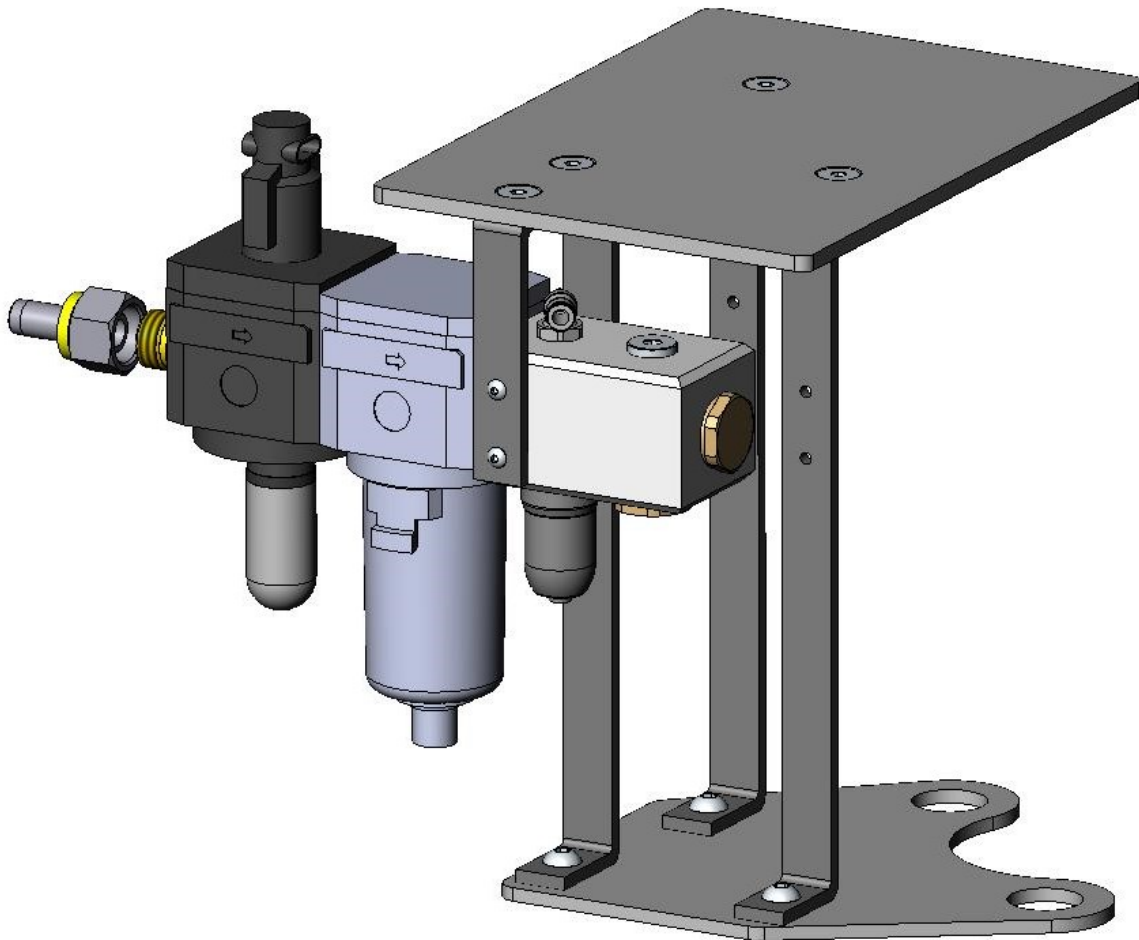


## Operating instructions



Type SC02

### Master Jet air unit

**Article number: 299368**

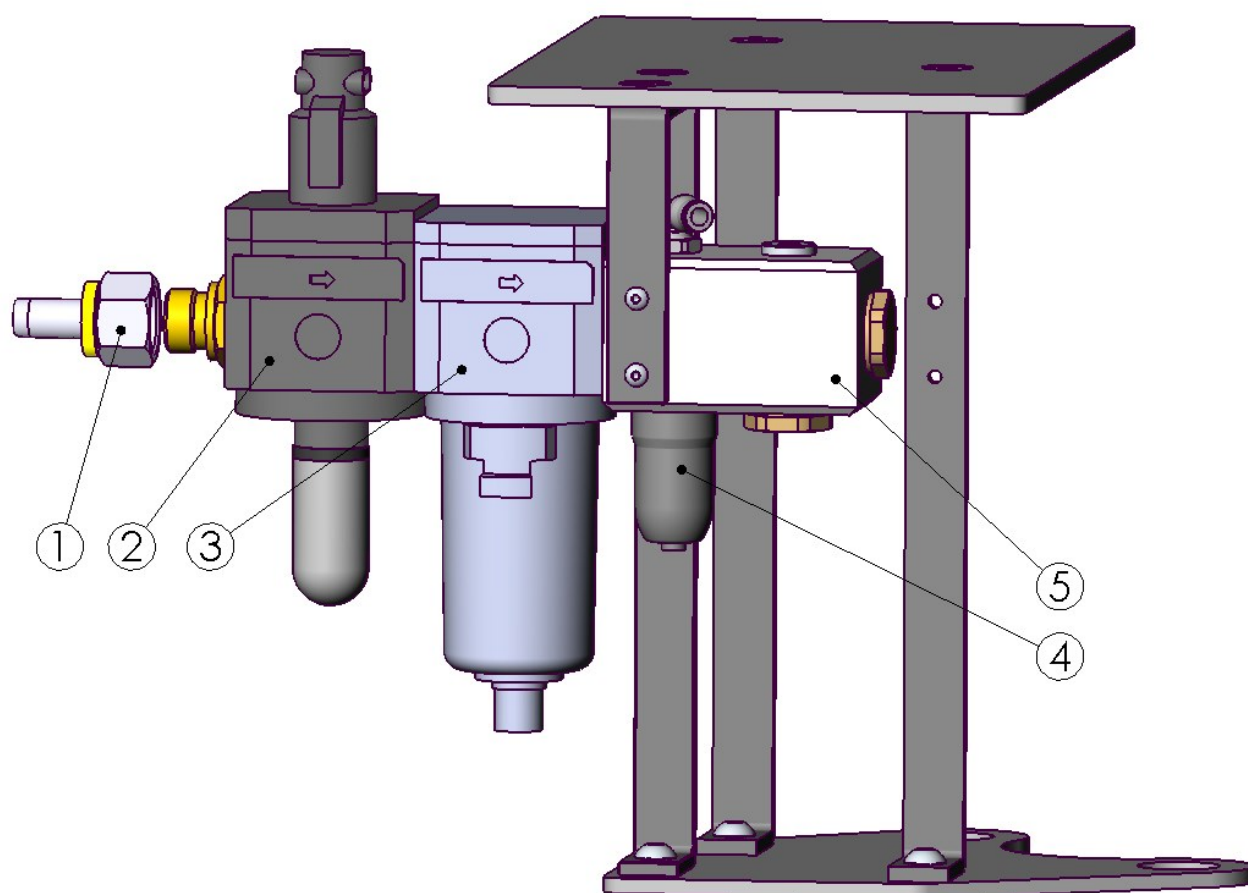
**Operating instructions:**

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Operating instructions 1701/01\_EN

# Master Jet air unit

## Overview of device



- 1 Sealing head DN12 on input side
- 2 Shut-off valve with deaeration, lockable
- 3 Compressed air filter
- 4 Pressure switch with M12 connector
- 5 Distributor housing

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# 1 Operating instructions

The operating instructions describe the entire life cycle of the device. Keep these instructions in a location which is easily accessible to every user and make these instructions available to every new owner of the device.

## **WARNING!**

**The operating instructions contain important safety information!**

Failure to observe these instructions may result in hazardous situations.  
The operating instructions must be read and understood.

## 1.1 Symbols

### **DANGER!**

**Warns of an immediate danger!**

Failure to observe the warning will result in a fatal or serious injury!

### **WARNING!**

**Warns of a potentially hazardous situation!**

Failure to observe the warning may result in serious injuries or death!

### **CAUTION!**


**Warns of a potential danger!**

Failure to observe this warning may result in a moderate or minor injury.

## **NOTE!**

**Warns of damage!**

Failure to observe the warning may result in damage to the device or other equipment.

 *Important additional information, tips and recommendations.  
Refers to information in these operating instructions or in other documentation.*

→ Designates a section which you must carry out.

## 2 Authorized use



### WARNING!

#### General hazard information

Non-authorized use of the air unit may be dangerous to people, nearby equipment, and the environment.

- The Master Jet air unit is designed to control and monitor cooling circuits in industrial production plants.
- The air unit must not be used in potentially explosive areas.
- Use according to the authorized data, operating conditions, and conditions of use specified in the contract documents and operating instructions. These are described in the chapter entitled "Technical Data".
- The air unit may be used only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- Correct transportation, storage and installation as well as careful operation and maintenance are essential for reliable and fault-free operation.
- Do not make any external modifications to the device housings. Do not paint the housing parts or screws!
- Use the air unit only as intended.

### 2.1 Restrictions

If exporting the system, observe any existing restrictions.

### 2.2 Predictable misuse

- Supply the media connections of the system only with those media which are specified as flow media in the chapter entitled "Technical Data".

### 3 Basic safety instructions

These safety instructions do not make allowance for any

- Contingencies and events which may arise during assembly, operation, and maintenance of the air unit.
- local safety regulations – the operator is responsible for observing these regulations, also in relation to the installation personnel.



#### **DANGER!**

##### **Danger – high pressure!**

- Before loosening lines and valves, turn off the pressure and vent the lines!

##### **Risk of electric shock!**

- Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation!
- Observe the applicable accident prevention and safety regulations for electrical equipment!

##### **General hazardous situations.**

To prevent injuries:

- Do not introduce any liquids into the compressed air connections.
- The step protection on the upper side of the device must not be loaded with more than 70 kg.
- The system cannot be activated unintentionally.
- Installation and repair work may be carried out by authorized technicians only and with the appropriate tools
- The process must restart in a defined or controlled manner after an interruption in the power supply or pneumatic supply
- The device may be operated only when in perfect condition and in consideration of the operating instructions.
- The general rules of technology apply to application planning and operation of the device.



*The device has been developed with due consideration given to the accepted safety rules and is state-of-the-art. Nevertheless, dangerous situations may occur. Failure to observe these instructions as well as any unauthorized tampering with the device release us from any liability and also invalidate the warranty covering the accessories!*

## 4 General information

### 4.1 Scope of supply

- Base frame with pneumatic unit
- Operating instructions for Master Jet air unit

### 4.2 Contact address

Bürkert Fluid Control Systems  
Sales Center  
Christian-Bürkert-Strasse 13-17  
D-74653 Ingelfingen

Tel. + 49 (0) 7940 – 10 91 111  
Fax + 49 (0) 7940 – 10 91 448  
Email: [info@de.buerkert.com](mailto:info@de.buerkert.com)  
[www.buerkert.com](http://www.buerkert.com)

### 4.3 Warranty

The warranty is only valid if the Master Jet air unit is used as intended in accordance with the specified application conditions.



*The warranty extends only to defects in the air unit and its components.  
We accept no liability for any kind of collateral damage which could occur due to failure or malfunction of the device.*

## 5 Product description

### 5.1 Intended use

The Master Jet air unit is designed for use in industrial facilities, in particular robot applications for resistance spot welding and material handling.

### 5.2 Description

- Lockable shut-off valve with quick pressure relief function
- Compressed air filter with aluminum housing, 5 µm micro filter, manual condensate drainage
- Pressure switch (NO) preset to 3.5 bar (50.7 PSI), M12 electric connector
- Distributor housing with pneumatic connection option G1/4" and G1/2"

## 6 Technical data

### 6.1 Operating conditions

#### WARNING!

##### **Risk of injury!**

Malfunction if used outside!

- Do not use the Master Jet air unit outdoors and avoid heat sources which may cause the permitted temperature range to be exceeded.

During installation work, always ensure sufficient access for potential maintenance work.

##### **Permitted temperatures**

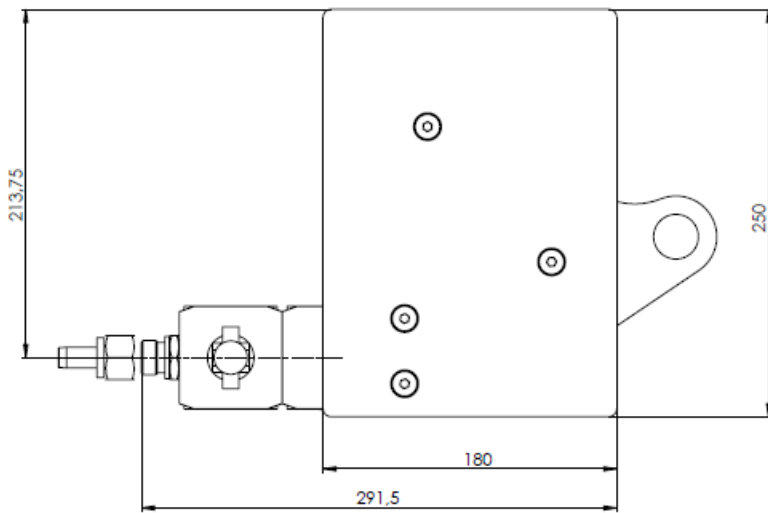
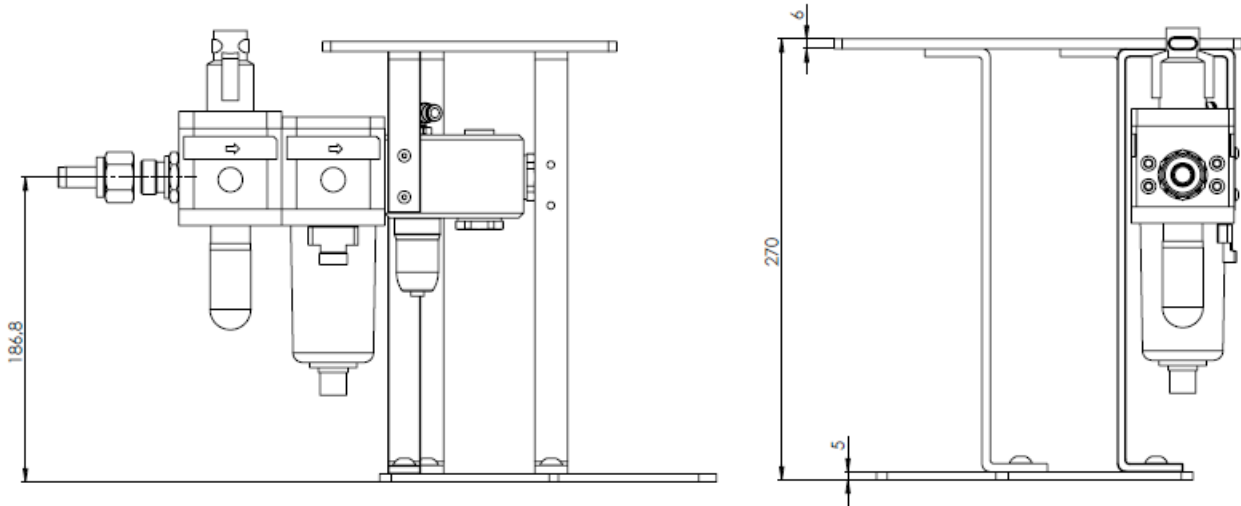
Ambient temperature: +5 °C to +55 °C (+41°F to + 131°F)

### 6.2 Specifications

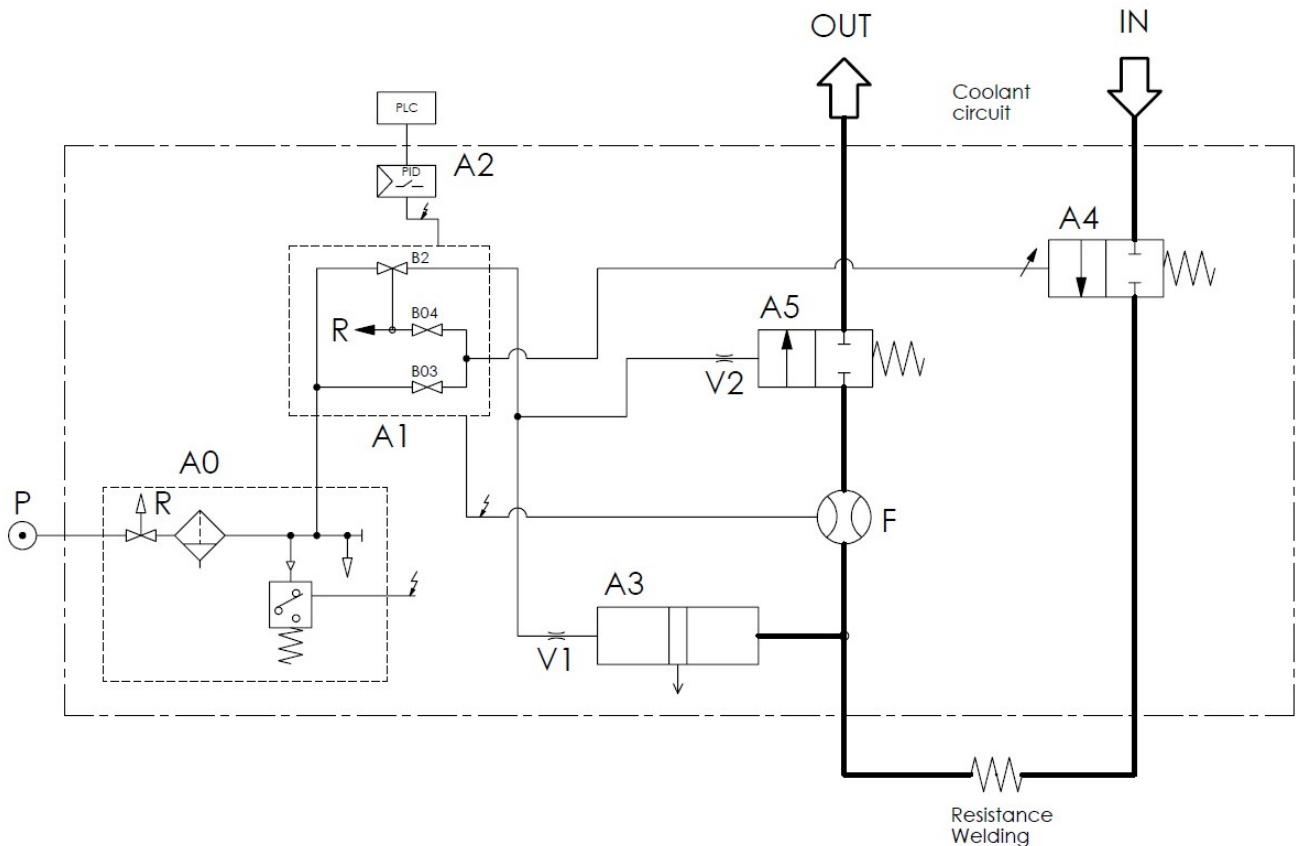
Weight:	4.4 kg (9.7 lbs)
Control medium:	Quality classes in accordance with DIN ISO 8573-1
Dust content:	Class 5 (max. particle size 40 µm, max. particle density 10 mg/m <sup>3</sup> )
Water content:	Class 3 (max. pressure dew point -20 °C or min. 10 °C below the lowest operating temperature)
Oil content:	Class 5 (max. 25 mg/m <sup>3</sup> )
Temperature range of compressed air:	-10 °C to +50 °C (+14 °F to 122 °F)
Pressure range:	4 bar to 10 bar (58 PSI to 145 PSI)
Pressure switch:	NO, preset to 3.5 bar (50.7 PSI), M12 electric connector Switching capacity: max. 42 V, 4 A, 100 VA Pressure range: 1 – 10 bar (14.5 – 145 PSI)
Connections:	Screw-in socket EO 24°, DN15 Plug-in hose connector Ø 6 mm x G1/4" (connection of the compressed air supply of the cooling water unit) Lock screw G1/2"



### 6.3 Dimensions



## 6.4 Pneumatic-hydraulic circuit diagram Master Jet



- P Compressed air supply pneumatic unit
- A0 Pneumatic unit
- A1 Control valve unit
- A2 Process control
- A3 Expansion cylinder
- A4 Control valve in the supply line
- A5 Shut-off valve in the return line
- BO3 Aeration pilot valve supply line
- BO4 Deaeration pilot valve supply line
- B2 Pilot valve return line
- F Impeller flow sensor
- R Air quick relief
- V1 Flow restrictor expansion cylinder
- V2 Flow restrictor shut-off valve return line

## 7 Assembly

### 7.1 Safety instructions

#### **DANGER!**

##### **Risk of injury due to high pressure in the system!**

- Before loosening lines and valves, turn off the pressure and vent the lines!

##### **Risk of injury due to electric shock!**

- Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation!
- Observe the applicable accident prevention and safety regulations for electrical equipment!

#### **WARNING!**

##### **Risk of injury due to improper assembly!**

- Assembly may only be carried out by authorized specialist personnel and using the appropriate tools.
- Install the function unit in an upright position only
- The installation position must be observed.
- Assembly is correct when the step protection plate is on top!

##### **Risk of injury due to unintentional activation of the system and uncontrolled restart!**

- Secure system against unintentional activation.
- Following assembly, ensure a controlled restart!

### 7.2 Assembling the air unit

#### **Procedure:**

→ Screw the air unit onto the robot base using the designated bores in the flanged connection plate.

#### **DANGER!**

##### **Risk of injury from falling robot!**

When the air unit has been assembled, the robot must be screwed back into place to prevent it from becoming detached from the base frame and overturning.

- Before screwing in the fastening screws, it is essential to insert the appropriate conical spring washers.

Always tighten to specified torque rate specified by KUKA for the particular robot type!

## 8 Installation

### 8.1 Safety instructions



#### **DANGER!**

##### **Risk of injury due to high pressure in the system!**

- Before loosening lines and valves, turn off the pressure and vent the lines!

##### **Risk of injury due to electric shock!**

- Before reaching into the device or the equipment, switch off electrical power supply and secure to prevent reactivation!
- Observe the applicable accident prevention and safety regulations for electrical equipment!



#### **WARNING!**

##### **Risk of injury due to improper installation!**

- Installation may only be carried out by authorized specialist personnel and using the appropriate tools.

##### **Risk of injury due to unintentional activation of the system and uncontrolled restart!**

- Secure system against unintentional activation.
- Following installation, ensure a controlled restart!

### 8.2 Pneumatic installation



#### **DANGER!**

##### **Risk of injury due to high pressure in the system!**

- Before loosening lines and valves, turn off the pressure and vent the lines!

→ Connect the factory compressed air supply to the pneumatic unit inlet (hose DN12).

#### **Note!**

##### **Damage caused by high inlet pressure!**

- The input pressure available at the factory must not exceed the maximum permitted input pressure of the system.
- If the pressure is too high, a pressure control valve must be connected upstream.

## 8.3 Electrical installation

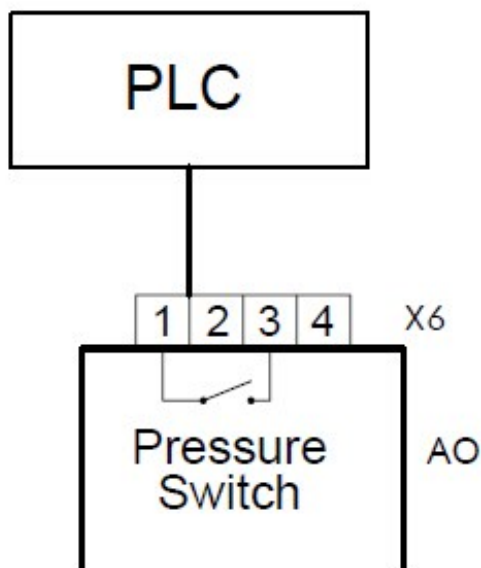
### DANGER!

#### Risk of injury due to electric shock!

- Before reaching into the device or the equipment, switch off electrical power supply and secure to prevent reactivation!
- Observe the applicable accident prevention and safety regulations for electrical equipment!

#### Procedure:

→ Connect the pressure switch of the pneumatic unit (X6) and connect it to the PLC (connection cable not included in the scope of supply).



<b>X6:</b>	<b>4-pole M12 device plug</b>
1	NO1
2	–
3	NO2
4	–

## 9 Start-Up

### 9.1 Safety instructions

#### **WARNING!**

##### **Risk of injury due to improper operation!**

Improper operation may result in injuries as well as damage to the device and its environment!

- Before starting up, ensure that the operating personnel are familiar with and completely understand the contents of the operating instructions.
- Observe the safety instructions and authorized use.
- Only adequately trained personnel may start up the equipment/the device.

### 9.2 Starting up the pneumatic unit

#### **DANGER!**

##### **Risk of injury from moving compressed air hoses that are not connected!**

- Check all of the hose connections are secured tightly before charging the pneumatic unit with compressed air.
- Ensure that the exhaust shut-off valve remains closed during initial start-up.

##### **Procedure:**

- Open the air supply line on the input side of the pneumatic unit.
- Check the compressed air connections and resolve any existing air leaks with suitable measures.
- Open the exhaust shut-off valve if there are no existing air leaks.
- Again, check the compressed air connections and components of the pneumatic unit for leaks.
- Ensure that there are no leaks.
- Now check the electrical feedback of the pressure switch.
- Check whether the input on the connected PLC or robot control is in logical switching state "1".
- When the quick pressure relief shut-off valve has been shut off, the input of the connected PLC should switch to logical switching state "0".

This completes start-up of the pneumatic unit.

## 10 Maintenance, troubleshooting

### 10.1 Safety instructions

#### **DANGER!**

##### **Risk of injury due to high pressure in the system!**

- Before loosening lines and valves, turn off the pressure and vent the lines!

##### **Risk of injury due to electric shock!**

- Before reaching into the device or the equipment, switch off electrical power supply and secure to prevent reactivation!
- Observe the applicable accident prevention and safety regulations for electrical equipment!

#### **WARNING!**

##### **Risk of injury due to improper maintenance work!**

- Maintenance may only be carried out by authorized specialist personnel and using the appropriate tools!

##### **Risk of injury due to unintentional activation of the system and uncontrolled restart!**

- Secure system against unintentional activation.
- Following maintenance, ensure a controlled restart.

### 10.2 Maintenance work

Parts which are subject to natural wear:

- Seals
- Filter element of the compressed air filter

Must be regularly maintained.

If leaks occur, replace the particular wearing part with an appropriate spare part.

## 10.3 Cleaning

Do not use alkaline cleaning agents to clean the surfaces of the device.

## 10.4 Malfunctions

If malfunctioning occurs, the following checks are recommended:

- Line connections
- Electric power supply and input signals
- Is the operating pressure within the permitted range?

Malfunction	Possible cause	Remedial action
No air flow available	Pneumatic unit not ready for operation	→ Check the pneumatic input pressure and, if necessary, replace the compressed air filter element
Signal level not available on PLC	Pressure switch not connected	→ Connect pressure switch to PLC
	Pressure switch defective	→ Replace pressure switch

## 11 Wearing parts

### CAUTION!

#### Risk of injury and/or damage due to use of incorrect parts!

- Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and its environment.
- Use original accessories and original spare parts from Bürkert only!

Wearing parts	Order number
Pneumatic unit complete	583822
Pressure switch pneumatic unit	772499
Replacement filter element 5 µm for compressed air filter	On request



## 12 DECOMMISSIONING

### 12.1 Safety instructions

#### **DANGER!**

##### **Risk of injury due to high pressure in the system!**

- Before loosening lines and valves, turn off the pressure and vent the lines!

##### **Risk of injury due to electric shock!**

- Before reaching into the device or the equipment, switch off electrical power supply and secure to prevent reactivation!
- Observe the applicable accident prevention and safety regulations for electrical equipment!

#### **WARNING!**

##### **Risk of injury due to improper removal!**

- Removal may be carried out by authorized technicians only and using the appropriate tools!

### 12.2 Removing the air unit

#### **DANGER!**

##### **Risk of injury from falling robot!**

When the air unit has been removed, the robot must be screwed back into place to prevent it from becoming detached from the base frame and overturning.

- Before screwing in the fastening screws, it is essential to insert the appropriate conical spring washers.
- Tighten the robot base screws to the specified torque rate found in the KUKA product specification

## 13 Transportation, storage and disposal

### NOTE!

#### Transport damage!

Inadequately protected devices may be damaged during transportation.

- During transportation protect the device against moisture and dirt in shock-resistant packaging.
- Prevent the temperature from exceeding or dropping below the permitted storage temperature.
- Protect the electrical interface of the solenoid coil and the pneumatic connections from damage by placing protective caps on them.

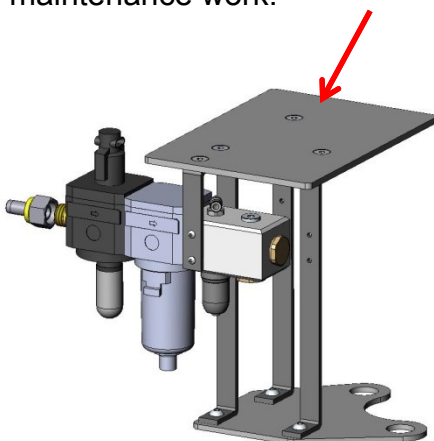
#### Incorrect storage may damage the device!

- Store the device in a dry and dust-free location
- Storage temperatures -10 °C to +55 °C. / 15 °F to 131 °F

#### Damage to the environment caused by device components contaminated with media!

- Dispose of the device and packaging in an environmentally friendly manner!
- Observe applicable disposal and environmental regulations

The air unit may be transported in the designated packaging only. Always use the step protection plate to raise the system when transporting it in-house to the place of installation or for maintenance work.



### NOTE!

Raising the device on the maintenance unit or other components may damage the air unit.