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1 SAFETY INSTRUCTIONS

IMPORTANT SYMBOLS



This symbol indicates informations and instructions.



Caution!

This symbol indicates a potentially dangerous situation. If it is not avoided, slight or minor injuries may result.



Danger!

This symbol indicates an immediate hazard. If it is not avoided, death or serious injuries may result.

GENERAL SAFETY INSTRUCTIONS



- These operating instructions contain important information on using the ejector. Please read the operating instructions thoroughly and keep them for later reference.



Never look into any open or closed vacuum vents (e.g. vacuum connections or suction pads). Serious injuries could occur as a result. Eyes can be sucked in.

- Compressed air can cause closed containers to explode. A vacuum can cause closed containers to implode.
- The ejector may only be operated with a silencer. Never look into the exhaust air jet of the silencer.
- The ejector emits noise. We recommend wearing ear protection.
- This device is not intended for use with hazardous dust, oil mist, vapors or aerosols, etc. If drawn in, these materials will enter the exhaust air and may result in poisoning.
- Use only the connections, mounting holes and attachment materials that have been provided.
- Carry out mounting and removal only when the device is in an idle, depressurized state.
- No person may sit or stand in the area in which the load is to be transported.
- No person may sit or stand in the danger zone while the machine or system is in automatic mode.
- Components may be installed by trained specialist personnel only.

- Specialist personnel must be familiar with current safety rules and requirements. For example, these apply to the use of components such as solenoid valves and pressure switches as well as to controllers used in devices, machines and systems.
- Specialist personnel must also be familiar with the system's control concept. In particular, they must be familiar with the system's redundant control components and feedback signals.

INTENDED USE

The ejector is designed to generate a vacuum for gripping and transporting objects when used in conjunction with suction pads. Neutral gases in accordance with EN 983 are approved as evacuation media. Neutral gases include air, nitrogen and inert gases (e.g. argon, helium and neon). Aggressive gases or media such as acids, acid fumes, bases, biocides, disinfectants or detergents are not permitted.



The ejector is **not** suitable for transporting or sucking through liquids or bulk material such as granulates.
Personal injury or damage to the ejector may occur.

INSTALLATION AND OPERATION

For safe installation and trouble-free operation, please observe and comply with the following points:



The ejector may only be operated using power supply units with protected extra-low voltage (PELV). The system must incorporate safe electrical cut-off of the power supply in compliance with EN60204.



**Do not operate the ejector in environments where there is a risk of explosion.
Risk of fire and explosion.**



The device may not be operated outside its specified performance limits. Doing so may cause it to malfunction or be destroyed.



During installation and maintenance, make sure that the ejector is disconnected and depressurized and that it cannot be switched on again without authorization. Personal injury or damage to the ejector may occur.

- Protect the ejector from damage at all times.
- No modifications may be made to the ejector.
- Opening the ejector will damage the “tested” labels. This voids the warranty.
- Connection symbols and labels are located on the ejector. These must be observed.
- Only the intended connections may be used.
- Pneumatic and electrical line connections must be securely connected and attached to the ejector.
- The ejector may be installed in any position.
- If these instructions are not observed, malfunctions, material damage and serious injury – including fatal injury – may result.
- If the ejector is no longer operative, the components must be disposed of in an ecologically sound manner.

2 PRODUCT OVERVIEW

GENERAL DESCRIPTION OF FUNCTIONS

VACUUM GENERATION (PICKING UP THE WORKPIECE)

The ejector is designed for vacuum handling of parts in combination with suction systems. The venturi nozzle is activated and deactivated using the “suction” pilot valve. In the NO version, the venturi nozzle is deactivated when voltage is applied. In the NC version, the venturi nozzle is activated when voltage is applied.

When objects with dense surfaces are picked up, the integrated non-return valve prevents the vacuum from dropping.

BLOW-OFF (DEPOSITING THE WORKPIECE)

The vacuum circuit of the ejector is supplied with compressed air using the “blow off” pilot valve. This ensures that the vacuum drops quickly, depositing the workpiece quickly as well.

VERSIONS

Each ejector has a specific item designation (e.g. SCPSb-10-S4-NO).

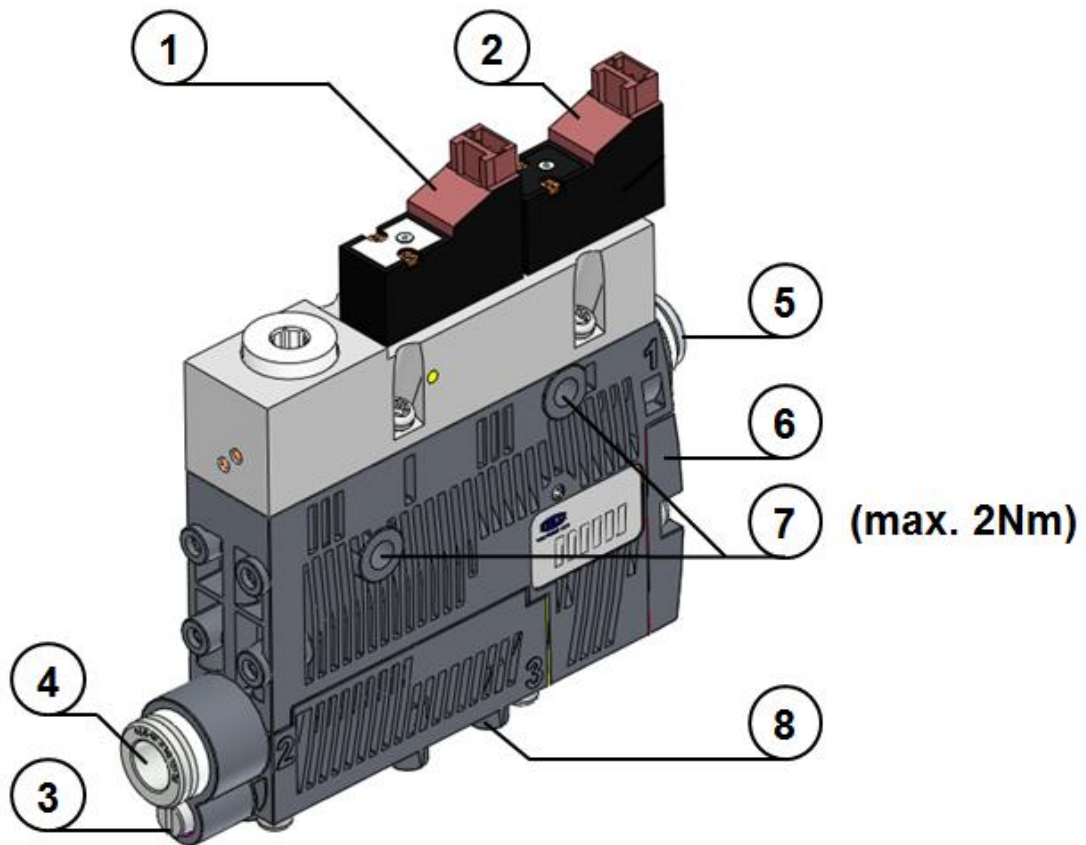
The item designation can be broken down as follows:

| Type | Performance class | Pneumatic connection | Electrical connection | Idle position |
|-------|-------------------|---|---|--|
| SCPSb | 07 10 15 | S4 (2x D6) S4 (2x D6) S2 (D6 an 1, D8 an 2) | Using the plug connection of the pilot valves | NO Normally open NC Normally closed |

ELECTRICAL CONNECTION

Plugs for magnetic valves are inserted until they lock into place. Press the lock lever to remove the plugs.

EJECTOR DESIGN



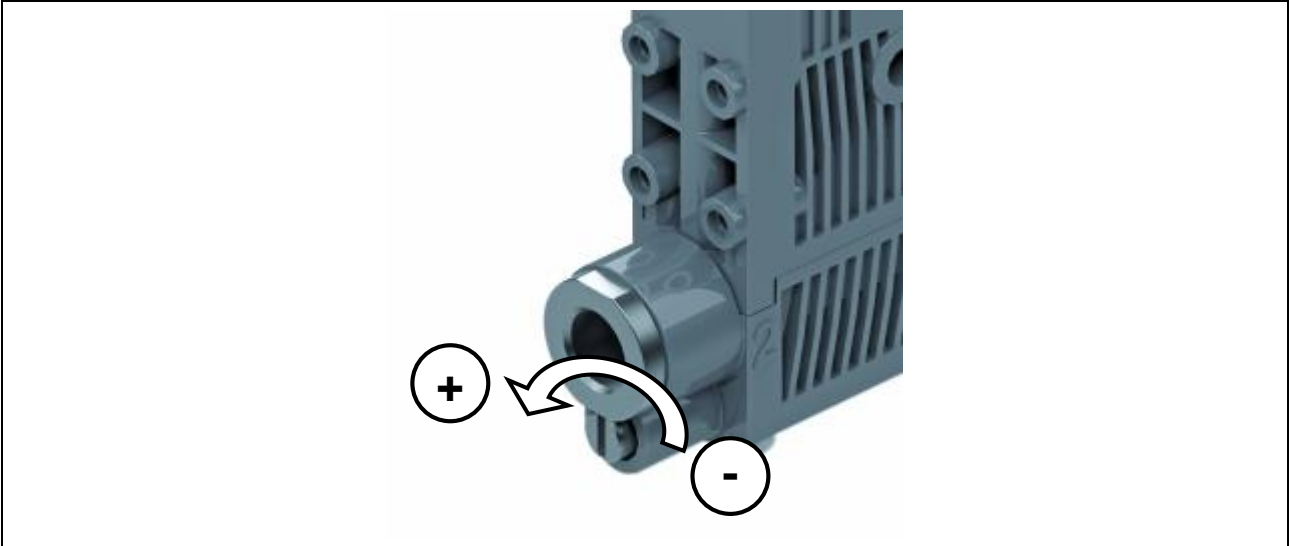
We recommend using washers on the mounting holes.
Do not look into the exhaust outlet (compressed air) during operation

| Position | Description | Max. tightening torque |
|----------|---|------------------------|
| 1 | Pilot valve „Suction“ | 0,2 Nm |
| 2 | Pilot valve „Blow-Off“ | 0,2 Nm |
| 3 | Blow-off valve screw | |
| 4 | Vacuum connection (label: 2 [V]) D6 – SCPSb – 07/10 D8 – SCPSb – 15 | |
| 5 | Compressed air connection D6 | |
| 6 | Silencer cover | 0,5 Nm |
| 7 | Mounting holes | 2 Nm |
| 8 | Exhaust outlet (label 3) | |

3 DESCRIPTION OF FUNCTIONS

GENERAL FUNCTIONS

SETTING THE BLOW-OFF VOLUME FLOW



There is a valve screw below the vacuum connection (2). This valve screw can be used to set the blow-off volume flow.

Turning the screw clockwise reduces the volume flow. Turning the screw counterclockwise increases the volume flow.

The valve screw is equipped with a stop on both sides.



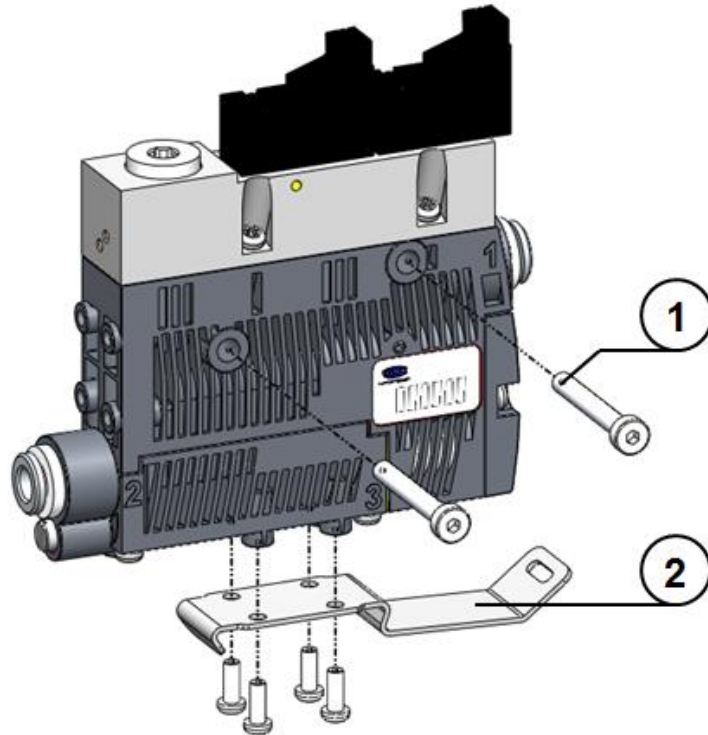
Do not turn the valve screw past the stops. A minimum volume flow of approx. 10% is always necessary for technical reasons.

The blow-off volume flow can be set between 10% and 100%.

4 OPERATING MODE

MOUNTING

SCPSb ...



We recommend using washers when mounting the securing screws.

| Position | Description | Max. tightening torque |
|----------|---|------------------------|
| 1 | M4 securing screw | 2 Nm |
| 2 | Top-hat rail clamp for TS35 top-hat rail, incl. plastic tapping screws (optional) | 0,5 Nm |

PNEUMATIC CONNECTION

- Use only well-maintained compressed air (air or neutral gas according to EN 983, filtered to 20 µm, oiled or unoled).
- High-quality compressed air is important to ensure a long service life for the ejector.
- If there are heavy accumulations of dirt on the suction-side, we recommended you use additional filters, e.g. VFI 6/4 for SCPSb 07/10 or VFI 8/6 for SCPSb 15
- Dirt particles or foreign bodies in the ejector connections, hoses or pipelines can lead to partial or complete ejector malfunction.
- Hoses and pipelines should be laid such that distances are minimized.
- If the internal diameter on the compressed air side is too small, insufficient compressed air will be supplied. This prevents the ejector from performing as specified in the performance data.
- Excessive flow resistance occurs if the internal diameter on the vacuum side is too small. This leads to both a reduction in suction capacity and increased evacuation times. Blow-off times are also lengthened.
- Hose lines must be laid without bends or crimps.
- Only use hoses or pipes with the internal diameters recommended for the ejector. If this is not possible, use the next largest internal diameter.

RECOMMENDED LINE CROSS-SECTIONS (INTERNAL DIAMETERS)

| SCPSb performance class | Line cross-section (internal diameter) [mm] ¹⁾ | |
|----------------------------|---|-------------|
| | Compressed air side | Vacuum side |
| 07 | 4 | 4 |
| 10 | 4 | 4 |
| 15 | 4 | 6 |

¹⁾ Based on a maximum hose length of 2 m. For longer hose lengths, the cross sections must also be larger and you must use corresponding adapters!

ELECTRICAL CONNECTION

- The ejector may only be operated using power supply units with protected extra-low voltage (PELV). The system must incorporate safe electrical cut-off of the power supply in compliance with EN60204.

Schmalz connection lines may be used to connect the ejector directly to the controller, e.g. Art.-no. 21.04.06.00086, 3m



When you connect the valves, you don't need to check the polarity.

5 MAINTENANCE

GENERAL MAINTENANCE

EXTERIOR SOILING

Remove dirt on the exterior of the device with a soft cloth and soap suds (max. 60°C). Ensure that the silencer and the controller are not soaked with soap suds.

SILENCER

Because it is open, the silencer may be exposed to high levels of dust, oil, etc., which may dirty the silencer to the point of reducing the suction capacity. If this happens, it must be replaced. Cleaning is not recommended due to the capillary effect of the porous material.

WARRANTY, SPARE PARTS AND WEARING PARTS

This system is guaranteed in accordance with our general terms of trade and delivery. The same applies to spare parts, provided that these are original parts supplied by us.

We are not liable for any damage resulting from the use of non-original spare parts or accessories.

Wearing parts are not covered by the warranty.

The following list contains the primary spare and wearing parts.

SPARE AND WEARING PARTS

| Type | Designation | Article no. | Legend | Max. tightening torque |
|-------|------------------------|----------------|--------|------------------------|
| | Silencer insert | 10.02.02.04141 | W | |
| NO/NC | Pilot valve „Blow-Off“ | 10.05.01.00104 | S | 0,2 Nm |
| NC | Pilot valve „Suction“ | 10.05.01.00104 | S | 0,2 Nm |
| NO | Pilot valve „Suction“ | 10.05.01.00103 | S | 0,2 Nm |
| | Insulating plate | 10.02.02.04152 | S | |

Legend: Spare part= **S** Wearing part= **W**



When tightening the securing screws on the silencer module, observe the maximum tightening torque of 0,5 Nm.



When you replace the silencer insert, we recommend that you also replace the insulating plate.

TROUBLESHOOTING

| Fault | Possible cause | Solution |
|---|---|---|
| Vacuum level is not reach or vacuum is created too slowly | Silencer is dirty | Replace silencer |
| | Leakage in hose line | Check hose connections |
| | Leakage at suction pad | Check suction pad |
| | Operating pressure too low | Increase operating pressure (observe max. limits) |
| | Internal diameter of hose lines too small | See recommended hose diameters |
| Payload cannot be held securely | Vacuum level too low | Increase operating pressure (observe max. limits) |
| | Suction pad too small | Select a larger suction pad |

ACCESSORIES

| Designation | Article no. |
|---|----------------|
| Connection cable for Pilot valves | 21.04.06.00086 |
| Top-hat rail clamp for TS35 top-hat rail, incl. plastic tapping screws (optional) | 10.02.02.04149 |

6 TECHNICAL DATA



Operating the ejector system outside of the specified values can result in damage to the system and attached components.

ELECTRICAL PARAMETERS

| Parameter | Symbol | Limit values | | | Unit | Comment |
|--|--------|--------------|-----|------|----------|--------------------|
| | | Min. | Typ | Max. | | |
| Supply voltage | U_A | 22,8 | 24 | 26,4 | V_{DC} | PELV ¹⁾ |
| SCPSb – xx – xx - NO | | | | | | |
| Rated current from U_A ²⁾ | I_A | — | — | 110 | mA | $U_A = 24,0V$ |
| SCPSb – xx – xx - NC | | | | | | |
| Rated current from U_A ³⁾ | I_A | — | — | 55 | mA | $U_A = 24,0V$ |

¹⁾ The power supply must comply with the requirements of EN60204 (protective extra-low voltage).

²⁾ Parallel control of the “suction” and “blow off” valves

³⁾ Separate control of the “suction” and “blow off” valves

MECHANICAL DATA

GENERAL PARAMETERS

| Parameter | Symbol | Limit values | | | Unit | Comment |
|----------------------|--|--------------|-----|------|------|------------------------|
| | | Min. | Typ | Max. | | |
| Ambient temperature | T_{amb} | 0 | — | 50 | °C | |
| Storage temperature | T_{Sto} | -10 | — | 60 | °C | |
| | | | | | | |
| Humidity | H_{rel} | 10 | — | 90 | %rf | Free from condensation |
| | | | | | | |
| Degree of protection | | — | — | IP65 | | |
| | | | | | | |
| Operating pressure | P | 2 | 4 | 6 | bar | |
| Operating medium | Air or neutral gas, filtered to 20 μm , oiled or unoled, compressed air w/ quality class 3-3-3 acc. to ISO 8573-1 | | | | | |

MATERIALS USED

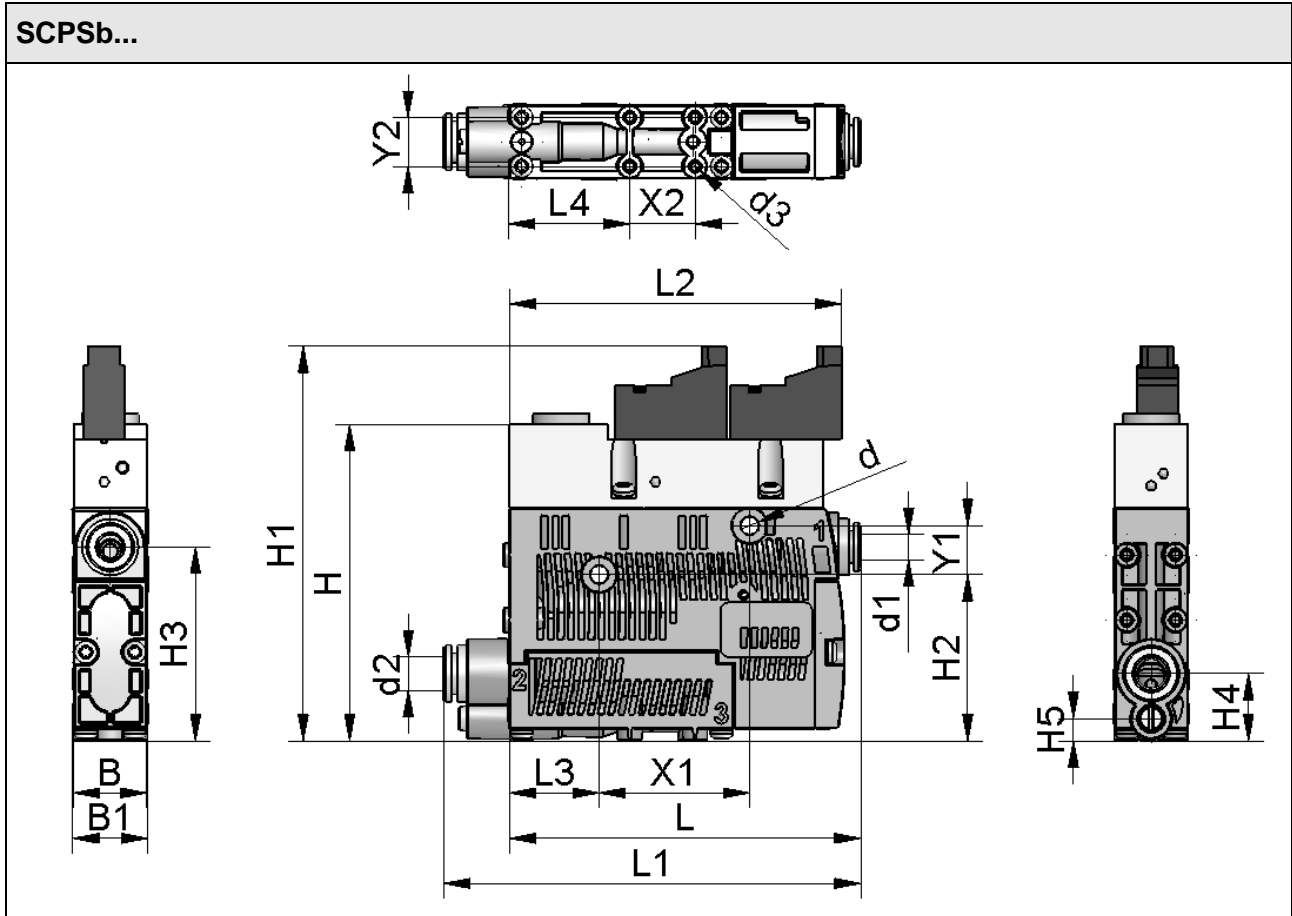
| Component | Material |
|------------------|---|
| Basic body | PA6-GF, Anodized aluminum alloy |
| Inner components | Anodized aluminum, Anodized aluminum alloy, brass, galvanized steel, stainless steel, PU, POM |
| Silencer insert | Porous PE |
| Seals | NBR |
| Lubricants | Silicone-free |
| Screws | Galvanized steel |

MECHANISCHE PARAMETER

| Type | Nozzle size | Max. vacuum ¹ | Suction rate ¹ | Max. blow-off capacity ¹ | Air consumption ¹ | Sound level ¹ | | Weight |
|----------|-------------|--------------------------|---------------------------|-------------------------------------|------------------------------|--------------------------|--------|--------|
| | | | | | | Free sucking | sucked | |
| | mm | % | l/min | l/min | l/min | dBA | dBA | kg |
| SCPSb-07 | 0,7 | 85 | 16 | 130 | 25 | 61 | 58 | 0,195 |
| SCPSb-10 | 1,0 | 85 | 34 | 130 | 42 | 66 | 59 | 0,195 |
| SCPSb-15 | 1,5 | 85 | 63 | 130 | 95 | 68 | 60 | 0,195 |

1) at 4 bar

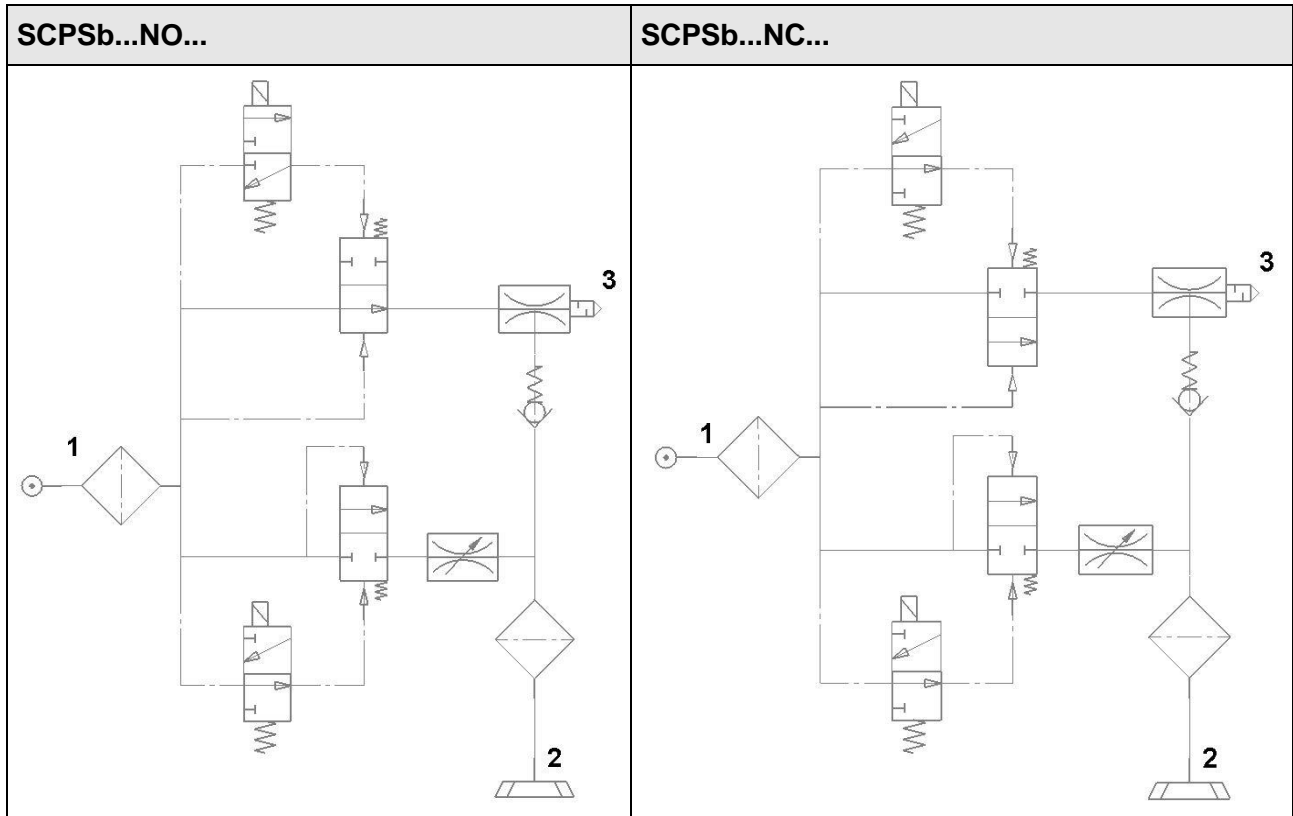
DIMENSIONS



| L | L1 | L2 | L3 | L4 | B | B1 | H | H1 | H2 | H3 | H4 |
|------|-------|------|----|------|----|------|------|----|------|------|------|
| 86,2 | 102,5 | 81,4 | 22 | 29,5 | 18 | 18,6 | 77,5 | 97 | 40,8 | 47,5 | 16,5 |

| H5 | d | d1 | d2 | d3 | X1 | X2 | Y1 | Y2 | | | |
|-----|-----|----|----|-----|------|----|----|----|--|--|--|
| 5,5 | 4,4 | 6 | 6 | 2,6 | 36,9 | 16 | 12 | 12 | | | |

PNEUMATIC CIRCUIT DIAGRAMS



7 CONFORMITY DECLARATION

DE EG-Konformitätserklärung
 EN EC- Declaration of Conformity
 FR CE-Déclaration de conformité
 ES Certificado de conformidad CE
 IT Dichiarazione di conformità CE
 NL CE Conformiteitsverklaring



Hersteller / Manufacturer / Fabricant / Fabricante / Produttore / Fabrikant

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Produktbezeichnung / Product name / Designation du produit /
 Denominación del producto / Denominazione del prodotto / Beschrijving van de machine

Ejektoren der Serie / Ejectors series / Ejecteurs de la série / Eyectores de la serie / Eiettori de la serie / Ejector Serie **SCPSb**

Erfüllte einschlägige EG-Richtlinien / Applicable EC directives met / Directives CE applicables respectées /
 Directivas vigentes de la CE cumplidas / Direttive CE applicate ed osservate / Nagekomen betreffende EG-richtlijnen

2006/42/EG Maschinenrichtlinie / Machinery Directive / Directive sur les machines /
 Directiva para máquinas / Direttiva macchine / Machinerichtlijn

2004/108/EG Elektromagnetische Verträglichkeit / Electromagnetic Compatibility / Compatibilité électromagnétique /
 Compatibilidad electromagnética / Compatibilità elettromagnetica / Elektromagnetische compatibiliteit

Angewendete harmonisierte Normen / Harmonised standards applied / Normes d'harmonisation appliquées /
 Normas armonizadas aplicadas / Norme armonizzate adottate / Toegepaste geharmoniseerde normen

EN ISO 12100 Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung / Safety of Machinery -
 General principles for design - Risk assessment and risk reduction / Sécurité des machines - Principes généraux de conception -
 Appréciation du risque et réduction du risque / Seguridad de máquinas - Principios generales de diseño - Evaluación del riesgo y
 reducción del riesgo / Sicurezza delle macchine - Principi generali di progettazione - Valutazione del rischio e riduzione del rischio
 / Veiligheid van machines - Algemene beginselen voor ontwerp - Risicobeoordeling en de risicoreductie

EN 61000-6-3 Elektromagnetische Verträglichkeit - Störaussendung / Electromagnetic Compatibility - Emission /
 Compatibilité électromagnétique - Norme sur l'émission / Compatibilidad electromagnética - Emisión de interferencias /
 Compatibilità elettromagnetica - Norma generica sull'emissione / Elektromagnetische compatibiliteit - emissie

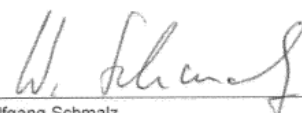
EN 61000-6-2 Elektromagnetische Verträglichkeit - Störfestigkeit / Electromagnetic Compatibility - Immunity /
 Compatibilité électromagnétique - Immunité / Compatibilidad electromagnética - Resistencia a interferencias /
 Compatibilità elettromagnetica - Immunità / Elektromagnetische compatibiliteit - immunitieit

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Glatten, 11.07.2013 /


 Wolfgang Schmalz
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These operating instructions were originally written in German and have been translated into English.

We reserve the right to make technical changes. No responsibility is taken for print errors or other types of errors.

All information and specifications are subject to change without notice.

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