ROTAPULS
Incremental encoder modules

Series IM30 • IM31 • IM56

- Low cost encoder modules
- Easy assembly and disc alignment
- Bearingless design

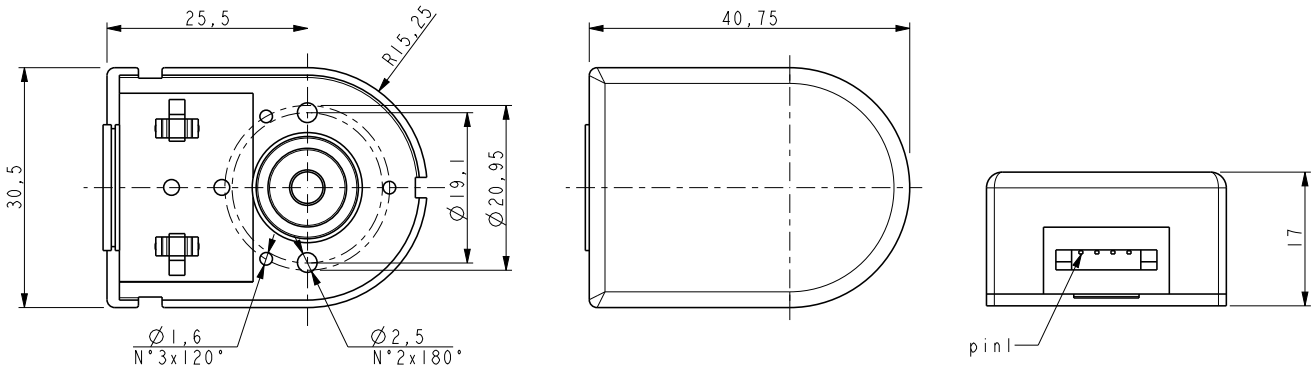
IM56 • IM31

ENVIRONMENTAL SPECIFICATIONS	
Operating temperature range:	-40°C +85°C (-40°F +185°F)
Storage temperature range:	-40°C +85°C (-40°F +185°F)
Option:	• Operating temperature range: -40°C +100°C (-40°F +212°F)

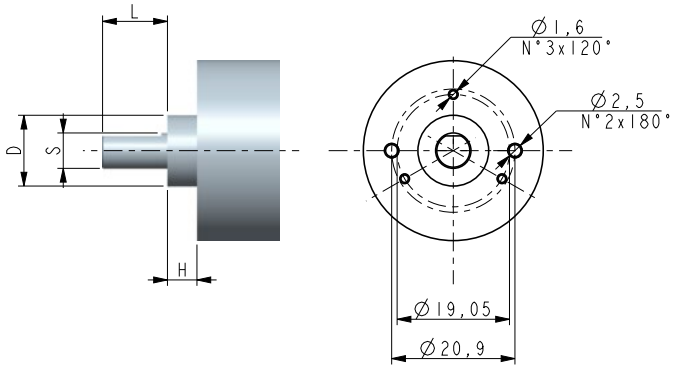
MECHANICAL SPECIFICATIONS	
Dimensions:	see drawing
Hub:	Ø 3, 4, 5, 6, 6.35, 8 mm
Electrical connections:	pin or 15 cm flat cable

ELECTRICAL SPECIFICATIONS	
Resolution (PPR):	**IM30:** 96, 100, 192, 200, 256, 300, 360, 400, 500, 512 1000, 1024, 1200, 1250 **IM31:** 50, 100, 200, 256, 360, 400, 500, 512, 1000, 1024 **IM56:** 1000, 1024, 2000, 2048
Output signals:	IM30: AB 90° ± 8° IM31, IM56: AB0 90° ± 8° (1000, 1024 PPR only AB)
Output circuit:	TTL
Power supply:	+5V ±10%
Output current (per channel):	5 mA max.
Counting frequency:	IM30: 20 kHz IM31, IM56: 100 kHz max.
Consumption:	60 mA (typical)
Option:	• Line Driver output circuit

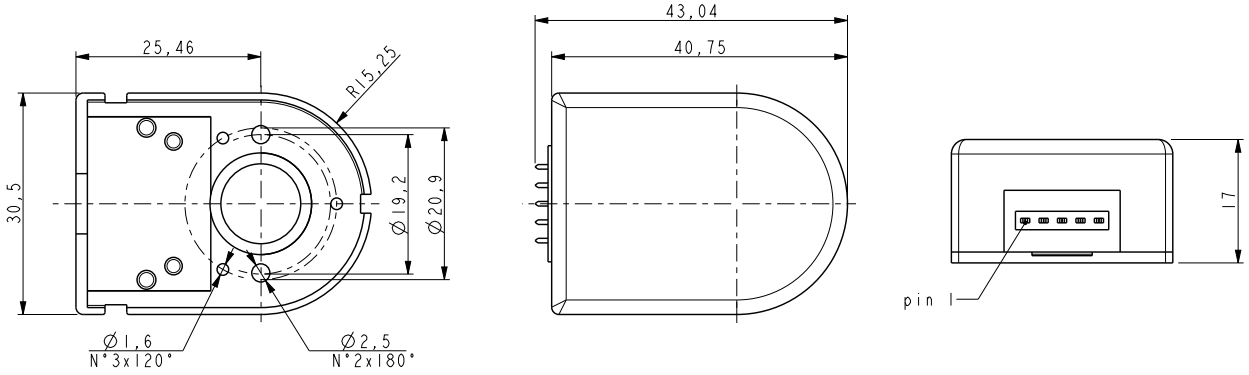
MATERIALS	
Housing:	Polyethylene
Hub:	Aluminium or plastic
Disk:	Mylar



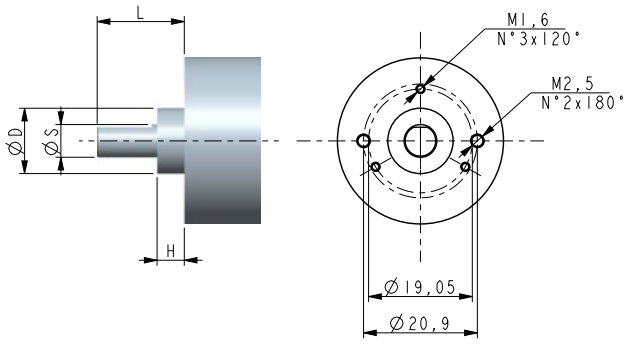
TOP VIEW (BASE PLATE ONLY) TOP VIEW SIDE VIEW

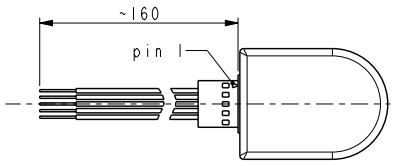


IM30



TOP VIEW (BASE PLATE ONLY) TOP VIEW SIDE VIEW

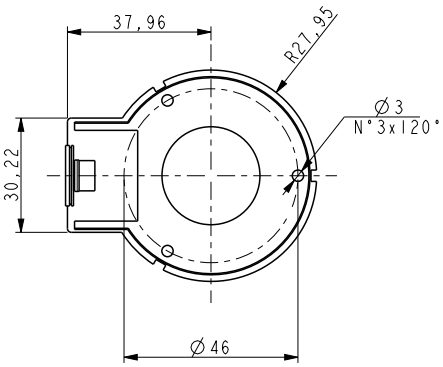




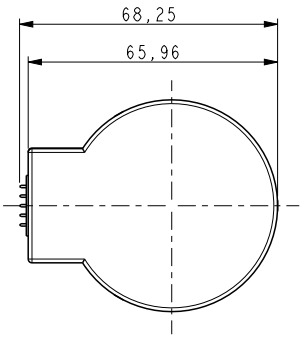
Cable: ~160mm length UL1007/AWG26
Connector: AMP 103686-4, MOLEX 2695+2759

Voltage (5 pin)		
Pin	Color	Description
1	Black	Ground
2	Yellow	Index
3	White	Channel A
4	Red	DC +5V
5	Green	Channel B

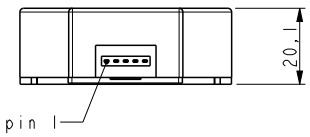
IM31



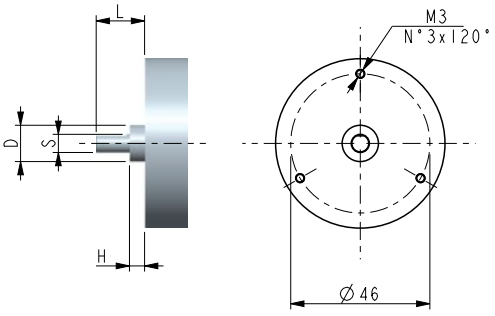
TOP VIEW (BASE PLATE ONLY)

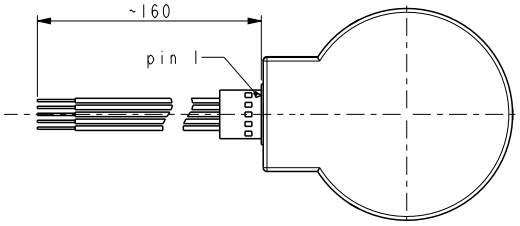


TOP VIEW



SIDE VIEW





Cable: ~160mm length UL1007/AWG26
Connector: AMP 103686-4, MOLEX 2695+2759

Voltage (5 pin)		
Pin	Color	Description
1	Black	Ground
2	Yellow	Index
3	White	Channel A
4	Red	DC +5V
5	Green	Channel B

Order code

IM30	-	X ⓐ	-	XXXX ⓑ	X ⓒ	X ⓓ	XX ⓔ	X ⓕ	X ⓖ	/Sxxx ⓗ

ⓐ **OUTPUT CIRCUITS**
N = TTL

ⓑ **RESOLUTION**
See electrical specifications

ⓒ **OUTPUT SIGNALS**
B = AB

ⓓ **POWER SUPPLY**
1 = +5Vdc ±5%

ⓔ **SHAFT DIAMETER**
3 = 3 mm
4 = 4 mm
5 = 5 mm
6 = 6 mm
P6 = 6.35 mm - 1/4"
8 = 8 mm

ⓕ **HUB STYLE**
A = Aluminium hub (standard)
P = Push on hub

ⓖ **OPERATING TEMPERATURE RANGE**
T = -40°C +85°C (-40°F +185°F)
K = -40°C +100°C (-40°F +212°F)

ⓗ **CUSTOM VERSION**

Order code

IM31	-	X ⓐ	-	XXXX ⓑ	X ⓒ	X ⓓ	XX ⓔ	X ⓕ	X ⓖ	/Sxxx ⓗ

ⓐ **OUTPUT CIRCUITS**
N = TTL (AB0)
L = Line Driver (AB0 /AB0)

ⓑ **RESOLUTION**
See electrical specifications

ⓒ **OUTPUT SIGNALS**
Z = AB0

ⓓ **POWER SUPPLY**
1 = +5Vdc ±5%

ⓔ **SHAFT DIAMETER**
3 = 3 mm
4 = 4 mm
5 = 5 mm
6 = 6 mm
P6 = 6.35 mm - 1/4"
8 = 8 mm

ⓕ **HUB STYLE**
A = Aluminium hub (standard)
P = Push on hub

ⓖ **OPERATING TEMPERATURE RANGE**
T = -40°C +85°C (-40°F +185°F)
K = -40°C +100°C (-40°F +212°F)

ⓗ **CUSTOM VERSION**

Order code

IM56	-	X ⓐ	-	XXXX ⓑ	X ⓒ	X ⓓ	XX ⓔ	X ⓕ	X ⓖ	/Sxxx ⓗ

ⓐ **OUTPUT CIRCUITS**
N = TTL (AB0)
L = Line Driver (AB0 /AB0)

ⓑ **RESOLUTION**
See electrical specifications

ⓒ **OUTPUT SIGNALS**
Z = AB0

ⓓ **POWER SUPPLY**
1 = +5Vdc ±5%

ⓔ **SHAFT DIAMETER**
8 = 8 mm

ⓕ **HUB STYLE**
A = Aluminium hub (standard)
P = Push on hub

ⓖ **OPERATING TEMPERATURE RANGE**
T = -40°C +85°C (-40°F +185°F)
K = -40°C +100°C (-40°F +212°F)

ⓗ **CUSTOM VERSION**

ROTAPULS

The low-cost heavy duty solution

Series SGSM • SGSD

- Low-cost heavy duty solution
- Sealed housing, IP68
- Redundant version SGSD
- Up to 50 mm hollow shaft
- Outdoor & mobile equipment applications

SGSM • SGSD

ENVIRONMENTAL SPECIFICATIONS	
Operating temperature range:	-40°C ÷ +85°C (-40°F +185°F)
Storage temperature range:	-40°C ÷ +100°C (-40°F +212°F)
Protection:	IP68

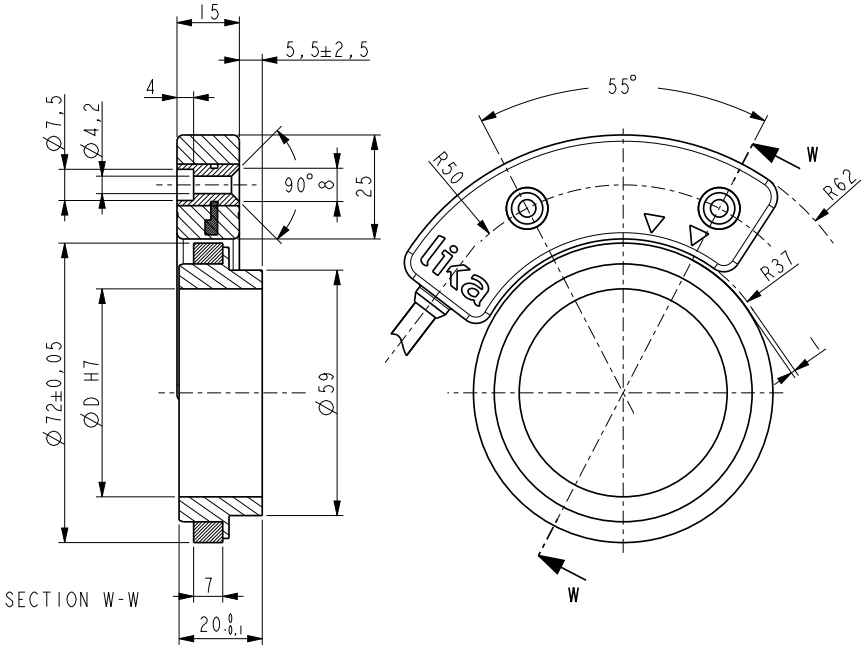
MECHANICAL SPECIFICATIONS	
Dimensions:	see drawing
Hollow shaft diameter:	Ø 30, 50 mm
Shaft rotational speed:	10000 rpm max. (mechanical)
Gap sensor-ring:	0,1 ÷ 1,5 mm
Electrical connections:	M12 8 pin inline plug or Lika Hi-flex cable 2,0 m (6.56 ft)
Weight:	~ 200 g (7 oz)
Option:	• additional cable

ELECTRICAL SPECIFICATIONS	
Resolution (PPR):	256, 512, 1024
Accuracy:	± 0,05°
Counting frequency:	100 kHz max.
Output circuits:	Line Driver, Push-Pull
Power supply:	+5Vdc ±5%, +10Vdc ÷ +30Vdc
Consumption:	70 mA max.
Output signals:	AB, /AB
Output current (per channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, EN 61000-4-2 EN 61000-4-4

MATERIALS	
Housing:	Macromelt OM 646-EN
Hub:	Anticorodal, UNI EN AW-6082
Ring:	Plastoferrite

ACCESSORIES	
EM12F8:	M12 8 pin mating connector

Specifications subject to changes without prior notice



SGSM • SGSD

Order code - Sensor

SGSM SGSD	-	X ⓐ	-	X ⓑ	-	XX ⓒ	-	X ⓓ	-	XX ⓔ	/Sxxx ⓕ

ⓐ **OUTPUT CIRCUITS**
Y = Push Pull (AB, /AB)
L = Line Driver (AB, /AB)

ⓑ **SUPPLY VOLTAGE VS OUTPUT CIRCUIT**
1 = +5V±5% (L output circuit)
2 = +10V÷ +30V (Y output circuit)

ⓒ **RESOLUTION**
16 = 256 PPR
32 = 512 PPR
64 = 1024 PPR

ⓓ **INDEX**
N = without Index

ⓔ **CONNECTIONS**
1 = cable output 1 m
x = cable output x m
M2 = 2 m cable + M12 8 pin inline plug (only SGSM)

ⓕ **CUSTOM VERSION**

Order code - Magnetic ring

MRI	/	XX ⓐ	-	XX-X ⓑ	-	XX ⓒ	/Sxxx ⓓ

ⓐ **RING TYPE**
72 = size 72 with grub screw fixing

ⓑ **MAGNETIC CODING**
64-3 = 64 poles

ⓒ **SHAFT DIAMETER**
30 = 30 mm
50 = 50 mm

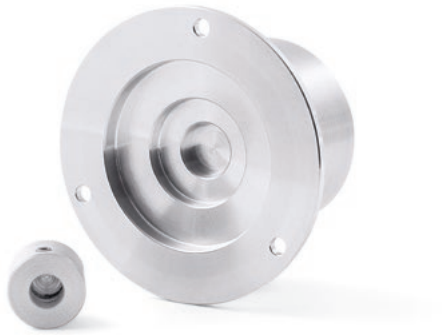
ⓓ **CUSTOM VERSION**

ROTAMAG

Magnetic bearingless encoder

Series **MIK36 • MSK36**

- High speed rotary encoder
- Bearingless, non contact design
- IP67 or IP68 protection with sealed circuits
- Incremental and absolute version



MIK36 • MSK36

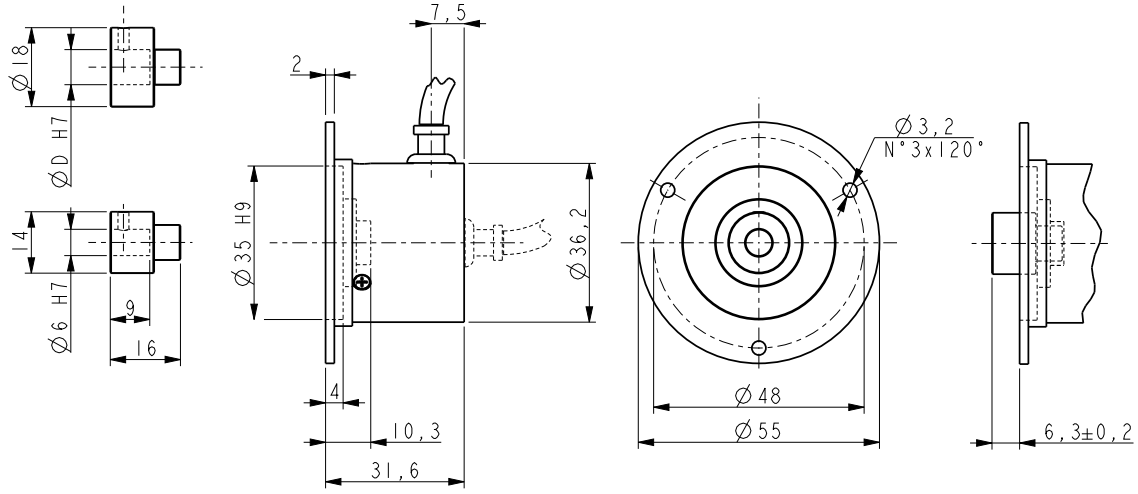
ENVIRONMENTAL SPECIFICATIONS	
Shock:	100 g, 6 ms
Vibrations:	10 g, 5-2000 Hz
Protection:	IP67
Operating temperature range:	-20°C +85°C (-4°F +185°F)
Storage temperature range:	-20°C +85°C (-4°F +185°F) (98% R.H. without condensation)
Option:	• IP68 protection with sealed circuits

MECHANICAL SPECIFICATIONS	
Dimensions:	see drawing
Shaft diameter:	Ø 6, 8, 10 mm
Shaft rotational speed:	30000 rpm max.
Electrical connections:	M12 8 pin inline plug or cable output 1 m (3.3 ft)
Weight:	~ 50 g (1,7 oz)
Option:	• additional cable

ELECTRICAL SPECIFICATIONS	
Resolution:	**MIK36 (PPR):** 4-8-10-16-20-25-32-40-50-64-80-100 125-128-200-250-256-400-500-512-1024-2048 **MSK36 (cpr):** 8192
Accuracy:	± 0,9°
Counting frequency:	300 kHz max. (MIK36)
Output circuits:	MIK36: NPN, Push-Pull, Line Driver MSK36: SSI, 13 clock max. 1 MHz
Power supply:	5Vdc ±5%, +10Vdc +30Vdc
Consumption:	MIK36 50 mA max. MSK36 65 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:	anticorodal, UNI EN AW-6082
Housing:	anticorodal, UNI EN AW-6082
Shaft:	anticorodal, UNI EN AW-6082

Specifications subject to changes without prior notice



MIK36 • MSK36

MIK36 Resolution	Rpm max.
> 128	30000
> 256	20000
> 512	10000
1024	5100
2048	2550

Order code - Incremental encoder

MIK36	-	X ⓐ	-	XXXX ⓑ	XXX ⓒ	X ⓓ	XX ⓔ	X ⓕ	X ⓖ	XX ⓗ	/Sxxx ⓘ

ⓐ **OUTPUT CIRCUITS**
N = NPN
Y = Push Pull
L = Line Driver (RS422)

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

ⓒ **OUTPUT SIGNALS**
ZNF = AB0
ZCU = AB0, /AB0

ⓓ **SUPPLY VOLTAGE**
1 = +5V±5% (L output circuit)
2 = +10V÷ +30V (Y or N output circuit)

ⓔ **SHAFT DIAMETER**
6 = 6 mm
8 = 8 mm
10 = 10 mm

ⓕ **CONNECTION POSITION**
- = axial
R = radial

ⓖ **PROTECTION**
- = IP67
J = IP68 with sealed circuits

ⓗ **CONNECTIONS**
L1 = cable output 1 m (standard)
L2 = cable output 2 m
Lx = cable output x m
M0,5 = 0,5 m cable + M12 8 pin inline plug
M2 = 2 m cable + M12 8 pin inline plug

ⓘ **CUSTOM VERSION**

Order code - Absolute encoder

MSK36	XX ⓐ	/	XX ⓑ	-	XX ⓒ	-	X ⓓ	X ⓔ	X ⓕ	XX ⓖ	/Sxxx ⓗ

ⓐ **RESOLUTIONS**
13 = 8192 counts/rev.

ⓑ **OUTPUT CODE**
BS = Binary, SSI
GS = Gray, SSI

ⓒ **SHAFT DIAMETER**
6 = 6 mm
8 = 8 mm
10 = 10 mm

ⓓ **CONNECTION POSITION**
- = axial
R = radial

ⓔ **ZERO SETTING**
- = without (standard)
E = zero setting

ⓕ **PROTECTION**
- = IP67
J = IP68 with sealed circuits

ⓖ **CONNECTIONS**
L1 = cable output 1 m (standard)
L2 = cable output 2 m
Lx = cable output x m
M0,5 = 0,5 m cable + M12 8 pin inline plug
M2 = 2 m cable + M12 8 pin inline plug

ⓗ **CUSTOM VERSION**

ROTAPULS

Modular magnetic encoder for Heavy-Duty applications

Series SMRI5 - MRI

- Bearingless encoder
- Non contact magnetic sensing
- Sensor/ring clearance up to 1.5 mm
- IP67 washdown protection (IP69K on request)

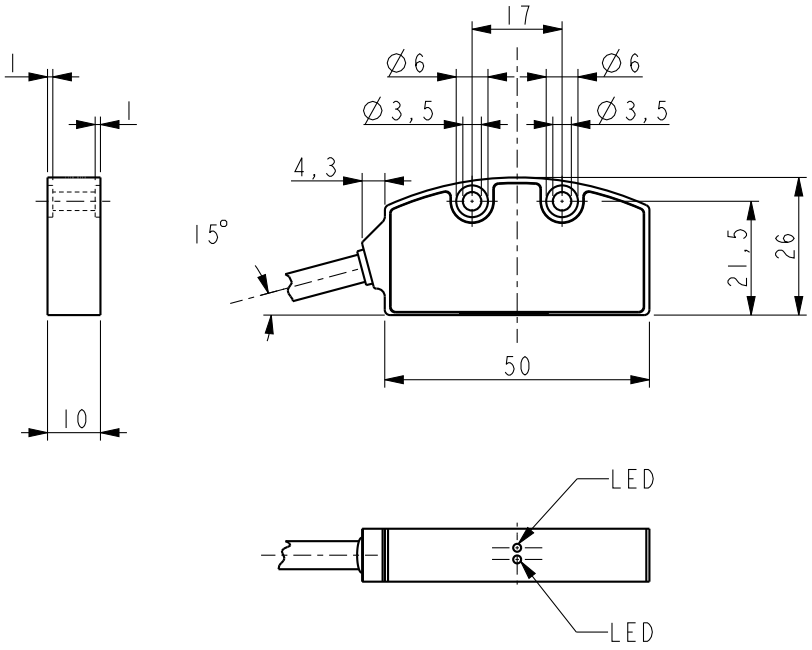
SMRI5 • MRI

ENVIRONMENTAL SPECIFICATIONS	
Operating temperature range:	-25°C +85°C (-13°F +185°F)
Storage temperature range:	-40°C +100°C (-40°F +212°F)
Protection:	IP67

MECHANICAL SPECIFICATIONS	
Dimensions:	see drawing
Hollow shaft diameter:	see drawing (from Ø 6 to 250 mm)
Shaft rotational speed:	MRI/31, MRI/48: 25000 rpm max. (mechanical) MRI/57: 22000 rpm max. (mechanical) MRI/114, MRI/141: 15000 rpm max. (mechanical) MRI/284: 9000 rpm max. (mechanical)
Gap sensor-ring:	0,1 ÷ 1,5 mm (typical)
Electrical connections:	M12 8 pin inline plug or Lika Hi-flex cable 2,0 m (6.56 ft)
Option:	• additional cable

ELECTRICAL SPECIFICATIONS	
Resolution (PPR):	see specifications
Accuracy:	± 0,05° (± 0,1° typical)
Output circuits:	Line Driver, Push-Pull
Power supply:	+5Vdc ±5%, +10Vdc ÷ +30Vdc
Consumption:	70 mA max.
Output signals:	AB /AB, AB0 /AB0
Output current (per channel):	40 mA max.
Protection:	against inversion of polarity and short-circuit (except L circuit)
EMC:	electro-magnetic immunity, EN 61000-4-2 EN 61000-4-4

MATERIALS	
Housing:	anticorodal, UNI EN AW-6082
Hub:	anticorodal, UNI EN AW-6082 or stainless steel
Ring:	ferrite or plastoferrite



SMRI5

Order code

SMRI5	-	XX ⓐ	-	X ⓑ	-	XXX ⓒ	-	XX ⓓ	-	X ⓔ	-	X ⓕ	/Sxxx ⓖ

ⓐ **OUTPUT CIRCUITS**
Y = Push Pull (AB)
YC = Push Pull (AB, /AB)
L = Line Driver (AB, /AB)

ⓑ **POWER SUPPLY**
1 = +5Vdc ±5% (L)
2 = +10Vdc÷ +30Vdc (Y and L)

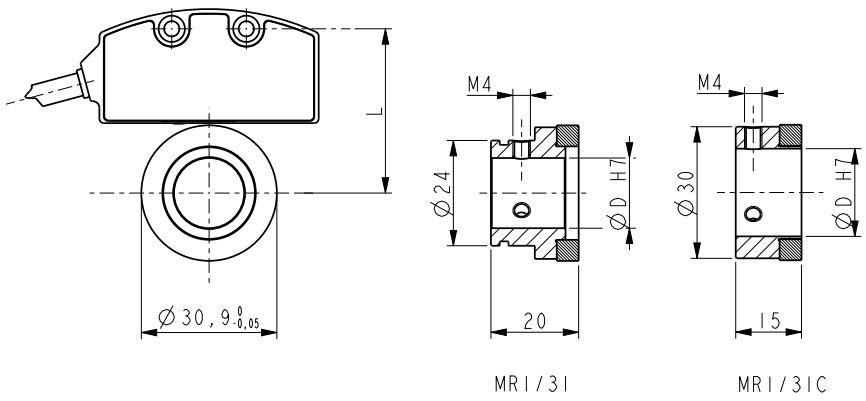
ⓒ **RESOLUTION**
see Resolution vs rpm combinations
(other resolutions on request)

ⓓ **INDEX**
N = without
R = with reference signal

ⓔ **CONNECTIONS**
Lx = cable output x m
M0,5 = 0,5 m cable + M12 8 pin inline plug
M2 = 2 m cable + M12 8 pin inline plug

ⓕ **MIN. EDGE DISTANCE**
J = 0,5 µs (2 MHz)

ⓖ **CUSTOM VERSION**



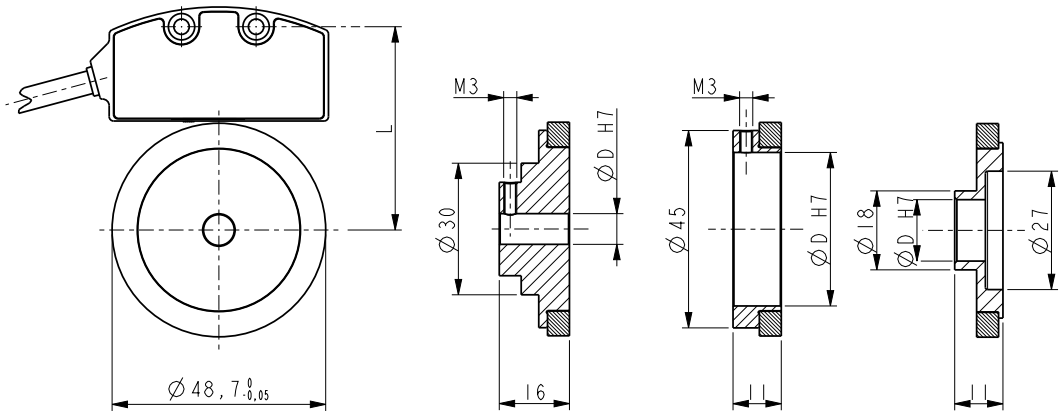
MRI/31 MRI/31C

Resolution vs rpm combinations

Order code Resolution	PPR	Max. counting speed
100	500	21000 rpm
200	1000	21000 rpm
400	2000	11000 rpm
1K	5000	4000 rpm

Order code magnetic ring	D H7
MRI/31-20-5-16	Ø 16 mm
MRI/31-20-5-19	Ø 19 mm
MRI/31C-20-5-20	Ø 20 mm

All rings without reference



MRI/48 MRI/48C MRI/48D

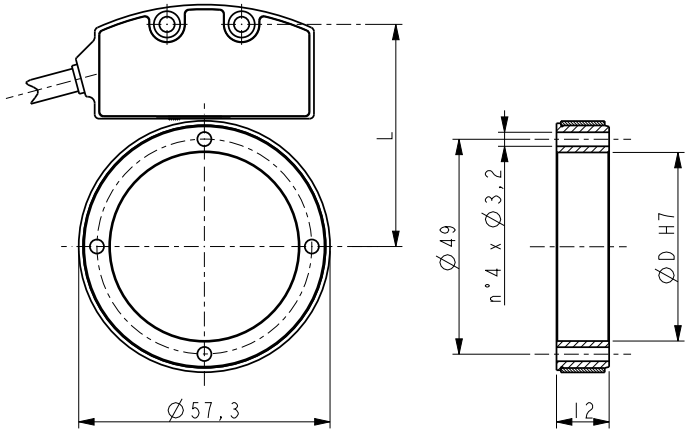
Resolution vs rpm combinations

Order code Resolution	PPR	Max. counting speed
32	256	82000 rpm (a)
64	512	41000 rpm (a)
128	1024	20000 rpm
256	2048	10000 rpm
512	4096	5000 rpm

(a) limited by mechanical speed

Order code magnetic ring	D H7
MRI/48-32-5-6	Ø 6 mm
MRI/48C-32-5-35	Ø 35 mm
MRI/48D-32-5-14	Ø 14 mm

All rings without reference

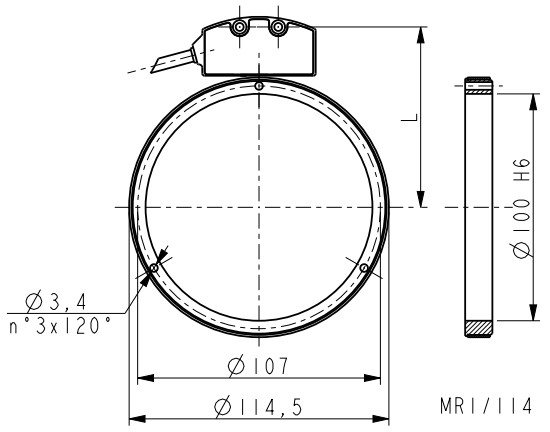


MRI/57
MRI/57Z

Resolution vs rpm combinations

Order code Resolution	PPR	Max. counting speed
80	760	7000 rpm
100	950	11000 rpm
128	1216	17000 rpm
800	7600	3000 rpm

Order code magnetic ring	D H7
MRI/57-38-5-43 (without reference)	Ø 43 mm
MRI/57Z-38-5-43 (with reference)	Ø 43 mm

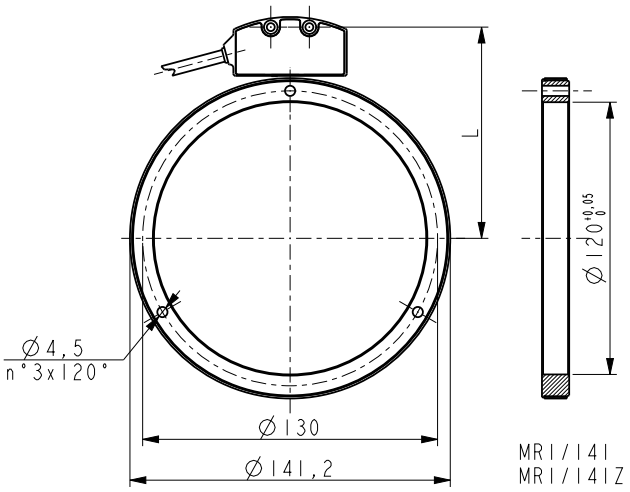


Resolution vs rpm combinations

Order code Resolution	PPR	Max. counting speed
100	1800	6000 rpm
200	3600	6000 rpm
400	7200	3000 rpm
500	9000	2500 rpm
1K	18000	1200 rpm

Order code magnetic ring	D H6
MRI/114-72-5-100	Ø 100 mm

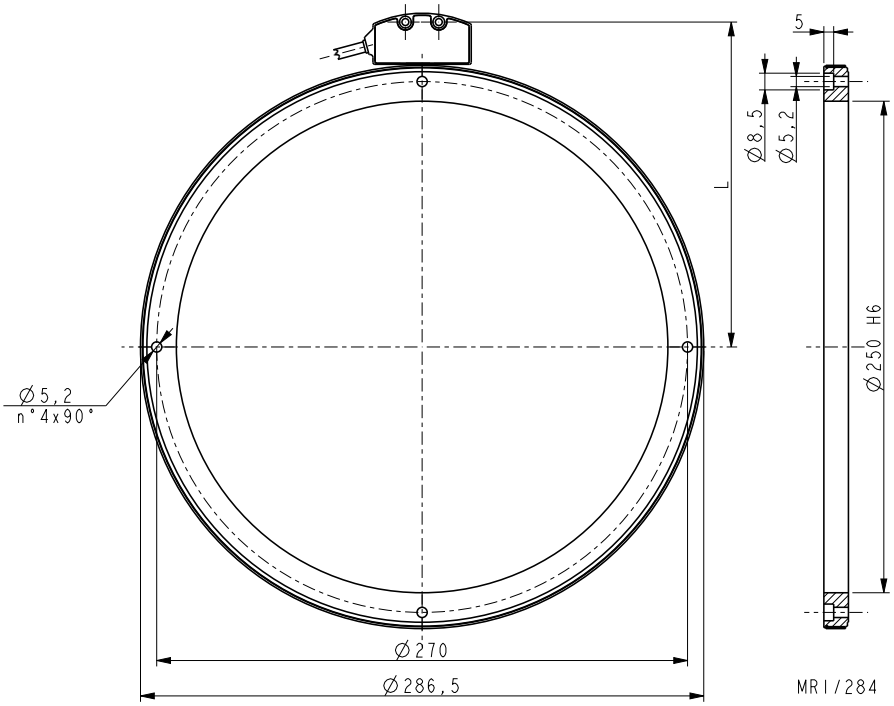
Ring without reference



Resolution vs rpm combinations

Order code Resolution	PPR	Max. counting speed
40	900	3000 rpm
80	1800	3000 rpm
160	3600	3000 rpm
200	4500	5000 rpm
320	7200	3000 rpm
400	9000	2500 rpm

Order code magnetic ring	D
MRI/141-90-5-120 (without ref.)	Ø 120 mm
MRI/141Z-90-5-120 (with reference)	Ø 120 mm



Resolution vs rpm combinations

Order code Resolution	PPR	Max. counting speed
8	360	58000 rpm (a)
32	1440	14000 rpm (a)
40	1800	1500 rpm
80	3600	1500 rpm
100	4500	2500 rpm
200	9000	2500 rpm

(a) limited by mechanical speed

Order code magnetic ring	D H6
MRI/284-180-5-250	Ø 250 mm

Ring without reference