



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 (8192 ppr) and 12 bits as number of turns (4096 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 SINGLETURN 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.

PARALLEL ENCODER ORDERING CODE

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

SERIES
absolute multiturn
encoder **EAM**

SIZE

mm 58
mm 63
mm 90
mm 115

TYPE OF FLANGE

mod. EAM63 / EAM90 / EAM115 **A**
mod. EAM58 **B**
mod. EAM58 **C**
mod. EAM63 **D**
mod. EAM63 **E**
mod. EAM58 / EAM63 **F**
mod. EAM63 **G**

rev. 2.0 (versione compatta) **R**

TURNS

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

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**

INPUT VOLTAGE

5 V DC **5**
8 ... 28 V DC **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

VARIANT

XXX custom version

OUTPUT DIRECTION

A axial
R radial

OUTPUT TYPE

PD cable output 16 poles (standard length 1.5m)
PE cable output 32 poles (standard length 1.5m)
MA 19 poles MS type connector
ME 32 poles MS type connector

MAX ROTATION SPEED

3 3000 rpm with IP 66
6 6000 rpm

ENCLOSURE RATING

X IP 54
S optional IP 66 (with the exception of EAM58F - EAM63 F/G - EAM115)

SHAFT DIAMETER

6 mm - 58B
8 mm - 58B - 63A/D/E - 90A
9 mm (9.52 mm 3/8") - 63A/D/E - 90A
10 mm - 58B/C - 63A/D/E - 90A - 115A
11 mm - 115A

BORE DIAMETER ONLY FOR MOD. 58F - 63F/G

8 mm
9 mm (9.52 mm 3/8")
10 mm
12 mm
14 mm
15 mm

OPTIONS

L Latch
X to be reported if not used

LOGIC

N Negative
P Positive

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 ⁰ / G ⁰	green	green	A	A
bit 2	B ¹ / G ¹	yellow	yellow	B	B
bit 3	B ² / G ²	blue	blue	C	C
bit 4	B ³ / G ³	brown	brown	D	D
bit 5	B ⁴ / G ⁴	pink or orange	pink or orange	E	E
bit 6	B ⁵ / G ⁵	white	white	F	F
bit 7	B ⁶ / G ⁶	gray	gray	G	G
bit 8	B ⁷ / G ⁷	violet	violet	H	H
bit 9	B ⁸ / G ⁸	gray/pink	gray/pink	J	J
bit 10	B ⁹ / G ⁹	white/green	white/green	K	K
bit 11	B ¹⁰ / G ¹⁰	brown/green	brown/green	L	L
bit 12	B ¹¹ / G ¹¹	white/yellow	white/yellow	M	M
bit 13	B ¹² / G ¹²	yellow/brown	yellow/brown	N	N
bit 14	B ¹³ / G ¹³	/	white/gray	P	P
bit 15	B ¹⁴ / G ¹⁴	/	gray/brown	R	R
bit 16	B ¹⁵ / G ¹⁵	/	white/pink	S	S
bit 17	B ¹⁶ / G ¹⁶	/	pink/brown	/	T
bit 18	B ¹⁷ / G ¹⁷	/	white/blue	/	U
bit 19	B ¹⁸ / G ¹⁸	/	brown/blue	/	V
bit 20	B ¹⁹ / G ¹⁹	/	white/red	/	W
bit 21	B ²⁰ / G ²⁰	/	brown/red	/	X
bit 22	B ²¹ / G ²¹	/	white/black	/	Y
bit 23	B ²² / G ²²	/	brown/black	/	Z
bit 24	B ²³ / G ²³	/	gray/green	/	a
bit 25	B ²⁴ / G ²⁴	/	yellow/pink	/	d
bit 26	B ²⁵ / G ²⁵	/	yellow/blue	/	c
bit 27	B ²⁶ / G ²⁶	/	green/blue	/	b
LATCH	/	yellow/gray	yellow/gray	/	e
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° turns 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 27 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	Connection number
2	1	1
4	2	2
8	3	3
16	4	4
32	5	5
64	6	6
90	7	7
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

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

SERIES
absolute multiturn
encoder **EAM**

SIZE
mm 58
mm 63
mm 90
mm 115

TYPE OF FLANGE
mod. EAM63 / EAM90 / EAM115 **A**
mod. EAM58 **B**
mod. EAM58 **C**
mod. EAM63 **D**
mod. EAM63 **E**
mod. EAM58 / EAM63 **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 V DC **5**
8 ... 28 V DC **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**

VARIANT
XXX custom version

OUTPUT DIRECTION
A axial
R radial

OUTPUT TYPE
PC 12 poles with 1.5m standard output
cable
MC MS type 7 poles connector
HA H type 12 poles connector

MAX ROTATION SPEED
3 3000 rpm with IP 66
6 6000 rpm

ENCLOSURE RATING
X IP 54
S optional IP 66 with the exception EAM63F/G -
EAM115)

SHAFT DIAMETER
6 mm - 58B
8 mm - 58B - 63A/D/E - 90A
9 mm (9.52 mm 3/8") - 63A/D/E - 90A
10 mm - 58B/C - 63A/D/E - 90A - 115A
11 mm - 115A

BORE DIAMETER ONLY FOR MOD. 58F - 63F/G
8 mm
9 mm (9.52 mm 3/8")
10 mm
12 mm
14 mm
15 mm

OPTIONS
X to be reported if not used

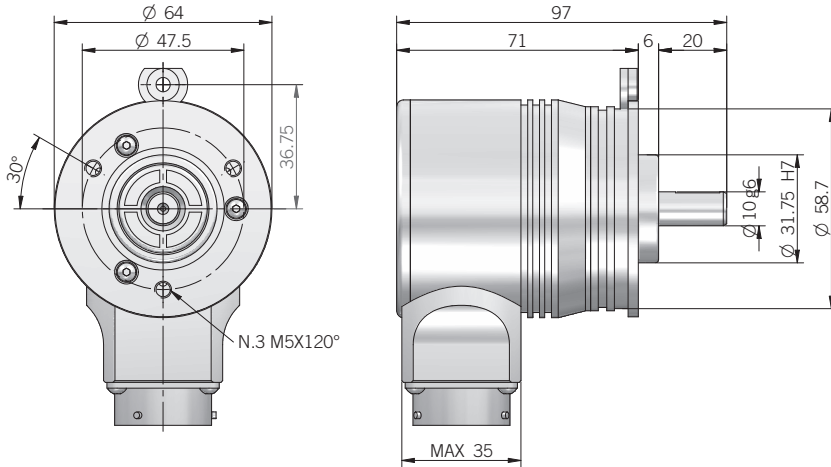
MULTITURN ABSOLUTE ENCODERS

Output connections for SSI

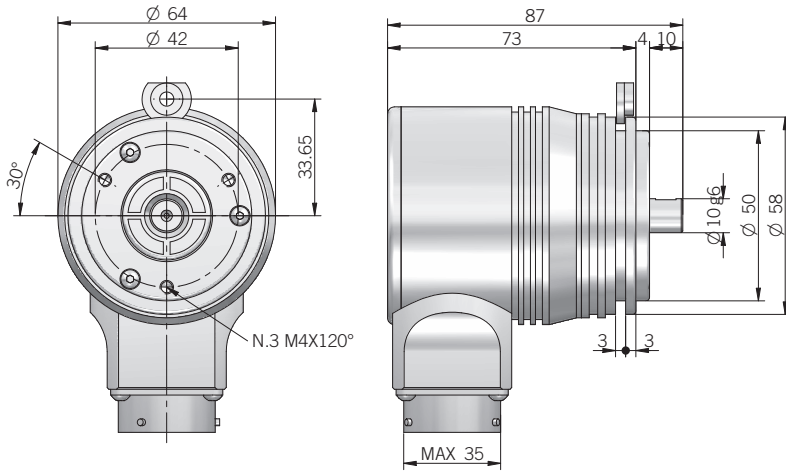
Function	12 wire cable colours	Pin M07MP	Pin H12
+ Vdc	red	G	8
0 Volt	black	F	1
U / D	red/blue	E	5
Dato +	green	C	2
Dato -	brown	D	10
Clock +	yellow	A	3
Clock -	orange	B	11

EAM PARALLEL - SSI

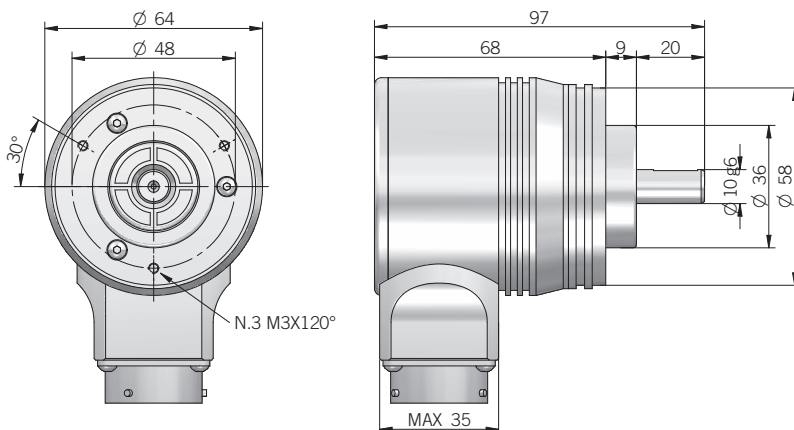
EAM 63 AR



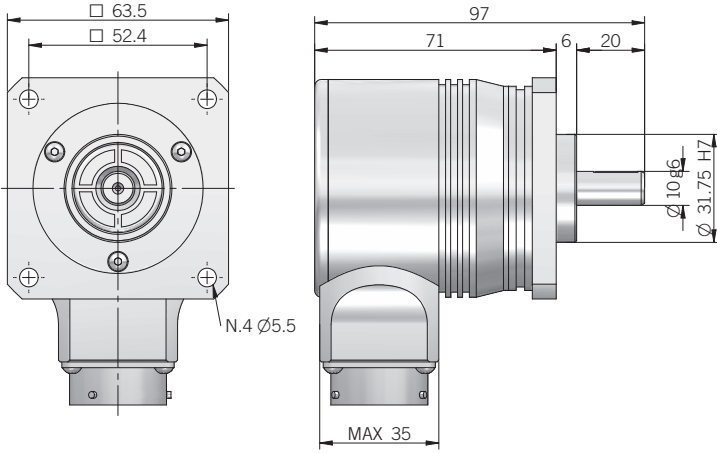
EAM 58 BR



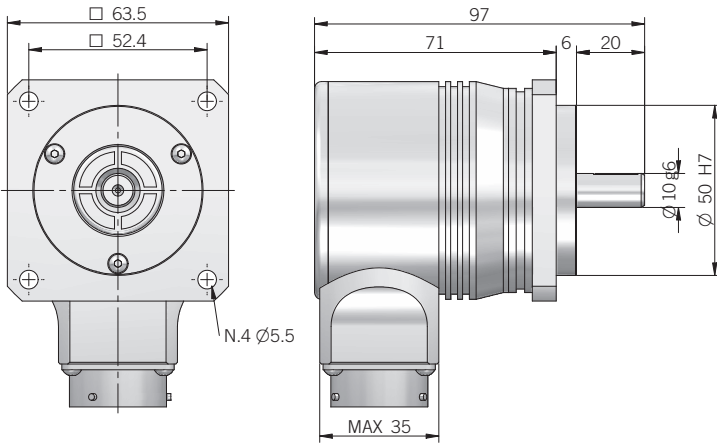
EAM 58 CR



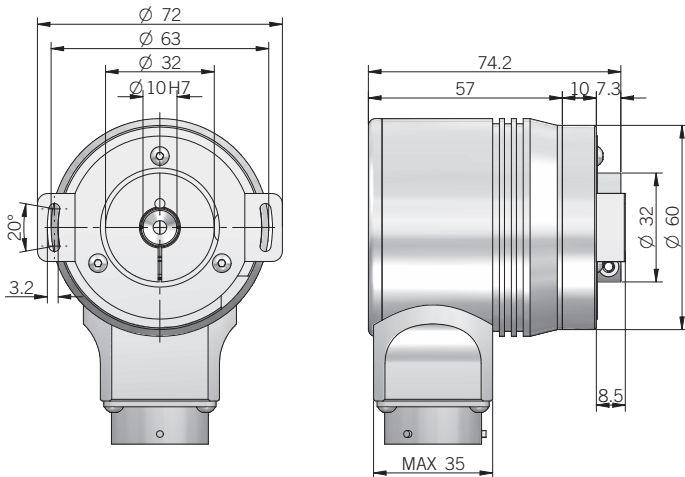
EAM 63 DR



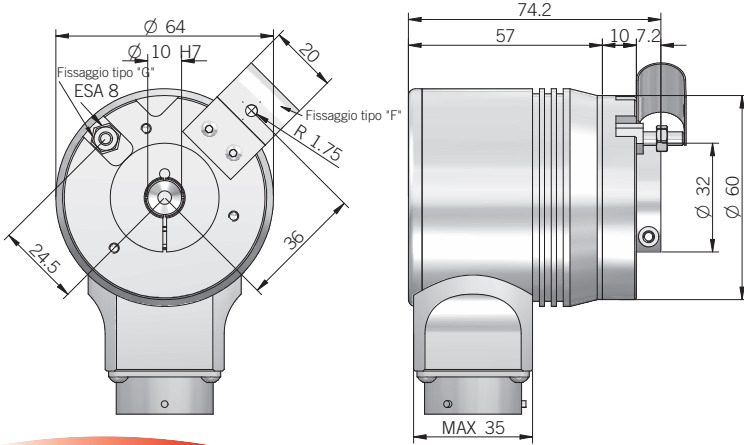
EAM 63 ER



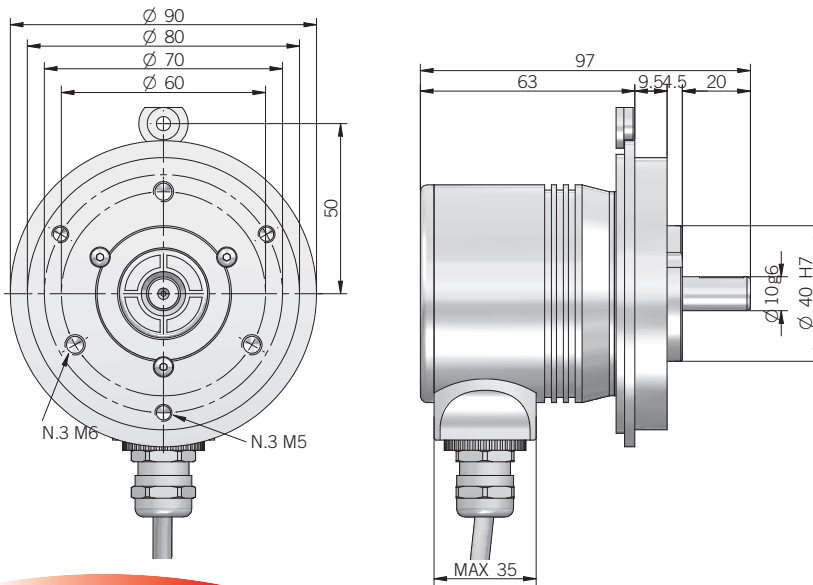
EAM 58 FR



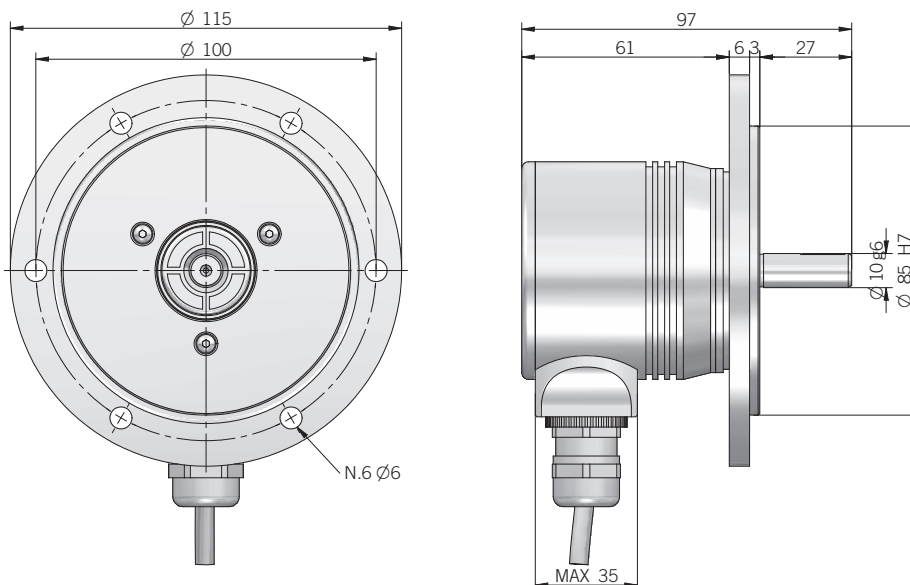
EAM 63 FR - EAM 63 GR



EAM 90 AR

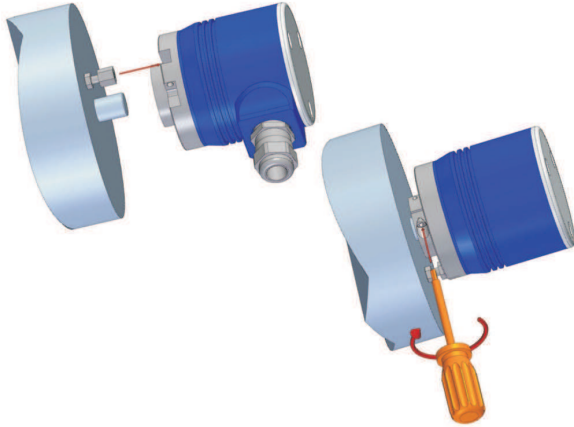


EAM 115 AR



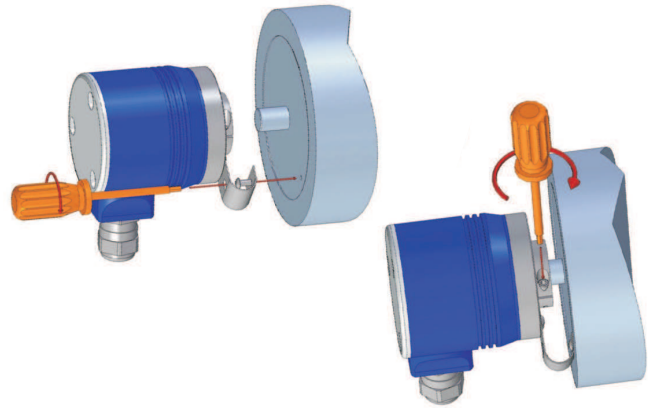
HOW TO MOUNT THE EAM63GR

- 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 EAM63FR

- 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

Shaft diameter (mm)	6 (58B) 8 (58B - 63A/D/E - 90A) 9.52 (63A/D/E - 90A) 10 (58B - 63A/D/E - 90A - 115A) 11 (115A) mm
Bore diameter (only for mod.58F - 63F/G)	8 / 9 / 10 / 12 / 14 / 15 mm
Max rotation speed	6000 rpm continuous 3000 rpm continuous for 58F - 63G 3000 rpm with IP66
Max shaft load	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
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibrations	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Bearings life	10 ⁹ revolutions
Bearings	n° 2 ball bearings
Shaft material	stainless steel UNI X10CrNiS1809
Body material	aluminium UNI 9002/5
Housing material	aluminium alloy 6060
Flange material	alluminio UNI 9002/5
Weight	circa 350 g - 58B/C - 63A/D/E/G circa 750 g - 90A - 115A

Environmental specifications

Enclosure rating	IP 54 IP 66 optional -58B/C -63A/D/E -90A
Operating temperature	0° ... +60°C
Storage temperature	-15° ... +70°C

PARALLEL electrical specifications

Turns	2 / 4 / 8 / 16 / 32 / 64 / 128 / 256 / 512 / 1024 / 2048 / 4096
PPR	2 / 4 / 8 / 16 / 32 / 64 / 128 / 256 / 512 / 1024 / 2048 / 4096 / 8192
Input voltage	8 ... 28 V DC
Input current with no output load	100 mA
Source and sink current	20 mA for channel
Output types	PUSH PULL (Positive logic)
Max output frequency	25 kHz output code
Accuracy	+/- 1/2 LSB

SSI electrical specifications

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