

**TECHNICAL DATASHEET**

**Incremental Encoder RI 58-O / RI 58-T**



Synchro flange



Clamping flange

- Universal industry standard encoder
- Up to 40 000 steps with 10 000 pulses
- High signal accuracy
- Protection class up to IP67
- Flexible due to many flange and configuration variants
- Suitable for high shock ratings
- Applications: machine tools, CNC axles, packing machines, motors/ drives, injection moulding machines, sawing machines, textile machines
- For EX version, see RX 70-I
- Operating temperature up to 100 °C (RI 58-T)



**NUMBER OF PULSES**

RI 58-O

1 / 2 / 3 / 4 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 60 / 64 / 70 / 72 / 80 / **100** / 125 / 128 / 144 / 150 / 180 / 200 / 230 / **250** / 256 / 300 / 314 / 350 / 360 / 375 / 400 / 460 / 480 / **500** / 512 / 600 / 625 / 635 / 720 / 750 / 900 / **1000** / **1024** / 1200 / **1250** / 1500 / 1600 / 1800 / 2000 / 2048 / **2500** / 3000 / 3480 / **3600** / 3750 / 3968 / 4000 / **4096** / 4800 / **5000** / 5400 / 6000 / 7200 / 7680 / 8000 / 8192 / 9000 / 10000

Other number of pulses on request

Preferably available versions are printed in bold type.

**NUMBER OF PULSES**

RI 58-T

4 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 60 / 64 / 70 / 72 / 80 / **100** / 125 / 128 / 144 / 150 / 180 / 200 / 230 / **250** / 256 / 300 / 314 / 350 / 360 / 375 / 400 / 460 / 480 / **500** / 512 / 600 / 625 / 635 / 720 / 750 / 900 / **1000** / **1024** / 1200 / **1250** / 1500 / 1600 / 1800 / 2000 / 2048 / **2500**

Other number of pulses on request

Preferably available versions are printed in bold type.

**TECHNICAL DATA  
mechanical**

Housing diameter	58 mm
Shaft diameter	6 mm / 6.35 mm / 7 mm / 9.52 mm / 10 mm / 12 mm (Solid shaft)
Flange (Mounting of housing)	Synchro flange, Clamping flange, Square flange, Synchro clamping flange
Protection class shaft input (EN 60529)	IP64 or IP67
Protection class housing (EN 60529)	IP65 or IP67
Shaft load axial / radial	Ø 6 mm / 6,35 mm: 20 N / 40 N Ø 7 ... 10 mm: 40 N / 60 N Ø 12 mm: 60 N / 80 N
Max. speed	max. 10 000 rpm
Starting torque typ.	≤ 0.5 Ncm ≤ 1 Ncm (IP67)

**TECHNICAL DATASHEET**

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**TECHNICAL DATA  
mechanical (continued)**

Moment of inertia	approx. 14 gcm <sup>2</sup> (Synchro flange) approx. 20 gcm <sup>2</sup> (Clamping flange)
Vibration resistance (DIN EN 60068-2-6)	100 m/s <sup>2</sup> (10 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s <sup>2</sup> (6 ms)
Operating temperature	RI 58-O: -10 °C ... +70 °C RI 58-T: -25 °C ... +100 °C
Storage temperature	RI 58-O: -25 °C ... +85 °C RI 58-T: -25 °C ... +100 °C
Material housing	Aluminum
Weight	approx. 360 g
Connection	PVC cable, axial or radial M23 connector (Conin), axial or radial TPE cable, axial or radial M16 (Binder), axial or radial MS, axial oder radial

**TECHNICAL DATA  
electrical**

General design	as per DIN VDE 0160, protection class III, contamination level 2, overvoltage class II
Supply voltage <sup>1</sup>	RS422 + Sense (T): DC 5 V ±10 % RS422 + Alarm (R): ± 10% DC 5 V or DC 10 - 30 V Push-pull (K), Push-pull antivalent (I): DC 10-30 V
Current w/o load typ.	40 mA (DC 5 V), 60 mA (DC 10 V), 30 mA (DC 24 V)
Max. pulse frequency	RS422: 300 kHz Push-pull: 200 kHz
Standard output versions	RS422 + Alarm (R): A, B, N, $\bar{A}$ , $\bar{B}$ , $\bar{N}$ , $\overline{\text{Alarm}}$ RS422 + Sense (T): A, B, N, $\bar{A}$ , $\bar{B}$ , $\bar{N}$ , Sense Push-pull (K): A, B, N, $\overline{\text{Alarm}}$ Push-pull complementary (I): A, B, N, $\bar{A}$ , $\bar{B}$ , $\bar{N}$ , $\overline{\text{Alarm}}$
Pulse width error	± max. 25° electrical
Number of pulses	1 ... 10 000
Alarm output	NPN-O.C., max. 5 mA
Pulse shape	Square wave
Pulse duty factor	1:1

<sup>1</sup> Pole protection with supply voltage DC 10 - 30 V

**ELECTRICAL CONNECTIONS  
Cable PVC**

Cable PVC (A, B) Colour	Output RS422 (R, T)	push-pull (K)	push-pull complementary (I)
red	DC 5 / 10 - 30 V	DC 10 - 30 V	DC 10 - 30 V
yellow/red	Sense V <sub>cc</sub>		Sense V <sub>cc</sub>
white	Channel A	Channel A	Channel A
white/brown	Channel $\bar{A}$		Channel $\bar{A}$
green	Channel B	Channel B	Channel B
green/brown	Channel $\bar{B}$		Channel $\bar{B}$
yellow	Channel N	Channel N	Channel N
yellow/brown	Channel $\bar{N}$		Channel $\bar{N}$
black	GND	GND	GND
yellow/black	$\overline{\text{Alarm}}$ /Sense GND <sup>1</sup>	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$
screen <sup>2</sup>	screen <sup>2</sup>	screen <sup>2</sup>	screen <sup>2</sup>

<sup>1</sup> depending on ordering code

<sup>2</sup> connected with encoder housing

**TECHNICAL DATASHEET**

**Incremental Encoder RI 58-O / RI 58-T**

**ELECTRICAL CONNECTIONS**

Cable TPE

Cable TPE (E, F) Colour	Output RS422 (R, T)	push-pull (K)	push-pull complementary (I)
brown/green	DC 5 / 10 - 30 V	DC 10 - 30 V	DC 10 - 30 V
blue	Sense V <sub>cc</sub>		Sense V <sub>cc</sub>
brown	Channel A	Channel A	Channel A
green	Channel $\bar{A}$		Channel $\bar{A}$
grey	Channel B	Channel B	Channel B
pink	Channel $\bar{B}$		Channel $\bar{B}$
red	Channel N	Channel N	Channel N
black	Channel $\bar{N}$		Channel $\bar{N}$
white/green	GND	GND	GND
violet (white) <sup>1</sup>	Alarm/Sense GND <sup>2</sup>	Alarm	Alarm
screen <sup>3</sup>	screen <sup>3</sup>	screen <sup>3</sup>	screen <sup>3</sup>

<sup>1</sup> white with RS422 + Sense (T)

<sup>2</sup> depending on ordering code

<sup>3</sup> connected with encoder housing

**ELECTRICAL CONNECTIONS**

M23 connector (Conin), 12 pole

Pin	RS422 + Sense (T)	RS422 + Alarm (R)	push-pull (K)	push-pull complementary (I)
1	Channel $\bar{B}$	Channel $\bar{B}$	N.C.	Channel $\bar{B}$
2	Sense V <sub>cc</sub>	Sense V <sub>cc</sub>	N.C.	Sense V <sub>cc</sub>
3	Channel N	Channel N	Channel N	Channel N
4	Channel $\bar{N}$	Channel $\bar{N}$	N.C.	Channel $\bar{N}$
5	Channel A	Channel A	Channel A	Channel A
6	Channel $\bar{A}$	Channel $\bar{A}$	N.C.	Channel $\bar{A}$
7	N.C.	Alarm	Alarm	Alarm
8	Channel B	Channel B	Channel B	Channel B
9	N.C.	N.C. <sup>1</sup>	N.C. <sup>1</sup>	N.C. <sup>1</sup>
10	GND	GND	GND	GND
11	Sense GND	N.C.	N.C.	N.C.
12	DC 5 V	DC 10 - 30 V	DC 10 - 30 V	DC 10 - 30 V

<sup>1</sup> screen for cable with CONIN connector

**ELECTRICAL CONNECTIONS**

MS connector, 10 pole

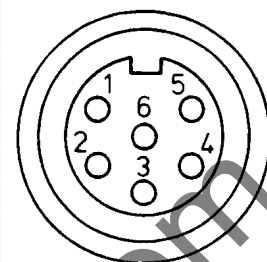
Pin	Description RS422 / Euro-pinout (Connection codes O and K)	push-pull	push-pull complementary
1/A	Channel A	Channel A	Channel A
2/B	Channel B	Channel B	Channel B
3/C	Channel N	Channel N	Channel N
4/D	DC 5/10 - 30 V	DC 10 - 30 V	DC 10 - 30 V
5/E	Alarm	Alarm	Alarm
6/F	GND	GND	GND
7/G	Channel $\bar{A}$	screen	Channel $\bar{A}$
8/H	Channel $\bar{B}$	N.C.	Channel $\bar{B}$
9/I	Channel $\bar{N}$	N.C.	Channel $\bar{N}$
10/J	screen	screen	screen

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-O / RI 58-T

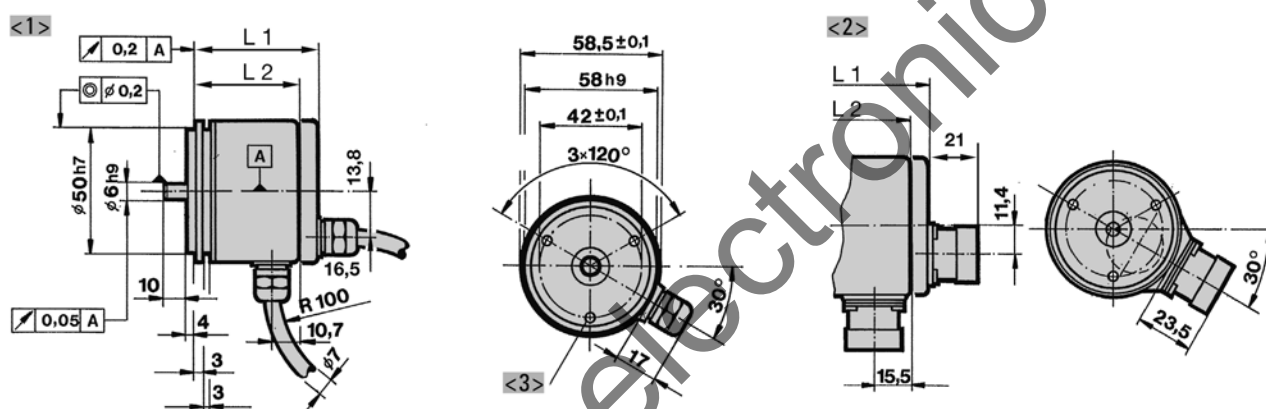
**ELECTRICAL CONNECTIONS**  
M16 connector (Binder), 6 pole

Description (push-pull)	Pin
DC 10 - 30 V	1
Channel A	2
Channel N	3
Channel B	4
Alarm	5
GND	6



#### DIMENSIONED DRAWINGS

##### Synchro flange. 58 mm

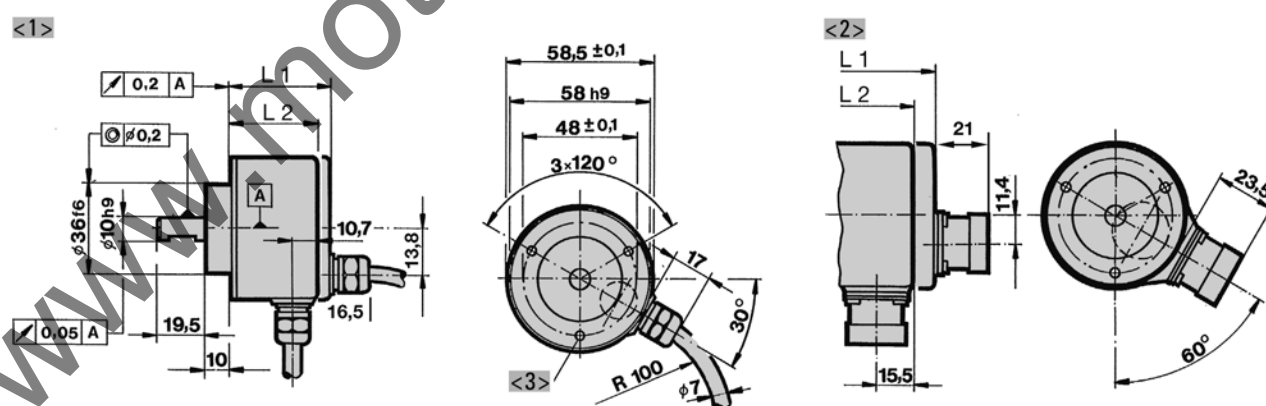


- <1> Connection cable, axial/radial
- <2> M23, 12 pole, axial/ radial
- <3> mounting thread M4x5

Cable bending radius R for flexible installation  $\geq 100$  mm  
Cable bending radius R for fixed installation  $\geq 40$  mm

Dimensions in mm

##### Clamping flange. 58 mm



- <1> Connection cable, axial/radial
- <2> M23, 12 pole, axial/ radial
- <3> mounting thread M3x5 (Option M4x5)

Cable bending radius R for flexible installation  $\geq 100$  mm  
Cable bending radius R for fixed installation  $\geq 40$  mm

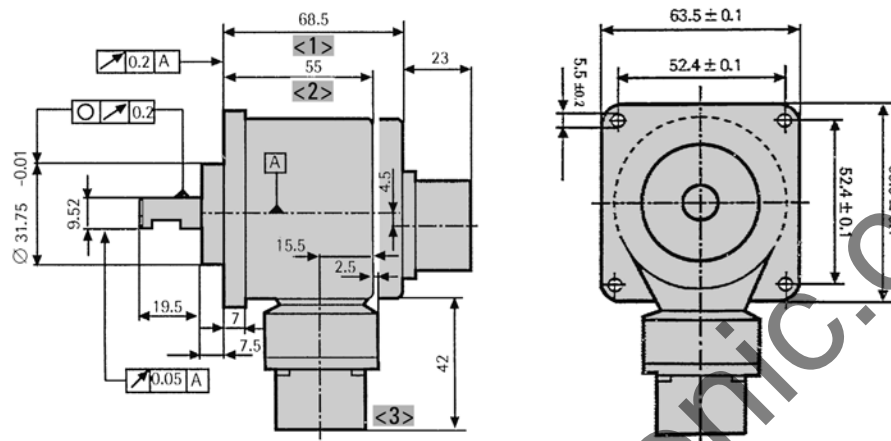
Dimensions in mm

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-0 / RI 58-T

#### DIMENSIONED DRAWINGS (continued)

Square flange, 63.5 mm x 63.5 mm (2.5" x 2.5")

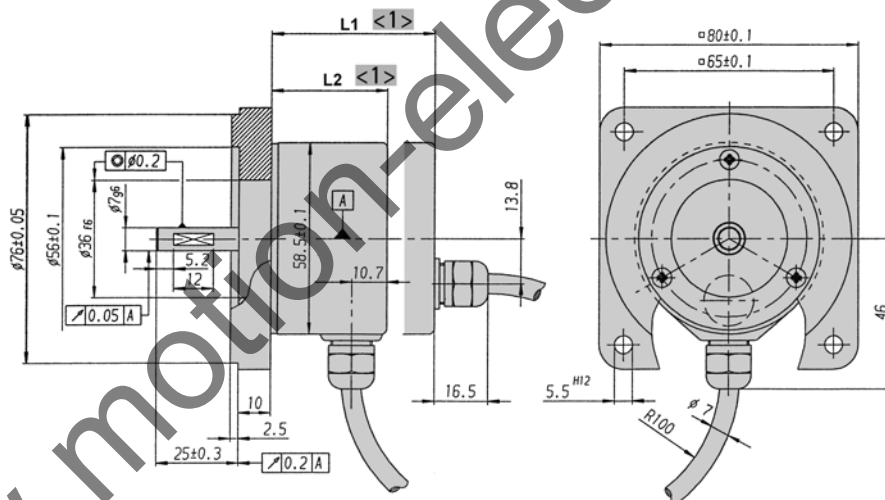


<1> axial  
<2> radial

<3> MS 6 - 10 pole

Dimensions in mm

Square flange 80 x 80 mm



<1> L1, L2 see clamping flange  
Cable bending radius R for flexible installation  $\geq 100$  mm

Cable bending radius R for fixed installation  $\geq 40$  mm

Dimensions in mm

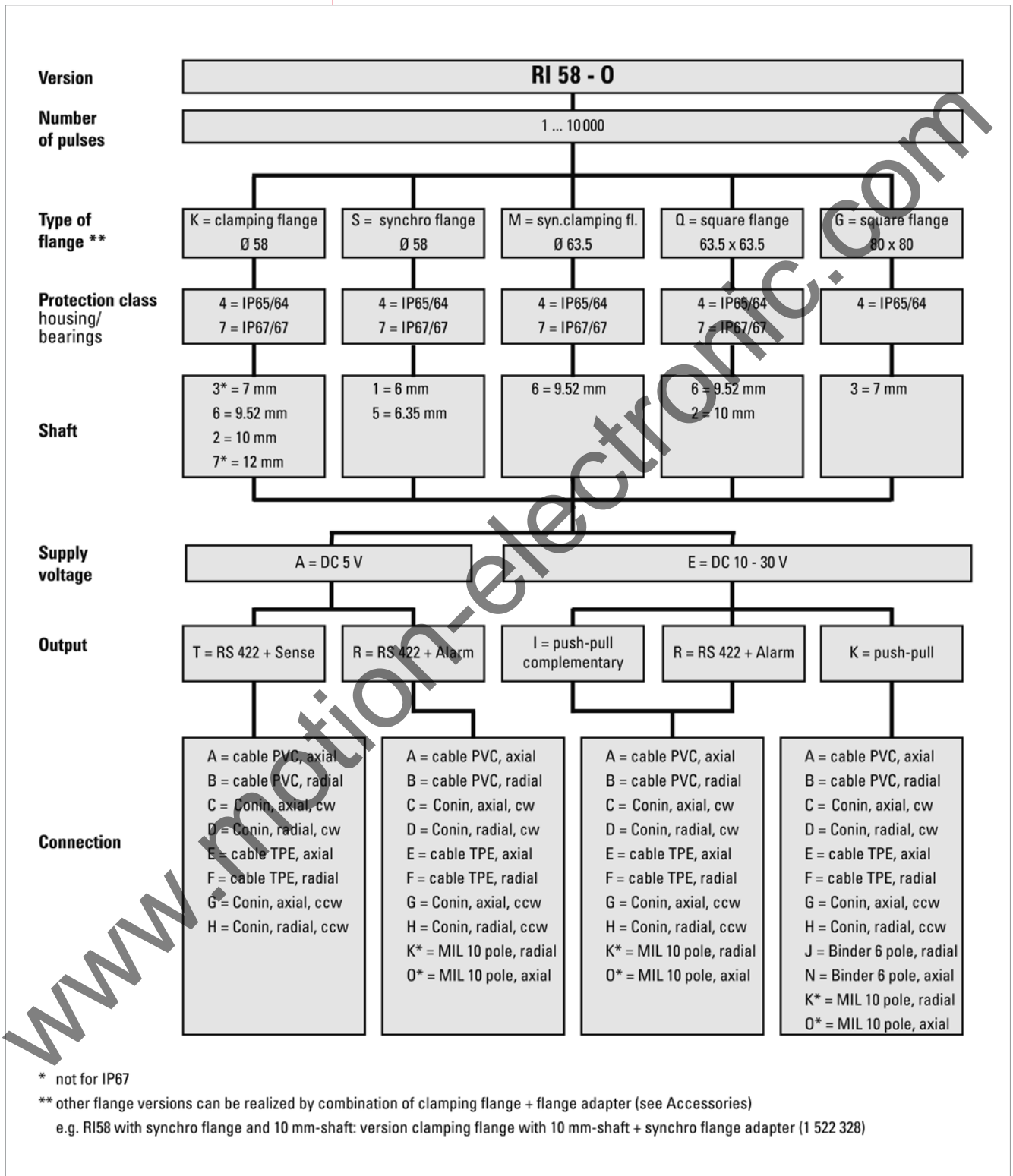
#### DIMENSIONS

Typ	Connection	Output	axial L1 mm	radial L2 mm
Synchro flange, 58 mm	cable	R (with $U_B = DC 5 V$ ), T, K, I	51.5	41.5
		R (with $U_B = DC 10 - 30 V$ )	56	56
	connector	R (with $U_B = DC 5 V$ ), T, K, I	57.5	51.5
		R (with $U_B = DC 10 - 30 V$ )	57.5	56
Clamping flange, 58 mm	cable	R (with $U_B = DC 5 V$ ), T, K, I	45.5	35.5
		R (with $U_B = DC 10 - 30 V$ )	50	50
	connector	R (with $U_B = DC 5 V$ ), T, K, I	51.5	45.5
		R (with $U_B = DC 10 - 30 V$ )	51.5	50

**TECHNICAL DATASHEET**

**Incremental Encoder RI 58-O / RI 58-T**

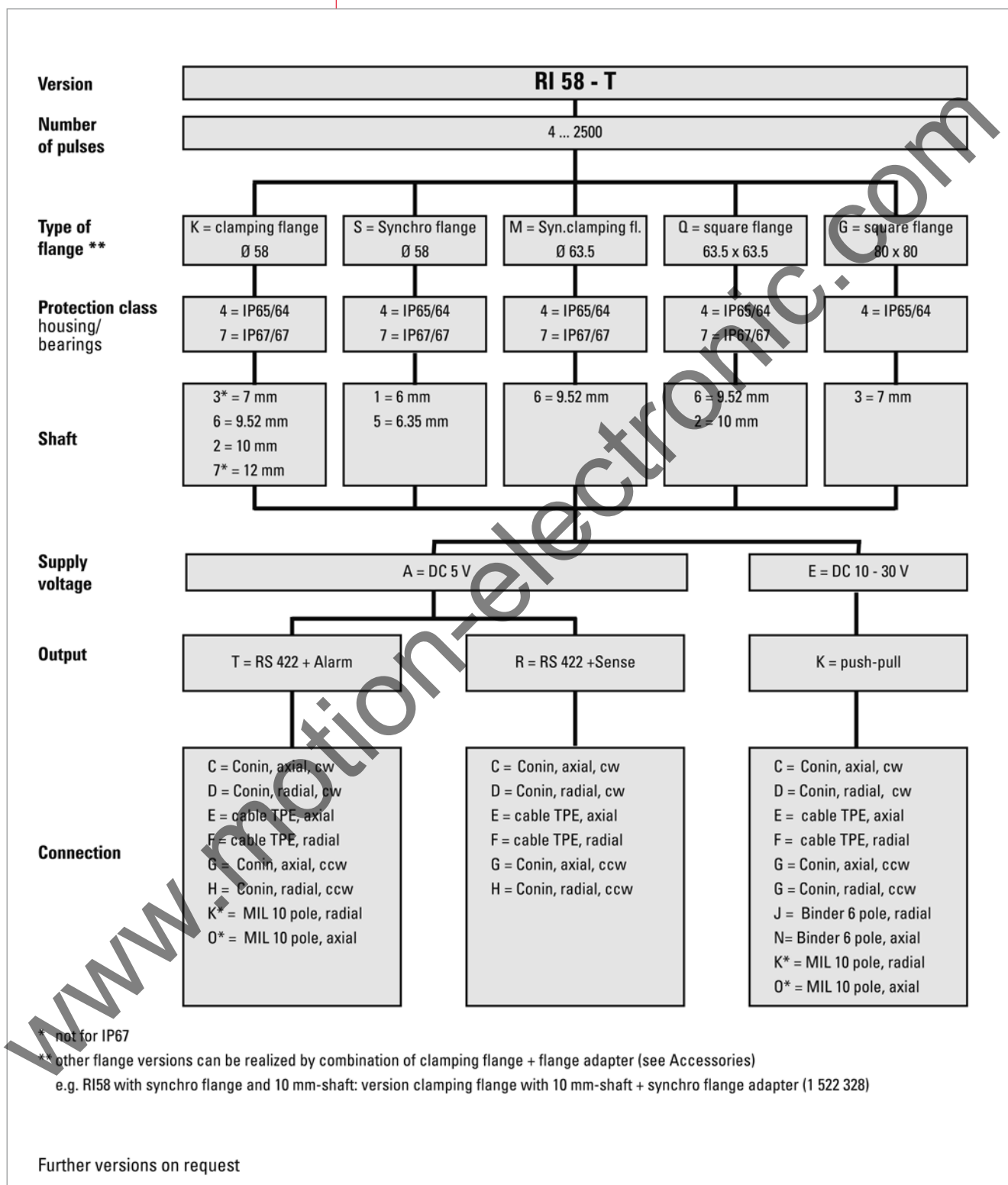
STANDARD VERSIONS



## TECHNICAL DATASHEET

### Incremental Encoder RI 58-O / RI 58-T

STANDARD VERSIONS (100 °C max. operating temperature)





## TECHNICAL DATASHEET

### Incremental Encoder RI 58-O / RI 58-T

#### ORDERING INFORMATION

Type	Number of pulses	Supply voltage <sup>1</sup>	Flange, Protection, Shaft <sup>2,3</sup>	Output <sup>4</sup>	Connection <sup>5,6</sup>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>RI58-O</b> <b>RI58-T</b>	RI 58-O: <b>1 ...</b> <b>10000</b> RI 58-T: <b>4 ...</b> <b>2500</b>	<b>A</b> DC 5 V <b>E</b> DC 10 - 30 V	<b>S.41</b> Synchro, IP64, 6 mm <b>S.45</b> Synchro, IP64, 6.35 mm <b>S.71</b> Synchro, IP67, 6 mm <b>S.75</b> Synchro, IP67, 6.35 mm <b>K.42</b> Clamping, IP64, 10 mm <b>K.47</b> Clamping, IP64, 12 mm <b>K.43</b> Clamping, IP64, 7 mm <b>K.46</b> Clamping, IP64, 9.52 mm <b>K.72</b> Clamping, IP67, 10 mm <b>K.76</b> Clamping, IP67, 9.52 mm <b>M.46</b> Syn.clamping, IP64, 9.52 mm <b>M.76</b> Syn.clamping, IP67, 9.52 mm <b>O.46</b> Square, IP64, 9.52 mm <b>O.42</b> Square, IP64, 10 mm <b>O.76</b> Square, IP67, 9.52 mm <b>O.72</b> Square, IP67, 10 mm <b>G.43</b> Square 80x80, IP64, 7 mm	<b>R</b> RS422 +Alarm <b>T</b> RS422 +Sense <b>K</b> Push-pull <b>I</b> Push-pull complementary	<b>A</b> PVC cable, axial <b>B</b> PVC cable, radial <b>E</b> TPE cable, axial <b>F</b> TPE cable, radial <b>C</b> M23 connector (Conin), 12 pole, axial, cw <b>D</b> M23 connector (Conin), 12 pole, radial, cw <b>G</b> M23 connector (Conin), 12 pole, axial, ccw <b>H</b> M23 connector (Conin), 12 pole, radial, ccw <b>J</b> M16 connector (Binder), 6 pole, radial <b>N</b> M16 connector (Binder), 6 pole, axial <b>O</b> MS connector, 10 pole (Insert arrangement 18-1), axial <b>K</b> MS connector, 10 pole (Insert arrangement 18-1), radial

<sup>1</sup> DC 10 - 30 V available with output K, I, R/ DC 5 V available with output R, T

<sup>2</sup> other flange versions can be realized by combination of clamping flange + flange adapter (see Accessories), e.g. RI58 with synchro flange and 10 mm-shaft: version clamping flange with 10 mm-shaft + synchro flange adapter (1 522 328)

<sup>3</sup> Output code "K" and "I": short-circuit-proof

<sup>4</sup> Connection code "O", "K": according to MIL-C-5015 (only RI 58-O)

<sup>5</sup> IP67 on cover with connector only if IP67 mating connector mounted properly.

<sup>6</sup> Connection code "O", "K": according to MIL-C-5016 (only RI 58-T)

#### ORDERING INFORMATION

##### Selection of cable length

Versions with cable outlet (connection A, B, E or F) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. For variants with connector on cable end please add cable length code in between. Further cable lengths on request.

Code	Cable length
without code	1.5 m
-D0	3 m
-F0	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m

Example:

Cable 3 m length: ... B - D0

Cable mit 3 m length and M23 connector, cw: ... B - D0 - I