Instruction Manual
PSx3xxPN

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Purpose of instruction manual

This instruction manual describes the features of the PSx3xxPN positioning system and provides guidelines for its use.

Improper use of these devices or failure to follow these instructions may cause injury or equipment damage. Every person who uses the devices must therefore read the manual and understand the possible risks. The instruction manual, and in particular the safety precautions contained therein, must be followed carefully. **Contact the manufacturer if you do not understand any part of this instruction manual.**

Handle this manual with care:

- It must be readily available throughout the lifecycle of the devices.
- It must be provided to any individuals who assume responsibility for operating the device at a later date.
- It must include any supplementary materials provided by the manufacturer.

The manufacturer reserves the right to continue developing this device model without documenting such development in each individual case. The manufacturer will be happy to determine whether this manual is up-to-date.

Conformity

This device is state of the art. It complies with the legal requirements of EC directives. This is shown by the CE mark.

CE

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1 Safety precautions

1.1 Appropriate use

Positioning systems are especially suitable for automatically setting tools, stops or spindles for wood-processing equipment, packing lines, printing equipment, filling units and other types of special machines.

PSx3xxPN positioning systems are not stand-alone devices and may only be used if coupled to another machine.

Always observe the operating requirements — particularly the permissible supply voltage — indicated on the rating plate and in the “Technical data” section of this manual.

The device may only be handled as indicated in this manual. Modifications to the device are prohibited. The manufacturer is not liable for damages caused by improper use or failure to follow these instructions. Violations of this type render all warranty claims null and void.

1.2 Shipping, assembly, electrical connections and start-up

Assembly and the electrical connections should only be handled by professionals. They should be given proper training and be authorised by the operator of the facility.

The device may only be operated by appropriately trained individuals who have been authorized by the operator of the facility.

Specific safety precautions are given in individual sections of this manual.

1.3 Troubleshooting, maintenance, repairs, disposal

The individual responsible for the electrical connections must be notified immediately if the device is damaged or if errors occur.

This individual must take the device out of service until the error has been corrected and ensure that it cannot be used unintentionally.

This device requires no maintenance.

Only the manufacturer may perform repairs that require the housing to be opened.

The electronic components of the device contain environmentally hazardous materials and materials that can be reused. The device must therefore be sent to a recycling plant when you no longer wish to use it. The environment codes of your particular country must be complied with.

1.4 Symbols

The symbols given below are used throughout this manual to indicate instances when improper operation could result in the following hazards:

WARNING! This warns you of a potential hazard that could lead to bodily injury up to and including death if the corresponding instructions are not followed.

CAUTION! This warns you of a potential hazard that could lead to significant property damage if corresponding instructions are not followed.

INFORMATION! This indicates that the corresponding information is important for operating the device properly.

2 Device description

2.1 Features

The PSx3xxPN positioning system, an intelligent, compact, complete solution for positioning auxiliary and positioning axes, consists of an EC motor, gear power amplifier, control electronics, absolute measuring system and PROFINET interface. The integrated absolute measuring system eliminates the need for a time-consuming reference run. Connecting to a bus system simplifies the wiring. A hollow shaft with adjustable collar makes assembly quite simple. The positioning system is especially suitable for automatically setting tools, stops or spindles for wood-processing equipment, packing lines, printing equipment, filling units and other types of special machines.

PSx3xxPN positioning systems convert a digital positioning signal into an angle of rotation.

If the device names are given **without** the diameter of the output shaft (8, 14), the relevant information is valid for **all** offered output shafts (applies throughout the document).
'x' in the device name stands for a number in the range 0...9. 'xx' in the device name stands for a number in the range 10...999.

2.2 Installation

Hollow shaft:

The PSx3xxPN is mounted onto the machine by sliding the hollow shaft of the positioning gear onto the axis to be driven and then securing it with an adjustable collar (recommended diameter of the axis is either 8h9 or 14h9; wrench torque for screw: 1.5Nm). The adjustable collar should be tightened only just to the point where it can no longer rotate freely.
Securing the pin under the hollow shaft into an appropriate bore will prevent further rotation.

Solid shaft:

The PSx3xxPN is mounted on the machine by fixing the solid shaft with coupling and intermediate flange to the axis of the machine.

Never apply force to the housing cover, e.g., for supporting weight**.**

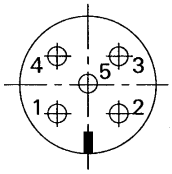
Driving the PSx3xxPN rearward is prohibited (e.g. it's not allowed to turn the output shaft by an external force)**.**

2.3 Pin assignment

For the supply voltage either a Binder series 713/763 (A-coded) round, 5-pin plug for PSE and PSS devices or a 5-pin Harting plug with protective sleeve (HAN4A) for the PSE34xx devices is located in the housing cover of the PSx3xxPN.
Two round 4-pin sockets, Binder series 825 (D-coded) are provided for connection to the bus.

Supply voltage connector:

round plug Harting plug

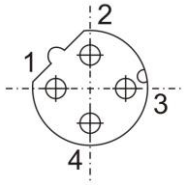


(external top view)

1. +24V motor
2. ground (motor)
3. +24V control unit
4. ground (control unit)
5. housing/pressure balance

To prevent the ingression of fluids into the PSW-housing during cooldown, use a special cable with an airtube for pressure balancing of your PSW

Round socket for bus:



(external top view)

1. TD+ (WH/GN, white/green)
2. RD+ (WH/OG, white/orange)
3. TD- (GN, green)
4. RD- (OG, orange)

Due to the use of 4-pin sockets, only four-wire cables should be used**.**

Electrical grounding:

Next to the connecting plugs there is a M4 stud bolt. It is recommended to connect the positioning system with a cable as short as possible to the machine base. The minimum wire cross section therefor is 1.5mm².

2.4 Setting of the device name

It's possible to set the device name by 3 different ways:

1) For variants with address switches the device name is built up of a basic part and the address in the following way:

   `pse-xx`

   (xx is the setting of the address switches when powering on the drive, provided that the address is > 0)

2) If no address switches are included in the device or the setting of the address switches is "00", the address which is stored in the internal EEPROM is effective, in case it is > 0 (parameter 92). The device name then is built up in the following way:

   `pse-xxxxx`

3) If no address switches are included in the device or the setting of the address switches is "00" AND the address which is stored in the internal EEPROM is equal 0, the device name which was assigned at last by the IO controller is valid.

In delivery state address switches are at setting 0 (if present), the address which is stored in the internal EEPROM is 0 and the device name is empty (→ PROFINET compliant behaviour).

In order to identify the drive during start-up, the "blinking service" is supported, i.e. the drive can be accessed via the MAC address and a device naming can be executed.

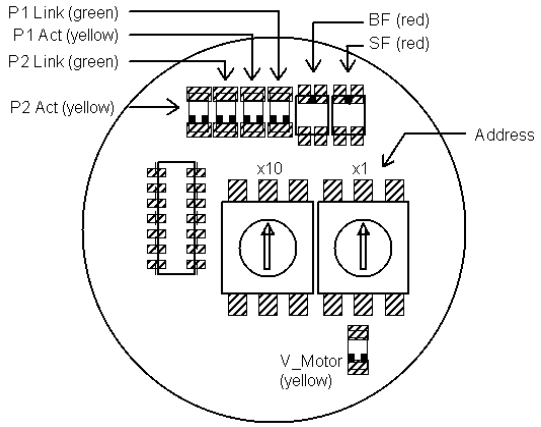
2.5 LEDs

The following LEDs are located under the transparent sealing plug:

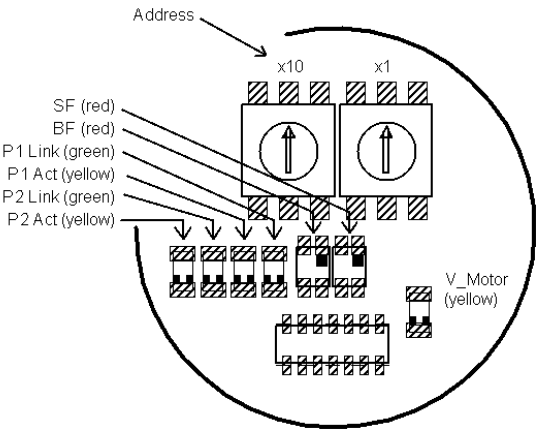
P1/P2: green LINK LEDs and yellow ACT LEDs for ports 1 and 2
BF: Profinet bus fault LED
SF: Profinet status fault LED
V_Motor: The LED is illuminated yellow when power is available to the motor.

Switch configurations:

PSx30xPN, PSx31xPN-8, PSx32xPN, PSE31xxPN, PSE34xxPN



PSx31xPN-14, PSx33xPN,



Meaning of the LEDs:

1) Each of the ports (P1/P2) has two associated LEDs (one green for the “Link” state and one yellow for the “Activity” state).

For each port the following states are possible:
- green off, yellow off → no line connection
- green on, yellow off → line connection is active, no data activity
- green on, yellow is flickering with 10 Hz → line connection is active, data activity

2) red Profinet LED “bus fault” (BF)

- Off → The drive is in the process of exchanging data.
- Flashing with 2Hz → The drive is connected to the Ethernet network and is not in the process of exchanging data.
- On → The drive is not connected to the Ethernet network.

3) red Profinet LED “status fault” (SF)

- Off → No fault, no diagnostic message is present.
- Flashing with 2Hz, duration 3 sec. → DCP signal service is initiated via the bus
- On → Watchdog Time-out; system fault or diagnostic message is present

4) The yellow “motor” LED indicates the motor power supply:

- off → Motor power supply too low or too high
- on → Motor power supply well
flashing → Motor power supply well, PSx in delivery state

2.6 Start-up

After the supply voltage has been hooked up, a positioning or manual run can begin immediately:

a) Positioning run

- To be able to control the drive, first a cyclic process data connection has to be established.
- Transfer target value:
  control word = 0x14 and desired target value
  → Drive begins run
- Abort run by resetting the release bit:
  control word = 0x00
- If a new target value is transferred during a positioning run, the device will immediately proceed to the new target. There will be no interruption if the direction of rotation does not need to be altered.
- If a manual run is transmitted during a positioning run, the positioning run will be aborted (speed will be reduced to that of a manual run) and the device proceeds with the manual run.

The following sequence of steps is also possible:
Starting situation: release has not been set
- Transfer target value:
  control word = 0x04 and desired target value
- Set release:
  control word = 0x10
  → Drive begins run

Where applicable, positioning runs involve a “loop run” which causes the target position to be reached from a predefined direction. The direction and the length of the loop run can be set to the desired value with Par. 45 (“length of loop”) before the run. With Par. 45 the loop run might also be disabled.

b) Manual run

- Start manual run (control word = 0x11 resp. 0x12): Drive begins run
- End manual run by clearing the manual run command (transmit control word = 0x10) or by deasserting release (transmit control word = 0x00).
- Transferring a target value during a manual run will end the manual run and the device will immediately move on to the transmitted position (control word = 0x14 and desired target value).

Underwater usage of the PSW is not allowed.

2.7 PROFINET interface

When setting up the project, care should be taken to use the appropriate DAP (either “PSx with 1 connector” or “PSx with 2 connectors”). When choosing the wrong DAP, no communication will establish.

Although the mode “IRT” is mentioned in the GSD file associated to the device, currently only the mode “RT” is supported.

Process data:

As process data for the IO controller a 14-byte output module and a 16-byte input module exist. With the help of the process data, the positioning commands are initiated and monitored, besides parameters might be written and read. For that purpose, the “PKW parameter interface” is being used, which is described in the drive profile “Profidrive”.

Acyclic read and write requests:

Access on all parameters is also possible with acyclic read and write requests instead via the PKW parameter interface. The parameter number is in both cases the same.

When using acyclic write requests, it has to be considered that just before the effective value which a parameter shall receive, a control byte has to be transmitted, which specifys if the drive shall execute or ignore the write request. If the write request shall be ignored, this control byte has to be set to 0, otherwise the write request will be executed.

Thus, the data length of the write requests result to 3 byte for 16-bit values and 5 byte for 32-bit values.

For acyclic reading, the data length of the returned value is 2 byte for 16-bit values and 4 byte for 32-bit values.

The advantage of this method is when doing a parametrization in the context of running up a device, a parameter might be taken over out of the project design or alternatively the values which are stored in the EEPROM of the drive keep their validity. This is being controlled by the control byte which was described before and which is present for each parameter in the GSD file and which is being displayed in the project design.

a) Table of implemented parameter entries

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Status requests						
status word	1	Bit 0: target position reached Bit 1: drag error Bit 2: reserved Bit 3: reserved Bit 4: motor power present Bit 5: positioning run aborted Bit 6: drive is running Bit 7: temperature exceeded Bit 8: movement opposite loop direction Bit 9: error Bit 10: positioning error (block) Bit 11: manual displacement Bit 12: incorrect target value Bit 13: motor power was missing Bit 14: positive range limit Bit 15: negative range limit	0 ... 0xFFFF 16 bit			R
actual speed	2	value in rpm	±15 bit			R
actual value	3	current actual position value in 1/100 mm (for a 4mm spindle and default settings of numerator, Par. 38 and denominator, Par. 39) Writing onto this parameter causes the current position to be “referenced” onto the transferred value. Changes only possible when at standstill	±31 bit	no		R/W
actual torque	4	value in cNm	16 bit			R
maximum torque	5	maximum torque occurring during the most recent run (start phase, during which the maximum start-up torque applies, see Par. 63/71, and the phase when the drive is braking down, are not considered) value in cNm	16 bit			R
U control	6	current supply voltage for control unit given in increments of 0.1 V	16 bit			R
U motor	7	current supply voltage for motor given in increments of 0.1 V	16 bit			R
device temperature	8	internal device temperature in °C	16 bit			R
address switch	9	current setting of the (optionally present) address switch	16 bit			R
production date	10	year and week of manufacturing (given as an integer)	YYWW 16 bit			R
serial number	11	serial device number	0 ... 65535 16 bit			R

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Status requests (continued)						
device model (as number)	12	device model within the PSE series as number (e.g. 31208)	16 bit			R
device model (as string)	13	device model within the PSE series as string (e.g. “PSE312-8-B”) When requesting with “Read Record”, the drive is sending the string as one piece, when requesting via the PKW parameter interface, consecutively 5 segments have to be requested (IND = 0...4), with each of them containing 4 byte (example for the first read double word: 0x50534533). The string is zero-terminated.				R
version	14	software version number	16 bit			R
Run commands						
control word (only writable in process data)	32	Bit 0: manual run to larger values Bit 1: manual run to smaller values Bit 2: transfer target value Bit 4: release: The axle will only run if this bit is set. All other bits must be set to 0!	16 bit	no	0	R
target value (only writable in process data)	33	target position to be achieved value in 1/100 mm (for a 4mm spindle and default settings of numerator, Par. 38 and denominator, Par. 39)	±31 bit	no	0	R
Parameter group “position settings”						
direction of rotation	37	0: clockwise with larger values (if looking at the output shaft) 1: counter clockwise with larger values Changes only possible when at standstill	0 or 1 16 bit	yes	0	R/W
position scaling, numerator	38	These values can be used to set a desired user resolution to the drive. For a numerator factor of 400, the denominator factor holds the spindle pitch per resolution e.g.: spindle pitch 1.5 mm with resolution 1/100 mm: numerator = 400, denominator = 150 Changes only possible when at standstill	1...10000 16 bit	yes	400	R/W
position scaling, denominator	39		1...10000 16 bit	yes	400	R/W

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Parameter group “position settings” (continued)						
referencing value	40	correction factor for the target, actual and limit switch values Changes only possible when at standstill	±31 bit	yes	0	R/W
upper mapping end	41	definition of the positioning range relative to the absolute measuring system permissible values: (actual position value + 3 revolutions) … (actual position value + 253 revolutions) Changes only possible when at standstill	±31 bit	yes	102400	R/W
upper limit	42	maximum permitted target position minimum value: upper mapping end - 253 revolutions maximum value: upper mapping end - 3 revolutions Changes only possible when at standstill	±31 bit	yes	101200	R/W
lower limit	43	minimum permitted target position minimum value: upper mapping end - 253 revolutions maximum value: upper mapping end - 3 revolutions Changes only possible when at standstill	±31 bit	yes	1200	R/W
positioning window	44	permissible difference between target and actual values for “position reached” bit value in 1/100 mm (for a 4mm spindle and default settings of numerator and denominator) The maximum value that can be set changes according to the same factor as the resolution. Changes only possible when at standstill	1...100 16 bit	yes	2	R/W
length of loop	45	minimum number of increments which the drive moves in a pre-defined direction when approaching a target position value in increments (value = 0 → no loop) Changes only possible when at standstill	-1...1 rotation ±31 bit	yes	-250	R/W
drag error	46	maximum drag error before the “drag error” bit is set. value in 1/100 mm (for a 4mm spindle and default settings of numerator and denominator)	0...1000 16 bit	yes	0	R/W
readjustment	47	readjustment at standstill 0 → off; 1 → on	0 or 1 16 bit	yes	0	R/W
drag error correction	48	maximum modification of the target speed for drag error correction Changes only possible when at standstill	0...10 16 bit	yes	4	R/W

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Parameter group “velocity”						
target speed	53	maximum rpm to be used for positioning runs value in rpm	*) 16 bit	yes	*)	R/W
target speed for manual run	56	maximum rpm to be used for manual runs value in rpm	*) 16 bit	yes	*)	R/W
speed limit for aborting run	57	value in % of the target speed	30...90 16 bit	yes	30	R/W
acceleration	58	value in rpm per sec.	*) 16 bit	yes	*)	R/W
deceleration	59	value in rpm per sec.	*) 16 bit	yes	*)	R/W
Parameter group “torque”						
maximum start-up torque	63	value in cNm	*) 16 bit	yes	*)	R/W
maximum torque	64	Applies after completion of start phase (during start phase the value Par. 63 applies); value in cNm	*) 16 bit	yes	*)	R/W
maximum holding torque at end of run	65	value in cNm	*) 16 bit	yes	*)	R/W
maximum holding torque	66	maximum holding torque at standstill in cNm (after completion of the phase “max. holding torque at end of run”)	*) 16 bit	yes	*)	R/W
Parameter group “time”						
time elapsed until speed falls below speed limit for aborting run	70	value in msec (see also Par. 57)	50...500 16 bit	yes	200	R/W
time period for start-up torque	71	time period at begin of run, in which the “maximum start-up torque” applies (value in msec, see also Par. 63)	10...1000 16 bit	yes	200	R/W

*) Values depend on device type (see following table).

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Parameter group “time” (continued)						
duration of maximum holding torque at end of run	72	time period at end of run, in which the “maximum holding torque at end of run” applies (value in msec, see also Par. 65)	0...1000 16 bit	yes	200	R/W
idle period for direction change	73	idle period when reversing the direction of rotation (value in msec)	10 ... 10000 16 bit	yes	10	R/W
waiting time for brake at end of run	75	time period after the end of run, in which the brake stays released (value in msec)	0...3000 16 bit	yes	1000	R/W
UMot filter	76	average time for measuring current power to motor (value in msec)	100 ... 1000 16 bit	yes	100	R/W
Parameter group “others”						
general purpose	80-89	10 general purpose registers	32 bit	yes	0	R/W
Umot limit	90	voltage limit for bit 4 (“motor power present”); given in increments of 0.1 V Beginning a positioning run or a manual run is only possible if the supply voltage for the motor is higher than the value of this parameter. During the run the voltage might fall down to 17.5V.	180 ... 240 16 bit	yes	185	R/W
temperature limit	91	upper temperature limit in °C	10...70 16 bit	yes	70	R/W
address	92	If no address switches are included in the device or the setting of the address switches is “00”, this value is effective as address, in case it is > 0. The device name then is built up in the following way: pse-xxxxx When writing, this value only will be valid after saving (s. Par. 96) and restart. If additionally to the address switch setting “00” parameter 92 is zero, the name which was assigned by the IO controller during device naming is valid.	16 bit	yes	0	R/W

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Parameter group “others” (continued)						
configuration for connection timeout	93	Bits 1-0: configuration for connection timeout (if a connection has been established and lost) 0x00: continue moving (drive will continue moving to the actual target position) 0x01: drive will abort any positioning 0x02: drive will move to a save position which is defined by Par. 94 0x03: reserved Bits 3-2: configuration of save position run when no connection is being established after a certain time at power-up 0x00: no save position run at power-up 0x01: save position run after 15 sec 0x02: save position run after 30 sec 0x03: save position run after 60 sec	16 bit	yes	1	R/W
save position for connection timeout	94	drive will move to this position if - a connection loss has been detected and bits 1-0 of Par. 93 are set to 0x02 - no connection is being established after a certain time at power-up and bits 3-2 are being set appropriate	±31 bit	yes	0	R/W
repetition time for save position run	95	drive will start another save position run if the last save position run was not successful (e.g. because of undervoltage, positioning error (block) or overtemperature) value in sec; 0→ no repetition	16 bit	yes	0	R/W

Name	Par. Number	Function	Type/ Range	Back up	Delivery State	R/W
Parameter group “others” (continued)						
delivery state	96	writing “-6”: resets the drive (equal to switching off and on again the control power supply) writing “-5”: sets the values of all parameters to the delivery state, saves all parameters in the EEPROM, afterwards positioning run to the middle of the measurement range *) (device name and IP address stay unaffected) writing “-4”: sets the values of all parameters to the values which are saved last by the user, afterwards positioning run to the middle of the measurement range *) (device name and IP address stay unaffected) writing “-3”: sets the values of all parameters to the delivery state, erases the device name and the IP address and saves all parameters in the EEPROM writing “-2”: sets the values of all parameters to the values which are saved last by the user, without saving the parameters in the EEPROM (device name and IP address stay unaffected) writing “-1”: sets the values of all parameters to the delivery state, without saving the parameters in the EEPROM (device name and IP address stay unaffected) writing “1”: saves all parameters in the EEPROM reading directly after boot: 0 → content of memory correct ≠ 0 → content of memory incorrect reading after saving: 0 → saving finished successfully ≠ 0 → saving is still in progress or is finished incorrectly (the time for saving is up to 200 msec) Changes only possible when at standstill	-6…-1 or 1 (writing) 0...2 (reading) ±15 bit	no		R/W

*) In cyclic process data exchange, the control word is ignored during a run to the middle of the measurement range (unless it changes). Thus a run to the middle of the measurement range may be interrupted by a change of the control word. Run commands issued before the run to the middle of the measurement range will not automatically restart after finishing the

the run to the middle of the measurement range. (I. e. control word 0x14 and old target position will not lead to a run to this position.)

Table of rated speed and torque values for various models of gears

device model PSE and PSS		301-x 311-x	302-x 312-x	305-x 315-8	322-14 332-14	325-14 335-14
Name	Par. No.	value range delivery state				
target speed	53	15...230 230	10...150 150	3...70 70	20...200 170	10...100 85
target speed for manual run	56	15...230 80	10...150 50	3...70 20	20...200 80	10...100 40
acceleration	58	97...600 600	50...400 400	23...130 130	97...525 525	50...260 260
deceleration	59	97...600 600	50...400 400	23...130 130	97...525 525	50...260 260
maximum start-up torque	63	2...125 125	10...250 250	50...600 600	10...250 250	20...500 500
maximum torque	64	2...125 100	10...250 200	50...600 500	10...250 200	20...500 400
maximum holding torque at end of run	65	0...180 60	0...300 100	0...600 200	0...200 70	0...400 140
maximum holding torque	66	0...90 30	0...150 50	0...300 100	0...100 35	0...200 70

device model PSW		301-x 311-x	302-x 312-x	305-x 315-8	322-14 332-14	325-14 335-14
Name	Par. No.	value range delivery state				
target speed	53	15...180 180	10...125 125	3...60 60	20...150 125	10...80 60
target speed for manual run	56	15...180 80	10...125 50	3...60 20	20...150 80	10...80 40
acceleration	58	97...600 600	50...400 400	23...130 130	97...525 525	50...260 260
deceleration	59	97...600 600	50...400 400	23...130 130	97...525 525	50...260 260
maximum start-up torque	63	2...125 125	10...250 250	50...600 600	10...250 250	20...500 500
maximum torque	64	2...125 100	10...250 200	50...600 500	10...250 200	20...500 400
maximum holding torque at end of run	65	0...180 60	0...300 100	0...600 200	0...200 70	0...400 140
maximum holding torque	66	0...90 30	0...150 50	0...300 100	0...100 35	0...200 70

device model PSE		313-x	3110-x	3125-x	3210-x 3310-x	3218
Name	Par.-Nr.	value range delivery state				
target speed	53	20…120 120	1…30 30	1...12 12	5...45 38	3...30 28
target speed for manual run	56	20…120 50	1…30 12	1...12 5	5...45 15	3...30 10
acceleration	58	40…600 600	9…50 50	4...20 20	20...117 117	11...70 70
deceleration	59	40…600 600	9…50 50	4...20 20	20...117 117	11...70 70
maximum start-up torque	63	20...400 375	100...1200 1200	250...3000 3000	100...1200 1200	180...2200 2200
maximum torque	64	20...400 300	100...1200 1000	250...3000 2500	100...1200 1000	180...2200 1800
maximum holding torque at end of run	65	0...300 200	0...1200 400	0...2500 900	0...1000 350	0...1800 600
maximum holding torque	66	0...150 50	0...600 200	0...1250 450	0...500 175	0...900 300

device model PSE		3325	3410	3418
Name	Par.-Nr.	value range delivery state		
target speed	53	2...18 15	10...100 100	10...90 90
target speed for manual run	56	2...18 6	10...100 40	10...90 30
acceleration	58	8...45 45	20...350 350	10...315 315
deceleration	59	8...45 45	20...350 350	10...315 315
maximum start-up torque	63	250...3000 3000	100...1200 1200	500...2000 2000
maximum torque	64	250...3000 2500	100...1200 1000	500...2000 1800
maximum holding torque at end of run	65	0...2500 900	0...600 400	0...900 600
maximum holding torque	66	0...1250 450	0...300 200	0...450 300

Structure of process data

1) Output module (from the perspective of the IO controller)

Assignment (cannot be modified):

Byte	Description	corresponding parameter number
0-1	PKE	
2-3	IND	
4-7	PWE	
8-9	control word	32
10-13	target position	33

2) Input module (from the perspective of the IO controller)

Assignment (cannot be modified):

Byte	Description	corresponding parameter number
0-1	PKE	
2-3	IND	
4-7	PWE	
8-9	status word	1
10-11	actual speed	2
12-15	actual position	3

b) Detailed description of the status bits

Bit 0: target position reached
This bit is set:
- when a transferred target position has been reached successfully (not at the end of a manual run, elsewise the target position is the same as the applicable limit switch)
- after manual displacement while at standstill, when the actual position is within the positioning window again

This bit is reset:
- after transferring a target position if the difference from the actual value is larger than the positioning window (Par. 44)
- by a manual run
- if an invalid target value has been transferred
- if rotated manually when on standstill

Bit 1: drag error
This bit is set:
- if during a run (except in the braking phase) the difference between actual target position and actual position exceeds the value which has been set with Par. 46

This bit is reset:
- with each new run command

Bit 2: reserved

Bit 3: reserved

Bit 4: motor power present
This bit is set:
- if the supply voltage to the motor is above the Umot limit (Par. 90) and below 30V

This bit is reset:
- if the supply voltage to the motor is below the Umot limit or above 30V

Bit 5: positioning run aborted
This bit is set:
- if a positioning run is aborted because release in the control word has been withdrawn or because of an invalid bit combination in the control word

This bit is reset:
- with each new run command

Bit 6: drive is running
This bit is set:
- when the drive is rotating

This bit is reset:
- when the drive is on standstill

Bit 7: temperature exceeded
This bit is set:
- if the internal device temperature device exceeds the limit value (Par. 91)

This bit is reset:
- if the internal device temperature falls below the limit value by 5°C

Bit 8: movement opposite loop direction
This bit is set:
- after power-up or a reset (a lash in a driven spindle which might be present is not yet eliminated)
- when commanding a positioning run or a manual run in opposite of the loop direction
- when commanding a positioning run or a manual run, when no loop is configured (Par. 45 is zero)

This bit is reset:
- when a transferred target position has been reached successfully in the loop direction (not after a manual run)

Bit 9: error
This bit is set:
- if an internal problem is detected when calculating a position

No run commands can be executed when the error bit is set!
This bit is reset:
- only possible by resetting or power-cycle the drive

Bit 10: positioning error (block)
This bit is set:
- if a positioning run or a manual run is aborted because the device is overloaded (block, extreme difficulty while running)

This bit is reset:
- with each new run command

Bit 11: manual displacement
This bit is set:
- if, while on standstill, the drive is turned externally by more than the value in the positioning window after a positioning run has been finished correctly

This bit is reset:
- with each new run command

Bit 12: incorrect target value
This bit is set:
- when a transferred target value lies outside of the limit switches; also caused, for instance, because of the actual value of the reference value (Par. 40)
- when a transferred target value lies inside of the limit switches; but because of a necessary loop run the specified interval would be left

This bit is reset:
- with each new run command

Bit 13: motor power was missing
This bit is set:
- if the power to the motor is less than the Umot limit (Par. 90) or above 30V when initiating a positioning run or a manual run
- if during the run the voltage leaves the given corridor

This bit is reset:
- if the power to the motor is above the Umot limit and below 30V when initiating a positioning run or a manual run

Bit 14 / 15: positive / negative range limit
This bit is set:
- if the limit value is reached during a manual run (but not if reached during a positioning run)
- if a limit value is modified such that the current position lies beyond the limit
- if, while on standstill, by means of an external force the drive is moved to a position which is outside the area which is defined by the range limits

This bit is reset:
- as soon as the actual position is again inside the range limits (Exception: After the end of a manual run the drive is located still at the range limit within the positioning window and no new run command was issued yet.)

c) Detailed description of control bits

Bit 0: manual run to larger values

Bit 1: manual run to smaller values

Bit 2: transfer target value
The target value in the process data is being accepted as a new valid target value, if this bit is set. A positioning run which starts simultanously or later uses this target value as new target position. If together with taking over the target value the positioning run shall start immediately, bit 4 (“release”) has to be set additionally.

If bit 2 is not set, the target value will not be taken over, instead there might be a positioning run to the target value which has been sent at last and which has been marked as valid.

Bit 3: reserved, must be programmed to 0

Bit 4: Release
Run commands will only be executed if this bit is set.
This bit must be set for positioning runs and manual runs.
If this bit is cleared during a run, the run will be aborted and status bit 5 will be set (“positioning run aborted”).

Bits 5-15: reserved, must be programmed to 0

d) PKW parameter interface

Via the PKW parameter interface it’s possible to write and read parameter values by using the cyclic process data connection, besides, also other values might be retrieved from the drive.

With the help of the PKW parameter interface the IO controller sets and transmits a new command. It repeats this command cyclically until the drive has processed the command and has sent back an answer. The drive provides this answer until the IO controller formulates a new command. A parameter value that’s being sent back by the the drive as an answer to a read request, refers to the moment at which the IO controller has been issued the command. I.e. in case of a parameter value that should be monitored for a longer time, the IO controller has to send another command after taken over the actual parameter value. This takes place by setting the request identifier 0 (“no request”) and subsequent waiting, until the drive confirms this request with the response identifier 0 (“no response”). Afterwards the same parameter value might be requested again.

One drive can only process one request at a time.

Structure of the PKW parameter interface:

PKW							
PKE		IND		PWE			
0	1	2	3	4	5	6	7

PKE = Parameter identifier
IND = Index
PWE = Parameter value

Structure of the parameter identifier PKE:

The information “parameter identifier” (PKE) consists of a data word (byte 0 and 1 of the PKW parameter interface), in which the type of the request (or the response) and the related parameter number are coded:

Parameter identifier PKE															
Bit No.															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
AK				SPM	Parameter number (PNU)										

AK = request identifier or response identifier
SPM → not used, set to 0
PNU = Parameter number

The parameter number (PNU) refers to the table above (“Table of implemented parameter entries”).

Request identifier (IO controller → drive):

Request identifier	Function	Possible response identifier of drive *)	
		positive	negative
0	No request	0	7
1	Request parameter value	1 or 2	
2	Modify parameter value (word)	1	
3	Modify parameter value (double word)	2	
6	Request parameter value (array)	4 or 5	
7	Modify parameter value (array, word)	4	
8	Modify parameter value (array, double word)	5	
9	Request number of array elements	6	

)* The column “response identifier” contains the possible responses for a certain request, distinguished between a successful completion of the request (“positive”) or an error (“negative”).

Response identifier (drive → IO controller):

Response identifier	Function
0	No response
1	Transfer parameter value (word)
2	Transfer parameter value (double word)
4	Transfer parameter value (array, word)
5	Transfer parameter value (array, double word)
6	Transfer number of array elements
7	Cannot process request (with error number)

Subindex IND:

For requests and responses which refer to array elements, the field IND contains the array subindex.

Parameter value PWE:

This field contains the numerical value which belongs to the related parameter.

When a request cannot be completed successfully (e.g. response identifier AK = 7), the drive reports an error code according to the following table:

Error code	Meaning
0	Illegal parameter number
1	Parameter value cannot be modified
2	Minimum/maximum limit exceeded
3	Faulty subindex
4	No array
5	Incorrect data type
6	Setting not allowed (resetting only)
17	Request cannot be processed due to operating state
18	Other error

When a write request is being completed successfully (e.g. request identifier AK = 2, 3, 7 or 8) the response contains the same data as a read request of this parameter. The response identifier then is one of the values 1, 2, 4 or 5, depending on the data type. The parameter number PNU, the index IND and the parameter value PWE are the same as given in the request. Hence it is possible to check again that the drive actually took over the requested values.

3 Specials

3.1 Speed, acceleration and deceleration

Manual runs are performed at the maximum speed specified in Par. 56; positioning runs are performed at the maximum speed specified in Par. 53. For all runs the maximum acceleration in Par. 58 and the maximum deceleration in Par. 59 apply. At the end of each run the maximum deceleration decreases during the approach to the destination successively in order to realize a harmonic transient behaviour.

A stop command causes the drive to brake with the maximum deceleration, independently of the setting in Par. 59.

3.2 Response of drive in case of block

If during a run due to load the speed falls below the threshold parameter of 30% of the selected maximum speed (Par. 57) for longer than 200 msec (Par. 70), the device detects blocking, aborts the run and sets the “positioning error” bit (here the default values are given). The drive from now on stands with the selected holding torque (Par. 66).

New run commands can then be transmitted with no further steps to take, i.e. transmitting a target value (change of the target value in the process data) starts a new run.

An exception is, if the run should go to the same target than before. In this case, deassert the release (bit 4 of the control word) and assert it again. Bit 2 (“transfer target value”) has to be set at the same time. The drive then moves on when the release bit is being asserted again.

Runs which involve specifically a block run (e.g. reference runs on block), may only be started with reduced torque (max. torque max. 10% of the nominal torque, resp. the lowest possible value).

3.3 Response of drive in case of manual displacement (readjustment)

If after a correctly finished positioning run (or a manual run to the range limit) during standstill the PSx3xxPN is displaced by external force opposite to the loop direction and the release bit (bit 4 in the control word) is set and the readjustment function (Par. 47) is enabled, the device will attempt to reach the previously transmitted target value once again (readjustment). The device does not attempt to readjust if rotated in the loop direction; it merely sets bit 11 in the status word (“manual displacement”) and resets bit 0 (“target position reached”). If the loop run is disabled (Par. 45 is 0), the drive readjusts the position in both directions.

If at standstill the drive continuously looses its position, the attempt to readjust starts exactly when the actual position is leaving the positioning window (assumed that all the conditions above are being fulfilled). The

motor power has to be in a valid range at the time when this transition happens (e.g. Bit 4 in the status word is being set). If the motor power is missing at that time, the readjustment fails and bits10 (“positioning error”) and 13 (“motor power was missing”) will become active. If later the motor power comes back again (after leaving the positioning window), there will be **no** further attempt to readjust. This is to prevent a situation that suddenly a drive begins to run if motor power is being switched on.

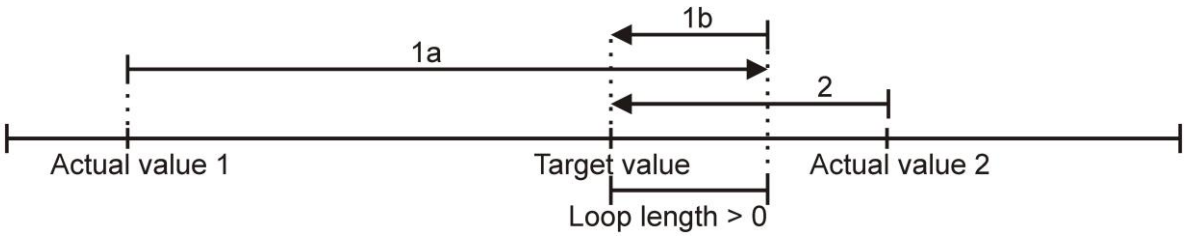
If an ongoing positioning run or manual run is aborted (relaese bit in the control word to 0), the drive readjusts the position not before a new run is being sent and finished successfully.

Deasserting the release bit and/or disabling the readjustment function can completely disable the readjustment process.

Drives with a brake generally don’t have a readjustment function.

3.4 Positioning sequence with loop

The length of loop (Par. 45) has the effect of ensuring that a target value is always approached from the same direction. This allows, for example, to eliminate the lash in a driven spindle. The diagram below illustrates the function of the length of loop:



If the target value is above the current position (actual value 1) and the length of loop is > 0, the drive runs past the target value by the specified length of loop (run 1a) and then runs to the target value (run 1b).
If the target value is below the current position and the actual value (actual value 2) is outside the length of loop, the drive approaches the target value directly (run 2).
If the position always should be approached from the left, the length of loop must be < 0.

Hence the PSx3xxPN differs between the following steps of a positioning sequence (Presumption: the target position is always approached through backward motion, i.e. the length of loop is > 0, which corresponds to the drawing above):

1. New position value is larger than the current value: The device overruns the target position by 5/8 of one rotation, then approaches the exact position in backward motion.
2. New position value is smaller than the current value: The position will be approached directly.
3. New position value is smaller than the current value, but before there was a forward run without loop (e.g. a manual run): Because the loop length is > 0, the device by all means approaches the position by moving in backward direction. The distance in backward direction is at least the length of loop. To achieve this, the device first will run in forward direction, if necessary (i.e. in opposite to the actually desired direction). The maximum length of this run is the length of loop.

Once the target position has been reached, the device compares it to the internal absolute encoder status. If a discrepancy is detected, the device then sets the “error” bit (bit 9 in the status word).

In delivery state the length of loop is < 0, i.e. each target position is approached in forward direction.

It is not possible to perform a positioning run to the upper limit (Par. 42) with a length of loop > 0 because the drive would have to run past the upper limit in order to do so. The same applies to the lower limit (Par. 43) with a length of loop < 0.

3.5 Positioning sequence without loop

The mode “positioning without loop” mode is used primarily for moving the small distances involved in fine adjustments. In this case, each position is approached directly. This does NOT eliminate any play present in the spindle in question. The PSx3xxPN internal gear backlash does not play a role in this case, as position data are acquired directly at the output shaft.

3.6 Calculating the absolute physical position

The PSx3xxPN actuator includes an absolute measuring system with measurement range of 256 rotations. In order to avoid an overflow when the drive is switched off and moved by an external force, the user can only command positionings in the range of 250 rotations. Thus the upper as well as the lower 3 rotations of the measurement range are inaccessible.
The mapping of the desired positioning range to the physical positioning range is done with the help of the parameter “upper mapping end” (Par. 41).
In the delivery state, the drive is at position 51200, the upper limit switch is set to 101200 and the lower limit switch is set to 1200, yielding a positioning range of ±125 rotations (±50000 increments). So if the desired positioning range doesn’t exceed ±125 rotations, in delivery state none of the following actions to adjust the positioning range have to be taken.

For the realization of any desired positioning range independent of the possible positioning range which is defined by the mounting situation (physical positioning range) there are the following two possibilities:

1) Move the axle (for example a spindle) to the desired position, then move the drive (with opened collar) to the position value which belongs to the physical position of the axle, only then close the collar.
   Examples:
   a) Move the axle in middle position, then move the drive at no-load (with opened collar) also to middle position (position 51200), then close the collar. The drive is now capable of moving 125 rotations (±50000 increments by default) in each direction.
   b) Move the axle completely to the left (resp. bottom), then move the drive at no-load (with opened collar) without loop to the lowest position (position 1200), then close the collar. The drive is now capable of moving 250 rotations (100000 increments by default) to the right (resp. top).
   c) Move the axle completely to the right (resp. top), then move the drive at no-load (with opened collar) to the highest position (position 101200), then close the collar. The drive is now capable of moving 250 rotations (100000 increments by default) to the left (resp. bottom).

2) Mount the drive in any position on the axle, close the collar, then adjust the positioning range with the help of Par. 41. Par. 41 defines the upper end of the positioning range. By default, the upper end is at +256 rotations (position 102400). If the positioning range doesn't suit to the actual displayed position after mounting the drive, the upper end of the positioning range can be adjusted freely between +3 rotations and +253 rotations (measured from the actual position).
   Examples:
   a) After mounting the drive, the displayed position is 51200 (which corresponds the delivery state). But the positioning range shall solely spread to the right (resp. top).
      → upper mapping end = actual position + 253 rotations
      → Set Par. 41 to 152400
   b) After mounting the drive, the displayed position is 100000. But the positioning range shall solely spread to the right (resp. top).
      → upper mapping end = actual position + 253 rotations
      → Set Par. 41 to 201200
   c) After mounting the drive, the displayed position is 2000. But the positioning range shall solely spread to the left (resp. bottom).
      → upper mapping end = actual position + 3 rotations
      → Set Par. 41 to 3200

Remarks:
1) When calculating the upper mapping end (Par. 41), a security reserve of 3 rotations has to be kept in mind (1200 increments by default, see the examples above), because the highest possible position value is 3 rotations below the upper mapping end. The lowest possible position value is 253 rotations below the upper mapping end.
2) The above given increment and position values relate to the following settings, which correspond to the delivery state:
   a) position scaling, numerator (Par. 38) = 400
   b) position scaling, denominator (Par. 39) = 400
   c) referencing value (Par. 40) = 0
   These 3 parameters have an influence on the above given increment and position values: With the help of the referencing value a shift can be reached, with the help of the position scaling numerator and denominator a stretching or distension can be reached (see below).
3) When changing the direction of rotation (Par. 37), the referencing value (Par. 40), the upper mapping end (Par. 41) and the upper and lower limit (Par. 42 and 43) are set to delivery state.
4) When changing the upper mapping end (Par. 41), the upper limit (Par. 42) will be set to the value [upper mapping end - 3 rotations x scaling] and the lower limit (Par. 43) to the value [upper mapping end - 253 rotations x scaling]. This results in a positioning range of 250 rotations.
5) When changing the position scaling numerator or denominator (Par. 38 or 39), the target value, the actual value, the referencing value, the upper mapping end, the upper and lower limit, the drag error, the positioning window and the length of loop are re-calculated.
6) When changing the referencing value (Par. 40), the target value, the actual value, the upper mapping end and the upper and lower limit are re-calculated.
7) If the user wants to go over any automatic re-calculation of values when setting up the device, the optimum order of transfering the parameter is the following:
   a) direction of rotation (Par. 37),
      position scaling, numerator (Par. 38),
      position scaling, denominator (Par. 39)
   b) referencing value (Par. 40)
   c) upper mapping end (Par. 41)

d) upper limit (Par. 42),
lower limit (Par. 43),
positioning window (Par. 44),
length of loop (Par. 45),
drag error (Par. 46)

8) In order to save the settings permanently in the EEPROM, write 1 to Par. 96. As soon as reading of Par. 96 shows 0, the saving is finished.

Referencing value (Par. 40):
With the help of the referencing value (Par. 40) a shift of the whole range of values can be reached. The referencing process affects all transferred values, i.e., the target value, actual value, upper mapping end and upper and lower limit.
There are two ways of setting the referencing value:

1) Directly, by writing the referencing value to Par. 40.
2) Indirectly, by writing an actual value to Par. 3. This makes it possible to assign any "true" actual value to the current, physical actual value. The resulting difference is then the referencing value. This value will immediately be included in calculations for each transferred value and can also be read via Par. 40.

When changing the referencing value, automatically the target value, the actual value, the upper mapping end and the upper and lower limit are re-calculated.

The removal of the **motor** power supply has no affect on the internal measuring system.

3.7 Using position scaling factors to set the spindle pitch

Par. 38 (numerator factor) and Par. 39 (denominator factor) can be used to represent any desired spindle pitch:

$$number\ of\ \ steps\ per\ revolution = 400 * \frac{numerator\ factor}{denom.\ factor}$$

Both factors are set to a value of 400 by default, resulting in a resolution of 0.01 mm at a spindle pitch of 4 mm.
The denominator factor serves as a simple means of setting the spindle pitch and resolution.
The numerator factor is primarily used for setting "unlevel" resolutions.

Examples:

Spindle pitch	Resolution	Numerator factor	Denominator factor
4 mm	1/100 mm	400	400
1 mm	1/100 mm	400	100
2 mm	1/10 mm	400	20

Numerator and denominator factors may take on values between 1 and 10,000.

3.8 Drag error monitoring

During a positioning run, the device compares the computed target position with the current actual value. If the difference is larger than the “drag error” value (Par. 46), the device sets the corresponding bit in the status word. This situation is especially likely to occur if external factors (required torque, voltage to motor too low) prevent the device from achieving the target rpm.

By setting Par. 46 to 0 the drag error monitoring can be disabled.

3.9 Drag error correction

With Par. 48 the drag error correction can be enabled. With this feature enabled, the drive will raise or lower the target speed proportional to the drag error by the configured value. The drive attempts under consideration of the configured maximum current to compensate the drag error which has developped by controlling the target speed to a value which lays slightly above or below the specified value of the target speed (Par. 53).

By setting Par. 48 to 0 the drag error correction can be disabled.

Drag error monitoring and correction take effect always except during a braking operation when approaching a target position or when aborting a positioning. The actual target speed when accelerating is determined by the actual speed at the beginning of the positioning and the acceleration setting (Par. 58).

3.10 Abort run when the master fails

If the connection to the master is interrupted during a positioning run, the master cannot abort an actual run. In order to generate an automatic run abort in this case, there’s a mechanism implemented in the drive that monitors the communication to the IO controller. In case of a timeout, the drive will abort any positioning (if bits 1-0 of Par. 93 are set to 01, which is the default value). If the connection contains valid data after its re-establishment, the drive might continue to move immediately (where applicable).

3.11 Devices with optional holding brake

The device models PSx30xPN-14, PSx31xPN-14, PSx32xPN and PSx33xPN can be supplied with an optional holding brake. This brake prevents the output shaft from turning when the power supply to the motor is removed, or, if the motor holding torque is too low, to a maximum of the level of the nominal torque. A small degree of rotation always occurs at the output, i.e. the brake cannot be used to hold the drive at a defined position (for this purpose where appropriate the holding torque might be increased with the help of Par. 65 and Par. 66).

To release the brake when a run command is transmitted, these devices first wait for a short time and then run a few increments against the actual direction of movement. The brake is closing at the end of every run (by default 1 sec after the end of the run, Par. 75). The advantage of this feature is, that in case of many subsequent runs the brake has not to be released anew each time.

To adjust the position of the drive manually, it is first necessary to remove the rubber-plug in the top cover (see drawings at the end of these instructions). Then release the brake by pressing down and simultaneously turning using a hex wrench NW3 (PSx31xPN and PSx33xPN) or NW4 (PSx30xPN and PSx32xPN).

3.12 Devices with optional friction brake

The device model PSE34xxPN can be supplied with an optional friction brake. This brake prevents the output shaft from turning when the power supply to the motor is removed, or, if the motor holding torque is too low.

A run command is not approached immediately but only after a short idle period to tighten the brake.
The brake releases at the end of every run.

To adjust the drive manually, it is first necessary to remove the corresponding rubber-plug in the top cover (see drawings at the end of these instructions). The drive can then be rotated using a hex wrench NW4. This is quite difficult as the operator has to overcome both any torque present at the output and the force of the friction brake.

3.13 Reference runs

The PSx3xxPN positioning system is equipped with an absolute measuring system, therefore there's no need for a reference run when powering on the drive. However, if in certain cases a reference run onto a hard block should be desired (e.g. uniquely when installing the drive at a machine), the course of action should be the following:

1) Before commanding the reference run the following settings have to be carried out:
   - set the maximum torque (Par. 64) and the maximum start-up torque (Par. 63) to max. 10% of the nominal torque, resp. the lowest possible values
   - set the maximum holding torque (Par. 66) and the maximum holding torque at end of run (Par. 65) to 0
   - set the rpm limit for aborting run (Par. 57) to 60
   - set the time elapsed until speed falls below rpm limit for aborting run (Par. 70) to 100
     (The span of time in which the drive trys to get over the block, decreases: With the reduced values the positioning will be aborted if the speed stays below 60% of the target speed for longer than 100ms. By default, these values are 30% and 200ms.)
   - set the corresponding upper and lower limit (Par. 42 or 43) in a way that the block location lays considerable within the area between the upper and lower limit
     (Otherwise there's the danger that the block is located within the positioning window and consequently won't be recognized.)
   - Where appropriate, reduce the target speed for manual run (Par. 56).
2) Now start the reference run as manual run, i.e. set bit 0 or 1 and the release bit (bit 4) in the control word.
3) Wait for the drive moving (bit 6 in the status word is set).
4) Wait for the drive has stopped and a positioning error has appeared (bit 6 in the status word is cleared, bit 10 is set).
5) Start a manual run in the opposite direction with the same settings (move a certain distance away from the hard stop in order the drive can move freely).

6) Only now adjust the desired settings of the adove mentioned parameters for normal operation.

4 Technical Data

Ambient conditions

ambient temperature	0 °C to +45 °C		
storage temperature	-10 °C to +70 °C		
shock resistance according to DIN IEC 68-2-27	50 g 11 ms		
resistance to vibration according to DIN IEC 68-2-6	10 Hz to 55 Hz 1,5 mm 55 Hz to 1000 Hz 10 g 10 Hz to 2000 Hz 5 g		
EMC standards	CE		
conformity	CE declaration of conformity available upon request		
protection class	PSE	IP 54	
	PSS	IP 65	
	PSW	IP 66 (in operation) IP 68 (at standstill)	
duty cycle	Device model	Duty cycle in %	Base time in sec.
	PSE34xx PSE30xx to 33xx PSS PSW	20 30 20 20	300 300 600 600

Electrical data

nominal power output	PSx30xPN, PSx31xPN, PSE31xxPN	25 W mit 30 % ED
	PSx32xPN, PSx33xPN	35 W mit 30 % ED
	PSE34xxPN	100 W mit 20 % ED
supply voltage	24 VDC ±10 % (supply voltages for motor and control unit are galvanically isolated) advice: use regulated power supplys	
nominal current, control unit	0.15 A	
nominal current, motor	PSx30xPN, PSx31xPN, PSE31xxPN	2.2 A
	PSx32xPN, PSx33xPN,	3.0 A
	PSE34xxPN	7.8 A
positioning resolution	0.9°	
positioning accuracy	0.9°	
protocol	PROFINET (IEC 61158-6-10)	
absolute value acquisition	optical - magnetic	

Physical data

positioning range	250 usable rotations, no mechanical limits measuring system has a span of 256 turns, minus 3 turns security stock at upper and lower range limit	
torsional rigidity (angle of rotation when switching from operation without backlash to maximum torque)	max. 0.2°	
gear backlash (without spindle compensation run)	max. 0.5°	
spindle lash compensation	automatic loop after every positioning run (may be deactivated)	
output shaft	PSE30xPN-8, PSE31xPN-8	8H9 hollow shaft with adjustable collar
	PSE30xPN-14, PSE31xPN-14, PSE32xPN, PSE33xPN	14H7 hollow shaft with adjustable collar
	PSE31xxPN, PSE34xxPN	14h7 hollow shaft with clamp and feather key
	PSS3xxPN-8 PSW3xxPN-8	8H9 hollow shaft with adjustable collar or 8h8 solid shaft
	PSS3xxPN-14, PSW3xxPN-14	14H7 hollow shaft with adjustable collar or 14h8 solid shaft
recommended diameter of the spindle head	according to the hollow shaft diameter with an interference fit of h9	
maximum radial force	40 N	
maximum axial force	20 N	
dimensions (l x w x h)	see drawings	
weight (approx.)	PSx30xPN-8	650 g
	PSx30xPN-14, PSx32xPN	1200 g
	PSx31xPN-8	700 g
	PSx31xPN-14, PSx33xPN	700 g
	PSE31xxPN	1200 g
	PSE34xxPN	1900 g

For additional specifications and dimension drawings, please visit our website at

http://www.halstrup-walcher.de/en/produkte/positioniertechnik/positioniersysteme/index.php

halstrup walcher

Die Lösung liegt im Detail

EG-Konformitätserklärung im Sinne der
EG- Richtlinie 2014/30/EU, EMV

Certificate of Conformity based on the
European Standard 2014/30/EU

Der Hersteller
The manufacturer

halstrup-walcher GmbH
Stegener Straße 10
79199 Kirchzarten
Deutschland

erklärt, dass die Bauart des Produktes
declares, that the construction of instrument type

Gerätebezeichnung PSE3xx, PSS3xx, PSW3xx
Device designation PSE3xx, PSS3xx, PSW3xx

entwickelt, konstruiert und gefertigt ist in Übereinstimmung mit den EG – Richtlinien
is developed, designed and manufactured in accordance with the EC Directives.

EN 61000-6-2 : 2005
EN 61000-6-4 : 2011

abgegeben durch / stated by:

Sura, Christian
(Nachname, Vorname / Surname, first name)

Geschäftsführer, Managing Director
(Stellung im Betrieb des Herstellers / Position)

Kirchzarten, 10. 10. 2016
(Ort, Datum / City, Date)

(Rechtsgültige Unterschrift/ Signature)