

## Z58-6XX SERIES

**6 Digits Universal Position Indicator for  
incremental or absolute encoders**



- connectable to incremental- or absolute encoders (FMAX, FEMAX, EMAX)
- approved standard functions (e.g. pulse scaling, multi-edge-counter, Inch/mm-switch over)
- three external inputs (+ 24 V)
- serial interface RS-232
- analog input 0... 10 V or 0... 20 mA (option) analog output 0... 10 V / 0 (4)...20 mA (option)
- Optionally 2 shutter-relay-outputs (option)

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## 1. General features

- Power supply 24 VDC (standard)
- 115/230 VAC with external power pack NG13.0
- Panel- or built-on housing available
- Cut out for panel 93 x 67 mm (w x h)
- Install depth 73 mm (110 mm with D-SUB-Connector)
- Plug-in connections

ELGO position indicator "Z58" is usable for displaying of actual positions.

Z58 is a universal device, which can work with output signals of all standard linear encoders from ELGO. An optional SSI interface allows, to evaluate additionally conventional absolute encoders.

With the Z58, ELGO is able to offer always a complete solution.

The predecessor type "Z54" can be replaced with Z58 for most applications (except some special-devices). Please consider the pin-allocations with replacement, because with Z58 new additional plugs are available!



#### 4. List of parameters

To lock the programming-level of the menu, please press at the same time,  
for 3 seconds...

→ Buttons **F + Incr/Abs** and it appears → on Display **P 01**

**Incr/Abs – Button** → Step up the Number of Parameter.

With **▲**- and **▶** Buttons it's possible to select the parameter No. directly:

**Button - ▶** = select decade **Button - ▲** = increase appropriate decade

With **F-Button** it's possible to switch-over the sign, with admissible parameters.

**Important:** Any modification must be stored with the **Incr/Abs – Button**.

For leaving the setup, press renewed for 3 seconds, at the same time,  
the Buttons **F + Incr/Abs**.

The following parameters are available:

No.	Function	Range	DEFAULT
<b>P 00</b>	reserved		
<b>P 01</b>	Counting direction (0: up, 1: down)	0, 1	0
<b>P 02</b>	empty		-----
<b>P 03</b>	Decimal point	0, 1, 2, 3	1
<b>P 04</b>	Power down memory (0: active, 1: not active)	0, 1	0
<b>P 05</b>	Front lateral keys (0: active, 1: not active)	1. 1	0000
<b>P 06</b>	Edge multiplier (0 = x 1, 1 = x 2, 2 = x 4)	0, 1, 2	0
<b>P 07</b>	Selection of measuring-system (0: Encoder, 1: RS422 Encoder , 2: EMAX/FEMAX, 3: FMAX,)	0, 1, 2, 3	0
<b>P 08</b>	Pulse scaling factor	0.0001...9.9999	01.0000
<b>P 09</b>	Datum value	-99999... 99999	00000.0
<b>P 10</b>	Tool offset	-99999... 99999	00000.0
<b>P 11</b>	Width of saw-blade	-99999... 99999	00000.0
<b>P 12</b>	Preset relays 1 (min value)	-99999... 99999	00000.0
<b>P 13</b>	Preset relays 2 (max value)	-99999... 99999	00000.0
<b>P 14</b>	Display brightness (0 = dark, 9 = bright)	0...9	5
<b>P 15</b>	Reserved for relay-pulse-time (in preparation)		0
<b>P 16</b>	Set to default parameters (0: no, 1: yes)	0, 1	0
<b>P 17</b>	Measuring unit: mm or inch (0: mm, 1: inch)	0, 1	0
<b>P 18</b>	empty		-----
<b>P 19</b>	empty		-----
<b>P 20</b>	Analog-output (min value)	-99999... 99999	00000.0
<b>P 21</b>	Analog-output (max value)	-99999... 99999	00000.0
<b>P 22</b>	empty		-----
<b>P 23</b>	empty		-----
<b>P 24</b>	empty		-----
<b>P 25</b>	empty		-----
<b>P 26</b>	empty		-----
<b>P 27</b>	empty		-----
<b>P 28</b>	empty		-----
<b>P 29</b>	empty		-----
<b>P 30... 31</b>	reserved		00000.0
<b>P 32... 98</b>	empty		-----
<b>P 99</b>	Software version		XX.XX

## 5. Functions of parameters

- P00** = Reserved for tests  
**P01** = Switch over of counting direction  
**P02** = Empty  
**P03** = Selection of **decimal point**  
**P04** = Activate or deactivate **Power down memory** here  
  
**P06** = Select **multi-edge-counter** here (x 1, x 2 x or x 4)  
**P07** = **Selection of measuring-system:**  
 The connected encoder system must be selected here!  
**0** = Incremental signals A/B/Z  
 (e.g.. EMIX/LMIX/MIX/FMIX or rotary encoders)  
**1** = Differential encoders A/A', B/B', Z/Z' (RS422-interface)  
**2** = Absolute ELGO-systems → EMAX and FEMAX  
**3** = Absolute ELGO-system → FMAX  
**P08** = **Pulse scaling factor**  
**P09** = **Deposit able datum-value**  
 The programmed value will be take over to the display, if **Button - ►** will be pressed or the external **reference-input** will be closed.  
**P10** = **Adjustable tool offset**  
 This value will be added to the actual value if **Button - ▲ is pressed** or the external **tool-offset-input** will be closed.  
**P11** = **Saw blade width (Incr Mode only!)**  
 To compensate the saw blade width of a saw machine, a value can be deposited in this register.  
**P12** = **Preset-limit for relays 1** (active when under runs)  
**P13** = **Preset-limit for relays 2** (active when over runs)  
**P14** = **Display brightness**  
 The brightness of the LED-display can be modulated digitally to the ambience, with 0... 9 steps  
**P15** = **Relays static or pulsing** (in preparation)  
     **0** = static  
     **0.01...9.99** = pulsing (please select the pulse-time in X.XX sec)  
**P16** = **Set all parameters to default-values**  
**P17** = **Measuring unit mm or inch**  
**P20** = **Analog-output (min value)**  
**P21** = **Analog-output (max value)**  
**P22... P98** = Empty  
**P99** = To indicate the **software-version** of the unit

## 6. Functions of the keypad and of external inputs

### 6.1 Reset

For setting the actual value to zero:

Use the external input **ST2/Pin6**, and connect resp. close it for a short time to + 24 V to reset the actual value.

**Please note:** The external input is a static input and is active, when it's connected with + 24 V. If the input remains constantly in connected state, the display remains "0" and no counting is possible. For this a push-button without self-holding is recommend.

### 6.2 Absolute/Incremental mode

The front located **Incr/Abs - Button** allows to switch over the display from absolute- (resp. "entire") to incremental- (resp. "relative") measurement. After switch over to the relative measuring „incremental mode“ the display will be set to zero. The further counting procedure starts from this point then. After renewed pressing of **Incr/Abs – Button**, the unit switches back to absolute measuring mode.

### 6.3 Additional tool-offset

The in **P10** deposited value will be added to the actual value, if **Button - ▲** will be pressed or the external **tool-offset-input ST2/Pin4** will be closed. The process can be cancelled by renewed pressing of **Button - ▲** or closing **input ST2/Pin4**.

### 6.4 Set to datum-value

By pressing **Buttons – F** and **- ►** at the same time or alternatively closing of **input ST2/Pin5**, the display sets to the value, deposited in Parameter P09.

## 7. Teaching procedure

(only when using an ELGO FMAX absolute linear encoder)

If an ELGO-FMAX encoder is connected, the following steps must be done, to calibrate and modulate the sensor with Z58:

1. Press for 3 sec., at the same time - in normal operation mode - **Buttons** - ► and ◀

The display shows L 2

2. Move the FMAX-sensor app. 2 cm forwards and backwards and press **Button** - ► then

The display shows L 1

3. Now move the FMAX-sensor to the desired offset and press **Button** - ▲ then

The display shows L 0

4. With releasing the **Button** - ▲ the system is calibrated and the display shows 0.00

## 8. Information's about Pulse Scaling Factor

The adjustable range is between 0,0001 and 9,9999 with **mm**-operation as well as **Inch**-operation. With factors higher than „1“ the resolution decreases.

### Calculating the factor:

$$\text{Factor} = \frac{\text{Demand value (defined value)}}{\text{Displayed value}}$$










### Example :

$$\text{Factor} : \frac{100,0}{100,5} = 0,9950$$









## 9. List of most important key-functions

### Normal mode:

Datum value =	 + 	at the same time
For a short time → Setting reference		
For 3 seconds → Change reference value (P09)		
Back to normal Operation mode =	 + 	press for 3 sec.
Tool offset =		
Undo =		
Abs./Incr =		switch over between "entire" and "relative" measurement
Change to Programming mode =	 + 	for 3 sec. at the same time

### Programming mode:

Parameter step up =		
Select decade =		
Increase decade =		
Store modification =		
Back to counting mode =	 + 	for 3 sec. at the same time

## 10. Serial Interface

**Technology:**

Standard RS232

**Data format:**

Baud rate = 9600

8 Data bits, 1 Stopbit, no parity

Z58 answers only on request of the PC

### 10.1 Commands

**Readout the actual value:**

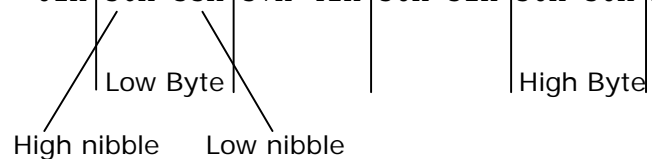
Command: STX 'i' ETX

Example: 02h 69h 03h

Answer: e.g.. 9712.3 (decimal) bzw. 0001 7B63 (hexadecimal)

STX <8 Byte Datas> CRC ETX

02h | 36h 33h | 37h 42h | 30h 31h | 30h 30h | A3h 03h



Please note:

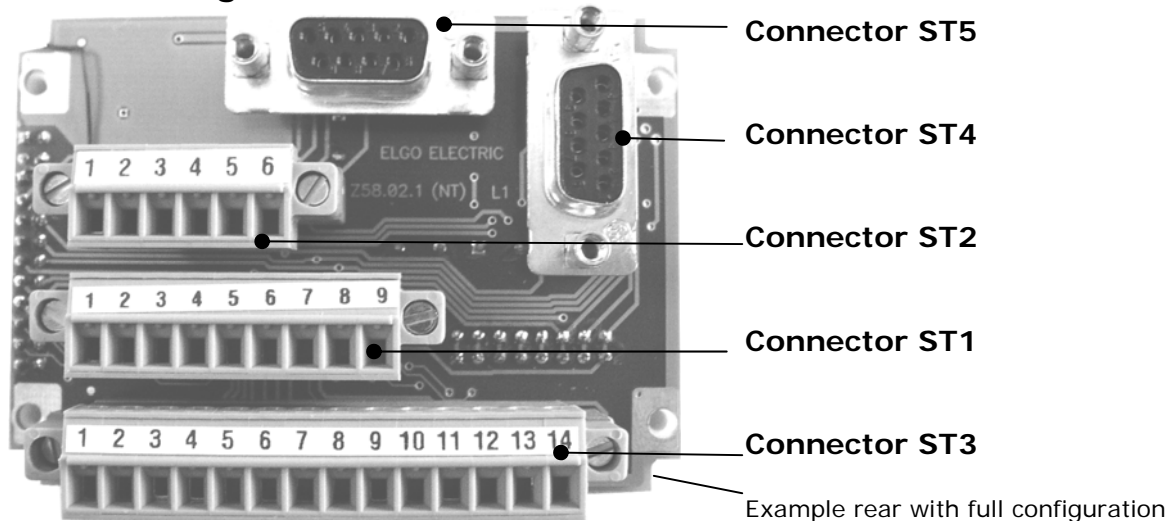
The datas are transmitted in hexadecimal ASCII-Code, (starting with Low-Byte).

With an invalid command a " Q " is transmitted.  
CRC is an addition of the 8 Data bytes (a possible carry is void).

## 11. Error Numbers

No.	Meaning
190	EEPROM damaged

## 12. Pin-Assignment



### Connector ST1 (standard encoders):

- 1: GND (output)
- 2: + 5 VDC/24 VDC (output)
- 3: Channel A
- 4: Channel B
- 5: Screen/shield/PE
- 6: Channel A'
- 7: Channel B'
- 8: Channel Z'
- 9: Channel Z

### Connector ST2 (supply):

- 1: Screen/shield/PE
- 2: GND (Input)
- 3: + 24VDC (Input)
- 4: Tool-offset-Input
- 5: Datum-Input
- 6: Reset-Input

### Connector ST5 (RS-232 PC-interface)

- 2: TxD
- 3: RxD
- 5: GND

Inverted signals are marked with ' '

### Connector ST3 (absolute signals, relays, analog-output):

- 1: Screen/shield/PE
- 2: GND (Encoder supply)
- 3: + 24VDC / 5VDC (Encoder supply out)
- 4: RS422\_RX'
- 5: RS422\_RX
- 6: RS422\_RS485\_TX'
- 7: RS422\_RS485\_TX
- 8: Analog-input 0... 10 VDC or 0... 20 mA
- 9: Analog-output 0... 10 VDC
- 10: Analog-output 0 (4)... 20 mA
- 11: Relays\_1\_A
- 12: Relays\_1\_B
- 13: Relays\_2\_A
- 14: Relays\_2\_B

### Connector ST4 (differential encoders):

- 1: GND (Encoder supply out)
- 2: + 24VDC / 5VDC (Encoder supply out)
- 3: Channel A
- 4: Channel B
- 5: GND (output)
- 6: Channel A'
- 7: Channel B'
- 8: Channel Z
- 9: Channel Z'

## 12.1 Pin-Assignment Z58-654

Additional sheet for 115 or 230 VAC power supply

**Please Note!** The following functions are not available with the AC-Variant!

### 1. Encoder Systems

- 2 = A/A' B/B' Z/Z' 24 VDC Encoder supply, 5 V-TTL (PNP)- 100 KHz
- 3 = A/A' B/B' Z/Z' 5 VDC Encoder supply, 5 V-TTL (PNP) - 100 KHz
- 4 = Modulated for connection with ELGO – FMAX linear encoder
- 5 = Modulated for connection with ELGO – EMAX linear encoder
- 6 = SSI interface
- 8 = A/A' B/B' Z/Z' 24 VDC Encoder supply, 5 V-TTL (PNP) - 500 KHz
- 9 = A/A' B/B' Z/Z' 5 VDC Encoder supply, 5 V-TTL (PNP) - 500 KHz

### 2. Options

- R = 2 shutter relay outputs (24 V/1 A)
- C = Analog input 0... 10 V (in preparation)
- E = Analog input 0... 20 mA (in preparation)
- F = Analog output 0... 10 V
- G = Analog output 0... 20 mA
- H = Analog output 4... 20 mA

Basically the AC variant is offered for replacement of the parent Z54 type. Owing to place requirement the functions described above are not realizable here. If these functions are although necessary, a standard 24 VDC Z58 should be used. Alternatively the external ELGO Power Pack NG13.0 is useful, if no 24 VDC voltage is available in the switch cabinet.

### Connections:

#### Encoder ST 1

- Pin 1 = 0 V
- Pin 2 = + 24 VDC out
- Pin 3 = A out
- Pin 4 = B out
- Pin 5 = Screen

#### put Terminal ST 2

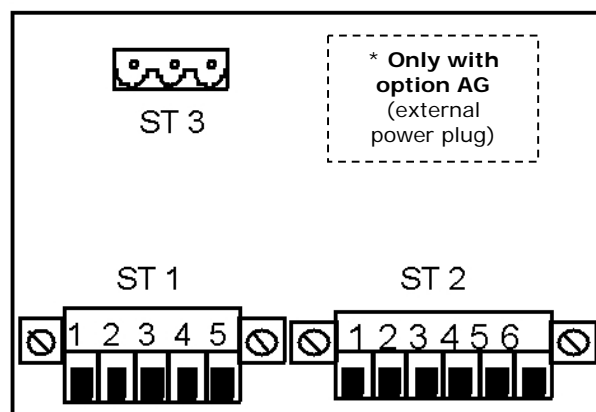
- n 1 = Screen
- n 2 = 0 V
- n 3 = + 24 VDC out
- n 4 = Tool Offset input
- n 5 = Reference input
- n 6 = Reset input

Note: All inputs are active „high“ (+ 24 VDC / PNP)

#### AC - Power Supply ST 3\*

- Pin 1 = L1
- Pin 2 = N
- Pin 3 = PE

\* **ST3** is not applicable with **Option AG** (built on housing). In this case, a separate power plug is included in the delivery.



## 13. Technical specifications

### 1) Position Indicator Z58.6XX.024

24 VDC - Version  
 Power voltage 24 VDC +/- 20 %  
 Consumption max. 70 mA (without measuring system)

### 2) 115 or 230 VAC supply

If there is only an AC-Voltage is available (115/230 VAC), please use the external ELGO power pack Type NG13.0.

Alternatively a functionally-restricted Z58-000-115/230 variant is available. For wiring and explanation the supplemental sheet manual (Doku Art. Nr. 799000083) must be used additionally.

### 3) General specifications:

System accuracy	: +/- 1 Digit
Operating temperature	: 0... +50 °C
Stock temperature	: -20... +80 °C
Display window	: 14 mm high LED red, 6 Decades
PC- Interface	: Standard RS-232
SSI – Interface	: Standard SSI, on request as absolute measuring input
Protection class (front)	: IP43 (installed state)
Protection class (rear)	: IP00
Analog input * (Option)	: 10 Bit A/D – Converter, 0... 10 VDC oder 0... 20 mA
Analog output (Option)	: 12 Bit D/A – Converter, 0 ...10 VDC (I <sub>max</sub> = 5 mA) or 0 (4)... 20 mA R <sub>max</sub> = 200 Ω
2 Relay outputs	: potential free shutters 24 VDC / max. 1 A

#### Power down memory:

EEProm

#### Inputs:

Max. input current 10 mA PNP (active high), 24 VDC +/- 10 %

#### Encoder supply:

24 VDC, max. 75 mA load by encoder or measuring system  
 Housing: Aluminium, black

#### Housing dimensions:

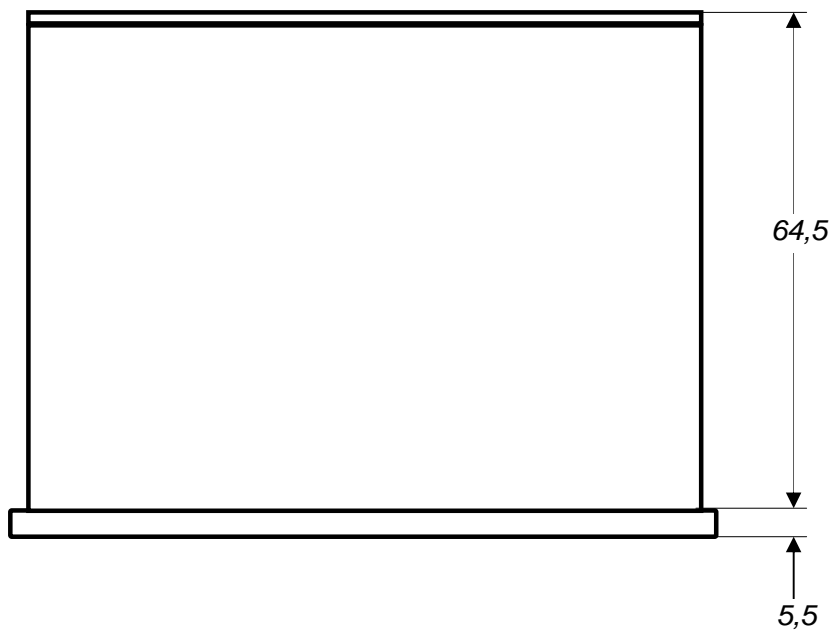
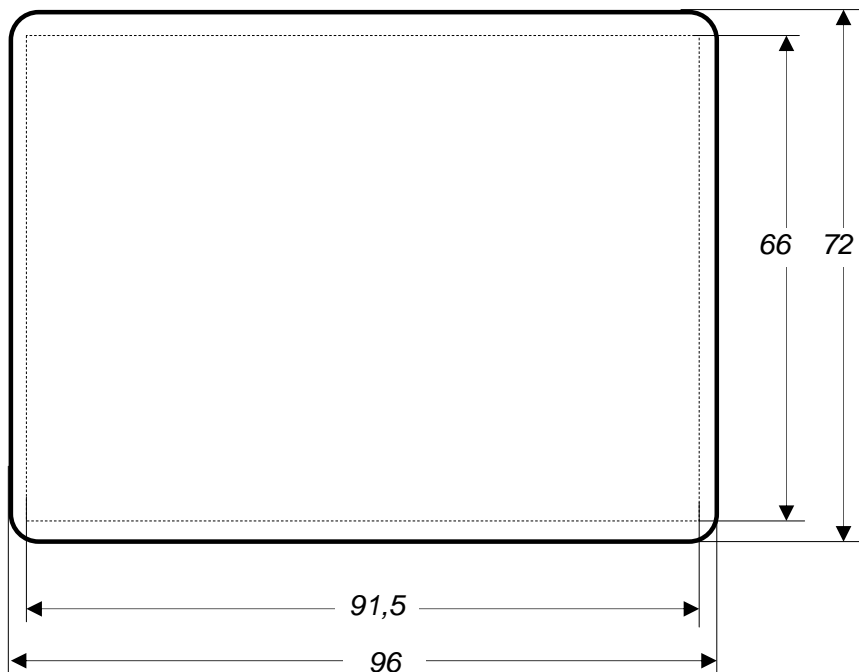
Panel version (standard) b x h	= 96 x 72 mm (cut out 93 x 67 mm)
Install depth with screw terminals	= 78 mm
Install depth with SUB-D connectors	= 115 mm
Built on version (Option A): b x h	= 107 x 76 mm
Install depth:	= 95 mm (160 mm with power-connector)
Mounting holes:	2 x M5 max. 7 mm deep, bore hole distance 60 mm

\* in preparation

## 14. Dimensions

### 14.1 Measurements of the panel housing

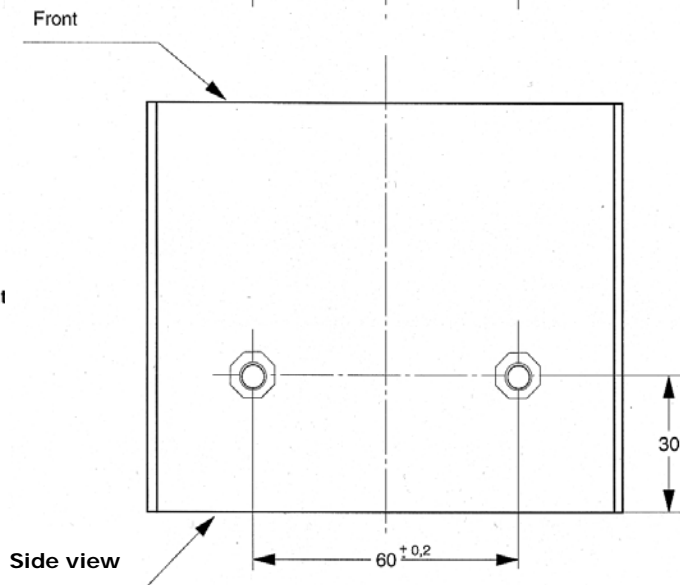
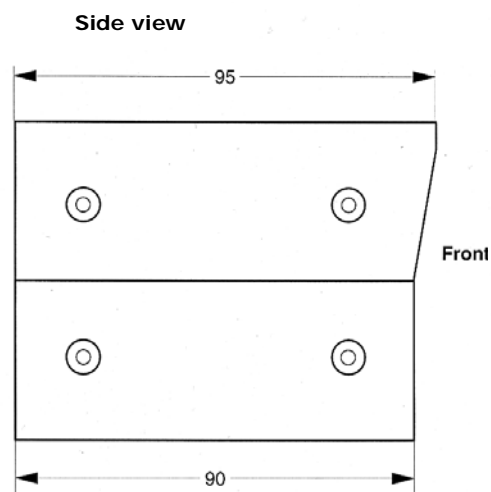
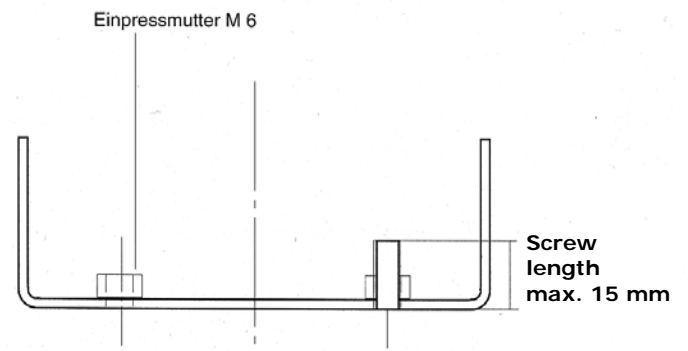
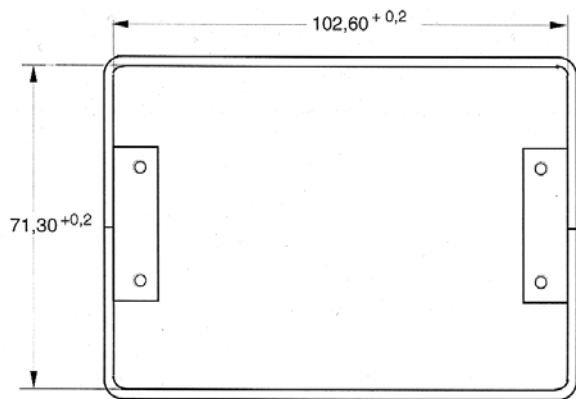
(in mm)



Install depth with screw terminals  
= 78 mm  
Install depth with SUB-D connector  
= 115 mm

### 14.2 Measurements of the built on housing (Option AG)

(in mm)



Depth inclusive power plug: 160 mm

## 15. Type designation

**Z58 - 6XX - XXX - X - XXXXXXXX**

### Position Indicator

Universal single axis

### SN-Number

600 = Standard

601 = First special version

602 = Second special version etc.

### Power supply voltage

024 = 24 VDC (+/- 20 %)

### Signal inputs

1 = A/B/Z 24 VDC Encoder supply, 24 V- output level (PNP) - 100 KHz

2 = A/A' B/B' Z/Z' 24 VDC Encoder supply, 5 V-TTL (PNP)- 100 KHz

3 = A/A' B/B' Z/Z' 5 VDC Encoder supply, 5 V-TTL (PNP) - 100 KHz

4 = Modulated for connection with ELGO – FMAX linear encoder

5 = Modulated for connection with ELGO – EMAX linear encoder

6 = SSI interface (on request)

7 = A/B/Z 5 VDC Encoder supply, 5 V- TTL output level (PNP) - 100 KHz

8 = A/A' B/B' Z/Z' 24 VDC Encoder supply, 5 V-TTL (PNP)- 500 KHz

9 = A/A' B/B' Z/Z' 5 VDC Encoder supply, 5 V-TTL (PNP) - 500 KHz

10= A/B/Z VDC Encoder supply, 24 V output level (PNP) - 500 KHz

### Options

A = Built on housing

C = Analog input 0... 10 V (in preparation)

E = Analog input 0... 20 mA (in preparation)

F = Analog output 0... 10 V

G = Analog output 0... 20 mA

H = Analog output 4... 20 mA

D = 9-pol. connector (D-SUB) for LMIX/EMIX



## **16. Liability exclusion / Guarantee**

We have checked the contents of this instruction manual carefully, to the best of our knowledge and belief for conformity with the described hardware and software. Nevertheless errors, mistakes or deviations can not be excluded, therefore we do not guarantee complete conformity. Necessary corrections will be included in the subsequent editions.

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