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Functional description

RZ-24-05

Release device for hold-open systems with energy supply

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1. Versions

| Version | Date | Name | Comments |
|---------|------------|----------|----------|
| 1.0 | 30.09.2020 | Herrmann | new |
| 1.1 | 23.06.2022 | Herrmann | Revision |
| | | | |
| | | | |
| | | | |
| | | | |

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:

- "Requirements and test specifications for the approval procedure of hold-open systems" (version 28.09.2015),
- the national technical [approval Z-6.510-2435](#) for the RZ-24-05,
- General construction technique permit: [Z-6.500-2436](#)


The control unit is the main item of the hold-open system with the designation RZ-24-05, which is generally composed of four essential components:


- a) Energy supply facility (RZ-24-05)
- b) Release mechanism (RZ-24-05-MC and RZ-24-05-KL)
- c) Hold-open device (e.g.: holding magnets)
- d) Fire/smoke detector

Conditions:

- 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-24-05 and differs in this point significantly from other fire control units.

Hazard warnings:

| Danger | |
|---|---|
|  | Attention: During operation, some components inside the housing carry hazardous voltages! The connection should only be operated by specialists in de-energised state! |

| WARNING | |
|---|--|
|  | The maximum power and voltage values indicated in this functional description should not be exceeded. |

3. Function and operation

3.1. About the function

Die RZ-24-05-device-combination consists of 3 individual components:

- RZ-24-05-MC = control unit with integrated membrane keypad and snap-on frame,
- RZ-24-05-KL = support ring with integrated terminal board,
- RZ-24-05-NT = 85 V...264 V AC 50/60 Hz auf 24 V 0,5 A DC energy supply,

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 depending on the DIP switch setting stored or acknowledged automatically. A stored release needs to be reset at the central unit. The automatic alarm acknowledgement is only possible if, the released detectors have been reset.

There are 2 not potential free outputs to actuate hold-open devices (e.g. holding magnets) and for an additional optical/acoustic signalling. In case of a power failure, the release is made immediately as the 24 V DC power supply is no longer available.

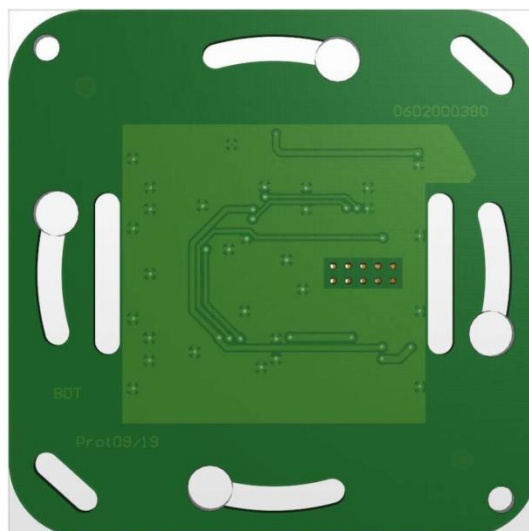
Optionally the release can be delayed by up to 30 seconds using an energy storage device (Powerpac) . This means short interruptions (few seconds) will not lead to a release.



RZ-24-05-MC



RZ-24-05-NT



RZ-24-05-KL

3.2. Function of detection loop

The detection loop of the RZ-24-05 provides at the outputs 1 (+) and 2 (-) an output voltage of approx. 20 V...22 V DC. The fire detectors are connected in parallel to this loop (according to the wiring diagrams). The detection loop is closed by a terminating resistor between (+) and (-) in the last fire detector. The loop current created in this way is the result of the current consumption of each detector and the current flow by the terminating resistor of the last detector in line.

| Detection loop current | Condition | Effect |
|-------------------------------|--|------------|
| between approx.3 mA and 12 mA | detection loop in operation | no release |
| < 3 mA | detection loop open/wire breakage | release |
| > 12 mA | Detection loop detector released/short circuit | release |

According to the national technical approval a maximum number of 20 detectors can be connected to the fire detection loop.

WARNING



Do not connect +24 V or ground to the fire detection loop. This may lead to malfunctions and/or failures of the electronics. The contact of the detection loop with parts with earth potential must be avoided to prevent disruptions and in consequence false releases

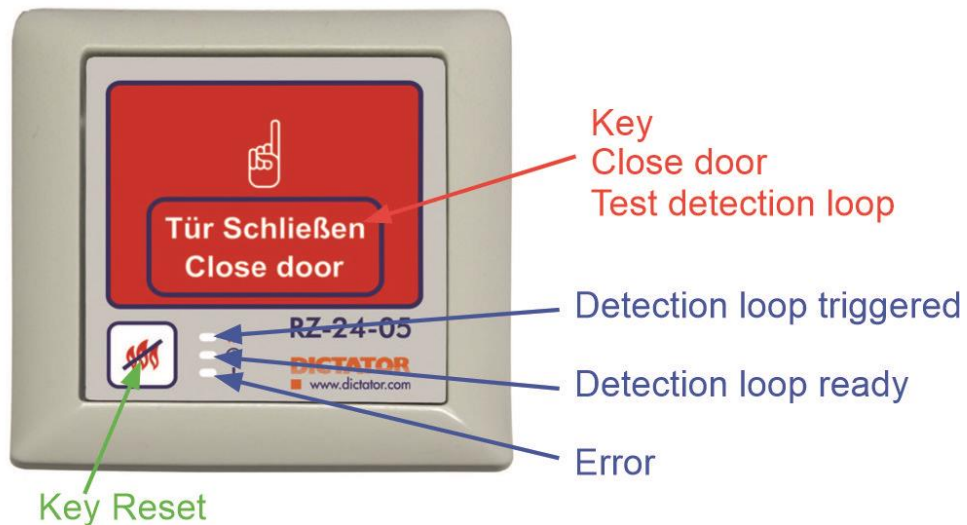
The operation of the fire detection loop is performed via 2 buttons on the membrane keyboard. When actuated, the big, red button "Close door" switches the detection loop on 0 V. This has the following effect:

- Test release of the detection loop (normal operation status required).
- Test of the hold-open system during the monthly inspection and maintenance.
- Resetting of triggered detectors by test gas or fire alarm.

The small, white „Reset“-button resets the detection loop if the connected detectors are reset.

Please note that: The reset of the fire detection loop will be possible only 3 seconds after the actuation of the red button "Close door". This time delay guarantees the complete release of the hold-open system.

3.3. Function of the membrane keypad



3.3.1. General Information

The membrane keyboard is slightly heated by the underlying electronics. Thus the foil surface feels warm to the touch. When using the controller in cool rooms, the heating of the keyboard prevents the formation of condensation water. The controller is only suitable for deep-freeze areas if it is housed in an additional enclosure with an additional heater.

3.3.2. Key "Close door", test detection loop

The "Close door" key is a 35 x 47 mm red flat key without button click, which has two functions:

- Function 1: Test activation of the fire detection loop and closing of the connected closing device.
- Function 2: Resetting the triggered detectors by switching off the loop voltage.

After pressing the button, the detection loop can only be reset after a waiting period of 3 seconds.

3.3.3. Key "Reset"

The "Reset" key is a 10 x 10 mm white key with button click, which resets the central unit when pressed. The reset can be performed only if the connected detectors are not triggered and ready for operation and the 3 seconds waiting period after pressing the "Close door" button has expired.

3.3.4. LED “detection loop released”

The LED “detection loop triggered” lights up red if the detection loop of the RZ-24-05 is triggered. The output “hold-open magnet” is switched off and the output “warning light” lights up.

3.3.5. LED “detection loop ready”

The LED “detection loop ready” lights up green if the detection loop of the RZ-24-05 is ready for operation (not triggered). The output “hold-open magnet” (6,7) is switched on, the output “warning light” (8,9) is off.

3.3.6. LED “Error”

The LED “Error” lights up or blinks yellow. A constantly yellow lighting LED is a sign for a major defect of the RZ-24-05. A yellow blinking LED indicates various other malfunctions: the blinking pattern indicates the kind of malfunction with signals separated from each other by breaks of 1 seconds

- 1x blinking = Undervoltage Error -> operating voltage drops below 15 V
- 2 x blinking = flash - storage error of control unit, change control unit
- brief light up of the error LED when switching the system on is normal and serves to test the display
- example: undervoltage error and flash-storage error are displayed: 1x yellow blinking, break 1 second, 2 x yellow blinking, break 1 second, 1 x yellow blinking, break 1 second, etc.

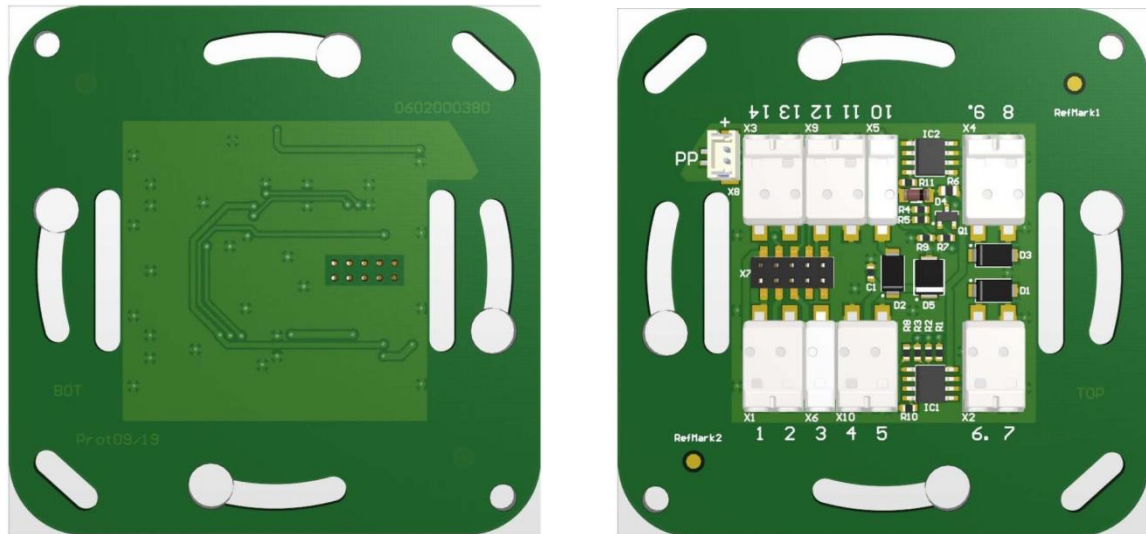
3.3.7. DIP switch 1

- The DIP switch 1 set to position OFF (factory setting), a tripping is stored. That means, the release will not be reset automatically and the reset of the detection loop has to be made manually by the user.
- The DIP switch 1 in position ON realizes the automatic reset mode. That means, a tripping is reset automatically after 3 seconds when the detection loop with their detectors is ready to operate.

3.3.8. DIP switch 2

- The DIP switch 2 in position OFF (factory setting) realizes the central closing via the external input. Therefor 24 V are briefly applied to the input (pin 12). With the help of central closing, doors can be closed (only for door holding magnets) without triggering the RZ-24-05 detection loop. This function is no closing in case of fire but realises the closing of the fire protection closures, e.g. the end of a working day. The hold-open magnet output (pin 6,7) is switched off for approx. 3 seconds by applying the 24 V to the external input.
- The DIP switch 2 on position ON enables an external reset of the central unit via the external input. Therewith, it is possible, for example in combination with a Protronic manual release button, to reset the detection loop by using the reset button of the manual release button.

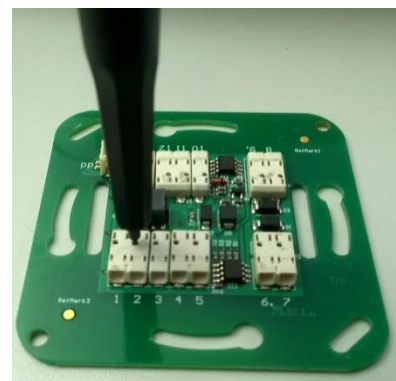
3.4. Function of the RZ-24-05-KL support ring/terminal board



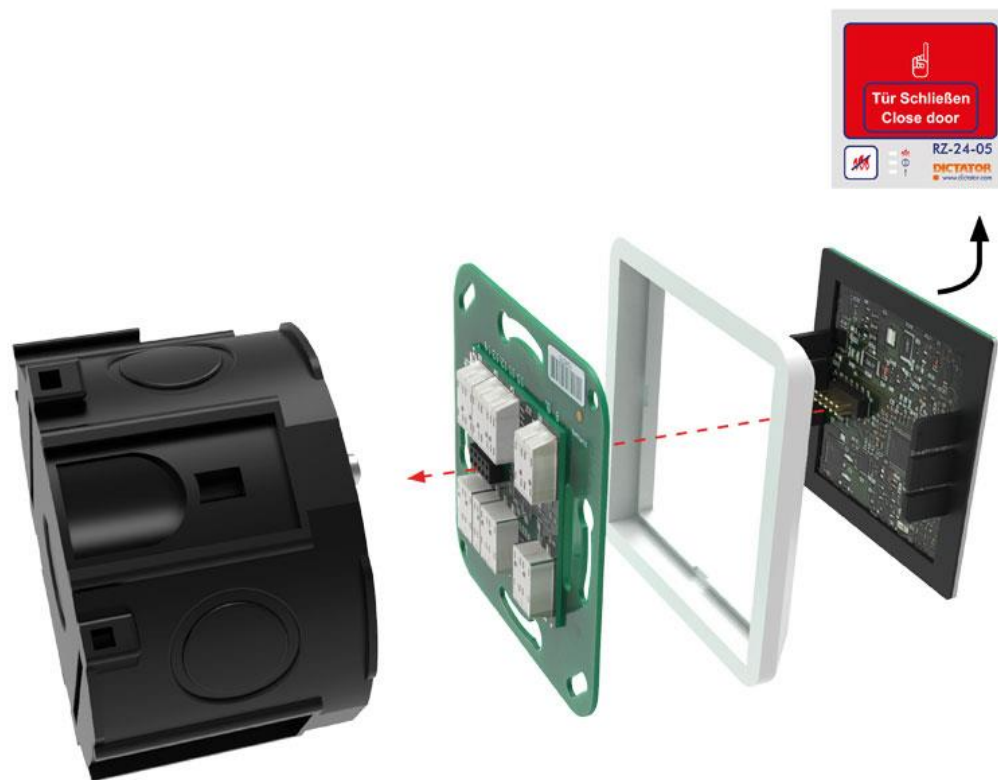
3.4.1. General information

The RZ-25-05-KL unit is the supporting element of the control unit. The support ring is screwed to the surface-mounted, flush-mounted box or to the wall and the RZ-24-05-MC unit is connected to the 10-pin connector. The terminals on the backside serve to connect the necessary connecting cables. The side with the components always points into the flush-mounted or surface-mounted box in the direction of the cables.

The terminals are designed for a wire thickness from minimum 0.2 mm² to maximum 0.75 mm². The terminals may only be loosened with the special extraction tool. A normal screwdriver will damage the terminals!



3.4.2. Assembly of the RZ-24-05



Installation tips for the RZ-24-05:

Flush-mounted/cavity-wall/ surface mounted

- The used boxes should have a diameter of 60 mm and a depth of a least 45 mm. Deeper boxes are possible and sometimes appropriate.
- Insulate suitably unused cores, short-circuit hazard.
- The support ring (RZ-24-05-KL) has to be aligned precisely and to be screwed to the box or the wall. You can find holes/ oblong holes for this purpose.
- Gently push the snap-in piece with the membrane keypad in the guide slots of the RZ-24-05-KL. In case of not fitting, check that there aren't any contacts bent on the 10-pin terminal.
- For disassembly always pull out the snap-in piece together with the cover frame and do not try to lever out only the snap-in piece.

3.4.3. Terminal assignment

The RZ-24-05 has 14 terminals. The following table shows the terminals and their function.

| Klemme | Funktion | Beschreibung |
|--------|------------------------|--|
| 1 | Detection loop (+) | Output detection loop (+) (terminating resistor 4k7) |
| 2 | Detection loop (-) | Output detection loop (-) (terminating resistor 4k7) |
| 3 | +24 V output | Power supply for fire detectors and/or manual release Protronic. |
| 4 | Ground (0 V) | |
| 5 | Ground (0 V) | Ground 0 V |
| 6 | Output HM (+) | Output hold-open magnet (+) free-wheeling diode present |
| 7 | Output HM (-) | Output hold-open magnet (-)/ground 0 V |
| 8 | Output WS (-) | Output warning signal (-)/ground 0 V |
| 9 | Output WS (+) | Output warning signal (+) free-wheeling diode present |
| 10 | 24 V operating voltage | Operating voltage +24 V (connect power supply output (+)) |
| 11 | Ground (0 V) | Operating voltage 0V (connect power supply output (-)) |
| 12 | External input | Input central closing or external reset (+) |
| 13 | Ground (0 V) | Ground 0 V |
| 14 | External input | Input central closing or external reset (+) |

When connecting stranded cores, pay attention that all the wires of the strand are inserted into the terminal. Otherwise there is the risk of short circuits.

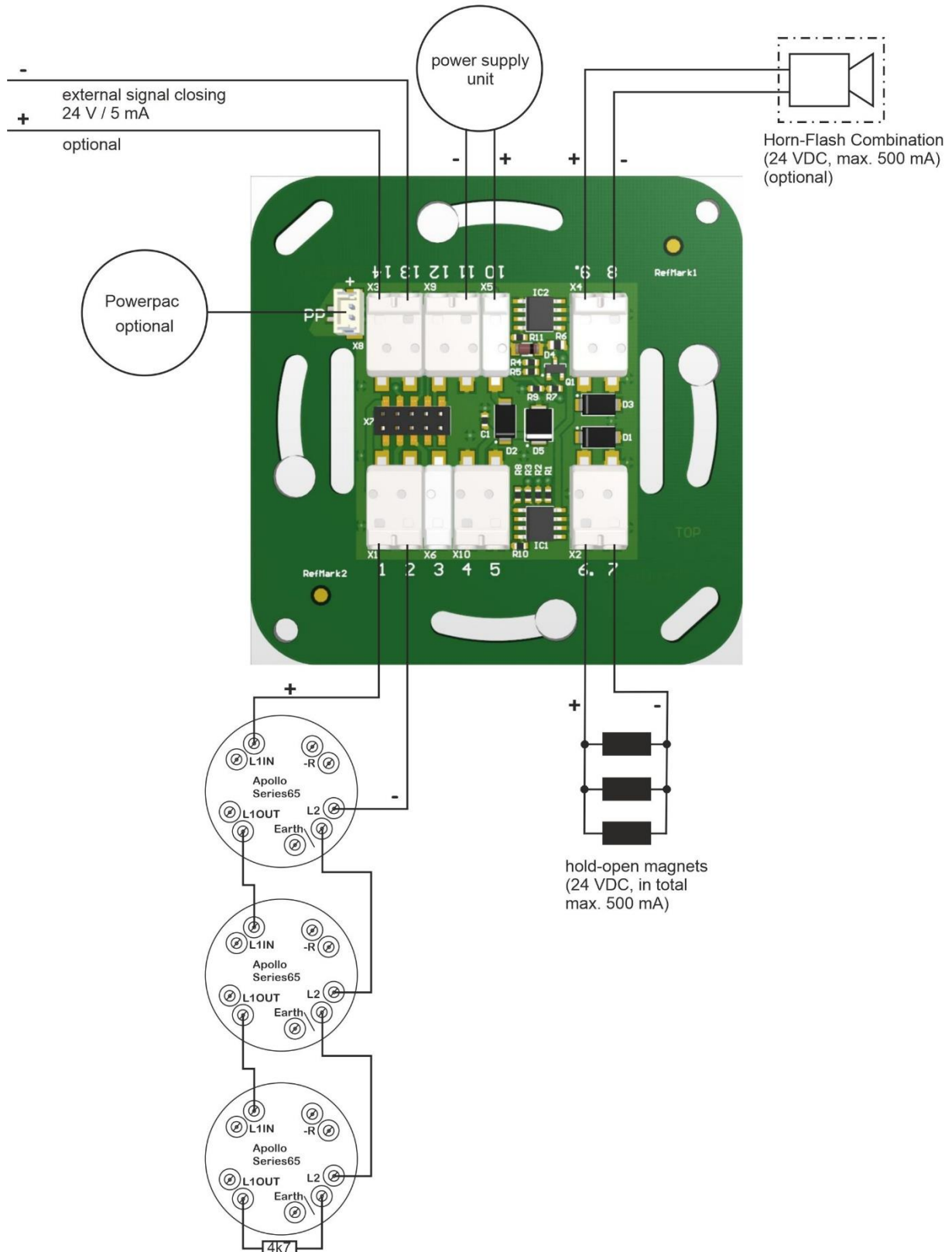
3.4.4. Input central closing or external reset

This input (terminal 12 or 14) on the RZ-24-05-KL serves to control centralized more than one RZ-24-05 control unit. In this way a "end of work - closing" (DIP2 =OFF) can be realized centralized by a non-locking pushbutton. The signal is positive-switching, the ground of the signal is connected to terminal 13 of the RZ-24-05-KL. Is this function triggered by +24 V on the input 12 or 14, the control unit switches OFF the hold-open magnet for 3 seconds and the warning signal ON without triggering the fire detection loop.

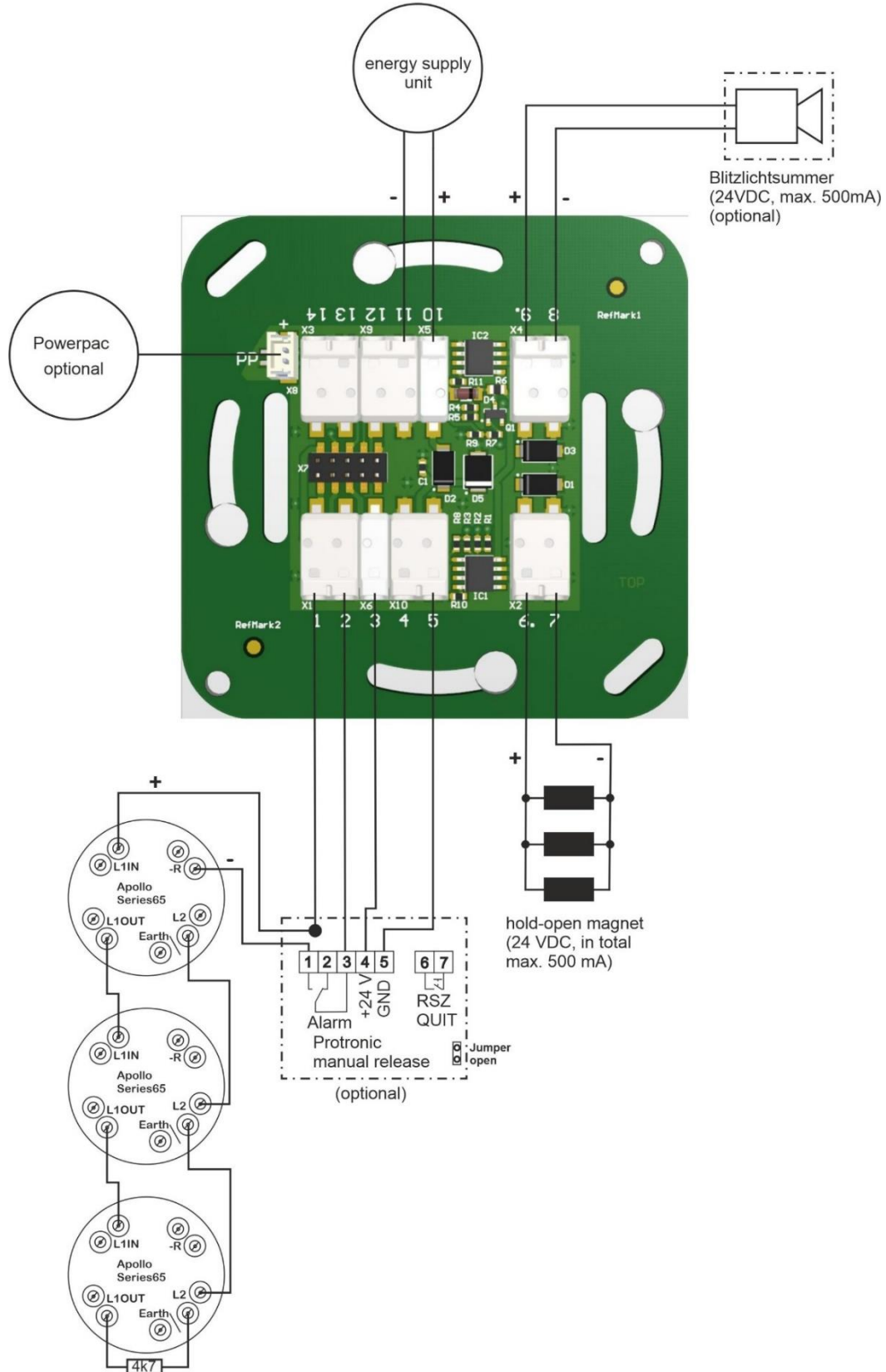
DIP2 - button = ON activates the input for external reset, if e.g. a two-sided reset of a door is necessary. Therefor a non-locking pushbutton can be used. A reset is possible only if the fire detection loop (detector) is not blocked by a release.

3.4.5. Wiring diagrams for the RZ-24-05-KL

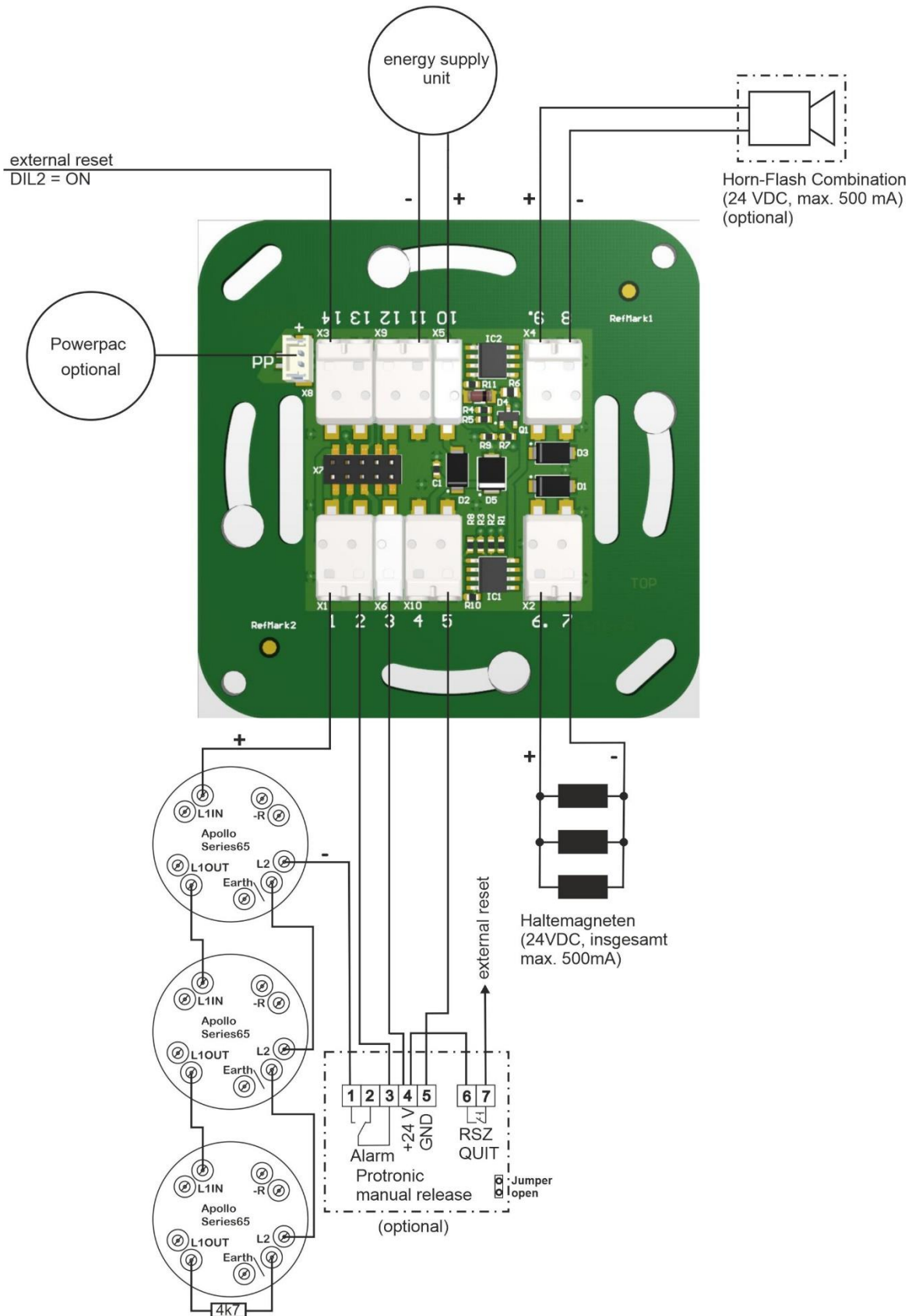
**RZ8-05 / RZ-24-05 with Apollo S65 detectors
 without manual release pushbutton**



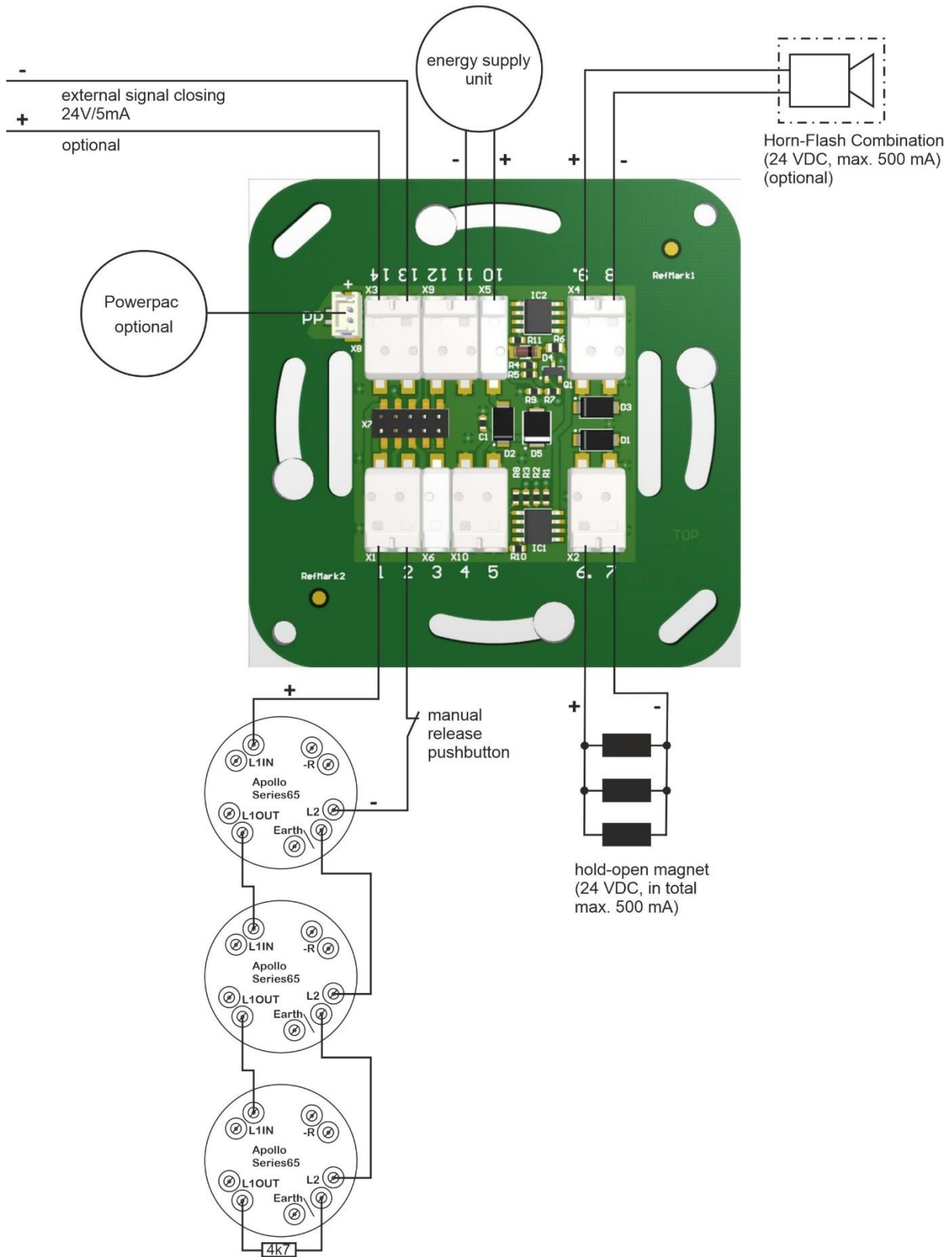
RZ8-05 / RZ-24-05 with Apollo S65 detectors and with Protronic manual release pushbutton



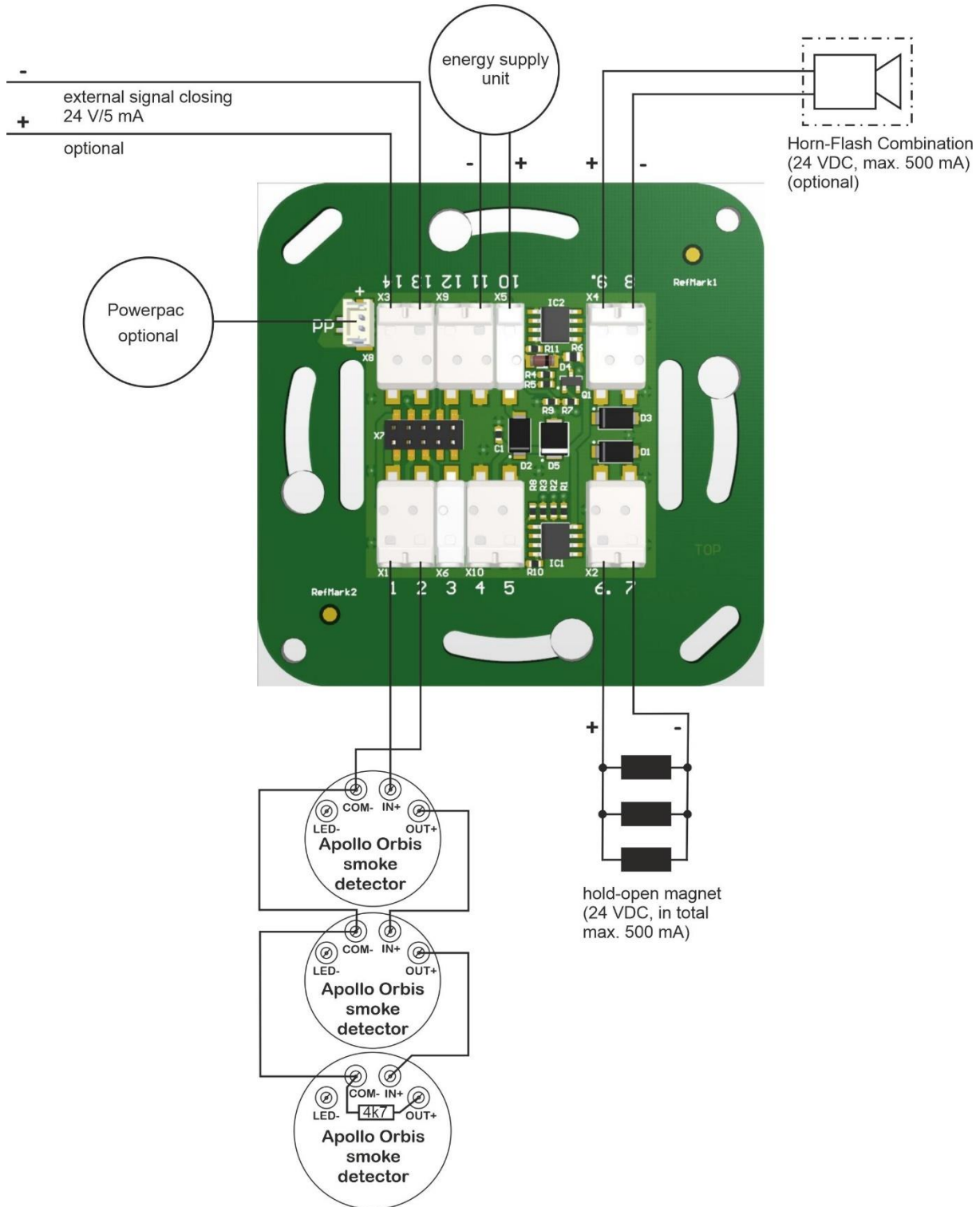
RZ8-05 / RZ-24-05 with Apollo S60/S65 detectors with Protronic manual release and reset-function



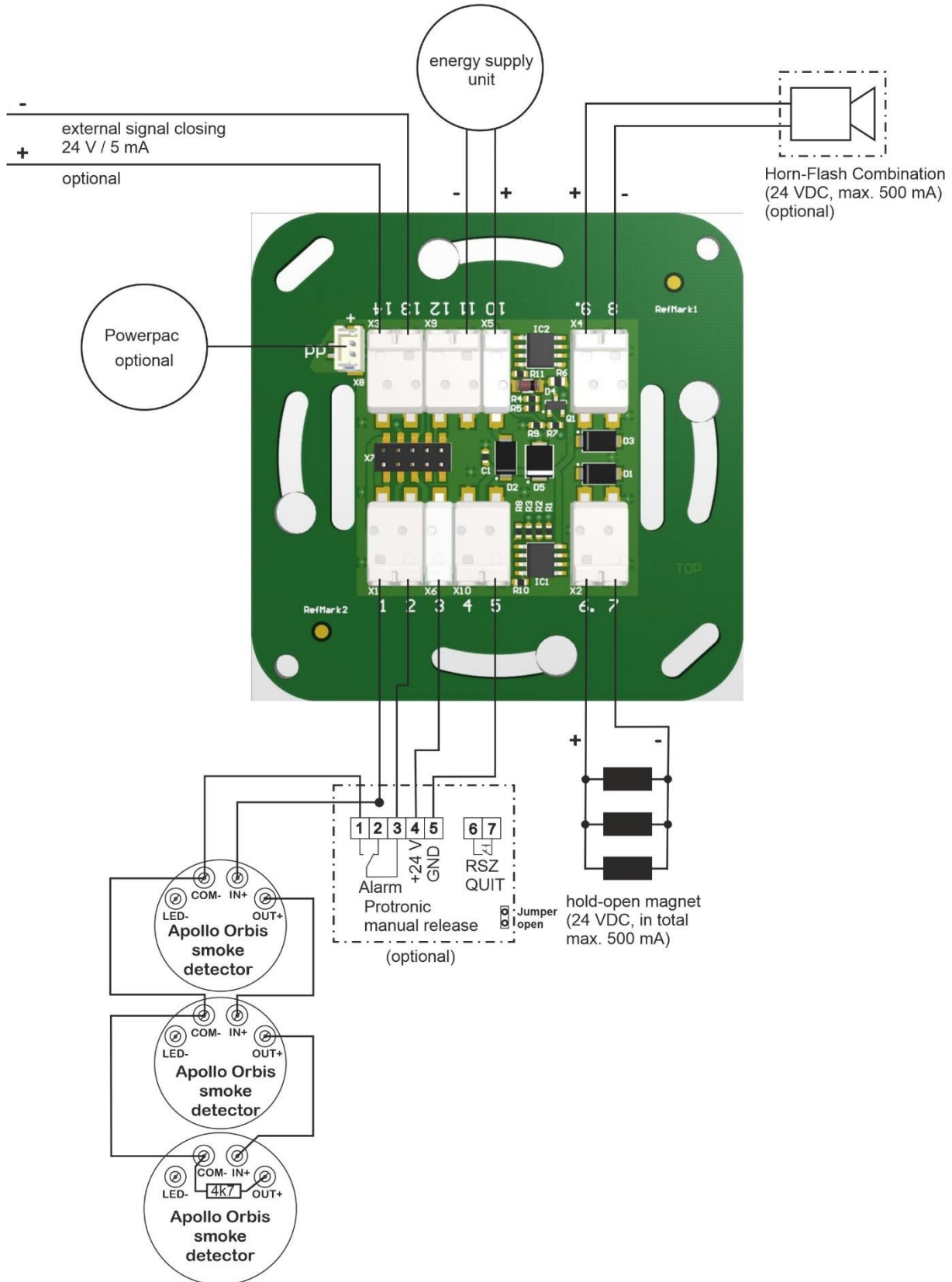
RZ8-05 / RZ-24-05 with Apollo S65 detectors with manual release pushbutton



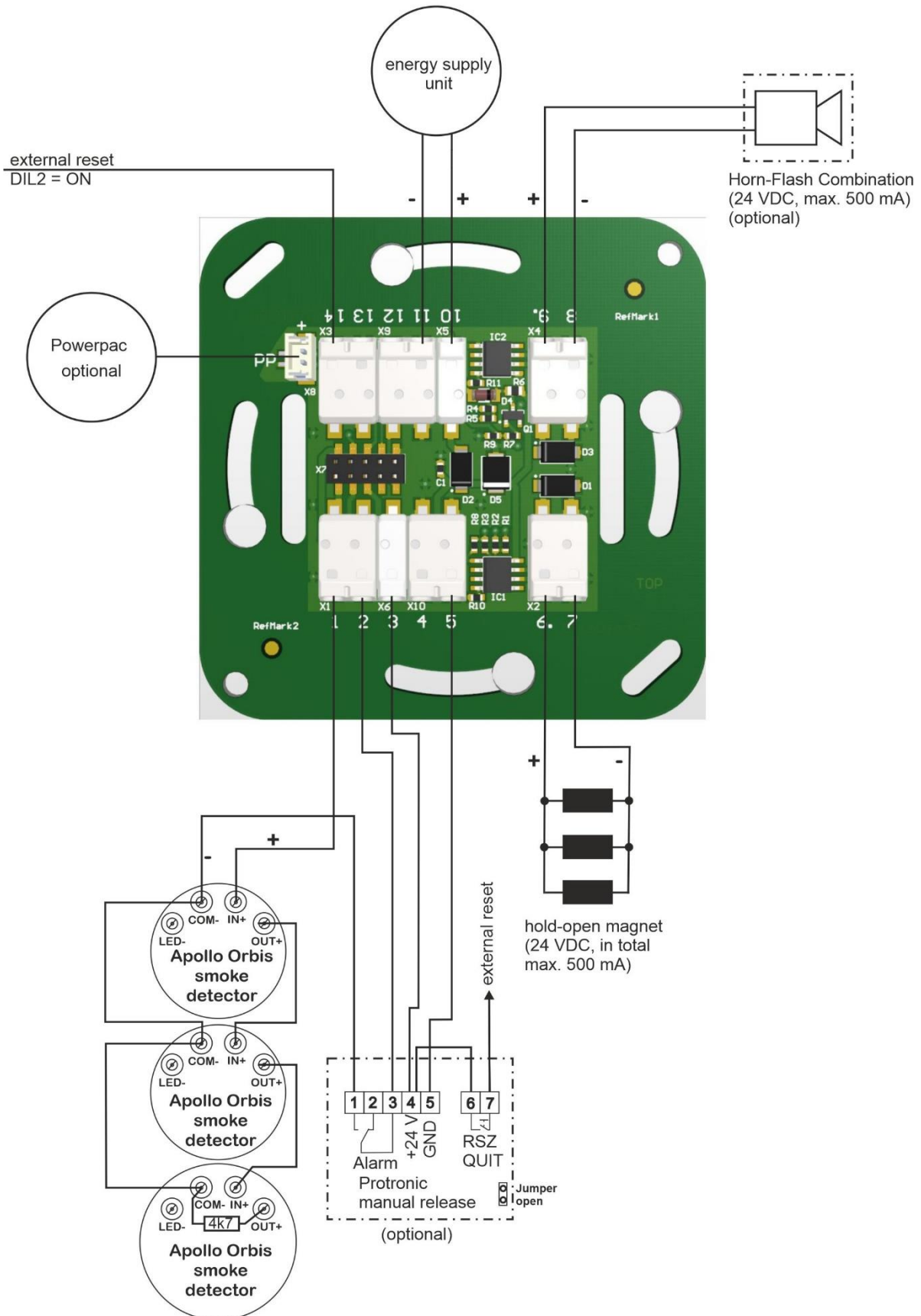
RZ8-05 / RZ-24-05 with Apollo Orbis detectors without manual release pushbutton



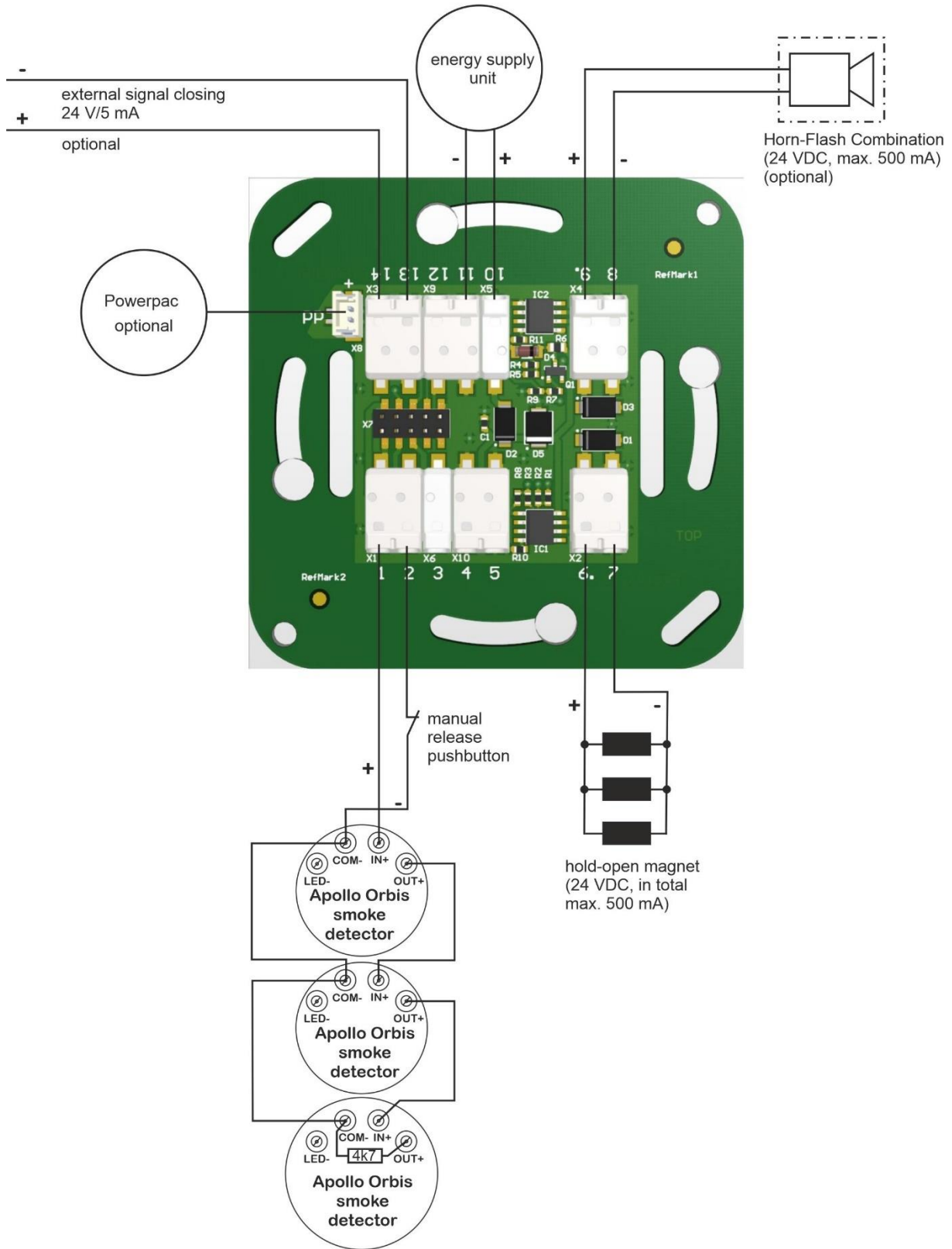
RZ8-05 / RZ-24-05 with Apollo Orbis detectors and with Protronic manual release pushbutton



RZ8-05 / RZ-24-05 with Apollo Orbis detectors and with Protronic manual release and reset function

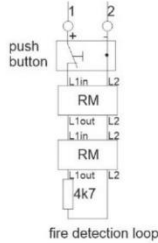


RZ8-05 / RZ-24-05 with Apollo Orbis detectors and manual release pushbutton



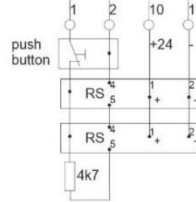
Note: The displayed manual release buttons are optional if the internal manual release button of the RZ-24-05 or RZ8-05 can be used .

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

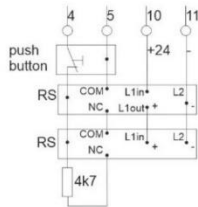


fire detection loop

2. smike switches z.B.:
Hekatron (ORS 142,142W, TDS247)

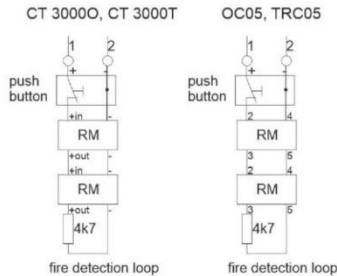


3. smoke switches e.g.:
Apollo (S65 55000-317, -122
with relay socket S65 45681-245APO)



fire detection loop

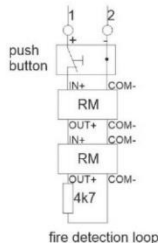
4. fire detection loop for fire detectors e.g.:
Detectomat CT 3000O, CT 3000T, OC05, TRC05



fire detection loop

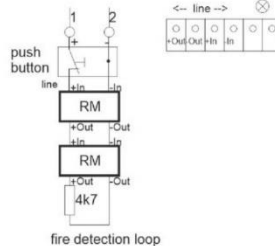
fire detection loop

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



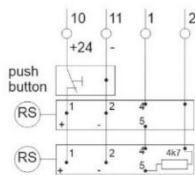
fire detection loop

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

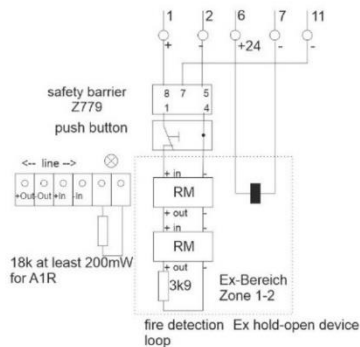


fire detection loop

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

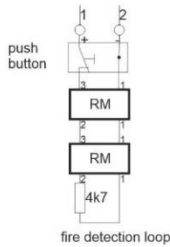


fire detection Ex hold-open device loop

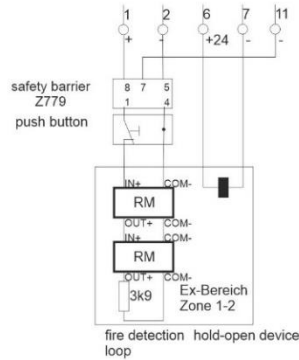
Protronic Innovative Steuerungselektronik GmbH
Grimmaische Str. 92; 04828 Bennewitz OT Pausitz
File: Klemmplan_RZ-24-05_BM1_07_2019_engl.cdr
Titel: Titel: Terminal diagramm RZ-24, RZ8
connection fire detectors 1
Datum: 13.07.2022

Note: The displayed manual release buttons are optional if the internal manual release button of the RZ-24-05 or RZ8-05 can be used .

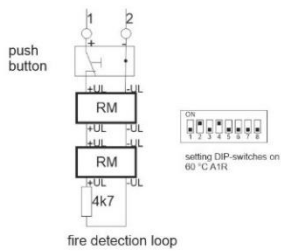
9. fire detectors e.g.:
Hekatron MSD 523, UTD 523



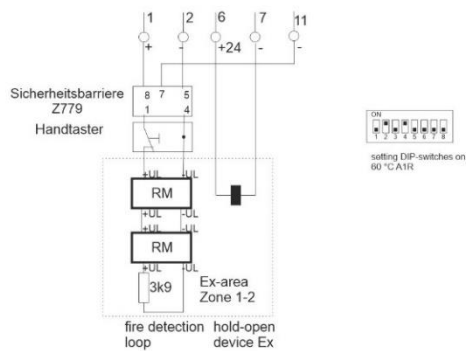
10. fire detectors and hold-open devices in Ex-areas
Zone 1 and 2 with safety barrier 28 V 300R P+FZ779
e.g.: Apollo Orbis IS OP 52027, Orbis IS A1R HT-51145



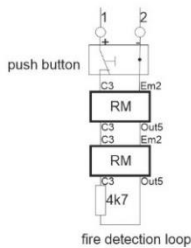
11. fire alarm loop for fire detectors e.g.:
Minimax UniVario WMX5000



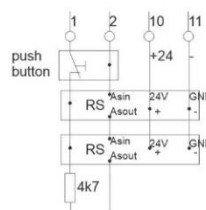
12. fire detection loop for fire detectors.:
Minimax UniVario WMX5000 Ex with safety barrier P+F Z779



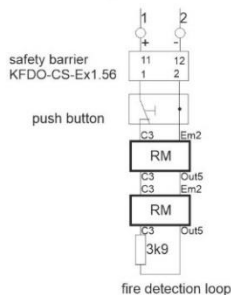
13. fire detection loop for fire detectors e.g.:
Esser IQ8Quad 803371, 803271, 803374 O²T,



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



| |
|---|
| Protronic Innovative Steuerungselektronik GmbH Grimmaische Str. 92; 04828 Bennewitz OT Pausitz |
| File: Klemmplaen_RZ-24-05_BM2_02_2021_engl.cdr |
| Titel: Titel: Terminal diagramm RZ-24, RZ8 connection fire detectors 2 |
| Datum: 13.07.2022 |

4. Energy supply RZ-24-05-NT

3.5. General information



The energy supply of RZ-24-05 is provided by the energy supply unit RZ-24-05-NT. It is a modern switching power supply unit with high-efficiency and integrated overload cut-off device. To connect the power supply use the white cables and terminals. The +24 V are connected via the red cable and ground (-) via the black cable. The red cable has to be connected to terminal 10 and the black one to terminal 11 on the RZ-24-05-KL.

DANGER



**ATTENTION: Voltage-carrying cables and components!
The connection should only be operated by specialists in
de-energised state!
The casing/shrink tubing should not be opened!**

5. Technical data of the RZ-24-05

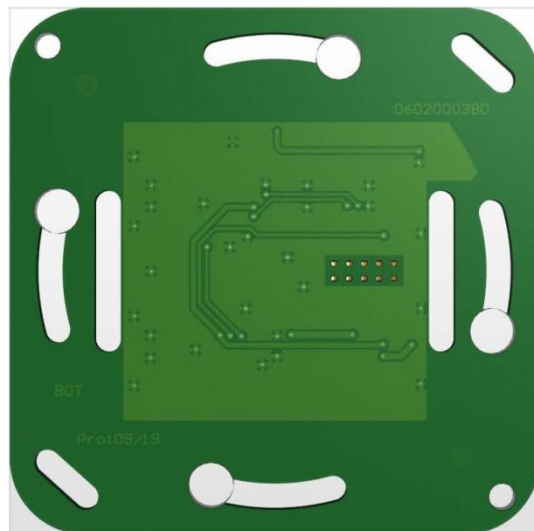
| | |
|---|---|
| Operating temperature | +10 °C...+40 °C |
| Input voltage energy supply unit AC | 230 V (85 V - 264 V) 50/60Hz |
| Input voltage energy supply unit DC | 120 V...360 V DC |
| Output voltage energy supply unit DC | 24 V +/-10% |
| output current permanent DC | 500 mA |
| Max. number of detectors | 20 |
| Power consumption of detection loop | Alarm: $I > 12 \text{ mA}$ |
| | Interruption: $I < 3 \text{ mA}$ |
| | Line tension: 20 V...22 V |
| | Maximum current: 45 mA |
| | Quiescent current: 4,5 mA bei 4k7 Abschlusswiderstand |
| Output current output hold-open magnet | max 500 mA, recommended 400 mA |
| Output current output warning signal | Max. 500 mA, recommended 400 mA |
| ext. Input, voltage level ON | >10 V |
| ext. Input current | 5 mA |
| minimum triggering time of detection loop | 3 seconds |
| LED display | Release, ready for operation, error |
| approvals | abZ: Z-6.510-2435 aBG: Z-6.500-2436 |

6. Troubleshooting

| Error | Troubleshooting |
|--|--|
| Detection loop cannot be reset | Check whether the RZ-24-05 can be reset with a 3.9 kΩ resistor on terminals 1 and 2. If not, check whether the control module is correctly inserted in the terminal board. If the problem persists, replace the control module. If resettable with a 3.9 kΩ resistor on terminals 1 and 2, check the external detection loop step by step. Is a 3.9 kΩ resistor in the last detector? Is the manual push button reset and is a correct contact used? |
| Error LED lights up permanently yellow | Voltage from power supply too low? Please measure. External load too high? Replace the power supply unit if necessary. Control module defective, replace it. |
| Key "Close door" does not work | Replace the control module. |
| Key "RESET" does not work | Replace the control module. |
| Electromagnets don't work | Check the cable path from the terminal board to the electromagnets. Replace the terminal board. |
| Warning signal does not work | Check the cable path from the terminal board to the warning signal device. Replace the terminal board |



RZ-24-05-MC



RZ-24-05-KL



RZ-24-05-NT