



Smoke Vent System RZN 4416-M

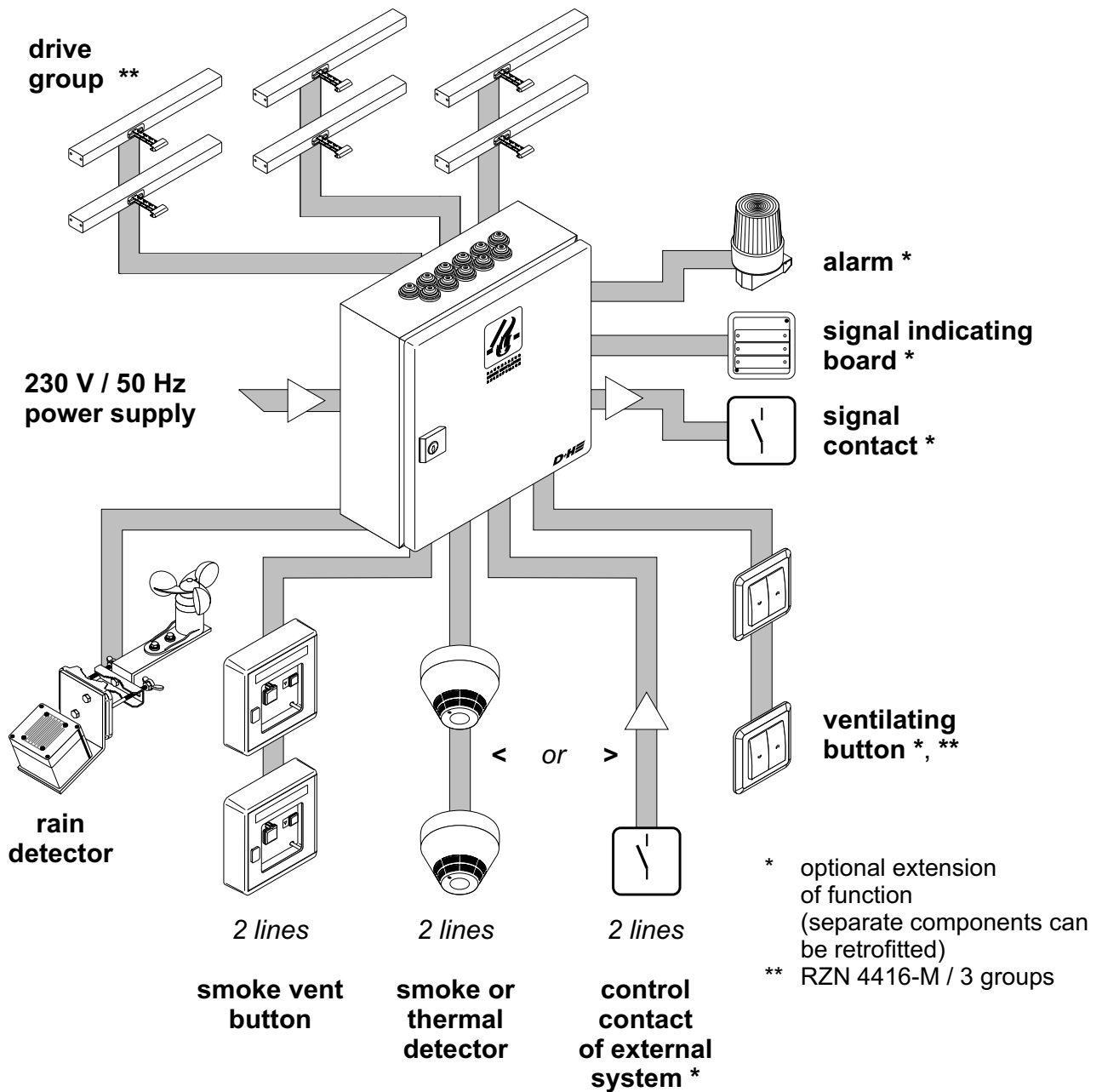
installation

Safety system protects human life and material assets!

Connection, mounting and functional testing by a specialist company authorized by the manufacturer.

Green control diodes in the buttons must constantly lighten, otherwise see "Informations for Starting".

Repair power failure at once. Emergency power supply for 72 hours.



Content

Maintenance / Guarantee / Piktograph explanation	2
Technical Data / Accumulator Control TID	3
Introduction	4
View motherboard RZN 4416-K	5
Drives and smoke vent buttons	6
Wiring plan	7
Connection cables	8
Connection plans	9-15
Starting	16
Encode of Line/ Group / control panel	17-19
Examination	20

Maintenance

Once a year by a specialist company, who is authorized by the appliance manufacturer. Renew test badge, keep control book.

The respective current D+H maintenance instruction is decisive.

D+H authorized expert companies have been specially trained by D+H for carrying out expertly this maintenance, and they get automatically the latest maintenance instructions.

Following tests must be carried out in the course of maintenance:













- Outside examination / inspection of system components
- Measuring of insulation resistances
- Checking of all relevant power supply units
- Functional testing of connected system components
- Record of competent carrying-out of maintenance, and designation according to directions

Guarantee

You will get **2 years** guarantee for all D+H products from date of verified handing over of the system up to maximal 3 years after date of delivery, when mounting and starting has been carried out by a D+H authorized **distributor**.

D+H guarantee is expired, with connection of D+H components with external systems or with mixing of D+H products with parts of other manufacturers.

Piktograph explanation

	Smoke and heat vent alarm
	Control panel O.K.
	Power supply
	Vent button function "ON"
	Vent/ smoke vent function "OFF"
	Fault
	Charging voltage regulator
	Ground short
	Regulator for OPEN-running time limitation
	Regulator for ventilating time limitation
	Fuse
	Reset

Technical Data

Rated voltage	: 230 VAC, 50 Hz
Rated capacity	: 500 VA
Capacity Consumption standby	: 13.6 W
Interfering emission	: EN 50081-2, EN 55022
Res. to jamming	: EN 50082-1, EN 61000-4-2 to -6, EN 50204
Protective category	: I
Fire resistance	: -5 to + 40 °C
Protective system	: IP 54
Class of rating	
- Monitoring	: Continuous duty
- Emergency state/ ventilation	: Short-time duty
Output voltage	: 24 VDC / res. ripple <10 %
Safe output	
- rated current	: 12.8 A
- cutoff current	: 16 A
- each group max.	: 6.3 A rated current resp. 8 A cutoff current
Dimensions	: 500 x 500 x 210 (W x H x D)

24 V - Emergency Supply

Emergency power supply for 72 hours
Use VdS approved storage batteries only!

2x 12 V / 7.0 Ah \pm 15 %

With connection of D+H alarm devices:
2x 12 V / 12 Ah \pm 15 %

Accumulator Control TID

T Temperature-guided charging of accumulator

I Impedance measuring

Internal resistance of accumulator will be measured cyclically.

For example, if a total discharged accumulator is connected to the control panel
= malfunction (LED on PCB)

D Discharge control

In case of power failure and total discharge of accumulator, the control panel will switch off. In this case, smoke vent is no longer ensured. In this case a malfunction will be no more indicated either.

Introduction

Smoke and heat vent systems (RWA's) are very important elements of structural preventive fire protection.

Smoke and heat vent systems are appliances of preventive fire protection. They fulfil important functions in case of fire: protection of human life by providing a smokeless layer, by which rescue routes are kept free for the fire-brigade. Consequential damages by conflagration gases are reduced, and therefore, considerable material assets are often protected from destruction. Precondition for this is, that the systems will function absolutely reliable in a case of fire. Only electrical specialist companies are authorized to install these systems, who have electrical specialist staff with relevant experiences in installing danger alarm systems or smoke and heat vent systems. Only these ones can take on responsibility for functioning, and can ensure product liability for the whole system (see product liability law BGBL.I S.2198 and BGB (bodily injury, compensation for damage)).

Therefore, regular maintenance and checking of functional readiness is imperative and has to be ensured. These standard requirements are demanded according to regulations of the DIN, of the Association of German Insurer against damage of property (VdS) and the respective local authorities. Recommended is, that maintenance work should be carried out by authorized specialist companies, only.

Only regular and professional maintenance warrants the necessary and permanent functional safety.

Only authorized specialist companies are allowed to install and maintain smoke and heat vent systems and system components, constructed and distributed by **D+H Mechatronic AG**. All **D+H Mechatronic AG** partners belong to these authorized specialist companies, who regularly undergo an in-house training to ensure their qualification and experience.

Smoke and heat vent systems must be maintained at annual intervals by authorized specialist companies according to DIN 18232 section 2 paragraph 10.2, and VDE 0833 section 1 paragraph 5.3.4 for alarm systems and manufacturer guidelines.

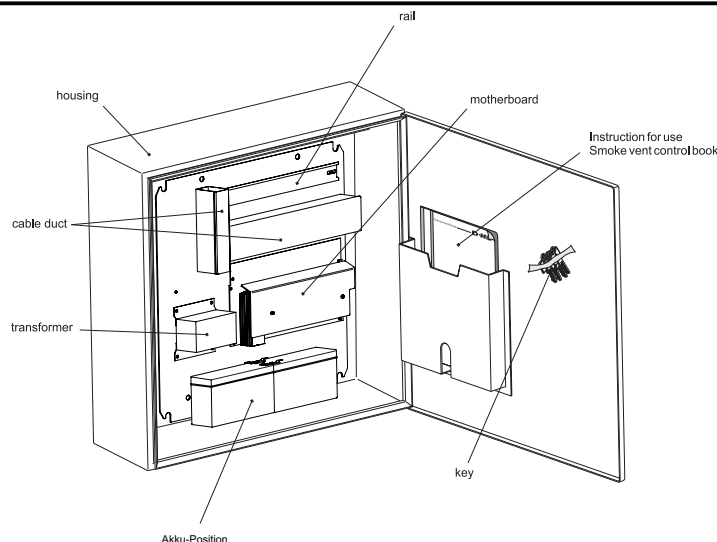
According to DIN VDE 0108 section 1 paragraph 9.1.1 accumulators for emergency supply (lead accumulators) must be checked every six months by a person, who has been introduced to this task, and once a year, maintenance must be carried out by specialist companies. Accumulator types, which are used for **D+H Mechatronic AG** smoke and heat vent systems must be VdS approved, and must be released by **D+H Mechatronic AG** to use in smoke and heat vent systems. According to DIN 18232 section 2 paragraph 10.2 the tests must be put down in an operational book, which the operator/ building owner must present to the building supervision authority on request. This operational book is available at D+H (Ord.-No.: 68.700.15)

Executed maintenance must be proved by a **D+H Mechatronic AG** maintenance/ and testing confirmation.

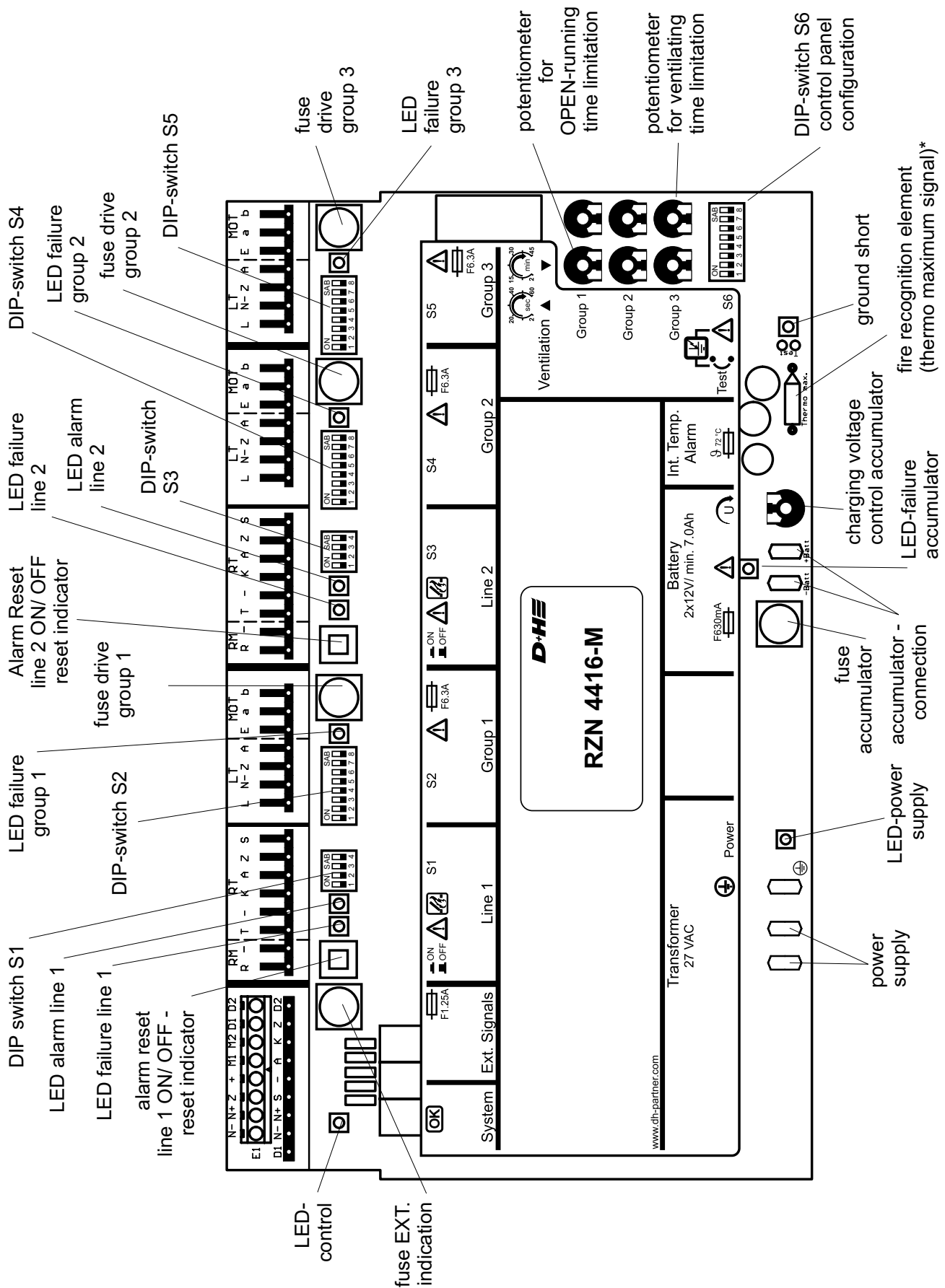
Important Regulations

Observe regulations for danger warning systems VDE 0833, guidelines for electrical systems VdS 2221, VDE 0100, DIN 18232 for smoke and heat vent systems, regulations of the local fire-brigade and of EVU for connection to mains supply.

Inside Design



View motherboard RZN 4416-M



* for monitoring of the internal temperature of the control device. If the internal temperature is exceeding 72°C (caused by radiant heat of a fire in immediate vicinity of the mounting place), the entire smoke and heat vent system will be emergency opened under alarm conditions.

Drives

Smoke and heat vent opening:

Smoke gases are to be carried off as unhindered as possible through smoke and heat vent opening in case of fire.

According to relevant rules, openings have to be placed always in the upper part of a building.

The smoke and heat vent opening can be mounted in the wall as well as in the ceiling. Size, kind and arrangement of the opening is of decisive significance for an optimal effect of the smoke and heat vent system.

The important thing here is, that an escape must not be hindered by the window wing itself, by structural facts like offsets, or the like.

Minimum ventilating surface is given by legal regulations and structural facts. The smoke vent opening must be at least 1m² or 5% of the basis, dependent on the LBO.

The valuated sizes of opening angles of smoke and heat vent systems must be in agreement with the responsible fire protection authority.

Observe! Window wings, opening inward, must not project in escape/ and rescue routes and obstruct them.

High-Speed function:

All D+H drives with SHEV high-speed function are supported. In daily ventilation operation, a considerable noise reduction is achieved through the reduced drive speed. In case of SHEV the drives run - triggered through the orange monitoring line - with a very high speed to reach the OPEN position defined within 60 seconds at the most.

Mounting of the drives:

Please take mounting informations from the relevant instruction for use of the respective drive, because of varied possibilities for choosing drives.

Attention:

When Dip switch 8 is on ON, the smoke vent will be triggered with an OPEN-impulse every 2 minutes for a duration of 30 minutes according to VdS 2581. For this, the drive must be blockage safe according to VdS 2580 par. 4.7. . All D+H drives meet this precondition. Otherwise Dip switch 8 is to be switched on OFF.

Smoke Vent Button

Place(s) of mounting:

Maximal 8 smoke vent buttons can be connected.

Main control must be mounted on ground-floor according to VdS 2221.

Secondary control is to be installed in all other floor levels according to VdS 2221.

Install buttons so, that they are accessible any time and clearly visible.

Mounting height:

1,5m above upper edge of firm flooring.

Fastening:

With plug screws 4,5 x 40mm diagonal, or direct on 55mm flush box with 2 screws.

Housing colour:

Standard: deep orange (RAL 2011), according to VdS 2592.

However, deviating colours might be locally required (e.g. grey, blue, yellow, red).

Please consult your D+H distributor.

Cables for D+H Smoke and Heat Vent Systems

The smoke vent control panel is designed for opening smoke vent devices, which operate by thermal ascending force and by automatic fire recognition devices (thermal detector, smoke detector), and they release either self-acting or manual by smoke detectors at an early stage of a fire, and remain in opened position without further power consumption. In these cases, functioning preservation of the electrical line system is required only at an early stage of fire. Protected wiring is required with protection against mechanical damages according to DIN 18232 section 2.5.5 paragraph 4.

Control Cables (Group):

Cables from the smoke vent control panel to connection of drive (drive lines have a monitoring wire, in which fire recognition devices (thermal maximal detector e.g. THE) can be looped-in):

- Safety line, with functional conservation ... E30, according to DIN 4102* or standard guidelines for line systems MLAR.

Detector Cables (Line):

The detector cables are monitored for short circuit and for break.

The opening device is automatically triggered and opens up in case of fault, when DIP-switch 7 is on ON.

Smoke vent button cable and cable of automatic detectors:

- weak current sheathed flexible cable YR 6 x 0.8
or
- house wiring cable IY(ST)Y 4 x 2 x 0.6

Cables through areas not monitored:

An increased time of functioning of the cable can be required, when drive lines are installed through building parts, which are not monitored.

- Safety line with functional conservation ... E90, according to DIN 4102* or standard guidelines for line systems MLAR.

(see supplementary sheet 1 to DIN VDE 0108)

** Notice: No type designation is given for these cables, because of a large variety on the market. Please consult your D+H distributor about these.*

Line lengths and Cross sections:

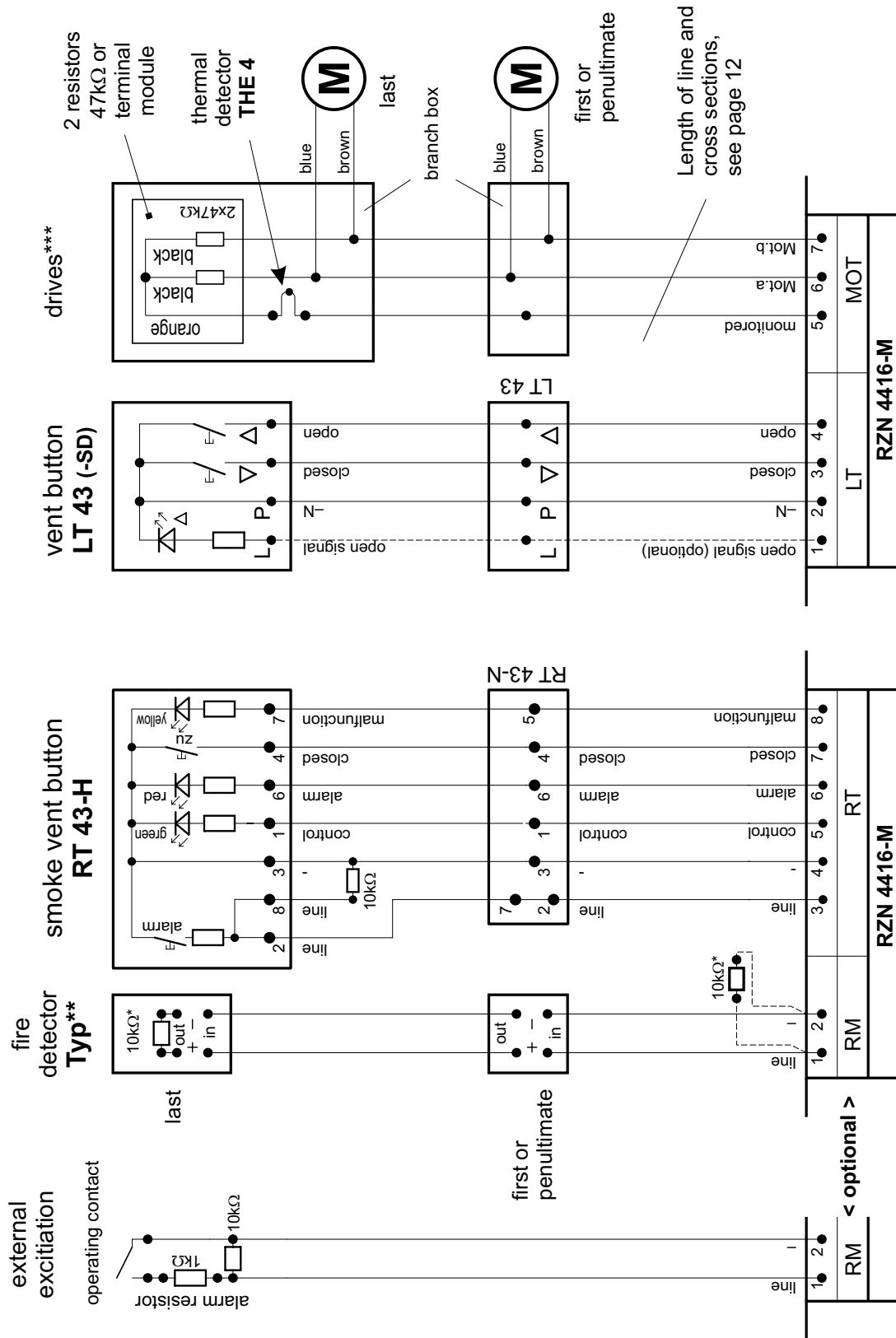
Number of wires and cross-sections indicated, refer to required lines only. In case of using a line with earthed conductor (green/ yellow), this one will not be counted in and must not be wired.

Gesamtstrom / total consumption	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10	
3x 1,5mm ²	240	120	80	60	48	40	34	30	26	24	21	20	18	17	16	15	14	13	13	12	m
3x 2,5mm ²	400	200	130	100	80	65	55	50	44	40	36	33	30	28	26	25	24	22	21	20	m
*5x 2,5mm ²	800	400	260	200	160	130	110	100	88	80	70	65	60	56	52	50	47	44	42	40	m
**7x 2,5mm ²	1200	600	390	300	240	200	170	150	130	120	110	100	92	85	80	75	71	67	63	60	m

$$\text{cross section (mm}^2\text{)} = \frac{\text{plain cable length (m)} \times \text{total current}}{80}$$

* Connect in parallel 2 wires for each drive line.

Standard Connection with RT 43-H / -N



*** Terminal resistors for line monitoring:**

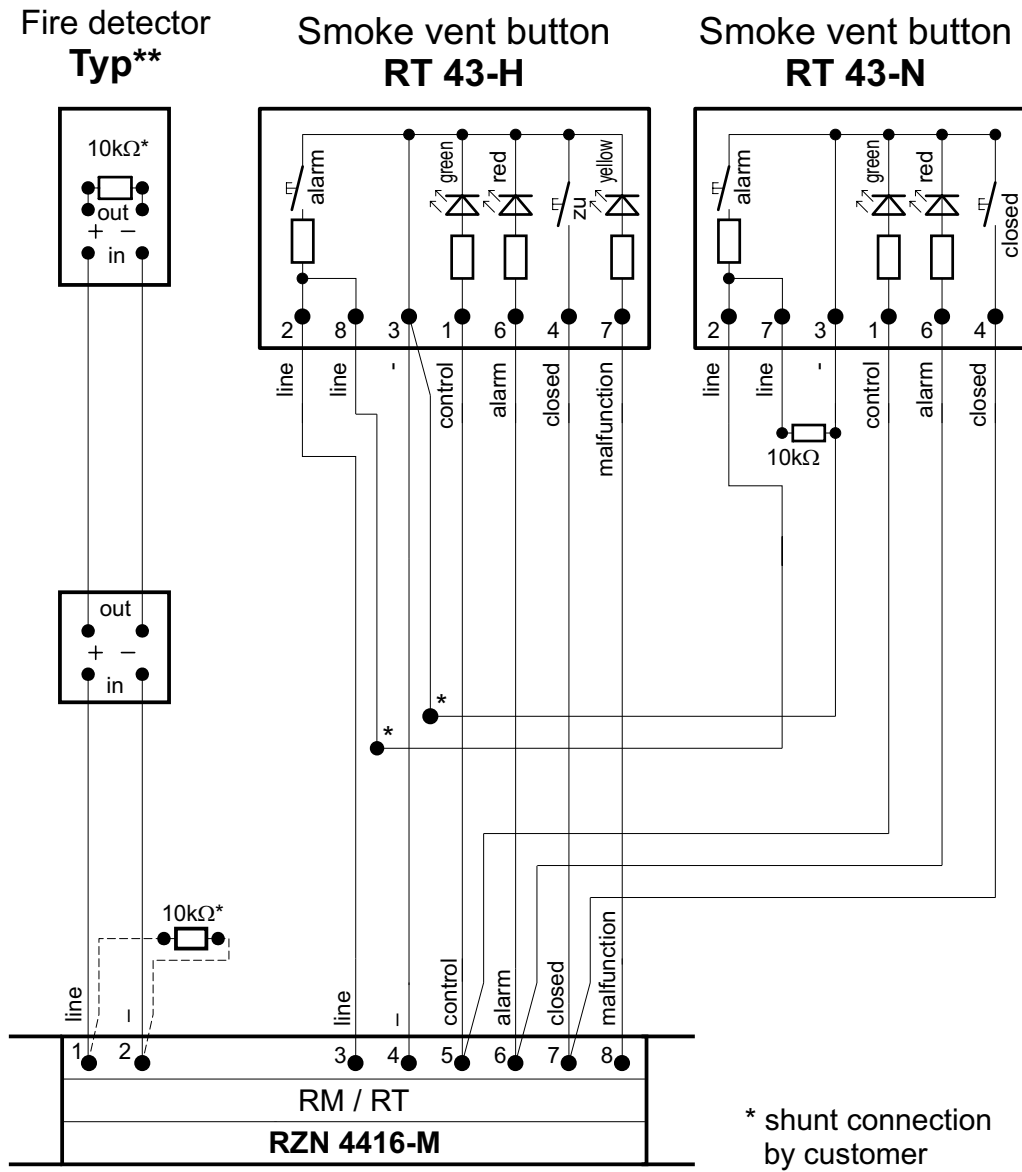
They are pinched in control panel for transport. Take it off there and connect according to plan. Terminal resistors must remain at binder RM 1,2, when no fire detector or external control exists.

**** Fire detectors**

Only D+H system approved detectors must be used (see page 7).

******* For detailed information concerning the connection, please refer to the instruction for use of respective drive.

Parallel Connection of Smoke Vent Buttons - RT 43-H / -N

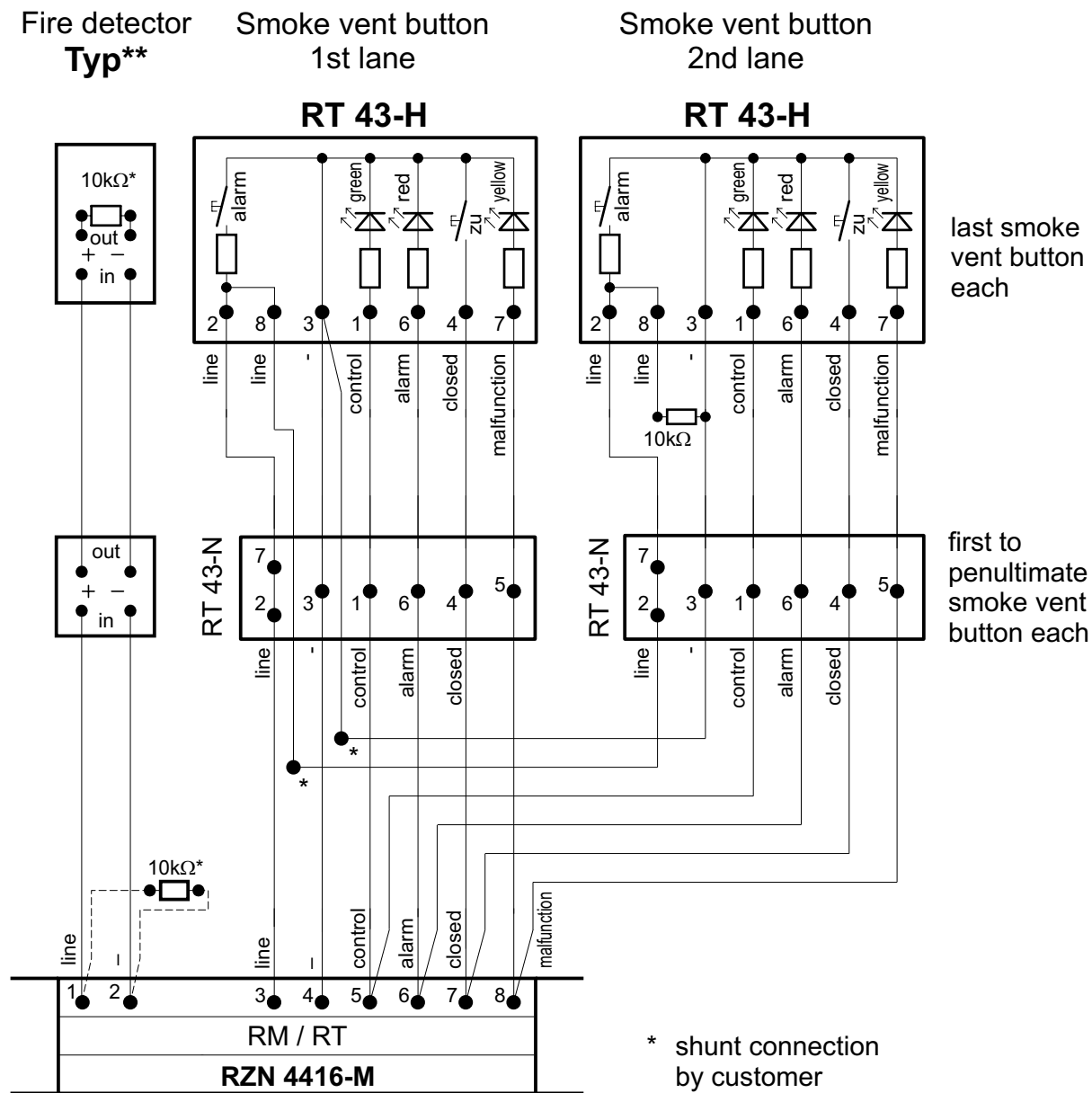


* shunt connection
by customer

** Fire detectors

Only D+H system approved detectors must be used (see page 7).

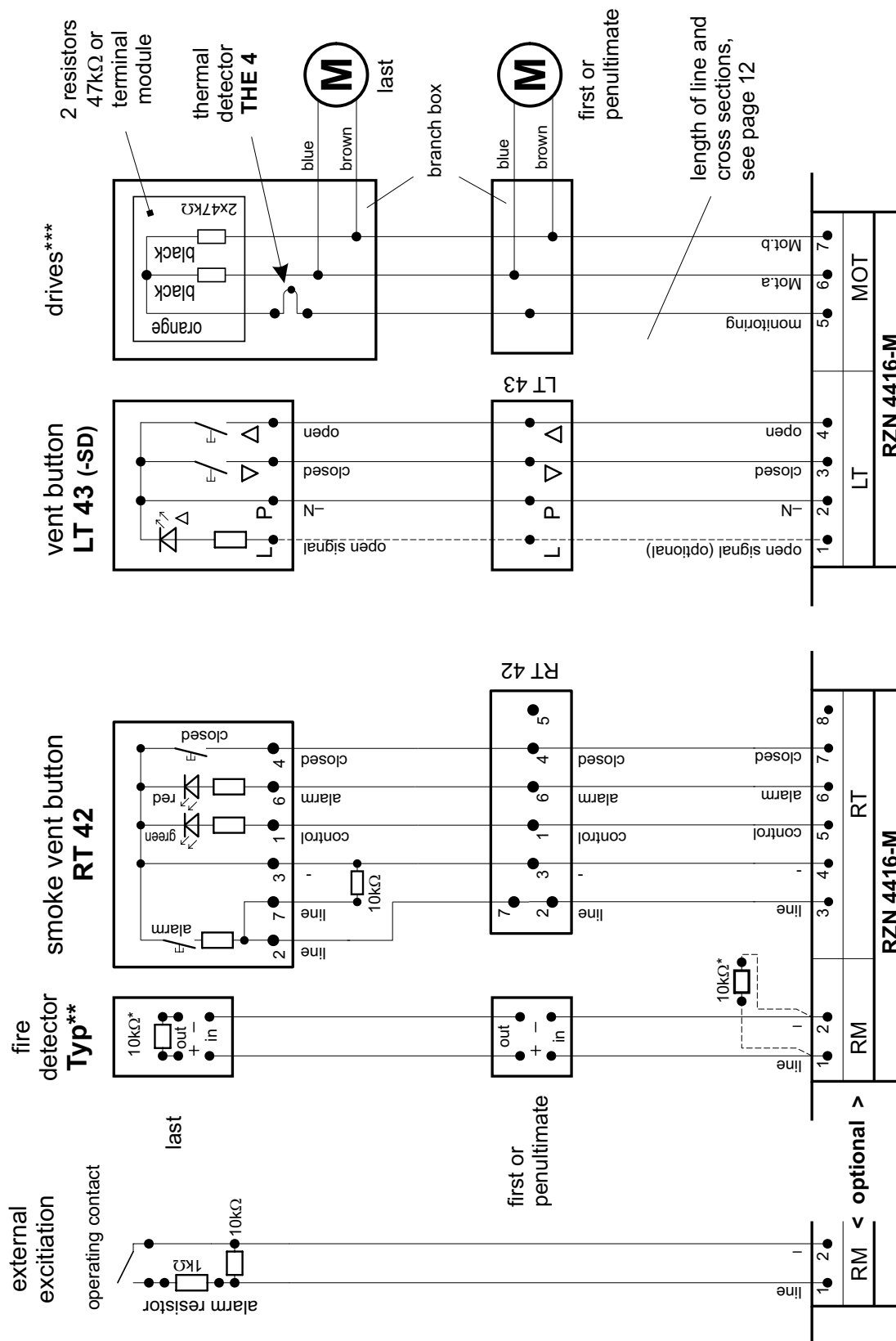
Parallel Connection of 2 x 2 Smoke Vent Buttons - RT 43-H / -N



** Fire detectors

Only D+H system approved detectors must be used (see page 7).

Standard Connection with RT 42



*** Terminal resistors for line monitoring:**

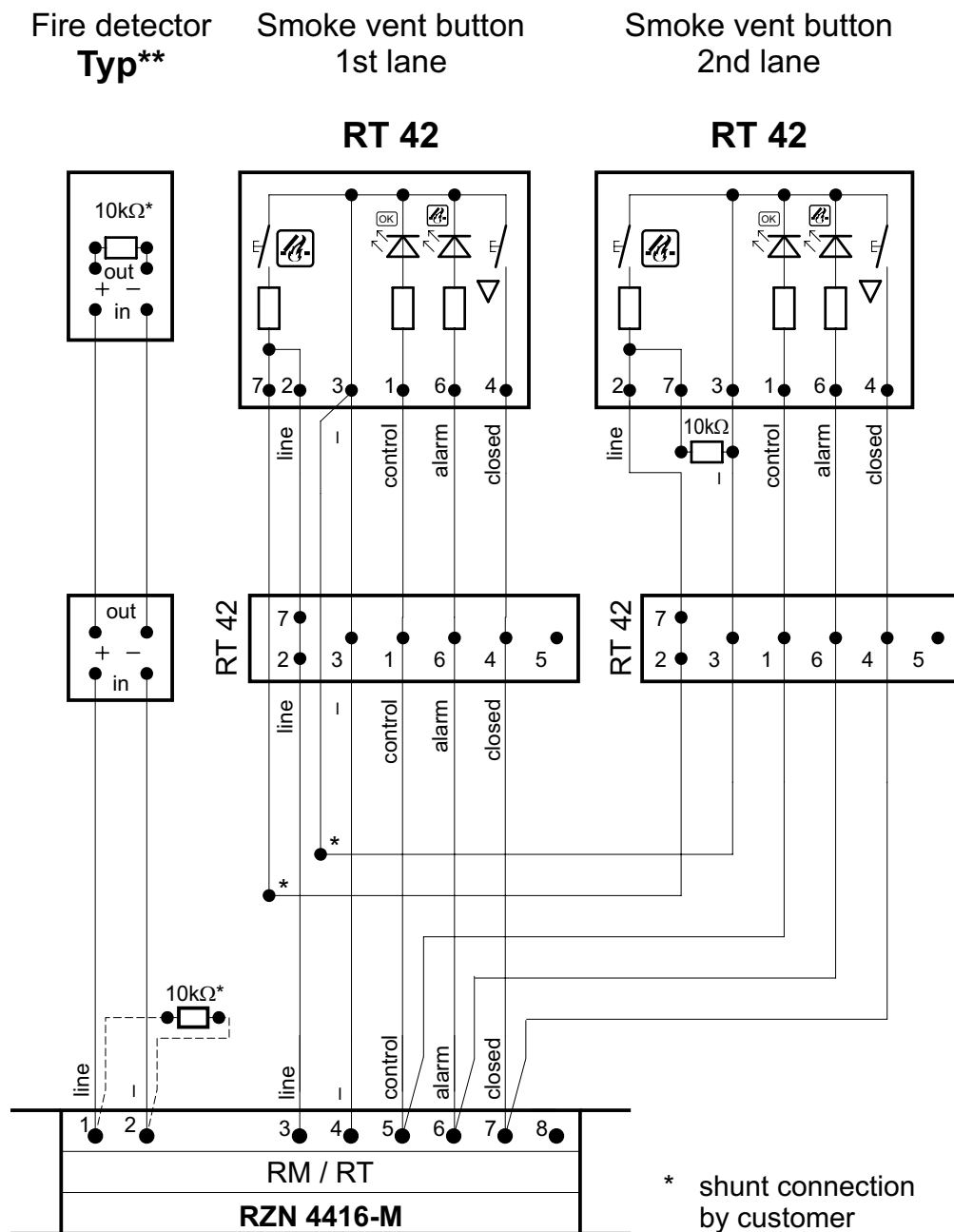
They are pinched in control panel for transport. Take it off there and connect according to plan. Terminal resistors must remain at binder RM 1,2, when no fire detector or external control exists.

**** Fire detectors**

Only D+H system approved detectors must be used (see page 7).

******* For detailed information concerning the connection, please refer to the instruction for use of respective drive.

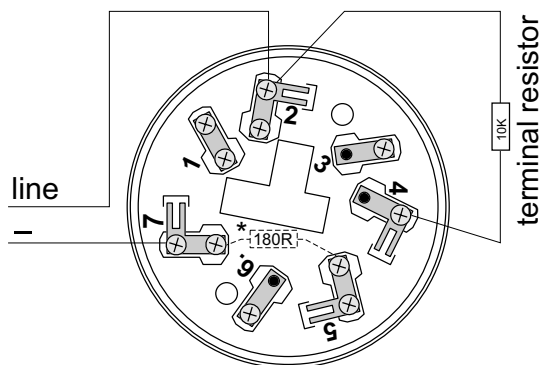
Parallel Connection of Smoke Vent Buttons - RT 42



** Fire detectors

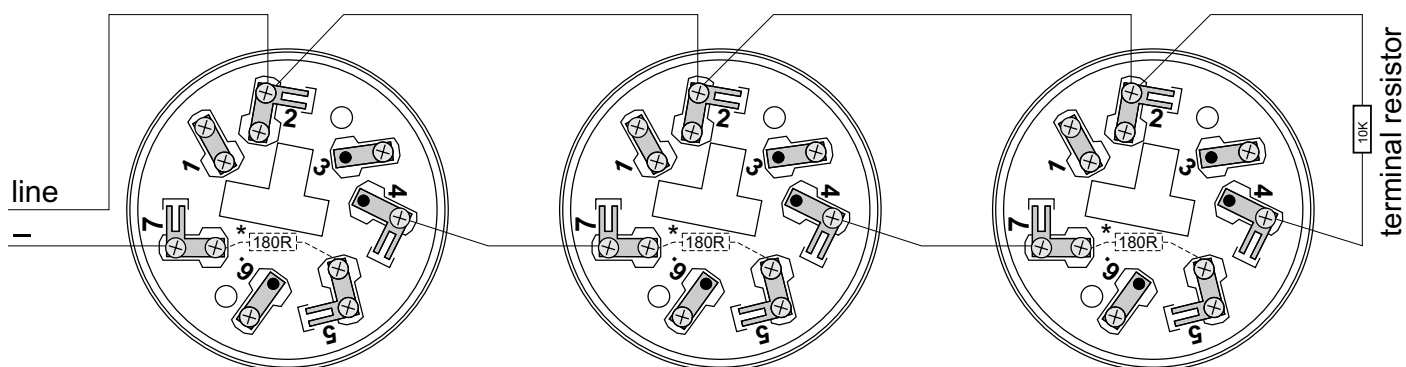
Only D+H system approved detectors must be used (see page 7).

Connection of one fire detector



single fire detector

Connection of several fire detectors



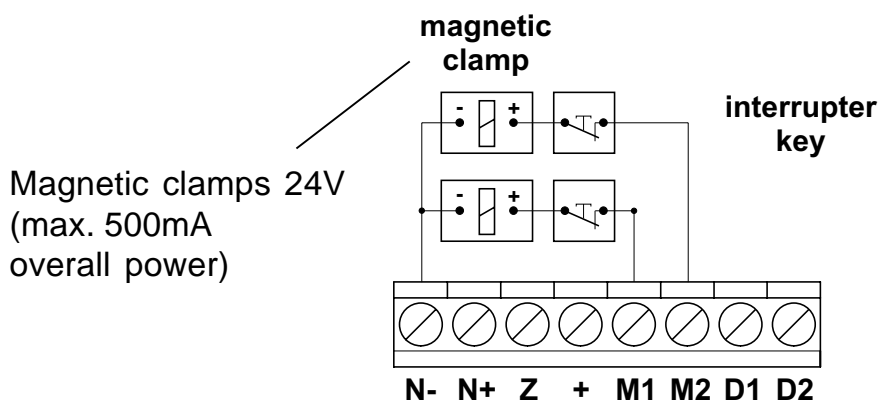
first fire detector

second to penultimate
fire detector

ultimate
fire detector

* The resistor must not be used, when line connections with 2-detector dependency are employed!

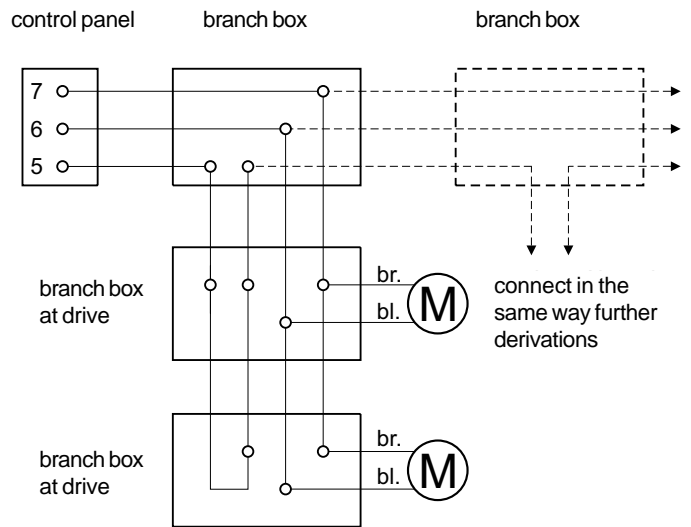
Connection of magnetic clamps on RZN 4416-M



Connection Examples

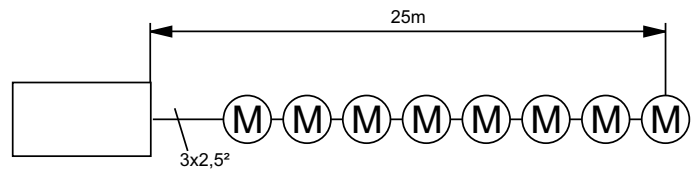
Connection with line derivation:

supply wires **Mot a / Mot b** derive off in parallel, **monitoring** will be looped through all cables up to group end.



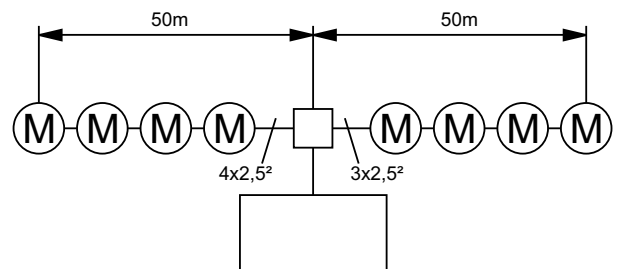
Example 1: 1 lane

Simple installation, but unfavourable for voltage drop: All drives on one line.



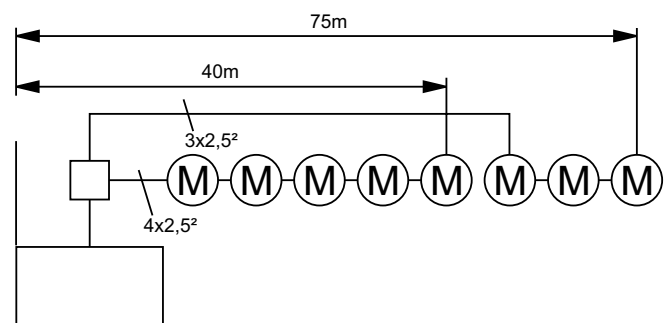
Example 2: 2 lanes

Control panel in centre, one side wired as derivation, the other as terminal line. Observe 4 wires for derivation!



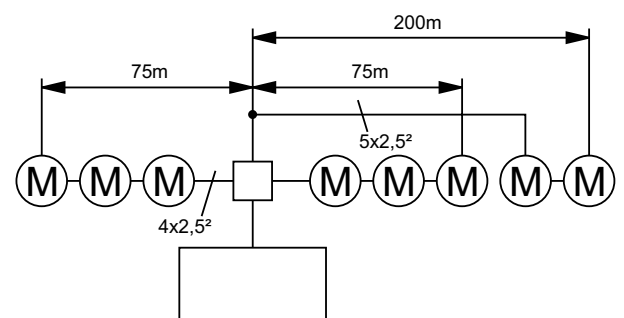
Example 3: 2 lanes on one side

Derivation and terminal lines in same direction; number of drives vary according to line lengths. Observe 4 wires for derivation!



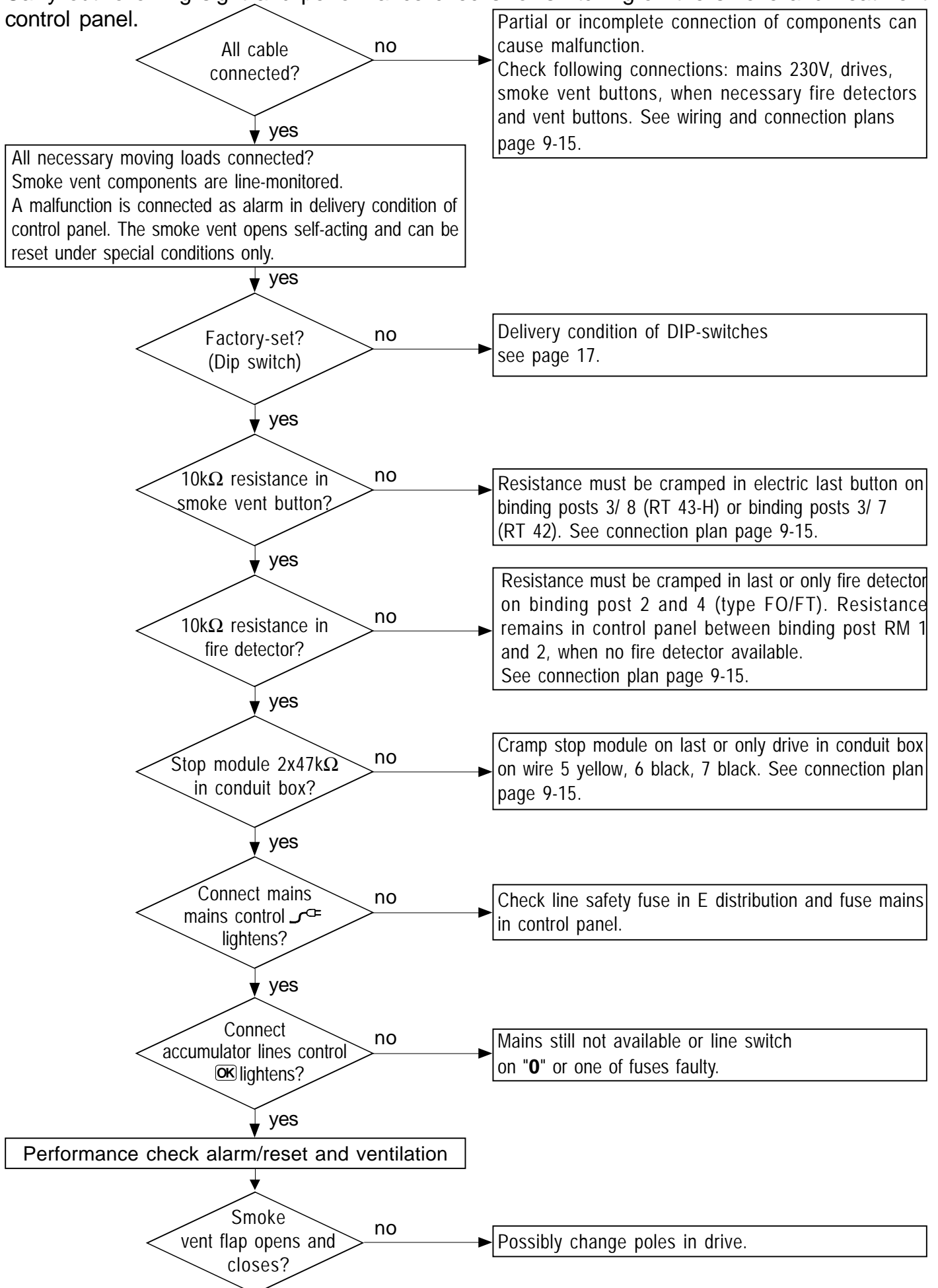
Example 4: 3 lanes

3 line lanes have been provided due to extremely long distances: 2 line lanes with 3 drives each on 75 m line as derivation, and 1 line lane with 2 drives on 200 m line. Observe 4 wires for derivation!



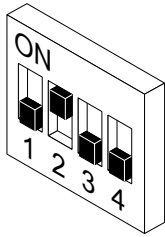
Informations for Starting

Carry out following sight and performance checks for switching-on the smoke and heat vent control panel.

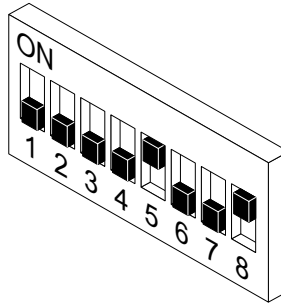


Factory preset of the DIP-Switch

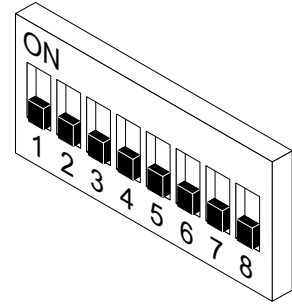
S1, S3



S2, S4, S5



S6



Codification of group S2, S4, S5

<p>Switch 1 on ON =</p>	<p>OPEN-running time limitation Using a potentiometer, running time in Open direction can be Limited. If the vent button is actuated in Open direction, the drive will run open as long as the running time is set.</p>	
<p>Switch 2 on ON =</p>	<p>Ventilation time limitation <i>Only possible in conjunction with group-DIP-switches 4 = ON (storage operation in CLOSED-direction)!</i> Using a potentiometer, ventilation time can be set. Drives will automatically close again, after the adjusted time has expired.</p>	
<p>Switch 3 on ON =</p>	<p>OPEN-retriggering <i>Only possible in conjunction with group-DIP-switch 1 = ON (OPEN-running time limitation)!</i> If Dip switch 1 is switched on ON, the OPEN-running time limitation can be retriggered again.</p>	
<p>Switch 4 on ON =</p>	<p>Storage operation in CLOSED-direction Press ventilating button ▽ 1x shortly > the drive will be closing up to its final position</p>	
<p>Switch 4 on OFF =</p>	<p>Key operation in CLOSED-direction The drives will be closing only so long as the ventilating button ▽ is pressed.</p>	
<p>Switch 5 on ON =</p>	<p>Storage operation in OPEN-direction Press ventilating button △ 1x shortly > the drive will run open up to its final position.</p>	
<p>Switch 5 on OFF =</p>	<p>Key operation in OPEN-direction The drives will run open only so long as the ventilating button △ is pressed.</p>	
<p>Switch 6 on ON =</p>	<p>Group CLOSED in case of alarm The group will be closing in case of alarm!</p>	
<p>Switch 7 on ON =</p>	<p>Group fault on alarm The control panel will be switched on alarm, that means, the smoke vent opens in case of group fault (e.g. in case of an interrupted control line).</p>	
<p>Switch 8 on ON =</p>	<p>Alarm re-clocking The smoke vent is triggered for a duration of 30 minutes in intervals of 2 minutes according to VdS 2581. See page 6 about this.</p>	

Codification of Line S1, S3

Switch 1 on ON =	Two-smoke detectors dependency (<i>Only in conjunction with FO 1362</i>) Alarm will be triggered only, if at least two smoke detectors of one line respond. False alarm of one smoke detector will be prevented. <i>See also page 14 about this.</i> Attention! Two smoke detectors in one room must be always installed. If only one smoke detector is connected to one line, switch is on OFF!
Switch 2 on ON =	Smoke detector alarm can be reset only in control panel Smoke detector alarm can not be reset by single pressing on button in smoke vent button. Dip switch 2 must be switched on OFF, when remote reset is desired of smoke detectors by the smoke vent button.
Switch 3 on ON =	Line fault = alarm The control panel will be switched on alarm, that means the smoke vent opens at a line fault (e.g. at an interrupted detector line or short circuit).
Switch 4	= idle

Codification of Control Panel S6

Switch 1 on ON =	Line 2 on group 3 Line 2 is also effective on group 3
Switch 1 on OFF =	Group 3 is independent of line 2
Switch 2 on ON =	Central alarm In case of alarm of one line, the other line will be set on alarm as well
Switch 3 on ON =	Power failure-CLOSED If the power supply breaks down, the drive will close. Only when group-DIP switch 4 (key operation in CLOSED-direction) = ON
Switch 4 on ON =	Bus control Factory-setting must be on “OFF“
Switch 5	= idle
Switch 6 on ON =	LED Test / Reset WDT error (Watch Dog Timer) Actuate DIP-switch (ON / OFF). LED's will light up for 3 seconds in control panel
Switch 7	= idle
Switch 8	= idle

Delivery Condition RZN 440x-M

	Switch	Delivery condition		Conf. at starting		Function
		ON	OFF	ON	OFF	
S1 Line 1	1		X			Two-smoke detectors dependency
	2	X				Smoke detector alarm only to be reset in control panel
	3		X			Line fault = Alarm
	4		X			Idle
S2 Group 1	1		X			OPEN-running time limitation
	2		X			Ventilating time limitation
	3		X			OPEN-retriggering
	4		X			Duty cycle in CLOSED-direction
	5	X				Duty cycle in OPEN-direction
	6		X			Group CLOSED in case of alarm
	7		X			Group fault on alarm
	8	X				Alarm re-clocking
S3 Line 2	1		X			Two-smoke detectors dependency
	2	X				Smoke detector alarm only to be reset in control panel
	3		X			Line fault = Alarm
	4		X			Idle
S4 Group 2	1		X			OPEN-running time limitation
	2		X			Ventilating time limitation
	3		X			OPEN-retriggering
	4		X			Duty cycle in CLOSED-direction
	5	X				Duty cycle in OPEN-direction
	6		X			Group CLOSED in case of alarm
	7		X			Group fault on alarm
	8	X				Alarm re-clocking
S5 Group 3	1		X			OPEN-running time limitation
	2		X			Ventilating time limitation
	3		X			OPEN-retriggering
	4		X			Duty cycle in CLOSED-direction
	5	X				Duty cycle in OPEN-direction
	6		X			Group CLOSED in case of alarm
	7		X			Group fault on alarm
	8	X				Alarm re-clocking
S6 Control panel	1		X			Line 2 on group 3
	2		X			Central alarm
	3		X			Power failure-CLOSED
	4		X			Bus Control
	5		X			Idle
	6		X			LED Test / Reset WDT error (watch dog timer)
	7		X			Idle
	8		X			Idle

Examination

Every six months and after repair by a specialist or staff, who has been introduced to the task.
Eliminate failings at once. Keep control book.





Preparation:

Notify user, that the system is out of operation before starting with inspection.
Notify user about false alarms.
Interrupt or switch off monitored alarm indication and remote controls.


Inspection:




Check all appliances and cable connections for outer damage and dirt accumulation.
Fire detectors, smoke vent buttons, smoke vents and so on must not be impaired in their function by goods in storage or structural changings.

Smoke vent button:



Open smoke vent button.
Press red button , red display diode  lightens in button and control panel.
Smoke vent must open.
Press masked button  (1 sec.), red display diode  extinguishes in button and control panel.
Smoke vent must close.

Automatic fire detectors:



Release smoke detector individual by D+H-smoke detector tester, as an alternative by cigarette smoke (response delay circa 20 sec.).
Red display diode must lighten.
Smoke vent must open.
For closing wait until there is no more smoke in detector.
Reset line in control panel (switch off/ switch on press button), red display diode  extinguishes in button and control panel.

Press masked button  in smoke vent button. Smoke vent must be closing.
The line can also be directly reset via smoke vent button, if Dip switch 9 is switched on OFF.
For this, press masked button  in smoke vent button (for 1 second).
Red display diode  extinguishes in button and in control panel. Smoke vent must close.
At severe dirt accumulation visible from outside or false alarms, send detector in for maintenance and install an exchange detector.

External control (optional):

Release external control.
Smoke vent must open.
Open contact in external system for closing, for example by resetting of fire detector system.
Press masked button  in smoke vent button (1 second). Red display diode  extinguishes in button and control panel.
Smoke vent must close.

Emergency supply:

Detach fuse MAINS on motherboard of control panel.
Green mains indication diode  on control panel must not lighten.
Repeat functioning testing.
Green control diode  in smoke vent buttons must not lighten. Ventilation is out of function.
If Dip switch 4 and 5 on ON, the group will be automatically closing.