Type 2Q

- **Shaft Encoder - □63,5 x 63,5**
- **Shaft ø1/4 inch to ø10 mm**
- **Resolution up to 10.000 ppr**
- **Standard IP 65 (*IP 66, 67 optional*)**

Electrical Specifications

Code:	Incremental
Resolution:	1 to 10.000 ppr (pulses per revolution)
Supply Voltage:	4,5 Vdc min. to 30 Vdc max. ** (45 mA max. - no load)
Output Voltage:	Low: 500 mV max. at 10 mA High: (V_{in} – 0,6) at -10 mA (V_{in} – 1,3) at -25 mA
Output Current:	30 mA max. load ** per output channel
Frequency Response:	300 kHz max. **
Output Format:	Two channel (A, B) quadrature with Index (Z) and optional complementary (A-, B-, Z-) outputs
Phase Sense:	A leads B counterclockwise (CCW) from the shaft end of the encoder
Index:	Gated with Channel B low
Accuracy:	+/- 0,8 arc-min.
Outputs:	ASIC Push pull and Differential OL7272 Push-pull and Differential Line Driver 26C31 Differential Line Driver 5V output (with 5V input)
Electrical Protection:	Reverse polarity and output short circuit protected
Noise Immunity:	Tested to EN61000-6-2 : 2005 (industrial environments) Electromagnetic compatibility (EMC) and EN 61000-6-3 : 2007 (residential, commercial, and light-industrial environments) for Electromagnetic compatibility (EMC)

**= It is recommended user not to combine max. Value for all 3 parameters

Mechanical Specifications

Material:	Housing: Aluminum Cap: Aluminum Hollow Shaft: Stainless steel Note: Lifetime lubricated ball bearings
Weight:	Encoder: ~ 190 gr (6,7 oz) Cable: 60 gr / meter (2,12 oz / meter)
Bearing Life:	> 1,9 x 10^{10} revolutions at rated load
Shaft Speed:	6.000 rpm (max. sustained) IP 65 4.500 rpm (max. sustained) IP 66 / IP 67
Starting Torque:	< 0,02 Nm (2,83 oz-in) at 25° C
Mass Moment of Inertia:	6,0 gcm² (8,5 x 10^{-5} oz-in-sec²)
Shaft Loads:	Axial: 150 N (33,75 lbs) max. Radial: 250 N (56 lbs) max.

Environmental Specifications

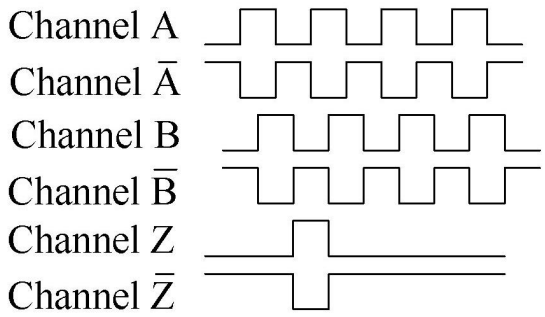
Operating Temp.:	-40° to +85° C
Storage Temp.:	-40° to +85° C
Shock:	100 G / 11 ms
Vibration:	10-2000 Hz / 10 G
Bump:	10 G / 16 ms (1000 x 3 axis)
Humidity:	98 % RH without condensation
IP Rating:	IP 65 / Nema 5 (approx.) IP 66 / Nema 6 (approx.) option IP 67 / Nema 7 (approx) option

Connection Options

Cable:	8 leads (0,14 mm², 26 AWG) twisted pairs; shielded
Connector:	5-pin M12 8-pin M12 9-pin M23 12-pin M23 6-pin Mil radial 7-pin Mil radial 10-pin Mil radial

Output waveform

CCW Seen from shaft end



Channel tolerance	**180 e° +/- 36 e°**
Phase difference tolerance	**90 e° +/- 18 e°**
Z channel tolerance	**180 e° +/- 18 e°**

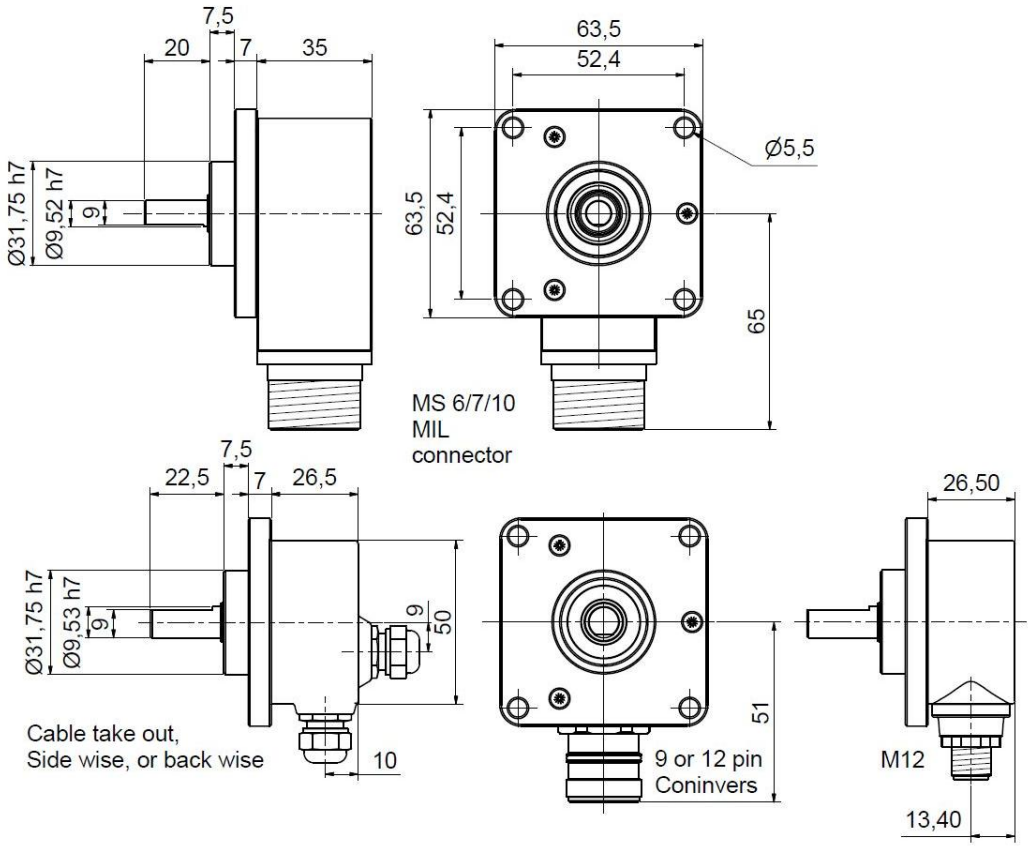
Disk Resolutions (Pulses per revolution)

1	32	125	720	3000
2	36	150	800	3072
5	40	180	1000	3600
6	45	200	1000	4000
7	47	250	1024	4096
8	50	256	1131	5000
10	60	300	1200	8192
12	64	360	1250	9000*
15	70	400	1270	10000*
16	75	455	1500	
18	80	500	2000	
20	90	512	2048	
25	100	600	2400	
30	120	635	2500	

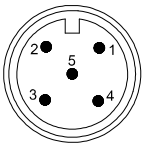
Other options on request
Pulses per revolution,
min. 1 – max. 10.000

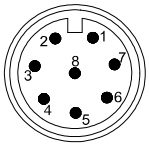
** Operating temperature: -20° C to 50° C*

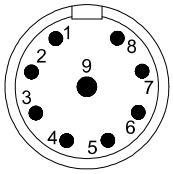
Mechanical Dimensions

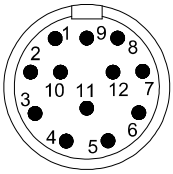


Output Terminations









	Standard Cable	
	Standard Output	Differential Output
Channel	Wire Color	
A	Pink	Pink
A -	*Gray**	Gray
B	Green	Green
B -	*Yellow**	Yellow
Z	White	White
Z -	*Brown**	Brown
Vsup	Red	Red
GND	Blue	Blue

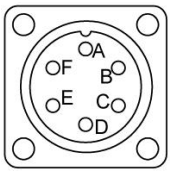
GND = Circuit Ground

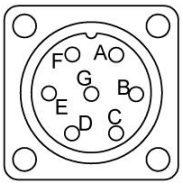
** Internally connected as GND*

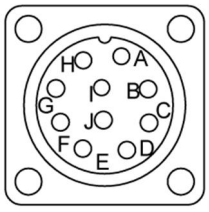
	M12 5 - pin	M12 8 - pin	M23 9 - pin	M23 9 - pin	M23 12 - pin	M23 12 - pin
	Standard Output	Differential Output	Standard Output	Differential Output	Standard Output	Differential Output
Pin	Channel	Channel	Channel	Channel	Channel	Channel
1	Vsup	A	A	A	GND	B -
2	B	Vsup	B	B	*NC*	*NC*
3	GND	A -	Z	Z	Z	Z
4	A	B	GND	A -	GND	Z -
5	Z	B -	GND	B -	A	A
6		Z	GND	Z -	GND	A -
7		GND	Vsup	Vsup	*NC*	*NC*
8		Z -	GND	GND	B	B
9			Shield	Shield	Shield	Shield
10					GND	GND
11					*NC*	*NC*
12					Vsup	Vsup

GND = Circuit Ground

Shield = Case Ground







	6-pin Mil Connector		7-pin Mil Connector			10-pin Mil Connector	
	Standard Output	Differential Output	Standard Output	Optional Standard Output *	Differential Output	Differential Output	Optional Differential Output *
Pin	Channel	Channel	Channel	Channel	Channel	Channel	Channel
A	GND	GND	Ch. A	Ch. A	Ch. A	Ch. A	Ch. A
B	Vsup	Vsup	Ch. B	Ch. B	Ch. B	Ch. B	Ch. B
C	Z	A -	Ch. Z	NC	Ch. A -	Ch. Z	Ch. A -
D	B	B	Vsup	Vsup	Vsup	Vsup	Vsup
E	A	A	NC	NC	Ch. B -	NC	Ch. B -
F	Shield	B -	0 volt	0 volt	0 volt	0 volt	0 volt
G			Shield	Shield	Shield	Shield	Shield
H						Ch. A -	NC
I						Ch. B -	NC
J						Ch. Z -	NC

Ordering Code

Example: 2Q – 1024 – D – 10 – 20 – 65 – 01 – S – 00

2Q	-		-		-		-		-		-		-	
		Pulses per Revolution		**Output**		**Shaft Dia.**		**Shaft Length**		**IP Rating**		**Cable Length**		**Cable Takeout**		**Connector**

Pulses per Revolution: See table

Output:

Standard	**N**
Standard - *Open Collector NPN*	**NON**
Standard - *Open Collector PNP*	**NOP**
Differential	**D**
26C31 Line Driver *5V input / 5V output*	**L**
26C31 Line Driver *9 to 30V input / 5V output*	**5L**
OL 7272 Line Driver	**M**

Shaft Dia. / Shaft Length:

Ø 6,35 (1/4 inch)	**1/4**	**-**	**20**
Ø 9,52 (3/8 inch)	**3/8**	**-**	**22**
Ø 8	**8**	**-**	**20**
Ø 10	**10**	**-**	**20**

IP Rating:

IP 65	**65**
IP 66	**66**
IP 67	**67**

Cable Length:

Standard is 1 meter	**01**
Specify length	**XX**
No Cable	**00**

Cable Takeout:

Side	*radial*	**S**
Back	*standard*	**B**

Connector:

M12	5-pin	**P5**
M12	8-pin	**P8**
M23	9-pin	**C9**
M23	12-pin	**C12**
No Connector		**00**
Mil 6		**C6**
Mil 7		**C7**
Mil 10		**C1**

Other options on request:
Please contact Scancon A/S