

LABOR – ASTER

AUTOMATYKA PRZEMYSŁOWA



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WZM-PP AMPLIFIER MODULE WITH SEPARATION

- channel 1 or channel 2 Ovation Servo Driver Electronics module „Analog Input/Output DC LVDT Servo Driver (SVD)”,
- valves type: NEYRPIC ACTIONNEUR type 50 2x13Ω.

TECHNICAL MANUAL

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1. Introduction.

This manual is intended for the users of WZM-PP amplifier with separation and it contains basic technical information and tips that are necessary for knowing the principles of device's operation and how to work with it. Manual contains important recommendations regarding the installation, maintenance and behavior in case of failure.

2. List of parts. Warranty.

Users receive devices packed individually or in bulk containers. Warranty is included in the package and is valid for 12 months from the day of delivery. LABOR-ASTER ensures warranty and post-warranty services in its headquarters.

The "Technical Manual" and a copy of the "Declaration of conformity" (optional) are included with every group of the devices delivered. Number of copies depends on the customer's wish.

3. Intended use of the product .

WZM-PP amplifier with separation processes the input control signal, e.g. from DCS system, into two push-pull current signals that supply the analogue electro-valve's coils. WZM-PP provides mutual galvanic separation between input, output and power supply circuits.

4. Technical data.

Input signal „IN“:	- - 1,283 ÷ + 1,283 V (or another as agreed)
Input resistance	- 60 Ω ±2% (or another as agreed)
Output signals:	current „BOBINE 1" - I _{OUT-1} = 0,8 ÷ 0,4 A
current BOBINE 2"	- I _{OUT-2} = 0,4 ÷ 0,8 A
Load resistance of coil:	
- with connections resistance R=0Ω and no pilot's slider vibration	- 12 ÷ 19,4 Ω
- with connections resistance R=0,6Ω and no pilot's slider vibration	- 12 ÷ 17,9 Ω
- with connections resistance R=0,6Ω and typical pilot's slider vibration	- 12 ÷ 16,6Ω
Min current limit	- 0,39 A
Max current limit	- 0,81 A
Power supply voltage	- 20 ÷ 240 V ac, dc operation at 230Vac, 50Hz is recommended
maximum power consumption	- 27 VA for AC power supply 20 W for DC power supply
power supply indicator	- Green LED „ALIM"
Precision	- ± 0,5 %
Influence of power supply voltage fluctuations	- ± 0,05 %
Influence of load resistance fluctuations	- -0,13% / 1 Ω
Influence of ambient temperature fluctuations	- ± 0,02 % / °C
Bandwidth (3 dB)	- 30 Hz
Potentiometer "ZERO" regulation	- ± Δ I _{OUT-1} = Δ I _{OUT-2} = 0,04 A for R _{BOBINE} = 12 Ω ⇒ U _{BOBINE 1} - U _{BOBINE 2} ≤ (2•0,48V)=0,96V for R _{BOBINE} = 16,4 Ω ⇒ U _{BOBINE 1} - U _{BOBINE 2} ≤ (2•0,656V)=1,31 V
Potentiometer „TREND" regulation	- Allows to set the following condition U _{BOBINE 1} - U _{BOBINE 2} - TREND ≤ 0,2 V when U _{BOBINE 1} - U _{BOBINE 2} ≤ 0,8 V
Binary input „REG"	
Default operation state	- 15 ÷ 24 V (logic „1") - LED „REG" is turned on yellow
Default operation turned off state	0 ÷ 3 V (logic „0") - LED „REG" is turned off
Mutual galvanic separation between circuits	- input „IN", input „REG", outputs „BOBINE 1 – BOBINE 2", outputs „K1, K2, K3, K4" power supply „ALIM"
Isolation test voltage	- 1,5 kV
Ambient temperature: operation	- + 5 ÷ + 50 °C
storage and transport	- - 30 ÷ + 60 °C

Binary outputs – ALARMS: Opto-relays (24 Vdc, $I_{max}=100$ mA, $r_{ON}=30$ Ω) are used as outputs K1, K2, K3, K4.

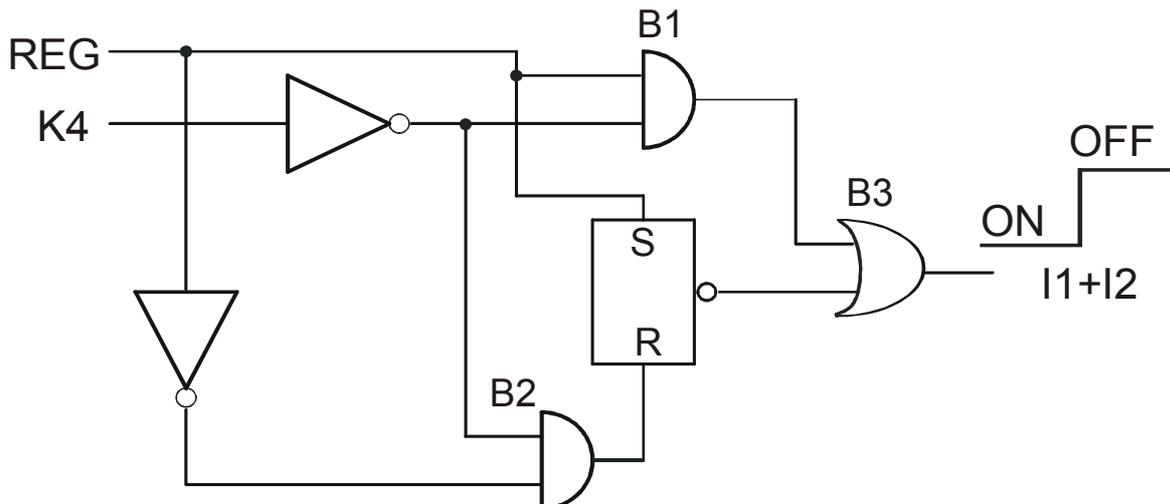
Marks: U_1, U_2 – valve's coils voltages

Alarms K1, K2, K3 active \Rightarrow log „1” – dry contacts $R_{ON} \leq 50 \Omega$ (closed)

Alarm K4 active \Rightarrow log „0” – dry contact $R_{OFF} \geq 1 M\Omega$ (open).

Nr	Description	Opto-relay	Mark
1	Opening direction failure („tendance ouverture”). If the following conditions are met for longer than $T_P=1,5$ s , the device switches into status K1 ($R_{ON} < 50$ Ω) indicated by red K1 LED: a) input signal $U_E \in (-0,128, V + 0,128V)$, b) binary signal „REG”=logic “1” 15÷24 V – active mode; yellow LED “REG” is turned on, c) change of the coils voltage difference $ U_1 - U_2 - TREND > 0,16$ V (hysteresis 0,05 V) yellow LED “REG” starts flashing. This status is to be deleted by passive “REG” signal = logic “0” (< 3 V). If ‘REG’=log „0” \Rightarrow alarm K1=log „0” immediately	K1	„K1 tendance ouv”
2.	Break in the coil („repture bobine”). If the following conditions are met for longer than $T_P=1,5$ s , the device switches into status K2 ($R_{ON} < 50$ Ω) indicated by red K2 LED: a) $(I_{OUT-1} + I_{OUT-2}) < 1,0$ A $\pm 10\%$, b) binary „REG” signal= logic „1” 15÷24 V – active mode; yellow LED “REG” is turned on. If ‘REG’=log „0” \Rightarrow alarm K2=log „0” after $t < 0,1$ s.	K2	Rupture Bobine
3	Coil monitoring while not operational („surveillance bobine”). If the following conditions are met for longer than $T_P=1,5$ s , the device switches into status K2 ($R_{ON} < 50$ Ω) indicated by red K3 LED: a. $ I_{OUT-1} + I_{OUT-2} > 0,11$ A $\pm 10\%$, b. binary signal „REG”= logic „0” 0÷3V – passive mode; yellow LED “REG” turned off. If ‘REG’=log „1” \Rightarrow alarm K3=log „0” immediately..	K3	Defaut Surveillance Bobine a L'ARRET
4	General failure („normal/default”). Devices switches to K4 ($R_{ON} < 50$ Ω), LED K4 changes color from green to red after the delay $T_P=1,5$ s in which minimum one of the following conditions is met: a. no power b. K2 = “1” c. K3 =”1”	K4	Defaut General

Current I1, I2 control – by software logic circuit driven by signals REG and K4 showed in the figure below.

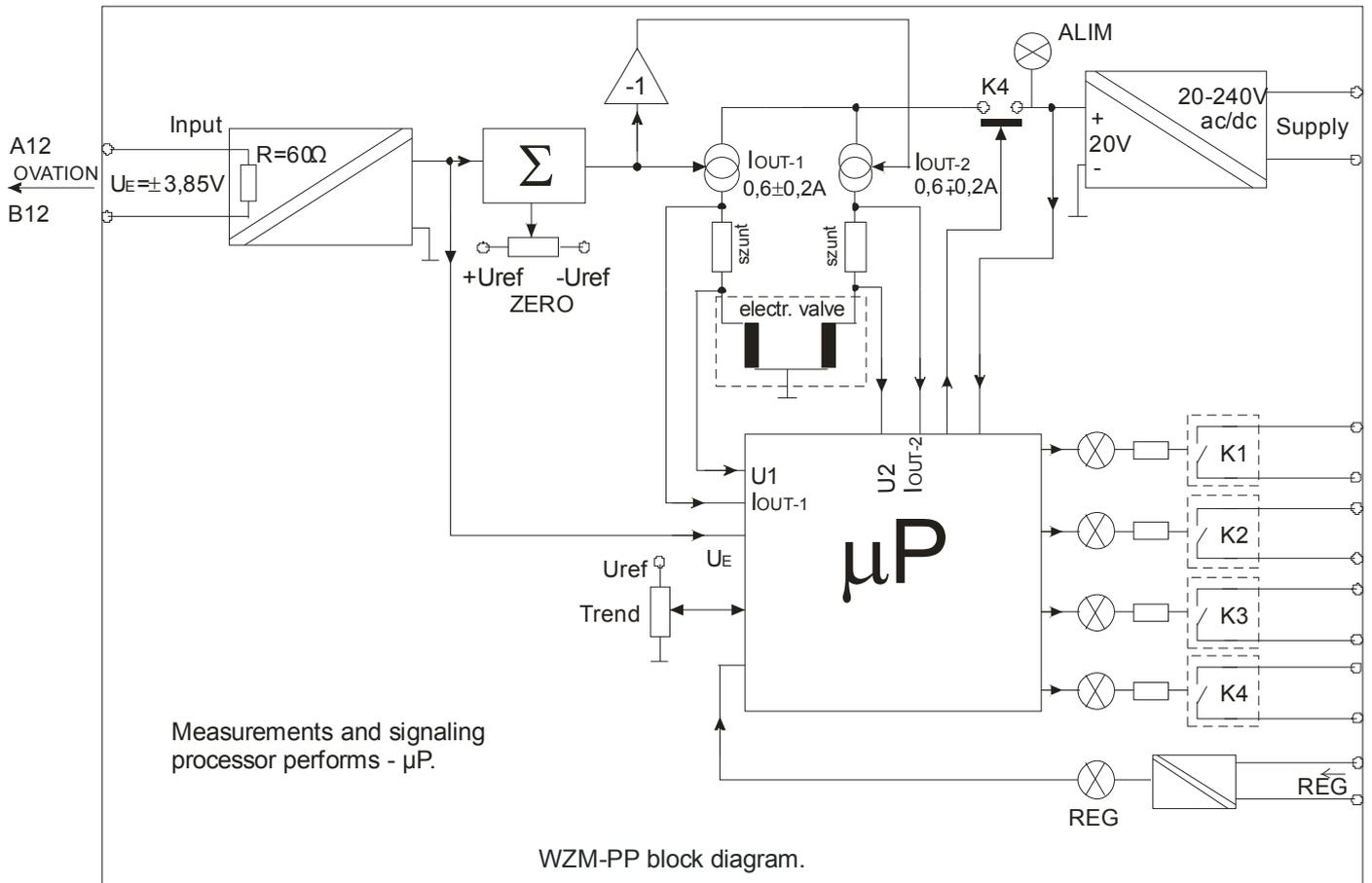


LED indications:

- Two color LED K4
 - lights green during normal operation with binary signal “REG” = logic “1”, 15÷24 V.
 - lights red when alarm K4 was triggered.
- Yellow LED “REG”
 - lights during normal operation with binary signal “REG”=logic “1”, 8÷24 V.
 - flashes when $||U_1 - U_2| - TREND| > 0,16$ V $\pm 20\%$
 - flashing stops when $||U_1 - U_2| - TREND| < 0,16$ V $\pm 20\%$ which can be achieved with the “TREND” potentiometer.

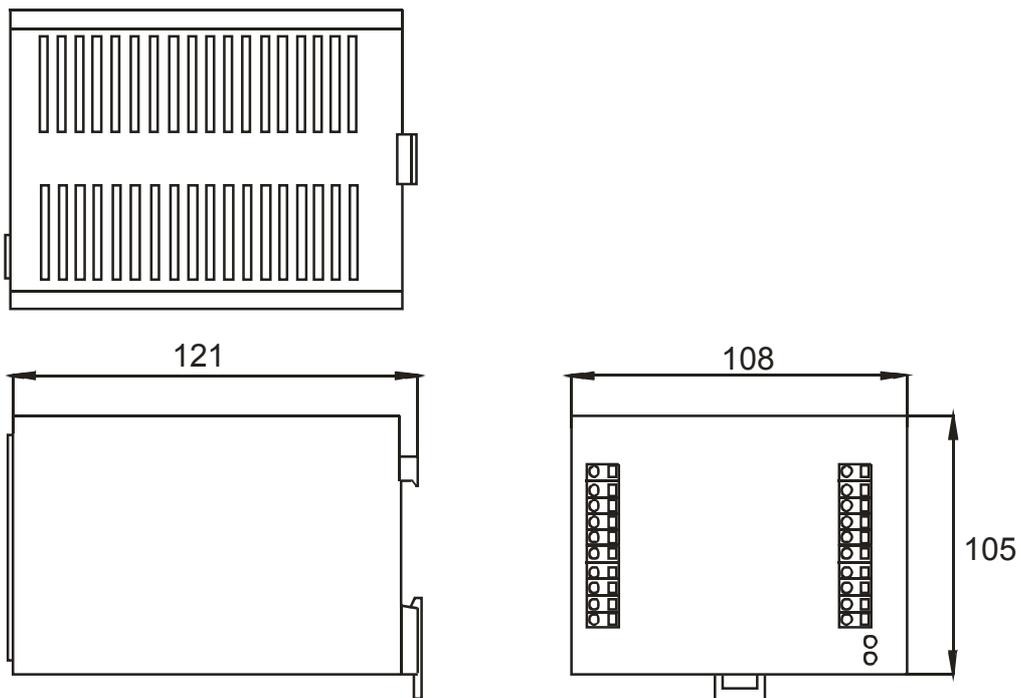
5. Technical description.

5.1. WZM-PP block diagram.



5.2. Housing and construction overview.

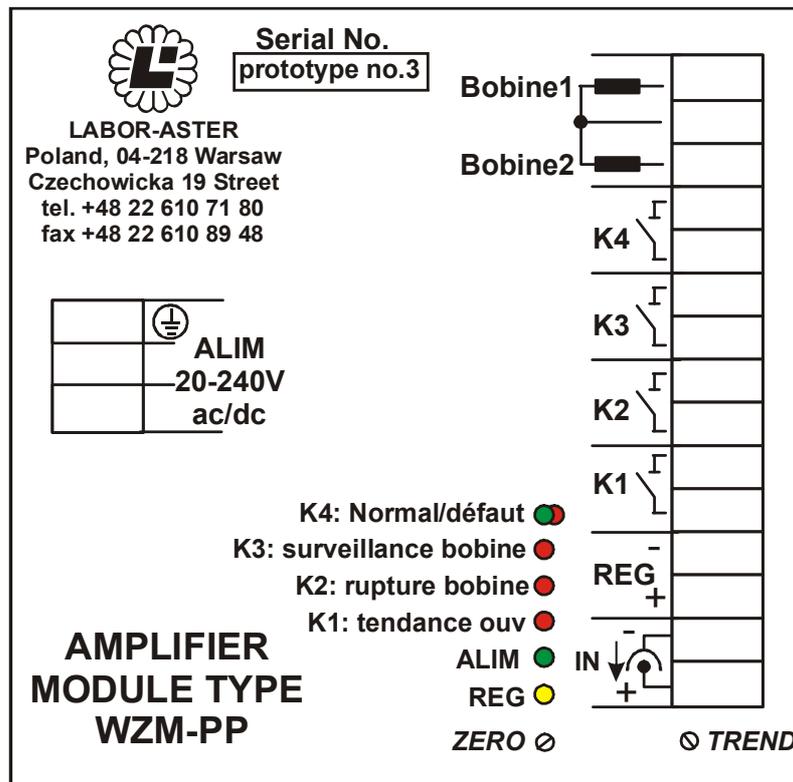
Device is mounted in a housing made of coated sheet steel. Housing protection level is IP20. General look and dimensions (in millimeters) are shown on the following drawing:



Protection level: IP20.
Weight: 1,2 kg

6. Installation. Operating conditions.

6.1. Assembly and connections.



Front panel and connection terminals.

Mounting has to be done on a standard 35 mm TS rail. The housing strip catch must be placed vertically. Distance of at least 5 mm between the housing and neighboring device side-walls must be provided.

Operation position – according to the arrow placed on the side wall of the housing. Such position ensures correct gravity cooling due to perforation on the top and bottom wall of the housing. There must be a space of 50mm from the top and bottom wall of WZMP-PP to any other devices or cable trough.

All external connections have to be copper wire of diameter $\varnothing \leq 2.5$ mm. Cable ends should be framed in the clamping sleeves or twisted and not tinned.

Twisted cables for input and output circuits of signal lines and separate tracks for signal and feed lines are recommended. Cables tracks should cross under right angle. Twisted and shielded cables are required for zones with high electromagnetic interference. It is recommended to use EMI filter on the connection cables.

6.2. Default operation conditions.

Ambient temperature	5 °C...+50 °C
Relative humidity	5...95 %
Atmospheric pressure	80... 120 kPa
Constant and variable magnetic field	0...1 A/m
Sinusoidal vibrations (within range of 5...80 Hz)	do 2 g
Ambient atmosphere	dust and corrosive vapours free
Working position	housing catch positioned vertically
Warming up time	15 minutes

7. Settings and regulations.

According to the recipient specification, the manufacturer sets:

- the type and value of the input and output signal,
- bandwidth.

There is no possibility for the user to change the above, factory settings. There are two openings in the front panel that allow user to access "ZERO" and "TREND" potentiometers. Their functions are described in paragraph 4 – Technical data.

8. Usage, maintenance, examinations, repairs

8.1. Periodic reviews.

While normal operation the device does not demand any special maintenance or settings corrections. Reviews should be carried on periodically according to the users control standards. During the review examination of the device external condition is required. Wiring terminals and cramps should be controlled and corrected if needed. The following aspects should be checked:

- mechanical damages,
- loosening of electrical connections and correct attachment to the mounting board,
- legibility and integrity of the nameplate.

8.2. Non-periodic reviews.

8.2.1.

In case of no output signal and the power supply voltage together with input signal are correct one should check if LED "ALIM", which indicates the operation of the supply transformer, is turned on. If it does not light it means that the power circuit protection fuse may be damaged. This fuse is not accessible from outside. It is soldered on a board and its symbol is F1 (MST 250 4A type). Burned fuse likely means that failure is serious and it is necessary to send the device to repair, back to the manufacturer. Replacing fuse inserts with other ones, of nominal current value different from WZM-PP documentation, is not permitted. Replacement of the fuse can be done by the manufacturer (LABOR-ASTER) or by the staff trained by the manufacturer only. If the LED "ALIM" lights, it is likely that the input or output signal connection line is broken.

8.2.2.

In case of malfunction the quality of the power supply voltage, which should be in the range of 20 ÷ 240 V dc/ac, must be checked. If non – stabilized power source is used its voltage value should never drop below 20V. A 230Vac power supply is recommended.

If the voltage supply is correct but the malfunction persists the next step is to verify the input signal transmission characteristic at the initial, middle and terminal point of the measurement range. If measured characteristics differ much from the technical specification, device has to be turned over to LABOR-ASTER for service. E.g. if the difference occurs at the beginning of the range ($U_E=0V$), it can be corrected with "ZERO" potentiometer. Potentiometer "ZERO" is used for setting the initial operating point of the electrovalve – typically $I_{\text{bobine1}} \approx 0,6A+0,025A$ for $U_E=0V$.

No repairs and interference into the electronic system of the device are permissible. Only the manufacturer or his representative are authorized to carry out repairs and examinations of the device.

9. Labeling and versions.

Device is labeled with type name: WZM-PP

Device is available in versions designed according to detailed customer specifications.

10. Packing, storage and transport.

10.1. Packing.

Individual packaging or bulk container are equally recommended, provided they prevent damages of the device during the transport. Indoor space, air temperature above 15°C and relative humidity below 85% are required for packing of the device.

10.2. Storage.

The devices should be stored in bulk containers in indoor space with ambient atmosphere – free of corrosive vapors and substances, with temperatures ranging from +5°C to +40°C and with relative humidity below 85%.

10.3. Transport.

Individual packaging or bulk container are equally appropriate for transport. The packaging should prevent the translocation of the device during the transport. Air, sea and surface transport are suitable, provided the direct influence of atmospheric factors is eliminated.

THE END