



BZ929

Art. Nr: 871

Tachometer analyser to Baumer pulse generator



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1. Function / Description

1.1. Object / function

This device is specifically made to control and monitor the incoming pulses from the BAUMER Pulse generator which is mounted onto the wheel axle of the vehicle. It works purely analog without any kind of microcontroller or software.

Basically the device is signalling with independent Relay contacts three different states:

Mode 1: Vehicle is standing still (no movement)

Mode 2: Vehicle is moving with speed greater > 10 km/h

Mode 3: Vehicle is moving with speed greater > 15 km/h

The device is also powering the BAUMER Pulse generator with the required 15VDC power.

The device has additionally a built in controller circuit which detects the precise quiescent-current of 10mA from the pulse generator to ensure that the device is attached and working properly. If the current is out of range, the device is signalling a failure.

While powering up the device with UBatt a reset circuit prevents during 2 seconds any pulse measurements. That means the device first becomes effective after the 2 second power up reset pulse.

For each working mode there is a separate relay switching contact which can be used with 10A DC max load

So the device is used as a control module in rolling stock applications according to EN 50155.

2. Technical data

• Standards

The product is manufactured in accordance with the following standards:

ISO 9001:2015

Electronic equipment used on rolling stock: EN50155

Electromagnetic compatibility: EN50121-3-2

Isolation: EN50124-1

Shock and vibration: EN50155/EN61373

Fire protection according to EN 45545

The standards applicable to this product are dependent on the version available at the time of development.

2.1. Mechanical Data

• Measures

B x T x H: 50x 102 x 113 mm

Maximal length
with connectors : 170 mm

Weight : 300 g

• Materials

Housing: Glass reinforced Plastic

PCB: Epoxy resin



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- **Mounting**

Fixing: Snap on T-rail 35mm, EN-50022-35
 Mounting position: Horizontal

- **Screwless front connector strip**

1 Stk. 14-pin front male connector: WAGO (codeable)
 1 Stk. 8-pin front male connector: WAGO (codeable)

- **Counter connector (optional)**

1 Stk. 14-pin female row front connector: WAGO (codeable)
 1 Stk. 8-pin female row front connector: WAGO (codeable)

2.2. Electrical data

- **Operating voltage**

Rated voltage: 24VDC according to EN 50155
 Voltage range: + 25% / -30%
 Rated current: approx. 75mA
 Protective circuit: Polarity reversal protection diode, overvoltage protection for relay coil.

- **Contact load**

Relais type: A, nach EN 50205
 Current load limit DC: ohm = 50V/2A, inductive = 50V/0.8A

- **Relay data**

Wiring data

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
24V DC	70%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	22mA	1,100Ω	530mW	130%V of nominal voltage (at 60°C 140°F) 120%V of nominal voltage (at 85°C 185°F)*4



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Relay data (continued)

Characteristics	Item	Specifications	
		Standard type	High capacity type
Contact	Contact material	1 Form A: AgSnO ₂ type 1 Form C, 2 Form A and 2 Form C: AgNi type	
	Arrangement	1 Form A, 1 Form C, 2 Form A and 2 Form C	1 Form A and 1 Form C
	Contact resistance (Initial)	Max. 100 mΩ (By voltage drop 6 V DC 1A)	
Rating	Nominal switching capacity (resistive load)	5A 250V AC, 5A 30V DC	10A 250V AC, 10A 30V DC
	Max. switching power (resistive load)	1,250VA, 150W	2,500VA, 300W
	Max. switching voltage	250V AC, 30V DC	
	Max. switching current	5A	10A
	Min. switching capacity (reference value)*1	100mA, 5V DC	
Electrical characteristics	Insulation resistance (Initial)	Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section.	
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1 min. (Detection current: 10 mA)
		Between contact and coil	5,000 Vrms for 1 min. (Detection current: 10 mA)
		Between contact sets	3,000 Vrms for 1 min. (2 Form A, 2 Form C) (Detection current: 10 mA)
	Temperature rise (coil)	1 Form A: Max. 45°C 113°F, 1 Form C, 2 Form A and 2 Form C: Max. 55°C 131°F (resistive method, with nominal coil voltage and at nominal switching capacity, at 20°C 68°F)	1 Form A: Max. 45°C 113°F, 1 Form C: Max. 55°C 131°F (resistive method, with nominal coil voltage and at nominal switching capacity, at 20°C 68°F)
	Surge breakdown voltage ^{*2} (Between contact and coil) (Initial)	10,000 V	
	Operate time (at nominal voltage) (at 20°C 68°F)	Max. 15 ms (excluding contact bounce time.)	
Release time (at nominal voltage) (at 20°C 68°F)	Max. 5 ms (excluding contact bounce time) (Without diode)		
Mechanical characteristics	Shock resistance	Functional	98 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)
		Destructive	980 m/s ² (Half-wave pulse of sine wave: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1.6 mm (Detection time: 10μs.)
		Destructive	10 to 55 Hz at double amplitude of 2.0 mm
Expected life	Mechanical (at 180 times/min.)	Min. 5×10 ⁶	
	Electrical (at 6 times/min.)	Min. 10 ⁵ (at resistive load)	
Conditions	Conditions for operation, transport and storage ^{*3}	Ambient temperature ^{*4} : -40°C to +60°C -40°F to 140°F (Class E), (Class B: -40°C to +85°C -40°F to 185°F) Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	
	Max. operating speed (at nominal switching capacity)	Flux-resistant type: 20 times/min., Sealed type: 6 times/min.	
Unit weight	Approx. 13 g .46 oz		

* Specifications will vary with foreign standards certification ratings.

Notes:

*1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to *6. Usage, Storage and Transport Conditions* in AMBIENT ENVIRONMENT section in Relay Technical Information.

*4. The pick-up and drop out voltages rise approximately 0.4% for every 1°C 33.8°F given a standard ambient temperature of 20°C 68°F. Therefore, when using relays where the ambient temperature is high, please take into consideration the rise in pick-up and drop out voltages and keep the coil applied voltage within the maximum applied voltage.



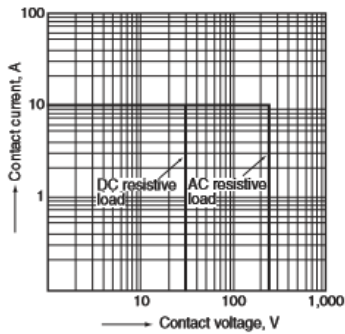
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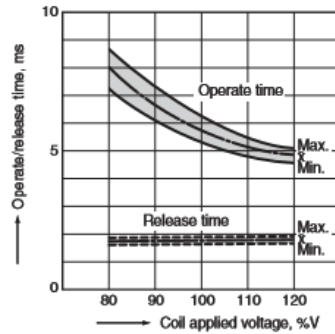
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1. Maximum operating power

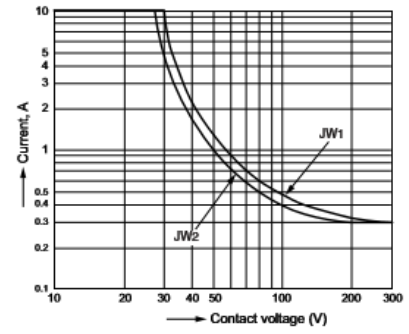


2. Operate/release time

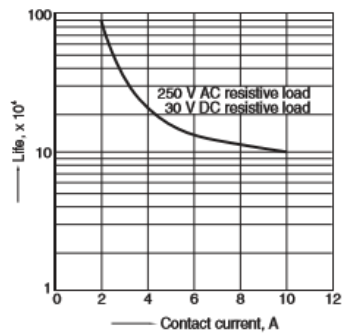
Sample: JW1aFSN-DC12V, 10 pcs.
Ambient temperature: 20°C 68°F



3. Max. switching power

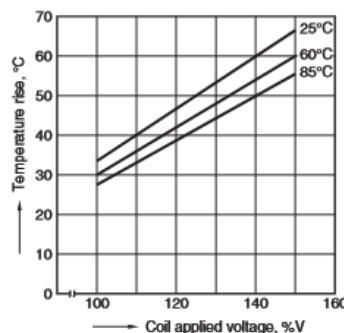


4. Life curve



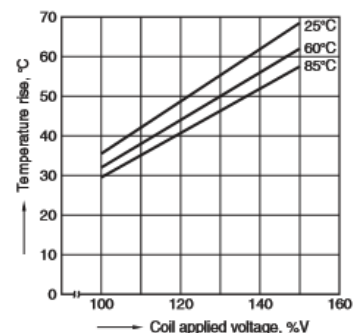
5-(1). Coil temperature rise

(Contact carrying current: 5A)
Sample JW1aFSN-DC12V-F, 6 pcs.
Point measured: Inside the coil



5-(2). Coil temperature rise

(Contact carrying current: 10 A)
Sample: JW1aFSN-DC12V-F, 6 pcs.
Point measured: Inside the coil



2.2.3. Protective measures

• Electrical protective measures

Reverse polarity protection, Transzorb diodes for limiting overvoltages and electrical protection for relay coil.

• Mechanical protection

Protection class. IP30

2.3. Other information

• Climatic conditions

Environment temperature : - 20°C...+60°C

2.3.2. Disposal

According to local regulations



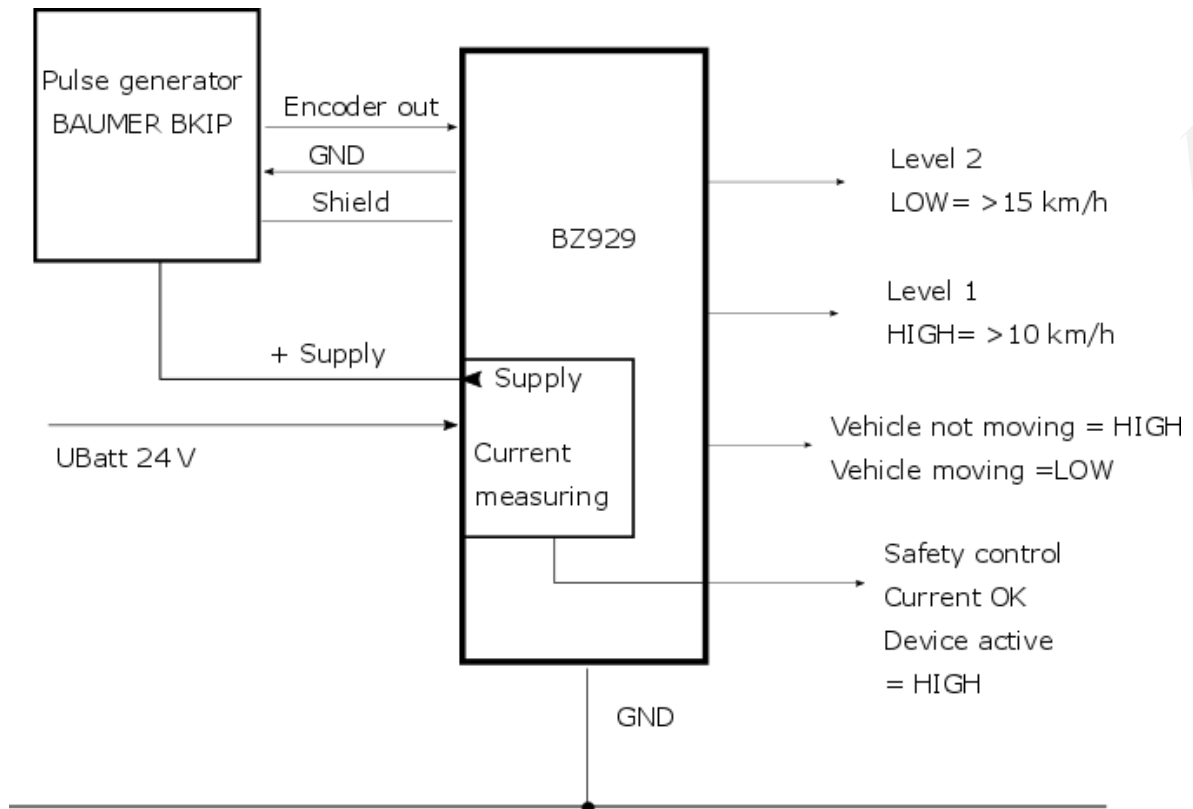
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3. Block diagram



Connection diagram

Connector A		Connector B	
1	GND UBatt	7	Contact vehicle not moving NO
2	+24V UBatt	8	Contact vehicle not moving NC
3	+15VDC OUT to TachoSensor	9	Contact vehicle not moving Common
4	Puls signal from TachoSensor	4	Contact vehicle moving level 1 NO
5	GND from TachoSensor	5	Contact vehicle moving level 1 NC
6	Not connected	6	Contact vehicle moving level 1 Common
7	Not connected	1	Contact vehicle moving level 2 NO
8	Not connected	2	Contact vehicle moving level 2 NC
		3	Contact vehicle moving level 2 Common
		10	Alarm contact NO
		11	Alarm contact NC
		12	Alarm contact Common
		13	Not connected
		14	Not connected



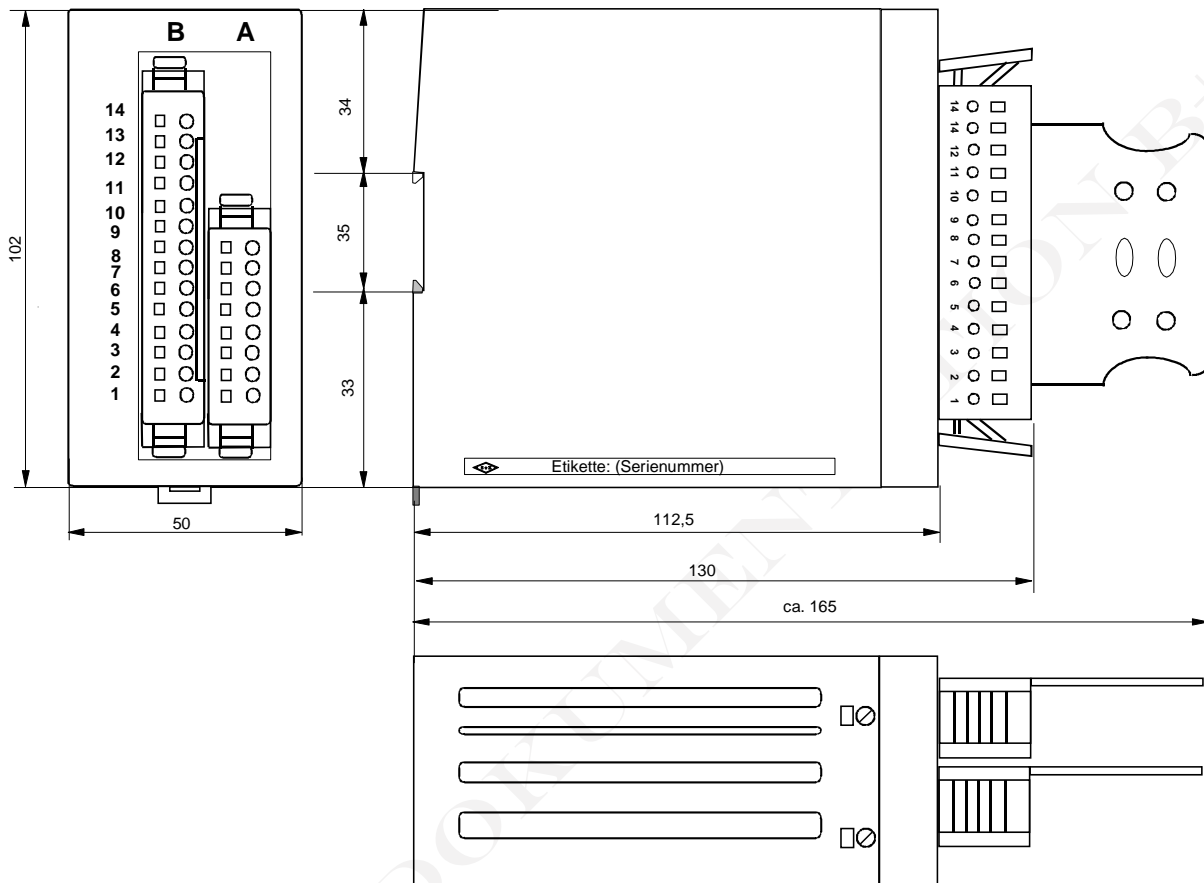
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4. Measures / Mounting



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