

Smoke and Heat Ventilation Pneumatics – Electronics Control Systems

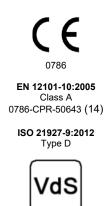


Installation and Operating Instructions

Version 6/21

SHEVS Control Centre RWZ 1 b





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Please read these instructions carefully.

Work at the Control Centre may be performed only by qualified personnel.

Symbols used:

OK = Trouble-free operation

Alarm

Fault

Maintenance

= Automatic fire detector

∆ = Button / travelling command "OPEN"

∇ = Button / travelling command "CLOSED"

/ = "OPEN" position

> = Wind

🌧 = Rain

= Manual call point

= Warning tone / buzzer

X-_ = Ventilation position

✓ = Ventilation time

F = Fire Alarm Control Panel (FACP)

1 Concept of Control Centre

- Smoke and Heat Exhaust Ventilation System (SHEVS) Control Centre for the connection of 24 V- actuators
- Certified according to DIN EN 12101-10 (Internal power supply) and ISO 21927-9 (control unit)
- VdS approved according to the guidelines VdS 2581 and VdS 2593
- One SHE group, two signal lines:
 - Line

 = : automatic fire detectors or Fire Alarm Control Panel (FACP)
 - Line : manual call point RT 2 or RT 4 (main alarm point RT 2/4-*-BS or secondary alarm point RT 2/4-*).
 Connectable versions see section 6 "Technical data"

- Reset the alarm/detector using the button in the main alarm point or in the Control Centre
- Selectable functions:
 - "Auto close" (automatic closure after resetting an alarm)
 - "Malfunction = Alarm" (alarm upon malfunction of a signal line)
 - "Automatic OFF" (automatic travel commands apart from the alarm are disabled)
 - "Thermal alarm" (alarm on exceeding an enclosure inside temperature of 70 °C)
- Possibility of connecting ventilation buttons, also with indication of position
- Adjustable ventilation position X₋ and ventilation time X₋
- Possibility of connecting a Wind and Rain Control (WRC), e.g. type WRS. Optionally internal Wind and Rain Control
- Internal service display for detailed status information during installation and maintenance
- Plug-in connection terminals (apart from actuator output)
- The use of K + G/Grasl actuators is recommended. When driving third-party actuators, compatibility is to be checked. Also note section 6 "Technical data"
- Actuator specification: 24 V actuators, travelling time for full stroke at rated load (total travelling time) < 4 min.
- Upon direct change of the sense of travel, the actuators are briefly stopped before changing the sense
- Sheet steel enclosure, light grey (RAL 7035)

1.1 Options/Accessories

- PK: potential-free contacts (PFC) for alarm/malfunction forwarding
- WRM: Internal Wind- and Rain Control Connection of wind sensor WM and/or rain sensor RS is required (accessory)
- $\tilde{\mathbb{N}}$ As there are no corresponding regulations, the optional board WRM is not VdS approved. However, their use has no influence on the VdS-approval of the control centre, as interactions were checked and excluded as part of the approval procedure.

2 Putting into service / Putting out of service

Work may only be carried out by specialised personnel! Before starting any work, it is mandatory to deflect static charge!

We do not assume any guarantee or liability for defects caused by faulty connection.

ß Planning and design of SHEVS require observation of the following rules, as far as applicable: National building codes/model building code and regulations of local building and fire safety authorities, VDE regulations (particularly VDE 0100, 0108 and 0833), VdS Guidelines 2098 and 2221, DIN 18232, EN 12101, DIN 4102, model line systems policy.

2.1 Installation / Putting into service

- Perform work only in de-energised condition!
- √ Actuators must not be actuated directly (e.g., with external accumulators during installation / maintenance) when they are already connected. This can lead to defects in the power output.
- Fasten the enclosure securely to a wall using suitable mounting material. Guide the connection cables through the openings provided and wire them according to the connection diagrams.
- Make function settings (see 3.2).

- Switch on the mains voltage. The indicators and the service display light up briefly. Subsequently, the indicator ⚠ flickers for about 15 s (calibration process). If the indicator ⚠ is permanently lit, there is a fault in a signal line (see 5).
- Insert the accumulators in the enclosure as illustrated on the "Line voltage, Installation, Accumulators" plan, secure them with the fastening plates and connect them.
- The indicator OK lights up, the indicator △ goes out, the system is ready for operation. If a fault is still displayed, follow the instructions in section 5 "Detection of fault / Troubleshooting". If necessary, decommission the Control Centre again (see 2.2).
- While putting into service, check all functions and indicators of the Control Centre and its components. The individual functions are described in section 3. Also simulate faults and check detection (see 5).
- To finish putting into service, retract all actuators completely (press button ∇).
- After about 24 hours of continuous operation without mains failure, the accumulators are sufficiently charged to achieve the full standby time in case of mains failure.

2.2 Putting out of service

- Disconnect the accumulators from the Control Centre (remove accumulator connection line or fuse F2).
 - 1 Charged accumulators have a shelf-life of about 6 months. They must be recharged if stored for a longer period.
- Switch off line voltage.

3 Functions and operation

Before touching the control elements in the Control Centre it is mandatory to deflect static charge!

3.1 Indicators / control elements of the Control Centre

- Indicators on the board:
 - OK (green): **Trouble-free operation**. Goes out when a fault is detected.
 - (red): **Alarm**, see 3.2 3.4.
 - ⚠ (yellow): **Fault**, see 5.
 - % (blue): Wind and Rain Control is active.
 - / (blue): Maintenance is due (flashes) or maintenance mode enabled (lights up).
 - 8 (red): Service display, see 5.2.
 - ∆ / ∇ (blue): Travel command in OPEN / CLOSE direction active.
- Control elements on the board:
 - Button Reset (red): Reset the alarm function.
 - **Button Reset** (yellow): Switch off the warning tone.
 - Button ⊀ (ventilation position) and potentiometer ⊀ (ventilation time): see 3.5.2 and 3.5.3.
 - Button Test -
 - Button µC-Reset: Only for service purposes.

3.2 Selectable functions

• "Auto close" DIP switch S1-1:

In the ON position, the actuators are automatically retracted after resetting an alarm. When the function responds, ventilation can be resumed only after 4 minutes. Factory setting: ON (automatic closure is activated).

"Fault = Alarm" DIP switch S1-2:

In the ON position, the alarm function (see 3.4) is executed if a signal line is faulty. The alarm can also be reset by pressing the button *Reset* [4] in a main alarm point or the Control Centre before eliminating the fault. Factory setting: OFF (no alarm in case of fault).

• "Automatic OFF" DIP switch S1-3:

Setting ON deactivates the following automatic functions: Auto close, ventilation position and ventilation time, repetition of cycle ∇ and closing in case of mains failure or active wind and rain control. The actuators only travel in ventilation mode as long as an Δ / ∇ button is pressed.

Factory setting: OFF (Automatic OFF is activated).

- if When changing from the ON to the OFF position, the actuators are retracted automatically. Ventilation can be resumed only after 4 minutes.
- "Thermal Alarm" DIP switch S1-4:

In the ON position, the alarm function (see 3.4) is executed when the inside temperature of the enclosure exceeds 70 °C.

Factory setting: OFF (no alarm when 70 °C is exceeded).

• DIP switches S1-5 and S1-6: Do not change the setting. Factory setting: OFF.

3.3 Indicators / functions of the manual call points

- For activation and reset, see 3.4.
- Show:
 - (red, **RT 2/4-***): **Alarm**, see 3.4.
 - OK (green, RT 2/4-*-BS): Trouble-free operation. Goes out when a fault is detected.
 - <u>∧</u> (yellow, **RT 2/4-*-BS**): **Fault**, see 5.
- Button Reset [4] (RT 2/4-*-BS): Reset the alarm function (accessible after opening the door with a key).

The buzzer emits a continuous tone in the event of alarm, and an intermittent warning tone in the event of fault

The warning tone is switched off with the button *Reset* ⊈.

Manual call point with indication of position /_ (RT 2-*-BS-A): see 3.5.4
 Manual call point with ventilation button and indication of position (RT 4-*-BS-LT-A): see 3.5.1 and 3.5.4.

3.4 Alarm functions

The ventilation functions are disabled while an alarm function is running.

- Resetting the alarm function: Resetting is done by briefly pressing the button *Reset* (in a main alarm point or the Control Centre. Then the indicators (will go out and the buzzers (will be switched off.
 - \Im If the actuators are retracted by pressing the button ∇ after an alarm has been reset, ventilation can be resumed only after 4 minutes.
- Manual call points: For manual alarm signalling, break open the glass of the manual call point and press the control button until the indicator (4) confirms the detection of the alarm.

 For maintenance work, the door of the manual call point can be opened with a key.
- Automatic fire detectors: The alarm is triggered automatically (depending on the type of detector due to smoke and/or heat detection).

If an automatic fire detector responds immediately after resetting, press the button *Reset* again (smoke particles may still be present in the detector).

Fire Alarm Control Panel (FACP): When an alarm is signalled by the FACP, the alarm function will be executed.

The alarm is reset at the FACP.

Other alarm functions ("Fault = Alarm", "Thermal Alarm", "Auto Close") see 3.2.

3.5 Ventilation functions

- If the function "Automatic OFF" is activated (see 3.2), the functions ventilation position, ventilation time and wind and rain control are deactivated. The actuators only travel as long as a \triangle / ∇ button is pressed.
- When performing ventilation functions, do not exceed the duty cycle of the actuator output and of the actuators.

3.5.1 Manual ventilation

- After briefly pressing a ventilation button (∆ / ∇), the actuators travel up to the end position or the set ventilation position
 ✓ (see 3.5.2). Pressing the button again stops the actuators. Pressing the button for the opposite direction switches the travel direction after a brief stop.
- If the button is pressed for longer (> 1 s), the actuators travel as long as the button remains pressed. It is also possible to travel up to the end position or up to the set ventilation position.

3.5.2 Setting the ventilation position X.

- This setting can only be made when the system has no faults and WRC is not active.
 Initially, all actuators must be completely retracted and the travel command ∇ has to have finished.
- The desired ventilation position is defined by setting the travelling times in the OPEN and CLOSE directions. Factory setting: 15 s travelling time OPEN, 30 s travelling time CLOSE.
 - Enabling / disabling the ventilation position: Press button ⅓_ for longer than 3 s. The display shortly shows (activated) or □ (deactivated).
 - Reset to factory setting: Press button ✗ for longer than 6 s. The display shortly shows ŏ.
- · Setting the travelling times:
 - Briefly press button *\(\frac{1}{2}\) to activate the programming mode (display: \(\frac{1}{2}\)).
 - Briefly press button ¾ or a ventilation button ∆ to extend the actuators. When the desired ventilation position is reached, press the button again.
 - Briefly press button ¾ or a ventilation button ∇ to retract the actuators. When all actuators are fully retracted, press the button again. The display L goes out.
 - The actuators automatically travel to the ventilation position for verification and then retract again.

3.5.3 Setting the ventilation time <a>

• The ventilation time can be set to between 5 and 30 minutes using a screwdriver on potentiometer <a>_. After the set time has elapsed, the actuators retract automatically. The ventilation time is deactivated at the left stop (= factory setting).

3.5.4 Indication of position / in the ventilation button

- The indicator
 - lights up: Actuators are in OPEN position
 - flickers: A travel command is active
 - blinks: Wind and rain control is active

In case of a travel command towards CLOSED, the indicator goes out latest after 4 minutes.

1 If the function "Automatic OFF" is activated (see 3.2), the indicator is deactivated.

3.5.5 External Wind and Rain Control (WRC)

If the wind and rain control is active, the actuators are retracted automatically. The ventilation functions are
disabled. The indicator on the logic board lights up, until the WRC releases the ventilation functions once
again. An alarm has priority.

3.6 Repetition of cycle **▽**

- If not all actuators are properly retracted (e.g., actuator has switched off due to a gust of wind), the repetition of cycle function can be activated by briefly pressing the ventilation button ∇. The actuators are briefly extended and following the closing command is executed once again.
 - Note the setting of the "Automatic OFF" function (see 3.2).

3.7 Mains failure

- In case of mains failure, the accumulators cannot be charged, but they provide the operating power for the standby time. Actuators in ventilation position are retracted and pressing the ventilation button ∆ is ignored. Alarm functions are not affected by the mains failure.
 - The mains failure must be rectified immediately to prevent the deep-discharge protection from responding, to recharge the accumulators, and to ensure safe functioning of the system.
 - Note the setting of the "Automatic OFF" function (see 3.2).
- **Deep discharge protection:** If the accumulators are in critical condition, the device is **switched off** completely. However, a low quiescent current continues to flow (in addition to the natural self-discharge). Therefore, without recharging, there is a risk of permanent damage to the accumulators after only a few days.

4 Maintenance

• In the course of maintenance - unless other local regulations apply - check all the functions and displays of the device and the components at least once a year. This also includes checking the terminal points, connection cables, indicators and fuses, and cleaning of various components, if necessary.

The individual functions are described in section 3. Likewise simulate faults of the signal lines and power supply and check the detection, see 5.

• Indication of due maintenance

If the maintenance company has enabled this function, the indicator \checkmark flashes after about 11 months of service life. After about 14 months, the overdue maintenance leads to the indication of a fault \triangle .

Accumulators:

- Check the accumulators at least once a year for proper functioning. They should be replaced following a typical service life of 3, but no more than 4 years in an ambient temperature of 20 °C. For every 10 °C rise in ambient temperature, the service life decreases by about 1 year!
- Checking the accumulators:

 Briefly press button *Test*

 and then button *Reset*

 . This switches from mains to accumulator operation during the test alarm. Fully extend the actuators. If the accumulator voltage drops too low during this, the accumulators are defective. A fault will be displayed until the accumulators have been replaced.

 After testing the accumulators, reset the test alarm (press button *Reset*

 briefly) and retract all actuators again
 - $\vec{\hat{\eta}}$ A quick check of the accumulators with low load takes place automatically every 60 minutes.
- The end user, i.e., the final owner, has to return used batteries / accumulators to a distributor or public waste management company. This return obligation applies regardless of whether the end user is a private or commercial consumer.
- If the system needs to be put out of service / temporarily shut down, the accumulators have to be disconnected and the mains voltage has to be switched off!
- Accumulators that are charged but not yet connected have a shelf-life of about 6 months. They must be recharged if stored for a longer period.
- Actuators must not be actuated directly (e.g., with external accumulators during installation / maintenance) when they are already connected. This can lead to defects in the power output.

5 Detection of fault / Troubleshooting

5.1 General notes

Occurrence of a fault is indicated by flashing of the indicator \triangle in main alarm points and in the control centre. With the help of the service display, the cause can be limited (see 5.2).

- The following are detected as faults:
 - Accumulator or mains failure, accumulator polarity reversed
 - Failure of the fuses F1 to F3
 - Wire-break or short-circuit of the signal lines
 - Wire-break or short-circuit of the actuator line (unbranched common line)
 - Maintenance overdue (if activated)
- Notify the maintenance company in case of faults.
- Spare material: In the control centre, there is a bag of spare fuses and resistors.
- Automatic calibration in case of a fault in the signal line **=**: After rectifying a fault that was present for more than 10 minutes, the line is automatically calibrated. The indicator <u>↑</u> flickers for about 15 s. If the indicator <u>↑</u> then lights up continuously, there is another fault.

5.2 Service display

- Operating conditions can be accurately displayed with the help of the service display.
 The display is switched off in normal condition. It can be switched on for 120 s by pressing the button Reset

 for 4 s.
- If no alarm/fault message is present, the memory content of the display can be shown for 1 s by briefly pressing the button Reset[A] (alarm memory) or the button Reset[A] (fault memory).
- In case of alarm/fault, the display is switched on automatically, but switched off again after 10 s in the event of a power failure. In this case it can be switched on again for 10 s by pressing the button *Reset* ⊈ for 4 s.

Operating conditions:

Code	Description	Code	Description
0	Mains failure or fuse F1 blown		Setting ventilation position
:	Wire-break of accumulator or F2 blown	Р	Changeover contact for ventilation detected
2	Actuator output: Fuse F3 blown		"Automatic OFF" with changeover contact
3	Actuator output: Wire-break / short-circuit	9	Alarm through internal thermal sensor
Ч	Line ⊞: Alarm	E	Accumulator test active
5	Line ⊞: Wire-break	Ш	Accumulator is defective
8	Line ⊞: Short-circuit		Accumulator polarity reversed
٦	Line ⊞: Undefined	-	Memory alarm / fault empty
8	Line : Alarm		Button Reset 4.: Short-circuit
9	Line : Wire-break	اـــــــــــــــــــــــــــــــــــــ	Button <i>Reset</i> ⊈: Short-circuit
Я	Line : Short-circuit	31	Test alarm active
ь	Line : Undefined	<u></u>	Maintenance due
h	"Fault = Alarm" active	ō	Error, service required

Accu charging phases:

 $[\cdot, \cdot] = I$ -charging, $[\cdot, \cdot] = U$ -charging, $[\cdot, \cdot] = I$ -charging

6 Technical data

6.1 Version

RWZ 1-4b
8100 1204 0000
4 A (24 V==/96 W)
0.7 A/230 V~
337 x 337 x 113
2 x 2 Ah / 12 V

Only supplied or approved accumulators may be used.

See compatibility list on: www.kg-tectronic.de (Electronics - System Accessories - Accumulators)

The requirements of the Directives 2014/35/EU and 2014/30/EU are met. Suitable for operation in residential, business and commercial areas.



6.2 Performance data and characteristics

General	
Line voltage supply	230 V~/50 - 60 Hz
Internal supply voltage/standby time	24 V==/72 h in case of mains failure
Cable entry	from above, below or behind
Environmental class 1/III (EN 12101-10/VdS 2581)	-5 °C +40 °C
Relative humidity	20 % 80 %, non-condensing
Enclosure protection rating	IP30

Mounting dimensions, see plan "Line voltage, mounting and accumulators".

Not suitable for use outdoors. Protect from direct sunlight, humidity and excessive formation of dust! Preferably, the installation should be carried out in dry, heated rooms.

Signalling lines

Signalling lines	
Line monitoring	Wire-break, short-circuit
Line :: Automatic fire detectors: Smoke detector/heat detector (RM 2/TM 2 or RM 3/TM 3) or	20 pieces, of which max. 10 heat detectors ¹
Fire alarm control panel:	normally open contact
Line □, manual call points: - RT 2/4-* - RT 2/4-*-BS	total of 10 pieces, of which max. 3 pieces with buzzer
Inputs/outputs Ventilation button LT △ ▽	unlimited
Ventilation button LT x-A △ ∇ .	10 pieces
Wind and Rain Control (type WRS)	Normally closed contact ²

¹ heat detector: **TM 2-D** (65-55000-122), **TM 2-M** (65-55000-137), **TM 3-D** (FD-851RE), **TM 3-M** (FD-851HTE), **RM 3-OT** (SD-851-TE), Optical detectors: RM 2-O (65-55000-317), RM 3-O (SD-851-E)

² In the WRC, a separate contact is required for each Control Centre to be controlled.

Actuator output

Rated voltage

Mode of operation/duty cycle

Maximum cable cross-section of the supply line

Line monitoring (unbranched common line)

24 V== (+6 V/-4 V)

S3 30 %

2 x 10 mm² (rigid)

wire-break, short-circuit

Permissible cable length between control centre and actuator for 1 V voltage drop (simple arrangement without extensive branching). Depending on the operation voltage range of the actuator, a higher voltage drop may be permissible.

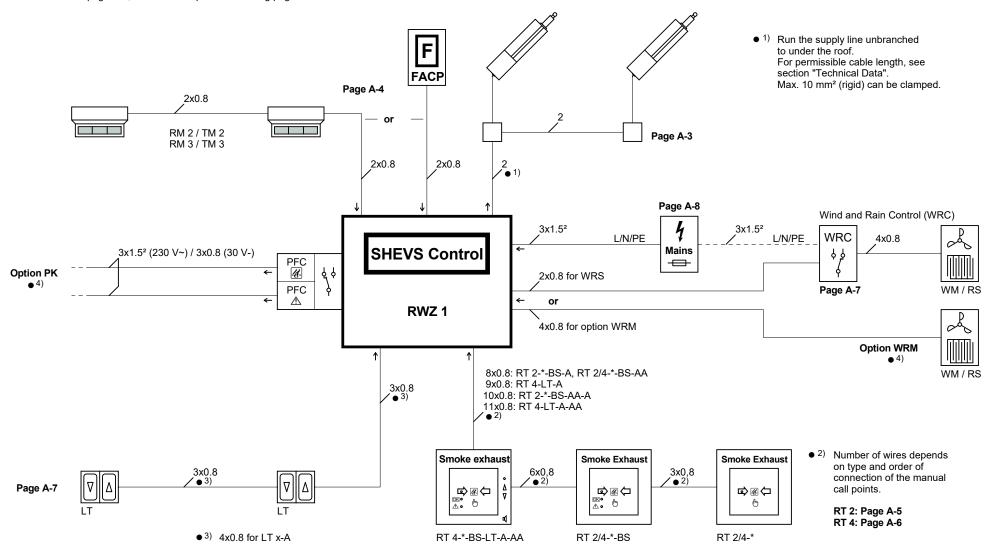
Strom Querschnitt	1,0 A	2,0 A	3,0 A	4,0 A
2 x 1,5 mm ²	44 m	22 m	15 m	11 m
2 x 2,5 mm ²	73 m	36 m	24 m	18 m
2 x 4,0 mm ²	116 m	58 m	39 m	29 m
2 x 6,0 mm ²	174 m	87 m	58 m	44 m
2 x 10,0 mm ²	290 m	145 m	97 m	73 m

Fuses

Primary mains (miniature fuse 5 x 20 mm)	F1: T 2 A
Accumulators (flat fuse 19 mm)	F2: 10 A
Actuators (flat fuse 19 mm)	F3: 10 A

System diagram (please consider local conditions / components)

Example of connection on page A-2, detailed examples on following pages.



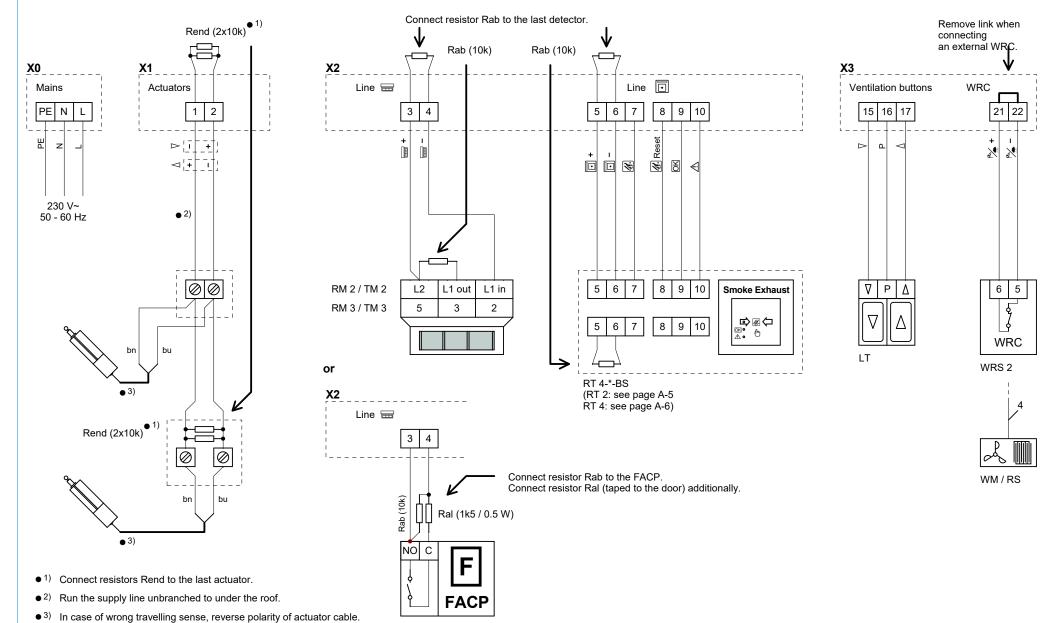
Cable types (examples): Signal lines: J-Y(St)Y 2x2x0.8 - 4x2x0.8 Mains: NYM-J 3x1.5 mm²

PFC: NYM-J 4x1.5 mm² / NYM-O 3x1.5 mm²

• 4) Separate documentation

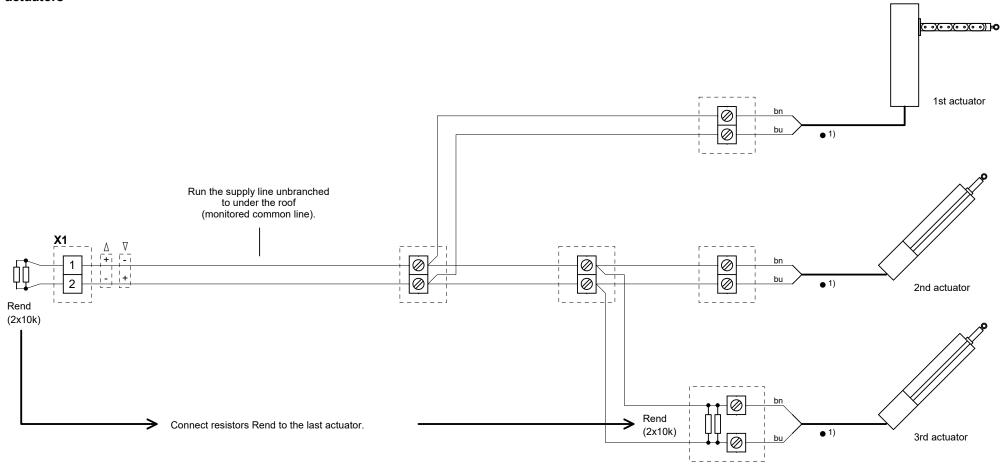
General: length of cable max. 400 m, if not specified otherwise.

Example of connection



A-2/8

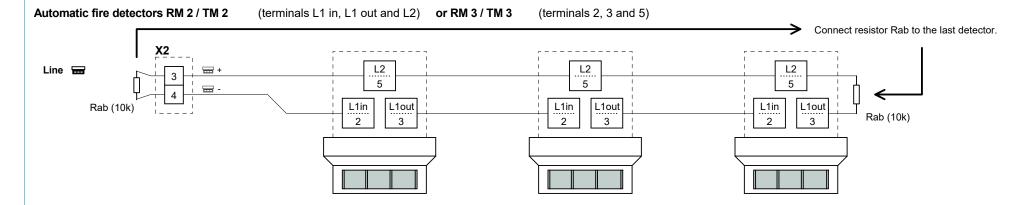
24 V- actuators



- Actuators must not be actuated directly (e.g., with external accumulators during installation / maintenance) when they are already connected. This can lead to defects in the power output.
- 1) In case of wrong travelling sense, reverse polarity of actuator cable.

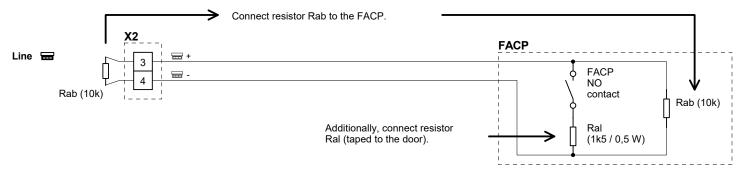
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Automatic fire detectors or Fire Alarm Control Panel (FACP)



or

Fire Alarm Control Panel (FACP)

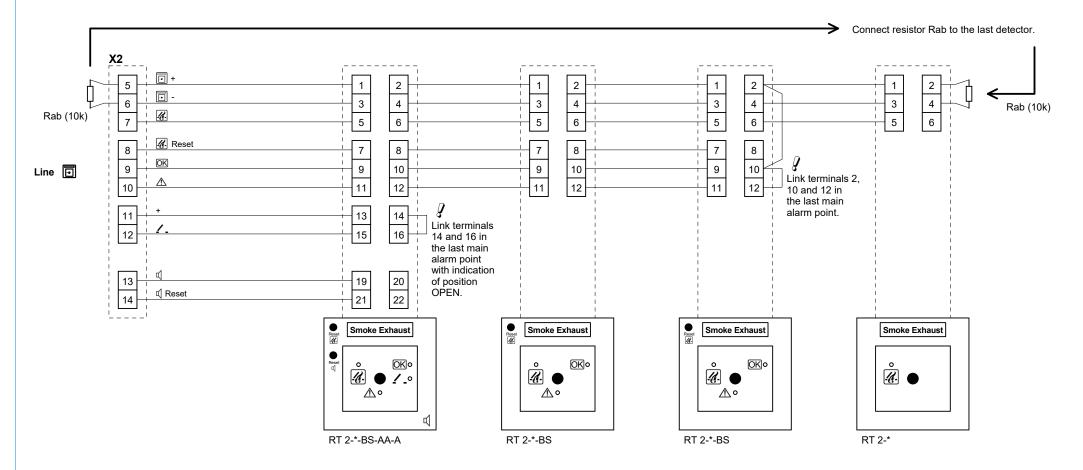


for more convenient connection of an NO contact to terminals X2, the module MA (accessory) can be used. The required resistors are already present on the module and do not need to be wire separately.

RW71hA34 sch RW71hA35 sch

Manual call points RT 2

(Manual call points RT 4 see page A-6)

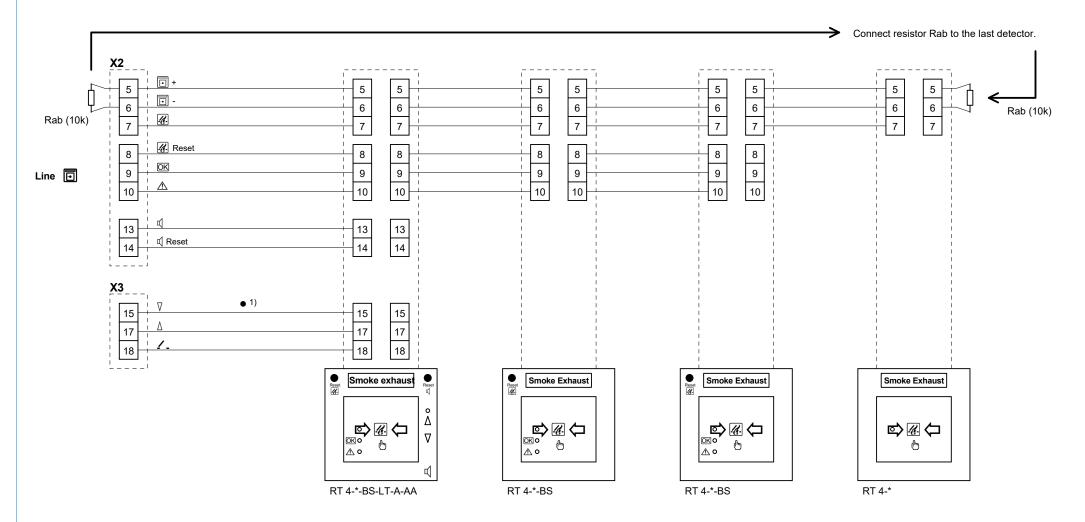


RWZ1bA35.sch RWZ1bA36.sch

A-5/8

Manual call points RT 4

(Manual call points RT 2 see page A-5)



• 1) Lines are connected parallel to the ventilation buttons (see page A-7).

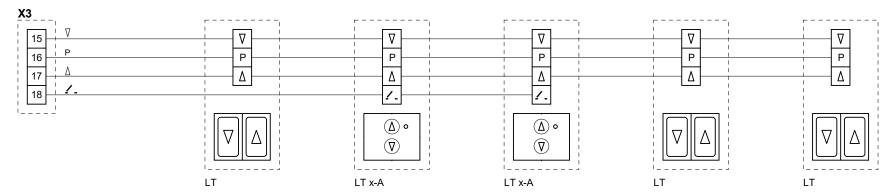
Colour code for resistors: 10k = brown/black/black/red

 RWZ1bA36.sch
 RWZ1bA37.sch

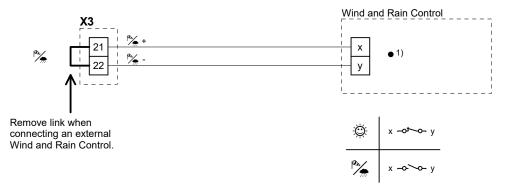
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Ventilation buttons, external wind and rain control

Ventilation buttons



External Wind and Rain Control



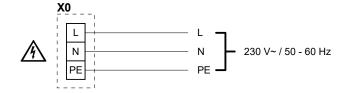
1)	WRS 2	х	у
	Output contact 1	5	6
	Output contact 2	8	9
	Output contact 3	11	12
	Output contact 4	14	15

Use a separate contact for each connected Control Centre / Control!

RWZ1bA37.sch RWZ1bA48.sch

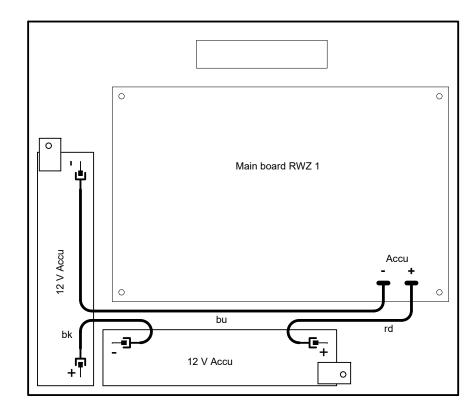
Line voltage, mounting, accumulators

Line voltage:

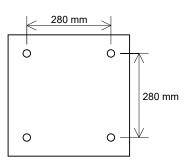


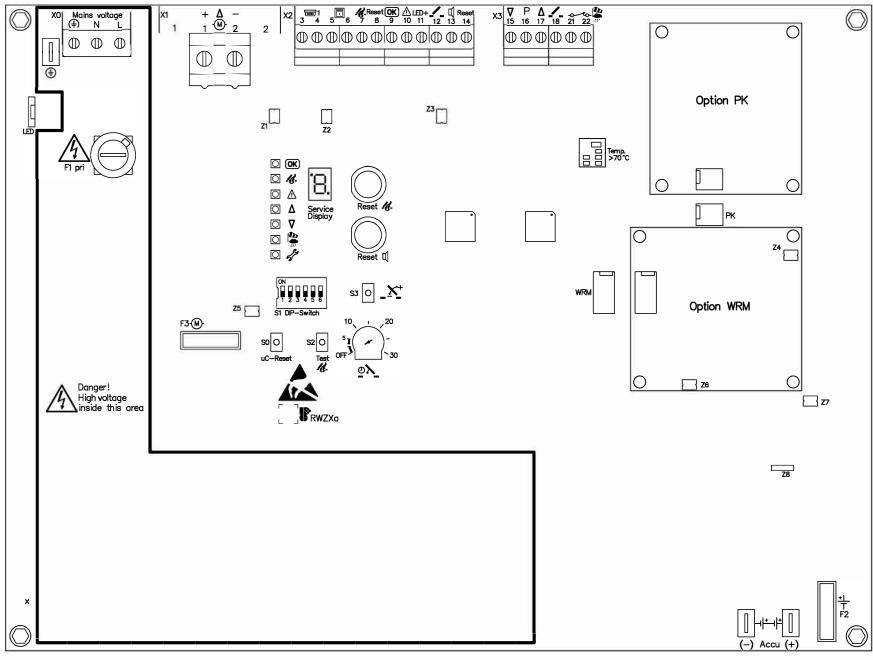
Accumulators:

Insert the accumulators in the enclosure, secure them with the fastening plates and connect them as illustrated.



Mounting:





Füses

F1: T 2 A Primary mains

10 A Accumulators F3: 10 A Actuators

DIP-switch

- S1: 1: Auto close
 - 2: Fault=Alarm
 - 3: Automatic OFF
 - 4: Thermal alarm
 - 5: Do not change the setting
 - 6: Do not change the setting

SHEVS Control Centre RWZ	1b
Layout diagram	

RWZ1bA31.pcb Ver. 3/18 Mo 8 mar. 2018