

# Pneumatic direct workpiece clamping system

## VERO-S WDP-5X

### Assembly and Operating Manual

Translation of Original Operating Manual

## Imprint

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### Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

**Document number:** 0489075

**Version:** 08.00 | 23/02/2024 | 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

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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.

#### **CAUTION**

Information about avoiding material damage.

### 1.1.2 Applicable documents

- General terms of business \*
- Catalog data sheet of the purchased product \*

Die mit Stern (\*) gekennzeichneten Unterlagen können unter [schunk.com/downloads](https://www.schunk.com/downloads) heruntergeladen werden.

## 1.2 Warranty

The warranty is valid for:

- 24 months from delivery date from the production facility or
- 500,000 cycles\* for VERO-S clamping systems NSE3 99-ZLD
- 200,000 cycles\* for VERO-S clamping systems NSE-M plus 99-ZL
- 200,000 cycles\* for connection interfaces of VERO-S WDP-5X workpiece direct clamping modules or
- 300,000 cycles\* for VERO-S clamping systems WDP-5X-DSM 99-70
- 200,000 cycles\* for VERO-S clamping systems WDP-5X-ASM 99-70-Ø36 and WDP-5X-ASM 99-70-Ø36-M

for appropriate use under the following conditions:

- Observe the applicable documents, ▶ 1.1.2 [ 6 ]
- Observe the ambient conditions and operating conditions, ▶ 2.5 [ 8 ]
- Observance of the specified care and maintenance instructions ▶ 7 [ 47 ]

Parts touching the workpiece and wear parts are not included in the warranty.

\* A cycle consists of a complete clamping process ("Open" and "Close").

## 1.3 Scope of delivery

- Direct workpiece clamping modules in the version ordered
- Assembly and Operating Manual

### 1.3.1 Accessories

(see catalog or data sheets when ordering separately)

Blank of a clamping pin type BRR

Thread bore hole grid plates

Clamping pallets type PAL-S, PAL-A

Clamping pin type SPA 40, SPB 40, SPC 40, SPG 40

Clamping pin for compensation modules type SPC-ASM 36

Protective cover type SDE

Alignment element ARE 25 (for basic module)

Sleeve HUE Ø24/Ø25 (for base module, basic module, clamping pin extensions)

Compressed air hoses

Protection covers with shrink hoses

Hexagonal screwdriver

Torque wrench

## 2 Basic safety notes

### 2.1 Intended use

The clamping systems VERO-S WDP-5X are intended for clamping workpieces and devices on machine tools and other suitable technical devices.

- The clamping systems may only be used on the basis of their technical data, ▶ 3 [15].
- The clamping systems are intended for industrial applications.
- Appropriate use of the product includes compliance with all instructions in this manual.

### 2.2 Not intended use

The VERO-S WDP-5X clamping system is not being used as intended if, for example:

- It is used as a pressing tool, a toolholder, a load-handling device or as lifting equipment.
- It is used in working environments that are not permissible.
- The technical data specified by the manufacturer are exceeded during usage.

### 2.3 Constructional 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.

- Use only original spare parts or spares authorized by SCHUNK.

## 2.5 Environmental 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 to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▶ 3 [15].
- Make sure that the product is a sufficient size for the application.
- Make sure that the contact surfaces of the interface are always clean.
- Make absolutely sure that no chips of any kind can enter the interface and that the interface does not fill with cooling emulsion, which is particularly possible with vertical positioning of the clamping pin axis. The best way to ensure both of these is to use the SDE protection covers. If the interface should fill with cooling emulsion, initiate the unlocking process and dry out the interface in actuated state.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.

## 2.6 Personnel qualification

### Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

#### Trained electrician

Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

#### Qualified personnel

Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

<b>Instructed person</b>	Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.
<b>Service personnel of the manufacturer</b>	Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

## 2.7 Personal protective equipment

### Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

## 2.8 Notes on safe operation

### Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

### **Maintenance specifications**

Follow the maintenance and care instructions. These instructions are based on a normal working environment. If the product is to be operated in an environment with abrasive dusts or corrosive or aggressive fumes or fluids, prior approval must be obtained from SCHUNK.

### **Safety during assembly and servicing**

During assembly, connection, adjustment, commissioning and testing, make sure that no accidental operation of the system by the fitter or other persons is possible.

## **2.8.1 Holding force and screw strength**

**The holding force of the System is essentially limited by the strength of the screwed connections with which the clamping pin is connected to the pallet or device. On this basis fastening screws of the property class 12.9 are to be used only.**

**Only original SCHUNK Clamping-Pins are to be used.**

When the clamping pin is used in the customer's own assembly device, the customer is to provide for a sufficiently dimensioned tap and satisfactory strength of the fastening material.

## **2.9 Transport**

### **Handling during transport**

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

## **2.10 Malfunctions**

### **Behavior in case of malfunctions**

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

## 2.11 Disposal

### Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

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

## 2.12 Fundamental dangers

### General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

### 2.12.1 Protection during handling and assembly

#### Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

#### Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

## 2.12.2 Protection during commissioning and operation

### Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

## 2.12.3 Protection against dangerous movements

### Unexpected movements

Residual energy in the system may cause serious injuries while working with the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.
- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

## 2.12.4 Notes on particular risks



### **⚠ WARNING**

#### **Risk of injury due to falling parts when setting up, fitting and transporting workpiece/workpiece exchange modules.**

Parts that have not been properly secured can come loose and fall off.

- Use suitable lifting equipment and means of transport.
- When fitting the clamping structure, do not enter the danger zone.
- Wear personal protective equipment.



### ⚠ WARNING

**Risk of injury due to falling device, pallet or workpiece if the clamping pin or the change interfaces on the workpiece direct clamping modules are loosened erroneously or as a result of negligence.**

- During operation, incorrect or negligent loosening of the clamping pin must be prevented using suitable countermeasures (disconnecting the power supply after locking, use of check valves or safety switches).
- The machines and equipment must fulfill the minimum requirements of the EC Machinery Directive 2006/42/EC; specifically, they must have effective technical measures to protect against potential mechanical hazards.
- Wear personal protective equipment.



### ⚠ WARNING

**Risk of injury to the operating personnel when transporting the workpiece tool changing modules or if the clamping structure, the device or the workpiece falls down.**

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



### ⚠ WARNING

**The system clamps using spring force. Risk of injury due to parts automatically moving to their end positions following actuation of an "emergency stop" or after switching off the power supply.**

- Wait for the system to shut down completely.
- Do not reach into the clamping modules.
- Use pressure maintenance valves.



### ⚠ CAUTION

**Risk of injury due to impurities (e.g. metal chips) in the exhaust and air purge connections of the clamping station.**

- The danger zone must be surrounded by a protective enclosure during operation.
- Wear personal protective equipment (safety goggles).



**⚠ CAUTION**

**Risk of injury due to compressed air hoses coming loose when connected improperly.**

- Use check valves or safety switches.
- The danger zone must be surrounded by a protective enclosure during operation.



**⚠ CAUTION**

**There is a risk of limbs being crushed by moving parts during manual loading and unloading and the clamping procedure.**

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



**⚠ CAUTION**

**Risk of slipping or falling if the quick-change pallet system's operational environment is not clean (e.g. contaminated with coolants or oil).**

- Ensure that the working environment is clean before starting assembly and installation work.
- Wear suitable safety boots.
- Follow the safety and accident-prevention regulations when operating the quick-change pallet system, especially when working with machine tools and other technical equipment.



**⚠ CAUTION**

**Risk of burns due to workpieces with high temperatures**

There is a risk of burns due to workpieces with high temperatures.

- Wear protective gloves when removing the workpieces.
- Automatic loading is preferred.



**⚠ CAUTION**

**Danger due to pneumatic exhaust noises.**

Noise pollution from the exhaust system and whistling pneumatic equipment during the working process.

- Wear hearing protection.

### 3 Technical data

Installation position	any
Operating temperature [°C]	+5 to +60
Required level of cleanliness in accordance with DIN EN 60529	IP 30

#### 3.1 Basic modules and stacking modules

##### 3.1.1 Technical data

Change interface holding force [kN]	50
Change interface pull-in force [kN]	min. 10 / max. 25
Change interface actuation moment [Nm]	min. 20 / max. 50

Designation	ID number	Weight [kg]	Height [mm]
WDP-5X-BM 99-60	0471617	4.2	60
WDP-5X-BMG 99-60	0471618	3.1	60
WDP-5X-BMR 99-60	0471619	2.9	60
WDP-5X-SM 99-30	0471601	1.7	30
WDP-5X-SM 99-50	0471602	2.8	50
WDP-5X-SM 99-80	0471607	3.9	80
WDP-5X-SM 99-120	0471608	5.5	120
WDP-5X-SM 99-160	0471609	7.2	160

##### 3.1.2 Permissible machining force

The maximum machining force  $F_{B,max}$  depends on the number of force-transmitting columns ( $n$ ), as well as on the column height ( $h$ ). The resulting lateral force  $F_Q$  or the resulting bending moment  $M_b$  resulting from the machining force must not exceed the permissible maximum values  $F_{Q,max}$  or  $M_{b,max}$ . The maximum machining force  $F_{B,max}$  corresponds to the smallest value of lateral force  $F_Q$  or bending moment  $M_b$ .

$$F_{Q,max} = 1,500 \text{ N}$$

$$M_{b,max} = 500 \text{ Nm}$$

With several force-transmitting columns ( $n$ ) ( $N \leq 6$ ), the permissible maximum values for the maximum machining force  $F_{B,max}$  increase. The permissible machining forces are shown in the figure "Machining force".

### 3.1.3 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.

#### CAUTION

**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.**

#### CAUTION

**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.**

### 3.2 Pneumatic direct clamping module WDP-5X-DSM 99-70

Designation	WDP-5X-DSM 99-70
ID	0471603
Height [mm]	70
Holding force * (M10 / M12 / M16) [kN]	35 / 50 / 75
Pull-in force without turbo [kN]	5.0
Pull-down force with turbo [kN]	18
Weight [kg]	3.9
Actuating pressure [bar]	6
Repeat accuracy [mm]	<0.005 mm
Noise emission [dB (A)]	≤70
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]
Tightness level IP	IP 67

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

### 3.3 Manual direct clamping module WDP-5X-DSM 99-70-M

Designation	WDP-5X-DSM 99-70-M
ID	0471611
Height [mm]	70
Holding force * (M10 / M12 / M16) [kN]	35 / 50 / 75
Actuation moment [Nm]	20
Maximum pull-in force [kN]	15
Revolutions for full clamping stroke	6
Hexagon socket connection for actuation [mm]	Wrench size: 6
Weight [kg]	3.9
Repeat accuracy [mm]	< 0.005

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

### 3.4 Pneumatic compensation module WDP-5X-ASM 99-70-Ø36

Designation	WDP-5X-ASM 99-70-Ø36
ID	0471615
Height [mm]	70
Ø clamping stem [mm]	36
Extraction length [mm]	11
Holding force – without turbo / with turbo [kN]	0.8 / 4.0
Max. gripping force – without turbo / with turbo [kN]	4.0 / 15
Weight [kg]	3.6
Actuating pressure [bar]	6
Repeat accuracy [mm]	<0.15 (radially floating compensation)
Noise emission [ dB (A)]	≤70
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]
Tightness level IP	IP 67

### 3.5 Manual compensation module WDP-5X-ASM 99-70-Ø36-M

Designation	WDP-5X-ASM 99-70-Ø36
ID	1358030
Height [mm]	70
Ø clamping stem [mm]	36
Extraction length [mm]	11
Actuation moment [Nm]	20
Holding force [kN]	4.0
max. clamping force [kN]	14
Repeat accuracy [mm]	<0.15 (radially floating compensation)
Weight [kg]	4.0

## 4 Assembly

### 4.1 Screw tightening torques

Screw tightening torques to mount the base module WDP-5X-BM 99-60 or the raster module WDP-5X-BMR 99-60 on the machine table (screw quality 10.9)

Screw size	M10	M12	M16
Tightening torques $M_A$ [Nm]	52	92	224

Screw tightening torques for the attachments screw of the change interface for connecting two joined workpiece direct clamping modules (screw quality 12.9)

Tightening torques $M_A$ [Nm] for the clamping screw of the change interface	20	25	30	35	40	42	50
Achievable pull-in force at the change interface [Nm]	7.5	10	10.8	13	20	21.5	25

### 4.2 Pre-assembly measures



#### ⚠ 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.

Check that the delivery is complete and that there is no transport damage.

Assembly, dismantling and modification work on the workpiece direct clamping module may only be carried out by specialist personnel.

**Disconnect the power supply lines and ensure that there is no residual energy in the system before performing assembly, modification, maintenance, or adjustment work.**

Until the workpiece direct clamping module is assembled, access to the side attachment screw of the clamping units must be ensured, particularly when the clamping pallets are clamped.

Before installing, check whether the drive pistons and the attachment screw can be easily reached for opening and for clamping and loosening the interface connection on the workpiece direct clamping systems respectively.



**⚠ WARNING**

**Risk of injury due to falling when transporting the workpiece tool changing modules.**

- Transport with care.



**⚠ CAUTION**

**Risk of injury due to crushing.**

- Carefully install the workpiece direct clamping systems.
- Ensure that limbs do not enter into the gaps between the adaptable workpiece direct clamping modules or the base module and machine.
- Wear protective gloves.

### 4.3 General assembly notes

If several clamping pillars with VERO-S WDP-5X plus clamping systems are mounted linked together, make sure that the interface position deviation does not exceed  $\pm 0.015$  mm.

Due to redundancy between several quick-change pallet systems VERO-S WDP-5X, the clamping pins or the clamping pin extensions with positioning accuracy in one direction (SPB 40 / SPB-VLK 50) must be used for clamping systems that are more than 160 mm apart or that do not show a positioning tolerance of  $\pm 0.01$  mm. For the clamping areas that are not intended for alignment of the device, the workpiece or the pallet, clamping pins or clamping pin extensions with centering clearance (SPC 40 / SPC-VLK 50) or alternatively the compensation module WDP-5X-ASM 99-70-Ø36 can be used (see ▶ 4.5 [ 34]). An individual height compensation on the Z-axis can be achieved at the same time as the longitudinal distance between two shifted clamping pillars using the compensation module WDP-5X-ASM 99-70-Ø36.

**NOTE**

When connecting the WDP-5X-BM 99-60, WDP-5X-BMG 99-60 or WDP-5X-BMR 99-60 base modules for supplying compressed air to the quick-change pallet system, bear in mind that it is only possible to completely ventilate the piston chamber via the air connections during the locking process. The relevant valves or shut-off valves should therefore be equipped with load relief. This also applies to the turbo connection. If the turbo connection is not used, it must be possible to ventilate the relevant side of the piston. In this case, the pressure ventilation would have to take place via an open air connection on the WDP-5X-BM 99-60 or WDP-5X-BMG 99-60 base module. The connection may not be closed by a locking screw for this, as otherwise an air cushion in the quick-change pallet system would form; this would mean the quick-change pallet system would no longer be able to be opened.

When disconnecting hose lines, the relevant openings must be secured with seal plugs to prevent ingress of dirt or coolant. If several units are activated via shared hose lines, feed lines with the following minimum cross-sections must be used.

<b>Number of stacking columns with VERO-S WDP-5X-DSM 99-70 direct clamping module or WDP-5X-ASM 99-70-Ø36 compensating module</b>	<b>at least nominal hose width</b>
1, 2	4 mm
3, 4, 5, 6	6 mm

**4.4 Fastening and connection**

**4.4.1 WDP-5X-BM 99-60**

The WDP-5X-BM 99-60 base module is secured on the machine table by two or four M12 screws and nuts for T-slots suitable for the machine table. It can be mounted on thread bore hole grid plates with tapped holes M16 with fitting seats Ø24 H6/H7 and grid spacings of 50 mm. To do so, the base module is screwed on at a diagonal distance of 141.42 mm using the grid plate as orientation.

Four M12 screws and 2 M16 screws with 2 washers are included in the scope of delivery. The nuts for T-slots are not included in the scope of delivery of the clamping system.

For machine tables with T-slots, various center hole distances are available. Alternatively, the clamping system can be secured using two or four cylindrical clamp blanks BRR 50

(see ▶ 1.3.1 [ 6]). There are slots on the bottom of the clamping system to mount loose T-nuts in order to align the clamping stations to the machine table slots.

The clamping system can be positioned on machine tables with hole pattern bore holes or machine tables with T-slots for screw connection via the central bore hole in the base.

#### **Assembly on grid plates**

With sleeve, type: HUEØ24/Ø25 (Accessory ID: 0471632) for alignment on machine tables with hole pattern bore holes. (Illustration "Mounting the WDP-5X-BM 99-60 on grid plates")

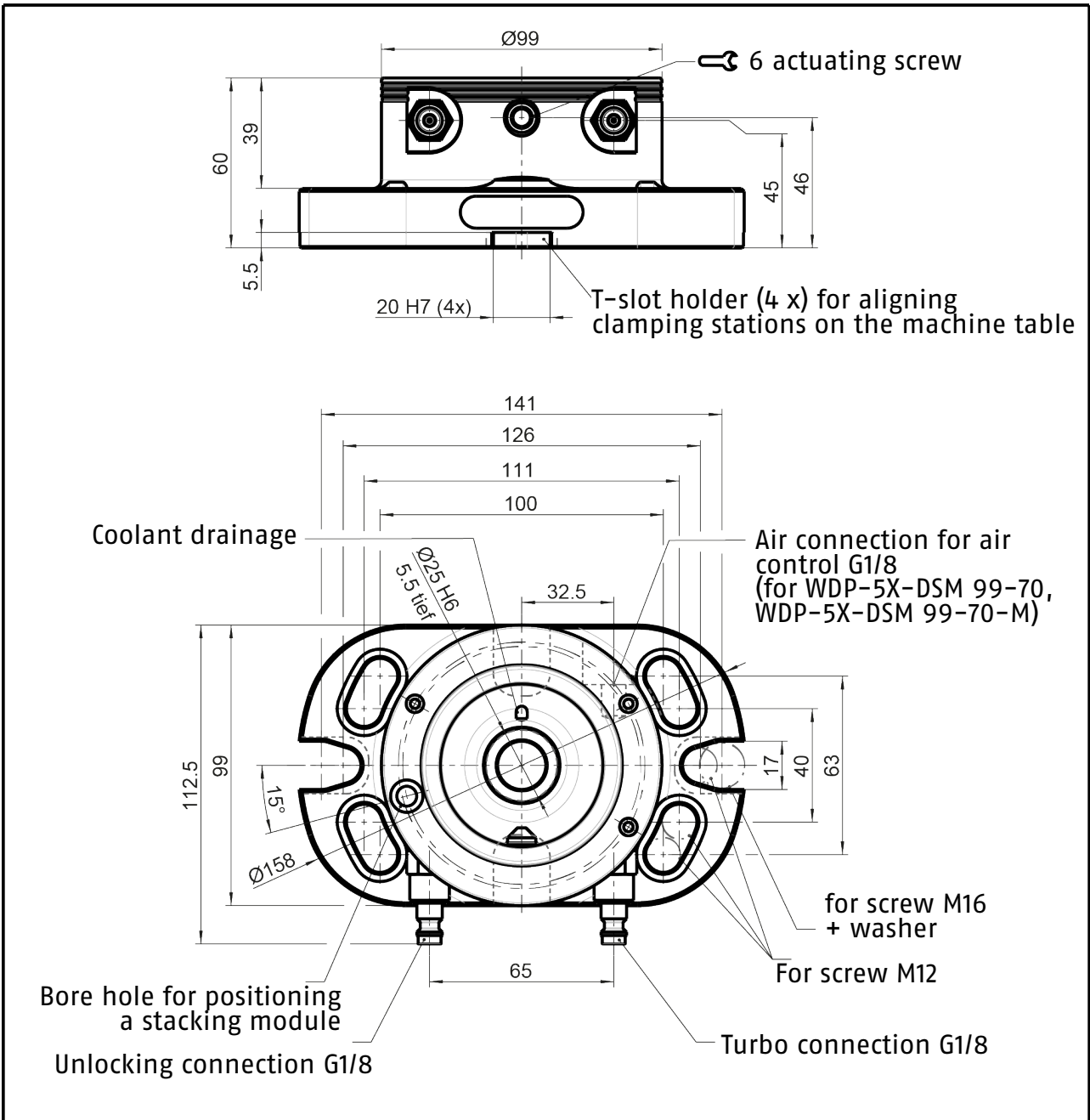
#### **Assembly on T-groove table**

With alignment element, type: ARE 25 (Accessory ID: 1319098) for alignment on machine tables with T-grooves (Illustration "Mounting the WDP-5X-BM 99-60 on T-groove table").

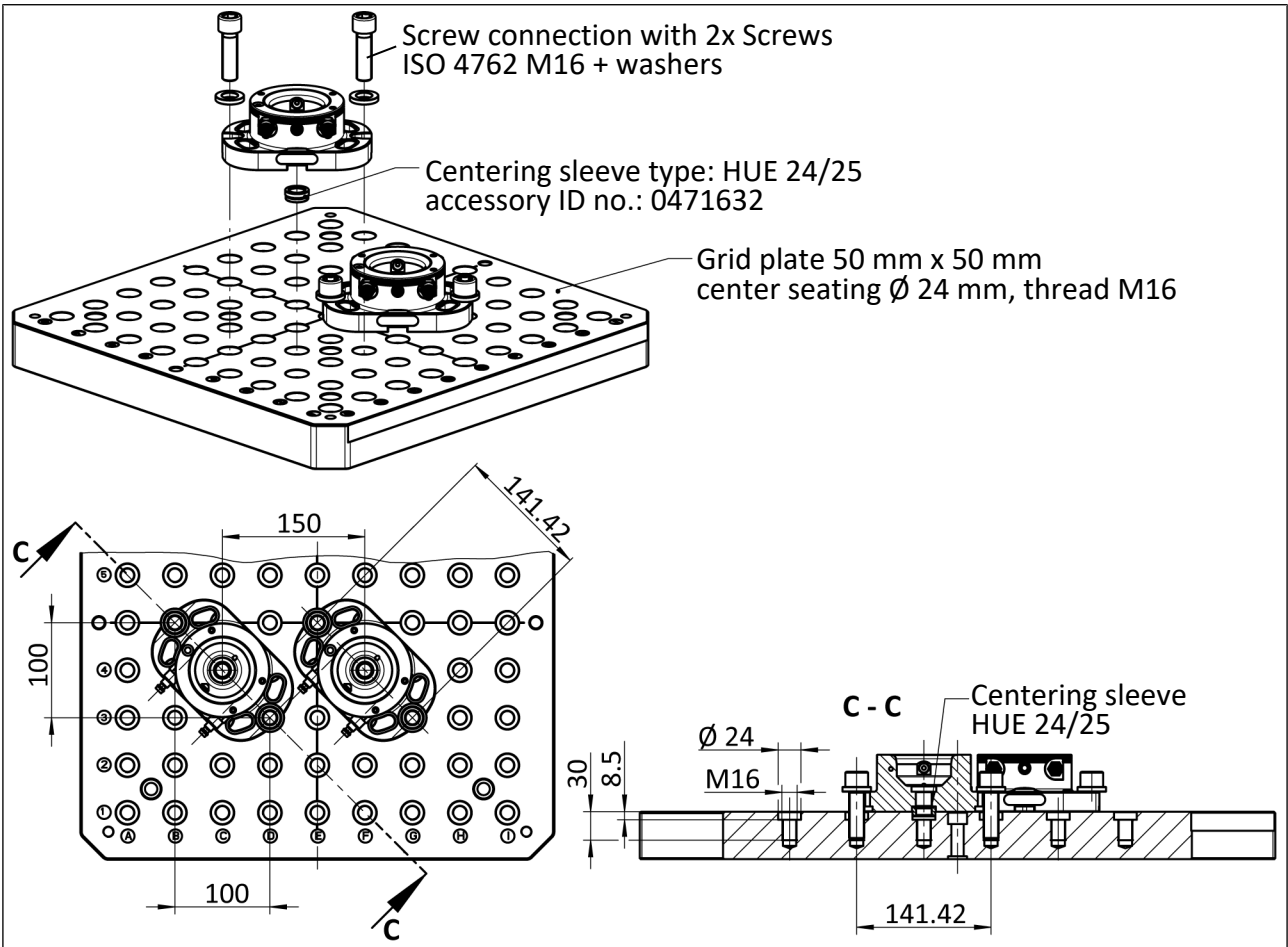
The WDP-5X-BM 99-60 base module allows further change components of the modular system to be adapted to the workpiece direct clamping. The change interface of the clamping system has a central connection screw for clamping an adaptable stacking module or a workpiece direct clamping or compensation module.

The WDP-5X-BM 99-60 basic module has three air supply connections G 1/8. The air supply is intended to supply a VERO-S workpiece direct clamping module or a WDP-5X compensation module with pneumatic actuation. The unlocking connection and the turbo connection can be found on the front side. The turbo connection serves to amplify the pull-in force on the quick-change pallet system or the clamping force on the compensation module. On the back there is an air connection for the air control to the WDP-5X-DSM 99-70. Via the integrated air forwarding in the exchange interfaces, a direct clamping module WDP-5X-DSM 99-70(-M) or a compensation module WDP-5X-ASM 99-70 can be controlled.

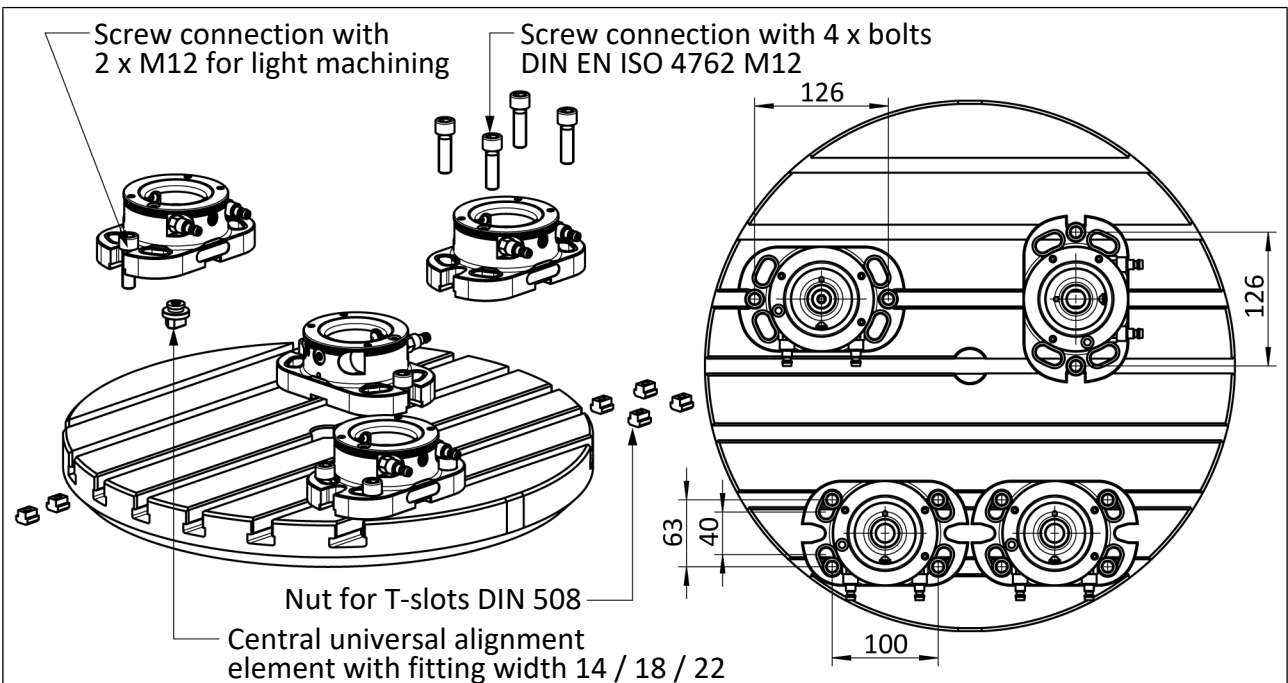
If a pneumatic clamping system is to be supplied with compressed air on the clamping pillars, the closing nipples included in the scope of delivery must be connected to the clamping system. In the delivery state, the air connection for air control is closed with a G1/8 locking screw.



Mounting and connection WDP-5X-BM 99-60



Mounting the WDP-5X-BM 99-60 on grid plates



Mounting the WDP-5X-BM 99-60 on a T-groove table

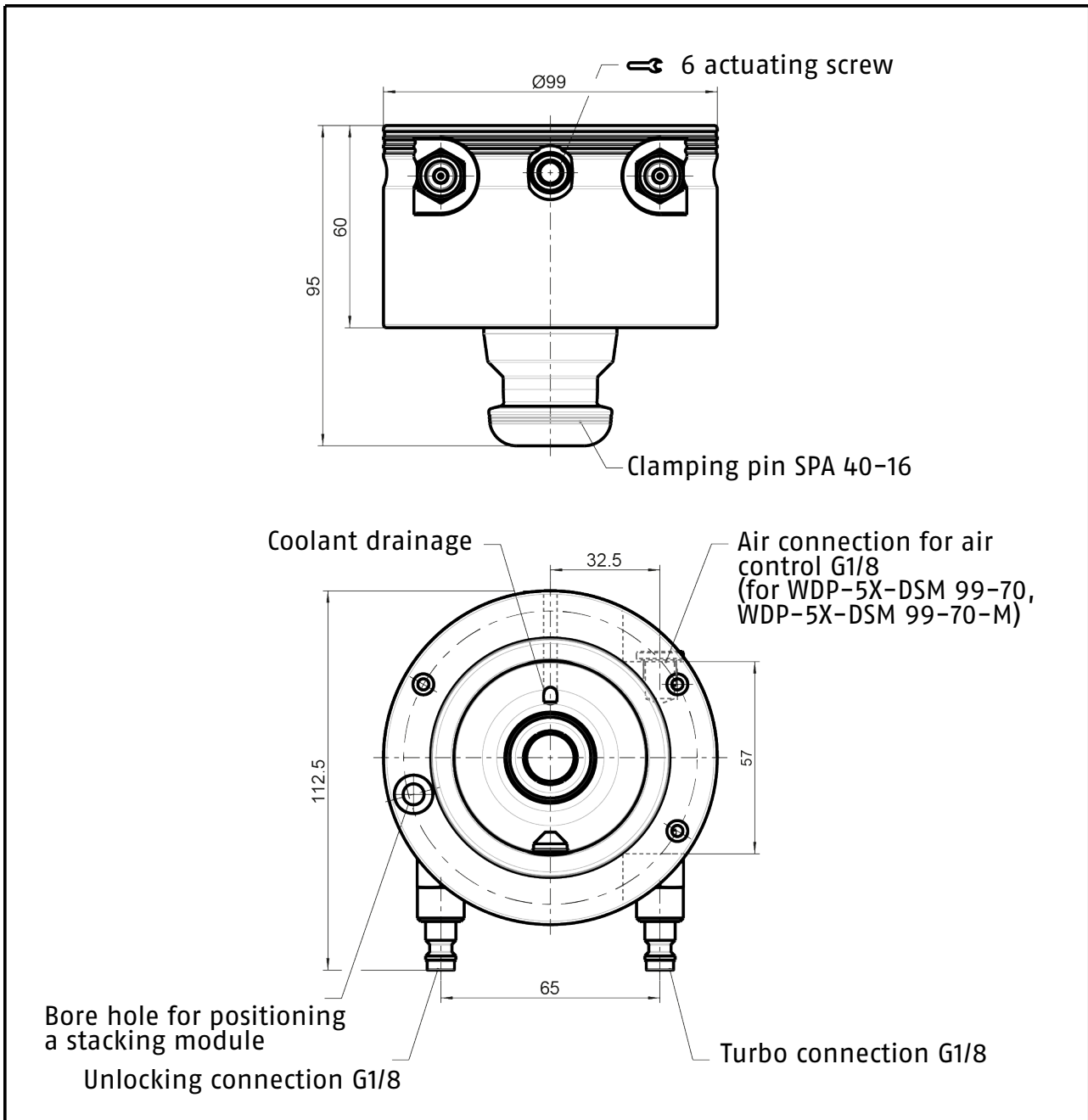
#### 4.4.2 WDP-5X-BMG 99-60

The WDP-5X-BMG 99-60 base module has a change interface with VERO-S SPA 40 clamping pins. This makes it compatible with SCHUNK quick-change pallet modules VERO-S NSE3. It therefore constitutes the basic holder for a further changing module from the WDP-5X modular program.

The WDP-5X-BMG 99-60 contains no position-accurate torque-pin for radial positioning on the quick-change pallet module. A workpiece structure should therefore be fixed on several clamping pillars in order to withstand the torque caused by the machining forces.

The integrated change interface of the clamping system has a central connection screw for clamping an adaptable stacking module WDP-5X-SM or a workpiece direct clamping module WDP-5X-DSM 99-70 or a compensation module WDP-5X-ASM 99-70 Ø36.

The WDP-5X-BMG 99-60 basic module has three air supply connections G 1/8. The air supply is intended to supply a VERO-S workpiece direct clamping module or a WDP-5X compensation module with pneumatic actuation. The unlocking connection and the turbo connection can be found on the front side. The turbo connection serves to amplify the pull-in force on the quick-change pallet system or the clamping force on the compensation module. On the back there is an air connection for the air control to the WDP-5X-DSM 99-70(-M).



Mounting and connection WDP-5X-BMG 99-60

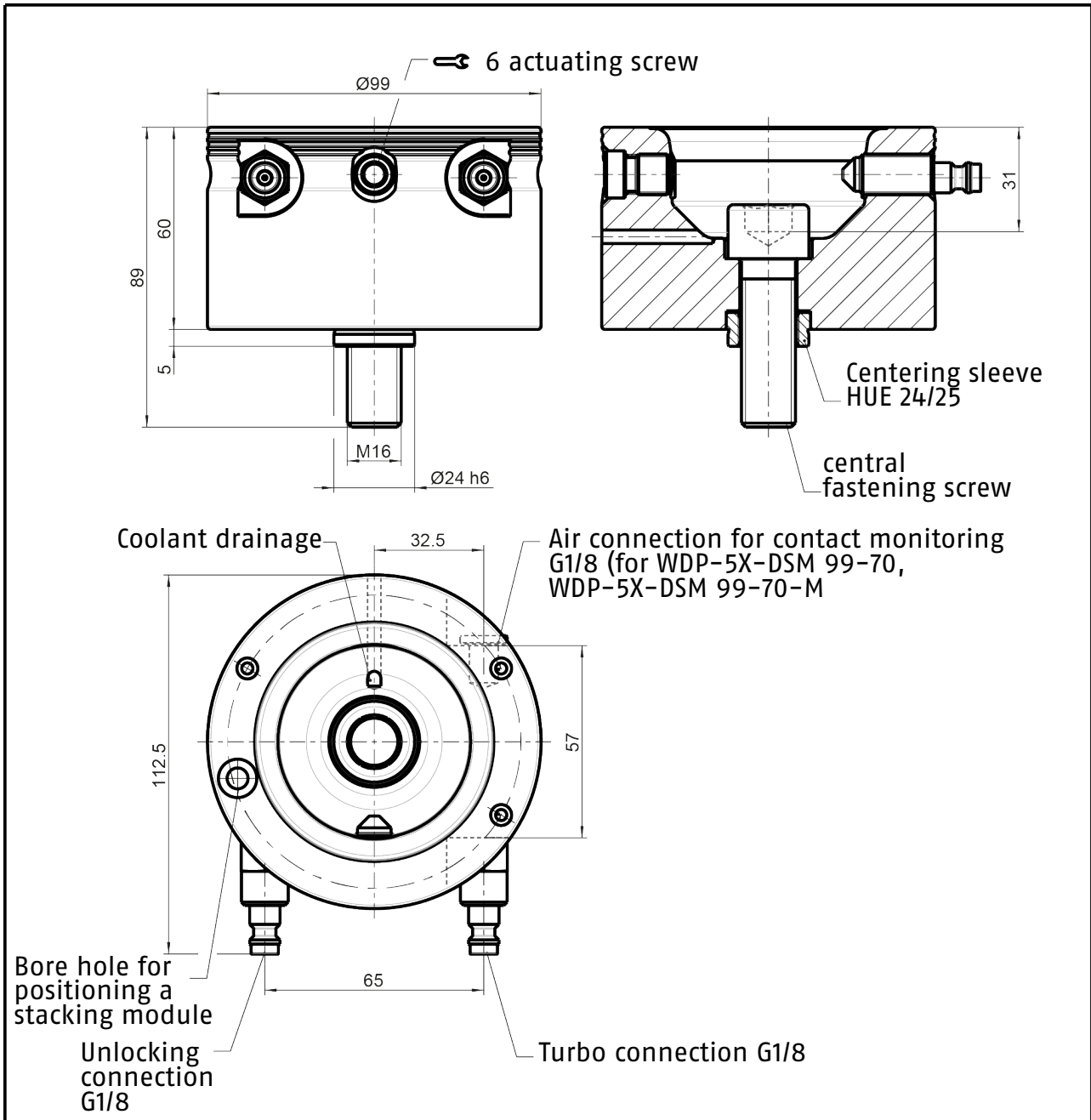
Via the integrated air forwarding in the exchange interfaces, a direct clamping module WDP-5X-DSM 99-70 or a compensation module WDP-5X-ASM 99-70- $\varnothing 36$  can be controlled.

If a pneumatic clamping system is to be supplied with compressed air on the clamping pillars, the closing nipples included in the scope of delivery must be connected to the clamping system. In the delivery state, the air connection for air control is closed with a G1/8 locking screw.

### 4.4.3 WDP-5X-BMR 99-60

The raster module WDP-5X-BMR 99-60 has a change interface with central fastening screw and centering sleeve HUE  $\varnothing 24/\varnothing 25$ . This makes it compatible with conventional thread bore hole plates with centering bores  $\varnothing 24$  H6/H7 mm and tapped hole M16 in bore hole grid spacing 50 mm x 50 mm.

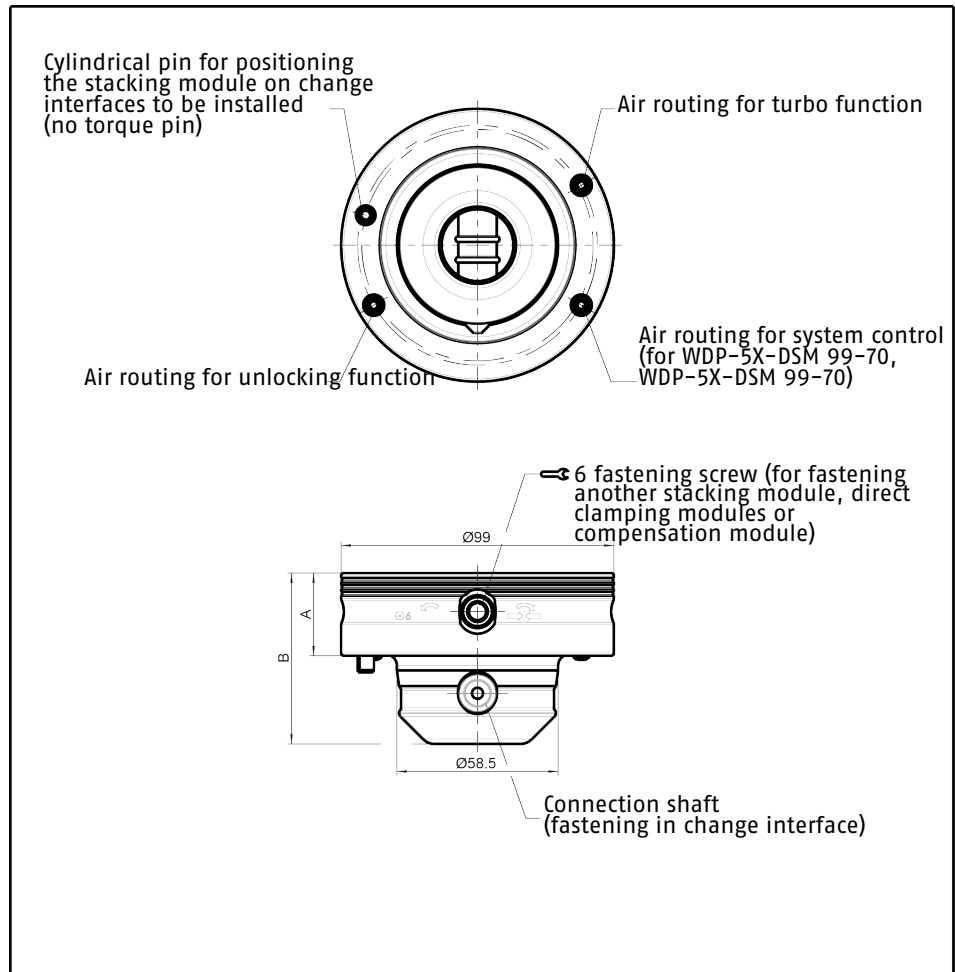
The technical equipment features and the functions are identical to the basic module WDP-5X-BMG 99-60 (► 4.4.2 [□ 25]). The mounting scheme on grid plates corresponds to the central screw connection from the illustration (assembly of the WDP-5X-BM 99-60 on grid plates).



Mounting and connection WDP-5X-BMR 99-60

#### 4.4.4 WDP-5X-SM

The WDP-5X-SM stacking modules are intended for adjusting the height of the clamping pillars. The system components have two change interfaces with which the units can be joined together. The fastening to the already mounted clamping system is done by means of an integrated shaft connection in the clamping unit. The connection is loosened or tightened using the tapered screws with around 5 full revolutions in each case.



*Mounting and connection WDP-5X-SM 99-30*

The tapered screw is tightened by the precise tightening torque specification clockwise on the mounted module. The screw reaches into the shaft and moves it to the opposite support structure. This centers the stacking module in the taper interface and at the same time clamps and positions it against the flat surface of the pre-assembled module. The shaft connection allows a torque load on the clamping pillars, which for instance is exerted through machining forces. For orientation of the installation position, a cylindrical pin grips into the interface to be inserted.

The stacking module has integrated routing air for the functions: unlocking, turbo function and workpiece contact monitoring. These functions are required for an adapted direct clamping module WDP-5X-DSM 99-70 or a compensation module WDP-5X-ASM 99-70-Ø36.

The query functionality is only intended for the WDP-5X-DSM 99-70 direct clamping module and with the manual direct clamping module WDP-5X-DSM 99-70-M.

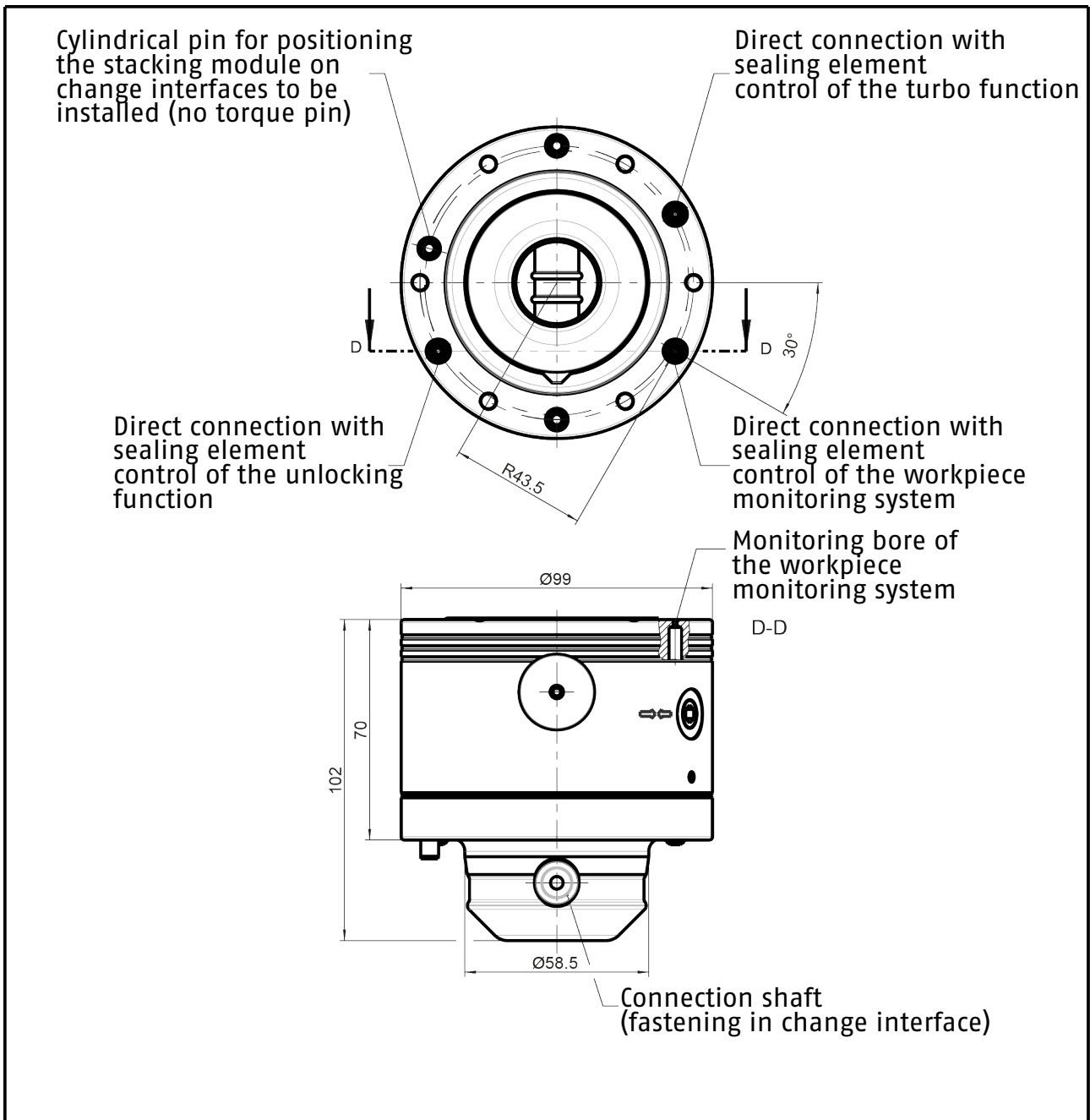
#### Height and dimensions of WDP-5X-SM 99

Designation	ID	A	B
WDP-5X-SM 99-30	0471601	30 mm	62 mm
WDP-5X-SM 99-50	0471602	50 mm	82 mm
WDP-5X-SM 99-80	0471607	80 mm	112 mm
WDP-5X-SM 99-120	0471608	120 mm	152 mm
WDP-5X-SM 99-160	0471609	160 mm	192 mm

#### 4.4.5 WDP-5X-DSM 99-70

Workpiece direct clamping module WDP-5X-DSM 99-70 forms the change interface to the workpiece or the clamping pallet. It can be positioned as the top clamping system on the WDP-5X clamping pillars via the change interface.

The clamping system has a VERO-S NSE3 99-ZLD quick-change pallet module, which is supplied with compressed air via the integrated air routing of the change components assembled on top of each other. The quick-change pallet module is a system secured by a spring. The unlocking of the VERO-S change interface takes place via the air routing of a WDP-5X-BM 99-60, WDP-5X-BMG 99-60 or WDP-5X-BMR 99-60 base module, on which the clamping pillar has been assembled. An extra connected compressed air pulse via the turbo connection serves to enhance the pull-in force on the quick-change pallet system or the clamping force on the compensation module.



Mounting and connection WDP-5X-DSM 99-70

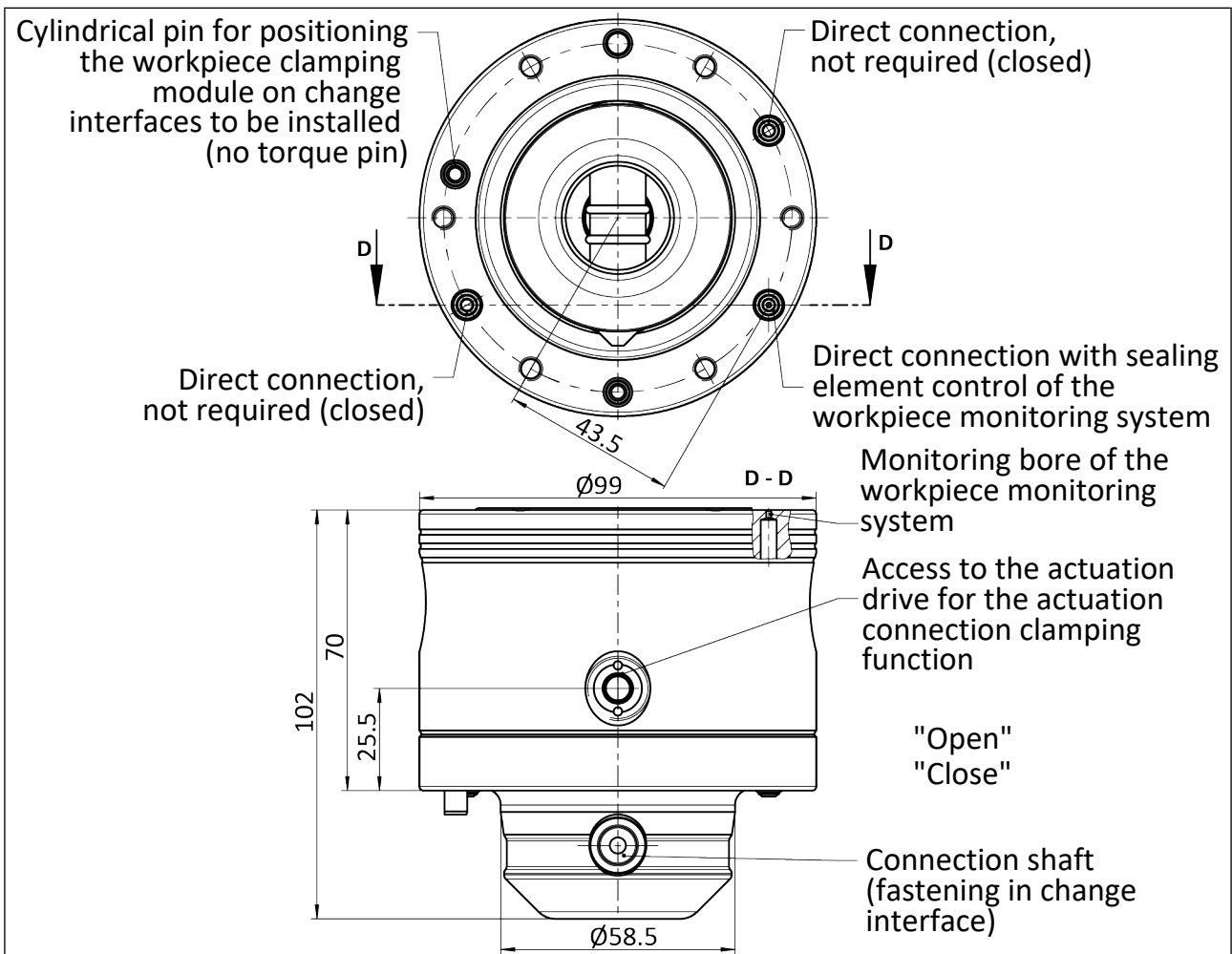
The clamping system also has a workpiece monitoring function, with which whether the work surface of the workpiece or the clamping pallet is flat can be monitored via a differential pressure switch (see chapter "Function of the workpiece monitoring function" ▶ 5.3 [45]). For orientation of the installation position, a cylindrical pin grips into the interface to be inserted.

#### 4.4.6 WDP-5X-DSM 99-70-M

Manual workpiece direct clamping module WDP-5X-DSM 99-70-M forms the change interface to the workpiece or the clamping pallet. It can be positioned as the top clamping system on the WDP-5X clamping pillar via the change interface.

The clamping function of the clamping system is driven manually using rotary movement on the actuator screw on the side of the housing. The clamping system can be operated by means of a hexagonal screwdriver (angled pin wrench). The clamping force is initiated according to the precise torque specification using a torque wrench. No air supply is required for operation of the clamping system.

The clamping system also has a workpiece monitoring function, with which whether the work surface of the workpiece or the clamping pallet is flat can be monitored via a differential pressure switch (see chapter "Function of the workpiece monitoring function" ▶ 5.3 [45]).

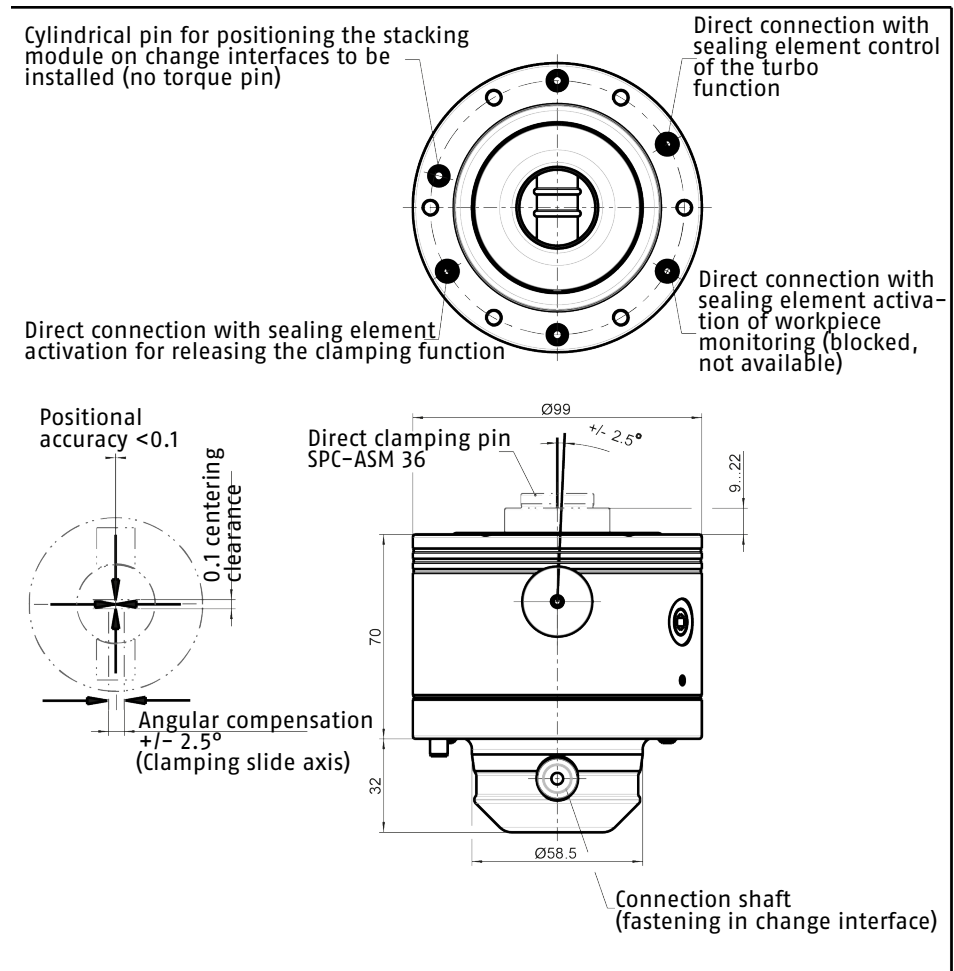


Mounting and connection WDP-5X-DSM 99-70-M

#### 4.4.7 WDP-5X-ASM 99-70-Ø36

The WDP-5X-ASM 99-70-Ø36 compensation module in connection with the SPC-ASM 36 direct clamping pin workpiece is intended for individual height adjustment to the workpiece. It forms the flexible change interface to the workpiece or the clamping pallet. A cylindrical direct clamping pin can be fixed with this up to a certain extension limit.

This compensation module satisfies the clamping and holding function for flexible workpiece support. For positioning in the plane of fixation, gauge tolerances for the reference clamping areas can be compensated. Angle tolerances to the workpiece can be compensated at an angle to the clamping slide axis. This compensation module can be used several times in the entire clamping structure. Several clamping pillars can be loaded with this compensation module. At least two clamping pillars in the system structure must be fitted with a clamping pin with centering function such as VERO-S SPA 40 (centering pin) and a VERO-S SPB 40 clamping pin with sword function. The "Workpiece monitoring system" function cannot be activated.



Mounting and connection WDP-5X-ASM 99-70-Ø36

It can be positioned as the top clamping system on the WDP-5X clamping pillar via the change interface. The clamping system has a pneumatic clamping unit and is clamped or loosened via the compressed air supply of the base module or basic module. The change interface is suitable for the WDP-5X-SM stacking modules.

An upcoming compressed air supply from the stacking modules at the connection for the workpiece presence monitoring is closed via an integrated sealing element in the compensation module and disabled. For orientation of the installation position, a cylindrical pin grips into the interface to be inserted.

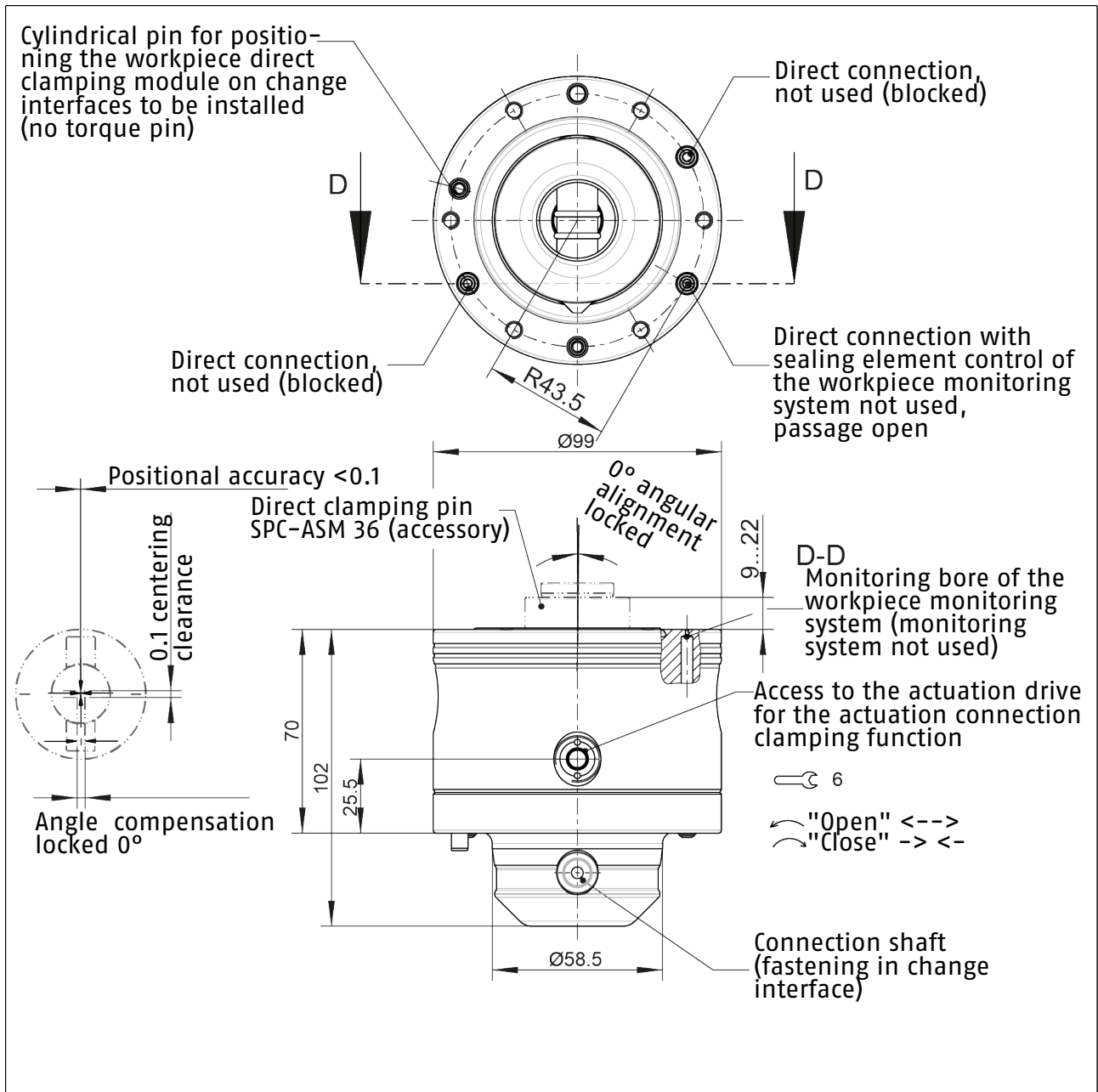
#### **4.4.8 WDP-5X-ASM 99-70-Ø36-M**

The WDP-5X-ASM 99-70-Ø36-M compensation module in connection with the SPC-ASM 36 direct clamping pin workpiece is intended for individual height adjustment to the workpiece. It forms the flexible change interface to the workpiece or the clamping pallet. A cylindrical direct clamping pin can be fixed with this up to a certain extension limit.

The clamping function of the clamping system is driven manually using rotary movement on the actuator screw on the side of the housing. The clamping system can be operated by means of a hexagonal screwdriver (angled pin wrench). The clamping force is initiated according to the precise torque specification using a torque wrench. No air supply is required for operation of the clamping system.

This compensation module satisfies the clamping and holding function for flexible workpiece support. For positioning in the plane of fixation, gauge tolerances for the reference clamping areas can be compensated. At a right angle to the clamping slide axis, support is guaranteed without angle compensation to the table clamping. This compensation module can be used several times in the entire clamping structure. Several clamping pillars can be loaded with this compensation module. At least two clamping pillars in the system structure must be fitted with a clamping pin with centering function such as VERO-S SPA 40 (centering pin) and a VERO-S SPB 40 clamping pin with sword function.

Activation of the "Workpiece monitoring system" function is not possible.



#### 4.5 Clamping pins SPA 40, SPB 40, SPC 40, SPG 40

VERO-S clamping pins SPA 40, SPB 40, SPC 40 and SPG 40 are compatible with the pneumatic direct clamping module WDP-5X-DSM 99-70 and manual direct clamping module WDP-5X-DSM 99-70-M.

These clamping pins are suitable for use on clamping structures with precisely aligned height supports on the workpiece or the clamping pallet.

If variable height distances on the workpiece or the clamping pallet are to be compensated, the compensation module WDP-5X-ASM 99-70- $\varnothing 36(-M)$  with pneumatic or manually

operated clamping device and the corresponding clamping pins for compensation modules are used (see chapter "Workpiece direct clamping pins for compensation modules" ▶ 4.6 [□ 37]).

## CAUTION

### Notes on clamping pins and mounting screws

The holding force of the quick-change pallet system is limited essentially by the tightness of the screw connection, which connects the clamping pin to the pallet or the device.

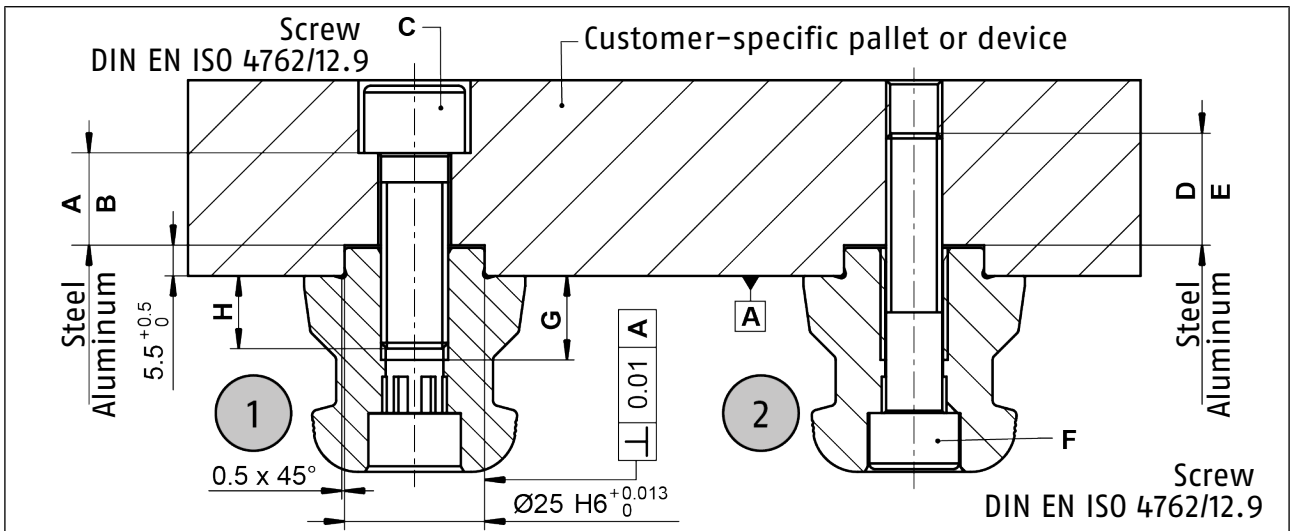
- This is why only screws of strength class 12.9 may be used.
- Only original SCHUNK clamping pins may be used.
- If the clamping pins are to be used in customer-owned devices, the customer must provide sufficiently dimensioned threaded holes or a sufficiently thick mounting material.

The clamping pins can be attached to the workpiece or pallet in two different ways; the mounting variants are however numbered in the preferred order.

These clamping pins are preferably to be used with precisely height-coordinated workpiece gradings. These do not allow any height tolerances to be compensated to the workpiece. If height tolerances to the workpiece are to be overcome, a compensation module with SPC-ASM 36 height-adjustable workpiece direct clamping pins must be used in the affected clamping area (see chapter "Workpiece direct clamping pins for compensation modules" ▶ 4.6 [□ 37]).

If clamping pins are used outside of SCHUNK pallets, for example in customer-specific devices or workpieces, the outer diameter of the part to be clamped must be large enough to completely cover the O-ring on the top of the quick-change pallet system.

Designation type	ID	min. outer diameter at the part contact point
WDP-5X-DSM 99-70	0471603	75 mm
WDP-5X-DSM 99-70-M	0471611	75 mm



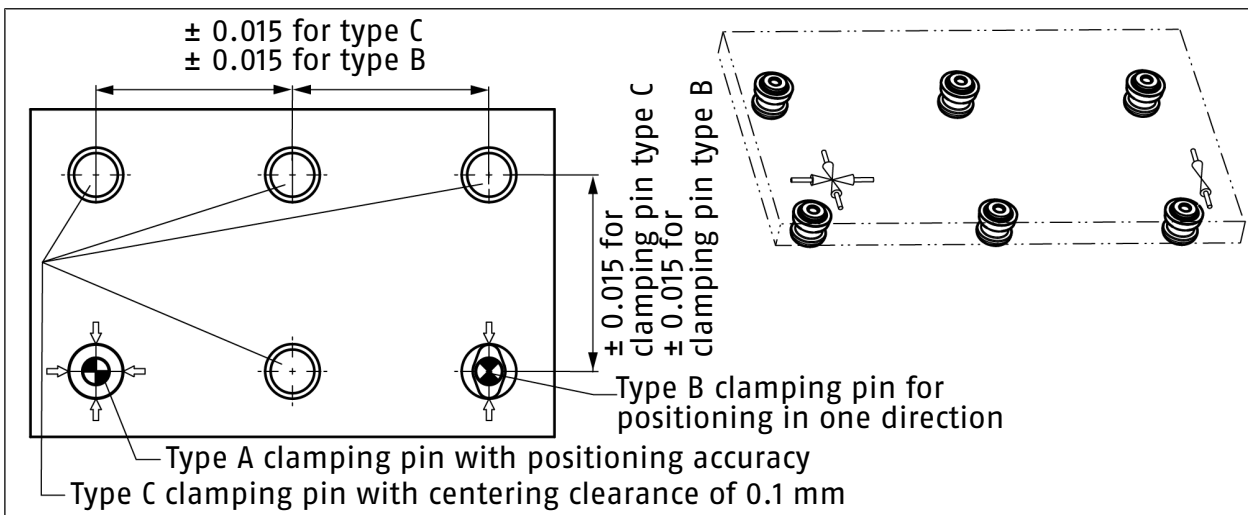
Clamping pin installation

**Tolerances and installation conditions**

Type	ID	A	B	C	D	E	F	G*	H
SPA 40	0471151	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPB 40	0471152	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPC 40	0471153	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPG 40	0471154	> 12	> 17	M12	> 15	> 20	M10	25	>22
SPA 40-16	0471064	> 13	> 18	M16	> 18	> 24	M12	20	>16
SPB 40-16	0471065	> 13	> 18	M16	> 18	> 24	M12	20	>16
SPC 40-16	0471066	> 13	> 18	M16	> 18	> 24	M12	20	>16

\* The length of the screwed thread must not exceed the dimension "G" under any circumstances!

**Usage/arrangement of the different types of clamping pins**  
(Application: pallet with 6 clamping areas)



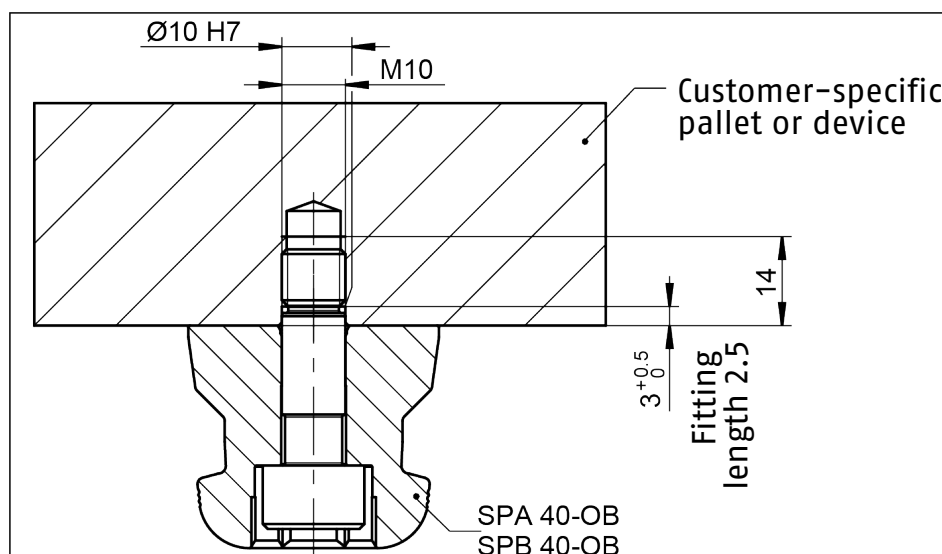
**Tightening torques for mounting VERO-S clamping pins type SPA / SPB / SPC (Screw quality 12.9)**

Screw size	M10	M12	M14	M16
Maximum admissible torques (Nm)	62	108	170	262

### 4.5.1 Clamping pin without collar SPA 40-OB, SPB 40-OB, SPC 40-OB

The clamping pins without collar only require a slim fitting bore  $\varnothing 10$  H7 in the installation space.

For the SPC 40-OB design, fit seating is not required.



Clamping pin installation SPA 40-OB, SPB 40-OB

These clamping pins are designed for reduced machining forces due to their shortened thread length. The functionality and the selection for installation are described in the chapter ▶ 4.5 [34].

Type	ID
SPA 40-OB	0471631
SPB 40-OB	1316935
SPC 40-OB	1316936

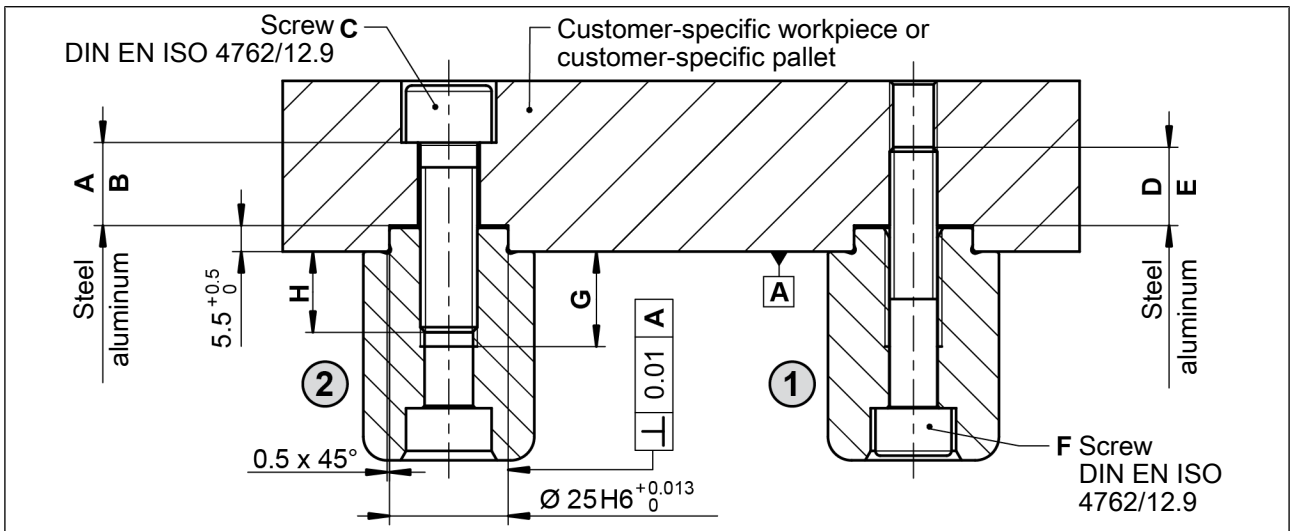
## 4.6 Workpiece direct clamping pins for compensation module

### 4.6.1 SPC-ASM 36

Clamping pin SPC-ASM 36 is compatible with compensation module WDP-5X-ASM 99-70- $\varnothing 36$ . With this clamping pin, individual heights can be adapted to the workpiece. The SPC-ASM 36 acts as a holding pin with centering clearance similar to clamping pin SPC 40. In the compensation module WDP-5X-ASM 99-70- $\varnothing 36(-M)$ , the clamping pin can be clamped axially to the initial height in a limited extension range.

This enables height tolerances on the workpiece or also height offsets to the additional clamping pillars to be compensated and adjusted. Using this clamping pin, a small radial offset and an angular deviation to the modular axis can be compensated.

The clamping pin SPC-ASM 36 should be used in combination with the clamping pins VERO-S SPA 40 (centering pin) and SPB 40 (sword pin).



SPC-ASM 36 installation

**Tolerances and installation conditions**

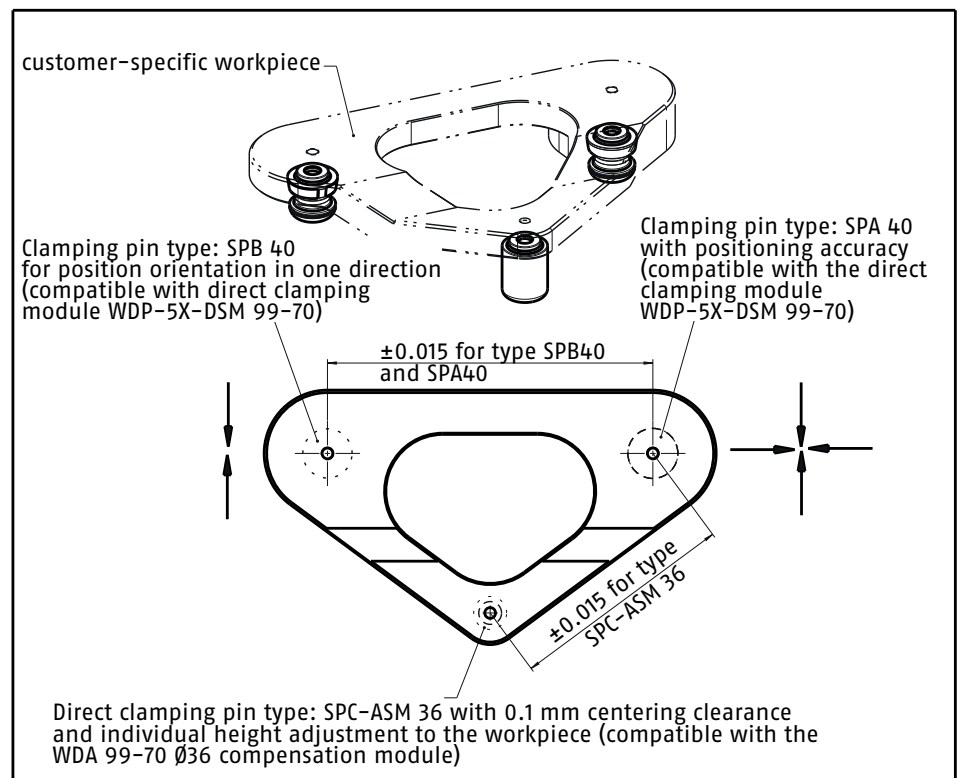
Type	ID	A	B	C	D	E	F	G*	H
SPC-ASM 36	0471616	> 12	> 17	M12	> 15	> 20	M10	20	>12

\* The length of the screwed thread must not exceed the dimension "G" under any circumstances!

**Tightening torques for fastening VERO-S clamping pins type SPC-ASM 36 (Screw quality 12.9)**

Screw size	M10	M12
Maximum admissible torques (Nm)	62	108

**Use of workpiece direct clamping pin SPC-ASM 36 in combination with two VERO-S clamping pins in a workpiece application**

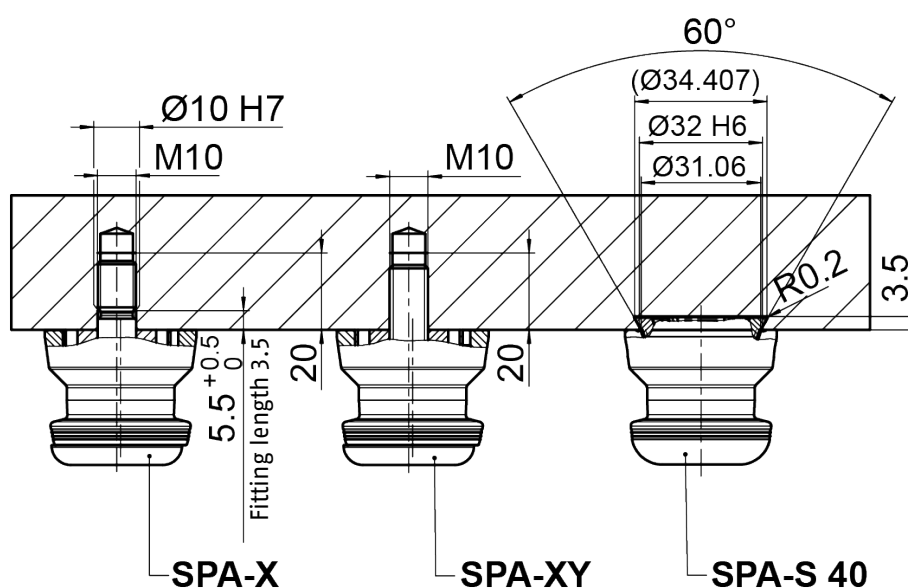


#### 4.7 Clamping pin with position balancing SPA-X, SPA-XY

The clamping pins have a movable clamping element, which can be used to compensate for flexible bore hole fluctuations.

Clamping pin SPA-X performs the function of a sword bolt and allows a position balancing in the longitudinal direction of  $\pm 1$  mm. For use of the SPA-X, a fitting seating in the installation space is required.

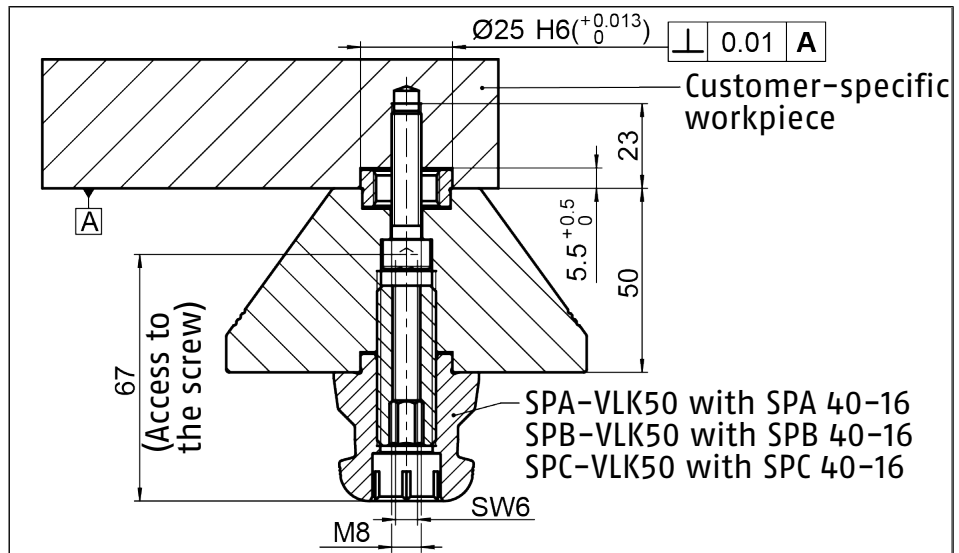
The clamping pin SPA-XY can be used to compensate for concentric positioning tolerances. These clamping pins can be combined with all other VERO-S clamping pins in a workpiece interface. Using these clamping pins ensures smooth operation of workpiece clamping.



Type	ID
SPA-X	0471155
SPA-XY	0471156
SPA-S 40	1310630

#### 4.8 Clamping pin extensions SP-VLK 50

The SP-VLK 50 clamping pin extensions are equipped for optimized accessibility to the machining point of the workpiece with a spacer. The functionality and the selection for installing the workpiece adaption are described in more detail in the "Clamping pins SPA 40, SPB 40, SPC 40, SPG 40" ▶ 4.5 [ 34 ] chapter.



Type	ID no.
SPA-VLK 50	1318565
SPB-VLK 50	1317936
SPC-VLK 50	1317937

#### 4.9 Pneumatic circuit diagram

The pneumatic circuit diagram shown serves as an example for the functional illustration for the WDP-5X-DSM 99-70 direct clamping module clamping systems and WDP-5X-ASM 99-70-Ø36 compensation module.

The air supply lines can be branched over several clamping pillars. Depending on the system structure, the recommended minimum line diameters must be adhered to ▶ 4.3 [□ 20].

Monitoring for the workpiece monitoring system is not integrated with the compensation module. For this, no air supply needs to be connected at the connection for the monitoring function on the WDP-5X-BM 99-60 or the WDP-5X-BMG 99-60 basic modules. The air connection can be closed with the locking screw included in the scope of delivery. Otherwise, the WDP-5X-ASM 99-70-Ø36 compensation module has a sealing element for this, which closes the air supply against the upcoming system pressure to the base module.

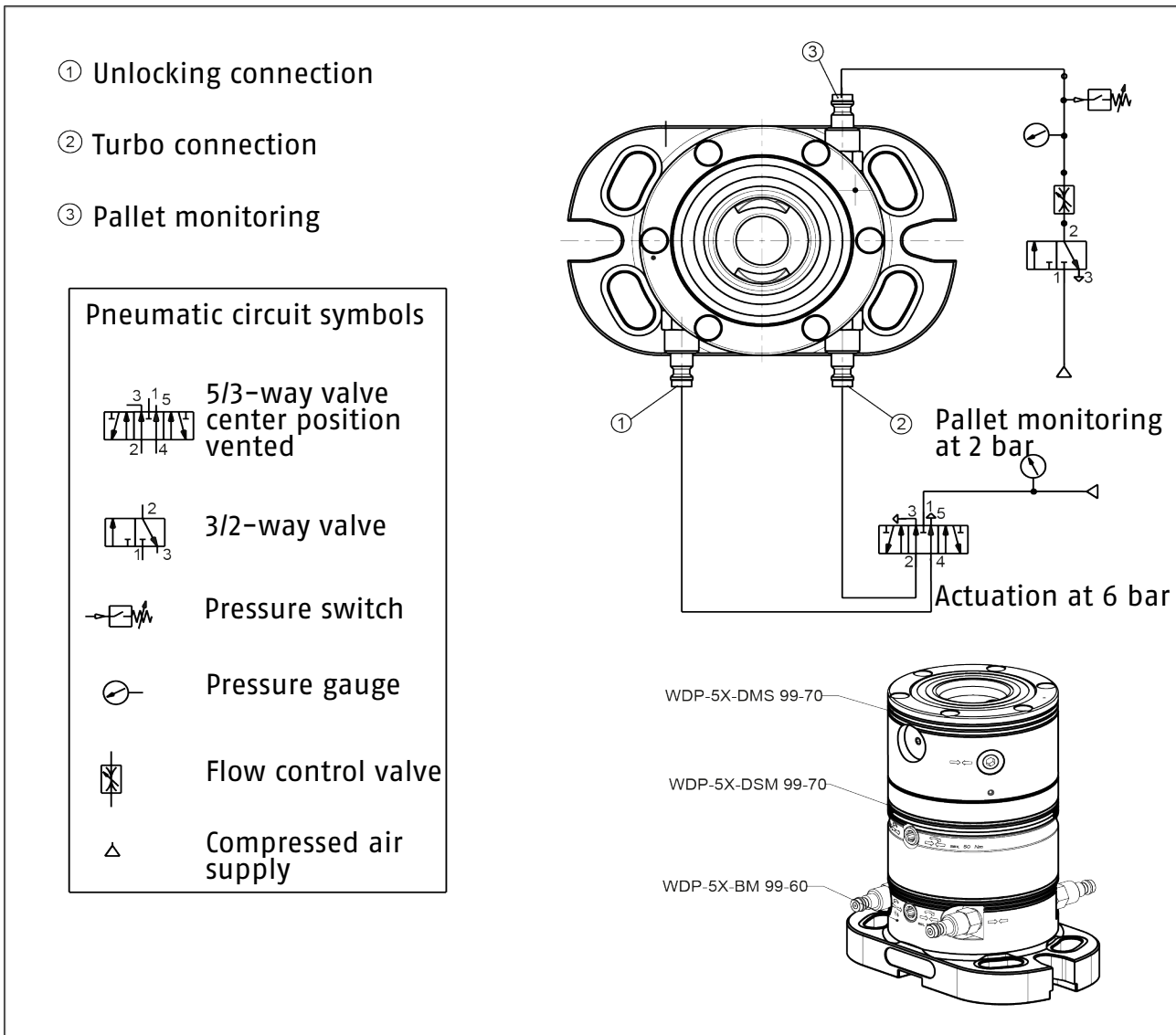
When controlling the WDP-5X-DSM 99-70 direct clamping modules and the WDP-5X-ASM 99-70-Ø36 compensation module, it is important to observe the following:

Unlocking function, release function, turbo function:

- Max. pressure 6 bar

Workpiece contact monitoring (only with WDP-5X-DSM 99-70 direct clamping module) see chapter: "Workpiece contact monitoring function" ▶ 5.3 [□ 45]:

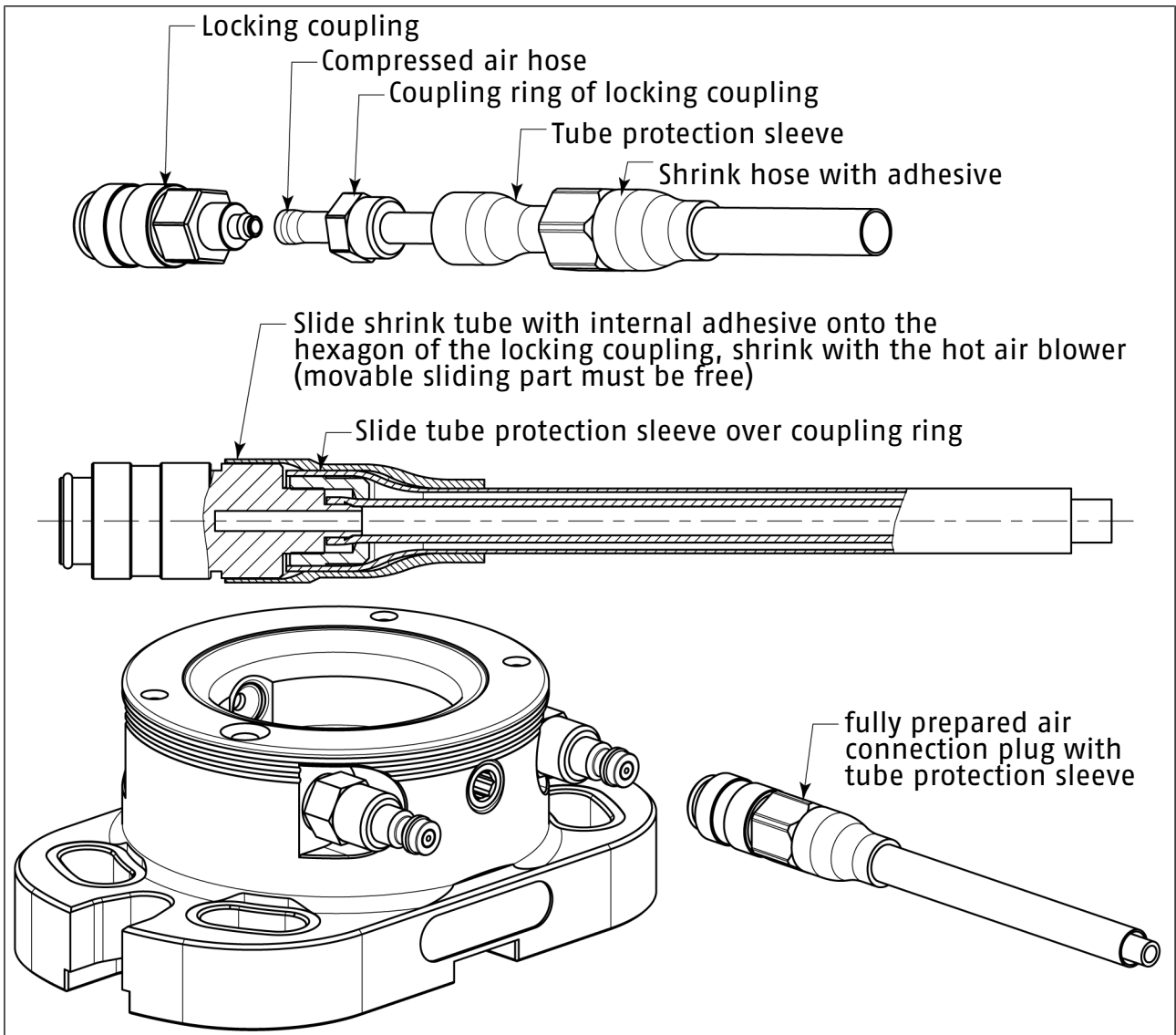
- Max. pressure 2 bar
- Limit volumetric flow to 15 l/min



Pneumatic circuit diagram

### 4.10 Compressed air supply

The compressed air is supplied to the clamping systems via conventional compressed air tubes of nominal size 4 mm. The compressed air tubes can be reinforced with separately available tube protection sleeves made of stainless steel to protect them from hot splinters. The tube protection sleeves are available in three prepared lengths and can be cut to length. With the enclosed heat-shrink tube, the tube protection sleeve is fixed and stuck for connection coupling (see "Preparing the air connector plug" illustration). To make a heat-resistant air connection plug, a metal cutter and a hot air blower are required.



Preparing the air connection plug

Type	ID	Length
Tube protection	1313147	5 m
Tube protection	1313148	10 m
Tube protection	1313149	15 m

## 5 Functional description

The clamping systems of the modular system WDP-5X can be combined with individual clamping pillars using change interfaces similar to a quick-change pallet system, and can be joined using the manual connecting devices of the system components. This enables a clamping device setup for 5-sided machining of a workpiece to be joined together on several clamping pillars.

The clamping systems adapted on the clamping pillars can be actuated pneumatically or manually as desired.

With the WDP-5X-SM stacking modules, five different heights are available. Appropriate combinations of systems enable clamping pillars to be mounted in increments of 10 mm. The WDP-5X-ASM 99-70-Ø36-M pneumatic clamping system is designed for fine adjustment of height with regard to the workpiece interface in conjunction with the matching direct workpiece clamping pin.

### 5.1 Function of the connecting unit in the change components

The clamping systems of the WDP-5X modular system have a special connecting mechanism that includes a quick-change function.

The connection is transferred to a connection shaft by a tapered screw. At the same time, a pre-tension force is applied at the clamping point on the flat surfaces positioned against one another. A hexagonal socket screw drive with wrench size 6 mm is required to clamp and loosen the connecting unit.

For the connecting points, the corresponding screw tightening torques for the clamping screws of the change interface must be adhered to (see chapter "Screw tightening torques" ▶ 4.1 [19]).

The achievable pull-in force on the change interface varies, depending on the screw tightening torque. The maximum torque for the clamping screw may not be exceeded; for this reason, a torque wrench with socket must be used. A lower torque is sufficient for low clamping columns.

To quickly fit the clamping structure, the WDP-5X-BM 99-60 base modules and the WDP-5X-BMG 99-60 basic module include a hexagonal socket screwdriver.

When changing an additional modular system component, the tapered screw at the intake interface of a base module or stacking module must be turned back clockwise until the tapered tip of the screw does not protrude into the taper mounting.

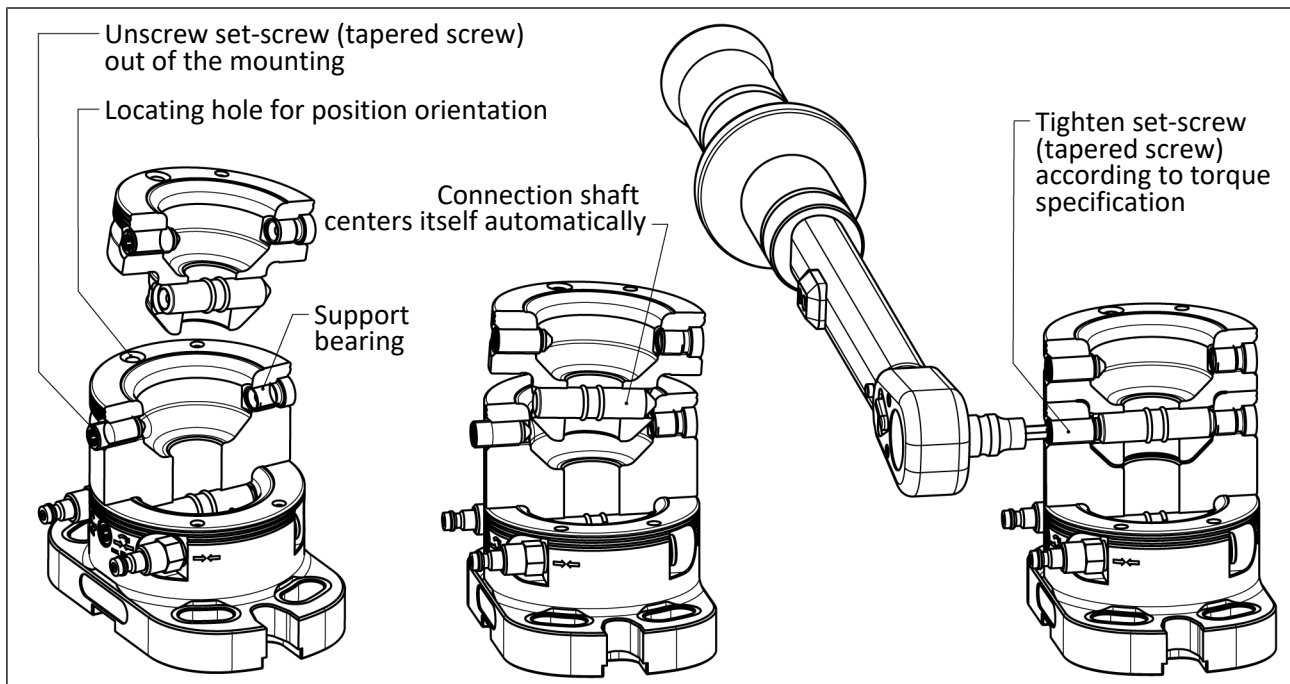
The contact surfaces of the clamping systems must be clean and dry before changing. Make sure that the sealing elements for the compressed air routing are not damaged. The change

components can now be changed into the unlocked intake interface. In doing so, ensure that they are installed in the correct direction. A cylindrical pin is intended as a guide.

The clamping systems can be fixed using the T-handle hexagonal socket screw driver included. For clamping, the precise screw tightening torque must be initiated at the clamping area. The connection point is hereby fixed and positioned.

A tapered screw is included in the scope of delivery as a spare part.

### Sequence when substituting a stacking module into the change interface



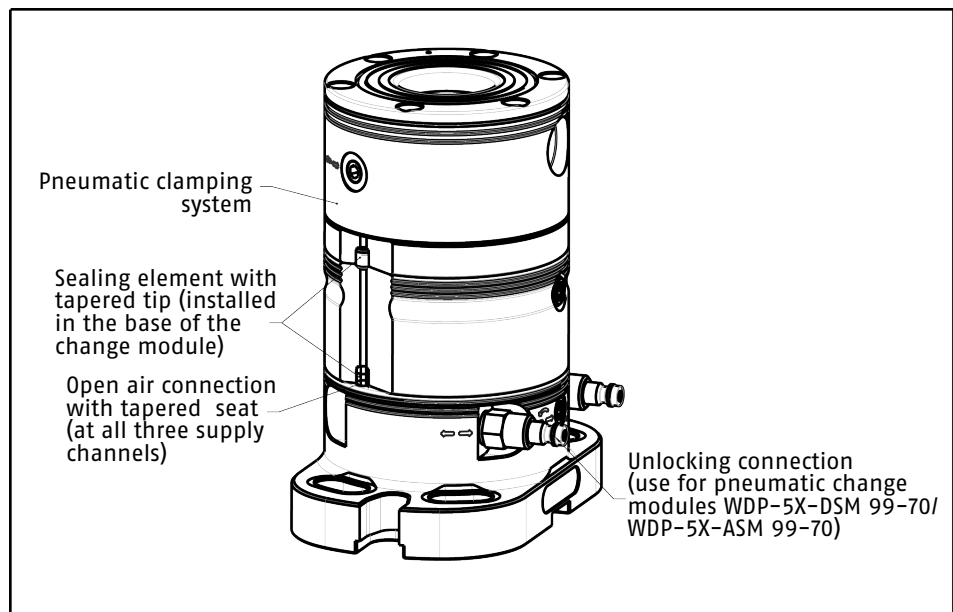
## 5.2 Functions of the air routings in the change components

The modular system for workpiece direct clamping is coordinated to the pneumatic direct clamping module WDP-5X-DSM 99-70. For air supply to the quick-change pallet module, the clamping systems have integrated air routings, which are controlled via base modules (see ▶ 4.9 [40]).

In the clamping devices, sealing elements are inserted at the bottom, which ensure a hose-free connection to the air supply.

For clamping devices without pneumatic actuation, such as a WDP-5X-ASM 99-70-Ø36-M compensation module, sealing elements are likewise used; these act as sealing plugs.

When changing a change component, it must be ensured that the sealing elements are not damaged and are intact. This is the only way to ensure that an adapted pneumatic clamping system can be unlocked and monitored properly.



Air routing in the change components

### 5.3 Function of the workpiece system control

- Max. pressure 2 bar
- Limit volumetric flow to 15 l/min

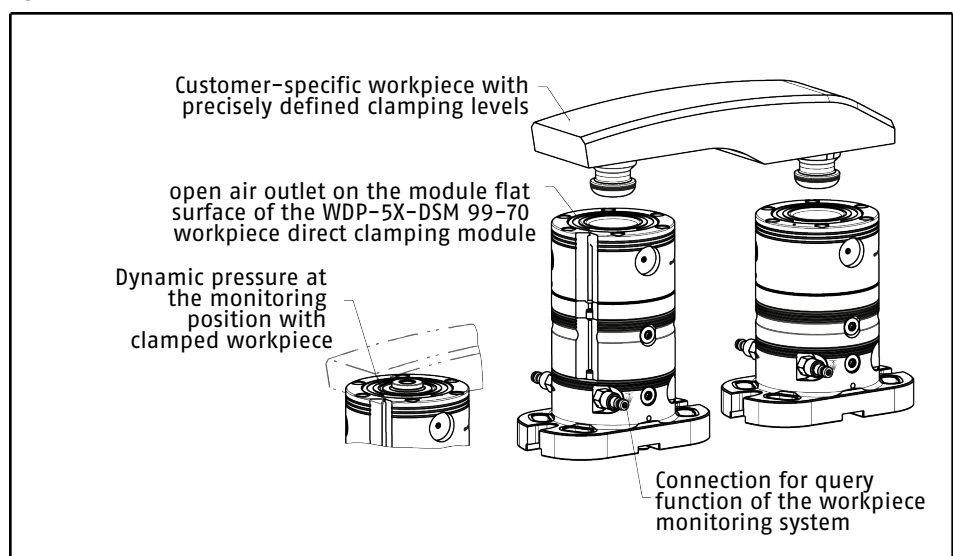
In order to guarantee a reliable evaluation, the pressure and air volume must be held constant. Pressure fluctuations can affect the settings of the pressure switch and lead to incorrect measurement results.

The length and cross-section of the line can affect the switching time of the control components. It may be necessary to readjust the control components.

Check the control components of the monitoring functions at regular intervals. The sealing elements installed in the base of the change elements must be checked regularly for damage.

If errors occur in the monitoring control system, you must detect the cause of the error.

#### System control (for WDP-5X-DSM 99-70, WDP-5X-DSM 99-70-M)



## 6 Operation



### ⚠ WARNING

**Risk of injury due to loss of pallets or workpieces in the case of incorrect actuation and by means of turning application.**

- The danger zone must be surrounded by a protective enclosure during operation.
- Do not use the clamping systems on lathes.
- The clamping systems are only permitted for stationary applications with low turning and rotational motion of the clamping structure.



### ⚠ WARNING

**Risk of injury due to falling parts during transport of the quick-change pallet system, when the axis of the clamping pin is in a horizontal position, or in the case of overhead application**

- Use a crane for transportation.
- In the case of overhead application, or if the system is in a horizontal position, secure the pallets or workpieces so that they do not fall when the change modules are released.



### ⚠ WARNING

**Risk of injury due to loss of pallets or workpieces if the supply of compressed air drops or fails, and due to the clamping pins immediately closing**

- Do not reach into the clamping modules.
- Use pressure maintenance valves.
- Use loading devices.



### ⚠ CAUTION

**There is a risk of limbs being crushed by moving parts during manual loading and unloading and the clamping procedure.**

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

### CAUTION

**For manual loading and unloading of workpieces using a crane, there is a danger of damage to the clamping systems by tilting.**

Do not tilt the workpiece clamping structures when loading and unloading manually.

## 7 Maintenance and care

The clamping systems for the workpiece direct clamping VERO-S WDP-5X and the quick-change pallet systems VERO-S WDP-5X-DSM 99-70, WDP-5X-ASM 99-70-Ø36 are designed for low-maintenance operation, meaning it is only necessary to open and disassemble the clamping systems and clamping modules in exceptional circumstances.



### ⚠ CAUTION

**Risk of injury and risk of damage to the clamping module when opening the housing cover.**

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

**The covers of the clamping modules are spring preloaded and must only be removed by trained specialist personnel. The covers of the WDP-5X-DSM 99-70 direct clamping module and the WDP-5X-ASM 99-70-Ø36 compensation module may also only be assembled and disassembled in compliance with the corresponding assembly and disassembly instructions.**

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

Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]

### CAUTION

**A separate maintenance unit with oiler must be used for the air supply.**

### 7.1 Ambient conditions and operating conditions

- Make sure that the contact surfaces of the interface are always clean.
- Always ensure that no chips of any kind enter the interface of the change components.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.
- Check the pneumatic clamping systems and the workpiece direct clamping modules at regular intervals (at least every 2 weeks or after 200 clampings).
- Carry out regular visual/functional checks.

In the case of visible damage or signs of malfunctions on the clamping systems or the quick-change pallet system installed on the WDP-5X-DSM 99-70 workpiece direct clamping module, shut down the clamping systems immediately. The system may only be commissioned again once the faults have been removed. For example, by replacing the damaged module.

## **7.2 Maintenance and care for manual direct clamping module WDP-5X-DSM 99-70-M and for manual compensation module WDP-5X-ASM 99-70-Ø36-M**

Ensure

- that the drive screw (Item A) is not jolted on tightening.
- that the maximum permissible tightening torque is not exceeded.
- that the assembly tool is positioned straight and not askew.
- that the drive screw (Item A) is replaced every 2,000 clamping cycles, depending on how long the clamping system is used.

### **Maintenance**

- When replacing the drive screw (Item A), the sleeve that is screwed on the front at the access point to the drive (Item B) needs to be removed. The sleeve is fitted with a left-hand thread. The sleeve can be unscrewed clockwise using a spanner wrench with two end spigots that engage in the holes.
- Unscrew the drive screw (Item A).
- Clean all components.
- Grease a new drive screw (Item A) on the thread and then screw it in.
- Screw in the sleeve (Item B) with the thread locking device counterclockwise.
- Perform a functional check.

## 8 Trouble shooting

### The quick-change system no longer clamps properly on the change components

Possible cause	Remedial measures
Clamping screw stiff	Replace clamping screw (spare part scope of delivery)
Drive hexagon socket on the clamping screw defective	Replace clamping screw (spare part scope of delivery)
Connection point remains loose	Check clamping screw for wear and replace if necessary (spare part scope of delivery) check that connecting shaft is installed in the correct position
Connection point is stiff	Clean connection interface and put it into operation
Flat work surface between the modules not achieved	Clean component at the contact surfaces. Assess sealing elements and replace if necessary

### The clamping area on the direct clamping module or compensation module does not unlock or release

Possible cause	Remedial measures
Defective air connections	Check air supply (► 4.9 [□ 40])
Defective sealing elements for air routing	Replace sealing elements at the affected change components
Pressure below minimum	Check operating pressure (min. 5 bar)
A component is broken (e.g. due to overloading)	Replace the module or send it to SCHUNK for repair
Compressed air loss in a quick-change interface connection	Tighten change interface with torque
Excess tensile load on clamping pins	Reduce support weight
Clamping pins locked or clamped	Be aware of the direction of rotation for unlocking on the manual direct clamping module or manual compensation module

### The clamping area on the direct clamping module or compensation module does not unlock or release

Possible cause	Remedial measures
Pressure below minimum	Check operating pressure (min. 5 bar)
Defective sealing elements for air routing	Replace sealing elements at the affected change components
The module was not operated with oiled compressed air	Install maintenance unit with oiler
Hose diameter below minimum	required hose diameters, see ► 4 [□ 19]
The turbo connection is still pressurized	Ventilate connection on the base module or basic module
Clamping module not completely opened	Manual actuation counter-clockwise to the drive until the end position is reached

**The direct clamping module or the pneumatic compensation module 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

**The manual direct clamping module WDP-5X-DSM 99-70-M / the manual compensation module WDP-5X-ASM 99-70-Ø36-M no longer functions correctly**

Possible cause	Remedial measures
A component is broken (e.g. due to overloading)	Replace the module or send it to SCHUNK for repair
Hexagon socket of the actuator screw is defective	Replace actuator screw or send module to SCHUNK for repair

## 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 Seal kit and part lists

### 10.1 Seal kit lists

Sealing kit*	ID
WDP-5X-SM 99-30	0471621
WDP-5X-SM 99-50	0471621
WDP-5X-SM 99-80	0471621
WDP-5X-SM 99-120	0471621
WDP-5X-SM 99-160	0471621
WDP-5X-DSM 99-70	0471623
WDP-5X-DSM 99-70-M	0471623
WDP-5X-ASM 99-70-Ø36	0471625
WPD-5X-ASM 99-70-Ø36-M	0471625
WDP-5X-ASM 99	0471626

\* For included items, see note **X** in the Parts List chapter below. Seals are wearing parts and are recommended to be replaced during maintenance. The sealing kit can only be ordered as a complete kit.

### 10.2 Part lists

#### SPA-VLK 50 (ID 1318565)

Item	Designation	Quantity	Note
1	SP-VLK 50	1	
2	HUE 24/25	1	
3	Screw DIN 4762	1	
4	Clamping pin SPA 40-16	1	
5	Set-screw M16 x 43.5 SPL	1	

#### SPB-VLK 50 (ID 1317936)

Item	Designation	Quantity	Note
1	SP-VLK 50	1	
2	HUE 24/25	1	
3	Screw DIN 4762	1	
4	Clamping pin SPB 40-16	1	
5	Set-screw M16 x 43.5 SPL	1	

#### SPC-VLK 50 (ID 1317937)

Item	Designation	Quantity	Note
1	SP-VLK 50	1	
2	HUE 24/25	1	
3	Screw DIN 4762	1	
4	Clamping pin SPC 40-16	1	
5	Set-screw M16 x 43.5 SPL	1	

**WDP-5X-BM 99-60 (ID 0471617)**

Item	Designation	Quantity	Note
1	Base plate	1	
2	Support bushing	1	
3	Set-screw	1	
4	Sealing ring	3	
5	Sealing nipple	2	
6	Locking screw	3	
8	Screw DIN EN 4762	4	
9	Screw DIN EN 4762	2	
11	Metal washer	2	
12	Locking coupling	2	
13	Allen key 6 mm	1	

**WDP-5X-BMG 99-60 (ID 0471618)**

Item	Designation	Quantity	Note
1	Holder	1	
2	Support bushing	1	
3	Set-screw	1	
4	Clamping pin SPA 40-16	1	
5	Sealing ring	3	
6	Sealing nipple	2	
7	Locking screw	3	
8	Screw DIN 4762	1	
11	Locking coupling	2	
12	Allen key 6 mm	1	

**WDP-5X-BMR 99-60 (ID 0471619)**

Item	Designation	Quantity	Note
1	Holder	1	
2	Support bushing	1	
3	Set-screw	1	
4	Sleeve HUE 24/25	1	
5	Sealing ring	3	
6	Sealing nipple	2	
7	Locking screw	3	
8	Screw DIN 4762	1	
11	Locking coupling	2	
12	Allen key 6 mm	1	

**WDP-5X-SM 99-30** (ID 0471601)

**WDP-5X-SM 99-50** (ID 0471602)

**WDP-5X-SM 99-80** (ID 0471607)

**WDP-5X-SM 99-120** (ID 0471608)

**WDP-5X-SM 99-160** (ID 0471609)

Item	Designation	Quantity	Note
1	Holder	1	
2	Shaft	1	
3	Support bushing	1	
4	Set-screw	1	
5	Cylindrical pin	1	
6	O-ring	2	X
7	SWK seal M5	3	X

**WDP-5X-DSM 99-70** (ID 0471603)

Item	Designation	Quantity	Note
1	Holder	1	
2	Shaft	1	
4	O-ring	1	X
5	Cylindrical pin	2	
6	O-ring	2	X
7	SWK seal M5	3	X
10	VERO-S NSE3 99-ZLD	1	

**WDP-5X-DSM 99-70-M** (ID 0471611)

Item	Designation	Quantity	Note
1	Holder	1	
2	Shaft	1	
4	O-ring	1	X
5	Cylindrical pin	2	
6	O-ring	2	X
7	SWK seal M5	3	X
8	Cylindrical pin	1	
10	VERO-S NSE-M plus 99-ZL	1	

**WDP-5X-ASM 99-70-Ø36 (ID 0471615)**

Item	Designation	Quantity	Note
1	Holder	1	
2	Shaft	1	
4	O-ring	1	X
5	Cylindrical pin	3	
6	O-ring	2	X
7	SWK seal M5	3	X
10	VERO-S WDP-5X-ASM 99	1	

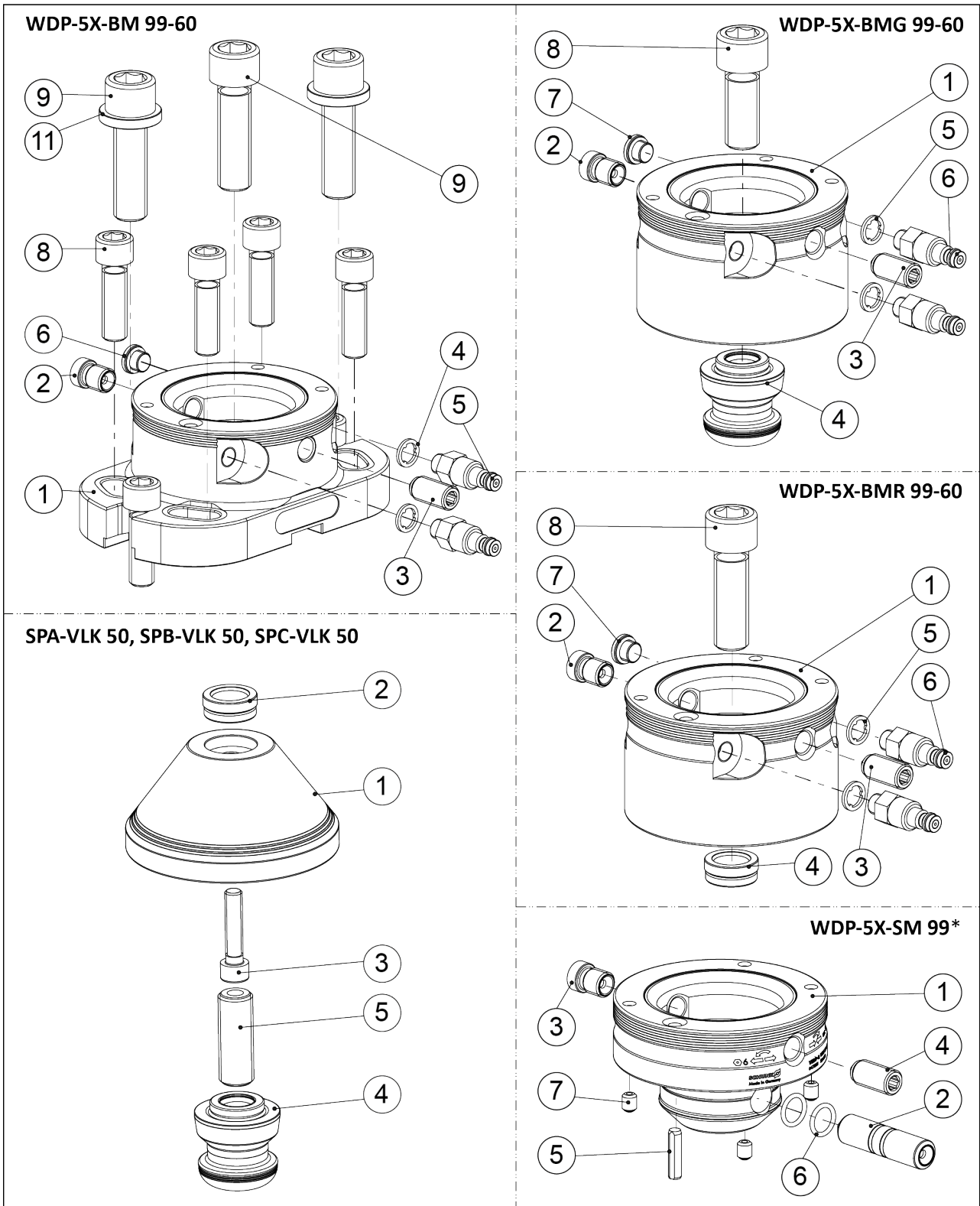
**SPC-ASM 36 (ID 0471616)**

Item	Designation	Quantity	Note
1	Clamping pin SPC-ASM 36	1	
2	Screw	1	

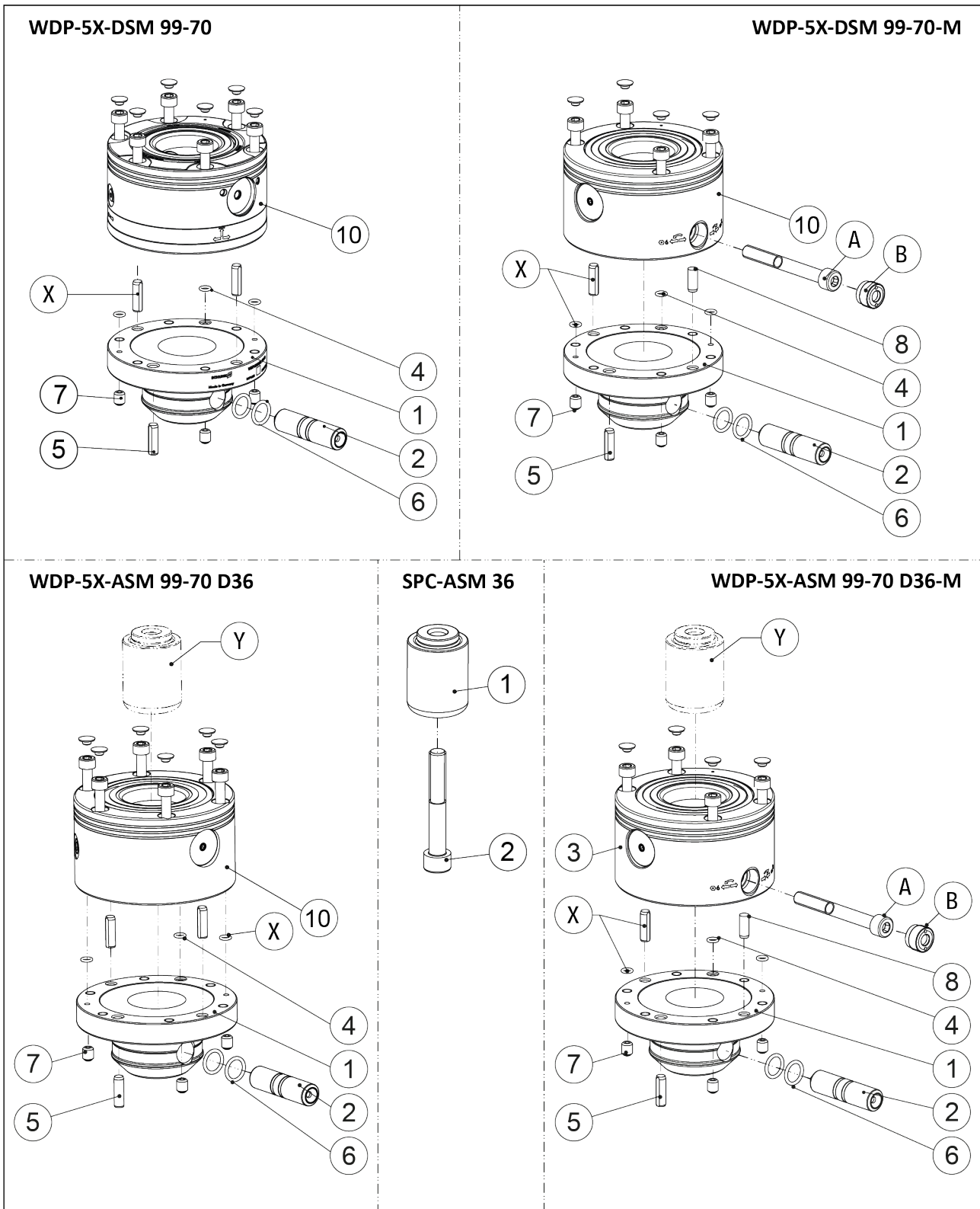
**WDP-5X-ASM 99-70-Ø36-M (ID 1358030)**

Item	Designation	Quantity	Note
1	Holder	1	
2	Shaft	1	
3	VERO-S WDP-5X-ASM 99-56-M	1	
4	O-ring	1	
5	Cylindrical pin	1	
6	O-ring	2	
7	SWK seal M5	3	
8	Cylindrical pin	1	
16	O-ring	1	X
20	O-ring	1	X
23	O-ring	4	X
24	O-ring	2	X
25	O-ring	1	X
26	O-ring	3	X
27	O-ring	1	X
40	Slide washer	1	X
45	Cover plug VERO-S ADK M6	6	X

## 11 Assembly Drawings



\* Illustration representative for the sizes 30, 50, 80, 120, 160

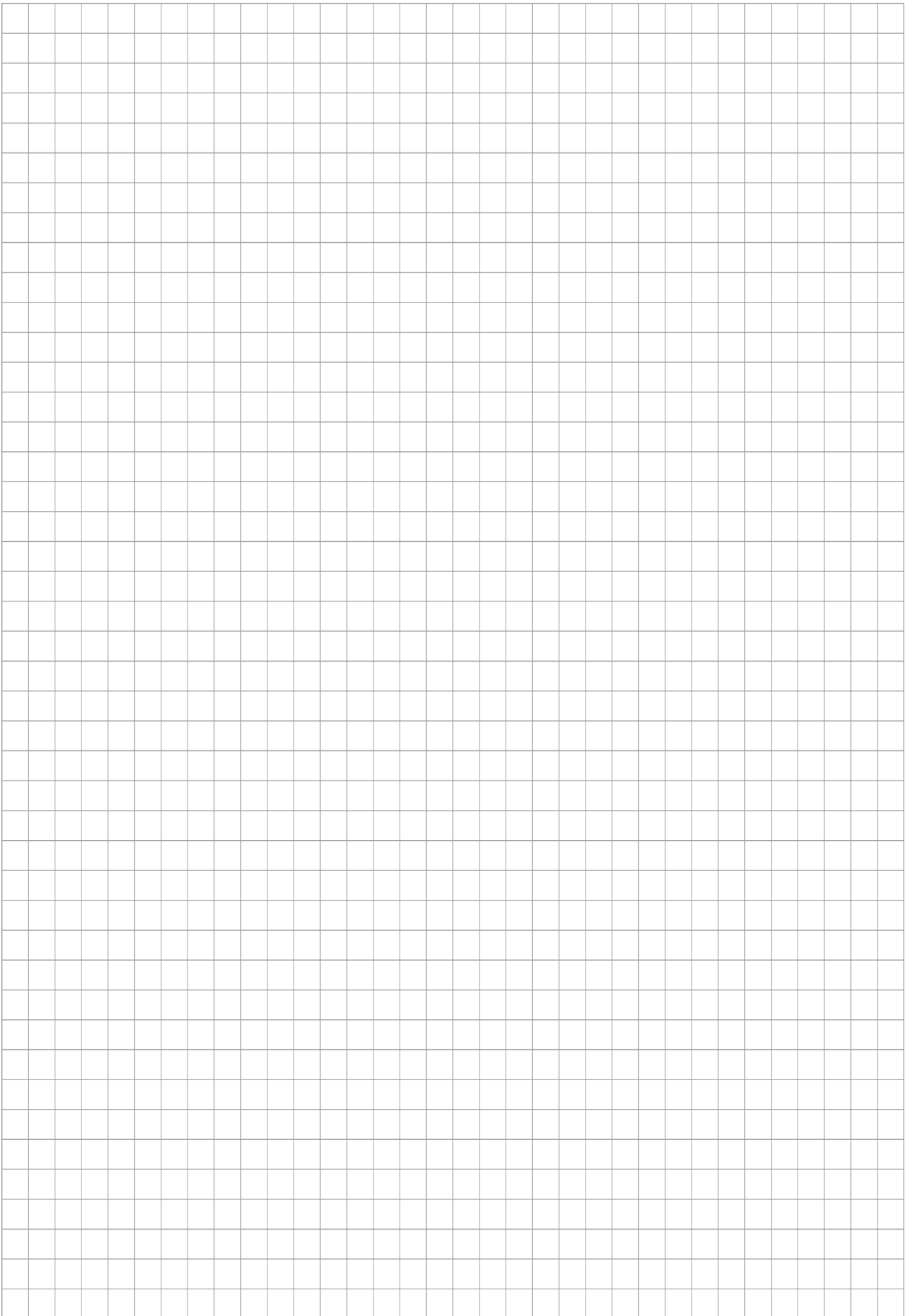


A Replace actuator screw for maintenance

B Remove sleeve for disassembly of drive screw (left-hand thread)

X Included in WDP-5X DSM, WDP-5X-ASM

Y For SPC-ASM 36 (accessory kit), suitable for WDP-5X-ASM





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# Manufacturer certificate

**Manufacturer /** Heinz-Dieter SCHUNK GmbH & Co. Spanntechnik KG.  
**Distributor:** Lothringer Str. 23  
D-88512 Mengen

**Product:** Quick-change pallet system  
**Description:** VERO-S  
**Type designation:** WDP, WDG

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 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.
- **fault exclusion** against the fault "Unexpected release without pending release signal".
- the **fault exclusion** against the fault "Breakage during operation" in compliance with the parameters, limitations, ambient conditions, characteristic values and maintenance intervals, etc., specified in the operating manual.
- that internal bore diameters in the **pipe or control lines** are at least 2 mm for pneumatic clamping systems and at least 3 mm for hydraulic clamping systems

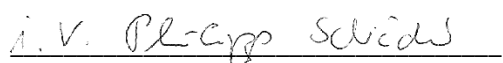
#### Harmonized standards applied:

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

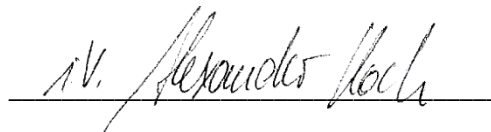
#### Other related technical standards and specifications:

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

Mengen, 25. Apr. 2023



p.p. Philipp Schröder / Head of Development standard products



p.p. Alexander Koch / Head of Engineering Design special products

Reviewed and approved / Date: P. Schröder / 05/31/2022

Created/Date: A. Koch / 05/31/2022;

FB No. 824M ; Ver. 00

Revision status 00/10/16/2021