




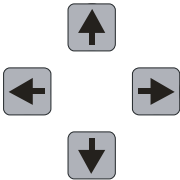



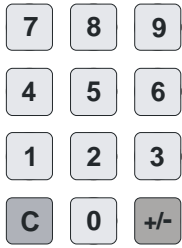
Installation Manual For Two Axis Position Controller PS821P_01



Softwareversion PS821_03

Hardwareversion PS821P_01

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1. Introduction

The two axis position controller PS821P is a complete ready to plug in unit including two 12 bit analog outputs +/- 10V or 0 – 10V.

Up to 99 programs or up to 6000 data-sets comprising demand values and quantity can be stored in the unit.

The large, 5,7 inch wide color touch screen display can be read easily at a distance out of different viewing angles.

The operating guide is available in English and German.

The device with maximum equipage has 23 driver outputs, and 24 inputs for various functions.

Changes to software version 02:

- When using Dave software, speed can be transmitted too now.
- New integral term added to closed loop function
- Reset error message on Con 8, Pin 6 now available.

2. Safety

This operating guide contains instructions for ensuring safe and proper installation and operation. If you have any difficulties which cannot be resolved by consulting this guide, please consult the machine manufacturer or vendor for additional information.

HEJM GmbH is not liable for any personal injury or equipment damage resulting from improper commissioning, incorrect operation, misunderstandings or errors contained in this guide or on the display.

HEJM GmbH reserves the right to make technical changes to the equipment or operating guide without prior notice. This means that errors in agreement between the equipment and the guide cannot be precluded.

Pay particular attention to hazard notices in this operating guide.

This equipment description should be read carefully in full before commissioning.

Use of the operating guide presumes that the user is technically qualified.

2.1 Personnel Qualifications

Commissioning, installation and operation are to be performed only by qualified personnel. The personnel must have qualifications which are appropriate to their function and activity, e.g.

- Instruction and obligation to observe all application-related, regional and in-house regulations and requirements.
- Training in accordance with the standards of safety technology in the use and care of commensurate safety and work protection equipment.
- Courses in first aid, etc.

2.2 Proper use

This position controller has been developed solely for use on industrial machinery.

Any further use is considered improper. The manufacturer assumes no liability for damages resulting from such misuse. This risk is assumed solely by the user.

2.3 Safety Notes

In the description of the device, the following symbols are used to denote hazards and other important notes:



The **Hazard** symbol warns of errors and hazards in commissioning and operation of the controller. This warning notice signifies a directly threatening hazard to the health of persons and contains special specifications and instructions as well as imperatives and prohibitions to prevent personal injury and damage to equipment.



The **Attention** symbol denotes a possible hazardous situation and contains special specifications and instructions as well as imperatives and prohibitions to prevent personal injury and damage to equipment.



The **Note** symbol indicates important and useful information and provides application tips.

2.4 Safety Precautions

The device must be secured in accordance with the relevant regulations.

The device may not be opened and no screws removed from the housing!

The device should be, wherever possible, mounted on a metal plate that is connected to PE.

2.5 Warranty and Delivery Terms

We deliver exclusively under the general conditions for the supply of products and services of the electrical and electronics industry.

Hejm GmbH, warrants this product for a period of twenty-four (24) months from the date of shipment.

3. Technical Data

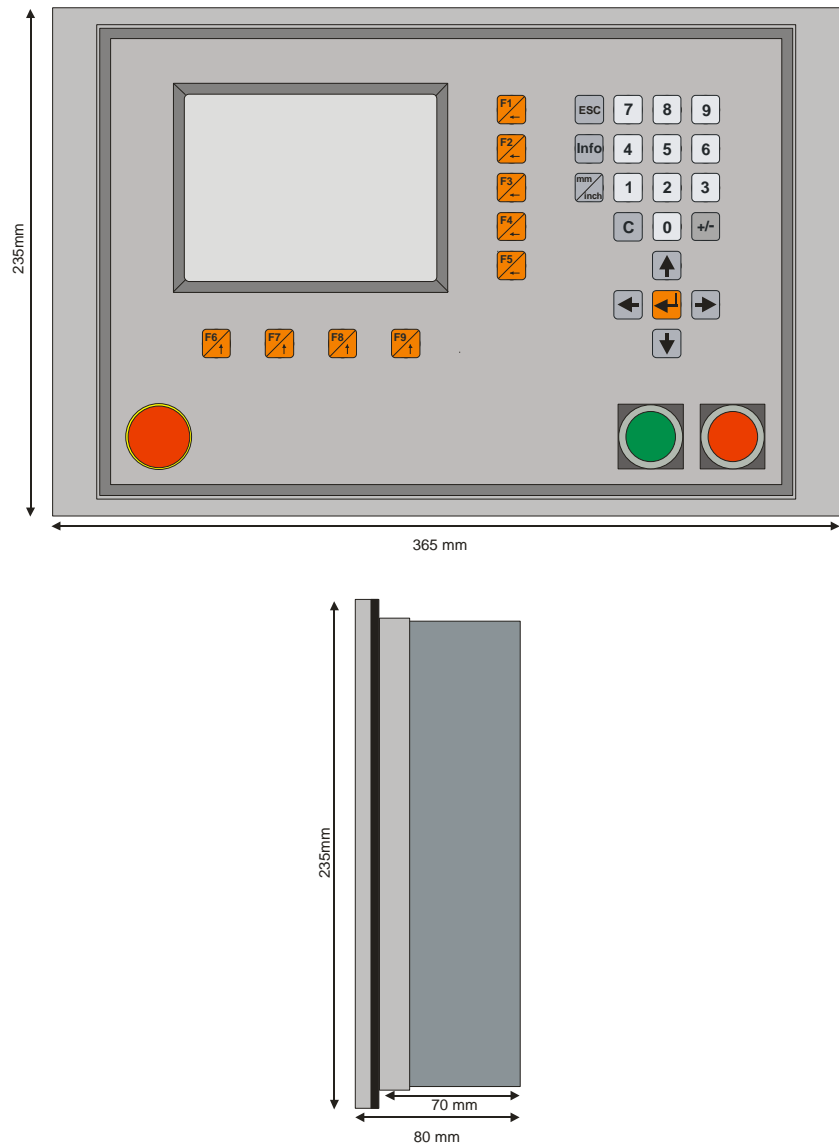


Abb. 1 Dimensions (illustration reduced)

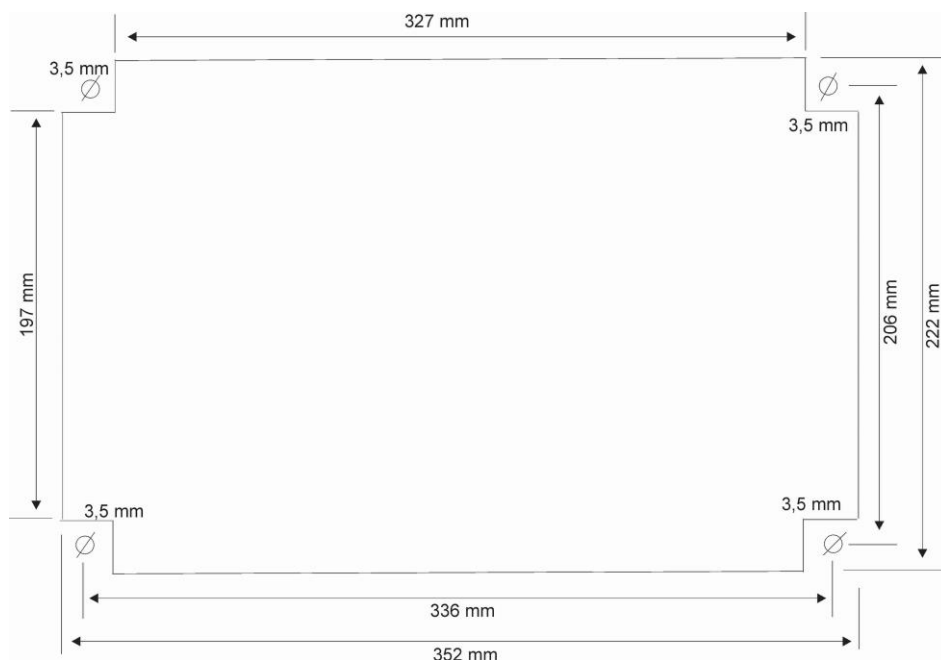


Abb. 2 Panel cut-out (illustration reduced)

Supply voltage	24 V DC \pm 10 %
Current draw	Max.200 mA excluding encoders.
Display	Grafic LCD display with 320 x 240 dots and touch functionality
Input Signals	24 inputs 0 – 5 V active low 10 – 30 V active high
Encoder	Incremental encoder A, B, Z. (max. 100 kHz, one edge counting)
Output Signals	24V DC supply 23 output drivers 24V, 600 mA, PNP sourcing
Analog Outputs	+/- 10V, 12 Bit max. 20 mA or 0 – 10V, 11 Bit max. 20 mA
Analog Inputs	3 analog inputs 10Bit optional
Interface	RS232, RS485 optional
Operating temperature	0 – 40 °C
Storage temperature	-20 - + 65 °C
Relative humidity	max. 90 %
Installation orientation	Any
Enclosure rating	IP 54 from frontside
Dimensions	365 x 235 x 80 mm ³ (B x H x T)

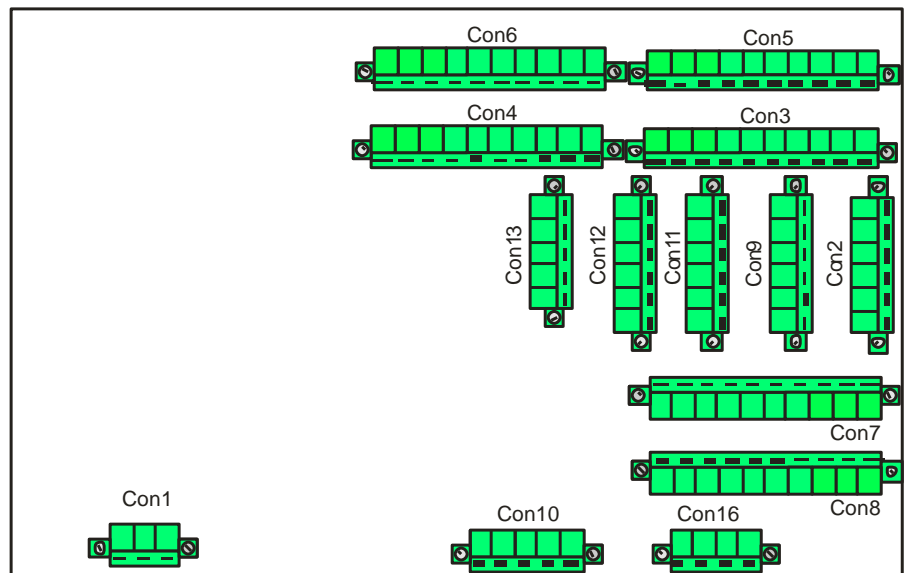


Abb. 3 Wiring diagram

Connector and pinouts

CON1 Supply voltage

Terminal strip, 3-pin

Pin 1	GND
Pin 2	+24V DC max. 200 mA (excluding encoders)
Pin 3	GND

CON2 Encoder Input 1

Terminal strip, 6-pin

Pin 1	GND
Pin 2	+24V DC output max. 150 mA
Pin 3	Signal A (track)
Pin 4	Signal B (track)
Pin 5	Signal Z (track)
Pin 6	PE, connection for shield

CON9 Encoder Input 2

Terminal strip, 6-pin

Pin 1	GND
Pin 2	+24V DC output max. 150 mA
Pin 3	Signal A (track)
Pin 4	Signal B (track)
Pin 5	Signal Z (track)
Pin 6	PE, connection for shield

CON3 Inputs 1

Terminal strip, 10-pin

- Pin 1 GND
- Pin 2 +24V DC output max. 100 mA
- Pin 3 Limit swith axis 1 + direction
- Pin 4 Limit swith axis 1 - direction
- Pin 5 Not used
- Pin 6 Zero / index pulse enable (reference switch) axis 1
- Pin 7 Quantity input with drive free functionality

When the quantity switch is a normally open, the switch must be closed to start the motor.

When the limit switch is a normally closed, the switch must be open to start the motor.

- Pin 8 Emergency stop
- Pin 9 Not used
- Pin10 Not used

CON4 Inputs 2

Terminal strip, 10-pin

- Pin 1 GND
- Pin 2 +24V DC output max. 100 mA
- Pin 3 Not used
- Pin 4 Not used
- Pin 5 Not used
- Pin 6 Error drive axis 2
- Pin 7 Error drive axis 1
- Pin 8 Zero / index pulse enable (reference switch) axis 2
- Pin 9 Limit swith axis 2 + direction
- Pin10 Limit swith axis 2 - direction

CON5 Outputs 1

Terminal strip, 10-pin

Pin 1	+24V DC supply input for outputs 1
Pin 2	Position reached
Pin 3	Drive free axis 1
Pin 4	Forward, backward direction for axis 1 when 0 – 10V analog output is used
Pin 5	Brake axis 1, activated / deactivated output is 24V during positioning
Pin 6	Auxiliary output 1
Pin 7	Auxiliary output 2
Pin 8	Auxiliary output 3
Pin 9	Auxiliary output 4
Pin10	Program running

CON6 Outputs 2 + Analog Outputs

Terminal strip, 10-pin

Pin 1	+24V DC supply input for outputs 2
Pin 2	Forward, backward direction for axis 2 when 0 – 10V analog output is used
Pin 3	Not used
Pin 4	Brake axis 2, activated / deactivated output is 24V during positioning
Pin 5	Quantity reached
Pin 6	Drive free axis 2
Pin 7	GND, axis 2
Pin 8	0 – 10V, +/-10V analog output axis 2
Pin 9	GND, axis 1
Pin10	0 – 10V, +/-10V analog output axis 1

CON7	Inputs 3
	Terminal strip, 10-pin
Pin 1	GND
Pin 2	+24V DC output max. 100 mA
Pin 3	Not used
Pin 4	Not used
Pin 5	Not used
Pin 6	Not used
Pin 7	Not used
Pin 8	Not used
Pin 9	Optional 10 Bit analog input
Pin10	Optional 10 Bit analog input

CON8 Schaltausgänge 3

Terminal strip, 10-pin

Pin 1	+24V DC supply input for outputs 3
Pin 2	Not used
Pin 3	Not used
Pin 4	Not used
Pin 5	Not used
Pin 6	Reset error message of connected drive.
Pin 7	Not used
Pin 8	Not used
Pin 9	Output for start key led (Option)
Pin 10	Output for stop key led (Option)

CON10 RS232 + RS485 interface

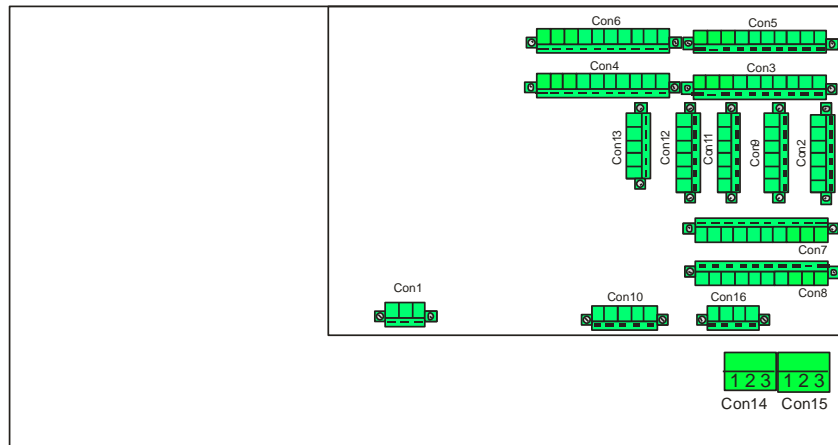
Terminal strip, 5-pin

Pin 1	TxD, RS232 interface 2, or signal A when RS485 interface is used
Pin 2	RxD, RS232 interface 2, or signal B when RS485 interface is used
Pin 3	TxD, RS232 interface 1
Pin 4	RxD, RS232 interface 1
Pin 5	GND

CON16 Option for scanner interface

Terminal strip, 4-pin

Pin 1	Reserved
Pin 2	+5V supply for scanner (max. 150 mA) .
Pin 3	Reserved
Pin 4	Reserved



**CON14, Option internal E-Sop
Potential free switch**

Terminal strip 3 pins

Pin 1	NC, normal closed
Pin 2	CO, common
Pin 3	Not used

CON15, Option interner NotAus

Terminal strip 3 pins

Pin 1	Connected to Con3, Pin 8
Pin 2	+24V DC power from unit
Pin 3	Not used

4. Parameter and Function Levels

4.1.1 Entering Parameters, changing the Device functions



When changing control and calibration parameters, always take into account the effects on the overall system.



Only qualified personal should change any parameters to avoid malfunctions of the machine.



The parameters may be protected against unintended changes by using a security code.

This may be selected by the machine manufacturer himself.

Activate "Settings" with the touch screen function or press F5 to open the parameter and adjustment level.

4.1.2 Parameter Functions



□

The parameters shown in the following are all performed according to the sample

Parameter number Name [unit, minimum/maximum value] Parameter description.

Parameters in which P05 is entered as the unit refer to the unit specified in parameter P05 (axis 1 level).

Parameters with index ro can only be read.

User level:

P00 *Saw blade width [P05/ 0,1]*

The user can enter the width of a saw blade which will be automatically calculated when using incremental positioning.

P01 *Quantity input function [function/ 0,1]*

Setting	Function
0	No function when the quantity input is activated
1	The automatic retract function is activated, when the quantity input is activated and then deactivated

P02 *Decrement value when quantity input is activated [quantity/ 1,4]*

The quantity counter is subtracted by the value set in this parameter, when the quantity input is activated.

User level:

P03 *Retract distance axis 1 [P05/ 0,30000]*

The device can be applied for longitudinal stop with motor-driven and pneumatic retraction.

The distance the longitudinal stop moves with the motor-driven retraction can be entered here.

If 0 is entered in this parameter, or P01 (User level) is set to 0 the retract function is deactivated.

The retraction functions can be activated in both, single and in program operation.

P04 *Retract distance axis 2 [P05/ 0,30000]*

Same function as in parameter P03 for axis 2 only.

P14 *Display colour foreground [colour/ different colours]*

Text and symbols will be shown in the adjusted colour .

P15 *Display colour background [colour/ different colours]*

The background will be shown in the adjusted colour .

.

Parameter level All:

- P00** *Number of axes shown [Quantity/ 1,3]*
Comprises the number of axes to be displayed.
Always set this parameter to 2.
- P01** *Unit type [ro/-----,-----]*
Shows the unit type 821.
- P02** *Software version [ro/-----,-----]*
Number of the software currently in use in the device.
- P03** *Customer number [ro/-----,-----]*
In special units the customer number is displayed .
- P05** *Enable automatic go-to datum [disabled/enabled/ 0,1]*

Setting	Function
0	Automatic go-to datum function is disabled. The goto datum symbol will disappear from the display.
1	Automatic go-to datum function is enabled.



This parameter may only be set to 1, when the machine is equipped with all components needed for this function. If this is not the case, damage to the device may occur. (The unit will ignore any kind of software limit switches here.)

Parameter level All:

P06 *Machine type (Type/ 0,1]*

Not activated at the moment.

P07 *Display type (Type/ standard, special]*

Not activated at the moment.

P08 *Language [Language/ 0,1]*

At the moment there are two languages implemented in the unit.

Select on of these two languages here.

P09 *Stop when an error message occurs (axis/axis number]*

This parameter selects, whether all axis are stopped when an error message occurs or only the axis that caused the problem.

P10 *Positioning sequence (sequence/axis]*

Select the positioning sequence here..

Parameter level All:

P11 *Enable the inch/mm key [axis/ no axis, all axis]*

This parameter selects the axis which will be influenced by the inch/mm key.
Axis showing angles in degrees will not be affected then.

P12 *Parameter base for the inch/mm key [base/ mm, inch]*

When the inch/mm key is pressed, several parameters in the different parameter levels will be changed from inch to mm or vice versa.

When the user opens a parameter level, the parameters should be shown in the unit of length programmed the first time.

Therefore the unit has to know the unit of length.

When all the parameters are set in inch, this parameter must be set to "inch".

P13 *Touch function [function/ off, on]*

This parameter allows the user to deactivate the touch functions in normal operation.

All the different fields in the display can be activated by the F1- F5 and F6 – F9 keys matrix.

Pressing the F1 and F6 key together for example will activate the field in the first row on the left.

Only in the parameter level the touch function will still be activated.

P14 *Potentiometer for speed control [axis/ no axis, all axis]*

Here the influence of the speed potentiometer on the front panel is set.

The potentiometer can take influence on the speed of axis 1, axis 2 or both axis. The function can be turned off also and the potentiometer will then have no influence on any axis.

Parameter level All:

P26 *Switching output logic 1 [binary code/ 0,255]*

The switching characteristic of the outputs 1 – 8 can be inverted with this parameter.

Example:

The following table gives a more detailed description of the procedure.

Output	0	1	2	3	4	5	6	7
Function	S	I	S	S	S	I	S	S
Binary value	0	1	0	0	0	1	0	0
Decimal value	1	2	4	8	16	32	64	128

S = Standard (Binary value 0)

I = Inverted (Binary value 1)

The following outputs are used here:

Output 0 = Position reached – BCD Code1

Output 1 = Drive free axis 1 – BCD Code 2

Output 2 = For-, backward axis 1 – BCD Code 4

Output 3 = Break axis 1 – BCD Code 8

Output 4 = Auxiliary output 1 – BCD Code 16

Output 5 = = Auxiliary output 2 – BCD Code 32

Output 6 = = Auxiliary output 3 – BCD Code 64

Output 7 = = Auxiliary output 4 – BCD Code 128

To calculate parameter value to be entered, determine if output 1 to 8 is needed as a standard or inverted.

Then multiply the binary value with the decimal value for each input and add up the results of each output.

Parameter level All:

In our example on the last side, the parameter must be set to 34 when the outputs 1 and 5 should switch inverted.

P27 *Switching output logic 2 [binary code/ 0,255]*

The switching characteristic of the outputs 9 to 16 can be inverted here.

The setting of this parameter is the same as described in P26.

The following outputs are used here:

Output 0 = Program running – BCD Code 1

Output 1 = For-, backward axis 2 – BCD Code 2

Output 2 = not used – BCD Code 4

Output 3 = Break axis 2 – BCD Code 8

Output 4 = Quantity reached– BCD Code 16

Output 5 = Drive free axis 2 – BCD Code 32

Output 6 = not used – BCD Code 64

Output 7 = not used – BCD Code 128

Parameter level All:

P28 *Switching output logic 3 [binary code/ 0,255]*

The switching characteristic of the outputs 17 to 23 can be inverted here.

The setting of this parameter is the same as described in P26.

The following outputs are used here:

Output 0 = not used – BCD Code 1

Output 1 = not used – BCD Code 2

Output 2 = not used – BCD Code 4

Output 3 = not used – BCD Code 8

Output 4 = not used – BCD Code 16

Output 5 = Led start – BCD Code 32

Output 6 = Led stop – BCD Code 64

P29 *Switching input logic 1 [binary code/ 0,255]*

In engineering both normally open and normally closed devices are used as electrical switches.

In order to adapt the device quickly to suit any hardware, the switching behavior of the inputs can be determined using this parameter.

The input is connected with a NO contact by pressing 1, and it is connected with a NC contact by pressing 0.

Up to 256 various combinations are possible with the first 8 inputs.

The following table gives a more detailed description of the procedure.

Parameter level All:

Input	0	1	2	3	4	5	6	7
NC/NO	NO	NO	NC	NC/NO	NC/NO	NO	NC/NO	NC/NO
Binary	0	0	1	1/0	1/0	0	1/0	1/0
Decimal	128	64	32	16	8	4	2	1

NO = Normally Open (binary value = 0)

NC = Normally closed (binary value = 1)

The following inputs are used in this software:

Input 0 = External Start – BCD Code 128 (Not in this version)

Input 1 = External Stop – BCD Code 64 (Not in this version)

Input 2 = Emergency stop active – BCD Code 32

Input 3 = Quantity – BCD Code 16

Input 4 = Zero/Index pulse axis 1 enable – BCD Code 8

Input 5 = Not used – BCD Code 4

Input 6 = Limit switch (-) axis 1 – BCD Code 2

Input 7 = Limit switch (+) axis 1 – BCD Code 1

To calculate parameter value to be entered, determine if input 1 to 8 is needed as NO or NC. Then multiply the binary value with the decimal value for each input and add up the results of each input.

Example: Input 0, 1, 3, 4, 5 = NO.

Input	NC / NO	Binary	Decimal	Binary x Decimal	
0	NO	0	128	0	+
1	NO	0	64	0	+
2	NC	1	32	32	+
3	NO	0	16	0	+
4	NO	0	8	0	+
5	NO	0	4	0	+
6	NC	1	2	2	+
7	NC	1	1	1	=
			Total	35	

Enter "35" in parameter All/P29 to get required input configuration

Parameter level All:

P30

Switching input logic 2 [binary code/ 0,255]

Switching input logic of internal components is in accordance with the P29 parameter.

The following inputs are used in this software:

Input 0 = Limit switch (-) axis 2 – BCD Code 128

Input 1 = Limit switch (+) axis 2 – BCD Code 64

Input 2 = Zero/Index pulse axis 2 – BCD Code 32

Input 3 = Error drive 1, frequency inverter 1 – BCD Code 16

Input 4 = Error drive 2, frequency inverter 2 – BCD Code 8

Input 5 = Not used – BCD Code 4

Input 6 = Not used – BCD Code 2

Input 7 = Not used – BCD Code 1

P31

Switching input logic 3 [binary code/ 0,255]

Switching input logic of internal components is in accordance with the P29 parameter.

The following inputs are used in this software:

Input 0 = Not used – BCD Code 128

Input 1 = Not used – BCD Code 64

Input 2 = Not used – BCD Code 32

Input 3 = Not used – BCD Code 16

Input 4 = Not used – BCD Code 8

Input 5 = Not used – BCD Code 4

Input 6 = Not used – BCD Code 2

Input 7 = Not used – BCD Code 1

Parameter level All:

P32 *Quantity reached output time [Seconds / 0.00,100.00]*

When the quantity window shows 0, the output will be set to high for the specified time.

When the parameter is set to 0 the output will be static.

P33 *In position output time [Seconds / 0.00,100.00]*

This parameter contains the dwell time for the position reached signal.

The output remains static, when this value is set to 0.

If the function retract is activated, then "position reached" is activated after retraction and repositioning at the starting position only, when this parameter is set to 0.

P42 *Security code for parameter level [7 decade number/ 0, 9999999]*

The parameters may be protected against unintended changes by using a security code.

Data can only be entered in the parameter level All and Ach1 after entering this code.

P43 *Security code for 0V adjustment [7 decade number/ 0, 9999999]*

The 0 V adjustment of the analog output may be protected against unintended changes by using a security code.

Changes can only be made in the adjust level after entering this code.

Parameter level All:

P44 *Security Code for calibrate level [7 decade number/ 0, 9999999]*

By entering a security code the device can be protected from calibration.
Calibration to a new value is only possible after entering this code.

P45 *Security Code for program protection [7 decade number/ 0, 9999999]*

Programs can be protected against unintended changes by using a security code.

This parameter is not activated in the actual software version.

P46 *In position output function[output function/ 0, 255]*

In this software version the “in position ” output only functions in special function mode.

When this parameter is set to 1, the in position output will only be activated in program mode.

When this is set to 0, the in position output will also be activated in single mode.

In manual mode the output is always deactivated.

Parameter level All:

P47 *Incremental move mode [Modes/ 0, 1]*

Different applications require different incremental functions.

The set increment is always added to or subtracted from the current actual value (actual value mode), or after the first positioning, added to or subtracted from the demand value (demand value mode)

The various settings can be found in the table below.

0	demand value mode
1	actual value mode

P48 *Automatic program sequence [manual/automatic manual,automatic]*

A completely automatic program sequence can be activated in this parameter.

If this sequence is activated and a program is selected, then by pressing the quantity input the device restarts to the next demand value.

Parameter level All:

P49 *Quantity counter function [function/ Input, Pos. reached]*

Setting Function

Input The quantity counter is decremented by the external quantity input.

Pos. reached The quantity counter is decremented by the "in position" signal.

P60 *Maximal number of programs [max. Programs/ 1, 99]*

The user can determine how many programs will be required in the future by means of this parameter.

The PS821 memory can store up to 6000 steps.

These steps are divided among the number of programs.

The maximal number of steps per program is 999.

Maximal Length = available steps/number of programs.

When P60 is set to a value smaller than 7, a part of the program memory will not be used.



Changes carried out to the parameter setting after some programs have already been stored, causes a displacement in the existing programs.

This may lead to the loss of stored programs.

Parameter level All:

P61 *Program sequence mode [Sequence/ 0, 3]*

Setting	Sequence
0	The first address line of a program will always be stored as an absolute position even if the device is equipped with an incremental function. All other steps are stored in incremental mode.
1	First address line of a program is stored as shown on the display.
2	Automatic program restart when the last address line is reached.
3	Combination of features 1 and 2.

P62 *Actual program number [number of program/ 0, 99]*

This parameter is used to select a program for serial reading, writing and processing via the RS232 interface.

P63 *Current status of program demand value [ro/ 0,1]*

Setting	Staus of the demand value
0	Current demand value is absolute
1	Current demand value is relative

Parameter level All:

P66 *Restart function when in position [mode/ 0,2]*

Setting	Function
0	The "in position" output is activated once, when the start key is activated inside the tolerance window.
1	The backlash compensation is started, when the start button is activated inside the tolerance window.
2	The "in position" output is activated again, when the start key is activated inside the tolerance window. (Only when the "in position" output is set to dwell.)

P90 *Serial address [address/ 11,99]*

When using the serial RS232 interface option, enter the unit number here.
Do not use addresses like 20, 30, 40,..., 90. as these addresses are reserved for unit groups.
(A unit will not respond when communicating with such an address.)

P91 *Baud rate [baud/ 0,3]*

The following baud rates are available.
4800, 9600, 19200,38400.

Parameter level All:

P92 Protocol for Printer and barcode reader [Protocol/ 0,3]
(on demand)

P93 Importing bar code scanner values [Mode/ 0,1]
(on demand)

Parameter level Axis1, Axis2:

- P00** *Actual value [P05/ -999999,999999]*
Current actual value
- P01** *Demand value [P05/ -999999,999999]*
Current demand value
- P02** *Calibration value [P05/ -999999,999999]*
Calibration value is equivalent with the value in the calibration function.
- P03** *Software limit switch lower [P05/ -999999, 999999]*
Contains the lowest acceptable demand value for the controller in P01.
- P04** *Software limit switch upper [P05/ -999999, 999999]*
Contains the maximum acceptable demand value for the controller in P01.

Parameter level Axis1, Axis2:

P05 *Distance for multiplication [any desired length unit/ 1, 10000]*

Contains any desired distance.

These two parameters are needed so that the counter can be set to various mechanical conditions, such as drives, spindle stroke, etc.

1. Any desired distance in the desired unit and resolution

(P05).

2. The number of increments sent by the encoder to the

unit when travelling the distance in P05. (P06).

Only if these specifications are entered in P05 and P06 with no rounding error, will the counter operate correctly over the entire range.

Therefore the distance selected should always be one where a whole number of pulses is sent by the encoder .

P06 *Pulse/ distance [encoder resolution/1,30000]*

Number of pulses per travel distance entered in P05 (the factor is automatically calculated from P05 and P06).

Example 1: The encoder in use sends 100 pulses to the counter over a distance of 1.00 mm. The actual value and the demand values etc. should be sent in 1/100 mm. Therefore each pulse arriving from the encoder must be accounted for. Therefore, set P05 and P06 to the same value (e.g. 1, 1 or 10,10 or 100, 100).

Parameter level Axis1, Axis2:

Example 2: The encoder in use again has a resolution of 1/100 mm. But here the actual values and demand values need to resolve to one place after the decimal point, i.e. 1/10 mm. This means that over a distance of 1 (0.1 mm) 10 pulses are sent by the encoder to the counter. Therefore set P05 to smaller than P06 by a factor of 10 (e.g. 1, 10 or 10.100 or 100, 1000).

Example 3: A machine with a spindle drive has the following key data:
Spindle rise 5.0 mm/rotary encoder with a resolution of 20 pulses per revolution. The actual value and demand values need to resolve down to one decimal place, i.e. 1/10 mm. This means that over a distance of 50 (5.0 mm) 20 pulses are sent by the encoder to the counter.
Therefore, set P05 to 50 and P06 to 20.
For inch settings, enter P05 in inches.

Parameter level Axis1, Axis2:

- P07** *Maximum permanent current [x.xx Ampere/ 0.01, 10.00]*
- Contains the current which the motor may receive for an undefined period without causing the drive to abort and send an error message.
- An error message is sent and the positioning in process aborted if the maximum current is exceeded for a period of 2-4 seconds.
- The measured current can differ from the real value by $\pm 10\%$.
- This feature can be used when DC drives like DR111 are connected to the PS821. These drives includes a voltage output 0 – 10V that is proportional to a motor current of 0 – 10A.
- P08** *Number of automatic restarts [piece / 0, 255]*
- If the actual value lies outside the demand value +/- tolerance window when positioning has been completed, then positioning to the same demand value will be restarted. This process is repeated until the actual value lies within the tolerance window, but not more often than the value entered here.
- P09** *Tolerance window [P05/ 0, 255]*
- If the actual value is in the demand value \pm tolerance window range after positioning, then the demand value is displayed instead of the real actual value (P00 = P01).
- P10** *Brake activation delay time when position reached or stop*
[x.xx sec/ 0.00, 2.00]
- To avoid the motor overheating unnecessarily when positioning has been completed, the drive free signal is switched off after the time period entered here.
- If the time selected is too short, the motor may not dwell at the target point but continue beyond it due to inertia.

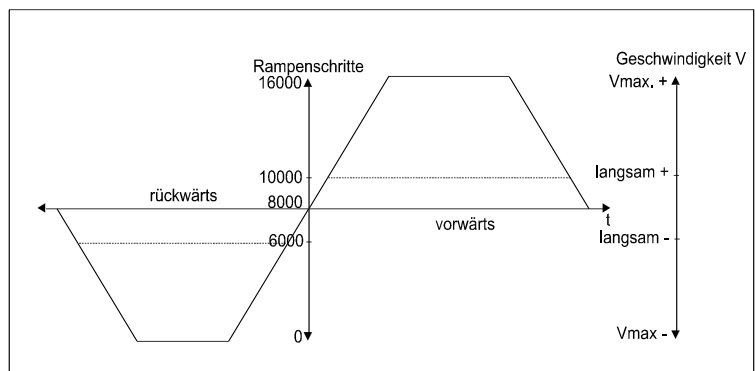
Parameter level Axis1, Axis2:

P11 *Maximum ramp distance for acceleration ramp*

[encoder pulses / 1, 250000]

This parameter determines the number of ramp steps the controller passes over in its complete range.

The negative and positive positioning process is presented in the following graph.



In the reverse range, the controller accelerates from standstill (ramp value 8000) to its maximum possible speed in a backwards/reverse direction (ramp value 0) remains at this speed for a certain period of time before deceleration and reaching standstill (ramp value 8000)

In the forward range, the controller accelerates from standstill (ramp value 8000) to its maximum possible speed in a forwards direction (ramp value 16000) remains at this speed for a certain period of time before deceleration and reaching standstill (ramp value 8000)

The ramp length determines how rapidly the controller should reach its maximum speed.

High values lead to long and low values lead to short ramp distances.

Parameter level Axis1, Axis2:

P12 *Maximum ramp distance for deceleration ramp*

[encoder pulses / 1, 250000]

See P11 for more detailed information.

This parameter is used for the deceleration ramp.

If the ramp length is too short, it can cause the target to be overshoot, whereas if the ramp length is too long, it can lead to a long positioning time.

P13 *Fast speed forwards and backwards [Per cent 1, 100]*

1% ... 100%: per cent of the maximum speed of automatic positioning and rapid manual operation.

P14 *Manual slow speed [Per cent / 1, 100]*

1% ... 100%:per cent of the maximum speed of automatic positioning or rapid manual operation.

P15 *Deceleration ramp after stop command [x.xxx sec/ 1, 2000]*

The time interval the motor requires to reach standstill after a stop command.

P17 *Backlash compensation time [x.xx sec/ 0, 20.00]*

The time during which the motor pauses at the loop reversal point before moving towards the target .

If P17 is set to 0 , the backlash compensation function is deactivated.

Parameter level Axis1, Axis2:

P18 *Backlash compensation distance [P05/-50000,50000]*

Exceed demand values on this distance during backlash compensation.

The backlash compensation is driven to lower demand values when in the negative range, to higher demand values when in the positive range.

P19 *Integral term [controller intervention all / 1, 9999]*

The integral term of the regulating algorithms determines, how often the I term should intervene in the closed loop control.

1 is equivalent with the time entered in P 22, 2 is equivalent with 2 x P22 etc.

1 = Max. gain (the controller intervenes in the positioning of all in the P22 set time field) The consequence is rapid start and sharp braking depending on the time set.

...

9999 = Min. reinforcement (the controller intervenes in the positioning of all 9999 in the P22 set time field.) The consequence is slow start and gentle braking depending on the time set.

P20 *Integral term 2 [controller intervention all / 1, 9999]*

See parameter P19, however only for restarting if specified in P08

P21 *Differential term for brake ramp [ramp steps/ 0, 10000]*

The differential term only intervenes before the target during the declining ramp if the motor decelerates too much or comes to a standstill.

Setting = 0 deactivates the D term.

Setting = 10000 D- term adjusts 10000 ramp increment

Parameter level Axis1, Axis2:

P22 *Feedback monitoring interval [x.x msec/ 0.1, 200.0]*

Measurement period during which the internal demand values and actual values of the controller must agree before it intervenes.

P23 *Feedback acceleration ramp pulse no.[pulse/ 0, 255]*

The controller has a with superimposed closed loop control to monitor stopping.

During the period P22 the encoder must send the pulse value written in P23 to the controller.

If this does not occur, the controller identifies this as a stop and the superimposed control is activated.

A higher value leads to an early closed loop intervention

P24 *Feedback deceleration ramp pulse no. [pulse/ 0, 255]*

The controller has a with superimposed closed loop control to monitor stopping

During the period P22 the encoder must send the pulse value written in P24 to the controller.

If this does not occur, the controller identifies this as a stop and the superimposed control is activated.

A higher value leads to an early closed loop intervention

P25 *Edge counting mode [Edge evaluation/ 1, 4]*

Setting	Edge evaluation
1	Single edge evaluation
2, 3	Double edge evaluation
4	Four edge evaluation

Parameter level Axis1, Axis2:

P26 *Counting direction [direction/ 0, 1]*

Altering this value from 0 to 1, or vice versa, reverses the counting direction of the unit.

0 = forwards

1 = backwards

P27 *Decelerate Gain [%/ 0, 10000]*

This parameter can be used to increase the decelerate gain.

In most cases it is possible to decrease P12 (deceleration ram)

when increasing this parameter and therefore a more dynamic positioning

is possible. The maximum value depends on the overall system!

P37 *Motor direction for manual mode [standard, inverted/ 0, 1]*

The motor positioning direction can be reversed by using the manual key.

This is useful if the arrow key, which points to the left, would otherwise position to the right from the user's point of view.

P38 *Brake release delay time [seconds/ 0.01,2.50]*

If the motor is held in position by a mechanical brake during still-stand, then, when repositioning takes place, it must be opened with respect to the break time needed to open this break before the motor can be repositioned.

The time can be entered in this parameter.

P40 *Decimal place [Decimal place 0, 6]*

This parameter is used to set the decimal place within the display.

0 = turn off decimal point

1 = one decimal place etc.

Setting the decimal place has no effect on the display resolution.

This is only done using parameters P05 and P06 in Ach1.

Parameter level Axis1, Axis2:

P48 *Closed loop controller [Mode/0,2]*

The controller has an integrated position control to ensure the motor stays at the defined point.

- 0 Position control deactivated.
- 1 Position control mode 1 activated.
- 2 Position control mode 2 activated

Position control may only be used in machines which constitute no direct hazard to people or machines due to the continually active closed loop feature. This works constantly against mechanical influences such as pressure and tension.



Please note: the motor may overheat due to constant closed loop activity. In certain circumstances, this may lead to faster deterioration or even motor failure.

P49 *Closed loop gain factor (Gain factor / 0, 10.0000)*

The closed loop controller time is now constant.

This parameter set the force of the integral term of the controller.

A setting of 1.0000 means, that an increment difference of the measuring system is sent 1:1 to the analogue output of the unit.

Parameter level Axis1, Axis2:

P50 *Closed loop window (increments / 0, 1000)*

After positioning, if the actual value does not correspond to the demand value \pm position window in encoder increments, then the closed loop controller is activated automatically.

Within this position window the closed loop control is deactivated.

P51 *Closed loop mode (mode / 0, 2)*

The closed loop controller can function in two different modes.

- 0- The closed loop controller is only activated when positioning is complete. (Closed loop to demand values only).
- 1- The closed loop controller sets to actual value after switch-on or stop, but when positioning is complete, to the demand value.

Also in this mode, if the stop key is repeatedly pressed, the closed loop controller is deactivated.

Parameter level Axis1, Axis2:

P52 *Closed loop P- term (amplification/ 0, 50000)*

If parameter P48 is set to 2, the closed loop controller proportional term can be set. In this parameter.

The value entered here is multiplied by the difference between the demand value and actual value (in encoder increments) and used as ramp increments.

This means that when there are long ramp lengths in P 11 Ach1, a higher value can be set. For shorter ramp lengths a lower value must be set to prevent oscillation.

This value should not be greater than 1% of the ramp length entered in P11 ACH1 when running the first trials.

If no oscillation occurs, the value can be increased.

Parameter level Axis1, Axis2:



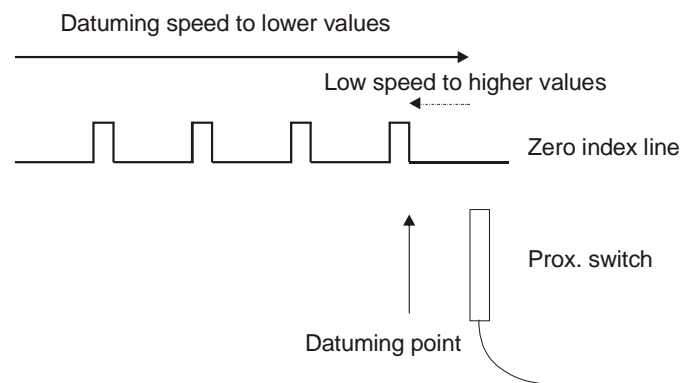
Parameters P53 to P56 are only active, when P05/ALL is set to 1.

P53 "Go-to-datum" direction[direction/ 0, 1]

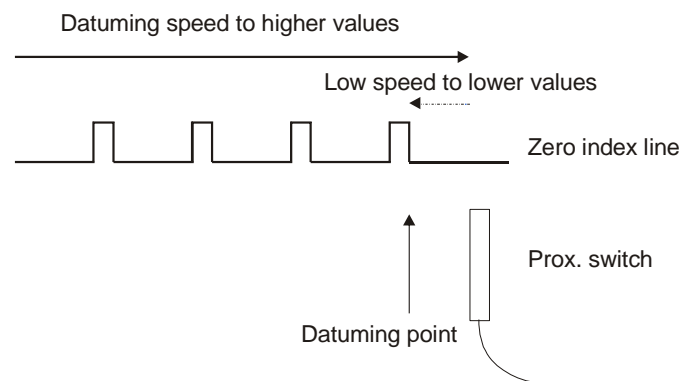
0 = "Go-to-datum" direction moves towards lower actual values

1 = "Go-to-datum" direction moves towards higher actual values

Mode 0:



Mode 1:



Parameter level Axis1, Axis2:

P54 *Zero pulse edge trigger [edge/ 0, 1]*

0 = falling edge

1 = rising edge

P55 *“Go-to-datum offset (P05 / -999999, 9999999]*

If the index pulse is reached during “go-to-datum”, after the reference cam is left, the new actual value is calculated from actual

value $P00 = \text{calibration value} + \text{Offset}$

P56 *Parking position after “go-to-datum” routine [P05/ / -999999, 9999999]*

After the “go-to-datum” routine, the positioning unit repositions to the parking position entered in this parameter.

If the motor should stop after the “go-to-datum” routine, then the calibration value + offset should be entered here.

P57 *Encoder monitoring interval [x.xxx sec]*

During this interval at least two pulses must be sent from the encoder to the unit while positioning is taking place otherwise the positioning is halted with an error signal when P58 is set to a value unlike 0.

Parameter level Axis1, Axis2:

P58 *Ramp threshold (% / 0, 100)*

To ensure error-free operation of the encoder monitoring even at low rotational speed (r.p.m.), a switching threshold to determine the point at which encoder monitoring is activated can be set in this parameter.

This setting is entered as a % value of the ramp length.

If the encoder or positioning system ceases to function during positioning, the loop controller will accelerate the motor.

If the ramp height reaches the value entered in P58, the encoder monitor is activated and switches the loop controller off.

P59 *“Go-to-datum” speed [per cent/ 1, 100]*

1% ... 100%: Value in per cent of the maximum “go-to-datum” speed to reference switch.

P60 *Motor rotation direction (forwards, backwards / 0, 1)*

This parameter inverts the actual direction of engine rotation.

If the motor is rotating in the wrong direction, this parameter must be altered or the cables connecting the motor must be exchanged.

Parameter level Axis1, Axis2:

P61 *Maximum encoder counting frequency (Hz / 1, 300000)*

The device has a superimposed speed control to ensure constant motor speed in all zones.

For this purpose, the encoder counting frequency in Hertz at 100% motor rotation must be entered in this parameter.

The pulse multiplier x1, x2, x4 should be observed.

P62 *Encoder pulse time interval(ms / 0, 1000.0)*

Enter the time during which the controller measures the pulses sent by the encoder and compares them with the value stored in P61.

The greater the connected encoder counting frequency the lower the value which can be entered here.

The setting 0 deactivates the speed control.

Parameter level Axis1, Axis2:

P67 *Analog output range (Range / +/-10V, 0-10V)*

Setting	Analog output range
+/- 10V	The analog output works in a range of +/- 10V.
0- 10V	The analog output works in a range of 0 - 10V. When the motor should run in negative direction the output Con 10, Pin 6 is active.

P68 *DAC value for 0V output voltage (Value/ 0, 4095)*

This value normally is detected in the adjust menu and is also shown here.

P80 *Status [Status/ 0,255]*

When the unit is equipped with a RS232 interface, the unit status can be read out of this parameter.

0x00	0	Axis not ready
0x01	1	Axis ready
0x02	2	Axis is running
0x04	4	Axis is in position
0x08	8	Goto datum routine is running
0x10	16	Motor overcurrent
0x20	32	Motor short circuit
0x40	64	Measuring system error
0x80	128	Limit switch error
0x100	256	Program mode running

Parameter level Axis1, Axis2:

P81 *Distance reference switch to zero pulse (cam index)
of the encoder [ro(P05)/ -----,-----]*

When auto datuming is used this parameter shows the difference in increments between the reference switch and the first zero pulse of the encoder.

This parameter facilitates the adjustment of a rotary pulse encoder with index pulse.

Set this difference to be as large as possible so that the controller can always evaluate the same index pulse.

Parameter level facto:

Only for the use of company HEJM employees.

4.2 Parameter list

For servicing purposes, it is advisable to document the parameters stored in the controller at the time of delivery. The following table can be used for this purpose.

Parameter	Spezifische Maschineneinstellung
Parameter User	
P00 Saw blade width	
P01 Quantity input function	
P02 Decrement value when quantity input is activated	
P03 Retract distance axis 1	
P04 Retract distance axis 2	
P14 Display colour foreground	
P15 Display colour foreground	
Parameter All	---
P00 Number of axis shown	2
P01 Unit type	821
P02 Software number	01
P03 Customer number	
P05 Enable automatic go-to datum	
P06 Machine type	
P07 Display type	
P08 Language	
P09 Stop when error message occurs	
P10 Positioning sequence	
P11 Enable the inch/mm key	

P12	Parameter base for the inch/mm key
P13	Touch function
P14	Potentiometer for speed control
P26	Switching output logic 1
P27	Switching output logic 2
P28	Switching output logic 3
P29	Switching input logic 1
P30	Switching input logic 2
P31	Switching input logic 3
P32	Quantity reached output time
P33	In position output time
P42	Security code for parameter level
P43	Security code for 0V adjustment
P44	Security code for calibrate level
P45	Security code for program protection
P46	In position output function
P47	Incremental move mode
P48	Automatic program sequence
P49	Quantity counter function
P60	Maximal number of programs
P61	Program sequence mode
P62	Actual program number
P63	Current status of program demand value
P66	Restart function when in

position	
P90 Serial address	
P91 Baud rate	
P92 Protocol for printer and barcode reader	
P93 Importing bar code scanner value	

Parameter	ACH1	ACH2
P00 Actual value		
P01 Demand value		
P02 Calibration value		
P03 Software limit switch lower		
P04 Software limit switch upper		
P05 Distance for multiplication		
P06 Pulse/distance		
P07 Maximum permanent current		
P08 Number of automatic restarts		
P09 Tolerance window		
P10 Breake activation delay Time when position reached or stop		
P11 Maximum ramp distance for acceleration ramp		
P12 Maximum ramp distance for deceleration ramp		
P13 Fast speed forwards and backwards		
P14 Manual slow speed		

P15 Deceleration ramp after stop command
P17 Backlash compensation time
P18 Backlash compensation distance
P19 Integral term 1
P20 Integral term 2
P21 Differential term for brake ramp
P22 Feedback monitoring interval
P23 Feedback acceleration ramp pulse no.
P24 Feedback deceleration ramp pulse no.
P25 Edge counting mode
P26 Counting direction
P27 Decelerate gain
P37 Motor direction for manual mode
P38 Break release delay time
P40 Decimal place
P48 Closed loop controller
P49 Closed loop gain factor
P50 Closed loop window
P51 Closed loop mode
P52 Closed loop P- term
P53 Go-to-datum direction
P54 Zero pulse edge trigger
P55 Go to datum offset
P56 Parking position after go-to datum routine
P57 Encoder monitoring interval
P58 Ramp threshold

P59 Go-to datum speed	
P60 Motor rotation direction	
P61 Maximum encoder counting frequency	
P62 Encoder pulse time interval	
P67 Analog output range	
P68 DAC value for 0V output voltage	
P80 Status	
P81 Distance reference switch to zero pulse	

5. Display

The unit includes a touch screen monitor with an additional keyboard. Therefore the display needn't be switched for the keyboard input function and all important values are still visible for the user.

5.1 Main menu

After power on the main menu appears after 2 seconds.

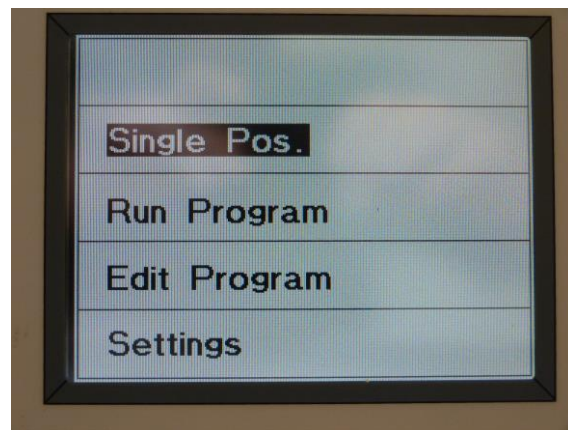


Abb. 4 Main menu

A menu can be opened directly by the arrow keys F1 to F5, or the up and down arrow keys and pressing the Enter key afterwards, when the menu is selected.

Also it is possible to open a menu by the touch function..

5.2 Single Pos. Menu

The single pos.menu shows the actual values and all other important information on the display.

All values and information can be activated by the touch or by the key functions.

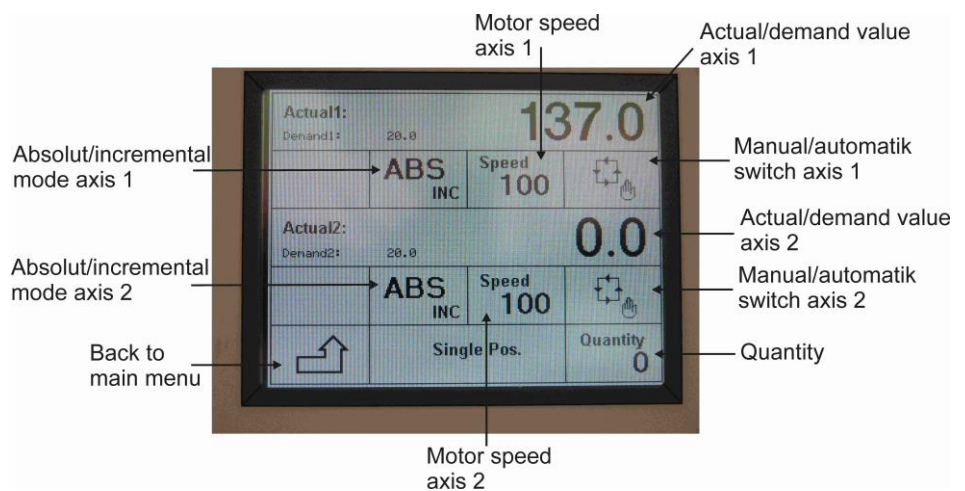


Abb. 5 Single pos. menu 1

To change the demand value of axis 1 type at the axis 1 display area. The demand value will then appear big and inverted.

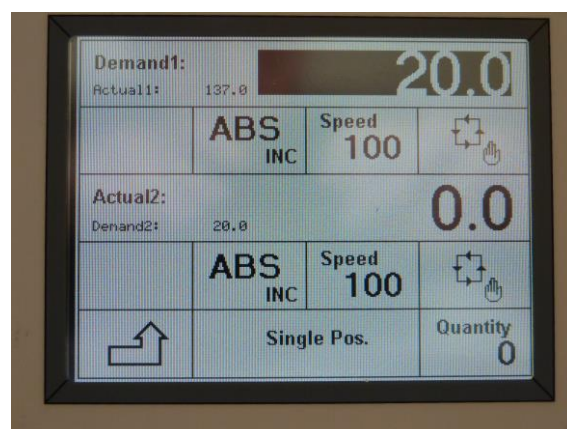


Abb. 6 Single pos. menu 2

The demand value can now be changed with the numeral keys.

The input value can be confirmed by pressing the E key or activating another area on the display.

When the input value is in the permitted range the input will be finished and a positioning will be started after pressing the start button.

The following pictures show different setting all for axis 1.

1. Demand value input is active for incremental mode

(INC is displayed big, ABS is displayed small)



Abb. 7 Single pos. menu 3

2. The speed area is selected (Input in % of the maximum speed).

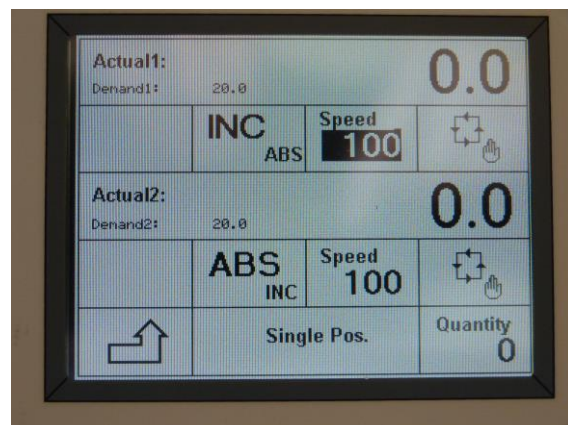




Abb. 8 Single pos. menu 4

3. The same as in Abb 8 but with manual mode activated . Axis 1

can now be moved by using the   keys.

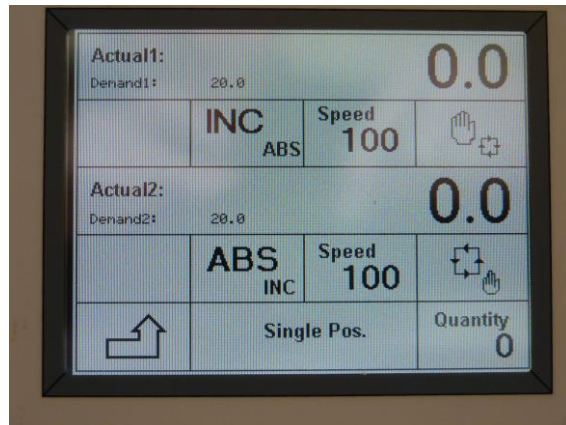


Abb. 9 Single pos. menu 5

4. Quantity input active.

The quantity is decremented by the quantity input or the position reached signal.

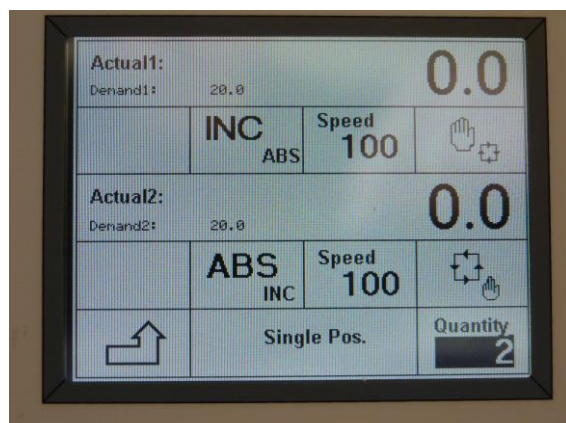


Abb. 10 Single pos. menu 6

5.3 Run program menu

In this mode programs can be run in half-, or full automatic mode.

When „run program“ is selected in main menu the following window will appear. .

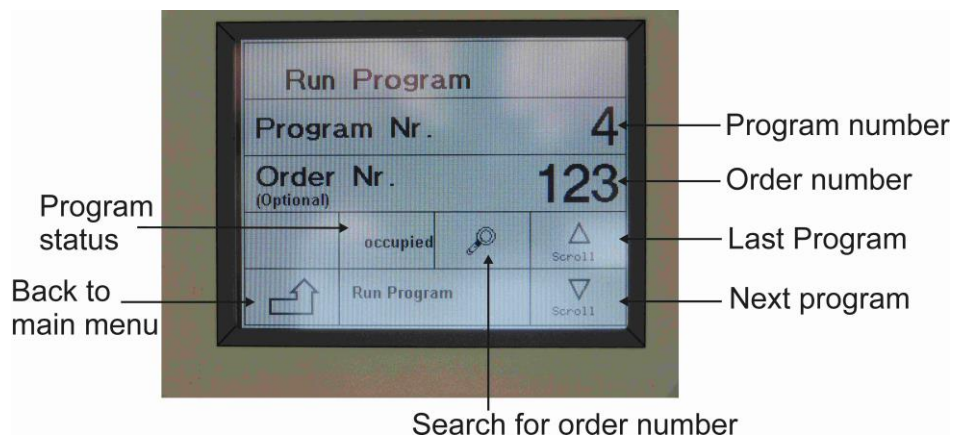


Abb. 11 Program run menu 1

Activate the field program number and type in the desired number or scroll through the program numbers with the scroll up and down fields on the display or the arrow up and down keys on the keyboard.

When the desired program number does not exist an error message appears on the display.

When the scrolling up and down fields, or up and down keys are used only program numbers with a valid program are displayed.

Also it is possible to store a program under its order number or material number.

This number can be used afterwards to find a program by typing in the number in the specified field and press onto the loupe area on the display.

When a program was selected the following window appears on the screen.



Abb. 12 Program run menu 2

To start the program the „start button“ must be pressed.

To leave the program, the “Back” field on the display must be touched or the “Escape” button has to be pressed.

In the „Run program“ information field the actual program number, its size in steps, and the actual active step is shown.

The actual activated auxiliary output is also shown on the screen.

Auxiliary output 0 means, that no output is activated in this step.

5.4 Edit program menu

When edit program is selected the following window appears.

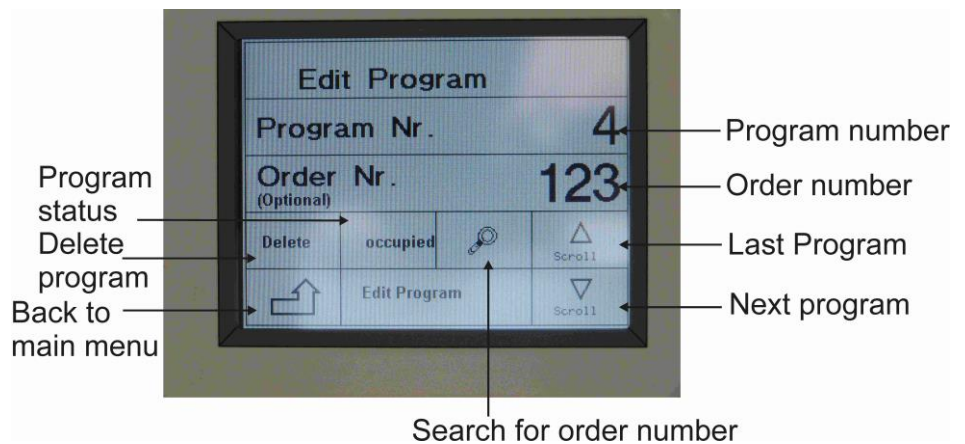


Abb. 13 Edit program menu 1

In this mode the user can create a new program, change or delete an existing program.

When the scroll fields are used here all available program numbers are shown.

The program status (free or occupied) is shown in the program status field.

When an occupied program is deleted by pressing the „Delete“ field the program status field will change from occupied to free.

To open a program the enter key must be pressed after selecting a desired program-, or order number .

When the order number is used to open a program, the unit will search for this number in the memory.

When the number is found, this program will be opened. If this number does not exist, a new (free) program will be searched and opened.

When a program is opened the following display appears.

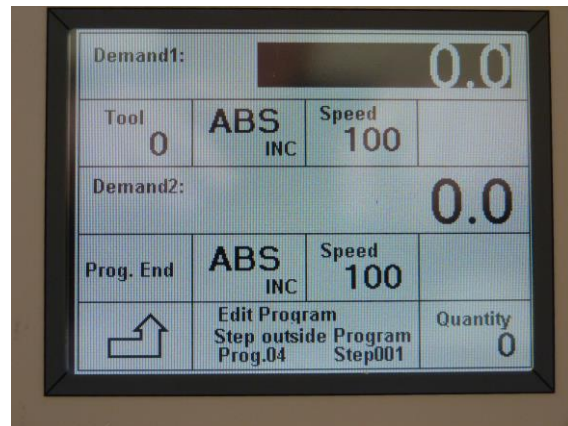


Abb. 14 Edit program menu 2

Every step must include a demand value for axis 1 a demand value for axis 2 and a quantity. This is the minimum demand for a step.

When only the Enter key is used to jump between the different fields in the display, only these three fields become active.

Changing the speed or move modes of the axis or changing the auxiliary outputs is optional.

These features can be activated directly by touching the fields or using the arrow keys.

The field „Tool“ can have a value between 0 and 15.

0 means that all output are off.

15 means that all 4 outputs are on.

The auxiliary outputs are on as long, as the specified step is active.

Important:

Mark the last step of a program always by pressing the “Prog. End” field.

Otherwise the program would not abort after the last step or would on the other hand abort to early.

In the following picture, „Tool“ 2 is allocated to step 1 of program 5.
When running this program the auxiliary output 2 would be activated as long as step 1 is active .

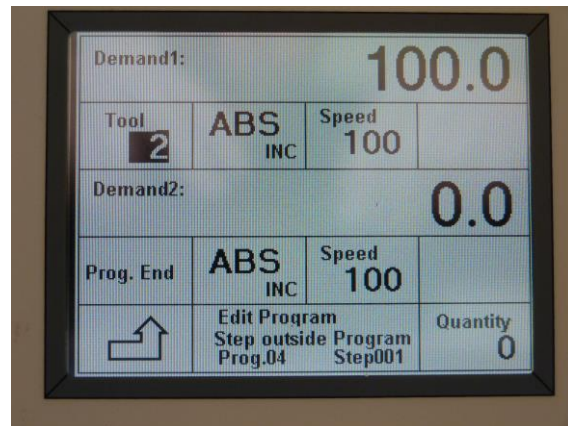


Abb. 15 Edit program menu 3

In the following example all values are programmed.

In the „Edit program“ information window this step is still marked as outside the program.

This means that this step will not be activated in the run program menu.

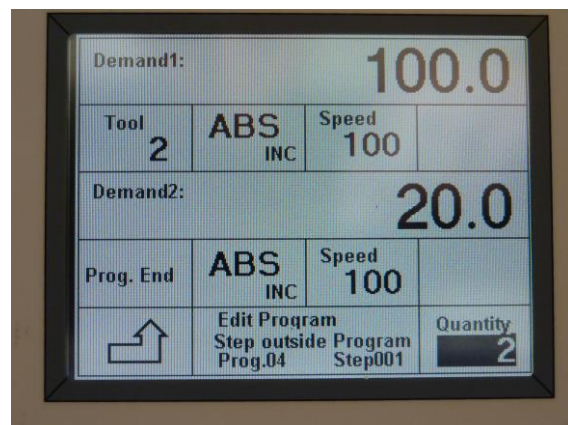


Abb. 16 Edit program menu 4

To activate this step the “Prog. End” field must be pressed here, or once when the last step is programmed. Then all steps with lower numbers are activated automatically and “Step inside program” or “Last Step” will appear in the information area.

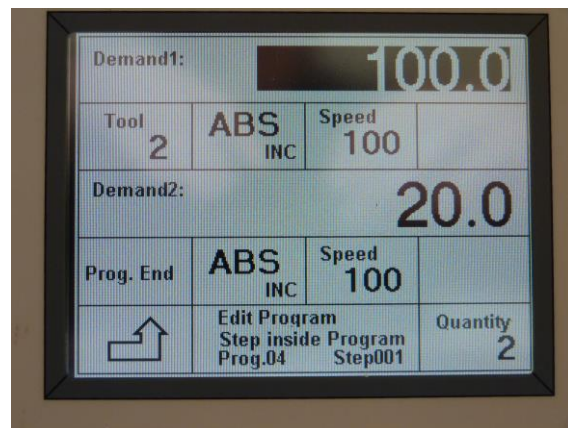


Abb. 17 Edit program menu 5

In the following picture the last step of program 5 is shown.

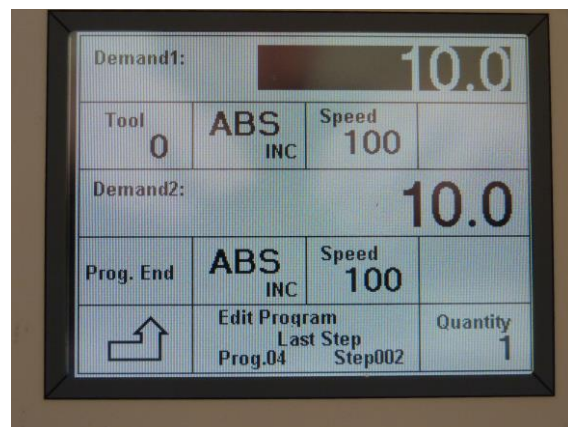


Abb. 18 Edit program menu 6

5.5 Setting Menu

This menu is normally used for commissioning purpose.

All machine specific settings are made.

The automatic go-to datum routine can also be started out of this menu.

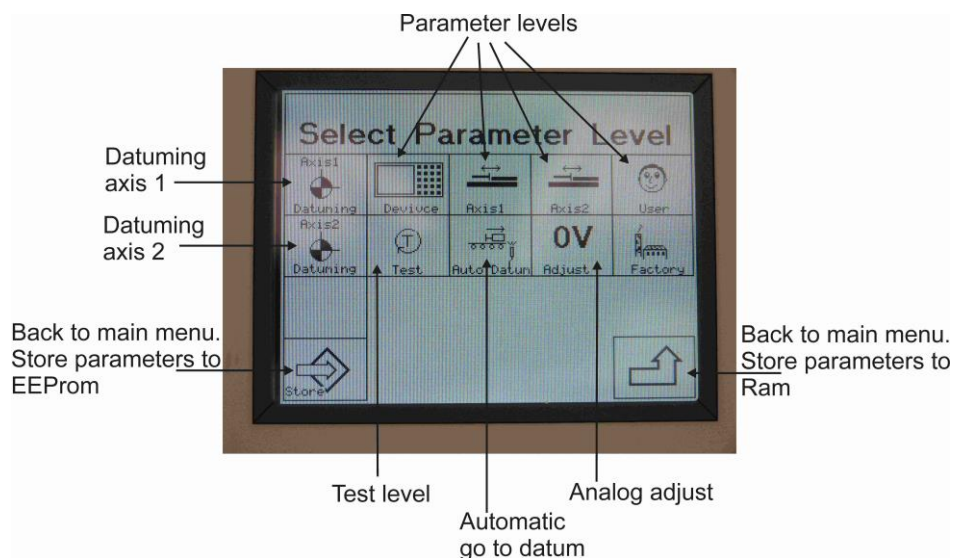


Abb. 19 Setting menu 1

Important:

Only when the menu is left by pressing the „Store“ field on the display, changes are stored in the EEPROM of the unit and will be still active after power down.

In all other cases the parameters are only stored in the RAM and will be Lost after power down.

Only when the axis are datumed it is not necessary to store the values in the EEPROM.

This is done by the unit itself.

5.5.1 Datuming an axis

Press the field „Datuming“ and the following window appears.

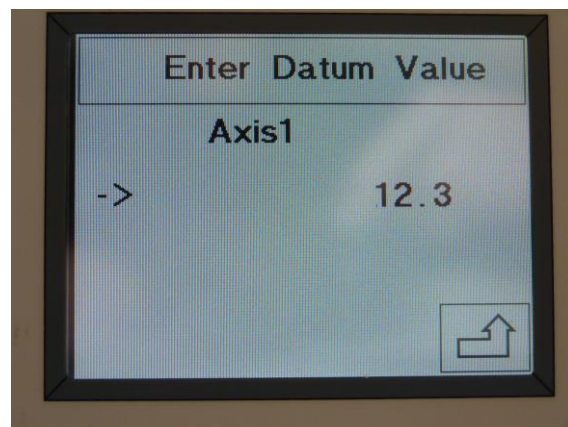


Abb. 20 Eichen

Type in the absolut position of the axis and press enter.

When the value is accepted this window will be closed.

5.5.2 Setting of parameters

In the picture below a typical parameter window is shown.

In the upper line the parameter level is shown.

The parameter is displayed by its name and number.

To change a parameter value use the numeral keys and type enter to activate it in the RAM.

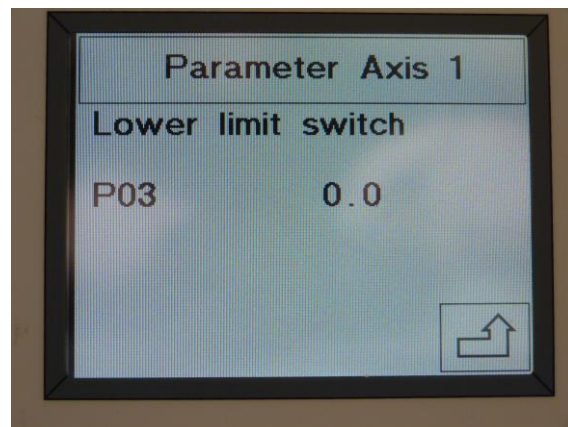


Abb. 21 Setting of parameters

Parameters that does not have a numerical value can be changed with

the   keys.

5.5.3 Automatic go- to datum

The automatic go- to datum function detects the position of the axis automatically.

Therefore the axis are moved and the machine must be equipped for this.

When the „Auto Datum“ field is activated the following window appears.



Abb. 22 Go- to datum 1

Before starting the automatic go- to datum function with the start key, the axis that should be datumed must be switched from locked to free.

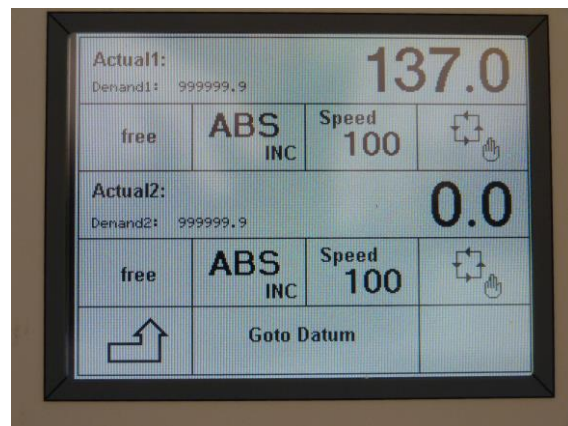


Abb. 23 Go- to datum 2

5.5.4 0V Adjustment

Here it is possible to adjust the analog output of the unit with the analog input of a drive or frequency inverter of a machine .



When the 0V adjustment is done the connected motor can run very fast .

Take care that nobody can be injured or the machine could be damaged because of this movement .

The Stop key has no function in this menu.

The 0V adjustment window looks like that.

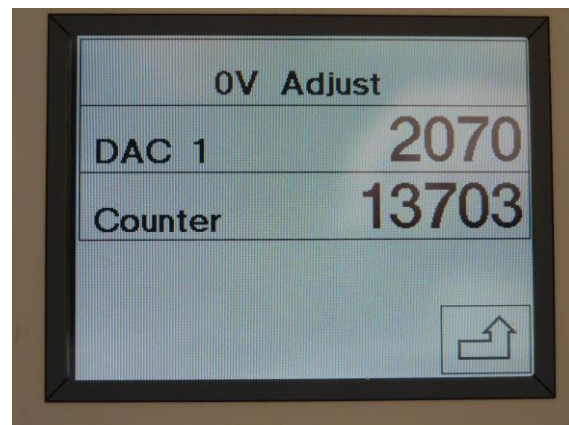




Abb. 24 0V Adjustment

In the field marked as DAC 1 or DAC 2 the actual value of the digital to analog converter is shown.

In the field below, the counter values of specific axis are shown.

This makes it possible to recognize very slow movements of the motor.

By using the   keys it is possible to change the DAC value as long as the motor still moves in one direction.

Store the value into RAM by pressing the Enter key.

Leave the menu by pressing escape or touching the Back symbol.

6. Keyboard function

6.1 Keys to

These keys can be used to activate the different fields on the display, when this should not be made by the touch function .

Therefore these keys work like a matrix in horizontal and vertical direction. When one of the keys F1 to F5 is pressed simultaneously with one of the keys F6 to F9 the specific function will be activated.

6.2 Enter key



The Enter key finish the entry of a demand value, quantity or parameter setting and stores this value into the RAM.

The key will also open a Program in run-, and editor mode.

6.3 Arrow keys

The arrow keys are used to navigate threth the menus and to scroll between different windows.

Additionally they can be used to scroll threth the parameters without storing them into the RAM.

Parameters that are not numerical ones (multiple choice objects) can be changed by the  and  keys.

6.4 Key 

The Escape key will close the actual menu and will switch back to the last.

6.5 Key 

This key will switch some display and parameter values to inch or back to mm.

This function can only be used when it is activated in the Parameter level All.

6.6 Key 

This key has no function in this software version.

It can be used for customer specific options to show machine or customer information.

6.7 Numerical key block 

These keys are used to change numerical values or parameters.

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