

Control Unit **KEH PLUS**

Assembly and Operating Manual



Legal notices :

Copyright:

This manual remains the copyrighted property of SCHUNK GmbH & Co. KG. It is solely supplied to our customers and operators of our products and forms part of the unit. This documentation may not be duplicated or made accessible to third parties, in particular competitive companies, without our prior permission.

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: 5034722 [ex QM.UC.00034]

Edition: 1.0 | 24/06/2022 | en

© H.-D. SCHUNK GmbH & Co. Spanntechnik KG

All rights reserved

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

H.-D. SCHUNK GmbH & Co. Spanntechnik KG

Lothringer Str. 23

88512 Mengen

Deutschland

Tel. +49-7572-7614-0

Fax +49-7572-7614-1099

info@de.schunk.com

www.schunk.com



Reg. No. 003496 QM08



Reg. No. 003496 QM08

Table of contents

1. About this manual	4
1.1 Warnings	4
1.1.1 Signal words.....	4
1.1.2 Symbols	4
2. Basic safety notes	5
2.1 Intended use	5
2.2 Environmental and operating conditions	5
2.3 Product safety	5
2.3.1 Protective equipment.....	5
2.4 Personnel qualification	5
2.5 Using personal protective equipment.....	5
2.6 Notes on particular risks.....	6
3. Warranty	6
3.1 Procedure in the event of warranty	6
4. Scope of delivery	7
5. Technical Data	8
5.1 Dimensions	9
5.2 Name plate.....	10
6. Description	11
6.1 Control Unit	11
6.2 Remote control (optional)	14
6.3 Remote control with power regulation (optional)	16
7. Installation and connections	21
7.1 Connection to the performed magnetization system / PLC.....	23
8. Normal operation	24
9. Alarms	27
10. Troubleshooting	29
11. Servicing and maintenance	30
12. Transportation and storage	32
12.1 Transportation	32
12.2 Storage.....	32
13. Disposal	33
13.1 Procedure for final decommissioning and disposal of the control unit.....	33
14. Spare parts	33

1. About this manual

This instruction is an integral part of the product and contains important information for a safe and proper assembly, commissioning, operation, maintenance and helps for an easier trouble shooting.

Before using the product, read and note the instruction, especially the chapter "Basic safety notes".

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 requirements of the applicable standards must be observed and complied with. 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 machine tool, for which it is provided, 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. "Technical data".
- Make sure that the environment is clean and the ambient temperature corresponds to the specifications.

2.3 Product safety

Dangers arise from the product, if e.g.:

- it 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
	<p>Danger due to a magnetic field.</p> <p>This product always uses a magnetic system. The following groups of persons must not come into contact with it:</p> <ul style="list-style-type: none"> • Persons with pacemakers. • Persons with metal or electronic prostheses. • Persons with insulin pumps. • Persons with muscular stimulation systems. • Pregnant women. <p>These persons should always keep a safe distance of at least 2 m from the magnetic system.</p>

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:

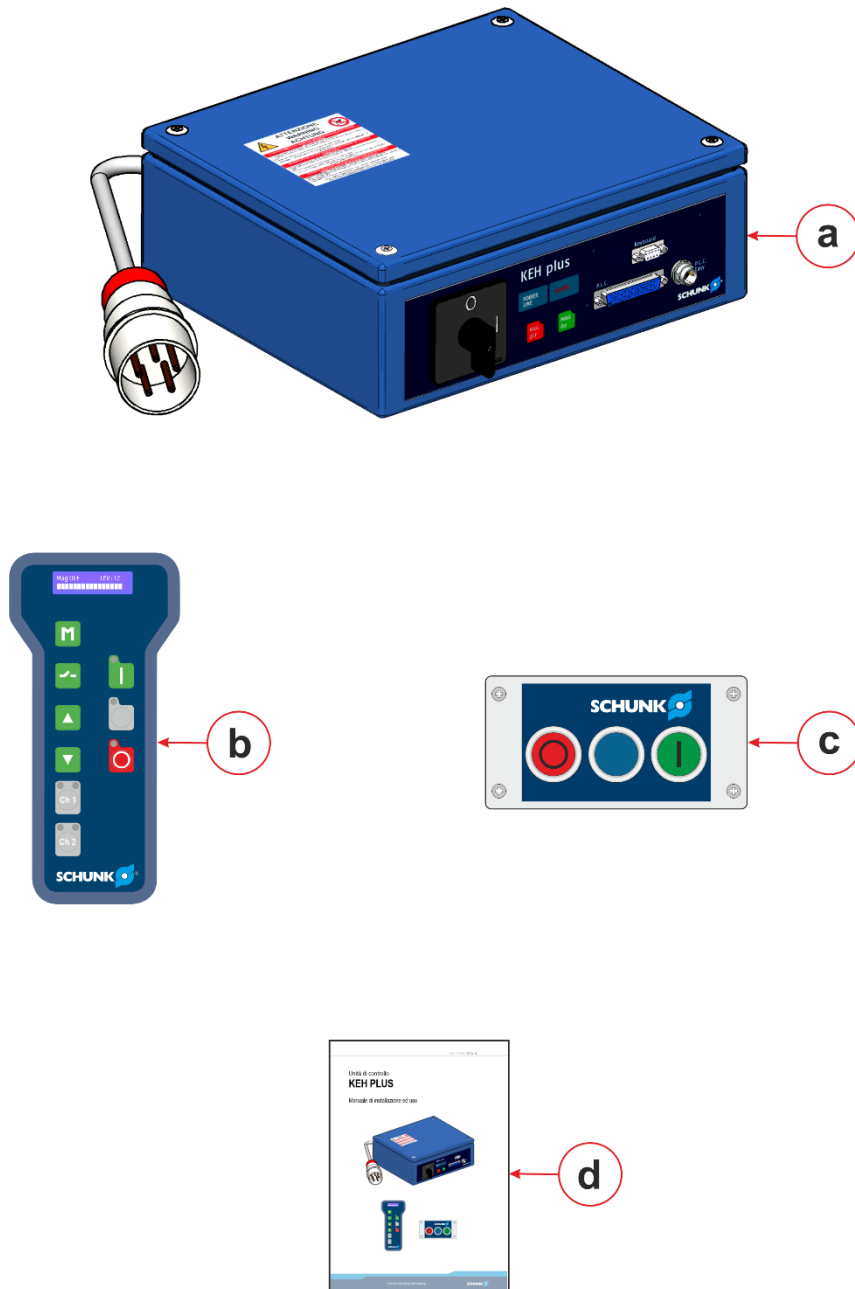
- observe the mandatory maintenance and lubrication intervals.
- observe the environmental and operating conditions.

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



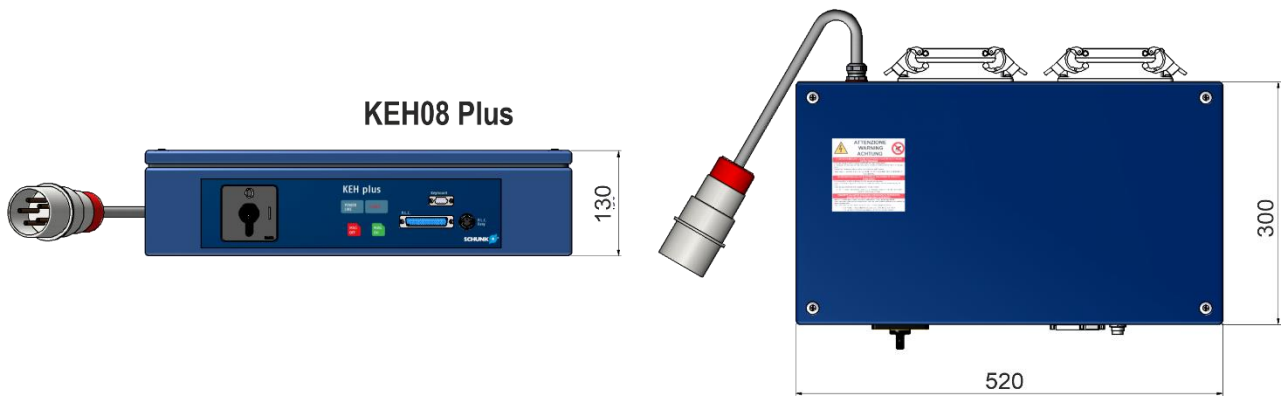
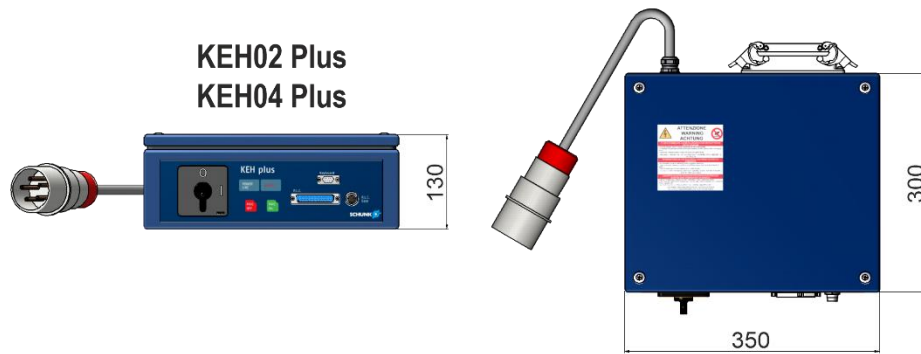
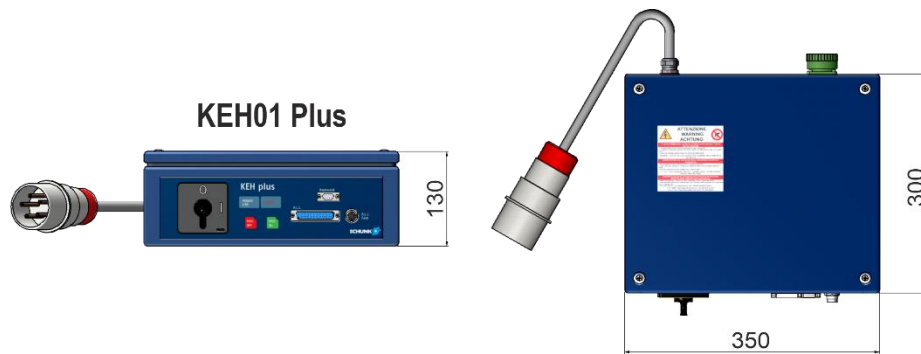
The scope of delivery includes:

- a. Control Unit
- b. Remote control with power regulation (optional)
- c. Remote control (optional)
- d. Assembly and Operating Manual

5. Technical Data

Type	KEH 01 Plus	KEH 02 Plus	KEH 04 Plus	KEH 08 Plus
Voltage	220 / 400 / 415 / 460 / 480 [VAC]			
Frequency	50 / 60 Hz			
Phases	3 + PE for 400 – 415 - 460 – 480 VAC F + N + PE for 220VAC			
Rated current	32 A			
Rated short circuit current	6 kA			
Breaking current of the fuse for the auxiliary circuit	125 mA at 500 VAC			
IP rating	IP20			
Weight	~ 10Kg	~ 10Kg	~ 10Kg	~ 15Kg
Ambient temperature	5° ÷ 40°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




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			



H.-D. SCHUNK GmbH & Co.
 Spanntechnik KG
 Lothringer Str. 23
 D-88512 Mengen
 Tel. +49-7572-7614-1301
 Fax +49-7572-7614-1039
 spannsysteme@de.schunk.com
 schunk.com



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 must never be removed!

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

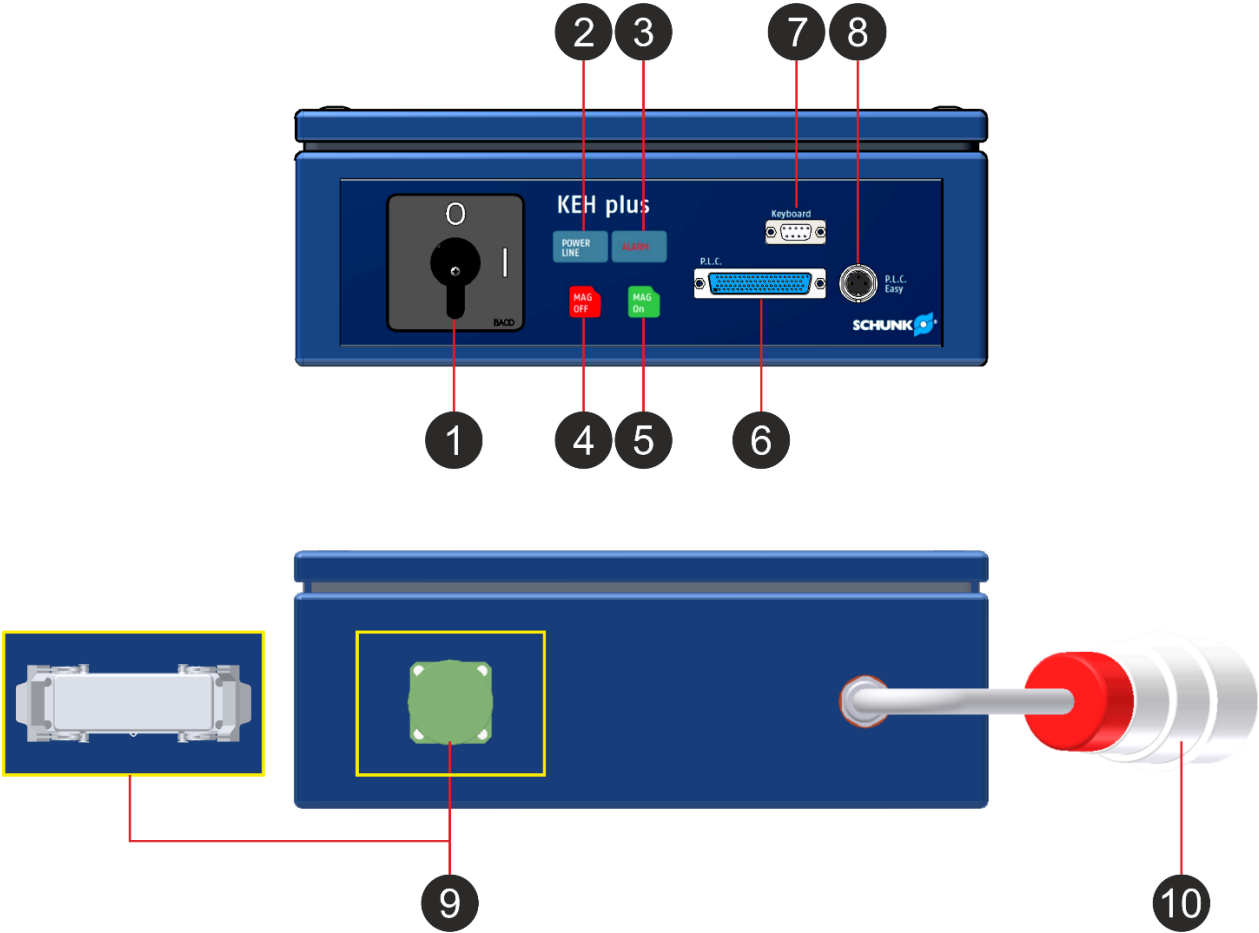
6. Description






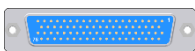
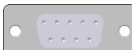


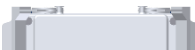

By using this type of electronic control unit, the operator is able to magnetize and to demagnetize small and large magnetic electro-permanent chucks by SCHUNK.

The use of the control unit model with 4, or 8 channels allows the clamping of large magnetic workpieces through 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.




6.1 Control Unit



Ref.	Description
 ①	<p>MAIN SWITCH Main power switch for control unit.</p>
 ②	<p>POWER LIGHT When the light comes on, it indicates that the control unit is correctly powered.</p>
 ③	<p>ALARM LIGHT. When the light comes on, it indicates a malfunction of the unit or of a peripheral connected to it.</p>
 ④	<p>MAG OFF KEY. Key to start a demagnetizing cycle. The lighting of the red light indicates that the system has been properly demagnetized.</p>
 ⑤	<p>MAG ON KEY. Key to start a magnetizing cycle. The lighting of the green light indicates that the system has been properly magnetized.</p>
 ⑥	<p>PLC INPUT Connector for the PLC interface.</p>
 ⑦	<p>REMOTE CONTROL CONNECTOR Connector for the remote control.</p>
 ⑧	<p>"PLC EASY" CONNECTOR Connector for the "PLC Easy" type magnetization interface.</p>
  ⑨	<p>DISCHARGE CABLE CONNECTOR Connector for the magnetic system (type and quantity vary according to the type of control unit).</p>
 ⑩	<p>POWER CABLE Mains connection cable with plug.</p>




Magnetization

The magnetizing operation is started by pressing the green MAG ON key ⑤. During the operation the control unit will switch to the "BUSY" state and at the end of the operation the new magnetic state of the system will be displayed.

INITIAL STATE Demagnetized system	OPERATION IN PROGRESS System in BUSY state	NEW STATE Magnetized system
		

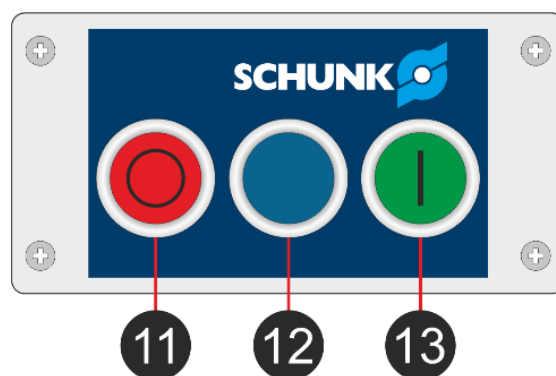
Demagnetization




The demagnetization operation is started by pressing the red MAG OFF key ④. During the operation the control unit will switch to the "BUSY" state and at the end of the operation the new magnetic state of the system will be displayed.

INITIAL STATE Magnetized system	OPERATION IN PROGRESS System in BUSY state	NEW STATE Demagnetized system
		

6.2 Remote control (optional)

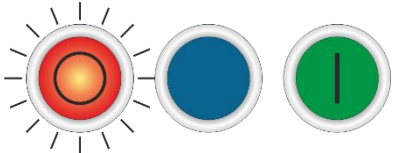

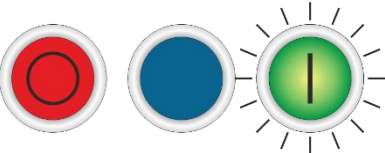
The remote control allows you to perform magnetization and demagnetization operations and to view, through the signal lights, the status of the magnetic system.



Ref.	Description
 11	DEMAG BUTTON To be pressed simultaneously with the SAFE button to start the demagnetizing cycle. The lighting of the red light indicates that the system has been properly demagnetized. The workpiece can be removed.
 12	SAFE BUTTON This button must be pressed every time you want to start a (de-)magnetization cycle. This button prevents the accidental start of a cycle.
 13	MAG BUTTON To be pressed simultaneously with the SAFE button to start the magnetizing cycle. The lighting of the green light indicates that the system has been properly magnetized. The workpiece can be machined.

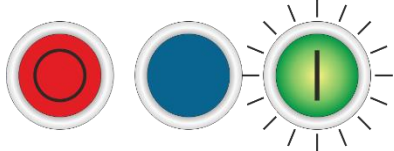

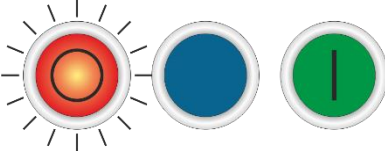
Magnetization

The magnetization operation is started by pressing the blue SAFE ⑫ and green MAG ⑬ buttons at the same time (after pressing the blue SAFE ⑫ button it lights up). During the operation the control unit will switch to the "BUSY" state and at the end of the operation the new magnetic state of the system will be displayed.

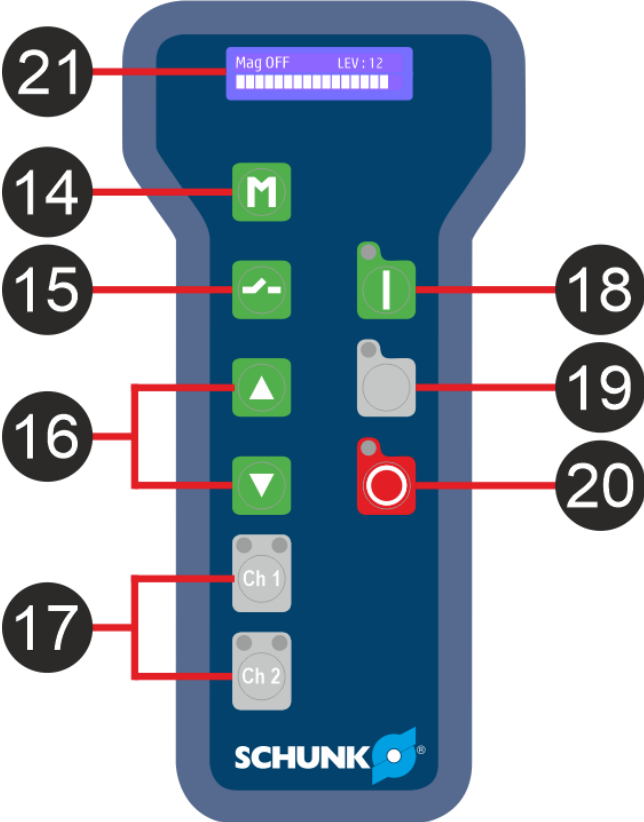
INITIAL STATE Demagnetized system	OPERATION IN PROGRESS System in BUSY state	NEW STATE Magnetized system
		










Demagnetization

The demagnetization operation is started by pressing the blue SAFE ⑫ and red DEMAG ⑪ buttons at the same time (after pressing the blue SAFE ⑫ button it lights up). During the operation the control unit will switch to the "BUSY" state and at the end of the operation the new magnetic state of the system will be displayed.

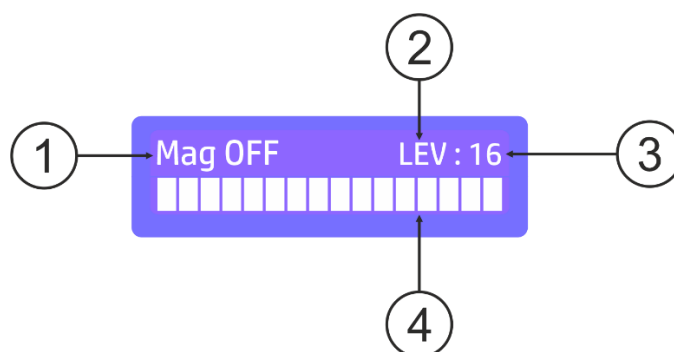
INITIAL STATE Magnetized system	OPERATION IN PROGRESS System in BUSY state	NEW STATE Demagnetized system
		

6.3 Remote control with power regulation (optional)



Ref.	Description
 14	<p>STORING OF THE CLAMPING FORCE</p> <p>This key can be used to recall a previously stored clamping force level.</p>
 15	<p>MAGNETIZATION CONTACT</p> <p>This key allows you to enable the magnetization contact (M.S.S.) even if the system is not magnetized at the maximum force level.</p>
 16	<p>POWER LEVEL UP</p> <p>Through this key the operator is able to increase the clamping force with which the next magnetization operation will be performed.</p>
 16	<p>POWER LEVEL DOWN</p> <p>Through this key the operator is able to decrease the clamping force with which the next magnetization operation will be performed.</p>
 17	<p>CHANNEL SELECTION KEY</p> <p>Activate or deactivate the relevant channel by turning the yellow light at the top left of the button on or off. The other light indicates the channel status: it is red for a demagnetized channel or green for a magnetized channel.</p>
 18	<p>MAG KEY</p> <p>To be pressed simultaneously with the SAFE key 19 to start the magnetization cycle of the activated channels. The turning on of the green light on the upper part of the button indicates the goodness of the operation.</p>
 19	<p>SAFE KEY</p> <p>Pressed simultaneously with the 18 or 20 keys, this key allows you to perform the MAG or DEMAG operations respectively. The blue light at the top of the button will turn on during startup and will always stay on.</p>
 20	<p>DEMAG KEY</p> <p>To be pressed simultaneously with the SAFE key 19 to start the demagnetization cycle of the activated channels. The turning on of the red light on the upper part of the button indicates the goodness of the operation.</p>
 21	<p>MULTIFUNCTION DISPLAY</p> <p>The display shows the status of the magnetic system, the current level of the clamping force and any malfunctions that may occur during normal operation.</p>


Display



①	Magnetic status indicator and any alarms
Mag OFF	Magnetic demagnetized system
Mag ON	System magnetized at a level between 1 and 15
Mag FULL	System magnetized at the highest clamping force level
BUSY	(De-) magnetization cycle in progress
Err :	Malfunction
Memo	Correctly memorized level of clamping force

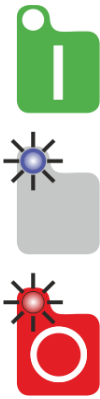
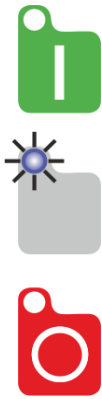
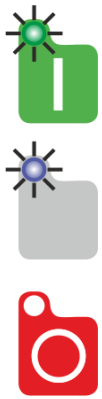



②	Clamping force adjustment source
LEV :	Clamping force adjustment from remote control
PLC :	Clamping force adjustment from machine tool

③	Clamping force level indicator
: 16	Indicates the value, on a 16-level scale, of the clamping force chosen before carrying out the magnetization operation

④	Barra di livello
	Visually indicates, by means of a 16-character bar, the clamping force chosen before carrying out the magnetization operation

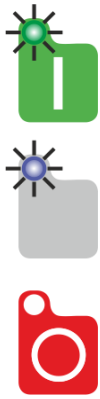
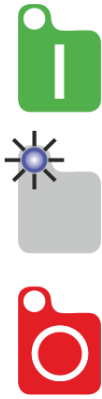
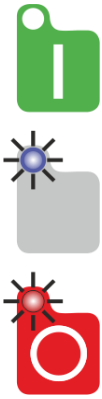



Magnetization

The magnetization operation is started by pressing keys 19 and 18 simultaneously. During the operation the control unit will switch to the "BUSY" state and at the end of the operation the new magnetic state of the system will be displayed.

INITIAL STATE Demagnetized system	OPERATION IN PROGRESS System in BUSY state	NEW STATE Magnetized system
		
		

Demagnetization

The demagnetization operation is started by pressing keys 19 and 20. During the operation the control unit will switch to the "BUSY" state and at the end of the operation the new magnetic state of the system will be displayed.

INITIAL STATE Magnetized system	OPERATION IN PROGRESS System in BUSY state	NEW STATE Demagnetized system
		
		

Clamping force adjustment

It is possible to adjust the clamping force by acting on the appropriate keys **16**. If the magnetic system is already set at a certain level, and the selection of another clamping force level is not followed by a new magnetization cycle, after 10s both level indicator and scale will automatically be set to the level of the last magnetization cycle.

Clamping force storage

To enable the data storage it is necessary to :

- select the clamping force level to be stored
- press and hold the **14** and **19** keys simultaneously for about 1s and wait for the "MEMO" message to appear on the display
- release the keys **14** and **19**
- to retrieve the previously stored level, press the **14** key

Management of the performed magnetization signal

The performed magnetization signal (M.S.S.) informs the machine tool connected to the control unit that the magnetic system has correctly been magnetized.

In case of a remote control with clamping force adjustment it is possible to programme the activation of the M.S.S.

If a magnetization cycle at a level below the maximum one (16) has been correctly carried out, the message "MAG ON" instead of "MAG FULL" will appear on the display under "Status indication".

The M.S.S. it will be active only for magnetizations carried out with the maximum anchoring force.



To set off the performed magnetization signal even if the magnetic system has not been magnetized at the maximum clamping force, it is necessary to:



- press and hold the **15** and **19** keys simultaneously for about 1s and wait for the message "MAG FULL" to appear on the display
- release the **15** and **19** keys

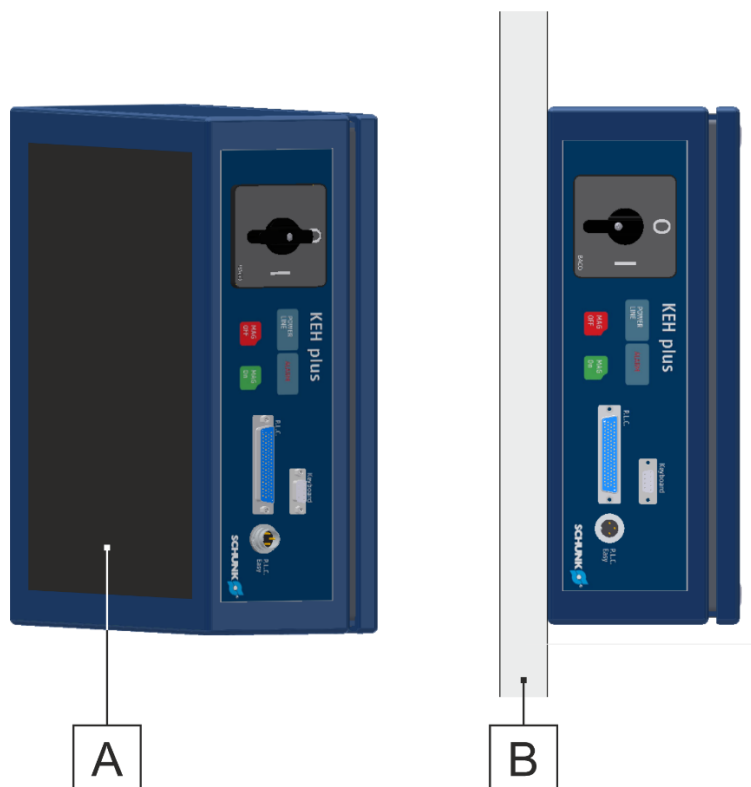
The operator can disable the previously set off performed magnetization signal M.S.S. by repeating the above mentioned step.

7. Installation and connections


- 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
	<p>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).</p>

	 CAUTION
	<p>Danger caused by falling control unit. When fixing the control unit with the help of the "magnetic rubber foil" on the bottom, ensure that the magnetic foil firmly sticks to the metal surface of the machine tool.</p>



- A. Magnetic rubber foil
 B. Metal surface of the machine tool

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

	ATTENTION
	<p>Damage to the control unit following a short circuit.</p> <p>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.</p>

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 the installation according to the following instructions:

NOTE

Depending on the model, the unit has different types of connections for connecting to the magnetic system. On all models there is instead the power cable (in some models complete with connector).

- If supplied, connect the remote control to the appropriate connector **7** on the control unit (tighten the screws on the sides).
- If supplied, connect the PLC interface to the appropriate connector **6** on the control unit (tighten the screws on the sides).
- If provided, connect the M.S.S. interface to the appropriate connector **8** of the control unit (turn the ring clockwise until it stops).
- Compare the performance data on name plate of the control unit with the mains data on site.
- Position the control unit in such a way that the requirements of the IP protection grade are met and that 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 the operating level.
- Connect the power supply cable of the control unit to the electrical grid according to the instructions on the wiring diagram.

	ATTENTION
	<p>Damage to the control unit due to the removal of the plug The control unit can be damaged if the electric plug is removed during a (de-)magnetization cycle. The electric plug must always be connected to an interlocked socket outlet.</p>

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

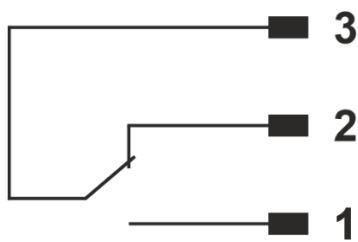
- Overcurrent protection device for, i.e. fuse or circuit breaker. This device must comply with the specifications on the wiring diagram of the control unit and always with the relevant regulations and standards applicable in the country of installation and operation. This device must furthermore be 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.**
- **The residual current circuit breakers must be high sensitivity 30mA, type A or B.** Some applications may require a different size. Check what is reported in the wiring diagram.

NOTE

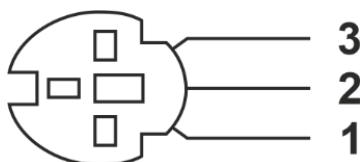
When using junction boxes, carefully read through the supplied operating manuals and circuit diagrams so as to ensure correct installation and selection of the interrupting devices.

7.1 Connection to the performed magnetization system / PLC

The control unit can be connected to the machine tool via two connectors identified as "P.L.C. Easy" and "P.L.C.".





Changeover contact 50V AC/DC - 2A





System	Contacts
Demagnetized	Circuit between pin 2 and 3 closed
	Circuit between pin 1 and 2 open
Magnetized	Circuit between pin 2 and 3 open
	Circuit between pin 1 and 2 closed



8. Normal operation

After installing the control unit and connecting it to the machine tool, ensure that the magnetic chuck is not magnetized with the help of the steel tip of a screwdriver. (There may be slight residual magnetization on delivery, e.g. due to transportation of the chucks with magnets).

	 WARNING
	<p>Danger due to suspended loads. If moving the workpiece requires the use of lifting equipment, cranes etc., please keep the respective safe distances.</p>

1. Place the workpiece on the magnetic chuck.
2. The contact area between control unit and discharge cable of the magnetic system must be free of metal, chips and dirt in general. The area must also be absolutely dry. In case of 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 connector **9** on the rear side of the control unit and ensure that it is free of chips, dirt and liquids. Otherwise carefully remove everything that could cause problems to the electromechanical properties of the connector.
4. Using the discharge cable, make the connection between the control unit and the magnetic chuck.

	 CAUTION
	<p>Danger due to faulty connection. Problems may arise with partial magnetization or demagnetization. The discharge cable must be properly connected to the control unit. For this purpose, in case of a control unit type KEH01 Plus, connect the discharge cable to the connector, and then turn the ring clockwise as far as it will go. In case of a control unit type KEH02 Plus, KEH04 Plus or KEH08 Plus connect the discharge cable to the connector, and then fasten the side brackets.</p>

	 DANGER
	<p>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.</p>



5. Turn the main switch on the control unit ① to "I" : the unit will turn on.
6. Check that the power supply light ② on the control unit is switched on.
7. If a remote control with power regulation is connected, check the execution of the Start-up procedure on the display:

KEH PLUS
Wait Please ..

KEH PLUS
Connection ..



KEH PLUS
Ready for use ..

8. At the end of the Start-up procedure, check the lighting of :
the red MAG OFF button ④ on the front panel (*on first start*)
 - the red key DEMAG ⑪ on the remote keyboard (if connected)
 - the DEMAG button ⑳ on the remote control with power adjustment (if connected)
9. If a remote control with power adjustment and channel selection keys ⑰ is connected:
 - press the key corresponding to the channel you wish to (de) select. The activation of the channel is signaled by the lighting of the yellow light at the top left of the button (*activate all the channels at the first start*).
 - select the desired power level using the ⑯ keys (*set the maximum power at the first start*).
10. Perform the magnetization operation with the control panel or with the remote control if connected (see Chapter 6)



	 CAUTION
	<p>Risk of injury due to workpieces not properly anchored to the magnetic chuck as a result of faulty displays of the magnetic clamping system.</p> <p>Check that the workpiece is properly anchored to the magnetic chuck, taking the necessary safety precautions.</p>

11. Turn the main switch on the control unit ① to "O" : the unit will turn off.
12. The contact area between control unit and discharge cable of the magnetic system must be free of metal, chips and dirt in general. The area must also be absolutely dry. In case of dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
13. Remove the discharge cable between control unit and magnetic chuck.
14. Put back the protective cap to protect the connector ⑨ of the control unit from dirt, liquids, chips etc.

15. The workpiece is ready to be machined.
16. The contact area between control unit and discharge cable of the magnetic system must be free of metal, chips and dirt in general. The area must also be absolutely dry. In case of dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
17. Remove the protective cap from the connector ⑨ and reconnect the control unit to the magnetic chuck.
18. Turn the main switch on the control ① to “I” : the unit will turn on.
19. Perform the demagnetization operation with the control panel or with the remote control if connected (see Chapter 6)

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

20. Turn the main switch on the control unit ① to “O” : the unit will turn off.
21. The contact area between control unit and discharge cable of the magnetic system must be free of metal, chips and dirt in general. The area must also be absolutely dry. In case of dirt, water or chips, carefully clean the connecting elements and contact surfaces and remove any causes of problems.
22. Remove the discharge cable between control unit and magnetic chuck.
23. Put back the protective cap to protect the connector ⑨ of the control unit from dirt, liquids, chips etc.

	 WARNING
	<p>Danger due to suspended loads.</p> <p>If moving the workpiece requires the use of lifting equipment, cranes etc., please keep the respective safe distances.</p>

24. 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

9. Alarms

In the event that, during a (de-)magnetization maneuver, a malfunction occurs, on the front panel the alarm light ③ is activated and the lights ④ and ⑤ start flashing. The sequence of flashes of the red light separated by the flash of the green light determines the error code. If a remote control with power regulation is connected, the error code is shown directly on the display of the same.

The unit also signals any internal memory errors by activating the lights ③ ④ and ⑤ on the front panel.

The unit also notifies the operator of any communication / configuration errors with the remote control. In particular, if due to disturbances or malfunctions, the communication between the control unit and the remote control is compromised, the control unit (logically) disconnects the remote control panel and provides a signal to the operator through the fixed lighting of the alarm light ③. In this condition the control unit continues to be operational, accepting commands only from the panel or from the PLC interface (if connected).

In the event that the control unit cannot be configured correctly (incorrect configuration of the discharge cables, incorrect type of remote control panel, incorrect system setting), the alarm light ③ starts flashing and the system is blocked and not working .

The following table lists the possible error codes generated by a system malfunction.

NOTE

For any contact with SCHUNK Customer Service, please specify the model and serial number indicated on the product identification plate and the error code generated by the control unit.



Error codes	Description	Flashes indicator light MAG OFF ④	Flashes indicator light MAG ON ⑤
<i>Err 100</i>	Short-circuit during the magnetization cycle	1	1
<i>Err 101</i>	Short-circuit during the demagnetization cycle		
<i>Err 102</i>	Low current absorbed by the magnetic system during the magnetization	4	1
<i>Err 103</i>	Low current absorbed by the magnetic system during the demagnetization		
<i>Err 104</i>	Reverse current during a magnetization cycle	3	1
<i>Err 105</i>	Reverse current during a demagnetization cycle		
<i>Err 106</i>	Excessive peak current towards the magnetic system during a magnetization cycle	2	1
<i>Err 107</i>	Excessive peak current towards the magnetic system during a demagnetization cycle		
<i>Err 108</i>	Unwanted unstable voltage towards the magnetic system	5	1
<i>Err 109</i>	Malfunction of the current reading system	6	1
<i>Err 110</i>	Faulty rotation of the built-in status indicator after the magnetization cycle.	2	2
<i>Err 111</i>	Faulty rotation of the built-in status indicator after the demagnetization cycle.		
<i>Err 112</i>	Error on the inside of the control unit	7	1
<i>Err 114</i>	Unwanted stable voltage towards the magnetic system	9	1

10. Troubleshooting

Problem	Possible cause	Corrective action
No (de-) magnetization.	The control unit is switched off.	Turn the main switch into the "I" position.
	The connection cable is not coupled.	Check the connection between the control unit and the magnetic system.
	The signals linked to the PLC interface don't follow the correct logical sequence.	Check and if necessary modify the logical sequence of the machine tool control program.
	The MAG OFF ④ and MAG ON ⑤ keys are active simultaneously on the control panel.	Switch the system off, disconnect it from the mains and notify the SCHUNK Service. Secure the magnetic system, as it could still be partially magnetized.
	The display of the remote control shows a malfunction	
Configuration error between control unit and remote control.		
The LEDs on the remote control panel (if connected) do not switch on.	Loose contact inside the remote control.	Switch the system off, disconnect it from the mains and check the connection between remote control and control unit.
Even if the system has correctly been magnetized, the machine tool doesn't receive the performed magnetization signal in order to proceed with the machining. On the display of the remote control the message "MAG ON" appears.	The system has been magnetized at a too low clamping force level.	On the remote control with power adjustment, press the ⑮ and ⑰ keys simultaneously. MAG FULL will appear on the display.
Demagnetization and magnetization are inverted.	Fault on the inside of the electronic control.	
The protection device for overcurrent interrupts the power supply during (de-) magnetization.	Chips on the connector of the control unit and/or on connector of the magnetic system.	Switch the system off, disconnect it from the mains and notify the SCHUNK Service. Secure the magnetic system, as it could still be partially magnetized.
The residual current circuit breaker interrupts the power supply during (de-) magnetization.	Water / liquid on the connector of the control unit and/or on connector of the magnetic system.	

11. Servicing and maintenance

We recommend checking the state of the power cables regularly and replace them as if necessary. Do not bundle cables! The power supply cable and the connection 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 qualified electricians. 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 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 inconveniences.



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

After maintenance and before reconnecting and restarting the control unit, restore all protection devices.

Activity	Description	Frequency			
		For every use	1 x week	1 x month	1 x year
Cleaning of the connector	With the control unit switched off: inspect the connector for chips, dirt etc. and remove if necessary.	•			
Inspection of the connection cable of the magnetic system	Check the metal jacket of the discharge cable for damage.	•			
Inspection of 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 labels etc. on the control unit for damage and ensure their good legibility.	•			
Seals inspection	Check all the seals of the system (connectors, caps, housings etc.).	•			
Outer cleaning	Wipe with a damp cloth and dry immediately with a dry one.		•		
Power cable inspection	Check the insulation of the power cable for damage.		•		
Check indicator lights	Check all the indicators and warning lamps (control unit and remote control) for proper functioning.		•		
Check of control unit functioning	With the system demagnetized and disconnected from the magnetic chuck, start the magnetization cycle by pressing only the green MAG ON button: the status indicated on the remote control must not change.		•		
Check of the enabling button on the remote control	With the system demagnetized and connected to the magnetic chuck, start the magnetization cycle by pressing only the green button: the status indicated on the remote control must not change.			•	
Check of the fault current circuit breaker	Check the proper functioning of the upstream protective system by using suitable tests.	Carry out the test according to the frequency and methods recommended by the manufacturer.			

12. Transportation and storage

12.1 Transportation

	 WARNING
	<p>Risk of injury and risk of damage to the control unit if it falls during transportation!</p> <ul style="list-style-type: none">• 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.

12.2 Storage

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

- store the product in its original packaging
- the control unit and the packaging should be inspected at regular intervals
- inspect packaging for outer damage and effects of the weather

13. 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 control unit 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.


13.1 Procedure for final decommissioning and disposal of the control unit

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

- 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 control unit disposed of by a company that specializes in the disposal of electrical equipment.

14. Spare parts

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


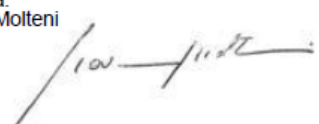
 <p>TÜVRheinland®</p>	<p>Test Report nr. 28110874-002</p>
	<p>Page: 1 of 31 Date: 25/10/2017</p>

1. OGGETTO DEL TEST REPORT / ITEM UNDER TEST REPORT

Descrizione <i>Description</i>	Electronic control for magnetic plane
Modello <i>Model type</i>	KEH 08 Plus
Identificativo interno <i>Storage No.</i>	170568 (sampled by applicant)
Richiedente <i>Applicant</i>	S.P.D S.p.A
Indirizzo <i>Address</i>	Via Galileo Galilei, 2/4, 24043 - Caravaggio (BG) - ITALY

Prove effettuate presso <i>Test carried out by</i>	TÜV Rheinland Italia Srl Via E. Mattei, 3 – 20010 Pogliano Milanese (Italy)
Norme di riferimento <i>Reference Standards</i>	EN 61000-6-4:2007; EN 61000-6-2:2005
Scopo delle prove <i>Scope of the tests</i>	To verify the compliance with the following clauses of reference standards See part 10. TESTS SUMMARY section
Risultati di prova <i>Test Results</i>	COMPLIANT

Data ricevimento campioni <i>Date of samples receiving</i>	15/09/2017
Data inizio prove <i>Date of tests start</i>	25/09/2017
Data fine prove <i>Date of tests end</i>	13/10/2017
Rapporto composto da <i>Test report composed by</i>	31 Pages

Provato da / Tested by <i>(name + signature)</i>	Approvato da / Approved by <i>(name + signature)</i>
 Riccardo Morandi <i>(Laboratory Technician)</i>	Firmato da: Giovanni Molteni Motivo:  Data: 25/10/2017 13:19:24 Giovanni Molteni <i>(Laboratory Manager)</i>

The results referred in this report are only relevant to the samples tested and described in this report.
Only complete reproduction of this test report is permitted without written authorisation of TÜV Rheinland Italia
TÜV Rheinland Italia – Via Enrico Mattei, 3 – 20010 Pogliano Milanese (MI) – Italy Tel. +39 02 9396871 Fax. +39 02 93968723

QMA TRLP 6.1-350

Version: 1
01.08.2011



Produkte

Products

Prüfbericht - Nr.: 28110562 001 <i>Test Report No.:</i>			Seite 1 von 21 <i>Page 1 of 21</i>		
Auftraggeber: <i>Client:</i>			SPD S.p.A. – Via Galileo Galilei, 2/4 – 24043 Caravaggio (BG) - Italy		
Gegenstand der Prüfung: Magnetic Electro-Permanent System <i>Test item:</i>					
Bezeichnung: <i>Identification:</i>		KEH 08 Plus		Serien-Nr.: 0012954.001 <i>Serial No.:</i>	
Wareneingangs-Nr.: <i>Receipt No.:</i>			170281		
Eingangsdatum: <i>Date of receipt:</i>			11/5/2017		
Prüfart: <i>Testing location:</i>			TUV Rheinland Italia S.r.l. – Via Mattei, 3 – 20010 Pogliano Milanese (MI) - Italy		
Prüfgrundlage: <i>Test specification:</i>			EN 60204-1:2006 + A1 Safety of machinery – Electrical equipment of machines – Part 1: General requirements		
Prüfresultat: <i>Test Result:</i>			Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
Prüflaboratorium: <i>Testing Laboratory:</i>			TUV Rheinland Italia S.r.l. – Via Mattei, 3 – 20010 Pogliano Milanese (MI) - Italy		
geprüft/ tested by:			kontrolliert/ reviewed by:		
13/10/2017		S. Montanari	13/10/2017		S. Orecchia
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges/ Other Aspects:					
Despite a new edition of standard is available, the customer required to use the edition EN 60204-1:2006+A1					
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet			Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested		
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

TÜV Rheinland LGA Products · Tillystrasse 2 · D-90431 Nürnberg · Tel.: +49 911 655 5225 · Fax +49 911 655 5226
Mail: service@de.tuv.com · Web: www.tuv.com

