

## P8822-000-P SERIES

### Dual axes position controller

- 2 or 3 switched speed operation
- digital 24 V-PNP drive control outputs
- manual inching mode
- single set operation
- 200 line program memory



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## 1. Short description

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

Substantial characteristics:

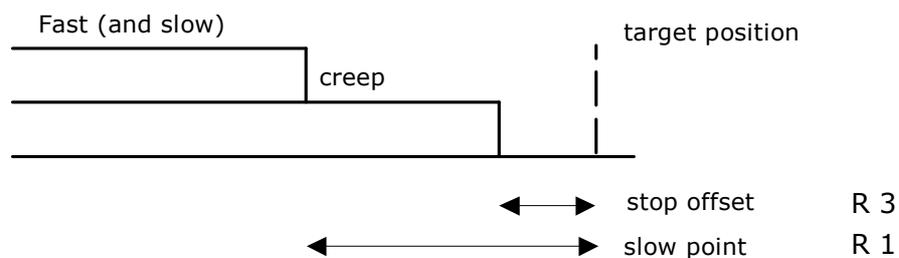
- extensive standard functions
- manual inching mode via keypad (with keys **7, 8, 9, NR**) for X and Y axis
- switched 2 or 3 speed operation

## 2. Functions

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

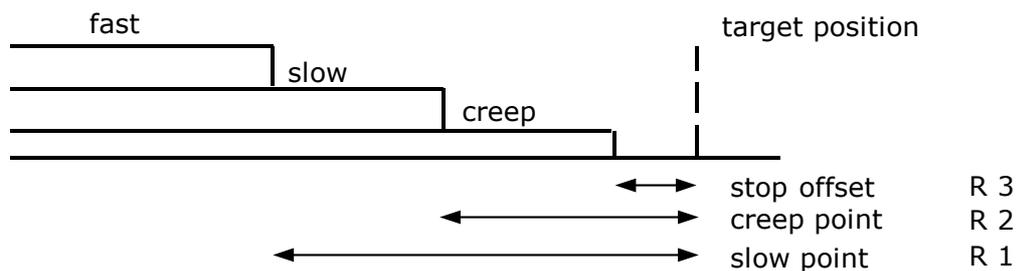
### 2.1 Two speed operation (switched)

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 8** (X- Axis) or **ST3 Pin 7** (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 8** (X- Axis) or **ST3 Pin 7** (Y- Axis), the **actual target value** will be taken over into the actual position window (single mode only).

### **R8 = XX4XXX – 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.

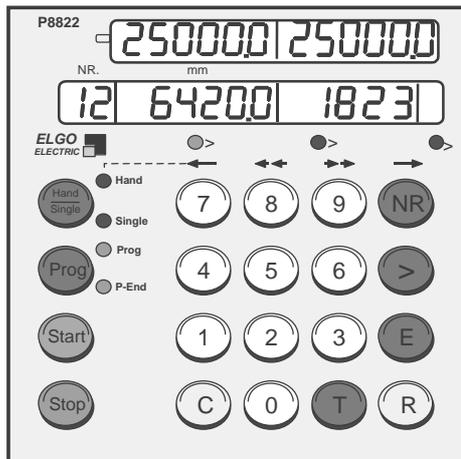
Error number	<b>01</b>	= Encoder error
	<b>02</b>	= End Limit minimum active
	<b>03</b>	= End Limit maximum active
	<b>04</b>	= Actual position < min software limit (R13) Hand Target position < min software limit (R13) Single
	<b>05</b>	= Actual position > max software limit (R14) Hand Target position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

> - 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	<b>System Register 1</b>	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	<b>System Register 2</b>	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	<b>System Register 3</b>	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	<b>System Register 4</b>	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 7** (Y- Axis) resp. **8** (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 7** (Y-Axis) resp. **Pin 8** (X- Axis) initiates loading.

## R8 System Register 1

Target value windows X and Y



### Backlash compensation

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

### 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

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

Output signals ST5 Pin X/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 ST5 Pin X/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 ST5 Pin X/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 ELECTRONIC - Standard setting)

Output signals ST5 Pin X/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 ST5 Pin X/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 ST5 Pin X/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 ST5 Pin X/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 ST5 Pin X/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 = 8** 2 speeds, separate outputs for speed and direction

Output signals ST5 Pin X/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 = 9** 2 speeds, separate outputs for speed, additional reverse output

Output signals ST5 Pin X/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

### 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**

### 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

**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



- Incremental error comp**  
0 = not active  
1 = active
- Output / Input Version**  
0 = D-Sub connector  
1 = Relays output / Ria type input
- Double start at Prog end**  
0 = without  
1 = with
- Address Line switching**  
0 = at position reached  
1 = at start
- Default selection**  
0 = Elgo standard (EL)  
1 = Customer 1 (DR)  
2 = Customer 2 (LD)  
3 = Customer 3 (AD)
- Option**

### 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



- Option**  
0 = mm mode  
1 = Inch mode 0,001 inch resolution

### 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 connections)

### ST 3 Pin 1 System reset

→ The controller resets to home position

### ST 3 Pin 2 External START input for X-Axis

→ The START input is an edge triggered input

→ With activating, the **X-Axis** starts positioning

### ST 3 Pin 3 External START input for Y-Axis

→ The START input is an edge triggered input

→ With activating, the **Y-Axis** starts positioning

### ST 3 Pin 4 External "double" START input (X/Y-Axis)

→ The START input is an edge triggered input

→ With activating, **both axes** starts positioning

### 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 Keyboard interlock

→ With activating **ST3 Pin 6**, the keyboard interlock (adjusted in **R18/5**) is unlocked.

### ST 3 Pin 7 Reference / Datum of Y-Axis

If the number of **0** or **1** is adjusted in the **System Register R8/3 Y**, the actual value can be calibrated to datum by activating this input:

a) **08 = XX0XXX** → datum with **R7**

b) **08 = XX1XXX** → datum with **target value window**

### ST 3 Pin 8 Reference / Datum of X-Axis

If the number of **0** or **1** is adjusted in the **System Register R8/3 X**, the actual value can be calibrated to datum by activating this input:

a) **08 = XX0XXX** → datum with **R7**

b) **08 = XX1XXX** → datum with **target value window**

### ST 3 Pin 14 External STOP input X/Y

**Input open** → STOP active (no positioning possible)

**Input closed** → STOP inactive (positioning possible)

**ST 3 Pin 15 NC**

**ST 3 Pin 16 Program cycle counter** – switches actual values into the display

With activating **ST3 Pin 6**, the counter value of the program cycle counter is displayed in the actual value windows:

Actual value X = Counter value

Actual value X = Counter value

**ST 3 Pin 17 NC**

**ST 3 Pin 18 Retract X**

Activating of **ST3 Pin 18**, starts the **retract function** of the **X axis**.

- a. **R 18/X=X0XXXX** → retract distance = actual value + value in **R6**
- b. **R 18/X=X1XXXX** → retract to value in **R5**
- c. **R 18/X=X2XXXX** → retract to time in **R10**

**ST 3 Pin 19 Retract Y**

Activating of **ST3 Pin 19**, starts the **retract function** of the **Y axis**.

- a. **R 18/X=X0XXXX** → retract distance = actual value + value in **R6**
- b. **R 18/X=X1XXXX** → retract to value in **R5**
- c. **R 18/X=X2XXXX** → retract to time in **R10**

**ST 3 Pin 20 NC**

**ST 3 Pin 21 NC**

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

### **ST 5 Pin 1-4 drive control output of X axis**

These outputs are differently configurable in register **R8/5 X**

### **ST 5 Pin 5-8 drive control output of Y axis**

These outputs are differently configurable in register **R8/5 Y**

### **ST 5 Pin 14 position reached X pulse**

After positioning of the **X** axis, the output pulses according to the time adjusted in **R9/X**.

### **ST 5 Pin 15 position reached Y pulse**

After positioning of the **Y** axis, the output pulses according to the time adjusted in **R9/Y**.

### **ST 5 Pin 16 positioning in process**

With pressing **START**, the output **positioning in process** will be set.

The output resets first after reaching the target position of both axes and completion of the time in **R29**.

### **ST 5 Pin 17 program end**

Immediately after reaching the targets in the last program step, the output **program end** will be set, according to the time adjusted in **R30** (0,1 - 9,9 s).

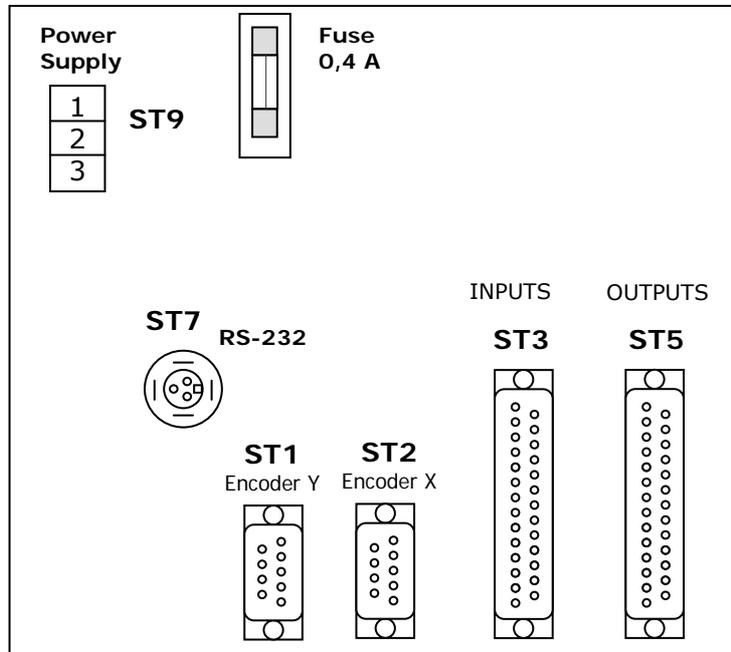
### **ST 5 Pin 18 program cycle counter – preset reached**

If the program cycle counter reaches its preset value (**R46**), the output **program counter** is active. The output resets by pressing the **STOP** button.

### **ST 5 Pin 19 positioning X/Y completed**

If the positioning of both axes is terminated, the output **positioning completed** will be set. The output resets by activating **START** or pressing the **STOP** button.

## 10. Rear of the unit



## 11. Connections

Pin	ST 5 OUTPUT assignment	← Please note: Outputs 1... 8 are configurable in a variety of ways (see pages 14/15/16). The ELGO- Default setting is R8/5 = 3	
1	Drive control output for X- Axis	<b>Pin</b>	<b>ST 2 ENCODER for X - Axis</b>
2	Drive control output for X- Axis	1	0V (GND)
3	Drive control output for X- Axis	2	+ 24 VDC out
4	Drive control output for X- Axis	3	A channel
5	Drive control output for Y- Axis	4	B channel
6	Drive control output for Y- Axis	5	PE / screen / shield
7	Drive control output for Y- Axis		
8	Drive control output for Y- Axis	<b>Pin</b>	<b>ST 1 ENCODER for Y - Axis</b>
9	PE	1	0V (GND)
10	PE	2	+ 24 VDC out
11	0V (GND)	3	A channel
14	Position reached - X	4	B channel
15	Position reached - Y	5	PE / screen / shield
16	Positioning in process		
17	Program end reached	<b>Pin</b>	<b>ST 9 POWER SUPPLY 230/115 VAC or 24VDC</b>
18	Programm counter reached	1	115 VAC / 230 VAC or +24 VDC
19	Positioning X/Y completed	2	115 VAC / 230 VAC or 0 VDC (GND)
20	NC	3	PE
21	NC	4	-
23	+ 24 VDC out	5	-
24	-	6	-
25	-	7	-
		8	-
		9	-
<b>Pin</b>	<b>St 3 INPUT assignment</b>	<b>Pin</b>	<b>ST 7 SERIAL INTERFACE (Option)</b>
1	Reset system	1	RX
2	Start - X	2	TX
3	Start - Y	3	0 V
4	Start - X und Y		
5	mm/inch switch over		
6	Keyboard interlock		
7	Datum - Y		
8	Datum - X		
9	PE		
10	PE		
11	+ 24 VDC out - PNP Common		
14	Stop positioning		
15	NC		
16	Program counter display		
17	NC		
18	Retract - X		
19	Retract - Y		
20	NC		
21	NC		
23	0V (GND) NPN - Common*		
24	-		
25	-		

In standard version, the controller is equipped with PNP inputs. NPN is an option and must be indicated for the order.

**Please note:**

- **PNP** (standard) inputs are active high and must be connected to + 24 V
- **NPN** (option) inputs are active low and must be connected to 0 V (GND)

## 12. Technical specifications

Function	Data
Power supply	+24 VDC (e.g. with ext. power pack NG 13.0) or <b>230V/115V AC</b> +/- 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 <sup>2</sup> Prom, service life: 10 <sup>5</sup> 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°
<b>NG 13.0 - External POWERPACK</b>	
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 <sup>2</sup>

## 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  $\mu$ F/100  $\Omega$ ).
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

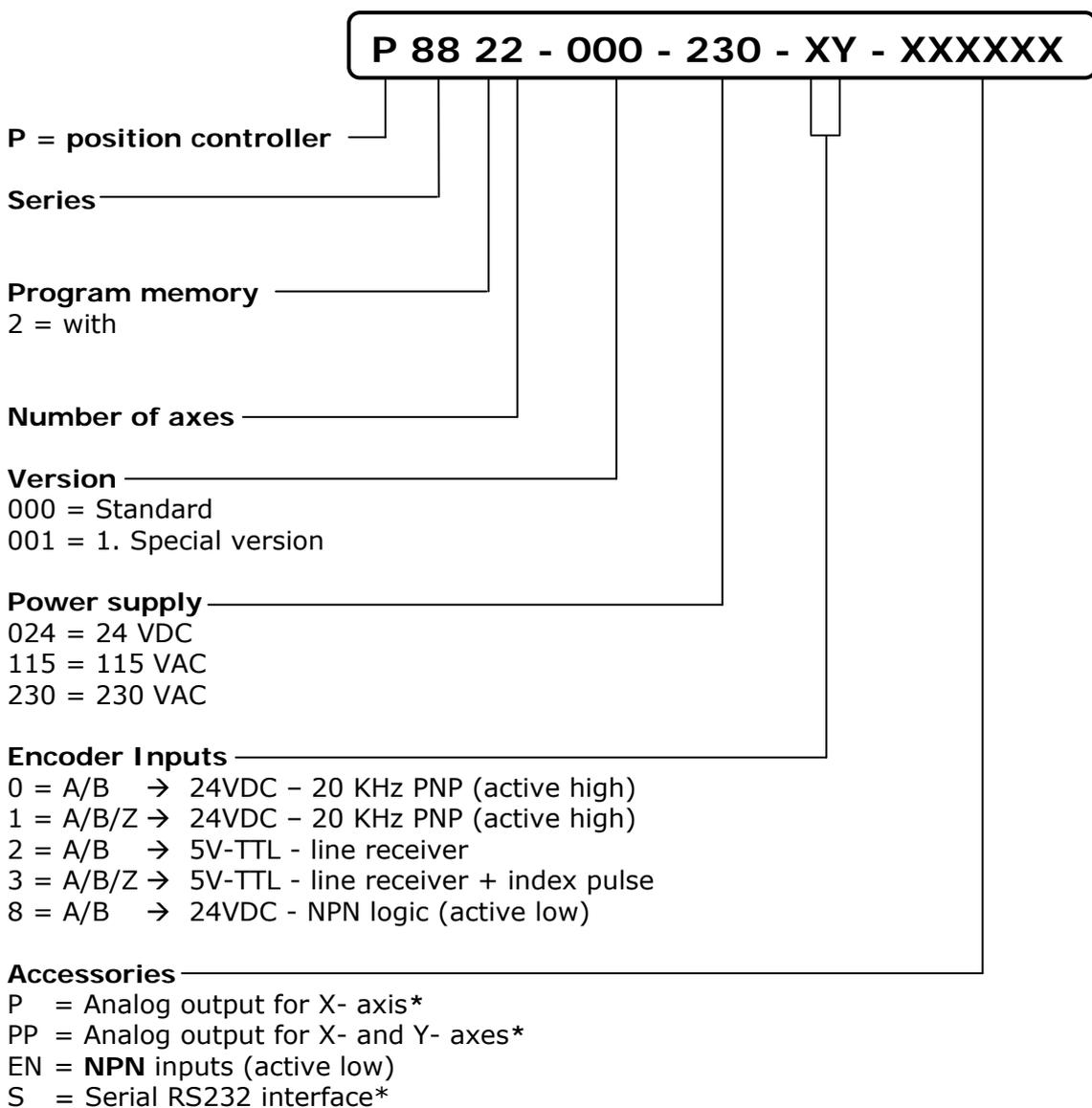
### Service Register 90

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



\* 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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