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EWDR 905

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controllers dual output DIN rail

WHAT IT IS

The EWDR 905 is a series of micro-processor based and fully programmable process controllers for dual setpoint or Neutral Zone applications.

Three different versions of this controller are available: EWDR 905/T for Temperature, EWDR 905/R for Relative humidity and EWDR 905/P for Pressure control.

HOW IT IS MADE

- **Housing:** 4-DIN module 70x85 mm (2.75x3.34"), plastic resin PC+ABS extinguishing grade V0
- **Depth:** 61 mm (2.40")
- **Mounting:** DIN-rail (Omega 3) or surface mount
- **Connections:** screw terminal block (2.5 mm²)
- **Display:** 12.5 mm LED (0.50")
- **Outputs:** two (2) SPDT relays 8(3)A 250V~
- **Auxiliary output:** 12 V~/60 mA (for transducer power supply, e.g. humidity sensor, pressure transducer, etc.)
- **Inputs (depending on model):** PTC / RTD (Ni100, Pt100) / Tc (J, K) / 4...20 mA (Ri = 41 Ω) for EWDR 905/T; EWHS 28/31 for EWDR 905/R and EWPA 007/030 for EWDR 905/P
- **Resolution:** 1 °C (°F) or 0.1 °C (°F). The right-most digit can also be set to read-out in 0 or 5 only, or in all 10 digits
- **Accuracy:** better than 0.5% of full scale
- **Power supply (depending on model):** 230, 110, 24 V~; 18...36 V~, 24...48 V~; 12 V~/-

GENERAL DESCRIPTION

The EWDR 905 is a new series of micro-processor based and fully programmable process controllers for dual Setpoint or Neutral Zone applications.

In the Neutral Zone control mode it provides two relay outputs which are located at equal values above and below the Setpoint selected. This value - the Neutral Zone - is field adjustable.

The front keypad of these controllers offers several alpha-numeric menu prompts to configure the controller for each specific application (see further). This series of instrument is designed for surface or DIN - rail mounting.

Three different versions of this controller are available: EWDR 905/T for Temperature, EWDR 905/R for Relative humidity and EWDR 905/P for Pressure.

FRONT KEYPAD

SET (dual Setpoint control mode): pushed once the Setpoint 1 value will be displayed for 3 seconds (Led "OUT I" blinks). Pushed once again within 3 seconds the Setpoint 2 value will be displayed (Led "OUT II" blinks). The Setpoint can be changed with the "UP" or "DOWN" button.

SET (Neutral Zone control mode): push and release to display the Setpoint for 3 seconds. During this period, the Led "OUT I" blinks and the Setpoint can be changed with the "UP" or "DOWN" button only.

UP: used to increase the Setpoint value, as well as the parameter when in programming. When held down for a few seconds, the change rate accelerates.

DOWN: used to decrease the Setpoint value, as well as the parameter when in pro-

gramming. When held down for a few seconds, the change rate accelerates.

Led "OUT I": status light of output 1. Blinks when in Setpoint display/change mode or during programming.

Led "OUT II": status light of output 2.

PARAMETER PROGRAMMING

Programming is easily accessed by holding the "SET" button down for more than 4 seconds; the first parameter is displayed while the status light Led "OUT I" remains blinking during the programming period. Other parameters are accessed with the "UP" and "DOWN" button. With the "SET" button, the actual setting of each parameter is displayed. To change a parameter setting, push the "SET" plus the "UP" (or "DOWN"). The system will automatically return to its normal operating mode a few seconds after the programming procedure is completed or interrupted.

DESCRIPTION OF PARAMETERS

The following list of parameters is complete. According to the selected control mode (ON-OFF or Neutral Zone, see parameter "Ft"), only the applicable parameters will be shown and accessed.

d1: differential Setpoint 1.

The switching differential (hysteresis) Setpoint 1 can be set with positive value (make on rise) or with negative value (make on fall). See parameters "HC1" and "HC2".

d2: differential Setpoint 2.

Same as "d1".

db: dead band (or Neutral Zone).

This is the temperature span above and below the Setpoint beyond which relay 1, respectively relay 2 are energized; once an



DEFAULT SETTINGS - STANDARD MODELS

Parameter	Description	ON - OFF	Dead band	Unit
d1	differential set 1	1 (C) / -1 (H)	/	°C / °F
d2	differential set 2	1 (C) / -1 (H)	/	°C / °F
db	dead band	/	1	°C / °F
LS1	Lower Set 1	min	min	°C / °F
LS2	Lower Set 2	min	min	°C / °F
HS1	Higher Set 1	max	max	°C / °F
HS2	Higher Set 2	max	max	°C / °F
od	output delay	0	0	seconds
*od1	output delay 1	0	0	seconds
*od2	output delay 2	0	0	seconds
Lci	Lower current input	20 (%R.H.)	20 (%R.H.)	°C / °F
Hci	Higher current input	100 (%R.H.)	100 (%R.H.)	°C / °F
CAL	CALibration	0	0	°C / °F
Ft	Function type	on	nr	flag
PSE	Probe SElection	Ni / Pt / Fe / Cr	Ni / Pt / Fe / Cr	flag
OCO	Output COnnection	in	in	flag
HC1	Heating / Cooling 1	H / C	/	flag
HC2	Heating / Cooling 2	H / C	/	flag
rP1	relay Protection 1	ro	ro	flag
rP2	relay Protection 2	ro	ro	flag
LF1	Led Function 1	di	di	flag
LF2	Led Function 2	di	di	flag
dP	decimal Point	on / oF	on / oF	flag
hdd	half digit display	n	n	flag
tAb	tAble of parameters	/	/	/

* these parameters are available in the models featuring independent activation delay only.

output is energized, the output remains ON until Setpoint is reached.

LS1: Lower Set 1.

This is the lower limit below which the user cannot change the Setpoint 1; normally set at the lowest value recommended for the sensor.

LS2: Lower Set 2.

This is the lower limit below which the user cannot change the Setpoint 2; normally set at the lowest value recommended for the sensor.

HS1: Higher Set 1.

Similar to LS1, however setting an upper limit for the Setpoint 1.

HS2: Higher Set 2.

Similar to LS2, however setting an upper limit for the Setpoint 2.

od: output delay.

This parameter can only be viewed in standard models. This provides a delay selection for the outputs in applications where noise may cause brief erroneous signals from the sensor to the controller. Factory set at "0".

***od1:** output delay 1.

This parameter is viewed in the model featuring independent activation delay. It allows setting an activation delay for relay 1.

***od2:** output delay 2.

This parameter is viewed in the model featuring independent activation delay. It al-

lows setting an activation delay for relay 2.

Lci: Lower current input (for EWDR 905/R, EWDR 905/P and EWDR 905/T with current input only). Read-out corresponding to 4 mA input signal (factory set at 20% R.H. for EWDR 905/R).

Hci: Higher current input (for EWDR 905/R, EWDR 905/P and EWDR 905/T with current input only). Read-out corresponding to 20 mA input signal (factory set at 100% R.H. for EWDR 905/R).

CAL: CALibration.

This offers an adjustment up or down of the read-out, if needed. Factory set at "0".

Ft: Function type.

Control mode selection (output 1).

on = ON/OFF;

nr = neutral zone.

PSE: Probe SElection.

Input type (for RTD or Thermocouples only).

RTD models: Ni = Ni100; Pt = Pt100.

Tc models: Fe = TcJ; Cr = TcK.

OCO: Output COnnection.

Setpoint dependency.

di = Setpoint 2 dependent on set 1 (for 2-stage control;

in = Setpoint 2 independent from set 1.

HC1: Heating / Cooling output 1.

Relay switch function output 1.

H = heating (humidification; reverse action);

C = cooling (dehumidification; direct ac-

tion).

HC2: Heating / Cooling output 2.

Relay switch function output 2.

H = heating (humidification; reverse action);

C = cooling (dehumidification; direct action).

rP1: relay Protection 1.

Determines the status of the relay in case of sensor defect. Factory set at "ro".

ro = relay open;

rc = relay closed.

rP2: relay Protection 2.

Same as "rP1".

LF1: Led Function 1.

Determines whether the status light is ON or OFF in relation to output 1.

di = direct = light ON when output 1 is energized;

in = reverse = light OFF when output 1 is energized.

LF2: Led Function 2.

Same as "LF1".

dP: decimal Point.

Choose whether the resolution is required with or without decimal point.

oF = without decimal point;

on = with decimal point.

NOTES: (a) the decimal point of models with current or voltage input is shifted: the actual value of parameters "Lci" and "Hci" must be multiplied by 10; (b) on all versions, if a unit is changed from without decimal point to with decimal point, all parameter values expressed in degrees will automatically be divided by 10, including the Setpoint !! (c) the decimal point selection is not available on models for thermocouple input.

hdd: half digit display.

The right-most digit can be set to read-out in 0 or 5 only, or in all 10 digits.

hdd = n: e.g. 070, 071, 072 etc. (if without decimal point) or 70.0, 70.1, 70.2 etc. (if with decimal point);

hdd = y: e.g. 070, 075, 080, etc. (if without decimal point) or 70.0, 70.5, 80.0, etc. (if with decimal point).

Useful when measuring values varying rapidly (e.g. %R.H.).

tAb: tAble of parameters.

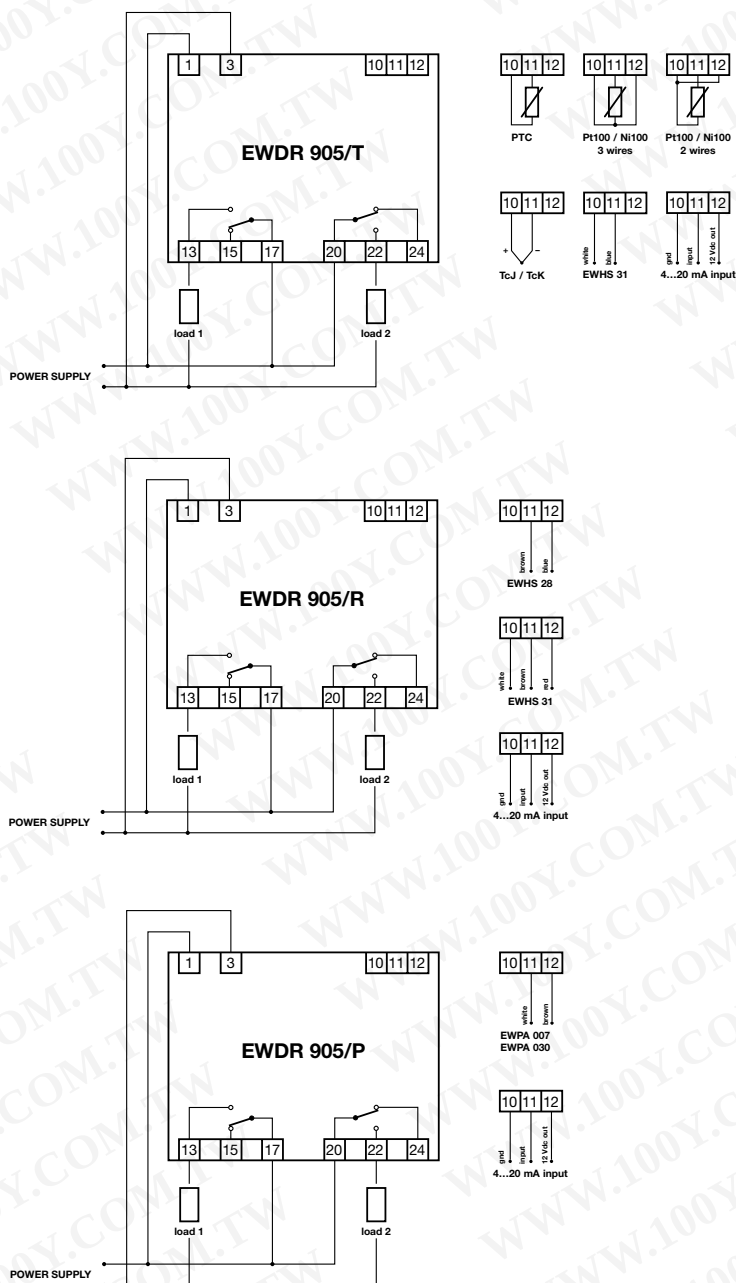
This shows the configuration of the parameters as set in the factory; can not be modified (for factory identification and diagnostic purposes only).

NEUTRAL ZONE (DEAD BAND)

The Neutral Zone (Dead band) control is obtained by setting to "nr" the parameter "Ft". This band width is always such that the Setpoint is at midpoint.

Both output relays are OFF as long as the temperature remains within these two limits. The total value of the dead band is twice the value set with parameter "db". As soon as the process temperature exceeds the upper band limit or falls below the lower band limit, the corresponding output relay will be energized and stay on until the temperature comes back to the Setpoint.

CONNECTIONS



INSTALLATION

The instrument is designed for wall or DIN-rail mounting.

The operating temperature range for correct operation is from -5 to 65 °C.

Do not install the instrument in moist and/or dirty places; it is suitable for operation in environments with an ordinary pollution level. Leave enough room for air circulation by the cooling holes of the instrument.

ELECTRICAL WIRING

The instrument is equipped with an internal screw terminal block suitable for max 2.5 mm^2 wiring. Make sure that the power supply corresponds with the rating shown on the instrument.

Refer to the instrument label for the applicable terminals to be used for the sensor

cable. If an ELIWELL humidity or pressure sensor is used (EWDR 905/R or EWDR 905/P) keep in mind that it can be powered by the controller (see wiring diagram).

Probe cables (and power supply cables in the case of instruments powered by dangerous voltage current) must be kept away from relay cables and from the power supply cord (if current has dangerous voltage) both for EMC and safety reasons.

The coordinated European safety regulations state that the relay contacts (and generally speaking, all parts subject to dangerous voltage) shall be kept away from the very low safety voltage connections (probe, power supply) using insulation systems and distances providing at least a double or reinforced insulation.

However EMC requirements for correct operation suggest/impose better accuracy

in such separation by using separated insulating pipes and special cable fixing systems. The relay output contacts are voltage free and independent; do not exceed the resistive rating of 8 A at 250 V- . For larger loads, please use an external contactor or relay. To comply with safety regulations in 24 V- powered instruments, a special protection device (eg. a delayed fuse) shall be connected in series with the power supply to limit the absorbed current in case of fault (the protection shall be dimensioned considering that instruments absorb 4 VA max).

ERROR ANNOUNCEMENT

Any sensor input defect will be displayed as follows: “---” in case of shorted sensor; “EEE” in case of sensor break, or sensor absence. The “EEE” error message also appears in the event of overrange or under-range of the system temperature. It is recommended to doublecheck the sensor wiring before diagnosing a probe as defective.

AUTHORISED USE

For safety reasons, the control device should be installed and used according to the given instructions and, particularly, all parts subject to dangerous voltage shall not be accessible. Under normal conditions. As to its application, the device should be properly protected against water and dust and, in addition, it should only be accessible by using a tool.

The device may be applied on household appliances and/or similar refrigerating equipment.

Regarding the reference rules, this device may be classified as follows:

- according to its manufacture: automatic, electronic, independent-mounting control device to be incorporated;
- according to its automatic operating features: acting control device, 1 BY type;
- according to the class and structure of the software it uses: class A device.

UNAUTHORISED USE

Any use different from the authorised one is forbidden.

We point out that relay contacts are of the functional type, and therefore subject to failure. Any protection device required by the rules concerning this product or dictated by common sense due to obvious safety reasons should be applied outside the instrument.

LIABILITY AND RESIDUAL RISKS

Eliwell cannot be held responsible for any damages due to:

- installation and/or use different from what the manufacturer intended and, in particular, differing from the safety rules provided for by law and/or hereby stated;
- use on equipment lacking a proper protection against electrical shock, water or

dust under the performed installation conditions;

- use on equipment allowing access to dangerous parts without employing any tools;
- products tampering and/or alteration;
- installation or use on equipment which does not comply with the provisions of the law presently in force.

TECHNICAL DATA

Housing: 4-DIN module 70x85 mm (2.75x3.34"), plastic resin PC+ABS extinguishing grade V0.

Depth: 61 mm (2.40").

Mounting: DIN-rail (Omega 3) or surface mount.

Connections: screw terminal block (2.5 mm²).

Display: 12.5 mm LED (0.50").

Push buttons: located on front panel.

Data storage: non-volatile EEPROM memory.

Operating temperature: -5...65 °C; (23...149 °F).

Storage temperature: -30...75 °C; (-22...167 °F).

Outputs: two (2) SPDT relays 8(3)A 250V~.

Auxiliary output: 12 V~/60 mA (for transducer power supply, e.g. humidity sensor, pressure transducer, etc.).

Inputs (depending on model): PTC / RTD (Ni100, Pt100) / Tc (J, K) / 4...20 mA (Ri = 41 Ω) for EWDR 905/T; EWHS 28/31 for EWDR 905/R and EWPA 007/030 for EWDR 905/P.

Resolution: 1 °C (°F) or 0.1 °C (°F). The right-most digit can also be set to read-out in 0 or 5 only, or in all 10 digits.

Accuracy: better than 0.5% of full scale.

Power supply (depending on model): 230, 110, 24 V~ ±10%; 18...36 V~, 24...48 V~; 12 V~/= ±15%.

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