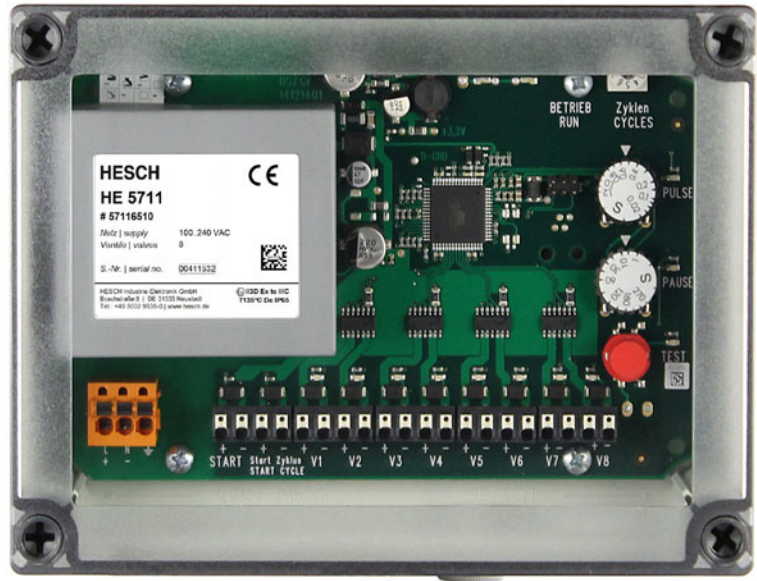


HE 5710 / HE 5711

µP-magnetic valve control



Operating manual

Translation of the original operating manual
(Original version German)

HESCH

AUTOMATION PARTNER

Imprint

HESCH Industrie-Elektronik GmbH
Boschstraße 8
D-31535 Neustadt
Germany
Phone +49 (0) 5032 9535-0
Fax +49 (0) 5032 9535-99
Internet: www.hesch.de
E-Mail: info@hesch.de

District court Hanover
HRB 111184
VAT No.: DE813919106

Management:
Walter Schröder, Werner Brandis
Publisher:
HESCH Industrie Elektronik GmbH, Documentation Department

Copyrights



© Copyright 2019 HESCH Industrie-Elektronik GmbH. All rights reserved. The content including pictures and the design of this manual are subject to copyright protection and other laws for protection of intellectual property. The dissemination or alteration of the content of this manual is prohibited. Moreover, these contents may not be copied, disseminated, altered or made accessible to third parties for commercial reasons.

Table of content

| | | |
|----------|---|-----------|
| 1 | Foreword | 5 |
| 1.1 | Information regarding the usage of these operating instructions | 5 |
| 1.2 | Legal provisions | 6 |
| 2 | Safety information | 7 |
| 2.1 | Symbols and basic safety information | 7 |
| 2.2 | Safety during the individual phases of operation | 8 |
| 3 | Device description | 11 |
| 3.1 | Overview | 11 |
| 3.2 | Display and control elements | 12 |
| 3.3 | Technical data | 13 |
| 4 | Installation | 14 |
| 5 | Electrical commissioning | 15 |
| 5.1 | Safety information | 15 |
| 5.2 | Supply voltage | 16 |
| 5.3 | Connection diagram | 17 |
| 5.4 | Inputs | 18 |
| 5.5 | Valves | 18 |
| 5.6 | Commands | 18 |
| 6 | Setting-up | 19 |
| 7 | Declaration of conformity | 20 |
| 8 | Maintenance and service | 21 |
| 8.1 | Notes | 21 |

1 Foreword

1.1 Information regarding the usage of these operating instructions

Structure

| | |
|------------------|--|
| Chapter 1 | Foreword Information on chapter structure, document history, intended use and device safety. |
| Chapter 2 | Safety information Important safety information regarding the Differential Pressure Regulator. |
| Chapter 3 | Device description Description of the magnetic valve control, control elements and technical specifications. |
| Chapter 4 | Installation Dimensions of the device and scope of delivery. |
| Chapter 5 | Electrical commissioning Connection of supply voltage and signals. |
| Chapter 6 | Setting-up Performing setting-up on the device. |
| Chapter 7 | Declaration of conformity |
| Chapter 8 | Maintenance and service Information regarding control operations and disposal. |

Target group

These operating instructions are intended for qualified electricians that will install, wire, commission and put the magnetic valve control HE 5710 / HE 5711 into operation.

Document history

| Date / version | Description |
|-----------------------|---|
| 12/2013 / 1.0 | First Creation |
| 04/2014 / 1.1 | Page 2 (footer): Corrected item number. Chapter 7: Added declaration of conformity. Chapter 3 (Fig. 3.1 + 3.2), 3.3, Chapter 5.2 + 5.3: Changed value for wide-range power supply (100 – 240 VAC) |
| 09/2019 / 1.2 | Chapter 2: device marking adapted |
| 12/2019 / 1.3 | Chapter 2.2: device marking explanation completed. Chapter 3.3: Typing error in device marking corrected Bilingual name plates added. |

1.2 Legal provisions

Manufacturer

HESCH Industrie-Elektronik GmbH, Boschstraße 8, D-31535 Neustadt, Germany

Intended use

- The magnetic valve control HE 5710 / HE 5711 serves to clean industrial filtration plant.
- The control unit can be operated within the usage and ambient conditions stated in this manual without causing any safety risks.
- The manufacturer is not liable for improper usage and the resulting personnel injuries or damage; the risk lies entirely with the operator. Failure to comply with the above mentioned criteria regarding intended use may void the warranty – the manufacturer cannot be held liable for damage to the device in this case.

Personnel qualification

Only qualified electricians with the appropriate knowledge in the field of electrical engineering are allowed to conduct any work on the magnetic valve control.

Device safety

The device was built and tested in accordance with VDE 0411 / EN 61010-1 and has left the factory in an operationally safe condition. In order to maintain this condition and to ensure safe operation, the user has to follow the instructions and warnings contained in this manual, see chapter 2 "Safety information" on page 7.

2 Safety information

2.1 Symbols and basic safety information

This chapter contains important safety provisions and information. In order to protect against personnel injury and damage, it is necessary to carefully read this chapter before working with the device.

Used symbols

The following symbols are used in this manual. All safety information notes are structured in a uniform manner.



Warning of personnel injury!

The severity of the danger is indicated by the respective signal word, see page 8.



Warning of explosive atmosphere!



Warning of dangerous electrical voltage!



Warning of material damage due to electrostatic charging!



Warning of material damage!



Note!

Indicates possible malfunctions and provides information regarding optimal operating conditions.

Signal words

DANGER!

Indicates an immediate danger with *high* risk that will result in death or serious injury if not avoided.

WARNING!

Indicates a possible danger with *medium* risk that may result in death or serious injury if not avoided.

CAUTION!

Indicates a danger with *low* risk that might result in slight or moderate injury if not avoided.

Structure of warning notes

All warning notes in these operating instructions are structured in a uniform manner. The pictogram designates the type of danger.



SIGNAL WORD!

An informative text describes the danger and suggests how it can be avoided.

2.2

Safety during the individual phases of operation

The following safety information must be observed when installing the device and during operation.



Danger of electric shock!

Disconnect the power supply before working on the device. Install the electrical lines in accordance with the respectively applicable local regulations (VDE 0100 in Germany). Lay the measuring lines separately from the power lines. Produce a connection between the protective ground connection (in the respective device carrier) and a protective ground.



Danger of electric shock!

Any interruption of the protective ground in the device carrier may cause the device to become dangerous. Deliberate interruptions are not permissible. If it can be assumed that safe operation is no longer possible, then the device shall be put out of commission and be secured against unintended operation or re-activation.



Danger of electric shock!

Do not open the device under voltage! When opening the devices or removing covers and parts, live parts may become exposed. Connecting points may also be live!



Caution!

The device may not be put into operation when there is visible damage on the device.

**Caution!**

Observe the accident prevention regulations applicable to the system, such as BGV A 3 "Electrical Systems and Equipment" during installation, commissioning, maintenance and troubleshooting.

**Caution!**

Clean soiled contacts using oil-free compressed air or spirit and a lint-free cloth.

**Material damage due to electrostatic charging!**

Observe the safety measures according to DIN EN 61340-51/-3 in order to prevent electrostatic discharging!

The original packaging protects against any electrostatic discharge.

Only transport the device in its original packaging

During assembly observe all regulations for protection against electrostatic discharges.

**Electrical connection!**

Install the electrical lines in accordance with the respectively applicable local regulations (VDE 0100 in Germany).

Lay the measuring lines separately from the power lines.

Produce a connection between the protective ground connection (in the respective device carrier) and a protective ground.

The cable shielding belongs to the measurement earth.

The effects of interference fields can be prevented through use of twisted and screened measuring lines.

The respective connection diagrams / connection designs for the devices apply.

**Explosion protection!**

This device (the version with the Makrolon housing) is suitable for operation in Explosion Zone 22 with the lid closed (where an explosive atmosphere may arise due to electrically conductive dusts).

Prior to opening the device, one must ensure that there are no explosive ambient conditions, such as dust formation.

The special regulations governing operation in an Ex-area must be observed.

**Blowing of a fuse!**

First determine the causes for the failure and remove them.

Only use fuses which have the same specification as the original type as a replacement.

Repaired fuses or short circuiting are not permissible.

The device is marked with:

 II3D Ex tc IIIC T135°C Dc
CE

| | | |
|--------|---|---|
| II3D | Device category: | use in zone 22 for dust during normal operation |
| Ex | Designates an electrical equipment | |
| tc | Type of ignition protection: | protection by housing |
| IIIC | Dust group: | conductive dusts |
| T135°C | Temperature class: | maximum permissible surface temperature |
| Dc | Device protection level: | use in zone 22 for dust |
| IP65 | Protection class: dust-proof, scoop-proof | |



Troubleshooting!

When beginning to troubleshoot, all possible sources of error regarding additional equipment or cables (measuring lines, wiring, slave devices) should be taken into consideration. If no error source can be found after examining these points, we recommend to send the device to the supplier.



Decommissioning!

Disconnect the power supply entirely if the device is to be decommissioned. Secure the device against inadvertent operation!
If the device is interconnected with other devices and/or equipment, the effects of the deactivation should be considered prior to disconnecting the device and the appropriate precautions should be taken beforehand.

The following provisions must be observed:

- Attach the cables to the cable glands correctly in order to retain the protection class.
- Operation with an opened lid is not permissible.
- The tightness of the hose screw connections/glands, for example for Δp measurement or measuring hose cleaning, must be checked.
- Provide unneeded housing bores with locking bolts.
- It is only permitted to clean the housing with wet cleaning agents in order to avoid static charging.
- It is required to clean the device in order to prevent increased dust formation.

3 Device description

3.1 Overview

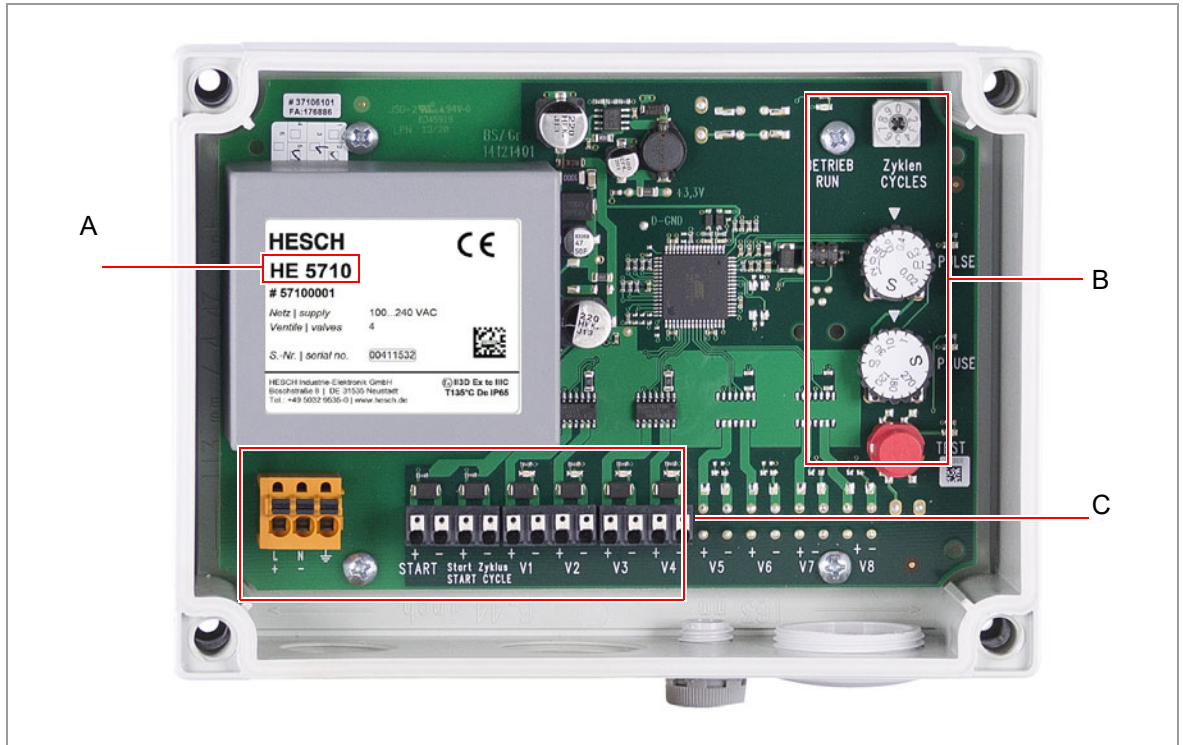


Fig. 3.1: An overview (taking the 5710 as an example)

- A. Type designation
- B. Display and control elements
- C. Connection compartment

3.2 Display and control elements

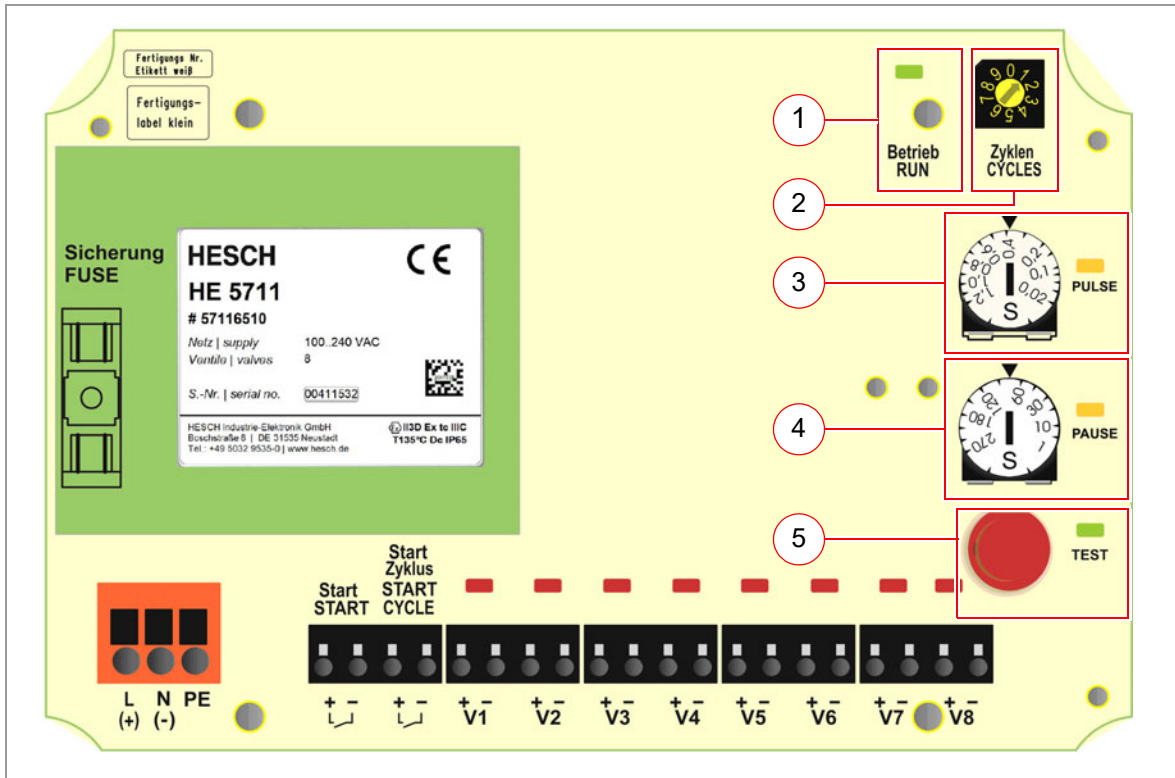



Fig. 3.2: Display and control elements (on the 5711 as an example)

| Symbols | Meaning |
|---------|--|
| 1. | <ul style="list-style-type: none"> • RUN • LED, green • Lights up if the operating voltage is being applied and the processor is active |
| 2. | <ul style="list-style-type: none"> • CYCLES • Coding switch • Determines the number of cycles (1 – 9). The setting 0 deactivates the cyclic cleaning |
| 3. | <ul style="list-style-type: none"> • PULSE • LED, yellow • Lights up during the actuation period (pulse) of the valves • Potentiometer for pulsing period setting between 0.02 and 1.2 seconds |
| 4. | <ul style="list-style-type: none"> • PAUSE • LED, yellow • Lights up in the pause leading up to actuation of the next valve. The condition of the control unit is recognisable, also for a longer pause time. • Potentiometer for pause time setting between 1 and 270 seconds |
| 5. | <ul style="list-style-type: none"> • Button TEST • The first press of the button starts the pulse and pause of the next valve. • The second press of the button interrupts the pause of the active valve or starts the next valve. • Longer pressing of the button (for longer than 2 seconds) starts cleaning for the set cycles. If the number of cycles is 0, cleaning will continue until the button is pressed again. |

3.3 Technical data

| Technical data | |
|-------------------------|---|
| Intended use: | The magnetic valve control serves to clean industrial filtration plant |
| Supply voltage: | <ul style="list-style-type: none"> • 100 – 240 VAC, 50 – 60 Hz • 24 VDC ±10% (option) |
| Power consumption: | 30 VA, own power consumption about 3 W |
| LEDs: | <ul style="list-style-type: none"> • HE 5710: 4 for valve control unit, red • HE 5711: 8 for valve control unit, red • RUN, green • PULSE, yellow • PAUSE, yellow • TEST, green |
| Control elements: | <ul style="list-style-type: none"> • Button TEST: the next valve is actuated • PULSE, setting the pulse period Potentiometer from 0.02 and 1.2 seconds • PAUSE, setting the pause time Potentiometer from 1 and 270 seconds • CYCLES: setting the cycles Rotary coded switch 0 - 9; 0 deactivates the function |
| Inputs: | <ul style="list-style-type: none"> • START: start cleaning (contact closed) • START CYCLE: cyclic cleaning (trigger signal) Switchable with a potential-free contact or a semiconductor switch, "Active Low" |
| Valve outputs: | <ul style="list-style-type: none"> • HE 5710: 1 – 4 • HE 5711: 1 – 8 |
| Valve voltage: | 24 VDC ±10% |
| Valve current: | <ul style="list-style-type: none"> • 1 A for a pulse period of ≤ 1s and a pause time ≥ the pulse period • The outputs are short-circuit-proof |
| Fuse: | Glass fuse 5 × 20 mm, 2 A, slow blow |
| Electrical connections: | Vertical cage spring release terminals |
| Operating temperature: | -20°C ... +50°C / -20°C ... +40°C in Ex-area |
| Explosion protection: |  ATEX II 3D Ex tc IIIC T135° Dc, IP65, Zone 22 (version with the housing) |
| Versions: | <ul style="list-style-type: none"> • Construction on a standardised rail support; 165 mm × 111 mm (W × H) • A dustproof Makrolon housing (IP65) with a transparent lid, with a M25 × 1.5 thread and two M32 × 1.5 threads for metric screw connections Openings should be closed, if necessary with screw plugs, to make the device dustproof (IP65) An M32 screw plug is in the scope of delivery of the HE 5710 Housing dimensions: 180 mm × 130 mm × 78 mm (W × H × D) |
| Connectors: (option) | <ul style="list-style-type: none"> • 1 × M25 screwed cable gland • 2 × M32 screwed cable gland • Multiple sealing inserts and locking bolts • Height of the cable gland: 40 mm |

Subject to technical changes.

4 Installation

The ambient temperature at the installation position may not exceed the permissible temperature for rated use listed in the data sheet. The device may be installed in areas subject to the EX ATEX Zone 22 Explosion Class. The special provisions should be observed, see chapter 2.2 "Safety during the individual phases of operation" on page 8.

Dimensions

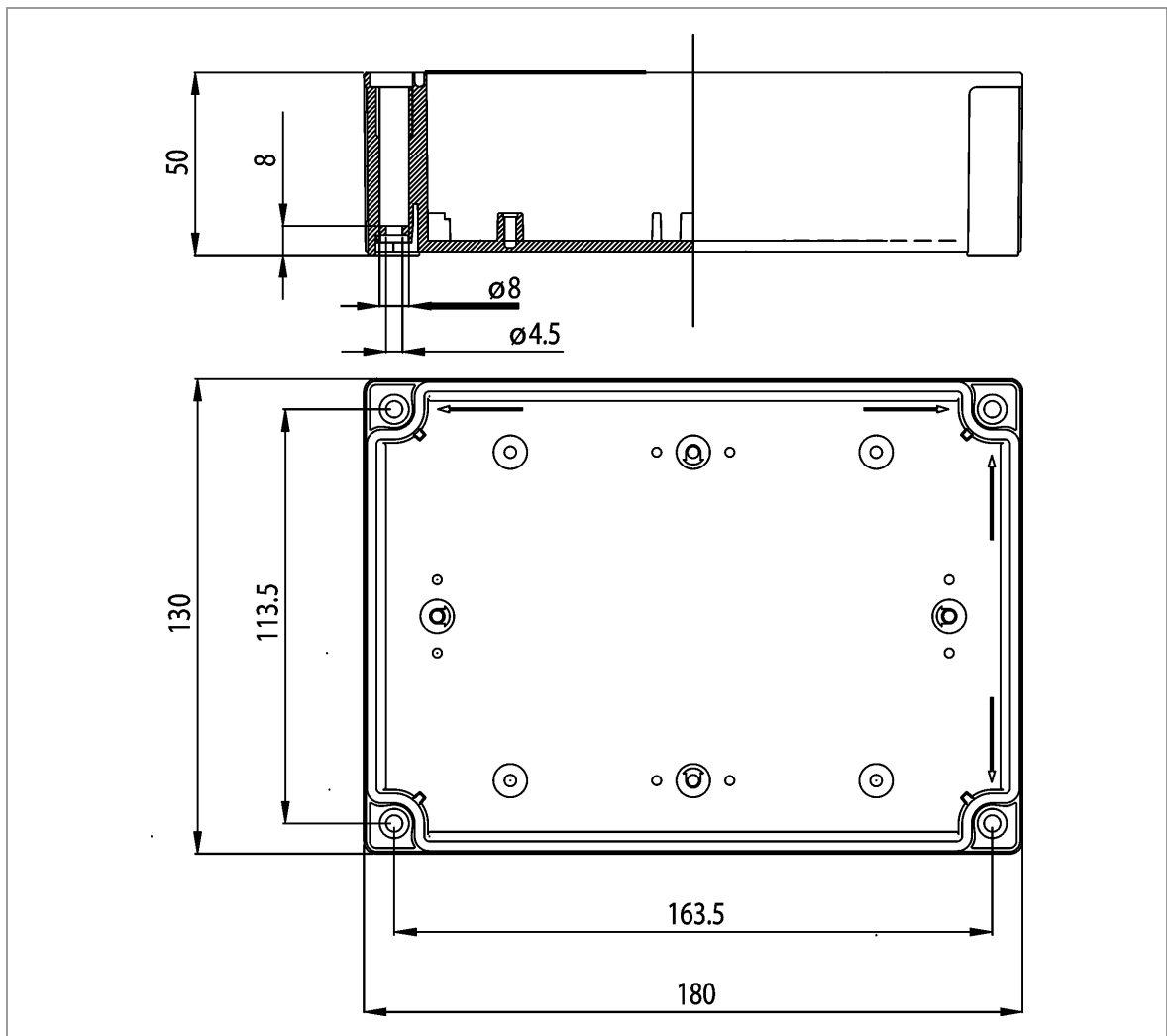


Fig. 4.1: Dimensions

Scope of delivery

- HE 5710 / HE 5711
- Operating manual



Note!

After receiving the delivery, check it for completeness and obvious defects. In case of a complaint, immediately contact your local HESCH representative.

5 Electrical commissioning

Mind the following points prior to turning on the device:

- Firmly connect the cables to the cable glands. The supply voltage must match the specifications on the type plate.
- The device may only be operated in a closed state.
- The temperature limitations specified for use of the device have to be observed before and during operation.
- The protective ground connection in the appropriate device carrier has to be conductively connected to the protective ground.

5.1 Safety information



Danger of electric shock!

Only perform the electrical installation in a dead-voltage state.



Material damage due to electrostatic charging!

Observe the safety measures according to DIN EN 61340-51/-3 in order to prevent electrostatic discharging!



Note!

Only qualified specialists may work on the electronics.

5.2 Supply voltage

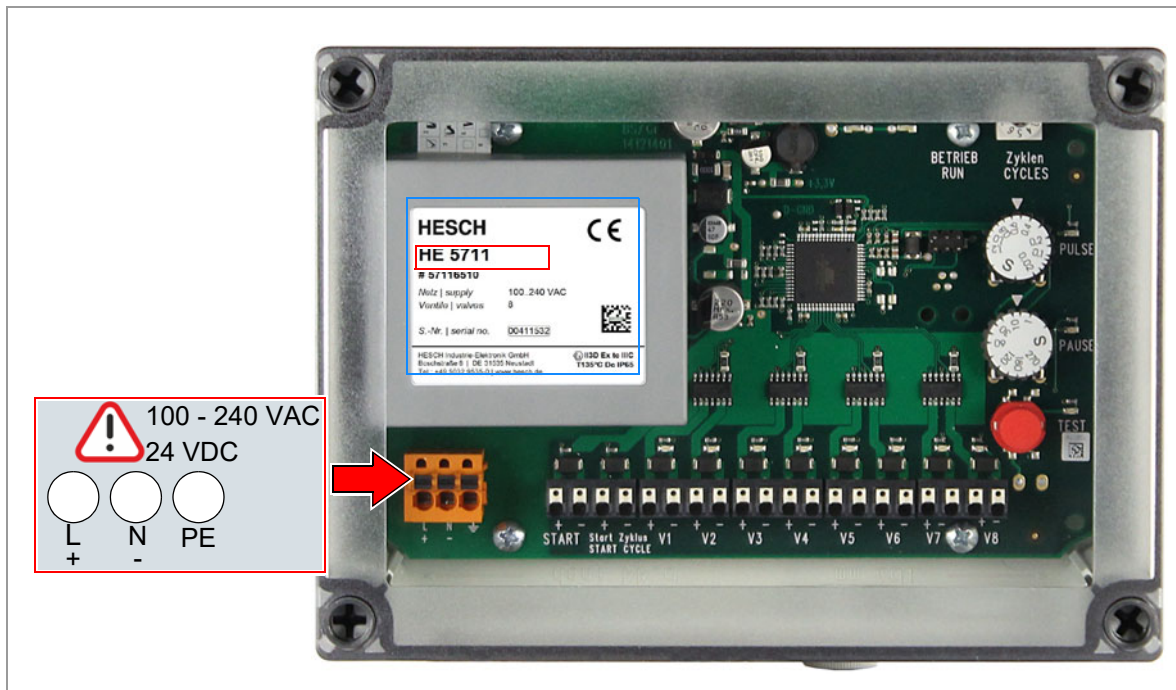


Fig. 5.1: Supply voltage

1. Loosen the screws on the housing cover and remove the cover.
2. Read the supply voltage value off the type plate (for example 100 – 240 VAC or 24 VDC mains voltage).
3. Connect PE conductors.

5.3 Connection diagram

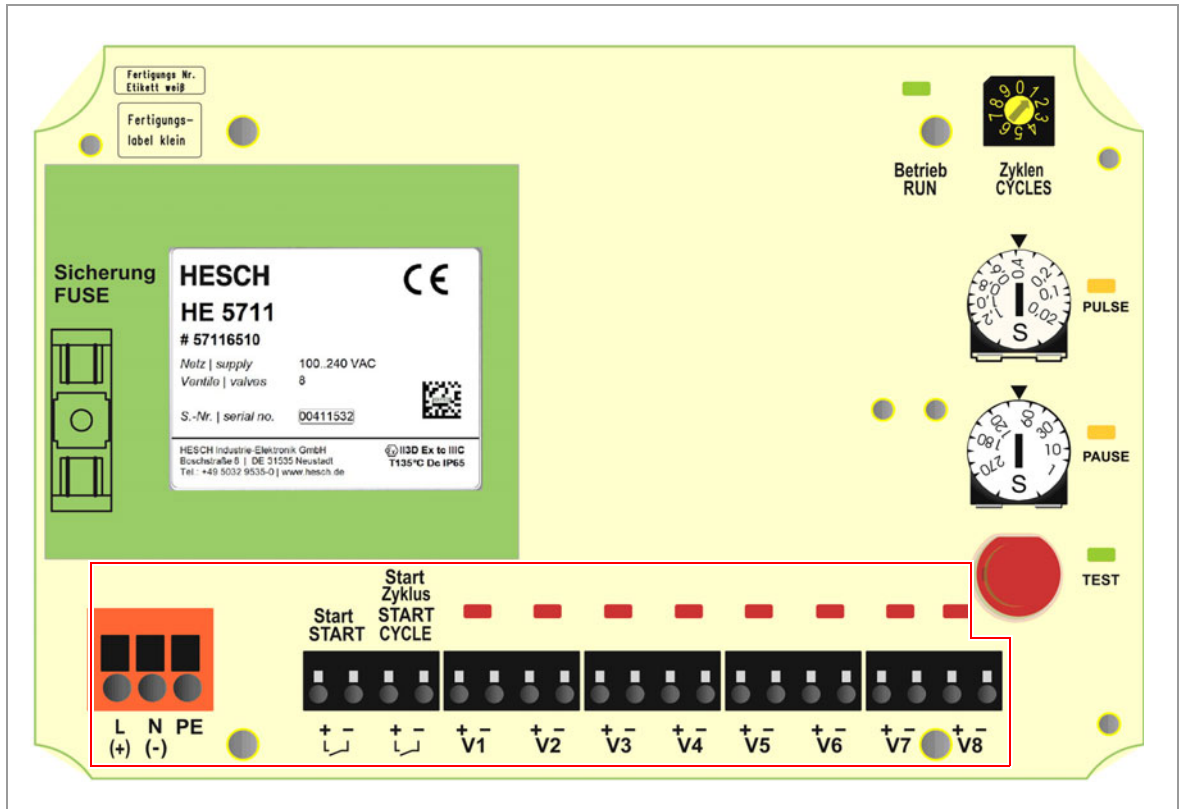


Fig. 5.2: Connection diagram (on the 5711 as an example)

| Terminal | Description |
|---------------|--|
| L (+) | Supply voltage L, 100 – 240 VAC, or (+) 24 VDC |
| N (-) | Supply voltage L, 100 – 240 VAC, or (-) 24 VDC |
| PE | Potential to ground |
| + START | Input for cleaning start (+), Active Low |
| - START | Input for cleaning start (GND) |
| + START CYCLE | Input for cyclic cleaning (+), Active Low |
| - START CYCLE | Input for cyclic cleaning (GND) |
| + V1 | Output of valve 1 (+24 V DC) |
| - V1 | Output of valve 1 (GND) |
| + V2 | Output of valve 2 (+24 V DC) |
| - V2 | Output of valve 2 (GND) |
| + V3 | Output of valve 3 (+24 V DC) |
| - V3 | Output of valve 3 (GND) |
| + V4 | Output of valve 4 (+24 V DC) |
| - V4 | Output of valve 4 (GND) |

| Terminal | Description |
|----------|------------------------------|
| + V5 | Output of valve 5 (+24 V DC) |
| - V5 | Output of valve 5 (GND) |
| + V6 | Output of valve 6 (+24 V DC) |
| - V6 | Output of valve 6 (GND) |
| + V7 | Output of valve 7 (+24 V DC) |
| - V7 | Output of valve 7 (GND) |
| + V8 | Output of valve 8 (+24 V DC) |
| - V8 | Output of valve 8 (GND) |

The terminals V5 (+ and -) to V8 (+ and -) only for HE 5711.

5.4 Inputs

The magnetic valve control has 2 inputs: START and START CYCLE. The inputs are internally supplied with + 24 VDC and are active when they are switched to (-) with a potential-free contact.

5.5 Valves

Connection: HE 5710 on terminals V1 (+ and -) to V4 (+ and -)
HE 5711 on terminals V1 (+ and -) to V8 (+ and -)

Valve type: 24 VDC, a maximum of 1 A

Common potential: -

Switched output: +

The outputs are short-circuit-proof.

5.6 Commands

Steady-state operation: connect the terminals START (+ and -).

Cyclic operation: connect the terminals START CYCLE (+ and -) (trigger signal).

6 Setting-up

Number of valves

The number of valves is determined automatically by the control unit. Recognised valves are displayed by lit up LEDs.

Number of full cleaning cycles

Using the coding switch CYCLES, set the number (1 – 9). The setting 0 deactivates cyclic cleaning. The cleaning process for the set cycles is started by means of trigger signal to the START CYCLE terminals (+ and -).

Pulsing period of the valves

Setting using the PULSE potentiometer between 0.02 and 1.2 seconds.

Pause time of the valves

Setting using the pausing potentiometer PAUSE between 1 and 270 seconds.

7 Declaration of conformity

You will find the declaration of conformity on www.hesch.de

8 Maintenance and service

8.1 Notes

Maintenance, repair

The device has to be cleaned regularly in order to avoid increased dust formation on the device.

Disposal

Recycle metals and plastics. Electrical and electronic components should be collected separately and be disposed of accordingly. Properly dispose of printed circuit boards.

Service

HESCH Industrie-Elektronik GmbH
Boschstraße 8
D-31535 Neustadt
Germany
Phone: + 49 (0) 5032 9535-90