

Incremental Rotary Encoders

Overview



Incremental rotary encoders



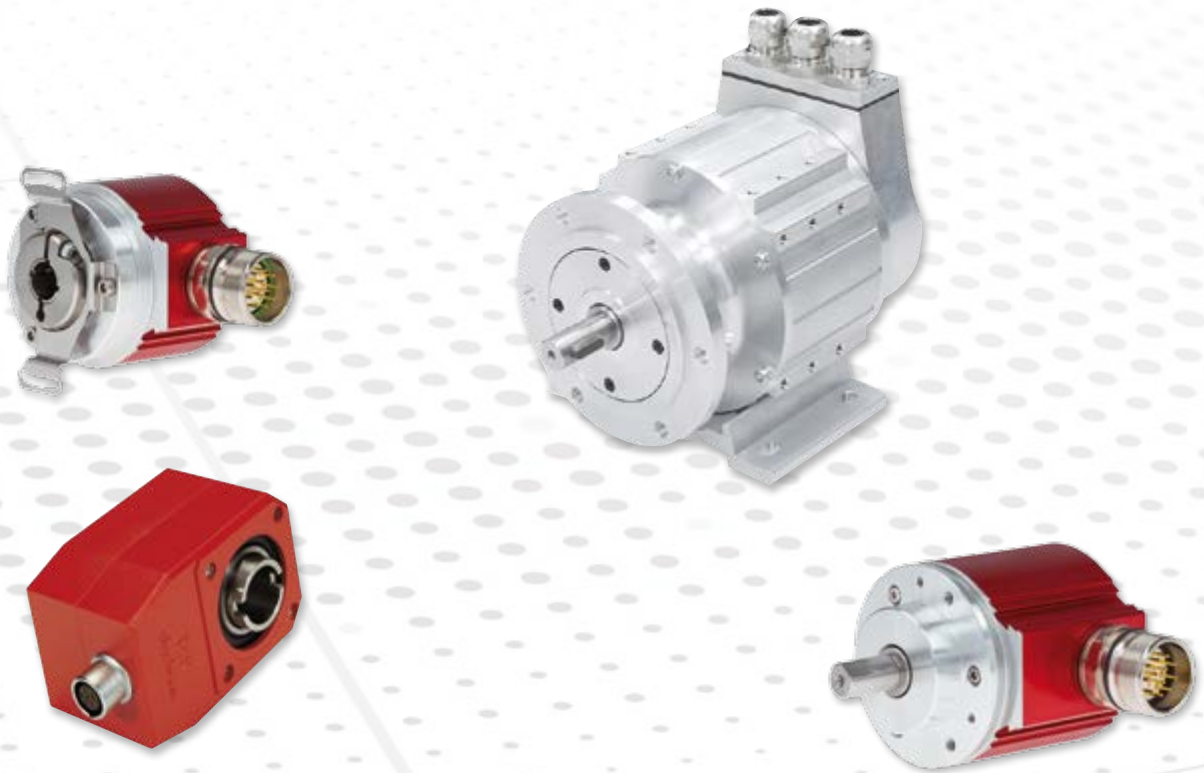
Programmable, extremely resilient and more

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 58mm 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.

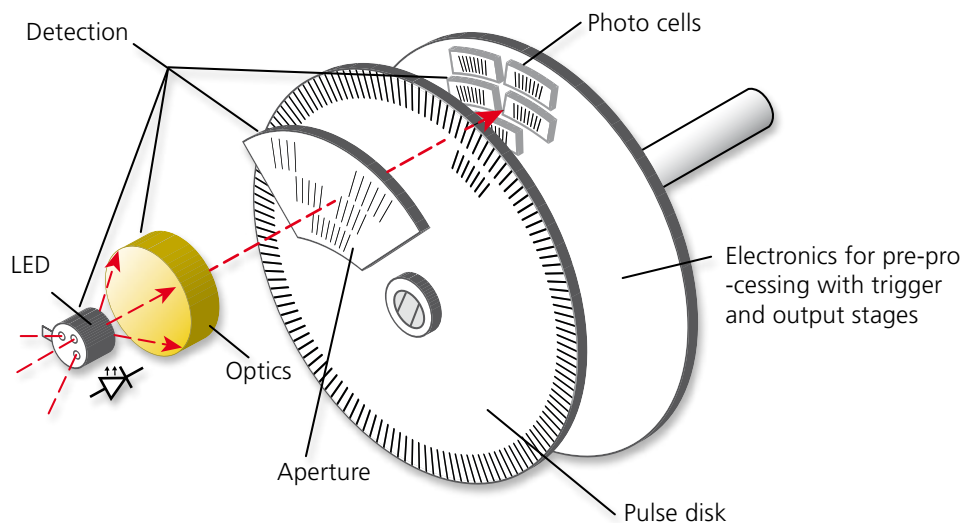
You will also find a multitude of housing options, e.g. ATEX-compliant housings and housings for use in aggressive media or for heavy mechanical stress (heavy-duty).



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Pulse encoder mode of operation

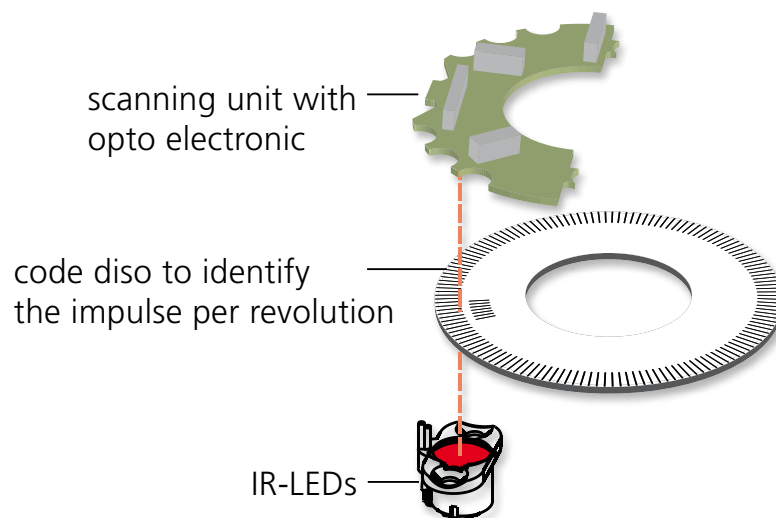


Consistent mechanical concept

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.

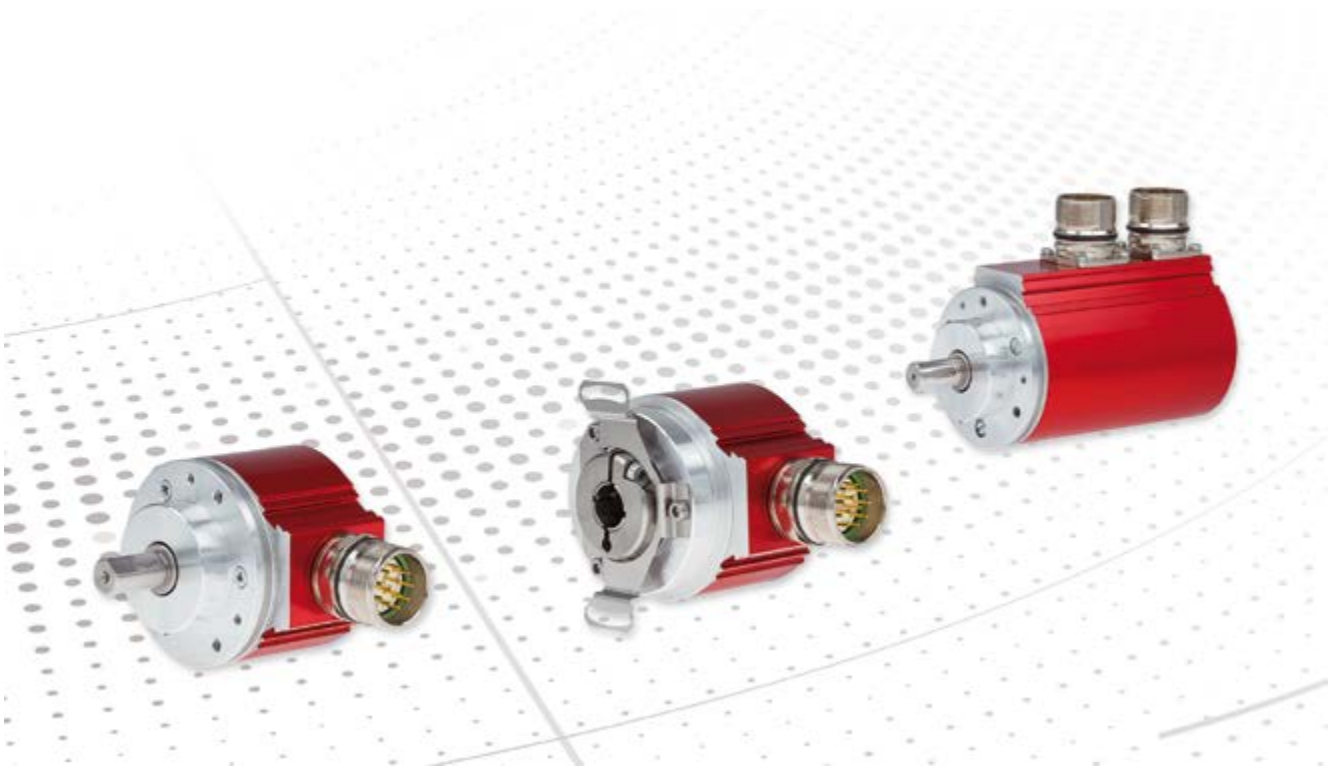
The new generation I__58:2 offers wide range input of 4.5 ... 32 V DC and number of graduation marks up to 62,450 increments per revolution as well as a hollow shaft diameter up to 15 mm or 1/2".

Non-programmable incremental rotary encoders 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.

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 70.000. Additionally, it provides hollow and blind shaft diameters up to 15 mm resp. 1/2".

Up to 10.000 Pulses





Product	IEV58:2	IES58:2	IEH58:2
			
Detection	Optical (E)	Optical (E)	Optical (E)
Supply	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)
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
Protection Class	IP67 / Shaft IP65	IP67 / Shaft IP65	IP67 / Shaft IP65
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			

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Up to 70.000 Pulses

Product	IOV58:2 	IOS58:2 	IOH58:2 	
Detection	Optical (O)	Optical (O)	Optical (O)	
Supply	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)	
Steps per Turn	$\geq 2 \dots \leq 70000$	$\geq 2 \dots \leq 70000$	$\geq 2 \dots \leq 70000$	
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	
Protection Class	IP67 / Shaft IP65	IP67 / Shaft IP65	IP67 / Shaft IP65	
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

<p>IDV58</p> 	<p>IDS58</p> 
<p>Double detection (D)</p>	<p>Double detection (D)</p>
<p>24 VDC (11 .. 28), 5V DC (+-5%)</p>	<p>24 VDC (11 .. 28), 5V DC (+-5%)</p>
<p>>= 2...<= 1024, 2048, 4096, 8192</p>	<p>>= 2...<= 1024, 2048, 4096, 8192</p>
<p>6, 8, 10, 12, 3/8"</p>	<p>8, 10, 11, 12</p>
<p>Connector or Cable</p>	<p>Connector or Cable</p>
<p>0...+60 °C</p>	<p>0...+60 °C</p>
<p>IP65</p>	<p>IP65</p>
<p>Square</p>	<p>Square</p>
<p>www.tr-electronic.com/s/S008486</p>	<p>www.tr-electronic.com/s/S008487</p>
	

ATEX, up to 10.000 Pulses

Product	AEV58I:2 	AE558I:2 	AEH58I:2 	
Detection	Optical (E)	Optical (E)	Optical (E)	
Supply	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)	
Steps per Turn	>= 2...<= 10000	>= 2...<= 10000	>= 2...<= 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	-30...+75 °C	-30...+75 °C	-30...+75 °C	
Protection Class	IP67 / Shaft IP65	IP67 / Shaft IP65	IP67 / Shaft IP65	
ATEX-Zone	2/22	2/22	2/22	
Interface	Square	Square	Square	
Weblink	www.tr-electronic.com/s/S008488	www.tr-electronic.com/s/S008489	www.tr-electronic.com/s/S008490	
QR-Code				

ATEX, up to 70.000 Pulses

AOV58I:2	AOS58I:2	AOH58I:2
		
Optical (O)	Optical (O)	Optical (O)
24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)	24 VDC (4,5 .. 32)
≥ 2...≤ 70000	≥ 2...≤ 70000	≥ 2...≤ 70000
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 or Cable	Connector or Cable	Connector or Cable
-30...+75 °C	-30...+75 °C	-30...+75 °C
IP67 / Shaft IP65	IP67 / Shaft IP65	IP67 / Shaft IP65
2/22	2/22	2/22
Square	Square	Square
www.tr-electronic.com/s/S008492	www.tr-electronic.com/s/S008493	www.tr-electronic.com/s/S008491
		

Suggested Products

Order code	Steps per Turn - delivered	Maximum Steps per turn	Channels	Shaft / Flange	Connector Position	Supply	Signal level
IEV58:2 - solid shaft							
IEV58:2-00001	10000	10000	A,\A, B,\B, 0,\0	10FL/19,5, ZB36 3xM3+3xM4	M23 12 pin, radial	4,5V..32V	=Ub
IEV58:2-00003	10000	10000	A,\A, B,\B, 0,\0	6GL/10, ZB50	M23 12 pin, radial	4,5V..32V	=Ub
IEH58:2 - hollow shaft							
IEH58:2-00001	10000	10000	A,\A, B,\B, 0,\0	15H7	M23 12 pin, radial	4,5V..32V	=Ub
IEH58:2-00003	10000	10000	A,\A, B,\B, 0,\0	12H7	M23 12 pin, radial	4,5V..32V	=Ub
IEH58:2-00004	10000	10000	A,\A, B,\B, 0,\0	10H7	M23 12 pin, radial	4,5V..32V	=Ub
IEH58:2-00005	10000	10000	A,\A, B,\B, 0,\0	3/8" H7	M23 12 pin, radial	4,5V..32V	=Ub
IEH58:2-00006	10000	10000	A,\A, B,\B, 0,\0	1/2" H7	M23 12 pin, radial	4,5V..32V	=Ub
AEV58I:2 - ATEX solid shaft Zone 2/22							
AEV58I:2-00001	600	10000	A,\A, B,\B, 0,\0	10FL/19,5, ZB36	Cable gland, radial, 5 m, open end	4,5V-32V	=Ub

Further product information

1. Enter order code into ...



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



3. Choose desired information

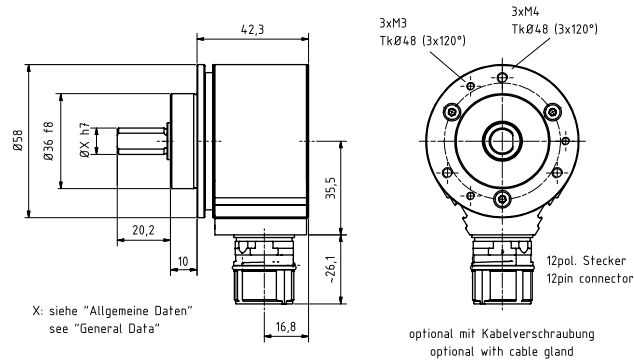


We will help you to select the most suitable products from the complete TR range. Please contact us (info@tr-electronic.de).

Dimensional Drawings

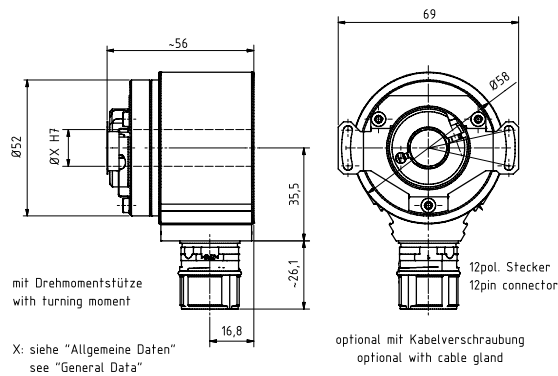
Solid Shaft

IEV58:2; IOV58:2; AEV58I:2; AOV58I:2



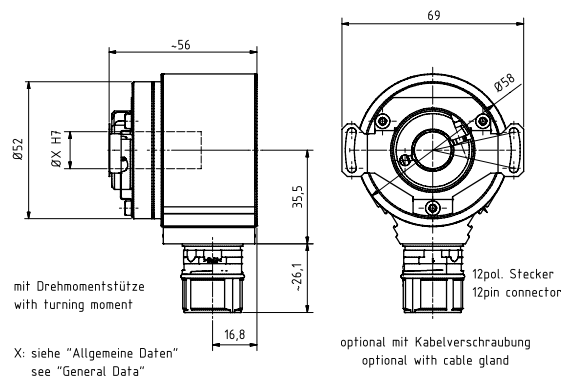
Hollow Shaft

IEH58:2; IOH58:2; AEH58I:2; AOH58I:2

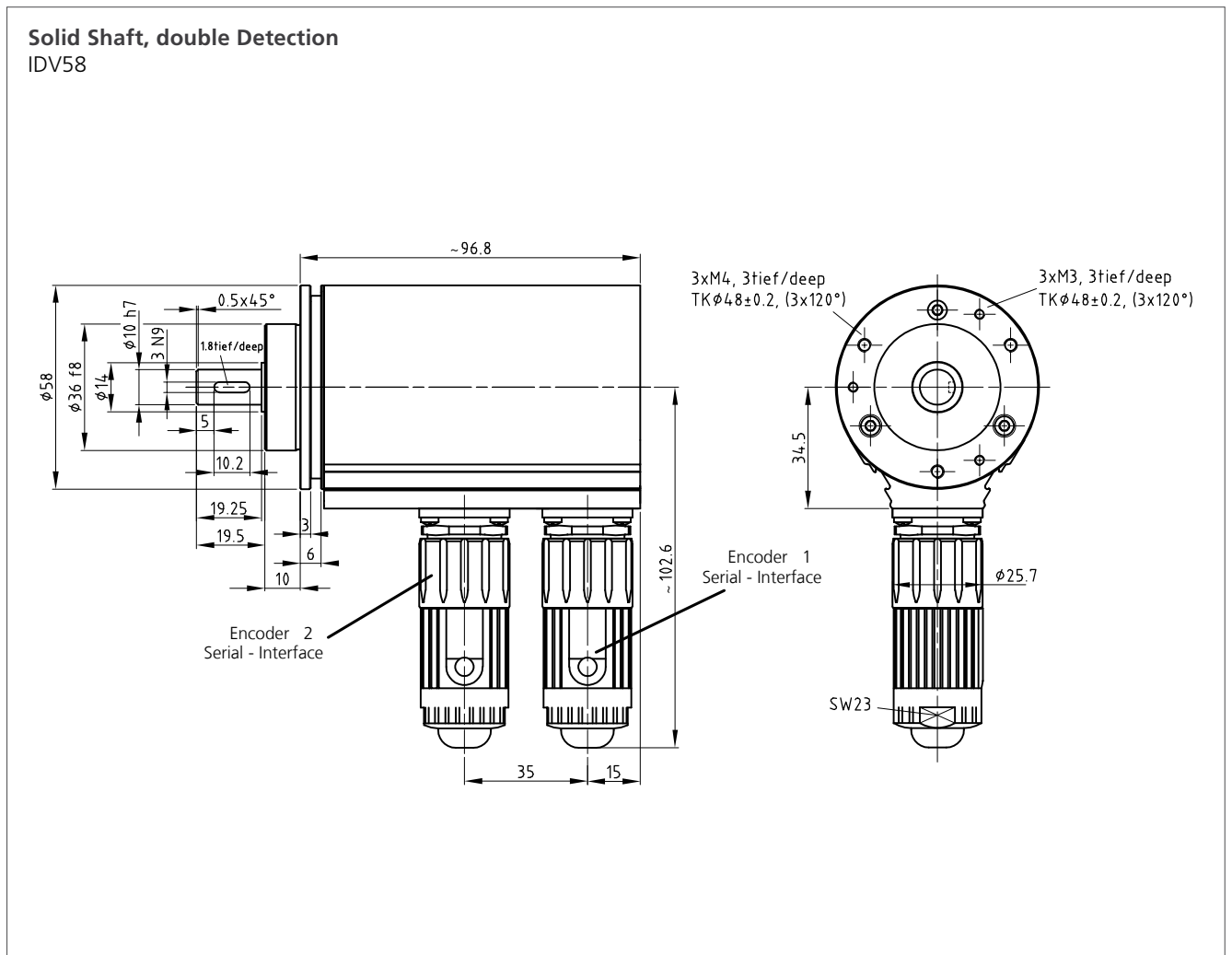


Blind Shaft

IES58:2; IOS58:2; AES58I:2; AOS58I:2

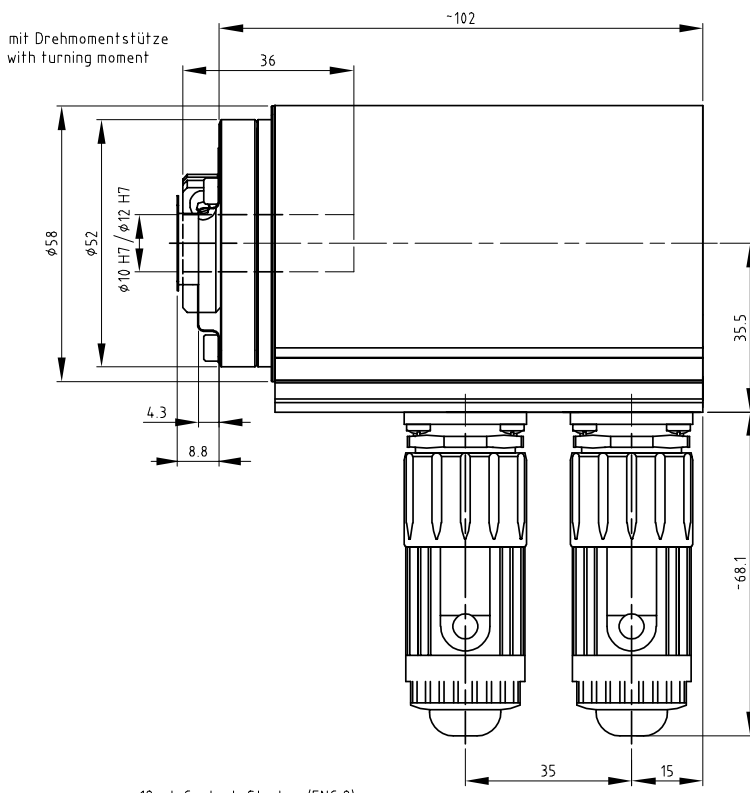


Dimensional Drawings

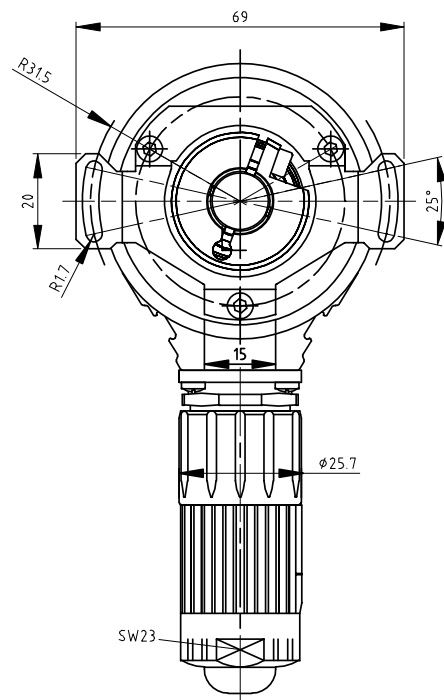


Dimensional Drawings

Blind Shaft, double Detection IDS58

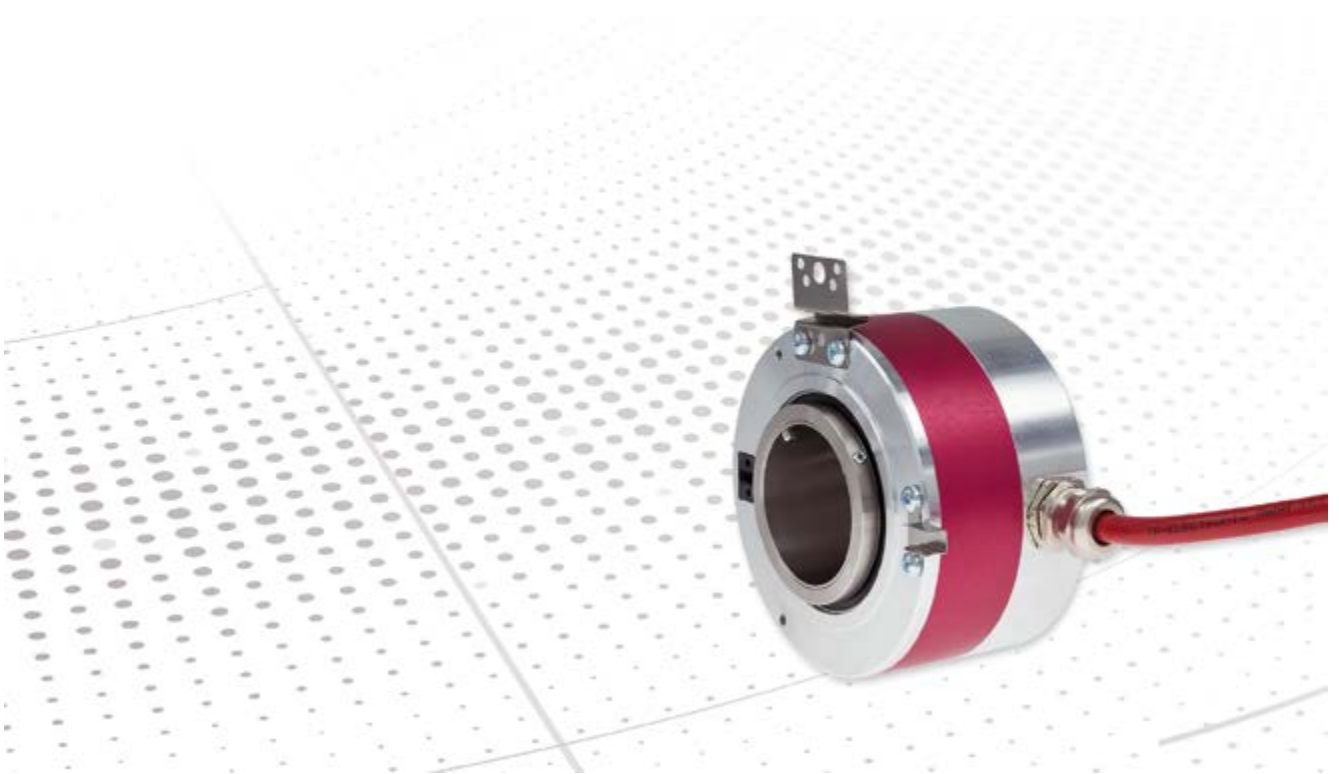


12pol. Contact-Stecker (ENC 2)
12pin. Contact-connector (ENC 2)



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 diameter

Programmable incremental encoders 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.

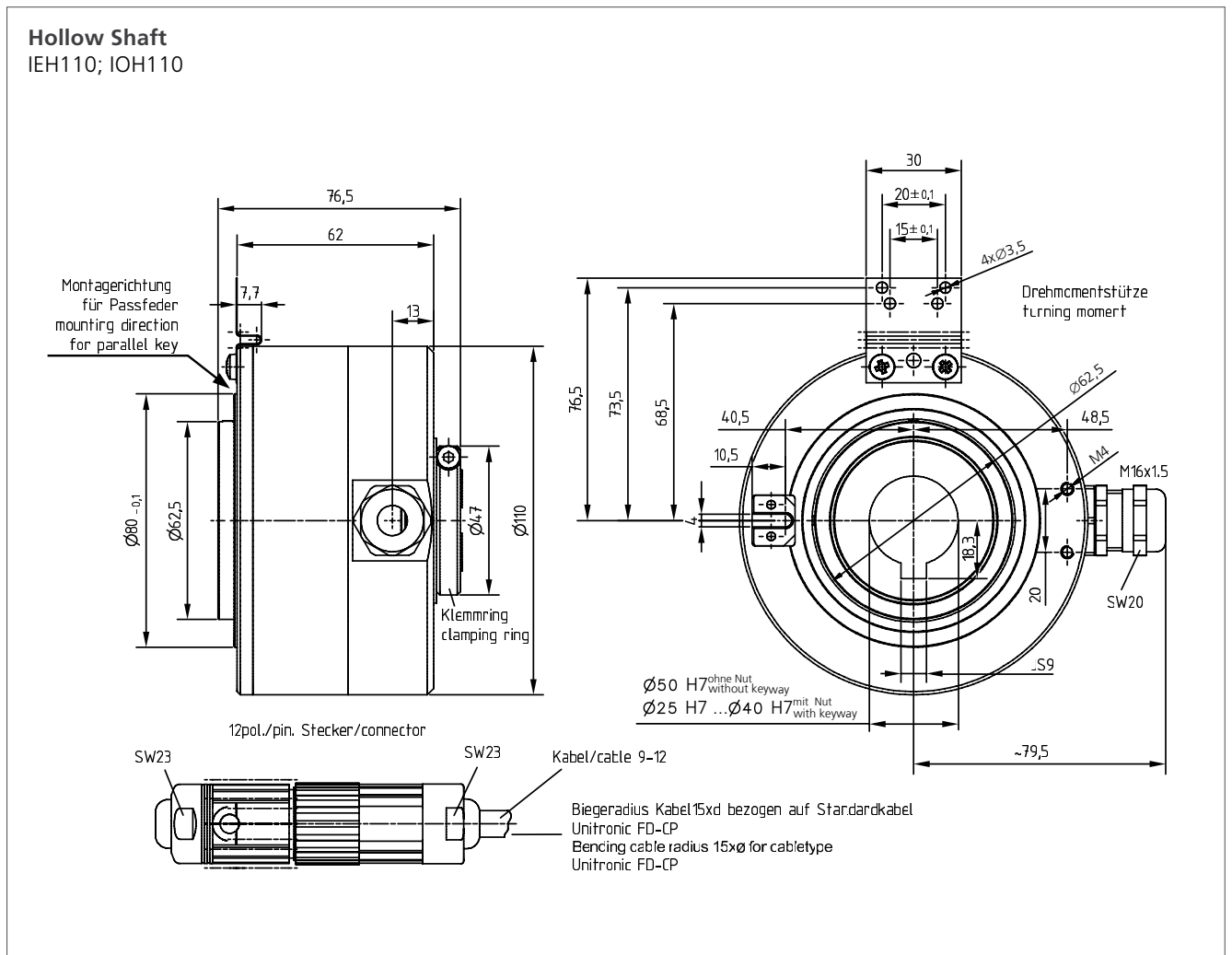
Depending on required resolution, IEH 110 with up to 8192 Steps per turn or IOH 110 with up to 36.000 Steps per turn fit your needs.

Up to 8.192 Pulses

Up to 36.000 Pulses

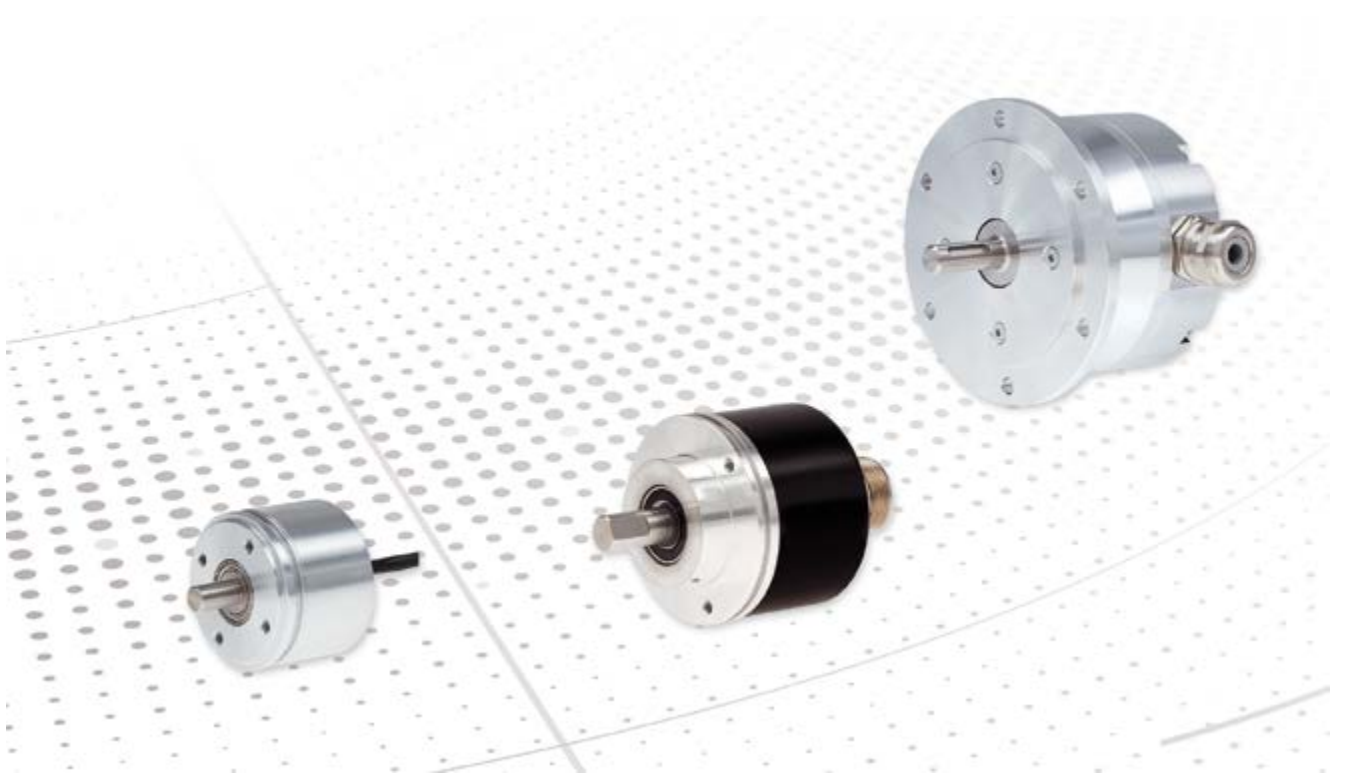
Product	IEH110	IOH110
		
Detection	Optical (E)	Optical (O)
Supply	24 VDC (11...27)	24 VDC (11...27)
Steps per Turn	2 ... 8192	2 ... 36 000
Shaft diameters available	15, 28, 30, 35, 38, 40, 45, 50	15, 28, 30, 35, 38, 40, 45, 50
Connectors	Connector or Cable	Connector or Cable
Ambient Temperature	0...+60°C (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 resp. programming the detection electronic with the requested number of lines. These incremental rotary

encoders are available in different sizes from 24 mm - 120 mm. Naturally they are also available with different mechanical connections such as solid shaft, continuous hollow shaft, blind shaft or integrated coupling.

Solid Shaft

Product	IE24	IE35	IMV36
			
Detection	Optical (E)	Optical (E)	Magnet Detection (M)
Supply	11...27 VDC (5 VDC \pm 5 %)	11...27 VDC (5 VDC \pm 5 %)	11...27 VDC (5 VDC \pm 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 	IMV58 	
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...3.600	1...10.000	1, 2, 4, 8, 10, 16, 20, 25, 32, 40, 50, 64, 80, 100, 125, 128, 200, 250, 256, 400, 500, 512, 1024, 2048*	
Shaft diameters available	6	6, 10, inch based	6, 10	
Connectors	Connector or Cable	Connector or Cable	Connector or Cable	
Ambient Temperature	0...+80 °C	0...+70 °C (-20...+70 °C)	-10...+70°C	
Protection Class	IP64	IP65	IP64	
Interface	Square	Square / Sine-Cosine	Square / Sine-Cosine	
Weblink	www.tr-electronic.com/s/S008424	www.tr-electronic.com/s/S008425	www.tr-electronic.com/s/S008426	
QR-Code				

*Others on Request

Solid Shaft Blind Shaft

<p>IE92V</p> 	<p>IV99</p> 	<p>IS24</p> 	<p>IS58U</p> 
Optical (O)	Optical (E)	Optical (E)	Optical (E)
11...27 VDC (5 VDC ± 5 %)	11...30 VDC	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)
9000, 10000, 18000	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*
10	6...24 (with groove 10...24)	3...6H7	8H7, 10H7, 12H7
Cable	Cable gland	Cable	Connector or Cable
0...+80 °C	-20...+80°C	0...+80 °C	-20...+85 °C
IP64	IP67	IP64	IP67
Square	Square	Square	Square
www.tr-electronic.com/s/S008431	www.tr-electronic.com/s/S008432	www.tr-electronic.com/s/S008420	www.tr-electronic.com/s/S008428
			

*Others on Request


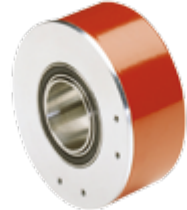
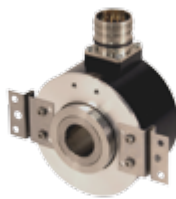




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Blind Shaft

Product	IS99 	IMF36 	IH58 	
Detection	Optical (E)	Magnet Detection (M)	Optical (E)	
Supply	11...30 VDC	11...27 VDC (5 VDC ± 5 %)	11...27 VDC (5 VDC ± 5 %)	
Steps per Turn	1024, 2048, 4096, 8192, 16384, 32768	8, 10, 16, 20, 25, 32, 40, 50, 64, 80, 100, 125, 128, 200, 250, 256, 400, 500, 512, 1024, 2048	1...10.000	
Shaft diameters available	16G7 & 17JS8 (Cone)	See drawing	<= 12 H7	
Connectors	Cable gland	Cable	Connector or Cable	
Ambient Temperature	-20...+80°C	-40...+70 °C	0...+80 °C	
Protection Class	IP67	IP65	IP64	
Interface	Square	Square / Sine-Cosine	Square / Sine-Cosine	
Weblink	www.tr-electronic.com/s/S008433	www.tr-electronic.com/s/S008421	www.tr-electronic.com/s/S008427	
QR-Code				

*Others on Request

Hollow Shaft

<p>IH20</p> 	<p>IH76A</p> 	<p>IH76B</p> 	<p>IH76V</p> 
Optical (E)	Optical (E)	Optical (E)	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, 15, 25, 30, 60, 100, 200, 218, 360, 500, 600, 720, 800, 900, 1000, 1024*	1...10.000	1...10.000	9000, 10000, 18000
20H7	<= 15H7	<= 28H7	<= 28H7
Connector or Cable	Connector or Cable	Connector or Cable	Connector or Cable
0...+60 °C (-20...+70 °C)	0...+80 °C	0...+80 °C	0...+80 °C
IP54 (Option IP 65)	IP64	IP64	IP64
Square	Square / Sine-Cosine	Square / Sine-Cosine	Square
www.tr-electronic.com/s/S008418	www.tr-electronic.com/s/S008429	www.tr-electronic.com/s/S008429	www.tr-electronic.com/s/S008429
			

*Others on Request

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Hollow Shaft

Product	IH92V 	IH120 	IH120V 
Detection	Optical (O)	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	9000, 10000, 18000	1024, 2500, 3600, 10000*	9000, 10000, 18000
Shaft diameters available	20H7, 22H7	27...55H7	27...55H7
Connectors	Cable	Cable	Cable
Ambient Temperature	0...+80 °C	0...+80 °C	0...+80 °C
Protection Class	IP64	IP52 (Option IP65)	IP64
Interface	Square	Square	Square
Weblink	www.tr-electronic.com/s/S008430	www.tr-electronic.com/s/S008434	www.tr-electronic.com/s/S008434
QR-Code			

*Others on Request

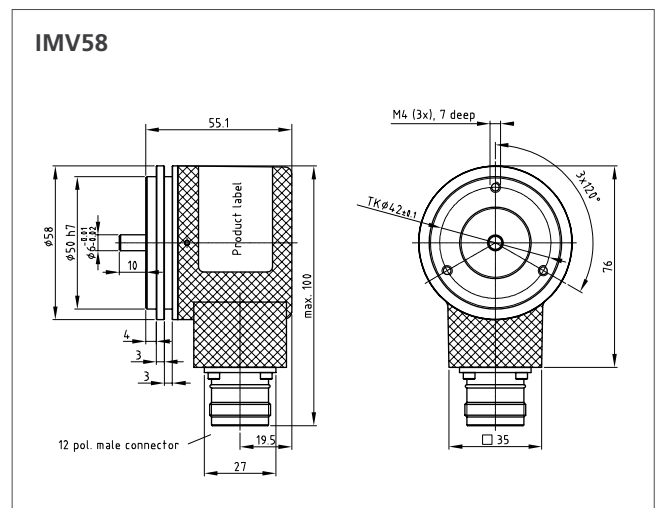
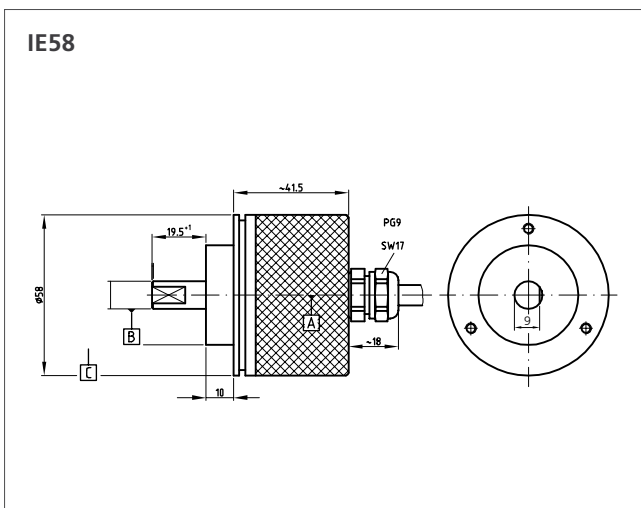
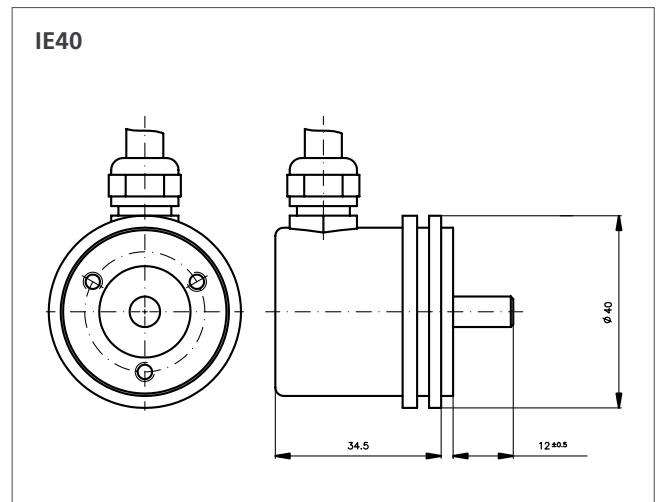
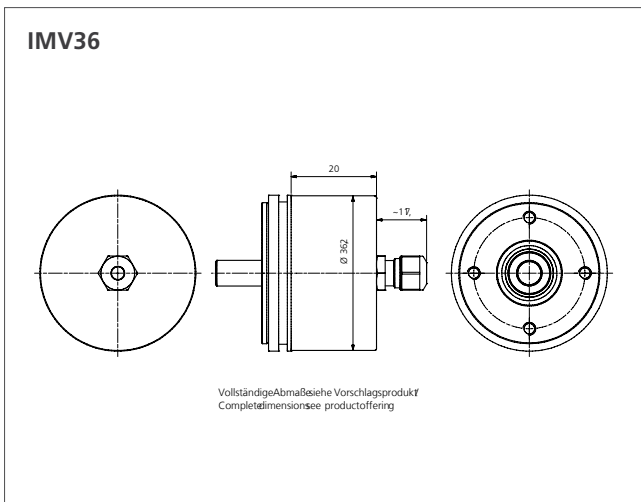
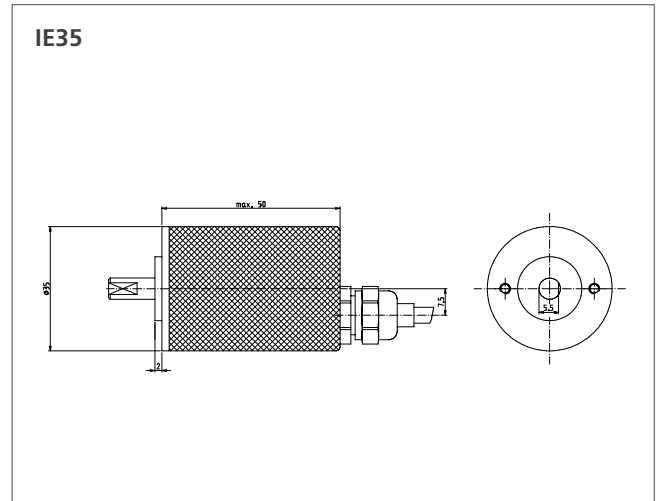
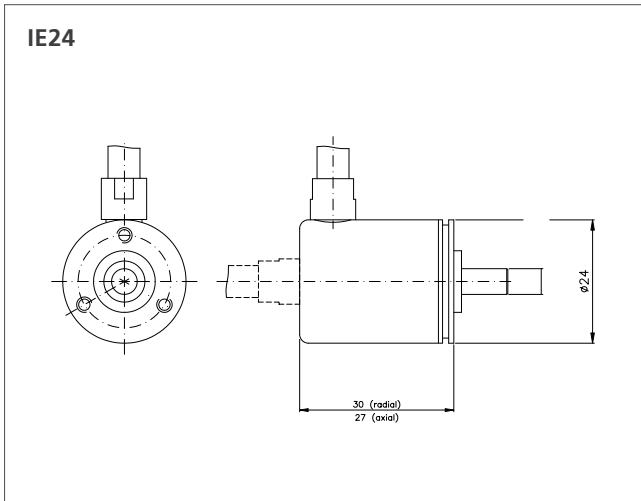
Can't find the right variant? Please contact us (info@tr-electronic.de)

Suggested Products

Order code	Steps per Turn	Channels	Shaft / Flange	Connector Position	Cable length	Remark
IE58A						
219-00059	1024	A,\A, B,\B, 0,\0	10FL/19,5 ZB36	M23 12P RADIAL		
219-00292	10000	A,\A, B,\B, 0,\0	6GL/10 ZB50	M23 12P AXIAL		
219-00590	10000	A,\A, B,\B, 0,\0	10FL/19,5 ZB36	M23 12P RADIAL		
219-01530	2048	A,\A, B,\B, 0,\0	10FL/19,5 ZB36	M23 12P RADIAL		
IV99						
IV99-00001	2048	A,\A, B,\B, 0,\0	11Glatt/32 ZB85	Cable gland M20x1,5 radial		
IV99-00002	1024	A,\A, B,\B, 0,\0	11Glatt/32 ZB85	Cable gland M20x1,5 radial		
IS24						
215-00002	500	A,\A, B,\B, 0,\0	4H7 blind shaft	open End Cable gland RADIAL	2,000 m	
IMF36						
IMF36-00005	2048	A,\A, B,\B, 0,\0		open End 1X M6 AXIAL	1,000 m	
IMF36-00012	2048	A,\A, B,\B, 0,\0		SUBD 9P 1X M6 AXIAL	1,000 m	
IS99						
IS99-00001	2048	A,\A, B,\B, 0,\0	16G7 blind shaft	Cable gland M20x1,5 radial		
IS99-00003	1024	A,\A, B,\B, 0,\0	16G7 blind shaft	Cable gland M20x1,5 radial		
IS99-00004	1024	A,\A, B,\B, 0,\0	16G7 blind shaft	Cable gland M20x1,5 radial		
IH20						
240-00001	25	A, B	20H7 hollow shaft	LEMO 6P		
240-00005	1024	A,\A, B,\B, 0,\0	20H7 hollow shaft	BINDER 12P		
240-00148	1024	A,\A, B,\B, 0,\0	20H7 hollow shaft	open End cable gland RADIAL	5,000 m	
240-00161	1000	A,\A, B,\B, 0,\0	20H7 hollow shaft	LUMBERG 8P		

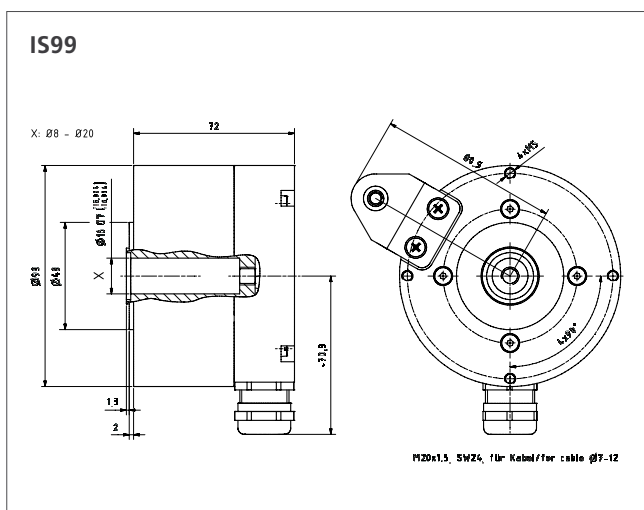
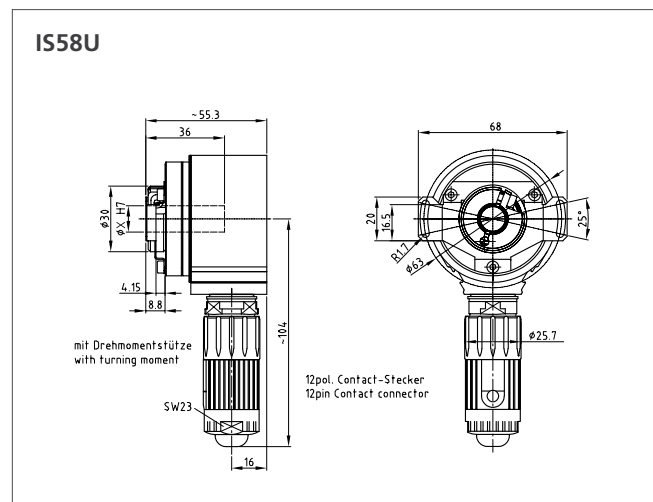
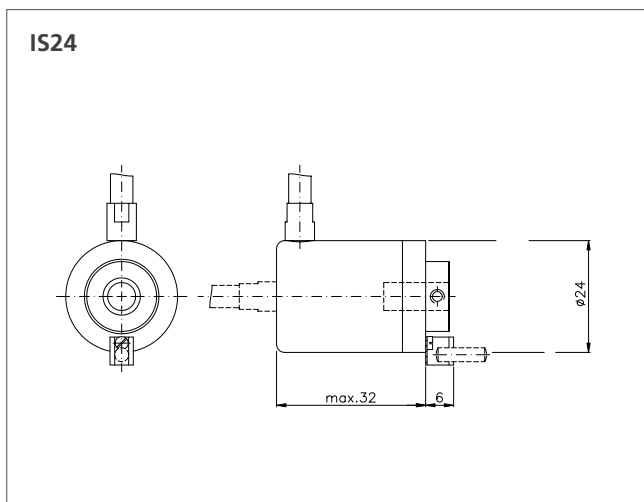
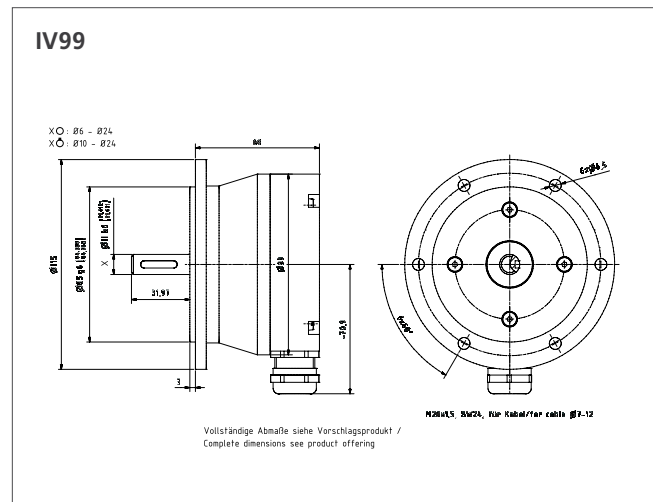
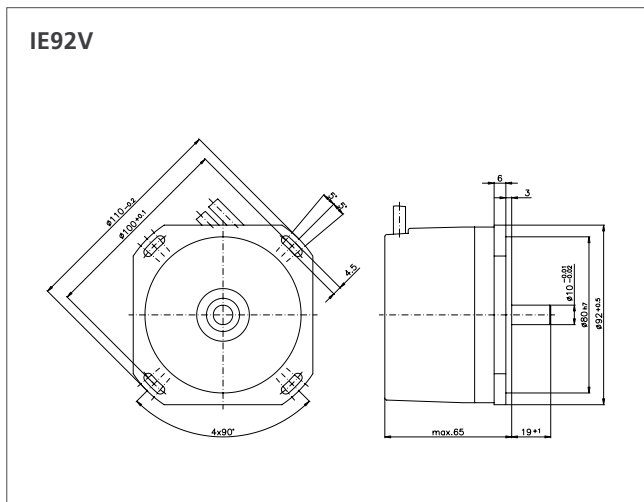
For further product information simply enter the order number in the search field at www.tr-electronic.de.

Dimensional Drawings

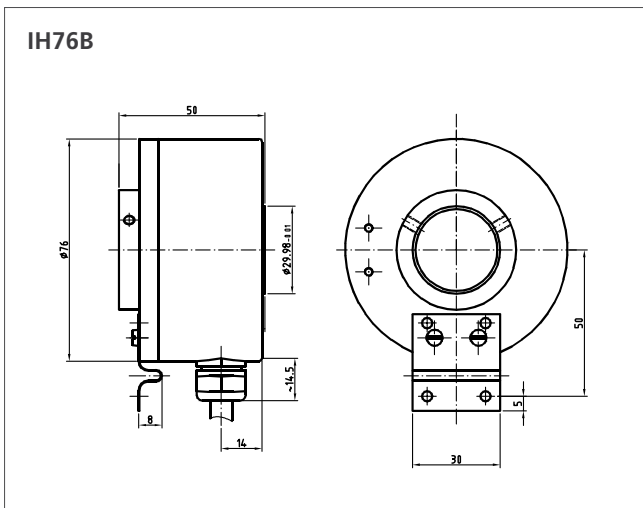
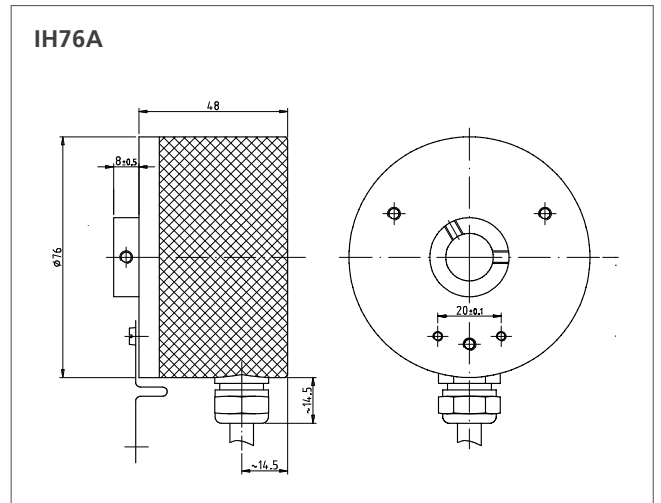
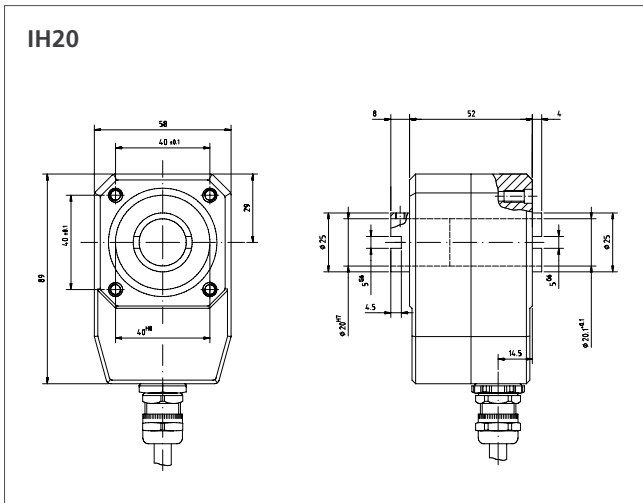
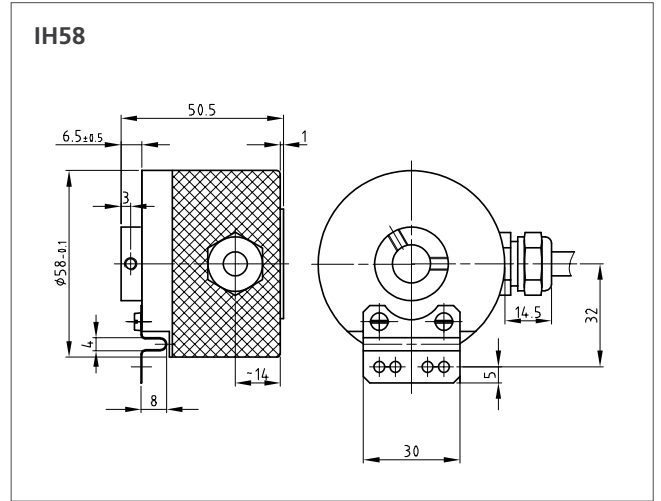
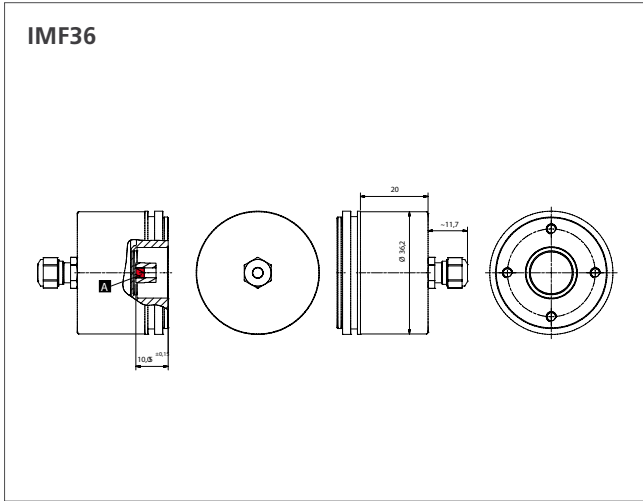


Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.

Dimensional Drawings

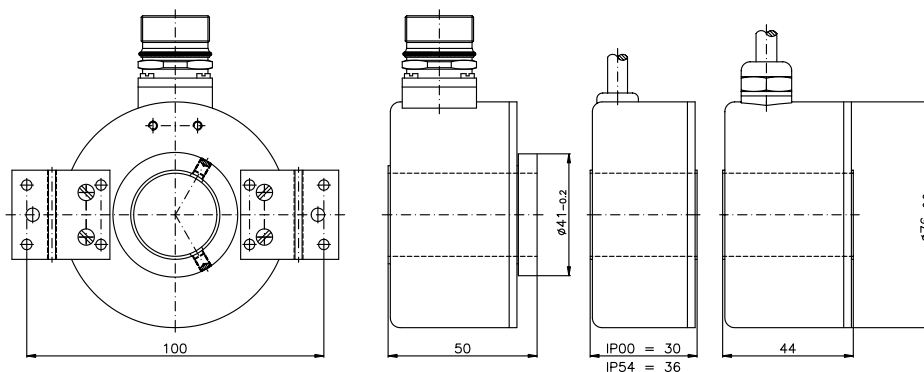


Dimensional Drawings

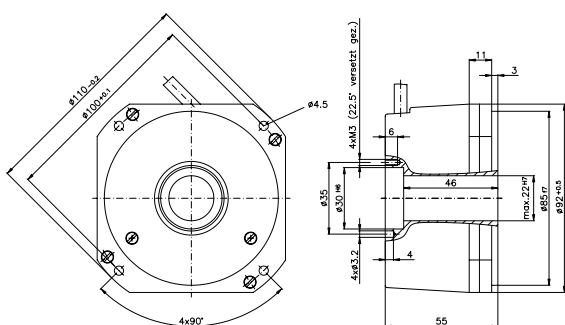


Dimensional Drawings

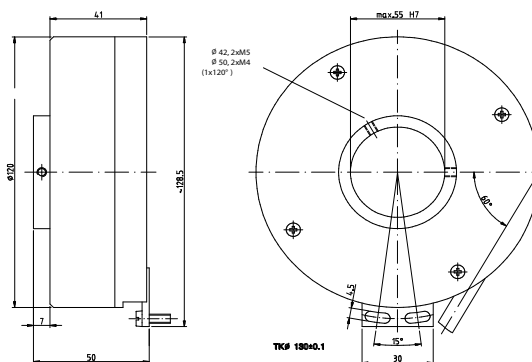
IH76V



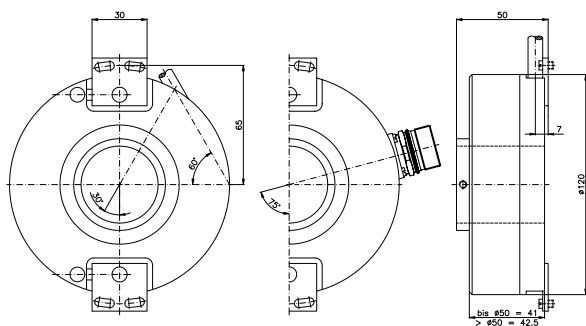
IH92V



IH120



IH120V



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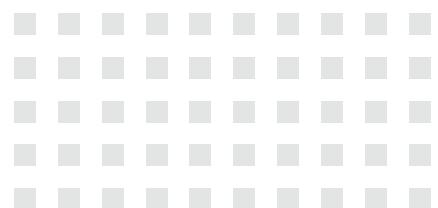
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