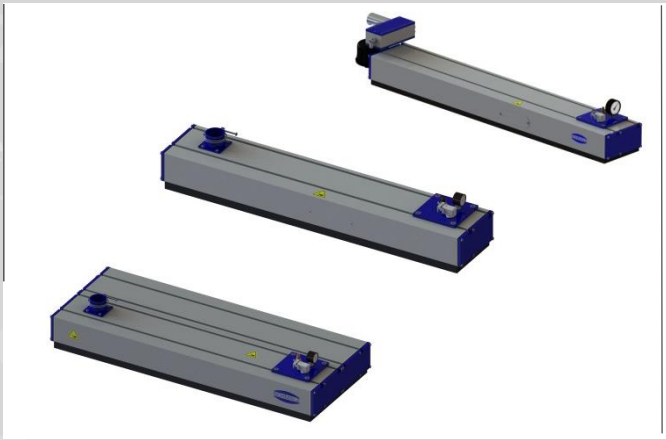
Innovative Vacuum for Automation



EN

Operating Instructions
Area gripping system SBX-C

30.10.02.00604/02 | 10.2017

Note
These operating instructions were originally written in German and have been translated into English. Store in a safe place for future reference.

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

Published by

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Contents

Area gripping system SBX-C

1 Safety Instructions

1.1 Classification of safety instructions

Danger
This warning informs the user of a risk that will result in death or serious injury if it is not avoided.

DANGER	
	Type and source of danger Consequence ► Remedial action

Warning
This warning informs the user of a risk that could result in death or serious injury if it is not avoided.

WARNING	
	Type and source of danger Consequence ► Remedial action

Caution
This warning informs the user of a risk that could result in injury if it is not avoided.

CAUTION	
	Type and source of danger Consequence ► Remedial action

Attention
This warning informs the user of a risk that could result in damage to property if it is not avoided.

ATTENTION	
	Type and source of danger Consequence ► Remedial action

General notes
This symbol is used when important notes and information regarding use of the machine/the system/the device are provided.

Note/Information

1.2 Prohibition signs

Explanation of the prohibition signs used in the operating instructions.

Icon	Description	Icon	Description
	Do not stand under suspended loads		

1.3 Warnings

Explanation of the warning symbols used in the operating instructions.

Icon	Description	Icon	Description
	Pollution warning		Crushing injury warning
	Suspended load		Hand injury warning
	Electrical voltage	-	-

1.4 Mandatory symbols

Explanation of the mandatory symbols used in the operating instructions.

Icon	Description	Icon	Description
	Observe the instructions		Wear eye protection
	Use protective footwear		Activate prior to maintenance or repair

1.5 General safety instructions

The system is state-of-the-art and operationally reliable. However, dangers may arise.

WARNING

Failure to follow the safety instructions

Personal injuries and damage to the system

- The operating instructions contain important information on using the system. Read the operating instructions thoroughly and keep them for later reference!
- The system must only be operated by trained personnel who have read and understood the operating instructions.
- The operating instructions are tailored to the scope of delivery from Schmalz. These operating instructions do not take into account any modifications to the system made by the customer.
- The system may only be connected and operations started once the operating instructions have been read and understood.
- Use only the connections, mounting holes and attachment materials that have been provided.
- Carry out mounting or removal only when the device is in an idle, depressurized state.
- Only qualified specialist personnel, mechanics and electricians may perform the installation. Qualified specialist personnel are persons who have received technical training and have the knowledge and experience – including knowledge of corresponding regulations – necessary to enable him or her to recognize possible dangers and implement the appropriate safety measures
- General safety regulations, European standards and VDE guidelines must be observed and complied with.
- The gripper is to be used in combination with an automated handling system (gantry/robot). For this reason, you must also follow the safety regulations of the corresponding system.
- Personnel and animals are not permitted to sit or stand in the transport area.
- Transporting persons or animals is prohibited!
- No person may sit or stand in the danger zone while the machine or plant is in automatic mode.
- It is not permitted to make changes to system components.
- The system must only be operated at the operating voltage specified for the components.
- Make sure that the workplace and surroundings are kept clean.
- Protect the components from damage of any kind.

⚠ WARNING	
	**Failure to follow the safety instructions** Personal injuries and damage to the system ► Compressed air or a vacuum could cause closed containers to explode or implode. Check the products before use. ► Do not apply suction to any dangerous dusts, oil mists, vapors, aerosols, etc. ► Only use suitable and approved vacuum filters. ► Do not look into the exhaust air flow of the vacuum generator.

1.6 Intended use

The system is used to lift and transport workpieces such as lumber, wooden components, furniture parts or similar materials that allow suction. Neutral gases in accordance with EN 983 are approved as evacuation media. Neutral gases include air, nitrogen and inert gases. The device is not suitable for manual handling. Operations using the device must take place in a secure area where no people are allowed to enter.

The system is mounted on the load suspension provided by the customer using the T-slots designated for this purpose. The customer also provides a control device.

The system can only be used when hung vertically. (You must consult the manufacturer regarding tilted positions, as well as pivoting or tipping motions.)

1.7 Note on the type plate

The type plate contains important information about the device. The type plate is firmly attached to the exterior of the device.

The type plate contains the following information:

- Type
- Part number
- Year of manufacture
- Serial number

The type, part number and year of manufacture are important information for identifying the device. They must always be specified when ordering replacement parts and making warranty claims or other inquiries about the device.

2 Product Description

2.1 Functional principle

The system lifts the defined products using a vacuum and is designed to customer requirements. The system is a variable gripping system whose length and design can be adapted to customer requirements. It can be used to lift layers of boards, planks or similar workpieces of various sizes without adapting the suction area to the specific workpiece.

Each individual suction opening in the system is equipped with a check valve that automatically closes the suction opening when it is not in use. This allows the suction openings that are in use to achieve a higher vacuum level, even if only part of the system's overall surface is covered.

The system achieves its maximum load-bearing capacity when all the suction openings are covered with workpieces.

The automated handling system to which the system was attached by the customer is responsible for motion in the various axes.

2.2 Versions

The system is available in 3 different versions with different overall widths and types of vacuum generation:

- SBX-C 200 (width: 200 mm), single beam with integrated vacuum generation
- SBX-C 200 (width: 200 mm), single beam with connection for external vacuum generation
- SBX-C 400 (width: 400 mm), double beam with connection for external vacuum generation

The length can vary for all versions of the system.

2.2.1 Vacuum generation

The system can be operated using an ejector (Venturi effect), a blower or a pump. You can find a more detailed description of each vacuum generator in section 13, Other Applicable Documents.

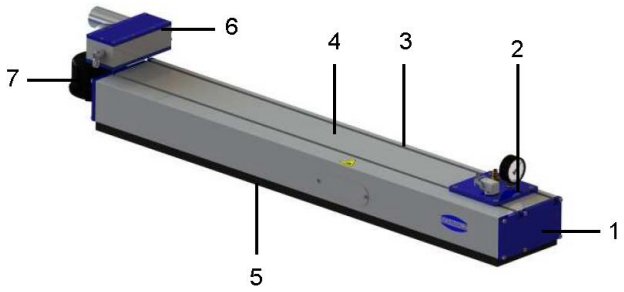
The system is generally connected to the external vacuum generation using a vacuum hose.

The vacuum generator (ejector version) has the optimal settings ex works and these settings must not be changed.
Adjustments to the vacuum generator made by employees without the necessary qualifications can reduce the device's load-bearing capacity or cause unexpected downtime.

⚠ **WARNING**	
	Adjustments to the vacuum generator by unqualified employees Serious personal injury ► Do not change the vacuum generator's settings.

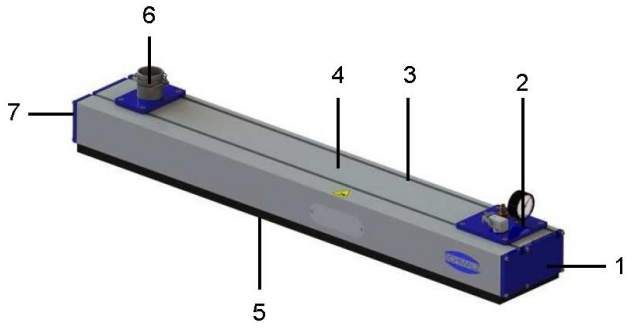
2.3 Design

2.3.1 Ejector SBX-C 200



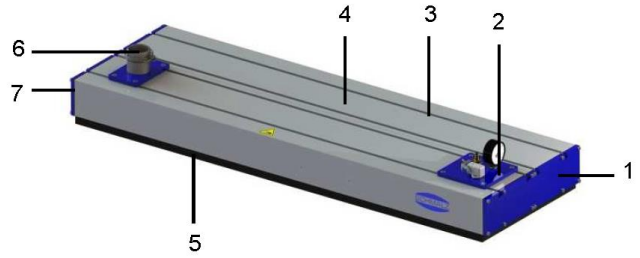
1. Cover
2. Connection plate
3. T-slot
4. Main body with integrated function modules
5. Sealing mat
6. Vacuum ejector
7. Dust filter (2.3.7)

2.3.2 Blower/pump SBX-C 200



1. Cover
2. Connection plate
3. T-slot
4. Main body with integrated function modules
5. Sealing mat
6. Vacuum connection
7. Cover

2.3.3 Blower/pump SBX-C 400



1. Cover
2. Connection plate
3. T-slot
4. Main body with integrated function modules
5. Sealing mat
6. Vacuum connection
7. Cover with venting unit

2.3.4 Suction bar

The suction bar is used to lift the item. The system can be connected to the vacuum generation (blower, pump) using a vacuum hose.
The suction bar must be completely covered with workpieces to achieve the system's maximum load-bearing capacity.

2.3.5 Pneumatic cylinders

Pneumatic cylinders are used to activate the separating cylinder (see 2.3.10), and a ventilation cylinder for blower/pump operation (see 2.3.10).

2.3.6 Solenoid valve

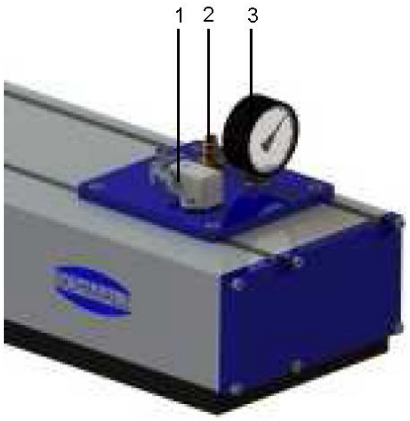
The cylinder(s) is/are controlled by a pneumatic valve. The valve is switched electrically (DC 24 V) using an external controller.

2.3.7 Dust filter

(Optional; integrated at the factory for ejectors)

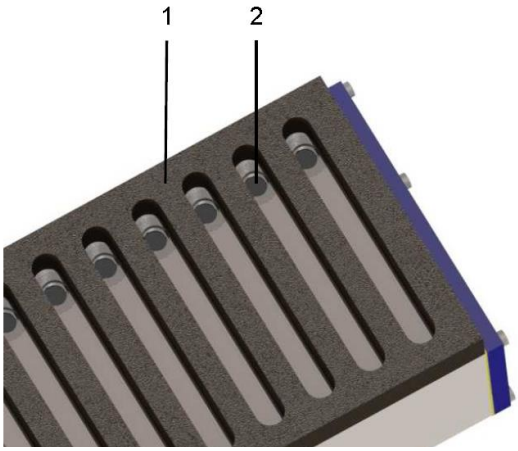
A dust filter is installed between the system and the vacuum generator to filter out dust.

2.3.8 Connection plate



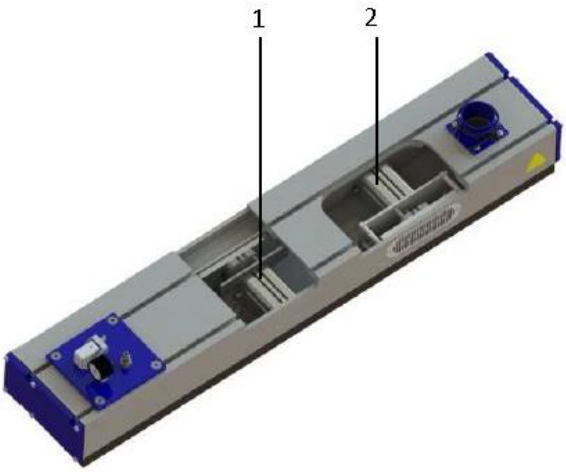
1. Multi-pole plug
2. Pneumatic connection
3. Vacuum gauge (manometer)

2.3.9 Bottom of SBX-C



1. Sealing mat
2. Check valve

2.3.10 Separating and ventilation cylinders



1. Separating cylinder
2. Ventilation cylinder

3 Technical Data

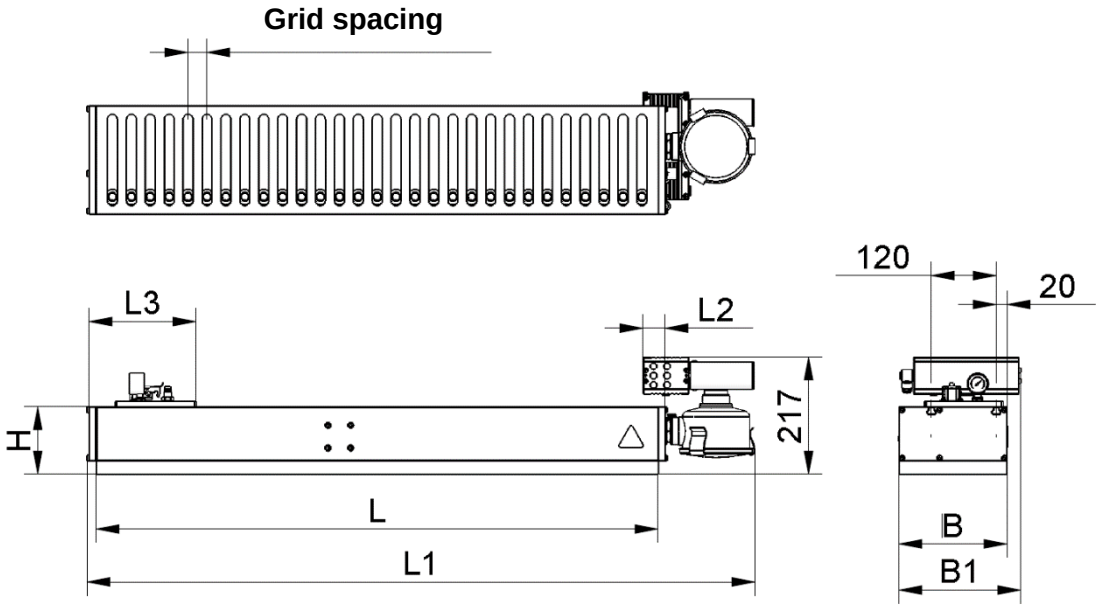
3.1 Ejector SBX-C 200

Technical Data

Type	Vacuum generator	Number of suction cells	Air consumption [l/min]	Max. suction flow [l/min]	Max. degree of evacuation [%}	Suction force** [N]	Weight [kg]
SBX-C 1040x200 35 25 SEM-150*	Ejector	29	640	1400	80	2400	25
SBX-C 1250x200 35 25 SEM-150*	Ejector	35	640	1400	80	3000	28

*Sound level 78 dB(A)
**With a vacuum of -0.25 bar and a fully covered gripper

Dimensions



Type	Dimensions							
	H	H1	B	B1	L	L1	L2	L3
SBX-C 1040x200 35 25 SEM-150	125	217	200	225.5	1040	1234	41	198
SBX-C 1250x200 35 25 SEM-150	125	217	200	225.5	1250	1444	41	198

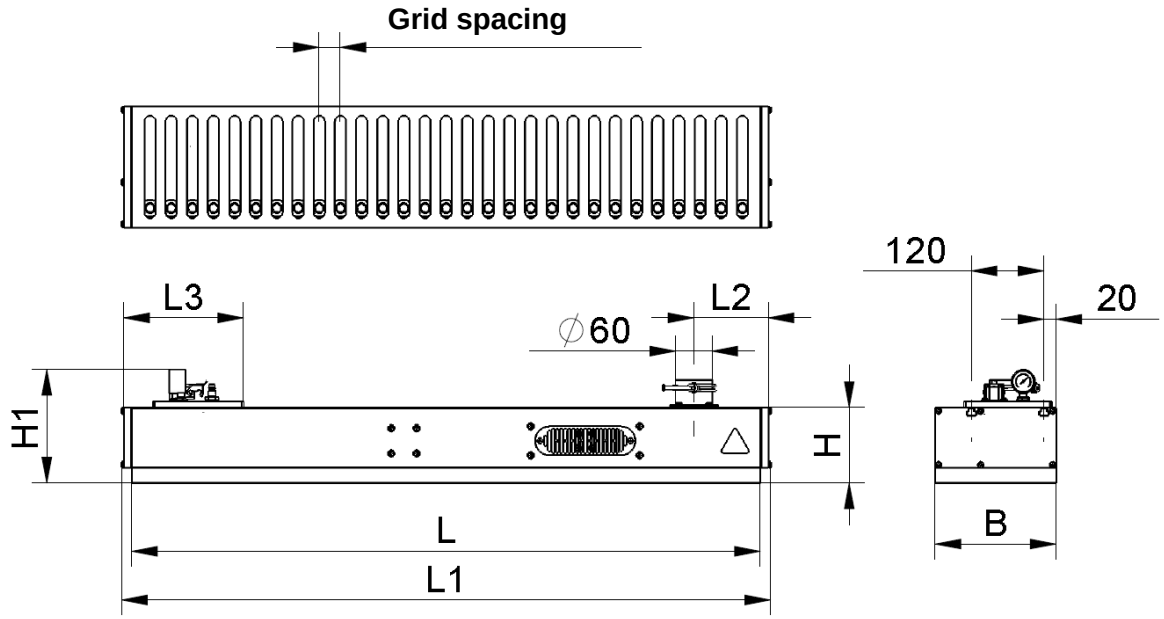
3.2 External vacuum generators (blowers/pumps) SBX-C 200

Technical Data

Type	Vacuum generator	Number of suction cells	Air consumption [l/min]	Max. suction flow [l/min]	Max. degree of evacuation [%}	Suction force* [N]	Weight [kg]
SBX-C 1040x200 35 25	Blower/pump	29	**	**	**	2400	23
SBX-C 1250x200 35 25	Blower/pump	35	**	**	**	3000	26

*With a vacuum of -0.25 bar and a fully covered gripper
**Depending on the vacuum generation used

Dimensions



Type	Dimensions						
	H	H1	B	L	L1	L2	L3
SBX-C 1040x200 35 25 SEM-150	125	187.5	200	1040	1234	123	198
SBX-C 1250x200 35 25 SEM-150	125	187.5	200	1250	1444	123	198

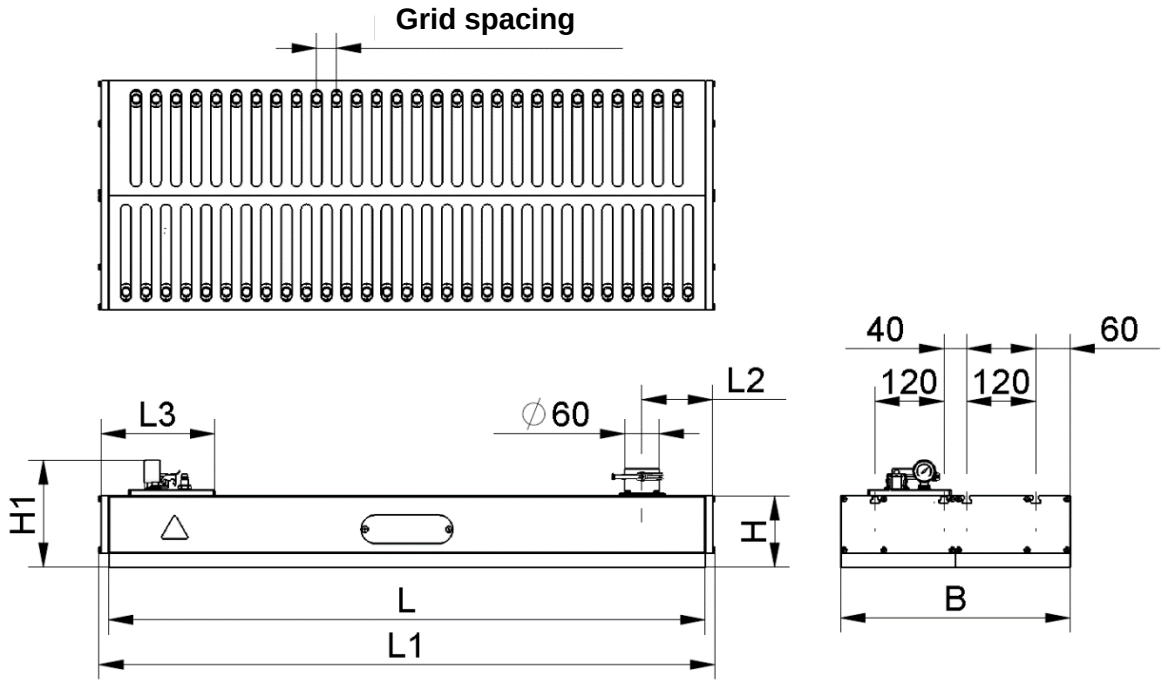
3.3 External vacuum generators (blowers/pumps) SBX-C 400

Technical Data

Type	Vacuum generator	Number of suction cells	Air consumption [l/min]	Max. suction flow [l/min]	Max. degree of evacuation [%}	Suction force* [N]	Weight [kg]
SBX-C 1040x400 35 25	Blower/pump	57	**	**	**	4500	46
SBX-C 1250x400 35 25	Blower/pump	69	**	**	**	5900	52

*With a vacuum of -0.25 bar and a fully covered gripper
**Depending on the vacuum generation used

Dimensions



Type	Dimensions						
	H	H1	B	L	L1	L2	L3
SBX-C 1040x400 35 25 SEM-150	125	187.5	400	1040	1234	123	198
SBX-C 1250x400 35 25 SEM-150	125	187.5	400	1250	1444	123	198

4 Transport and Assembly

4.1 Delivery

4.1.1 Included in delivery

Refer to the order confirmation for specific details about the scope of delivery.
The delivery documents list the shipping weight and dimensions. Note the system weight and dimensions when choosing suitable lifting equipment.

Note
The operating instructions are part of the system and must be kept with the system every time it is relocated.

4.1.2 Check that the delivery is complete

Using the enclosed delivery documents, check the entire shipment to ensure that it is complete. Also refer to our Terms and Conditions of Sale and Delivery.

4.1.3 Report damage

After delivery of the shipment, damage due to faulty packaging or transport must be reported immediately to the carrier and J.Schmalz GmbH.

4.2 Packaging

The system is transported in a transport box produced specifically for the system.

ATTENTION	
	**Incorrect disposal of the system or individual components** Environmental damage ► Disposal according to national guidelines.

4.3 Transport

DANGER	
 	**Transport via moving loads** Improper unloading and transport can result in personal injuries and damage to property. Moving loads can tip over, fall or crush people. When lifting transport units, parts can fall over, move or fall out. ► Only trained personnel who have received safety instructions may unload and transport the items. ► Use suitable lifting equipment and mounting equipment. ► Ensure that all persons leave the danger zone before the transport units are lifted. ► Wear protective footwear.

4.4 Removing the system from the transport box

Open the transport box carefully. First open the lid to allow you to see the position of the system in full.
Attach a suitable lifting device to the system.
Remove all attachments which fasten the system to the transport box.
Now lift the system so that it is freely suspended when the transport box is removed.

If you did not use the final lifting device (robot/gantry) to lift the system out of the transport box and you need to lower it, place battens at the end of the suction bar under the lid.

ATTENTION	
	Storing the system on suction elements Material damage to the system ► The system may only be stored as described in the operating instructions.

5 Start of operations

5.1 Start of operations

WARNING	
	**System set-up by untrained personnel** Serious personal injury ▶ The system must only be set up by trained personnel who have read and understood the operating instructions.

DANGER	
 	**Moving systems/parts throughout the production system during setup at the workplace** Danger to life and limb ▶ The production system must be stopped in the area where the system is being set up ▶ Switch off the system's voltage during setup ▶ The production system must be secured to prevent activation during setup. ▶ The system may only be set up at the workplace in accordance with the operating instructions.

WARNING	
	Failure to observe the work safety instructions Personal injuries and damage to the system ▶ The device may only be started up in a secure area which no people are allowed to enter. ▶ Never lift loads at an angle and never drag them. Do not tear off stuck loads. ▶ Only pick up and lift suitable loads (check inherent stability and surface density). ▶ Only deposit workpieces on clear, even surfaces Danger of slipping ▶ Do not release the load until it rests completely and safely on a secure surface. ▶ Do not come close to the load when releasing/depositing it and do not touch it.

⚠ WARNING	
	**Open or closed vacuum openings** Eyes can be sucked in ► Keep your distance. ► Do not look into vacuum openings. ► Wear protective glasses.

5.2 Suction bar

The system is mounted on the load suspension provided by the customer (e.g. a gantry crane or robot) using the T-slots designated for this purpose. The customer also provides a control device. The suspension should be designed to allow the system to adapt flexibly to the workpieces when it is placed on them (e.g. spring-mounted or floating suspension).
The system must be attached securely, taking the weight of the system and its maximum load-bearing capacity into account.

5.3 Pneumatic connection

The compressed air is connected to the valve plate using the pneumatic coupling included in delivery.
Requirements for the compressed air provided by the customer:

- Dry, filtered air according to ISO 8573-1:2010 [7:4:4]
- Constant operating pressure: 6 bar.

Standard nominal diameters for the pneumatic coupling:

- SBX with external vacuum generation DN 7.2

If you select a supply hose that is too small, not enough compressed air will be supplied to the pneumatic elements (ejector, etc.) for optimal operation.

5.4 Vacuum connection

In systems with external vacuum generation, a hose that is suitable for vacuum applications must be connected to the installed nozzle and secured with a suitable hose clamp. The supply hose should have the same nominal diameter as the installed nozzle. Reducing the nominal diameter of the hose can impair the system's functionality.

5.5 Solenoid valves

The solenoid valves control the separating and ventilation cylinders. The customer is responsible for the control system. The pin assignments for control of the solenoid valves can be found in the pin assignment diagram (5.6).

⇨ The functional sequence is described in detail for each suction bar type. (See 6.2)

5.6 Electrical connection

The customer is responsible for electrical connection of the blower or pump on site. The electrical connection for controlling the pneumatic valves is made using a multi-pole plug included in delivery (24 V DC).

DANGER

Inappropriate voltage supply

Electric shock, destruction of the electrical components

- ▶ Connection work may only be carried out by a qualified electrical specialist.
- ▶ The system must incorporate safe electrical cut-off of the power supply in compliance with EN60204.
- ▶ Do not connect or disconnect the plug connectors when voltage is applied.

Observe the separate operating instructions when connecting the vacuum generator (blower/pump).

Pin	Designation		
	Ejector SBX-C 200	**Blower/pump SBX-C 200**	**Blower/pump SBX-C 400**
1	Magnetic valve 1 (separating cylinder) (black/DC 24 V)	Magnetic valve 1 (separating cylinder) (black/DC 24 V)	Magnetic valve 1 (separating cylinder) (black/DC 24 V)
2	Magnetic valve 2 (blow off) (black/DC 24 V)	Magnetic valve 2 (ventilation cylinder) (black/DC 24 V)	Magnetic valve 2 (ventilation cylinder) (black/DC 24 V)
3	Magnetic valve 3 (vacuum generator) (black)	n.c.	n.c.
4	n.c.	n.c.	n.c.
5	0 V (blue) (valve 1 + 2)	0 V (blue) (valve 1 + 2)	0 V (blue) (valve 1 + 2)
6	val (blue) (valve 3)	n.c.	n.c.

ATTENTION

Incorrectly connected compression fitting

Reduced suction capacity/leakage

- ▶ The multi-pole plug's compression fitting must be sealed securely and correctly during installation of the customer's cable.

6 Operation

6.1 General notes

The system may not be operated in potentially explosive atmospheres.

DANGER	
	Switching components not explosion-proof Risk of fire and explosion. ► The product must not be used in explosion risk areas.

DANGER	
	Operation of the system at the wrong ambient temperature Danger of burns, personal injuries and damage to the system ► The system may only be operated at ambient temperatures from +5°C to +40°C

Consult the manufacturer before operating it at higher or lower ambient temperatures.

The system can only achieve its maximum load-bearing capacity if it is completely covered by a workpiece.

WARNING	
	**System operation by untrained personnel** Serious personal injury ► The system may only be operated by trained personnel who have read and understood the operating instructions.

WARNING	
	Failure to observe the work safety instructions Personal injuries and damage to the system ► General safety regulations, European standards and VDE guidelines must be observed and complied with. ► Operations using the device must take place in a secure area which no people are allowed to enter. ► Never carry loads at an angle and never drag them. Do not tear off stuck loads. ► Only pick up and lift suitable loads (check inherent stability and surface density). ► Lower workpieces onto clear, even surfaces only. Otherwise, they could slide away when released. ► Do not release the load until it rests completely and safely on a secure surface. ► Do not come close to the load when releasing/depositing it and do not touch it. ► Make sure that the workplace and surroundings are kept clean.

DANGER	
	**Falling parts due to vacuum failure** Danger to life and limb ► Do not stand under the suspended load or the system. ► Do not place any body parts under the suspended load or the system.

DANGER	
	► The system’s maximum permitted load must not be exceeded.

6.2 Activation

6.2.1 Ejector SBX-C 200

Pretensioning

Before the suction process starts, the reservoir integrated into the suction bar must be evacuated.
The amount of time this process takes varies based on the suction bar type and the length. Generally, this process is started approximately three to five seconds before picking up the load.

- ⇨ Activating magnetic valve I (separating cylinder):
  The cylinder's piston rod extends and separates the suction chamber from the storage chamber.
- ⇨ Activating magnetic valve III (vacuum generation):
  The vacuum generator evacuates the storage chamber.

Picking up

Once the sealing mat has been placed on the workpiece, the system can start picking it up.

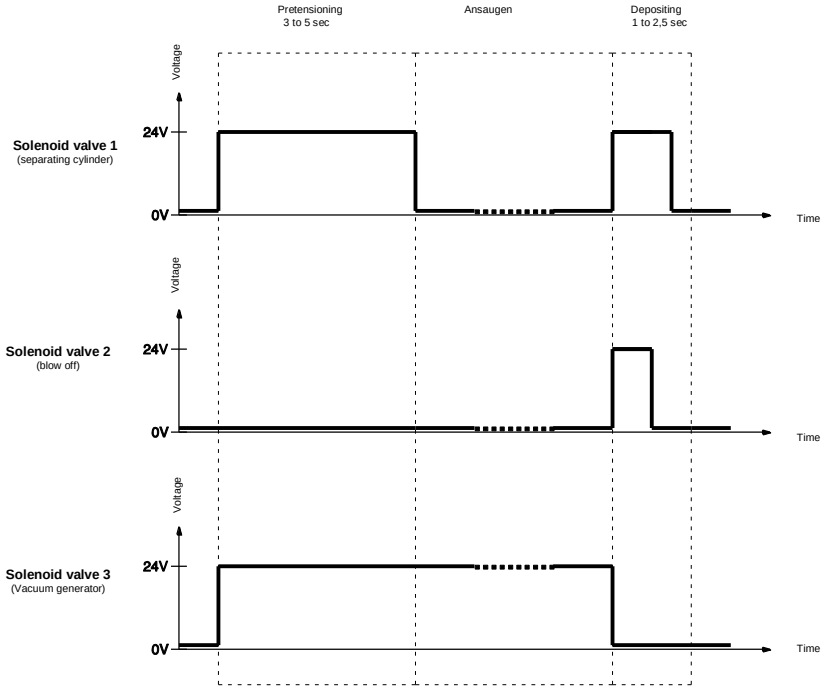
- ⇨ Resetting magnetic valve I (separating cylinder):
  The cylinder's piston rod is retracted and the load is picked up.

Depositing

Once the workpiece has been transported and set down, it must be deposited.

- ⇨ Resetting magnetic valve III (vacuum generation):
- ⇨ Activating magnetic valve I (separating cylinder):
  The cylinder's piston rod extends and separates the storage chamber from the suction chamber again.
- ⇨ Activating magnetic valve II (blow off):
  The blow-off pulse should be applied for 1 to 2 seconds
- ⇨ Reset magnetic valve I (separating cylinder) after 2.5 seconds.

Functional diagram



6.2.2 Blower/pump SBX-C 200

Pretensioning

Before the suction process starts, the reservoir integrated into the suction bar must be evacuated.
The amount of time this process takes varies based on the suction bar type and the length. Generally, this process is started approximately three to five seconds before picking up the load.

⇨ Activating magnetic valve I (separating cylinder):
The cylinder's piston rod extends and separates the suction chamber from the storage chamber. Vacuum is generated in the storage chamber.

⇨ Activating magnetic valve II (ventilation cylinder):
The cylinder's piston rod extends and seals the ventilation shaft.

Picking up

Once the sealing mat has been placed on the workpiece, the system can start picking it up.

⇨ Resetting magnetic valve I (separating cylinder):
The cylinder's piston rod is retracted and the load is picked up.

Depositing

Once the workpiece has been transported and set down, it must be deposited.

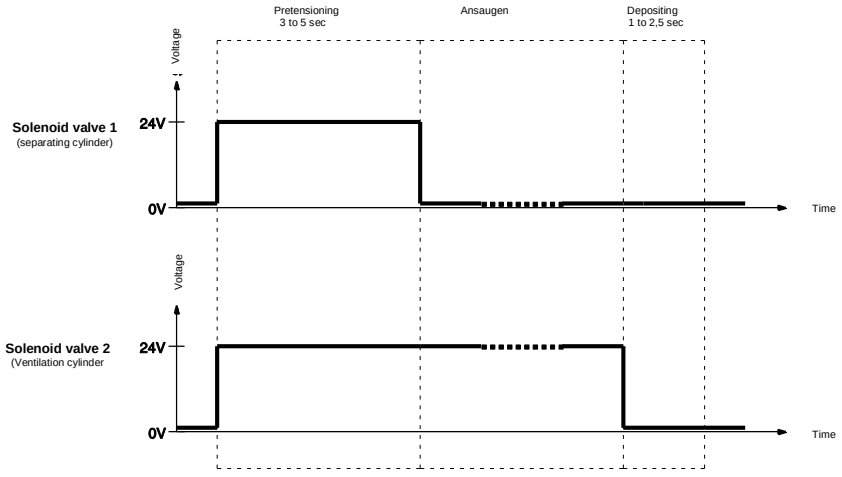
⇨ Resetting magnetic valve II (ventilation cylinder)
The cylinder's piston rod is retracted, the vacuum in the suction chamber drops and the workpiece is released from the sealing mat.

Caution:

Operating the vacuum blower with the reservoir sealed can cause the vacuum blower to overheat after 2 minutes of continuous operation.

The cylinders are retracted when no voltage is applied. This means that the storage and suction chambers are connected to each other and the ventilation shaft is open.
This open circuit ensures that the vacuum blower is cooled sufficiently.

Functional diagram



6.2.3 Blower/pump SBX-C 400

Pretensioning

Before the suction process starts, the reservoir integrated into the suction bar must be evacuated.
The amount of time this process takes varies based on the suction bar type and the length. Generally, this process is started approximately three to five seconds before picking up the load.

- ⇨ Activating magnetic valve I (separating cylinder):
  The cylinder's piston rod extends and separates the suction chamber from the storage chamber. Vacuum is generated in the storage chamber.
- ⇨ Activating magnetic valve II (ventilation cylinder):
  The cylinder's piston rod extends and seals the ventilation shaft.

Picking up

Once the sealing mat has been placed on the workpiece, the system can start picking it up.

- ⇨ Resetting magnetic valve I (separating cylinder):
  The cylinder's piston rod is retracted and the load is picked up.

Depositing

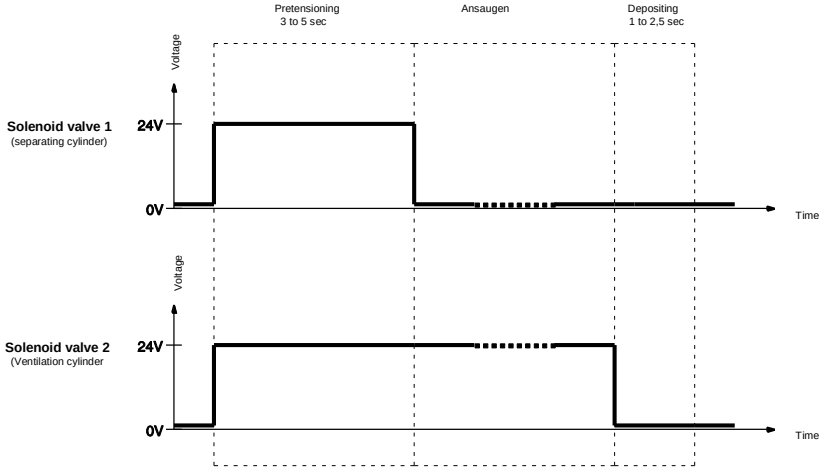
Once the workpiece has been transported and set down, it must be deposited.

- ⇨ Resetting magnetic valve II (ventilation cylinder)
  The cylinder's piston rod is retracted, the vacuum in the suction chamber drops and the workpiece is released from the sealing mat.

Caution:

Operating the vacuum blower with the reservoir sealed can cause the vacuum blower to overheat after 2 minutes of continuous operation.
The cylinders are retracted when no voltage is applied. This means that the storage and suction chambers are connected to each other and the ventilation shaft is open.
This open circuit ensures that the vacuum blower is cooled sufficiently.

Functional diagram



7 Storage

The system may not be deposited on the sealing mat because this can damage the sealing mat. When storing the system (e.g. when it is switched off for the night), always use padding in the area of the end covers to prevent damage to the sealing mat.

ATTENTION	
	Incorrect storage of the system Material damage to the system ► The system may only be stored as described in the operating instructions.

8 Troubleshooting

WARNING

System maintenance by untrained personnel

Serious personal injury

- ► The system may only be maintained by trained personnel who have read and understood the operating instructions.
- ► The system must be depressurized and disconnected from the power supply for repair and maintenance work.

CAUTION

Hot solenoid valves

Burns

- ► Do not touch hot components.
- ► Wear protective gloves.

Problem	Possible cause	Solution
Vacuum generator does not generate a vacuum	Elect. connection reversed, faulty	Check connection; correct if necessary
	Motor protection switch triggered	Check motor protection switch
		Check motor for faults
		Thermal overload of motor? ➔ Allow to cool; clean any dust filters.
	Voltage only on two phases	Check connection/fuse
	Power consumption increased	Check blower for faults; is it overheated? ➔ (Allow it to cool)
	Power supply interrupted	Check the power supply line
	Ejector receiving no compressed air or insufficient compressed air	Check compressed air line Check pressure
	Vacuum generator does not work	*Ejector operation:* Remove the ejector, open it and clean it if necessary (the coating on the inside of the cover must not be damaged!) *Blower or pump operation:* Have the blower or pump repaired (by the manufacturer)
	Incorrect direction of rotation of the blower	Check connection; correct if necessary

Problem	Possible cause	Solution
Vacuum generator works, but workpieces are not picked up	Dust filter is contaminated	Clean or replace dust filter
	Sealing mat is damaged	Replace sealing mat
	Workpiece is too heavy	Workpiece is not suitable
	Sealing rings of the separating or ventilation cylinder are damaged	Replace sealing rings
	The suction bar's slider is clogged with chips or resin	Clean slider and check valves
	L x W x H – proportions of the parts to be lifted are not correct	Parts cannot be lifted
	Operating pressure is too low	Set compressed air supply to 6 bar
Pneumatic cylinder is not working	Cylinder is defective	Repair cylinder or replace if necessary
	Operating pressure is too low	Set compressed air supply to 6 bar
Solenoid valve is not working	Electrical control is not working	Check the connections and replace valve if necessary
	Solenoid valve is defective	Repair or replace the solenoid valve
Vacuum in the storage chamber (below -300 mbar)	Leak in the system or the supply line	Perform leak test (see section 9.10)

9 Maintenance

9.1 General maintenance instructions

WARNING

System maintenance by untrained personnel

Serious personal injury

- ► The system may only be maintained by trained personnel who have read and understood the operating instructions.
- ► The system must be depressurized and disconnected from the power supply for repair and maintenance work.

CAUTION

Hot solenoid valves

Burns

- ► Do not touch hot components.
- ► Wear protective gloves.

The blower or pump may not be opened during the warranty period. Opening them voids the warranty.
(For exceptions, see the vacuum generator's documentation (section 13, Other Applicable Documents))

9.2 Maintenance Schedule

	Interval				
	Daily	Weekly	Monthly	Every six months	Annual check
Does the blower make strange noises when a full load is picked up?		X			X
Has the dust filter been cleaned?		X			X
Is the electrical installation still OK? Is the cable screw union secure?					X
Regrease the blower bearings according to the operating instructions for the blower	See the operating instructions for the blower				
Are the vacuum hoses in good condition (not brittle, not kinked, no worn sections and no leaks)?			X		X
Check that all the connections are secure, e.g. the screws, hose clamps, etc.				X	
Are the type plate and maximum load plate still attached to the device?					X
Are the operating instructions available and are workers familiar with them?					X
Check all load-bearing parts (e.g. suspension) for deformation, wear or other damage.			X		X
Check the sealing mats for wear, tears and leaks. Replace if necessary. video www.schmalz.com/sealing-foam-replacement		X			X
General condition of the device					X
Leak Test			X		X
Check the storage and suction chambers for contamination → They may only be cleaned by trained and instructed specialist personnel/the manufacturer	The interval depends on the application/ambient conditions. We recommend checking the contamination within the suction bar for the first time in the first month after start of operations (2-shift operation).				

9.3 Cleaning agents

Use cleaning solvents to clean the device (not petroleum ether or corrosive liquids. Petroleum ether or corrosive liquids destroy the vacuum hoses).

9.4 Blower/pump

See section 13, Other Applicable Documents.

9.5 Ejector

See the included operating instructions for the ejector (section 13, Other Applicable Documents).

ATTENTION	
	Damage to the coating on the inside of the ejector cover Reduced suction capacity; leaks in the ejector ► When opening or cleaning the ejector, make sure the coating on the inside of the cover is not damaged or scratched.

9.6 Dust filter

See the included operating instructions for the dust filter.

9.7 Sealing mat

Check the sealing mats for wear, tears and leaks on a regular basis and replace them if necessary. The sealing mats must also be replaced if you notice that the vacuum achieved is constantly declining when handling the same parts. The limit value for the latest point by which the suction mats must be replaced is a vacuum of -250 mbar in the suction openings (recommended at -300 mbar).
For systems whose designs require higher vacuum levels, this vacuum is the relevant lower limit for replacing the sealing mat.

video

www.schmalz.com/sealing-foam-replacement

Replacing the sealing mats

- Remove the sealing mat from the system.
- Clean the adhesive residues off of the system. (See 9.3, Cleaning agents).
- Peel the paper off the adhesive tape on the new sealing mat and attach the new sealing mat to the system.

9.8 Check valves

If a vacuum of at least -250 mbar (recommended: -300 mbar) cannot be achieved, the system has no leakage (leaks, defective hoses, etc.) and the sealing mats are still relatively new (max. half of the service life), check the check valves' sliders and clean them if necessary.
For systems whose designs require higher vacuum levels, this vacuum is the relevant lower limit.

9.8.1 Check

You can press the sliders into the seat of the check valves with your finger. If the slider can no longer seal the seat of the check valves properly (stroke length of the slider is significantly shorter), the check valves must be cleaned.

9.8.2 Cleaning

By removing a retaining ring on the outside of the system, you can remove the affected slider, clean the slider housing (see also 9.3, Cleaning agents) and insert the slider again.

9.9 Separating/ventilation cylinders

The seals of the separating cylinder, and those of the ventilation cylinder for blower operation, must be replaced if there are leaks.

9.9.1 Replacing the seals on the separating/ventilation cylinders

- Depressurize the system.
- Open both end covers.
- Unscrew 4x fastening screws on the separating cylinder (ventilation cylinder).
- Remove the pneumatic hoses from the cylinder.
- Remove the cylinder opposite the valve unit from the system.
- Remove the defective sealing gasket and adhesive residues from the slot (see also 9.3, Cleaning agents).
- Attach the replacement sealing gasket to the slot using special adhesive.
- Install the cylinder again, connect it to the pneumatic hoses and close the end covers.
- Afterwards, perform a leak test.

9.10 Checking the system for leaks

Read out the vacuum on the gauge during preliminary storage (in the storage chamber). (The separating cylinder is extended and separating the storage chamber from the valve chamber). The measured value must correspond to the maximum value of the relevant vacuum generator.

If the vacuum is not achieved, the system must be checked for leakage as follows.

1. Check the hose, hose connections, tubing and the cable screw union on the multi-pole plug for damage and leaks, and replace them as necessary.
2. Check whether the vacuum filter is blocked or dirty; if necessary, clean the filter cartridge or replace it.
3. Replace the seal on the separating cylinder/ventilation cylinder.
4. Check that the blower or pump is fully functional.
5. Check that the vacuum generator is fully functional.

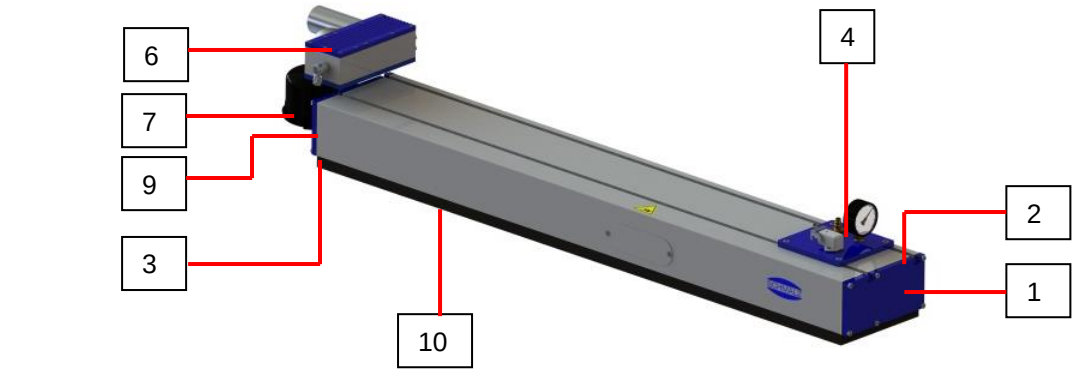
10 Spare and Wearing Parts

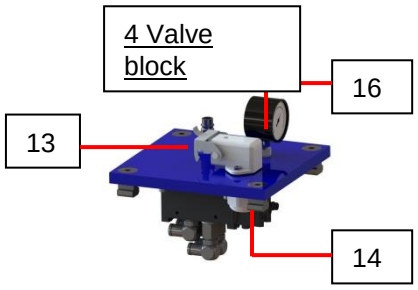
Spare and Wearing Parts

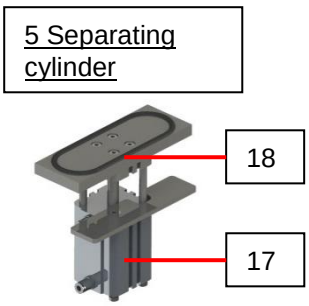
We guarantee this device pursuant to our General Terms and Conditions of Sale and Delivery. The same applies to spare parts, provided that these are original parts supplied by us. We are not liable for any damage resulting from the use of non-original spare parts or accessories. Wearing parts are not covered by the warranty.

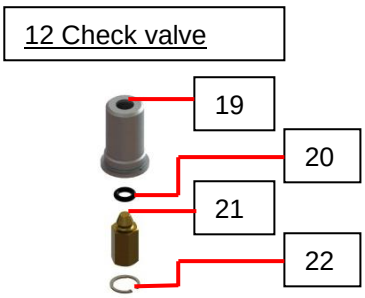
ATTENTION	
	**Incorrect disposal of the system or individual components** Environmental damage ► Disposal according to national guidelines.

10.1 Ejector SBX-C 200







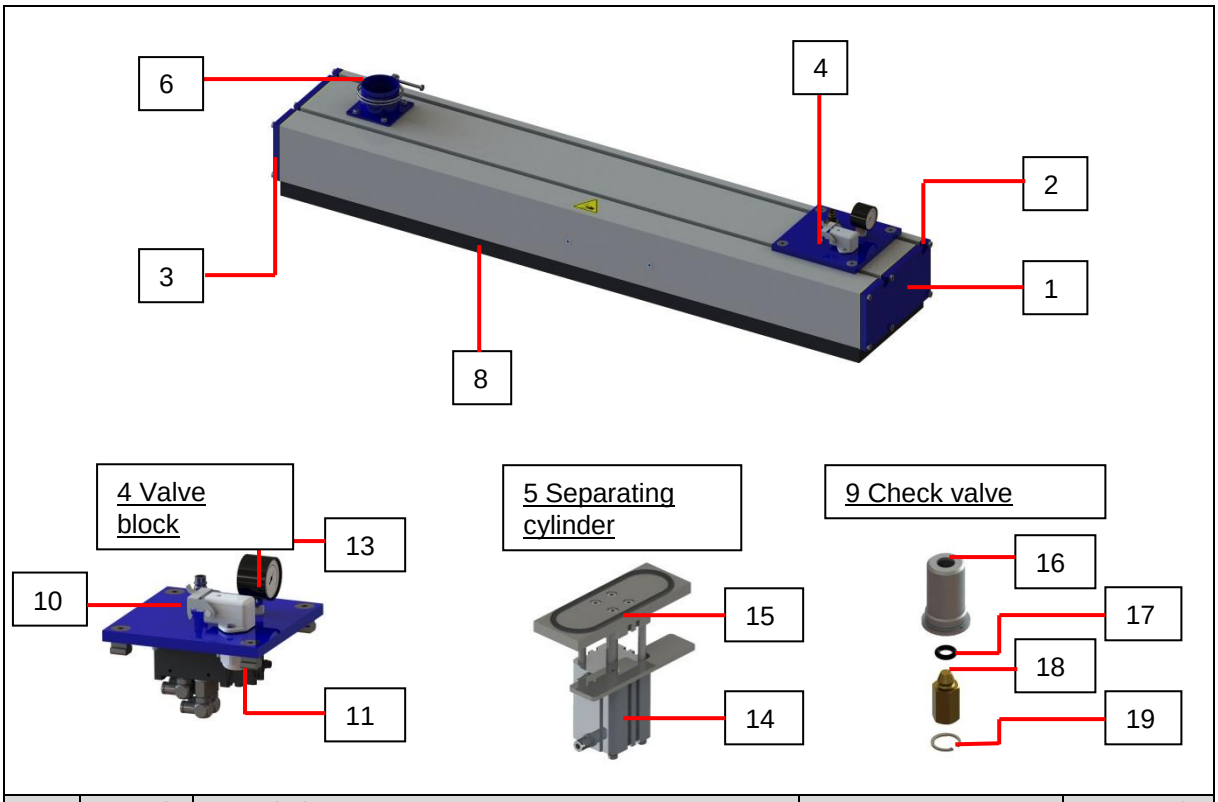


Item	Quantity	Description	Part no.	Legend
1	1	Cover	10.01.20.01016	S
2	1	Sealing plate	10.01.20.00119	W
3	1	Sealing plate	10.01.20.00120	W
4	1	Valve block	10.01.20.01027	WA
5	1	Separating cylinder	10.01.20.00126	WA
6	1	Multi-stage ejector	10.02.01.00489	S
7	1	Dust filter	10.07.01.00008	WA
8*	1	Filter insert	10.07.01.00018	W
9	1	Cover	10.01.20.00161	S
10	1	Sealing mat	On request	W
11*	1	Non-return valve	10.05.05.00087	W
12	x**	Check valve	10.01.20.01018	WA
13	1	Multi-pole plug	21.04.06.00199	S
14	3	Solenoid valve EMV8 DC 24 V	10.05.01.00333	W
15*	3	Connection cable	10.06.02.00084	S
16	1	Vacuum gauge (manometer)	10.07.02.00046	S
17	1	Pneumatic cylinder (sep. & ventilation cyl.)	10.10.02.00104	W
18	1	Sealing profile (sep. & ventilation cyl.)	10.07.04.00014	W
19	x**	Valve housing	10.01.20.01017	S
20	x**	Check valve O-ring	10.07.08.00148	W
21	x**	Plunger	10.01.20.00115	S
22	x**	Check valve retaining ring	20.06.05.00026	S

* Items not shown **Number depends on the gripper length

S= **S**pare part, **W**= **W**earing part, **WA**= **W**earing part **a**ssembly, contains wearing parts

10.2 Blower SBX-C 200

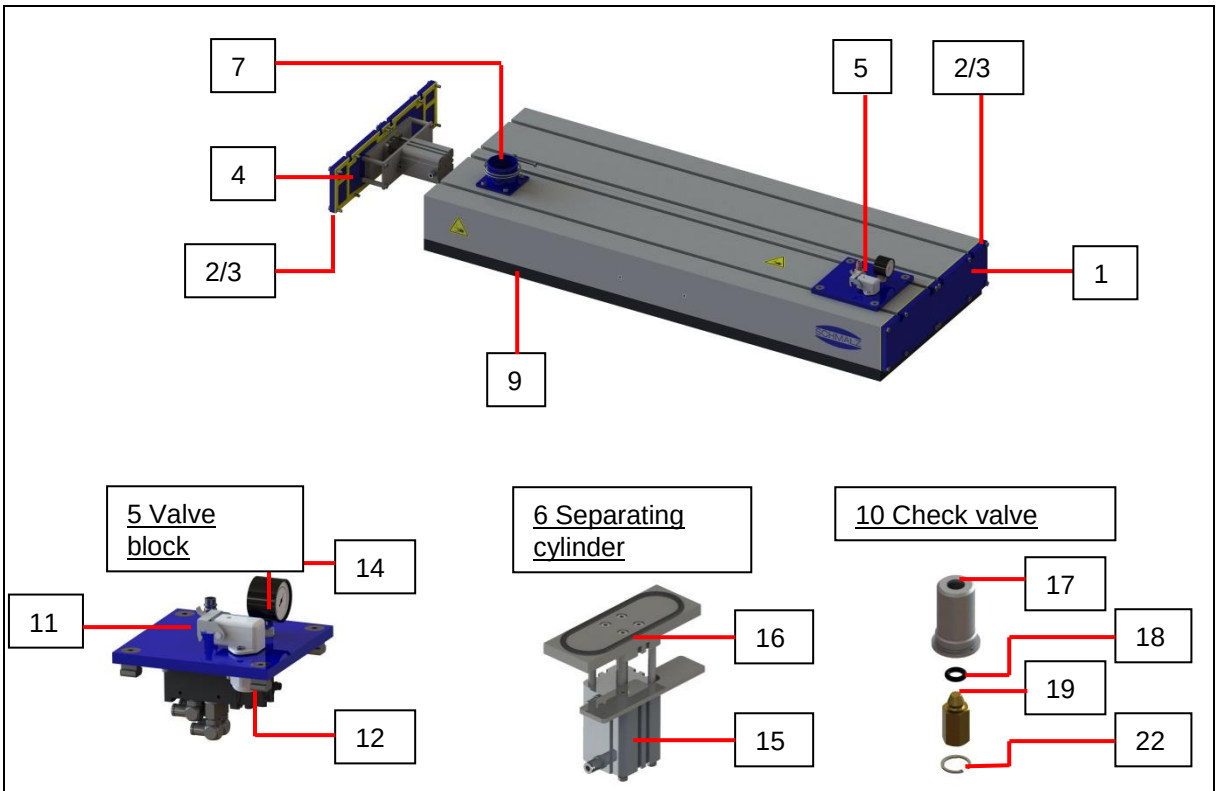


Item	Quantity	Description	Part no.	Legend
1	1	Cover	10.01.20.01016	S
2	1	Sealing plate	10.01.20.00119	W
3	1	Sealing plate	10.01.20.00120	W
4	1	Valve block	10.01.20.01014	WA
5	1	Separating cylinder	10.01.20.00126	WA
6	1	Hose connection	10.01.38.00301	S
7*	1	Ventilation cylinder	10.01.20.00138	WA
8	1	Sealing mat	On request	W
9	x**	Check valve	10.01.20.01018	WA
10	1	Multi-pole plug	21.04.06.00199	S
11	2	Solenoid valve EMV8 DC 24 V	10.05.01.00333	W
12*	2	Connection cable	10.06.02.00084	S
13	1	Vacuum gauge (manometer)	10.07.02.00046	S
14	1	Pneumatic cylinder (sep. & ventilation cyl.)	10.10.02.00104	W
15	1	Sealing profile (sep. & ventilation cyl.)	10.07.04.00014	W
16	x**	Valve housing	10.01.20.01017	S
17	x**	Check valve O-ring	10.07.08.00148	W
18	x**	Plunger	10.01.20.00115	S
19	x**	Check valve retaining ring	20.06.05.00026	S

* Items not shown **Number depends on the gripper length

S= **S**pare part, **W**= **W**earing part, **WA**= **W**earing part **a**ssembly, contains wearing parts

10.3 Blower SBX-C 400



Item	Quantity	Description	Part no.	Legend
1	1	Cover	10.01.20.00183	S
2	1	Sealing plate	10.01.20.00119	W
3	1	Sealing plate	10.01.20.00120	W
4	1	Ventilation unit	10.01.20.00150	WA
5	1	Valve block	10.01.20.01014	WA
6	1	Separating cylinder	10.01.20.00126	WA
7	1	Hose connection	10.01.38.00301	S
8*	1	Ventilation cylinder	10.01.20.00138	WA
9	1	Sealing mat	On request	W
10	x**	Check valve	10.01.20.01018	WA
11	1	Multi-pole plug	21.04.06.00199	S
12*	2	Solenoid valve EMV8 DC 24 V	10.05.01.00333	W
13	2	Connection cable	10.06.02.00084	S
14	1	Vacuum gauge (manometer)	10.07.02.00046	S
15	1	Pneumatic cylinder (sep. & ventilation cyl.)	10.10.02.00104	W
16	1	Sealing profile (sep. & ventilation cyl.)	10.07.04.00014	W
17	x**	Valve housing	10.01.20.01017	S
18	x**	Check valve O-ring	10.07.08.00148	W
19	x**	Plunger	10.01.20.00115	S
20	x**	Check valve retaining ring	20.06.05.00026	S

* Items not shown **Number depends on the gripper length

S= **S**pare part, **W**= **W**earing part, **WA**= **W**earing part **a**ssembly, contains wearing parts

11 Accessories

11.1 Accessories set

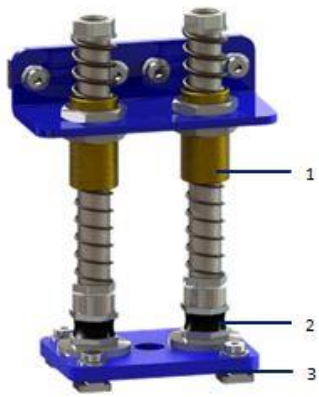
Quantity	Description	Part no.
1	Compressed air coupling DRUC-KUPP-D27-G3/8-IG	10.08.01.00019
1	Single-ear clamp EOKL-14.6-16.8	10.07.10.00009
8	Sliding block NUT-STEI-15x15xM8-IG	10.01.20.00141
1	Vacuum gauge VAM-40-V-U	10.07.02.00046
1	Multi-pole plug set STEC-SET-6-HAN	21.04.06.00200
1	Cable screw union KAB-VERS-PG11-37-PA	21.05.03.00004
1	Reducing fitting RED-STK-G1/4-AG	10.08.04.00091
1	Sealing ring DR-G1/4-PA	10.07.08.00021

The accessories set is included in delivery with the purchase of an SBX-C.

11.2 Optional accessories

Rigid suspension FST STARR

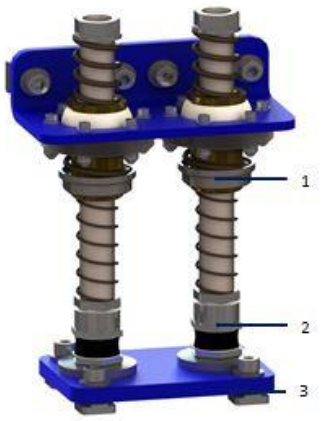
Item	Description	Part no.
1	FST-STARR 25-2 (spring plunger, 25mm stroke)	10.01.10.05806
1	FST-STARR 50-2 (spring plunger, 50mm stroke)	10.01.10.05805
1	FST-STARR 75-2 (spring plunger, 75mm stroke)	10.01.10.05803
2	FLK G1/2-IG G1/2-AG (Flexolink)	10.01.03.00175
2	FLK G1/2-IG G1/2-AG V (Flexolink, reinforced design)	10.01.03.00207
3	FLAN-PL (flange plate SBX-C 200)	10.01.10.05706
3	FLAN-PL (flange plate SBX-C 400)	10.01.10.05702



If you are combining FST-STARR and FST FLEX suspensions, we recommend consulting the manufacturer.

Rigid suspension FST FLEX

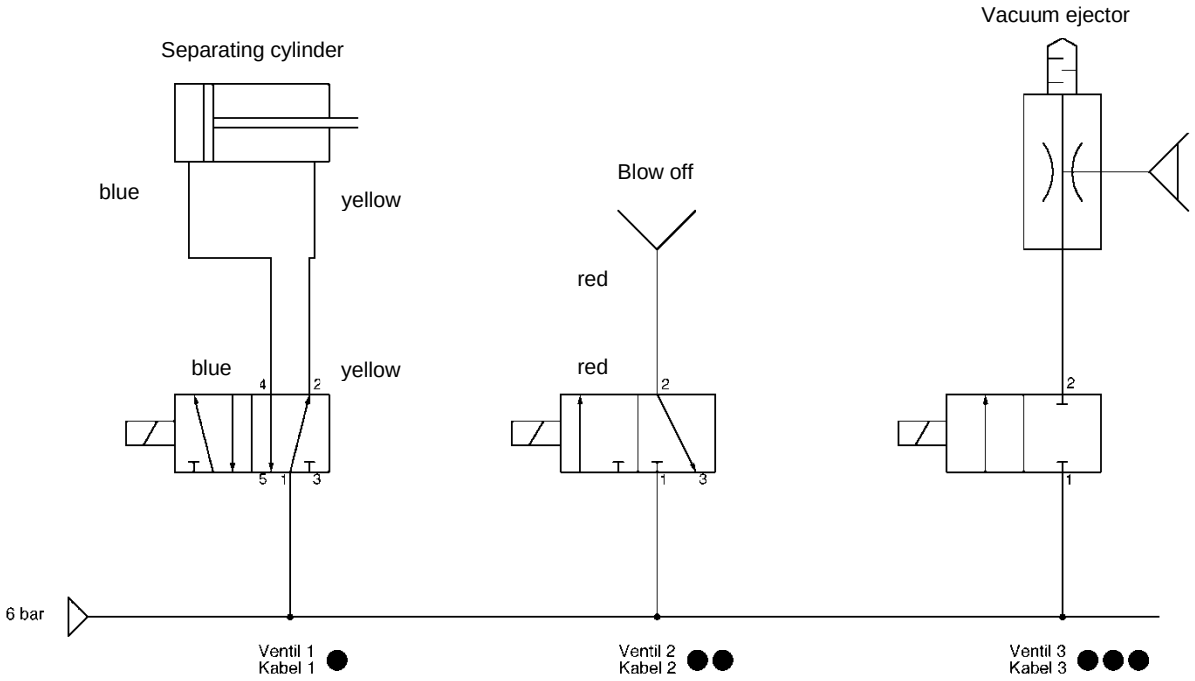
Item	Description	Part no.
1	FST-FLEX 25-2 (spring plunger, 25mm stroke)	10.01.10.05695
1	FST-FLEX 50-2 (spring plunger, 50mm stroke)	10.01.10.05168
1	FST-FLEX 75-2 (spring plunger, 75mm stroke)	10.01.10.05695
2	FLK G1/2-IG G1/2-AG (Flexolink)	10.01.03.00175
2	FLK G1/2-IG G1/2-AG V (Flexolink, reinforced design)	10.01.03.00207
3	FLAN-PL (flange plate SBX-C 200)	10.01.10.05706
3	FLAN-PL (flange plate SBX-C 400)	10.01.10.05702



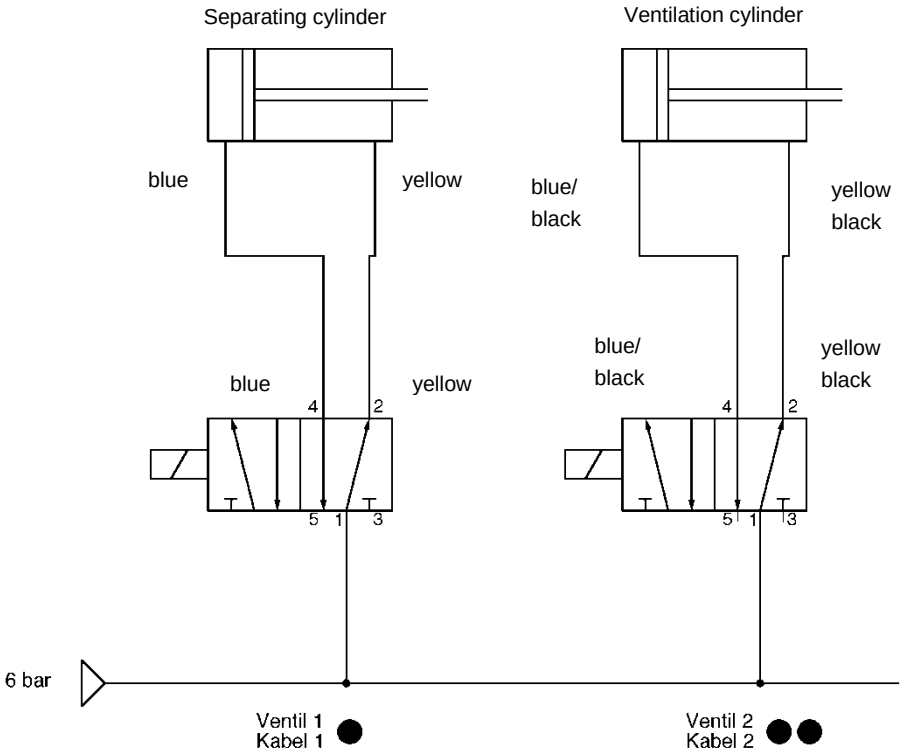
If you are combining FST-STARR and FST FLEX suspensions, we recommend consulting the manufacturer.

12 Pneumatic Circuit Diagram

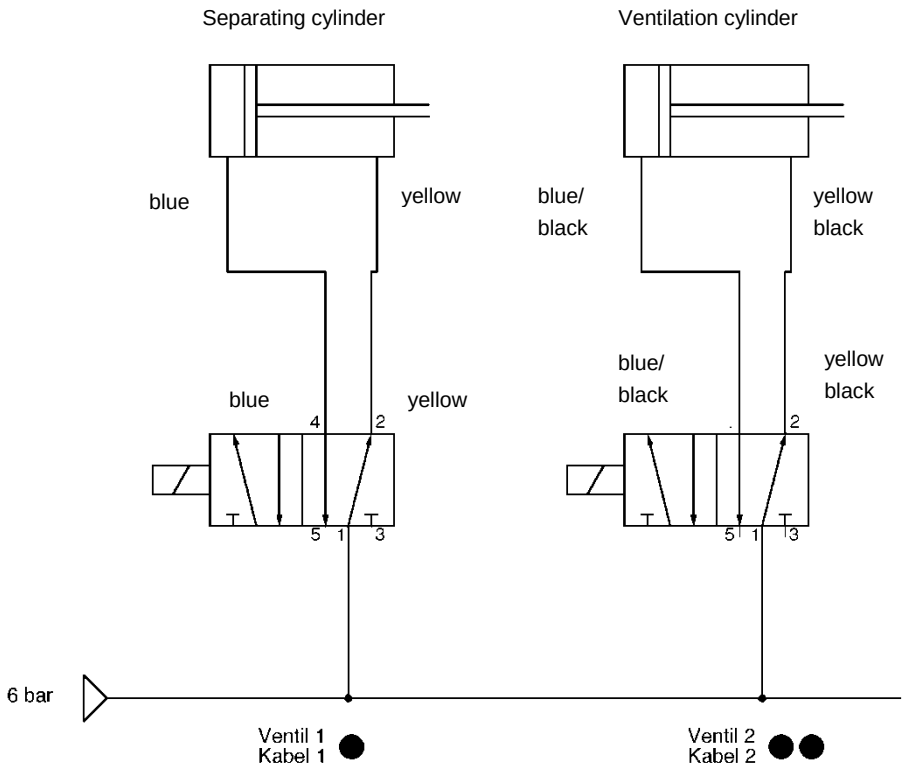
12.1 Ejector SBX-C 200



12.2 Blower SBX-C 200



12.3 Blower SBX-C 400



13 Other Applicable Documents

Other Applicable Documents

☒	EC declaration of incorporation	30.30.01.00525
☐	Operating instructions for blower type: _____	_____
☐	Operating instructions for pump type: _____	_____
☐	Operating instructions for ejector type: _____	_____
☐	Operating instructions for dust filter type: _____	_____

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