

Single Stage Thermostat

XR20S

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1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.

1.2 SAFETY PRECAUTIONS

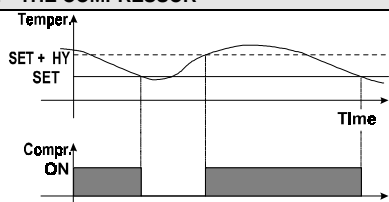
- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- The instrument must not be opened.
- Fit the probe where it is not accessible by the end user.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell s.r.l." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

Model XR20S, 31 x 64 mm format, is a single stage temperature controller suitable for applications in the field of refrigeration or heating.

3. CONTROLLING LOADS

3.1 THE COMPRESSOR

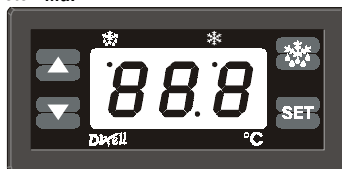


The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point: if the temperature increases and reaches set point plus differential the

compressor is started and then turned off when the temperature reaches the set point value again. In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters "CO_n" and "CO_F".

3.2 DEFROST

Defrost is performed through a simple stop of the compressor. Parameter "IdF" controls the interval between defrost cycles, while its length is controlled by parameter "MdF".



SET: To display target set point, In programming mode it selects a parameter or confirm an operation.

(DEF) To start a manual defrost

(UP>) To see the max stored temperature; in programming mode it browses the parameter codes or increases the displayed value.

(DOWN) To see the min stored temperature; in programming mode it browses the parameter codes or increases the displayed value.

KEY COMBINATIONS:

SET + (UP>) To lock & unlock the keyboard.

SET + (DOWN) To enter in programming mode.

SET + (DEF) To return to the room temperature display.

3.3 MEANING OF LEDS

Each LED function is described in the following table.

LED	MODE	FUNCTION
❄	Light	Output enabled
❄	Flashing	- Programming Phase (flashing with ❄) - Anti-short cycle delay enabled
❄	Flashing	Programming Phase (flashing with ON)

3.4 HOW TO SEE THE MIN TEMPERATURE

- Press and release the **(UP>)** key.
- The "Lo" message will be displayed followed by the minimum temperature recorded.
- By pressing the **(UP>)** key again or by waiting 5s the normal display will be restored.

3.5 HOW TO SEE THE MAX TEMPERATURE

- Press and release the **(DOWN)** key.
- The "Hi" message will be displayed followed by the maximum temperature recorded.
- By pressing the **(DOWN)** key again or by waiting 5s the normal display will be restored.

3.6 HOW TO RESET THE MAX OR MIN TEMPERATURE RECORDED

- Hold press the SET key for more than 3s, while the max. or min temperature is displayed. (rSt message will be displayed)
- To confirm the operation the "rSt" message starts blinking and the normal temperature will be displayed.

Note: at the first installation reset the max&min recorded temperatures.

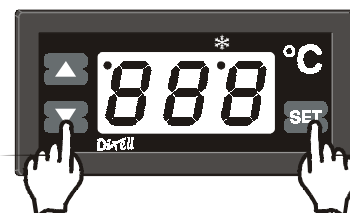
3.7 HOW TO SEE THE SETPOINT

- Push and immediately release the SET key: the display will show the Set point value;
- Push and immediately release the SET key or wait for 5 seconds to display the probe value again.

3.8 HOW TO CHANGE THE SETPOINT

- Push the SET key for more than 2 seconds to change the Set point value;
- The value of the set point will be displayed and the ON LED starts blinking;
- To change the Set value use the **(UP>)** or **(DOWN)** arrows within 10s.
- To memorise the new set point value push the SET key again or wait 10s.

3.9 CHANGING A PARAMETER'S VALUE



To change the parameter's value operate as follows:

- Enter the Programming mode by pressing the Set and DOWN key for 3s (LED 1 and ON start blinking).
- Select the required parameter.
- Press the "SET" key to display its value (Now only the ON LED is blinking).
- Use **(UP>)** or **(DOWN)** to change its value.
- Press "SET" to store the new value and move to the following parameter.

To exit: Press SET + **(UP>)** or wait 15s without pressing a key.

NOTE: the set value is stored even when the procedure is exited by waiting the time-out to expire.

3.10 HOW TO LOCK THE KEYBOARD

- Keep pressed for more than 3s the **(UP>)** and **(DOWN)** keys.
- The "POF" message will be displayed and the keyboard will be locked. At this point it will be possible only to see the set point or the MAX o Min temperature stored
- If a key is pressed more than 3s the "POF" message will be displayed.

3.11 TO UNLOCK THE KEYBOARD

Keep pressed together for more than 3s the **(UP>)** and **(DOWN)** keys.

4. LIST OF PARAMETERS

REGULATION

Hy Differential: (1 ÷ 25°C / 1÷255 °F) Intervention differential for set point.

Cooling: Compressor Cut IN is Set Point Plus Differential (Hy). Compressor Cut OUT is when the temperature reaches the set point.

Heating: Compressor Cut IN is Set Point minus Differential (Hy). Compressor Cut OUT is when the temperature reaches the set point.

LS Minimum set point: (- 50°C÷SET / -58°F÷SET): Sets the minimum acceptable value for the set point.

US Maximum set point: (SET÷ 150°C / SET÷302°F). Set the maximum acceptable value for set point.

Ot Thermostat probe calibration: (-12÷12°C; -120÷120°F) allows to adjust possible offset of the thermostat probe.

AC Anti-short cycle delay: (0÷50 min) minimum interval between the compressor stop and the following restart.

CO_n Compressor ON time with faulty probe: (0÷255 min) time during which the compressor is active in case of faulty thermostat probe. With CO_n=0 compressor is always OFF.

COF Compressor OFF time with faulty probe: (0÷255 min) time during which the compressor is OFF in case of faulty thermostat probe. With COF=0 compressor is always active.

CH Type of action: CL = cooling; Ht = heating.

DISPLAY

CF Temperature measurement unit: °C = Celsius; °F = Fahrenheit. **WARNING:** When the measurement unit is changed the SET point and the values of the parameters Hy, LS, US, Ot, ALU and ALL have to be checked and modified)

DEFROST

IdF Interval between defrost cycles: (1÷120h) Determines the time interval between the beginning of two defrost cycles.

MdF Length for defrost: (0÷255min) It sets the defrost duration.

ALARMS

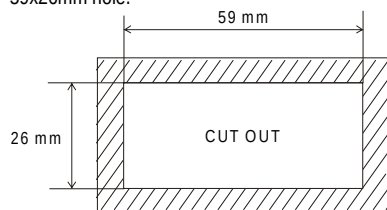
ALU MAXIMUM temperature alarm: (ALL÷150°C; ALL÷302°F) when this temperature is reached the alarm is enabled, after the "Ald" delay time.

ALL Minimum temperature alarm: (-50°C ÷ ALU; -58°F ÷ ALU) when this temperature is reached the alarm is enabled, after the "Ald" delay time.

ALd Temperature alarm delay: (0÷255 min) time interval between the detection of an alarm condition and alarm signalling.

5. INSTALLATION AND MOUNTING

Instrument XR20S shall be mounted on panel, in a 59x26mm hole.



The ambient temperature range allowed for correct operation is 0 - 60 °C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes. Let air circulate by the cooling holes.

6. ELECTRICAL CONNECTIONS

The instrument is provided with screw terminal block to connect cables with a cross section up to 2,5 mm². Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

6.1 PROBE CONNECTION

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place probe away from air streams to correctly measure the average room temperature.

7. ALARM SIGNALS

Message	Cause	Outputs
"EE"	Memory failure	
"P1"	Room probe failure	Compressor output according to par. "Con" and "COF"

Message	Cause	Outputs
"HA"	Maximum temperature alarm	Outputs unchanged.
"LA"	Minimum temperature alarm	Outputs unchanged.

7.1 ALARM "EE"

The instrument is provided with an internal check verifying memory integrity. Alarm "EE" flashes when a failure in the internal memory is detected. In such case call the service.

7.2 ALARM RECOVERY

Probe alarm "P1", starts some seconds after the fault in the probe; it automatically stops some seconds after the probe restarts normal operation. Check connections before replacing the probe.

Temperature alarms "HA" and "LA" automatically stop as soon as the thermostat temperature returns to normal values.

8. TECHNICAL DATA

Housing: self extinguishing ABS.

Case: frontal 31x64 mm; depth 73mm;

Mounting: panel mounting in a 59x26 mm panel cut-out

Frontal protection: IP54

Connections: Screw terminal block ≤ 2,5 mm² wiring.

Power supply: 12Vac/dc, ±10%

Power absorption: 3 VA max.

Display: 3 digits, red LED.

Inputs: 1 PTC or NTC probe.

Relay outputs: SPDT relay 8(3)A; 250Vac

Data storing: on the non-volatile memory (EEPROM).

Operating temperature: 0÷60 °C.

Storage temperature: -30÷85 °C.

Relative humidity: 20÷85% (no condensing)

Measuring and regulation range:

PTC: -50÷150°C

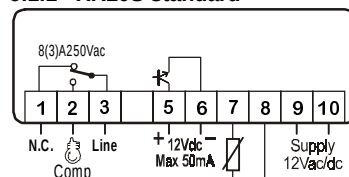
NTC: -40÷110°C

Resolution: 1 °C or 1°C or 1 °F (selectable).

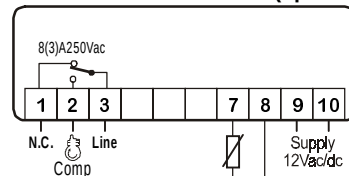
Accuracy (ambient temp. 25°C): ±1 °C ±1 digit

9. CONNECTIONS

9.1.1 XR20S standard



9.1.2 XR20S with buzzer (optional)



10. DEFAULT SETTING VALUES

Label	Name	Range	Values
Set	Set point	LS÷US	2
Hy	Differential	1÷25°C	2
LS	Minimum set point	-50°C÷SET	-50
US	Maximum set point	SET÷150°C	150
Ot	Thermostat probe calibration	-12÷12°C	0
OdS	Outputs delay at start up	0÷255 min	0
AC	Anti-short cycle delay	0 ÷ 50 min	1
Con	Compressor ON time with faulty probe	0 ÷ 255 min	0
COF	Compressor OFF time with faulty probe	0 ÷ 255 min	30
CH	Type of action (cooling, heating)	CL, Ht	CL
CF	Temperature measurement unit	°C ÷ °F	°C
IdF	Interval between defrost cycles	1 ÷ 120 hour	8

Label	Name	Range	Values
MdF	(Maximum) length for defrost	0 ÷ 255 min	20
dFd	Displaying during defrost	rt, it, SET, DEF	it
dAd	MAX display delay after defrost	0 ÷ 255 min	30
ALc	Temperat. alarms configuration	rE; Ab	Ab
ALU	MAXIMUM temperature alarm	ALL÷150.0°C	150
ALL	Minimum temperature alarm	-50.0°C÷ALU	-50
ALd	Temperature alarm delay	0 ÷ 255 min	15
dAO	Delay of temperature alarm at start up	0 ÷ 23h e 50'	1.0
PbC	Probe selection	Ptc ÷ ntc	Ptc
rEL	Release SW	-	1.3
Ptb	Parameters table	-	-

Hidden parameters

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