P8822-000-R SERIES

Dual axes position controller

- 2 or 3 switched speed operation
- manual inching mode
- single set operation
- 200 line program memory

ELGO Electronic GmbH & Co. KG
Measure - Control - Position
Carl - Benz - Straße 1, D-78239 Rielasingen
Fon: +49 (7731) 9339-0, Fax: +49 (7731) 28803
Internet: www.elgo.de. Mail: info@elgo.de

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1. Short description

The dual axes position controller P8822 is the consistent advancement of the proven 88P2.

Substantial characteristics:

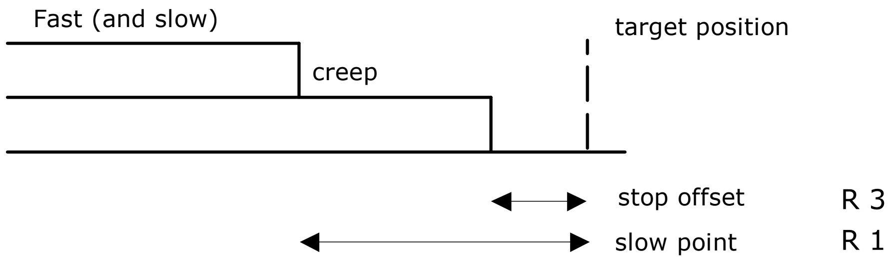
- extensive standard functions
- manual inching mode via keypad (with keys **7, 8, 9, NR**) for X and Y axis
- switched 2 or 3 speed operation

2. Functions

The P8822 controller can be operated with 2 or 3 different speeds

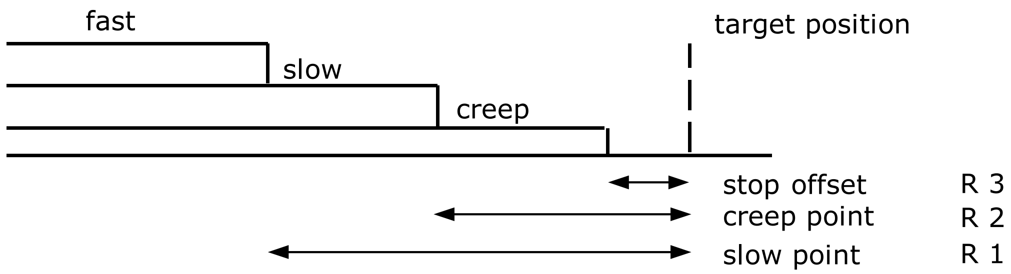
2.1 Two speed operation (switched)

NB: **R1 = R2 > R3** → The value in Register 1 must be the same value as **R2**



2.2 Three speed operation (switched)

NB: **R1 > R2 > R3** → The value in Register 1 must be larger than **R2**



Notice: The stop offset is only effective when **R8 = 1xxxxx.**

2.3 Setting Datum / Reference

Datum can be set in a variety of ways. The method is selected in Register **R8 / 3**

R8 = XX0XXX – Datum to R7
With activating the external input **ST3 Pin 4** (X- Axis) or **ST8 Pin 4** (Y- Axis), the value deposited in **R7**, will be taken over into the actual position window.

R8 = XX1XXX – Datum to preset (target value)
With activating the external input **ST3 Pin 4** (X- Axis) or **ST8 Pin 4** (Y- Axis), the **actual target value** will be taken over into the actual position window (single mode only).

R8 = XX3XXX – Datum directly to R7 (without external reference input)

2.4 Encoder pulse monitoring

There are a number of faults on a machine that can stop the operation i.e.
Stalled motor, Controller failure, Cable failure, **Encoder failure**

Should pulses fail to reach the controller after start has been given and before in position is reached, then one of the above faults must be present. The controller monitors the pulses at intervals set in Register **R19 X / Y**. If the Register **R19 X / Y** is set to "0", the monitoring features will be disabled. Should a failure occur, the **ERROR01** is displayed in target position window.

2.5 Error messages

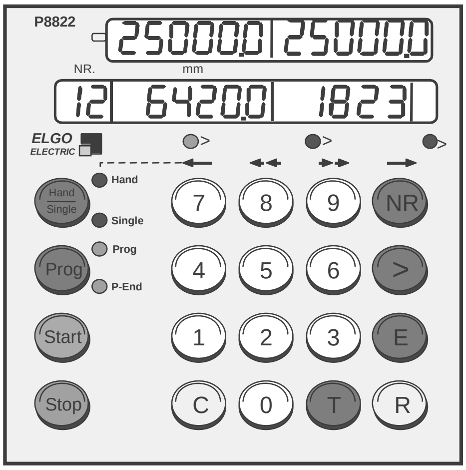
If any failures are present, the following error numbers flashes in the target value window.

Error number	**01**	=	Encoder error
	02	=	End Limit minimum active
	03	=	End Limit maximum active
	04	=	Actual position < min software limit (R13) Hand Target position < min software limit (R13) Single
	05	=	Actual position > max software limit (R14) Hand Target position > max software limit (R14) Single
	07*	=	External stop activated or wire break
	08	=	Maximum number of program lines exceeded

The fault message is cleared by pressing any button.
"07" also flashes if Stop on front panel is activated in middle of any move.

> ***Notice for 07:** The external STOP input must be linked before system can operate. Therefore, if external n/c pushbutton is not fitted, then insert a permanent wire link. Thus the stop input can be used as wire break input.

3. Front view / control elements



3.1 Function of the displays

Actual value	:	shows the actual positions of the axes
Target value	:	preset window for the target positions
Nr.	:	shows the number of the selected program line
LED Hand	:	shines if the button **Hand / Single** is pressed for 2 times
LED Single	:	shines if the button **Hand / Single** is pressed for 1 or 2 times
LED Prog	:	shines if the button **Prog** is pressed (program mode active)
LED P-End	:	shines if the **end of the program** is reached
LED 1 - 3	:	shows which preset window is selected by the **> Button**

3.2 Function of the keypad

Hand / Single

1. After pressing the **Hand / Single** - Key (LED "Single" shines), the **X-Axis target position** can be entered. The **Y-Axis target position** can be entered with pressing **>**

2. With renewed pressing of **Hand / Single** (LED Hand shines additionally) and using the keys **7, 8, 9, NR,** the selected axis can be proceeded with 2 speeds in both directions.

Button 7	=	slow speed backward
Button 8	=	fast speed backward
Button 9	=	fast speed forward
Button Nr.	=	slow speed forward

The desired axes can be selected by pressing the > - Button. The active axis will be indicated by the LED's, located below the target windows

Prog - Activates the program line mode

Start - Starts the positioning procedure. The **START** Button is disabled in the parameter set up mode and during manual inching operation.

Stop - Interrupts the positioning procedure. For a new positioning, press **START** again.

NR – This key is only active in the **Prog-** Mode (**Prog** must be pressed before and the LED Prog must shine) and has the following functions:

1. Begin of the program memory entry (after this, use **> -** Button to step up)

2. Test of an existing program: Each pressing of **NR** causes a continuous-switching into the next program line.

3. Selection of any line in the table operation (look at 4.3 Table operation)

> - The cursor button selects the preset windows sequentially.
On completion of a line, the next press of **>** will select the next address line.
LEDs 1 – 3 indicate the selected Window.

E - This button will :

- Set the end of program and reset the controller into operation mode.
  This Button should be pressed only, when the last window is selected.
- Confirm and save the entered values
- End register setting at any point

R - Selector for entry of Register values. Only active when "Prog" selected (LED **Prog** shines)

T - Reset button : Resets all preset windows in program mode.

C - Clears selected Target window value

0… 9 - Numerical keys for data entry

4. Controller in Operation

Switch on conditions: On switch on, the controller assumes the same conditions as at the switch off time. The actual position is memorized.

- In **Hand-** and **Prog- Mode**, the target windows are set to zero
- In **Single- Mode** the old target values (before power off) are present

4.1 Single operation

Additional to program operation, a single line for X and Y axes can be operated.
Note: Only an absolute position and quantity can be entered in the single mode.

Please press

1. **T** → To set the controller to the basic position (all preset windows are „0")
2. **Single** → The LED's for **single** and **target value** are shining
3. **0... 9** → Enter the target position for **X-Axis**
4. **>** → The LED for the **target value - Y** shines
5. **0... 9** → Enter the target position for **Y-Axis**
6. **Start** → The target values **X** and **Y** will be positioned

The next positions can be operated by renewed using of the steps 3 – 6 then.

4.2 Program line operation (R 8 / 4 = 0)

4.2.1 Selection of a program block

The P8822 is equipped with a program memory of 200 address lines. These can be divided into several blocks of equal quantity of lines (see Register R41). The number of blocks is calculated by the number of datasets. If the input is larger than the number of program blocks, the program block **0** is selected automatically, and an error message **Err 08** is shown in the display.

Please press

1. **R** → the **Nr.** (No.) window flashes
2. **4 + 0** → the **Nr.** (No.) window flashes with "40"
3. **>** → the previously selected program block is displayed in the target window
4. **C** → to clear the window to ZERO
5. **3** → 3 appears in the target window (program block 3 is selected)
6. **E** → the set up is ready now, all preset values are "0".
   The controller returns to normal operation mode.

Now the block can be used with the existing program, or a new program can be entered.

4.2.2 Enter a program

The required program block is selected in accordance with section 4.2.1.

***First step* - Target value X**

Please press **NR** → **01** appears in the **Nr.** window
→ The LED under target window **X** shines
Now press **C** → Clears the target value – **X**, the display shows „0"
Use the keys **0… 9** → to enter a new value for the target **X**…

***Second step* - Target value Y**

… please press **>** → The LED under target window **Y** shines
→ Clears the target value – **Y**, the display shows „0"
Use the keys **0… 9** → to enter a new value for the target **Y**

The first line of program is complete now …

***Third step* - End or continue**

Press **E** → to end programming
Press **>** → to continue resp. programming the next line

4.3 Table operation (R8 / 4 = 1)

With setting **R8 / 4 = 1** (**R8 = XXX1XX**), the controller operates in 99 selectable address tables mode. Programming is exactly the same as described in chapter 4.2.2.

4.3.1 Function of a table operation

The address lines of the stored program can be individually selected and positioned in arbitrary order.

Press **Prog** → Activates the program mode
Press **T** → Basic position, resets the both target windows
Press **Nr** → The Nr. window flashes "0"
Type in **58** now → "58" flashes in Nr. window
Press **>** → The programmed values of address 58 are displayed.
Press **Start** → The axes executes the desired target positions

4.4 Manual inching

Press **T** → to reset all target windows to zero

Use
Hand / Single → to activate **Hand** mode → the appropriate LED shines

The buttons **7**/**8**/**9**/**NR** can be used to move the axis forward and backwards at high and low speeds (whilst the button is depressed).

Press **>** → to **select the axis**, which want to be moved

Press **7** → to move **slow reverse**

Press **8** → to move **fast reverse**

Press **9** → to move **fast forwards**

Press **NR** → to move **slow forwards**

If a 3 speed drive is used, the **fast** and **creep speeds** are used. The physical direction of movement, can be reversed by setting of Register **R64**. When operating in switched speed mode (i.e. without analog output) the outputs **fast**/**slow**/**creep**/**reverse** are set according to the button pressed.

> When closed loop analog control is used, the respective speeds are set in R60… R63 in rpm. The proportional analog output voltage is given, when the button is pressed.

5. Register Input

5.1 Unlocking Registers by Security Code

The values of Registers **R1**… **R97** can be changed after the security code **250565** has been entered into Register **R98** (Exception R6/R7/R40).
The security code can be entered in program mode.

Use the button **E** to → **a)** save register values **b)** end editing

Press **Prog** → Controller is set to program mode. **Prog -** LED shines.
Press **R** → The **Nr.** window flashes
Press **C** → Clears display to zero
Type in **98** → Value 98 appears in **Nr.** window flashes "8"
Press **>** → The Target window shows "000000" without decimal point
Press **C** → Clears display to zero
Type in **250565** → Display shows 250565 (the security code)
Press **E** → The Controller is now set to data entry mode.
All Windows are set to zero. Decimal point is reinstated.

5.2 Setting and Changing Register Values

Example: A slowdown point of 20.0 mm needs to be entered.
Assuming that registers have been unlocked as above :

Press **R**	→ The **Nr. window flashes**.
Press **1**	→ **1** flashes in **Nr. window** i.e. Register 01.
Press **>**	→ The existing value of **R01** is displayed in the target windows of **X**- and **Y**- axes, decimal point is extinguished.
Press **C**	→ To reset the old value
Type in **200**	→ The window shows 200 (i.e. 20.0 mm).
Press **E**	→ The new value is saved now. All windows are **0** and the decimal point is reinstated.

Any Register from 1 to 97 can be selected and changed in the above manner.

5.3 Locking of Registers

After editing the registers, it is necessary to relock the registers to avoid accidental changes. There are 3 methods to do so.

1. Access R98 and - instead of security code 250565
   type in a "**0**" by the **C-** Button → Now press **R** - **9** - **8** - **>** - **C** – **E**

2. Activate the reset input

3. Switch OFF the controller and ON after a few seconds.

6. Register table (Parameter)

Registers, signed as * can be changed without the security code R98.

Register	Function	Unit	X- Axis	Y- Axis
R 1	Slow speed distance	0.1 mm		
R 2	Creep speed distance	0.1 mm		
R 3	Correction stop (stop offset)	0.1 mm		
R 4	Backlash compensation	0.1 mm		
R 5	Retract distance	0.1 mm		
R 6	Tool width *	0.1 mm		
R 7	Datum / Reference value	0.1 mm		
R 8	**System Register 1**	see page 14		
R 8/1	Character of positioning	0-1		
R 8/2	Option	0		
R 8/3	Datum mode „Set reference“	0-4		
R 8/4	Paging of program memory	0-1		
R 8/5	Relay output configurations	0-9		
R 8/6	Backlash compensation	0-2		
R 9	Time „position reached“	0.1 sec.		
R 10	Backlash dwell time	0.1 sec.		
R 12	Width of tolerance window	0.1 mm		
R 13	min. end limit	0.1 mm		
R 14	max. end limit	0.1 mm		
R 18	**System Register 2**	see page 18		
R 18/1	Interface activated / deactivated	(still in preparation)		
R 18/2	Retract function	0-2		
R 18/3	Character of single positioning	0-2		
R 18/4	Character of program line positioning	0-2		
R 18/5	Keyboard interlock	0-3		
R 18/6	Option	-		
R 19	Pulse time of encoder monitoring	0.1 sec.		
R 20	Decimal place	see page 18		
R 28	**System Register 3**	see page 18		
R 29	Time delay for drive inhibit	0,1 sec.		
R 30	Program end pulse	0.1 sec.		
R 40	Program block selection*	see page 8		
R 41	Program block size	1-99		
R 46	Program counter Limit	0-9999		
R 47	Program cycle counter	0-9999		
R 56	Multi edge counter IW 1, 2, 4	1, 2 or 4		
R 64	UP/DOWN manual inching buttons	0-1		
R 73	Automatic stop offset calculation	0-5		
R 80	Comparator mode	0-2		
R 81	Comparator distance	0.1 mm		
R 88	**System Register 4**	see page 20		
R 88/1	Option	-		
R 88/2	Customer setting	0		
R 88/3	Program stepping	0-1		
R 88/4	Double start function	0-1		
R 88/5	Relay/Transistor version	0-1		
R 88/6	Error compensation in incremental mode	0-1		
R 90	Service registers	0-2		
R 92	Display brightness	0-15		
R 96	Pulse scaling factor	0.1 mm		
R 97	Inch/mm measurement unit selection	0-1		
R 98	Security code	250565		

Please note: Logical sequence values such as these must always be present, regardless whether a 3 speed, 2 speed or 1 speed drive is used. **R1 > R2 > R3 for 3 speed drive R1 = R2 > R3 for 2 speed or 1 speed drive.**

7. Description of Registers

R01 - Slow speed distance X / Y
Distance to the target position at which the controller switches from high speed to slow speed. The output high speed will be switched off.

R02 - Creep speed distance X / Y
Distance to the target position at which the controller switches from slow to creep speed

R03 - Stop offset distance X / Y
The over run distance can be programmed to compensate for distance from the switch-off point of the motor to standstill. For exact positioning, the over run distance should be very small (0.0… 0.5 mm). Therefore the mechanical friction should be steady and the creep speed should be very slow.

During commissioning, first set **R12** to zero (to eliminate Tolerance window blanking), then set the value of **R03** to **0.0** and execute a number of moves in both directions. Note the average overrun distance and then set **R03** to that value. Then set **R12** to suit.

Note: Stop offset is only functional when **R8 / 1 = 1**

R04 - Backlash overrun X/Y
To correct for screw or pinion backlash, the target position should be approached from one direction only. In positive direction therefore, the target position will be overrun by the value of **R4** and drive back to the target position with creep speed, after the time delay of **R10**.

R05 - Retract distance X / Y
There are different modes available in the P8822, selectable by Register R18/2.
If R18 / 2 = 0 Retract Position to the actual **value + R5**
Whilst the input **St3 Pin 6** (Y- Axis) **ST8 Pin 6** (X- Axis) is activated, the P8822 will move to the **retract position**. With deactivating the input, the controller returns to the basic position (Value 0).
If R18 / 2 = 1 Retract Position to the **value of R5**
When input St3/8 is activated, the axis moves to position as set in **R5**, but will not return to original position on release of input. (Value 1)
If R18 / 2 = 2 Retract with backlash dwell time of **R10**

R06 - Tool offset compensation X / Y
This Register can be accessed without security code. When moving in incremental mode, it is often the case that the subsequent function is a cut, that removes part of the material. Thus to cut the correct pre-set lengths, it is necessary to move the desired distance plus the **tool offset**. This feature is active in incremental mode only.

R07 - Datum / Reference X / Y
This Register can be accessed security code. The Datum value is stored in this Register. The value is used in different ways, in accordance with setting of **P8 / 3**. Input **St3 Pin 4** (X-Axis) **ST8 Pin 4** (Y- Axis) initiates loading.

R8 System Register 1

Target value windows **X** and **Y**

1 2 3 4 5 6

Backlash compensation
0 = Without backlash compensation
1 = With negative backlash compensation
2 = With positive backlash compensation

Relay output configuration
0 = 2 speeds, independent outputs for speed and direction
1 = 2 speeds, independent outputs for speed, additional reverse
2 = 2 speeds, separate outputs for each condition
3 = 3 speeds, additional reverse output
4 = 2 speeds, independent outputs for speed and direction
5 = 2 speeds, independent speed and direction, separate reverse
6 = 2 speeds, separate outputs for each condition
7 = 2 speeds, separate outputs for each condition
8 = 2 speeds, separate outputs for speed and direction
9 = 2 speeds, separate outputs for speed, additional reverse

Program / Table operation
0 = Program operation mode
1 = Table operation mode

Datum / Reference
0 = Reference with R7 by external input
1 = Reference with target window by external input
4 = Directly with R7 by keypad

Option

Character of positioning
0 = PID regulated positioning (Option)
1 = Switched positioning

Drive control output configuration (Relays)

R8 / 5 = 0 2 speeds, independent outputs for speed and direction

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X			X
Slow forwards	X			X
Fast forwards	X		X	
Creep reverse		X		X
Slow reverse		X		X
Fast reverse		X	X	

X = output activated

R8 / 5 = 1 2 speeds, independent outputs for speed and additional reverse signal

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X			X
Slow forwards	X			X
Fast forwards	X		X	
Creep reverse	X	X		X
Slow reverse	X	X		X
Fast reverse	X	X	X	

X = output activated

R8 / 5 = 2 2 speeds, separate outputs for each condition

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X			
Slow forwards	X			
Fast forwards			X	
Creep reverse		X		
Slow reverse		X		
Fast reverse				X

X = output activated

R8 / 5 = 3 3 speeds, additional reverse output (ELGO ELECTRIC - Standard setting)

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X			
Slow forwards	X	X		
Fast forwards	X	X	X	
Creep reverse	X			X
Slow reverse	X	X		X
Fast reverse	X	X	X	X

X = output activated

R8 / 5 = 4 2 speeds, independent outputs for speed and direction

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X	X		
Slow forwards	X	X		
Fast forwards	X		X	
Creep reverse		X		X
Slow reverse		X		X
Fast reverse		X	X	X

X = output activated

R8 / 5 = 5 2 speeds, independent speed and direction outputs, separate reverse output

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X	X		
Slow forwards	X	X		
Fast forwards	X		X	
Creep reverse	X	X		X
Slow reverse	X	X		X
Fast reverse	X		X	X

X = output activated

R8 / 5 = 6 2 speeds, additional reverse output, separate outputs for speed

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X			
Slow forwards	X			
Fast forwards		X		
Creep reverse			X	
Slow reverse			X	
Fast reverse				X

X = output activated

R8 / 5 = 7 2 speeds, separate outputs for each condition

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X			
Slow forwards				
Fast forwards				X
Creep reverse		X		
Slow reverse				
Fast reverse			X	

X = output activated

R8 / 5 = 8 2 speeds, separate outputs for speed and direction

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X		X	
Slow forwards				
Fast forwards	X			X
Creep reverse		X	X	
Slow reverse				
Fast reverse		X		X

X = output activated

R8 / 5 = 9 2 speeds, separate outputs for speed, additional reverse output

Output signals ST4=X/ST6=Y	1 / 5	2 / 6	3 / 7	4 / 8
Creep forwards	X		X	
Slow forwards	X			
Fast forwards	X			X
Creep reverse	X	X	X	
Slow reverse	X			
Fast reverse	X	X		X

X = output activated

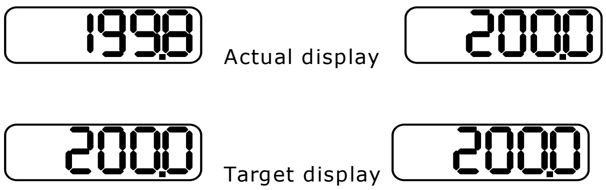
R9 - Time "in position"
At the end of each move, the controller gives an output, to signal "in position" as long as the time register **R9 / X** resp. **R9 / Y** is. The length of this pulse is adjustable in **R9** (range: 0.1… 9.9 s). Setting 0.0 gives a maintained output.

R10 - Backlash dwell time
When the machine stops at the end of the overrun, it is usually desirable to have a short delay. The time is set in register **R10** (range: 0.1… 9,9 sec.).

R12 - Tolerance window
It is possible to enter a value in Register **R12** that represents an acceptable tolerance e.g. 0.1 mm. When the actual position is within the tolerance window, the actual position displayed is made equal to the Target position. The actual error is not lost, as the controller knows the true position.

Example: **R12** = 0.2 Therefore tolerance window is +/- 0.2mm

Display without tolerance set Display with tolerance set



Note: At first start-up, the tolerance window is to be set first to "0".
Only after a correct adjustment of **R1… R4**, other values can be used here.

R13 / R14 - Min / Max software limits
Target < Limit **R13** = error message **ERR04**
Target > Limit **R14** = error message **ERR05**

Program / Single operation
Immediately after a start signal, the controller checks the software limits. If the target position is greater or smaller than the corresponding limit, the controller will stop and show the error message on the display. The backlash distance in **R4** is considered at the check of the Max software limit, if the backlash is activated in **R8 / 6** X/Y.

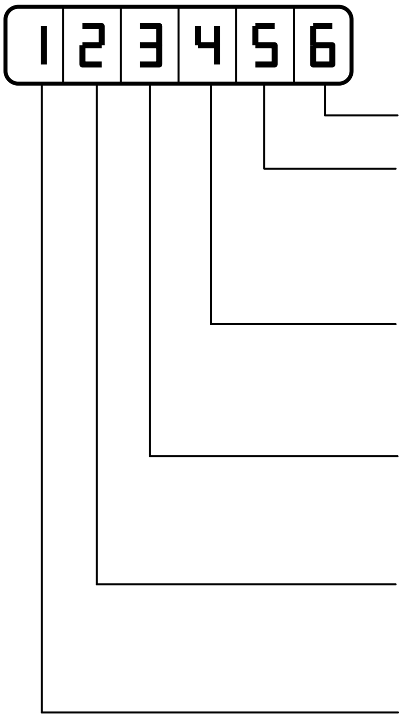
Manual operation
The movement will stop when software limits are reached. If moving at high speed, the drive will drop to creep speed at a distance set in **R1** from this limit. This prevents running into the ends of the machine. The end limit values are modified by backlash value as set in **R4**, if **R8 / 6** X/Y is selected.

R15 - Software Limit Selection
Software limits (**R13** & **R14**) are active in accordance with the setting of **R15 / 6**

xxxxx0 → Both software limits active
xxxxx1 → Min software limit (**R13**) inhibited
xxxxx2 → Max software limit (**R14**) inhibited
xxxxx3 → Both software limits (**R13** & **R14**) inhibited

R18 System Register 2

Target value windows **X** and **Y**



Option

Keyboard interlock
0 = Programming enabled
1 = Programming disabled
2 = All keyboard functions disabled
3 = Memory and START/STOP disabled

Positioning in Prog
0 = Absolute
1 = Incremental +
2 = Incremental -

Positioning in single
0 = Absolute
1 = Incremental +
2 = Incremental –

Retract mode
0 = retract to Actual + R5 setting value
1 = retract to absolute position in R5
2 = retract whilst input active Return on deactivation

Serial link
0 = none

R19 cycle time of encoder monitoring

If after positioning is initiated, no encoder pulses are sensed after a time set in **R19** (0.1… 9.9 s), positioning will be aborted and Fault **ERROR01** will be displayed. To deactivate the encoder pulse monitoring, **R19** must be is set to 0.0.

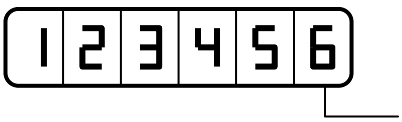
R20 decimal place

The decimal point is placed in a fixed position and is optical only. It does not change the resolution of the system.

R20 = XXXXX0	=	without
R20 = XXXXX1	=	1/10
R20 = XXXXX2	=	1/100
R20 = XXXXX3	=	1/1000
R20 = XXXXX4	=	1/10000

R28 System Register 3

Target value window **X**



Function of the front located START button
0 = Start of both axes
1 = Only start of the axis, selected by the cursor (single mode)

R29 Time delay for drive inhibit (positioning)
On activating start, output positioning is activated. On arriving in position, after a time delay of **R29** this output deactivates.

R30 Time of “program end” signal
If last step of a program is completed, the output signal **program-end** is activated for the time programmed in this register.

R40 Program block selection
This register can be accessed without security code **(R98)**. The program block required for operation can be entered here (0… 99).

R41 Number of Lines in each program block
Enter the number of lines required per program block (1 – 99). The number of Blocks will be calculated automatically.

Example : Total number of lines = 200, Number of Lines required per Block = 25
(enter 25 into **R41**). Therefore number of Program blocks = 8

R46 Program cycle- pre selection
To limit the execution of the Program the cycle counter can be set. If the Register **R47** (Cycle counter) is equal the pre selection the signal ready will drop off. To Disable the counter set **R46** to zero.

R47 Program cycle counter
When the cycle counter is complete. i.e. **R46** equal to **R47** the output ready drop of and cycle count is displayed in actual position window. The external and front panel Start are disabled. To clear the output to allow positioning again **R47** must be set to zero. For temporary unlock press Stop. The one more Program cycle can be done. After completing this Program new counter value is displayed and ready drop of again.

R56 Encoder edge multiplication

1 = x 1 2 = x 2 4 = x 4
Entry of any other value will automatically select 1

R73 Automatic stop offset calculation and positioning retry
If the value of **R73 X/Y** is set to zero, the controller will operate without recalculation and without retry. If the value of **R73 X/Y** is set to "1" this means that should the position reached be outside the tolerance window, the controller will recalculate the new stop offset but no retry. If **R73** is set to any value bigger than “1” the controller will also retry.

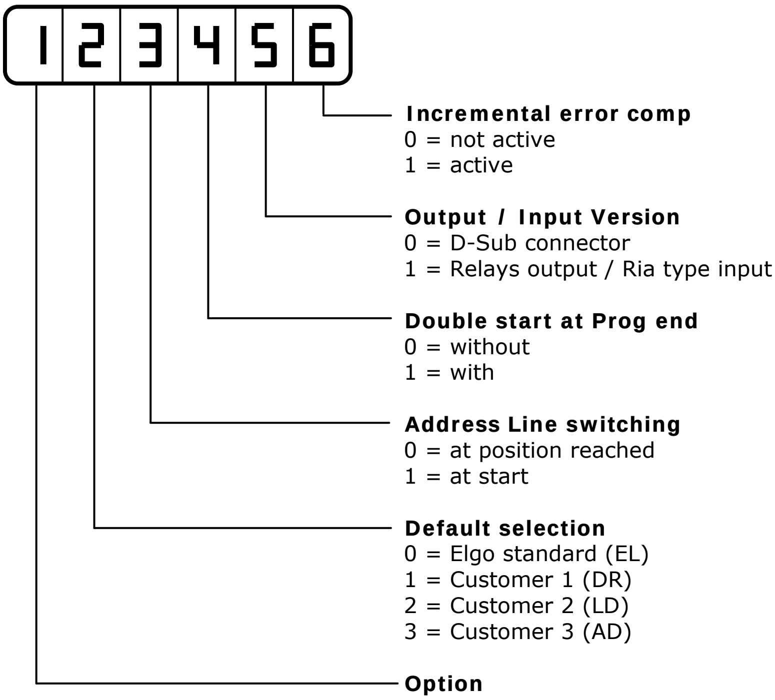
R80 Two axis position comparator
Two modes are required. Anti collision control and Balance control

Setting **R80**: Value 0 : Checking mode inoperative
Value 1 : Anti-collision operation.
Value 2 : Skew Detection

R81 Comparator distance
Controller checks both positions whilst running and if difference is bigger than value set in **R81**, stop is activated and **ERROR09 / ERROR10** info is activated.

R88 System Register 4

Target value window **X**



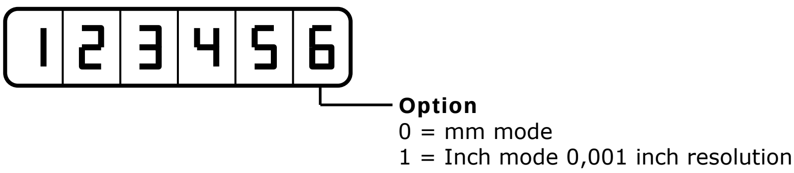
R90 Service register
Only active when **R98** is unlocked. Select button as shown below:
Button 1 - Pressing this button loads default values into all registers
Button 2 – Clear memory

R92 Display brightness
With the setting of this register, the brightness of the display can be altered digitally:
0.0 = dark, **9.9** = max. brightness

R96 Pulse scaling factor
A factor (0.00001… 9.9999) can be entered in this register. The encoder pulses will be multiplied by this factor, to manipulate the display to required dimensions. If no multiplication is required, this register must be set to 1.00000.

R97 Inch / mm - selection
This register sets the metric or inch mode. This setting has priority to the external selection of the input. Active in Ad default.

Target window **X**



R98 Security code
Enter **250565** to unlock and change parameters and registers

R99 Service (only for service), see page 28

8. Function of inputs (ST3 / ST 8 connections)

ST 3 Pin 1 - reference potential + 24 VDC (0V = option EN) ST3 Pin 1
→ in order to activate the respective entrances from ST3 to, they must be switched to this potential

ST 3 Pin 2 - External START input for X Axis + Y-Axis
→ The START input is an edge triggered input
→ With activating, both axis starts positioning

ST 3 Pin 3 - External STOP input for X Axis + Y-Axis
→ The STOP input is open = STOP active (positioning impossible)
→ Will now an initial instruction given is indicated the error message to 07
→ entrance closed = stop inactively (positioning possible)

ST 3 Pin 4 - Reference Datum X-Axis
→ if the number of 0 or 1 is adjusted in the system parameter **R8/3**, the actual value can be calibrated over this entrance

a) **R8 = XX0XXX** calibrate over parameters
b) **R8 = XX1XXX** calibrate over desired value

ST 3 Pin 5 - Inch / mm
→ With activating **ST3 Pin 5**, the controller switches over into **INCH mode.**
The actual value announcements and length parameters are converted in inch.

ST 3 Pin 6 - Retract X-Axis
→ if the number of 0 or 1 is adjusted in the system parameter R18/3, the actual value can be calibrated over this entrance

a) **R18 = X0XXXX** departure distance = (actual value + value R6)
b) **R18 = X1XXXX** departure on a goal point in R5

ST 3 Pin 7 - program counter - actual value into the announcement switch
(only during customer attitude R88/2 = 3AD)

→ this entrance is wired, the count of the program run counter into the actual value window is indicated

ST 3 Pin 8 - Keyboard interlock
→ will this entrance wired is waived the keyboard bolting device

ST8 connections

ST 8 Pin 1- reference potential + 24 VDC (0V = option EN) ST8 Pin 1
→ in order to activate the respective entrances from **ST 8** to, they must be switched to this potential

ST 8 Pin 2 - NC

ST 8 Pin 3 - NC

ST 8 Pin 4 - Reference Datum Y-Axis
→ if the number of **0** or **1** is adjusted in the system parameter **R8 / 3**, the actual value can be calibrated over this entrance

ST 8 Pin 5 - Start X
→ the start input X is edge triggered, i.e. it is sufficient to release an impulse around the starting procedure entrance 1x operated = positioning procedure starts at the axis X

ST 8 Pin 6 – Retract Y-Axis
→ if the number of 0 or 1 is adjusted in the system parameter **R18 / 3**, the actual value can be calibrated over this entrance

ST 8 Pin 7 - NC

ST 8 Pin 8 – Start Y-Axis
→ Start Y-Axis
the start input is edge triggered, i.e. it is sufficient to release egg impulse around the starting procedure

9. Functions of the outputs (ST4 / ST6 connections)

ST 4 Pin 1-2 Axis in position
into register **R9** worth (0.1 - 9.9 seconds.) one enters, then the contact ST4 pin 1-2 is switched with position reached wiping.

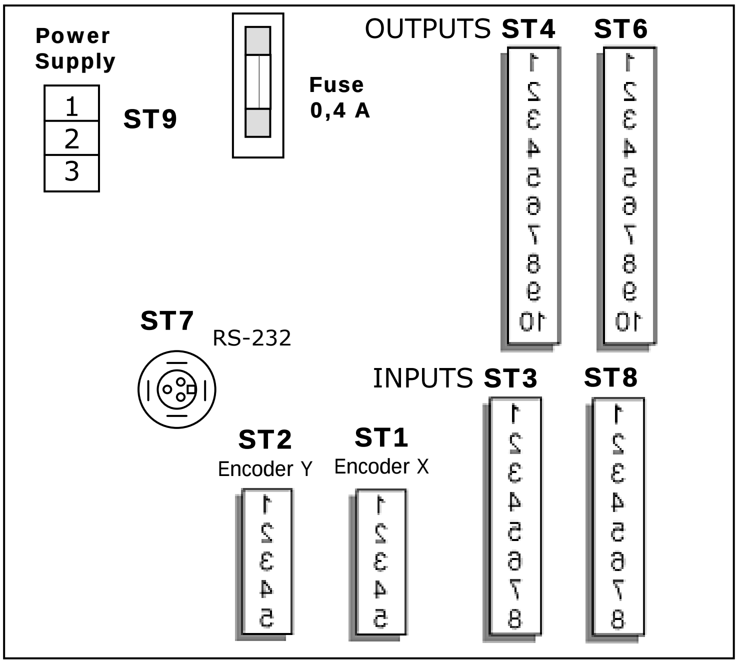
ST 4 Pin 3-10 drive control X axis

the driving signal outputs are differently configurable

ST 6 Pin 1-2 bending release / (only during customer attitude R88 / 2 =7)
After positioning of the **X** axis, the output pulses according to the time adjusted in **R9 / X**.

ST 6 Pin 3 - 10 drive control Y axis
the driving signal outputs are differently configurable **(R8 / 5)**

10. Rear of the unit



11. Connections

ST 4 Relay control outputs for X Axis

PIN	Conf. 3	Conf. 7 (LD)	Conf. 8 (AD)	Conf. 9 (DR)	Relay
1 - 2	Axes in position	Axes in position	Axes in position	Axes in position	R1
3 – 4	Run	Slow forwards	Forwards	Run	R2
5 – 6	Slow	Slow backwards	Backwards	Backwards	R3
7 – 8	Fast	Fast backwards	Slow	Slow	R4
9 - 10	Reverse	Fast forwards	Fast	Fast	R5

ST 6 Relay control outputs for Y Axis

PIN	Conf. 3	Conf. 7 (LD)	Conf. 8 (AD)	Conf. 9 (DR)	Relay
1 - 2	Bend enable	Positioning in process	Bend enable	Bend enable	R6
3 – 4	Run	Slow forwards	Forwards	Run	R7
5 – 6	Slow	Slow backwards	Backwards	Backwards	R8
7 – 8	Fast	Fast backwards	Slow	Slow	R9
9 - 10	Reverse	Fast forwards	Fast	Fast	R10

ST 3 Inputs

PIN	Standard 0	Customer 2 (LD)	Customer 3 (AD)	Customer 1 (DR)
1	**+24V** (EN - 0V)	**+24V** (EN - 0V)	**+24V** (EN - 0V)	**+24V** (EN - 0V)
2	Start X/Y	NC	Start X/Y	Start X/Y
3	Stop X/Y	Stop X/Y	Stop X/Y	Stop X/Y
4	Datum X	Datum X	Datum X	Datum X
5	Inch/mm X/Y	NC	NC	Inch/mm X/Y
6	Retract X	Retract X	Retract X	Retract X
7	Program counter	Sequence Start	Program counter	NC
8	Keyboard enable	Keyboard enable	Keyboard enable	Keyboard enable

ST 8 Inputs

PIN	Version 0	Version 2 (LD)	Version 3 (AD)	Version 1 (DR)
1	**+24V** (EN - 0V)	**+24V** (EN - 0V)	**+24V** (EN - 0V)	**+24V** (EN - 0V)
2	NC	NC	NC	NC
3	NC	NC	NC	NC
4	Datum Y	Datum Y	Datum Y	datum Y
5	Start X	NC	Start X	Start X
6	Retract Y	Retract Y	Retract Y	Retract Y
7	NC	NC	NC	NC
8	Start Y	NC	Start Y	Start Y

ST 1 = Y / ST 2 = X Encoders

PIN	FUNCTION
1	0 V (GND)
2	+24 VDC out
3	A Signal
4	B Signal
5	Screen / Shield

ST 9 Power supply

PIN	FUNCTION - AC	FUNCTION – DC
1	**L1** 115 VAC/230 VAC	**0 V** (GND)
2	**N** 0 V	**+ 24 VDC**
3	PE	-

12. Technical specifications

Function	**Data**
Power supply	**+24 VDC** (e.g. with ext. power pack NG 13.0) or **230V/115V AC** +/- 10 % Note: Please don't exceed the max. load of 600 mA (max. available with NG 13.0,) when connecting the equipment, inclusive connected encoders and loaded resp. activated output signals.
Consumption	max. 110 mA at + 24 V DC with unloaded outputs or 50 / 100 mA at 230 / 115 V AC 50 / 100 mA
Encoder supply	24 V DC; max. 130 mA
Input signals	PNP (standard): Active high (+24 VDC) NPN (option): Active low (GND)
Input pulse time	min. 300 ms
Input current / Pin	max. 10 mA
Output signals are	- push/pull - caused short circuit proof - with a max. load of 50 mA - with integrated recovery diode
Power down memory	E^2 Prom, service life: 10^5 power- on/off cycles
Connectors	D-SUB
Displays	Red LED displays, height: 10 mm
Hardware	16-Bit Micro controller with 256 Kbytes E-Prom and 32 Kbytes RAM
System accuracy	+/- 1 Digit
Input frequency	20 KHz (more on request) corresponding to 0.1 mm resolution resp. an operating speed of 120 m / min
Panel cut out	B x H = 138 x 138 mm's
Install depth	75 mm's without connectors 110 mm's including connectors
Ambient temperature	0°… + 45°
NG 13.0 - External POWERPACK	
Input voltage	230 V / 115 V AC +/- 10 %
Input frequency	50 - 60 Hz
Power consumption	40 VA
Output voltages	10 VDC / 24 VDC
Output current	400 mA / 600 mA
Connections	Screw terminal for a wire cross section of max. 2 x 2,5 mm^2

13. Installation and wiring

Attention! To ensure a perfect function of the controller P8822 the following installation guide-lines must be strictly observed and followed. Otherwise the guarantee expires and **ELGO Electric GmbH** takes no liability and guarantee for malfunctions or damages caused e.g. by incorrect installed wires or other external sources of error or interference, which are exactly explained below. Please read the instructions carefully, before start up the unit.

To guarantee a perfect operation of the controller, the following (external) measures have to be taken additionally:

Place of installation:
Don't install the controller near to sources of interference generating strong inductive or capacitive interferences or strong electrostatic fields.
Install the external power supply directly beside the controller to avoid long low voltage wires.

Power supply:
Connect the external power supply to a phase of 230 VAC or 115 VAC, which is not used for engines. If not possible use a galvanic separation over an additional transformer.

Wire installation:
Install all wires for low voltages and encoders always separately from power wires (230 VAC/400 VAC). Avoid to install these wires close to any contactor or contactor wires.

Shielding:
All external signal wires have to be installed shielded:
1. Rotary encoder wires
2. Wires for all other input signals
3. Wires for all output signals
4. Wires from the power supply to the controller

All shields have to be connected centrally low ohm to **PE** (earth potential), connect only one-sided at the P8822-Controller.

IMPORTANT!
1. Don't connect the P8822's GND to **PE** (earth potential)
2. Don't connect the shielding on both sides to **PE** (earth potential)
3. If the protective ground potential is heavily "contaminated" by interference voltages, try to connect the shielding to the GND potential instead of **PE** (earth potential)

Fault clearance: If there occurs interferences in spite of applying all above mentioned measures proceed as follows:

1. Add RC elements over contactor reels of AC contactors (for example 0,1 µF/100 Ω).
2. Add recovery diodes over DC inductances
3. Add RC elements over each engine phase (in connector box of the engine)
4. Install a power filter before the external power supply

14. Only for Service

Service Register 90
How to access the service register? At first the security code in **R98** must be used and the service enable must be activated **R90.**

With entering the service register R90, the following functions are selectable:

R 90 = 000001 → **Load customer adjustment** (Register **R88/2** adjustment)
R 90 = 000002 → **Clear memory**

15. Type designation

P 88 22 - 000 - 230 - XY - XXXXXX

P = position controller

Series

Program memory
2 = with

Number of axes

Version
000 = Standard
001 = 1. Special version

Power supply
024 = 24 VDC
115 = 115 VAC
230 = 230 VAC

Encoder Inputs
0 = A/B → 24VDC – 20 KHz PNP (active high)
1 = A/B/Z → 24VDC – 20 KHz PNP (active high)
2 = A/B → 5V-TTL - line receiver
3 = A/B/Z → 5V-TTL - line receiver + index pulse
8 = A/B → 24VDC - NPN logic (active low)

Accessories
P = Analog output for X- axis*
PP = Analog output for X- and Y- axes*
EN = **NPN** inputs (active low)
S = Serial RS232 interface*

* In preparation

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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The guarantee period is one calendar year from the date of delivery and includes the delivered unit with all components. ELGO Electronic GmbH & Co. KG 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 Electronic GmbH & Co. KG 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.!

ELGO Electronic GmbH & Co. KG
Measure - Control - Position
Carl - Benz - Straße 1, D-78239 Rielasingen
Fon: +49 (7731) 9339-0, Fax: +49 (7731) 28803
Internet: www.elgo.de. Mail: info@elgo.de