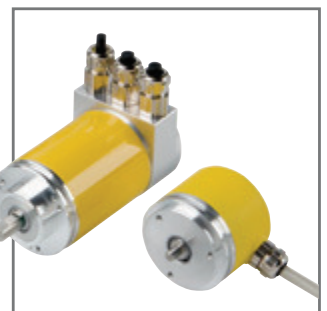
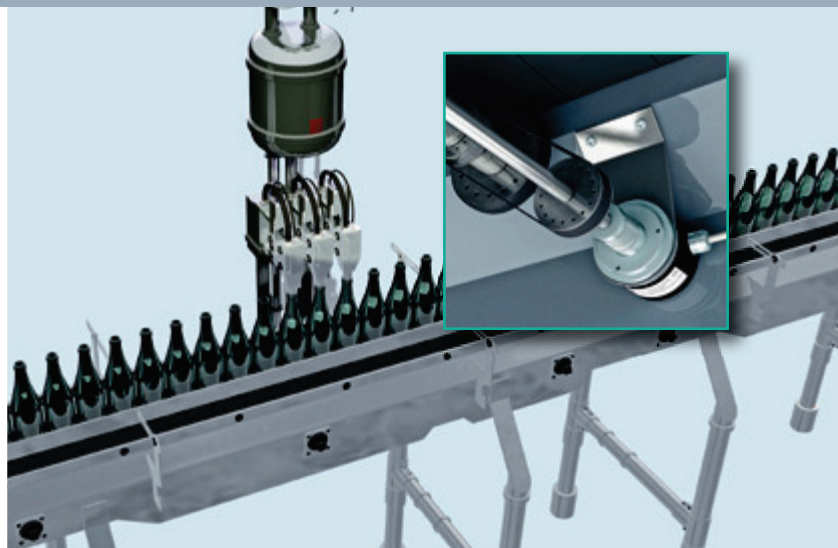


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# ROTARY ENCODERS



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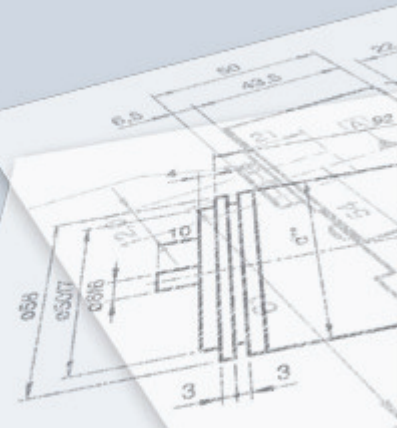
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## “CUSTOMIZED ENCODER SOLUTIONS”

Can't find a rotary encoder for your application under the standard products? We can help you match a rotary encoder to your specifications. Please speak to our experts, so that we can help you develop a tailor-made solution.

Your direct line to  
**Pepperl+Fuchs:**  
Tel.: 0621 776-1111  
E-mail: [fa-info@de.pepperl-fuchs.com](mailto:fa-info@de.pepperl-fuchs.com)





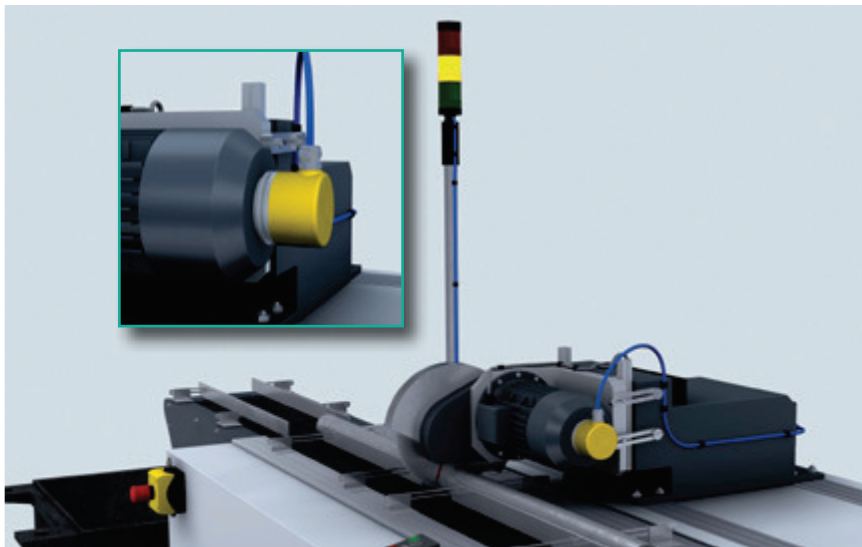
Rotary encoders are used for accurate position measurement and speed feedback. Due to their universal application possibilities, rotary encoders can be found in almost all applications in automation technology, as well as in machine and plant engineering. Let us help you to select a rotary encoder that suits your application requirements.

## INCREMENTAL ROTARY ENCODERS

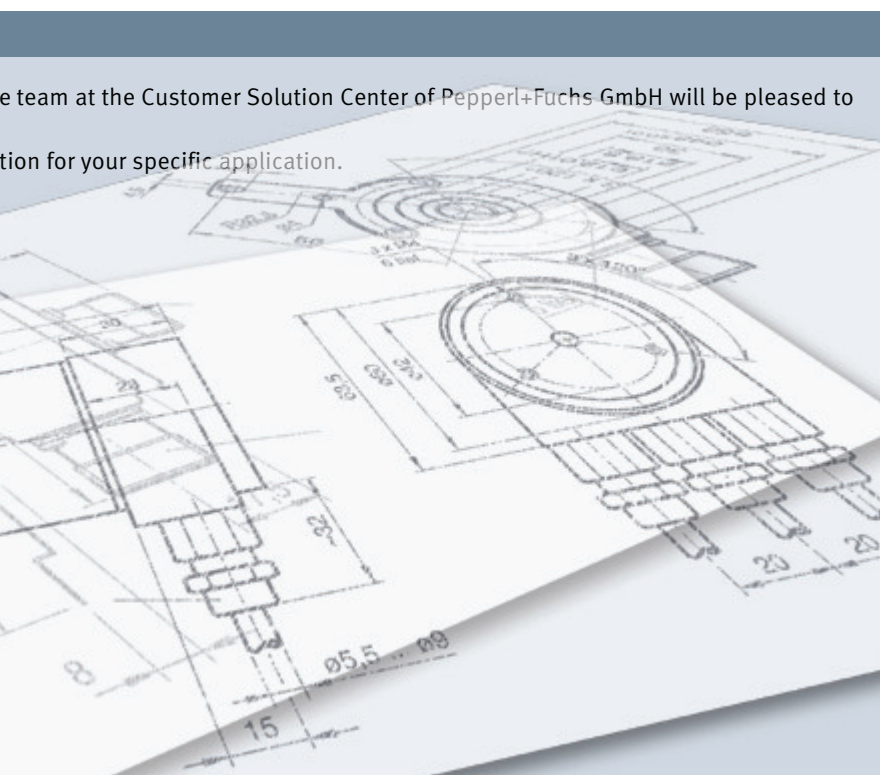
Incremental rotary encoders provide a defined number of pulses per shaft revolution. Measurement of the cycle duration and the number of pulses per unit of time provide the rotational speed. If the number of pulses from a reference point are measured, the numerical value represents a measure of the angle displaced and the distance covered around the path. Two-channel encoders – with a phase shift of  $90^\circ$  – provide the series connected electronics to determine the direction of rotation of the shaft and thereby also enable bi-directional positioning tasks. Three-channel incremental encoders provide a so-called null signal once per revolution.

## ABSOLUTE ROTARY ENCODERS

Absolute value rotary encoders output a uniquely coded numerical value at each shaft position. In particular in positioning tasks, absolute encoders are free of the electronics of the counting tasks, so that complicated and expensive input assemblies can be eliminated. In addition, no referencing movements are required when switching the machine on and following a power failure, since the current position value remains immediately available. New technologies, such as magnetic scanning, extend the applications and complete the range of absolute rotary encoders. With serial absolute rotary encoders, the output data is emitted via standardized interfaces and according to standardized protocols. Although in the past point-to-point connections with serial data transfer were frequently employed, today fieldbus systems are increasing.



The team at the Customer Solution Center of Pepperl+Fuchs GmbH will be pleased to assist you in the selection of a rotary encoder for your specific application.



# INCREMENTAL ROTARY ENCODERS

R LINE



up to 50,000 Pulse



ECOLAB

	RHI58	RSI58	RVI58	RVI58L
Pulse count	≤ 50.000	≤ 50.000	≤ 50.000	≤ 5.000
Housing Diameter [mm]	ø58	ø58	ø58	ø58
Flange type	–	–	Clamping flange, servo flange	Clamping flange
Flange Diameter [mm]	–	–	ø36, ø50	ø36
Solid shaft [mm]	–	–	ø6, ø10	ø10
Hollow shaft [mm]	ø10, ø12, ø15	–	–	–
Recessed hollow shaft [mm]	–	ø10, ø12	–	–
Maximum rpm	6.000	12.000	12.000	3.600
Max. shaft load, axial [N]	–	–	40	40
Max. shaft load, radial [N]	–	–	60	60
Operating voltage [V DC]	5 or 10 ... 30	5 or 10 ... 30	5 or 10 ... 30	5 or 10 ... 30
Output type	Push-pull, RS422	Push-pull, RS422	Push-pull, RS422	Push-pull, RS422
Max. output frequency [kHz]	200	200	200	600
Signal outputs	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class	IP54	IP54	IP65	IP67 / IP69K
Extended temperature range	–	–	•	–

## ORDER CODES

R H I 5 8 N - . . . A K 1 R 6 . N - . . . . .

**Shaft dimension**  
**0A** Hollow shaft ø10 mm (up to 5000 pulses)  
**0B** Hollow shaft ø12 mm (up to 5000 pulses)  
**2A** Hollow shaft ø10 mm, Clamped on both sides (> 5000 pulses)  
**2B** Hollow shaft ø12 mm, Clamped on both sides (> 5000 pulses)  
**2T** Hollow shaft 15mm Clamped on both sides (> 5000 pulses)

**Output**  
**1** 10 V to 30 V, push-pull  
**6** 5 V, RS422  
**X** 10 V to 30 V, RS422

**Pulse count**  
 100, 360, 500, 512, 1000, 1024, 1250, 2048, 2500, 3600, 4096, 5000, 6000, 8192, 10000, 20000, 50000

R V I 5 8 N - . . . . . 6 . N - . . . . .

**Shaft dimension**  
**011** Shaft ø10 mm x 20 mm with clamping flange  
**032** Shaft ø6 mm x 10 mm with servo flange  
**044** Shaft ø10 mm x 20 mm flattening 1 x 20 mm clamping flange

**Connection position**  
**A** axial  
**R** radial

**Pulse count**  
 100, 360, 500, 512, 1000, 1024\*, 1250, 2048\*, 2500\*, 3600, 4096\*, 5000, 6000\*, 8192\*, 10000\*, 20000\*, 50000\*

**Connection type**  
**AA** Plug connector Type 9416, 12-pin  
**AB** Plug connector Type 9416L, 12-pin  
**K1** Cable ø7.8 mm, 6 x 2 x 0.14 mm<sup>2</sup>, 1 m

**Output**  
**1** 10 V to 30 V, push-pull  
**6** 5 V, RS 422  
**X** 10 V to 30 V, RS422

**N** Standard  
**T** Extended temperature range to -40°C (see possible pulse counts\*)

R S I 5 8 N - . . . A . . . . . N - . . . . .

**Shaft dimension**  
**01** Recessed hollow shaft ø10 mm x 20 mm  
**02** Recessed hollow shaft ø12 mm x 20 mm

**Connection type**  
**AA** Plug connector Type 9416, 12-pin  
**AB** Plug connector Type 9416L, 12-pin  
**K1** Cable ø7.8 mm, 6 x 2 x 0.14 mm<sup>2</sup>, 1 m

**Pulse count**  
 100, 360, 500, 512, 1000, 1024, 1250, 2048, 2500, 3600, 4096, 5000, 6000, 8192, 10000, 20000, 50000

**Output**  
**1** 10 V to 30 V, push-pull  
**6** 5 V, RS422  
**X** 10 V to 30 V, RS422

**Signal output**  
**3** A + B + 0  
**6** A + B + 0 and A\ + B\ + 0\

**Connection position**  
**A** axial  
**R** radial

R V I 5 8 L - . . . . . 6 . N - . . . . .

**L** Hygiene-tested according to EHEDG, Approval for ECOLAB cleaning agents

**Shaft dimension**  
**011** Shaft ø10 mm x 20 mm with clamping flange

**Connection position**  
**A** axial  
**R** radial

**Pulse count**  
 50, 100, 150, 200, 360, 500, 1000, 1024, 1250, 2048, 2500, 4096, 5000

**Output**  
**1** 10 V to 30 V, push-pull  
**6** 5 V, RS422  
**X** 10 V to 30 V, RS422

**Connection type**  
**K2** Cable ø7.8 mm, 6 x 2 x 0.14 mm<sup>2</sup>, 2 m

# INCREMENTAL ROTARY ENCODERS

R LINE



	RV150	RV178	RH190
Pulse count	≤ 2.500	≤ 5.000	≤ 50.000
Housing Diameter [mm]	ø50	ø78	ø90
Flange type	Clamping flange	Clamping flange	–
Flange Diameter [mm]	ø30	ø42	–
Solid shaft [mm]	ø8	ø10	–
Hollow shaft [mm]	–	–	ø16, ø20, ø24, ø25, ø30, ø38, ø45
Recessed hollow shaft [mm]	–	–	–
Maximum rpm [rpm]	10.000	6.000	3.500
Max. shaft load, axial [N]	30	50	–
Max. shaft load, radial [N]	50	100	–
Operating voltage [V DC]	5 or 4.75 ... 30	10 ... 30	5 or 10 ... 30
Output type	Push-pull, RS422	Push-pull	Push-pull, RS422
Max. output frequency [kHz]	160	100	200
Signal outputs	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, B, 0	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class	IP65	IP65	IP65
Increased bearing load	–	•	–
Off-shore availability			on request

## ORDER CODES

**R V I 5 0 N - 0 9 B . . . . N - . . . . .**

### Connection type, connection position, signals, output

- AAA3T** Device connector Type 9416, 12-pin, axial  
A + B + 0, 4.75 V to 30 V, push-pull
- AAA66** Device connector Type 9416, 12-pin, axial  
A + B + 0 and  $\bar{A}$  +  $\bar{B}$  +  $\bar{0}$ , 5 V, RS422
- K0A3T** Cable ø6 mm, 5 x 0.38 mm<sup>2</sup>, 0.5 m, axial  
A + B + 0, 4.75 V to 30 V, push-pull

### Pulse count

- 30, 60, 90, 100, 180, 200, 250, 300,  
314, 360, 400, 500, 600, 720, 900,  
1000, 1024, 1200, 1250, 1440,  
1500, 1800, 2000, 2048, 2400, 2500

**R V I 7 8 N - 1 0 C . . A 3 1 N - . . . . .**

### Connection type

- AL** Plug connector Type 42306, 6-pin
- K2** Cable ø6 mm, 5 x 0.38 mm<sup>2</sup>, 2 m

### Pulse count

- 30, 60, 90, 100, 180, 200, 250, 300,  
314, 360, 400, 500, 600, 720, 900,  
1000, 1024, 1200, 1250, 1440,  
1500, 1800, 2000, 2048, 2400, 2500,  
3000, 3600, 4000, 4096, 5000

**R H I 9 0 N - . . A . . R 6 . N - . . . . .**

### Shaft dimension

- OE** Hollow shaft ø16 mm
- OF** Hollow shaft ø20 mm
- OG** Hollow shaft ø24 mm
- OH** Hollow shaft ø25 mm
- OI** Hollow shaft ø30 mm
- OL** Hollow shaft ø38 mm
- ON** Hollow shaft ø45 mm

### Output

- 1** 10 V to 30 V, push-pull
- 6** 5 V, RS 422
- X** 10 V to 30 V, RS 422

### Connection type

- AA** Plug connector Type 9416, 12-pin
- AB** Plug connector Type 9416L, 12-pin
- K1** Cable ø7.8 mm, 6 x 2 x 0.14 mm<sup>2</sup>, 1 m

### Pulse count

- 100, 360, 500, 512, 1000,  
1024, 1250, 2048, 2500,  
4096, 5000, 8192,  
10000, 25000, 50000

# INCREMENTAL ROTARY ENCODERS

T LINE



	TVI40	TSI40	THI40
Pulse count	≤ 1.024	≤ 1.024	≤ 1.024
Housing diameter [mm]	ø40	ø40	ø40
Flange type	Clamping flange	–	–
Flange Diameter [mm]	ø20	–	–
Solid shaft [mm]	ø6, ø8, ø1/8", ø1/4"	–	–
Hollow shaft [mm]	–	–	ø6, ø6.35, ø8, ø3/16", ø5/16"
Recessed hollow shaft [mm]	–	ø4, ø6, ø3/16", ø5/16", ø3/8"	–
Maximum rpm	6.000	6.000	6.000
Max. shaft load, axial [N]	20	–	–
Max. shaft load, radial [N]	30	–	–
Operating voltage [V DC]	4,75 ... 30	4,75 ... 30	4,75 ... 30
Output type	Push-pull, RS422	Push-pull, RS422	Push-pull, RS422
Max. output frequency [kHz]	100	100	100
Signal outputs	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class	IP54	IP54	IP54

## ORDER CODES

**T V I 4 0 N - . . T . . T 6 T N - . . . . .**

### Shaft dimension

- 09** Shaft ø8 mm x 15 mm
- 14** Shaft ø6 mm x 15 mm
- 17** Shaft ø1/4" x 15 mm
- 19** Shaft ø1/8" x 15 mm

### Connection type

- K0** Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 0.5 m
- K2** Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 2 m

### Pulse count

- 25, 40, 50, 60, 90, 100, 120, 150, 180, 200, 250, 256, 300, 360, 400, 500, 512, 600 1000, 1024

**T S I 4 0 N - . . . . . T 6 T N - . . . . .**

### Shaft dimension

- 16A** Hollow shaft ø4 mm x 15 mm
- 14A** Hollow shaft ø6 mm x 15 mm
- 20A** Recessed hollow shaft ø3/8" x 15 mm
- 21A** Recessed hollow shaft ø3/16" x 15 mm
- 22A** Recessed hollow shaft ø5/16" x 15 mm

### Connection type

- K0** Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 0.5 m
- K2** Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 2 m

### Pulse count

- 25, 40, 50, 60, 90, 100, 120, 150, 180, 200, 250, 256, 300, 360, 400, 500, 512, 600 1000, 1024

**T H I 4 0 N - . . A K 2 R 6 T N - . . . . .**

### Shaft dimension

- 0S** Hollow shaft ø6 mm, clamping ring, flange side
- 0U** Hollow shaft ø6.35 mm, clamping ring, flange side
- 0X** Hollow shaft ø3/16", clamping ring, flange side
- 2A** Hollow shaft ø5/16", clamping ring, flange side
- 0C** Hollow shaft ø8 mm, clamping ring, flange side
- 1S** Hollow shaft ø6 mm, clamping ring, cover side
- 1U** Hollow shaft ø6.35 mm, clamping ring, cover side
- 1C** Hollow shaft ø8 mm, clamping ring, cover side
- 1X** Hollow shaft ø3/16", clamping ring, cover side
- 3A** Hollow shaft ø5/16", clamping ring, cover side

### Pulse count

- 25, 40, 50, 60, 90, 100, 120, 150, 180, 200, 250, 256, 300, 360, 400, 500, 512, 600 1000, 1024

# INCREMENTAL ROTARY ENCODERS

T LINE



	TVI50	TVI58	THI58
Pulse count	≤ 1.024	≤ 1.500	≤ 1.500
Housing diameter [mm]	ø50	ø58	ø58
Flange type	Clamping flange, servo flange, rectangular flange	Clamping flange, servo flange	–
Flange Diameter [mm]	ø30	ø30, ø50	–
Solid shaft [mm]	ø8, ø1/8", ø1/4", ø3/8"	ø6, ø10	–
Hollow shaft [mm]	–	–	ø10, ø12, ø15
Recessed hollow shaft [mm]	–	–	–
Maximum rpm [rpm]	6.000	6.000	6.000
Max. shaft load, axial [N]	20	20	–
Max. shaft load, radial [N]	40	40	–
Operating voltage [V DC]	4,75 ... 30	4,75 ... 30	4,75 ... 30
Output type	Push-pull, RS422	Push-pull, RS422 up to 30 V operating voltage*	Push-pull, RS422
Max. output frequency [kHz]	100	100	100
Signal outputs	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class	IP54	IP54	IP54

## ORDER CODES

T V I 5 0 N . . . . . 6 T N . . . . .

### Shaft dimension

- 09 Shaft ø8 mm x 15 mm
- 24 Shaft ø1/4" x 19 mm
- 25 Shaft ø1/8" x 19 mm
- 26 Shaft ø3/8" x 19 mm

### Flange version

- B Clamping flange
- U Rectangular flange 2"
- W Servo flange 2" (4)
- X Servo flange 2" (3)

### Connection position

- A axial
- R radial

### Connection type

- K0 Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 0.5 m
- K2 Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 2 m

### Pulse count

- 25, 40, 50, 60, 90, 100, 120, 150, 180, 200, 256, 300, 360, 400, 500, 512, 600, 1000, 1024

T V I 5 8 N . . . . . 6 . N . . . . .

### Shaft dimension/ Flange version

- 01N Shaft ø10 mm x 20 mm  
Clamping flange, 3 x M3  
and 3 x M4
- 032 Shaft ø6 mm x 10 mm  
servo flange

### Connection position

- A axial
- R radial

### Connection type

- K0 Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 0.5 m
- K2 Cable ø6 mm, 8 x 0.128 mm<sup>2</sup>, 2 m

### Output

- T 4.75 V to 30 V, push-pull
- X 10 V to 30 V, RS422\*

### Pulse count

- 60, 64, 100, 125, 200, 250, 300, 360, 500, 512, 600, 900, 1000, 1024, 1500

T H I 5 8 N . . . . . A . . . . . R 6 T N . . . . .

### Shaft dimension

- 0A Hollow shaft ø10 mm, Clamping ring, flange side
- 0B Hollow shaft ø12 mm, Clamping ring, flange side
- 0T Hollow shaft ø15 mm, Clamping ring, flange side
- 1A Hollow shaft ø10 mm, Clamping ring, cover side
- 1B Hollow shaft ø12 mm, Clamping ring, cover side
- 1T Hollow shaft ø15 mm, Clamping ring, cover side

### Connection type

- K0 Cable ø6 mm, 8 x 0.14 mm<sup>2</sup>, 0.5 m, UL-Style 2571
- K2 Cable ø6 mm, 8 x 0.14 mm<sup>2</sup>, 2 m, UL-Style 2571

### Pulse count

- 60, 64, 100, 125, 200, 250, 300, 360, 500, 512, 600, 900, 1000, 1024, 1500

# INCREMENTAL ROTARY ENCODERS

## SINE-COSINE OUTPUT



	RHS58	RHS90	RVS58
Pulse counts	up to 2,048	up to 2,048	up to 2,048
Housing diameter [mm]	ø58	ø90	ø58
Flange type	Hollow shaft	Hollow shaft	Clamping flange, servo flange
Flange Diameter [mm]	–	–	ø36, ø50
Solid shaft [mm]	–	–	ø6, ø10
Hollow shaft [mm]	ø10, ø12, ø15	ø19, ø20, ø25, ø45	–
Recessed hollow shaft [mm]	–	–	–
Maximum rpm [rpm]	6.000	3.500	12.000
Max. shaft load, axial [N]	–	–	40
Max. shaft load, radial [N]	–	–	60
Operating voltage [V DC]	5	5	5
Output type	Sine/cosine	Sine/cosine	Sine/cosine
Max. output frequency [kHz]	200	200	200
Signal outputs	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class	IP54	IP65	IP65

The combination of solid construction and high precision – the rotary encoder with sine/cosine interface. Typical applications for these rotary encoders are in drive technology (motor feedback in mounting areas). Thanks to the 1V peak-to-peak sine/cosine interface, the rotary encoder is compatible with the electrical drive inverters typically available on the market. The strengths of the sine/cosine rotary encoder series include significantly increased precision, improved drive running characteristics, and an attractive price.

### ORDER CODES

**RHS58N** - . . . **AK1R6ZN** - . . . . .

#### Shaft dimension

- 2A** Hollow shaft ø10 mm, Clamping ring flange and cover side
- 2B** Hollow shaft ø12 mm, Clamping ring flange and cover side
- 2T** Hollow shaft ø15 mm, Clamping ring flange and cover side

**Pulse counts**  
1024, 2048

**RHS90N** - . . . **K1R6ZN** - . . . . .

#### Shaft dimension/Flange version

- 2CA** Hollow shaft ø19 mm
- OFA** Hollow shaft ø20 mm
- OHA** Hollow shaft ø25 mm
- ONA** Hollow shaft ø45 mm

**Pulse counts**  
1024, 2048

**RVS58N** - . . . . . **6ZN** - . . . . .

#### Shaft dimension

- 011** Shaft ø10 mm x 20 mm with clamping flange
- 032** Shaft ø6 mm x 10 mm with servo flange

#### Connection position

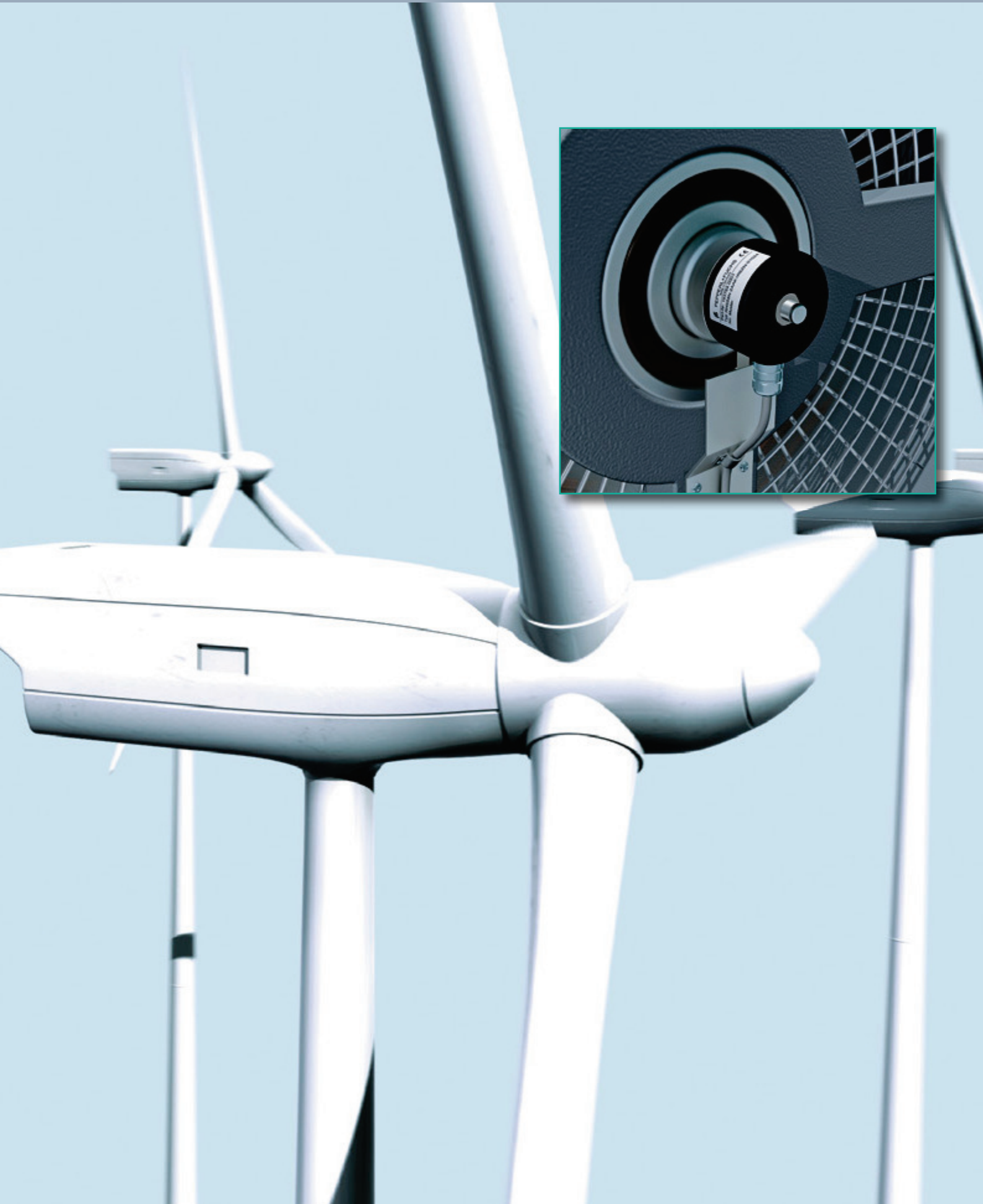
- A** axial
- R** radial

**Pulse counts**  
1024, 2048

#### Connection type

- AA** Plug connector Type 9416, 12-pin
- AB** Plug connector Type 9416L, 12-pin
- K1** Cable ø7.8 mm, 6 x 2 x 0.14 mm<sup>2</sup>, 1 m





# MAGNETIC INCREMENTAL ROTARY ENCODERS

The MNI40N magnetic incremental rotary encoder combines an extraordinarily robust measuring system with intelligent diagnostic and adjustment functions in an extremely compact unit. The sensor from Pepperl+Fuchs GmbH is based on the most up-to-date AMR/GMR technology and is housed in an encapsulated and highly compact enclosure with a degree of protection up to IP69k. These features provide the sensor with a high level of resistance to harsh environmental conditions. Easy installation and easy adjustment of the sensor by means of a two-color LED considerably reduce installation time.



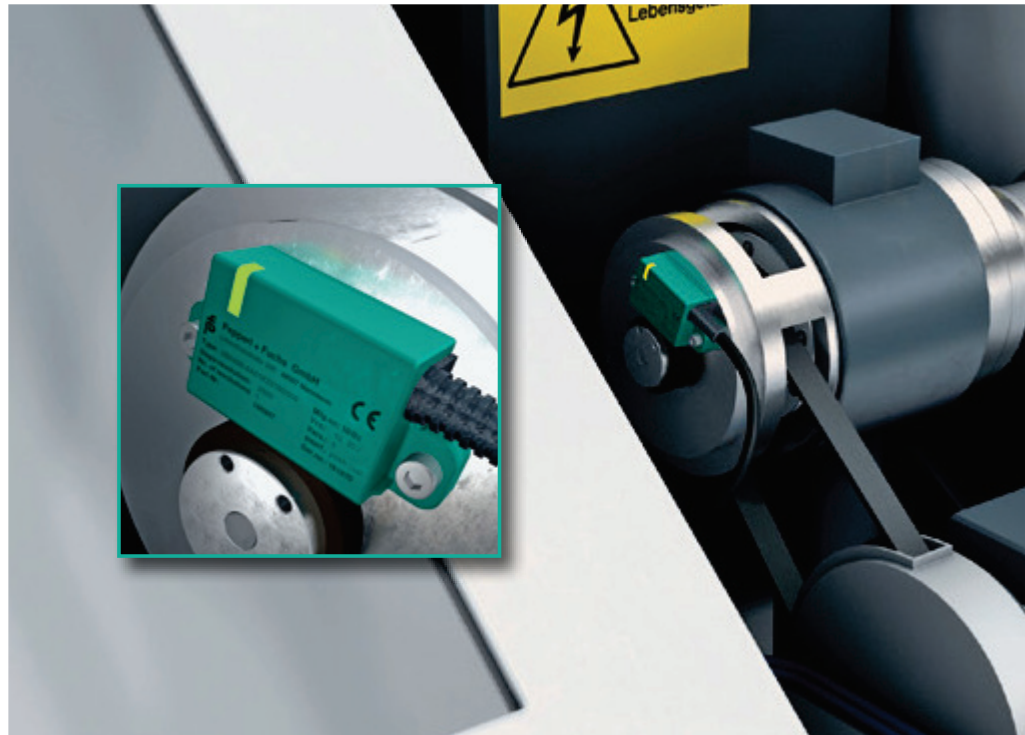
		MNI40N
Pulse count		up to 5,000
Housing		cube-shaped with magnetic wheel
Hollow shaft	[mm]	ø6, ø10, ø12, ø15
Maximum rpm	[rpm]	up to 30,000
Operating voltage	[V DC]	5 or 10 ... 30
Output type		Push-pull, RS422
Max. output frequency	[kHz]	1.000
Signal outputs		A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class		IP68/69k
Shock resistance		200 g
Vibration resistance		40 g
Operating temperature		-40°C to +100°C

## APPLICATIONS

- Machine / Plant construction
- Automation technology
- Wind power plants
- Vehicle manufacture
- Construction machinery
- Lifting and handling technology
- Outdoor applications/offshore

## MAIN FEATURES

- Clear verification of functions via LED (2-color)
- Easy installation and checking through assistance functions reduces costs
- Quality assurance through complete self-diagnosis including magnetic wheel
- Reliable function in the application through internal intelligence during commissioning
- Resistant to dirt as well as thermal and mechanical shock through elastomer coating of the magnetic wheel
- Long service life at high speeds and temperatures



## ORDER CODES

M N I 4 0 N - . . . K 2 6 . N - . . . . .

Hollow shaft magnetic wheel Internal diameter

- OS 6 mm
- OA 10 mm
- OB 12 mm
- OT 15 mm

### Output

- 1 10 to 30 V, VDC push-pull
- 6 5 V, VDC RS422

### Features of the magnetic wheel

- 01** 50 poles, ø31.7 mm  
Pulse counts 100, 500, 1000, 1250, 1600, 2400, 2500
- A1** 64 poles, ø40.6 mm  
Pulse counts 128, 512, 1024, 2048, 3072, 3200
- E1** 72 poles, ø46 mm  
Pulse counts 360, 1800, 3600



		MNI20N
Pulse count		up to 5,000
Housing		cube-shaped with magnetic ring
Maximum rpm	[rpm]	up to 20,000
Operating voltage	[V DC]	5 or 10 ... 30
Output type		Push-pull, RS422
Max. output frequency	[kHz]	800
Signal outputs		A, $\bar{A}$ , B, $\bar{B}$
Protection class		IP67
Shock resistance		200 g
Vibration resistance		40 g
Operating temperature		-25°C to +85°C

The low cost version of the new magnetic incremental-encoder MNI20N is based on the proven and advanced AMR sensor technology from Pepperl+Fuchs GmbH. The MNI20N is integrated in an extremely robust measuring system that is housed in an encapsulated and highly compact enclosure with IP67 protection. This protects the magnetic incremental rotary encoder from harsh environmental conditions. Other characteristics for this series include the easy mounting of the sensor and an LED integrated in the housing that clearly displays the operating mode.

## APPLICATIONS

In all industrial sectors where robust but precise and cost-effective solutions for determining speed or position are required. The standardized interface guarantees fault-free signal processing.

## MAIN FEATURES

- Low cost version
- Resistant to dirt as well as thermal and mechanical shock
- Long service life at high speeds and temperatures
- Cube design with plastic ferrite magnetic ring
- Easy installation
- Operating light to verify functionality
- Up to 5000 pulses
- High IP rating



## ORDER CODES

M N I 2 0 N - . . . . K 2 4 . N - . . . . .

### Output

- 1 10 to 30 V, VDC push-pull
- 6 5 V, VDC RS 422

### Features of the magnetic ring

- OTB2** 2 mm,  $\phi$ 15m, 32 pole, plastic ferrite,  $\phi$ 20.4 mm  
Pulse counts 32, 64, 128, 256, 512, 800, 1024, 1600, 3200
- OH02** 2 mm,  $\phi$ 25m, 50 pole, plastic ferrite,  $\phi$ 31.7 mm  
Pulse counts 50, 100, 500, 1000, 1250, 800, 1600, 2400, 2500, 5000

# ABSOLUTE ROTARY ENCODERS

Absolute value rotary encoders output a uniquely coded numerical value at each shaft position. Absolute rotary encoders eliminate the need for expensive input components in a positioning application because they have built-in reference data. In addition, reference runs after a power failure or when the machine is switched off are not required because the encoder provides the current position value immediately. New technologies, such as magnetic sampling, extend the applications and complete the range of absolute rotary encoders. With serial absolute rotary encoders, the output data is output via standardized interfaces and according to standardized protocols. While in the past, pure point-to-point connections with serial data transfer were implemented, fieldbus systems are now becoming increasingly popular.

## SINGLE-TURN FUNCTION

In the case of single-turn absolute rotary encoders, one rotation of the encoder (360°) is divided into a maximum of 65,536 measuring steps (16 bits). After each full rotation, the coding starts at its initial value again. The encoder electronics do not recognize how many rotations have been completed.

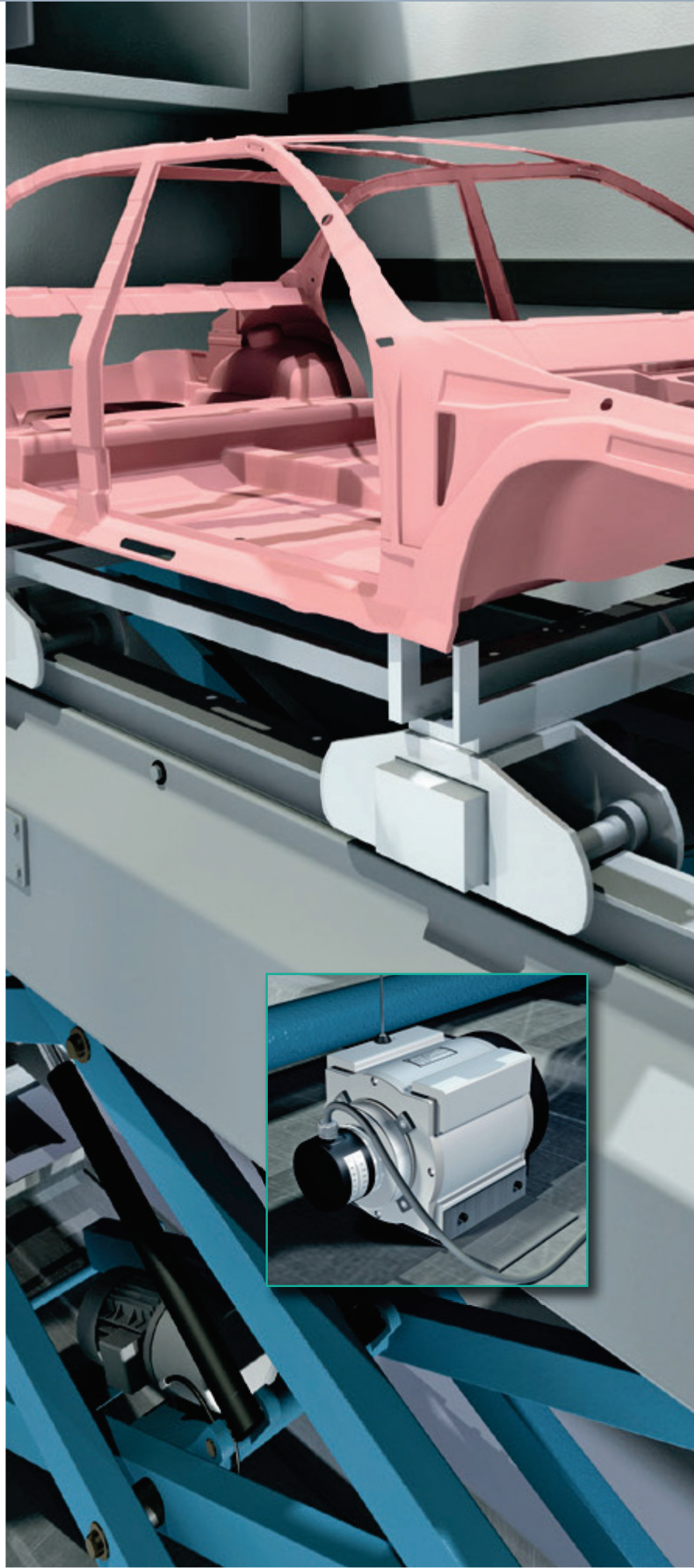
## MULTI-TURN FUNCTION

The number of rotations can also be recorded in the multi-turn version. Thus, in addition to the single-turn position, the multi-turn position is also available, multiplying the resolution. Depending on the technology and version, a total resolution of up to 30 bits can be achieved.

With optical absolute rotary encoders, the most common multi-turn technology is implemented using a mechanical drive. In the case of magnetic absolute rotary encoders, a magnetic process is used that works without battery backup. Whichever of the two technologies is used, the current position is always shown after the operating voltage is applied.

## INTERFACES

- Parallel interface
- SSI interface
- AS-Interface
- CANopen
- DeviceNet
- PROFIBUS
- Industrial Ethernet



# ABSOLUTE ROTARY ENCODERS

INDUSTRIAL  
**ETHERNET**

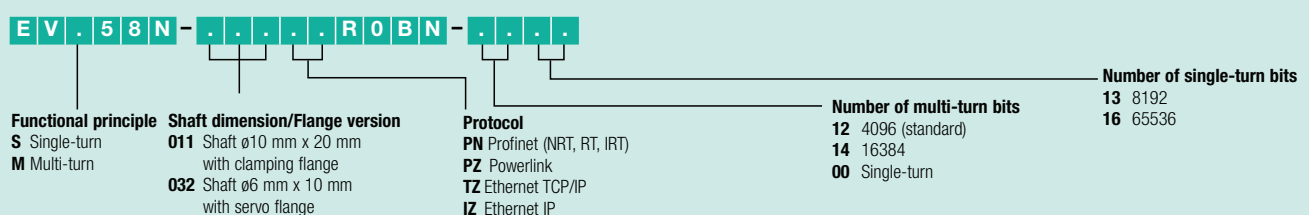
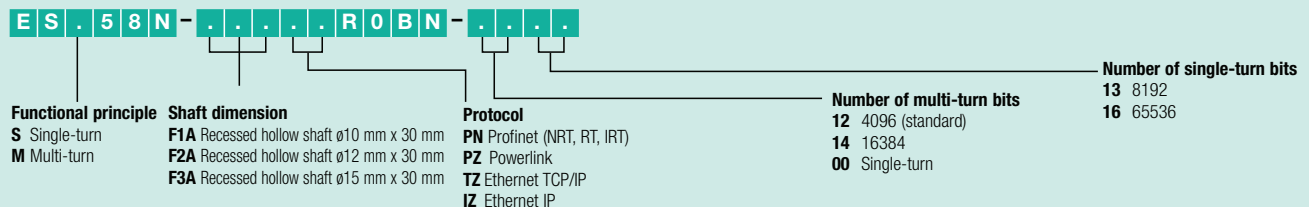


**ETHERNET  
POWERLINK**  
STANDARDIZATION GROUP



	ESS58	ESM58	EVS58	EVM58
Single-turn resolution	65.536	65.536	65.536	65.536
Multi-turn resolution	1	16.384	1	16.384
Housing diameter [mm]	ø58		ø58	
Flange type	-		Clamping flange, servo flange	
Flange Diameter [mm]	-		ø36, ø50	
Solid shaft [mm]	-		ø6, ø10	
Hollow shaft [mm]	-		-	
Recessed hollow shaft [mm]	ø10, ø12, ø15		-	
Maximum rpm [rpm]	6.000		6.000	
Max. shaft load, axial [N]	-		40	
Max. shaft load, radial [N]	-		110	
Operating voltage [V DC]	10 ... 30		10 ... 30	
Interfaces	Industrial Ethernet		Industrial Ethernet	
Resolution scaling	Yes		Yes	
Selection of counting direction	Yes		Yes	
PRESET	Yes		Yes	
Protection class	IP65		IP65	

## ORDER CODES



## INDUCTIVE ANGLE MEASUREMENT SYSTEM

The F130 is an absolute 360° angle sensor with 4 mA to 20 mA current output and two definable switching points. The zero point and switching points can be programmed using the TEACH-IN BUTTON and LED support. Typical areas of application in process technology include the determining of angle positions or angle settings (open/closed valve setting). In the area of factory automation, the F130 is used as an electronic cam switching unit or for similar positioning tasks.



PMI360-F130-IE8-V15	
Measurement range	0° ... 360°
Resolution	0,4°
Repeatability	0,5°
Temperature drift	1.5° (-25°C to 70°C)
Linearity error	≤ 1,2°
Internal diameter	41.5 mm
Output type	Analog output 4 mA to 20 mA Zero point + 2 switching points adjustable

# ABSOLUTE ROTARY ENCODERS

CANopen DeviceNet™



	CSS58	CSM58	DSS58	DSM58	PSS58	PSM58
Single-turn resolution	65.536	65.536	65.536	65.536	65.536	65.536
Multi-turn resolution	1	16.384	1	16.384	1	16.384
Housing diameter [mm]	ø58		ø58		ø58	
Flange type	-		-		-	
Flange Diameter [mm]	-		-		-	
Solid shaft [mm]	-		-		-	
Hollow shaft [mm]	-		-		-	
Recessed hollow shaft [mm]	ø10, ø12, ø15		ø10, ø12, ø15		ø10, ø12, ø15	
Maximum rpm [rpm]	12.000		12.000		12.000	
Max. shaft load, axial [N]	-		-		-	
Max. shaft load, radial [N]	-		-		-	
Operating voltage [V DC]	10 ... 30		10 ... 30		10 ... 30	
Interfaces	CANopen		DeviceNet		PROFIBUS	
Output type	DSP406, Class 1 and 2		-		RS485	
Selection of counting direction	Yes		Yes		Yes	
LATCH	-		-		-	
TRISTATE	-		-		-	
PRESET 1	Yes		Yes		Yes	
PRESET 2	-		-		-	
Protection class	IP65		IP65		IP65	

## ORDER CODES

. S S 5 8 . - . . . . R O B N - 0 0 . .

### Interface

C CAN-Bus)  
D DeviceNet  
P PROFIBUS

### Connection type

AG detachable housing cover with terminal compartment  
AN detachable housing cover with 1 x M12 plug connector

### Number of single-turn bits

12 4096  
13 8192  
16 65536

### Housing material

N Aluminum, powder-coated  
I Inox

### Shaft dimension/Flange version

F1A Recessed hollow shaft ø10 mm x 30 mm  
F2A Recessed hollow shaft ø12 mm x 30 mm  
F3A Recessed hollow shaft ø15 mm x 30 mm

. S M 5 8 . - . . . . R O B N - . . . .

### Interface

C CAN-Bus)  
D DeviceNet  
P PROFIBUS

### Number of multi-turn bits

12 4096 (standard)  
13 8192  
14 16384

### Number of single-turn bits

12 4096  
13 8192  
16 65536

### Housing material

N Aluminum, powder-coated  
I Inox

### Connection type

AG detachable housing cover with terminal compartment  
AN detachable housing cover with 1 x M12 plug connector

### Shaft dimension/Flange version

F1A Recessed hollow shaft ø10 mm x 30 mm  
F2A Recessed hollow shaft ø12 mm x 30 mm  
F3A Recessed hollow shaft ø15 mm x 30 mm

# ABSOLUTE ROTARY ENCODERS

CANopen DeviceNet™



	CVS58	CVM58	DVS58	DVM58	PVS58	PVM58
Single-turn resolution	65.536	65.536	65.536	65.536	65.536	65.536
Multi-turn resolution	1	16.384	1	16.384	1	16.384
Housing diameter [mm]	ø58		ø58		ø58	
Flange type	Clamping flange, servo flange		Clamping flange, servo flange		Clamping flange, servo flange	
Flange Diameter [mm]	ø36, ø50		ø36, ø50		ø36, ø50	
Solid shaft [mm]	ø6, ø10		ø6, ø10		ø6, ø10	
Hollow shaft [mm]	-		-		-	
Recessed hollow shaft [mm]	-		-		-	
Maximum rpm [rpm]	12.000		12.000		12.000	
Max. shaft load, axial [N]	40		40		40	
Max. shaft load, radial [N]	110		110		110	
Operating voltage [V DC]	10 ... 30		10 ... 30		10 ... 30	
Interfaces	CANopen		DeviceNet		PROFIBUS	
Output type	DSP406, Class 1 and 2		-		RS485	
Selection of counting direction	Yes		Yes		Yes	
LATCH	-		-		-	
TRISTATE	-		-		-	
PRESET 1	Yes		Yes		Yes	
PRESET 2	-		-		-	
Protection class	IP65		IP65		IP65	

## ORDER CODES

**. V S 5 8 . - . . . . R O B N - 0 0 . . .**

**Interface**  
**C** CAN-Bus)  
**D** DeviceNet  
**P** PROFIBUS

**Connection type**  
**AG** detachable housing cover with terminal compartment  
**AN** detachable housing cover with 1 x M12 plug connector

**Number of single-turn bits**  
**12** 4096  
**13** 8192  
**16** 65536

**Housing material**  
**N** Aluminum, powder-coated  
**I** Inox

**Shaft dimension/Flange version**  
**011** Shaft ø10 mm x 20 mm with clamping flange  
**032** Shaft ø6 mm x 10 mm with servo flange

**. V M 5 8 . - . . . . R O B N - . . . .**

**Interface**  
**C** CAN-Bus)  
**D** DeviceNet  
**P** PROFIBUS

**Connection type**  
**AG** detachable housing cover with terminal compartment  
**AN** detachable housing cover with 1 x M12 plug connector

**Number of multi-turn bits**  
**12** 4096  
**14** 16384

**Number of single-turn bits**  
**12** 4096  
**13** 8192  
**16** 65536

**Housing material**  
**N** Aluminum, powder-coated  
**I** Inox

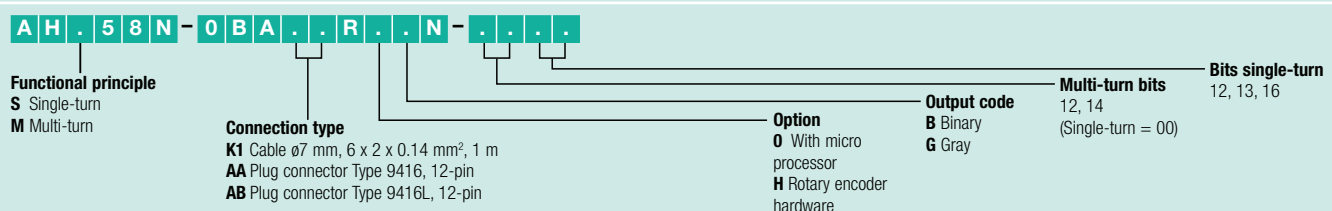
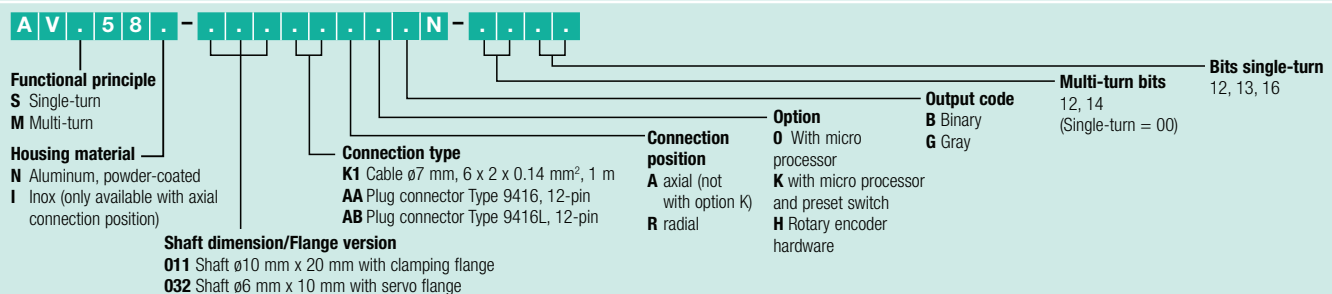
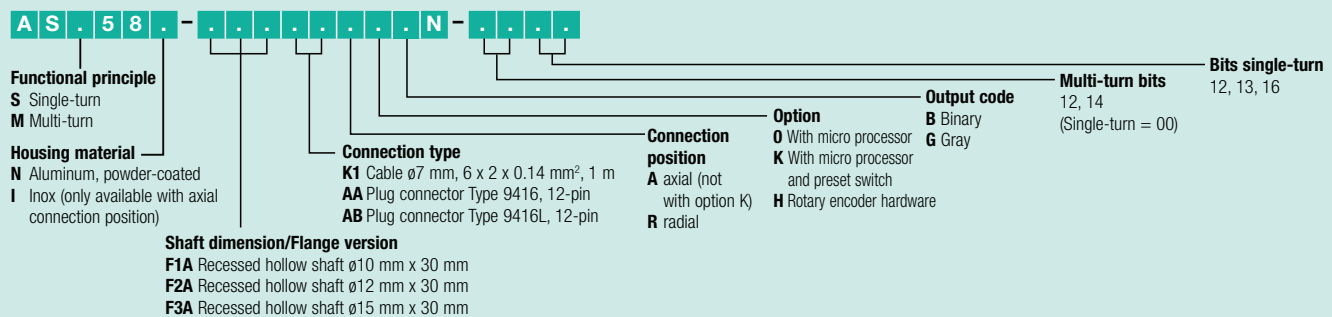
**Shaft dimension/Flange version**  
**011** Shaft ø10 mm x 20 mm with clamping flange  
**032** Shaft ø6 mm x 10 mm with servo flange

# ABSOLUTE ROTARY ENCODERS



	ASS58	ASM58	AVS58	AVM58	AHS58	AHM58
Single-turn resolution	65.536	65.536	65.536	65.536	65.536	65.536
Multi-turn resolution	1	16.384	1	16.384	1	16.384
Housing diameter [mm]	ø58		ø58		ø58	
Flange type	-		Clamping flange, servo flange		-	
Flange Diameter [mm]	-		ø36, ø50		-	
Solid shaft [mm]	-		ø6, ø10		-	
Hollow shaft [mm]	-		-		ø12	
Recessed hollow shaft [mm]	ø10, ø12, ø15		-		-	
Maximum rpm [rpm]	12.000		12.000		3.000	
Max. shaft load, axial [N]	-		40		-	
Max. shaft load, radial [N]	-		110		-	
Operating voltage [V DC]	10 ... 30		10 ... 30		10 ... 30	
Interfaces	SSI		SSI		SSI	
Output type	RS422		RS422		RS422	
Selection of counting direction	Yes		Yes		Yes	
LATCH	-		-		-	
TRISTATE	-		-		-	
PRESET 1	Yes		Yes		-	
PRESET 2	-		-		-	
Protection class	IP65		IP65		IP64	

## ORDER CODES





# ABSOLUTE ROTARY ENCODERS



	BSS58	BSM58	BVS58	BVM58
Single-turn resolution	8.192	8.192	8.192	8.192
Multi-turn resolution	1	4.096	1	4.096
Housing diameter [mm]	ø58		ø58	
Flange type	-		Clamping flange, servo flange	
Flange Diameter [mm]	-		ø36, ø50	
Solid shaft [mm]	-		ø6, ø10	
Hollow shaft [mm]	-		-	
Recessed hollow shaft [mm]	ø10, ø12		-	
Maximum rpm [rpm]	10.000	6.000	12.000	6.000
Max. shaft load, axial [N]	-		40	
Max. shaft load, radial [N]	-		60	
Operating voltage [V DC]	29,5 ... 31,6		29,5 ... 31,6	
Interfaces	AS-Interface		AS-Interface	
Output type	-		-	
Selection of counting direction	Yes		Yes	
LATCH	Yes		Yes	
TRISTATE	-		-	
PRESET 1	Yes		Yes	
PRESET 2	-		-	
Protection class	IP65		IP65	

## ORDER CODES

**B S S 5 8 . - . . . A V R O N N - 0 0 1 3**

### Housing material

**N** Aluminum, powder-coated  
**I** Inox

### Shaft dimension/Flange version

**01A** Recessed hollow shaft ø10 mm x 21 mm  
**02A** Recessed hollow shaft ø12 mm x 21 mm

**B S M 5 8 . - . . . A V R O N N - . . . .**

### Housing material

**N** Aluminum, powder-coated  
**I** Inox

### Shaft dimension/Flange version

**01A** Recessed hollow shaft ø10 mm x 21 mm  
**02A** Recessed hollow shaft ø12 mm x 21 mm

**Resolution**  
**Multi-turn/Single-turn**  
(see data sheet)

**B V S 5 8 . - . . . A V R O N N - 0 0 1 3**

### Housing material

**N** Aluminum, powder-coated  
**I** Inox

### Shaft dimension/Flange version

**011** Shaft ø10 mm x 20 mm with clamping flange  
**032** Shaft ø6 mm x 10 mm with servo flange

**B V M 5 8 . - . . . A V R O N N - . . . .**

### Housing material

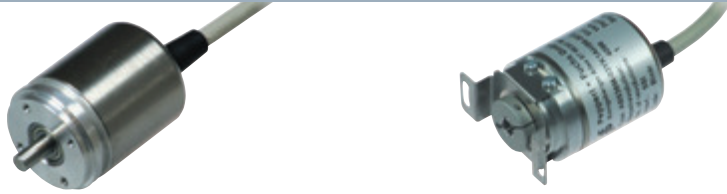
**N** Aluminum, powder-coated  
**I** Inox

### Shaft dimension/Flange version

**011** Shaft ø10 mm x 20 mm with clamping flange  
**032** Shaft ø6 mm x 10 mm with servo flange

**Resolution**  
**Multi-turn/Single-turn**  
(see data sheet)

# MAGNETIC ABSOLUTE ROTARY ENCODERS



	AVS36M	AVS36M	ASS36M	ASS36M
Single-turn resolution	8.192	8.192	8.192	8.192
Multi-turn resolution	1	4.096	1	4.096
Housing diameter [mm]	ø36		ø36	
Flange type	Servo flange		Recessed hollow shaft	
Flange Diameter [mm]	ø33		-	
Solid shaft [mm]	ø6		-	
Recessed hollow shaft [mm]	-		ø6	
Maximum rpm [rpm]	12.000		12.000	
Max. shaft load, axial [N]	40		-	
Max. shaft load, radial [N]	60		-	
Operating voltage [V DC]	10 ... 30		10 ... 30	
Interfaces	SSI		SSI	
Output type	RS422		RS422	
Selection of counting direction	Yes		Yes	
LATCH	-		-	
TRISTATE	-		-	
PRESET 1	Yes		Yes	
PRESET 2	-		-	
Protection class	IP67		IP67	
Vibration resistance	30 g		30 g	

## ORDER CODES

**A V S 3 6 M - 0 3 S . . A 0 . N - 0 0 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BE** Device connector, M12 x 1, 8-pin

### Output code

**B** Binary  
**G** Gray

### Number of single-turn bits

**12** 4096  
**13** 8192 (max.)

**A V M 3 6 M - 0 3 S . . A 0 . N - 1 2 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BE** Device connector, M12 x 1, 8-pin

### Output code

**B** Binary  
**G** Gray

### Number of single-turn bits

**12** 4096  
**13** 8192 (max.)

**A S S 3 6 M - F 4 A . . A 0 . N - 0 0 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BE** Device connector, M12 x 1, 8-pin

### Output code

**B** Binary  
**G** Gray

### Number of single-turn bits

**12** 4096  
**13** 8192 (max.)

**A S M 3 6 M - F 4 A . . A 0 . N - 1 2 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BE** Device connector, M12 x 1, 8-pin

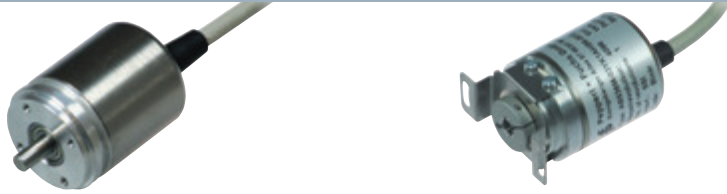
### Output code

**B** Binary  
**G** Gray

### Number of single-turn bits

**12** 4096  
**13** 8192 (max.)

# CANopen



	CVS36M	CVM36M	CSS36M	CSM36M
Single-turn resolution	8.192	8.192	8.192	8.192
Multi-turn resolution	1	4.096	1	4.096
Housing diameter [mm]	ø36		ø36	
Flange type	Servo flange		Recessed hollow shaft	
Flange Diameter [mm]	ø33		–	
Solid shaft [mm]	ø6		–	
Recessed hollow shaft [mm]	–		ø6	
Maximum rpm [rpm]	12.000		12.000	
Max. shaft load, axial [N]	40		–	
Max. shaft load, radial [N]	60		–	
Operating voltage [V DC]	10 ... 30		10 ... 30	
Interfaces	CANopen		CANopen	
Output type	DSP406, Class 1 and 2		DSP406, Class 1 and 2	
Selection of counting direction	Yes		Yes	
LATCH	–		–	
TRISTATE	–		–	
PRESET 1	Yes		Yes	
PRESET 2	–		–	
Protection class	IP67		IP67	
Vibration resistance	30 g		30 g	

## ORDER CODES

**C V S 3 6 M - 0 3 S . . A 0 . N - 0 0 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BD** Device connector, M12 x 1, 5-pin

### Output code

**B** Binary

**Number of single-turn bits**  
**12** 4096  
**13** 8192 (max.)

**C V M 3 6 M - 0 3 S . . A 0 . N - 1 2 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BD** Device connector, M12 x 1, 5-pin

### Output code

**B** Binary

**Number of single-turn bits**  
**12** 4096  
**13** 8192 (max.)

**C S S 3 6 M - F 4 A . . A 0 . N - 0 0 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BD** Device connector, M12 x 1, 5-pin

### Output code

**B** Binary

**Number of single-turn bits**  
**12** 4096  
**13** 8192 (max.)

**C S M 3 6 M - F 4 A . . A 0 . N - 1 2 . .**

### Connection type

**K1** Cable ø6 mm, 4 x 2 x 0.14 mm<sup>2</sup>, 1 m  
**BD** Device connector, M12 x 1, 5-pin

### Output code

**B** Binary

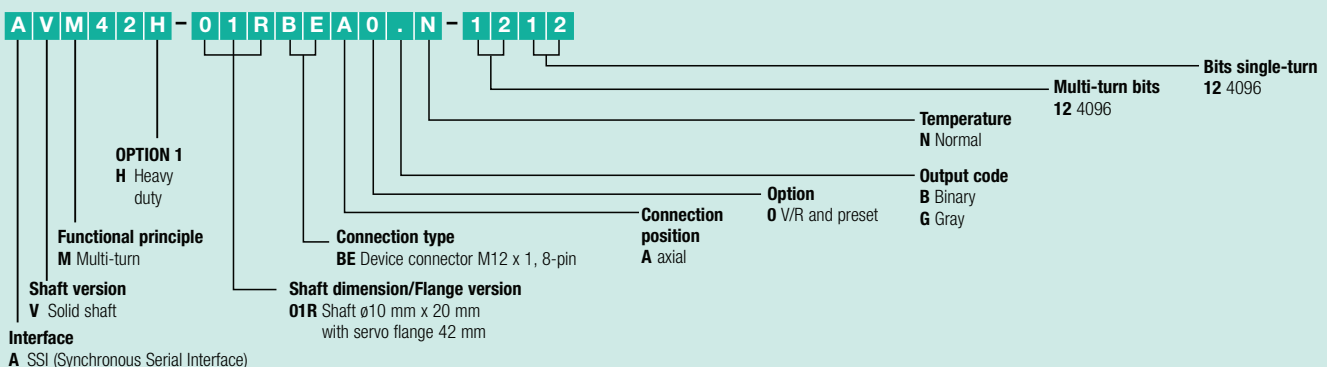
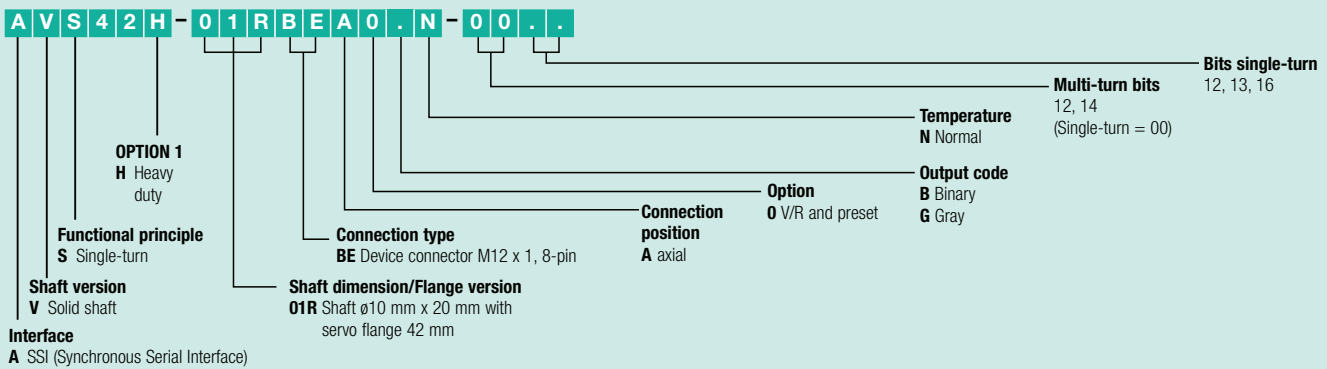
**Number of single-turn bits**  
**12** 4096  
**13** 8192 (max.)

# MAGNETIC ABSOLUTE ROTARY ENCODERS – HEAVY DUTY



	AVS42H	AVM42H
Single-turn resolution	8.192	8.192
Multi-turn resolution	–	4.096
Housing diameter [mm]	ø42	
Flange type	Servo flange	
Flange Diameter [mm]	–	
Solid shaft [mm]	10 x 21	
Hollow shaft [mm]	–	
Maximum rpm [rpm]	6.000	
Max. shaft load, axial [N]	270	
Max. shaft load, radial [N]	270	
Operating voltage [V DC]	10 ... 30	
Interfaces	SSI	
Output type	RS422	
Selection of counting direction	Yes	
LATCH	–	
TRISTATE	–	
PRESET 1	Yes	
PRESET 2	–	
Protection class	IP66 / IP68 / IP69K	
Vibration resistance	30 g	

## ORDER CODES

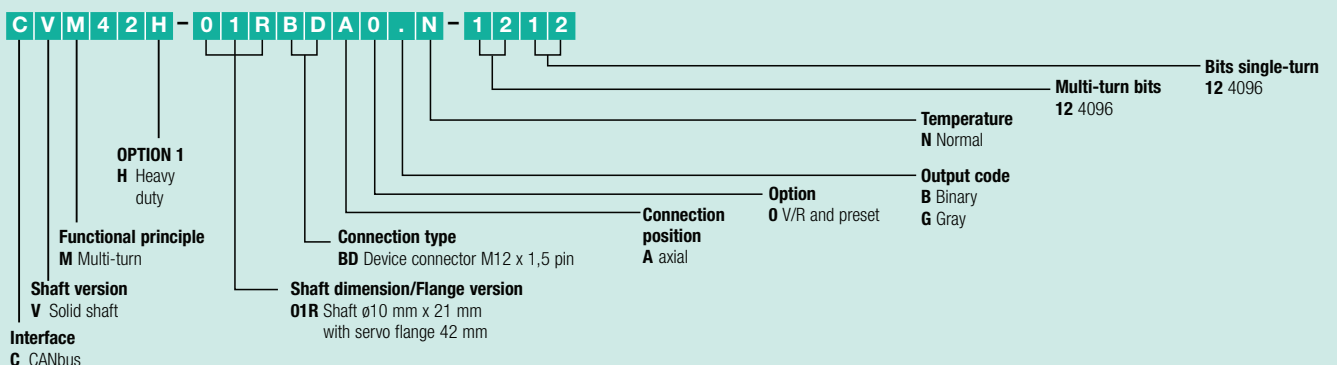
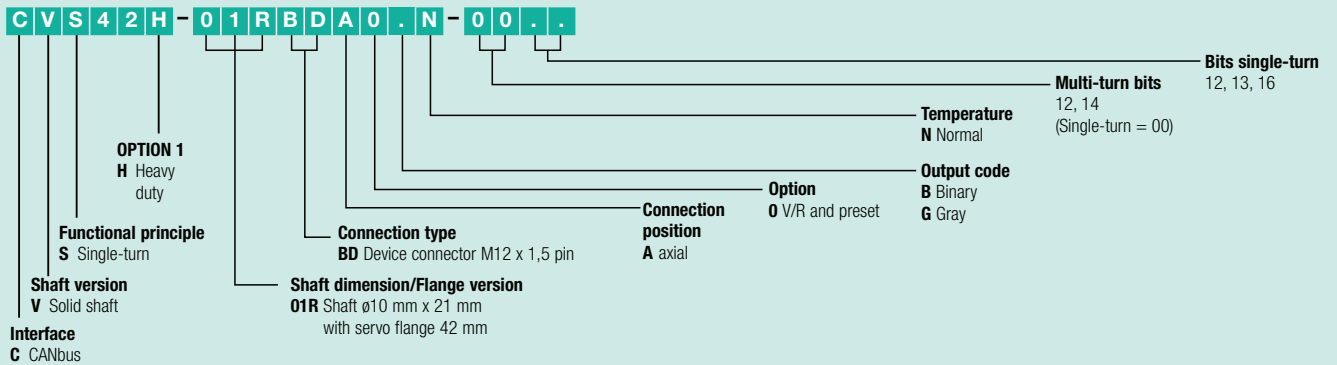


# CANopen



	CVS42H	CVM42H
Single-turn resolution	4.096	4.096
Multi-turn resolution	–	4.096
Housing diameter [mm]	ø42	
Flange type	Servo flange	
Flange Diameter [mm]	–	
Solid shaft [mm]	10 x 21	
Hollow shaft [mm]	–	
Maximum rpm [rpm]	6.000	
Max. shaft load, axial [N]	270	
Max. shaft load, radial [N]	270	
Operating voltage [V DC]	10 ... 30	
Interfaces	CANopen	
Output type	RS485	
Selection of counting direction	Yes	
LATCH	–	
TRISTATE	–	
PRESET 1	Yes	
PRESET 2	Yes	
Protection class	IP66 / IP68 / IP69K	
Vibration resistance	30 g	

## ORDER CODES



**SIL**  
IEC61508



Plant manufacturers, system integrators and component manufacturers are faced with ever-higher standards of functional safety due to an increase in the level of automation in machine and plant engineering. Some of the more common requirements include improvements in the functionality of conventional control systems and the capacity to meet high standards of functional safety offered by modern drive controllers. Reliable rotary encoders with a high level of functional safety have adopted a whole new meaning.

In response to these needs, Pepperl+Fuchs has developed a range of certified rotary encoders that incorporate innovative concepts to enable economical system integration. New ideas make the system easier to use with existing communication channels and allow it to be used in high safety category systems up to SIL3 (according to IEC 61508).



Versions up to 115°C  
available on request

## APPLICATIONS

- Drive technology
- Stage equipment
- Suspended rails
- Conveyor systems
- Lifting / Elevator technology
- Machine / Plant construction
- Automation technology
- Vehicle manufacture
- Wind power plants
- General applications:  
Systems that fall within the application scope of Machinery Directive 2006/42/EC.



## MAIN FEATURES

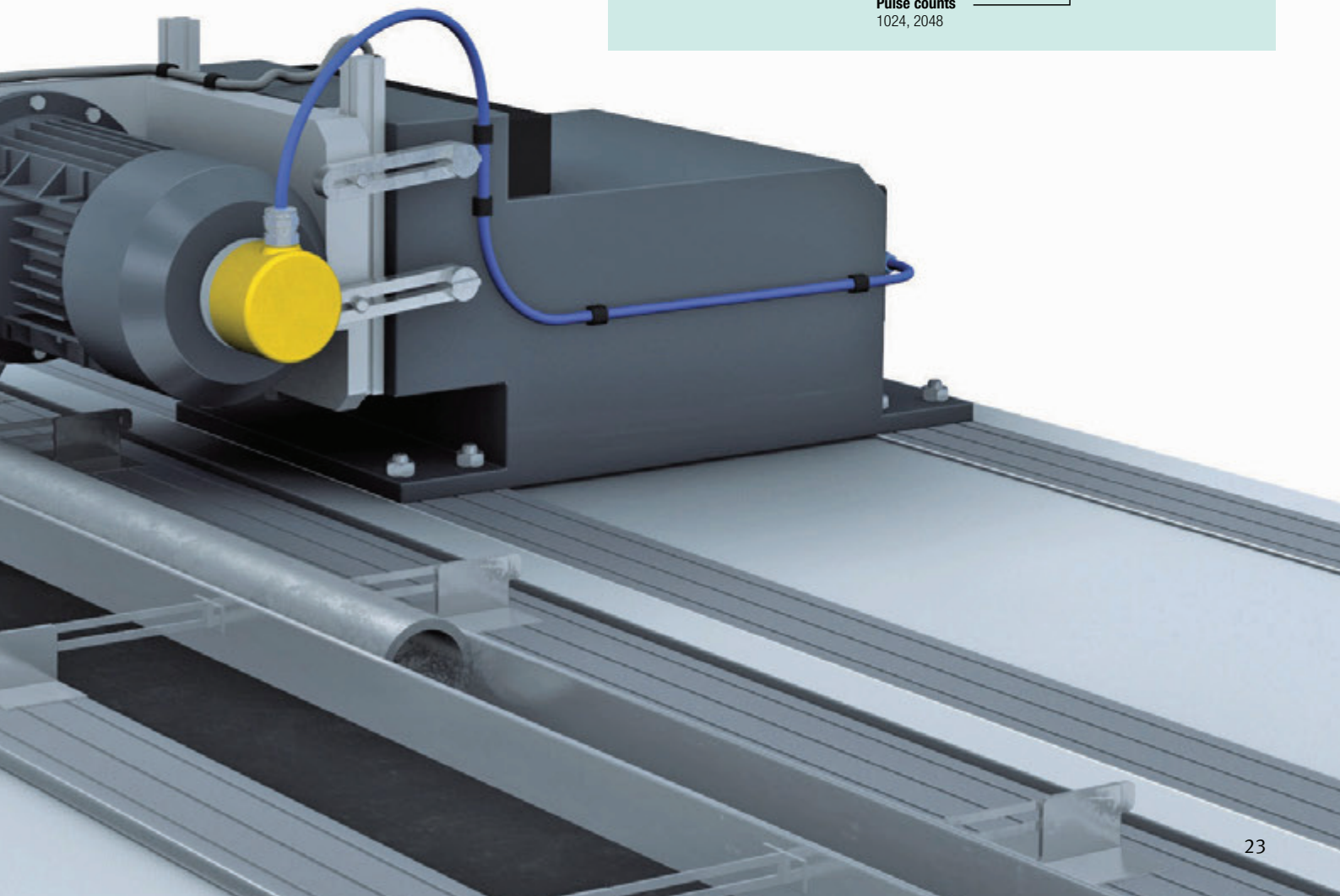
- Certified functional safety
- The use of existing communication channels enables simple integration
- Incremental/absolute rotary encoder technology
- Reliability and simple installation provide an economical solution
- For systems up to SIL3 according to IEC 61508
- Performance Level e according to ISO 13849
- Safety category 4 according to EN 954-1
- For electrical drives as per IEC 61800-5-2

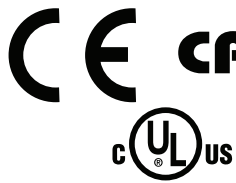
		RVS58S
Pulse counts		up to 2048
Housing diameter	[mm]	ø58
Flange type		Servo flange
Flange Diameter	[mm]	ø50
Solid shaft	[mm]	ø6
Maximum rpm	[rpm]	12.000
Max. shaft load, axial	[N]	40
Max. shaft load, radial	[N]	60
Operating voltage	[V DC]	5
Output type		Sine/Cosine
Max. output frequency	[kHz]	200
Signal outputs		A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class		IP65

## ORDER CODES

R V S 5 8 S - 0 3 2 K 1 R 6 Z N - . . . . .

Pulse counts  
1024, 2048





**SIL**  
IEC61508



	CVS58S	CVM58S
Single-turn resolution	65.536	65.536
Multi-turn resolution	1	16.384
Housing diameter [mm]	ø58	
Flange type	Clamping flange, servo flange	
Flange Diameter [mm]	ø36, ø50	
Solid shaft [mm]	ø6, ø10	
Hollow shaft [mm]	-	
Recessed hollow shaft [mm]	-	
Maximum rpm [rpm]	12.000	
Max. shaft load, axial [N]	40	
Max. shaft load, radial [N]	110	
Operating voltage [V DC]	10 ... 30	
Interfaces	CANopen	
Output type	DSP406/301/304, Class 1 and 2	
Selection of counting direction	Yes	
LATCH	-	
TRISTATE	-	
PRESET 1	Yes	
PRESET 2	-	
Protection class	IP65	

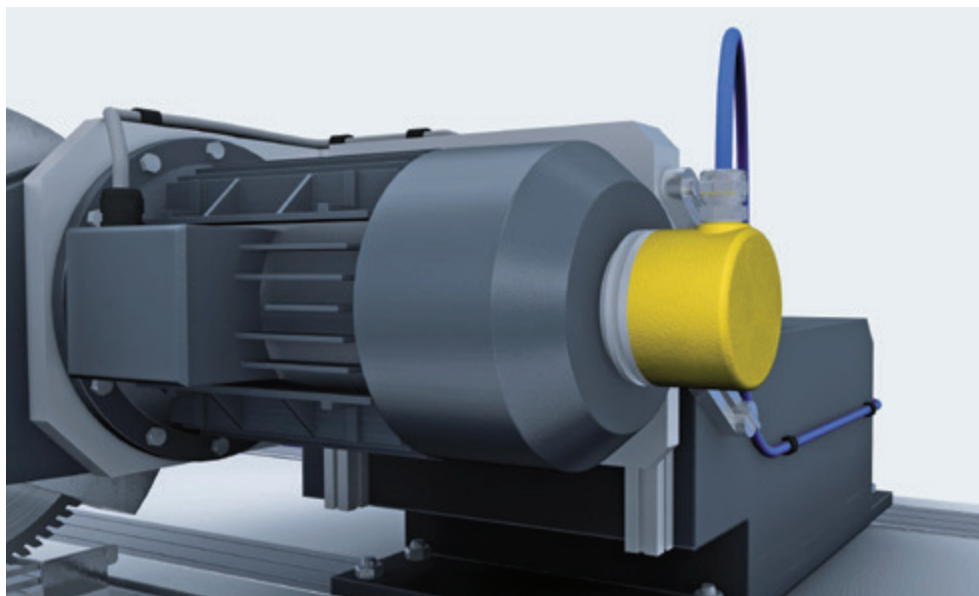
## ORDER CODES

**C V . 5 8 S - 0 1 1 A G R 0 B N - . . . .**

**Functional principle**  
**S** Single-turn  
**M** Multi-turn

**Number of multi-turn bits**  
**12** 4096  
**14** 16384  
 (Single-turn = 00)

**Number of single-turn bits**  
**12** 4096  
**13** 8192  
**16** 65536





## SAFE SPEED MONITOR

The safe speed monitor fulfills all safety requirements up to SIL 3 / PL e.

The system has a modular design and the simplest version consists of a compact safety controller, a rotational speed monitor module and a safe sine/cosine rotary encoder. The functions “safe stop“, “safe speed“ and “safe direction of rotation“ are available via two safe outputs to monitor the drive shaft(s). The monitor for a second axis is integrated in the basic device. The speed monitor is also equipped with four safe inputs and can be extended with up to 40 rotational axes.

## APPLICATIONS

- Drive technology
- Stock feeders
- Rides
- Conveyor systems
- Lifting / Elevator technology
- Packaging technology
- Handling technology (robotics)
- Wind power plants
- Machine / Plant construction

## MAIN FEATURES

- Certified functional safety including safety rotary encoder
- Slimline complete solution for all safety categories with only one rotary encoder per rotational axis
- Monitoring stoppages, speed, and direction of rotation for two axes and additional safe input/ outputs
- Integrated power supply for the rotary encoder
- Simplest modular adaptation/upgrade with additional rotation speed monitors based on the number of axes
- Simple safety retrofit for existing machines
- Simplest component replacement without reconfiguration using chip card



Safe speed monitor

Input type	Rotary encoder: optical scanning
Pulse count	Rotary encoder: 1024
Housing diameter [mm]	Rotary encoder ø58 Safe speed monitor 45 mm width for DIN mounting rail assembly
Operating voltage [V DC]	24 ± 20 %
Interfaces	Chip card slot, micro USB
Input	2 inputs for incremental rotary encoders via mini IO connector; 4 additional safe inputs for external safety sensor
Output	Output 1 and 2:
Ambient temperature [°C]	Modules: 0 ... 55 Rotary encoder: -20 ... +80
Protection class	Modules: IP20 / rotary encoder: IP65
Connection	Removable clamps
Rotational speed [rpm]	Rotary encoder: max. 12,000
Shaft load	Rotary encoder: Axial 40 N at max. 6000 rpm 10 N at max. 12,000 rpm Radial 60 N at max. 6000 rpm 20 N at max. 12,000 rpm

## ORDER CODES

Article number	Designation
<b>235505</b>	Safe speed monitor
<b>239050</b>	Rotary encoder with 1.5 m cable+mini I/O plug
<b>239557</b>	Bundle 1: Safe speed monitor and safety rotary encoder
<b>239560</b>	Bundle 2: Safe speed monitor, safety rotary encoder and software



# ROTARY ENCODERS IN EXPLOSIVE AREAS

The Pepperl+Fuchs range includes rotary encoders with two different ignition protection classes. A distinction is made between “Flameproof enclosure” ignition protection class (Ex d) and “Intrinsic safety” class (Ex i) and the use in Zone 2/Zone 22.

## IGNITION PROTECTION CLASS EX D

Devices with ignition protection class Ex d are designed so that their housings will not be damaged in the event of the internal explosion of an explosive mixture, thereby preventing the explosion from being transferred to the surrounding explosive atmosphere. The following devices are available:

- **Incremental rotary encoder:**  
Series 14 with counter timer and RS422 interface
- **Absolute rotary encoders:**  
available with CANopen, DeviceNet, SSI, and PROFIBUS interface

## ZONE 2/ZONE 22

In addition to ignition protection classes Ex d and i, Pepperl+Fuchs now also supplies rotary encoders for use in Zone 2/Zone 22 based on ignition protection classes nA and tD.

- **Absolute rotary encoders:**  
Series PVS/PVM58X and PSS/PSM58X with PROFIBUS interface
- **Incremental rotary encoder:**  
Series RVI58X and RSI58X

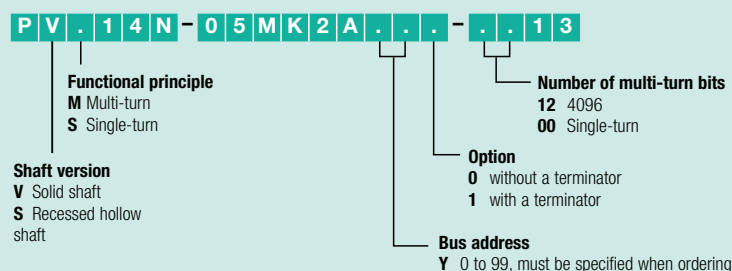
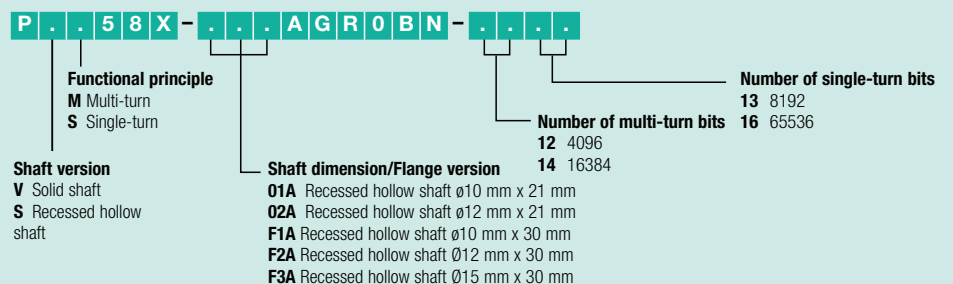


## ABSOLUTE ROTARY ENCODERS



	PSS58X · PSM58X · PVS58X · PVM58X	PVS14	PVM14
Explosion-proof labeling	<ul style="list-style-type: none"> <li>II 3G Ex nA IIB T4</li> <li>II 3D Ex tD A22 IP64 T120°C</li> </ul>	<ul style="list-style-type: none"> <li>II 2G Ex d IIC T6</li> <li>II 2D Ex tD A21 IP66 T80°C</li> </ul>	<ul style="list-style-type: none"> <li>II 2G Ex d IIC T6</li> <li>II 2D Ex tD A21 IP66 T80°C</li> </ul>
EC-type-examination certificate	ZELM 06 ATEX 3290 X	ZELM 02 ATEX 0078	ZELM 02 ATEX 0078
Single-turn resolution	65.536	8.192	8.192
Multi-turn resolution	16.384	1	4.096
Housing diameter [mm]	ø58	ø116	
Flange type	Clamping flange, servo flange		
Flange Diameter [mm]	ø36	ø40	
Solid shaft [mm]	ø10, ø6	ø12	
Hollow shaft [mm]	ø10, ø12, ø15	-	
Recessed hollow shaft [mm]	-	-	
Maximum rpm	6.000	6.000	
Max. shaft load, axial [N]	40	60	
Max. shaft load, radial [N]	110	80	
Operating voltage [V DC]	10 ... 30	10 ... 30	
Interfaces	PROFIBUS		
Output type	-		
Selection of counting direction	-		
LATCH	-		
TRISTATE	-		
PRESET 1	-		
PRESET 2	-		
Protection class	IP64	IP66	

## ORDER CODES



# ROTARY ENCODERS IN EXPLOSIVE AREAS

## ABSOLUTE ROTARY ENCODERS



	AVS14	AVM14	CVM14	DVM14
Explosion-proof labeling	II 2G Ex d IIC T6 II 2D Ex tD A21 IP66 T80°C		II 2G Ex d IIC T6 II 2D Ex tD A21 IP66 T80°C	II 2G Ex d IIC T6 II 2D Ex tD A21 IP66 T80°C
EC-type-examination certificate	ZELM 02 ATEX 0078 X		ZELM 02 ATEX 0078	ZELM 02 ATEX 0078
Single-turn resolution	4.096	4.096	8.192	8.192
Multi-turn resolution	1	4.096	4.096	4.096
Housing diameter [mm]	ø116		ø116	ø116
Flange type	Clamping flange		Clamping flange	Clamping flange
Flange Diameter [mm]	ø40		ø40	ø40
Solid shaft [mm]	ø12		ø12	ø12
Hollow shaft [mm]	-		-	-
Recessed hollow shaft [mm]	-		-	-
Maximum rpm [rpm]	6.000		6.000	3.000
Max. shaft load, axial [N]	60		60	60
Max. shaft load, radial [N]	80		80	80
Operating voltage [V DC]	10 ... 30		10 ... 30	10 ... 30
Interfaces	SSI		CANopen	DeviceNet
Output type	RS422		DSP406, Class 1 and 2	-
Selection of counting direction	Yes		-	-
LATCH	-		-	-
TRISTATE	-		-	-
PRESET 1	-		-	-
PRESET 2	-		-	-
Protection class	IP66		IP66	IP66

### ORDER CODES

**A V S 1 4 N - 0 5 M K 2 A 0 . N - 0 0 1 2**

Output code  
**B** Binary  
**14** Gray

**A V M 1 4 N - 0 5 M K 2 A 0 . N - 0 0 1 2**

Output code  
**B** Binary  
**14** Gray

**C V M 1 4 N - 0 5 M K 2 A P R . - 0 0 1 2**

Option  
**0** without terminator

**D V M 1 4 N - 0 5 M K 2 A P R . - 0 0 1 2**

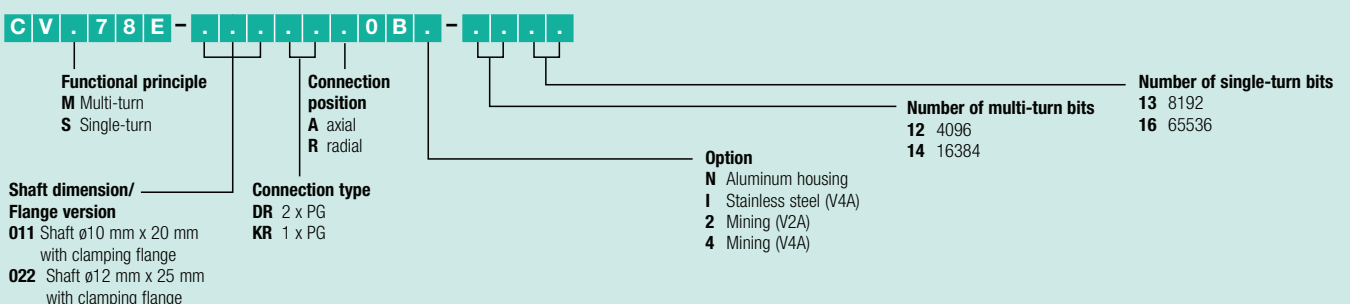
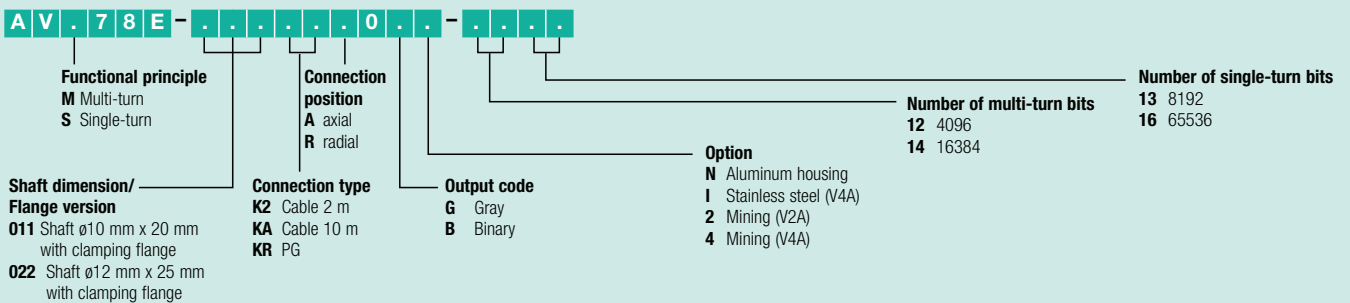
Option  
**0** without terminator

## ABSOLUTE ROTARY ENCODERS



	AVS78E	AVM78E	CVS78E	CVM78E
Explosion-proof labeling	II 2G Ex d IIC T5 Gb II 2D Ex tb IIIC T100°C Db IP6X		II 2G Ex d IIC T5 Gb II 2D Ex tb IIIC T100°C Db IP6X	
Explosion-proof labeling - mining	I M2 Ex db I/IIC T5		I M2 Ex db I/IIC T5	
EC-type-examination certificate	TÜV 11 ATEX 084272X IECEX TUN 11.0017X		TÜV 11 ATEX 084272X IECEX TUN 11.0017X	
EC-type-examination certificate Mining	TÜV 11 ATEX 086158 X IECEX TUN 11.0020 X		TÜV 11 ATEX 086158 X IECEX TUN 11.0020 X	
Single-turn resolution	8.192/65.536	8.192/65.536	8.192/65.536	8.192/65.536
Multi-turn resolution	1	4.096/16.384	1	4.096/16.384
Housing diameter [mm]	ø78		ø78	
Flange type	Clamping flange, servo flange		Clamping flange, servo flange	
Flange Diameter [mm]	ø36		ø36	
Removable bus cover	Yes		Yes	
Solid shaft [mm]	ø10, ø12		ø10, ø12	
Maximum rpm [rpm]	3.000		3.000	
Max. shaft load, axial [N]	60		60	
Max. shaft load, radial [N]	80		80	
Operating voltage [V DC]	10 ... 30		10 ... 30	
Interfaces	SSI		CANopen	
Output type	RS422		RS485	
Selection of counting direction	Yes		Yes	
Resolution scaling	-		Yes	
Velocity output	-		Yes	
PRESET	-		Yes	
Housing material	Aluminum, stainless steel		Aluminum, stainless steel	
Protection class	IP66		IP66	

### ORDER CODES



# ROTARY ENCODERS IN EXPLOSIVE AREAS

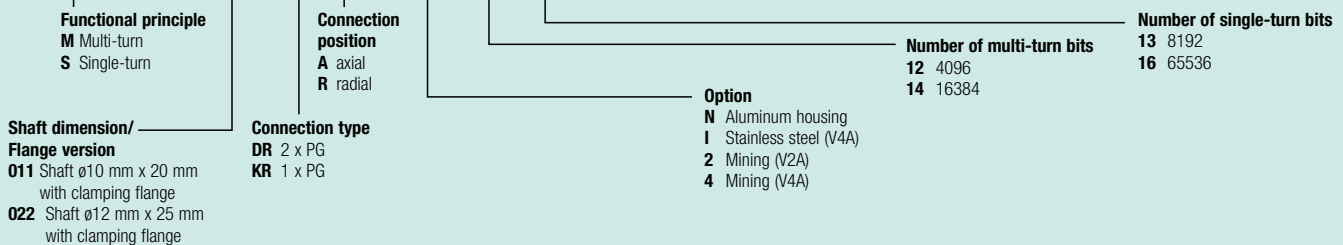
## ABSOLUTE ROTARY ENCODERS



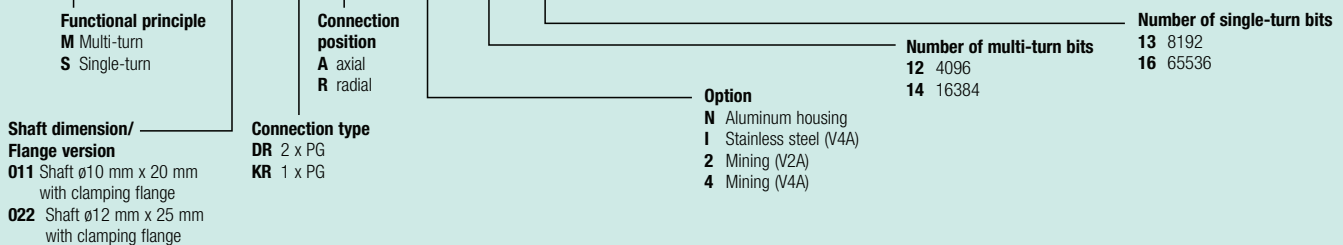
	DVS78E	DVM78E	PVS78E	PVM78E
Explosion-proof labeling	II 2G Ex d IIC T5 Gb II 2D Ex tb IIIC T100°C Db IP6X		II 2G Ex d IIC T5 Gb II 2D Ex tb IIIC T100°C Db IP6X	
Explosion-proof labeling - mining	I M2 Ex db I/IIC T5		I M2 Ex db I/IIC T5	
EC-type-examination certificate	TÜV 11 ATEX 084272X IECEX TUN 11.0017X		TÜV 11 ATEX 084272X IECEX TUN 11.0017X	
EC-type-examination certificate - mining	TÜV 11 ATEX 086158 X IECEX TUN 11.0020 X		TÜV 11 ATEX 086158 X IECEX TUN 11.0020 X	
Single-turn resolution Multi-turn resolution	8.192/65.536 1	8.192/65.536 4.096/16.384	8.192/65.536 1	8.192/65.536 4.096/16.384
Housing diameter [mm]	ø78		ø78	
Flange type	Clamping flange, servo flange		Clamping flange, servo flange	
Flange Diameter [mm]	ø36		ø36	
Removable bus cover	Yes		Yes	
Solid shaft [mm]	ø10, ø12		ø10, ø12	
Maximum rpm [rpm]	3.000		3.000	
Max. shaft load, axial [N]	60		60	
Max. shaft load, radial [N]	80		80	
Operating voltage [V DC]	10 ... 30		10 ... 30	
Interfaces	DeviceNet		PROFIBUS	
Output type	RS485		RS485	
Selection of counting direction	Yes		Yes	
Resolution scaling	Yes		Yes	
Velocity output	-		Yes	
PRESET	-		Yes	
Housing material	Aluminum, stainless steel		Aluminum, stainless steel	
Protection class	IP66		IP66	

## ORDER CODES

**D V . 7 8 E - . . . . . 0 B . . . . .**



**P V . 7 8 E - . . . . . 0 B . . . . .**



## INCREMENTAL ROTARY ENCODERS



	SERIES 14	RV158X	RS158X
Explosion-proof labeling	Ⓜ II 2G Ex d IIC T6 Ⓜ II 2D Ex tD A21 IP66 T80°C	Ⓜ II 3G Ex nA IIB T4 Ⓜ II 3D Ex tD A22 IP64 T105°C	Ⓜ II 3G Ex nA IIB T4 Ⓜ II 3D Ex tD A22 IP54 T105°C
EC-type-examination certificate	ZELM 02 ATEX 0078 X	ZELM 96 ATEX 3297 X	
Certificates			
Pulse count	≤ 5.000	≤ 5.000	
Housing diameter [mm]	∅116	∅58	
Flange type	Clamping flange	Clamping flange or servo flange	Hollow shaft flange
Flange Diameter [mm]	∅40	∅66	–
Solid shaft [mm]	∅10	∅10 or ∅6	–
Hollow shaft [mm]	–	–	–
Recessed hollow shaft [mm]	–	–	∅12 or ∅10
Maximum rpm [rpm]	6.000	6.000	6.000
Max. shaft load, axial [N]	60	40	–
Max. shaft load, radial [N]	80	60	–
Operating voltage [V DC]	5 or 10 ... 30	5 or 10 ... 30	5 or 10 ... 30
Output type	Push-pull, RS422	Push-pull, RS422	Push-pull, RS422
Max. output frequency [kHz]	100	200	200
Signal outputs	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$
Protection class	IP66	IP64	IP54

## ORDER CODES

1 4 - 1 4 3 6 . - . . . .

### Output

- 1 10 V to 30 V, counter pulse (Push-Pull)
- 6 5 V, RS422
- X 10 V to 30 V, RS422

### Pulse count

- 60, 100, 120, 180, 200, 250, 256, 300, 314, 360, 400, 500, 512, 600, 720, 900, 1000, 1024, 1200, 1250, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 5000

R V I 5 8 X - . . . K 1 . 6 . N - . . . .

### Shaft dimension/Flange version

- 011 Shaft ∅10 mm x 20 mm with clamping flange
- 032 Shaft ∅6 mm x 10 mm with servo flange

### Connection position

- A axial
- R radial

### Output

- 1 10 V to 30 V, counter pulse (Push-Pull)
- 6 5 V, RS422
- X 10 V to 30 V, RS 422

### Pulse count

- 100, 360, 500, 512, 1000, 1024, 1250, 2048, 2500, 3600, 4096, 5000

R S I 5 8 X - . . . A K 1 . 6 . N - . . . .

### Shaft dimension

- 01 Recessed hollow shaft ∅10 mm x 20 mm
- 02 Recessed hollow shaft ∅12 mm x 20 mm

### Connection position

- A axial
- R radial

### Output

- 1 10 V to 30 V, counter pulse (Push-Pull)
- 6 5 V, RS422
- X 10 V to 30 V, RS422

### Pulse count

- 100, 360, 500, 512, 1000, 1024, 1250, 2048, 2500, 3600, 4096, 5000

# ACCESSORIES

## MOUNTING ACCESSORIES

- Synchro clamping element
- Mounting bracket
- Mounting bracket for servo flange



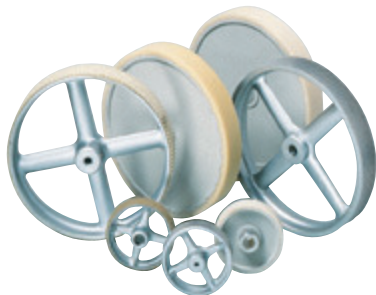
## COUPLINGS

- Spring steel coupling
- Spring disk coupling
- Bellows coupling
- Precision coupling
- Helix coupling



## MEASURING WHEELS

- Circumference 200 mm
- Circumference 500 mm
- Plastic
- Dimpled rubber
- Aluminum knurled screw
- Plastic knurled screw



## CONNECTORS

- Amphenol
- Coninvers
- SUB-D
- Souriau
- Connector



## CABLE PULLS

- 1000 mm measuring range
- 2000 mm measuring range
- 3000 mm measuring range
- 5000 mm measuring range
- 15,000 mm measuring range



## EVALUATION

- Counter



### Contact

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