Rotary Measuring Technology
Incremental shaft encoder

MICRONOR
automation components

High resolution Type ESI 58HA



- Sturdy model to industry standard, Ø58 mm housing
- Resolution up to 36000 ppr (internally interpolated)
- Pulse frequency up to 800 kHz
- IP 65
- Temperature and ageing compensation
- Short-circuit proof outputs
- Reverse connection protection (at U_B= 10 ... 30 V DC)
- Highly flexible PUR-cable
- High shaft load
- Many variations, also customized versions
- Alarm output (optional)
- Ex available as explosion proof zone 2 and 22

Mechanical characteristics:

Speed:	max. 12000 min^{-1}
Rotor moment of inertia:	approx. 1.8 x 10^{-6} kgm^2
Starting torque:	< 0.01 Nm
Radial load capacity of shaft*:	80 N
Axial load capacity of shaft:*:	40 N
Weight:	approx. 0.4 kg
Protection acc. to EN 60 529:	IP 65
Working temperature:	-20 °C ... +85 °C[1)2)]
Operating temperature:	-20 °C ... +90 °C[1)2)]
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27	1000 m/s^2, 6 ms
Vibration resistance acc. to IEC 68-2-6:	100 m/s^2, 10 ... 2000 Hz

* View also diagrams on page 25

1) Constant trailing: -20 ... +70 °C

2) Non-condensing

Pulse rates available at short notice:

6000, 7200, 8000, 8192, 9000, 10000, 18000, 25000, 36000

Other pulse rates on request

Electrical characteristics:

Output circuit:	RS 422 (TTL-compatible)	Push-pull
Supply voltage:	5 V (±5%) or 10 ... 30 V DC	10 ... 30 V DC
Power consumption (no load)	–	typ. 90 mA /
without inverted signal:		max. 135 mA
Power consumption (no load)	typ. 70 mA /	typ. 115 mA/
with inverted signals:	max. 120 mA	max.160 mA
Permissible load/channel:	max. ±20 mA	max. ±30 mA
Pulse frequency:	max. 800 kHz	max. 600 kHz
Signal level high:	min. 2.5 V	min. U_B – 2.5 V
Signal level low:	max. 0.5 V	max. 2.0 V
Rise time t_r	max. 200 ns	max. 1 µs
Fall time t_f	max. 200 ns	max. 1 µs
Short circuit proof outputs:[1)]	yes[2)]	yes
Reverse connection protection at UB:	no; 10 ... 30 V: yes	yes
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3		

1) If supply voltage correctly applied

2) Only one channel allowed to be shorted-out:
(If UB=5 V, short-circuit to channel, 0 V, or +UB is permitted)
(If UB=5-30 V, short-circuit to channel or 0 V is permitted)

Terminal assignment

Signal:	0V	0V Sensor2)	$+U_B$	$+U_B$ Sensor2)	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	Shield
12 pin plug, Pin:	10	11	12	2	5	6	8	1	3	4	PH[1)]
Cable colour:	WH 0.5 mm^2	WH	BN 0.5 mm^2	BN	GN	YE	GY	PK	BU	RD	

1) PH = Shield is attached to connector housing

2) Sensor cables are connected to the supply voltage internally if long feeder cables are involved they can be used to adjust or control the voltage at the encoder

- If sensor cables are not in use, they have to be insulated or 0 V_{Sensor} has to be connected to 0 V and $U_{BSensor}$ has to be connected to U_B

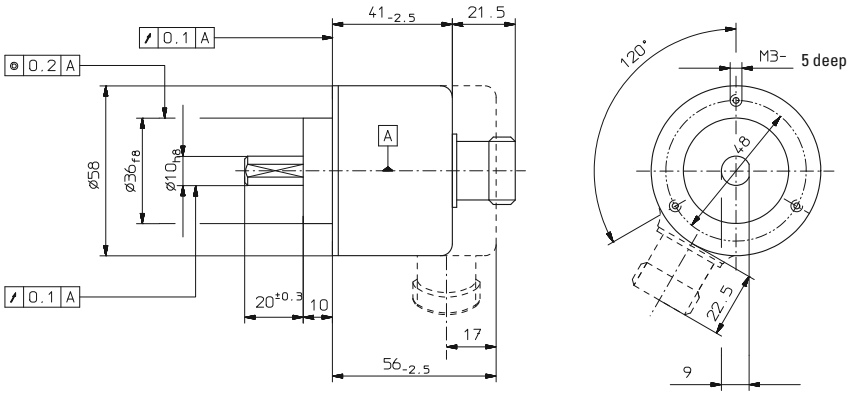
- Using RS 422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

Insulate unused outputs before initial startup.

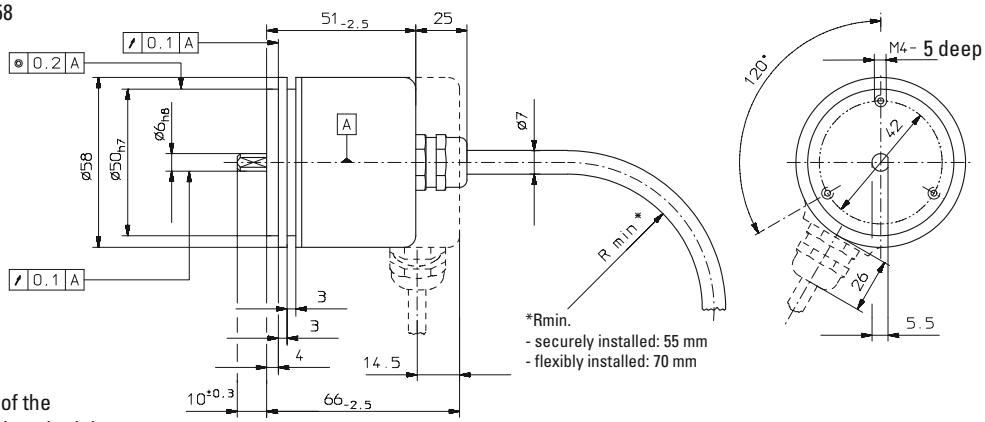
High resolution Type ESI 58HA

Dimensions

Clamping bracket ø 58



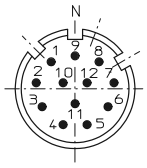
Synchronous bracket ø 58



Mounting advice:

The brackets and shafts of the encoder and drive should not both be rigidly coupled together at the same time! We recommend the use of suitable couplings (see Accessories section).

Top view of mating side, male contact base:



Order code:

ESI 58HA.XXXX.XXXXX

Range	
Bracket	
1 =	**Clamping bracket ø 58**
2 =	**Synchronous bracket ø 58**
Shaft	
1 = ø 6 mm x 10 mm	
2 = ø 10 mm x 20 mm	
Type of connection and supply voltage	
4 =	**RS 422 (with inverted signal) 5 V supply voltage**
5 =	RS 422 (with inverted signal) 10 ... 30 V supply voltage
6 =	**Push-pull (with inverted signal) 10 ... 30 V supply voltage**
7 =	Push-pull (without inverted signal) 10 ... 30 V Supply voltage
Pulse rate	
(e.g. 18000 pulses=> 18000)	
Type of connection	
1 =	Cable axial (1 m PUR-Cable)
2 =	Cable radial (1 m PUR-Cable)
3 =	axial 12 pin plug without mating
5 =	**radial 12 pin plug without mating**

Preferred types are indicated in **bold**

Rotary Measuring Technology
Incremental hollow shaft encoder

MICRONOR
automation components

High resolution Type ENI 58HA



- Only 42 mm clearance needed
- Very easy mounting. The encoder is mounted directly on the drive shaft without couplings. This saves up to 30 % cost and 60 % clearance compared to shaft versions
- Resolution up to 36000 ppr (internally interpolated)
- Many variations
- Temperature and ageing compensation
- Short-circuit proof outputs
- Reverse connection protection for voltage supply
- RS 422 or push-pull output
- IP 66
- Alarm output (optional)
- Ex available as explosion proof zone 2 and 22

Mechanical characteristics:

Speed without sealing:	max. 12000 min^{-1}
Speed with sealing[1]:	max. 6000 min^{-1}
Rotor moment of inertia:	approx. 6 x 10^{-6} kg m^2
Starting torque without sealing:	< 0.01 Nm
Starting torque with sealing:	< 0.05 Nm
Weight:	approx. 0.4 kg
Protection acc. to EN 60 529 without sealing:	IP 40
Protection acc. to EN 60 529 with sealing:	IP 66
Working temperature without sealing:	-20 °C ... +85 °C[2)3)]
Working temperature with sealing:	-20 °C ... +80 °C[2)3)]
Operating temperature without sealing:	-20 °C ... +90 °C [2)4)]
Operating temperature with sealing:	-20 °C ... +85 °C [2)4)]
Shaft:	stainless steel, H7
Shock resistance acc. to DIN-IEC 68-2-27	2000 m/s^2, 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s^2, 10...2000 Hz

1) For continuous operation max. 3000 min^{-1} ventilated
2) Non-condensing
3) 70 °C with Cable
4) 80 °C with Cable

Pulse rates available at short notice:
7200, 8000, 8192, 9000, 10000, 18000, 20000, 24000, 25000, 36000

Other pulse rates on request

Electrical characteristics:

Output circuit:	RS 422 (TTL-compatible)	Push-pull
Supply voltage:	5 V (±5 %) or 10 ... 30 V DC	10 ... 30 V DC
Power consumption (no load) without inverted signal:	not available	typ. 90 mA / max. 135 mA
Power consumption (no load) with inverted signals:	typ. 70 mA / max. 120 mA	typ. 115 mA/ max.160 mA
Permissible load/channel:	max. ±20 mA	max. ±30 mA
Pulse frequency:	max. 800 kHz	max. 600 kHz
Signal level high:	min. 2.5 V	min. U_B – 2.5 V
Signal level low:	max. 0.5 V	max. 2.0 V
Rise time tr	max. 200 ns	max. 1 µs
Fall time tf	max. 200 ns	max. 1 µs
Short circuit proof outputs:[1)]	yes[2)]	yes
Reverse connection protection at U_B:	5 V: no; 10 ... 30 V: yes	yes
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3		

1) If supply voltage correctly applied
2) Only one channel allowed to be shorted-out:
(If UB=5 V, short-circuit to channel, 0 V, or +UB is permitted)
(If UB=5-30 V, short-circuit to channel or 0 V is permitted)

High resolution Type ENI 58HA

Terminal assignment

Signal:	0 V	0 V Sensor[2)]	$+U_B$	$+U_B$ Sensor[2)]	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	Shield
12 pin plug; Pin:	10	11	12	2	5	6	8	1	3	4	PH[1)]
Cable-Colour:	WH	GY PK	BN	RD BU	GN	YE	GY	PK	BU	RD	

1) PH = Shield is attached to connector housing

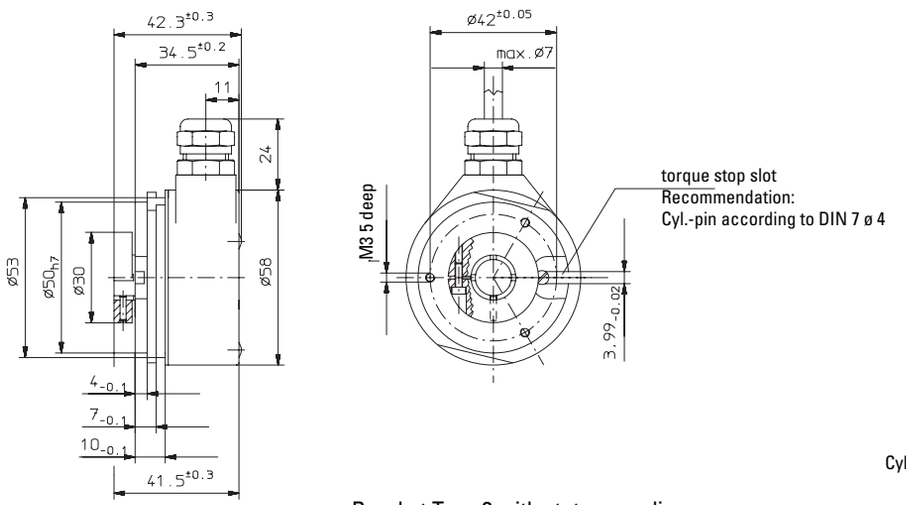
2) Sensor cables are connected to the supply voltage internally if long feeder cables are involved they can be used to adjust or control the voltage at the encoder

- If sensor cables are not in use, they have to be insulated or 0 V_{Sensor} has to be connected to 0 V and $U_{BSensor}$ has to be connected to U_B

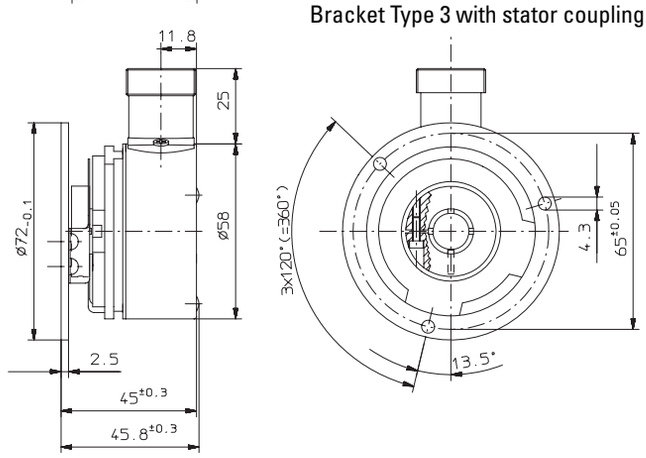
- Using RS 422 outputs and long cable distances, a wave impedance has to be applied at each cable end.
Insulate unused outputs before initial startup.

Dimensions

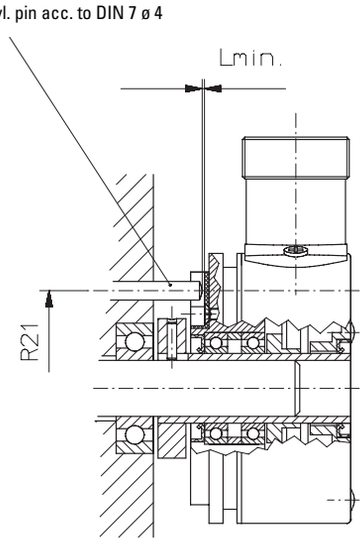
Bracket Type 1



Bracket Type 3 with stator coupling



Cyl. pin acc. to DIN 7 ø 4



Note: minimum insertion depth 1.5 x $D_{hollow\ shaft}$

Mounting advice:

1) The brackets and shafts of the encoder and drive should not both be rigidly coupled together at the same time.

2) When mounting a hollow shaft encoder, we recommend using a torque stop pin or a stator coupling.

3) When mounting the encoder ensure that the dimension Lmin. is larger than the maximum axial play of the drive. Otherwise there is a danger that the device could mechanically seize up.

High resolution Type ENI 58HA

Order code: ENI 58HA.XXXX.XXXXX

Range

Bracket

1 = Bracket for through shaft
2 = Bracket for blind hole shaft*
3 = Bracket for through shaft and stator coupling
4 = Bracket for blind hole shaft* and stator coupling

*length of drive shaft ≤ 30 mm

Shaft

1 = ø 6 mm without sealing
2 = ø 6 mm with sealing
3 = ø 8 mm without sealing
4 = ø 8 mm with sealing
5 = ø 10 mm without sealing
6 = ø 10 mm with sealing
7 = ø 12 mm without sealing
8 = ø 12 mm with sealing
further on request

Pulse rate

(e.g. 36000 pulses=> 36000)

Type of connection

1 = Cable radial (1 m PVC-cable)
2 = radial 12 pin plug without mating connector

Output circuit and voltage display

1 = RS 422 (with inverted signal) 5 V supply voltage
2 = Push-pull (without inverted signal) 10 ... 30 V supply voltage
3 = Push-pull (with inverted signal) 10 ... 30 V supply voltage
4 = RS 422 (with inverted signal) 10 ... 30 V supply voltage