



Protronic Innovative  
Steuerungselektronik GmbH  
Grimmaische Straße 92  
D-04828 Bennewitz, district: Pausitz  
Germany

info@protronic-gmbh.de  
phone: +49 34383 63 15-0  
fax: +49 34383 63 15-50  
www.protronic-gmbh.com

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## Functional description

Warning signal acoustic/optical with energy storage

**WS-24-R**

For hold-open systems

Article no.: 1019000017 and 1019000018

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## Versions

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Version	Date	Name	Comments
1.0	08.09.2021	Herrmann	new
1.1	15.09.2021	Herrmann	Update text and wiring diagrams

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## 1. General notes

To make a risk assessment according to standard EN16034 in conjunction with the machinery directive and from the point of view of the UVV (Accident Insurance Regulation), the standard: DIN EN 12604 "Industrial, commercial and garage doors and gates - Mechanical aspects - Requirements and test methods " has to be respected. This standard determines that in case of fire, the closing of vertical and horizontal curtains, doors and gates has to be accompanied by an acoustic and optical warning signal, if the closing speed exceeds 0.3 m/seconds or the force on the human body or parts of it exceeds 200N. The signalling has to be guaranteed even in case of power failure.

## 2. Function and operation

### 2.1 About the function

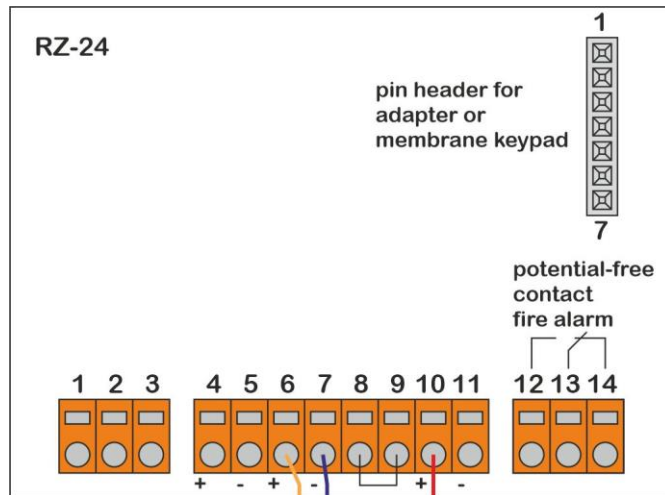
**The WS-24-R is a shapely, modern signal device, which displays visual and audible alarms or warnings. The following properties are realized by the WS-24-R:**

- A bridging time of at least 4 min in case of power failure.
- The acoustic signal can be switched off via DIP-switch.
- The frequency of signalling is adjustable by a potentiometer between 0.5 Hz und 2 Hz.
- The volume of the horn can be adjusted by a potentiometer and is limited to a maximum of 85 dB at a distance of 1 m.
- Via DIP switch you can either choose blinking (50:50) or flashing (30:70).
- Depending on operating conditions the WS-24-R triggers on the edges for 90 seconds or as long as the input signal is present.
- If the voltage of the internal energy storage decreases, the tact ratio (signal ON) for the acoustic and optical signalling is shortened to extend the bridging time.
- For a simple installation the WS-24-R consists of two parts: the warning light (red) and the socket (light grey or black).
- Easy installation due to bayonet lock.
- For reactivating the warning signal device after a short reopening, the optional installation of a door limit switch is possible.
- Optionally a permanent connection with 24 V or a supply connected in parallel (easy retrofitting) to the hold-open system is possible (for gates that already exist for example).

## 2.2 Functional description

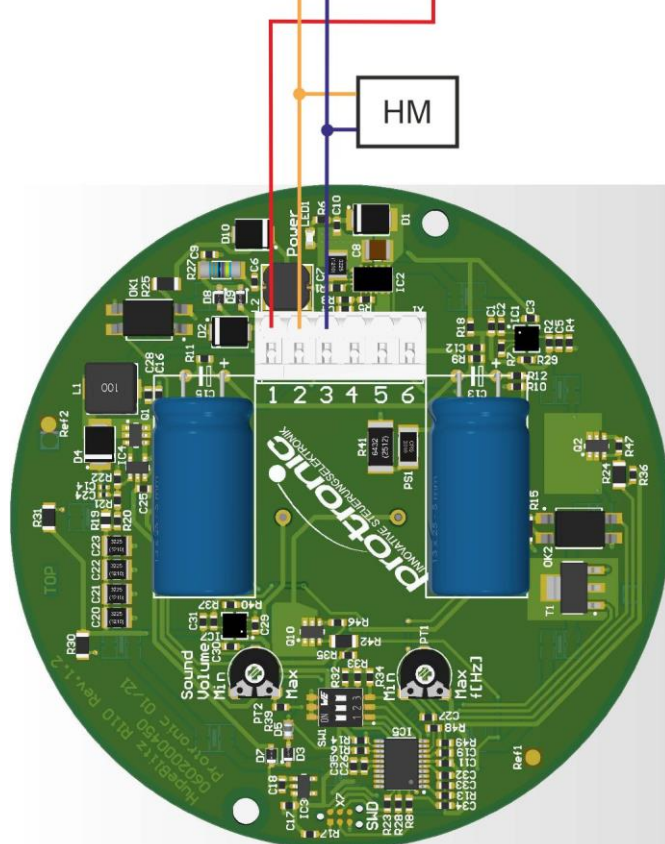
The WS-24-R can be operated in 3 circuit options.

### 2.2.1 Option 1: Permanent function of WS-24-R when triggered

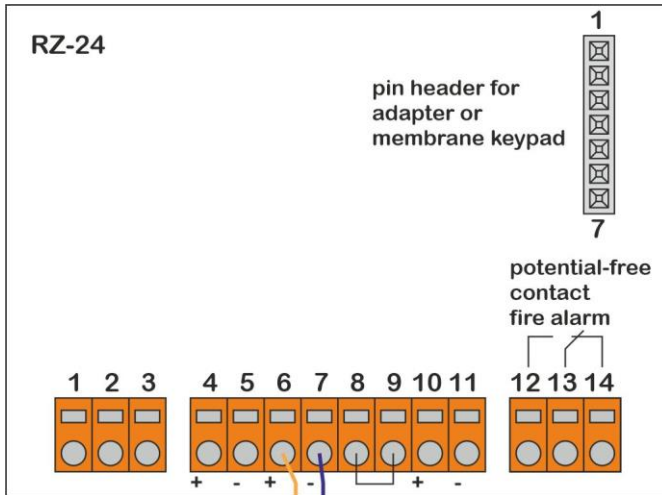


The +24V continuous voltage of the RZ-24 (10) is switched by pin 1 of the WS-24-R. The switched plus (6) of the RZ-24 (HM) is connected to pin 2 of the WS-24-R. GND is connected from pin 7 (RZ-24) to pin 3 (WS-24-R).

The 24V continuous voltage charges the internal energy storage of the WS-24-R and supplies the working warning light permanently with energy when the hold-open magnet output is switched off (in case of release). In case of a power failure the internal storage ensures the function for at least 4 min.

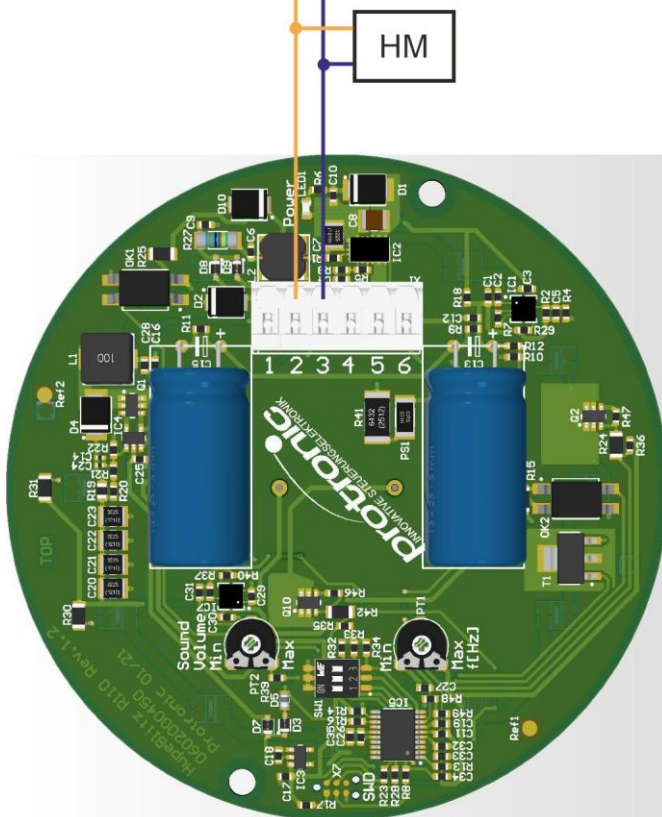


**2.2.2 Option 2: Function of WS-24-R when triggered until energy storage is empty**



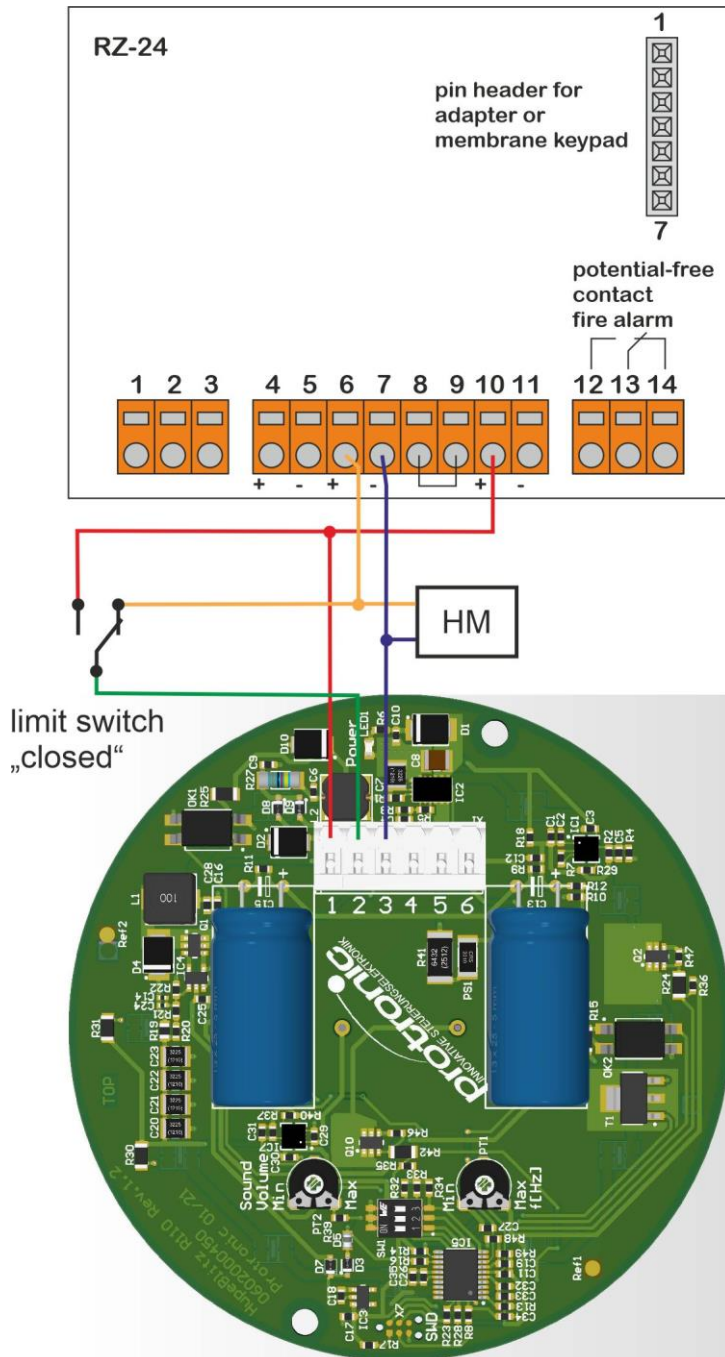
The WS-24-R is connected in parallel to the hold-open magnet. The +24V of the hold-open magnet (6) is connected to pin 2 and the GND of the hold-open magnet (7) is switched with pin 3 of the warning light.

The energy storage is charged when the hold-open magnet is switched on. When a release is triggered (hold-open magnet is switched off) the WS-24-R continues to signal until the energy storage is empty (approx. 4 min).





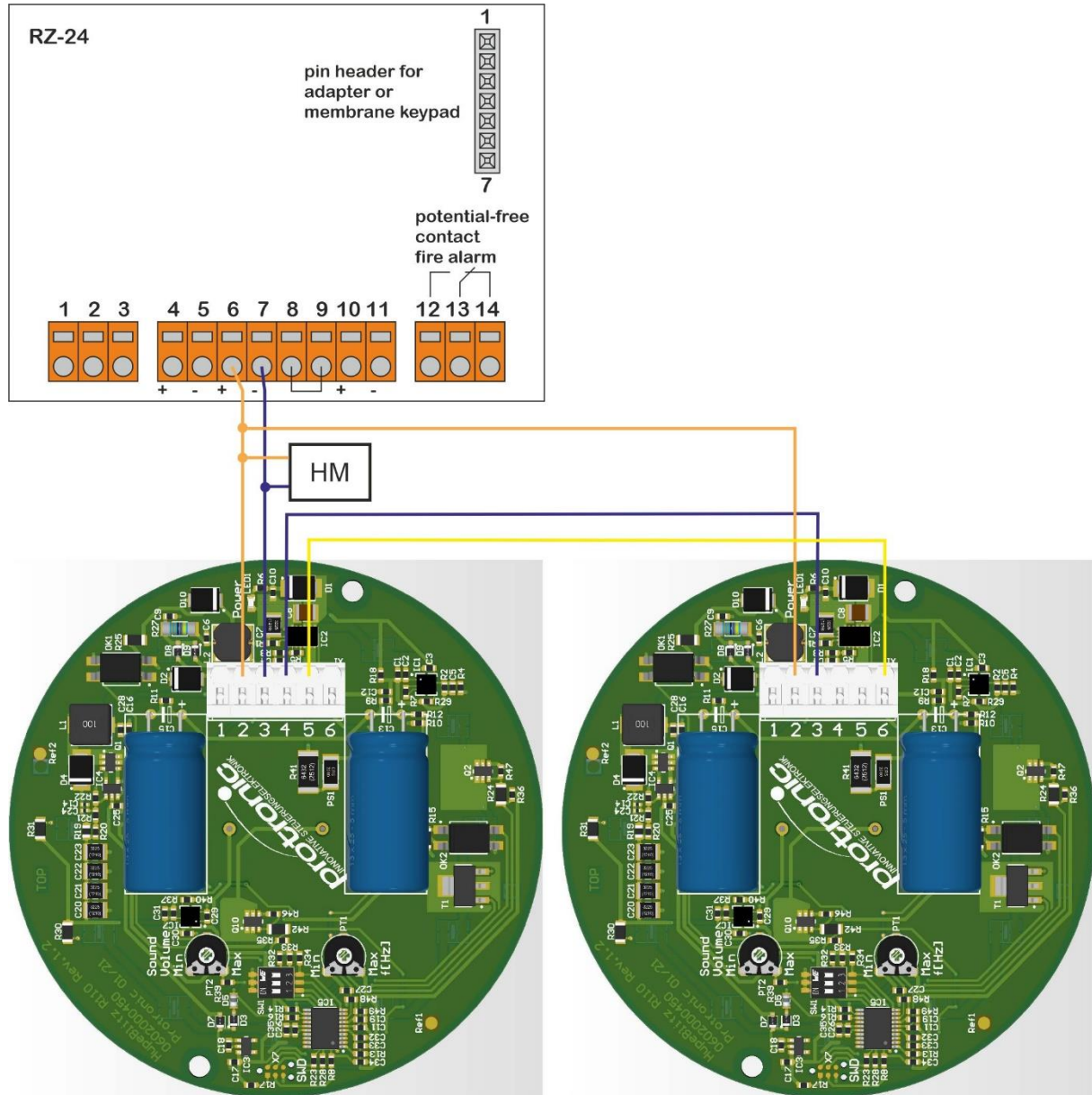
### 2.2.3 Option 3: Function with additional limit switch “closed”



The WS-24-R (1) is supplied with energy by the +24 V continuous voltage of the RZ-24 (10). The limit switch is connected with its common contact with pin 2 of the WS-24-R. The make contact of the limit switch is also connected to the +24 V continuous voltage of the RZ-24. The break contact of the limit switch is connected to the +Output of the hold-open magnet of the RZ-24.

Signalling starts when the hold-open magnet output (6) is switched off (release). When the end position (limit switch) “closed” is reached, signalling is finished. When reopening the closing device (limit switch not “closed”) signalling is reactivated.

### 2.2.4 Application of several WS-24-R for the same closing device



There is the possibility to synchronize the acoustic/optical signalling of the devices if more than one WS-24-R are applied. For this purpose one device (the first) is defined as “Host” and puts out via pin 5 the “synchronization tact”. The synchronization signal is connected to pin 6 on each of the following “Devices“. The frequency potentiometer of the “Device“ component is set to its left stop (MIN). Apart from that the “Device” components are connected like in the 3 options mentioned above (1, 2, 3). When the hold-open system is released all the WS-24-R devices will send their signals simultaneously.



### 2.2.5 Setting of the blinking frequency

The blinking frequency is set by a potentiometer (f[Hz]). In position left stop (MIN) the device puts out a permanent signal (no blinking). This setting is provided for the synchronization with a "Host" device. The "synchronization tact" connected to pin 5 controls the blinking of the device.

The blinking frequency can be set continuously between 0.5 Hz (near MIN) and 2 Hz (MAX).

### 2.2.6 Setting of Volume

The volume of the acoustic warning signal can be set continuously with the potentiometer sound volume. The volume is the quietest at the MIN setting and the loudest at the MAX setting. If the acoustic signalling isn't necessary, it can be switched off via DIP switch 1 (ON).

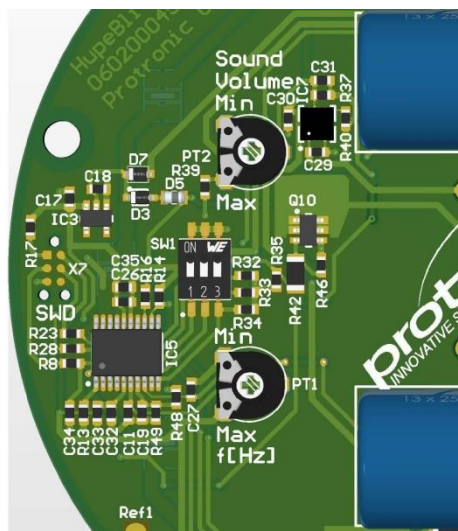
### 2.2.7 Choice: flash or blink mode

On DIP switch 2 blink mode (DIP 2 = OFF) or flash mode (DIP 2 = ON) can be set. In blink mode the activation time of the warning signal = deactivation time. In flash mode the activation time is much shorter than the deactivation time.

On discharge of the energy storage, the activation time is automatically reduced to guarantee a signalling time for as long as possible.

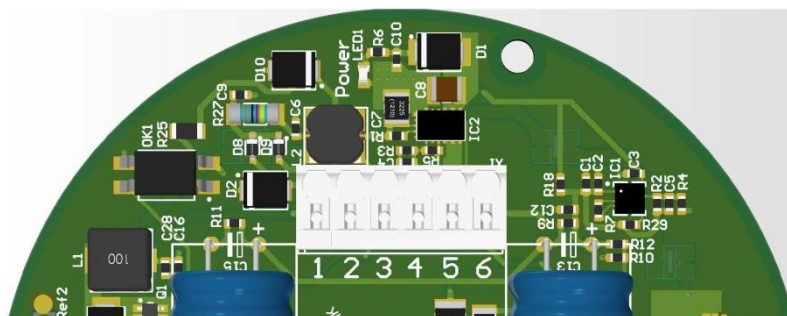
### 2.2.8 Control of the warning signal by an impulse

If the WS-24-R is controlled by a hold-open system with automatic resetting, the warning signal would be activated for only 3 seconds (approx.). To extend the signalling on 90 seconds, the DIP switch 3 has to be set to ON. The device detects the edge and starts the signalling, which continues time controlled.



## 2.2.9 Terminal assignment

The WS-24-R has 6 input terminals for a max. 1.5 mm<sup>2</sup> conductor cross section each.



Terminal	Function	Description
1	+24 V	+24 V permanent voltage
2	+24 V	+24 V control input (hold-open magnet)
3	ground (0 V)	ground (GND)
4	ground (0 V)	
5	„Host“ synchronized signal	Output for the synchronized signal of the “Host” which clocks the “Devices” synchronously
6	„Device“ synchronized signal	Input for the synchronized signal

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. Technical data

Operating temperature	+10 °C ... +40 °C
Degree of protection	IP40
Input voltage	18 V ... 28 V
Current consumption for signalling at 24 V	95 mA
Current consumption for charging energy storage at 24 V	95 mA
Current consumption charged without signalling at 24 V	20 mA
Signalling frequency	0.5 Hz ... 2 Hz
Signalling time from energy storage	at least 4 min
Charging time (energy storage empty)	approx. 5 min
Min. charging time to start function (on permanent voltage)	approx. 35 seconds
Diameter	approx. 110 mm
Height (with socket)	approx. 60 mm
Casing material socket	ABS UL 94 HB
Colour socket	RAL 9005 black, RAL 9002 grey white
Casing material light	translucent plastic
Colour light	Ruby red

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## 4. Installation

The socket and the upper luminaire part are connected by a bayonet lock. By turning the socket, the locking mechanism can be released. The socket has to be screwed to a wall or the ceiling. Pull in the cables and connect the cores with the appropriate terminals. The required adjustments of volume and blinking frequency can be made by the 2 potentiometers. Furthermore, set the DIP switches in accordance with the requirements. Afterwards put the upper luminaire part on the socket (find the corresponding recesses) and turn it until it locks into place.

## 5. Troubleshooting

Error	Troubleshooting
WS-24-R no function	<ul style="list-style-type: none"><li>• internal energy storage not charged sufficiently, wait approx. 35 seconds</li><li>• <b>incorrect wiring</b>, control wiring</li><li>• defective device, change device</li></ul>
WS-24-R no acoustic signal	<ul style="list-style-type: none"><li>• DIP switch 1 on position ON? Change to position OFF!</li><li>• defective horn, change device</li></ul>
WS-24-R no optical signal but acoustic signal is working	<ul style="list-style-type: none"><li>• defective device, change device,</li></ul>

## 6. Notes