

TECHNICAL SPECIFICATIONS

| Model | Voltage | Power |
|---|---|---|
| E | 230 V- (+10%, -15%), 50/60 Hz | 3 VA, 25 mA- max. |
| A | 115 V- (+10%, -15%), 50/60 Hz | 3 VA, 50 mA- max. |
| H | 115 to 230 V- (+10%, -15%), 50/60 Hz | 6 VA, 50 mA- max. |
| L | 12 to 24 V- (+10%, -15%), 50/60 Hz | 3 VA, 300 mA- max. |
| 0 | 12 V- (+10%, -15%), 50/60 Hz | Use only the transformer TRA12VDE00 with 315 mA slow-blow fuse in the secondary |
| It is always possible to power it using the transformer 3 VA except when the 5 relay version powers the repeater display. | | |
| Insulation guaranteed by the power supply | E, A, H | insulation in reference to very low voltage parts reinforced 6 mm in air, 8 on surface 3750 V insulation |
| | | insulation from relay outputs principale 3 mm in air, 4 on surface 1250 V insulation |
| 0, L | insulation in reference to very low voltage parts | externally guaranteed by safety transformer |
| | insulation from relay outputs | reinforced 6 mm in air, 8 on surface 3750 V insulation |

| Inputs | Details | | | |
|---|--|---|--------------------------------|-------|
| S1 | NTC or PTC depending on the model | | | |
| S2 | NTC or PTC depending on the model | | | |
| D1 | free contact, contact resistance < 10 Ω, closing current 6 mA NTC or PTC, depending on the model | | | |
| D2 | free contact, contact resistance < 10 Ω, closing current 6 mA NTC or PTC, depending on the model | | | |
| D3 | free contact, contact resistance < 10 Ω, closing current 6 mA NTC or PTC, depending on the model | | | |
| S5 | depending on the model | | | |
| Maximum distance of probes and digital inputs less than 10 m. Note: during installation keep the power and loads connection separate from probe cables, digital inputs, repeater display and supervisory system. | | | | |
| Probe type | Std. CAREL NTC | 10 kΩ at 25 °C, -50T90 °C range measurement error: 1 °C in the -50T50 °C range 3 °C in the -50T90 °C range | | |
| | NTC high temperature | 50 kΩ at 25 °C, -40T150 °C range measurement error: 1.5 °C in the -20T115 °C range 4 °C in the -20T115 °C range | | |
| PTC std. CAREL (specific model) | 985 Ω at 25 °C, range da -50T150 °C | 2 °C in the -50T50 °C range 4 °C in the -50T150 °C range | | |
| | measurement error: | | | |
| Relay outputs | depending on the model | | | |
| | EN60730-1 | UL 873 | | |
| 5 A slim | 5 (1) A | 100000 | 5 A resistive 1FLA 6LRA C300 | 30000 |
| 5 A | 5 (1) A | 100000 | 5 A resistive 1FLA 6LRA C300 | 30000 |
| 8 A | 8 (4) A on N.O. 6 (4) A on N.C. | 100000 | 8 A resistive 2FLA 12LRA C300 | 30000 |
| 16 A | 10 (4) A up to 60 °C on N.O. 12 (2) A on N.O. and N.C. | 100000 | 12 A resistive 5FLA 30LRA C300 | 30000 |
| 2 Hp | 10 (10) A | 100000 | 12 A resistive 12FLA 72LRA | 30000 |
| insulation from very low voltage parts | | reinforced 6 mm in air, 8 on surface 3750 V insulation | | |
| insulation between the relay outputs independent | | primary 3 mm in air, 4 on surface 1250 V insulation | | |

| Connections | Type of connection | Cross-section | Maximum current |
|-------------|------------------------------|---|-----------------|
| | fixed screw-on | for wires from 0.5 to 2.5 mm ² | 12 A |
| | removable for screw blocks | | |
| | faston with crimped contacts | | |
| | common contact | | |

The installer has to provide the correct dimensioning of the power supply and cable connection between the instruments and the loads. Depending on the model, the maximum current in the common terminals 1 and 3 is 12 A. When using the controller at maximum operating temperature and full load, use cables featuring a maximum operating temperature of 105 °C at least.

| Case | Material | Dimensions | Weight |
|---|------------------------------------|--|--------|
| plastic | E,A | 34.4 x 76.2 x 65 mm | |
| | O,L,H | 34.4 x 76.2 x 79 mm | |
| mount-in | E,A | 56.5 mm | |
| | O,L,H | 70.5 mm | |
| Mounting | panel | using side fastening brackets | |
| | drilling template | dimensions 29 x 71 mm | |
| Display | digits | 3 digit LED | |
| | display range | from -99 to 999 | |
| operating status | | indicated by graphic icons on the display | |
| Keypad | | 4 rubber silicon buttons | |
| Infrared receiver | | available depending on the model | |
| Clock with backup battery | | available depending on the model | |
| Buzzer | | available on all the models | |
| Clock | error at 25 °C | ±10 ppm (±5.3 min/year) | |
| | error in the temp. range -10T60 °C | -50 ppm (-27 min/year) | |
| ageing | | < ±5 ppm (±2.7 min/year) | |
| discharge time | | typical 6 months (max. 8 months) | |
| recharge time | | typical 5 hours (< max. 8 hours) | |
| Operating temperature | O,L power supply | -10T55 °C | |
| | E,A power supply | -10T50 °C | |
| H power supply | | -10T65 °C | |
| Operating humidity | | <90% r.H. non-condensing | |
| Storage temperature | | -20T70 °C | |
| Storage humidity | | <90% r.H. non-condensing | |
| Front panel index of protection | | for panel installation with gasket IP65 | |
| Environmental pollution | | normal | |
| PTI of the insulating material | | > 250 V | |
| Period of electric stress across insulating parts | | long | |
| Category of resistance to fire | | D (UL 94-V0) | |
| Class of protection against voltage surges | | category 1 | |
| Type of connections and disconnections | | 1c relay contacts (micro-disconnection) | |
| Classification according to protection against electric shock | | to be integrated in Class I and II devices | |
| Software class and structure | | class A | |
| Front panel cleaning | | use only neutral detergents and water | |
| Serial interface for CAREL network | | external, available on all models | |
| Interface for repeater display | | external, available on models with H, L and 0 power supply | |
| Maximum distance between interface and display | | 10 m | |
| Programming key | | available on all models | |

Safety standards: compliant with the European reference standards. **Precautions for installation:**
 • the connection cables must guarantee insulation up to 85 °C, with a current of less than 8 A.
 Above 8 A, cables rated to 105 °C must be used.
 • adequately secure the conn. cables to the outputs so as to avoid contact with very low voltage components.

| AWG | Sez. (mm ²) | Corrente A | AWG | Sez. (mm ²) | Corrente A | AWG | Sez. (mm ²) | Corrente A |
|-----|-------------------------|------------|-----|-------------------------|------------|-----|-------------------------|------------|
| 24 | 0.21 | 0.8 | 20 | 0.52 | 2.1 | 15 | 1.5 | 6 |
| 23 | 0.26 | 1 | 19 | 0.65 | 2.6 | 14 | 1.65 | 6.8 |
| 22 | 0.33 | 1.3 | 18 | 0.82 | 3.3 | 13 | 2.1 | 9 |
| 21 | 0.41 | 1.6 | 17 | 1 | 4 | 12 | 2.5 | 12 |
| 20 | 0.5 | 2 | 16 | 1.31 | 5.3 | 11 | 2.63 | 12.8 |
| | | | | | | 10 | 3.31 | 16.1 |

Signals on the display

The blinking status indicates a request for activation that cannot be implemented until the end of the corresponding delay times.

| Icon | Function | Normal operation | Startup |
|------------------|---|-----------------------------|---|
| COMPRESS. | compressor ON | comp OFF | compressor request |
| FAN | fan ON | fan OFF | fan request |
| DEFROST | defrost in progress | defrost not required | defrost request |
| AUX | auxiliary output | auxiliary output | anti-sweat heater function active |
| AUX | AUX active | AUX not active | |
| ALARM | delayed external alarm (before the expiry of the time A7) | no alarm present | alarms in normal operation (eg. high/low temp.) or alarm from ext. digital input immediate or delayed |
| CLOCK | at least one timed defrost has been set | no timed defrost is present | ON if Real-Time Clock present |
| LIGHT | auxiliary output | auxiliary output | anti-sweat heater function active |
| LIGHT | LIGHT ACTIVE | LIGHT NOT ACTIVE | |
| SERVICE | | no malfunction | malfunction (eg. EEPROM error or probe fault) |
| HACCP | HACCP function | HACCP function | HACCP alarm (HA and/or HF) not enabled |
| HACCP | HACCP function | HACCP function | enabled |
| CONTINUOUS CYCLE | enabled | not enabled | request |

Tab. 1

Buttons on the keypad

| Button | Normal operation |
|--------------|--|
| Pr | Press the button alone if pressed for more than 5 s accesses the menu for setting type "F" (frequent) parameters in the event of alarm: silences the audible alarm (buzzer) and disables the alarm relay |
| Pr | Pressing together with other buttons if pressed for more than 5 s together with the SET button, accesses the menu for setting the type "C" (configuration) or downloading the parameters if pressed for more than 5 s together with the UP/AUX button resets any alarm with manual reset |
| Start | Startup: if pressed for more than 5 s at startup, automatic address assignment: if pressed for 1 s enters the automatic address assigning procedure |
| aux | if pressed for more than 1 s, enables/disables the auxiliary output if pressed for more than 5 s together with DOWN/DEF button, enables/disables the continuous cycle operation if pressed for more than 5 s together with SET button, starts the procedure for printing the reports (function available, with management to be implemented) if pressed for more than 5 s together with PRG/MUTE button, resets any active alarm with manual reset |
| def | if pressed for more than 5 s, enables/disables a manual defrost if pressed for more than 5 s together with UP/AUX button, enables/disables the continuous cycle operation if pressed for more than 1 s together with SET button, displays a submenu with the HACCP alarm parameters (HA, HAN, HF, HFn) |
| Set | if pressed for more than 1 s, displays and/or set the set point if pressed for more than 5 s together with PRG/MUTE button, accesses the menu for setting the type "C" parameters "C" (configuration) or downloading the parameters if pressed for more than 1 s together with DOWN/DEF button, displays a submenu with the HACCP alarm parameters (HA, HAN, HF, HFn) if pressed for more than 5 s together with UP/AUX, starts the procedure for printing the report (function available, with management to be implemented) |

Tab. 2

Summary of operating parameters (U.O.M.= Unit of measure; Def.= Default value.)

| N° | Code | Parameter | Model | U.M. | Type | Def. | Max. | Min. |
|---------|-------------|---|-------|-------|------|------|------|------|
| | Pw | Password | MSYF | - | C | 22 | 200 | 0 |
| 1 | /2 | Measurement stability | MSYF | - | C | 4 | 15 | 1 |
| 2 | /3 | Probe display reaction | MSYF | - | C | 0 | 15 | 0 |
| 3 | /4 | Virtual probe | MSYF | - | C | 0 | 100 | 0 |
| 4 | /5 | Select °C or °F | MSYF | flag | C | 0 | 1 | 0 |
| 5 | /6 | Decimal point | MSYF | flag | C | 0 | 1 | 0 |
| 6 | /t1 | Display on internal terminal | MSYF | - | C | 1 | 7 | 1 |
| 7 | /tE | Display on external terminal | MSYF | - | C | 0 | 6 | 0 |
| 8 | /P | Select type of probe | MSYF | - | C | 0 | 2 | 0 |
| 9 | /A2 | Configuration of probe 2 | M-YF | - | C | 2 | 4 | 0 |
| | -S- | | -S- | - | C | 0 | 4 | 0 |
| 10...12 | /A3-4-5 | Configuration of probe 3-4-5 | MSYF | - | C | 0 | 4 | 0 |
| 13...17 | /c1-2-3-4-5 | Calibration of probe 1-2-3-4-5 | MSYF | °C/°F | C | 0.0 | 20 | -20 |
| 18 | St | Temperature set point | MSYF | °C/°F | F | 0.0 | 12 | 1 |
| 19 | rd | Controller diff. | -SYF | °C/°F | F | 2.0 | 20 | 0.1 |
| 20 | rm | Dead zone | -SYF | °C/°F | C | 4.0 | 60 | 0.0 |
| 21 | rr | Reverse control delta with dead zone | -SYF | °C/°F | C | 2.0 | 20 | 0.1 |
| 22 | r1 | Minimum SET allowed | MSYF | °C/°F | C | -50 | 12 | -50 |
| 23 | r2 | Maximum SET allowed | MSYF | °C/°F | C | 60 | 200 | 1 |
| 24 | r3 | Operating mode | -SYF | flag | C | 0 | 2 | 0 |
| 25 | r4 | Automatic night-time set point variation | MSYF | °C/°F | C | 3.0 | 20 | 0.0 |
| 26 | r5 | Enable temperature monitoring | MSYF | flag | C | 0 | 1 | 0 |
| 27 | rT | Temperature monitoring interval | MSYF | hours | F | - | 999 | 0 |
| 28 | rH | Maximum temperature read | MSYF | °C/°F | F | - | - | - |
| 29 | rL | Minimum temperature read | MSYF | °C/°F | F | - | - | - |
| 30 | c0 | Start delay for compressors, fans and AUX on power-up, in dead zone control | -SYF | min | C | 0 | 15 | 0 |
| 31 | c1 | Minimum time between successive starts | -SYF | min | C | 0 | 15 | 0 |
| 32 | c2 | Minimum compressor OFF time | -SYF | min | C | 0 | 15 | 0 |
| 33 | c3 | Minimum compressor ON time | -SYF | min | C | 0 | 15 | 0 |
| 34 | c4 | Duty setting | -SYF | min | C | 0 | 100 | 0 |
| 35 | c5 | Continuous cycle duration | -SYF | hours | C | 0 | 15 | 0 |
| 36 | c6 | Alarm bypass after continuous cycle | -SYF | hours | C | 2 | 15 | 0 |
| 37 | c7 | Maximum Pump-Down time | -SYF | s | C | 0 | 900 | 0 |
| 38 | c8 | Comp. start delay after open PD valve | -SYF | s | C | 5 | 60 | 0 |
| 39 | c9 | Enable autostart with PD operation | -SYF | flag | C | 0 | 1 | 0 |
| 40 | c10 | Select Pump-Down by time or pressure | -SYF | flag | C | 0 | 1 | 0 |
| 41 | c11 | Second compressor delay | -SYF | s | C | 4 | 250 | 0 |
| 42 | d0 | Type of defrost | -SYF | flag | C | 0 | 3 | 0 |
| 43 | d1 | Interval between defrosts | -SYF | hours | F | 8 | 250 | 0 |
| 44 | d11 | Evaporator end defrost temperature | -SYF | °C/°F | F | 4.0 | 200 | -50 |
| 45 | d12 | AUX Evaporator end defrost temperature | -SYF | °C/°F | F | 4.0 | 200 | -50 |
| 46 | dP1 | Maximum defrost duration, evap. | -SYF | min | F | 30 | 250 | 1 |
| 47 | dP2 | Maximum defrost duration, aux evap. | -SYF | min | F | 30 | 250 | 1 |
| 48 | d3 | Defrost start delay | -SYF | min | C | 0 | 250 | 0 |
| 49 | d4 | Enable defrost at startup | -SYF | flag | C | 0 | 1 | 0 |
| 50 | d5 | Defrost delay at startup | -SYF | min | C | 0 | 250 | 0 |
| 51 | d6 | Display off during defrost | -SYF | - | C | 1 | 2 | 0 |
| 52 | dd | Dripping time after defrost | -SYF | min | F | 2 | 15 | 0 |
| 53 | dd | Bypass alarms after defrost | -SYF | hours | F | 1 | 15 | 0 |
| 54 | dd | Alarm off after door open | -SYF | h/min | C | 0 | 250 | 0 |
| 55 | d9 | Defrost priority over compressor protection | -SYF | flag | C | 0 | 1 | 0 |
| 56...57 | d1...d2 | Display defrost probe | MSYF | °C/°F | F | - | - | - |
| 58 | dC | Base times for defrost | -SYF | flag | C | 0 | 1 | 0 |
| 59 | d10 | Compressor running time | -SYF | hours | C | 0 | 250 | 0 |
| 60 | d11 | Running time temperature threshold | -SYF | °C/°F | C | 1.0 | 20 | -20 |
| 61 | d12 | Advanced defrost | -SYF | - | C | 0 | 3 | 0 |
| 62 | dn | Nominal defrost time | -SYF | - | C | 65 | 100 | 1 |
| 63 | dH | Proportional factor for variation in 'dl' | -SYF | - | C | 50 | 100 | 0 |
| 64 | A0 | Alarm and fan differential | MSYF | °C/°F | C | 2.0 | 20 | 0.1 |
| 65 | A1 | Type of threshold for 'AL' and 'AH' | MSYF | flag | C | 0 | 1 | 0 |
| 66...67 | AL...AH | High/Low temperature alarm threshold | MSYF | °C/°F | F | 0.0 | 200 | -50 |
| 68 | Ad | Low and high temperature alarm delay | MSYF | min | F | 120 | 250 | 0 |
| 69 | A4 | Configuration of digital input 1 | -SYF | - | C | 0 | 14 | 0 |
| 70 | A5 | Configuration of digital input 2 | MSYF | - | C | 0 | 14 | 0 |
| 71 | A6 | Stop compressor from external alarm | -SYF | min | C | 0 | 100 | 0 |
| 72 | A7 | External alarm detection delay | -SYF | min | C | 0 | 250 | 0 |
| 73 | A8 | Enable alarms 'Ed1' and 'Ed2' | -SYF | flag | C | 0 | 1 | 0 |
| 74 | A9 | Configuration of digital input 3 | MSYF | - | C | 0 | 14 | 0 |
| 75 | Ado | Door switch light management mode | MSYF | flag | C | 0 | 1 | 0 |
| 76 | Ac | High condenser temperature alarm | -SYF | °C/°F | C | 70.0 | 200 | 0.0 |
| 77 | Ac | High cond. temp. alarm differential | -SYF | °C/°F | C | 10.0 | 20 | 0.1 |
| 78 | Ac | High cond. temp. alarm delay | -SYF | min | C | 0 | 250 | 0 |
| 79 | AF | Off time with light sensor | -SYF | s | C | 0 | 250 | 0 |
| 80 | ALF | Antifreeze alarm threshold | MSYF | °C/°F | C | -5.0 | 200 | -50 |
| 81 | AdF | Antifreeze alarm delay | MSYF | min | C | 1 | 15 | 0 |
| 82 | F0 | Fan management | ---F | flag | C | 0 | 2 | 0 |
| 83 | F1 | Fan start temperature | ---F | °C/°F | F | | | |