

OPERATING INSTRUCTIONS

SoftGripping Control Box

Original instructions

This document describes the usage of the SoftGripping Control Box in the combination with a SoftGripper

Revision 1.2.1
Date of Revision: 2020-06-08



Tip: For your own safety, read the operating instructions and follow the warning and safety instructions on the device and in the operating instructions. Keep the operating instructions for future reference.



Tip: If you wish to get the operating manual in an additional language, please send us your request and the corresponding product code via Email.



Warning! Not reading the manual properly can lead to injuries. Please mind the warnings provided in the operating instructions.

Technical Support: Do you have questions about the installation or operation of your device?

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www.soft-gripping.shop

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Original Instructions
Errors and technical modification subject to change, you can find the newest version on our homepage.

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1. About this document

This document describes the usage of the product, certain aspects of the device are described in other documents and must be observed as well.

1.1. Applicable documents

You can find additional information in the Quick Installation Guides and data sheets. For all available documentation visit our website or contact us directly.

2. Safety

2.1. Intended use

The SoftGripping Control Box is used to operate SoftGripper Fingers and the suction cup in following configurations: SoftGripper, SoftGripper – Developer and SoftGripper Fingers for End of Arm Tooling.

2.2. General safety information

- The product may only be used in its original status without unauthorized modifications.
- Only use the product if it is in perfect technical conditions.
- The use is intended inside building only.
- Take the ambient conditions at the location of use into consideration.

3. Service

Contact our regional SoftGripping partners if you need technical support.

4. Accessories

You can find all accessories in our catalogue and data sheets or on our website.

5. Product Overview

5.1. Design

Input Pressure

Tubing: outside diameter 6 mm

Pressure range: 4 to 7 bar

Finger Output

4 mm outside Ø

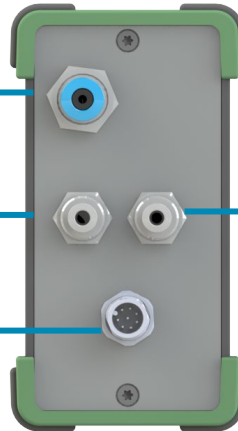
-0.75 to 2.5 bar

Signal Connector

M12 connector IEC 61076-2-101

Coding: A

Digital Signal input: 21.6 to 26.4 V DC



Suction Cup Output

4 mm outside Ø

-0.75 to 0 bar

Figure 1: Back side of the SoftGripping Control Box.

Pressure Indicator

Pressure Regulator



Figure 2: Front side of the SoftGripping Control Box.

5.2. Characteristics

Figure 3: Characteristics of the SoftGripping Control Box.

Input Air Pressure Connection	1 x 6 mm outside Ø
Output Pressure Connector	2 x 4 mm outside Ø
Input Pressure	4 to 7 bar
Output Pressure	- 0.75 to 2.5 bar
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Ambient Temperature	0 °C to 50 °C
Temperature of the medium	0 °C to 50 °C
Solenoid valve duty cycle	100 %
Signal Connector	M12 connector IEC 61076-2-101 8 Pins male
Digital Signal Input	3x 21.6 - 26.4 V DC 120 mA
Compatible Software	Soft-Gripping UR-Caps
Compatible Hardware	Soft-Gripping Fingers & Suction Cups

5.3. Pinout

Table 1: Pinout of the M12 connector.

Pin	Function	Color
1	Finger Release	White
2	GND	Brown
3	Finger Grip	Green
4	NC	Yellow
5	Suction Cup Active	Grey
6	NC	Pink
7	NC	Blue
8	NC	Red

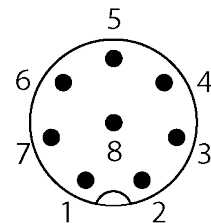


Figure 4: M12 connector male pinout.

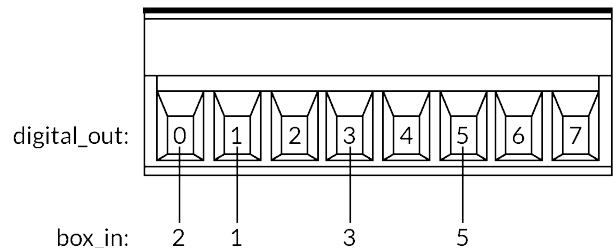


Figure 5: Phoenix connector to box standard configuration pinout.

6. Function

The control box is used to operate any SoftGripper, End of Arm Tooling or suction cup. On the front, the current pressure can be seen in the pressure indicator and adjusted via a knob. On the backside of the device you can find the pressure input and two outputs (e.g. fingers & suction cup). The outputs are controlling the position of the fingers. You can switch between 3 positions: Grip, Release and Relaxed setting the according Signal Connector's pins to high. Setting both, the "Finger Release" and "Finger Grip", respectively pins 1 & 3 to low results in the Relaxed position. The Suction Cup has two states. When pin 5 is set to high, the Suction Cup is activated, setting pin 5 to low results in a release.

6.1. Pneumatic Components

The SoftGripping Control Box works with pneumatics elements from Festo. The additional documentation for the MHE2-M1H-3/2G-QS-4-K (196136) Solenoid valve and Festo vacuum ejector nozzle OVEL-5-H-10-PQ-VQ4-UA-C-A-H3 can be acquired from Festo SE & Co. KG.

7. Installation



Figure 6: Back panel of the SoftGripping Control Box.

7.1. Mechanical

Place the SoftGripping Control Box in a suitable position to allow unhindered operation and ensure a safe working environment.



An unfavorable mounting position can impair the functionality of this product:

- Install the unit in a place where no condensation water from the compressed air line can collect in the device.
- Be sure that the box and the internal components are not heated above the maximal permitted operating temperature, either by the surrounding or hot compressed air.

7.2. Pneumatic

The SoftGripping Control Box comes with the tubing needed to operate SoftGripper Fingers, a suction cup or End of Arm Tooling. On the backside you find 3 connectors for pneumatics. The input connector is used to supply the pressurized air on which the system operates. Make sure to use the right diameter of tubing and the compressor to be suitable for the task and does not exceed the maximal operating pressure. Connect the tubing to the output connector and corresponding Fingers or suction cups. Verify, that the connections are not switched on. The compressed air to operate the SoftGripping Box, Fingers etc. must be in accordance with ISO 8573-1:2010 [7:4:4].



Keep the dangers of compressed air and the following points in mind:

- Make sure to connect and disconnect tubing while the compressor is turned off.
- Do not bend the tubing excessively. The flow must be provided at any time.
- Check the tubing for leaks and abrasions. Verify that you are using suitable tubing.
- Mind, that tubing with the right diameter must be used.
- The maximal input pressure should not be exceeded at any time.



Warning! Injury caused by pressurized system. To minimize risks of injuries while handling pneumatics:



- Wear personal protective equipment (PPE) such as hearing and eye protection at any time.
- and operate high pressure equipment behind a blast shield.

7.3. Electric

Connect the 8 pin M12 connector to the box your automation system.



Keep the dangers of compressed air and the following points in mind:

- Make sure to connect and disconnect the plug while system is turned off.
- Make sure to operate the device with voltage according to the voltage range.
- Keep the component away from moisture.

Warning! Improper operation can cause electric shocks, damage to the machine and system.



- For the electrical power supply, only use PELV circuits in accordance with IEC 60204-1/EN 60204-1.
- Only use voltage sources that ensure a reliable electric separation from the mains network in accordance with IEC 60204-1/EN 60204-1.
- Keep the requirements of IEC 60204-1/EN 60204-1 for PELV circuits.

8. Starting Procedure



Figure 7: Front panel of the SoftGripping Control Box.

After connecting all components, turn on the robot and compressor. The SoftGripping Control Box comes pretested and adjusted to 1 bar / 0.1 MPa output pressure. This setting can change, so make sure to calibrate the output pressure before connecting the box to the Fingers.

To calibrate the pressure, you need to:

1. Connect the blanking plug to the finger output.
2. Set the position to Grip
3. Read the built-in manometer by toggling the button under the display
4. Adjust the pressure using the knob on the front panel. Pull the knob to start setting the pressure. Turn it clockwise to reduce the pressure and counterclockwise to increase it.
5. Push the knob to save the settings.
6. Make sure to turn the pressure off before removing the blanking plug and inserting the tubing.



Always check the output pressure set before operating the robot to avoid damaging the Fingers. Commissioning should only be carried out by qualified personnel.

9. Operation

The Fingers and the suction cup are operated by triggering the respective pins described in the Pinout (Section 5.3).

This results in three positions for the Fingers:

1. Pin 1 High & Pin 3 Low: Grip
2. Pin 1 Low & Pin 3 High: Release
3. Pin 1 Low & Pin 3 Low: Relaxed

The suction cup can be operated between two positions:

1. Pin 5 High: Grip
2. Pin 5 Low: Relaxed



It is not recommended to set both Pin 1 and Pin 3 to High at the same time. Note that it will result in the Grip position of the Fingers.

10. Decommissioning

Set all pins to low and turn off the air compressor. If you are planning to disconnect the device after decommissioning, make sure to disconnect the signal connector first. Before disconnecting any tubing, be sure that the system is not pressurized. Store the SoftGripping Control Box under dry conditions.



Do not disconnect the pneumatics while the system is still pressurized.

11. Maintenance and Troubleshooting

The pneumatics can be maintained using manuals provided by Festo SE & Co. KG. If you find problems using the system, please follow the following steps checking the components:

1. Are all connections made?
2. Is the input pressure suitable?
3. Can you find leaks, excessive bends or ruptures in the tubing?
4. Is the input voltage suitable? Does the device receive inputs?

The Schmalz manometer is operated by a battery, if you cannot see the reading, you should replace the battery following the instructions given by J. Schmalz GmbH.

If you still have problems operating the device, please contact our service team.

12. Disassembly

The disassembly must be carried out by qualified personnel in order to guarantee the warranty.

13. Legal information

13.1. Damage in transit

The packaging of our devices ensures the best possible protection against transport damage. Check the packaging for transport damage. In case of damage, contact the manufacturer's technical customer service within three working days and inform the carrier.

13.2. Warranty and warranty conditions

The factory warranty for the device is contractually agreed. During the warranty period, the manufacturer will replace or repair free of charge any material or construction-related defects. Please inform yourself about our terms and conditions on the website.

Warranty claims will become void in the event of unauthorized intervention in the device. Also excluded from the warranty:

- Unintentional or intentional damage
- Damage or defects caused by third parties not contractually bound to the manufacturer at the time of damage
- Wearing parts
- Damage due to negligence or improper operation of the device
- Packaging and shipping damage

If your device malfunctions, contact the manufacturer directly:

Wegard GmbH
Kirchenheide 18
22395 Hamburg

Phone: +49 (0)40 319 76 995
E-Mail: info@soft-gripping.com

13.3. Declaration of Conformity

The declaration of conformity can be obtained directly from the manufacturer.

13.4. Disposal

Old devices or dismantled old assemblies can be returned to the manufacturer or a certified disposal company for proper disposal.



14. EC – Declaration of Conformity

DE EU-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:
Wegard GmbH, Kirchenheide 18, D - 22395 Hamburg

Produktbezeichnung / Product name / Designation du produit / Denominación del producto / Denominazione del prodotto / Beschrijving van de machine:
Control Box (SG.CB.2E.D1)

Erfüllte einschlägige EU-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
2014/30/EU	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: 2011-03	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 61000-6-2: 2012-11	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: 2006-03	Elektromagnetische Verträglichkeit - Störfestigkeit / Electromagnetic Compatibility - Immunity / Compatibilité électromagnétique - Immunité / Compatibilidad electromagnética - Resistencia a interferencias / Compatibilità elettromagnetica - Immunità / Elektromagnetische compatibiliteit - immunititeit

Dokumentationsverantwortlicher / Person responsible for documentation / Responsable de la documentation / Responsable de documentación / Responsabile della documentazione / Verantwoordelijk voor de documentatie:



Hamburg, 15.03.2020

Stephan Ulrich / Wegard GmbH, Kirchenheide 18, D - 22395 Hamburg

Unterschrift, Angaben zum Unterzeichner/ Signature, details of signatory / Signature, indications sur le soussigné / Firma y datos del firmante / Firma, dati concernenti il firmatario / Handtekening, omschrijving n de dertekenaar:



Hamburg, 15.03.2020

Stephan Ulrich, CEO