

# ROTAPULS

Incremental encoder

Series

I28



- Miniature incremental encoder, Ø 28mm
- Robust metal housing
- Resolution up to 2048 pulses/rev.
- For office equipment, electromedical and light industrial applications



I28

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP54
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

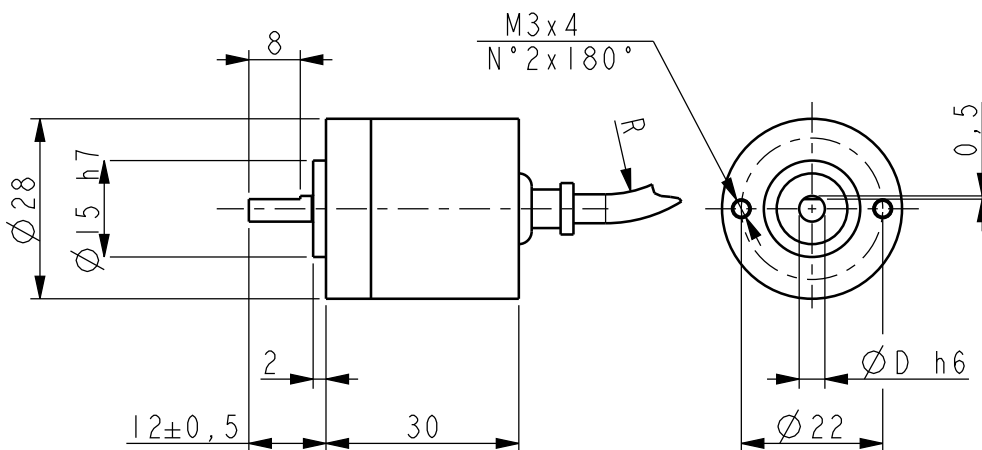
Dimensions:	see drawing
Shaft diameter:	Ø 4, 5 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	3000 rpm max.
Starting torque (at 20°C):	0,1 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 50 g (1,7 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	100-200-360-500-512-720-1000-1024-1440-2000-2048
Counting frequency:	30 ÷ 100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V,+5V +30V
Consumption:	50 mA max.
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes



I28

Order code

I28	-	X Ⓐ	-	XXXX Ⓑ	XXX Ⓒ	XX Ⓓ	XX Ⓔ	/Sxxx Ⓕ
-----	---	--------	---	-----------	----------	---------	---------	------------

<p>Ⓐ OUTPUT CIRCUITS</p> <p>Y = Push Pull L = Line Driver (RS422) H = PP/LD Universal circuit</p>	<p>Ⓑ RESOLUTION (PPR)</p> <p>See electrical specifications</p>	<p>Ⓒ OUTPUT SIGNALS</p> <p>BNF = AB BCU = AB, /AB ZNF = ABO ZCU = ABO, /ABO</p>	<p>Ⓓ SUPPLY VOLTAGE</p> <p>1 = <math>+5V \pm 5\%</math> (L output circuit) 2 = <math>+10V \div +30V</math> (Y output circuit) 4 = <math>+5V \div +30V</math> (H output circuit)</p>	<p>Ⓔ CUSTOM VERSION</p>	<p>Ⓕ CABLE LENGTH</p> <p>- = cable output 1 m (standard) L2 = cable output 2 m Lx = cable output x m</p>
---	--	---	---	-------------------------	--

# ROTAMAG

Magnetic incremental encoders

Series

MI36 • MC36



- Compact magnetic incremental encoder
- Resolution up to 2048 pulses/rev.
- Ø 6 mm solid or hollow shaft
- IP67 with sealed circuits (optional)



MI36 • MC36

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	• IP67 protection with sealed circuits

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	12000 rpm max.
Starting torque (at 20°C):	0,1 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 50 g (1,7 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

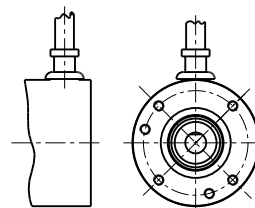
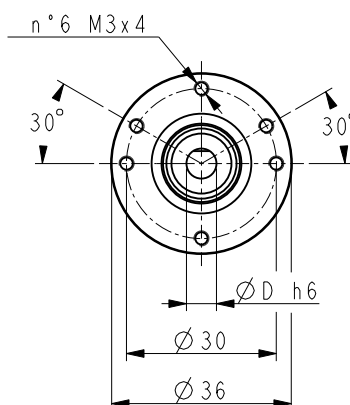
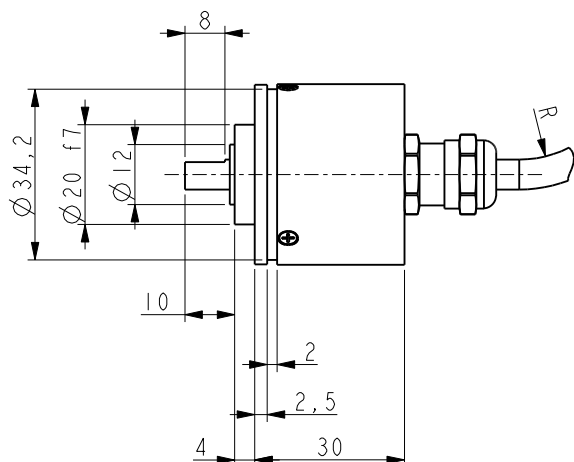
Resolution (PPR):	4-8-10-16-20-25-32-40-50-64-80-100-125-128 200-250-256-400-500-512-1024-2048
Accuracy:	± 1°
Counting frequency:	300 kHz max.
Output circuits:	NPN, Push-Pull, Line Driver
Power supply:	5Vdc ±5%, +10Vdc +30Vdc
Consumption:	50 mA max.
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4

## MATERIALS

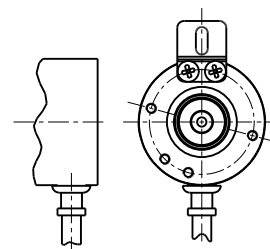
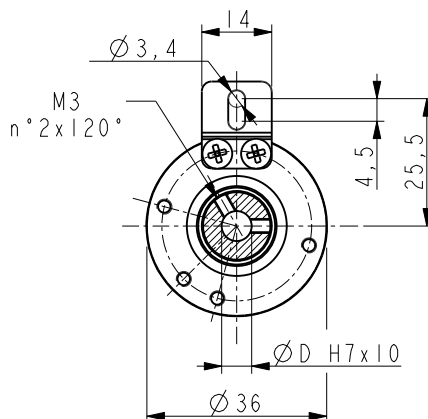
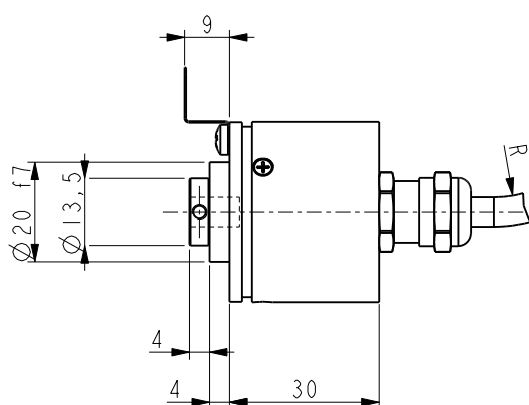
Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non magnetic, UNI EN 4305

## ACCESSORIES

PAN-6:	Aluminium coupling
PGF-6:	Flexible coupling



MI36



MC36

Order code

MI36	-	X	-	XXXX	XXX	X	X	X	X	XX	/Sxxx
MC36		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)

(a) OUTPUT CIRCUITS

N = NPN o.c.  
Y = Push Pull  
L = Line Driver (RS422)

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS

BNF = AB  
BCU = AB, /AB  
ZNF = ABO  
ZCU = ABO, /ABO

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V± +30V (Y or N output circuit)

(e) SHAFT DIAMETER

6 = 6 mm

(f) CONNECTION POSITION

- = axial  
R = radial

(g) PROTECTION

- = IP65  
J = IP67 with sealed circuits

(h) CABLE LENGTH

- = cable output 1 m (standard)  
L2 = cable output 2 m  
Lx = cable output x m

(i) CUSTOM VERSION

# ROTAMAG

Magnetic incremental encoder

Series

MI36K • MC36K



- Compact magnetic encoders
- Stainless steel housing for the food industry
- IP67 protection with sealed circuits (option)



MI36K • MC36K

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	• IP67 protection with sealed circuits

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6 mm
Shaft loading (axial and radial):	20 N max.
Shaft rotational speed:	12000 rpm max.
Starting torque (at 20°C):	0,1 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 50 g (1,7 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

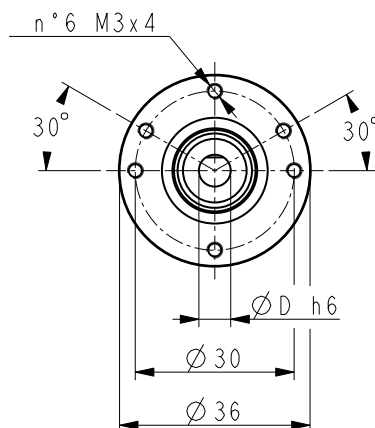
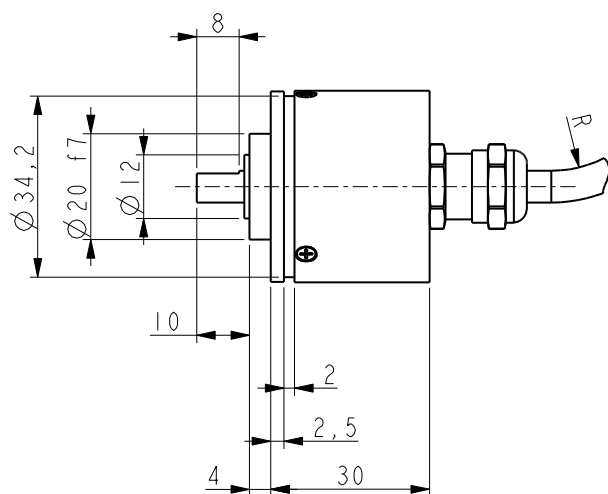
Resolution (PPR):	4-8-10-16-20-25-32-40-50-64-80-100-125-128 200-250-256-400-500-512-1024-2048
Accuracy:	± 1°
Counting frequency:	300 kHz max.
Output circuits:	NPN, Push-Pull, Line Driver
Power supply:	5Vdc ±5%, +10Vdc +30Vdc
Consumption:	50 mA max.
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4

## MATERIALS

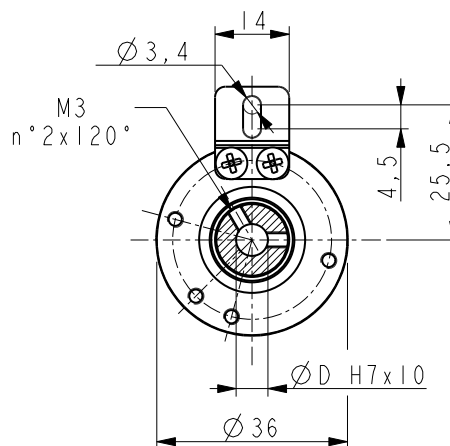
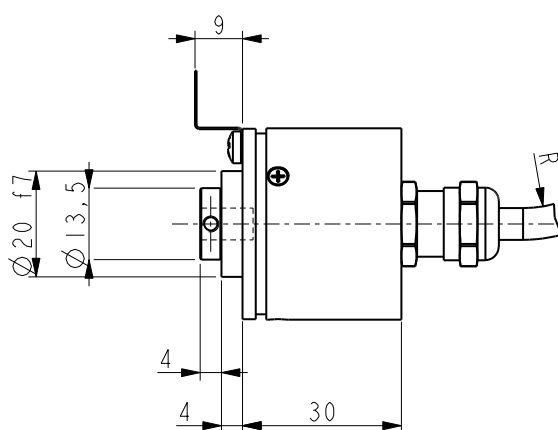
Flange:	AISI 303 stainless steel
Housing:	AISI 303 stainless steel
Bearings:	ABEC 5
Shaft:	AISI 303 stainless steel

## ACCESSORIES

MST5-16-6-6:	Stainless steel coupling
--------------	--------------------------



MI36K



MC36K

Order code

MI36K MC36K	-	X a	-	XXXX b	XXX c	X d	X e	X f	X g	XX h	/Sxxx i
----------------	---	--------	---	-----------	----------	--------	--------	--------	--------	---------	------------

<p><b>a</b> OUTPUT CIRCUITS</p> <p>N = NPN Y = Push Pull L = Line Driver (RS422)</p>	<p><b>c</b> OUTPUT SIGNALS</p> <p>ZNF = ABO ZCU = ABO, /ABO</p>	<p><b>e</b> SHAFT DIAMETER</p> <p>6 = 6 mm</p>	<p><b>h</b> CABLE LENGTH</p> <p>L1 = cable output 1 m (standard) L2 = cable output 2 m Lx = cable output x m</p>
<p><b>b</b> RESOLUTION (PPR)</p> <p>See electrical specifications</p>	<p><b>d</b> SUPPLY VOLTAGE</p> <p>1 = +5V±5% (L output circuit) 2 = +10V÷ +30V (Y or N output circuit)</p>	<p><b>f</b> CONNECTION POSITION</p> <p>- = axial</p>	<p><b>i</b> CUSTOM VERSION</p>
		<p><b>g</b> PROTECTION</p> <p>- = IP65 J = IP67 with sealed circuits</p>	

# ROTAPULS

Incremental encoders

Series

I40 • I41



- Compact industrial encoders
- Preferential versions with fast delivery
- Universal output circuit HTL/TTL
- High resolution up to 4096 PPR



I41 • I40

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	• IP65, IP66 protection shaft end

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 6.35 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque (at 20°C):	0,1 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 100 g (3,5 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	1-2-5-8-10-15-20-30-32-40-50-56-60-72-84-90-100-120 125-127-150-176-180-200-250-256-300-314-320-360-400 500-512-540-600-625-635-720-900-1000-1024(*)-1080-1200 1250-1440-1500-1600-1800-2000-2048(*)-2400-2500-2880 3600-4000(*)-4096(*)
(*) not available for I40 series	
Counting frequency:	50 ÷ 100 kHz max.
Output circuits:	NPN, PNP, Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

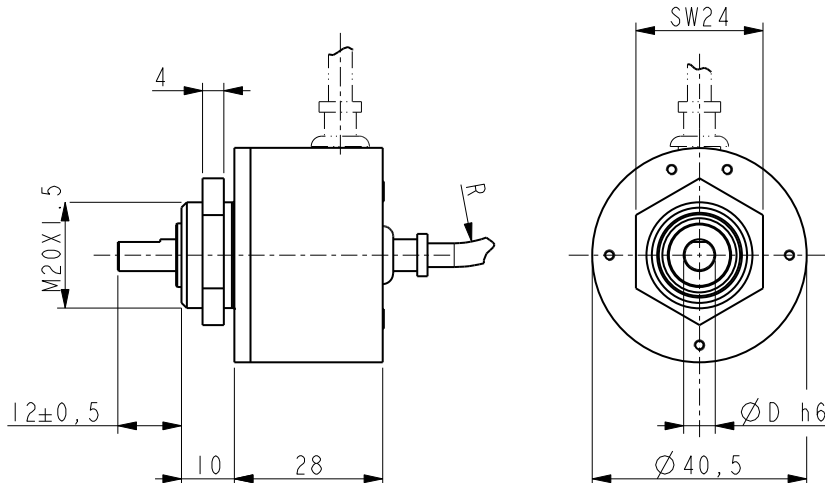
Flange:	anticorrosive, UNI EN AW-6082
Housing:	fibre glass epoxy resin
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## PREFERENTIAL MODELS

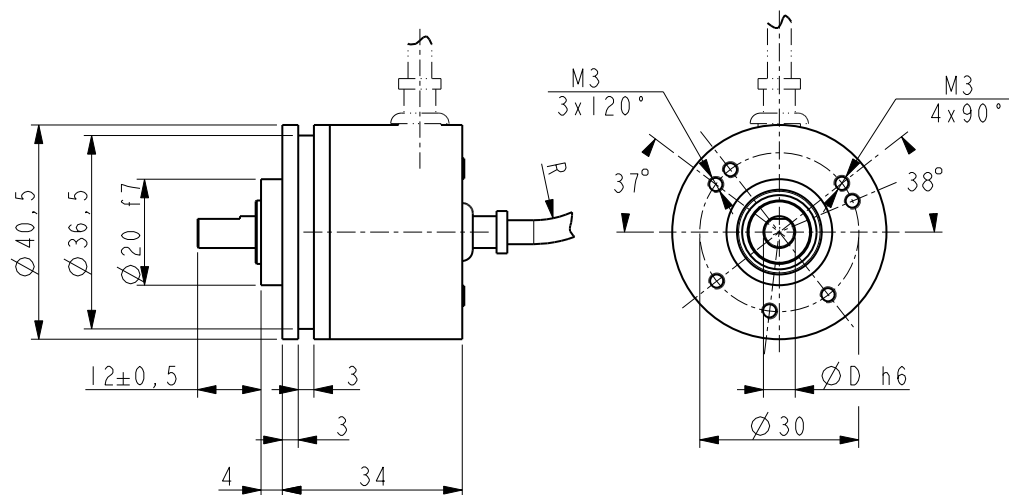
I41-H-100ZCU46L2	100 PPR, HTL/TTL output
I41-H-200ZCU46L2	200 PPR, HTL/TTL output
I41-H-360ZCU46L2	360 PPR, HTL/TTL output
I41-H-500ZCU46L2	500 PPR, HTL/TTL output
I41-H-1000ZCU46L2	1000 PPR, HTL/TTL output
I41-H-1024ZCU46L2	1024 PPR, HTL/TTL output

## ACCESSORIES

EDE9S:	9 pin DSub mating connector
PAN/PGF:	flexible couplings
LKM-386:	fixing clamps



I40



I41

Order code

I40	-	X	-	XXXX	XXX	X	XX	X	X	XX	/Sxxx
I41		Ⓐ		Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓘ

<p><b>Ⓐ OUTPUT CIRCUITS</b>                  N = NPN o.c.                  P = PNP o.c.                  Y = Push Pull                  L = Line Driver (RS422)                  H = PP/LD universal circuit</p> <p><b>Ⓑ RESOLUTION (PPR)</b>                  See electrical specifications</p>	<p><b>Ⓒ OUTPUT SIGNAL</b>                  BNF = AB                  BCU = AB, /AB                  ZNF = ABO                  ZCU = ABO, /ABO</p> <p><b>Ⓓ POWER SUPPLY</b>                  1 = +5V±5% (L output circuit)                  2 = +10V÷ +30V (Y, N, P output circuit)                  4 = +5V÷ +30V (H output circuit)</p>	<p><b>Ⓔ SHAFT DIAMETER</b>                  6 = 6 mm                  P6 = 6.35 mm - 1/4"</p> <p><b>Ⓕ PROTECTION</b>                  - = IP64                  P = IP65                  Q = IP66 shaft side (only I41)</p>	<p><b>Ⓖ CONNECTION POSITION</b>                  - = axial                  R = radial</p> <p><b>Ⓗ CABLE LENGTH</b>                  - = cable output 1 m (standard)                  L2 = cable output 2 m                  Lx = cable output x m                  CLx = x m cable with DSub 9 pin inline plug</p> <p><b>Ⓙ CUSTOM VERSION</b></p>
--	---	--	--



# ROTAPULS

Incremental encoders

Series

CK41 • CK46

- Compact hollow shaft encoders
- Preferential versions with fast delivery
- Universal output circuit
- Resolution up to 4096 PPR



CK46 • CK41

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Operating temperature range:	-25°C +85°C (-13°F, +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Protection:	IP64
Option:	• IP65 protection (3000 rpm max, torque 1 Ncm)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 6.35, 8 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	0,1 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 100 g (3,5 oz)
Options:	• additional cable • DSub 9 pin inline connector

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	1-2-5-8-10-15-20-30-32-40-50-56-60-72-84-90-100-120 125-127-150-176-180-200-250-256-300-314-320-360-400 500-512-540-600-625-635-720-900-1000-1024-1080-1200 1250-1440-1500-1600-1800-2000-2048-2400-2500-2880 3600-4000-4096
Counting frequency:	50 ÷ 100 kHz max.
Output circuits:	NPN, PNP, Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorrosive, UNI EN AW-6082
Housing:	fibre glass epoxy resin
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## PREFERENTIAL MODELS

CK41-H-1000ZCU46L2	1000 PPR, HTL/TTL output
CK41-H-1024ZCU46L2	1024 PPR, HTL/TTL output
CK41-H-2000ZCU46L2	2000 PPR, HTL/TTL output
CK41-H-2048ZCU46L2	2048 PPR, HTL/TTL output

## ACCESSORIES

EDE9S:	9 pin DSub mating connector
--------	-----------------------------



# ROTAPULS

Incremental encoder

Series

C50



- Best selling small size hollow shaft encoder
- Ideally suited for motor feedback applications
- Extended standard operating temperature from -40°C to 100°C
- Preferential versions with fast delivery
- Universal output circuit TTL/HTL 5-30Vdc



C50

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-40°C + 100°C (-40°F + 212°F)
Storage temperature range:	-40°C + 100°C (-40°F + 212°F) (98% R.H. without condensation)
Option:	<ul style="list-style-type: none"> <li>• IP54 Protection</li> </ul> (low inertia bearings, 10000 rpm for short periods)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	∅ 6, 6.35, 8, 9.52, 10 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque (at 20°C):	≤ 0,25 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 100 g (3,5 oz)
Options:	<ul style="list-style-type: none"> <li>• additional cable</li> <li>• DSub 9 pin inline connector</li> </ul>

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	100-180-200-250-256-300-360-400-500-512-600 1000-1024-2000-2048-4096
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

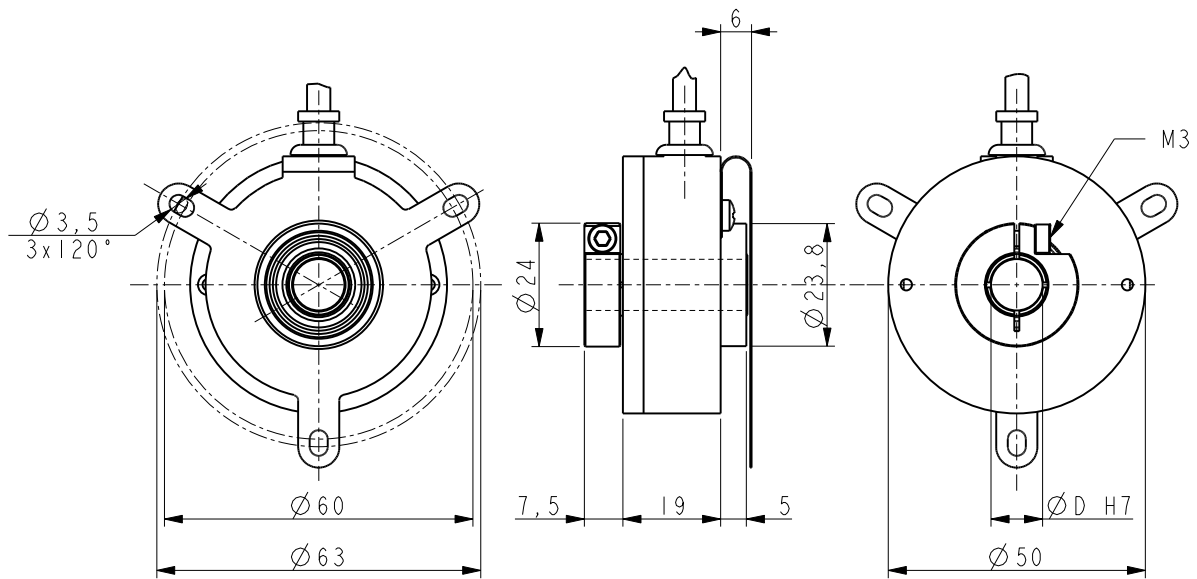
Flange:	zamac die cast
Housing:	zamac die cast
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## PREFERENTIAL MODELS

C50-H-100ZCU410	100 PPR, HTL/TTL output
C50-H-360ZCU410	360 PPR, HTL/TTL output
C50-H-500ZCU410	500 PPR, HTL/TTL output
C50-H-1000ZCU410L2	1000 PPR, HTL/TTL output
C50-H-1024ZCU410L2	1024 PPR, HTL/TTL output

## ACCESSORIES

EDE9S:	9 pin DSub mating connector
--------	-----------------------------



C50

Order code

C50	-	X	-	XXXX	XXX	X	XX	X	XX	/Sxxx
		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)

<p><b>(a) OUTPUT CIRCUITS</b>                  Y = Push Pull                  L = Line Driver (RS422)                  H = PP/LD universal circuit</p> <p><b>(b) RESOLUTION (PPR)</b>                  See electrical specifications</p>	<p><b>(c) OUTPUT SIGNALS</b>                  BNF = AB                  BCU = AB, /AB                  ZNF = ABO                  ZCU = ABO, /ABO</p> <p><b>(d) SUPPLY VOLTAGE</b>                  1 = +5V±5% (L output circuit)                  2 = +10V÷ +30V (Y output circuit)                  4 = +5V÷ +30V (H output circuit)</p>	<p><b>(e) SHAFT DIAMETER</b>                  6 = 6 mm                  P6 = 6.35 mm - 1/4"                  8 = 8 mm                  P9 = 9.52 mm - 3/8"                  10 = 10 mm</p> <p><b>(f) PROTECTION</b>                  - = IP65 (standard)                  V = IP54 (low inertia bearings)</p>	<p><b>(g) CABLE LENGTH</b>                  - = cable output 1 m (standard)                  L2 = cable output 2 m                  Lx = cable output x m                  CLx = x m cable with DSub 9 pin inline plug</p>
			<b>(h) CUSTOM VERSION</b>

# ROTAPULS

Incremental encoder

Series

C51



- Small size incremental encoder with high resolution
- DC and AC motor feedback



C51

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP54
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	• IP65 Protection

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 6, 6.35, 8, 9.52, 10 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	3000 rpm max.
Starting torque at 20°C:	≤ 1,5 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	cabl output 1 m (3.3 ft)
Weight:	~ 100 g (3,5 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

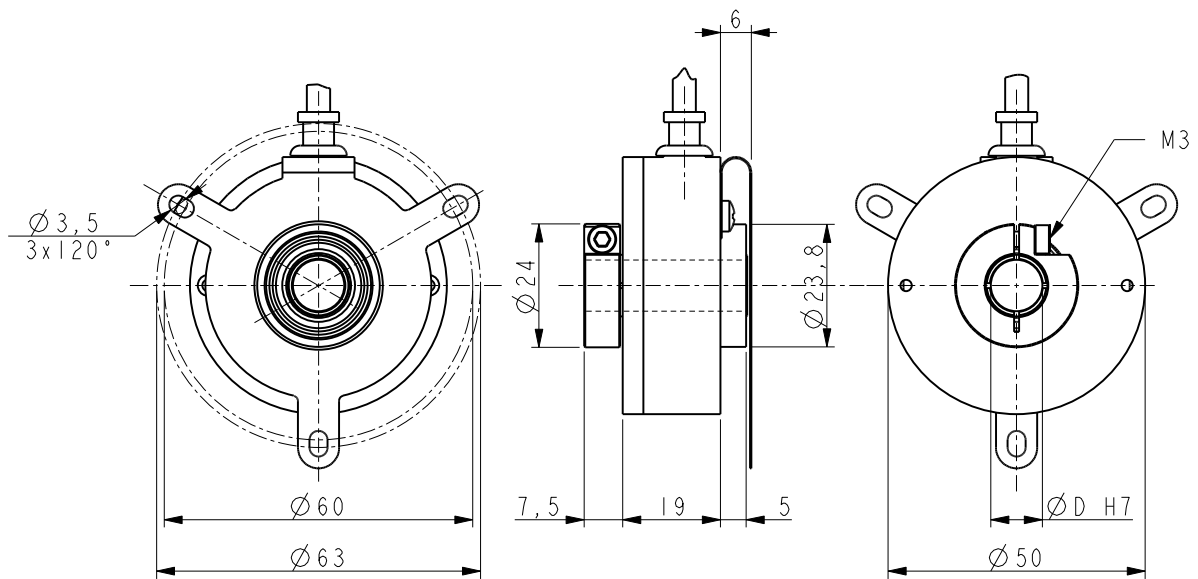
Resolution (PPR):	6-10-12-15-25-36-40-45-50-60-80-90-900 1500-2000-2048-2500
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V,+5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorrosional, UNI EN AW-6082
Housing:	anticorrosional, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EDE9S:	9 pin DSub mating connector
--------	-----------------------------



C51

Order code

C51	-	X (a)	-	XXXX (b)	XXX (c)	X (d)	XX (e)	X (f)	XX (g)	/Sxxx (h)
-----	---	----------	---	-------------	------------	----------	-----------	----------	-----------	--------------

(a) OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS

BNF = AB  
BCU = AB, /AB  
ZNF = AB0  
ZCU = AB0, /AB0

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

6 = 6 mm  
P6 = 6.35 mm - 1/4"  
8 = 8 mm  
P9 = 9.52 mm - 3/8"  
10 = 10 mm

(f) PROTECTION

- = IP54 (standard)  
P = IP65

(g) CABLE LENGTH

- = cable output 1 m (standard)  
L2 = cable output 2 m  
Lx = cable output x m  
CLx = x m cable with DSub 9 pin inline plug

(h) CUSTOM VERSION

# ROTAPULS

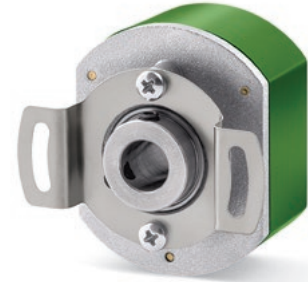
Feedback encoder for brushless motors

Series

CB50



- Brushless motor (BLDC) feedback encoder
- UVW commutation signals
- Easy installation with PCB connector
- Compact through hollow shaft encoder



CB50

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP20
Operating temperature range:	-20°C +100°C (-4°F + 212°F)
Storage temperature range:	-20°C +100°C (-4°F + 212°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 6, 6.35, 8, 9.52, 10 mm
Shaft loading (axial, radial):	20 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	0,2 Ncm (typical)
Misalignment:	± 0,3 mm axial ± 0,06 mm radial ± 0,2° angular
Bearings life:	2 x 10 <sup>9</sup> rev. min.
Electrical connections:	pins or PCB connection cable
Weight:	~ 100 g (3,5 oz)

## ELECTRICAL SPECIFICATIONS

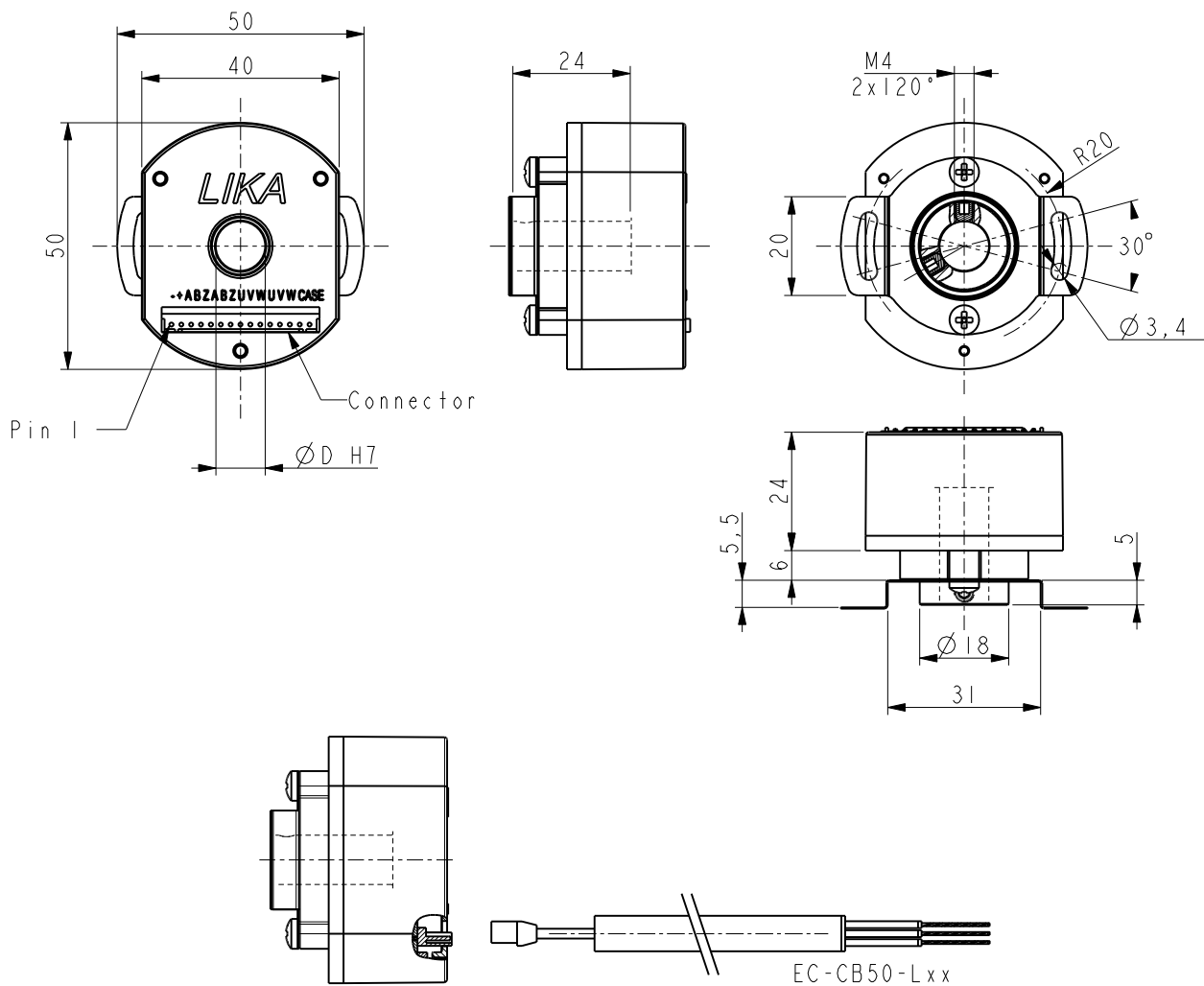
Pulse rate - Poles:	1000-1024-1250-2000-2048-2500
U, V, W commutations signals:	4 - 6 - 8 poles
Counting frequency:	100 ÷ 200 kHz max.
Output circuits:	Push-Pull, Line Driver
Power supply:	+5V±5%, +10V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	zamac die cast
Housing:	plastic, NYLON 6 FV 15%
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EC-CB50:	mating connector with cable (30 cm/11.8 in.)
----------	---



CB50

Order code

CB50	-	X (a)	-	XXXX (b)	/	X (c)	X (d)	XX (e)	/Sxxx (f)
------	---	----------	---	-------------	---	----------	----------	-----------	--------------

(a) OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)

(b) RESOLUTION (PPR)

1000, 1024, 1250, 2000, 2048, 2500

(c) N° POLES

4 = 4 poles  
6 = 6 poles  
8 = 8 poles

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)

(e) SHAFT DIAMETER

6 = 6 mm  
P6 = 6.35 mm - 1/4"  
8 = 8 mm  
P9 = 9.52 mm - 3/8"  
10 = 10 mm

(f) CUSTOM VERSION



# ROTAPULS

Incremental encoders

Series

I58 • I58S



- Standard encoder for general industrial application
- Pulse rates up to 10000 PPR (real)
- Servo or clamp flange mounting
- High operating temperature range (optional)
- Line Driver, HTL and sine/cosine output circuits



I58 • I58S

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"> <li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li> <li>• IP65 Protection</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 8, 9.52, 10, 12 mm
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	typ. 6000 rpm / 12000 temporary
Starting torque at 20°C:	I58: 0,15 Ncm / I58S: 0,4 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M12, M23 plug or cable output 1 m (3.3 ft)
Weight:	~ 200 g (7 oz)
Options:	<ul style="list-style-type: none"> <li>• additional cable</li> <li>• DSub 9 pin inline plug</li> </ul>

## ELECTRICAL SPECIFICATIONS

Resolution (PPR): (output circuit N, P, Y, L, H)	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80-90 100-120-127-142-150-160-180-200-216-230-236-240-250-254 256-267-270-300-314-360-375-400-410-435-471-500-512-600 635-720-750-800-900-1000-1024-1068-1200-1250-1270-1400 1440-1500-1800-2000-2048-2250-2400-2500-3000-3600-4000 4096-5000-6000-8192-9000-10000
Resolution (PPR): (output circuit V)	500-512-1000-1024-1250-2000-2048-2500
Counting frequency:	100 kHz max.
Output circuits:	NPN, PNP, Push-Pull, Line Driver, Universal circuit, Sine/cosine
Power supply:	+5V±5%, +10V +30V,+5V +30V (sine/cosine only +5V±5%)
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L and V circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	<ul style="list-style-type: none"> <li>• Counting frequency up to 300 kHz</li> <li>• Line Driver 24/5V</li> </ul>

## MATERIALS

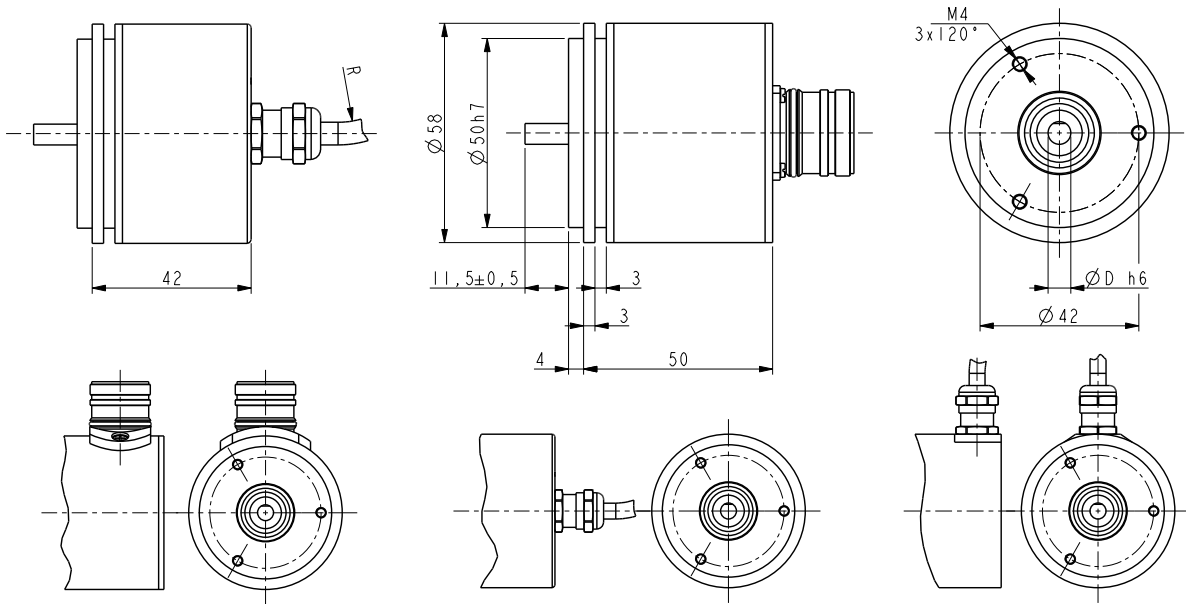
Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## PREFERENTIAL MODELS

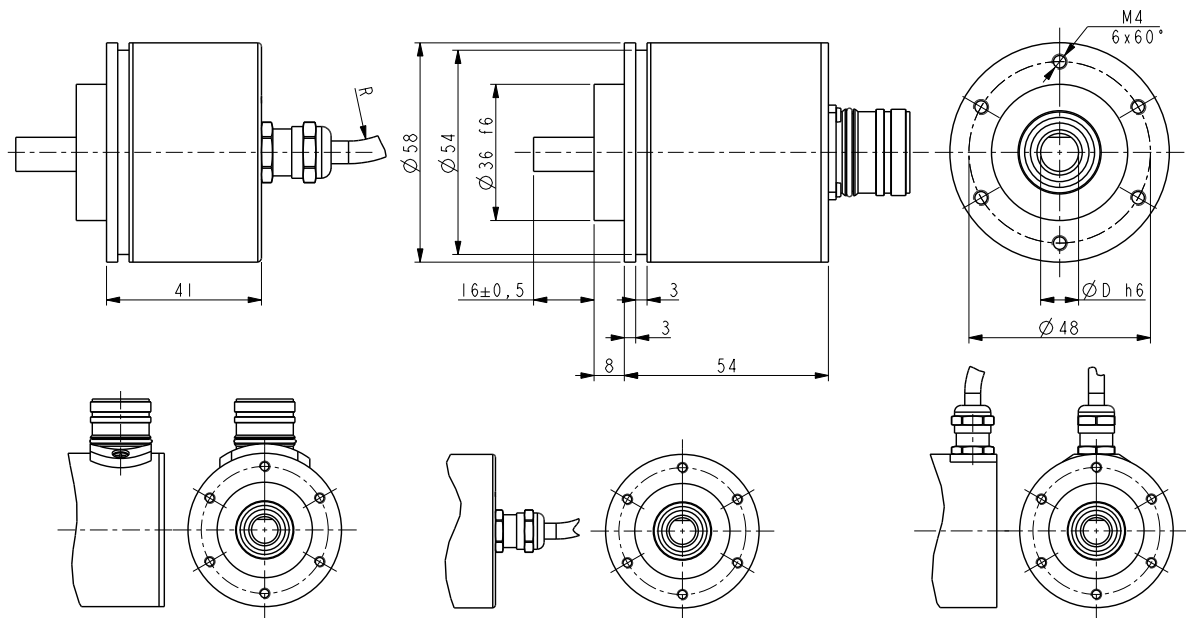
I58-H-500ZCU46RL2	I58-H-500ZCZ46R
I58-H-1000ZCU46RL2	I58-H-1000ZCZ46R
I58-H-1024ZCU46RL2	I58-H-1024ZCZ46R
I58-H-2048ZCU46RL2	I58-H-2048ZCZ46R
I58-H-2500ZCU46RL2	I58-H-2500ZCZ46R
I58-H-500ZCZ46	I58S-H-500ZCZ410R
I58-H-1000ZCZ46	I58S-H-1000ZCZ410R
I58-H-1024ZCZ46	I58S-H-1024ZCZ410R
I58-H-2048ZCZ46	I58S-H-2048ZCZ410R
I58-H-2500ZCZ46	I58S-H-2500ZCZ410R

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
EC-C12F-LK-I8-x:	cordset x meter, M23 connector
EDE 9S:	9 pin DSub mating connector
PAN/PGF:	flexible couplings
LKM-386:	fixing clamps



158



158S

Order code

I58	-	X	-	XXXXX	XXX	X	XX	X	X	X	X	XX	/Sxxx
I58S		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)

(a) OUTPUT CIRCUITS

N = NPN o.c.  
 P = PNP o.c.  
 Y = Push Pull  
 L = Line Driver (RS422)  
 H = PP/LD universal circuit  
 V = 1 Vpp sine/cosine

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

BNF = AB, cable output (except V output)  
 ZNF = ABO, cable output (except V output)  
 BCU = AB /AB, cable output  
 ZCU = ABO /ABO, cable output  
 BCZ = AB /AB, M23 12 pin plug  
 ZCZ = ABO /ABO, M23 12 pin plug  
 ZCM = ABO /ABO, M12 8 pin plug

(d) SUPPLY VOLTAGE

1 = +5V±5% (L, V output circuit)  
 2 = +10V÷ +30V (N, P, Y output circuit)  
 4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

6 = 6 mm  
 8 = 8 mm  
 P9 = 9.52 mm - 3/8"  
 10 = 10 mm  
 12 = 12 mm

(f) CONNECTION POSITION

- = axial  
 R = radial

(g) PROTECTION

- = IP64 (standard)  
 P = IP65

(h) COUNTING FREQUENCY

- = 100 kHz (standard)  
 W = 300 kHz

(i) OPERATING TEMPERATURE

- = -25°C +85°C (-13°F +185°F) standard  
 K = -40°C +100°C (-40°F +212°F)

(j) CABLE LENGTH

- = cable output 1 m (standard)  
 L2 = cable output 2 m  
 Lx = cable output x m  
 CLx = x m cable with DSub 9 pin inline plug

(k) CUSTOM VERSION

# ROTAPULS

Incremental encoder

Series

I58SK



- Stainless steel encoder for the food industry
- IP67 washdown protection
- Clamp flange mounting
- Cable or M23 connector output
- HTL, TTL and sine/cosine output



I58SK

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP67
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Options:	• Operating temperature range: -40°C +100°C (-40°F +212°F)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 8, 9.52, 10, 12 mm
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	6000 rpm
Starting torque at 20°C:	0,4 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M23 nichel plated plug or axial cable 1 m (3.3 ft)
Weight:	~ 500 g (17,6 oz)
Options:	• additional cable

## ELECTRICAL SPECIFICATIONS

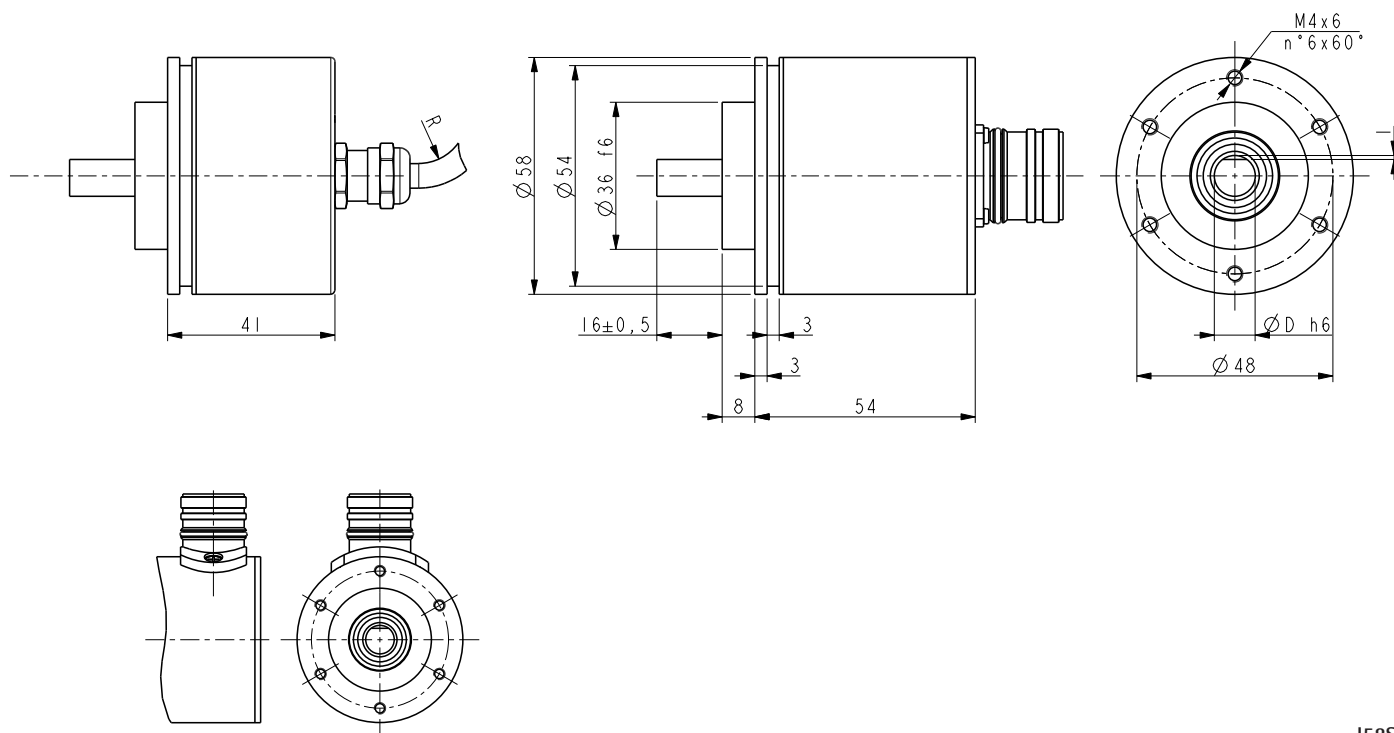
Resolution (PPR): (output circuit N, P, Y, L, H)	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80-90 100-120-127-142-150-160-180-200-216-230-236-240-250-254 256-267-270-300-314-360-375-400-410-435-471-500-512-600 635-720-750-800-900-1000-1024-1068-1200-1250-1270-1400 1440-1500-1800-2000-2048-2250-2400-2500-3000-3600-4000 4096-5000-6000-8192-9000-10000
Resolution (PPR): (output circuit V)	500-512-1000-1024-1250-2000-2048-2500
Counting frequency:	100 kHz max.
Output circuits:	NPN o.c., PNP o.c., Push-Pull, Line Driver, Universal circuit, Sine/cosine
Power supply:	+5V±5%, +10V +30V,+5V +30V (sine/cosine only +5V±5%)
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L and V circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Options:	• Counting frequency up to 300 kHz • Line Driver 24/5V

## MATERIALS

Flange:	AISI 410 stainless steel
Housing:	AISI 410 stainless steel
Bearings:	ABEC 5
Shaft:	AISI 303 stainless steel

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
EC-C12F-LK-l8-x:	cordset x meter with M23 connector
MWSS, MSTs:	stainless steel flexible couplings



I58SK

Order code

I58SK	-	X	-	XXXXX	XXX	X	XX	X	X	X	XX	/Sxxx
		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)

<p><b>(a) OUTPUT CIRCUITS</b>                  N = NPN o.c.                  Y = Push Pull                  L = Line Driver (RS422)                  H = PP/LD universal circuit                  V = 1 Vpp (sine/cosine)</p> <p><b>(b) RESOLUTION (PPR)</b>                  See electrical specifications</p> <p><b>(c) OUTPUT SIGNALS / CONNECTIONS</b>                  ZCU = ABO /ABO, cable output                  ZCY = ABO /ABO, M23 12 pin plug</p>	<p><b>(d) SUPPLY VOLTAGE</b>                  1 = +5V±5% (L, V output circuit)                  2 = +10V÷ +30V (N, P, Y output circuit)                  4 = +5V÷ +30V (H output circuit)</p> <p><b>(e) SHAFT DIAMETER</b>                  6 = 6 mm                  8 = 8 mm                  P9 = 9.52 mm - 3/8"                  10 = 10 mm                  12 = 12 mm</p>	<p><b>(f) CONNECTION POSITION</b>                  - = axial (standard)                  R = radial (only with M23 connector)</p> <p><b>(g) COUNTING FREQUENCY</b>                  - = 100 kHz standard                  W = 300 kHz</p> <p><b>(h) OPERATING TEMPERATURE</b>                  - = -25°C +85°C (-13°F +185°F) standard                  K = -40°C +100°C (-40°F +212°F)</p>	<p><b>(i) CABLE LENGTH (not with ZCY)</b>                  L1 = cable output 1 m (standard)                  L2 = cable output 2 m                  Lx = cable output x m</p>
---	---	---	---

**(j) CUSTOM VERSION**

# ROTAPULS

Programmable incremental encoder

Series

IP58 • IP58S • CKP58



- Programmable incremental encoder
- Resolution from 1 to 65536 PPR
- Freely programmable index (push-button)
- Counting direction cw, ccw
- Push-Pull + Line Driver compatible output
- Selectable output voltage 5Vdc or 10-30Vdc
- Programmable via USB cable



IP58

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	• Operating temperature range: -40°C +100°C (-40°F +212°F)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 8, 9.52, 10, 12 mm
Hollow shaft diameter:	Ø 14, 15 mm
Reducing sleeves BR1-xx from Ø 15 to:	Ø 6, 8, 9.52, 10, 11, 12 mm
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	typ. 6000 rpm / 12000 temporary
Starting torque at 20°C:	IP58: 0,15 Ncm / IP58S, CKP58: 0,4 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M12, M23 plug or cable output 1 m (3.3 ft)
Weight:	~ 200 g (7 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

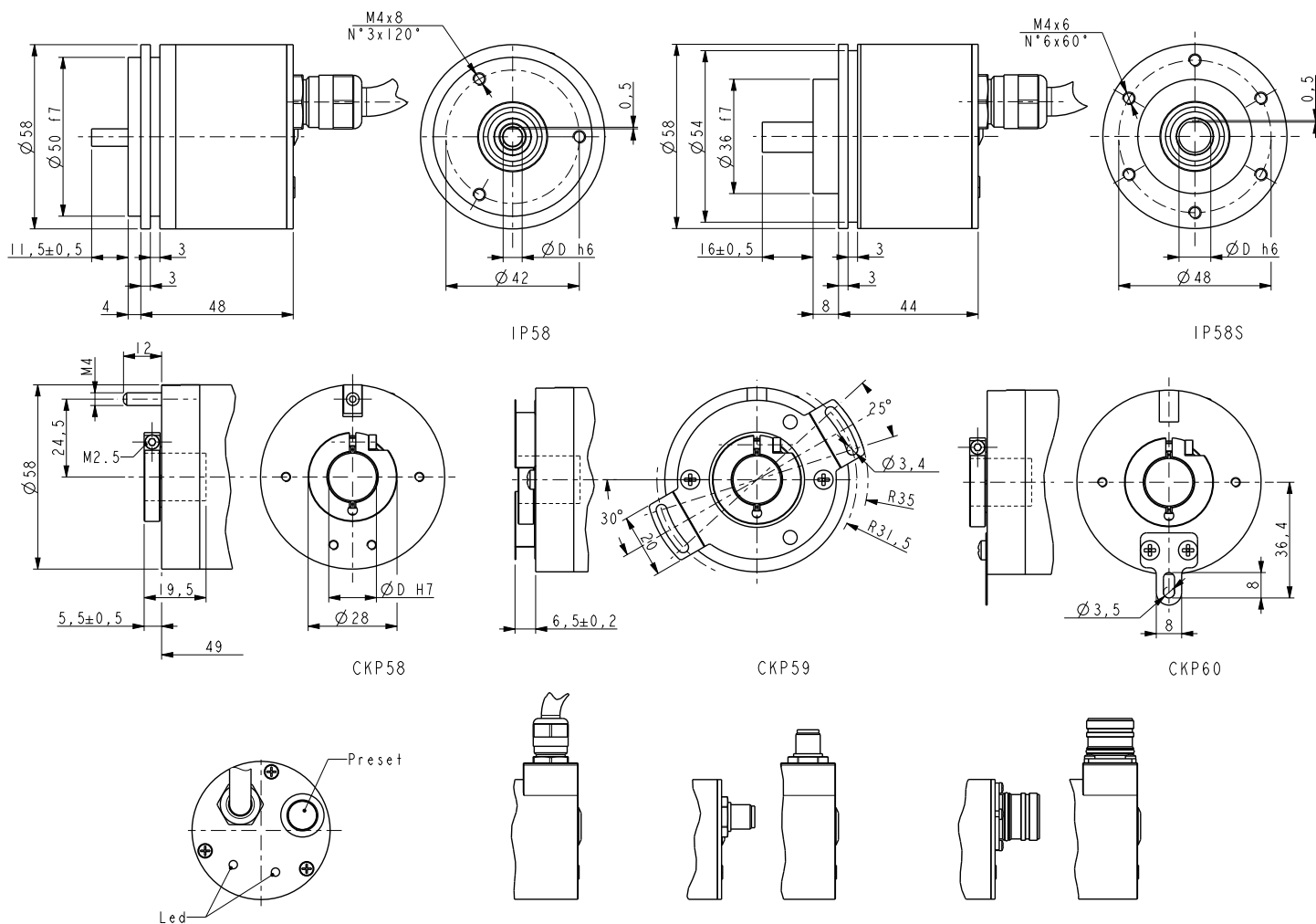
Resolution (PPR):	programmable from 1 to 65536
Counting frequency:	800 kHz max.
Output circuits:	Universal output (PP+LD compatible) 24/5V output programmable
Power supply:	+5V +30V
Consumption:	400 mW (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short cut
EMC:	electro-magnetic immunity, EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
BR1-xx:	reducing sleeves
PAN/PGF:	flexible couplings
KIT IP58:	USB programming kit



Order code

IP58	-	X	-	XXXX	XXX	X	XX	X	XX	/Sxxx
IP58S		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)
CKP58										

<p><b>(a) OUTPUT CIRCUITS</b> H = PP/LD universal circuit</p> <p><b>(b) RESOLUTION (PPR)</b> PROG = programmable</p> <p><b>(c) OUTPUT SIGNALS / CONNECTIONS</b> ZCU = ABO /ABO, cable output ZCZ = ABO /ABO, M23 12 pin plug ZCM = ABO /ABO, M12 8 pin plug</p>	<p><b>(d) SUPPLY VOLTAGE</b> 4 = +5V ÷ +30V</p> <p><b>(e) SHAFT DIAMETER</b> 6 = 6 mm 8 = 8 mm P9 = 9.52 mm - 3/8" 10 = 10 mm 12 = 12 mm 14 = 14 mm (only CKP58) 15 = 15 mm (only CKP58)</p>	<p><b>(f) CONNECTION POSITION</b> - = axial R = radial</p> <p><b>(g) CABLE LENGTH</b> - = cable output 1 m (standard) L2 = cable output 2 m Lx = cable output x m</p> <p><b>(h) CUSTOM VERSION</b></p>
---	--	--

# ROTAPULS

Incremental encoders

Series

C58 • C59 • C60



- Compact through hollow shaft encoders
- M23, M12 connector or cable output
- Ø15 or Ø14 mm shaft, other diameters with reduction sleeves
- Universal output circuit PP/LD



C60 • C58 • C59

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"> <li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li> <li>• IP65 Protection (3000 rpm max, torque 1 Ncm)</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 14, 15 mm
Shaft loading (axial, radial):	30 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	1 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M12, M23 plug or cable output 1 m (3.3 ft)
Weight:	~ 150 g (5,2 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

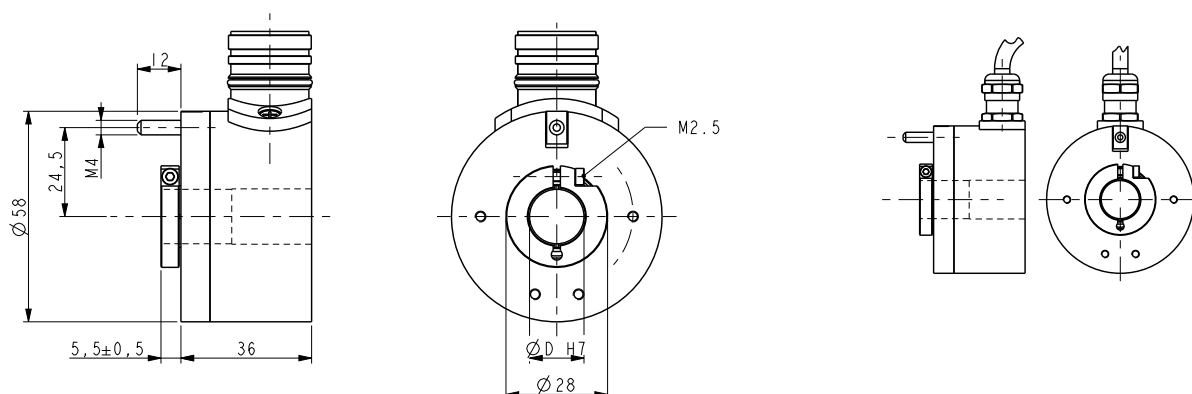
Resolution (PPR):	4-5-10-12-15-16-20-24-25-30-35-36-40-45-50-60-70 80-90-100-120-125-142-150-180-200-236-250-256 267-300-314-360-400-433-435-471-500-600-635-720 784-875-900-1000-1024-1250-1800-2000-2048-2500 3600-4000-4096-5000
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (per channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	counting frequency up to 300 kHz

## MATERIALS

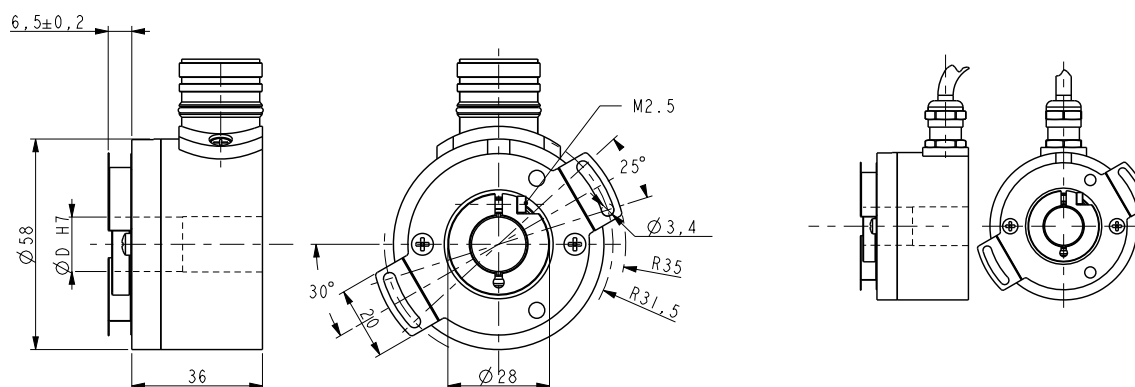
Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

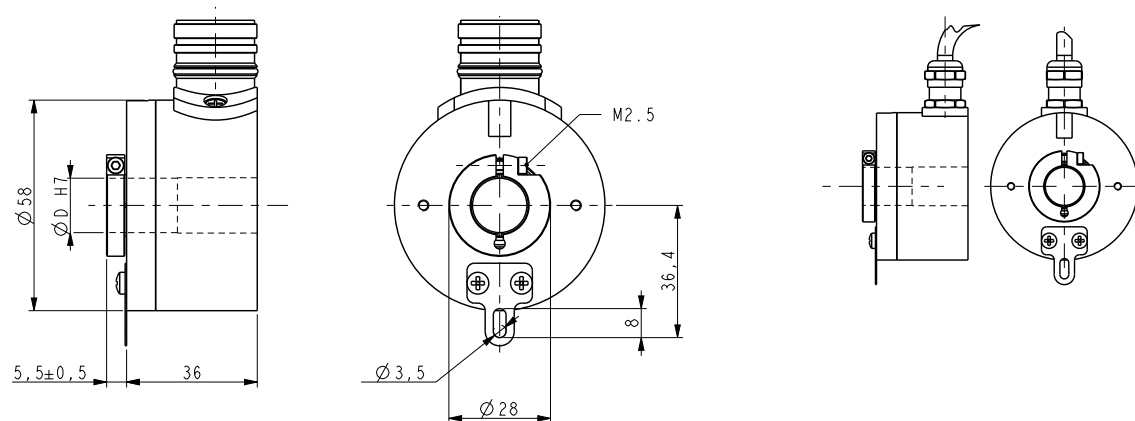
EPFL 121:	12 pin M23 mating connector
EC-C12F-LK-I8-x:	cordset x meter with M23 conn.
EC-M12F8-LK-M8-5:	cordset 5 meters with M12 conn.
EDE9S:	9 pin DSub mating connector
BR1:	Reducing sleeves



C58



C59



C60

Order code

C58	-	X	-	XXXXX	XXX	X	XX	X	X	X	XX	/Sxxx
C59		Ⓐ		Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓘ	⓵
C60												

<p><b>Ⓐ OUTPUT CIRCUITS</b>                  Y = Push Pull                  L = Line Driver (RS422)                  H = PP/LD universal circuit</p> <p><b>Ⓑ RESOLUTION (PPR)</b>                  See electrical specifications</p>	<p><b>Ⓒ OUTPUT SIGNALS / CONNECTIONS</b>                  BNF = AB cable output                  BCU = AB, /AB cable output                  ZNF = ABO cable output                  ZCU = ABO, /ABO cable output                  BCZ = AB /AB, M23 12 pin plug                  ZCZ = ABO /ABO, M23 12 pin plug                  ZCM = ABO /ABO, M12 8 pin plug</p> <p><b>Ⓓ SUPPLY VOLTAGE</b>                  1 = +5V±5% (L output circuit)                  2 = +10V÷ +30V (Y output circuit)                  4 = +5V÷ +30V (H output circuit)</p>	<p><b>Ⓔ SHAFT DIAMETER</b>                  14 = 14 mm                  15 = 15 mm</p> <p><b>Ⓕ PROTECTION</b>                  - = IP64 (standard)                  P = IP65</p> <p><b>Ⓖ COUNTING FREQUENCY</b>                  - = 100 kHz (standard)                  W = 300 kHz</p>	<p><b>Ⓗ OPERATING TEMPERATURE</b>                  - = -25°C +85°C (-13°F +185°F) standard                  K = -40°C +100°C (-40°F +212°F)</p> <p><b>Ⓘ CABLE LENGTH</b>                  (not with BCZ, ZCZ, ZCM)                  - = cable output 1 m (standard)                  L2 = cable output 2 m                  Lx = cable output x m                  CLx = x m cable with DSub 9 pin inline plug</p> <p><b>⓵ CUSTOM VERSION</b></p>
--	--	--	---



# ROTAPULS

Incremental encoders

Series

C58A • C58R



- Compact design, Ø 58 mm
- Through hollow shaft encoder
- Resolution up to 5000 pulses/rev.
- Feedback encoder for DC / AC motors
- C58A: fixing collar on front side
- C58R: fixing collar on back side



C58R • C58A

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	<ul style="list-style-type: none"> <li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li> <li>• IP65 Protection (3000 rpm max, torque 1 Ncm)</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 14, 15 mm
Shaft loading (axial, radial):	30 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	1 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M12, M23 plug or cable output 1 m (3.3 ft)
Weight:	~ 150 g (5,2 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

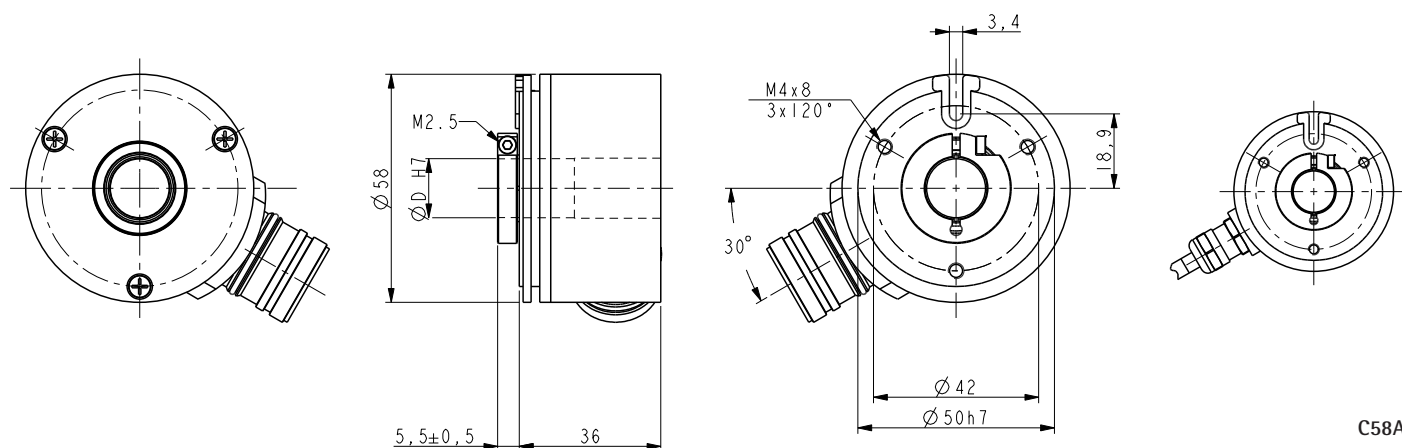
Resolution (PPR):	4-5-10-12-15-16-20-24-25-30-35-36-40-45-50-60-70 80-90-100-120-125-142-150-180-200-236-250-256 267-300-314-360-400-433-435-471-500-600-635-720 784-875-900-1000-1024-1250-1800-2000-2048-2500 3600-4000-4096-5000
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	counting frequency up to 300 KHz

## MATERIALS

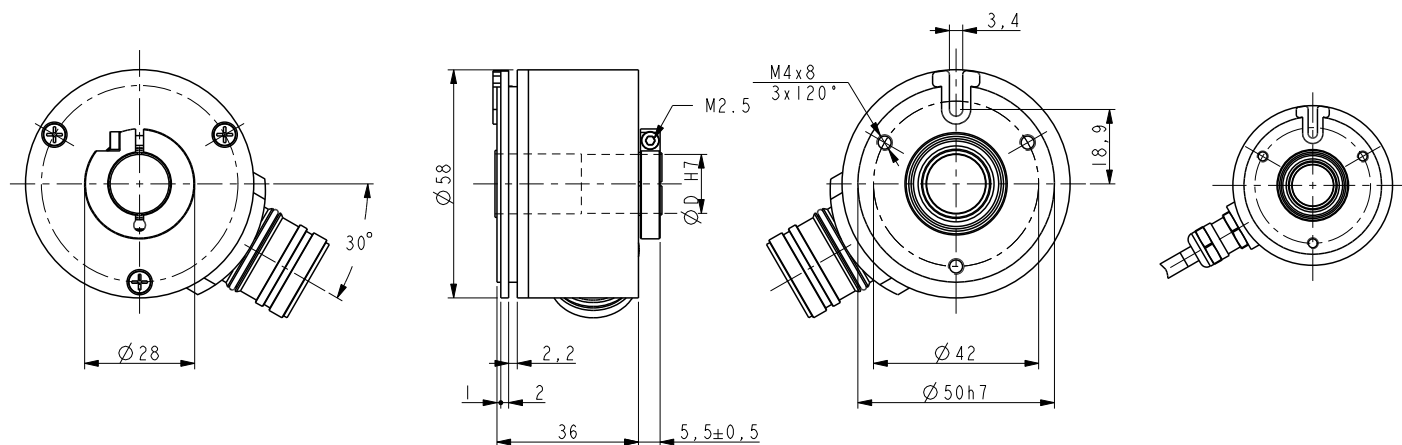
Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
EC-C12F-LK-I8-x:	cordset x meter with M23 conn.
EC-M12F8-LK-M8-5:	cordset 5 meters with M12 conn.
EDE9S:	9 pin DSub mating connector
BR1:	Reducing sleeves



C58A



C58R

Order code

C58A	-	X	-	XXXXX	XXX	X	XX	X	X	X	XX	/Sxxx
C58R		Ⓐ		Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓘ	⓵

Ⓐ OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

Ⓑ RESOLUTION (PPR)

See electrical specifications

Ⓒ OUTPUT SIGNALS / CONNECTIONS

BNF = AB cable output  
BCU = AB, /AB cable output  
ZNF = ABO cable output  
ZCU = ABO, /ABO cable output  
BCZ = AB /AB, M23 12 pin plug  
ZCZ = ABO /ABO, M23 12 pin plug  
ZCM = ABO /ABO, M12 8 pin plug

Ⓓ SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

Ⓔ SHAFT DIAMETER

14 = 14 mm  
15 = 15 mm

Ⓕ PROTECTION

- = IP64 (standard)  
P = IP65

Ⓖ COUNTING FREQUENCY

- = 100 kHz (standard)  
W = 300 kHz

Ⓗ OPERATING TEMPERATURE

- = -25°C +85°C (-13°F +185°F) standard  
K = -40°C +100°C (-40°F +212°F)

Ⓘ CABLE LENGTH

(not with BCZ, ZCZ, ZCM)  
- = cable output 1 m (standard)  
L2 = cable output 2 m  
Lx = cable output x m  
CLx = x m cable with DSub 9 pin inline plug

⓵ CUSTOM VERSION

# ROTAPULS

Incremental encoders

Series

CK58 • CK59 • CK60



- Standard encoder for heavy industrial applications
- Blind hollow shaft up to Ø 15 mm
- Connector or cable output
- ABO or sine/cosine signals



CK60 • CK58 • CK59

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"> <li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li> <li>• IP65 Protection (typ. 3000 rpm / 6000 temporary)</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	14, 15 mm
Reducing sleeves from Ø 15 mm to:	Ø 6, 8, 9,52, 10, 11, 12 mm
Shaft loading (axial, radial):	50 N max.
Shaft rotational speed:	typ. 6000 rpm / 12000 temporary
Starting torque (at 20°C):	0,4 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M12, M23 plug or cable output 1 m (3.3 ft)
Weight:	~ 200 g (7 oz)
Options:	<ul style="list-style-type: none"> <li>• additional cable</li> <li>• DSub 9 pin inline plug</li> </ul>

## ELECTRICAL SPECIFICATIONS

Resolution (PPR): (output circuit N, P, Y, L, H)	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80 90-100-120-127-142-150160-180-200-216-230-236-240-250 254-256-267-270-300-314-360-375-400-410-435471-500-512 600-635-720-750-800-900-1000-1024-1068-1200-1250-1270 1400-1440-1500-1800-2000-2048-2250-2400-2500-3000-3600 4000-4096-5000-6000-8192-9000-10000
Resolution (PPR): (output circuit V)	500-512-1000-1024-1250-2000-2048-2500
Counting frequency:	100 kHz max.
Output circuits:	NPN, PNP, Push-Pull, Line Driver, Universal circuit, Sine/cosine
Power supply:	+5V±5%, +10V +30V,+5V +30V (sine/cosine only +5V±5%)
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L and V circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	<ul style="list-style-type: none"> <li>• Counting frequency up to 300 kHz</li> <li>• Line Driver 24/5V</li> </ul>

## MATERIALS

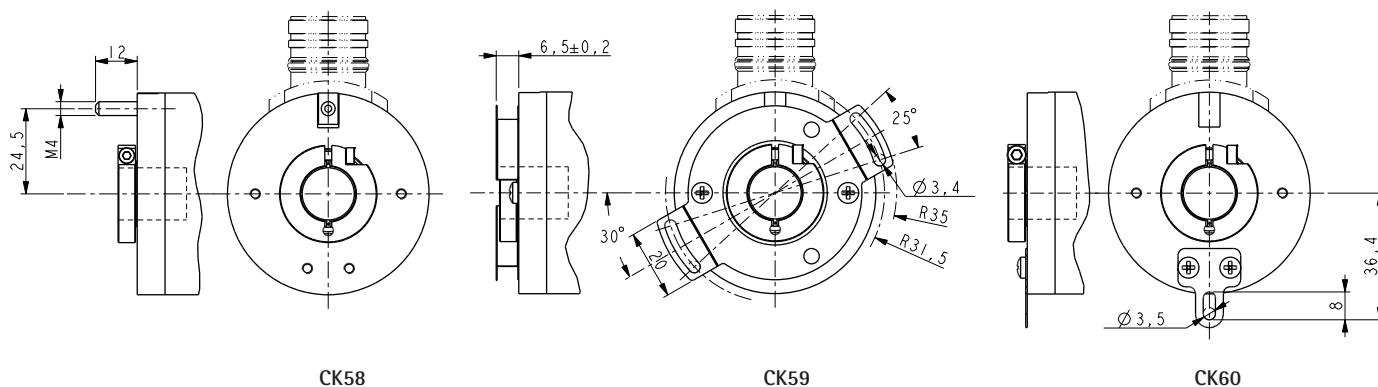
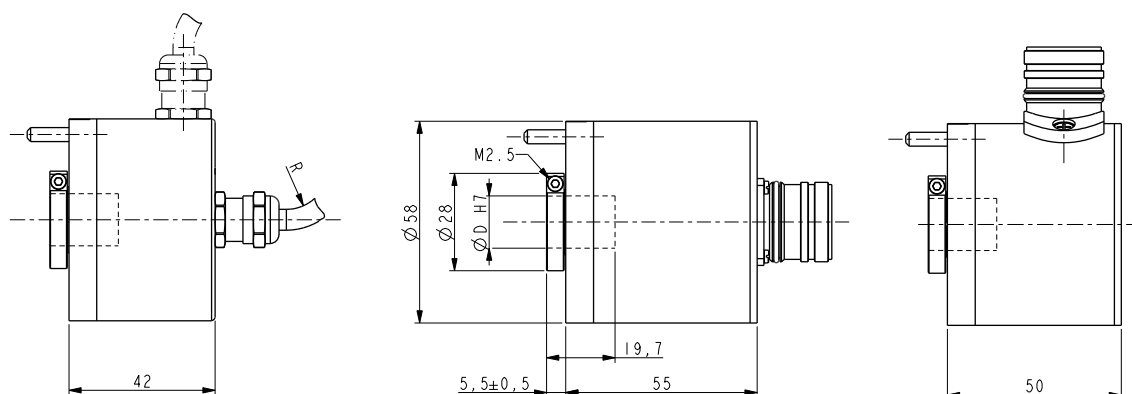
Flange:	anticorodal, UNI EN AW-6082
Housing:	anticorodal, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## PREFERENTIAL MODELS

CK58-H-500ZCU415R	500 PPR, HTL/TTL output
CK58-H-1000ZCU415R	1000 PPR, HTL/TTL output
CK58-H-1024ZCU415R	1024 PPR, HTL/TTL output
CK58-H-2048ZCU415R	2048 PPR, HTL/TTL output

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
EC-C12F-LK-l8-x:	cordset x meter with M23 conn.
EC-M12F8-LK-M8-5:	cordset 5 meters with M12 conn.
EDE9S:	9 pin DSub mating connector
BR1:	Reducing sleeves



CK58

CK59

CK60

Order code

CK58	-	X	-	XXXXX	XXX	X	XX	X	X	X	X	XX	/Sxxx
CK59		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
CK60													

<p><b>(a) OUTPUT CIRCUITS</b>                  N = NPN o.c.                  P = PNP o.c.                  Y = Push Pull                  L = Line Driver (RS422)                  H = PP/LD universal circuit                  V = 1 Vpp sine/cosine</p> <p><b>(b) RESOLUTION (PPR)</b>                  See electrical specifications</p>	<p><b>(c) OUTPUT SIGNALS / CONNECTIONS</b>                  BNF = AB, cable output (except V output)                  ZNF = ABO, cable output (except V output)                  BCU = AB /AB, cable output                  ZCU = ABO /ABO, cable output                  BCZ = AB /AB, M23 12 pin plug                  ZCZ = ABO /ABO, M23 12 pin plug                  ZCM = ABO /ABO, M12 8 pin plug</p> <p><b>(d) SUPPLY VOLTAGE</b>                  1 = +5V±5% (L, V output circuit)                  2 = +10V÷ +30V (N, P, Y output circuit)                  4 = +5V÷ +30V (H output circuit)</p>	<p><b>(e) SHAFT DIAMETER</b>                  6 = 6 mm                  8 = 8 mm                  P9 = 9.52 mm - 3/8"                  10 = 10 mm                  12 = 12 mm</p> <p><b>(f) CONNECTION POSITION</b>                  - = axial                  R = radial</p> <p><b>(g) PROTECTION</b>                  - = IP64 (standard)                  P = IP65</p>	<p><b>(h) COUNTING FREQUENCY</b>                  - = 100 kHz (standard)                  W = 300 kHz</p> <p><b>(i) OPERATING TEMPERATURE</b>                  - = -25°C +85°C (-13°F +185°F) standard                  K = -40°C +100°C (-40°F +212°F)</p> <p><b>(j) CABLE LENGTH</b>                  - = cable output 1 m (standard)                  L2 = cable output 2 m                  Lx = cable output x m                  CLx = x m cable with DSub 9 pin inline plug</p> <p><b>(k) CUSTOM VERSION</b></p>
---	---	--	---

# ROTAPULS

Feedback encoder for servo & gearless motors

Series

CB59 • CB60



- Feedback encoder for servo & gearless motors
- 2048 PPR sine/cosine output
- Absolute track for rotor/stator position
- Hollow or tapered shaft design
- Pin compatible connector with market products



CB59 • CB60

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP40
Operating temperature range:	-20°C+100°C (-4°F +212°F)
Storage temperature range:	-20°C+100°C (-4°F +212°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	hollow, Ø 12.7, 15 mm solid, 1:10 taper
Shaft loading (axial, radial):	40 N max.
Shaft rotational speed:	12000 rpm max.
Starting torque at 20°C:	0,15 Ncm (typical)
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	PCB connector (connection cable to be ordered separately)
Weight:	~ 200 g (7 oz)

## ELECTRICAL SPECIFICATIONS

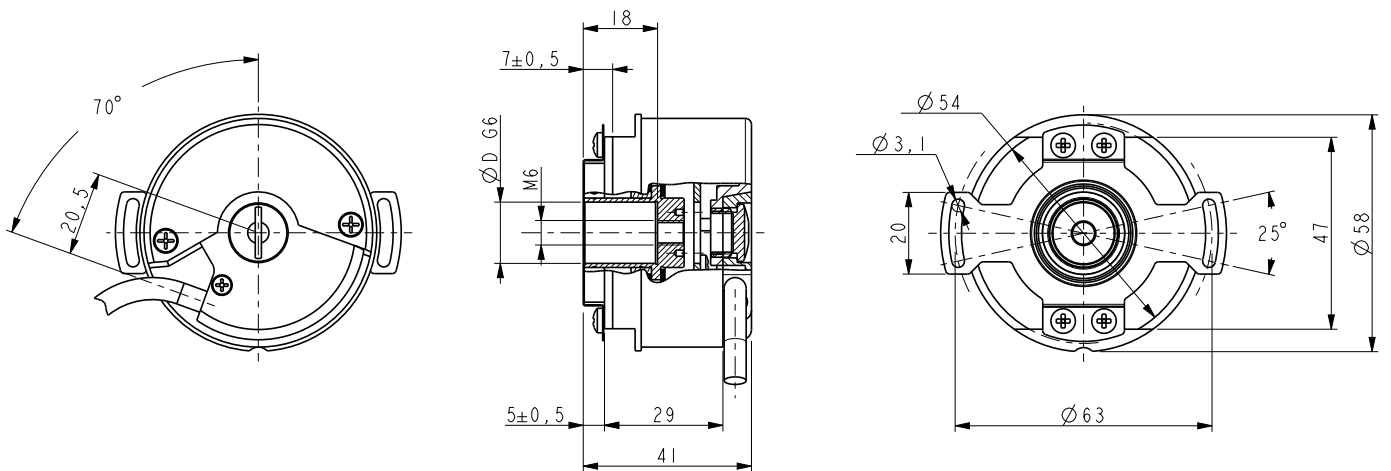
Resolution (PPR):	2048 + absolute Z-track
Counting frequency:	300 kHz max.
Output circuits:	1Vpp
Power supply:	+5V±5%
Consumption:	130 mA max.
Output current (each channel):	40 mA max.
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

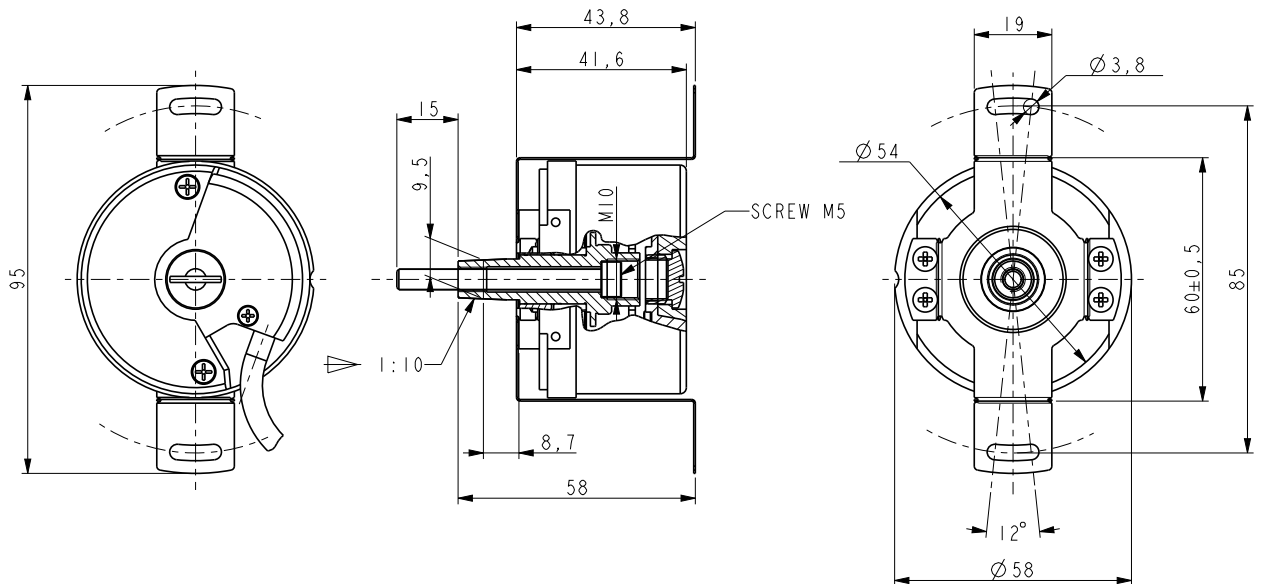
Flange:	aluminium, anticorrosive, UNI EN AW-6082
Housing:	aluminium, anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EC-CB61-1:	Connection cable 1 m
EC-CB61-4:	Connection cable 4 m
EC-CB61-7:	Connection cable 7 m



CB59



CB60

Order code

CB59	-	X	-	XXXX/X	X	XXX	/Sxxx
CB60		(a)		(b)	(c)	(d)	(e)

Accessories order code

EC-CB61-1
EC-CB61-4
EC-CB61-7

(a) OUTPUT CIRCUIT  
V = 1 V<sub>pp</sub> sine/cosine + Z track

(b) RESOLUTION (PPR)  
2048/1

(c) SUPPLY VOLTAGE  
1 = +5V ±5%

(d) SHAFT DIAMETER  
P12 = 12,7 mm - 1/2"  
15 = 15 mm  
C10 = 1:10 taper

(e) CUSTOM VERSION

Connection cable 1 m  
Connection cable 4 m  
Connection cable 7 m

# ROTAMAG

Magnetic incremental encoders

Series

MI58 • MI58S • MC58 • MC59 • MC60



- Magnetic sensing technology
- Solid and through hollow shaft design
- Resolution up to 10000 PPR (others on request)
- High protection degree with sealed circuits



MI58 • MI58S

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Option:	• IP67 protection (with sealed circuits)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 8, 9.52, 10, 12 mm
Hollow shaft diameter:	Ø 14, 15 mm
Reducing sleeves BR1-xx from Ø 15 mm to:	Ø 6, 8, 9.52, 10, 11, 12 mm
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	MI58, MI58S: 12000 rpm max. MC58, MC59, MC60: 3000 rpm (typ), 6000 rpm max.
Starting torque at 20°C:	MI58, MI58S: ≤ 0,4 Ncm (typical) MC58, MC59, MC60: 1 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M23 plug or cable output 1 m (3.3 ft)
Weight:	~ 300 g (10,6 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

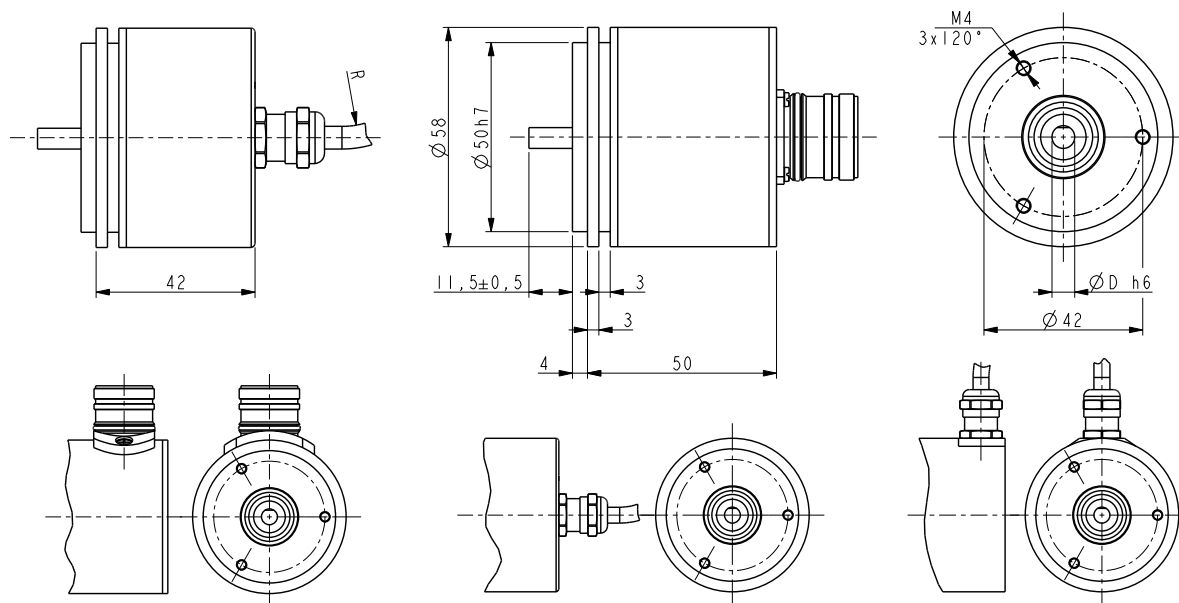
Resolution (PPR):	20-40-80-160-200-320-400-500-640-800-1000 1280-1600-2000-2500-2560-5000-10000
Accuracy:	± 0,5°
Counting frequency:	500 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	60 mA max.
Output current (per channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4

## MATERIALS

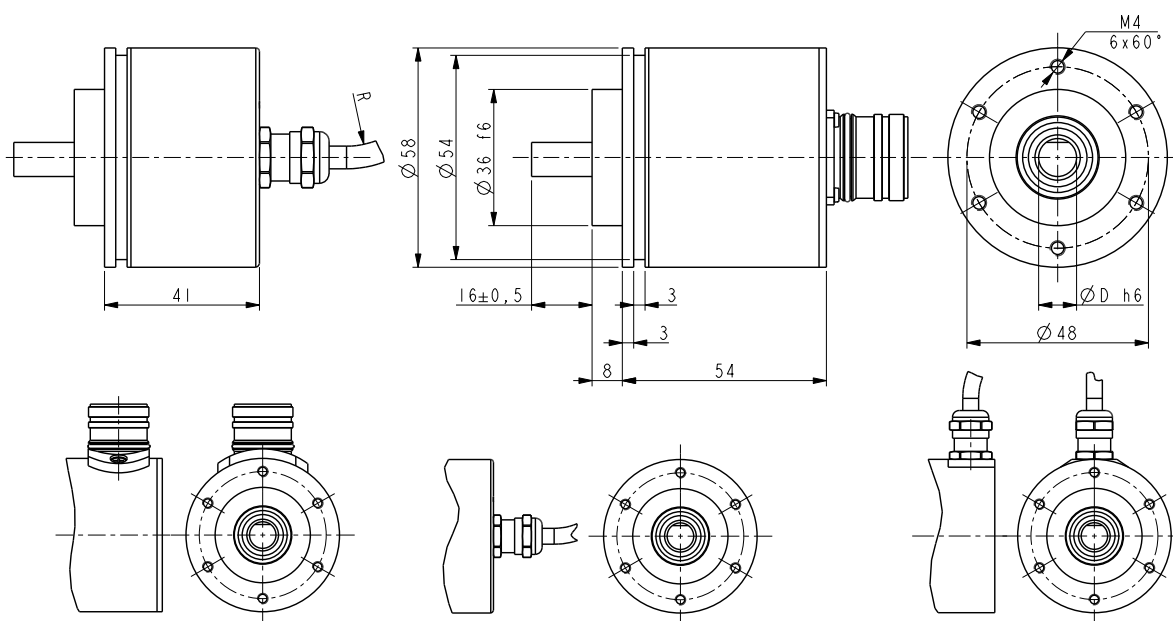
Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
EC-C12F-LK-I8-x:	cordset x meter with M23 conn.
PAN/PGF:	flexible couplings
LKM-386:	fixing clamps
BR1:	Reducing sleeves



MI58



MI58S

Order code

MI58	-	X	-	XXXXX	XXX	X	XX	X	X	X	/Sxxx
MI58S		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)

(a) OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

BNF = AB, cable output  
BCU = AB /AB, cable output  
BCZ = AB /AB, M23 12 pin plug  
ZNF = ABO, cable output  
ZCU = ABO /ABO, cable output  
ZCZ = ABO /ABO, M23 12 pin plug

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

6 = 6 mm  
8 = 8 mm  
P9 = 9.52 mm - 3/8"  
10 = 10 mm  
12 = 12 mm

(f) CONNECTION POSITION

- = axial  
R = radial

(g) PROTECTION

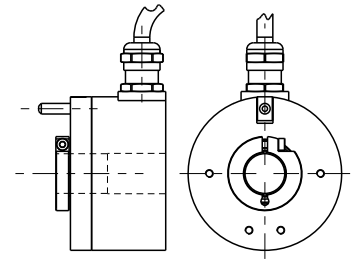
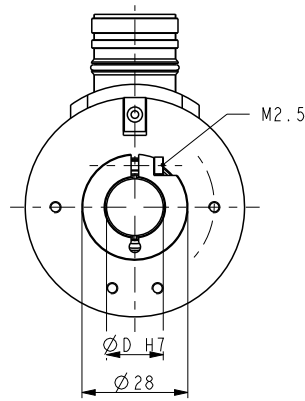
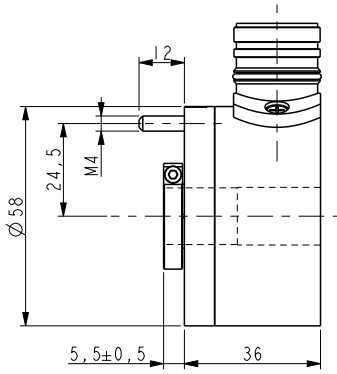
- = IP65 (standard)  
J = IP67 (only with cable output)

(h) CABLE LENGTH

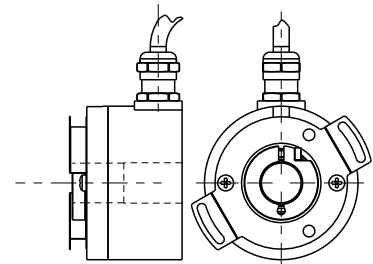
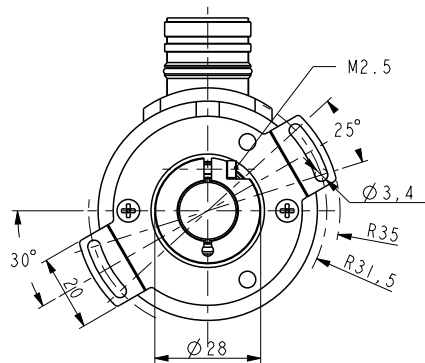
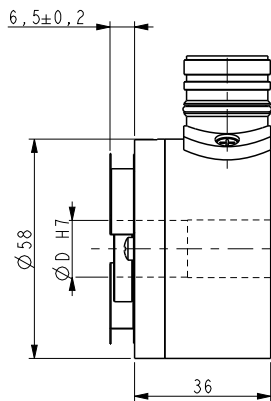
(not with BCZ, ZCZ)  
- = cable output 1 m (standard)  
L2 = cable output 2 m  
Lx = cable output x m

(i) CUSTOM VERSION

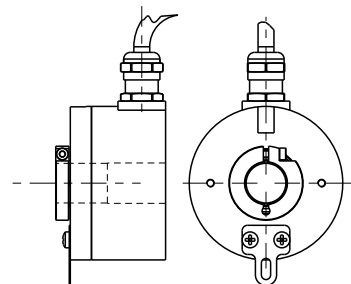
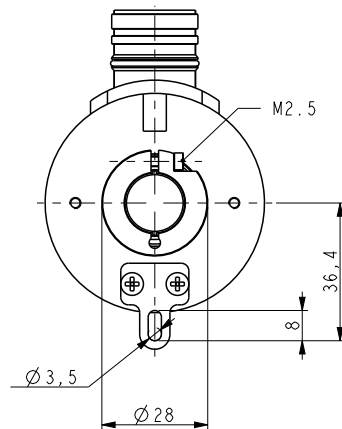
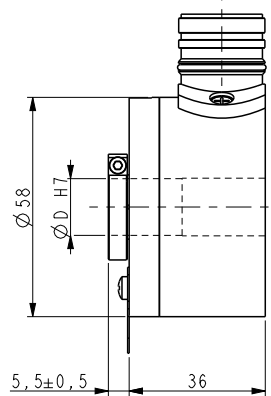




MC58



MC59



MC60

Order code

MC58	-	X	-	XXXXX	XXX	X	XX	X	X	X	/Sxxx
MC59		Ⓐ		Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓘ
MC60											

Ⓐ OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

Ⓑ RESOLUTION (PPR)

See electrical specifications

Ⓒ OUTPUT SIGNALS / CONNECTIONS

BNF = AB, cable output  
BCU = AB /AB, cable output  
BCZ = AB /AB, M23 12 pin plug  
ZNF = ABO, cable output  
ZCU = ABO /ABO, cable output  
ZCZ = ABO /ABO, M23 12 pin plug

Ⓓ SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

Ⓔ SHAFT DIAMETER

14 = 14 mm  
15 = 15 mm

Ⓕ CONNECTION POSITION

- = axial  
R = radial

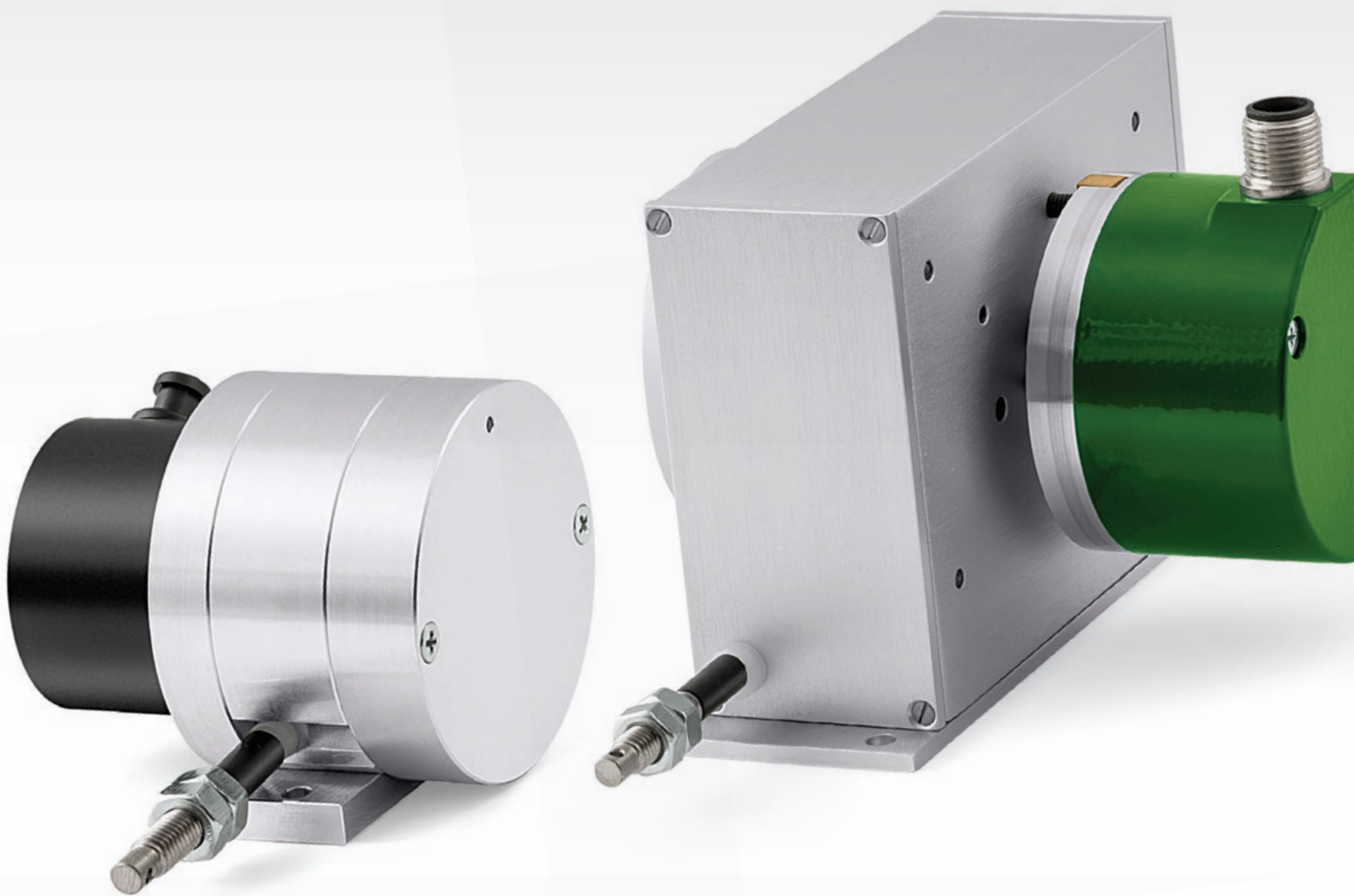
Ⓖ PROTECTION

- = IP65 (standard)  
J = IP67 (only with cable output)

Ⓖ CABLE LENGTH (not with BCZ, ZCZ)

- = cable output 1 m (standard)  
L2 = cable output 2 m  
Lx = cable output x m

Ⓘ CUSTOM VERSION



discover our  
Draw-wire catalogue on  
[www.lika.biz](http://www.lika.biz)

# ROTAPULS

Incremental encoders

Series

I65 • IT65



- Robust die cast housing
- High shaft load
- Protection up to IP66 (shaft side)
- Clamp flange
- Square flange, US size
- Preferential versions available



I65 • IT65

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"> <li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li> <li>• IP66 Protection shaft end (torque 2,5 Ncm and 3000 rpm max.)</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 6, 8, 9.52, 10, 12 mm
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	0,4 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	MIL 7 pin, MIL 10 pin plug or cable output 1 m (3.3 ft)
Weight:	~ 400 g (14,1 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80 90-100-120-127-142-150-160-180-200-216-230-236-240-250 254-256-267-270-300-314-360-375-400-410-435-471-500-512 600-635-720-750-800-900-1000-1024-1068-1200-1250-1270 1400-1440-1500-1800-2000-2048-2250-2400-2500-3000 3600-4000-4096-5000-6000-8192-9000-10000
Counting frequency:	100 kHz max.
Output circuits:	NPN, PNP, Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	• Output frequency up to 300 kHz

## MATERIALS

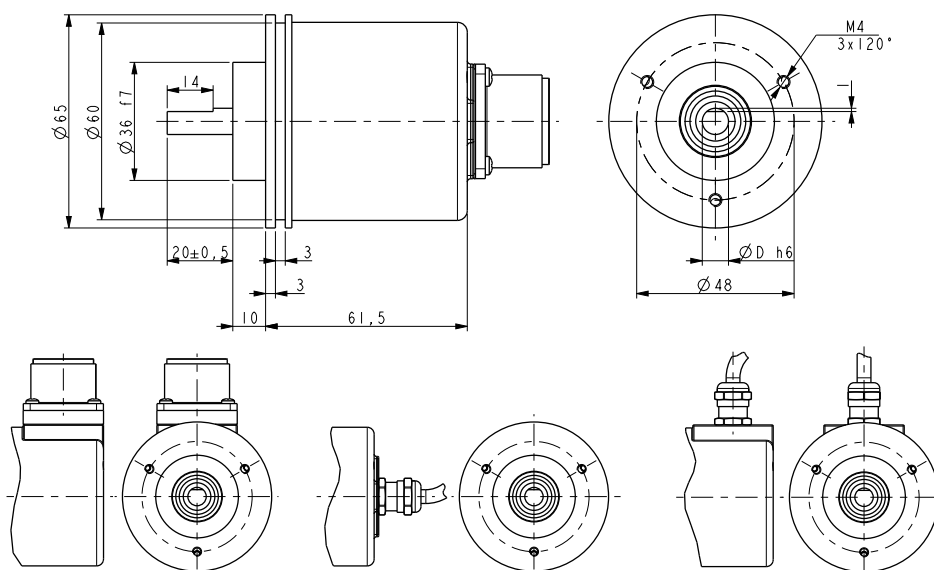
Flange:	anticorrosive, UNI EN AW-6082
Housing:	zamac die cast
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## PREFERENTIAL MODELS

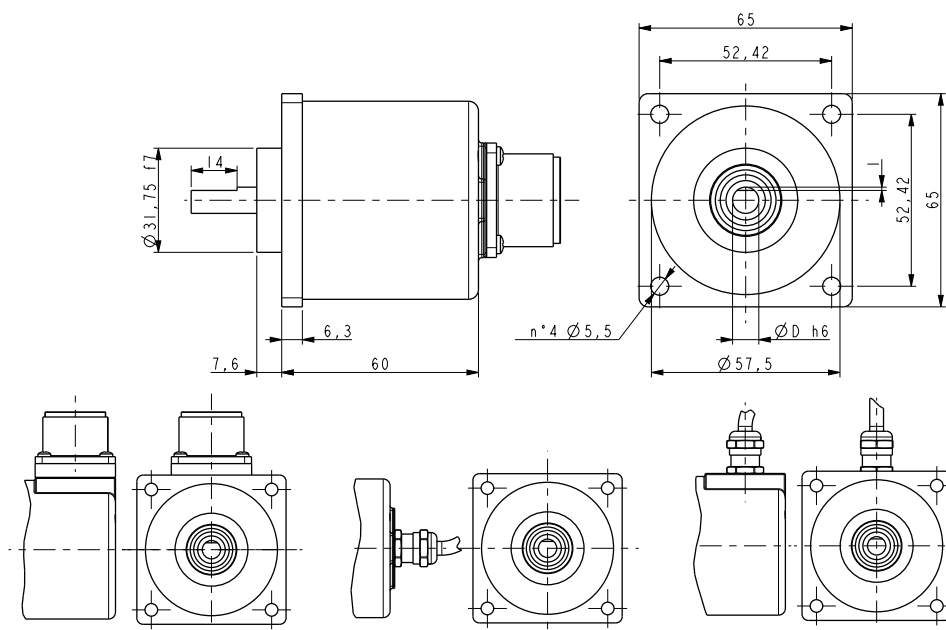
IT65-H-100ZCP4CR	100 PPR, HTL/TTL output
IT65-H-500ZCP4CR	500 PPR, HTL/TTL output
IT65-H-1000ZCP4CR	1000 PPR, HTL/TTL output
IT65-H-1024ZCP4CR	1024 PPR, HTL/TTL output
IT65-H-2500ZCP4CR	2500 PPR, HTL/TTL output
IT65-H-5000ZCP4CR	5000 PPR, HTL/TTL output

## ACCESSORIES

E7MLS:	7 pin MIL mating connector
E10MLS:	10 pin MIL mating connector
PAN/PGF:	flexible couplings
LKM-386:	fixing clamps



I65



IT65

Order code

I65	-	X	-	XXXXX	XXX	X	X	X	X	X	X	XX	/Sxxx
IT65		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)

<p><b>(a) OUTPUT CIRCUITS</b>                  N = NPN o.c.                  P = PNP o.c.                  Y = Push Pull                  L = Line Driver (RS422)                  H = PP/LD universal circuit</p> <p><b>(b) RESOLUTION (PPR)</b>                  See electrical specifications</p>	<p><b>(c) OUTPUT SIGNALS / CONNECTIONS</b>                  BNF = AB, cable output                  ZNF = AB0, cable output                  BND= AB, MIL 7 pin plug                  ZND= AB0, MIL 7 pin plug                  BCU = AB /AB, cable output                  ZCU = AB0 /AB0, cable output                  BCP = AB /AB, MIL 10 pin plug                  ZCP = AB0 /AB0, MIL 10 pin plug</p> <p><b>(d) SUPPLY VOLTAGE</b>                  1 = +5V±5% (L output circuit)                  2 = +10V÷ +30V (Y output circuit)                  4 = +5V÷ +30V (H output circuit)</p>	<p><b>(e) SHAFT DIAMETER</b>                  B = 6 mm                  C = 8 mm                  D = 9.52 mm - 3/8"                  E = 10 mm                  F = 12 mm</p> <p><b>(f) CONNECTION POSITION</b>                  - = axial                  R = radial</p> <p><b>(g) PROTECTION</b>                  - = IP65 (standard)                  Q = IP66 protection shaft side</p>	<p><b>(h) COUNTING FREQUENCY</b>                  - = 100 kHz (standard)                  W = 300 kHz</p> <p><b>(i) OPERATING TEMPERATURE</b>                  - = -25°C +85°C (-13°F +185°F) standard                  K = -40°C +100°C (-40°F +212°F)</p> <p><b>(j) CABLE LENGTH</b>                  - = cable output 1 m (standard)                  L2 = cable output 2 m                  Lx = cable output x m</p> <p><b>(k) CUSTOM VERSION</b></p>
--	---	---	--

# ROTAPULS

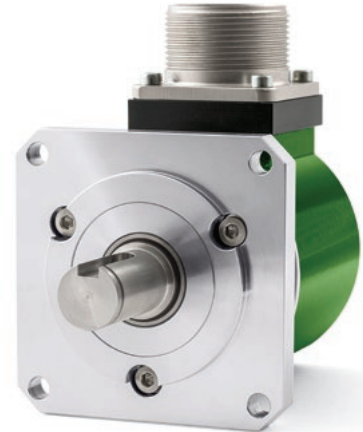
Incremental encoder

Series

IT68



- Popular machine tool encoder with increased reliability and performance
- Resolution up to 10000 PPR
- NPN, Push-Pull, Line Driver or Universal circuit
- Extended temperature range -40°C +100°C & IP66



IT68

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-40°C +100°C (-40°F +212°F)
Storage temperature range:	-40°C +100°C (-40°F +212°F) (98% R.H. without condensation)
Option:	• IP66 Protection shaft end (torque 2,5 Ncm and 3000 rpm max.)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 15 mm with keyway
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque (at 20°C):	0,4 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	MIL 10 pin, MIL 17 pin plug or cable output 1 m (3.3 ft)
Weight:	~ 500 g (17,6 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

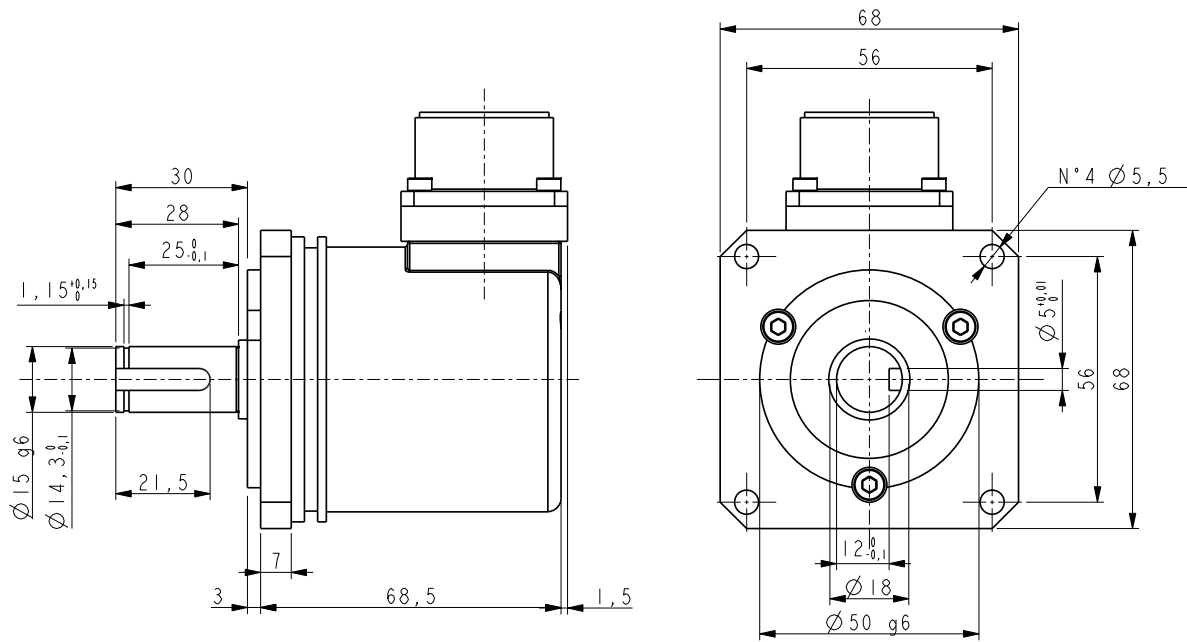
Resolution (PPR):	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80 90-100-120-127-142-150-160-180-200-216-230-236-240-250 254-256-267-270-300-314-360-375-400-410-435-471-500 512-600-635-720-750-800-900-1000-1024-1068-1200-1250 1270-1400-1440-1500-1800-2000-2048-2250-2400-2500 3000-3600-4000-4096-5000-6000-8192-9000-10000
Counting frequency:	100 kHz max.
Output circuits:	NPN, PNP, Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V,+5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	• Output frequency up to 300 kHz

## MATERIALS

Flange:	anticorodal, UNI EN AW-6082
Housing:	zamac die cast
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

E17MLS:	17 pin MIL mating connector
E10MLS:	10 pin MIL mating connector



IT68

Order code

IT68	-	X (a)	-	XXXXX (b)	XXX (c)	X (d)	G (e)	X (f)	X (g)	X (h)	K (i)	XX (j)	/Sxxx (k)
------	---	----------	---	--------------	------------	----------	----------	----------	----------	----------	----------	-----------	--------------

(a) OUTPUT CIRCUITS

N = NPN o.c.  
 P = PNP o.c.  
 Y = Push Pull  
 L = Line Driver (RS422)  
 H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

ZCU = ABO /ABO, cable output  
 ZCP = ABO /ABO, MIL 10 pin plug  
 ZCQ = ABO /ABO, MIL 17 pin plug

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
 2 = +10V± 30V (N, P and Y output circuit)  
 4 = +5V± 30V (H output circuit)

(e) SHAFT DIAMETER

G = 15 mm

(f) CONNECTION POSITION

- = axial  
 R = radial

(g) PROTECTION

- = IP65 (standard)  
 Q = IP66 protection shaft side

(h) COUNTING FREQUENCY

- = 100 kHz (standard)  
 W = 300 kHz

(i) OPERATING TEMPERATURE

K = -40°C +100°C (-40°F +212°F) standard

(j) CABLE LENGTH (only with ZCU)

L1 = cable output 1 m (standard)  
 L2 = cable output 2 m  
 Lx = cable output x m

(k) CUSTOM VERSION

# ROTAPULS

ATEX incremental encoder

Series

**XC77**



- Encoder with ATEX II 2GD Ex d IIC T6 certification
- Suitable for ATEX zones 1, 2, 21 and 22
- Compact & robust construction with axial/radial cable outlet
- Ø 14 mm hollow shaft
- Resolution up to 10000 PPR



XC77

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP66
Environmental temperature at max. speed:	40°C max
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-40°C +100°C (-40°F +212°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

Protection mode:	EEx d IIC T6
Dimensions:	see drawing
Hollow shaft diameter:	Ø 14 mm
Shaft loading (axial, radial):	60 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque (at 20°C):	≤ 5 Ncm
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	cable output 1 m (3.3 ft)
Weight:	~ 750 g (26,4 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80 90-100-120-127-142-150-160-180-200-216-230-236-240-250 254-256-267-270-300-314-360-375-400-410-435-471-500-512 600-635-720-750-800-900-1000-1024-1068-1200-1250-1270 1400-1440-1500-1800-2000-2048-2250-2400-2500-3000-3600 4000-4096-5000-6000-8192-9000-10000
Counting frequency:	100 kHz max.
Output circuits:	NPN, Push-Pull, Line Driver, Universal circuit
Power supply:	+5Vdc ± 5%, +10Vdc +30Vdc, +5Vdc +30Vdc
Consumption:	70 mA (typical)
Output current (per channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorodal, UNI EN AW-6082 (UNI EN 573)
Housing:	anticorodal, UNI EN AW-6082 (UNI EN 573)
Bearings:	ABEC 5
Shaft and clamping ring:	1.4305 (UNI EN 10088-1)

## ACCESSORIES

LKM-1578:	Ø 10 mm shaft extension
-----------	-------------------------





# ROTAPULS

Incremental encoder

Series

C80



- Feedback encoder with for big size motors
- Precise optical sensing
- Very flat design
- Through hollow shaft up to Ø 30 mm
- Robust die cast housing with IP65 protection



C80

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-40°C +100°C (-40°F +212°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"> <li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li> <li>• IP65 Protection (3000 rpm max, torque 2 Ncm)</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 25, 30 mm
Reducing sleeves, BR2-xx from Ø 30 mm to:	Ø 15, 5/8" (15,875), 16, 17, 18, 19, 20 22, 23, 24, 1" (25,4), 28 mm
Shaft loading (axial and radial):	30 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	≤ 1,5 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M23 12 pin plug or cable output 1 m (3.3 ft)
Weight:	~ 300 g (10,6 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	12-100-200-360-400-500-1000-1024-2000-2048
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V ±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

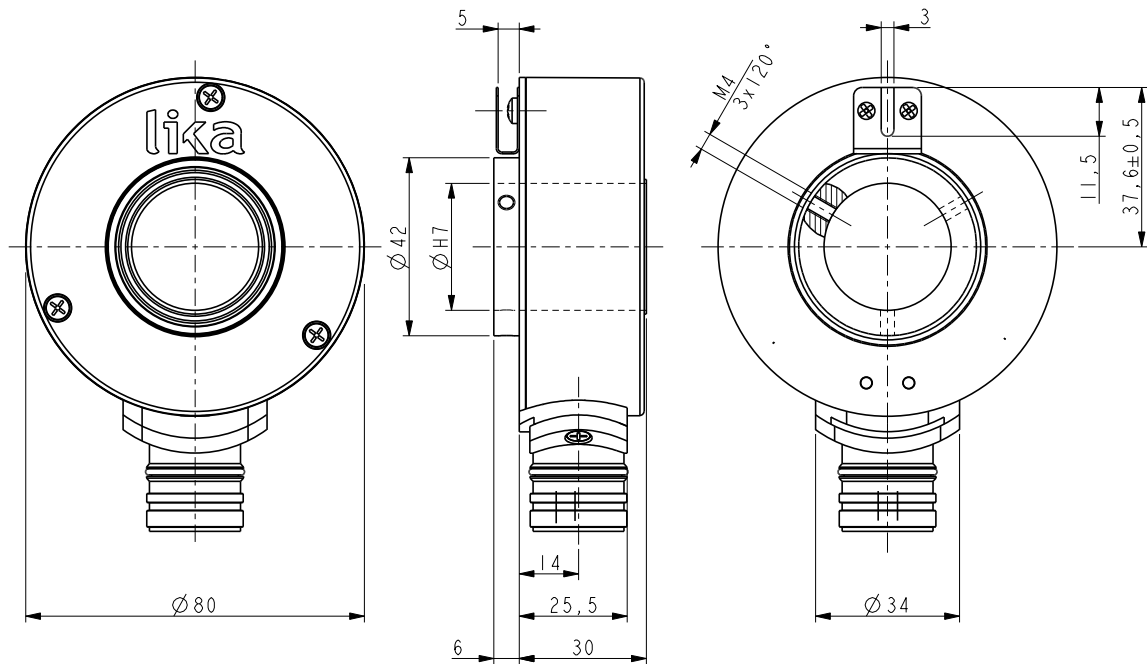
Flange:	die cast aluminium, UNI EN AC-46100
Housing:	die cast aluminium, UNI EN AC-46100
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic 1.4305 (UNI EN 10088-1)
Light source:	GaAl diodes

## PREFERENTIAL MODELS

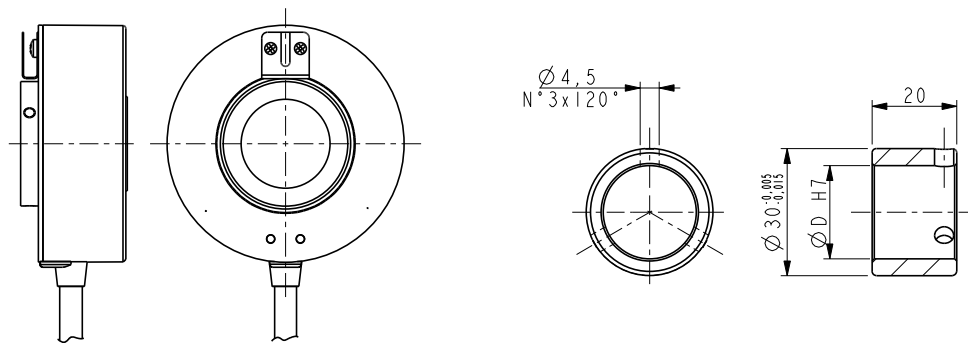
C80-H-1024ZCU430L2	1024 PPR, HTL/TTL output
C80-H-2048ZCU430L2	2048 PPR, HTL/TTL output

## ACCESSORIES

EDE9S:	9 pin DSub mating connector
BR2-xx:	reducing sleeves
EPFL121:	12 pin M23 mating connector



C80



BR2-xx

Order code

C80	-	X	-	XXXXX	XXX	X	XX	X	X	XX	/Sxxx
		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)

(a) OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

BNF = AB, cable output  
ZNF = ABO, cable output  
BCU = AB /AB, cable output  
ZCU = ABO /ABO, cable output  
BCZ = AB /AB, M23 12 pin plug  
ZCZ = ABO /ABO, M23 12 pin plug

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

25 = 25 mm  
30 = 30 mm

(f) PROTECTION

- = IP64 (standard)  
P = IP65

(g) OPERATING TEMPERATURE

- = -25°C +85°C (-13°F +185°F)  
K = -40°C +100°C (-40°F +212°F)

(h) CABLE LENGTH

- = cable output 1 m  
L2 = cable output 2 m  
L7 = cable output 7 m  
Lx = cable output x m  
CLx = x m cable with DSub 9 pin inline plug

(i) CUSTOM VERSION

# ROTAPULS

Incremental encoder

Series

C81



- Encoder for lift traction machines and big size motors
- Precise optical sensing
- Internal structure in stainless steel
- Hollow shaft from Ø 30 to Ø 44 mm



C81

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP54
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"><li>• Operating temperature range: -40°C +100°C (-40°F +212°F)</li><li>• IP65 Protection (2000 rpm max, torque 2 Ncm)</li></ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 30, 34, 35, 38, 40, 42, 44 mm
Reducing sleeves, BR2-xx from Ø 30 mm to:	Ø 15, 5/8" (15,875), 16, 17, 18, 19, 20 22, 23, 24, 1" (25,4), 28 mm
Shaft loading (axial, radial):	100 N max.
Shaft rotational speed:	max. 2000 rpm@70°C (158°F)/IP54, 3000 rpm@100°C (212°F)/IP54 max. 1500 rpm@70°C (158°F)/IP65, 2000 rpm@100°C (212°F)/IP65
Starting torque (at 20°C):	4 ÷ 12 Ncm (typical)
Misalignment:	± 0,3 mm radial ± 0,2 mm axial
Bearing life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	cabl e output 1 m (3.3 ft)
Weight:	~ 300 g (10,6 oz)
Option:	<ul style="list-style-type: none"><li>• additional cable</li></ul>

## ELECTRICAL SPECIFICATIONS

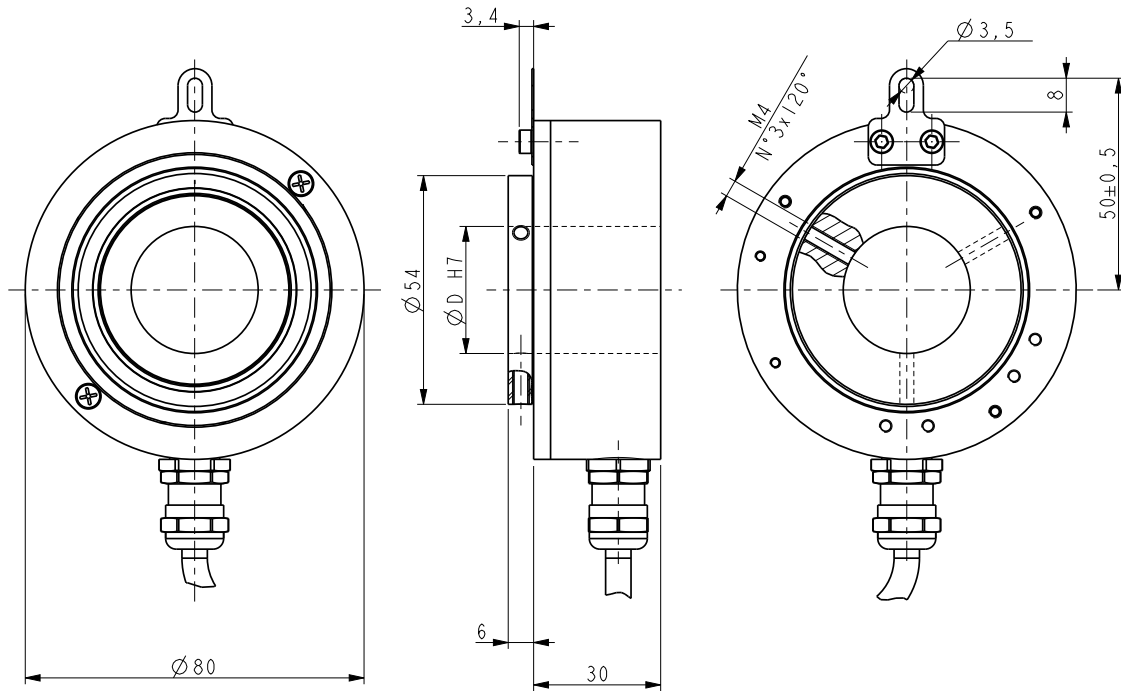
Resolution (PPR):	12-100-300-400-500-1024-2000-2048-2500-4096
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V ±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	<ul style="list-style-type: none"><li>• Output freq. 200 kHz max.</li></ul>

## MATERIALS

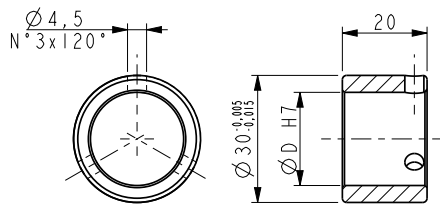
Flange:	steel, UNI EN 4305
Housing:	anticorodal, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EDE9S:	9 pin DSub mating connector
BR2-xx:	reducing sleeves



C81



BR2-xx

Order code

C81	-	X	-	XXXXX	XXX	XX	X	X	X	XX	/Sxxx
		(a)		(b)	(c)	(e)	(f)	(g)	(h)	(i)	(j)

(a) OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

BNF = AB, cable output  
ZNF = ABO, cable output  
BCU = AB /AB, cable output  
ZCU = ABO /ABO, cable output

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V± +30V (Y output circuit)  
4 = +5V± +30V (H output circuit)

(e) SHAFT DIAMETER

30 = 30 mm  
34 = 34 mm  
35 = 35 mm  
38 = 38 mm  
40 = 40 mm  
42 = 42 mm  
44 = 44 mm (43,97)

(f) PROTECTION

- = IP64 (standard)  
P = IP65

(g) COUNTING FREQUENCY

- = 100 kHz standard  
W = 200 kHz

(h) OPERATING TEMPERATURE

- = -25°C +85°C (-13°F +185°F)  
K = -40°C +100°C (-40°F +212°F)

(i) CABLE LENGTH

- = cable output 1 m  
L2 = cable output 2 m  
L7 = cable output 7 m  
Lx = cable output x m  
CLx = x m cable with DSub 9 pin inline plug

(j) CUSTOM VERSION

# ROTAPULS

Incremental encoder

Series

C82



- Encoder for elevator motors
- Precise optical sensing
- Operating temperature up to  $-40^{\circ}\text{C}$   $+100^{\circ}\text{C}$
- Resolution from 12 to 4096 PPR
- Hollow shaft from  $\varnothing$  30 to  $\varnothing$  44 mm



C82

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP54
Operating temperature range:	$-25^{\circ}\text{C}$ $+85^{\circ}\text{C}$ ( $-13^{\circ}\text{F}$ $+185^{\circ}\text{F}$ )
Storage temperature range:	$-25^{\circ}\text{C}$ $+85^{\circ}\text{C}$ ( $-13^{\circ}\text{F}$ $+185^{\circ}\text{F}$ ) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"><li>• Operating temperature range: <math>-40^{\circ}\text{C}</math> <math>+100^{\circ}\text{C}</math> (<math>-40^{\circ}\text{F}</math> <math>+212^{\circ}\text{F}</math>)</li><li>• IP65 Protection (2000 rpm max, torque 2 Ncm)</li></ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft hollow:	$\varnothing$ 30, 34, 35, 38, 40, 42, 44 mm
Reducing sleeves, BR2-xx from $\varnothing$ 30 mm to:	$\varnothing$ 15, 5/8" (15,875), 16, 17, 18, 19, 20, 22, 23, 24, 1" (25,4), 28 mm
Shaft loading:	axial: 100 N max. radial: 200 N max.
Shaft rotational speed:	max. 2000 rpm@ $70^{\circ}\text{C}$ ( $158^{\circ}\text{F}$ )/IP54, 3000 rpm@ $100^{\circ}\text{C}$ ( $212^{\circ}\text{F}$ )/IP54 max. 1500 rpm@ $70^{\circ}\text{C}$ ( $158^{\circ}\text{F}$ )/IP65, 2000 rpm@ $100^{\circ}\text{C}$ ( $212^{\circ}\text{F}$ )/IP65
Starting torque at $20^{\circ}\text{C}$ :	$4 \div 12$ Ncm (typical)
Misalignment:	$\pm 0,3$ mm radial $\pm 0,2$ mm axial
Bearings life:	$400 \times 10^6$ rev. min. ( $10^9$ rev. min. with 20 N shaft loading max.)
Electrical connections:	M23 12 pin plug or cable output 1 m (3.3 ft)
Weight:	$\sim 0,3$ g (10,6 oz)
Option:	<ul style="list-style-type: none"><li>• additional cable</li></ul>

## ELECTRICAL SPECIFICATIONS

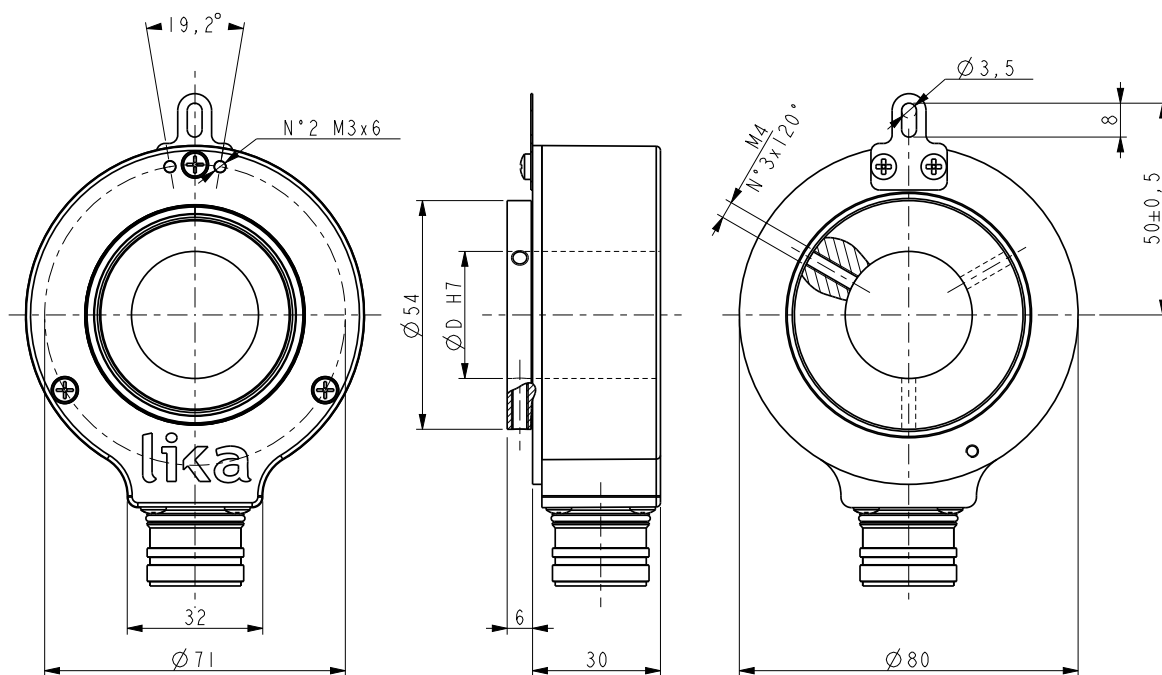
Resolution (PPR):	12-100-300-400-500-1024-2000-2048-2500-4096
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	$+5\text{V} \pm 5\%$ , $+10\text{V} +30\text{V}$ , $+5\text{V} +30\text{V}$
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	<ul style="list-style-type: none"><li>• Output freq. 200 kHz max.</li></ul>

## MATERIALS

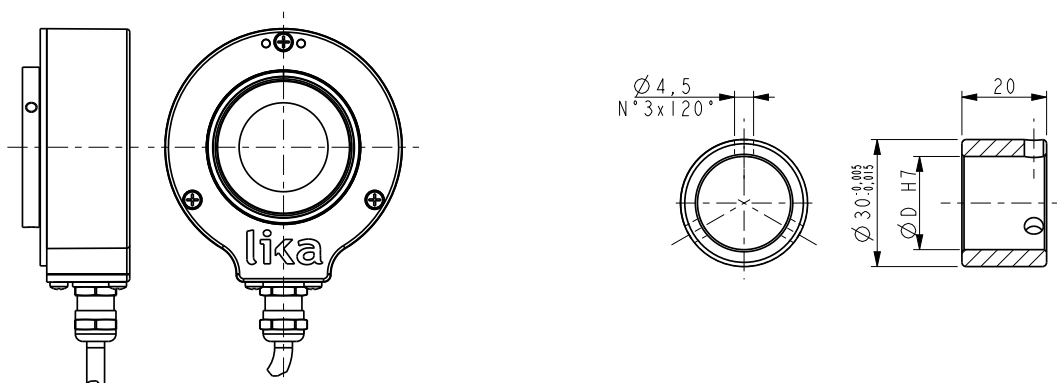
Flange:	anticorrosive, UNI EN AW-6082
Housing:	die cast aluminium, UNI EN AC-46100
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EPFL121:	M23 12 pin mating connector
BR2-xx:	reducing sleeves



C82



BR2-xx

Order code

C82	-	X	-	XXXXX	XXX	XX	XX	X	X	X	XX	/Sxxx
		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)

(a) OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

BNF = AB, cable output  
ZNF = ABO, cable output  
BCU = AB /AB, cable output  
ZCU = ABO /ABO, cable output  
BCZ = AB /AB, M23 12 pin plug  
ZCZ = ABO /ABO, M23 12 pin plug

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

30 = 30 mm  
34 = 34 mm  
35 = 35 mm  
38 = 38 mm  
40 = 40 mm  
42 = 42 mm  
44 = 44 mm (43,97)

(f) PROTECTION

- = IP64 protection (standard)  
P = IP65 protection

(g) COUNTING FREQUENCY

- = 100 kHz (standard)  
W = 200 kHz

(h) OPERATING TEMPERATURE

- = -25°C +85°C (-13°F +185°F)  
K = -40°C +100°C (-40°F +212°F)

(i) CABLE LENGTH

- = cable output 1 m  
L2 = cable output 2 m  
L7 = cable output 7 m  
Lx = cable output x m  
CLx = x m cable with DSub 9 pin inline plug

(j) CUSTOM VERSION

# ROTAPULS

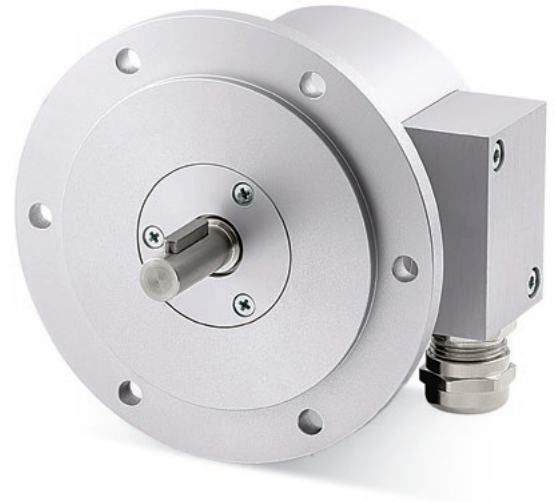
Incremental encoder

Series

I115



- Heavy-duty encoder for harsh environments
- "Tachogenerator" design, B10 Euro-flange
- Rotatable connection with screw terminals
- High shaft load
- Power output circuit for long distance transmissions
- Corrosion and salt mist resistant housing



I115

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP66
Operating temperature range:	-40°C + 100°C (-40°F + 212°F)
Storage temperature range:	-40°C + 100°C (-40°F + 212°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 11 mm
Shaft loading:	axial: 250 N radial: 350 N
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	1 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Weight:	~ 1 kg (35 oz)

## ELECTRICAL SPECIFICATIONS

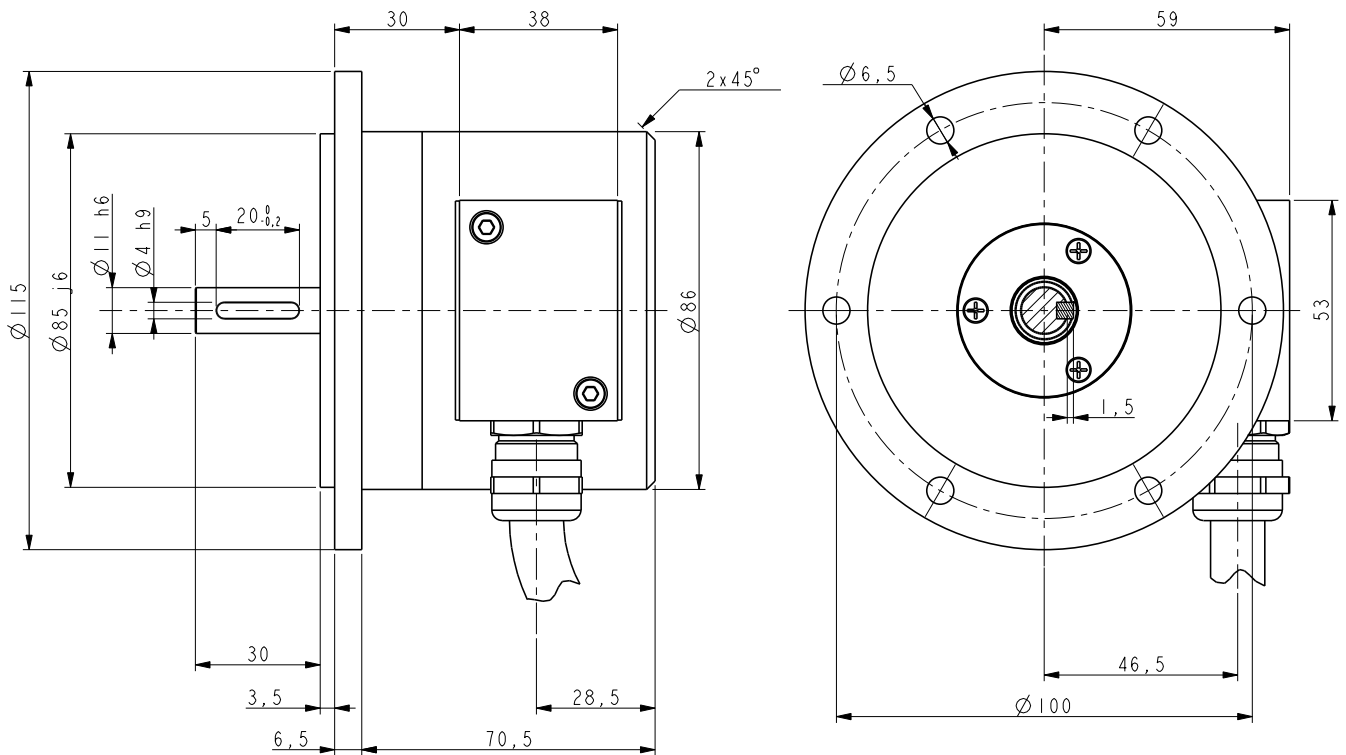
Resolution (PPR):	100-200-250-256-360-500-512-1000-1024-1250 1800-2000-2500
Counting frequency:	100 kHz max.
Output circuits:	NPN, Push-Pull, Line Driver, Universal circuit, Power Push-Pull
Power supply:	+5V ±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Connections:	via terminal box, cable Ø 4 ÷ 10 mm

## MATERIALS

Flange:	anticorodal, UNI EN AW-6082, anodized
Housing:	anticorodal, UNI EN AW-6082, anodized
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

MOL-32C-11K-11K:	flex. coupling with electric ins.
MSTS-32K-11-11:	stainless steel coupling
MDW-25C-11K-11K:	disk coupling



I115

Order code

I115	-	X Ⓐ	-	XXXXX Ⓑ	XXX Ⓒ	X Ⓓ	XX Ⓔ	/Sxxx Ⓕ
------	---	--------	---	------------	----------	--------	---------	------------

Ⓐ **OUTPUT CIRCUITS**  
 N = NPN o.c.  
 Y = Push-Pull  
 L = Line Driver (RS422)  
 H = PP/LD universal circuit  
 T = Power Push-Pull

Ⓑ **RESOLUTION (PPR)**  
 See electrical specifications

Ⓒ **OUTPUT SIGNAL / CONNECTION**  
 ZCT = ABO /ABO, terminal blocks

Ⓓ **SUPPLY VOLTAGE**  
 1 = +5V±5% (L output circuit)  
 2 = +10V÷ +30V (N, Y and T output circuits)  
 4 = +5V÷ +30V (H output circuit)

Ⓔ **SHAFT DIAMETER**  
 11 = 11 mm

Ⓕ **CUSTOM VERSION**



# ROTAPULS

Incremental encoder

Series

I116



- Double encoder with single housing design
- Heavy-duty construction for harsh environments
- Rotatable connections with screw terminals
- High shaft load
- Power output circuit for long distance transmissions
- Corrosion and salt mist resistant housing
- Two different resolutions or output circuits on request



I116

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP66
Operating temperature range:	-40°C + 100°C (-40°F + 212°F)
Storage temperature range:	-40°C + 100°C (-40°F + 212°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft diameter:	Ø 11 mm
Shaft loading:	axial: 250 N radial: 350 N
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	≤ 1 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Weight:	1,6 kg (56,4 oz)

## ELECTRICAL SPECIFICATIONS

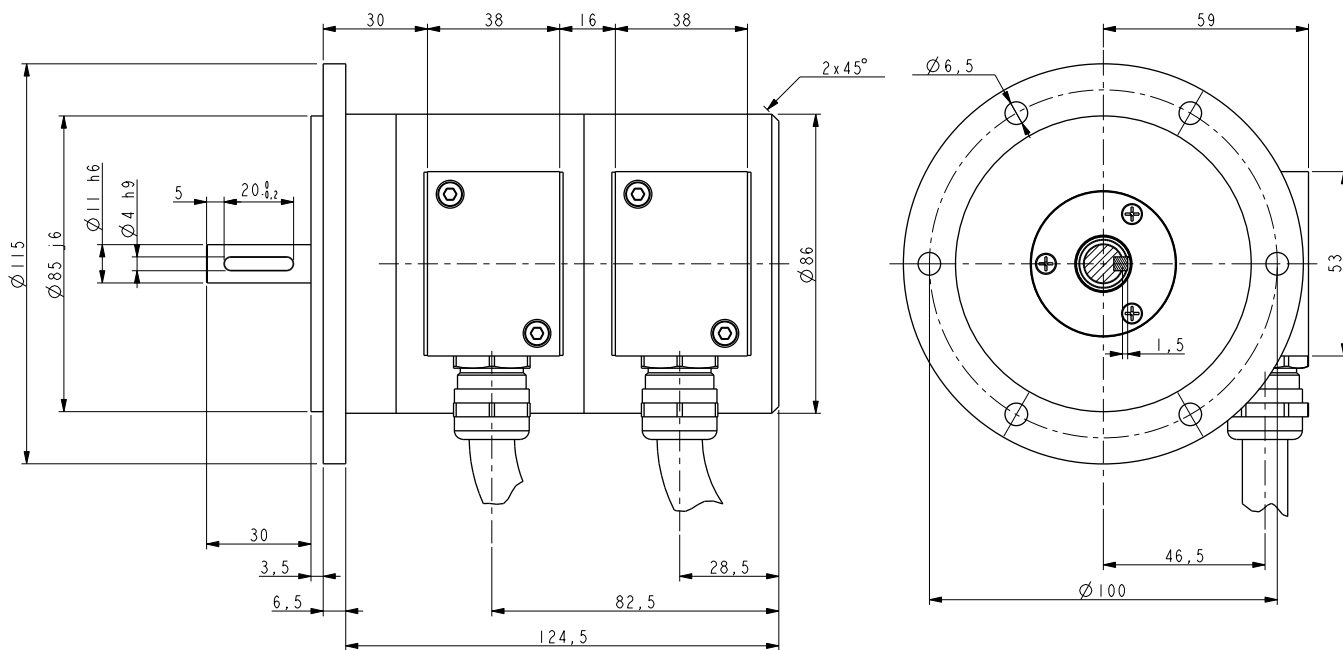
Resolution (PPR):	100-200-250-256-360-500-512-1000-1024-1250 1800-2000-2500
Counting frequency:	100 kHz max.
Output circuits:	NPN, Push-Pull, Line Driver, Universal circuit, Power Push-Pull
Power supply:	+5V ±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Connections:	via terminal box, cable Ø 4 ÷ 10 mm

## MATERIALS

Flange:	anticorodal, UNI EN AW-6082, anodized
Housing:	anticorodal, UNI EN AW-6082, anodized
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

MOL-32C-11K-11K:	flex. coupling with electric ins.
MSTS-32K-11-11:	stainless steel coupling
MDW-25C-11K-11K:	disk coupling



I116

Order code

I116	-	X Ⓐ	-	XXXXX Ⓑ	XXX Ⓒ	X Ⓓ	XX Ⓔ	/Sxxx Ⓕ
------	---	--------	---	------------	----------	--------	---------	------------

**Ⓐ OUTPUT CIRCUITS**  
 N = NPN o.c.  
 Y = Push-Pull  
 L = Line Driver (RS422)  
 H = PP/LD universal circuit  
 T = Power Push-Pull

**Ⓑ RESOLUTION (PPR)**  
 See electrical specifications

**Ⓒ OUTPUT SIGNAL / CONNECTION**  
 ZCT = ABO /ABO, terminal blocks

**Ⓓ SUPPLY VOLTAGE**  
 1 = +5V±5% (L output circuit)  
 2 = +10V÷ +30V (N, Y and T output circuits)  
 4 = +5V÷ +30V (H output circuit)

**Ⓔ SHAFT DIAMETER**  
 11 = 11 mm

**Ⓕ CUSTOM VERSION**

# ROTAPULS

Incremental heavy-duty encoder

Series

C100



- Heavy-duty hollow shaft encoder
- Corrosion resistant, robust housing
- High shaft load and environmental protection
- Power outputs for long distance transmission
- M23 connector or screw terminals
- Electrical shaft insulation



C100

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-40°C +100°C (-40°F +212°F) (98% R.H. without condensation)
Option:	• Operating temperature range: -40°C +100°C (-40°F +212°F)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø 16 mm 17 mm tapered
Shaft loading:	axial: 140 N radial: 350 N
Shaft rotational speed:	6000 rpm max. (short periods)
Electrical shaft insulation:	10 kV max.
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	M23 plug, screw terminals or cable output 1 m (3.3 ft)
Weight:	~ 1 kg (35 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

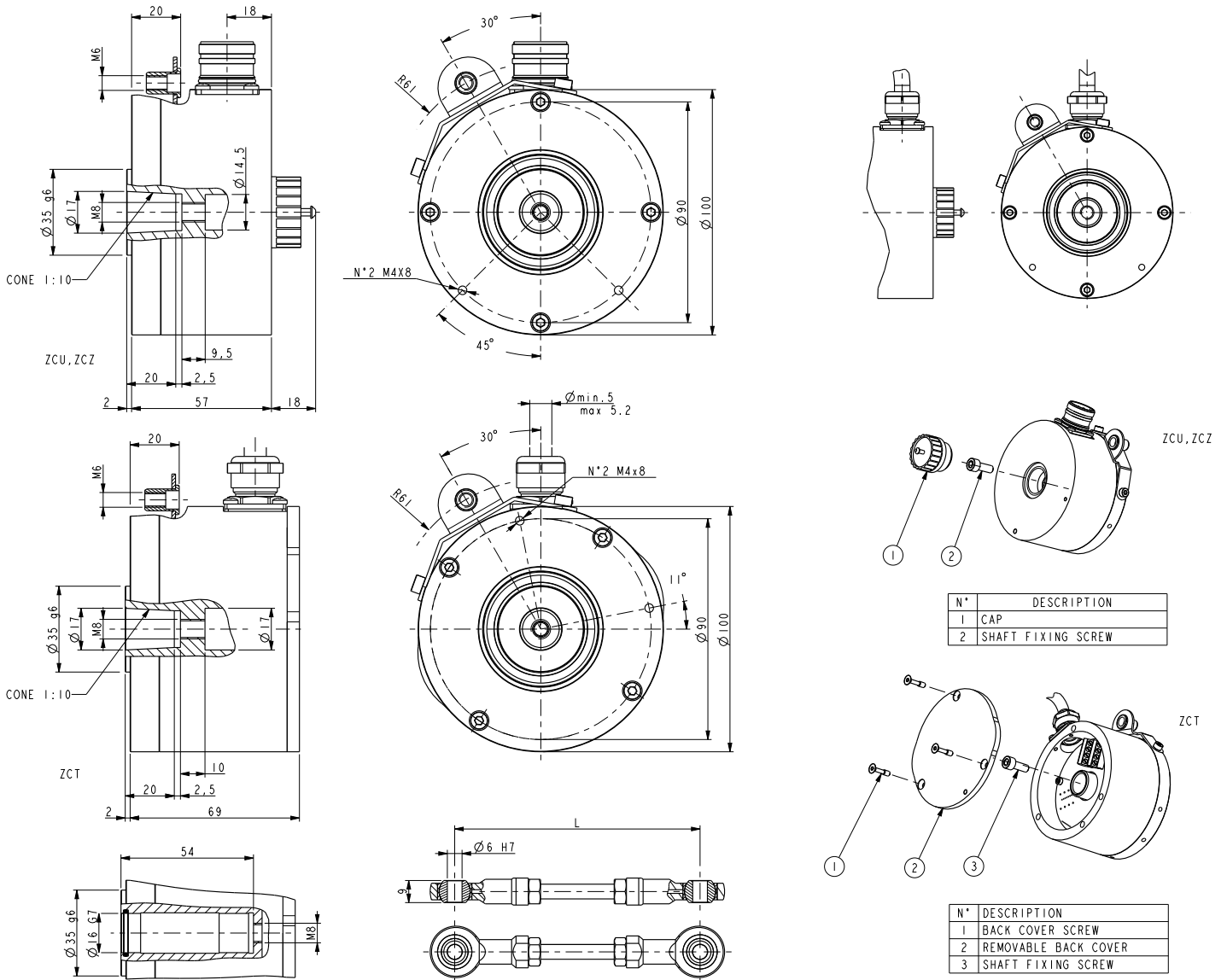
Resolution (PPR):	1024-2048-2500
Counting frequency:	100 kHz max.
Output circuits:	Power Push-Pull, Line Driver, Power Line Driver, Universal circuit
Power supply:	+5V ±5%, +10V +30V, +5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	100 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorodal, UNI EN AW-6082, anodized
Housing:	anticorodal, UNI EN AW-6082, anodized
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EPFL121:	12 pin M23 mating connector
EC-C12F-S19-M8-xx:	cordset x m with M23 connector
PF4284/xx:	torque arm



PF4284/XXX

C100

Order code

C100	-	X	-	XXXX	XXX	X	XXX	X	XX	/Sxxx
		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)

(a) OUTPUT CIRCUITS

L = Line Driver (RS422)  
 H = PP/LD universal circuit  
 K = Power Line Driver  
 T = Power Push Pull

(b) RESOLUTION (PPR)

1024, 2048, 2500

(c) OUTPUT SIGNALS / CONNECTIONS

ZCZ = ABO /ABO, M23 12 pin plug  
 ZCT = ABO /ABO, screw terminals  
 ZCU = ABO /ABO, cable output

(d) SUPPLY VOLTAGE

1 = +5V±5% (L, K output circuit)  
 2 = +10V÷ +30V (T output circuit)  
 4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

C17 = 17 mm tapered 1:10  
 16 = 16 mm

(f) OPERATING TEMPERATURE RANGE

- = -25°C +85°C (-13°F +185°F)  
 K = -40°C +100°C (-40°F +212°F)

(g) CABLE LENGTH (only with ZCU)

L1 = cable output 1 m  
 Lx = cable output x m

(h) CUSTOM VERSION

# ROTAPULS

Incremental heavy-duty encoder

Series

C101



- Heavy industry & wind generator applications
- Redundant version with 2 galvanically separated outputs
- Electrical shaft insulation (10 kV) for bearing protection
- Power output for long distance transmission
- M23 connectors or terminal blocks
- Corrosion resistant housing
- High shaft load



C101

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP54
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-40°C +100°C (-40°F +212°F) (98% R.H. without condensation)
Option:	• Operating temperature range: -40°C +100°C (-40°F +212°F)

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft hollow:	Ø 16 mm
Shaft loading:	axial: 140 N radial: 350 N
Shaft rotational speed:	6000 rpm max. (short periods)
Electrical shaft insulation:	10 kV max.
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	2 x M23 plug terminal blocks (max. cable Ø 9,5 mm)
Weight:	~ 1 kg (35 oz)

## ELECTRICAL SPECIFICATIONS

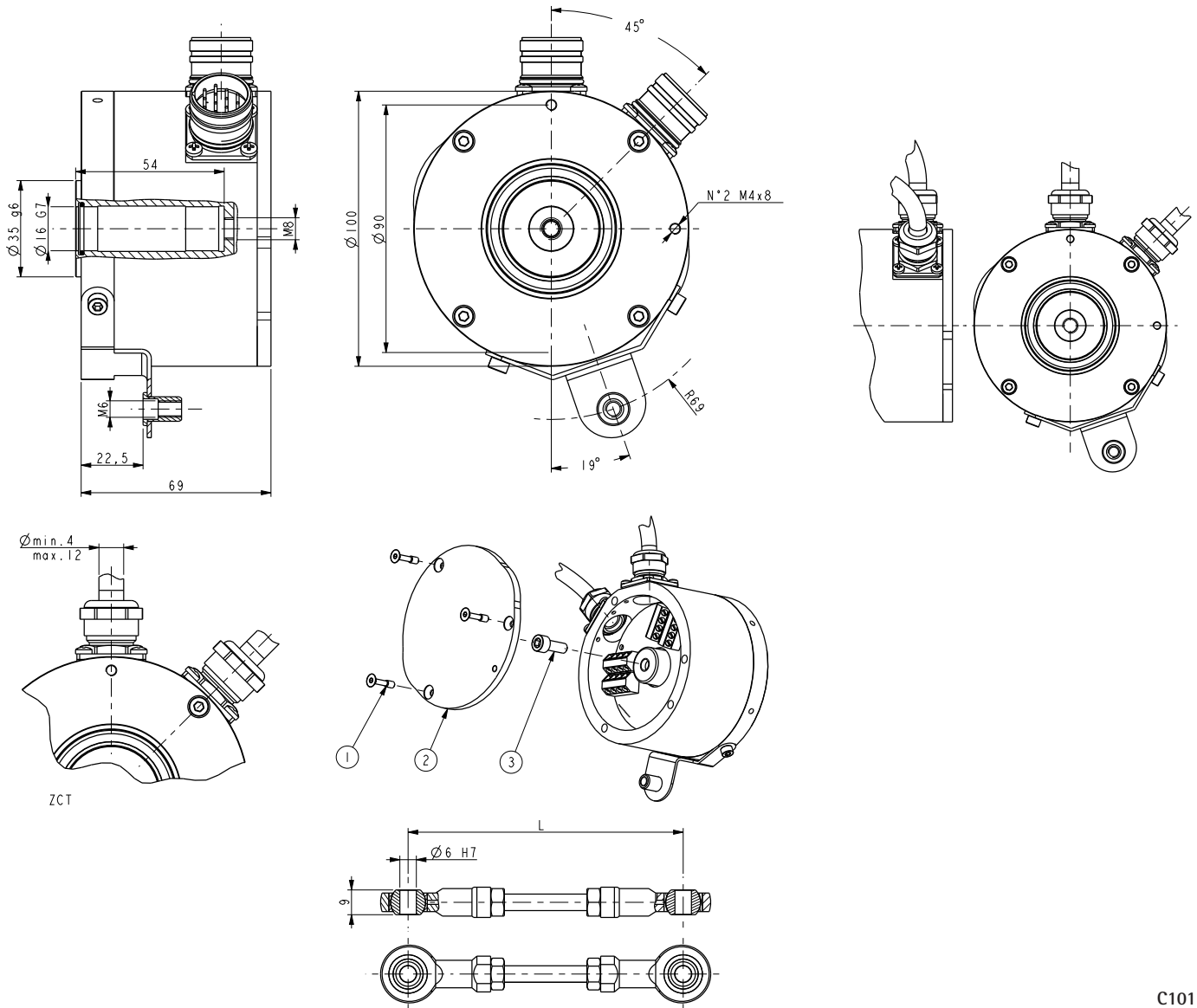
Resolution (PPR):	1024-2048
Counting frequency:	100 kHz max.
Output circuits:	Power Push-Pull, Power Line Driver
Power supply:	+5V ±5%, +10V +30V
Consumption:	70 mA (typical)
Output current (per channel):	100 mA max.
Protection:	against inversion of polarity and short-circuit
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Flange:	anticorodal, UNI EN AW-6082, anodized
Housing:	anticorodal, UNI EN AW-6082, anodized
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EPFL121:	12 pin M23 mating connector
EC-C12F-S19-M8-xx:	cordset x m with M23 connector
PF4284/xx:	torque arm



C101

Order code

C101	-	X a	-	XXXXX b	XXX c	X d	XX e	/Sxxx f
------	---	--------	---	------------	----------	--------	---------	------------

a OUTPUT CIRCUITS

K = Power Line Driver  
T = Power Push Pull

b RESOLUTION (PPR)

1024, 2048

c OUTPUT SIGNALS / CONNECTIONS

ZCZ = AB0 /AB0, M23 12 pin plug  
ZCT = AB0 /AB0, screw terminals  
ZCU = AB0 /AB0, cable output

d SUPPLY VOLTAGE

1 = +5V±5% (T output circuit)  
2 = +10V± +30V (K output circuit)

e SHAFT DIAMETER

16 = 16 mm

f CUSTOM VERSION

# ROTAPULS

Timing belt pulley with integrated encoder

Series

I70



- Integrated pulley encoder with 500 pulses/turn
- HTD type pulley for 20 mm belts
- Extremely robust construction, 1000 N shaft load
- Silent running & long life-time
- Easy assembly by M12 screw and size 21 wrench key



I70

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP65
Operating temperature range:	-20°C +85°C (-4°F +185°F)
Storage temperature range:	-20°C +85°C (-4°F +185°F) (98% R.H. without condensation)

## MECHANICAL SPECIFICATIONS

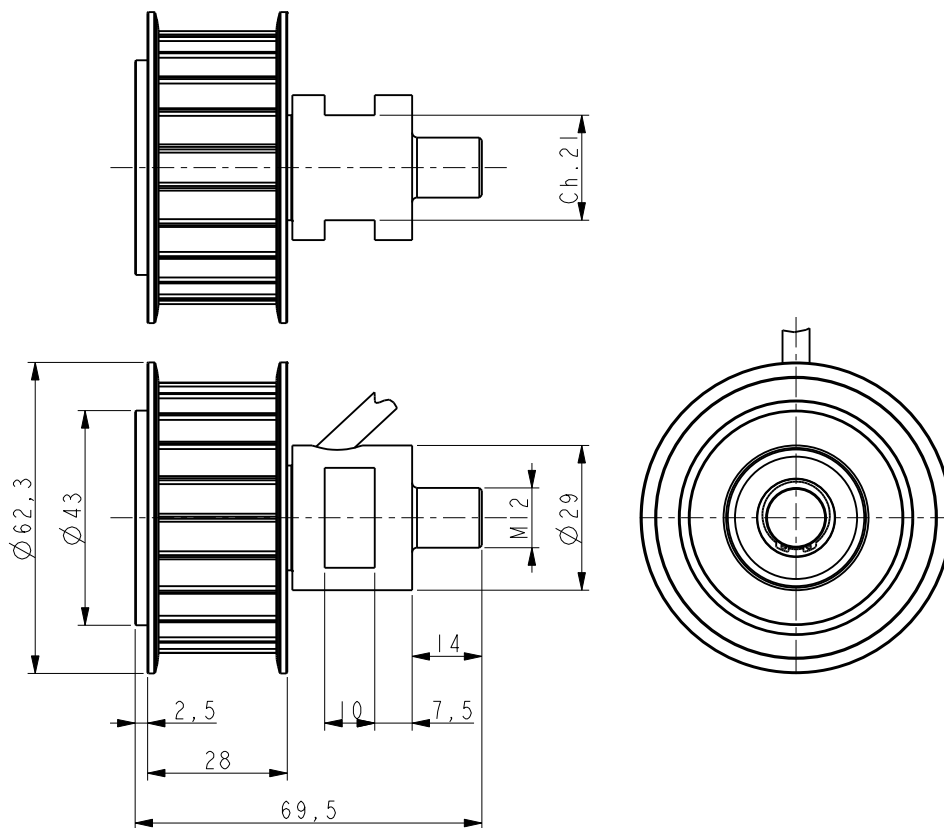
Dimensions:	see drawing
Pulley type:	HTD, 8 mm pitch, 22 teeth, belt width 20 mm
Shaft loading (axial and radial):	1000 N max.
Shaft rotational speed:	5000 rpm max.
Starting torque (at 20°C):	≤ 1,5 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	cabl e output 1 m (3.3 ft)
Weight:	~ 350 g (12,3 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

Resolution (PPR):	500
Counting frequency:	30 kHz max.
Output circuit:	Push-Pull
Power supply:	+10V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

Pulley:	Aluminium
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic, AISI 303



170

Order code

170	-	X ⓐ	-	XXX ⓑ	XXX ⓒ	X ⓓ	XX ⓔ	XX ⓕ	/Sxxx ⓖ
-----	---	--------	---	----------	----------	--------	---------	---------	------------

ⓐ OUTPUT CIRCUITS

Y = Push Pull

ⓑ RESOLUTION (PPR)

500

ⓒ OUTPUT SIGNALS

BNF = AB

ⓓ SUPPLY VOLTAGE

2 = +10V ÷ +30V

ⓔ SHAFT FIXING

12 = M12

ⓕ CABLE LENGTH

L1 = cable output 1 m

Lx = cable output x m

ⓖ CUSTOM VERSION



# ROTAPULS

Incremental encoder

Series

ICS



- Robust & corrosion resistant housing
- For linear measurements with pinion + rack or metric wheel
- Movable shaft absorbs mounting misalignments
- Absolute version on request



ICS

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-25°C +85°C (-13°F +185°F) (98% R.H.without condensation)
Protection:	IP67, connector IP65

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft hollow:	∅ 12 mm
Shaft loading (axial and radial):	100 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	≤ 3 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max)
Weight:	~ 1,2 kg (42,3 oz)

## ELECTRICAL SPECIFICATIONS

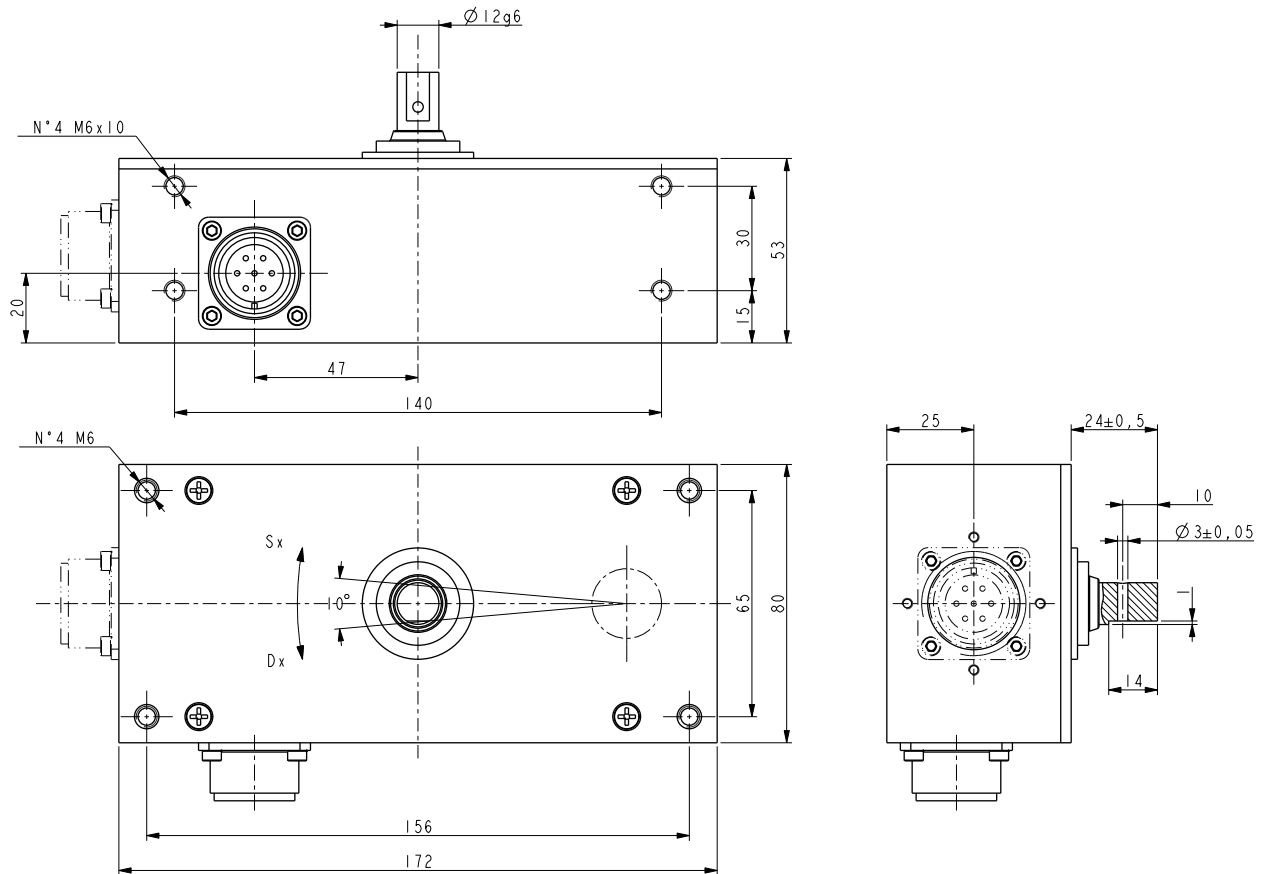
Resolution (PPR):	2-4-5-8-10-12-15-16-20-24-25-30-35-36-40-50-60-64-70-80 90-100-120-127-142-150-160-180-200-216-230-236-240-250 254-256-267-270-300-314-360-375-400-410-435-471-500 512-600-635-720-750-800-900-1000-1024-1068-1200-1250 1270-1400-1440-1500-1800-2000-2048-2250-2400-2500
Pulses/mm:	to be result of pinion and rack ratio
Counting frequency:	60 kHz max.
Output circuit:	NPN, PNP, Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V,+5V +30V
Consumption:	70 mA (typical)
Output current (each channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit
EMC:	electro-magnetic immunity, according to EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.

## MATERIALS

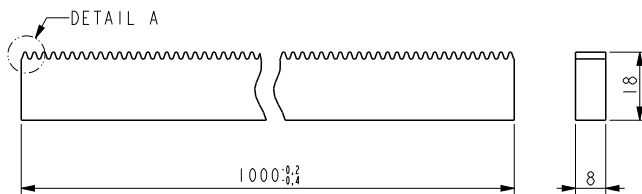
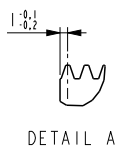
Housing:	anticorodal, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

E7MLS:	7 pin MIL mating connector
E10MLS:	10 pin MIL mating connector
LKM-1225:	Z40 pinion
LKM-1224:	M0,79 rack



ICS



M=0.79577  
P=2.5  
Z=399

LKM-1224 (rack)

Order code

ICS	-	X	-	XXXXX	XXX	X	X	XX	X	/Sxxx
		(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)

(a) OUTPUT CIRCUITS

N = NPN o.c.  
P = PNP o.c.  
Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

(b) RESOLUTION (PPR)

See electrical specifications

(c) OUTPUT SIGNALS / CONNECTIONS

BND = AB, MIL 7 pin plug  
BCP = AB /AB, MIL 10 pin plug (only radial)  
ZND = AB0, MIL 7 pin plug  
ZCP = AB0 /AB0, MIL 10 pin plug (only radial)

(d) SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

(e) SHAFT DIAMETER

F = 12 mm

(f) SHAFT REST POSITION

DX = right (see drawing)  
SX = left (see drawing)

(g) CONNECTION POSITION

- = axial  
R = radial (with BCP, ZCP)

(h) CUSTOM VERSION

# ROTAPULS

Incremental encoder

Series

I105



- High resolution encoder for rotary & index tables
- 18000 PPR without interpolation
- Robust construction with IP65 protection
- Large operating temperature range



I105

## ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP64
Operating temperature range:	-20°C+70°C (-4°F +158°F) - only for 16384 PPR +10°C +60°C (50°F +140°F) - only for 18000 PPR
Storage temperature range:	-20°C+80°C (-4°F +176°F) (98% R.H. without condensation)
Options:	<ul style="list-style-type: none"> <li>• Operating temp. range: -40°C +100°C (only for 16384 PPR)</li> <li>• IP65 protection</li> </ul>

## MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Shaft hollow:	Ø 10 mm
Shaft loading (axial and radial):	40 N max.
Shaft rotational speed:	6000 rpm max.
Starting torque at 20°C:	≤ 1 Ncm (typical)
Bearings life:	400 x 10 <sup>6</sup> rev. min. (10 <sup>9</sup> rev. min. with 20 N shaft loading max.)
Electrical connections:	cable output 2 m (6.56 ft)
Weight:	~ 900 g (31,7 oz)
Option:	• additional cable

## ELECTRICAL SPECIFICATIONS

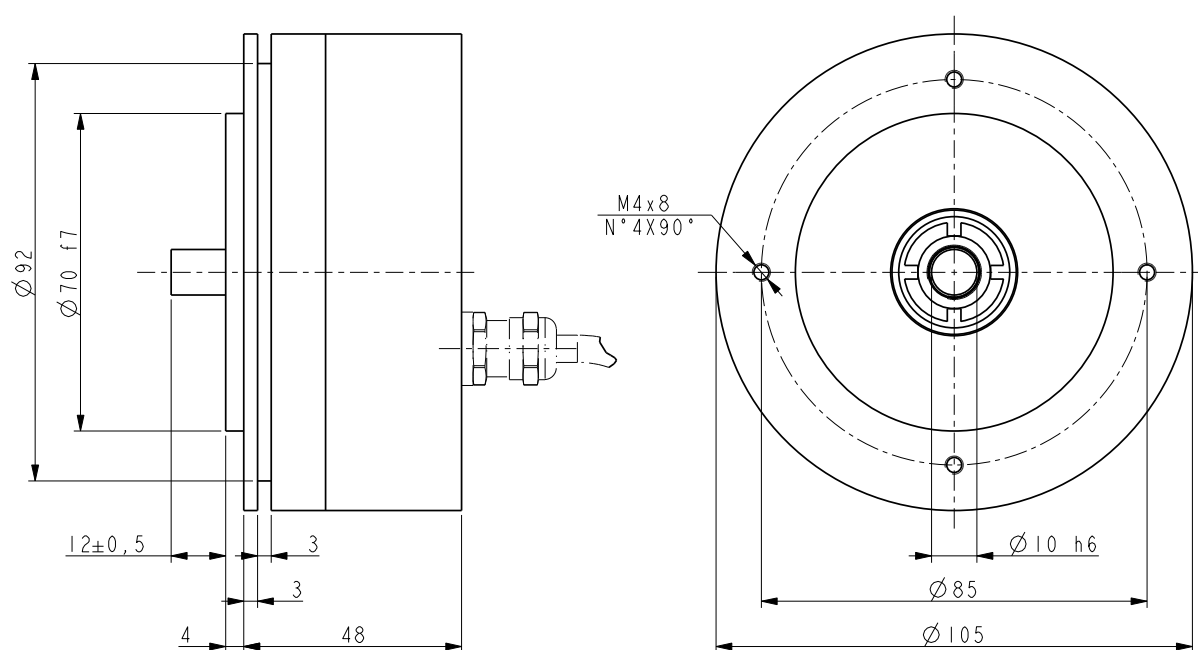
Resolution (PPR):	16384-18000
Counting frequency:	100 kHz max.
Output circuits:	Push-Pull, Line Driver, Universal circuit
Power supply:	+5V±5%, +10V +30V, +5V +30V
Consumption:	100 mA max.
Output current (per channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, according to EN 61000-4-2 EN 61000-4-4
Optoelectronic life:	100.000 hrs min.
Option:	<ul style="list-style-type: none"> <li>• Output frequency up to 300 kHz max.</li> </ul> (only for 16384 PPR; not in combination with K option)

## MATERIALS

Flange:	anticorrosive, UNI EN AW-6082
Housing:	anticorrosive, UNI EN AW-6082
Bearings:	ABEC 5
Shaft:	stainless steel, non-magnetic - UNI EN 4305
Light source:	GaAl diodes

## ACCESSORIES

EPFL 121:	12 pin M23 mating connector
PAN/PGF:	flexible couplings
LKM-386:	fixing clamps



I105

## Order code

I105	-	X Ⓐ	-	XXXXX Ⓑ	XXX Ⓒ	X Ⓓ	XX Ⓔ	X Ⓕ	X Ⓖ	X Ⓗ	XX Ⓘ	/Sxxx ⓵
------	---	--------	---	------------	----------	--------	---------	--------	--------	--------	---------	------------

## Ⓐ OUTPUT CIRCUITS

Y = Push Pull  
L = Line Driver (RS422)  
H = PP/LD universal circuit

## Ⓑ RESOLUTION (PPR)

See electrical specifications

## Ⓒ OUTPUT SIGNALS / CONNECTIONS

BCU = AB /AB, cable output  
BCZ = AB /AB, M23 connector output  
ZCU = ABO /ABO, cable output  
ZCZ = ABO /ABO, M23 connector output

## Ⓓ SUPPLY VOLTAGE

1 = +5V±5% (L output circuit)  
2 = +10V÷ +30V (Y output circuit)  
4 = +5V÷ +30V (H output circuit)

## Ⓔ SHAFT DIAMETER

10 = 10 mm

## Ⓕ PROTECTION

- = IP64 (standard)  
P = IP65

## Ⓖ COUNTING FREQUENCY

- = 100 kHz (standard)  
W = 300 kHz  
(only for 16384 PPR, not in combination with K option)

## Ⓗ OPERATING TEMPERATURE RANGE

- = standard (see specifications)  
K = -40°C +100°C (-40°F +212°F)  
(only for 16384 PPR, not in combination with W option)

## ⓵ CABLE LENGTH

L2 = cable output 2 m  
L7 = cable output 7 m  
Lx = cable output x m

## ⓵ CUSTOM VERSION