

7 Installation

7.1 Installation Instructions



⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

- ▶ Prior to installation and before maintenance work, the vacuum generator must be disconnected from the power supply and secured against unauthorized restart!

For safe installation, the following instructions must be observed:

Use only the connectors, mounting holes and attachment materials that have been provided.

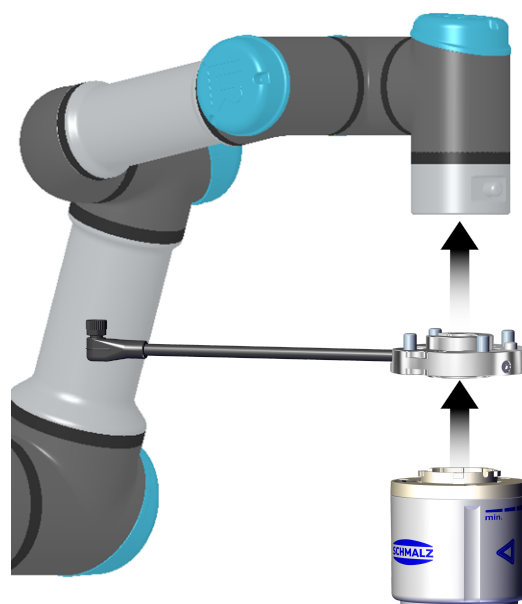
Firmly connect and secure pneumatic and electrical line connections to the vacuum generator.

7.2 Mechanical Attachment

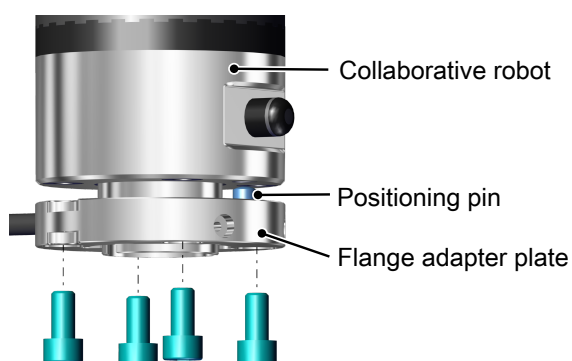
The ECBPMi may be installed in any position.

The ECBPMi can be adapted to a collaborative robot using a robot-specific flange adapter plate and connection cable. The markings and/or a positioning pin on the flange and a marking on the housing of the ECBPMi must be observed, because these determine the orientation of the display and the suction cup on the robot.

Flange connection: The angle of rotation of the bayonet flange is limited to 15° by stops.



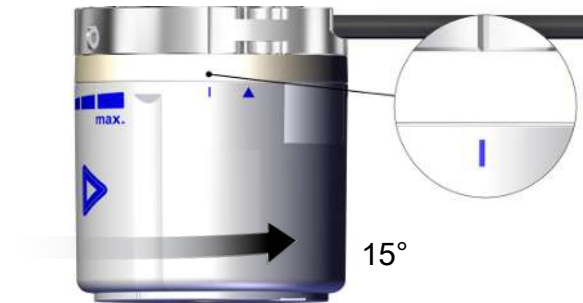
1. Position the flange adapter plate included in the delivery on the suitable collaborative robot using the positioning pin and fasten it using the four M6x12 cylinder head screws. Observe the permitted tightening torque for the thread.



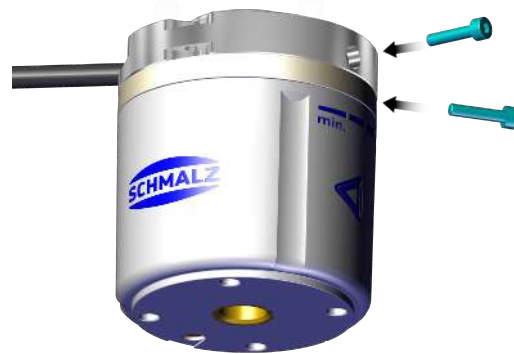
2. Tightly connect the ECBPMi to the flange adapter plate using the bayonet fastener. Position the ECBPMi so that the small triangle points toward the groove on the flange adapter plate.



3. Turn the ECBPMi clockwise by 15° (until it stops) (the line marking matches the groove on the adapter flange).

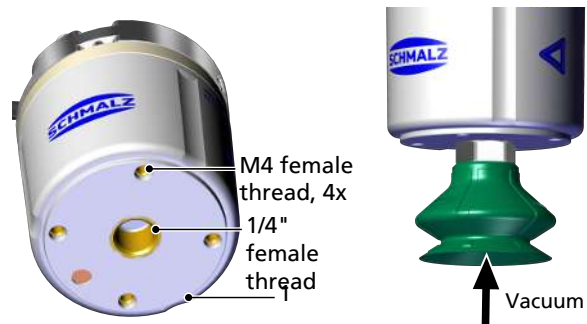


4. **NOTE! End position is not reached and the line on the ECBPMi does not match the groove on the flange. Screwing in the locking screws damages the light conductors.** They are then secured against being opened unintentionally with the two screws (M3x14). Observe the max. tightening torque of 0.6 Nm.



5. To attach the vacuum suction cup, vacuum end effector or custom gripper:
 - » Use the bottom universal flange interface with 4x M4 internal thread with a maximum tightening torque of 1.3 Nm or
 - » The central 1/4 inch internal thread interface with a maximum tightening torque of 2.0 Nm

When using the Schmalz modular system VEE, the mounted flange plate must be aligned to the marking (1).



7.3 Compatibility of the Schmalz Software for UR Robot Systems

Suitable Schmalz URCap software with the current version no. V4.3.6 is a requirement for the safe operation of the ECBPMi Plus model. Schmalz URCap is not downward compatible.

Below you will find the requirements or the description of the required software:

- Schmalz URCap (V4.3.6) valid for ECBPMi and ECBPMi PLUS on robot systems from UR with the control software Polyscope 5.8 or higher (used in UR e series).
- Schmalz URCap (V4.3.6) valid for ECBPMi on robot systems from UR with the control software Polyscope 3.12 or higher (used in UR CB series).



ECBPMi Plus is not compatible with Universal Robots CB series (Polyscope 3.x).

7.4 Description of the Electrical Connection



⚠ WARNING

Electric shock

Risk of injury

- ▶ Operate the product using a power supply unit with protected extra-low voltage (PELV).



⚠ CAUTION

Changing output signals when the product is switched on or plug is connected

Personal injury or damage to property!

- ▶ The electrical connection must be performed only by specialists who can evaluate the effects of signal changes on the overall system.



⚠ CAUTION

Risk of getting caught by the connection cable when the collaborative robot moves.

Injury due to limbs or hair getting caught.

- ▶ Route the connection cable as close to the robot arm as possible.
- ▶ Avoid the danger zone.

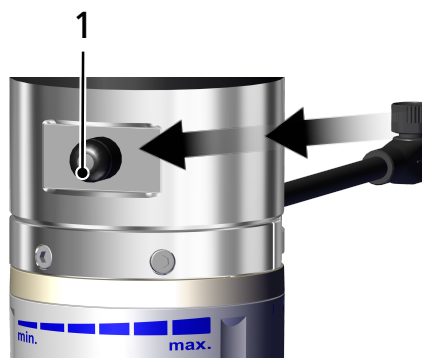
The electrical connection of the ECBPMi (the voltage supply and the transmission of input and output signals) is directly connected to the electrical interface of the robot using the adapted connection cable on the flange.

Carry out assembly or disassembly work only when the device is disconnected from the power supply. Electrical connections must be firmly connected to the ECBPMi and secured.

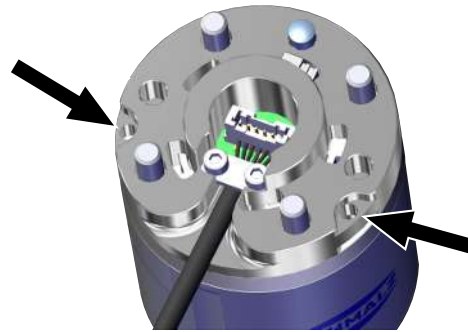
When connecting to the power supply, take note of the following:

- The maximum length of the connection cable is 20 m.
- The maximum length of the connection cable for the “ECBPMi Plus” is 10 m.

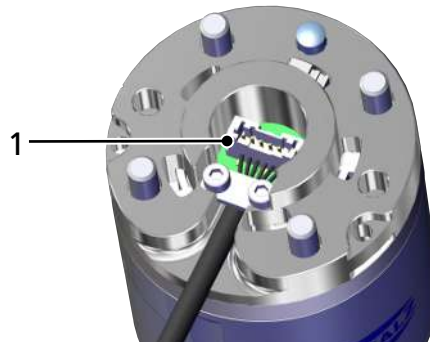
1. Connect the connection cable on the robot (1).



- 2. Optional: Use cable ties to fasten the connection cable to the drilled holes on the flange so that it is laid tightly against the robot arm.



The electrical interface to the robot is customer-specific. The PIN assignment on the flange connector (1) is always the same.



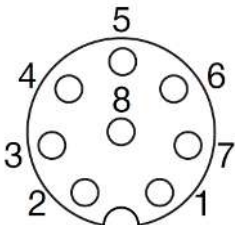
PIN assignment, 6-pin flange connector

Flange connector	PIN	Symbol	Function
	1	U	24 V supply voltage
	2	GND	Ground
	3	OUT2	Signal output for "Part Present"/IO-Link
	4	OUT3	Optional signal output (e.g. activate freedrive)
	5	IN1	"Suction" signal input
	6	IN2	"Blow off" signal input

PIN assignment, flange set for Schmalz standard M12 8-pin connector

8-pin M12 connector	Pin	Symbol	Function
	1	—	—
	2	U	24 V supply voltage
	3	—	—
	4	IN1	"Suction" signal input
	5	OUT2	Signal output for "Part Present"/IO-Link
	6	IN2	"Blow off" signal input
	7	GND	Ground
	8	OUT3	Optional signal output (e.g. activate freedrive)

PIN assignment, UR M8 flange set

8-pin M8 connector	Pin	Symbol	Function
	1	—	—
	2	—	—
	3	OUT2	Signal output for "Part Present"/IO-Link
	4	OUT3	Optional signal output (e.g. activate freedrive)
	5	U	24 V supply voltage
	6	IN1	"Suction" signal input
	7	IN2	"Blow off" signal input
	8	GND	Ground

PIN assignment, UR M8 ECBPMi Plus flange set

8-pin M8 socket	Pin	Litz wire color	Function
	1	White	Communication line RS485+
	2	Brown	Communication line RS485-
	3	Green	OUT2, "part present"/IO-Link signal output
	4	Yellow	OUT3, freedrive
	5	Gray	U, +24 V supply voltage
	6	Pink	Digital IN1
	7	Blue	Digital IN2
	8	Red	GND, ground

7.5 Start of Operations

As soon as power is supplied to the ECBPMi via the higher-level control unit, it is ready for operation. If the robot is active, the ECBPMi performs an internal test run and then lights up and remains blue.


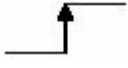
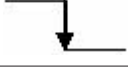
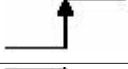
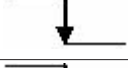
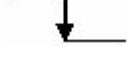
The vacuum of the ECBPMi is routed to the vacuum gripping system/suction cup via the 1/4 inch thread.

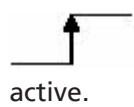
When using any grippers, ensure that the connection between the gripper and the ECBPMi is airtight.



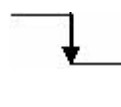
A typical handling cycle is divided into the following three phases: pickup, blowoff and idle.

To check whether sufficient vacuum has built up, the limit value H2 is monitored by an integrated vacuum sensor during suction and output to the higher-level control unit via OUT2.

Phase	Switching step	ECBPMi		
		Signal	Status	
1	1		IN1	Suction ON
	2		OUT2	Vacuum > H2
2	3		IN1	Suction OFF
	4		IN2	Blowoff ON
3	5		OUT2	Vacuum < (H2-h2)
	6		IN2	Blowoff OFF



Signal status changes from inactive to active.



Signal status changes from active to inactive.