

# Operation manual

## SERIES Z50-054

1-Axis Position Indicator 24 VDC



- Connection to incremental and absolute Measuring Systems
- Actual Value Memory
- 7-digit LCD-Display, digit height 10 mm
- 2 digital Inputs
- Serial Interface

## Content

1	General Information .....	3
1.1	Information Operation Manual .....	3
1.2	Explanation of Symbols .....	3
1.3	Statement of Warranties .....	4
1.4	Demounting and Disposal .....	4
2	Safety .....	5
2.1	General Cause of Risks .....	5
2.2	Personal Protective Equipment .....	5
2.3	Conventional Use .....	6
3	Transport and Storage .....	7
3.1	Safety instructions for transport, unpacking and loading .....	7
3.2	Handling of Packaging Material .....	7
3.3	Check of Transport .....	7
3.4	Storage .....	7
4	Product Features .....	8
5	Installation and Initial Start-Up .....	8
5.1	Operational Environment .....	8
6	Structure and Function .....	10
6.1	Keys .....	10
6.1.1	Keys/Mode .....	11
6.2	Parameter Menu .....	13
6.3	Description of Parameters .....	14
6.4	Serial Interface .....	16
7	Pin Connection .....	17
8	Interferences .....	18
8.1	Error Messaging .....	19
8.2	Restarting after fault clearance .....	19
8.3	Interferences .....	20
9	Maintenance .....	20
10	Technical Data .....	21
10.1	Overview technical specifications .....	21
10.2	Dimensions Z50 .....	21
11	Type Designation .....	22
12	Index .....	24
13	Document History .....	24

## 1 General Information

### 1.1 Information Operation Manual

The manual contains important information regarding the handling of the indicator. For your own safety please note all safety warnings and instructions.




Precondition for safe operation is the compliance with the specified safety and handling instructions. Moreover, observe the existing local accident prevention regulation and general safety rules.

Please read the operation manual carefully before starting to work. The manual should be kept accessible at anytime. The illustrations in the manual are for better representation of the facts they are not necessarily to scale and can be slightly different to the actual construction.


### 1.2 Explanation of Symbols

Warning notices are characterised by symbols in the operation manual. The notes will be introduced by signal words to express the magnitude of the danger.

Follow these advices in order to avoid accidents and injuries to persons and property.


	<b>DANGER!</b> ... Advertises to direct dangerous situations that can lead to death or severe injuries.
	<b>CAUTION!</b> ... Advices to potentially dangerous situations that can lead to death or severe injuries.
	<b>ATTENTION!</b> ... Advices to potentially dangerous situations that can lead to damages on property.

#### Tips and recommendations:

	<b>Note!</b> Here you can see Highlights, useful tips, information and recommendations for efficient and trouble-free operation.
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#### Specific safety instructions:

In order to point to specific dangers the following symbol is used in combination with safety instructions.

	<b>DANGER!</b> ...marks perilous situations by electricity. By non-observance of the safety instructions the possibilities of death or severe injuries exist. The operations have to be carried out only by an electrician.
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### 1.3 Statement of Warranties

The warranty conditions are in a separate document.

#### Guarantee

The producer guarantees the functional capability of the process engineering and the selected parameter. The period of warranty is one year and begins with the date of delivery.

### 1.4 Demounting and Disposal

Unless otherwise authorized, dispose the item considering the safety instructions.


#### Before demounting

- Disconnect the power supply
- Secure against re-start
- Disconnect supply lines physically and discharge remaining energy
- Dispose operating supplies with respect to the environment

#### Disposal

Recycle the decomposed elements:


- Scrap metal elements
- Electronic components in electronic scrap
- Recycle plastic parts
- Dispose the rest of the components according to their material consistence

	<b>ATTENTION!</b> Wrong disposal → damage caused to the environment!  Electronic waste, electronic components, lubricants and operating supplies are liable to treatment of hazardous waste. Only approved specialized companies should perform disposal.
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Local authorities and waste management facilities provide information about environmentally suitable disposal.

## 2 Safety

	<p><b>NOTE!</b> Please read the operation manual carefully, before using the device! Observe the Installation instructions! In case of damage caused by failure of these operating instructions the warranty expires.</p> <p>ELGO Electronic GmbH &amp; Co. KG and its subsidiaries are not liable for any damage at persons, property or asset caused by defective material on the device and / or it's associated. We take no responsibility for consequential damage!</p> <p>The operator is obliged to appropriate security-related measures and implement.</p> <p>The Commissioning may only be performed by qualified and by the operator authorized and trained personnel.</p>
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### 2.1 General Cause of Risks

This chapter gives an overview about all important safety aspects to guarantee an optimal protection of employees.

Non-observance of the instructions mentioned in this operation manual can result in hazardous situations.



### 2.2 Personal Protective Equipment

Employees should wear protective clothing during installation of the device to minimize the risk of accidents.

Therefore:

Change into protective clothing before beginning the work process. Also observe any labels in the operating area regarding protective clothing.

Protective clothing:

	<p><b>Safety working clothing</b> ... is close-fitting ... is tear proof ... has tight sleeves without distant parts</p> <p><b>Also wear no rings, necklaces or other jewellery.</b></p>
	<p><b>Protective gloves</b> ... For protecting the hands against abrasion and cuts.</p>

## 2.3 Conventional Use

The indicator **Z50-054** is for the limited purpose as described in this manual:

The **Z50-054** ELGO distance measuring system is constructed for measuring and displaying distances.



### CAUTION!

Danger through non-conventional use!  
Non-intended use and non-observance of this operation manual can lead to dangerous situations.  
Therefore:

- Use **Z50-054** only as described
- Strictly follow this manual

Avoid in particular:

Remodelling, refitting or changing of the device or parts of it with the intention to alter functionality or scope of the position indicator.

ELGO is not liable for any damages resulting from improper use of the product.  
The operator is liable for all damages during non-conventional use.

### 3 Transport and Storage

#### 3.1 Safety instructions for transport, unpacking and loading

**ATTENTION!**

Professional transport only.  
Do not throw, hit or fold the package.

#### 3.2 Handling of Packaging Material

Adverts for proper disposal refer Chapter General Information.

#### 3.3 Check of Transport

Examine delivery immediately after receiving for completeness and transport damages.

In case of externally recognizable transport damages:

- Do not accept the delivery or do accept under reserve
- Note extent of damages on the transportation documents or on the delivery note
- File complaint immediately

**NOTE!**

Claim any damages you recognize as soon as possible. The claims for damage must be filed in the lawful reclaim periods.

#### 3.4 Storage

Store device only under following conditions:

- Do not store outside
- Keep dry and dust-free
- Do not expose to aggressive media
- Protect from direct sun light
- Avoid mechanical shocks
- Storage temperature: -20 to + 80 °C
- Relative humidity: 80% non-condensing

Inspect packages regularly if stored for an extensive period of time (> 3 months)

## 4 Product Features

The position indicator has a LCD display with a height of 14 mm and allows to read out the actual value comfortable and accurate. Data can be entered with the help of the input panel or by external signals. The position indicator provides analysis of incremental square signals e.g. shaft encoder signals. Customisation to the ELGO magnetic measuring systems LMIX, EMIX, MIX, PMIX and EMAX (transmitted by RS422) is possible.

**NOTE!**

In the power-off mode the movements or adjustments of the magnetic sensor are not covered!

A reference has to be made after the start of operation (at a required mechanical position, the indicator is to set e.g. ZERO)

## 5 Installation and Initial Start-Up

**NOTE**

Please read the operating instructions carefully before using this device! Installation instructions must be observed!

In case of damage caused by failure observing the installation instructions, the warranty will be invalidated.

The ELGO Electronic GmbH & Co. KG and the subsidiaries are not liable for injury to persons, property or financial loss, which can be caused by faulty material on the device and / or incurred by the related components.

We assume no liability for damages!

The operator is obliged to take appropriate security measures and implement them.

The commissioning should only be performed by qualified and authorized personnel.

### 5.1 Operational Environment

**WARNING!**

Do not use the device in explosive or corrosive environments!



**CAUTION!**

The electrical connections are made by suitably qualified personnel in accordance with local regulations.



The device is designed for switchboard mounting. During the work on the switchboard, all components must be free of tension if the danger exists, that energized parts can be touched. (Finger protection)



Wiring may only be energized!

Thin wire cable strands are equipped with ferrule!

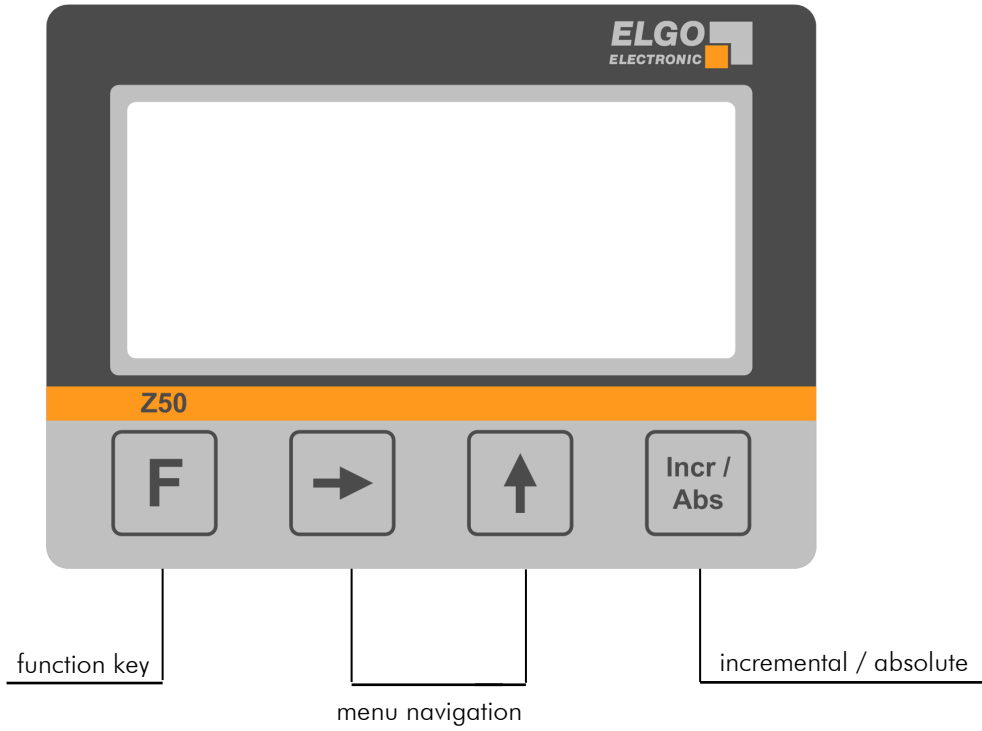
Before switching on all ports and connectors are to be reviewed!



The device must be mounted that it is protected against harmful environmental influences such as splashing water, solvent, vibration, shock and severe pollution and also the operating temperature is to maintain.

## 6 Structure and Function

### 6.1 Keys



### 6.1.1 Keys/Mode

The operation of the device is divided into the parameter, the operator level and the initialization level.

All operating parameters can be put in through the **parameter level** (see chapter 6.3).

At the **operator level** the basic functions are available (depending on the software version).

All entries are made solely on the 4 front-mounted buttons or keyboard shortcuts of those, the displays occur via the integrated LCD.

#### Regular Mode



Press shortly = switching from absolute to incremental measuring



Press shortly = activate tool offsets. (in the absolute mode)

Activated tool offsets are indicated by the digit „1“ shown in the upper display frame.



Press shortly = set to reference value (in the absolute mode)

Press for 3 seconds = change reference value

Switching back to normal mode: Incr/Abs key



Press shortly = set to „0“ (in the absolute mode)

Press for 3 seconds = change tool offset

Switching back to normal mode: Incr/Abs key



Press for 3 seconds = entering the parameter level

#### Parameter level



Press shortly = select decade



Press shortly = increase decade



Press shortly = save changes and switch over to next parameter



Input of negative parameter (negative sign only possible for a value unequal 0)



Press for 3 seconds = quit the parameter level

**NOTE!**

Entering the parameter level "P01" shows up in the display. Release the buttons „F“ & „incr/abs“ the display shows up the value of P01. Forward the parameter with „incr/abs“. Release the button „incr/abs“ the display shows up the value of the following parameter.

## 6.2 Parameter Menu

### Parameter menu

Access to the special parameters

		Customer settings	Default settings	Description
P01	Counting direction		0	forward
P02	Measurement unit display		0	mm
P03	Decimal point		1	1 decimal place
P04	Reserved		-	
P05	Keyboard lock		0000	off
P06	Edge triggering solution		0	1-edge
P07	Measuring System		0	incremental
P08	Multiplication factor		01,00000	
P09	Reference value		000000,0	
P10	Offset dimension		000000,0	
P11	Saw blade		0000,0	
P12...15	Reserved		-	
P16	Default Init		0	not active
P17	Function ext. Input 1		0	not active
P18	Function ext. Input 2		0	not active
P19	Trigger ext. Input 1		0	level sensitive
P20	Display-Mode		0	standard
P21	Revolution Speed		500	impulses/revolution
P22	Reserved			
P23	Rotation		0	not active
P24	Reserved			
P25	Reserved			
P99	Software version			



**NOTE!**

Additional parameters are reserved and not available!

### 6.3 Description of Parameters

#### P01: Counting direction

Change of counting direction. (0: forwards, 1: backwards)

#### P02: Measuring unit display

Indicating of the measuring unit.

A = 0: mm

A = 1: inch

A = 2: m

A = 3: degree

A = 4: RPM

A = 5: without display

#### P03: Decimal point

Setting of the decimal point (0: 1, 1: 0.1, 2: 0.01, 3: 0.001)

#### P05: keyboard lock

A = Button "F" (0 = deactivated / 1 = activated)

B = Button "⇌" (0 = deactivated / 1 = activated)

C = Button "↑" (0 = deactivated / 1 = activated)

D = Button "Incr/Abs" (0 = deactivated / 1 = activated)

#### P06: Edge evaluation (\*)

Settings of edge evaluation can be chosen.

Array: Evaluation of 1 / 2 / 4 edges (0: x1, 1: x2, 2: x4)

#### P07: Measuring system (\*)

Selection of the measuring system.

A = 0: incremental

#### P08: Multiplication factor

Settings of multiplication factor.

Array: 00,00001 ... 99,99999

#### P09: Reference value

Settings of reference.

Array: 000000,1 ... 999999,9

**P10: Offset dimension**

Settings of offset dimension.

Array: 000000,1 ... 999999,9

**P11: Saw blade**

Settings of saw blade.

Array: 0000,1 ... 9999,9

**P16: Default initialization (\*)**

Parameters are reset to default values. (0: not init., 1: default init.)

After entering „1“ for this parameter, confirm input with „Incr/Abs“ key. Shutdown the device. After restarting the default parameters are uploaded and the device is reset to default values.

**P17: Function of external input 1**

The external inputs can be programmed as following:

A = 0: External input 1 has no function

A = 1: Set the actual value to reference value (P09)

A = 2: Add offset dimension (P10)

A = 3: Set actual value to 0

**P18: Function of external input 2**

The external inputs can be programmed as following:

A = 0: External input 2 has no function

A = 1: Set the actual value to reference value (P09)

A = 2: Add offset dimension (P10) (only possible if P19=0)

A = 3: Set actual value to 0

**P19: Trigger external input 1**

A = 0: Level sensitive

A = 1: pos. Edge sensitive

**P20: Display-Mode**

0: Standard

1: Revolution speed

2: Rotation

**P21: Revolution speed**

Here the input of the impulses per revolution takes place.

**P23: Rotation**

Here the input of the switchover point takes place. The actual value is set back to 0 at the switchover point.

**P99: Software Version**

This parameter displays the software version.

\* Switch the display off and restart the display

## 6.4 Serial Interface

**Type:**

Standard RS232

**Data format:**

baud rate = 9600

1 data bit, 1 stop bit, no parity

The position indicator responds only to requests of the PC.

### 6.4.1. Kommandos

Read actual value:

Command	STX	'R'	'D'	'X'	ETX
Example	0x02	0x52	0x44	0x58	0x03

Answer	STX	'+'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	CRC	ETX
	0x02	0x2b	0x31	0x32	0x33	0x34	0x35	0x36	0x37	0x97	0x03

The data is sent in the ASCII-Code.

At an invalid command, a „Q“ is sent.

The CRC is a summation of the 8 data bytes (incl. sign).

An eventual carry-over does not apply.

Note: The PC is connected to the mini-USB-plug S3. For the communication a driver unit needs to be installed on the PC. The driver unit can be downloaded from the following site:

[http://www.elgo.de/fileadmin/kunden/ftdi\\_cdm20802.exe](http://www.elgo.de/fileadmin/kunden/ftdi_cdm20802.exe)

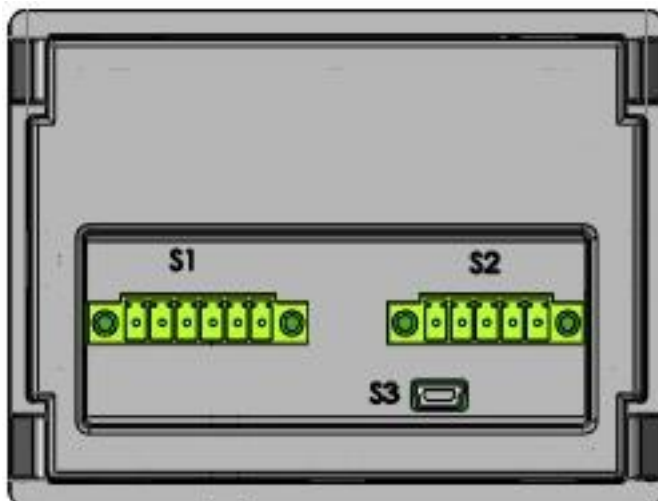


## 7 Pin Connection

Pin S1: 6-pin plug input supply	
1	PE Shield
2	0V
3	+ 24 VDC
4	Ext. Input 1
5	Ext. Input 2
6	NC – Not Connected

Pin S2: 5-pin plug	
1	0V
2	+ 24 VDC
3	Channel A
4	Channel B
5	PE Shield

Serial interface : mini USB plug



Note!  
Shield / earth has to be connected to the indicator and also to the measuring system. This is necessary for an operation without any interferences!

## 8 Interferences

The following chapters describe possible causes for malfunction and the instructions to correct them.



### WARNING!

Risk of injury by improper disposal!

Improper disposal can lead to severe disturbance to persons or property.

Therefore:

- Any work to rectify the fault may be performed only by qualified and adequately instructed personnel
- Before starting to work ensure sufficient space of mounting
- Paying attention to orderliness and to cleanliness at the mounting area, loose parts and tools, which are lying on each other or lying around, are sources of accidents

If components need to be replaced:

- Pay attention of proper mounting of the spare parts
- Install all fasteners correctly again
- Before restarting ensure that all covers and guards are properly installed and working correctly

## 8.1 Error Messaging

Error no.	Error
„Err 110“	Data Memory Error
„Err 210/220“	Sensor error (Only with Absolute Measuring Systems)
„Err 240“	The Power supply broke down during operation.
„Err 250“	The Power supply broke down during Power on.


## 8.2 Restarting after fault clearance


Once you resolve the failure:

1. Where appropriate, reset the emergency stop device
2. Where appropriate reset the fault message to the parent system
3. Ensure that there are no persons in the danger zone
4. Proceed in accordance with the instruction of section 8.3

### 8.3 Interferences

If errors cannot be corrected with the following instructions please contact the manufacturer (see last page).

	<p><b>NOTE!</b> Device, connection cables and signal cables must not be installed directly next to interference, which have strong inductive or capacitive interference or strong electrostatic fields!</p> <p>External interference can be avoided by a suitable cable routing.</p>
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	<p>Signal wires and cables are principally laid separately from the LASTSTROMLEITUNG and keep a safety distance of at least 0,5m to inductive or capacitive interference sources such as contactors, relays, motors, switching power supplies, clocked controllers, etc.!</p> <p>If faults occur despite of compliance of all the described items above, it must proceed as follows:</p> <ol style="list-style-type: none"><li>1. Attachment of RC elements of contactor coils of AC contactors (e.g. 0.1 <math>\mu</math>F / 100<math>\Omega</math>)</li><li>2. Attachment of free-wheeling diodes using DC inductors</li><li>3. Attachment of RC elements of individual motor phases (in the terminal box of the engine)</li><li>4. Do not connect safety ground and reference potential</li><li>5. Pre-connecting a mains filter on the external power supply</li><li>6. Use of sheet metal or metalized shielding housings</li></ol>
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## 9 Maintenance

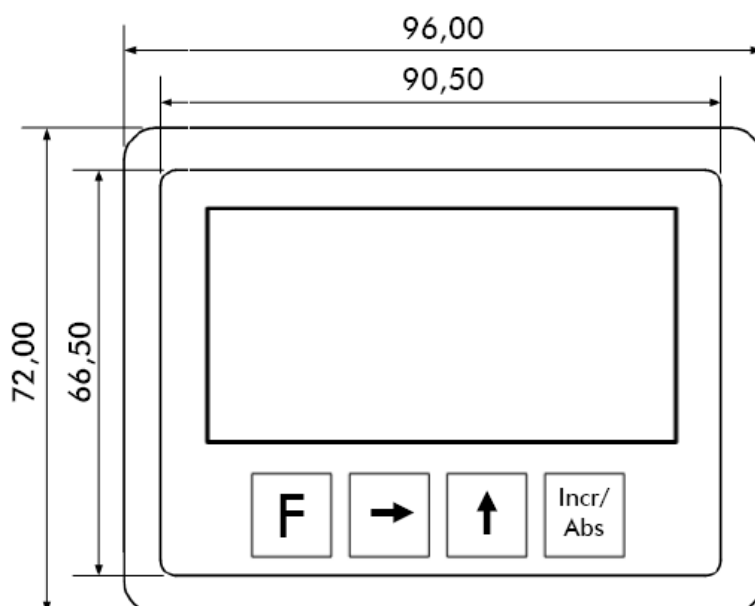
The device is maintenance-free.

## 10 Technical Data

### 10.1 Overview technical specifications

<b>Position Indicator Z50-054</b>	
LCD display	7 decades (digit height 14 mm) With sign and measurement units
Measuring unit	mm, m, Inch, RPM or °
Perspective	12 o'clock
Keyboard	Foil with soft keys
Measurement	linear or rotative
Power supply	+24 VDC +/- 20%
Power consumption (without measuring system)	50 mA with 24 VDC
Max. current load for sensor connection	300 mA
Operating temperature	0 ... + 50°C
Storage temperature	-20 ... +80 °C
Humidity	max. 80 %, non-condensing
Housing	Norm panel housing, ABS plastic, black
Housing dimensions	L x H x D = 96 x 72 x 31 mm (without seal) L x H x D = 98 x 74 x 31 mm (with seal)
Installation depth	27 mm
Front panel cut out	B x H = 93 x 67 mm
Protection class front	IP 54 (when installed with sealing) IP 43 (when installed without sealing)
Protection class back	IP 40

### 10.2 Dimensions Z50



## 11 Type Designation

### Position indicator

**Z50 - 054 - 024 - 0**Series  
**Z50**Version  
**054** = Replacement for series 54Power supply  
**024** = 24 VDC power supplySignal input  
**0** = A/B 24 VDC power supply for the sensor - 24 V HTL output level (PNP) – 100KHz

### **Accessories:**

#### **Power supply unit NG24.0:**

115/230 VAC possible with external power supply unit NG24.0

Notes:

## 12 Index

### C

Cause of Risks .....	5
Content .....	2
Conventional Use .....	6

### D

Demounting .....	4
Dimensions .....	20
Disposal .....	4

### E

Error messaging .....	18
Explanation of Symbols .....	3

### G

General .....	3
Guarantee .....	4

### I

Incremental measuring .....	11
Initial Start-up .....	8
Installation .....	8, 9

### O

Operational Environment .....	8
-------------------------------	---

### P

Product Features .....	8
Protective Equipment .....	5

### R

Reference value .....	11
-----------------------	----

### S

Safety .....	5
Safety Instructions .....	4
Storage .....	7

### T

Technical Data .....	20
Tool offset .....	11
Transport .....	7
Type Designation .....	21

### W

Warranty .....	4
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## 13 Document History

Rev.	Date	Author	Changes
0	16.02.12	RG	Created
1	14.07.16	CD	Correction of the content, logo and type designation updated

