000	9000, 10000, 18000	
Shaft diameters available	6	6, 10, inch based	10	
Connectors	Connector or cable	Connector or cable	Cable	
Ambient temperature	0...+80 °C	0...+70 °C (-20...+70 °C)	0...+80 °C	
Protection class	IP64	IP65	IP64	
Interface	Square	Square / Sine-Cosine	Square	
Weblink	www.tr-electronic.com/s/S008424	www.tr-electronic.com/s/S008425	www.tr-electronic.com/s/S008431	
QR-Code				

*Others on request

Solid shaft







Blind shaft

IV99 	IS24 	IS58U 	IS99 
Optical (E)	Optical (E)	Optical (E)	Optical (E)
11...30 VDC	11...27 VDC (5 VDC \pm 5 %)	11...27 VDC (5 VDC \pm 5 %)	11...30 VDC
1024, 2048, 4096, 8192, 16384, 32768*	1...2.500	7, 10, 18, 20, 32, 40, 50, 60, 64, 100, 125, 128, 180, 200, 250, 300, 360, 400, 440, 500, 512, 700, 900, 1000, 1024, 1250, 1500, 1885, 2000, 2048, 2500, 2600, 3600, 4000, 4096*	1024, 2048, 4096, 8192, 16384, 32768
6...24 (with groove 10...24)	3...6H7	8H7, 10H7, 12H7	16G7 & 17JS8 (Cone)
Cable gland	Cable	Connector or cable	Cable gland
-20...+80°C	0...+80 °C	-20...+85 °C	-20...+80°C
IP67	IP64	IP67	IP67
Square	Square	Square	Square
www.tr-electronic.com/s/S008432	www.tr-electronic.com/s/S008420	www.tr-electronic.com/s/S008428	www.tr-electronic.com/s/S008433
			

*Others on request

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

Blind shaft

Product	IMF36 	IH58 	IH20 	
Detection	Magnet detection (P)	Optical (E)	Optical (E)	
Supply	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	
Steps per turn	8, 10, 16, 20, 25, 32, 40, 50, 64, 80, 100, 125, 128, 200, 250, 256, 400, 500, 512, 1024, 2048	1...10.000	1, 25, 30, 200, 218, 360, 500, 900, 1000, 1024*	
Shaft diameters available	See drawing	≤ 12 H7	20H7	
Connectors	Cable	Connector or cable	Connector or cable	
Ambient temperature	-40...+70 °C	0...+80 °C	0...+60 °C (-20...+70 °C)	
Protection class	IP65	IP64	IP54 (option IP65)	
Interface	Square / Sine-Cosine	Square / Sine-Cosine	Square	
Weblink	www.tr-electronic.com/s/S008421	www.tr-electronic.com/s/S008427	www.tr-electronic.com/s/S008418	
QR-Code				

*Others on request

Hollow shaft

<p>IH76A</p> 	<p>IH76B</p> 	<p>IH76V</p> 	<p>IH92V</p> 
Optical (E)	Optical (E)	Optical (O)	Optical (O)
11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)
1...10.000	1...10.000	9000, 10000, 18000	9000, 10000, 18000
<= 15H7	<= 28H7	<= 28H7	20H7, 22H7
Connector or cable	Connector or cable	Connector or cable	Cable
0...+80 °C	0...+80 °C	0...+80 °C	0...+80 °C
IP64	IP64	IP64	IP64
Square / Sine-Cosine	Square / Sine-Cosine	Square	Square
www.tr-electronic.com/s/S008429	www.tr-electronic.com/s/S008429	www.tr-electronic.com/s/S008429	www.tr-electronic.com/s/S008430
			

*Others on request

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

Hollow shaft

Product	IH120	IH120V	ADH130I
			
Detection	Optical (E)	Optical (O)	Double (D)
Supply	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	11...30VDC
Steps per turn	1024, 2500, 3600, 10000*	9000, 10000, 18000	1024
Shaft diameters available	27...55H7	27...55H7	40, 45, 50, 55, 60 H7
Connectors	Cable	Cable	Cable
Ambient temperature	0...+80 °C	0...+80 °C	-20...+60°C
Protection class	IP52 (option IP65)	IP64	IP65
Interface	Square	Square	Square
Weblink	www.tr-electronic.com/s/S008434	www.tr-electronic.com/s/S008434	http://www.tr-electronic.com/s/S011358
QR-Code			

*Others on request

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Suggested Products

Order code	Steps per turn	Channels	Shaft / Flange	Connector position	Cable length	Remark
IE24						
216-00002	500	A,VA, B,VB, 0,0	6GL9 ZB12	open End Cable gland AXIAL	2,000 m	
IE58A						
219-00059	1024	A,VA, B,VB, 0,0	10FL/19,5 ZB36	M23 12P RADIAL		
219-00292	10000	A,VA, B,VB, 0,0	6GL/10 ZB50	M23 12P AXIAL		
219-00590	10000	A,VA, B,VB, 0,0	10FL/19,5 ZB36	M23 12P RADIAL		
219-01530	2048	A,VA, B,VB, 0,0	10FL/19,5 ZB36	M23 12P RADIAL		
219-01634	2048	A,VA, B,VB, 0,0	10FL/19,5 ZB36	M23 12P RADIAL		Sin/cos voltage
IH20						
240-00001	25	A, B	20H7 hollow shaft	LEMO 6P		
240-00005	1024	A,VA, B,VB, 0,0	20H7 hollow shaft	BINDER 12P		
240-00148	1024	A,VA, B,VB, 0,0	20H7 hollow shaft	open End cable gland RADIAL	5.000 m	
240-00161	1000	A,VA, B,VB, 0,0	20H7 hollow shaft	LUMBERG 8P		
IMF36						
IMF36-00005	2048	A,VA, B,VB, 0,0	bearing free	open End 1X M6 AXIAL	1.000 m	
IMF36-00012	2048	A,VA, B,VB, 0,0	bearing free	SUBD 9P 1X M6 AXIAL	1.000 m	
IMV36						
IMV36-00016	2048	A,VA, B,VB, 0,0	6GL/10,8 ZB33	open end cable gland axial	1,000 m	
IMV36-00025	2048	A,VA, B,VB, 0,0	6GL/10,8 ZB33	open end cable gland axial	3,000 m	
IS24						
215-00002	500	A,VA, B,VB, 0,0	4H7 blind shaft	open End Cable gland RADIAL	2.000 m	
IS99						
IS99-00001	2048	A,VA, B,VB, 0,0	16G7 blind shaft	Cable gland M20x1,5 radial		
IS99-00003	1024	A,VA, B,VB, 0,0	16G7 blind shaft	Cable gland M20x1,5 radial		
IS99-00004	1024	A,VA, B,VB, 0,0	16G7 blind shaft	Cable gland M20x1,5 radial		

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

We will help you to select the most suitable products from the complete TR range. Please contact us (info@tr-electronic.de).

Suggested Products

Order code	Steps per turn	Channels	Shaft / Flange	Connector position	Cable length	Remark
IV99						
IV99-00001	2048	A,VA, B,VB, 0,10	11/32 ZB85	Cable gland M20x1,5 radial		
IV99-00002	1024	A,VA, B,VB, 0,10	11/32 ZB85	Cable gland M20x1,5 radial		
IV99-00003	2048	A,VA, B,VB, 0,10	11 keyway /32 ZB85	Cable gland M20x1,5 radial		Push Pull
ADH130I						
ADH130I-00001	1024	A, /A, B, /B	60H7 hollow shaft	M23 12 pin, code right	1,2 m	ATEX Zone 2/22

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

Further product information

1. Enter order code into ...



2. Searchfield (top right) on www.tr-electronic.com

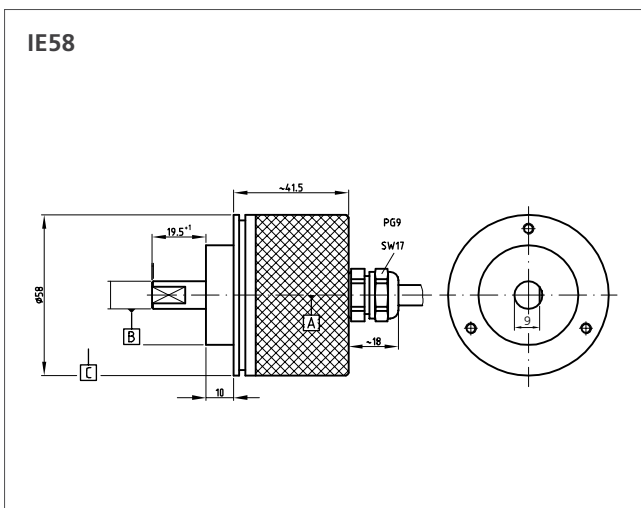
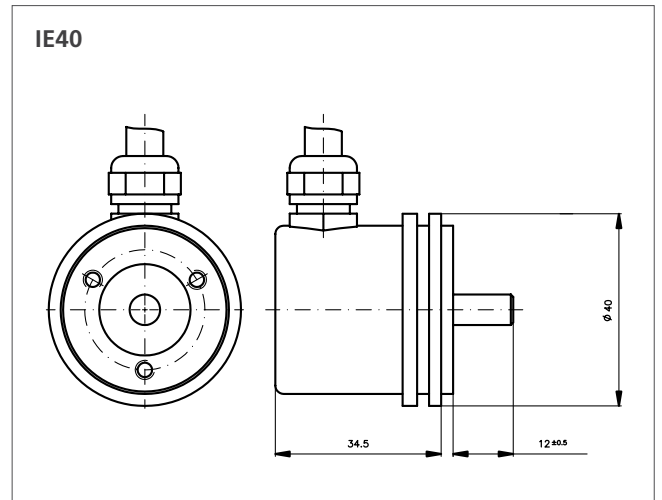
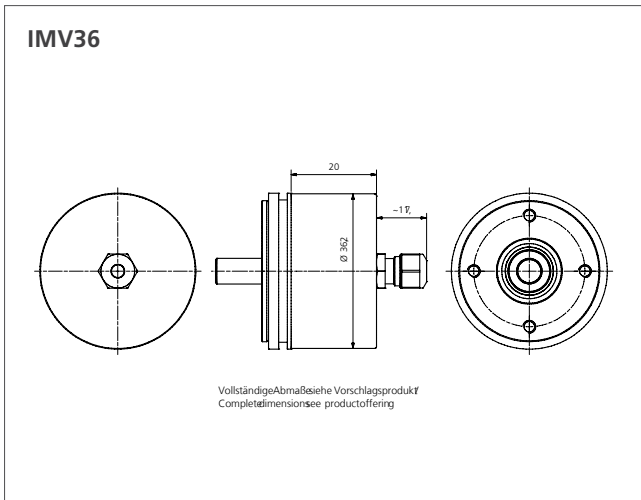
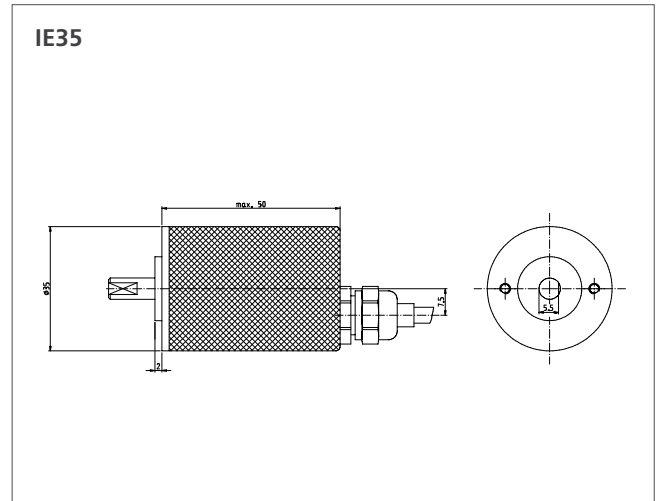
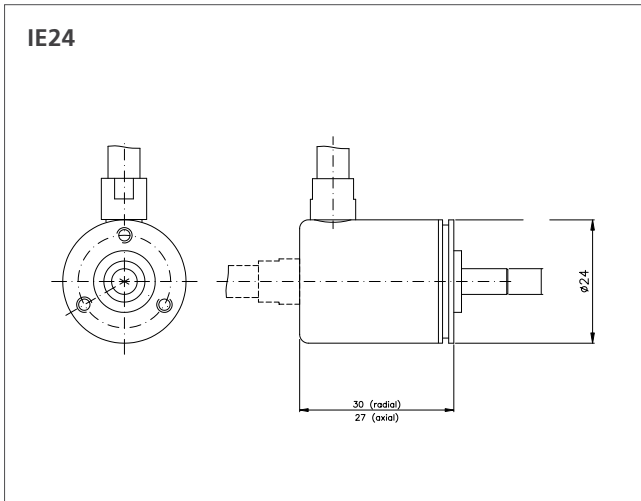


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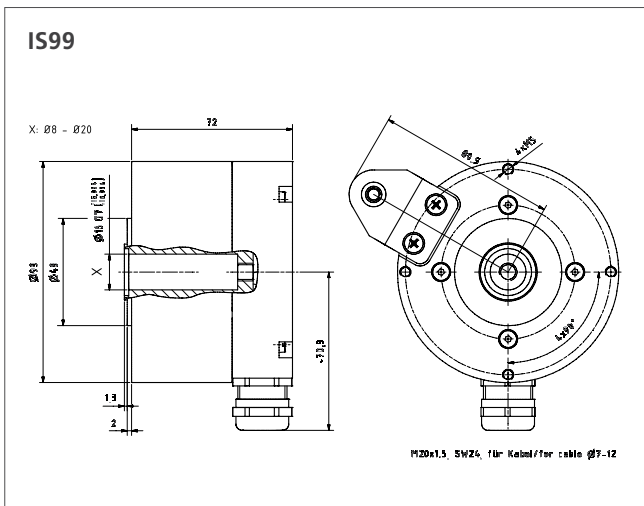
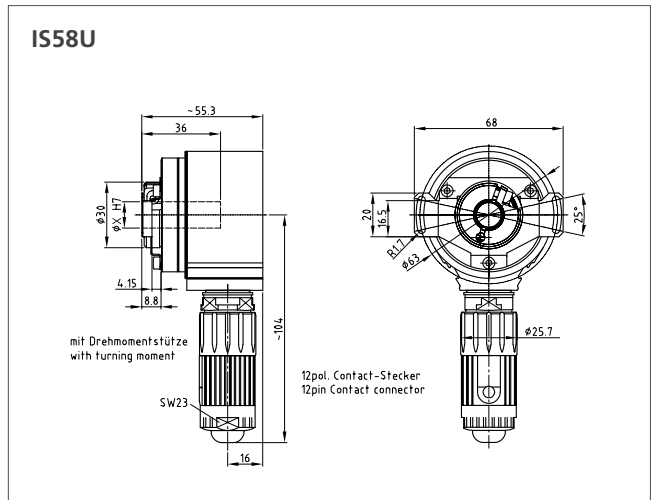
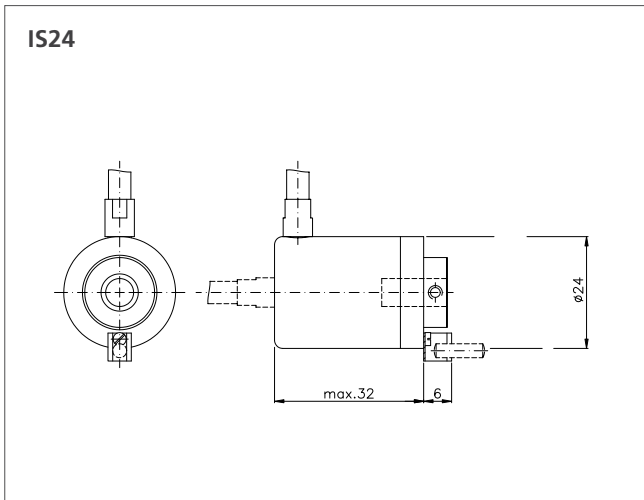
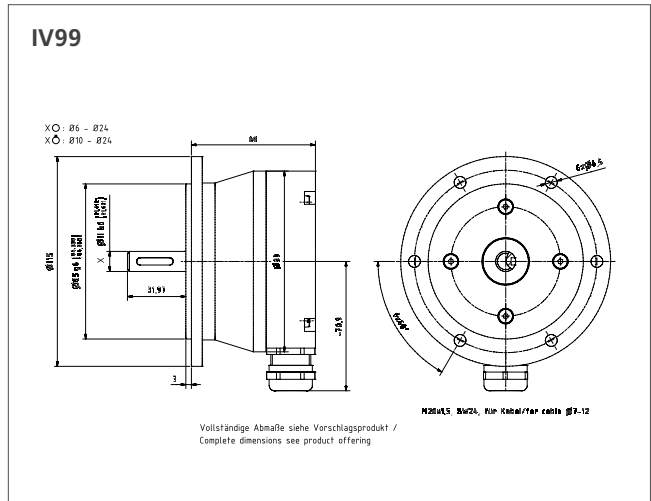
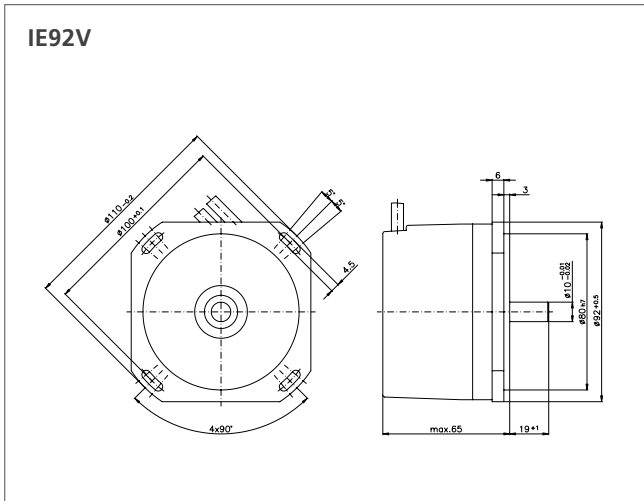


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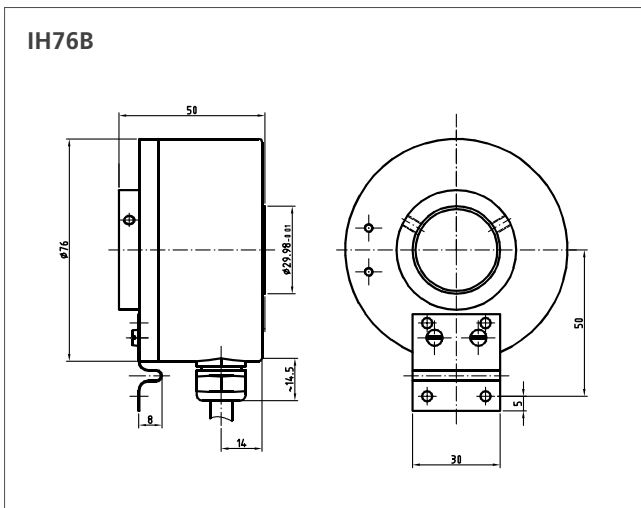
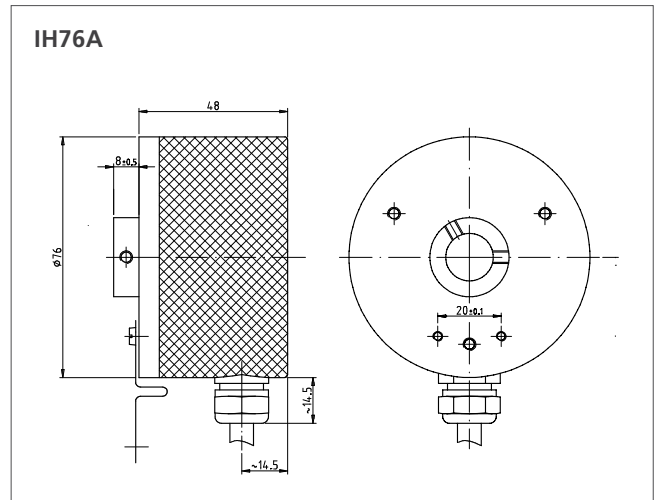
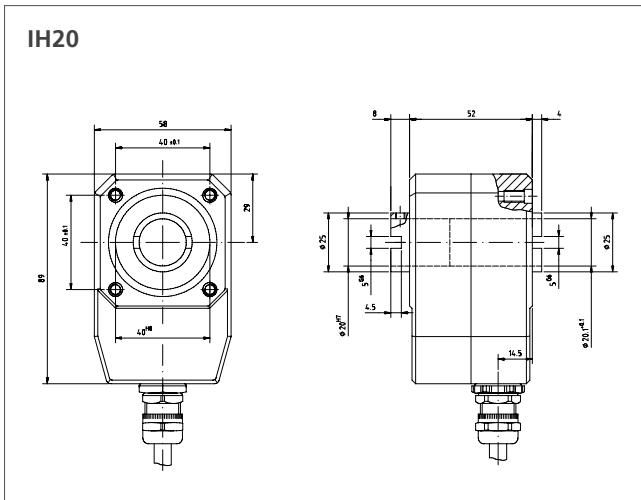
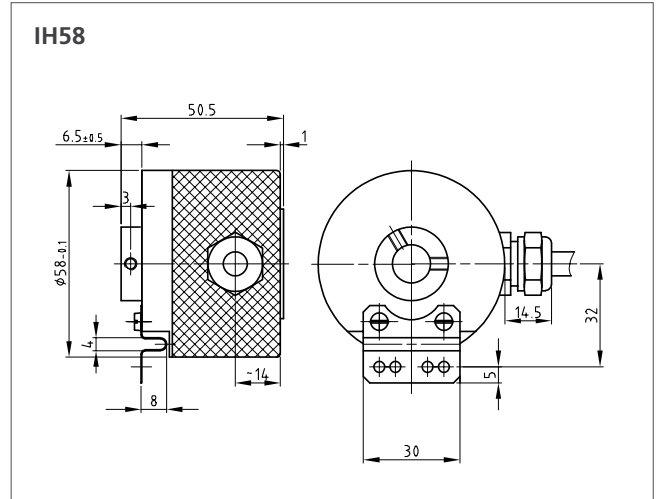
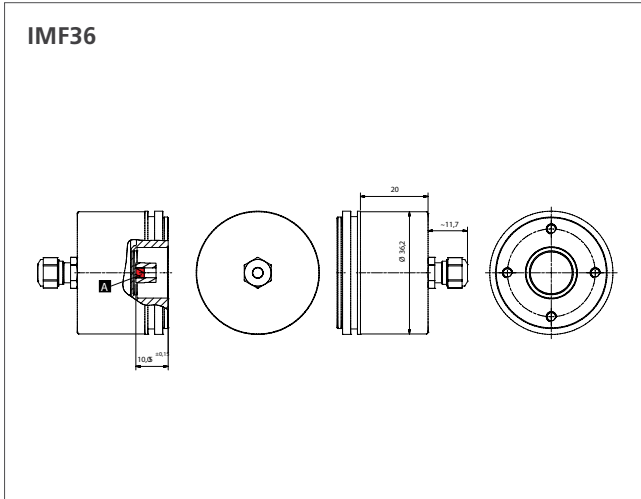
Dimensional Drawings



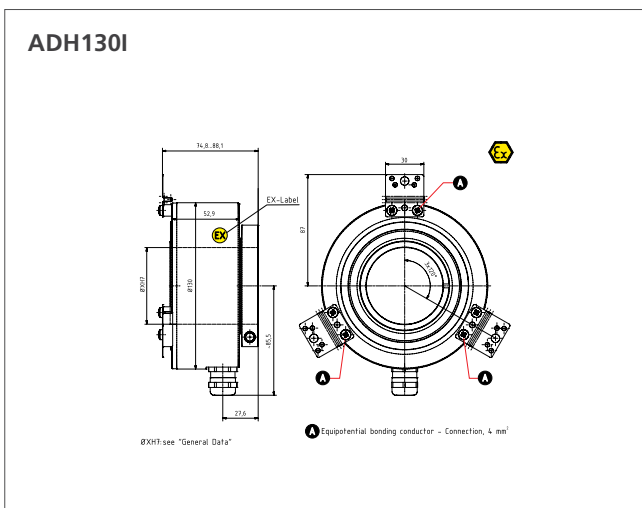
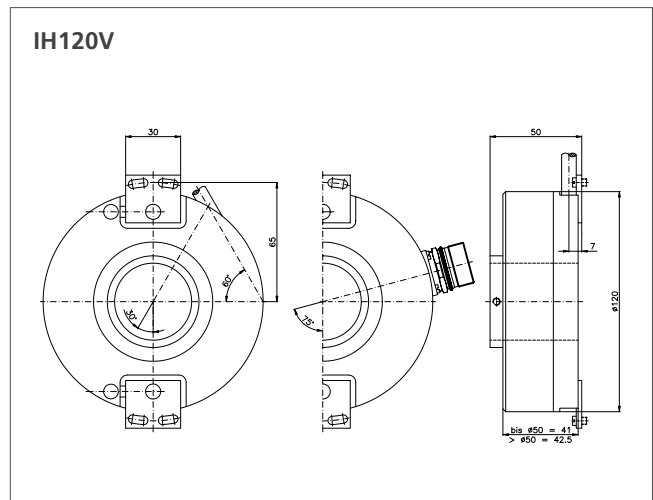
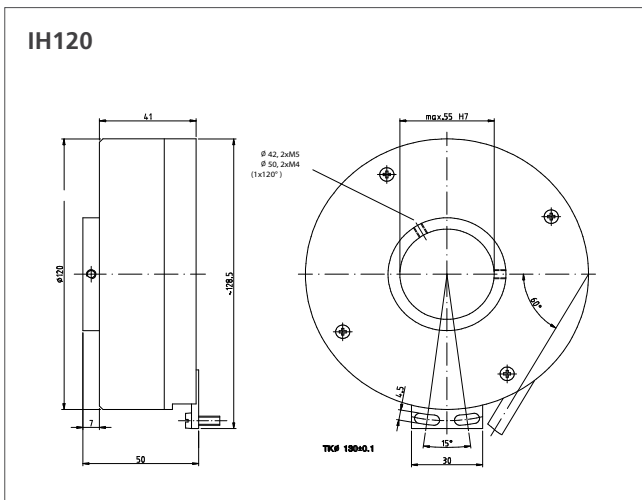
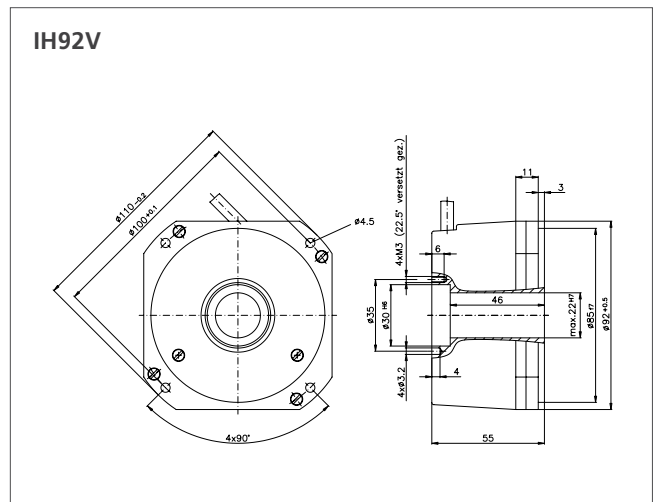
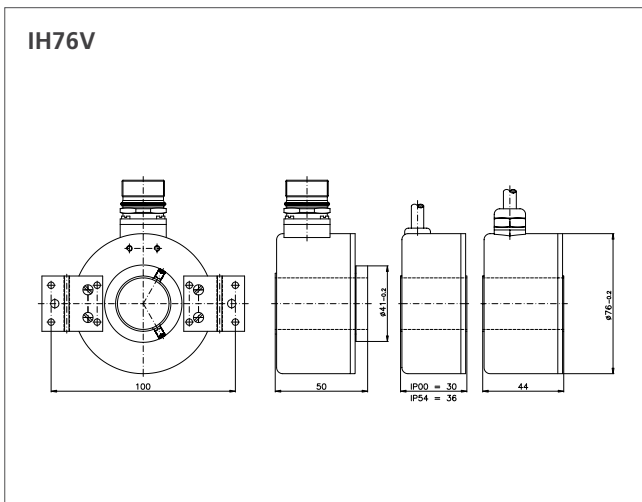
Dimensional Drawings



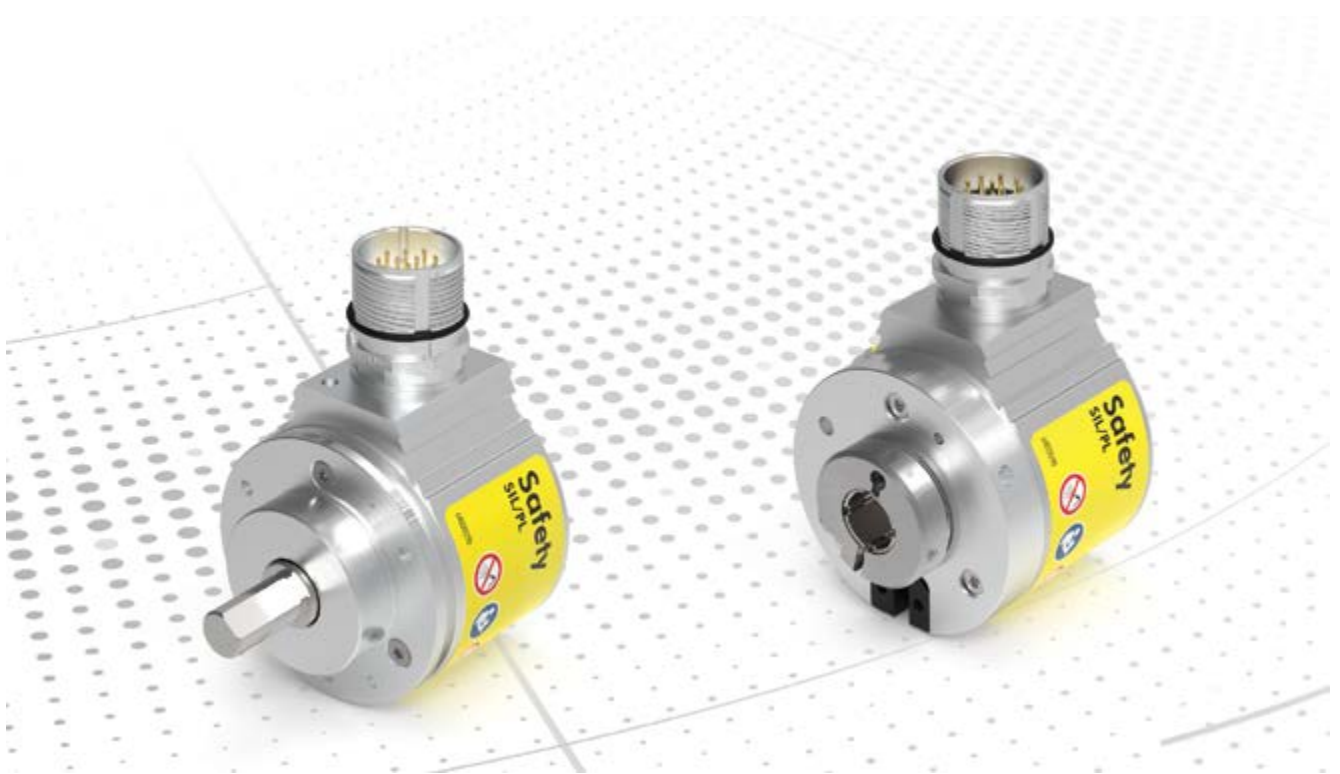
Dimensional Drawings



Dimensional Drawings



Incremental rotary encoders – I_58+FS - Housing 58 mm



Safety-oriented incremental rotary encoder






For applications that require a safety classification according 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.....	39
Suggested Products.....	40
Dimensional Drawings.....	41

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, PL _e	SIL3, PL _e	SIL3, PL _e
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;	M12, 23 pin, radial		HTL
IH58-00002	1024	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		SIN/COS
IH58-00003	1024	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		TTL
IH58-00004	2048	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		SIN/COS
IH58-00005	2048	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		TTL
IH58-00006	2048	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		HTL
IH58-00007	4096	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		SIN/COS
IH58-00008	4096	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		TTL
IH58-00009	4096	(K1/K2)+Inv; K0 + Inv	12H7/Keyway;	M12, 23 pin, radial		HTL
IV58+FS						
IV58-00001	1024	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		HTL
IV58-00002	1024	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		SIN/COS
IV58-00003	1024	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		TTL
IV58-00004	2048	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		SIN/COS
IV58-00005	2048	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		TTL
IV58-00006	2048	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		HTL
IV58-00007	4096	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		SIN/COS
IV58-00008	4096	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		TTL
IV58-00009	4096	(K1/K2)+Inv; K0 + Inv	10 Keyway /19,5; ZB36/D58	M12, 23 pin, radial		HTL

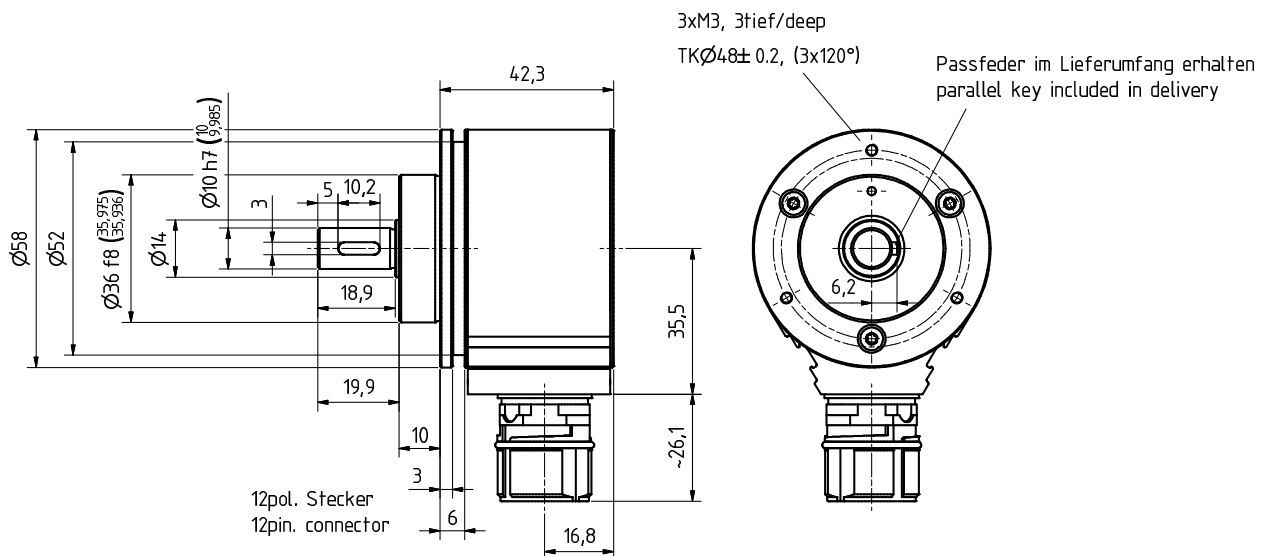
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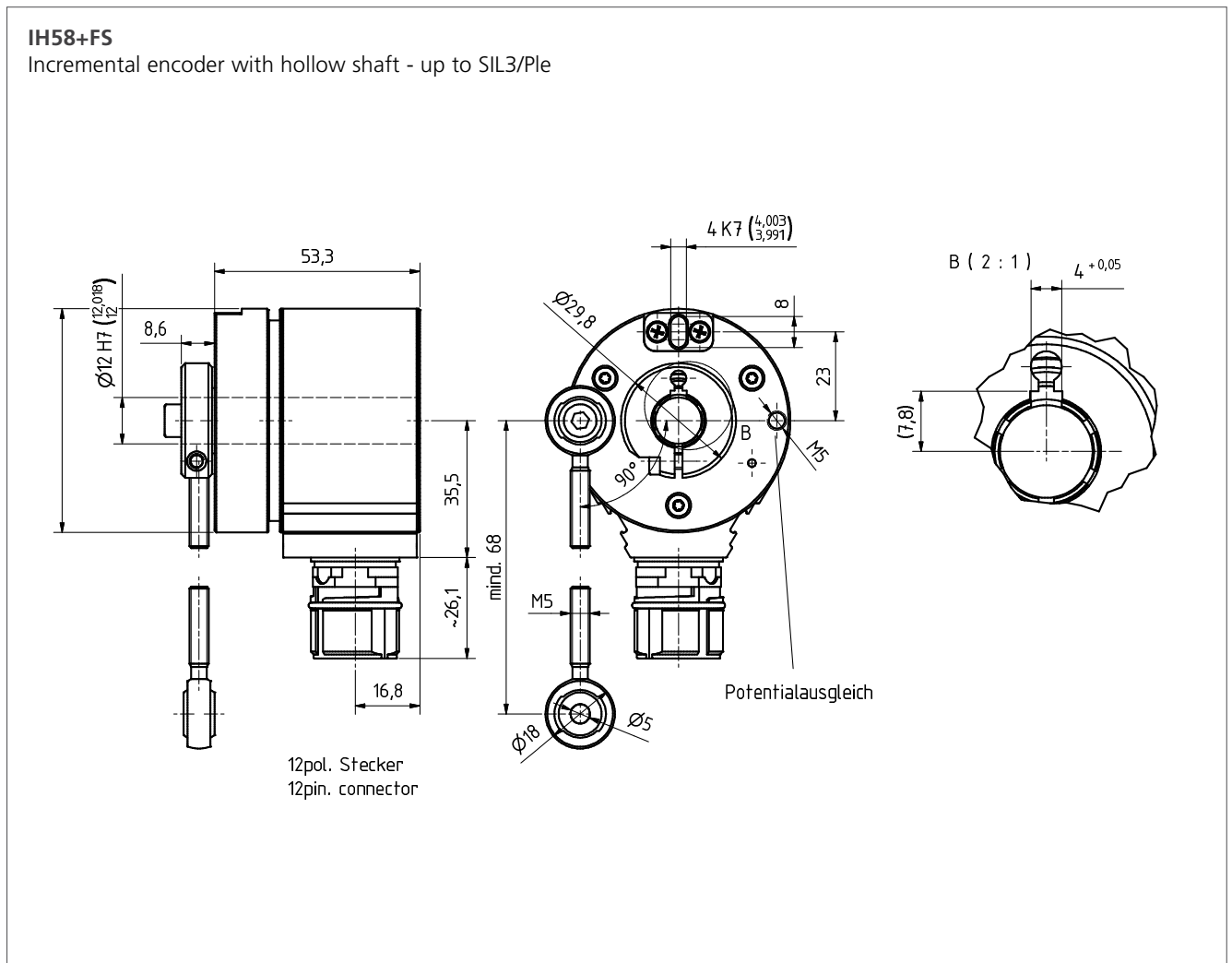
Dimensional Drawings

IE58+FS

Incremental encoder with solid shaft - up to SIL3/Plc



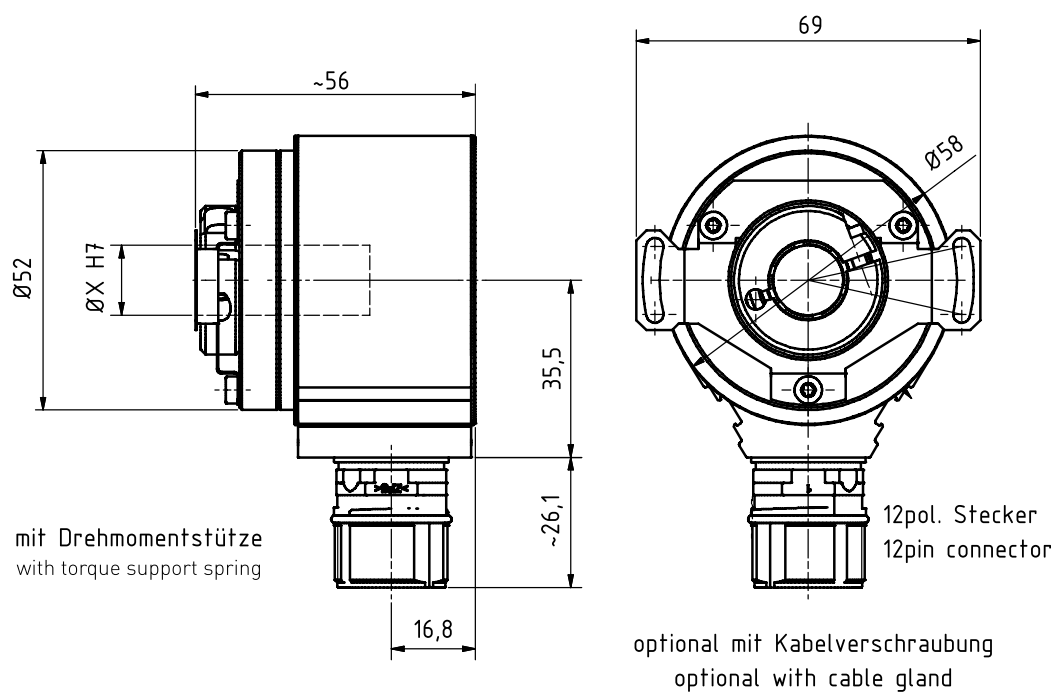
Dimensional Drawings



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 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

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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.

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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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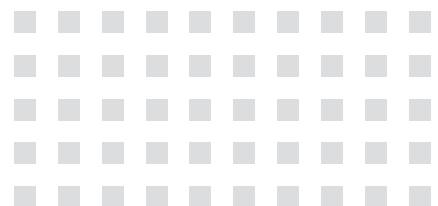
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