N500 Series

Electronic Cam Switch

- **8 programmable cams**
- **50 program levels**
- **„Teach-in" - operation**

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Measure - Control - Position
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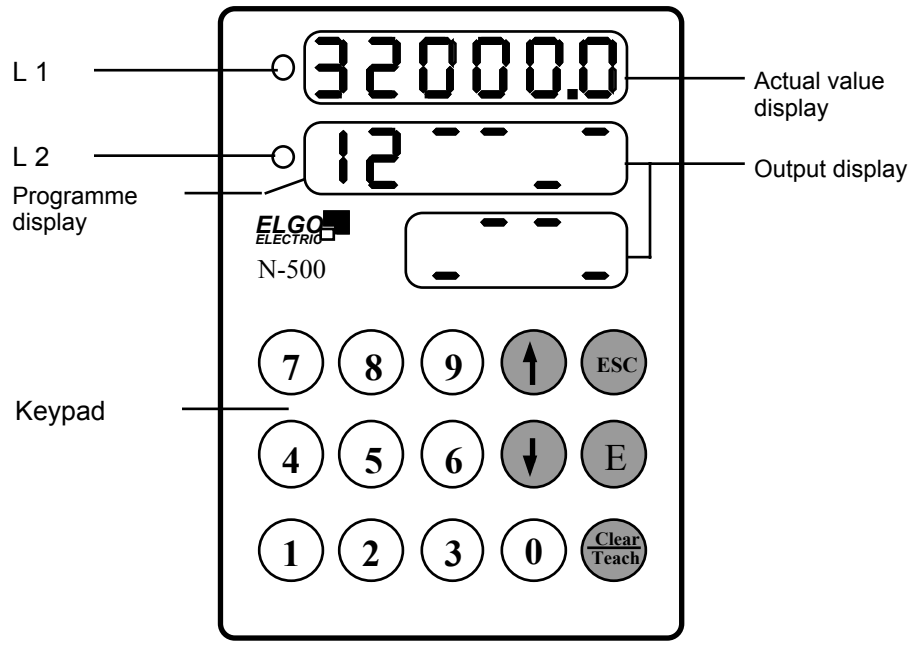
1. Principles of operation

- Can be used for all absolute measuring systems (linear or angular) with SSI-Interface.
- Can be used in different applications, especially for hydraulic presses.
- Teach mode
- Data input and parameters are locked by means of a security code and an enable-input.

2. Front panel



3. Pushbuttons

1. ↑ ↓
   1. Select different user modes
   2. Step through the selected user mode
   3. Change sign (+/-) in system parameter "Offset"

2. **E** Enter:
   1. Enters selected User Mode, Parameter or selected cam for data input.
   2. stores new value

3. **Clear/Teach**
   1. clears value
   2. Teach mode programming:
      1. Press this button for 3 seconds until actual position is displayed.
      2. Crank the machine to desired position
      3. Press "E"-button to store value. Teach mode is now deactivated.

4. **ESC** Escape: to exit data input step by step

4. System Parameters

	System Parameter		Function
1	Programme number	(P-nr)	max. 50 programmes
2	Security code	codE)	activates system parameters 3 to 14 and user mode "channel parameters"
3	max. Software limit	(L-o)	higher demand values will not be accepted
4	min. Software limit	(L-u)	lower demand values will not be accepted
5	Offset	(oFFS)	Offset between mechanical zero and zero of length measuring system
6	Decimal point	(unIt)	position of decimal point
7	Measuring direction	(GEbr)	to change counting direction enter here length of the linear measuring system
8	Error-limit	(L-r)	If actual position is higher than L-0+L-r error output will be activated and "Error limit" is shown in display
9	Display light	(DISP)	0 = dark, 100 = bright
10	Number of bits	(bits)	Number of bits, see encoder (1 to max. 32 bits)
11	SSI-Code	(SSI)	binary (BIN) or gray (GRAY)
12	Display resolution	(drES)	resolution of actual value - 1 mm - 1/10 mm - 1/100 mm - 1/1000 mm
13	Measuring system resolution (linear)	(SrES)	resolution of the measuring system in µm (zero means rotary absolute encoder)
14	Steps per round (rotative absolute encoders)	(StEP)	If you enter here the steps per round rotative of the rotary encoder (eg 1024), system parameter 13 will be set automatically to zero.

Examples:

1. Linear measuring System

Resolution : 0,02 mm (20 µm)
Bits : 24 Bits, binary
Display resolution : 1/100 mm

System Parameter 10 : 24
System Parameter 11 : bin
System Parameter 12 : 0.01
System Parameter 13 : 20
System Parameter 14 : 0

2. Rotary encoders

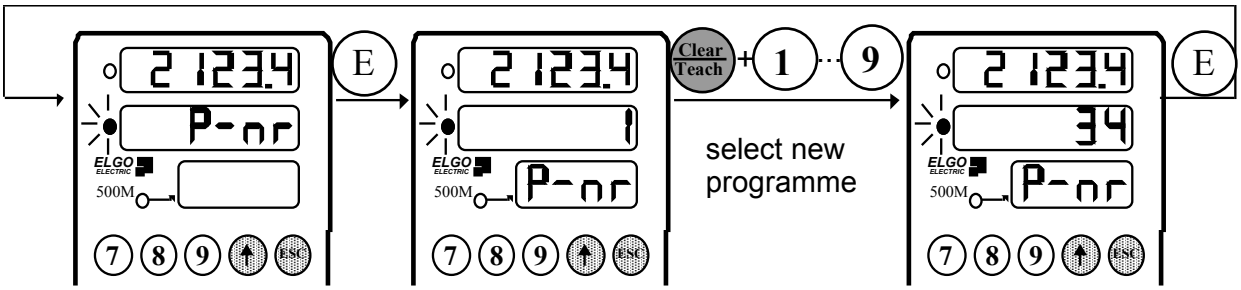
1024 steps per round: (=> 10 Bit)
Code : Gray
Display resolution : 1/10 °

System Parameter 10 : 10
System Parameter 11 : GrAY
System Parameter 12 : 0.1
System Parameter 13 : 0
System Parameter 14 : 1024

5. Programming

I User Mode 1 Programme-Number (P – nr)

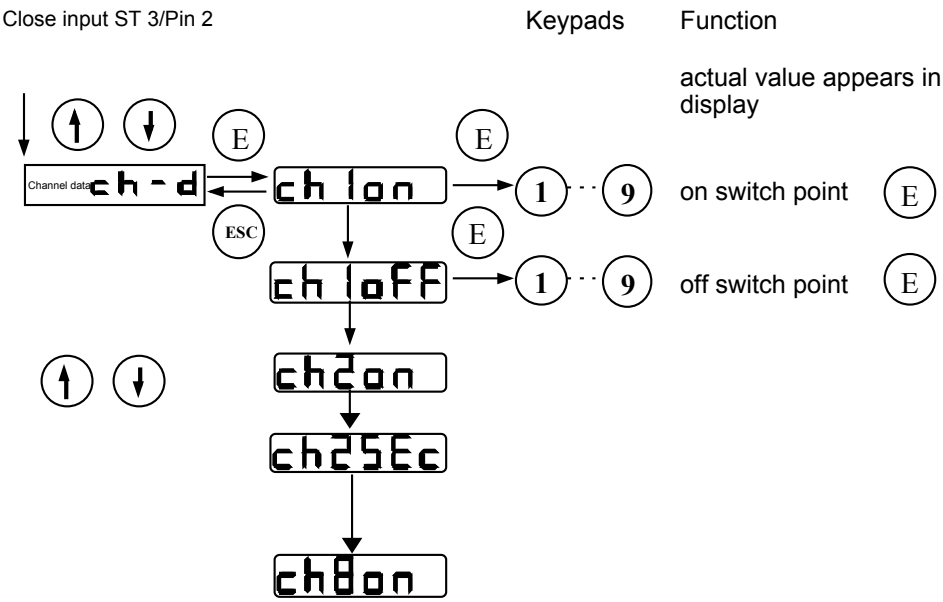
Close input ST3/Pin 2
by using an external keyswitch

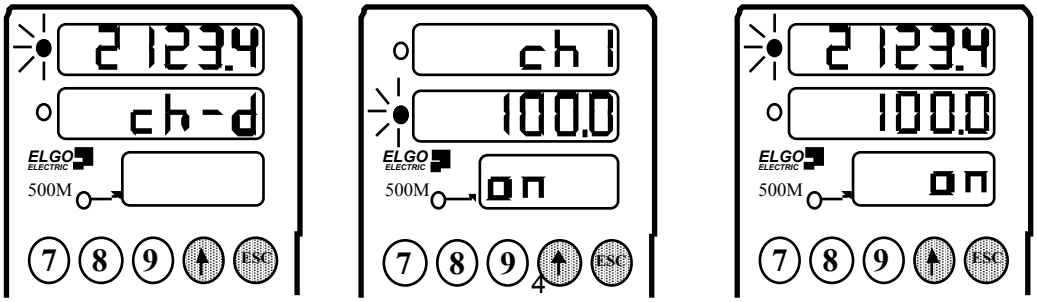


how to clear a programme: 1. Press "Clear"-button five times (in the display appears **CLEAR -**)

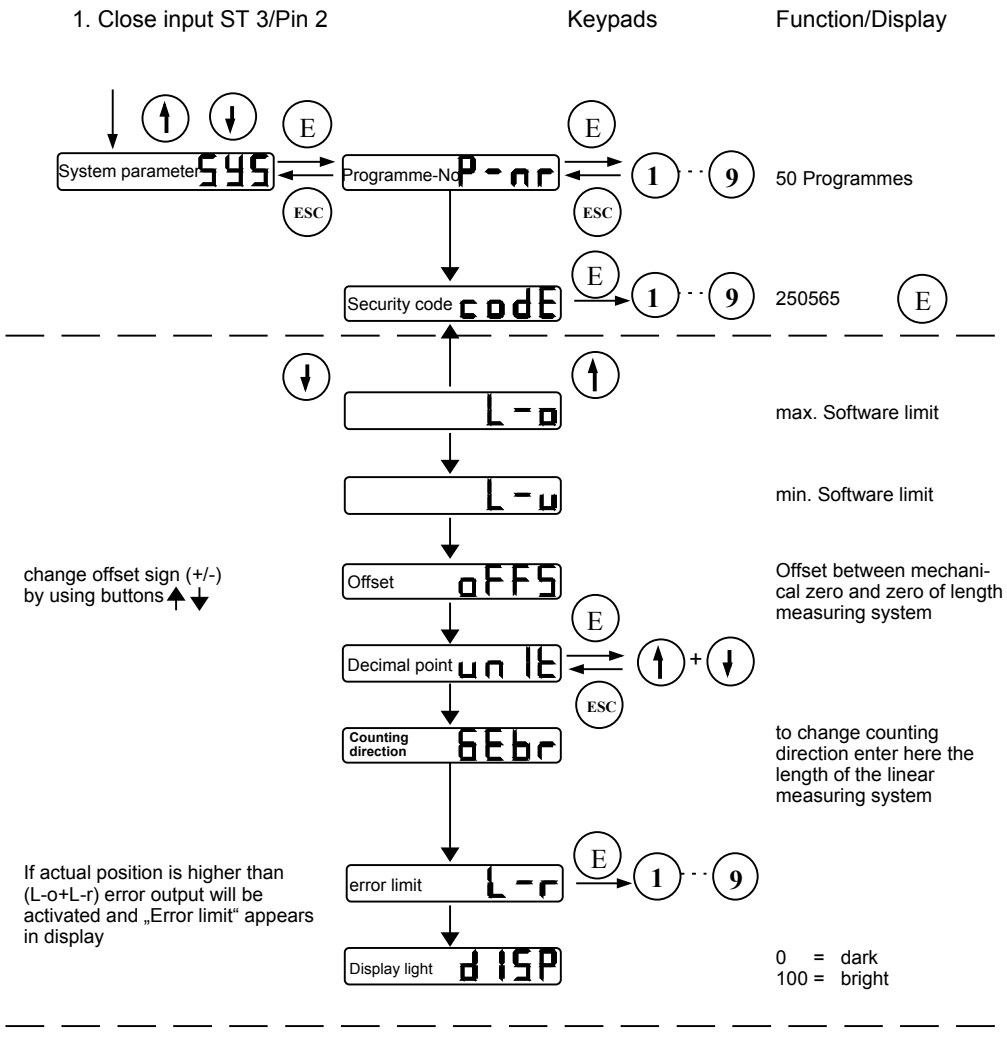
2. Press "E

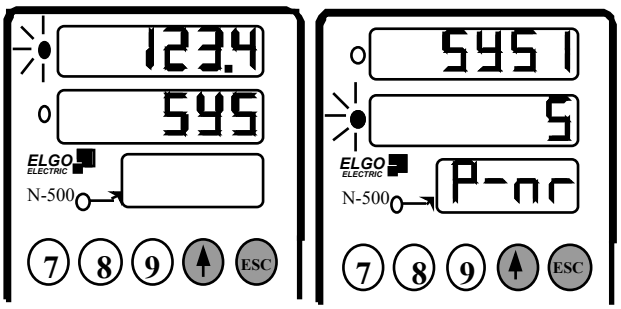
II User Mode 2 Channel data (ch – d)





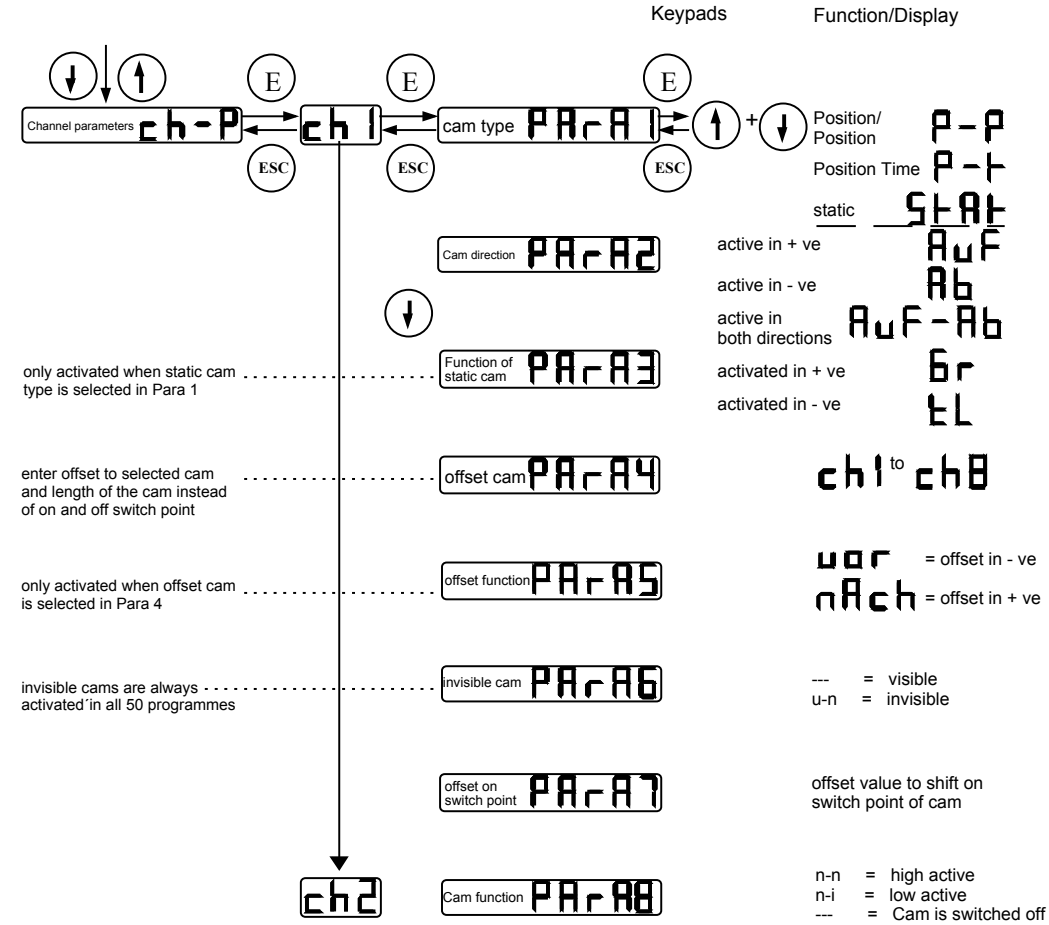
III User Mode 3 System parameters (545)

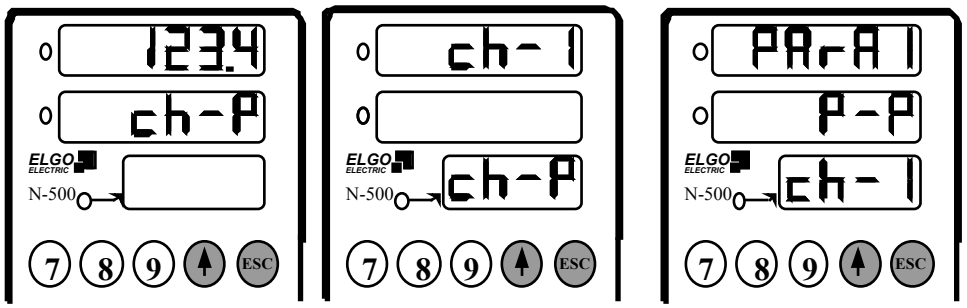




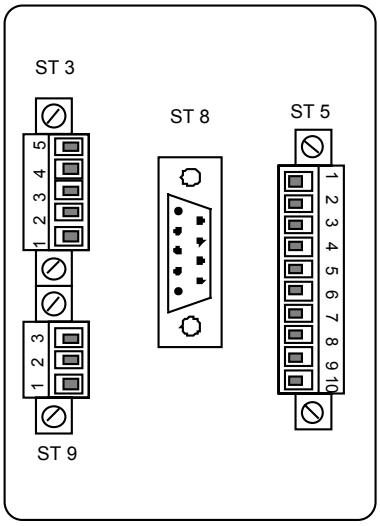
IV User Mode 4 Channel parameters (ch-P)

8. Close input ST3/PIN2
9. Enter security code in SYS-Parameter 2
10. Press button **„ESC“**
11. Select channel parameter mode





6. Connector designation



ST 3	Inputs PNP
Pin 1	+ 24 v
Pin 2	enable
Pin 3	NC
Pin 4	NC
Pin 5	Earth

ST 5	Outputs PNP
Pin 1	Channel 1
Pin 2	Channel 2
Pin 3	Channel 3
Pin 4	Channel 4
Pin 5	Channel 5
Pin 6	Channel 6
Pin 7	Channel 7
Pin 8	Channel 8
Pin 9	error
Pin 10	0 V

ST 8	SSI-encoder
Pin 1	0 V
Pin 2	+ 24 V
Pin 3	A
Pin 4	B
Pin 5	Earth
Pin 6	Data +
Pin 7	Data -
Pin 8	Clock +
Pin 9	Clock -

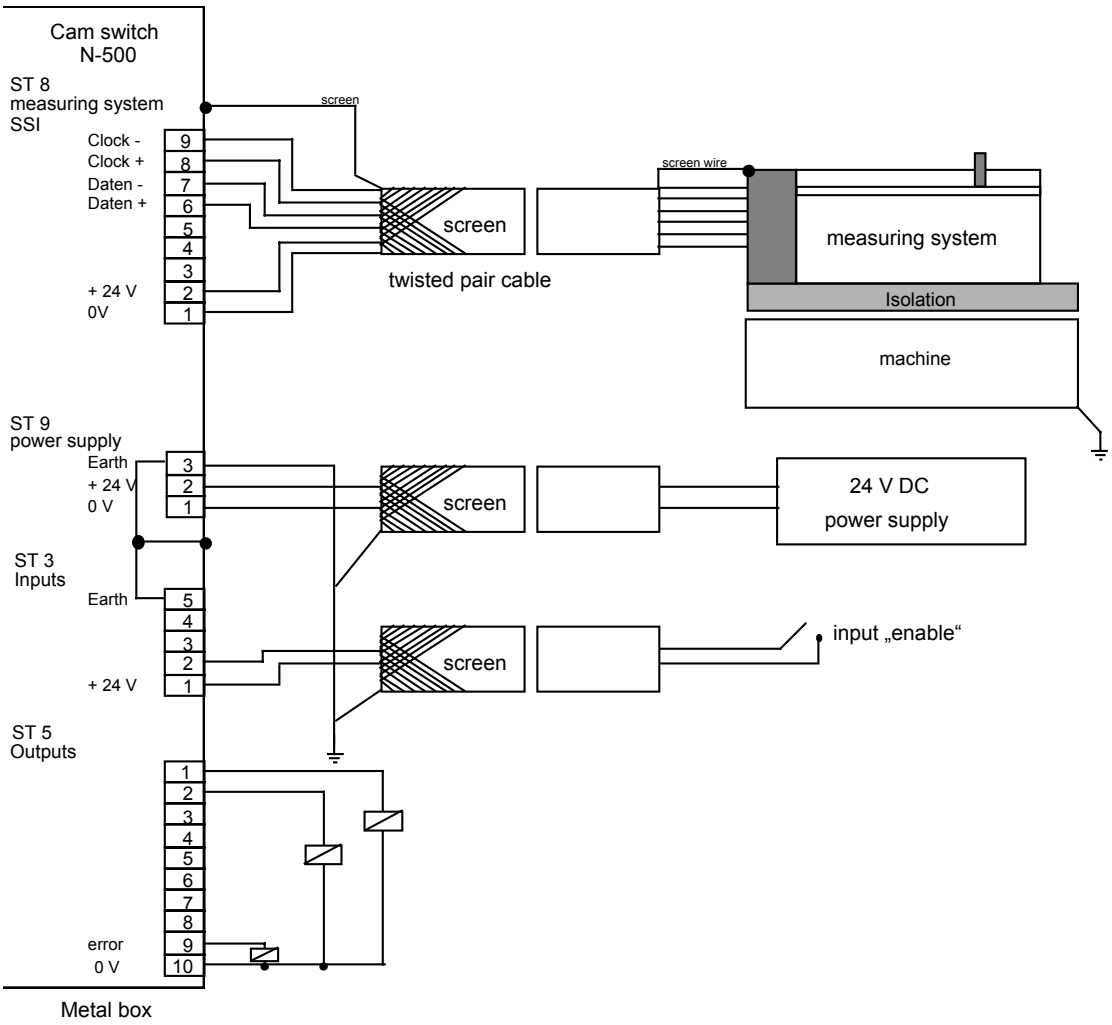
ST 9	Power supply
Pin 1	0 V
Pin 2	+ 24 V DC
Pin 3	Earth

7. Error output ST 5 Pin 9 (low active)

Error	output	display
1) output is short-circuited	low	Error PA
2) processor watch dog is activated because of high external interference	low	Error Proc.
3) actual value out of software limits (SYS 3 + SYS 8 and SYS 4	low	Error Limit
4) break in data line of measuring system	low	Error no55d

The fault message is cleared by closing input “enable” or on power down.

8. Connecting plan



9. Technical Data

Power Supply	:	+24 V DC
Consumption	:	max. 950 mA
Encoder Supply	:	24 V DC; max. 130 mA
Input Signals	:	PNP open collector Pulse : min. 150 msec input current : max. 10 mA
Output Signals	:	push-pull output current : max. 80 mA Free wheel diodes not integrated
Display	:	LED 7 Segment red 8 mm high
Hardware	:	16 Bit-Microcontroler
System accuracy	:	+/- 1 increment
Cycle time	:	1 msec
Enclosure	:	black metal, for fitting into control panel 72w x 96h x 50deep
Cut out	:	66 mm x 92 mm
Ambient temperature	:	0° C to + 45° C

10. Parameters

System parameters (SYS)			Customer value
2	Security code	(CodE)	
3	max. Software limit	(L-o)	
4	min. Software limit	(L-u)	
5	Offset	(OFFS)	
6	Decimal point	(unit)	
7	Measuring direction	(GEbr)	
8	Error-Limit	(L-r)	
9	Display light	(DISP)	
10	Number of bits	(bits)	
11	SSI-code	(SSI)	
12	Display resolution	(drES)	
13	Measuring system resolution	(SrES)	
14	Steps per round	(StEP)	

Cam Parameter	PArA1	PArA2	PArA3	PArA4	PArA5	PArA6	PArA7	PArA8
Cam 1								
Cam 2								
Cam 3								
Cam 4								
Cam 5								
Cam 6								
Cam 7								
Cam 8								

11. List of programmes

Prog.-No	Name of programme
1	
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Prog.-No	Name of programme
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12. Programming

	in	aus	sec.
Cam 1			
Cam 2			
Cam 3			
Cam 4			
Cam 5			
Cam 6			
Cam 7			
Cam 8			

	in	aus	sec.
Cam 1			
Cam 2			
Cam 3			
Cam 4			
Cam 5			
Cam 6			
Cam 7			
Cam 8			

13. 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. We appreciate your ideas and improvement suggestions very much. Reprint, duplication and translation, even in extracts, are only allowed with a written authorization by the company ELGO Electric GmbH. We constantly strive for improving our products, therefore we keep all rights reserved for any technical modifications without any notice.

ELGO Electric does not assume any liability for possible errors or mistakes.

The guarantee period is one calendar from the date of delivery and includes the delivered unit with all components. ELGO Electric GmbH will at its option replace or repair without charge defects at the unit or the included parts, verifiable caused by faulty manufacturing and/or material in spite of proper handling and compliance to the instruction manual.

Damages verifiably not caused by ELGO-Electric GmbH and due to improper handling are excluded from any guarantee e.g. by applying faulty voltage, diffusion of liquid into the interior of the engine, using force, scratching the surface, chemical influences etc.!

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