



- Compact & robust absolute encoders
- IP65 Protection, IP66 on request
- SSI 12 bit
- Analogue 0-5V, 0-10V and 4-20mA
- Bit parallel output up to 256 cpr
- Tool turret version with LED for zero position



MS40 • MSC40

### ENVIRONMENTAL SPECIFICATIONS

Shock:	100 g, 6 ms
Vibration:	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)
Option:	• Protection IP66 (shaft side)

### 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
Bearings life:	10 <sup>9</sup> rev. min.
Electrical connections:	M12 inline plug or cable output 1 m (3.3 ft)
Weight:	~ 100 g (3,5 oz)
Option:	• additional cable

### ELECTRICAL SPECIFICATIONS

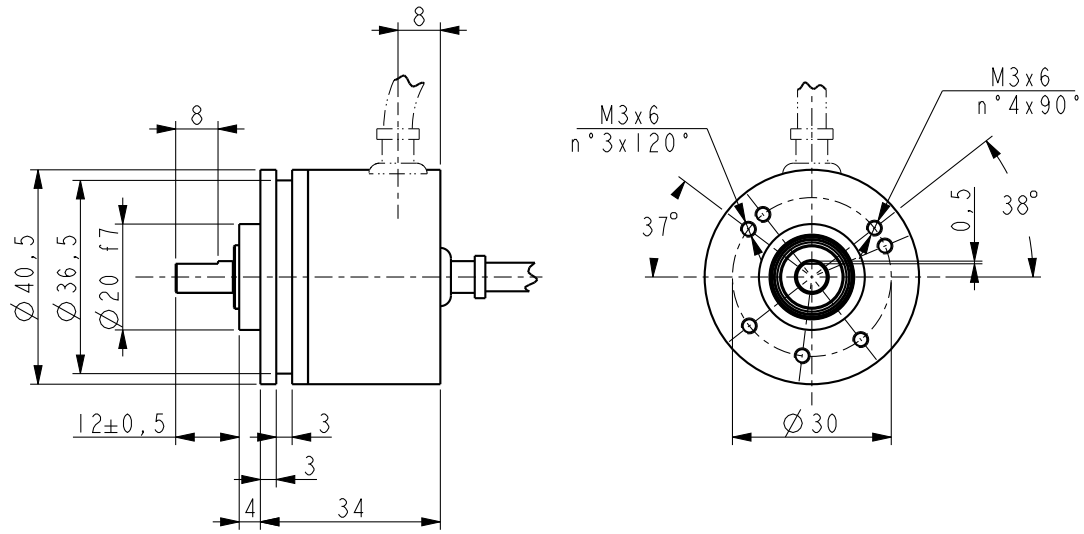
Resolution/Output:	Bit parallel: 256 cpr, binary NPN, PNP SSI: 4096 cpr, binary MSB aligned, T <sub>p</sub> : 15÷20 µs typ., clock 2 MHz max. Analogue: 0-5V, 0-10V, 4-20 mA Fault signal output Zero setting input (only MS41) Absolute tool turret 8 - 24 positions NPN, PNP
Power supply:	see order code MS40 "tool turret": +7Vdc +30Vdc
Power consumption:	65 mA max.
Protection:	protected against inversion of polarity
EMC:	electro-magnetic immunity, according to: EN 61000-4-2 EN 61000-4-4

### MATERIALS

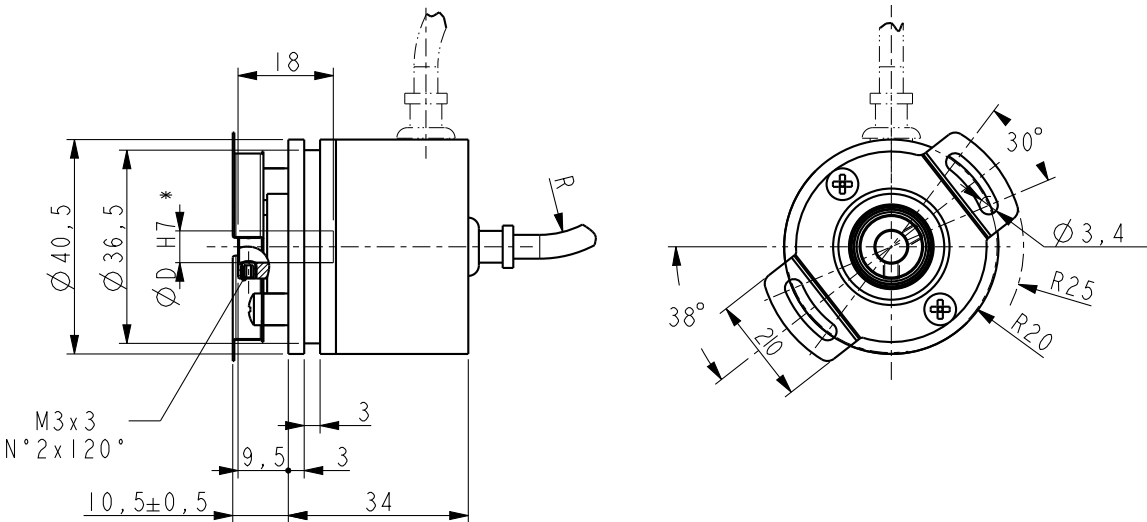
Flange:	anticorodal, UNI EN AW-6082
Housing:	fibre glass epoxy resin
Bearings:	ABEC 5
Shaft:	stainless steel, non magnetic, UNI EN 4305

### ACCESSORIES

PAN/PGF:	Flexible couplings
EM12F8:	M12 8 pin mating connector
E-M12FC:	M12 5 pin mating connector



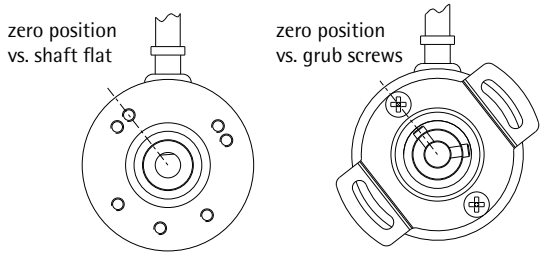
MS40 - MS41



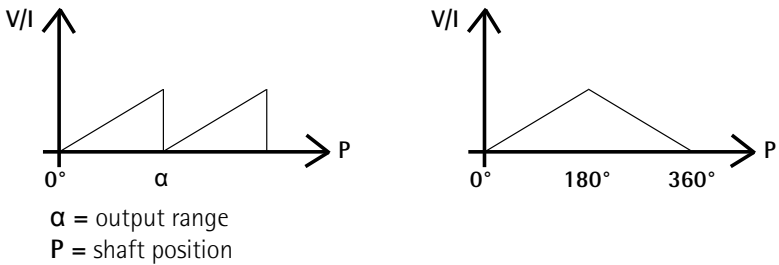
\*  $\varnothing 8$  bore depth = 9mm

MSC40 - MSC41

**Mechanical alignment of zero position on MS40, MSC40 series with SSI output**



**Analogue outputs**



MSx4008/360  
MSx41... (all versions)

MSx4008/180

## Order code - SSI output

MS40 MSC40	XX (a)	/	XX (b)	-	X (c)	-	X (d)	X (e)	X (f)	X (g)	XXX (g)
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<b>(a) RESOLUTION</b> 12 = 4096 counts/rev.	<b>(d) POWER SUPPLY</b> 1 = +5Vdc $\pm$ 5% 2 = +7Vdc +30Vdc	<b>(f) PROTECTION</b> - = IP65 (standard) Q = IP66 (shaft side)
<b>(b) OUTPUT</b> BG = SSI, binary MSB aligned	<b>(e) CONNECTION POSITION</b> - = axial R = radial	<b>(g) CONNECTIONS</b> L1 = cable output 1 m 8 wires (type I8) 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
<b>(c) SHAFT DIAMETER</b> 6 = 6 mm		

## Order code - Bit parallel output

MS41 MSC41	XX (a)	/	XX (b)	-	X (c)	-	X (d)	X (e)	X (f)	X (g)	XXX (g)
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<b>(a) RESOLUTION</b> 08 = 256 counts/rev.	<b>(c) SHAFT DIAMETER</b> 6 = 6 mm	<b>(f) PROTECTION</b> - = IP65 (standard) Q = IP66 (shaft side)
<b>(b) OUTPUT</b> BN = Binary, NPN o.c. BP = Binary, PNP o.c. BK = Binary, NPN 10k $\Omega$ pull-up BJ = Binary, PNP 10k $\Omega$ pull-down	<b>(d) POWER SUPPLY</b> 1 = +5Vdc $\pm$ 5% 2 = +10Vdc +30Vdc	<b>(g) CONNECTIONS</b> L1 = cable output 1 m (type M10) Lx = cable output x m
	<b>(e) CONNECTION POSITION</b> - = axial R = radial	

## Order code - Analogue output

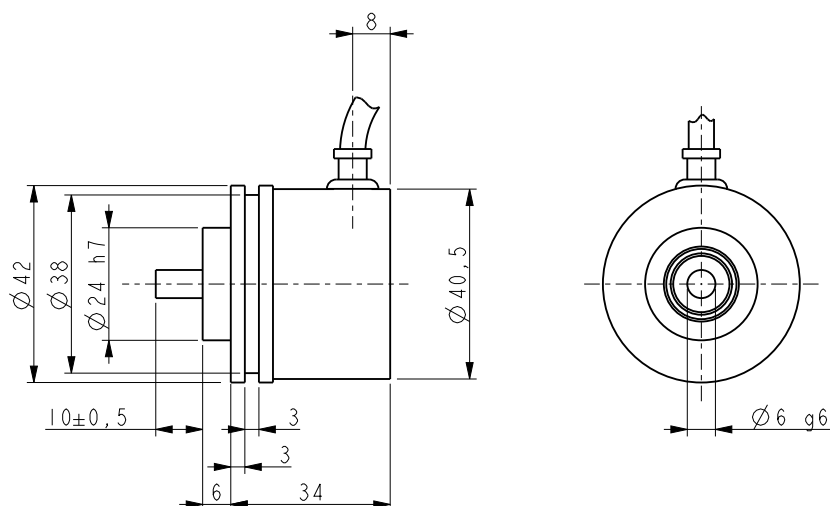
MS40 MSC40	XX (a)	/	XXX (b)	XXX (c)	-	X (d)	-	X (e)	X (f)	X (g)	XXX (h)
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<b>(a) RESOLUTION</b> 08 = 8 bit cw	<b>(d) SHAFT DIAMETER</b> 6 = 6 mm	<b>(g) PROTECTION</b> - = IP65 (standard) Q = IP66 (shaft side)
<b>(b) OUTPUT RANGE</b> 360 = output on 360° 180 = output on 180°	<b>(e) POWER SUPPLY</b> 2 = +10Vdc +30Vdc (AV1 output) +15Vdc +30Vdc (AV2, A1 output)	<b>(h) CONNECTIONS</b> L1 = cable output 1 m 5 wires (type I5) Lx = cable output x m M0,5 = 0,5 m cable + M12 5 pin inline plug M2 = 2 m cable + M12 5 pin inline plug
<b>(c) OUTPUT</b> AI1 = 4-20 mA AV1 = 0-5V AV2 = 0-10V	<b>(f) CONNECTION POSITION</b> - = axial R = radial	

## Order code - Analogue output

MS41 MSC41	XX (a)	/	XXX (b)	XXX (c)	-	X (d)	-	X (e)	X (f)	X (g)	XXX (h)
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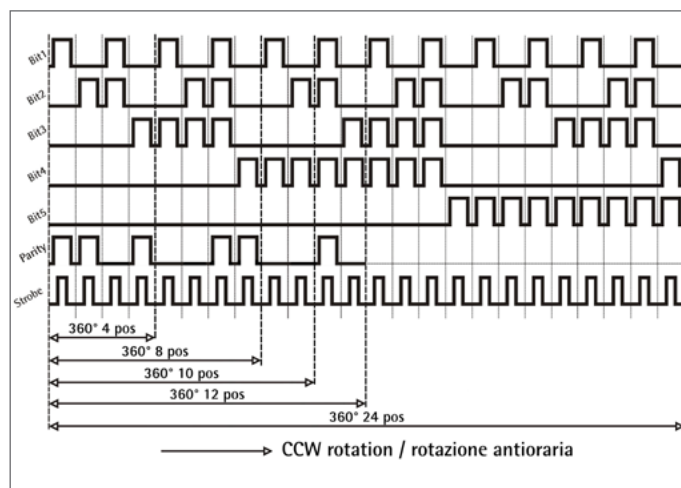
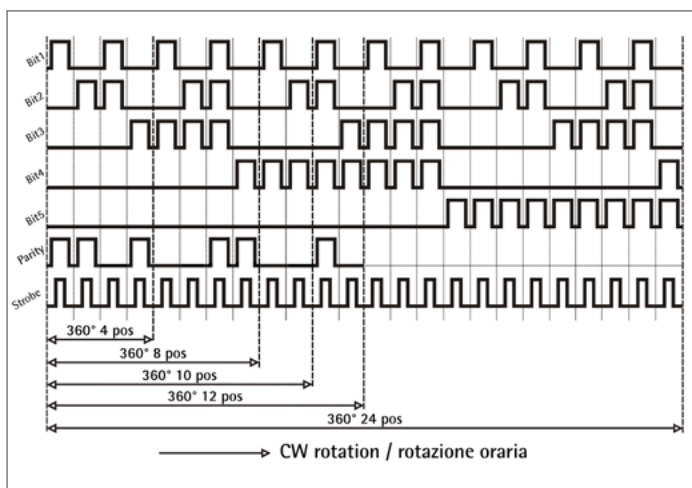
<b>(a) RESOLUTION</b> 10 = 10 bit cw X10 = 10 bit ccw	<b>(d) SHAFT DIAMETER</b> 6 = 6 mm	<b>(g) PROTECTION</b> - = IP65 (standard) Q = IP66 (shaft side)
<b>(b) OUTPUT RANGE</b> 360 = output on 360° 180 = output on 180°	<b>(e) POWER SUPPLY</b> 2 = +10Vdc +30Vdc (AV1 output) +15Vdc +30Vdc (AV2, A1 output)	<b>(h) CONNECTIONS</b> L1 = cable output 1 m 5 wires (type I5) Lx = cable output x m M0,5 = 0,5 m cable + M12 5 pin inline plug M2 = 2 m cable + M12 5 pin inline plug
<b>(c) OUTPUT</b> AI1 = 4-20 mA AV1 = 0-5V AV2 = 0-10V	<b>(f) CONNECTION POSITION</b> - = axial R = radial	



MS40

Output signals CW

Output signals CCW



Order code - Bit parallel "tool turret" output

MS40	XXX Ⓐ	XX Ⓑ	X Ⓒ	X Ⓓ	XXX Ⓔ	/Sxxx Ⓕ
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<p>Ⓐ POSITIONS PER TURN</p> <p>04/ = 4 pos CW 04X = 4 pos CCW 08/ = 8 pos CW 08X = 8 pos CCW 10/ = 10 pos CW 10X = 10 pos CCW 12/ = 12 pos CW 12X = 12 pos CCW 24/ = 24 pos CW 24X = 24 pos CCW</p>	<p>Ⓑ OUTPUT</p> <p>BP = Binary, PNP 10kΩ pull-down BN = Binary, NPN 10kΩ pull-up</p> <p>Ⓒ SHAFT DIAMETER</p> <p>6 = 6 mm</p>	<p>Ⓓ CONNECTION POSITION</p> <p>R = radial</p> <p>Ⓔ CONNECTIONS</p> <p>L0,3 = cable output 0,3 m Lx = cable output x m</p> <p>Ⓕ CUSTOM VERSION</p>
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