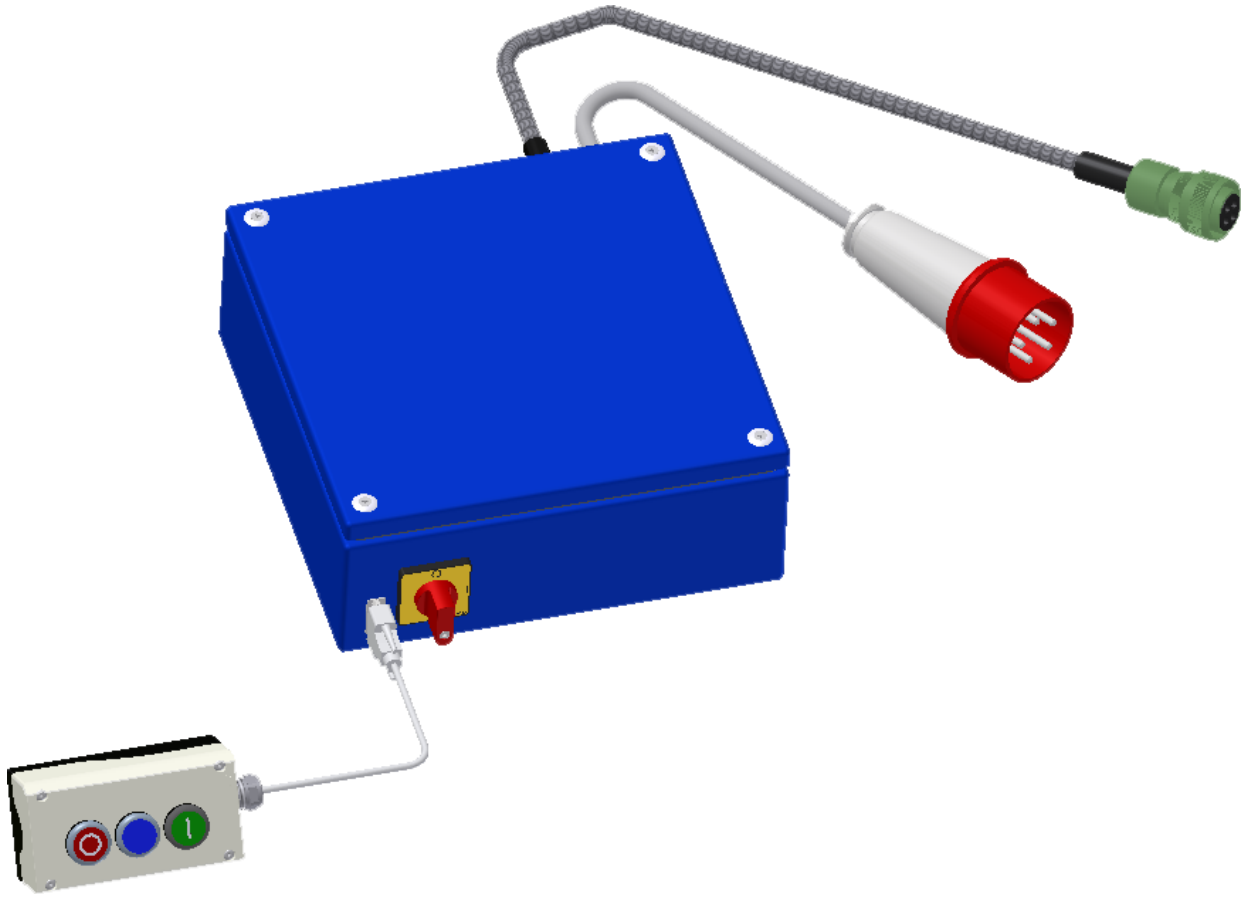
Control Unit

KEH

Assembly and Operating Manual



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Note
In order to improve the quality and performance of the product, we reserve the right to make technical changes at any time and without notice. The images of the product contained in the manual are purely indicative and may therefore not be perfectly representative of the packaging and characteristics of the product, differing in color, size or content.

Document: 5034706 [ex QM.UC.00001]

Edition: 1.0 | 15/03/2022 | en

Dear customer,
congratulation on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.
You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.
SCHUNK products are inspiring.
Our detailed assembly and operation manual will support you.
Do you have further questions? You may contact us at any time – even after purchase.
Kindest Regards

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Table of contents

1. About this manual

The manual contains important information regarding the assembly, operation, use and maintenance of the product. Pay particular attention to the "Safety Basics" chapter.

1.1 Warnings

The following signal words and symbols are used to highlight dangers.

1.1.1 Signal words

DANGER
Dangers for persons. Non-compliance will inevitably cause irreversible injury or death.

WARNING
Dangers for persons. Non-compliance may cause irreversible injury or death.

CAUTION
Dangers for persons. Non-observance may cause minor injuries.

ATTENTION
Information about avoiding material damage.

1.1.2 Symbols


Warning about a danger point


Warning about dangerous electrical voltage


Danger of magnetic field


Danger of falling down workpieces


General mandatory sign to prevent material damage

2. Basic safety notes

2.1 Intended use

The product may be used only in the context of its defined application parameters. To use this product as intended, it is also essential to observe the technical data and installation and operation notes in this manual and to comply with the maintenance intervals.

NOTE

This product must not be placed in service until the the combined "product + user machine" system *satisfies the requirements of the Machinery Directive 2006/42/EC.*

2.2 Environmental and operating conditions

- Use the product only within its defined application parameters. See "Technical data".
- Make sure that the environment is clean and the ambient temperature corresponds to the specifications.

2.3 Product safety

Using the product can be dangerous if:

- is not used in accordance with its intended purpose
- it is not installed or maintained properly.
- the safety and installation notes are not observed.

Avoid any manner of working that may interfere with the function and operational safety of the product.

2.3.1 Protective equipment

Provide protective equipment per EC Machinery Directive.

2.4 Personnel qualification

Assembly, initial commissioning, maintenance and repair of the product may be performed only by trained specialist personnel. Every person called upon by the operator to work on the product must have read and understood the complete assembly and operating manual especially the chapter "Basic safety notes". This applies particularly to personnel only used occasionally, such as maintenance personnel.

2.5 Using personal protective equipment

When using this product, observe the relevant industrial safety regulations and use the personal protective equipment (PPE) required :

- use protective gloves, safety shoes and safety goggles
- observe safe distances
- comply with the minimum safety requirements for the use of the equipment.

DANGER

Danger due to a magnetic field.
This product always uses a magnetic system. The following groups of persons must not come into contact with it:

- Persons with pacemakers.
- Persons with metal or electronic prostheses.
- Persons with insulin pumps.
- Persons with muscular stimulation systems.
- Pregnant women.

These persons should always keep a safe distance of at least 2m from the magnetic system.

2.6 Notes on particular risks

- Remove the energy supplies before installation, modification, maintenance, or adjustment work.
- Ensure that no residual energy remains in the system.
- Perform maintenance, modifications, and additions outside the danger zone.
- For all work, secure the product against accidental operation.

3. Warranty

The warranty is valid for 12 months from the delivery date to the production facility under the following conditions:

- intended use in 1-shift operation
- observe the mandatory maintenance intervals
- observe the environmental and operating conditions.

Parts touching the work piece and wearing parts are not part of the warranty.

3.1 Procedure in the event of warranty

The buyer agrees to send a written detailed report on newly discovered defects of the product to SCHUNK within 10 days after identification.

4. Scope of delivery

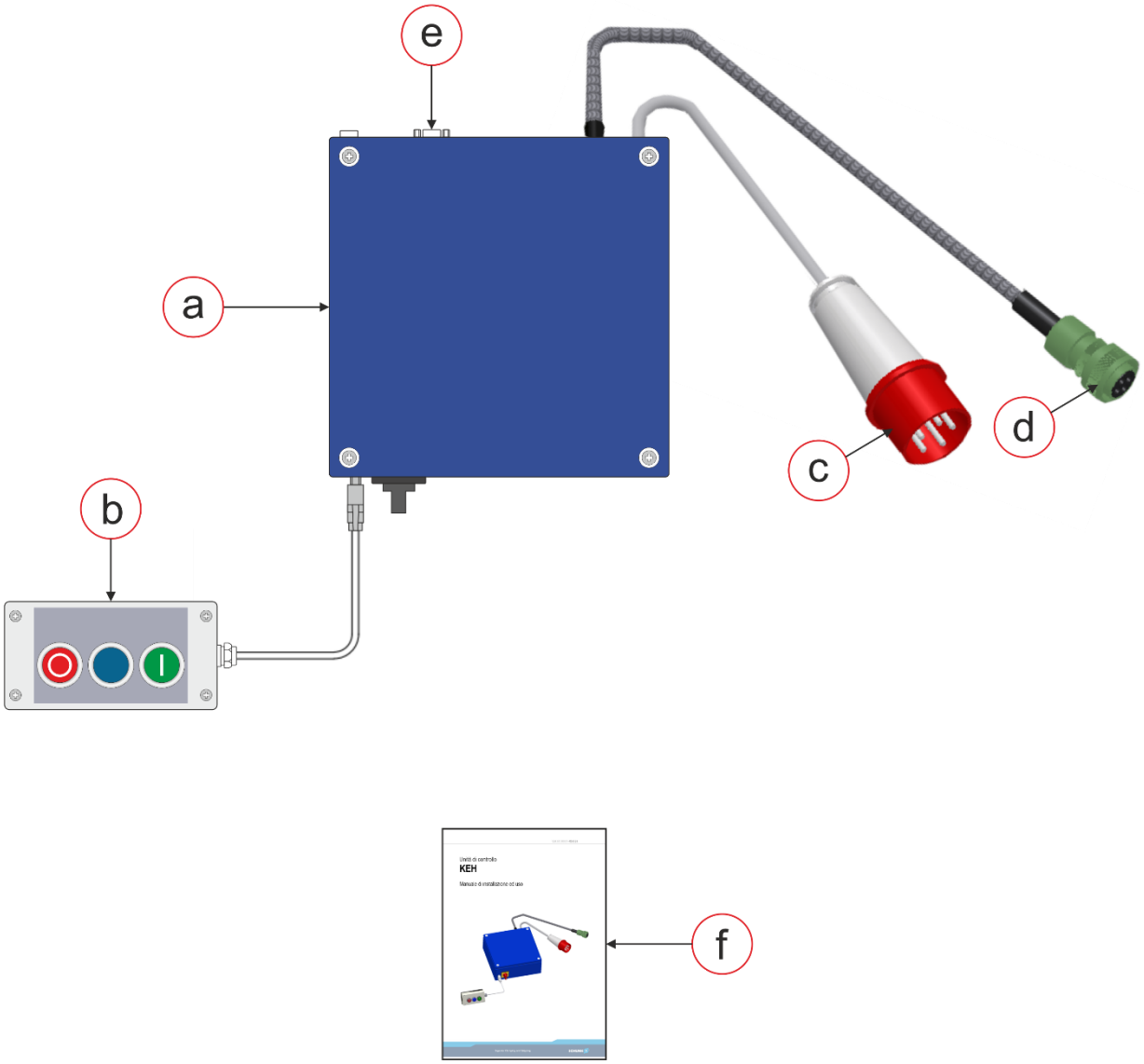


Fig.1

The scope of delivery includes:

a. Electronic control unit
b. Remote control with three buttons
c. Main power supply cable
d. Connection cable to magnetic chuck
e. Interface connector machine tool / PLC
f. Assembly and Operating Manual

5. Technical Data

Type	KEH 01	KEH 02	KEH 02-S	KEH 04	KEH 04-S
Mains voltage	220 - 400 - 415 - 460 - 480 Vac				
Frequency	50Hz / 60Hz				
Phases	3 + PE for 400 Vac - 415 Vac - 460 Vac - 480 Vac F + N + PE for 220 Vac				
Rated current	32 A				
Rated short circuit current	6 kA				
Breaking current of the fuse for the auxiliary cir-cuit	500 mA at 500 Vac				
IP rating	IP 20				
Activation time	~ 1 sec.	~ 1 sec. x channel	~ 1 sec. x channel	~ 4 sec.	~ 1 sec. x channel
Activation change	1 (de-) magnetization - max. every 3 min.				
Weight	~ 12 kg	~ 12 kg	~ 12 kg	~ 17 kg	~ 17 kg
Ambient temperature	+5°C ÷ +55° C				
Ambient conditions	Operation in dry interiors with a maximum relative air humidity of 50%. Protect product from caustic vapours and excessive heat.				

5.1 Dimensions

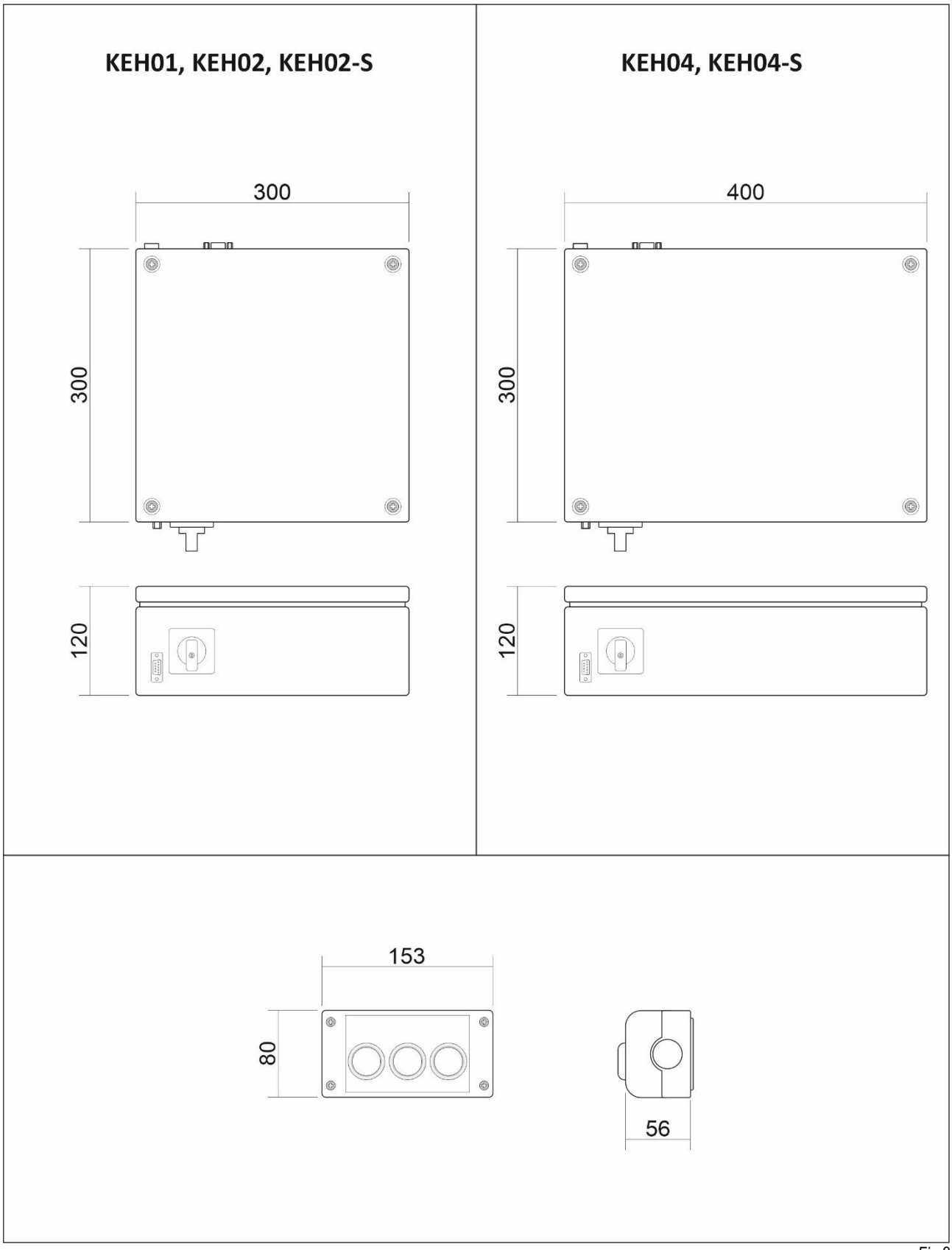


Fig.2

5.2 Name plate

The name plate on the control unit shows the following data :

Id.No.		Type	
Serial No.		Work No.	
Voltage		Frequency	
Channels		Phases	
Current		Icc	
Year		Weight	
Main Document			

Fig.3

Information	Description
Id. No.	Product code no.
Type	Model
Serial No.	Product serial no.
Work No.	Product production no.
Voltage	Rated voltage (mains)
Frequency	Rated frequency (mains)
Channels	Number of output channels
Phases	Phases (mains)
Current	Rated current (mains)
Icc	Rated short-circuit data
Year	Year of manufacture
Weight	Weight

NOTE

The name plate, once affixed, must never be removed!

For any contact with SCHUNK Customer Service, please specify the model and serial number indicated on the product identification plate.

6. Description

6.1 Functioning description

The control unit has been designed for installation on machine tools for clamping and machining pieces in dry indoor environments with relative humidity <50% and ambient temperature of + 5 ° C ÷ + 55 ° C. Using the electronic control unit the operator is able to magnetize and to demagnetize small and large magnetic electro-permanent chuck. The use of the control unit model with 2, or 4 channels allows the clamping of large magnetic workpieces across multiple magnetic chucks.
The power supply and the digital electronic system are incorporated into a single electronic board and an electric current monitoring system signals any operating irregularities.

6.2 Control panels description

KE01, KEH02 e KEH04

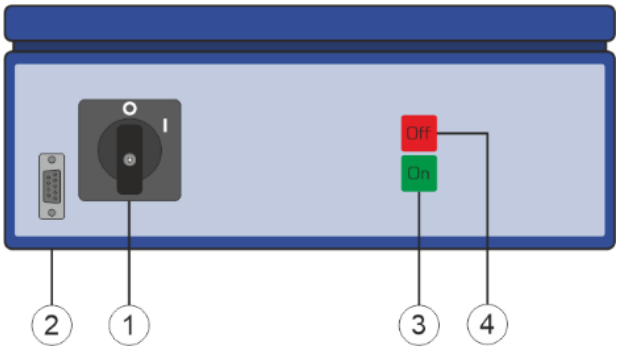


Fig.4

① O-I main switch
② Connector for the remote keyboard
③ Auxiliary magnetizing button (Green)
④ Auxiliary demagnetizing button (Red)

KEH02-S

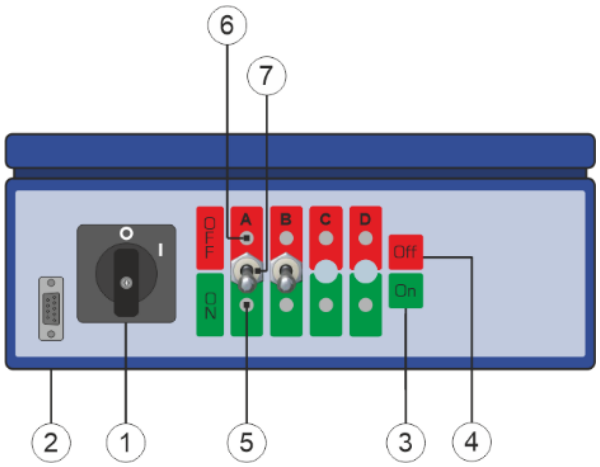


Fig.5

① O-I main switch
② Connector for the remote keyboard
③ Auxiliary magnetizing button (Green)
④ Auxiliary demagnetizing button (Red)
⑤ Green led - lights up when the corresponding channel is enabled
⑥ Red led - lights up when the corresponding channel is disabled
⑦ Enabling / disabling switch for the corresponding channel

KEH04-S

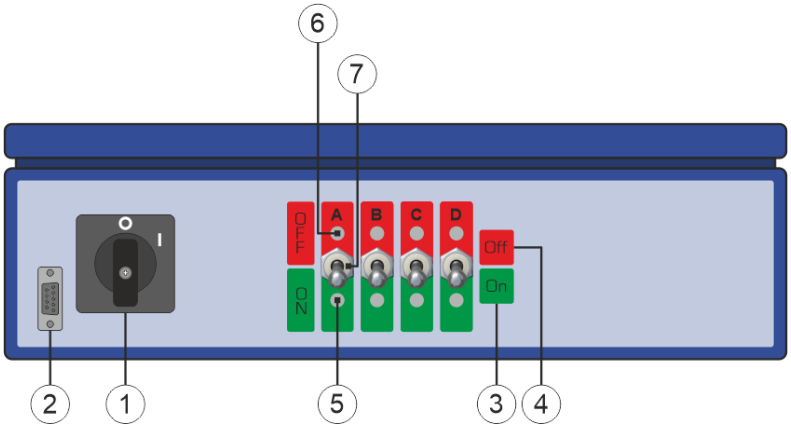


Fig.6

① O-I main switch
② Connector for the remote keyboard
③ Auxiliary magnetizing button (Green)
④ Auxiliary demagnetizing button (Red)
⑤ Green led - lights up when the corresponding channel is enabled
⑥ Red led - lights up when the corresponding channel is disabled
⑦ Enabling / disabling switch for the corresponding channel

6.3 Remote control and signals

The remote control allows you to perform magnetization and demagnetization maneuvers and to view the current status of the magnetic system by means of the indicator lights.

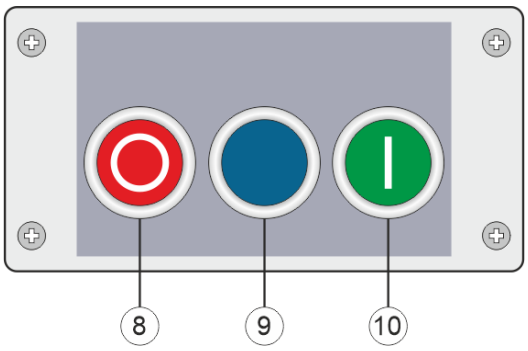


Fig.7

Signal	Meaning	Description
 ⑧	**DEMAG** button	To be pressed simultaneously with the SAFE button to start the demagnetization cycle. The turning on of the red light indicates that the system has been properly demagnetized. The piece can be removed.
 ⑨	**SAFE** button	This button must be pressed each time you wish to start a (de-)magnetizing cycle. This button prevents a cycle from being started accidentally.
 ⑩	**MAG** button	To be pressed simultaneously with the SAFE button to start the magnetization cycle. The turning on of the green light indicates that the system has been magnetized correctly. You can proceed with the machining of the piece.

⚠ WARNING

Danger caused by incorrect display of the magnetic clamping system.
Ensure that the workpiece is now properly clamped on the magnetic chuck. Take suitable safety precautions when doing so!

7. Installation

7.1 Installation

- Check the integrity of the packaging.
- Take out the product and check that it is free from damage caused by transportation.
- Compare the product with the specifications given in the order.
- Check the integrity of the connection cables.

DANGER

Danger caused by short-circuit.
Never start up the control unit if you have detected visual damage!
Notify the freight carrier or SCHUNK immediately if you detect damage and/or missing components! (With all the relevant details).

CAUTION

Danger caused by the fall of the control unit.
When fixing the control unit with the help of the "plastoferrite plate" placed on its bottom, make sure that the plate adheres perfectly to the metal surface of the machine tool.

DANGER

Danger from electric shock.
Touching live parts can cause death by electric shock.The control unit may be opened for the connections to the mains only by an electrican. Removing protective devices is reserved exclusively to SCHUNK
Always disconnect the product from the power supply before any intervention.

ATTENTION

Damage to the control unit following a short circuit.
The control unit can be damaged by oil or water. Therefore, its placement in the working area of the machine tool during installation and its operation should be avoided.

NOTE
For any contact with SCHUNK Customer Service, please specify the model and serial number indicated on the product identification plate

Once all of the requirements have been met, carry out installation based on the following notes:

- Connect the remote keyboard to the control panel by inserting the keyboard connector into the "Keypad" socket on the control panel on the front of the unit. Tighten the side screws.
- Connect the connecting cable to the machine tool / STS interface on the back of the control unit. Tighten the side screws.
- Compare performance data on the control unit's name plate with the mains data on site.
- Position the control unit in such a way that the requirements of the IP protection class are met and the control unit is easily accessible for maintenance and repairs. We recommend installing the control unit and the power supply interrupting devices in an easily accessible place; recommended **distances approx. 0.6 to 1.7 m** above operating level.
- Connect the main power supply cable of the control unit to the instructions in the circuit diagram.

The following devices must be installed upstream to the control unit in order to protect the unit, other devices and persons:

- Overcurrent protection device for, i.e. fuse or circuit breaker. This device must comply with the specifications in the wiring diagram of the control unit and always with the relevant regulations and standards applicable in the country of installation and operation. This device must furthermore be designed for a 32A rated current with **aM characteristics in the case of fuses and with tripping characteristic C in the case of circuit breakers**.
- **A highly sensitive residual current circuit breaker of 30 mA with rated current of 32A, and of type A or B, in case of earth leakage current.** Some applications may require a residual current circuit breaker of a different size. Please refer for this purpose to the corresponding wiring diagram.

Automatic power-off must be checked at the end of installation!

NOTE

When using junction boxes, carefully read through the supplied operating manuals and circuit diagrams so as to ensure correct installation and selection of the interrupting devices.

7.2 Connection to the machine enabling system / PLC

The control unit can be connected with the machine tool by means of a terminal strip. The following diagram explains the signal connections between the electronics of both machine and control unit, thus ensuring that the exchanged signals are correctly read for a smooth operation:

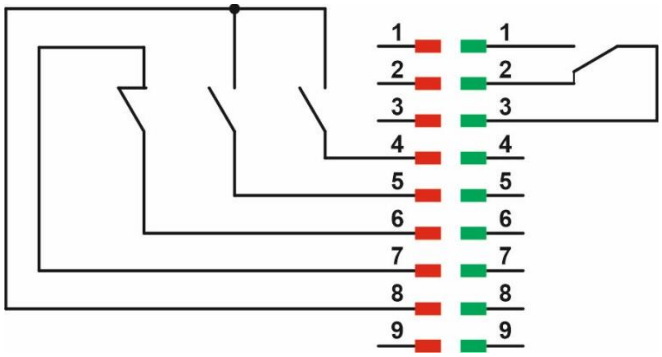
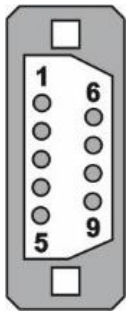


Fig.8



PIN	FUNCTION
1	OUT magnetized chuck – N.O. Contact
2	OUT magnetized chuck – N.C. Contact
3	OUT magnetized chuck – Common Contact.
4	IN – Magnetization contact
5	IN – Demagnetization contact
6	Safety contact
7	Safety contact
8	IN – Common contact
9	n.c.

Priority of the PLC inputs

The control unit can receive specific commands from specific input sources. If several commands need to be processed simultaneously, only those with the highest priority will be carried out

NOTE

The cycle times, i.e. the times between two subsequent actions, must be at least 3 min. in normal operating conditions with standard products. This is not supported by the control unit's firmware and must be set in the PLC. We recommend setting this limitation when the PLC function is checked.

List of priorities

Command received	Priority
Magnetization from PLC	1
Magnetization from remote control	2
Magnetization from key panel on the control unit	3
Demagnetization from PLC	4
Demagnetization from remote control	5
Demagnetization from key panel on the control unit	6

If e.g. the following commands arrive simultaneously:

- magnetization from remote control
- demagnetization from PLC

then only the magnetizing cycle will be performed. While this command is being executed, no further commands (inputs) will be admitted. So the control unit accepts no more magnetization or demagnetization commands, no matter whether they are sent from the key panel, the remote control or the PLC.

Assignment of the contacts of the PLC sub-D plug connectors

Pin	Description	Command Type
1	Output of the magnetized clamping system	Output
2	Output of the demagnetized clamping system	Output
3	Joint output	Output
4	Magnetization input	Input
5	Demagnetization input	Input
6	Safety contact 1	Safety
7	Safety contact 2	Safety
8	Joint input	Input

Output pins

Pins 1, 2, and 3 are output pins. They are used for the current operating status of magnetic system:

Status of the control unit	Status of the pins
Magnetized	Circuit between pin 1 and 3 closed
	Circuit between pin 2 and 3 open
Demagnetized	Circuit between pin 1 and 3 open
	Circuit between pin 2 and 3 closed

The following table contains the currents between pins 1 and 3 or 2 and 3:

Current	Voltage
0.3 A	125 V AC
0.3 A	110 V DC
1 A	30 V DC

Enable pins
Pins 6 and 7 are enable contacts. They are used to confirm commands on the input pins:

Status of the safety pins	Command via input pin	Executed command
Circuit between pins 6 and 7 closed	Magnetization	Magnetization
	Demagnetization	Demagnetization
Circuit between pins 6 and 7 open	Magnetization	no command
	Demagnetization	no command

The enable contacts can be used exclusively for the purpose of confirming the PLC input commands. They will then in no way affect the commands at the inputs for the remote control or the key panel on the control unit.

The following table contains the electrical properties of the safety contacts:

Status of the safety pins	Command via input pin	I76	V76
Circuit between pins 6 and 7 closed	Magnetization	≤10 mA	-
	Demagnetization	≤10 mA	-
	No command	≤ 31 µA	-
Circuit between pins 6 and 7 open	Magnetization	≤ 31 µA	~ 15 V
	Demagnetization	≤ 31 µA	~ 15 V
	No command	≤ 31 µA	-

It is direct voltage; the voltages are constant. The values for the electrical resistance RON and ROFF for opening and closing the electric circuits:

RON < 15 Ω
ROFF > 500 K Ω

Input pins
Pins 4, 5 and 8 are input contacts; they are used to transmit com-mands to the control unit (in connection with the enable contacts). The control unit only activates its power outputs once one of the following status changes takes place:

Closed circuit ► open circuit for contact pairs 4 – 8 and 5 – 8.

The following table presents the functions of the control system:

Status of the input pins	Status of the safety pins	Executed command
1 Circuit between pin 4 and 8 closed 2 Waiting time 250 ms 3 Circuit between pins 4 and 8 open	Circuit between pins 6 and 7 closed	Magnetization
1 Circuit between pins 5 and 8 closed 2 Waiting time 250 ms 3 Circuit between pins 5 and 8 open	Circuit between pins 6 and 7 closed	Demagnetization
1 Circuit between pin 4 and 8 closed 2 Waiting time 250 ms 3 Circuit between pins 4 and 8 interrupted	Circuit between pins 6 and 7 open	no command
1 Circuit between pins 5 and 8 closed 2 Waiting time 250 ms 3 Circuit between pins 5 and 8 interrupted	Circuit between pins 6 and 7 open	no command

The following tables contains the electrical properties of the input contacts:

Status pins 4 - 8	Status pin 6 - 7	I48	V48
Circuit closed	Circuit closed	≤10 mA	-
	Circuit open	≤ 31 µA	-
Circuit open	Circuit closed	≤ 31 µA	~ 15 V
	Circuit open	≤ 16 µA	-

Status pins 5- 8	Status pins 6 - 7	I58	V58
Circuit closed	Circuit closed	≤10 mA	-
	Circuit open	≤ 31 µA	-
Circuit open	Circuit closed	≤ 31 µA	~ 15 V
	Circuit open	≤ 16 µA	-

Values for the electrical resistance RON and ROFF for opening and closing the electric circuits:

RON < 15 Ω
ROFF > 500 K Ω

The closing time between pins 4 - 8 and 5 - 8 must be at least 250 ms.

General notes

- The PLC output pins are typically used as 'enable contacts' for the machine, on which the magnetic clamping system is installed (if required).
- The circuit from pin 3 in combination with pins 1 and 2 allows for identifying the status of the magnetic clamping system in the form of an open or closed circuit (positive or negative logic).
- Pin 8 on the sub-D connecting plug of the PLC is grounded; if grounding was carried out correctly (control unit and PLC), the PLC's ground (pin 8) will be identical with the control unit's ground.
- The control unit does not have an input pin that prevents operation; if required, this can be done with an input device.

7.3 Function diagram

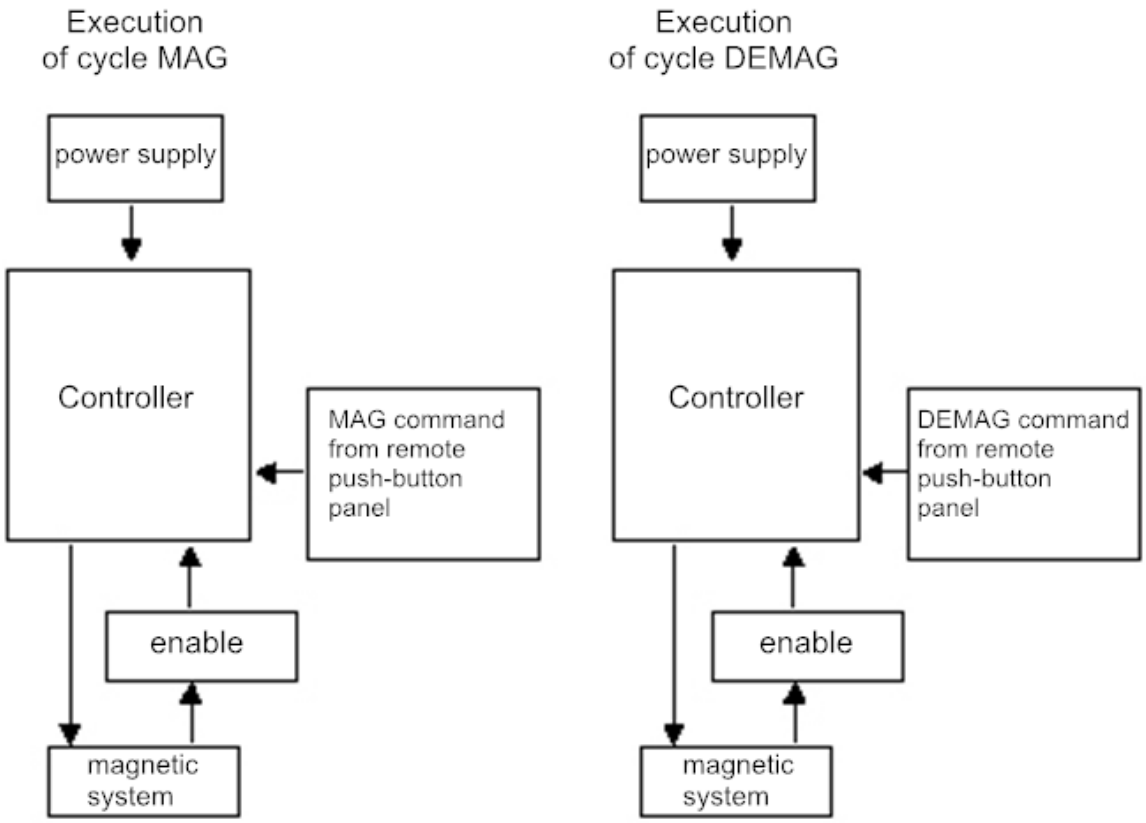


Fig.9

8. Initial commissioning and normal operation

8.1 Initial commissioning

After installing the control unit and connecting it to the machine, ensure that the magnetic chuck is not magnetized with the help of the steel tip of a screwdriver.

NOTE

There may be slight residual magnetization on delivery, e.g. due to transportation of the chucks with lifting magnets.

WARNING

Danger due to suspended loads.
If moving the workpiece requires the use of lifting equipment, cranes etc., please keep the respective safe distances!

1. Place the workpiece onto the magnetic chuck.
2. The contact area between the magnetic chuck and the discharging cable (reinforced) must be free of metal, chips and dirt in general. The area must also be absolutely dry. If there is dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
3. Remove the protective cap from the connection plug of the magnetic chuck and ensure that it is free of chips, dirt and liquids. Otherwise carefully remove everything that could cause problems for the electromechanical properties of the connection plug.
4. Connect discharging cable with the magnetic chuck using quick-change coupling.

DANGER

Danger of electric shock due to water infiltration.
Water contact with live parts can be fatal. The next step can only be performed after proper installation and verification of the protective devices.

ATTENTION

Damage to the magnetic chuck.
Failure to comply with the instructions relating to the connection between the magnetic chuck and the control unit can cause irreversible damage to the magnetic chucks and void the warranty.

DANGER

Danger of electric shock from faulty connection.
Touching live parts can cause death by electric shock. The following step may only be taken after correct installation and inspection of the protective devices.

5. Turn the main switch on the control unit ① to "**I**": the unit will turn on.
6. *For multi-channel units* : verify that all red lights ⑥ on the unit are ON.
7. Verify that the red button ⑧ on the remote control lights up (system demagnetized).

⚠ CAUTION

Danger due to faulty displays of magnetic status.
The unit performs a reset when it is switched on; the red button must therefore always be on, even if the connected magnetic clamping system is magnetized.

8. *For multi-channel units* : operate selector ⑦ of the control unit corresponding to the channel to be activated and check that the green light ⑤ on the selected selector turns on.
9. Magnetization with the remote control: press blue ⑨ and green button ⑩ at the same time (blue button lights up when pressed, green and red buttons light up during the cycle).
10. Check the status of the lights on the remote control at the end of the magnetization time: green light ⑩ ON, red light ⑧ OFF.

⚠ CAUTION

Risk of injury due to workpieces coming undone as a result of faulty displays of the magnetic clamping system.
Ensure that the workpiece is now properly clamped on the magnetic chuck. Take suitable safety precautions when doing so!

11. For demagnetization press the blue ⑨ and the red button ⑧ simultaneously (blue button lights up when pressed, green and red buttons light up during the cycle).
12. Check the status of the lights on the remote control at the end of the demagnetization time: spia verde ⑩ OFF, spia rossa ⑧ ON.

⚠ CAUTION

Risk of injury due to workpieces still partially anchored to the magnetic chuck as a result of faulty displays of the magnetic clamping system.
Ensure that the workpiece has now properly come undone from the magnetic chuck. Take suitable safety precautions when doing so!

13. *For multi-channel units* repeat steps 8 to 12 for each channel, checking the correct magnetization or demagnetization through the status of the lights.
14. Turn the main switch on the control unit ① to "**O**": the unit will turn off.
15. The contact area between the magnetic plate and the discharging cable must be free of metal, chips and dirt in general. The area must also be absolutely dry. If there is dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
16. Remove discharging cable from the magnetic chuck; to do so turn outer ring anti-clockwise.

17. Put back the protective cap to protect the magnetic chuck connector from dirt, liquids, chips etc.

⚠ WARNING

Danger due to suspended loads.
If moving the workpiece requires the use of lifting equipment, cranes etc., please keep the respective safe distances!

18. Remove the workpiece from the magnetic chuck.

NOTE
Please contact SCHUNK or the Service Centers if the results obtained are not in line with expectations. Always communicate the model and serial number of the product to the operator.

8.2 Normal operation

To guarantee proper magnetization or demagnetization, please follow the following steps:

1. Ensure that the magnetic chucks are not magnetized; you can do this with the steel tip of a screw driver.

⚠ WARNING

Danger due to suspended loads.
If moving the workpiece requires the use of lifting equipment, cranes etc., please keep the respective safe distances!

2. Place the workpiece onto the magnetic chuck.
3. The contact area between the magnetic chuck and the discharging cable must be free of metal, chips and dirt in general. The area must also be absolutely dry. If there is dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
4. Remove the protective cap from the magnetic chuck connection plug and ensure that it is free of chips, dirt and liquids. Otherwise carefully remove everything that could cause problems for the electromechanical properties of the connection plug.
5. Connect discharging cable with the magnetic chuck using quick-change coupling.

⚠ CAUTION

Danger due to faulty connection.
Problems may arise with partial magnetization or demagnetization. The connector of discharging cable must be properly connected with the magnetic system. For correct contacting, the connector of discharging cable must be inserted into the connector of magnetic chuck, and the ring must be turned clockwise as far as it will go.

6. Turn the main switch on the control unit ① to "I": the unit will turn on.

7. *For multi-channel units* : verify that all red lights ⑥ on the unit are ON.
8. Verify that the red button ⑧ on the remote control lights up (system demagnetized).

⚠ CAUTION

Danger due to faulty displays of magnetic status.
The unit performs a reset when it is switched on; the red button must therefore always be on, even if the connected magnetic clamping system is magnetized.

9. *For multi-channel units* : operate selector ⑦ of the control unit corresponding to the channel to be activated and check that the green light ⑤ on the selected selector turns on.
10. Magnetization with the remote control: press blue ⑨ and green button ⑩ at the same time (blue button lights up when pressed, green and red buttons light up during the cycle).
11. Check the status of the lights on the remote control at the end of the magnetization time: green light ⑩ ON, red light ⑧ OFF.

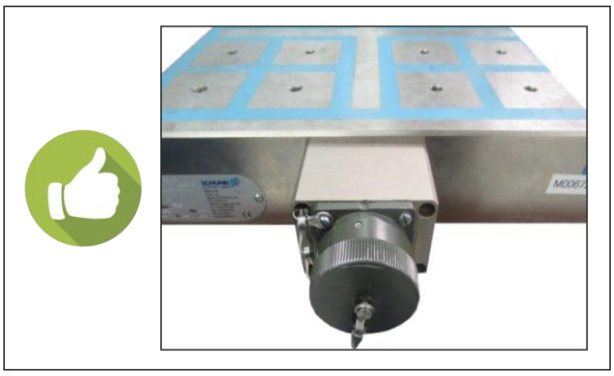
⚠ CAUTION

Risk of injury due to workpieces coming undone as a result of faulty displays of the magnetic clamping system.
Ensure that the workpiece is now properly clamped on the magnetic chuck. Take suitable safety precautions when doing so!

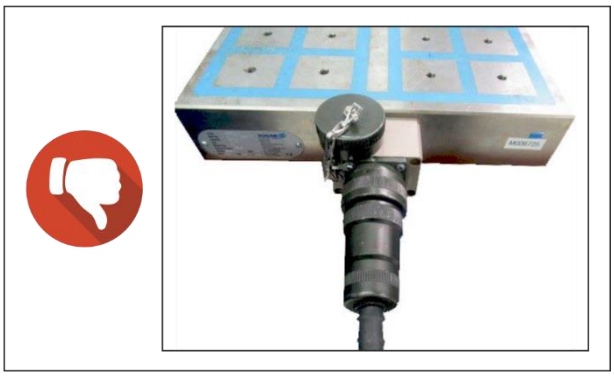
12. Turn the main switch on the control unit ① to "**O**": the unit will turn off.
13. The contact area between the magnetic chuck and the discharging cable must be free of metal, chips and dirt in general. The area must also be absolutely dry. If there is dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
14. Remove discharging cable from the magnetic chuck and turn outer ring anti-clockwise.
15. Put back the protective cap to protect the magnetic chuck connector from dirt, liquids, chips etc. Ensure that the cap snaps in properly and sits correctly.

ATTENTION

Damage to the product due to use with the discharge cable connected.
The magnetic chuck is designed to be used, during mechanical processing, with the discharge cable disconnected and the cap correctly inserted on the connector.
Only under these conditions is it possible to have an IP67 degree of protection.



If the discharge cable is left connected during processing, the magnetic chuck will have an IP20 degree of protection and there is a risk of damaging the magnetic chuck or the connected control unit.



16. The workpiece can now be machined.
17. The contact area between the magnetic chuck and the discharging cable must be free of metal, chips and dirt in general. The area must also be absolutely dry. If there is dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
18. Remove the protective cap from the magnetic chuck and re-connect control unit's connector to magnetic chuck connector.
19. Turn the main switch on the control unit ① to "I": the unit will turn on.
20. For demagnetization press the blue ⑨ and the red button ⑧ simultaneously (blue button lights up when pressed, green and red buttons light up during the cycle).

21. Check the status of the lights on the remote control at the end of the demagnetization time: green light ⑩ OFF, red light ⑧ ON.

⚠ CAUTION

Risk of injury due to workpieces still partially anchored to the magnetic chuck as a result of faulty displays of the magnetic clamping system.
Ensure that the workpiece has now properly come undone from the magnetic chuck. Take suitable safety precautions when doing so!

22. Turn the main switch on the control unit ① to "**O**": the unit will turn off.
23. The contact area between the magnetic chuck and the discharging cable must be free of metal, chips and dirt in general. The area must also be absolutely dry. If there is dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
24. Remove discharging cable from the magnetic chuck; to do so turn outer ring anti-clockwise.
25. Put back the protective cap to protect the magnetic chuck connector from dirt, liquids, chips etc. Ensure that the cap snaps in properly and sits correctly.

⚠ WARNING

Danger due to suspended loads.
If moving the workpiece requires the use of lifting equipment, cranes etc., please keep the respective safe distances!

26. Remove the workpiece from the magnetic chuck.

NOTE
Please contact SCHUNK or the Service Centers if the results obtained are not in line with expectations. Always communicate the model and serial number of the product to the operator.

ATTENTION

Damage to the magnetic chuck from overheating
The control unit has been designed for cycle times (magnetization and demagnetization) of at least 3 min. to avoid overheating of the magnetic chuck. The control unit has software protection to protect the magnetic chuck against overheating. This can temporarily put the system out of operation. Non-observance of these instructions may cause irreversible damage to the magnetic chuck and render the warranty invalid!

9. Troubleshooting

Problem	Possible cause	Corrective action
No (de-) magnetization	Control unit is switched off.	Turn main switch to "I" position.
	Cable not connected.	Check connection between the control unit and the magnetic chuck.
Red remote control LED is not on.	Loose contact in the remote control.	Switch the system off, disconnect from the mains and check connection between remote control and control unit.
Demagnetization and magnetization are inverted.	Fault in the electronic control.	Switch system off, disconnect from the mains and notify Schunk Service. Move magnetic chuck to a safe position since it could still be partially magnetized.
Protection device for overcurrent switches off the power during (de-) magnetization.	Chips on connector of the control unit and/or on connector of the magnetic chuck.	
Residual current circuit breaker switches off the power during (de-) magnetization.	Water / liquid on connector of the control unit and/or on connector of the magnetic chuck.	

NOTE

For any contact with SCHUNK Customer Service, please specify the model and serial number indicated on the product identification plate.

10. Service and maintenance

We recommend that you check the state of the power cables regularly and exchange them as required. Do not bundle cables! The connection cable and the cable from the remote control to the control unit should not be attached to each other with fixing devices (adhesive tape, cable straps). Excellent and careful maintenance is a decisive factor for optimum safety, functioning and performance and a longer service life of the product.

DANGER

Maintenance work must always be performed by an electrician. The maintenance personnel must read this operating manual carefully. Work inside the control unit must be done by SCHUNK Service personnel only.

To ensure optimum availability and reliability of the control unit in the long run, the parts that are exposed to the greatest strain during operation must be inspected regularly.
Please follow the instructions and maintenance intervals given in the table below so as to avoid repairs and resulting down-times, failures and inconvenience.

Defective electrical and electromechanical components must always be exchanged by SCHUNK Service personnel. If components are exchanged by the operator, this automatically renders the warranty invalid.

After maintenance and before connecting and restarting the control panel, all protection devices must be reset.

Activity	Description	Frequency			
		Every use	1 x week	1 x month	1 x year
Clean connector	With the control unit switched off: inspect connector for chips, dirt etc. and remove as necessary.	●			
Inspect connection cable tom magnetic chuck	Check the discharging cable's metal jacket for damage.	●			
Inspect the remote control cable	Check the cable between the remote control and the control unit for damage etc.	●			
Check the name plate / label on the control unit	Check name plates and other plates etc. on the control unit for damage and ensure good legibility.	●			
Inspect seals	Check all the seals in the system (connectors, caps, housings etc.).	●			
Outer cleaning	Wipe with a damp cloth and dry immediately with a dry cloth.		●		
Inspect power cables	Check the power cable's insulation for damage.		●		
Check light indicators	Check all the system's indicator and warning lamps (control unit and remote control) for proper functioning.		●		
Check safety on the control unit	Start with the demagnetized system. Do not connect discharging cable to the magnetic chuck. Start magnetizing cycle by pressing the green button. Check: the indicated status on the remote control must not change!		●		
Check the safety button of the remote control	Start with the demagnetized system. Connect discharging cable to the magnetic chuck, and start the magnetizing cycle by pressing the green button only. Check: the indicated status on the remote control must not change!			●	
Check fault current circuit breaker	Check proper functioning of the upstream protective system using suitable tests.	Test as often and with the method recommended by manufacturer			

11. Transportation and storage

11.1 Transportation

⚠ WARNING

Risk of injury and risk of damage to the control unit if it falls during transportation!

- The weight of the packet is stated on the label on the side; this should be noted during transport.
- Use the required personal protective equipment for transport.

11.2 Storage

When storing the product for a longer period of time, observe the following instructions to ensure functionality up to the time of installation:

- ensure correct packaging. Recommendation: store the product in its original packaging
- the product and the packaging should be inspected at regular intervals
- inspect packaging for outer damage and effects of the weather.

12. Disposal

This product is made of plastics, iron and electrical components. If it is taken out of operation, it has to be disposed of in compliance with the applicable regulations.
As soon as the end of the lifecycle has been reached, the product has to be decommissioned, i.e. put into a state in which it can no longer be used for its original intended use and in which it is still possible to recycle the raw materials contained.

NOTE
SCHUNK assumes no liability for material damage or personal injury that may result from reusing individual components of the control unit for purposes other than the original intended use. SCHUNK provides neither implicit nor explicit declarations about possible usability of recycled components after decommissioning the control unit.

12.1 Procedure for final decommissioning and disposal of the control unit

⚠ CAUTION

Risk of injury.
Decommissioning, disassembly and disposal of the product must be performed by qualified persons using suitable tools.

- Ensure that the machine tool has safely come to a halt. Disconnect all the electrical, hydraulic and pneumatic connections that could cause unexpected movements of the machine or its components.
- Disconnect product from all devices.
- Have the product disposed of by a company that specializes in the disposal of electrical equipment.

13. Spare parts

Please contact the SCHUNK Service department for any spare parts request.