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Functional description RZ-24

Energy supply unit with integrated release mechanism
for hold-open device RZ-24 FA

General construction technique permit (Bauartgenehmigung): [Z-6.500-2436](#)
National technical approval (allgemeine bauaufsichtliche Zulassung): [Z-6.510-2428](#)



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1. Versions

Version	Date	Name	Comments
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5.0	22.06.2022	Herrmann	Corrections

2. General notes

The hold-open device is suitable for holding open

- single and double-leaf revolving leaf doors,
- single and double-leaf sliding doors and gates,
- folding doors and sectional doors,
- flexible smoke- and fire protection closures,
- ventilators, conveyor systems, machines which have to be switched off in case of smoke development.

The following printed matter applies: "Directive for hold-open devices" (version 28.09.2015) and the general building supervisory approval [Z-6.510-2428](#) for the RZ-24 FA.

The RZ-24 centre is the main item of the hold-open device with the designation RZ-24 FA, which is generally composed of four essential components:

- a) Energy supply facility (RZ-24)
- b) Release mechanism (RZ-24)
- c) Hold-open device (list of [system components](#), e.g.: holding magnets)
- d) Fire/smoke detector (list of [system components](#))

- Fire protection closures must be released for self-actuated closing in case of a broken wire or short circuit or removal of a detector.
- To fulfil efficiently this condition a monitoring in form of a fire detection loop is integrated within the release mechanism of the control unit RZ-24 and differs in this point significantly from other fire control units.

Advantages:

- Not only smoke and thermo switches can be used, but also smoke and thermo detectors which are generally more economical
 - According to the approval of the RZ-24-FA detectors and hold-open devices made by diverse manufacturers are combinable. This large selection of different system components provides safety for the future as you may only supplement and replace hold-open devices with components which are indicated in the respective approval. If one of the components is no longer available (e.g. generation change or delivery bottlenecks of a fire detector) it cannot simply be replaced by the following type, even if this was possible functionally. You must then exchange the complete hold-open system in order to comply with the approved norm again. But an exchange is admissible with another component which is listed in the approval and whose function is equivalent (e.g. fire detectors or magnetic clamp from another manufacturer). For the RZ-24-FA an exchange of such components will be uncomplicated also in the future because of the wide spectrum of approved system components.
 - Whether for a fire door in an area endanger by explosion, a sliding fire gate or a fire curtain, the same control centres can be deployed for all kinds of applications.
- A manual release option must exist.

Advantage:

- The RZ-24 has a push button for manual release (Test). Only an explicit marking as required by the directive must be provided. Depending on the closure type, e.g. "close door" or also "closing a sliding gate, fire protection closure or flap".

- The use of a Powerpac enables short-term power failures to be bridged, e.g. until a back-up power generator is started.

Advantage:

- The Powerpac combined with the RZ-24 can replace considerably more complex battery couplings with chargers. The Powerpac is maintenance-free and has a lifespan of up to 10 years.
- If provided with screwed cable glands with IP64, the whole casing achieves protection degree IP64.

Advantage:

- RZ-24 can also be deployed under extreme ambient conditions, such as damp locations.

3. Function

The device combines a 24 V/0.9 A power supply and a fire detection evaluation for use in hold-open devices. It is designed for a wide range of the supply voltage of 85...265 V AC.

Diverse types of fire detectors can be deployed for fire detection evaluation. Fire detectors working on the switch principle (smoke switch) as well as fire detectors working on the current increase principle (fire detection loop with load resistor) can be connected. The release of one or more detectors is indicated optically and acoustically and is stored. A release needs to be reset at the central unit.

A 24 V-output is provided to actuate hold-open devices (e.g. holding magnets) which is switched off when released. A potential-free change-over contact exists to signal the release. The relay switches off on release.

In case of a power failure, the release is actuated immediately as the 24 V DC power supply is no longer available.

Release on:

- Short-circuit or interruption of the fire detection loop (X1:4,5)
- Mains power disturbance (power failure), DC voltage falls below 16 V
- Actuation of the manual push button (X1:8,9)
- Release of the fire detector (current increase X1:4,5)
- Actuation of test button

4. Technical Data

General:	Input voltage:	85 V AC - 265 V AC, 50/60 Hz
		120 V DC - 360 V DC
	Power draw:	approx. 30 W
	Output voltage:	24 V \pm 5%
	Output current:	max. 0.9 A in total
	Ambient temperature:	-25 °C...+40 °C
	Humidity:	50%@40°C, briefly up to 95%@25°C
	Casing:	TG ABS 1212-6-o IP64
		HxWxD 122x122x55 mm
	Cable insert:	4x thread M16 with screwed cable gland
Detection loop:	Alarm	I > 12 mA
	Interruption	I < 3.0 mA
	Short-circuit current	max. 50 mA
	Closed current (load resistor = 4k7)	approx. I = 4.5 mA
	For the use of a Powerpac a termination resistor of 5,9 k has to be used	approx. I = 3.5 mA
Line tension	U _{lin} = 20.0...21.4 V	

Fire detection evaluation:

- Via fire detection loop or smoke switch
- Potential-free contact of the fire detection centre
- Push button
- Test possible via "close door" button
- Reset via Reset button
- Acknowledge siren via white button
- Status display green = not released
 red = released
- potential-free contact to signal the release
8 A/250 V~/AC1; 2 A/24 V DC; 0.2 A/240 V DC
Relay switched off = release

Inputs: Mains power connection 85 V AC – 265 V AC 50/60 Hz (X1:1,2,3)
 Fire detection loop (X1:4,5)

Outputs: Hold-open device (X1:6,7)
 Supply voltage 24 V DC (X1:10,11)
 Relay potential-free release (X1:12,13,14)

Approval: Number [Z-6.510-2428](#) dated 02/08/2019 issued by "Deutsches Institut für Bautechnik"
(German Institute for Construction Technology), department of fire behaviour of
components, limitation of fire spread, fire safety

Bridging times when Powerpac 2 is deployed:

Device to be supported	Load at U _{Nenn} 24 V	Bridging time	Example configuration
RZ-24	60 mA + 50 mA	ca. 12 min:07 s	1 x GT50
Note: The fire detection loop of the RZ-24 is released at a voltage of approx. 16 V.	120 mA + 50 mA	ca. 7 min:50 s	2 x GT50
Own consumption RZ-24: approx. 50 mA	240 mA + 50 mA	ca. 4 min:35 s	4 x GT50

Note: These are reference values and not guaranteed bridging times. Each further additional load on the devices shortens the bridging time!

Formula for the calculation of the approximate bridging time:

$$\text{Bridging time (T)} = \frac{(U_{\text{Nenn}} - U_{\text{min}}) \times C}{I}$$

U_{Nenn} = charging voltage (V) here 24 V
 U_{min} = operating voltage (V) here 16 V (for the use of RZ-24/RZ8) or 10 V (only AMU-EV)
 C = capacitance (F) here 10 F (Powerpac 2)
 T = bridging time (sec.)
 I = load (A) at U_{Nenn} 24 V

Example for the configuration of 2 x GT50:

$$\text{Bridging time (T)} = \frac{(24 \text{ V} - 16 \text{ V}) \times 10 \text{ F}}{0,17 \text{ A}} = \text{approx. 470 sec.} = \text{approx. 7 min 50 sec.}$$

Note: The formula states the bridging times for constant power delivery. In reality, the voltage drops when the power-pack is discharged and thus the current also drops. This leads to somewhat longer bridging times than those calculated. The bridging times likewise depend on the charging status of the Powerpac and on the ambient temperature.

5. Start-up/operation

The installation of a hold-open system has to be made by certified specialists. The official acceptance test has to be performed by a certified person (acceptance test specialist). Protronic offers training courses to get the certification as maintenance and acceptance test specialist. Only system parts (fire detectors, Hold open devices) listed in schedule: [System Components](#) (6.) of the current General construction technique permit and their amendments, can be connected to the RZ-24.

Please note the following:

- Installation of fire detectors according to the General construction technique permit
- Installation of central unit and connecting cables within the detection range of the detectors
- Installation of the manual release device according to the General construction technique permit
- If devices (system parts) are combined in one casing or the cables for the system parts are laid all together in one cable conduit or cable duct, the cable separation is not necessary.
- When using Ex-fire-detectors with a Zener barrier a termination resistor of the fire detection loop of 3.9 kOhm has to be used.
- If a Powerpac is used a termination resistor of 5.9 kOhm is required.
- Please respect the [circuit diagrams](#) (7.).
 - Carefully open the casing cover (do not strain the foil keypad cable!)
 - Connect the necessary cables, such as
 - Power supply 230 V AC (85...265 V AC)
 - Fire detector
 - Hold-open device
 - Close the casing cover
 - Switch the power on, siren/horn on, LED red illuminated, reset fire detection loop with button RESET, siren/horn is now off



- The "TEST" button serves manual release and to reset the fire detectors



- Acknowledge siren/horn button (white) switches the siren/horn off



- If a fire detector is triggered, this must first be reset before the fire detection loop can be reset, e.g. by actuating the "TEST" button (interruption of the fire detection loop to reset the fire detector), subsequently actuate RESET.
In case of a smoke switch, actuate the manual button to reset the fire detectors, subsequently actuate RESET.

Charge the power supply unit only with a maximum 0.9 A in total. The maximum admissible current is composed of the sub-currents for fire detectors (4,5), hold-open devices (6,7), other consumers (10,11). If the output current is clearly overshoot, the power supply unit switches off automatically (electric overload fuse).

Danger



**During operation, some components inside the housing carry hazardous voltages!
The housing should only be operated by specialists in an isolated state!**

WARNING



Unused cable entries must be properly sealed! (Blind screw-connection)

5.1 Consumer current

When planning the maximum number of consumers, such as hold-open devices and fire detectors, consider the maximum current provided by the power supply. It totals 0.9 A for all external consumers. Note that smoke switches or evaluation devices, for example, likewise need to be considered in this context. If the maximum power consumption is overshoot or in case of overheating, the power supply switches off automatically.

5.2 Hold-open device

Hold-open devices as per schedule B of the approved system components can be selected. Note that only the hold-open devices approved for the respective fire protection closure may be deployed, or hold-open devices which do not influence the fire resistance of the fire protection closure, such as can be the case with bolts fixing anchor plates to the fire door.

5.3 Choice of detectors

Detectors should be selected by specialised staff in accordance with the local/operational conditions. Only smoke detectors may be used to safeguard escape routes (system components as per schedule A 1. and 2.)

In case ionization smoke detectors are deployed, for example in heavily soiled rooms or in rooms with a high accumulation of dust, be sure to observe the special instructions of the Radiation Protection Ordinance and of the manufacturer.

5.4 Manual release

A manual release button must be installed in the immediate vicinity of the closure. The manual release button should be red and be labelled "Close door".

5.5 Horn-sound deactivation

The integrated horn of the RZ-24 unit can be deactivated by pulling the jumper (if present). ATTENTION: Please respect the approval guidelines! The horn is part of the hold-open system and should normally not be deactivated.

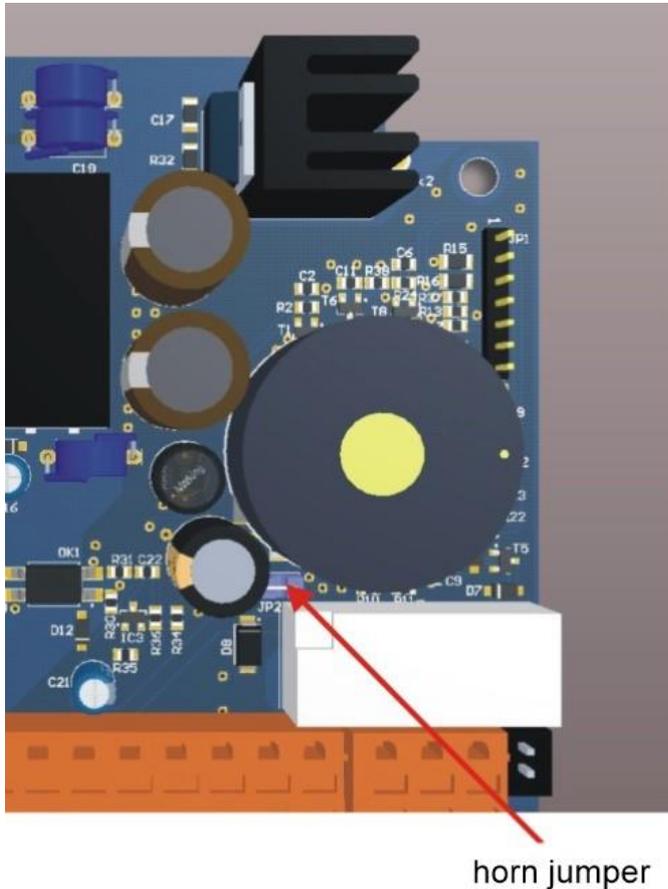


Fig. 4: Jumper for deactivation of internal horn in the RZ-24

5.6 Special terms of the general building supervisory approval

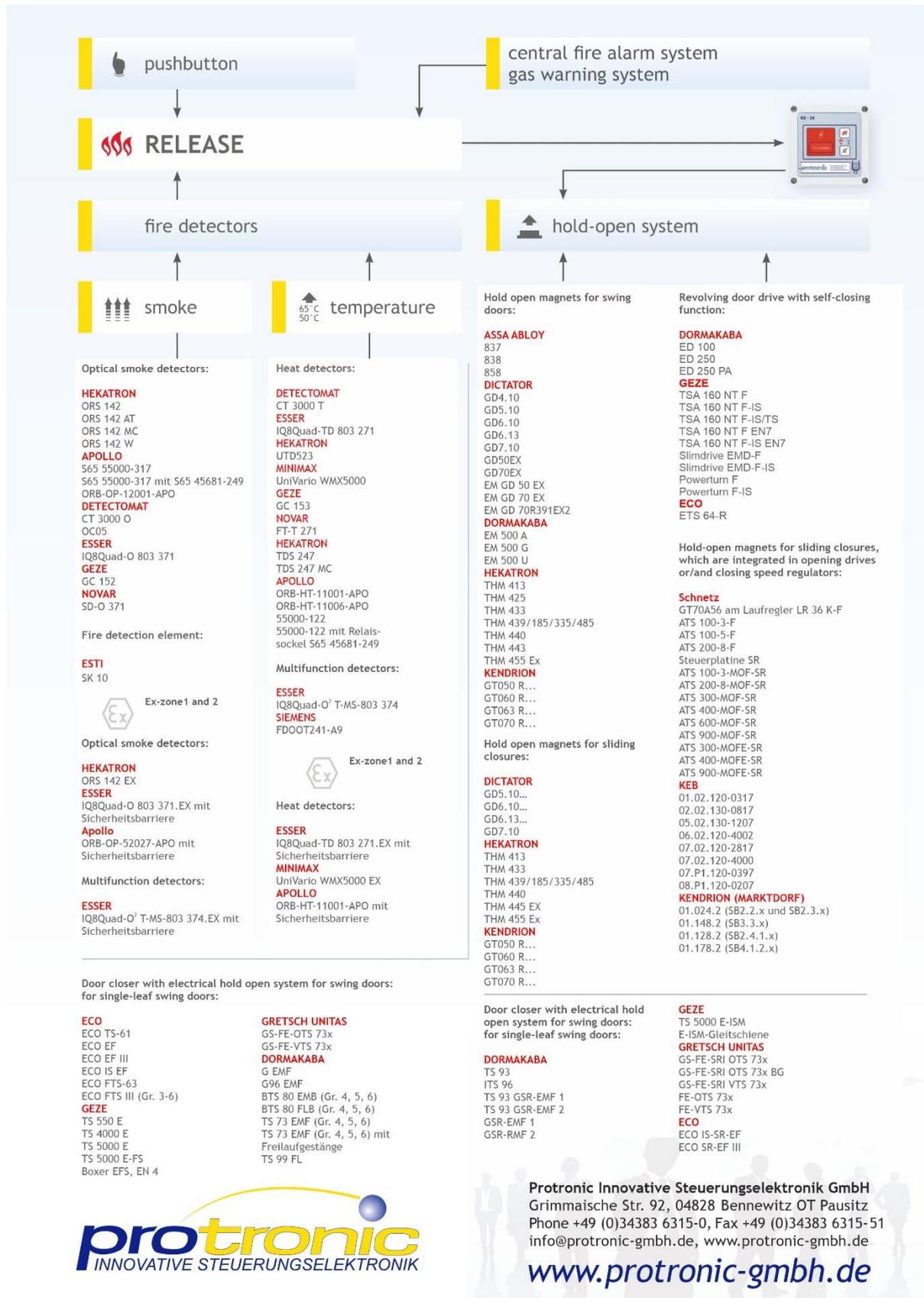
Comply with the regulations with particular regard to labelling, performance, acceptance, operation and maintenance according to [National technical approval \(german\)](#) number Z-6510-2428 RZ-24 from 02.08.2019 for the RZ-24 and [General construction technique permit \(german\)](#) Z-6.500-2436 from 17.10.2019 for the RZ-24_FA and RZ8-FA.

6. System components:

The list of system components currently approved in the hold-open system can be found under this link:

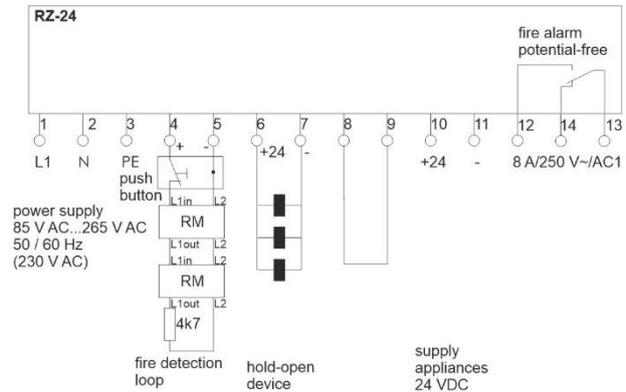
www.protronic-gmbh.com/wp-content/uploads/2022/09/062023backside_Flyer_RZ-24-FA.engl.pdf

6.1 List of currently approved system components:

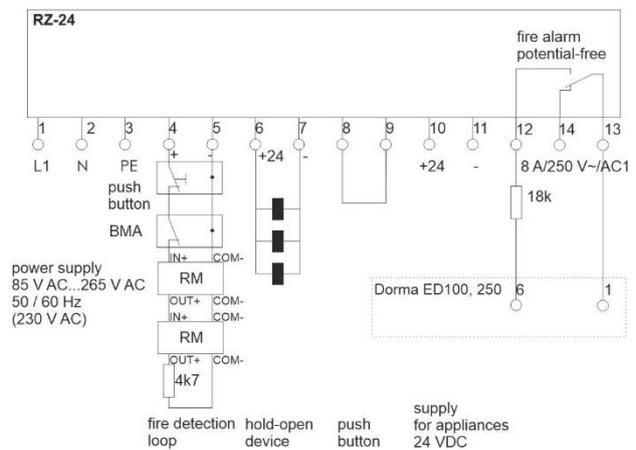


7. Circuit diagrams

Hold-open system RZ-24 with fire detection loop for fire detectors e.g.:
Apollo (55000-200,-317,-122)

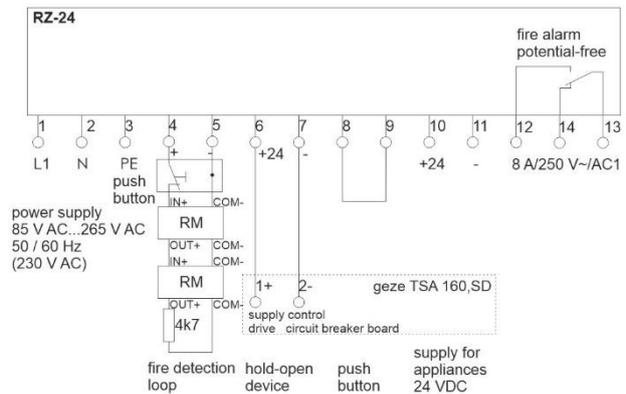


Hold-open system RZ-24 with fire detection loop for fire detectors e.g.:
Apollo Orbis OP 12001, A1R HT-11001, OH-13001 and release by fire alarm system and revolving door drive ED100, 250

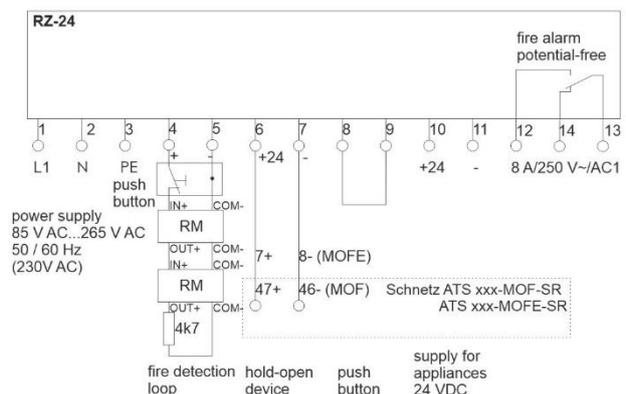


The series resistor 18k monitors the line for the release of the Dorma drive and has to be installed in the casing of the RZ-24/RZ8.

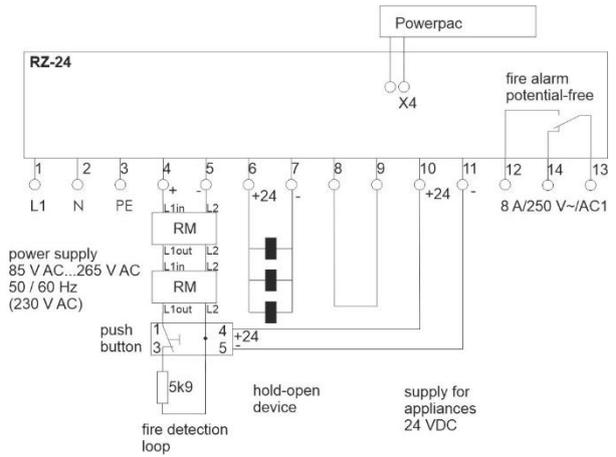
hold-open system RZ-24 with fire detection loop for fire detectors e.g.:
Apollo Orbis OP 12001, A1R HT-11001, OH-13001 and door automatics geze TSA 160 NT-F, NT-F-IS, NT-F-IS/TS or Slimdrive SD, SD-F-IS Servo



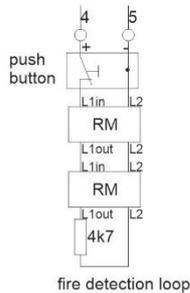
Hold-open system RZ-24 with fire detection loop for fire detectors e.g.:
Apollo Orbis OP 12001, A1R HT-11001, OH-13001 and door automatics Schnetz ATS...MOF, MOFE



Hold-open system RZ-24 with fire detection loop
for fire detectors e.g.:
Apollo (55000-200,-317,-122)
with Protronic manual release push button and Powerpac

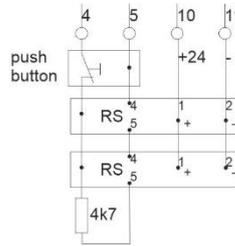


1. fire detection loop
for fire detectors e.g.:
Apollo (series 65 55000-317,-122)

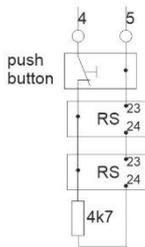


fire detection loop

2. smoke switches e.g.:
Hekatron (ORS 142,142W, TDS247)



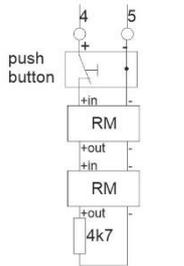
3. smoke switches e.g.:
Esti(SK10)



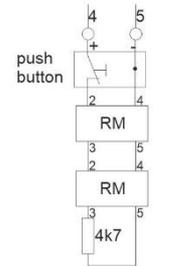
4. fire detection loop for fire detectors e.g.:
Detectomat CT 3000O, CT 3000T, OC05, TRC05

CT 3000O, CT 3000T

OC05, TRC05

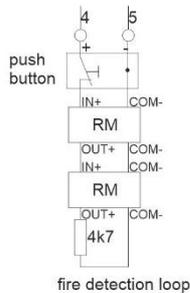


fire detection loop



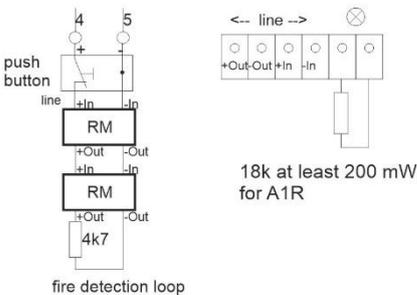
fire detection loop

5. fire detection loop for fire detectors e.g.:
Apollo Orbis OP 12001, HT-11001, HT-11006



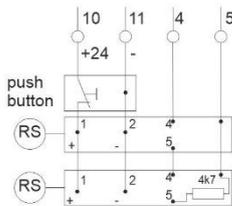
fire detection loop

6. fire detection loop for fire detectors e.g.:
Siemens FDOOT241-A9
(detector socket FDB201/FDB201-AA, FDB202)

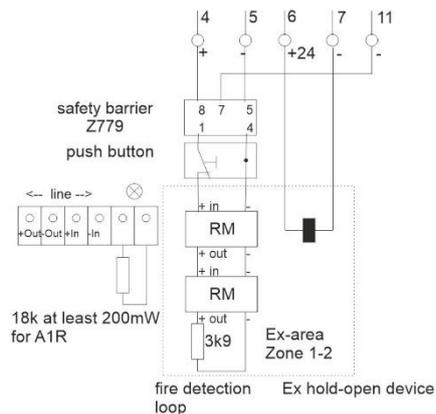


fire detection loop

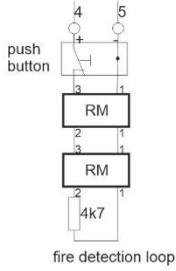
7. smoke switches e.g.:
Hekatron (ORS 142EX)



8. fire detection loop for fire detectors e.g.:
Siemens (FDOOT-A9-Ex) with safety barrier P+F Z779

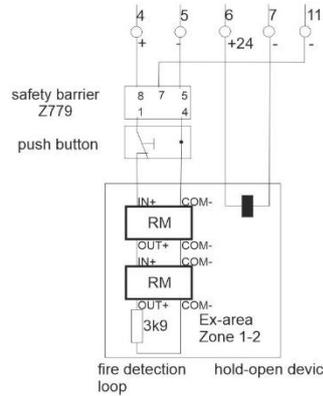


9. fire detectors e.g.:
Hekatron MSD 523, UTD 523



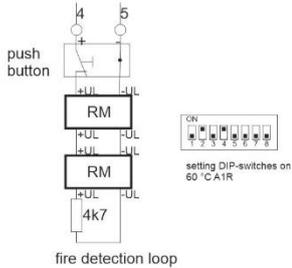
fire detection loop

10. fire detectors and hold-open devices in Ex-areas
Zone 1 and 2 with safety barrier 28 V 300R P+FZ779
e.g.: Apollo Orbis IS OP 52027, Orbis IS A1R HT-51145



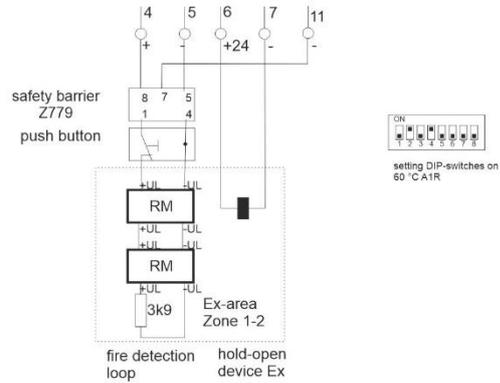
fire detection loop hold-open device

11. fire alarm loop for fire detectors e.g.:
Minimax UniVario WMX5000



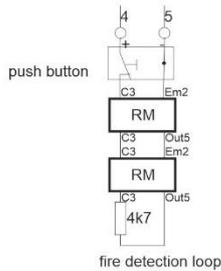
fire detection loop

12. fire detection loop for fire detectors.:
Minimax UniVario WMX5000 Ex with safety barrier P+F Z779



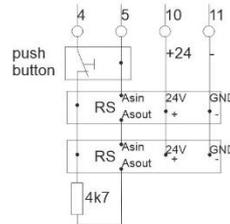
fire detection loop hold-open device Ex

13. fire detection loop for fire detectors e.g.:
Esser IQ8Quad 803371, 803271, 803374 O²T,

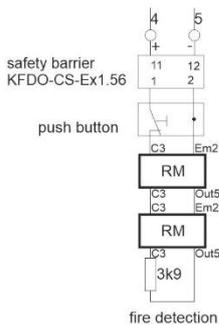


fire detection loop

14. fire detection loop for fire detectors e.g.:
Geze GC152, GC153

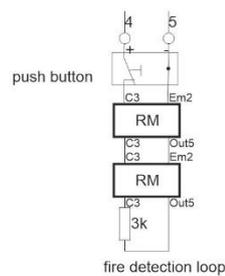


15. fire detection loop for fire detectors e.g.:
Esser IQ8Quad O 803371.Ex, TD 803271.Ex, MS 803374.Ex O²T
with safety barrier P+F KFDO-CS-Ex1.56



fire detection loop

16. fire detection loop for fire detectors e.g.:
D+H SD-O 371, FD-T 271



fire detection loop