

KA SHEV-3/-6(-AP) EN 1.2

Valid for following part numbers:

ST4 3140 (SHEV-3)
ST4 3141 (SHEV-6)
ST4 3146 (SHEV-3-AP)
ST4 3151 (SHEV-6-AP)

For further information,
please visit our product
website:



[short.simon-protec.com/
sheven](http://short.simon-protec.com/sheven)



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**These operating instructions are only valid with the supplied
supplementary sheet „Safety instructions and Warranty conditions!“**

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1. General

1.1. Foreword to this quick guide

This quick guide serves as a fast introduction for the installation by trained, experienced specialist personnel (e.g. mechatronics technician or electrician) and/or specialist personnel with knowledge involving the installation of electrical devices.

The complete operating manual can be found on our product website:

short.simon-protec.com/sheven

Please precisely observe the connection assignment, the minimum and maximum performance data (see Chapter 6: „Technical data“ on page 10) and the supplementary sheet „Safety instructions and warranty conditions“.

1.2. Use for the intended purpose

See supplementary sheet „Safety instructions and warranty conditions“!

2. Functional description

SHEV 3/6 (Smoke and Heat Exhaust Ventilation) represents the compact control panel system, mainly used in staircases for smoke extraction and daily ventilation.

It allows for the connection of

- smoke detectors,
- SHEV emergency switches,
- fire alarm signals

and the control of actuators.

SHEV 3/6 essentially consists of three components:

- power supply
- emergency power supply
- control electronics

2.1. Power supply (tested according to EN 12101-10)

If the SHEV 3/6 is connected to the mains, it provides the maximum output via the power supply (mains-operation).

2.2. Emergency power supply

The emergency power supply of the SHEV 3/6 is ensured by two 12 V lead batteries.

2.3. Control electronics (tested according to prEN 12101-9 / ISO 21927-9)

The complete control of the SHEV 3/6 is handled by a microcontroller.

2.4. Operating status indicators (OK, FAULT and ALARM)

The SHEV 3/6 has three operational status indicators on the control board to display the current operation mode.

- green LED: mains operation indication
- yellow LED: status or fault indication
- red LED: alarm indication

3. Functions

3.1. Ventilation function

In order to use the SHEV 3/6 for ventilation, ventilation OPEN/CLOSE switches can be connected.

Pressing both switches (OPEN/CLOSE) simultaneously causes the function STOP. The ventilation function can only be controlled during mains operation.

Many different action behaviors can be allocated to the switches. (See table 1: Matrix ventilation switch on page 4).

Figure 1: DIP switch SW1

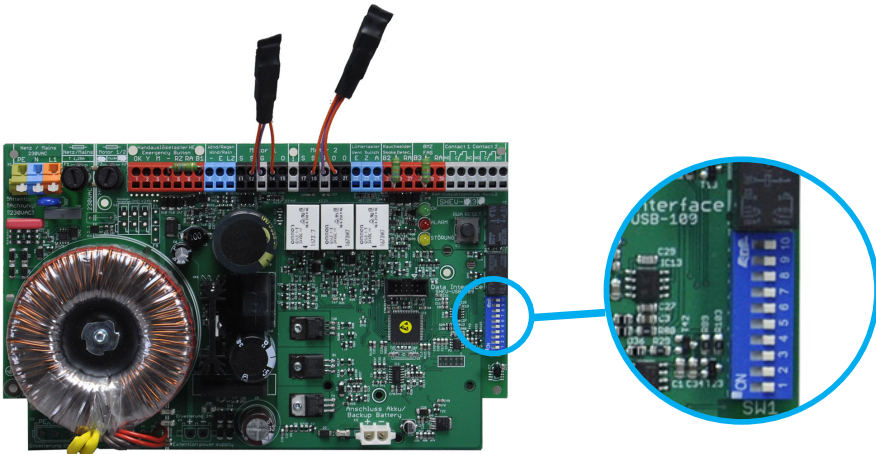


Table 1: Matrix ventilation switch

Con-fig.	SW1 – 1	SW1 – 2	SW1 – 3	SW1 – 4	Configuration ventilation switch	Remarks
1	OFF	OFF	OFF	OFF	Continuous OPEN /CLOSED	Delivery state
2	ON	OFF	OFF	OFF	OPEN and CLOSED with dead man function	
3	OFF	ON	OFF	OFF	OPEN with dead man function / CLOSED without	Dead man function – the actuator will run as long as the vent button is pressed in OPEN or CLOSE.
4	ON	ON	OFF	OFF	OPEN without dead man function / CLOSED with	
5	OFF	OFF	ON	OFF	Gap ventilation	In case of ventilation, the actuators open for the programmed time.
6	ON	OFF	ON	OFF	Automatic ventilation CLOSED	System closes automatically after the expiration of the time.
7	OFF	ON	ON	OFF	Gap ventilation with automatic ventilation CLOSED	Combination of configuration 5 and 6.
8	OFF	OFF	ON	ON	Programming mode for gap ventilation	
9	ON	OFF	ON	ON	Programming mode for automatic ventilation closed	
10	ON	ON	ON	ON	Ventilation switch closed	Ventilation disabled

Functions

3.2. Gap ventilation

Gap ventilation can be activated by setting DIP switch **SW1-3** to ON. This function is time controlled and factory-set to 3 seconds.



ATTENTION

Dead man function in the OPEN direction is inactive during limited ventilation.

3.3. Automatic ventilation CLOSED (time-dependent)

The automatic close function of the actuators after ventilation can be activated by setting DIP switches **SW1-1** and **SW1-3** to ON. This function time is controlled and factory-set to 10 minutes.

3.4. Wind / Rain detector (WTS)

If a wind/rain detector is installed and the

SHEV 3/6 receives a signal from the wind / rain detector due to rainfall or strong winds (> 5 BF), it triggers the connected actuators automatically in closing direction.

3.5. Reset function of the SHEV emergency switch

ALARM signals can be reset by the SHEV emergency switch. Pressing the RESET push button once resets the ALARM signal.

Pressing the RESET push button a second time, the actuators get triggered in closing direction.

3.6. External output of messages

The SHEV 3/6 is equipped with two volt-free relais or contacts for redirecting of fault or other messages. They can be allocated freely using DIP switches 5-8 at SW1 (see table 2 on page 5).

Table 2: Matrix signal relay (C1, C2)

SW1-5	SW1-6	SW1-7	SW1-8	Allocation C1	Allocation C2	Remarks
OFF	OFF	OFF	OFF	Message SHE alarm	OK	Delivery state
ON	OFF	OFF	OFF	Message SHE alarm	Actuators triggered in OPENING direction	
OFF	ON	OFF	OFF	Message SHE alarm	Actuators triggered in CLOSING direction	
ON	ON	OFF	OFF	Message SHE alarm	Wind / rain detector „CLOSING active“	
OFF	OFF	ON	OFF	Message SHE alarm	OK	Power supply OK and no wire break on motor lines 1/2
ON	OFF	ON	OFF	OK	Actuators triggered in OPENING direction	
OFF	ON	ON	OFF	OK	Actuators triggered in CLOSING direction	
ON	ON	ON	OFF	OK	Wind / rain detector „CLOSING active“	
OFF	OFF	OFF	ON	OK	OK	Power supply OK and no wire break on motor lines 1/2
ON	OFF	OFF	ON	Actuators triggered in OPENING direction	Actuators triggered in CLOSING direction	
OFF	ON	OFF	ON	Actuators triggered in OPENING direction	Wind / rain detector „CLOSING active“	
ON	ON	OFF	ON	Actuators triggered in OPENING direction	OK	Power supply OK and no wire break on motor lines 1/2
OFF	OFF	ON	ON	Actuators triggered in CLOSING direction	Wind / rain detector „CLOSING active“	
ON	OFF	ON	ON	Actuators triggered in CLOSING direction	OK	Power supply OK and no wire break on motor lines 1/2
OFF	ON	ON	ON	Wind / rain detector „CLOSING active“	OK	Power supply OK and no wire break on motor lines 1/2
ON	ON	ON	ON	Message SHE alarm	Message FAS fire alarm	

Mounting

4. Mounting



ATTENTION

Observe the instructions in the supplementary sheet „Safety instructions and warranty conditions“ under all circumstances!



ATTENTION

The openings of the battery cells (round lids on top of the batteries) must not point downwards. This may cause a leak out of the battery!



ATTENTION

Do NOT connect the battery during installation!

4.1. Mounting plastic housing

Figure 2: Mounting points plastic housing (SHEV 6 analog)

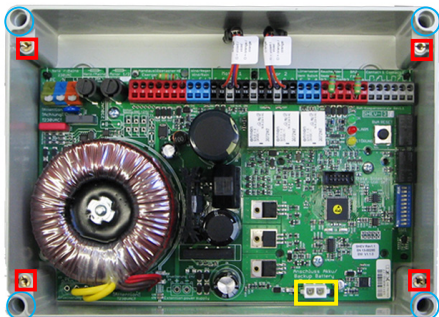
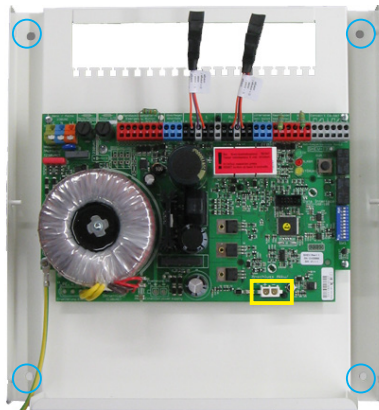





Figure 3: Mounting points SHEV 3-AP steel-sheet housing (SHEV 6 analog)



-  Mounting points housing
-  Mounting points batteries
-  Battery port

Mounting

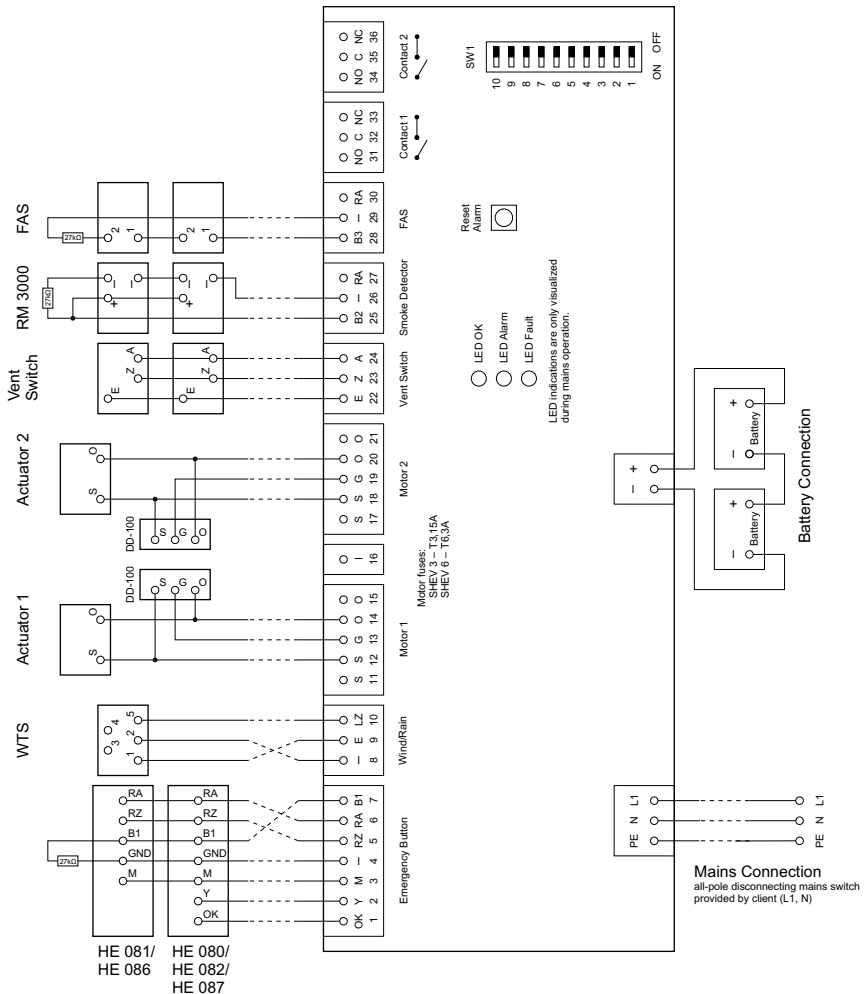
4.2. Electrical connection



DANGER

Disconnect the power supply chord for all poles from mains. The connection of the SHEV 3/6 must be done volt-free!

Figure 4: Wiring diagram complete (simplified illustration)



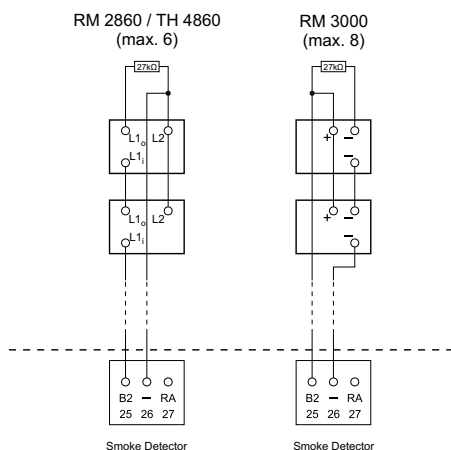
Mounting



INFORMATION

For the detection lines, the use of shielded cables is recommended.

Figure 5: Wiring diagram smoke detector

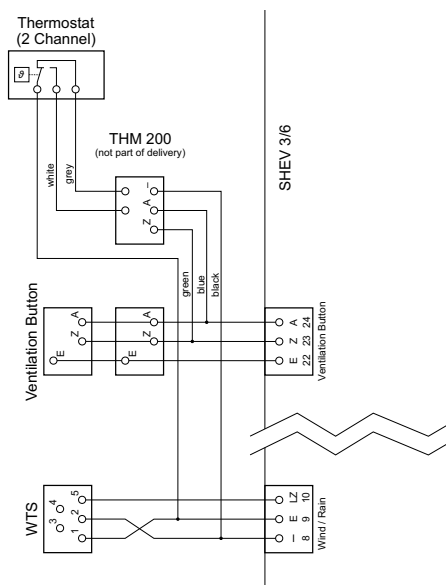


4.3. FAS Auto-RESET function

Generally, all SHEV alarms must be reset manually by pressing the reset button (on-board / EOS). For detection line 3 (FAS / fire alarm system), the Auto-RESET function can be activated. This resets the SHEV and powers the relays into CLOSE direction after the FAS has been reset.

Setting: DIP switch **SW1-10** to **ON**.

Figure 6: Wiring diagram thermostat



4.4. Wire lengths



INFORMATION

Dimension indications (rule of thumb):

Wire cross-section [mm²] = wire length [m]

x number of motors

x power input per Motor [A] / 73

The national regulations continue to apply.

4.5. Motor cable monitoring by DD-100

The EOL diode terminators DD-100 are for the cable monitoring of the motor outputs. They need to be installed in the junction box of the last actuator.

5. Commissioning



ATTENTION

Only after the SHEV 3/6(-AP) has been commissioned successfully and the permanent on-site mains power supply is ensured the battery may be installed and connected.



INFORMATION

If the battery is disconnected, the error message may appear after at least 8 minutes (green LED flashes, yellow LED lights up).



ATTENTION

Only batteries approved by the panel manufacturer are allowed for connection. If any other battery is used, the control panel loses the relevant certifications and the warranty expires.

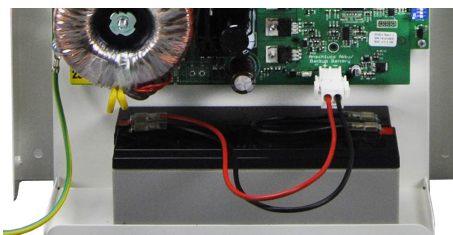
5.1. Commissioning SHEV 3/6 plastic housing

- Connect battery plug to port „Battery backup“ (see figs. 2 and 3 on page 6)
- Fasten the battery with 4 screws M4 x 8 mm (screws are included in the scope of delivery)

5.2. Commissioning SHEV 3-AP/6-AP steel-sheet housing

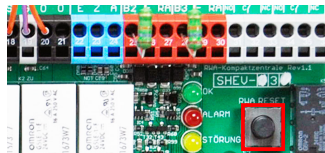
- Place the battery pack on the bottom panel of the housing
- Connect battery plug to port „Battery backup“

Figure 7: Battery connection SHEV 3-AP steel sheet housing (SHEV 6-AP analog)



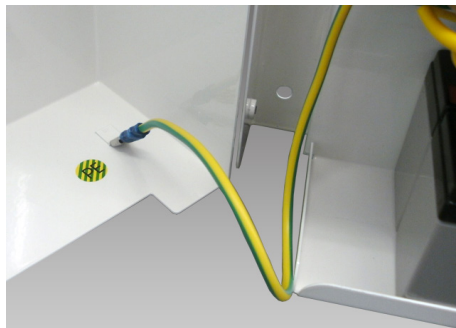
ATTENTION

After connecting the battery pack, press the RESET button for **5 seconds** in order to initialize the SHEV!



- Connect the PE cable to the PE-connection on the lid

Figure 8: PE-connection



- Place the cover and fasten it with the two screws on the side



5.3. Troubleshooting



ATTENTION

Due to the low loop current, the insulation resistance of the monitored wires (B1, B2 and B3) must be checked! The insulation resistance must be $> 20 \text{ M}\Omega / \text{km}$ (manufacturer information), otherwise wire interruptions will no longer be detected reliably



INFORMATION

The operating status of the SHEV 3/6 (-AP) can optionally be visualized with SIMON LINK (only during mains operation).

For more information visit

short.simon-protec.com/slen



6. Technical Data

Table 3: Electrical characteristics

Power supply information	
Nominal voltage	230 VAC
Acceptable voltage range	195 VAC to 264 VAC
Power consumption ¹	0.56 A (SHEV 3) 1.20 A (SHEV 6)
Min. series fuse (on-site)	$\geq \text{C } 16 \text{ A}$
Connected load	103 VA (SHEV 3) 206 VA (SHEV 6)
Inrush current	approx. 10 A (SHEV 3) approx. 20 A (SHEV 6)
Frequency range	47 Hz to 63 Hz
Mains fuse (internal)	Fuse characteristic: Type T 1.25 A
Clamp format	$0.5 \text{ mm}^2 - 2.5 \text{ mm}^2$
Out information motor channels	
Duty cycle (D)	ED 30%
Output voltage mains operation (nominal)	24 VDC
Voltage range (mains operation)	23.0 VDC to 24.5 VDC
Output voltage (battery operation, nominal)	24 VDC
Voltage range (battery operation)	21 VDC to 28.6 VDC
Output current (I_{out}) (short-term operation) ($I_{\text{out}} = I_{\text{mot1}} + I_{\text{mot2}}$)	3 A (SHEV 3) 6 A (SHEV 6)
Power output (non-stop operation)	50 W (SHEV 3) 100W (SHEV 6)
Power output (short-term operation)	73.5 W (SHEV 3) 145 W (SHEV 6)
Output fuse for actuators	Fuse characteristics: Type T 3.15 A (SHEV 3) Type T 6.3 A (SHEV 6)
Ripple of the output voltage ($0 \text{ A} < I_{\text{out}} < 3 \text{ A}$ resp. $0 \text{ A} < I_{\text{out}} < 6 \text{ A}$)	$\leq 50 \text{ mVpp}$
Power outage bridge-over time	10 ms
Clamp format	$0.5 \text{ mm}^2 - 2.5 \text{ mm}^2$

(1) Power consumption at maximum load of the supply system.

Technical Data

Table 4: Connection

Connection information emergency switches (HE 080 / HE 082 / HE 087 & HE 081 / HE 086)		
Maximum number of main emergency switches (e.g. HE 080 / HE 082 / HE 087)		1
Maximum number of off-site emergency switches (e.g. HE 081 / HE 086)		7
Output voltage range (B1)	Clamp 7	17.5 VDC to 18 VDC
Connection fire alarm system (FAS)		
Output voltage range (B3)	Clamp 28	17.5 VDC to 18 VDC
Reset time after SHEV reset (by disconnecting from mains B3)	Clamp 28	3 sec
Connection information smoke detector (RM 3000 / RM 2860)		
Maximum number		6 x RM 3000 4 x RM 2860
Output voltage range (B2)	Clamp 25	17.5 VDC to 18 VDC
Connection information wind / rain detector (WTS)		
Maximum number		1
The connection of the wind / rain detector (WTS) is deactivated in emergency power operation.		
Output voltage range (E)	Clamp 9	23.0 VDC to 24.5 VDC
Current carrying capacity (E)	Clamp 9	max. 150 mA
Connection information ventilation switch		
Output voltage range (E)	Clamp 22	23.0 VDC to 24.5 VDC
Connection information free input		
Input voltage range (I)	Clamp 16	DO NOT USE!
Connection information volt-free contacts (NO–C–NC)		
Voltage and current rating of the switching contacts 1 and 2	Clamp 32 to 31/33 Clamp 35 to 34/46	max. 30 VDC 2 A DC (60 W / 62.5 VA)

Table 5: Mechanical characteristics

Mechanical characteristics – plastic housing	
Size SHEV 3 (w x h x d)	254 x 180 x 111 mm
Size SHEV 6 (w x h x d)	254 x 361 x 111 mm
Weight (incl. battery)	4.40 kg (SHEV 3) 6.40 kg (SHEV 6)
Protection type	IP66 ¹ according EN 60529
Housing	Polystyrol Halogen-free
Mechanical characteristics – steel-sheet housing	
Size SHEV 3 AP (w x h x d)	301 x 323 x 85 mm
Size SHEV AP 6 (w x h x d)	301 x 444 x 85 mm
Weight (incl. battery)	4.80 kg (SHEV 3 AP) 8.30 kg (SHEV 6 AP)
Protection type	IP20 nach EN 60529
Housing	Steel-sheet (powder-coated)
Color	RAL 9010
Protection class	II ²

(1) With respective use of IP66 cable lead-through.

(2) The protective conductor is used as a functional conductor for a higher EMC immunity and should therefore be connected.

Technical Data

Table 6: Connection and operation

Connection	See figure 4 „Wiring diagram complete (simplified illustration)“ on page 7.
Terminal clamps	Tension spring clamps 0.5 mm ² – 2.5 mm ²
Deadlock according to prEN 12101-9	Optional, factory setting: On
Maximum wire length between control unit and actuator	See chapter 4 „Wire lengths“ on page 8
Pause time during change of direction	200 ms
Maintenance	See supplementary sheet „Safety instructions and warranty conditions“

Table 7: Installation and environmental requirements

Operating temperature	-5 to 40° C ¹
Storage temperature	
Suitable for outdoor installation	No

(1) This temperature range applies to all components of the SHEV 3/6 system (including the battery).

Table 8: Approvals and certificates

EN compliant	As per EMC-directive 2004/108/EC and the low-voltage directive 2006/95/EC
Additional approvals, certificates	ISO 21927-9 prEN 12101-9 DIN EN 12101-10 EPD acc. to ISO 14025 and EN 15804
Classification as per prEN 12101-9	Class D
Classification as per EN 12101-10	Class A
Environmental class as per EN 12101-10	1

Table 9: Control time of analog /

Input digital (RZ, RA, LZ, Z, A)	500 ms
Input analog (B1, B2, B3) during mains operation	500 ms
Input analog (B1, B2, B3) during emergency power operation	2500 ms

Table 10: Lead battery

Maintenance-free lead battery	
Size (w x d x h)	178 x 34 x 64
Weight	2 x 0.95 kg
VdS registration	G101139 (Yuasa) / G122013 (SIMON)
Output voltage per battery	10.5 VDC to 14.1 VDC
Output voltage total (series connection)	21.0 VDC to 28.2 VDC
Rated capacity (total)	2.3 Ah
Service life	approx. 4 years