



# EAM PARALLEL-SSI MULTITURN ABSOLUTE ENCODER



Multiturn ABSOLUTE ENCODERS

## Absolute multiturn PARALLEL encoder description

This series is designed for application where a very high precision is required, even also on extended linear distances. Resolutions up to 13 bits on the single turn (8,192 ppr) and 14 bits as number of turns (16,384 turns) are available. Sturdy mechanic parts and several flanges make this series suitable in such a wide range of applications assuring high performances even in the most tough industrial applications. This series is available with cable or connector output both with Gray or binary code. The PUSH PULL electronic is suitable for all industrial application fields.

## Absolute multiturn SSI encoder description

The absolute multiturn encoder series with SSI output provides data with the same format as previously described for singleturn encoders. Considering the high data volume in multiturn encoders, the serial data transfer is an efficient solution in order to curb the number of wires and the SSI standard is a valuable one.

The output data is a 25 bit word and useful bits are proportional to the resolution chosen for the encoder.

This transmission standard efficiently reduces wiring issues maintaining the highest level of performances. Similarly to singleturn encoders, number of wires for the transmission is 4 (2 for the data and 2 for the clock signal –both are transmitted in differential logic). A wide range of mechanical parts and flanges designed to satisfy different requirements is available.

EAM PARALLEL-SSI

# PARALLEL encoder ordering code

Full stop to separate special versions

EAM 63 A 4096 / 4096 G 8/28 P P X 10 X 3 MA R . XXX

Absolute multiturn encoder **EAM**

Body dimension 58  
Body dimension 63  
Body dimension 90  
Body dimension 115

### Type of flange

mod. EAM63/90/115 **A**  
mod. EAM58 **B**  
mod. EAM58 **C**  
mod. EAM63 **D**  
mod. EAM63 **E**  
mod. EAM58/63 **F**  
mod. EAM63 **G**

### Turns

2/4/8/16/32/64/128/256  
512/1024/2048/4096/  
8192/16384

### Resolution

2/4/8/16/32/64/128/256/512  
1024/2048/4096/8192

Please directly contact our offices for pulses availability

### Code type

Binary **B**  
Gray (Standard) **G**

Please directly contact our offices for binary offset code (0-XXX).

### Input voltage

5  
8 ÷ 28

### Output types

PUSH PULL with short circuit protection (positive logic standard) **P**  
For optional about output types please refer to the absolute output section

### Logic

Negative **N**  
Positive **P**

Special version code numbered from 001 to 999

**R** Radial  
**A** Axial

**PD** 16 poles with 1,5 m standard output cable  
**PE** 32 poles with 1,5 m standard output cable  
**MA** 19 poles MS type connector  
**ME** 32 poles MS type connector

### R.P.M.

**3** 3000 with IP66  
**6** 6000

### Enclosure rating

**X** IP54  
**S** Optional IP66 with the exception of EAM63G/F - EAM115A

### Shaft diameter

**6** ø 6g6 mm - 58B  
**8** ø 8g6 mm - 58B - 63A/D/E - 90A  
**9** ø 9,52g6 mm - 63A/D/E - 90A  
**10** ø 10g6 mm - 58B/C - 63A/D/E - 90A - 115A  
**11** ø 11g6 mm - 115A

### Bore diameter only for mod. 58F - 63F/G

**8** ø 8H7 mm  
**9** ø 9,52H7 mm  
**10** ø 10H7 mm  
**12** ø 12H7 mm  
**14** ø 14H7 mm  
**15** ø 15H7 mm

### Options

**L** Latch  
**X** To be reported if not used  
**ZE** Electronic zeroing  
**ZP** Push-button zeroing

Multiturn ABSOLUTE ENCODERS

EAM PARALLEL-SSI



## Connections and colours for PARALLEL models

FUNCTION	B / G	16 WIRE CABLE COLOURS	32 WIRE CABLE COLOURS	PIN M19MP	PIN M32MP
bit 1 (LSB)	B <sup>0</sup> /G <sup>0</sup>	green	green	A	A
bit 2	B <sup>1</sup> /G <sup>1</sup>	yellow	yellow	B	B
bit 3	B <sup>2</sup> /G <sup>2</sup>	blue	blue	C	C
bit 4	B <sup>3</sup> /G <sup>3</sup>	brown	brown	D	D
bit 5	B <sup>4</sup> /G <sup>4</sup>	pink	pink	E	E
bit 6	B <sup>5</sup> /G <sup>5</sup>	white	white	F	F
bit 7	B <sup>6</sup> /G <sup>6</sup>	gray	gray	G	G
bit 8	B <sup>7</sup> /G <sup>7</sup>	violet	violet	H	H
bit 9	B <sup>8</sup> /G <sup>8</sup>	gray/pink	gray/pink	J	J
bit 10	B <sup>9</sup> /G <sup>9</sup>	white/green	white/green	K	K
bit 11	B <sup>10</sup> /G <sup>10</sup>	brown/green	brown/green	L	L
bit 12	B <sup>11</sup> /G <sup>11</sup>	white/yellow	white/yellow	M	M
bit 13	B <sup>12</sup> /G <sup>12</sup>	yellow/brown	yellow/brown	N	N
bit 14	B <sup>13</sup> /G <sup>13</sup>	/	white/gray	P	P
bit 15	B <sup>14</sup> /G <sup>14</sup>	/	gray/brown	R	R
bit 16	B <sup>15</sup> /G <sup>15</sup>	/	white/pink	S	S
bit 17	B <sup>16</sup> /G <sup>16</sup>	/	pink/brown	/	T
bit 18	B <sup>17</sup> /G <sup>17</sup>	/	white/blue	/	U
bit 19	B <sup>18</sup> /G <sup>18</sup>	/	brown/blue	/	V
bit 20	B <sup>19</sup> /G <sup>19</sup>	/	white/red	/	W
bit 21	B <sup>20</sup> /G <sup>20</sup>	/	brown/red	/	X
bit 22	B <sup>21</sup> /G <sup>21</sup>	/	white/black	/	Y
bit 23	B <sup>22</sup> /G <sup>22</sup>	/	brown/black	/	Z
bit 24	B <sup>23</sup> /G <sup>23</sup>	/	gray/green	/	a
bit 25	B <sup>24</sup> /G <sup>24</sup>	/	yellow/pink	/	d
bit 26	B <sup>25</sup> /G <sup>25</sup>	/	yellow/blue	/	c
bit 27	B <sup>26</sup> /G <sup>26</sup>	/	green/blue	/	b
LATCH	/	/	yellow/gray	/	e
ZE	/	/	pink/green	/	f
0 Volt	/	black	black	T	j
U / D	/	red/blue	red/blue	U	g
+ Vdc	/	red	red	V	h

### Connector or cable choice

According to the resolution and the chosen number of turns is possible to calculate the connections required by the connector or the cable. From the below table is possible to know the connection number.

**EXAMPLE 1:**  
256 PPR = 8 connections  
N° turns 32 = 5 connections  
Total connections = 13.

**EXAMPLE 2:**  
4096 PPR = 12 connections  
N° turn 4096 = 12 connections  
Total connections = 24.

From 1 to 13 connections a 16 poles cable or a 19 poles connector have to be considered.

From 14 to 25 connections a 32 poles cable or a 32 poles connector have to be considered.

If optional signals are used a cable or a 32 poles connector is suggested.

### PPR + Turns number

PPR	Bit number	Connections number
2	1	1
4	2	2
8	3	3
16	4	4
32	5	5
64	6	6
128	7	7
180/225/250	8	8
256	8	8
360/450/500	9	9
512	9	9
720/900/1000	10	10
1024	10	10
1440/1800/2000	11	11
2048	11	11
2880/3600/4000	12	12
4096	12	12
8192	13	13
16384	14	14

# SSI encoder ordering code

Full stop to separate special versions

EAM 63 A 4096 / 4096 G 5 S X X 10 X 3 MC R . XXX

Absolute multiturn encoder **EAM**:

Body dimension **58**  
 Body dimension **63**  
 Body dimension **90**  
 Body dimension **115**

### Type of flange

mod. EAM63/90/115 **A**  
 mod. EAM58 **B**  
 mod. EAM58 **C**  
 mod. EAM63 **D**  
 mod. EAM63 **E**  
 mod. EAM58/63 **F**  
 mod. EAM63 **G**

### Turns

2/4/8/16/32/64/128/256  
 512/1024/2048/4096/  
 8192\*/16384\*

\*Please directly contact our offices for more than 25 bit coding availability

### Resolution

2/4/8/16/32/64/128/256/512  
 1024/2048/4096/8192

### Code type

Binary **B**  
 Gray (Standard) **G**

### Input voltage

5  
 8 ÷ 28

### Output types

SSI (Serial Synchronous Interface) **S**  
 For optional about output types please refer to the absolute output section

### Logic

To be reported if not used **X**

Special version code numbered from 001 to 999

**R** Radial  
**A** Axial

**PC** 12 poles with 1,5 m standard output cable  
**MC** MS type 7 poles connector  
**HA** H type 12 poles connector

### R.P.M.

**3** 3000 with IP66  
**6** 6000

### Enclosure rating

**X** IP54  
**S** Optional IP66 with the exception of EAM63G/F

### Shaft diameter

**6** ø 6g6 mm - 58B  
**8** ø 8g6 mm - 58B - 63A/D/E - 90A  
**9** ø 9,52g6 mm - 63A/D/E - 90A  
**10** ø 10g6 mm - 58B/C - 63A/D/E - 90A - 115A  
**11** ø 11g6 mm - 115A

### Bore diameter only for mod. 58F - 63F/G

**8** ø 8H7 mm  
**9** ø 9,52H7 mm  
**10** ø 10H7 mm  
**12** ø 12H7 mm  
**14** ø 14H7 mm  
**15** ø 15H7 mm

### Options

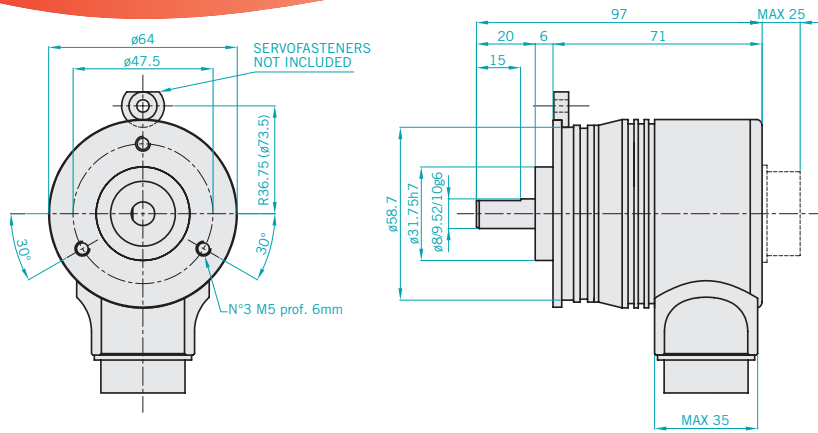
**X** To be reported if not used  
**ZE** Electronic zeroing  
**ZP** Push-button zeroing

## Output connections for SSI

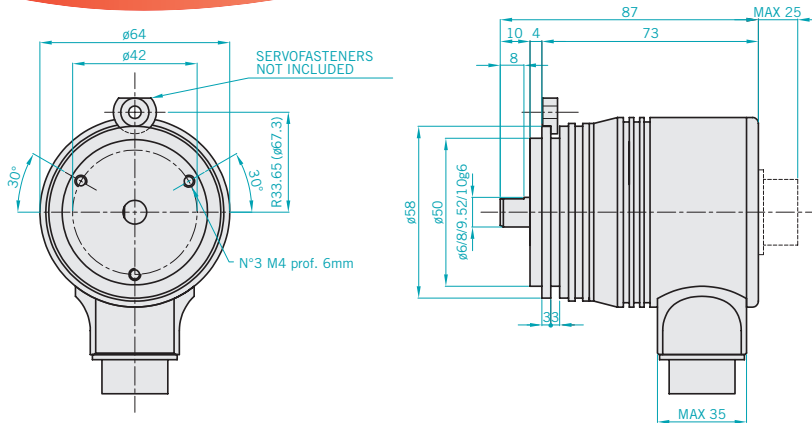
FUNCTION	12 WIRE CABLE COLOURS	PIN M07MP	PIN H12
+ Vdc	red	G	8
0 Volt	black	F	1
U/D	red/blue	E	5
Data +	green	C	2
Data -	brown	D	10
Clock +	yellow	A	3
Clock -	orange	B	11
ZE	white	/	4



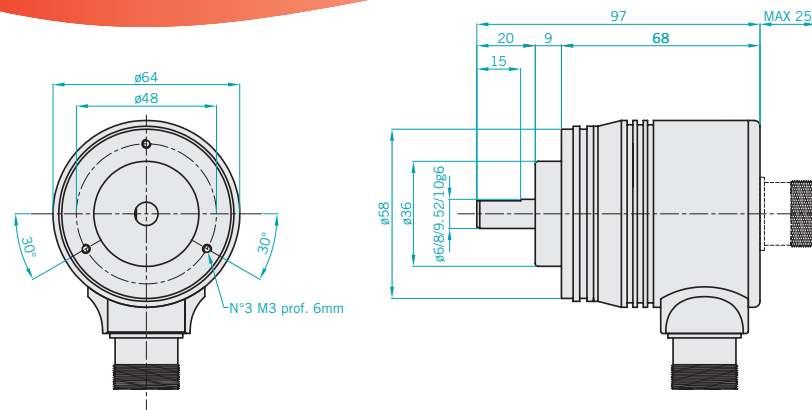
### EAM63 A



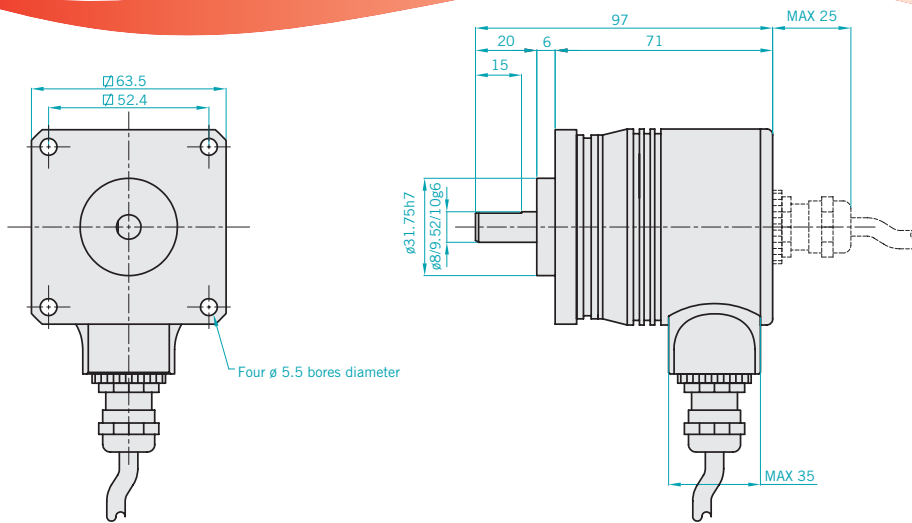
### EAM58 B



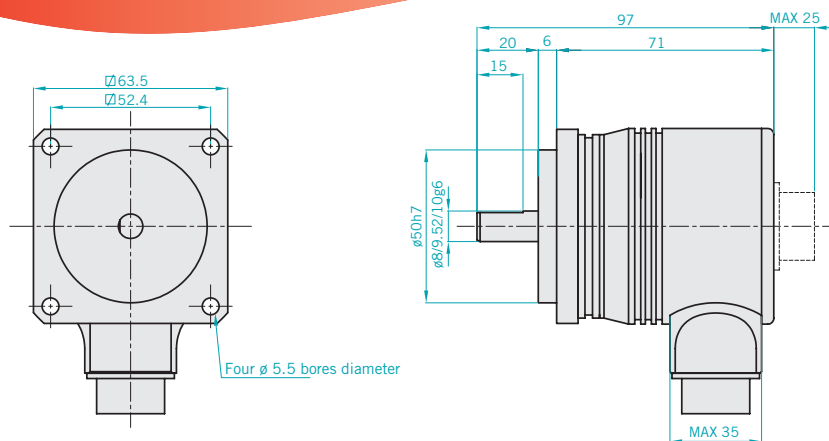
### EAM58 C



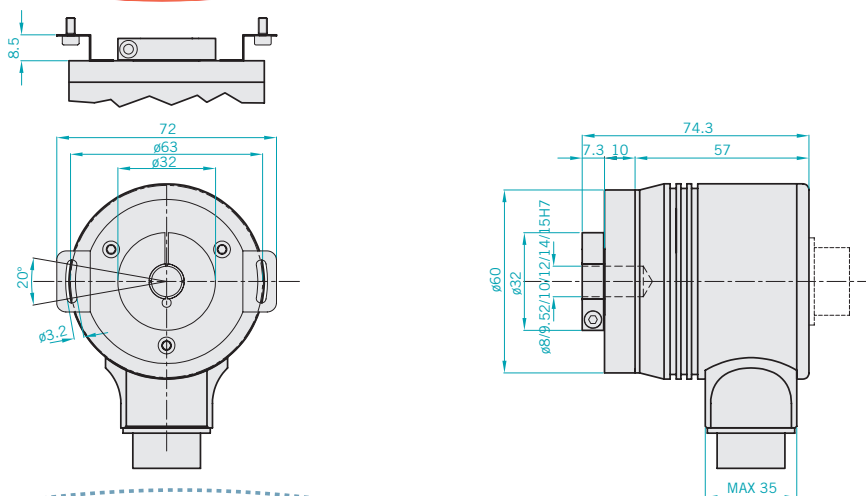
## EAM63 D



## EAM63 E



## EAM58 F

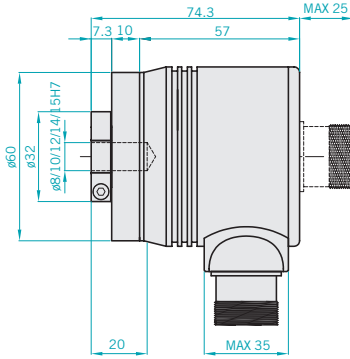
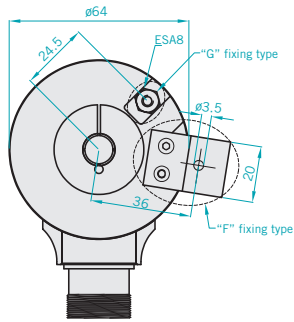




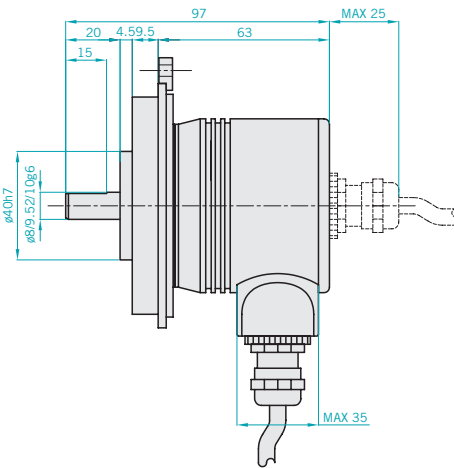
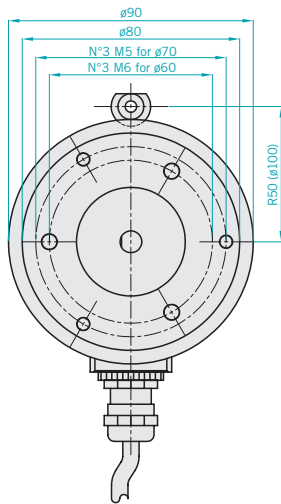
EAM63 F - EAM63 G



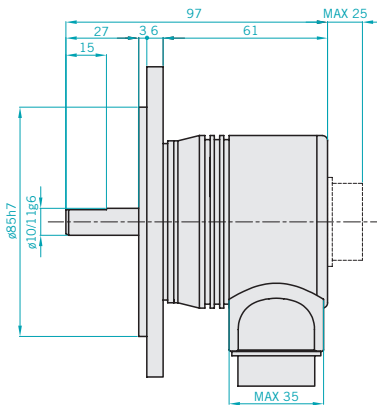
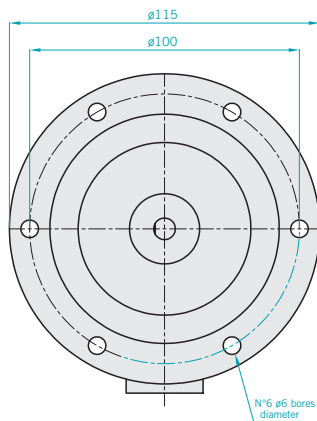
ISO 9001:2000



EAM90 A



EAM115 A

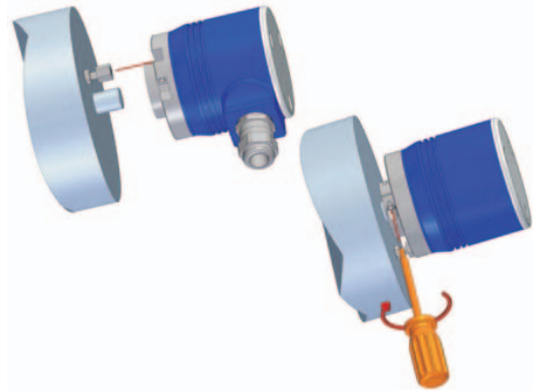


Multiturn ABSOLUTE ENCODERS

EAM PARALLEL-SSI

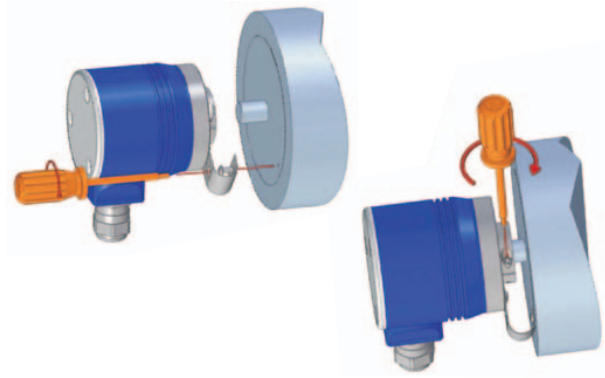
### HOW TO MOUNT THE EAM63G

- 1) Fix the antirotation pin on the motor flange.
- 2) Couple the encoder shaft with the motor shaft, ensuring that the pin is inserted on the frontal part of the encoder (maintaining a minimum distance of 0,5 mm).
- 3) Fix the encoder shaft by the metal ring.



### HOW TO MOUNT THE EAM63F

- 1) Couple the encoder shaft with the motor shaft.
- 2) Fix the spring at the motor flanges without screwing it.
- 3) Fix the encoder shaft by the metal gear.
- 4) Block the spring.



### Mechanical specifications

<b>Shaft diameter (mm)</b>	ø6 g6 - 58B ø8 g6 - 58B - 63A/D/E - 90A ø9,52 g6 - 63A/D/E - 90A ø10 g6 - 58B - 63A/D/E - 90A - 11A ø11 g6 - 11A
<b>Bore diameter (mm)</b>	ø8 H7- 58F - 63F/G ø9 H7- 58F - 63F/G ø10 H7- 58F - 63F/G ø12 H7- 58F - 63F/G ø14 H7- 58F - 63F/G ø15 H7- 58F - 63F/G
<b>R.P.M. Max</b>	6000 continuous 3000 continuous for 63G 3000 with IP66
<b>MAX shaft load</b>	10 N (1 Kp) axial with ø6 shaft 20 N (2 Kp) radial with ø6 shaft 100 N (10 Kp) axial 100 N (10 Kp) radial
<b>Shock</b>	50 G for 11 msec
<b>Vibrations</b>	10G 10 ÷ 2000 Hz
<b>Bearings life</b>	10 <sup>9</sup> revolutions
<b>Bearings</b>	n° 2 ball bearings
<b>Shaft material</b>	Stainless steel AISI303
<b>Body material</b>	Aluminium UNI 9002/5 - (D11S)
<b>Housing material</b>	Aluminium alloy 6060
<b>Flange material</b>	Aluminium UNI 9002/5 (D11S)
<b>Weight</b>	350 g -58B/C -63A/D/E/G 750 g - 90A -115A

### Environmental specifications

<b>Enclosure rating</b>	IP54 IP66 optional -58B/C -63A/D/E -90A
<b>Operating temperature</b>	0° ÷ +60°C
<b>Input current with no output load</b>	-15° ÷ +70°C

### PARALLEL electrical specifications

<b>Turns</b>	2 / 4 / 8 / 16 / 32 / 64 / 128 / 256 512 / 1024 / 2048 / 4096 / 8192 16384
<b>PPR</b>	2 / 4 / 8 / 16 / 32 / 64 / 128 / 256 512 / 1024 / 2048 / 4096 / 8192
<b>Input voltage</b>	8 ÷ 28 Vdc
<b>Input current with no output load</b>	100 mA
<b>Source and sink current</b>	20 mA for channel
<b>Output types</b>	PUSH PULL (Positive logic)
<b>Output frequency</b>	200 KHz output code $F = \frac{\text{RPM} \times \text{Resolution}}{60}$
<b>Accuracy</b>	+/- 1/2 LSB

### SSI electrical specifications

<b>Turns</b>	2 / 4 / 8 / 16 / 32 / 64 / 128 / 256 512 / 1024 / 2048 / 4096 / 8192 16384
<b>PPR</b>	2 / 4 / 8 / 16 / 32 / 64 / 128 / 256 512 / 1024 / 2048 / 4096 / 8192
<b>Input voltage</b>	5 Vdc / 8 ÷ 28 Vdc
<b>Input current with no output load</b>	100 mA
<b>Output types</b>	SSI (Serial Synchronous Interface)
<b>Monostable time</b>	10 - 25 us
<b>Time between two clock sequences</b>	> 35 us
<b>Frequency range</b>	100 KHz - 1 MHz
<b>Accuracy</b>	+/- 1/2 LSB