Rotary Measuring Technology
Absolute singleturn encoder hollow shaft version

MICRONOR
automation components

Universal Type ENA 58

- SSI or parallel interface
- Highest shock resistance on the market (≥2500 m/s2, 6 ms acc. to DIN IEC 68-2-27)
- Divisions: up to 16384 (14 bits), singleturn
- Housing Ø 58 mm
- IP 66
- Various options (e.g. LATCH, SET...)
- Gray, Binary or BCD code
- Temperature and ageing compensation
- Short-circuit proof outputs
- Integrative Technology® Patented new type of construction integrates all components; use of an opto-asic and 6-layer multilayer technology now on just a single PCB
- resolution up to 14 bits.
- 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} kgm^2
Starting torque with sealing:	< 0.05 Nm
Weight:	approx. 0.4 kg
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	2500 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. 1500 min^{-1}
2) Non-condensing
3) 70 °C with cable
4) 80 °C with cable

Divisions and code types available at short notice

Gray/Binary
250, **360**, 500, **720**, 900, **1000**, **1024** (10 Bit), 1250, 1440, 1800, 2000, 2500, 2880, **3600**, 4000, **4096** (12 Bit), 5000, 7200, **8192** (13 Bit), **16384** (14 Bit)

BCD
250, **360**, 500, **720**, 900, **1000**, **1024** (10 Bit), 1250, 1440, 1800, 2000
Other on request

Preferred divisions are bold
(reduced delivery time)

Electrical characteristics:

Interface type:	Synchronous Serial (SSI)	Synchronous Serial (SSI)	Parallel	Parallel
Supply voltage (U_B):	5 V DC (± 5 %)	10 ... 30 V DC	5 V DC (± 5 %)	10 ... 30 V DC
Output driver:	RS 485	RS 485	Push-pull	Push-pull
Current consumption typ.:	89 mA	89 mA	109 mA	109 mA
(no load) max.:	138 mA	138 mA	169 mA	169 mA
Permissible load/channel:	max. +/- 20 mA	max. +/- 20 mA	max. +/- 10 mA	max. +/- 10 mA
SSI pulse rate min./max.:	100 kHz/500 kHz	100 kHz/500 kHz	-	-
Signal level high:	typ. 3.8 V	typ. 3.8 V	min. 3.4 V	min. U_B – 2.8 V
Signal level low (I_{Load} = 20 mA):	typ. 1.3 V	typ. 1.3 V	-	-
(I_{Load} = 10 mA):	-	-	max. 1.5 V	max. 1.8 V
(I_{Load} = 1 mA):	-	-	max. 0.3 V	-
Rise time tr (without cable):	max. 100 ns	max. 100 ns	max. 0.2 µs	max. 1 µs
Fall time tf (without cable):	max. 100 ns	max. 100 ns	max. 0.2 µs	max. 1 µs
Short circuit proof outputs:[1)]:	yes	yes[2)]	yes	yes
Reverse connection protection at U_B:	no	yes	no	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)

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Control Inputs

Up/down input to switch the counting direction

By default, if glancing at the shaft side, absolute encoders deliver increasing code values when shaft rotates clockwise (cw). When the shaft rotates counter-clockwise (ccw), the output delivers accordingly decreasing code values.
As long as the Up/down input receives the corresponding signal (high), this feature is reversed. Clockwise rotation delivers decreasing code values while counter-clockwise rotation delivers increasing code values.

The response time is :	for 5 V DC supply voltage, 0.4 ms for 10 ... 30 V DC supply voltage, 2 ms.

SET input

This input is used to reset (to zero) the encoder. A control pulse (high) sent to this input allows storing the current position value as new zero position in the encoder.

Note :

Before activating the SET input after supplying the encoder with the supply voltage, a counting direction (cw or ccw) must be clearly defined on the Up/down input!

The response time is :	for 5 V DC supply voltage, 0.4 ms for 10 ... 30 V DC supply voltage, 2 ms.

LATCH input

This input is used to „freeze“ the current position value. The position value will be statically available on the parallel output as long as this input will remain active (high).

The response time is :	for 5 V DC supply voltage, 140 µs, for 10 ... 30 V DC supply voltage, 200 µs.

Switching level of the control inputs:

Supply voltage	5 V DC	10 ... 30 V DC
low	≤ 1.7 V	≤ 4.5 V
high	≥ 3.4 V	≥ 8.7 V

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Terminal assignment (SSI interface with 12pin plug):

Sig.:	0 V	+U_B	+T	-T	+D	-D	ST	VR					⏚	
Col.:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU		
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH	

T: Clock signal
D: Data signal
ST: SET input. The current position value is stored as new zero position.
VR: Up/down input. As long as this input is active, decreasing code values are transmitted when shaft turning clockwise.
PH: Plug housing
Insulate unused outputs before initial start-up.

Terminal assignment (Parallel interface, 14 bits and max. 2 options, cable version):

Sig.:	0V	+U_B	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR	VR/ LH		⏚	
Col.:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY			
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		PH	

Terminal assignment (Parallel interface, 13 bits and max. 2 options):

Sig.:	0V	+U_B	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR	VR/ LH	14	⏚	
Col.:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY	GY BN		

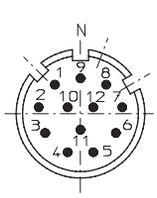
Terminal assignment (Parallel interface, 14 bits, 1 option, 17 pin plug):

Sig.:	0 V	+U_B	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR/ LH	14	⏚	
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	PH	

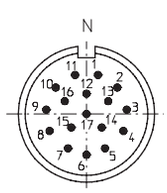
Sig.: 1 = MSB; 2 = MSB-1; 3 = MSB-2 etc.
ST: SET input. The current position value is stored as new zero position.
VR: Up/down input. As long as this input is active, decreasing code values are transmitted when shaft turning clockwise.
LH: LATCH input. High active. The current position is „frozen". It is statically available at the parallel output.
PH: Plug housing
Insulate unused outputs before initial start-up.

Top view of mating side, male contact base:

12 pin plug



17 pin plug



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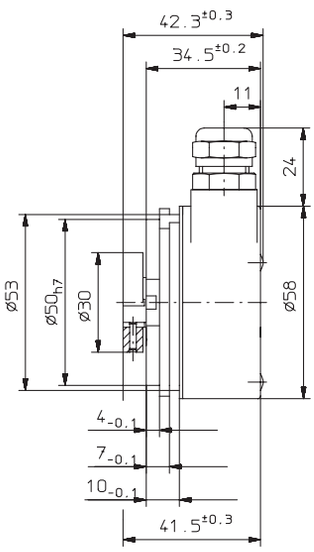
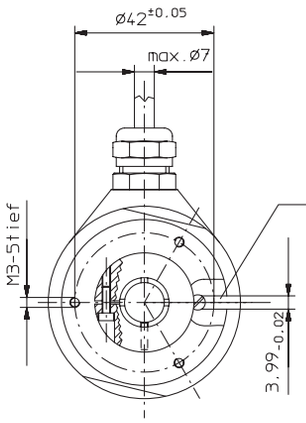
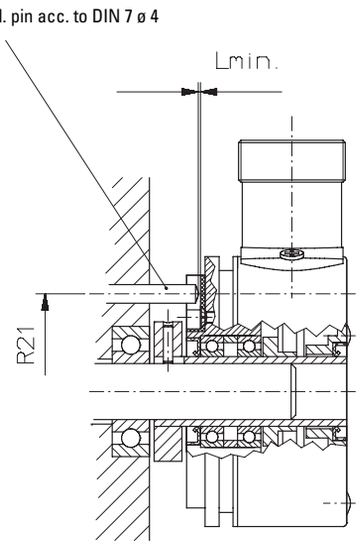
Dimensions

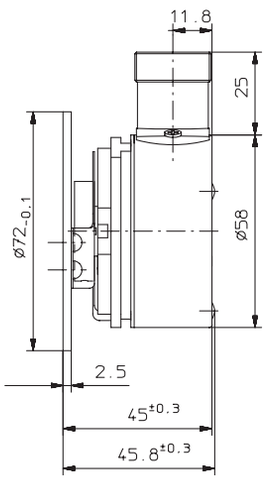


Bracket type 1

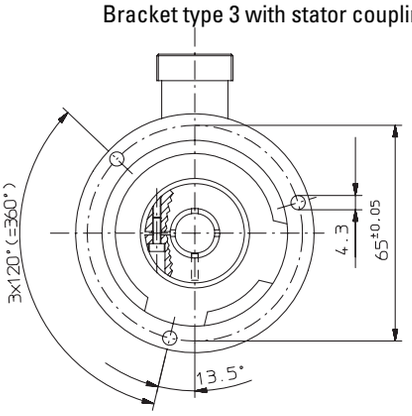


Cyl. pin acc. to DIN 7 ø 4





Bracket type 3 with stator coupling



Mounting advice:

1) The flances 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.

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Order code: ENA 58.XXXX.XXXX

Range

Bracket
- 1 = Bracket type 1 with through shaft
- 2 = Bracket type 1with blind hole shaft
- **3 = Bracket type 3 with stator coupling**
- 4 = Bracket type 2 with blind hole shaft

Hollow shaft
- **6 = ø 10 mm**
- **8 = ø 12 mm**

Interface and supply voltage
- 3 = Parallel with 5 V supply voltage
- **4 = Parallel with 10 ... 30 V supply voltage**

Options
- **2 = SET[1] and V/R**
- 3[2] = SET and Latch[1]
- 4[2] = V/R[1] and Latch
- Alarm output on request

[1] With 14 bits prallel output and 17 pin plug

[2] Not with SSI interface

Code type and division
use corresponding table

Type of connection
- 1 = radial cable 1 m PVC-cable)
- **2 = radial plug without mating connector**

Preferred types are indicated in **bold**

Code type and division with parallel output

Interface and supply voltage, version 3 or 4 (Parallel):

Division	Order code Gray/Gray-Excess	Order code Binary	Order code BCD
250	E02	B02	D02
360[1]	**E03**	B03	D03
500	E05	B05	D05
720[1]	E07	B07	D07
900	E09	B09	D09
1000[1]	E01	B01	D01
1024 (10 Bits)	**G10**	**B10**	D10
1250	E12	BA2	DA2
1440	E14	BA1	DA1
1800	E18	B18	D18
2000	E20	B20	D20
2500	E25	B25	
2880	E28	B28	
36001)	E36	B36	
4000	E40	B40	
4096 (12 Bits)	G12	B12	
5000	E50	B50	
7200	E72	B72	
8192 (13 Bits)	**G13**	B13	
16384 (14 Bit)	**G14**	**B14**	

Preferred divisions are bold

Code type and division for encoder with SSI-Output

Interface and supply voltage, version 1 or 2 (SSI):

Division	Order code Gray	Order code Binary
1024 (10 Bit)	G10	B10
4096 (12 Bit)	G12	B12
8192 (13 Bit)	G13	B13
16384 (14 Bit)	G14	B14