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**OPERATIONAL SAFETY**

- The controller shall be used in accordance with its operating instructions.
- The controller is a class I device, pursuant to the PN-EN 60950 standard. In order to ensure safety, the controller must be connected to electric power supply network, which utilizes a protective earth or equalization system as a form of shock protection.
- Any installation or maintenance work on the controller may only be performed after the controller's power supply is disconnected.
- Use exclusively WTA-FG/H fuses, with the rated current stated on the enclosure.
- Maintain cleanliness and order around the controller. The controller may only be used in premises, which are free of conductive dusts, where the temperature stays within the +0 °C to +40 °C range and the humidity does not exceed 80%. The unit must not be exposed to water.

**SELECTIVE WASTE DISPOSAL**



**Note!**

Marking of the equipment with this sign indicates that the worn out equipment must not be disposed with other waste (under pain of a fine). Detailed information on the product disposal and recycling may be obtained from the municipal or communal administration units, communal waste disposal facilities or at the product purchasing location. By providing the worn out equipment to a facility responsible for recycling and recovery, you contribute to elimination of the impacts of harmful substances and components contained in the equipment on the environment and on human health.



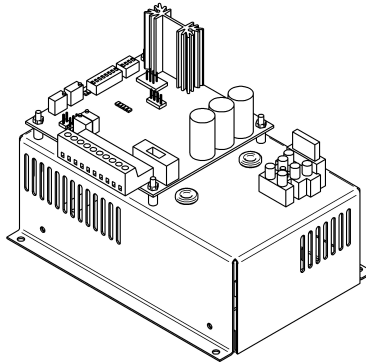
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## ELECTROMAGNETIC PARTICLE CLUTCH AND BRAKE CURRENT REGULATOR

**EZP-51-00**

### OPERATING INSTRUCTIONS ( DTR no. EZ5-4759 )



#### 1. INTENDED USE OF THE PRODUCT

The controller is designed to electromagnetic particle control brakes and clutches in one of the 3 operating modes:

- control using 0-10 V differential voltage input signals
- control using 4-20mA differential current input signals
- control using a 10 k $\Omega$  potentiometer

The above mentioned modes permit brake and clutch control across the whole braking moment range of the respective brake or clutch type.

Cooperating equipment, which generate the control signal (e.g. inductive transducers, ultrasonic sensors and proximity sensors, etc.) can be supplied off the terminal strip, using the terminal no. 6, labelled **Uin** "+" 24VDC 100mA, and terminal 4 "-" labelled GND, while not to exceeding the maximum permissible current draw of 100 mA.

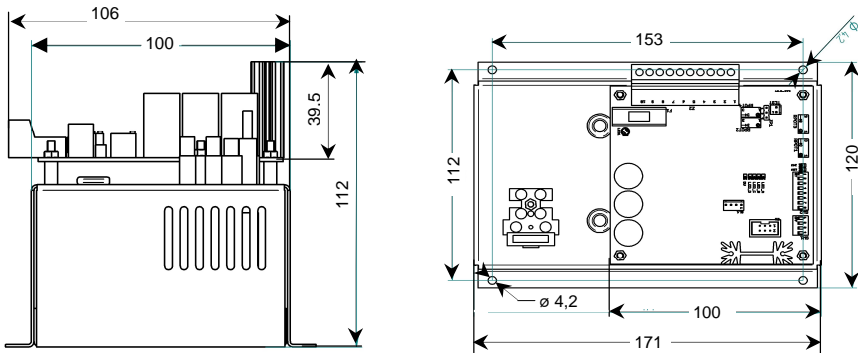
The residual magnetism reduction system utilized, permits operation across a broad parameters range and with high dynamics of braking moment variation. Braking moment is changed by proportionately altering the current flowing in the brake circuit, depending on the control signals. Current stabilization circuits used in the controller ensure constant value of the braking moment.

## 2. SPECIFICATIONS

|                               |        |              |
|-------------------------------|--------|--------------|
| Power supply:                 |        | 100-250 V AC |
| Power consumption:            |        | 60 VA        |
| Voltage control input         | STER-U | 0-10VDC 40mA |
| Current control input         | STER-I | 4-20mA       |
| Load current (PWM):           | LOAD   | 1,3 A        |
| Dimensions [mm]               |        | 171x120x112  |
| Weight [kg]                   |        | 1            |
| Clutch circuit protection     | F1     | 2.0A         |
| Mains circuit protection      | F2     | 3.15A        |
| Internal power supply voltage | Usup   | 30VDC        |

## 3. DESIGN AND AVAILABLE VERSIONS

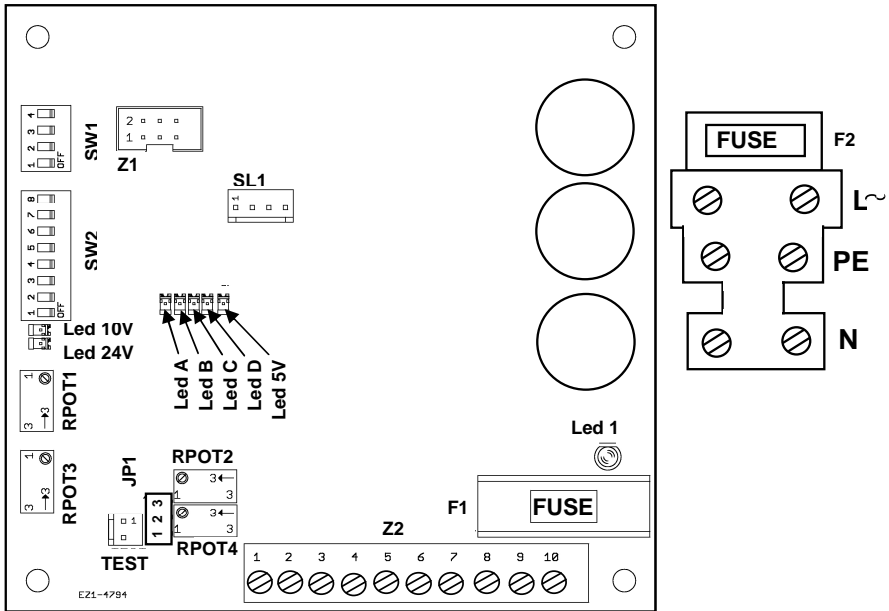
The controller consists of three main components: a power supply module, a current source, which supplies brake coil and residual magnetism automatic control system for the electromagnet. The power supply module is housed inside a metal enclosure, whereas the remaining components are placed outside of the enclosure.



### AVAILABLE CONTROLLER VERSIONS:

- EZP51-4            Controller card only
- EZP51-3            Controller card with 10 kΩ potentiometer
- EZP51-2/100-250    Controller card with 100-250 V AC/30V DC power supply module
- EZP51-1/100-250    Controller card with 100-250 V AC/30V DC power supply module and 10kΩ potentiometer

4. OPERATION



Controller's operational status is indicated by the set of LEDs:

- LED1 - illuminates, if the F1 fuse is blown;
- Led 5V, 10V, 24V indicates presence of respective voltages on the controller's PCB.
- LedA - illuminates constantly in case of a fault.
- LedB - when blinking, indicates correct operation of the controller.
- LedC - indicates the residual moment elimination process.
- LedD - indicates a current flow through the clutch.

**The controller must be configured for a specific clutch or brake type** by setting respective switches (SW1 , SW2) in the **ON** position, according to the **table 5c** .

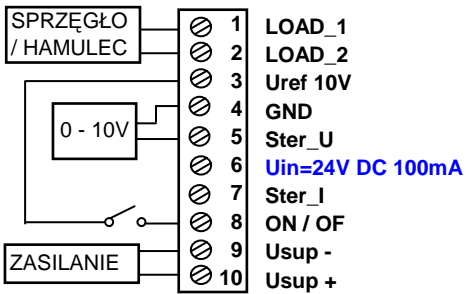
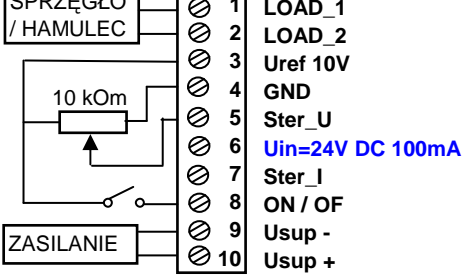
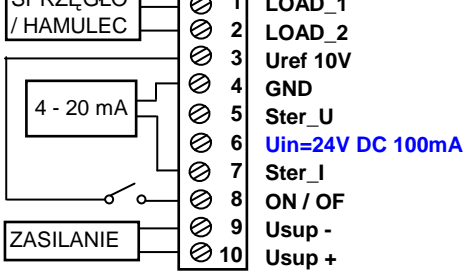
Select one of the 3 control modes and make relevant connection to the Z2 terminal strip. The controller controls the clutch when a voltage is applied to the ON/OFF input.

Two control modes are possible, depending on the position of the SW1-5 switch (it may only be changed with the power supply switched off).

SW1-4 OFF – when inputs are shorted, the controller will engage,

SW1-4 ON – when the input circuit is broken, the controller will engage.

**User may utilize the following means to control the braking moment of the clutch**

|   |   |
|---|---|
| <p>Using external 0 - 10V control voltage source (JP1 jumper in the 1-2 position), set the braking moment from min (0 V) to max. (10 V) value.</p>  |   |
| <p>Using the connected control potentiometer, controlling the voltage in the 0 - 10V control voltage source (JP1 jumper in the 1-2 position), set the braking moment from min (0 V) to max. (10 V) value.</p> |   |
| <p>Using an external 4 – 20 mA control current source (JP1 jumper in the 2-3 position), set the braking moment from min (4 mA) to max. (20mA) value.</p>  |  |
| <p><b>SPRZĘGŁO / HAMULEC – CLUTCH / BRAKE</b><br/> <b>ZASILANIE – POWER SUPPLY SOURCE 30VDC</b></p>   |   |

**5. CONTROLLER PREPARATIONS**

**a. Calibration of the 0-10V control voltage signal**

- Switch the controller to the voltage control mode (by setting the JP1 jumper on the 1-2 position)
- Connect the clutch to the controller with an ammeter connected in series
- Engage the controller by applying the ON/OFF signal

## Electromagnetic particle brake and clutch current controller

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- Set the reference voltage control input to 0V (STER-U)
- Using RPOT1 adjust the controller to that it is about to engage.
- Set the reference voltage control input to 10V (STER-U)
- Using RPOT3 set to the maximum current flowing through the clutch/brake
- by re-checking verify RPOT1 and RPOT3 settings

### b. Calibration of the 4-20mA control current signal

- Switch the controller to the current control mode (by setting the JP1 jumper on the 2-3 position)
- connect a voltage meter to TEST terminals
  - Using the reference source set the control current to 4mA (STER-I)
  - Using the RPOT2 potentiometer set the voltage at the TEST connector to be almost 0V
  - Using the reference source set the control current to 20mA (STER-I)
  - Using the RPOT4 potentiometer set the voltage at the TEST connector to be almost 10V
  - by re-checking verify RPOT2 and RPOT4 settings

### c. Controller settings table

| brake/clutch type | S2.1 | S2.2 | S2.3 | S2.4 | S2.5 | S2.6 | S2.7 | S2.8 | <b>S1.1</b> | <b>S1.2</b> |
|-------------------|------|------|------|------|------|------|------|------|-------------|-------------|
| NP-2              | ON   | x    | x    | x    | x    | x    | x    | x    | x           | x           |
| P-3               | x    | ON   | x    | x    | x    | x    | x    | x    | x           | x           |
| P-6, NP-5         | x    | x    | ON   | x    | x    | x    | x    | x    | x           | x           |
| NP-, P-12         | x    | x    | x    | ON   | x    | x    | x    | x    | x           | x           |
| P-35              | x    | x    | x    | x    | ON   | x    | x    | x    | x           | x           |
| P-65              | x    | x    | x    | x    | x    | ON   | x    | x    | x           | x           |
| P-80              | x    | x    | x    | x    | x    | x    | ON   | x    | x           | x           |
| P-120             | x    | x    | x    | x    | x    | x    | x    | ON   | x           | x           |
| P-170             | ON   | x    | x    | x    | x    | x    | x    | x    | ON          | x           |
|                   |      |      |      |      |      |      |      |      |             |             |
|                   |      |      |      |      |      |      |      |      |             |             |
|                   |      |      |      |      |      |      |      |      |             |             |

x = OFF

Selection of the relevant **SW1** and **SW2** switch positions, depending on the type of the clutch or brake being used.

To customize the settings, Customer may alter **SW1**, **SW2** switch positions, selecting one step lower (for smoother start and disengaging, but with higher residual magnetism), or one step higher (for faster engaging and disengaging and lower residual magnetism).

**Using the **SW1-3** ( ON , OFF ) switch, one may adjust the residual moment by modifying the residual magnetism of the electromagnet by about 8%**

## 6. OPERATION

### Operating conditions.

| Parameter                | Requirements             |
|--------------------------|--------------------------|
| Operating temperature    | 0°C to +40°C             |
| Relative humidity        | up to 80% at 40°C        |
| Housing IP rating        | IP20                     |
| Atmospheric pressure     | 84kPa-107kPa             |
| Dust concentration group | Z4 acc. to PN-83/T 42106 |
| Insolation               | Not permissible          |

### Sinusoidal vibrations permissible during operation:

|  |                       |
|--|-----------------------|
| Amplitude                              | 0.15 mm               |
| Frequency                              | 10 – 55 Hz            |
| Shocks during operation                | Not permissible       |
| Vibrations and shocks during transport | Acc. to PN-83/T 42106 |

### Installation

The controller shall be installed in a place, compatible with its operating conditions. Next, according to the control mode selected, connect the controller to relevant components.

### Mains connection

To connect use a 3-pole terminal strip with a fuse and 3 screw terminals, to connect the three wires: live - L, neutral - N, and protective earth - PE.

### Maintenance and repairs

Before attempting any maintenance activities on the device, disconnect it from the mains power. Housing cleaning may only be performed using dry materials. Warranty and post-warranty repairs are performed by the manufacturer's technical support service.

## 7. STORAGE AND TRANSPORT

### Packing

The controller is packed in individual factory packaging. In case of warranty repair, the controller shall be sent along with its packaging.

The following components are delivered along with the controller.

- Operating instructions.
- 10 kΩ potentiometer

### Storage

Controllers shall be kept in individual packaging, indoors, in premises free of aggressive and corrosive agents, where air temperature ranges between 0 and 40°C, and the relative humidity does not exceed 95% - without condensation.

### Transport

Controllers shall be transported in conditions preventing damage of their enclosures and controller themselves.

### **8. WARRANTY TERMS**

The warranty covers devices, which have been installed by persons having necessary qualifications and permits.

The warranty does not cover devices, which have been improperly operated, transported, stored, disassembled independently by users or tampered with or having breached warranty seals and corporate marks.

Faults of the product, used on the territory of Poland, discovered during the warranty period, will be removed within the term agreed with the user, which however shall not exceed 14 days since the product delivery to its manufacturer.

The necessary condition, for products used outside the territory of Poland, in order for them to qualify for the warranty repair, is to have them delivered to the manufacturer.

Costs of unjustified warranty claims shall be covered by the claiming party.

In case of a fault, the controller shall be sent along with its manufacturer's packaging.

In case of any disputes, provisions of the Civil Code shall apply.

#### **Note!**

- The controller may only be operated after this operating instructions is read.
- The manufacturer reserves the right to make changes and modifications having no impact on the device operation.