### WHAT IT IS

The EWPC 901/A is a temperature controller specifically designed for refrigeration applications. The instrument includes a 12 Vdc output on the terminal block which controls the external alarm.

#### HOW IT IS MADE

- Dimensions: front 74x32 mm (2.913x1.260"), depth 67 mm (2.637")
- Mounting: flush panel mount with mounting bracket
- Protection: the instrument frontpanel is waterproof IP65; an optional snap-on cover can be supplied to provide additional protection of the rear terminal block
- Connections: screw terminal block (2.5 mm<sup>2</sup>; one wire each terminal only, in compliance with VDE norms)
- Display: 12.5 mm LED (0.50")
- Push buttons: located on front
- panel • Output: one (1) SPDT relay 8(3)A 250V AC
- Alarm output: 1 output 12 Vdc (40 mA max)
- Input: PTC probe
- Resolution: 1 °C (°F)
- Accuracy: better than 0.5% of full scale
- Power supply (depending on model): 12 Vac/dc or 24 Vac/dc

# EWPC 901/A rel. 6/96 ing

# temperature controller with alarm output

#### **GENERAL DESCRIPTION**

The EWPC 901/A is a temperature controller specifically designed for refrigeration applications; it is designed to operate as a cooling control, which means that the switching differential is positive: the compressor cuts off at setpoint and is started at a temperature of set plus differential. In addition, the EWPC 901/A offers several system protection features, all easy to understand and easy to program.

With a suitable setting of parameter "HC" and a negative differential the controller can be used for heating applications. The relay is OFF at setpoint and is energized at a temperature of set minus differential.

The instruments also includes a 12 Vdc output on the terminal block which controls the external alarm; this alarm can be silenced by pushing one of the buttons on the face plate. A number of parameters are displayed alphanumerically to set up the instrument for each specific application. The EWPC 901/A is supplied in the popular "32x74" ELIWELL.

## FRONT KEYPAD

**SET**: push to display the setpoint temperature. The setpoint can be changed within 5 seconds with the "UP" or "DOWN" button. The control will automatically switch back to normal operating mode within 5 seconds; the last entered setpoint will stay in memory.

**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 programming. When held down for a few seconds, the change rate accelerates. **Led "ON"**: status light of the output.

#### PARAMETER PROGRAMMING

Programming is easily accessed by holding the "SET" button down for more than 4 seconds. The first parameter is displayed; 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**

HC: Heating/Cooling mode.

Relay switch function.

H = heating; C = cooling.

d: switching differential (histeresis).

Set with positive value for cooling applications; a negative value is used for heating mode.

#### LS: Low Set.

Setting of the lower user-access setpoint limit.

HS: High Set.

Setting of the upper user-access setpoint limit.

## CA: CAlibration.

Temperature read-out offset to allow for possible error due to probe location. **rP**: relay Protection.

Select relay status in case of probe defect. on = compressor ON in case of probe defect;

of = compressor OFF in case of probe defect.

**PS**: Protection System short cycle. Select type of compressor protection desired (the actual time delay is set with the next parameter; only for cooling applica-

tions):

0 = delay before start - in seconds;

1 = delay before start - in minutes;

- 2 = delay after stop in minutes;
- 3 =delay between starts in minutes.
- Pt: Protection time.

Time delay setting for compressor shortcycle protection (only for cooling applications); expressed in seconds (0 to 31) if PS = 0 or in minutes (0 to 31) if PS > 0 (see parameter "PS").

HA: High Alarm.

This sets the deviation above the setpoint at which the acoustic alarm (internal buzzer) will active.

LA: Low Alarm.

This sets the deviation below the setpoint at which the acoustic alarm (internal buzzer) will active.

Ad: Alarm differential.

The allowable temperature swing between ON and OFF of the alarms.

PA: Power-on Alarm.

Time delay after start-up during which the alarm will not activate, in hours.

#### INSTALLATION

The instrument is designed for flush panel mounting. Insert the unit through a 29x71 mm panel cut-out and affix with the Ubracket supplied.

The ambient temperature around the instrument should be kept between -5 and 65 °C (23...149 °F). Select a location which will not be subject to high humidity

## **DEFAULT SETTINGS - STANDARD MODELS**

Parameter	Description	Range	Default	Unit
HC	Heating / Cooling	H/C	С	flag
d	differential	-1515	2	°C / °F
LS	Lower Set	-5599	-55	°C / °F
HS	Higher Set	-5599	99	°C / °F
CA	CAlibration	-1515	0	°C / °F
rP	relay Protection	on / oF	oF	flag
PS	Protection System	03	0	number
Pt	Protection time	031	0	min / sec
HA	High Alarm	150	50	°C / °F
LA	Low Alarm	150	50	°C / °F
Ad	Alarm differential	131	2	°C / °F
PA	Power-on Alarm	015	2	hours

## CONNECTIONS



or condensation and allow some ventilation to provide cooling to the instrument.

#### **ELECTRICAL WIRING**

The instrument is equipped with an internal screw terminal block suitable for max 2.5 mm<sup>2</sup> wiring (one wire each terminal only, in compliance with VDE norms).

Make sure that the power supply corresponds with the rating shown on the instrument, i.e. 12 Vac/dc  $\pm 15\%$  or 24 Vac/dc  $\pm 15\%$ .

The 2-wire PTC type probe does not require polarity and can easily be extended by using common 2-lead wire.

It is strongly recommended to run the probe cable separate from line voltage wiring. Also, it is good practice to install the tip of the probe in upright position, to avoid moist from entering into the stainless steel sensor housing.

The output relay contacts are voltage-free and are suitable for in-line switching of compressors up to 0.5 HP at 220 Vac (or 0.25 HP to 110 Vac). For larger loads, an external contactor must be used.

#### **ERROR ANNOUNCIATION**

The instrument is provided with only one error message "E1", both in case of shorted sensor and in case of sensor break, or sensor absence. The "E1" error message also appears in the event of underrange of the system temperature (–55).

In the event of overrange of the system temperature (99), the "99" value will blink first, then the "E1" error message will be displayed in case the probe will exceed the value of 150 (values above 99 will not be visualized on the display).

It is recommended to doublecheck the sensor wiring before diagnosing a probe as defective.

## **TECHNICAL DATA**

**Housing** : black ABS plastic, autoestinguish.

**Dimensios** : front 74x32 mm (2.913x1.260"), depth 67 mm (2.637"). **Mounting** : flush panel mount with mount-

ing bracket.

**Protection** : the instrument frontpanel is waterproof IP65; an optional snap-on cover can be supplied to provide additional protection of the rear terminal block.

Connectios : screw terminal block (2.5 mm<sup>2</sup>; one wire each terminal only, in compliance with VDE norms). Display : 12.5 mm LED (0.50"). Push buttom : located on front panel. Data storag : non-volatile EEPROM memory. **Operating temperature**: -5...65 °C; (23...149 °F). Storage temperatu e: -30...75 °C; (-22...167 °F). Output : one (1) SPDT relay 8(3)A 250V AC. Alarm outpt : 1 output 12 Vdc (40 mA max). Input : PTC probe. Resolutia : 1 °C (°F). Accurag: better than 0.5% of full scale.

**Accurag** : better than 0.5% of full scale. **Power suppl** (dep. on model): 12 Vac/dc ±15% or 24 Vac/dc ±15%.

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# elivell

# **EWPC 901/N**

# temperature controller with single output

### **GENERAL DESCRIPTION**

The EWPC 901/N is a one-intervention point electronic temperature controller specifically designed for refrigeration applications;.

The differential shall be set to positive values; the compressor cuts off at setpoint and is started at a temperature of setpoint plus differential.

In addition, the EWPC 901/N offers several system protection features, that can be easily understood by analysing the programmable parameters, and ensure a suitable compressor protection at close startups. With a negative differential the controller can be used for heating applications. The output stops when the Setpoint is reached and restarts when the temperature is equal to Setpoint minus the differential.

The EWPC 901/N can be used in several applications with a measurement range of -50 and 50 °C, and is supplied in the "32x74" ELIWELL standard format.

## FRONT KEYPAD

**SET**: push and release to display the setpoint temperature. The setpoint can be changed within 15 seconds with the "UP" or "DOWN" button. The new value is automatically stored after 15 seconds since the last operation.

**UP**: used to increase the setpoint value, as well as the parameters 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 parameters when in programming mode. When held down for a few seconds, the change rate accelerates. **Led "OUT"**: led related to the compressor relay.

Led "SET": blinks during setpoint display/change and programming mode.

#### PARAMETER PROGRAMMING

Programming is accessed by holding the "SET" button down for more than 5 seconds. The first parameter label is displayed; other parameters are accessed with the "UP" and "DOWN" button. With the "SET" button, the current setting of each parameter is displayed. To change a parameter setting, push the "UP" or "DOWN" key. New values are stored on exiting programming mode (when no key is pressed for 15 seconds).

## **DESCRIPTION OF PARAMETERS**

LS: Lower Set.

Minimum allowed value for Setpoint (the upper limit is automatically updated to the Setpoint value).

#### **HS**: Higher Set.

Maximum allowed value for Setpoint (the lower limit is automatically updated to the Setpoint value).

d: differential of intervention.

Set to positive values for cooling applications; a negative value is used for heating mode.

ct: compressor type protection.

It establishes the type of protection adopted to prevent close startups of the compressor.

0 = delay on compressor activation, expressed in seconds;

1 = delay on compressor activation, expressed in minutes;

2 = there is a minimum compressor off time before the following startup. The delay is expressed in minutes;

3 = there is a minimum delay between two successive startups of the compressor. The delay is expressed in minutes.

cd: compressor delay protection.

Time related to the parameter "ct".

**cP**: compressor Probe protection.

Allows to select the use of the compressor



## WHAT IT IS

The EWPC 901/N is a one-intervention point electronic temperature controller specifically designed for refrigeration applications.

#### HOW IT IS MADE

- Dimensions: front 74x32 mm (2.913x1.260"), depth 67 mm (2.637")
- Mounting: flush panel mount with mounting bracket
- Output: one (1) SPDT relay 8(3)A 250V~
- Input: NTC probe

## **DEFAULT SETTINGS - STANDARD MODELS**

Parameter	Description	Range	Default	Unit
LS	Lower Set	–50HS	-50	°C / °F
HS	Higher Set	LS50	50	°C / °F
d	differential	-1212	2	°C / °F
ct	compressor type protection	03	0	number
cd	compressor delay protection	099	0	min / sec
сP	compressor Probe protection	oF / on / dc	oF	flag
On	time (compressor) On	199	5	minutes
OF	time (compressor) OFF	199	5	minutes
od	output delay at power-on	099	0	minutes
Lc	Lock keyboard	n / y	n	flag
dr	display read-out	°C / °F	°C	flag
CA	CAlibration	-1212	0	°C / °F
tA	tAble of parameters	/	/	/

relay in case of faulty probe.

oF = relay always disabled;

on = relay always enabled;

dc = relay controlled according to the timing set by parameters "On" and "OF".

**On**: time (compressor) On.

Referred to parameter "cP" when set to "dc"; defines the interval – in minutes – during which the compressor shall stay on. **OF**: time (compressor) OFF.

Referred to parameter "cP" when set to "dc"; defines the interval – in minutes – during which the compressor shall stay off. **od**: output delay (at power-on).

Time delay applied to activation of the relays after start-up.

Lc: keyboard Lock.

Allows to disable keyboard operations. **dr**: display read-out.

Permits to select either  $^\circ$ C or  $^\circ$ F display mode (no parameter is automatically converted from  $^\circ$ C to  $^\circ$ F).

#### CA: CAlibration.

Permits to change the value read by the probe in case of errors due to the sensor position.

tA: tAble of parameters.

Configuration index for factory set parameters; cannot be changed by the user.

#### **MECHANICAL MOUNT**

The instrument is designed for flush panel mounting. Drill a 71x29 mm hole and insert the unit fixing it with the U-bracket supplied. The ambient temperature around the instrument for correct operation should be kept between -5 and  $55 \,^{\circ}C$  (23...131  $^{\circ}F$ ). 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**

Operations on electrical connections shall always be carried out after turning the machine off. The instrument is equipped with an internal screw terminal block suitable for max 2.5 mm<sup>2</sup> wiring (one wire each terminal only, in compliance with VDE norms). Make sure that the power supply corresponds with the rating shown on the instrument, i.e. 230 V~  $\pm 10\%$  or 115 V~  $\pm 10\%$  or 12 V~/ $\pm 15\%$ .

The NTC type probe does not require polarity and can be easily extended by using common 2-lead wires (please note that long probes involve a worse instrument performance for electromagnetic compatibility: utmost care shall be put in cabling). It is strongly recommended to run the probe cable separate from line voltage wiring. The coordinated European standards impose that relay contact wires (and generally, all parts subject to dangerous voltage) shall be kept separate from very low voltage (probes, etc.) with insulation and distances suitable to ensure at least a doubled or reinforced insulation.

EMC requirements however suggest/impose to put more care in such separation by using insulating separate raceways and proper cable fixing methods.

The relay output is voltage-free and can control a direct compressors load up to 0.5 HP at 230 V~ (or 0.25 HP at 115 V~) or 1 hp 250 V~.

For heavier loads, an external contactor shall be used.

#### **ERROR SIGNALS**

The instrument is provided with error message "E1", in case of shorted sensor and in case of sensor failure, or sensor absence. The "E1" error message also appears in the event of underrange/overrange of the system temperature.

It is recommended to doublecheck the sensor wiring before replacing the probe.

## **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 B 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**: resin (PC+ABS) with self-estinguishing grade V0.

**Dimensions**: front 74x32 mm, depth 67 mm.

**Mounting**: flush panel mount with mounting bracket.

**Protection**: the frontpanel is waterproof IP65; an optional snap-on cover can be supplied to provide additional protection of the rear terminal block.

**Connections**: on screw terminal block (2.5 mm<sup>2</sup>; one wire each terminal only for power connections).

**Display**: on display with digit heights 12.5 mm.

**Commands**: all located on front panel. **Data storage**: on non-volatile EEPROM memory.

**Operating temperature**: -5...55 °C. **Storage temperature**: -30...75 °C.

**Main output**: one relay output 8(3)A 250V~ 0,5 hp 230V~ or 1 hp 250V~.

Input: NTC probe (SEMITEC 103AT-2 sensor -50...110 °C). Measurement range: -50...50 °C. Resolution: 1 °C. Accuracy: better than 0.5% of full scale. Consumption: 1.5 VA Power supply: dep. on model.

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## **CONNECTIONS 0,5 HP 12V**



**CONNECTIONS 0,5 HP 220V** 



Internet http://www.climate-eu.invensys.com 12/2000 eng

Email info@climate-eu.invensys.com

cod. 9IS21171

EWPC 901/N 12/2000 ing

**CONNECTIONS 1 HP**