

HE 5731 Compact / Modular

Solenoid valve controller



Operating instructions

(English translation
German original version)

HESCH
AUTOMATION



Imprint

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1. Legal provisions

Manufacturer

AXXERON HESCH electronics GmbH, Boschstraße 8, 31535 NEUSTADT, GERMANY.

Intended Use

- The solenoid valve controller HE 5731 is used for cleaning industrial filter systems. The number of valves is from 1 to a maximum of 64, and can be scaled, using modular extension units. The cleaning and de-dusting with HE 5731 can be carried out time-controlled or differential pressure-controlled. It can be operated with, as well as without an actual valve controller. A total of 64 valves can be controlled at one time.
- The controller can be operated within the operating and environmental conditions approved in this manual without impairing its safety.
- The manufacturer is not liable for improper use and any resulting personal injury or material damage; the risk is borne solely by the user. Failure to comply with the above criteria for intended use may result in the expiry of the warranty and liability for the device.



Note!

The device version **HE 5731 Compact** is available as **ATEX-approved device for use in EX zone 22 as well as without ATEX approval**. If you have ordered an ATEX-approved device, you must necessarily observe the safety instructions for explosion prevention, the indication on the name plate as well as the special regulations in *chapter 2.4 Device identification*

The device version **HE 5731 Modular** is not ATEX-approved!

Personnel qualification

All work on the device may only be carried out by qualified electricians with sufficient knowledge in the field of electrical engineering.

This documentation is intended for all electrically qualified people, who design, install, set up, and adjust the HE 5731 filter controller.

Device safety

The device has been constructed and tested in accordance with VDE 0411 / EN 61010-1 and has left the factory in perfect safety condition. To maintain this condition and ensure safe operation, the user must observe the notes and warnings described in this manual.

Declaration of Conformity

The valid declaration of conformity is available in the download center of our website

<https://www.hesch-automation.com/en/support/download-center/>.

Click on the tab **Declarations of Conformity** to select your device.

2. Safety Information

2.1. Symbols and Basic Safety Instructions

This chapter contains important safety regulations and notes. To protect against personal injury and material damage, it is necessary to read this chapter carefully before working with the device.

Symbols used

The following symbols are used in this manual. All safety instructions have a uniform structure.

**Personal injury warning!**

The severity of the danger is indicated by the respective signal word.

**Explosive atmosphere warning!**

**High voltage warning!**

**Warning of material damage caused by electrostatic charge!**

**Property damage warning!**

**Note!**

Identifies possible malfunctions and indicates optimum operating conditions.

2.2. Signal words

DANGER!

Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING!

Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

WARNING!

Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury

2.3. Safety in the individual operating phases

When installing the control unit and during operation, the following safety instructions must be observed.



Danger of Electrocutation!

Before working on the device, switch off all power supplies used. The electrical cables must be laid according to the respective national regulations (in Germany VDE 0100). The measuring lines must be laid separately from the mains leads. The connection between the connection for the functional earth (in the respective device carrier) and a protective conductor must be established.



Danger of Electrocutation!

Any interruption of the protective conductor in the device carrier can lead to the device becoming dangerous. Intentional interruptions are not permitted. If it is suspected that safe operation is no longer possible, the device is to be decommissioned and secured against unintentional operation.



Danger of Electrocutation!

Do not open the device while it is live! When opening the devices or removing covers and parts, live parts may be exposed. Connecting points can also be live!



Warning!

The device must never be put into operation despite any visible damage.



Warning!

During installation, commissioning, maintenance and troubleshooting, observe the accident prevention regulations applicable to your system, e.g. DGUV Regulation 3 "Electrical installations and equipment".



Warning!

Clean dirty contacts with oil-free compressed air or with spirit and a lint-free cloth.



Warning of material damage caused by electrostatic charge!

Observe the safety measures according to BS EN 61340-51/-3 to avoid electrostatic discharge!



Explosion Prevention! (for ATEX approved devices only!)

It is permitted to use the device version **HE 5731 Compact** (see Figure 1) in explosion zone 22 with closed lid. It is mandatory to ensure that no explosive ambient conditions, such as e.g. development of dust exist, before opening the device for e.g. parametrisation.



Troubleshooting!

At the beginning of troubleshooting, all possible sources of faults on additional devices or supply lines (measuring lines, wiring, downstream devices) should be taken into consideration. If the fault was not found after checking these points, we recommend sending the device to the supplier.



Decommissioning!

Switch off the power supply on all poles if the device is to be decommissioned. Secure the device against unintentional operation! If the device is connected to other devices and / or equipment, the effects must be considered and appropriate precautions taken before switching off.

2.4. Device identification



Note!

The device version **HE 5731 Compact** is available as **ATEX-approved device for use in EX zone 22 as well as without ATEX approval**. If you have ordered an ATEX-approved device, you must necessarily observe the safety instructions for explosion prevention, the indication on the name plate as well as the special regulations in *chapter 2.4. Device identification*.

The device version **HE 5731 Modular** is not ATEX-approved!

The devices are labelled as follows:

HE 5731 Compact with ATEX:	Without ATEX:
UK CA C E Ex II3D Ex tc IIIC T135°C Dc IP65	UK CA C E

II3D	Device category	Use in Zone 22 for dust during normal operation
Ex	Indicates an electrical operating material, standards of series EN 60079-0ff. were applied.	
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-tight and protected against water jets

The following special regulations must be observed:

- Connect cables professionally in glands.
- Close not needed housing bores with locking bolts.
- The ATEX approval remains valid only if the installation is carried out professionally in compliance with the protection class specified in the device identification.
- Cleaning of the housing is only permitted with moist cleaning agents to avoid static charging.
- Cleaning is necessary to prevent increased dust generation on the device.
- Operation under voltage, in zone 22, only in closed state.
- Before closing, ensure that the device housing is free of dust

3. Technical data

Intended use:	Solenoid valve controller for cleaning industrial filter systems
Models:	<ul style="list-style-type: none"> HE 5731 in compact housing as master controller with 16 valve outputs maximum HE 5731 operating unit as control panel built-in casing (the valve outputs are located on the control unit) extension units as slave controls, a total of 64 valves can be controlled
Supply voltage: (Please refer to the nameplate on the device)	<ul style="list-style-type: none"> 100...240 VAC / 50...60 Hz 24 VDC ±10% (option) safety extra-low voltage (SELV)
	Extension units are supplied by the master controller
Power consumption:	30 VA with 100...240 VAC control
	Max. 30 W with 24 VDC controls
Valves:	24 V DC, max. 1 A 16 valves per device, 64 valves per system
Pulse time:	0.01...9.99 seconds adjustable
Break time:	1.0... 999 seconds adjustable
Display:	7-segment display, 3-digit, 14 mm height, white for differential pressure/valve display, parameter and alarm values
LEDs:	14 LEDs for status displays, 16 LEDs for differential pressure column
Keys:	PARA (ESC), UP, DOWN, ENTER, TEST
Analogue output:	4...20 mA + sensor supply for differential pressure sensor, 24 VDC max. 80 mA
Digital inputs:	Start post-cleaning release
Relay output:	1 change-over contact 250 VAC, 5 A as combined operating and fault signal
Interfaces:	USB device, type B for writing and reading the parameters (USB / TTL adapter required)
	RS 485 as internal communication bus
Air / creepage distances:	Pollution degree 2, overvoltage category II
EMC:	Interference emission: BS EN 61000-6-4 Resistance to interference: BS EN 61000-6-2
Housing:	Polycarbonate
Housing dimensions:	
Compact housing	231 × 125 × 90 mm
Modular (panel mounting)	200 × 122 × 30 mm
Modular (control unit)	192 × 128 × 63 mm
Connection set for the compact housing	3 × M32×1.5 with multiple sealing insert for 6 cables 3 × M16×1.5 for supply and communication
Electrical connections:	Cross-section rigid/flex: max. 2.5 mm ² , flex.: max. 2.5 mm ² without ferrule Rest: cross-section rigid: max. 1.5 mm ² , flex.: max. 0.75 mm ² with ferrule
Mounting:	
Compact housing	Wall mounting. Mounting position: vertical
Modular	Panel-mounting housing, vertical mounting position Control unit: standard rail

Climatic ambient conditions	
Storage	- 20°C...+ 70°C
Transport	- 25°C...+ 85°C
Operation	Compact housing -20°C...+50°C in EX zone 22: -20°...+40°C Modular -20°C...+50°C -No ATEX approval
Relative humidity	Relative humidity 95%, no condensation allowed, KUF according to DIN 40040

Subject to technical changes.

4. Device description

The solenoid valve controller HE 5731 is available in different versions. The HE 5731 Compact is also available with or without ATEX approval.



Note!

The figures show devices with different equipment and may therefore be only similar to the device that you have received!

ATEX approved devices are delivered **closed** with blanking plugs. A suitable connection set with ATEX-compliant cable glands can be ordered separately (article number **#57310088**). Please contact our service department (see chapter 11 Maintenance and service).

4.1. Overview

4.1.1. HE 5731 Compact



Figure 1. HE 5731 (Compact)

Name plate for <u>ATEX approved</u> devices:	Name plate for devices <u>without ATEX approval</u> :
<p>HESCH UK CA CE</p> <p>HE 5731 Magnetventilsteuerung # 5731 7000</p> <p>Netz power 24 VDC Ventile valves 16 Eingang input 4...20 mA S.-Nr. serial no. 00600558</p> <p>AXXERON HESCH electronics GmbH Boschstraße 8 DE 31535 Neustadt Tel.: +49 5032 9535-0 hesch-automation.com</p> <p>II3D Ex tc IIIC T135°C Dc IP65</p>	<p>HESCH UK CA CE</p> <p>HE 5731 Magnetventilsteuerung # 5731 0099 2190</p> <p>Netz power 24 VDC Ventile valves 16 Eingang input 4...20 mA S.-Nr. serial no. 00606781</p> <p>AXXERON HESCH electronics GmbH Boschstraße 8 DE 31535 Neustadt Tel.: +49 5032 9535-0 hesch-automation.com</p>

Figure 2. Name plates (Compact)



Figure 3. HE 5731 (Compact) Connections



Figure 4. HE 5731 E extension unit

Name plate for <u>ATEX approved</u> devices:	Name plate for devices <u>without ATEX approval</u> :
<div style="display: flex; justify-content: space-between;"> HESCH UK CA CE </div> <p>HE 5731E Erweiterungseinheit # 5731 7400</p> <p>Netz power 24 VDC Ventile valves 16</p> <p>S.-Nr. serial no. 00602513</p> <div style="display: flex; justify-content: flex-end; align-items: center;"> </div> <hr/> <p><small>AXXERON HESCH electronics GmbH Boschstraße 8 DE 31535 Neustadt Tel.: +49 5032 9535-0 hesch-automation.com</small></p> <p style="text-align: right;"><small>II3D Ex tc IIIC T135°C Dc IP65</small></p>	<div style="display: flex; justify-content: space-between;"> HESCH UK CA CE </div> <p>HE 5731E Erweiterungseinheit # 5731 0099 0100</p> <p>Netz power 24 VDC Ventile valves 16</p> <p>S.-Nr. serial no. 00608312</p> <div style="display: flex; justify-content: flex-end; align-items: center;"> </div> <hr/> <p><small>AXXERON HESCH electronics GmbH Boschstraße 8 DE 31535 Neustadt Tel.: +49 5032 9535-0 hesch-automation.com</small></p>

Figure 5. Name plates extension unit

4.1.2. HE 5731 Modular

The operating unit HE 5731 can be installed with a distance of up to 100 metres away from the control unit. The operating unit itself has no valve outputs. The valve outputs are located on the control unit (see Figure 8 and Figure 9). Operating and control unit are connected with a patch cable (Cat5 or higher). (The patch cable is not within the scope of supply).

HE 5731 Operating unit



Figure 6. HE 5731 (Modular) Operating unit



Figure 7. Rear of HE 5731 (Modular) Operating unit

HE 5731 Control unit

The control unit for standard rail mounting has 16 valve outputs maximum. 4 control units maximum can be connected to the operating unit (see also chapter 6.3). Figure 8 shows the control unit where external display devices are connected via a connection adapter (see chapter 10 Options). HE 5731 (Modular) Figure 9 shows the control unit where the connection adapter is integrated.

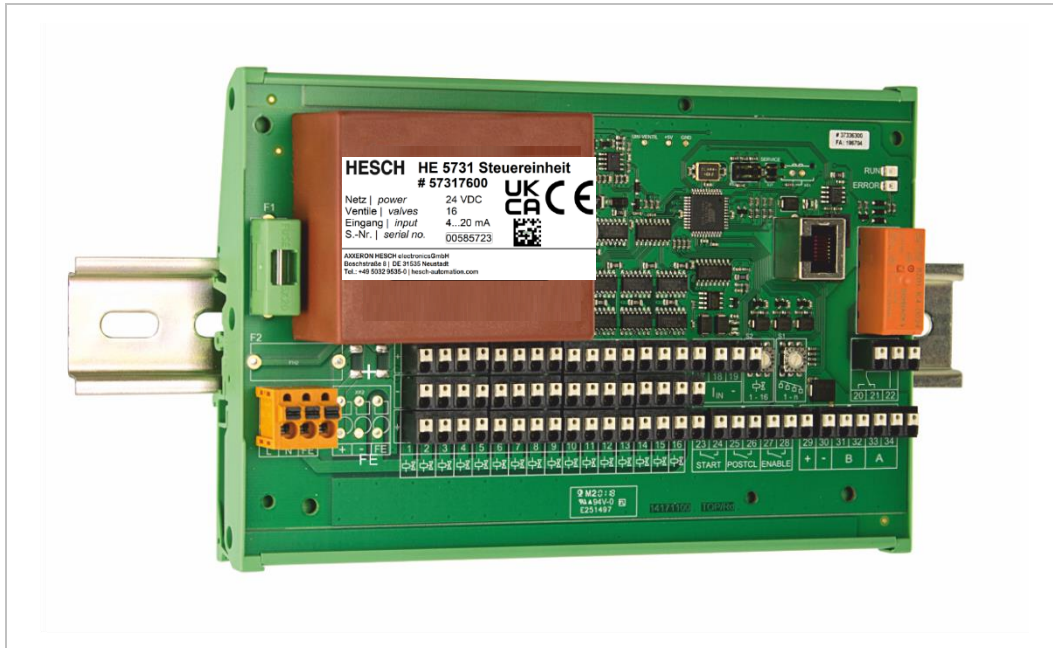


Figure 8. HE 5731 (Modular) control unit in standard rail enclosure (100...240 V AC) (connection adapter optional)

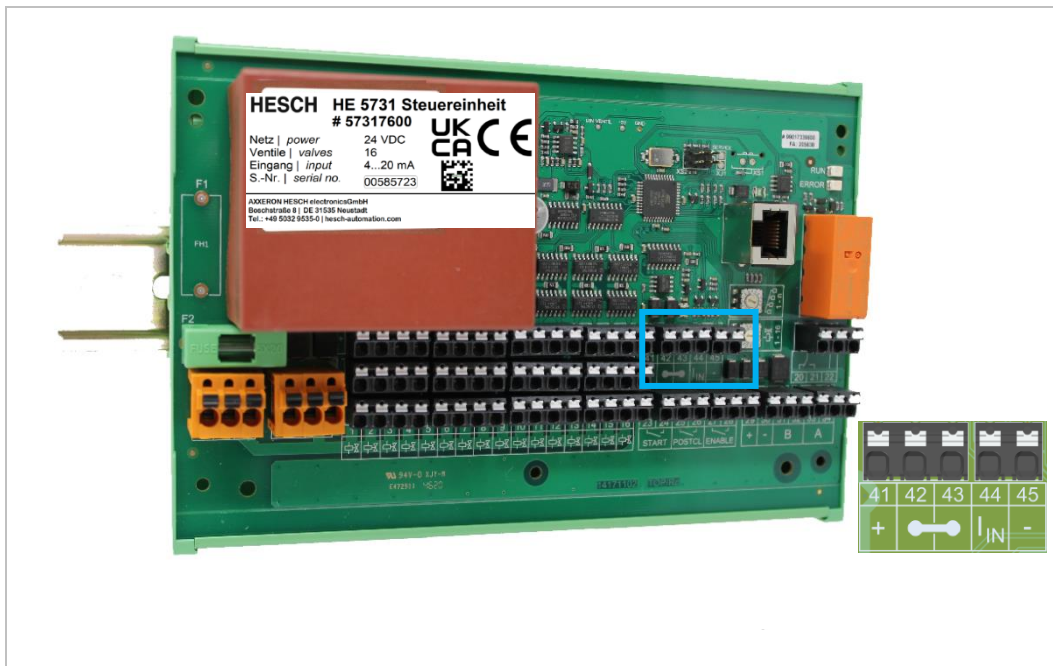








Figure 9. HE 5731 (Modular) control unit in standard rail enclosure (100...240 V AC) (without connection adapter)

4.2. Display and Operating Elements



Figure 10. HE 5731 Display and Operating Elements

Symbols	Meaning
	Operation signal
	Cleaning active
	Alarm active
	Pulse time
	Break time
	The number of valves is shown in the display and can be changed
	Post-cleaning cycles are shown in the display and can be changed
	Total / partial cycle is shown in the display and can be changed
	Interruption due to defective valve line or solenoid valves
	Short circuit of a valve line (overcurrent)
	Differential pressure is shown in the display
	The active valve number is shown in the display

Symbols	Meaning
	PARA key: parametrisation mode On/Off
	UP key: increase the displayed value
	DOWN key: decrease the displayed value
	ENTER key: Confirm the displayed value
	TEST key: Test mode On/Off
	Display <ul style="list-style-type: none"> • Normal operation: current differential pressure, current valve • Parametrisation mode: parameter values and alarm notes • Switch with UP / DOWN keys

4.3. Differential pressure column

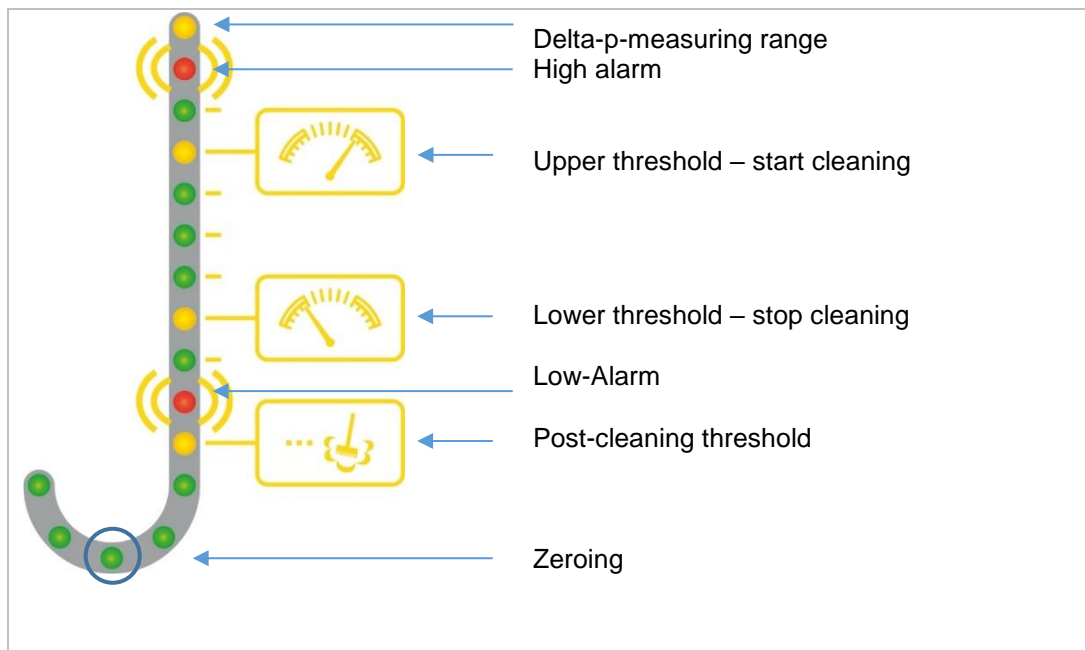


Figure 11. *Differential pressure column*

In normal operation, the LEDs display the differential pressure. In parametrisation mode, the selected parameter value blinks to show that it is operational.

5. Installation



Note!

If you want to drill the device to the wall, *Figure 12* can be used as a drilling template.

The ambient temperature at the installation point must not exceed the permissible temperature for nominal use specified in the technical data.



Note!

The HE 5731 Compact with **ATEX approval** may be installed in **EX zone 22**. You must necessarily observe the safety instructions for explosion protection, the indication on the name plate as well as the special regulations in *chapter 2.4 Device identification*.

The device version **HE 5731 Modular** is not ATEX-approved!

5.1. Dimensions

5.1.1. HE 5731 Compact

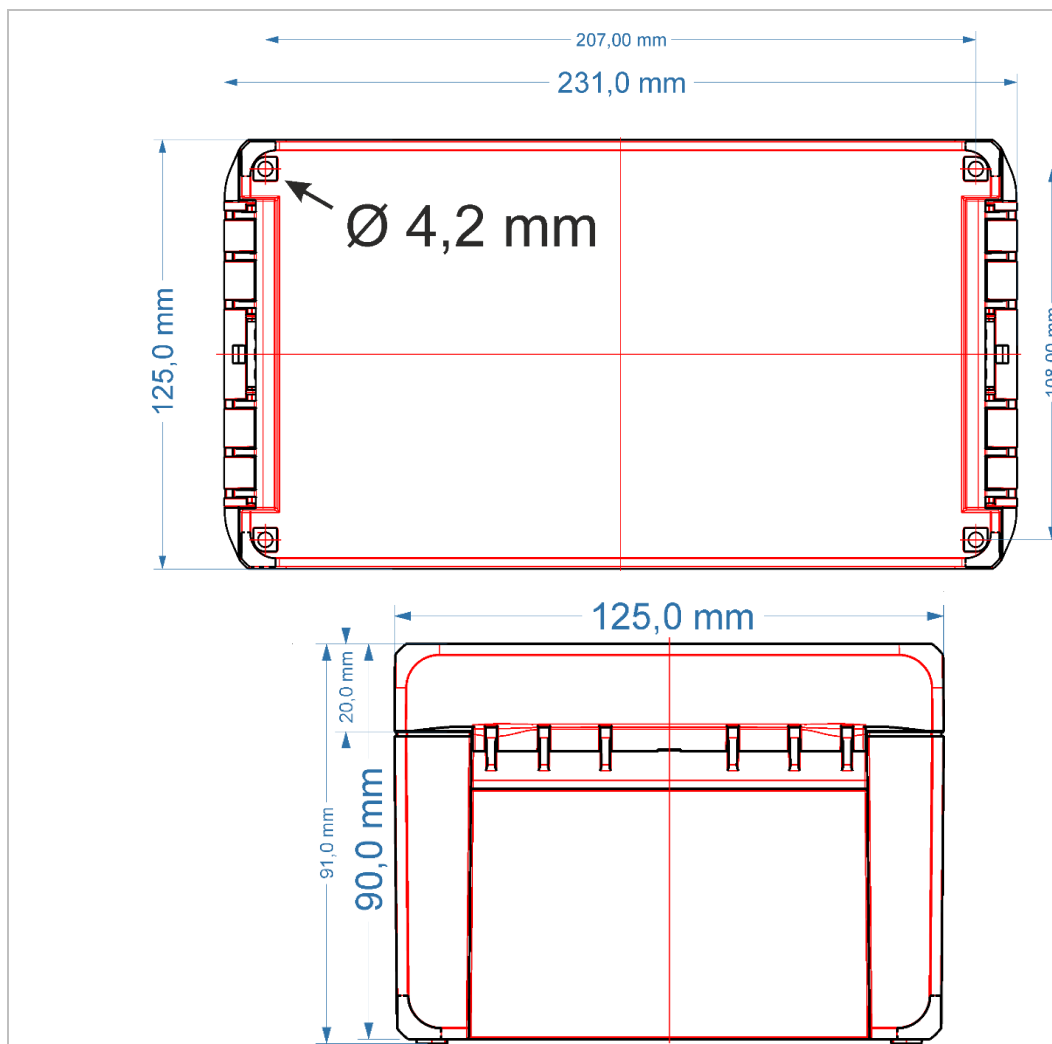


Figure 12. *Dimensions of compact housing (without screw connections)*

5.1.2. HE 5731 Modular

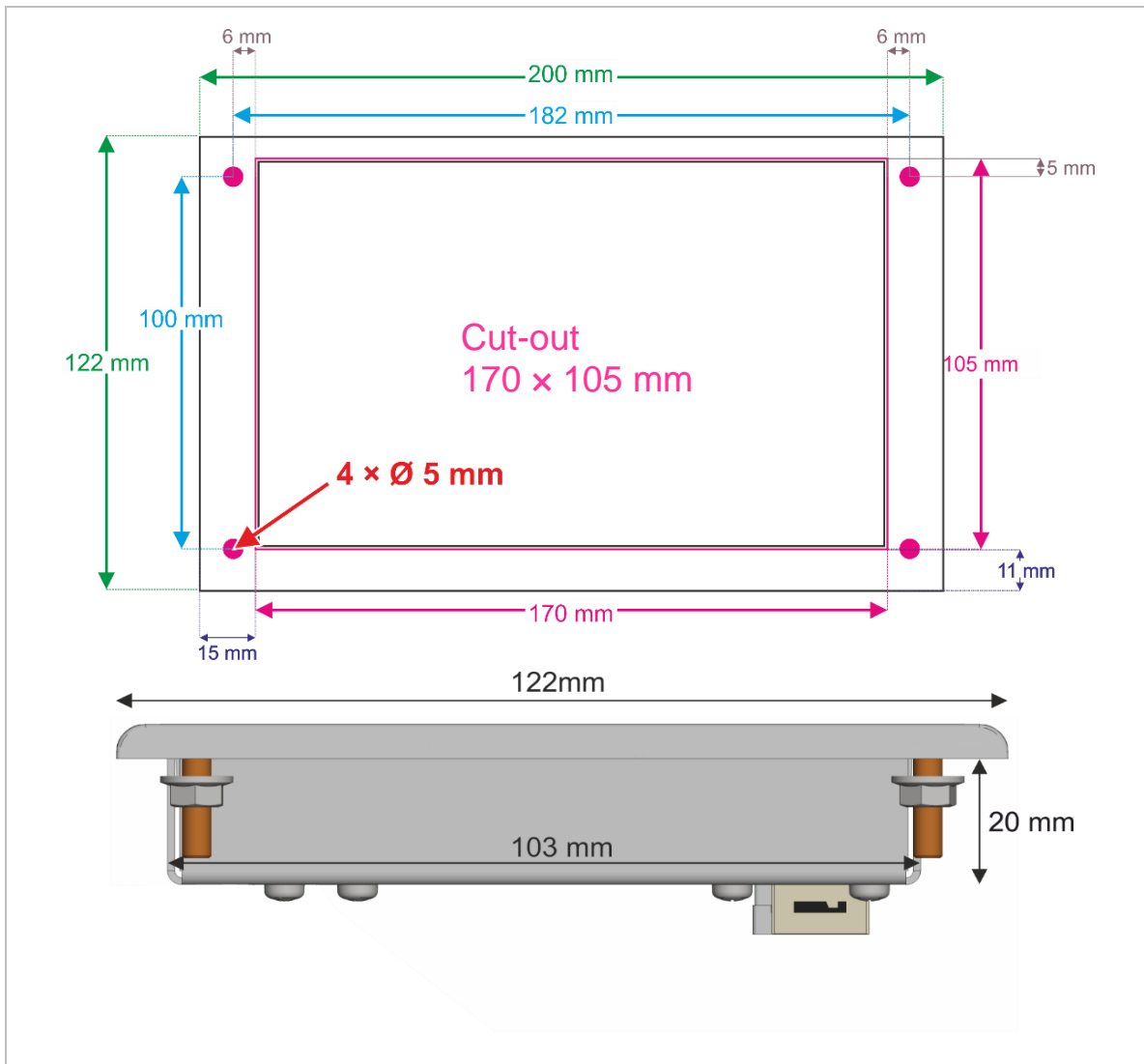


Figure 13. *Dimensions operating unit (panel mounting housing)*

Scope of delivery

- HE 5731
- Operating instructions #373344



Note!

Upon receipt, check the delivery for completeness and visible defects. In the event of a complaint, contact your responsible representative of AXXERON HESCH electronics GmbH immediately.

5.2. Opening the device (for HE 5731 Compact)

Opening and closing is performed by hinge technology without screws. A slit screwdriver is required to open the device. The screwdriver must be positioned at the intended position at the housing lid (see *Figure 14*).



Note!

Make sure to move the **screwdriver to the right** to open the hinge (see *Figure 14*). If the screwdriver is moved to the left, the housing cover may be damaged.

The housing lid can be opened to the left up to an angle of 105°. Optionally, the housing lid can be closed by 4 screws in addition, to protect it from unauthorised access. For further information, please contact your service representative of AXERON HESCH electronics GmbH.

The hinge closure without screws is recommended for a quick service access.

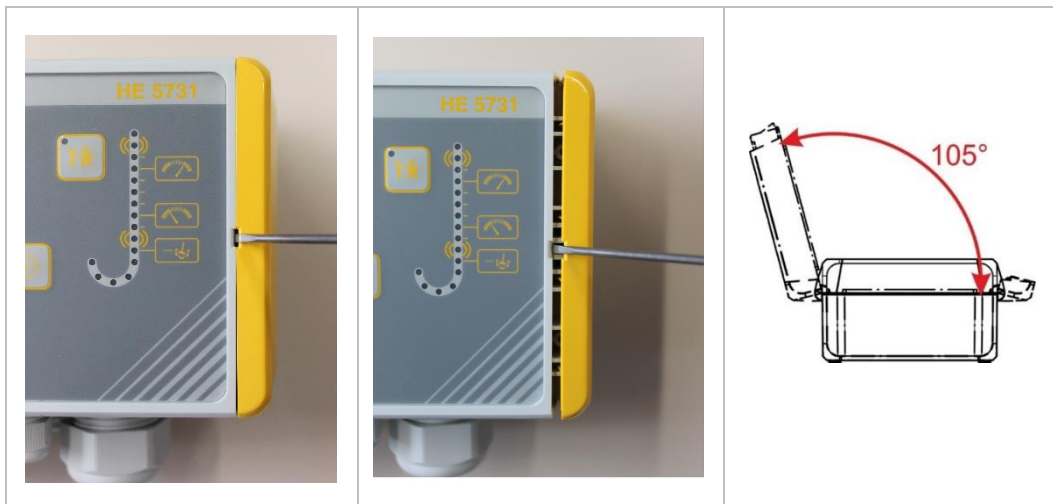


Figure 14. Opening housing lid to the left

6. Electrical Commissioning

Before switching on the device, observe the following:



Danger of Electrocutation!

Electrical installation must only be carried out when the power is disconnected.



Danger of Electrocutation!

Work on the electronics may only be carried out by qualified personnel.



Explosion prevention (for ATEX devices only!)

The HE 5731 Compact is suitable for use in explosion zone 22 with closed lid only. Before opening the device, it must be ensured that no explosive environmental conditions, such as dust exist.



Warning of material damage caused by electrostatic charge!

Observe the safety measures according to DIN EN 61340-51/-3 to avoid electrostatic discharge!



Material damage caused by wrong supply voltage!

The power supply must correspond to the voltage indicated on the nameplate.



Note!

Connect the cable firmly to the glands.



Note!

The temperature restrictions specified for the use of the device must be observed before and during operation.



Note!

Ensure that the FE conductor is connected.



Note!

The patch cable between the control unit and the operating unit may only be plugged/unplugged when switched off.

6.1. Read out and set password



1. Switch on the device while keeping both keys UP and DOWN pressed for 5 seconds. When the 5 seconds are up, "c o d" is displayed and afterwards the currently set password. In state of delivery, the pre-assigned password 001 is displayed (see also 7.2 Parameter table).



2. Press the ENTER key to set a new a password.



3. The first number starts blinking. Set the requested value with the UP and DOWN keys.



4. When the requested key is displayed, press the ENTER key.

5. Repeat step 3 and 4 to set the second and third number.



6. After the last number has been acknowledged with the ENTER key, HE 5731 is displayed and the control starts.

6.2. Supply voltage

See name plate for correct supply voltage. There are device versions with 100...240 V AC and device versions only with 24 V DC supply voltage.

6.2.1. Compact housing

Open the housing on the right hinge lock using a slotted screwdriver (see chapter 5.2 Opening the device (for HE 5731 Compact) and Figure 15):

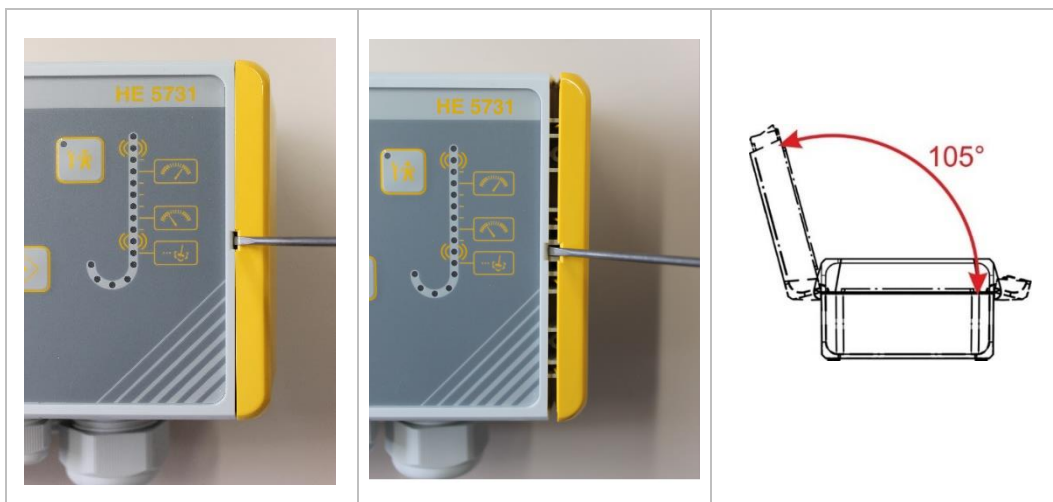


Figure 15. Opening the compact housing



Figure 16. HE 5731 Compact with 24 V DC supply voltage (connection adapter optional)



Figure 17. HE 5731 Compact with 24 V DC supply voltage (without connection adapter)

- See name plate for supply voltage value (on the right of the housing). (There are devices with 100...240 V AC and devices with 24 V DC supply voltage).

The supply for the extension units is done using the basic device, using terminals 29, 30 with 24 VDC.

- Make sure that the FE lead is connected. If extension units are used, the earth connection is to be connected separately for each extension unit.

The electrical commissioning of the extension units is carried out identically for HE 5731 Compact and HE 5731 Modular.

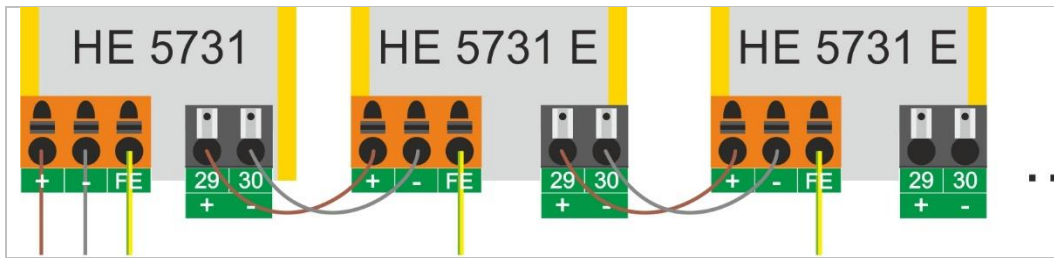


Figure 18. Connecting master device (24 V DC version) with extension unit (24 V DC)

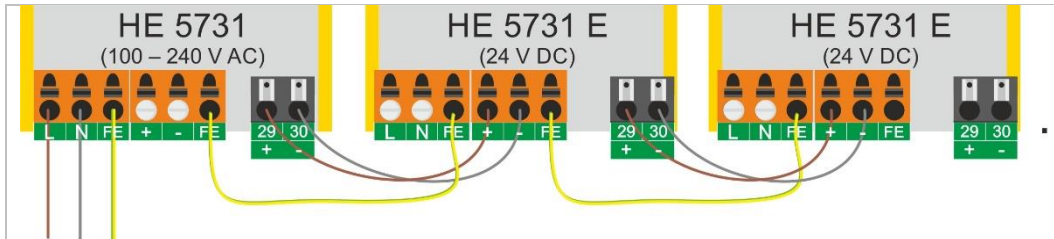


Figure 19. Connecting master device (100...240 V AC version) with extension unit (24 V DC)

6.2.2. Panel mounting housing

The supply voltage is connected centrally at the control unit. The operating unit is connected to the 24 V DC supply via a patch cable (CAT 5 or better). The patch cable must not be longer than 100 metres. (Patch cable is not included in delivery).

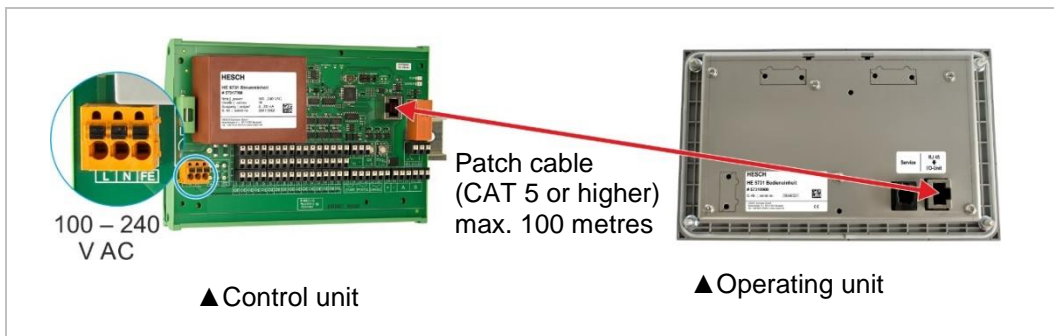


Figure 20. Electrical commissioning of HE 5731 Modular (100...240 V AC)

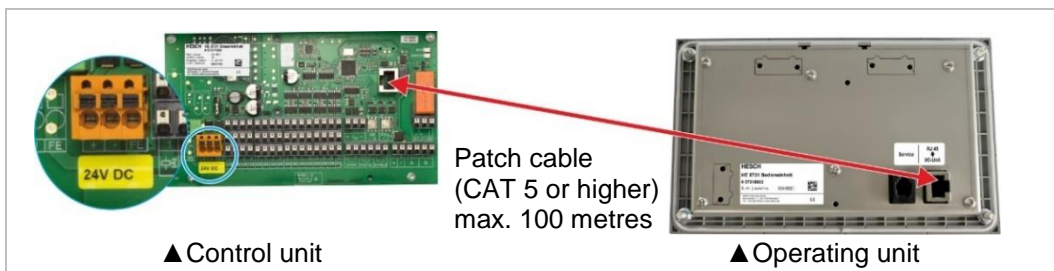


Figure 21. Electrical commissioning of HE 5731 Modular (24 V DC)

6.2.3. Communication

Serial communication is enabled by connecting the “B” or “A” connections, from device to device. The coding switch provides the logical position in the sequence of the controls, which do not have to correspond to the cabling sequence.



Caution!

The lines B and A must not be interchanged.

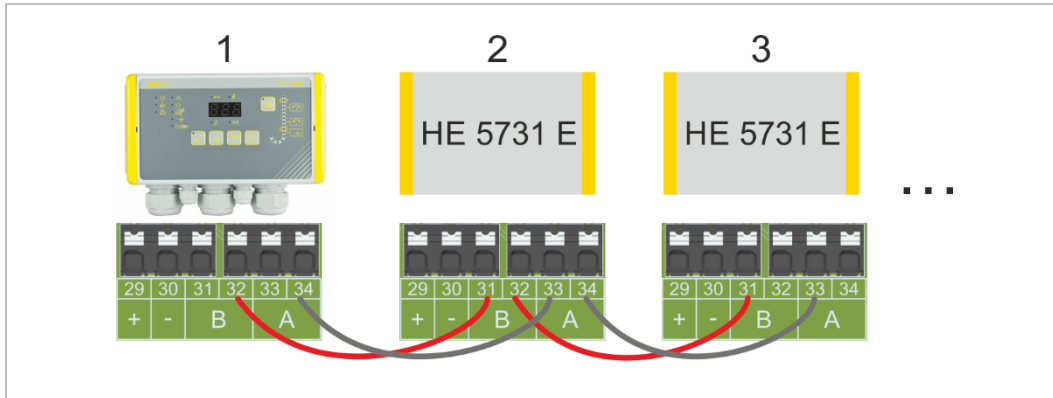


Figure 22. Communication

6.2.4. Bus structure



Warning!

Star-formed cabling of the serial connection or branches are not allowed.

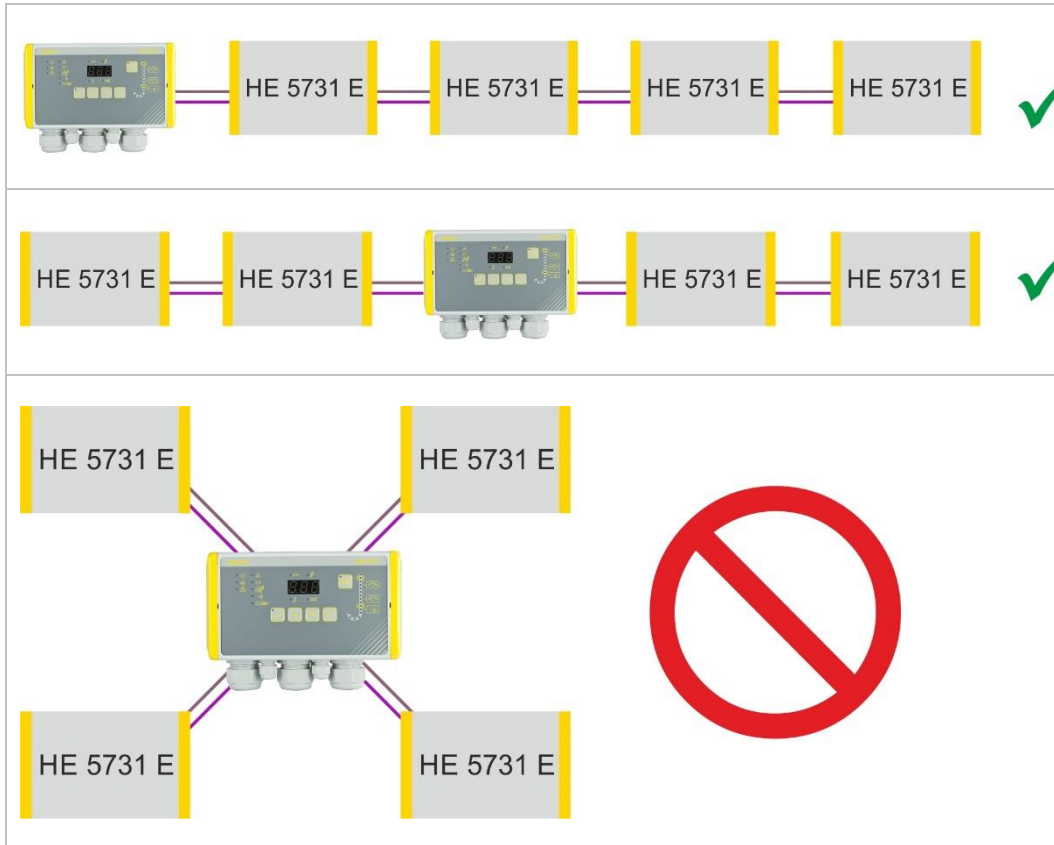


Figure 23. Bus structure

6.3. Valve connections

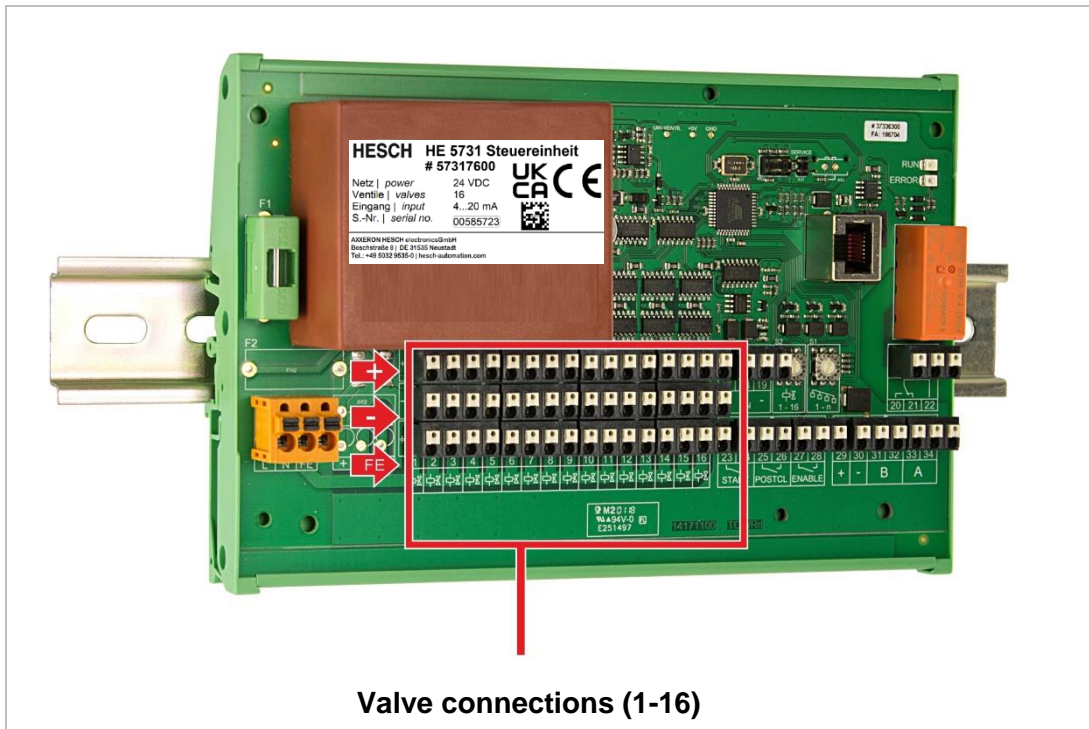


Figure 24. HE 5731 control unit (100...240 V AC) valve connections



Note!

All valve outputs of a system refer to the same ground (-). It is permitted to use one ground wire for multiple valves.



Note!

All valve outputs are short-circuit proof and are monitored for function. In case of a cable break (resistance too high) or of overcurrent >1.5 A (also short-circuit), an error is displayed (see also chapter 9 Error messages).

Max. 16 valves can be connected to the solenoid valve control. The connections of a valve are arranged vertically. One terminal is available for the PE connection of a valve.



The valve outputs are set up for 24 VDC and 1A. The minimum recovery time (pause) must be

- > or = ten times the pulse time when using software version up to 2.04,
- > or = the pulse time when using software version 2.10 or higher.

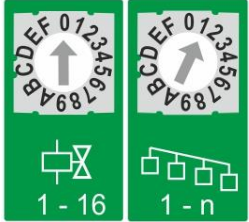
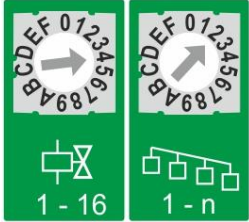
The control extends the effective pause time automatically to the above ratio.

The software version can be determined via a serial number query in the customer area of our website <https://www.hesch-automation.com/en/login/>.

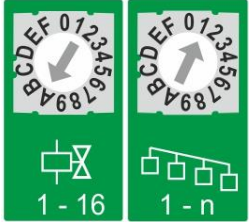
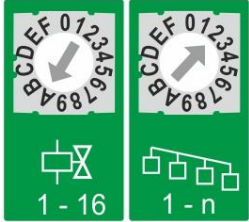
6.3.1. Coding switch

	<p>Coding switch for the device order. The device number of the communication indicates the controlled order of valves, independent of the order of wiring. The device number "5" is for the operating and control unit without effective valve connection. The valves are connected starting from control unit 1. Numbers 6 to 9 and letters A to F are without function.</p>
	<p>Valve coding switch 16 valves maximum can be connected to each device. The number of valves that are controlled via this device, are set from 1 to 16 by means of the valve coding switch (valve 10-15 = A-F, valve 16 = 0). If the device is operated without extension, the number of valves may stay set to "16". Then the adjustment set in the menu item "valve number" is valid.</p>

Example: 20 valves (HE 5731 Master=16, HE 5731 E Slave=4)

<p>Master: Valve coding switch = 0 Device coding switch = 1</p> 	<p>Slave: Valve coding switch = 4 Device coding switch = 2</p> 
---	--

Example: 20 valves (HE 5731 Master=10, HE 5731 E Slave=10)

<p>Master: Valve coding switch = A Device coding switch = 1</p> 	<p>Slave: Valve coding switch = A Device coding switch = 2</p> 
--	---

7. Parametrisation



Explosion Prevention! (for ATEX approved devices only!)

It is permitted to use the device version **HE 5731 Compact** (see Figure 1) in explosion zone 22 with closed lid. It is mandatory to ensure that no explosive ambient conditions, such as e.g. development of dust exist, before opening the device for e.g. parametrisation.

7.1. Parametrisation with Device Keyboard



1. Press the PARA key to change the values of the system parameters. A flashing LED indicates the value currently to be changed.

c o d

2. If a password has been assigned, c o d is displayed.



3. Press the ENTER key.



4. Press the UP and DOWN keys to enter the password digit by digit.



5. Press the ENTER key to acknowledge the password.

As long as you stay in the parameter menu, the password does not need to be entered again.



6. Use the UP and DOWN keys to select the required parameter. The current value is displayed.



7. Press the ENTER key to change the parameter value. The first digit to be changed flashes in the display.



8. Use the UP and DOWN key to set or change the value of the digit.



9. Press the ENTER key to acknowledge the value. The next digit then flashes in the display

10. Repeat steps 8 and 9 to set the second and third digit. The next parameter is offered.

11. If necessary, change the next parameter.



12. The parametrisation mode is terminated by pressing the PARA key again. To enter the parameter menu once again, you must re-enter the password.

7.2. Parameter table

Parameter	Adjustment range	Default setting	Pre-assignment
Password 3-digit number that must be entered before parameters can be changed. 0 = no password protection	0...999	000	001
Pulse time	0.01...9.99 s	0.10 s	0.10 s
Break time	1.0 s ...999 s	5.0 s	5.0 s
Number of valves	1...64	16	16
Post-cleaning cycles	OFF, 1-20	1	1
Type of cleaning Part/overall cycles (0 = part cycle, 1-9 = overall cycle)	0...9	0	0
Δp-measuring range (MB)	5.0...500 mbar	5.0 mbar	
0...35 mbar	5...35 mbar	35 mbar	35 mbar
0...90 mbar	5...90 mbar	35 mbar	90 mbar
0...450mbar	5...450 mbar	35 mbar	450 mbar
High alarm [mbar] Threshold for the high alarm message. If exceeded, the relay contact is closed	OFF, 0%...500.0 mbar	30.0 mbar	30.0 mbar (at 0...35 mbar measuring range)
			80.0 mbar (at 0...90 mbar measuring range)
			390.0 mbar (at 0...450 mbar measuring range)
Upper threshold [mbar] If exceeded, dp-dependent cleaning starts. Start of the Δp -cycle	0.0...500.0 mbar	15.0 mbar	15.0 mbar (at 0...35 mbar measuring range)
			40.0 mbar (at 0...90 mbar measuring range)
			190.0 mbar (at 0...450 mbar measuring range)

Parameter	Adjustment range	Default setting	Pre-assignment
Lower threshold [mbar] If underrun, dp-dependent cleaning stops. End of dp cycle	OFF, 0.0...500.0 mbar	10.0 mbar	10.0 mbar (at 0...35 mbar measuring range)
			25.0 mbar (at 0...90 mbar measuring range)
			130,0 mbar (at 0...450 mbar measuring range)
Low-alarm [mbar] Threshold for the low alarm message. If the value falls below this value, the relay contact is closed if the value does not fall below the post-cleaning threshold within the low-alarm delay.	OFF, -5.0...500.0 mbar	OFF	OFF (at 0...35 mbar measuring range)
			OFF (at 0...90 mbar measuring range)
			OFF (at 0...450 mbar measuring range)
Post-cleaning Threshold [mbar] The threshold is activated when the lower threshold is exceeded If the threshold is activated and the pressure falls below the threshold, a post-cleaning cycle is triggered and the cleaning relay is closed for the parameterised post-cleaning time.	OFF, 0.0...500.0 mbar	2.0 mbar	2.0 mbar (at 0...35 mbar measuring range)
			5.0 mbar (at 0...90 mbar measuring range)
			25.0 mbar (at 0...450 mbar measuring range)
dp-Offset [mbar] The offset is added to the currently measured differential pressure.	-50.0...50.0 mbar	0 mbar	0 mbar

The number of valves is valid for the entire system. The number of valves of each control unit is set via the valve coding switch (see *chapter 6.3.1 Coding switch*). An interruption alarm goes off, if less valves as indicated are connected.

The following parameters can only be changed with the "EasyTool Controls" program:
(see chapter 7.4 Parametrisation with Service PC)

Parameter	Adjustment range	Factory setting	Pre-assignment
Delta-p filter Filter constant for damping the Delta-p measurement.	0.1...10.0 s	2.0 s	2.0s
Delta-p working range Defines the working range below the upper threshold in % of the measuring range. Alternative to the lower threshold.	1...100%	10%	10%
High alarm Delay Delay after the high alarm threshold has been exceeded until the high alarm relay is switched.	0.1...30.0 s	2.0 s	2.0 s
Low-alarm Delay Delay after falling below the low alarm threshold until the low alarm relay is switched. The relay is not switched if the value falls below the final cleaning threshold within the delay.	1...600 s	300 s	300 s
Precoating Offset The precoating offset increases the start threshold for cleaning (upper threshold). At an offset of 0, the precoating function is disabled. After reaching the first cleaning threshold (increased by the precoating), the precoating is automatically disabled.	OFF, 0...500.0 mbar	1.0 mbar	1.0 mbar
			3.0 mbar
			13.0 mbar
Post-cleaning Offset The automatic post-cleaning is activated when the value "Post-cleaning threshold" + value "Offset post-cleaning" is exceeded (is independent of the lower threshold)	0.5...10.0 mbar	2.0 mbar	2.0 mbar
			5.0 mbar
			10.0 mbar

**Note!**

The threshold values can be set as required. There is no logical check. If the values of the lower thresholds are parametrised above the values of the upper thresholds, the cleaning and pressure display cannot function as expected.

**Note!**

Post-cleaning is suppressed as long as precoating is activated.

7.3. Offset for zeroing



1. Press PARA key.



2. Use the UP / DOWN keys to select the "Zeroing" parameter.



3. Confirm with the ENTER key. The display flashes.



4. Press UP / DOWN simultaneously for 2 seconds. The currently measured value is inverted and accepted as the offset.



5. If the UP / DOWN keys are pressed independently, the offset value can be set manually.

7.4. Parametrisation with Service PC

When parametrising several devices, parametrisation with a service PC is recommended. The USB / TTL adapter required for this is available from HESCH. The parameters can be changed via PC and the "EasyTool Controls" program. The program can be used to save a configuration or to restore a saved configuration.

1. Connect the PC to the operating unit via USB cable.
2. Start "EasyTool Controls" to transfer the files or data.

**Note!**

Instructions for the most important program functions are available at AXXERON HESCH electronics GmbH.

7.5. Enable / Disable Precoating



Enable: Press the TEST key and the UP key simultaneously. "P r E" is displayed alternately with other information.



Disable: Press the TEST key and the DOWN key simultaneously.

After reaching the first cleaning threshold (increased by the precoat), the precoat is automatically disabled.

7.6. Reset Default Settings



Note!

If a password has been assigned, it must be entered during reset. After the reset, the password is 0. A new password must be assigned. (see *chapter 6.1 Read out and set password*).



1. Switch on the device while keeping both keys UP and DOWN pressed for 5 seconds.

EEP

2. EEP is displayed.

cod

3. When the 5 seconds are up, cod is displayed to enter the password.



4. Press the ENTER key to start the password entr



5. After entering and acknowledging the last digit of the password, the control starts with default parameters (see *7.2 Parameter table*)



6. If no password has been assigned, the control starts automatically after 5 seconds with default parameters (see *7.2 Parameter table*).

8. Operation of the control

8.1. Normal Operation

Operation is started by applying the supply voltage. The valve cleaning is controlled via the inputs and outputs of the device.



Note!

All valve outputs of a system refer to the same mass (-). It is permitted to use one ground line for several inputs.

	<ol style="list-style-type: none"> 1) As long as the start input (START) is closed, the valves are controlled with the set control times. Prerequisite: The enable input (ENABLE) is closed. 2) A push-button signal at the post-cleaning input (POSTCL) starts the triggering of the valves with the set control times. The number of cleaning cycles is specified in the parameters. Prerequisite: The enable input (ENABLE) is closed. 3) To initiate cleaning, the enable input (ENABLE) must be closed. Cleaning can be triggered by closing the start input, a push-button signal at the post-cleaning input (POSTCL) or by exceeding the upper differential pressure threshold. <p>WARNING! In test mode, valves can also be controlled without release.</p>
	<p>Operating or fault signal relay</p> <p>In error-free operation, the contact between terminals 21 and 22 is closed.</p> <p>The following causes lead to an error message:</p> <ol style="list-style-type: none"> 1) power failure (fail-safe operation) 2) bus error 3) device fault (parameter error) 4) valve errors 5) Δp-alarms



Note!

Post-cleaning is suppressed as long as precoating is activated.

8.2. Test Function



1. Press the TEST key to perform a function test of the valves.



2. Select the desired valve with the UP / DOWN keys.



3. Press ENTER (The selected valve is permanently operated with the stored pulse and pause time).

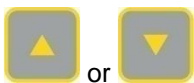
4. If necessary, test the next valve.



5. The active test mode is indicated by the illuminated LED on the TEST key and can be cancelled with the PARA key. If the TEST key is pressed longer than 2 seconds, the currently triggered valve is operated with the stored pulse and break time and can only be cancelled with the PARA key.

8.3. Specific key combinations

8.3.1. Changing the displayed value during normal operation



1. Three different display functions are available:
 - differential pressure dp
 - solenoid valve number
 - dp and solenoid valve number in rotation

Switch between the displays with the UP or DOWN keys. The LED below the display indicates which value is currently displayed.

8.4. Differential pressure measurement

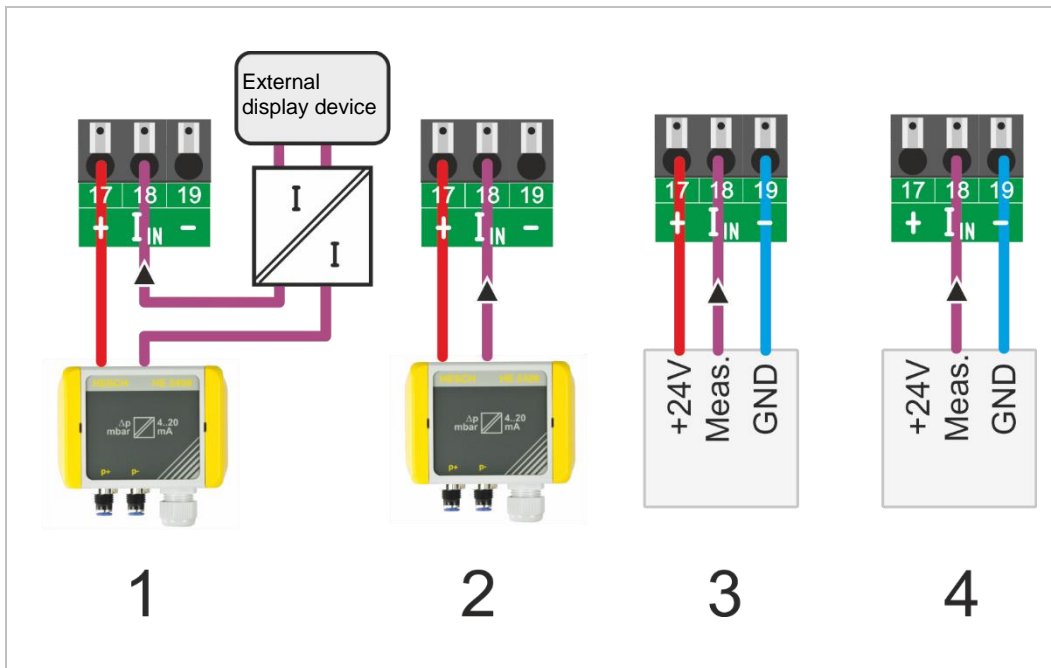


Figure 25. Differential pressure measurement (connection adapter optional)

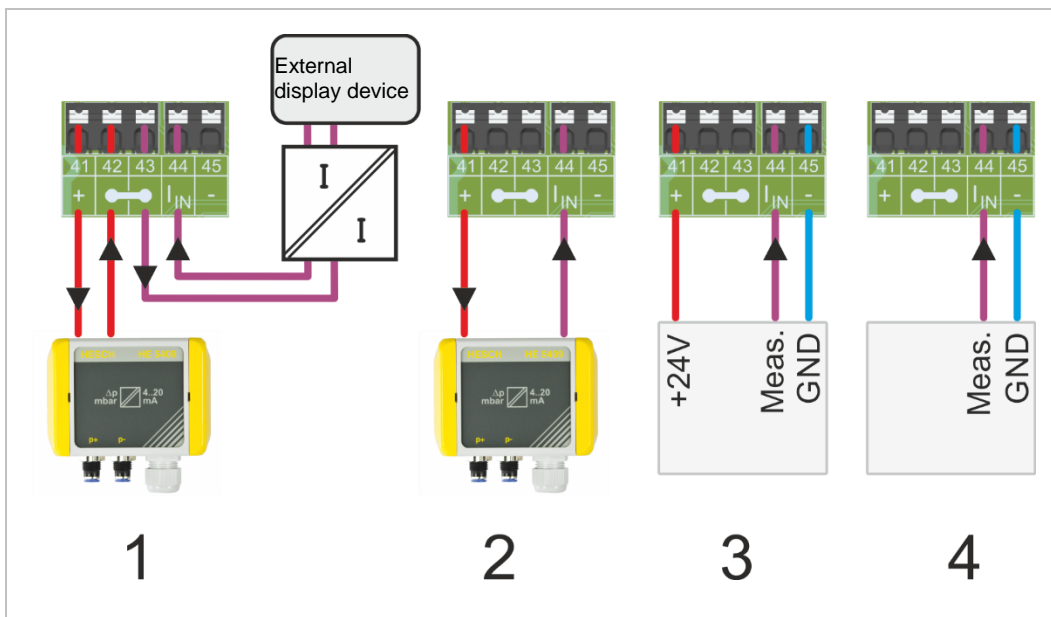


Figure 26. Differential pressure measurement (without connection adapter)

- 1 2-wire sensors, such as HE 5409, HE 5410, HE 5421 with communication of the power signal to an external display device (see *chapter 10 Options*).
- 2 2-wire sensors, such as HE 5409, HE 5410, HE 5421
- 3 3-wire sensors with supply and measurement output
- 4 Providing the measurement value through an analog output

The differential pressure (does not apply to devices with pure time control) is measured externally and passed on as a 4...20 mA signal to the control. The signal can be connected to both the master, as well as to one of the extension units. In addition, there is the possibility that the 4...20 mA signal can be connected to an external display device. To do that, the display device is switched corresponding to the connection plan in sequence with the differential pressure transducer (e.g. HE 5409), (see position 1 in Figure 25 or Figure 26). If a galvanic separation is required, an isolation amplifier (e.g. HE 501/HE 502) must be used.

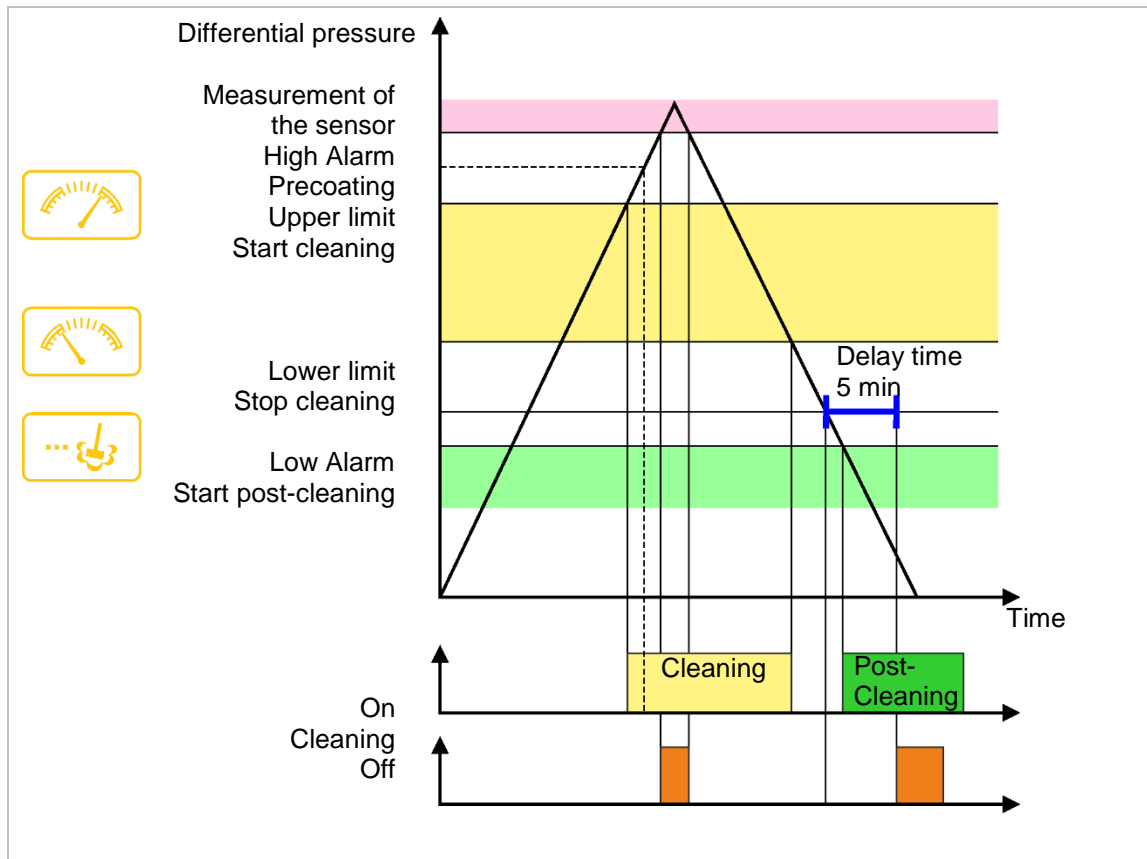










Figure 27. *Cleaning process*

The cleaning process is started in normal operation, when the upper limit is exceeded, and ended when the lower limit, "cleaning", is reached. During activated precoating function the de-dusting at the upper threshold that is increased by the precoating offset starts.

There is a delay time of 5 minutes to carry out purification during a normal shut-off process, without triggering an alarm warning of the low alarm. The purification limit must be reached before the end of the 5 minutes; otherwise, the low alarm is triggered.

9. Error messages

Display	Cause	Action
<p>“buS” is blinking in the display, the alarm LED is illuminated</p>	<p>The sum of the valves set on the devices is smaller than the set total valve number</p>	<ul style="list-style-type: none"> • Check the set total valve number • Check the valve number set on the coding switch • Check cabling of the interface and power supply. (Terminals 29-34 as well as + and – on the extensions)
<p>„d r x**“ flashes in the display</p> <p>*x= 1, 2, 3 or 4 (device number)</p>	<p>A slave device which is connected the master valve control, has no pressure switch function</p> <p>x=device number of the affected slave device</p>	<ul style="list-style-type: none"> • Update the software of the Slave device
<p>The differential pressure display shows</p> 	<p>The differential pressure signal is below the permissible measuring range</p>	<ul style="list-style-type: none"> • Check differential pressure • Check external cabling on terminal 17-19 or 41,44,45 • Eliminate possible interruption of the cabling
<p>The differential pressure display shows</p> 	<p>The differential pressure signal is above the permissible measuring range</p>	<ul style="list-style-type: none"> • Check differential pressure signal • Check external cabling on terminal 17-19 or 41,44,45 • Eliminate possible interruption of the cabling
<p>The LED   flashes. The display shows the relevant valve</p>	<p>No current flows through the valve line</p>	<ul style="list-style-type: none"> • Check the wiring to the indicated valve for interruption • Check the valve in question • Check if the valve plug is connected correctly.

Display	Cause	Action
The LED  flashes. The display shows the relevant valve	The permissible valve current of 1 A has been exceeded	<ul style="list-style-type: none"> • Check the indicate valve for short-circuit • Check the valve in question • Check if the valve plug is connected correctly.
Display is dark or lights up briefly and goes out again immediately	The internal fuse triggers (After a recovery time of a few minutes, the controller can be switched on again)	<ul style="list-style-type: none"> • Switch off the operating unit • Check whether the ambient temperature is above the permissible • Check current consumption of solenoid valves • Observe restrictions.
The segment display flashes. In the first field a „d“ is indicated 	The pressure switch (as an option) indicates a misfunction at the displayed valve or at the pressure switch itself.	<ul style="list-style-type: none"> • Check valve / pressure switch
Red LED is lit on the valve extension	A wrong knot number has been set.	<ul style="list-style-type: none"> • Check set knot number and adjust if necessary
The high alarm LED  flashes	The differential pressure exceeds the set limit	<ul style="list-style-type: none"> • Adjust the set pulse and pause times • Check the filter element • Check the solenoid valve, that it is mechanically functioning without defects or errors • Check the air pressure system
The low alarm LED  flashes	The differential pressure is going below the set limit for longer than 5 min. without reaching a post-cleaning limit	<ul style="list-style-type: none"> • Adjust the set pulse and pause times
Post-cleaning is not working	<ul style="list-style-type: none"> • no signal at post-cleaning entry • precoating function active • differential pressure does not exceed the lower cleaning threshold 	<ul style="list-style-type: none"> • Disable precoating (see chapter 7.5 Enable / Disable Precoating)

10. Options¹

10.1. Connection adapter current input / output

**Danger of electric shock!**

Electrical mounting only in de-energised state.

**Damage to property through electrostatic charge!**

Observe the safety measures specified in DIN EN 61340-51/-3 to avoid electrostatic discharge!

**Note!**

Work on the electronic parts may only be done by qualified personnel.

**Note!**

Once the connection adapter is mounted, it cannot be removed again.

**Note!**

The external device (display unit or similar) which is connected, must have a differential or a galvanically isolated current input. Otherwise, correct operation is not guaranteed.

In addition, there is the possibility that the 4...20 mA signal can be connected to an external device. To do that, the device is switched in sequence with the 2-wire sensor. The connection adapter for the analogue current input and output is plugged onto the existing terminals 17–19.

The connection adapter can be purchased at AXXERON HESCH electronics GmbH (article number # 57310089).

¹ This chapter only concerns devices that are designed to use an optional connection adapter.

1. Open the housing cover (see Figure 15).
2. Put the connection adapter with the pin header onto the terminals 17-19.
3. Connect the external device (see Figure 29).
4. Close the housing cover.

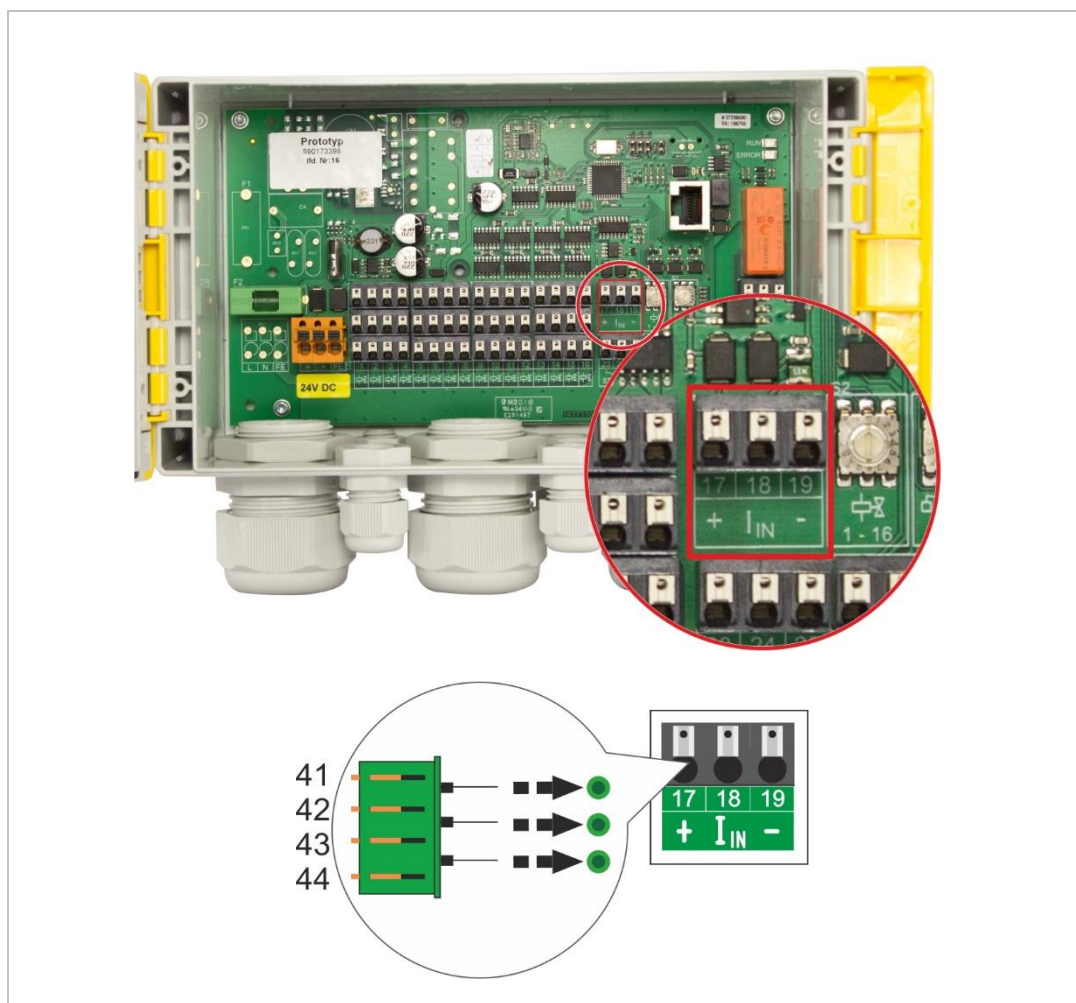


Figure 28. Connection adapter current input / output (article number # 57310089)



Note!

If no external device is connected, the analogue output must be bridged.

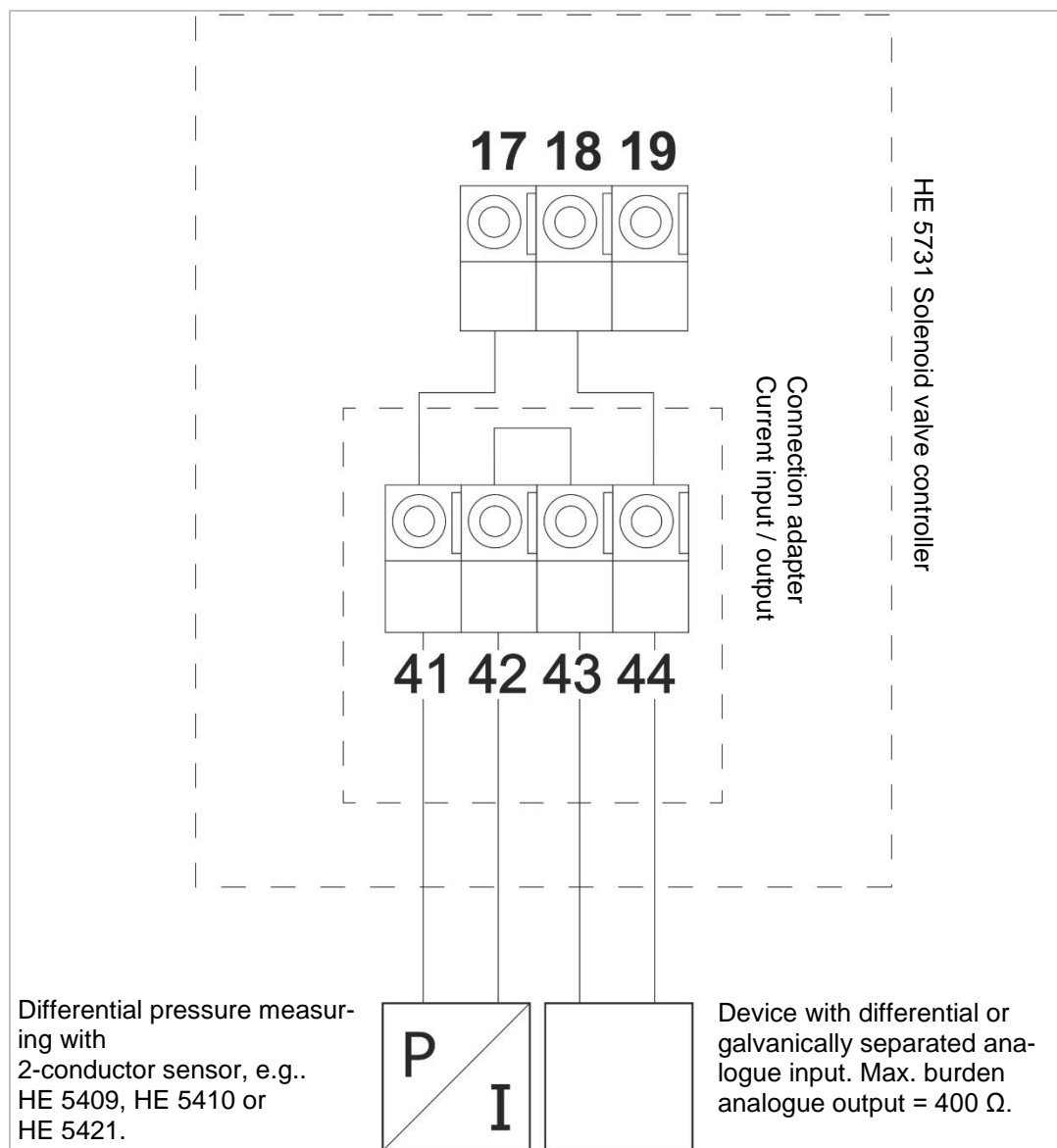


Figure 29. Connection adapter / terminals

10.2. Pressure switch

Optionally, the enable input (EN) can be used for connecting a pressure switch for controlling the system. "ENABLE" is then without function at this input.

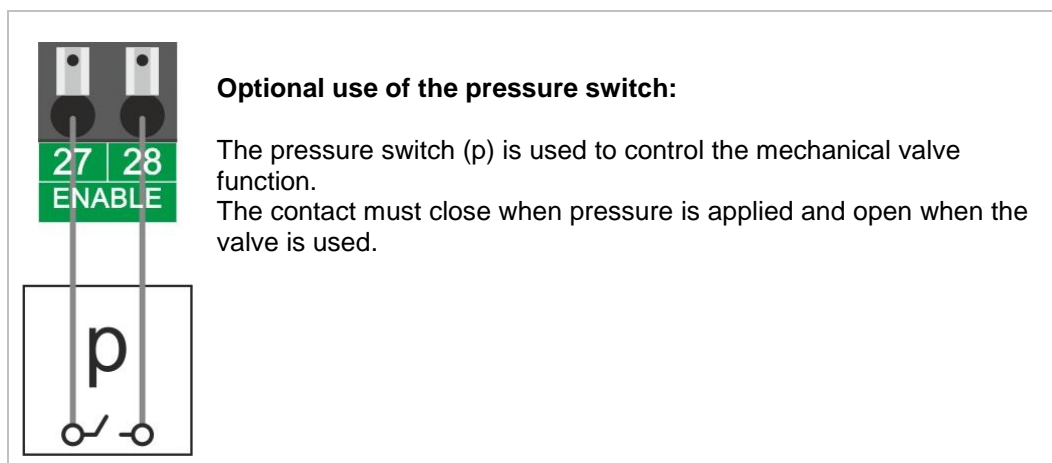


Figure 30. *Pressure switch*

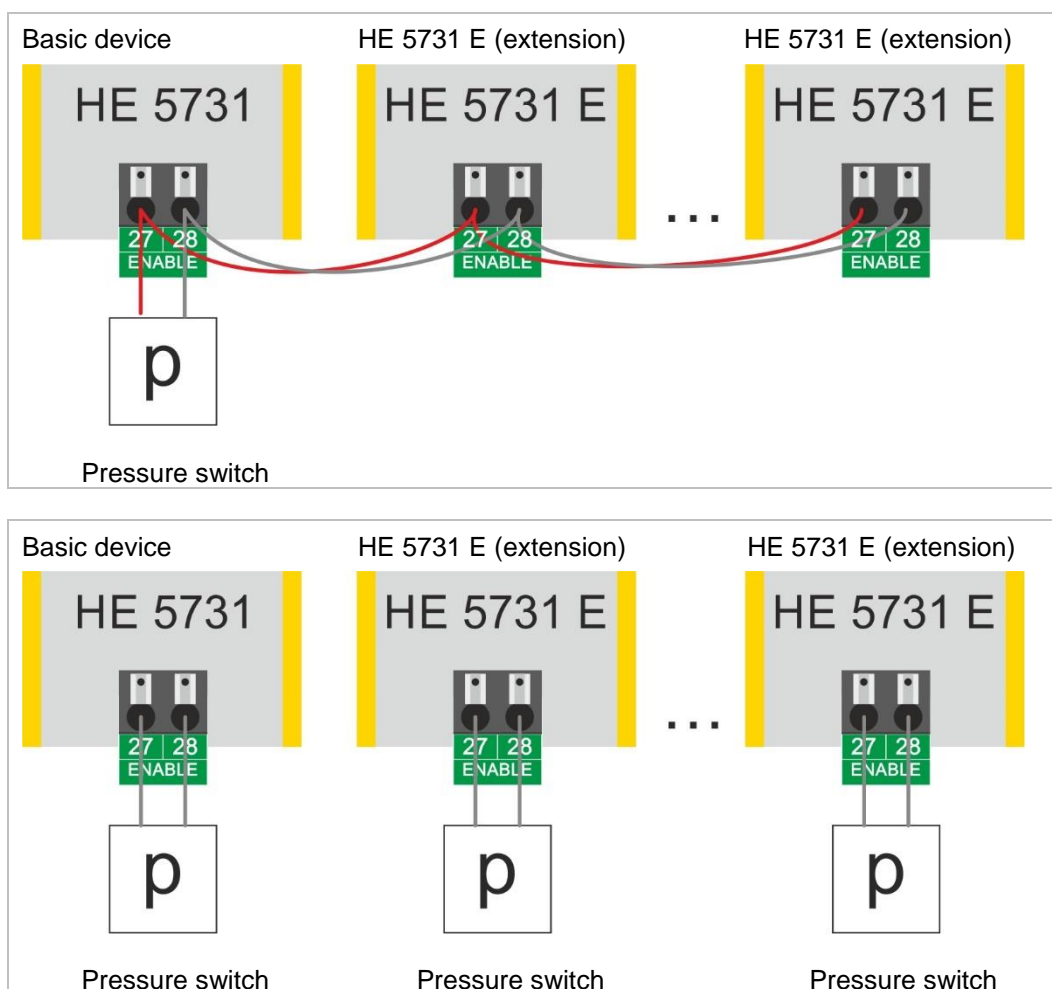


Figure 31. *Connection diagram of devices with pressure switch*

11. Maintenance and service

Maintenance

The device has to be cleaned regularly to avoid an increased dust development.

Disposal

Dispatch metals and plastics for recycling. Electrical and electronic components must be collected separately and disposed of accordingly. Dispose of assembled printed circuit boards professionally.

Service

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