

## Area Gripping System FXP-i/ FMP-i

# Short Instruction Manual

**Note:** These brief operating instructions were originally written in German and have been translated into English. The operating instructions describe the basic functions of the device. They are intended to provide a quick start for experienced users. The complete description of the device can be found in the detailed operating instructions at [www.schmalz.com](http://www.schmalz.com), via NFC on the Gripper or is available on request. These brief operating instructions make no claim to being exhaustive. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

J. Schmalz GmbH · Johannes-Schmalz-Str. 1 · D-72293 Glatten · T: +49 7443 2403-0  
[schmalz@schmalz.de](mailto:schmalz@schmalz.de)

# 1 Fundamental Safety Instructions

## 1.1 Personnel Qualifications

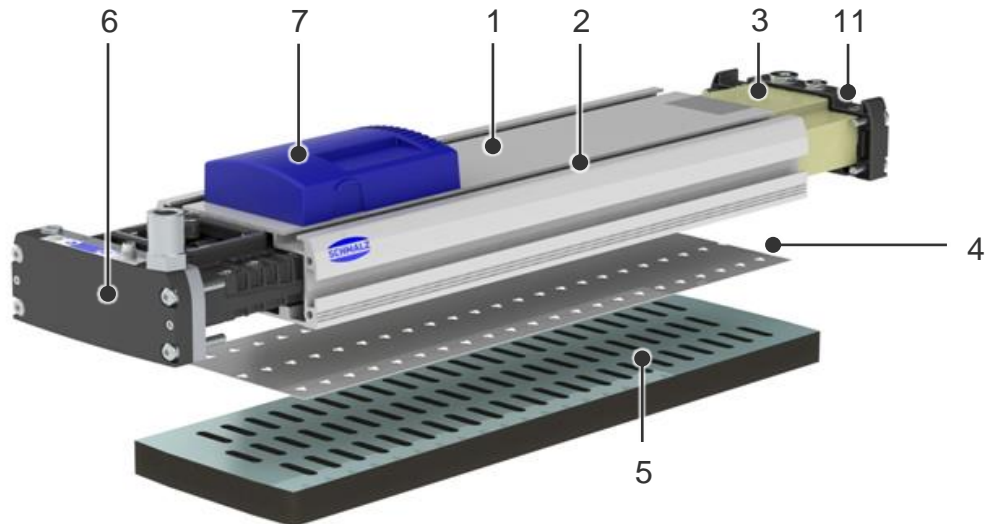
Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks! These operating instructions are intended for fitters who are trained in handling the product and who can operate and install it.

- Only instruct qualified personnel to perform the tasks described in these operating instructions.
- The product must only be operated by persons who have undergone appropriate training.
- Assembly and adjustment work must only be carried out by qualified personnel.
  - Trained personnel with industrial training and product-specific instruction.
  - Electrical work and installations must only be carried out by qualified electrical specialists.

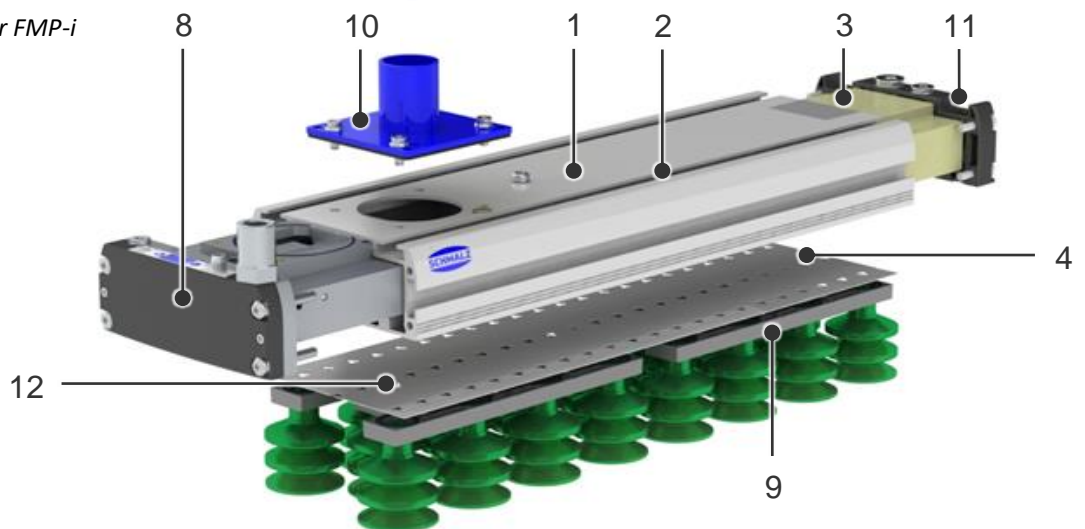
# 2 Product Description

## 2.1 Area gripper design

*Area gripper FXP-i*

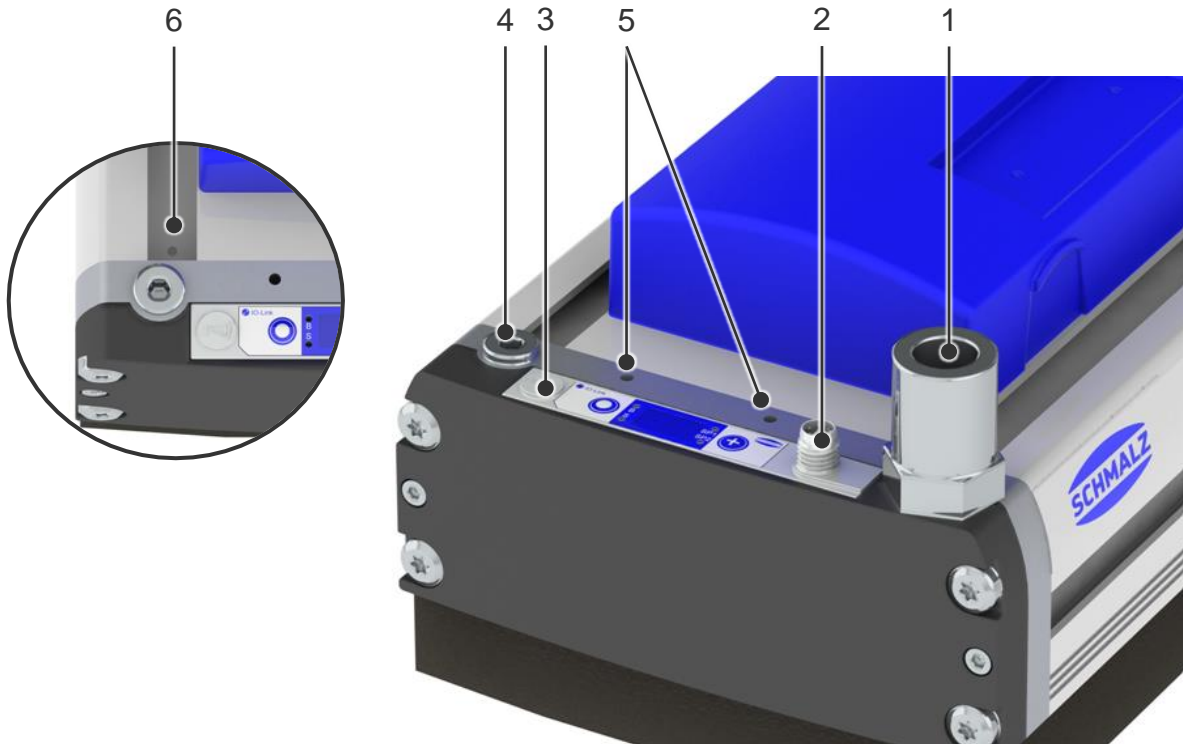


*Area gripper FMP-i*



1	Main body	2	Sliding block strips
3	Insert element for optimizing the flow	4	Valve film
5	Sealing plate	6	Ejector assembly FXP-i (functional unit)
7	Silencer FXP-i	8	Valve assembly FMP-i (functional unit)
9	Suction cup connection strip with suction cups	10	Hose connector FMP-i
11	End cover	12	Balls for SVK technology (not for SW)

## 2.2 Connections



1	Compressed air connection	2	M8 electrical connection, 6-pole
3	NFC area	4	Connection for separation function
5	Mounting holes for pentaprisms	6	Marking

## 2.3 Electrical Parameters

<b>Supply voltage</b>	DC 24 V ± 10% (PELV <sup>1)</sup> )		
<b>Polarity reversal protection</b>	yes		
<b>Current consumption (at 24 V)</b>	-	Typical current consumption	Max. current consumption
	FXP-i – xx – NC	50 mA	70 mA
	FMP-i – xx – NO	75 mA	115 mA
<b>NFC</b>	NFC Forum Tag type 4		
<b>IO-Link</b>	IO-Link 1.1 Baud rate COM2 (38.4 Kbits/s)		

1) The power supply must correspond to the regulations in accordance with EN60204 (protected extra-low voltage).

## 2.4 Mechanical data

### Flow rates

Type	Compressed air connection [mm]	Max. suction rate [NI/min]	Air consumption [NI/min]*	Type of ejector
FXP-i-SW-442	12/9	1030	250	1xSEM-P 50
FXP-i-SW-640	12/9	1350	375	1xSEM-P 75
FXP-i-SW-838	12/9	1600	500	1xSEM-P 100
FXP-i-SW-1234	2x12/9	2940	875	1xSEM-P 75 1x SEM-P 100
FXP-i-SW-1432	2x12/9	3180	1000	2xSEM-P 100

\* Air consumption: at the optimum operating pressure of 5.8 bar

## 3 Operating and Menu Concept

The area gripper is operated using two buttons on the foil keypad.



MENU BUTTON



PLUS BUTTON

Navigation is divided into three menus:

- The main menu: for standard applications
- The Extended Functions (EF) menu: for applications with special requirements
- The Info menu (INF): for reading out system data such as counters, the software version, etc.


If settings are changed, undefined states of the system may occur for a short time (for approx. 50 ms).

The following information can be shown on the display:

- The current vacuum measurement value
- The selected menu item
- The settings
- Error messages in the form of error codes

The operating menu's home screen shows the currently measured vacuum level in the selected display unit. The available units are millibar, kilopascal, inHg and psi. The measured value is displayed as positive compared to the ambient air pressure.

### 3.1.1 Displaying the Basic Settings (Slide Show)

When you press the  button from the home screen, the following parameters are automatically displayed one after the other on the display (slide show):

- The vacuum unit
- The current operating mode (S IQ or IQL)
- The currently activated production setup profile (P-0 to P-3)
- The value of switching point SP1
- The value of reset point rP1
- The value of switching point SP2
- The value of reset point rP2
- The supply voltage US

The display cycle returns to the vacuum display after a complete cycle or can be canceled at any time by pressing any button.










### 3.2 Functions in the Main Menu

The following table shows an overview of the display codes and parameters in the main menu:

Display code	Parameter	Explanation
SP1	Switching point 1	Value at which the control function deactivates (Only active when [cEr] = [ON])
rP1	Reset point 1	Reset value 1 for the control function
SP2	Switching point 2	Switching value for the "Parts control" signal
rP2	Reset point 2	Reset value 2 for the "Parts control" signal
tBL	Blow off time	Setting of the blow off time for time-controlled blow off
cAL	Zero-point adjustment (calibration)	Calibrate vacuum sensor, zero point = ambient pressure
EF	Extended functions	Open the "Extended Functions" submenu
INF	Information	Open the "Information" submenu
inc	Incorrect	The entered value is not within the permissible value range. This is an informational message that appears if incorrect information is entered.

#### 3.2.1 Changing the Parameters of the Main menu

If you wish to change values, e.g. the switching points, you have to enter the new value digit by digit.

1. Use the  button to select the desired parameter.
2. Confirm using the  button.  
⇒ The currently set value is displayed and the first digit flashes.
3. Use the  button to change the value. The value increases by 1 each time the button is pressed. After 9, the counter goes back to 0 when the  button is pressed.
4. Press the  button to save the modified value.  
⇒ The first digit is accepted and the second digit flashes.
5. Use the  button to select the second digit.
6. Press the  button to save the modified value.  
⇒ The second digit is accepted and the third digit flashes.
7. Use the  button to select the third digit.
8. Press the  button to save the modified value.  
⇒ If the value entered lies within the permissible value range, it is accepted and the modified parameter is displayed.  
⇒ If the value entered is not within the permitted value range, this is indicated briefly by the display [inc] and the new value is not applied.

If input is interrupted for longer than 1 minute or if no input is made, the display automatically switches to the measurement display.

## 4 Checking the delivery

The scope of delivery can be found in the order confirmation. The weights and dimensions are listed in the delivery notes.

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Report any damage caused by defective packaging or that has occurred in transit to the carrier and to Schmalz immediately.

## 5 Installation Instructions

### CAUTION



#### **Improper installation or maintenance**

Personal injury or damage to property!

During installation and maintenance, make sure that the area gripper is disconnected and depressurized and that it cannot be switched on again without authorization.

For safe installation, the following instructions must be observed:

1. Use only the connections, mounting holes and attachment materials that have been provided.
2. Carry out mounting and removal only when the device is in an idle, depressurized state.
3. Pneumatic and electrical line connections must be securely connected and attached to the area gripper.

### 5.1 Mounting the Area Gripper

#### CAUTION



#### **Compressed air or vacuum in direct contact with the eye**

Serious eye injuries!

Wear eye protection

- Do not look into compressed air openings
- Do not look into the silencer air stream
- Do not look into vacuum openings, e.g. suction cups

#### CAUTION



#### **Noise pollution due to incorrect installation of the pressure and vacuum connections**

Hearing damage!

- Correct installation.
- Wear ear protectors.

The area gripper is attached using sliding blocks. Special sliding block strips for holding the sliding blocks are integrated into the main body. The system can be adapted directly using the sliding block strip, a robot flange or a spring-mounted suspension eye.

## 5.2 Mounting the Electrical Connection

### NOTE



#### Change of output signals when product is switched on or plug is connected

Personal injury or damage to property

- ▶ Electrical connection must be performed only by a qualified specialist who can predict the effects that signal changes will have on the entire system.

### NOTE



#### Incorrect power supply

Destruction of the integrated electronics

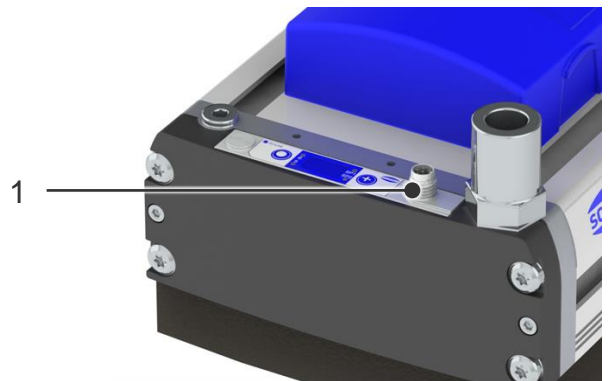
- ▶ Operate the product using a power supply unit with protected extra-low voltage (PELV).
- ▶ The system must incorporate safe electrical cut-off of the power supply in compliance with EN60204.
- ▶ Do not connect or disconnect the connector under tension and/or when voltage is applied.

The electrical connection supplies the area gripper with power and communicates with the controller of the higher-level machine using defined outputs or via IO-Link.

- ✓ Provide a connection cable with an M8 6-pole socket (customer's responsibility).

- ▶ Attach the connection cable to the area gripper at the electrical connection (1).

Maximum tightening torque = hand-tight.



Ensure that the electrical cable does not exceed the maximum length of 20 meters.

### 5.2.1 Pin Assignments

M8 plug	PIN	Symbol	Wire color <sup>1)</sup>	Function
	1	US	Brown	24 V power supply
	2	IN1	White	"Suction" signal input
	3	GND	Blue	Ground
	4	OUT / CQ	Black	"Parts control" output (SP2) or IO-Link
	5	IN2	Gray	"Blow-off" signal input
	6	—	Pink	Not used

<sup>1)</sup> When using a Schmalz connection cable, part no. 21.04.05.01015

## 6 Operation

Always carry out the following tasks before activating the system:

1. Before each use, check that the safety features are in perfect condition.
2. Check the area gripper for visible damage and deal with any problems immediately or notify your supervisor.
3. Ensure that only authorized personnel are present in the working area of the machine or system and that no other personnel are put in danger by switching on the machine.

There must be no people in the system's danger area while it is in operation.



### ⚠ CAUTION

#### Risk of crushing injuries

Serious injury!

Do not enter or reach into the secured danger zone.



### ⚠ CAUTION

#### Risk of injury due to exposed suction points and compressed air lines

Do not place eyes, ears or hands into suction points and compressed air lines.

Do not bring exposed suction points and compressed air lines close to eyes or body orifices.

Do not place suction plates on the human body.



### ⚠ CAUTION

#### Sharp objects

Damage to vacuum hoses from sharp objects

Always ensure that vacuum hoses cannot be damaged by sharp objects.



### ⚠ CAUTION

#### The gripper is not attached correctly.

Serious injury due to falling parts!

Ensure that the gripper is securely attached.



### ⚠ WARNING

#### Persons in the working area of the area gripper may suffer life-threatening injuries.

Serious injury or death!

The danger zone of the gripper is exclusively determined by the automatic system, such as the robot, handling system or gantry, and must be secured by the customer.

Ensure that no persons or animals are present in the danger zone at any time. The danger zone must be secured by the integrator.

Ensure that collisions with the surrounding environment and objects are avoided to prevent the load from breaking off.



**⚠ WARNING****Falling objects**

Serious injury or death!

Various causes: disruption to the energy supply, incorrect design of the holding force, wear, etc.

Do not enter the danger zone.

## 7 IO-Link Data Dictionary

IO-Link implementation		
Vendor ID		234 (0x00EA)
Device ID		100140 (0x01872C)
SIO mode		Yes
IO-Link revision		1.1 (compatible with 1.0)
IO-Link bitrate		38.4 kBit/sec (COM2)
Minimum cycle time		3.4 ms
Process data input		4 bytes
Process data output		2 bytes



For all process data and parameters see detailed operating instructions (art. no. 30.30.01.02851). These are available at [www.schmalz.com](http://www.schmalz.com), via NFC on the gripper or on request to [schmalz@schmalz.de](mailto:schmalz@schmalz.de)