



Quick-change pallet system

VERO-S NSE-E mini 90-25

Assembly and Operating Manual

Imprint

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Document number: 1590495

Version: 02.00 | 17/06/2025 | en

Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management

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Please read the operating manual in full and keep it close to the product.

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1 General

1.1 About this manual

This manual contains important information for the safe, correct use of the product.

It is an integral part of the product and must be kept accessible for personnel at all times.

Personnel must have read and understood this manual before beginning any work. The observance of all safety notes in this manual is a prerequisite to ensure safe work processes.

The illustrations are intended to provide a basic understanding and may deviate from the actual version.

Besides this manual, other documents which apply are those listed under ▶ 1.1.2 [6]

1.1.1 Illustration of safety notes

To make risks clear, the following signal words and symbols are used for safety notes.



⚠ DANGER

Denotes a hazard with a high degree of risk that, if not avoided, will result in death or serious injury.



⚠ WARNING

Denotes a hazard with a medium degree of risk that, if not avoided, could result in death or serious injury.



⚠ CAUTION

Denotes a hazard with a low degree of risk that, if not avoided, could result in a minor or moderate injury.

NOTICE

Information about avoiding material damage.

1.1.2 Applicable documents

- General Terms and Conditions *
- Catalog data sheet for the attached product *
- Technical data sheet for optional attachments *
- Installation drawing
- Software manual *
- IO-Link Device Description (IODD) *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com**.

1.1.3 Design

This manual applies to the following sizes in all variants ▶ 3 [14]

Quick-Change Pallet System

- Size NSE-E mini 90-25 IOL
- Size NSE-E mini 90-25 DIC12

1.2 Warranty

The warranty for standard products is 24 months from the date of delivery from the factory, or 50,000 cycles* for manually operated clamping devices and 500,000 cycles* for power operated clamping devices. For special clamping devices, it is 12 months from the date of delivery from the factory, assuming appropriate use in accordance with the following conditions:

- Observe the applicable documents, ▶ 1.1.2 [6]
- Observance of the ambient conditions and operating conditions
- Observe the care and maintenance instructions

Parts touching the workpiece and wearing parts are not covered by the warranty.

* One cycle comprises one complete clamping procedure ("opening" and "closing").

1.3 Scope of delivery

The scope of delivery includes

- Quick-change pallet system in the variant ordered
- Accessory kit

1.4 Accessories

(see catalog or data sheets when ordering separately)

- SPA mini, SPB mini, SPC mini clamping pins
- Indexing pins IXB V1 mini
- Fitting screw
- Protection cover SDE mini
- Rigid-contact interface

2 Basic safety notes

Improper handling, assembly and maintenance of this product may result in risk to persons and equipment if this operating manual is not observed.

2.1 Appropriate use

- This product and the compatible add-on components are intended for positioning and clamping workpieces or clamping pallets on machine tools or other suitable technical devices.
- The product may only be used within the scope of its technical data.
- The product is intended for industrial and commercial use.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Clamping of pallets and workpieces with temperatures between 5°C and 60°C, with clamping devices for higher temperatures (pneumatically HT variant) up to 200°C.

2.2 Inappropriate use

The product is not being used appropriately if:

- the product is used as a pressing tool, a toolholder, a load-handling device or as lifting equipment.
- the technical data specified are exceeded during usage.
- Ambient conditions and parameters are out of the defined range during use.
- the clamping pin or clamping ring is not mounted properly.
- the product is used for turning applications over 100 RPM without consulting SCHUNK.
- the product is not fully covered by the pallet, the fixture or the workpiece.
- the product is brought into contact with aggressive media, especially acids.
- the product is used in abrasive blasting processes, especially sandblasting.
- if the product is operated with a firmware other than the specified and approved firmware or with a modified firmware.

2.3 Structural changes

Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Only use original spare parts and spares authorized by SCHUNK.

2.5 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction in the service life of the product.

- Ensure that the product is only used within its technical data.
- Ensure that the product is of a sufficient size for the application.
- Ensure that the contact surfaces of the interface and recesses towards the locating surfaces above the mounting points are kept clean at all times.
Prevent chips from entering the interface and cooling emulsion from filling the interface.
- Only use cooling emulsions with anti-corrosive additives when machining.

2.6 Material limitations

The product is made of steel alloys, elastomers, aluminum alloys and bronze alloys. In addition, Branotect anti-rust oil and lubricating greases are incorporated into the product as auxiliary and operating materials.

2.7 Personnel qualification

Inadequate qualification of personnel

Any work on the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.

- All work must be performed by appropriately qualified personnel.
- Personnel must have read and understood the complete manual before beginning any work on the product.
- Observe country-specific accident prevention regulations and the general safety notes.

The following personnel qualifications are required for the various activities on the product:

Qualified electrician	Qualified electricians have the professional training, knowledge, and experience to work on electrical systems, to recognize and avoid potential dangers, and know the relevant standards and regulations.
Specialist personnel	Specialist personnel have the specialized training, knowledge, and experience to perform the tasks entrusted to them, to recognize and avoid potential dangers, and know the relevant standards and regulations.
Instructed person	Instructed persons have been instructed by the operator regarding the tasks entrusted to them and the potential dangers of inappropriate behavior.
Manufacturer's service personnel	The manufacturer's service personnel have the specialized training, knowledge, and experience to perform the work entrusted to them and to recognize and avoid potential dangers.

2.8 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff in the event of a danger that may interfere with their health or safety at work.

2.9 Transport

Handling during transport

Incorrect handling during transport can make the product unsafe and risks the danger of serious injuries and considerable material damage.

- During transport and handling, secure the product to prevent it from falling.

2.10 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly can make the product unsafe and can risk the danger of serious injuries and considerable material damage.

- All work must only be performed by appropriately qualified personnel.
- Secure the system against accidental operation during all work.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

2.11 Protection during commissioning and operation

Falling or violently ejected components

Falling and ejected components can lead to serious injury or death.

- Take suitable protective measures to secure the danger zone.

Manual loading

- If the clamping device is closed, the clamping pallet rests on the clamping slides after loading. When the clamping device is opened, the clamping pallet falls down. This poses a risk of crushing.

2.12 Notes on safe operation

Incorrect manner of working by personnel

An incorrect manner of working can make the product unsafe and risks serious injuries and considerable material damage.

- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. Products for special ambient conditions are excluded here.
- Do not expose the product to any media that lead to swelling or corroding of seals.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.
- The machine spindle must not be started until the clamping pressure in the clamping device has built up.
- Unclamping may only occur once the machine spindle has come to a standstill.

2.13 Disposal

Handling of disposal

Incorrect handling of disposal can make the product unsafe and lead to risks of environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.14 Fundamental dangers

General

- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- Do not reach into the open mechanism or movement area of the product during operation.

2.15 Protection against dangerous movements

Safe condition

Quick-change pallet system clamped and without energy.

Unexpected movements

If the system still retains residual energy, serious injuries can be caused while working on the product.

- Establish a safe state, switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.

2.16 Notes on particular risks



⚠ WARNING

Risk of injury due to falling device, pallet or workpiece if the clamping pin or clamping ring is loosened erroneously or as a result of negligence.

- During operation, unintentional loosening of the clamping pin or clamping ring must be prevented by suitable countermeasures (implementation of the safety functions according to the risk assessment of the integrator).
- Wear personal protective equipment.



⚠ WARNING

Risk of injury during commissioning due to a falling unlocked device, pallet or workpiece.

- During loading, check that the coupling elements, devices, pallets or workpieces are positioned so they are aligned to each other.
- Clamping pallets with torque pin must be fed to the module in the correct orientation before locking.



⚠ WARNING

Risk of injury when the clamping pin or clamping ring axis is in a horizontal position or during overhead applications due to the device or pallet falling down.

- Use a crane or a transport truck when transporting workpieces or clamping pallets.
- During horizontal or overhead applications, the device or clamping pallet must be secured before loosening to prevent it from falling.



⚠ WARNING

There is a risk of limbs being crushed during manual loading and unloading if the gaps on moving parts are too big, as well as during the clamping procedure.

- Do not reach into the clamping pin holder.
- Use loading devices.
- Wear protective gloves.



⚠ WARNING

Risk of injury due to rotation movements of the product.

When the product is commissioned, resulting rotation and swivel movements may catch or pull in adjoining components or limbs.

- The danger zone must be surrounded by a protective enclosure during operation.
- Follow the safety and accident-prevention regulations when operating the product, especially when working with machine tools and other technical equipment.



⚠ WARNING

Risk of injury due to hot surfaces!

Touching hot surfaces can cause burns.

- Before carrying out any work on the product, make sure that all surfaces have cooled down to the ambient temperature.
- Wear suitable protective equipment, especially protective gloves.



⚠ CAUTION

Risk of injury due to crushing.

- Install the product carefully.
- Do not place any limbs into the gaps or between the product and the machine.
- Wear protective gloves.



⚠ CAUTION

Risk of injury from media transfer unit interfaces under voltage. The actuated clamping device on top of these may move unexpectedly as a result.

- Do not control the media transfer units until the device is clamped on the quick-change pallet systems.
- Take suitable protective measures to secure the danger zone.



⚠ CAUTION

Risk of injury due to contamination (e.g. coolant or splashing water) in the change interface.

- Clean the quick-change pallet system before loading.
- Wear personal protective equipment (safety goggles).

3 Product description

3.1 Description of design and variant

NSE-E mini 90-25 Variant	I0-link	Digital inputs and outputs	Torque pin V1	Electrical spring contact interface	Electrical plug connection
I0L	X	-	-	X	-
-V1 I0L	X	-	X	X	-
DIC12	X	X	-	-	X
-V1 DIC12	X	X	X	-	X

3.2 Technical data

Supply voltage I0-Link [VDC]	24
Supply voltage drive system [VDC]	24
Quiescent current [mA]	50
Average current consumption* [mA]	600
Max. current peak over 100 ms** [mA]	3000
Repeat accuracy [mm]	< 0.005
Installation position	any
Operating temperature [°C]	+5 to +60
Storage temperature [°C]	-20 to +80
Required level of cleanliness	dry cleaned interfaces, not permanently exposed to humidity, use with coolant with corrosion protection additive
Noise emission [dB(A)]	≤ 70
Protection class	IP 67

Designation Variant	ID	Holding force*** (M6 / M8) [kN]	Pull down force [kN]
NSE-E mini 90-25 I0L	1521521	15 / 25	3
NSE-E mini 90-25-V1 I0L	1521522	15 / 25	3
NSE-E mini 90-25 DIC12	1547865	15 / 25	3
NSE-E mini 90-25-V1 DIC12	1547866	15 / 25	3

* Average current consumption over one clamping cycle (clamping / opening)

** Current peak max. 1 time over one clamping cycle

*** Holding force when fastening the clamping pin with cylindrical screw – DIN EN ISO 4762/12.9

3.2.1 Suitability for welding applications

The clamping device can be used for welding applications with a **welding current of up to 525 A**. The welding current is allowed to flow through the clamping device.

NOTICE

In welding applications, special care must be taken to ensure that the operating temperature of the clamping device is not exceeded due to heat conduction in the workpiece.

NOTICE

The contact surfaces of the workpiece and the clamping bolt must always be kept clean to ensure the best possible contact with the clamping device.

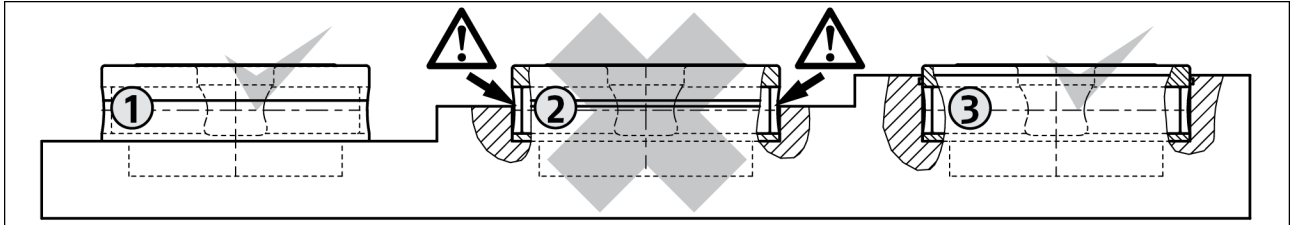
If the quick-change pallet system is to be used outside the specified welding currents, please contact your SCHUNK contact person.

4 Assembly

4.1 Pre-assembly

Request our installation drawings if installing the module in the customer's clamping stations yourself.

The installation position must be observed when performing the installation yourself.



1 Partial installation

2 Do not use

3 Full installation

NOTICE

With installation location 2, the clamping slide can be blocked by chips and dirt. For this reason, do not use this installation position.

- Damage to the clamping module is possible.

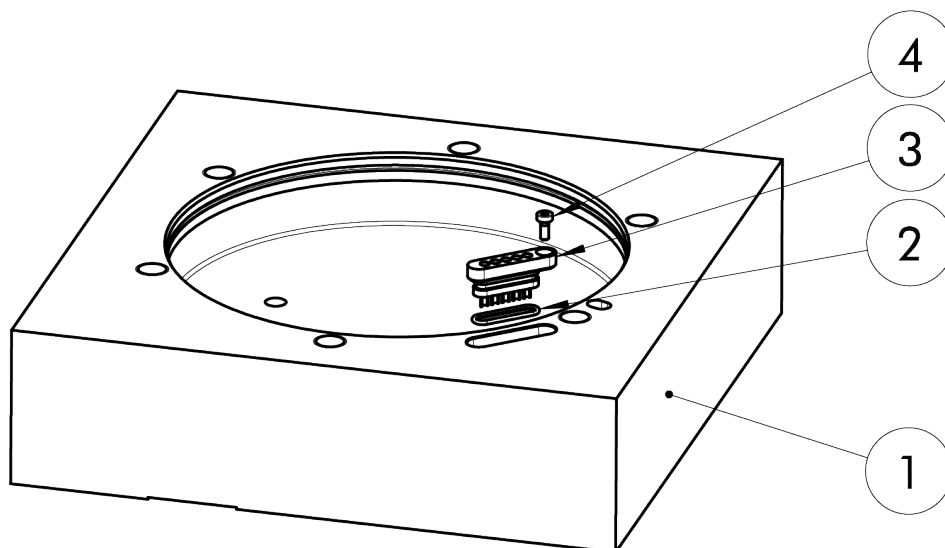
4.2 Electrical rigid contact interface

The electrical rigid contact interface is only used in the NSE-E mini 90-25 IOL and NSE-E mini 90-25-V1 IOL sizes.

The electrical rigid contact interface must be installed in the clamping station by the customer, electrically connected and tested. The screw tightening torques ▶ 4.3 [□ 17] and the cable cross-sections must be observed. The rigid-contact interface is not included in the scope of delivery of the module and must be ordered as an accessory in the desired version.

NOTICE

Do not use excessive temperatures when attaching the cables to the rigid contacts. This can damage the rigid contacts.



- 1 Customer-side clamping station
- 2 Sealing
- 3 Rigid-contact interface
- 4 Screw

NOTICE

The rigid contact interface is only protected against the ingress of water when the module is installed. Do not bring it into contact with moisture or water before installing the module!

4.3 Screw tightening torques

Tightening torques for mounting clamping pins

(Screw quality 12.9)

Screw size	M3	M4	M5	M6	M8	M10	M12	M14	M16
Tightening torque M_A (Nm)	2.4	5	9	15	32	62	108	170	262

Tightening torques for mounting the clamping modules

(Screw quality ≥ 10.9)

Schraubengröße	M3	M4	M5	M6	M8	M10	M12	M14
Tightening torque M_A (Nm)	1.7	4.2	7.5	13	28	50	88	120

Tightening torques for fastening the rigid contact interface

(Screw quality A2)

Schraubengröße	M2
Tightening torque M_A (Nm)	0.3

4.4 Installing and connecting



⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.



⚠ CAUTION

Danger of injury due to sharp edges and rough or slippery surfaces

- Wear personal protective equipment, particularly protective gloves.



⚠ CAUTION

Risk of injury from electric shock if the clamping device is not yet fitted (open interface)

Only connect the interface to the power supply after installation is complete



⚠ CAUTION

Risk of injury due to short circuit if the clamping device has not yet been fitted (open interface)

Only connect the interface to the power supply after installation is complete

Assembly sequence NSE-E mini 90-25 IOL

1. Disconnect the electrical interface from the power supply and secure against reconnection.
2. Check the flatness of the mounting surface, ▶ 4.5 [20].
3. Clean the interface and dry if necessary.

NOTICE

The interface is only splash-proof when the module is installed (IP 67). Only clean open interfaces dry. Do not clean the open interface with compressed air, otherwise dirt or humidity may get into the interior of the interface.

NOTICE

Humidity in the interface leads to corrosion of the contacts during operation and can lead to module failure. Humidity on the interface must be removed before assembling the module.

4. Screw the module with the O-rings inserted onto the clamping station.
Observe the orientation of the electronic interface or orientation pin.
Observe permissible tightening torques for the mounting screws and the strength class, ▶ 4.3 [17].
5. Connecting the power supply and IO-Link communication.

Assembly sequence NSE-E mini 90-25 DIC12

1. Disconnect the electrical interface from the power supply and secure against reconnection.
2. Check the flatness of the mounting surface, ▶ 4.5 [20].
3. Screw the module onto the clamping station.
Observe permissible tightening torques for the mounting screws and the strength class, ▶ 4.3 [17].
4. Provide electrical contact via a suitable cable ▶ 4.5.2 [25] on the electrical plug connection of the module.

NOTICE

The interface is only splash-proof (IP 67) when the corresponding plug is plugged in and tightened. Humidity on the contact pins of the connector leads to corrosion of the contacts during operation and can result in module failure.

4.5 Fastening and connection

Flatness

If several linked clamping modules are mounted, make sure that the flatness and height deviation of the locating surfaces from module to module (based on a 100 mm gauge for bore holes) is ≤ 0.01 mm. The gauge deviation may not exceed ± 0.015 mm.

Redundancy

Due to redundancy, the clamping pins with positioning accuracy in one direction (SPB mini 20) should be used for clamping systems that are more than 100 mm apart or that do not show a positioning tolerance of ± 0.01 mm. For the clamping areas that are not intended for alignment of the device or pallet, clamping pins with centering clearance (SPC mini 20) can be used (refer to ▶ 4.6 [□ 25]).

4.5.1 Size NSE-E mini 90-25 IOL

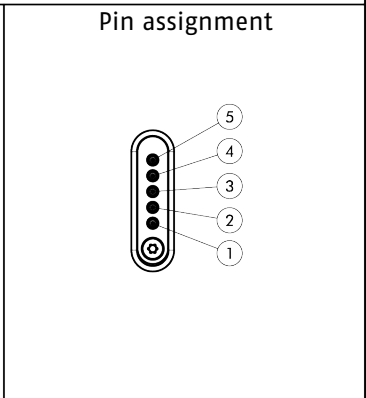
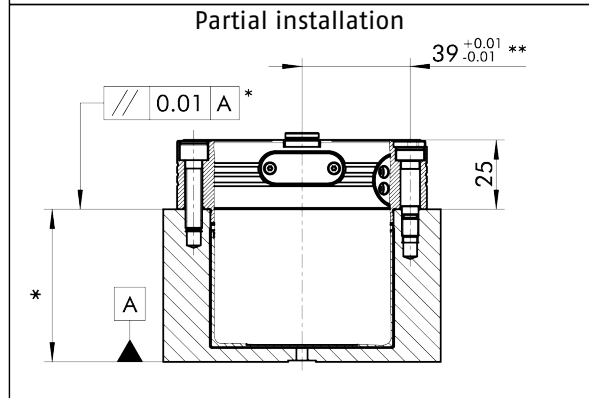
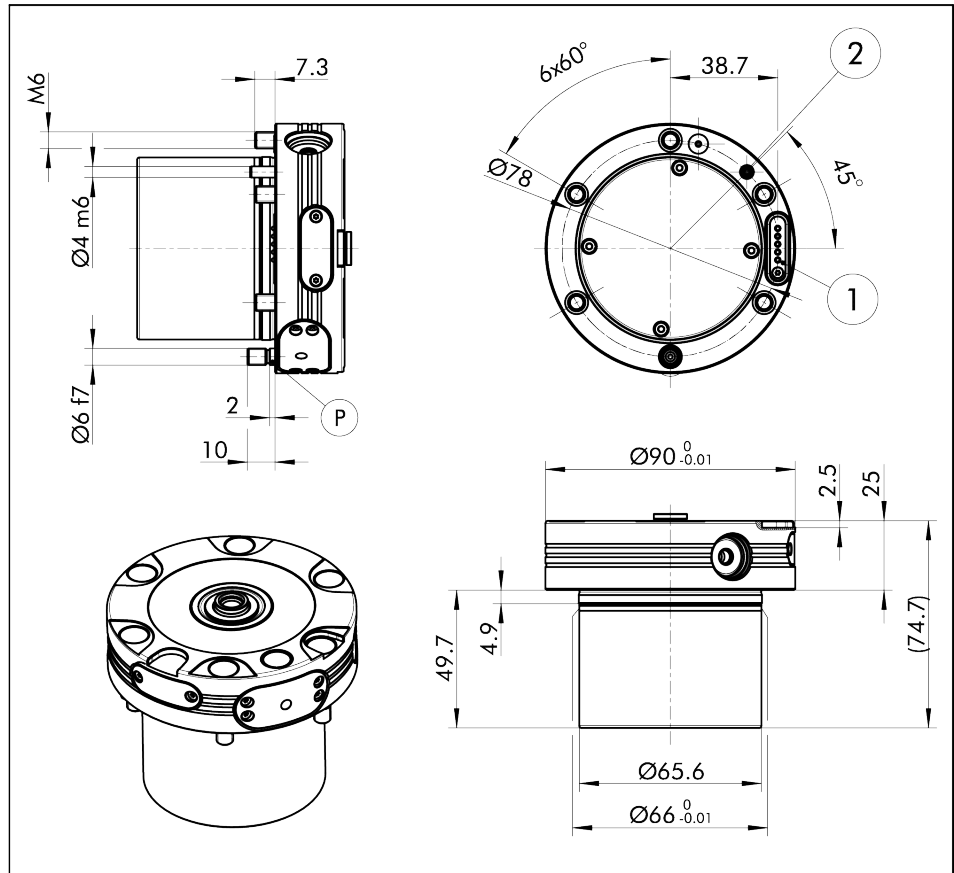
Fastening in the installation space with 6 M6 screws, ▶ 4.3 [□ 17]. The assembly module is positioned using the centering diameter of the installation space: **Ø66 H6**.

The orientation pin ② must be observed for positional orientation.

For variants with anti-rotation protection ▶ 3.1 [□ 14], one screw is designed as a fitting screw ③, which ensures exact position orientation via a fitting bore **Ø6 H7** in the counterpart.

The interface for IO-Link communication and the power supply for the drive unit is provided via the spring contact interface on the ground side ①. The rigid contact interface ▶ 10 [□ 35] (not included in the scope of delivery) must be implemented and connected by the customer. Two connection variants are possible here:

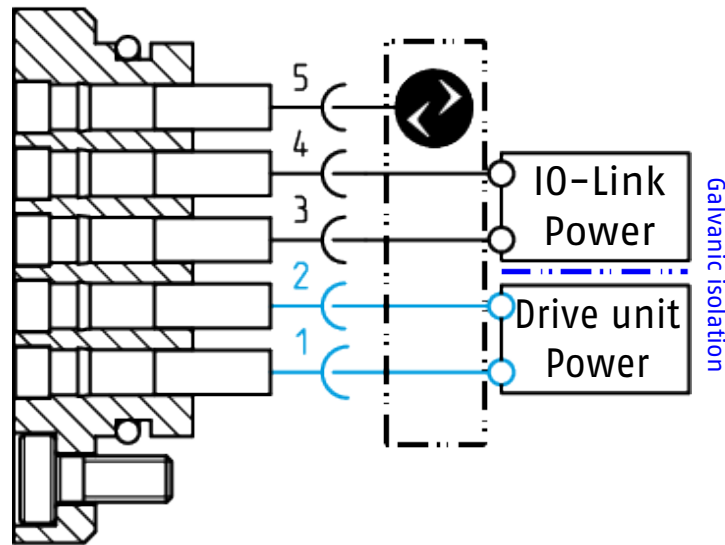
1. Connection to master with Class A port (Pin 3-5) and to galvanically isolated power supply unit (Pin 1-2).
2. Connection to master with Class B port (Pin 1-5).



* All clamping systems of equal height within 0.01 mm

** Clearance for fitting screw for variants with anti-rotation protection

Circuit diagram



Pin	Assignment	Function	minimum cross section	IO-Link connection port type		
				Power supply unit	Class A	Class B
1	2 L+	Drive unit +24 VDC Power	0.25 mm ²	X	-	X
2	2 L-	Drive unit GND	0.25 mm ²	X	-	X
3	L+	IO-Link +24 VDC Power	0.25 mm ²	-	X	X
4	L-	IO-Link GND	0.25 mm ²	-	X	X
5	C/Q	IO-Link Communication	0.25 mm ²	-	X	X

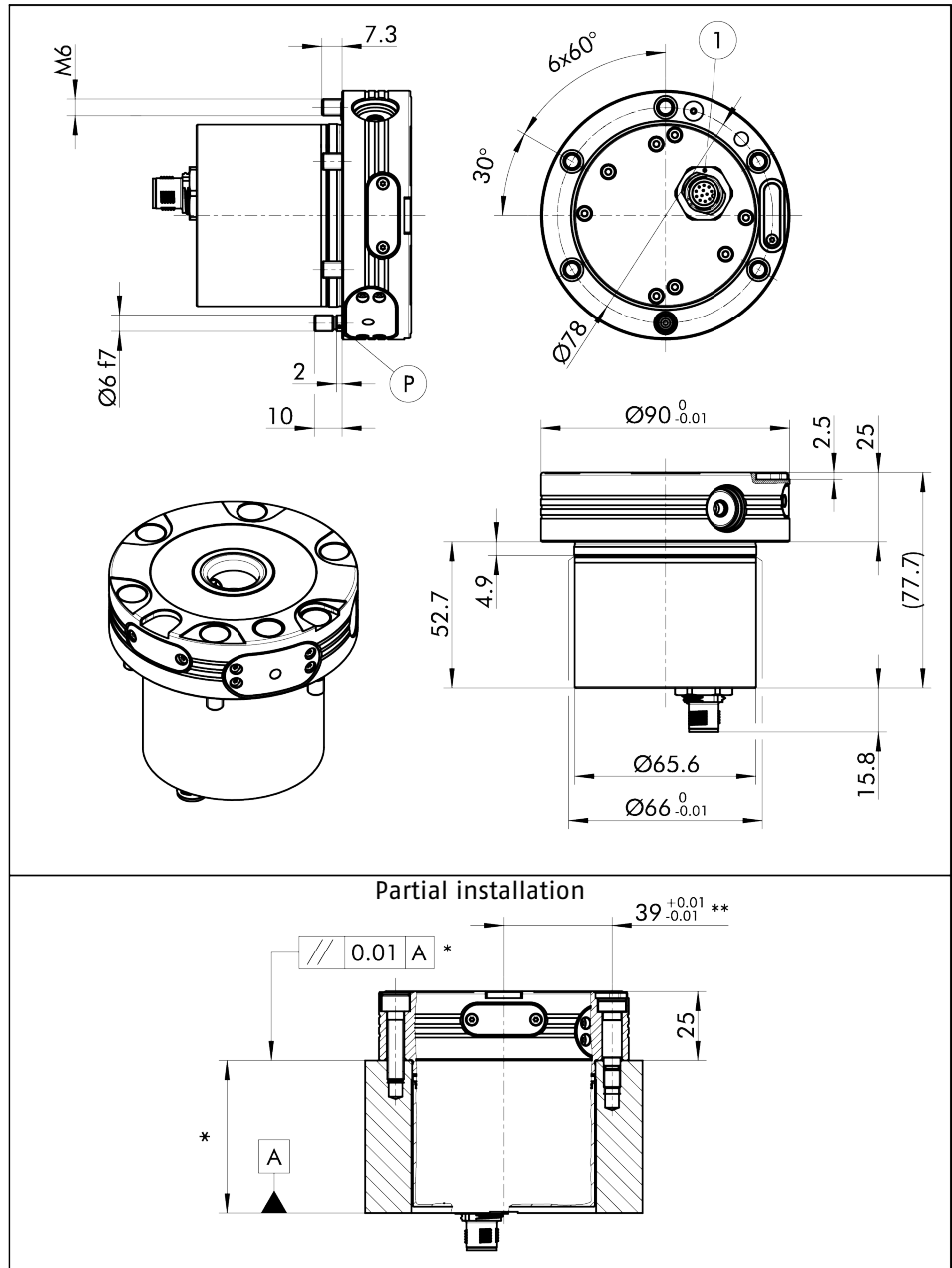
4.5.2 Size NSE-E mini 90-25 DIC12

Fastening in the installation space with 6 M6 screws, ▶ 4.3 [17].

The assembly module is positioned using the centering diameter of the installation space: **Ø66 H6**.

For variants with anti-rotation protection ▶ 3.1 [14], one screw is designed as a fitting screw ⊕, which ensures exact position orientation via a fitting bore **Ø6 H7** in the counterpart.

The interface for IO-Link communication and the power supply for the drive unit is provided via a 12-pin plug interface ①. The connection cable with corresponding mating connector must be installed by the customer.



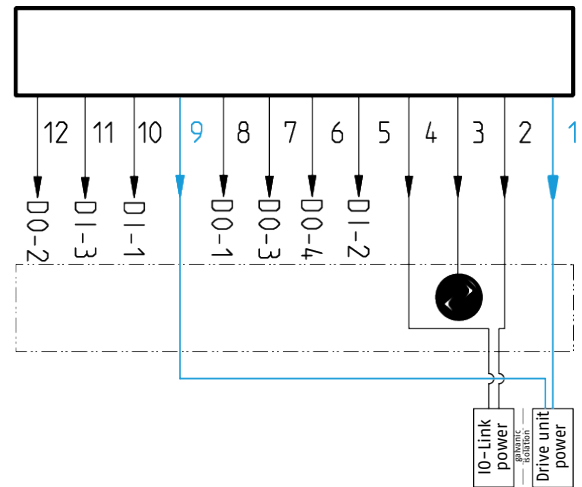
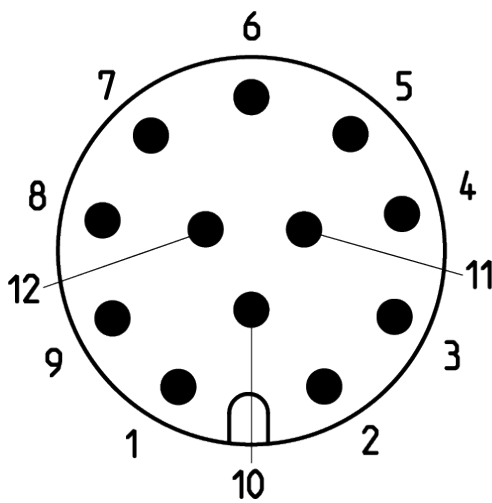
* All clamping systems of equal height within 0.01 mm

** Clearance for fitting screw for variants with anti-rotation protection

Electrical plug connection

Type	Circular connector
Thread type	M12
Number of poles	12
Coding	A

Circuit diagram & pin assignment



Pin	Assignment *	Function	minimum cross section	IO-Link connection port type		
				Power supply unit	Class A	Class B
1	2 L+	Drive unit +24 VDC Power	0.14 mm ²	X	-	X
2	L+	IO-Link +24 VDC Power	0.14 mm ²	-	X	X
3	C/Q	IO-Link Communication	0.14 mm ²	-	X	X
4	L-	IO-Link GND	0.14 mm ²	-	X	X
5	DI-2 **	Move to intermediate position	0.14 mm ²	-	-	-
6	DO-4	Presence detected	0.14 mm ²	-	-	-
7	DO-3	Clamped with clamping pin	0.14 mm ²	-	-	-
8	DO-1	Ready for operation and referenced	0.14 mm ²	-	-	-
9	2 L-	Drive unit GND	0.14 mm ²	X	-	X
10	DI-1 **	Release	0.14 mm ²	-	-	-
11	DI-3 **	Clamp	0.14 mm ²	-	-	-
12	DO-2	Open	0.14 mm ²	-	-	-

* DI = Digital input 0 / 24 V; DO = Digital output 0 / 24 V

** $0\text{ V} \leq U_{DI} < 8,2\text{ V}$ against L- (GND) = 0 [false]

$8,2\text{ V} \leq U_{DI} \leq 24\text{ V}$ against L- (GND) = 1 [true]

4.6 SPA mini 20, SPB mini 20, SPC mini 20 clamping bolts

NOTICE

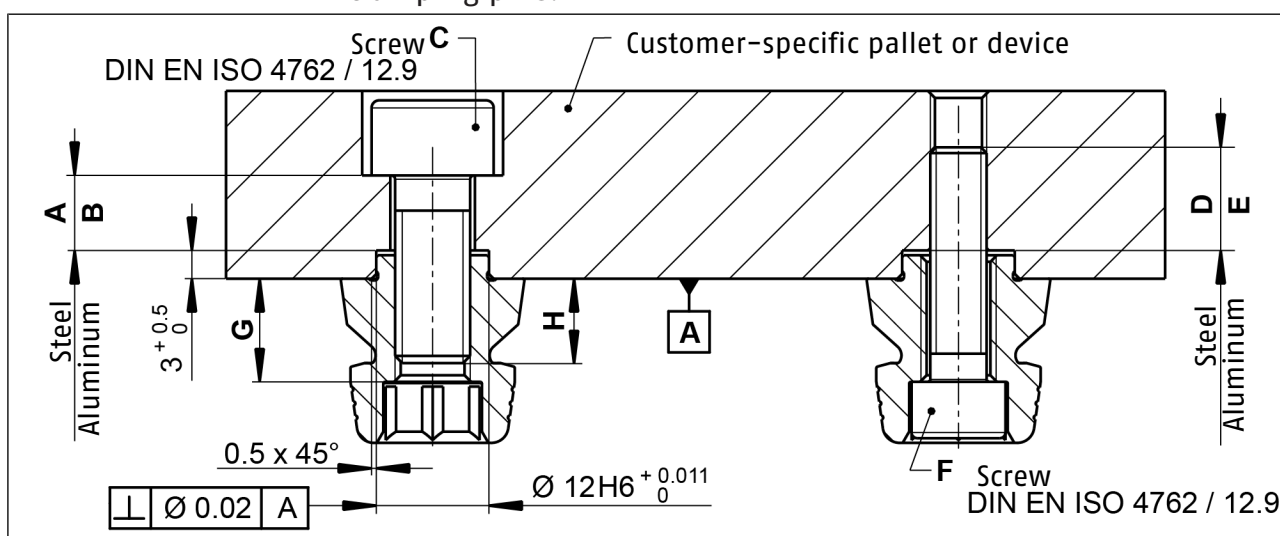
Notes on clamping pins and mounting screws

The holding force of the quick-change pallet system is essentially limited by the tightness of the screw connection connecting the clamping pin to the pallet or the device. This is why only screws of strength class 12.9 may be used, ▶ 4.3 [17].

Only original SCHUNK clamping pins may be used.

If the clamping pins are to be used in customer-owned devices, the customer must provide sufficiently dimensioned threaded holes or a sufficiently thick mounting material.

The clamping pins can be attached to the device or pallet in two different ways. The mounting variant on the left in the illustration, which is screwed from above, is the preferred variant. With this variant, if there is a module failure then the device or pallet can be removed after disassembling the clamping pins.

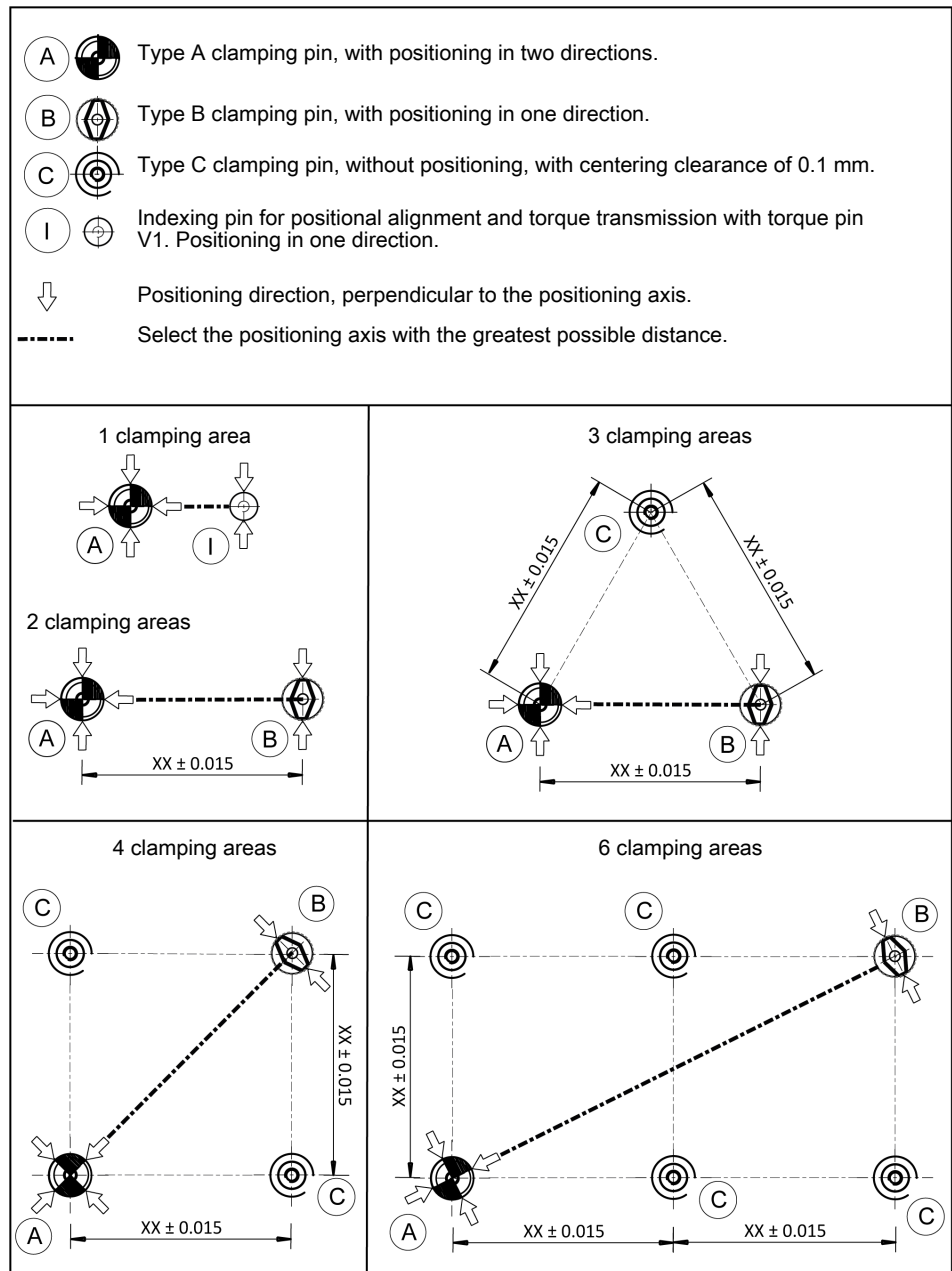


Mounting the clamping pins

Tolerances and installation conditions

Type	ID	A	B	C	D	E	F	G	H
SPA mini 20	0435610	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPB mini 20	0435620	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPC mini 20	0435630	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm

Usage/arrangement of the different types of clamping pins



5 Function

The VERO-S NSE-E mini 90-25 IOL and NSE-E mini 90-25 DIC12 are electromechanical quick-change pallet systems. The modules move the clamping slides via an electric actuator and clamp on the clamping pin and thus generate the pull-in force on the clamping pin.

The customer can adapt the communication to the higher-level fieldbus level by selecting the IO-Link master. The module, including the IO-Link, is fieldbus-independent.

The positions "open", "clamped with pin", "closed without pin", "intermediate position reached" and "pallet present" are displayed. Detailed information on the control and the signals can be found in the software manual.

5.1 Communication

5.1.1 Size NSE-E mini 90-25 IOL

Communication takes place via the IO-Link protocol. Detailed information about the individual parameters can be found in the software manual.

5.1.2 Size NSE-E mini 90-25 DIC12

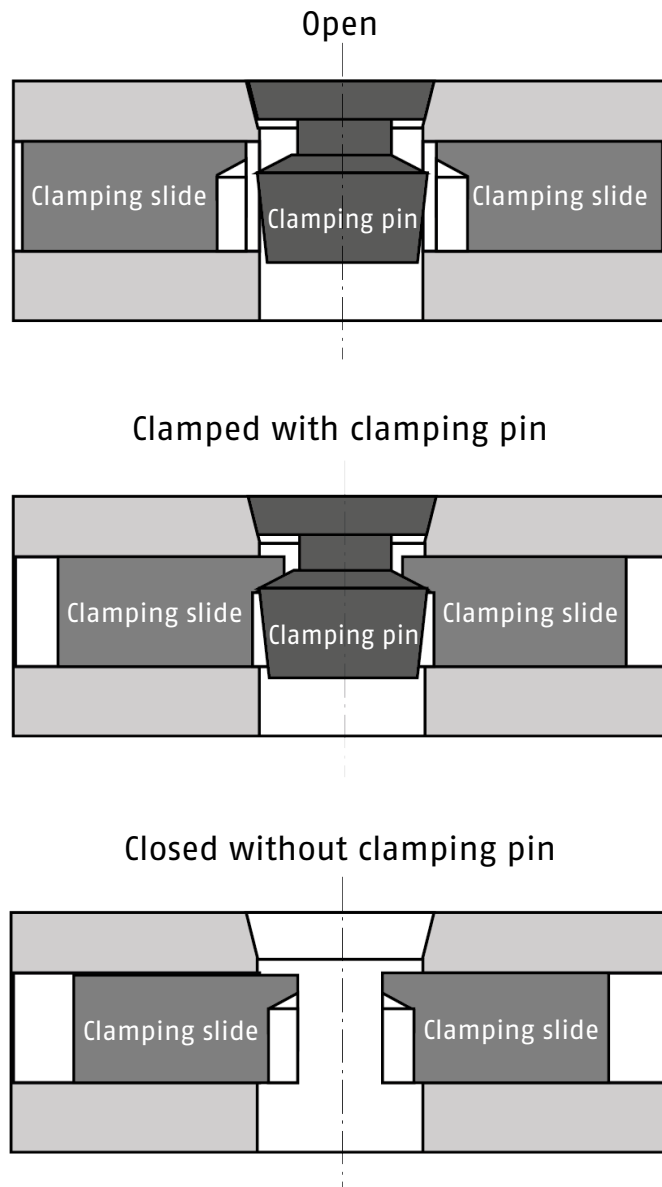
Communication takes place either via the IO-Link protocol and/or the digital inputs and outputs. The digital inputs can be activated or deactivated using the IO-Link interface by setting an acyclic parameter value. The digital inputs are activated by default. The digital outputs are always active regardless of the acyclical parameters. Detailed information on the individual parameters can be found in the software manual.

5.2 Move commands

The clamping slides of the quick-change pallet system can be moved using the move commands. More detailed information on the individual parameters can be found in the software manual.

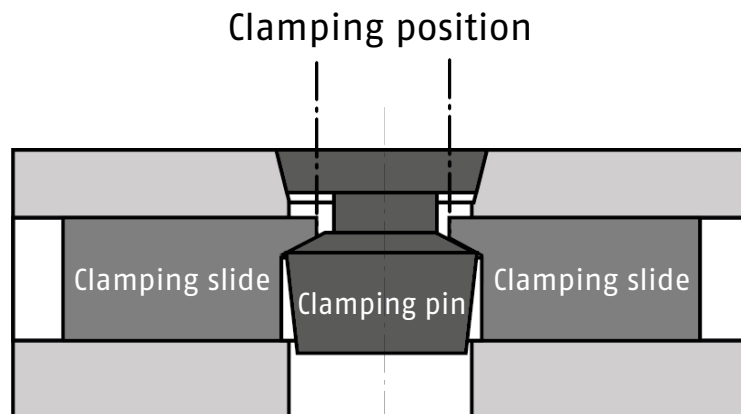
5.2.1 Clamping / releasing

The clamping / releasing commands are used to clamp or release the clamping pin. If the "Release" move command is actuated, the quick-change pallet system moves to its open position. The module then indicates "open", see illustration. If the "Clamp" movement command is actuated, the module moves with its clamping slides onto the clamping bolt and builds up the pull-in force according to the data sheet. The module then indicates "clamped with pin", see illustration. If no clamping pin is inserted, the module moves to the clamping slide end positions. The module then signals "closed without pin", see illustration.

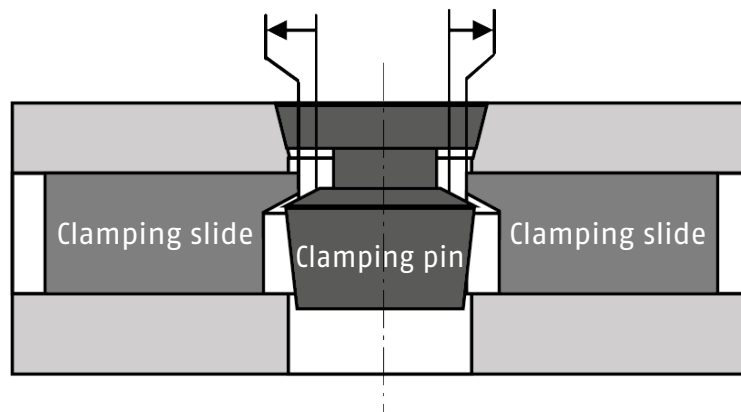


5.2.2 Intermediate position

The intermediate position is a position between clamped and open. The position can be set via the IO-Link parameter "Distance between clamping position and intermediate position". The intermediate position serves as a pre-position in which the clamping slides already engage over the clamping bolt, but no pull-in force is built up yet. This can be used, for example, to avoid a redundancy when joining components in handling tasks.



Distance between clamping position and intermediate position



⚠ WARNING

Risk of injury due to loss of the workpiece!

If the intermediate position is set incorrectly, the workpiece may be lost and cause serious injury.

- Ensure that the clamping slides in the intermediate position always extend over the clamping bolt.
- No workpiece transport in the intermediate position.
- No workpiece machining (e.g. milling) in the intermediate position.

5.2.3 Reference

The quick-change pallet system is factory-referenced. If energy is lost during movement, the module may lose its reference. This is indicated by the Boolean value [false] of the "referenced" status bit in the IO-Link process data word. During the reference run, the module moves at a reduced speed against its internal stops. To reference the module, ensure that no clamping pin is inserted and that the clamping slides can move freely, then press the "Reference" movement command.

5.2.4 Teaching on clamping pins

The quick change pallet system is taught to a reference clamping pin at the factory. It is possible to teach the position of the clamping pin again using the "Teach to pin" movement command. To do this, insert a pallet with a clamping pin into the module and press the "Teach to pin" movement command. The module then moves once onto the clamping pin and back again, saving the position of the clamping pin in the data memory.

5.3 Pallet presence detection

The presence of a pallet is detected via the front-mounted proximity sensor. The "Teach proximity sensor" movement command can be used to teach the material-dependent and, if necessary, distance-dependent threshold value for detecting the presence of a pallet.

5.4 LED indication

The LED is located on the side of the quick-change pallet system and is used to display the status.

LED	Clamping slide	Presence
green	clamped with clamping pin	detected
red	clamped with clamping pin	not detected
no signal	opened	any
red	closed without clamping pin	any
red	undefined	any
flashing red / green	Intermediate position reached	any
1x red and 1x green flashing	boot procedure	Boot procedure
flashing red	device error / connection setup / no IO-Link connection	device error / connection setup / no IO-Link connection

6 Operation

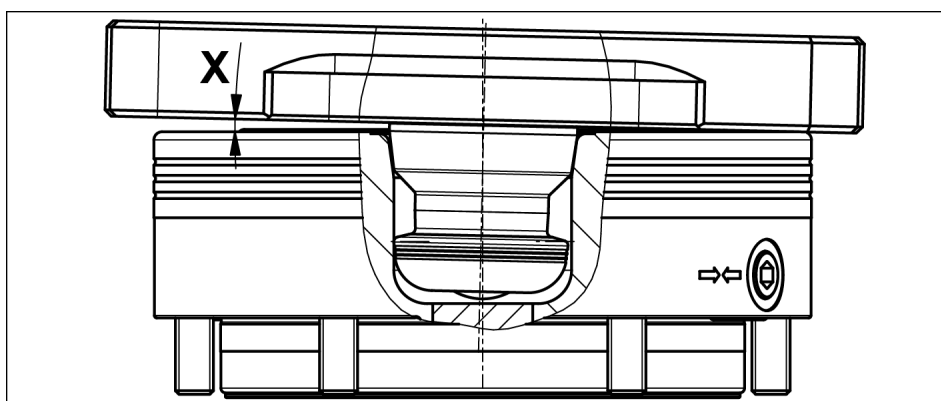
NOTICE

When changing the pallet using lifting equipment or a robot, ensure that the pallet is lifted exactly parallel to the modules.

The inclination (X) during lifting may not exceed 1.2°.

If the inclination is larger, the clamping pins can jam and the system components could be damaged or destroyed. In this case, the system must be inspected and damaged parts must be replaced immediately.

Only original SCHUNK spare parts may be used!



⚠ WARNING

Risk of injury due to losing pallets or workpieces in the case of incorrect actuation caused by incorrect operation.

- Disconnect the energy supply of the drive unit after locking.
- Use safety switches.
- The danger zone must be surrounded by a protective enclosure during operation.



⚠ WARNING

Risk of injury due to sudden movements!

- Before starting any work on the product: Switch off the energy supply of the drive unit and secure against re-connection.
- Ensure that no residual energy remains in the system.

7 Maintenance and care

The quick-change pallet system is designed for low-maintenance operation, so that opening and disassembling the clamping modules is only necessary in exceptional cases.



⚠ CAUTION

Allergic reactions or irritation due to skin or eye contact with lubricants on the product.

- Wear protective equipment (protective gloves, protective goggles) in case of foreseeable contact with lubricants on the product (e.g. when lubricating or cleaning)

NOTICE

If the clamping module has to be disassembled, send the module to SCHUNK for repair.

The covers of the clamping modules seal the electronics of the clamping module against moisture ingress and may only be removed by trained SCHUNK personnel. If the covers are opened independently, the warranty of the clamping module is voided.

To ensure the quick-change pallet system operates perfectly, the following instructions are to be observed:

- Check the units at regular intervals (at least every two weeks or after 1000 clampings).
The system is functioning correctly if all signals are transmitted correctly and no error messages are displayed during operation.
- Carry out regular visual/functional checks. In case of visible damage or signs of malfunction, shut down the quick-change pallet system immediately. The system may only be commissioned again once the faults have been corrected. For example, by replacing the damaged unit.

8 Troubleshooting

8.1 The clamping area does not lock

Possible cause	Remedial measures
Incorrect control	Check whether the correct move command is set Check that no 2nd move command is set
Defective power connections	Check actuator voltage / check cables Check logic voltage / check cables
The "Clamped with pin" position is not recognized due to increased wear on the clamping pin.	Insert new clamping pin. Teach on pin

8.2 The clamping area does not unlock

Possible cause	Remedial measures
Incorrect control	Check whether the correct move command is set Check that no 2nd move command is set
Defective power connections	Check actuator voltage / check cables Check logic voltage / check cables
Power supply too weak	Use a power supply unit that meets the requirements of the technical data ▶ 3 [14]
A component is broken (e.g. due to overloading)	Replace the module or send it to SCHUNK for repair
Excess tensile load on clamping pins	Reduce support weight

8.3 The quick-change pallet system no longer opens quietly

Possible cause	Remedial measures
The clamping faces on the clamping slides and on the clamping pin are dirty	Remove the clamping pin and clean the clamping faces on the clamping slides and on the clamping pin

9 Storage

When storing the product for a longer period of time, observe the following points:

- Clean the product and lubricate it lightly.
- Store the product in a suitable transport container.
- Only store the product in dry rooms.
- Protect the product from major temperature fluctuations.

NOTE: Before recommissioning, clean the product and all attachments, check for damage, functionality and leaks.

10 Part lists

NSE-E mini 90-25 IOL (ID 1521521)

NSE-E mini 90-25-V1 IOL (ID 1521522)

NSE-E mini 90-25 DIC12 (ID 1547865)

NSE-E mini 90-25-V1 DIC12 (ID 1547866)

Item	Designation	Quantity	Note
1	Base body	1	
2	Screw	5	V1
	Screw	6	
3	Cover cap	6	
4	Fitting screw	1	V1
5	O-ring	1	IOL
6	Rigid contact interface	1	IOL

* not included in the scope of delivery. To be ordered as an accessory.

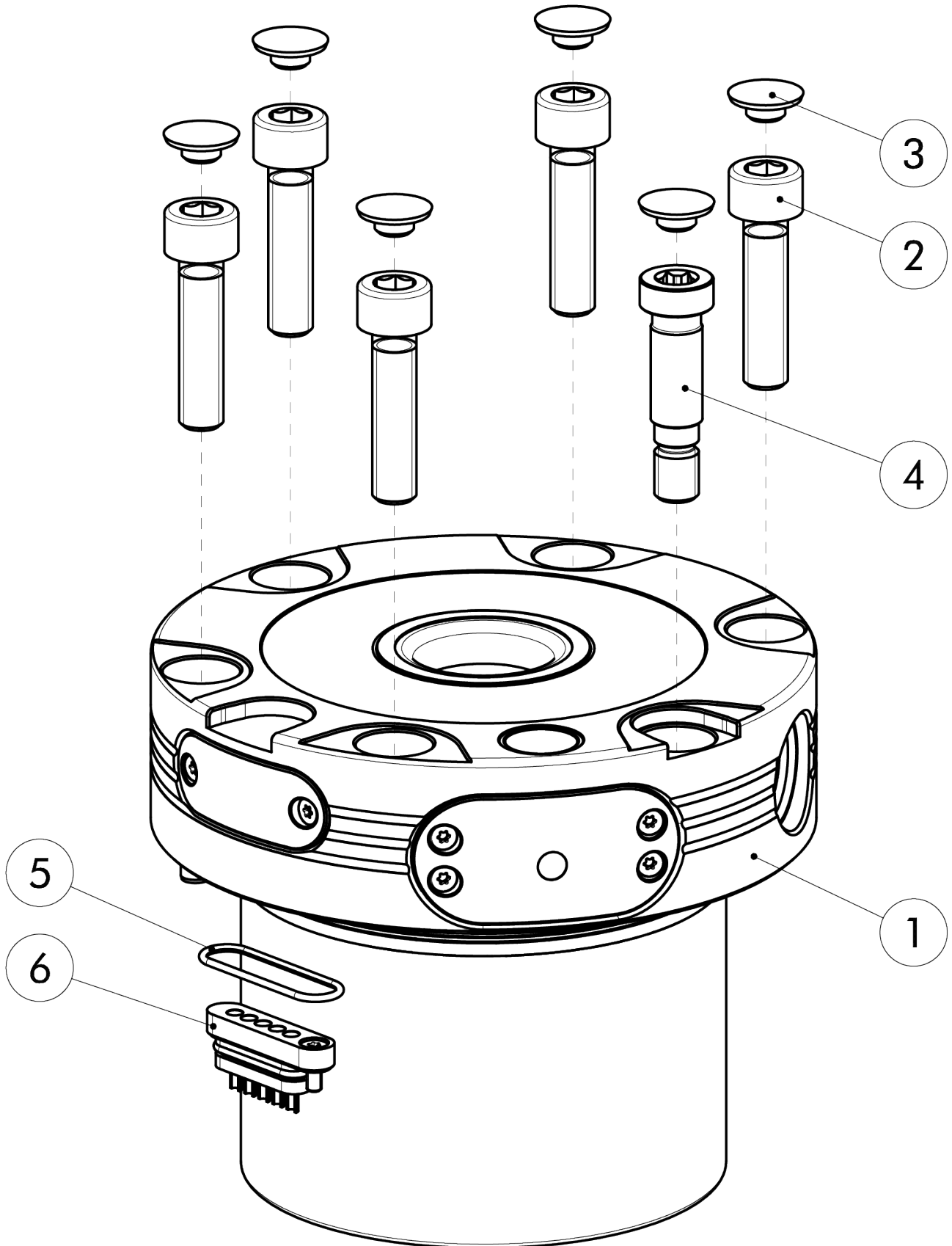
Parts list key

V1 only for NSE-E mini 90-25-V1 IOL and NSE-E mini 90-25-V1 DIC12

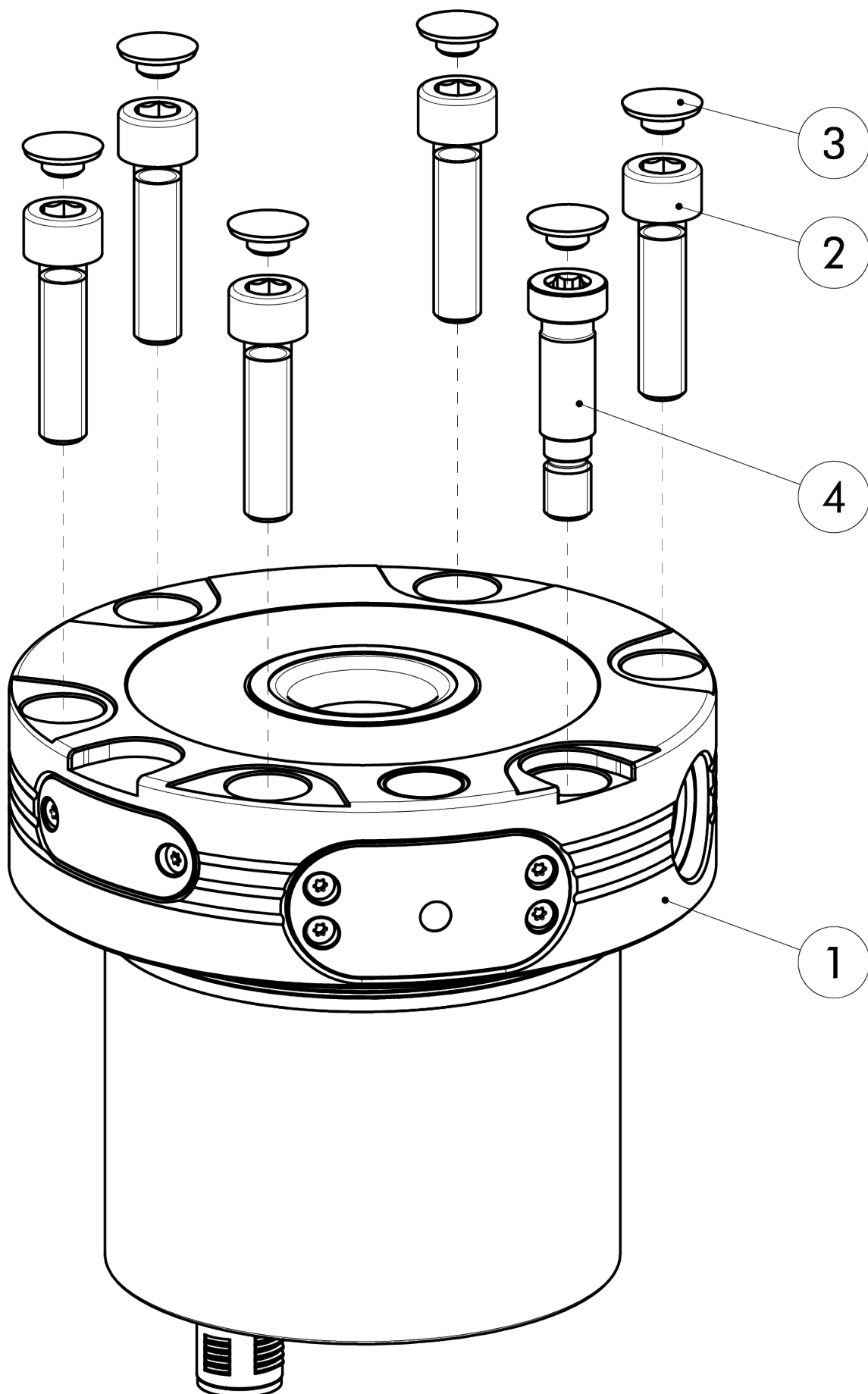
IOL only for NSE-E mini 90-25 IOL and NSE-E mini 90-25-V1 IOL

11 Assembly Drawings

11.1 NSE-E mini 90-25 IOL



11.2 NSE-E mini 90-25 DIC12



12 Manufacturer certificate

Manufacturer / Distributor:	H.-D. SCHUNK GmbH & Co. Spanntechnik KG Lothringer Str. 23 D-88512 Mengen
Product:	Electromechanical quick-change pallet system
Designation:	VERO-S
Type designation:	NSE-E mini 90-25 IOL

Heinz-Dieter SCHUNK GmbH & Co. Spanntechnik KG certifies that the above-mentioned products, when used as intended and in compliance with the operating manual and the warnings on the product, are safe according to the national regulations and:

- a **risk assessment** has been carried out in accordance with ISO 12100:2010.
- an **operating manual** for the assembly instructions has been created in accordance with the contents of the Machinery Directive 2006/42/EC Annex I No. 1.7.4.2. and the contents of the provisions of Annex VI of the Machinery Directive 2006/42/EC.
- **Markings** have been made in accordance with EN 1550:1997+A1:2008 Section 6.3.1, VDMA 34192:2019 Section 6.3 or ISO 16156:2004 Section 6.3. The requirements of Annex I No. 1.7.3. of the Machinery Directive 2006/42/EC have been complied with.
- the relevant basic and proven safety principles of the Annexes A to C of **ISO 13849-2:2012**, taking into account the requirements of the documentation have been observed for the component. The Parameters, limitations, ambient conditions, characteristic values, etc. for proper operation are defined in the operating manual.
- an $MTTF_D$ value of 150 years can be estimated for mechanical components using the informative procedure in Table C.1 of ISO 13849-1:2015.
- the **fault exclusion** against the fault "Breakage during operation" regarding Annex A to C in compliance with the parameters, limitations, ambient conditions, characteristic values and maintenance intervals, etc., specified in the operating manual.

Harmonized Standards applied:

- **ISO 12100:2010** Safety of machinery – General principles for design – Risk assessment and risk reduction

Other related technical Standards and specifications:

- **VDMA 34192:2019** Safety requirements for clamping devices for use on machines

Signature: see original declaration

Mengen, 18th of May 2024

p.p. Philipp Schröder; Head of Engineering Design

13 EU declaration of conformity

in accordance with Directive 2014/30/EU (electromagnetic compatibility), Annex IV of the European Parliament and Council of 26 February 2014.

The manufacturer bears sole responsibility for issuing this EU declaration of conformity.

Manufacturer/	H.-D. SCHUNK GmbH & Co.
Distributor	Spanntechnik KG Lothringer Str. 23 D-88512 Mengen

We hereby declare that the product described below is in conformity with the essential health and safety requirements of Directive 2014/30/EU in its design and construction and in the version placed on the market by us at the time of this declaration. The declaration is rendered invalid if modifications are made to the product.

Product designation:	Electromechanical quick-change pallet system
Type designation:	NSE-E mini 90-25 IOL
ID number:	1521521, 1521522

The object of the declaration described above complies with the following harmonization legislation:

2011/65/EU	RoHS Directive
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European harmonized standards applied:

DIN EN ISO 12100:2011-03	Safety of machinery – General principles for design – Risk assessment and risk reduction
EN 55011:2016 + A1:2017	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement
EN 61000-6-2:2019	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
EN 61000-6-4:2019	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN 61800-3: 2018	Adjustable speed electrical power drive systems – Part 3: EMC requirements including special test procedures

Related technical standards and specifications:

EN 61131-9:2021

Person authorized to compile the technical documentation:
Philipp Schröder, Address: see manufacturer's address

i. V. Philipp Schröder

Mengen, 15th of July 2024

p.p. Philipp Schröder; Head of Engineering Design



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