

Item Numbers			
952882	UniStat Low Temperature Dip 120Vac	952915	UniStat Low Temperature Key 230Vac
952913	UniStat Low Temperature Dip 230Vac	952885	UniStat Display
952884	UniStat Medium Temperature Dip 120Vac	952886	UniStat Temperature Probe
952914	UniStat Medium Temperature Dip 230Vac	952887	UniStat Programming Key
952883	UniStat Low Temperature Key 120Vac	952888	UniStat Conduit Coupler

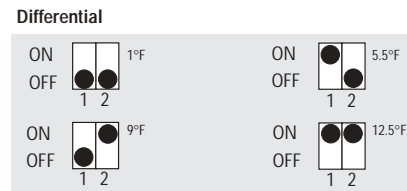


Fig. 17

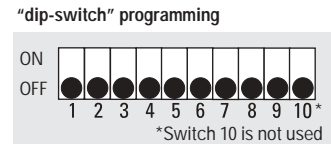


Fig. 16

Defrosting duration

ON/OFF	duration defrost by time	defrost end by temperature
ON	5 min. (by resistance)	0 °C (+32 °F)
OFF	1 min. (by hot gas)	+2 °C (+35 °F)
ON	2 min.	+4 °C (+39 °F)
OFF	4 min.	+6 °C (+42 °F)
ON	6 min.	+8 °C (+46 °F)
OFF	8 min.	+10 °C (+50 °F)
ON	10 min.	+12 °C (+53 °F)
OFF	12 min.	+14 °C (+57 °F)
ON	15 min.	+16 °C (+60 °F)
OFF	18 min.	+18 °C (+64 °F)
ON	20 min.	+20 °C (+68 °F)
OFF	25 min.	+22 °C (+71 °F)
ON	30 min.	+24 °C (+75 °F)
OFF	35 min.	+26 °C (+78 °F)
ON	40 min.	+28 °C (+82 °F)
OFF	50 min.	+30 °C (+86 °F)
ON	60 min.	

Fig. 21

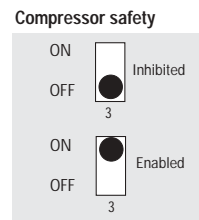


Fig. 18

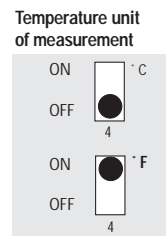


Fig. 19

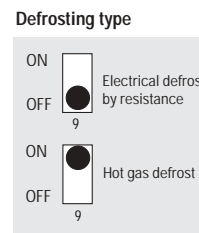


Fig. 20

- Dip-switch description**
- 1, 2 differential (Fig. 17)
 - added to the Set Point, establishes the temperature threshold, measured by the regulation probe, beyond which the compressor is activated;
 - 3 compressor safety function (Fig. 18)
OFF: function disabled; ON: function enabled;
 - 4 temperature display (Fig. 19);
OFF: displayed in °C; ON: displayed in °F;
 - 5,...,8 duration of defrost/defrost termination temperature (Fig. 21)
if the defrost sensor is utilized, these dip-switches select the defrost termination temperature, otherwise they select the defrost duration;
 - 9 type of defrost (Fig. 20)
OFF: resistance defrost, ON: hot gas defrost.

Set Point
Is set by rotating the circular selector in correspondence with the arrow placed nearby. The selector represents -33°F to 50°F (-35°C to +10°C) for low temperature models, and 14°F to 68°F (-10°C to +20°C) for medium temperature models. "10" is the coldest setting, "1" is the warmest. See Fig 24 for approximate values.

Differential
It is possible to modify the differential from 1°F minimum to 12.5°F maximum (Fig. 17). Simply shift the first two dip-switches to the ON or OFF position according to the wanted value.

Defrost management and setting
A defrost can be activated manually, by pressing the "man. def." button, or cyclically, the interval set by the "def. intl" rotary switch at the top left with respect to Set Point selector. The interval can be selected from 1 to 12 hours in 1 hour steps. If the selector is positioned on the "0", the cyclic defrost is disabled.

Note: manual defrost reinitializes the time required for successive cyclic defrosting. The selections are effective beginning from the successive cycle. For an immediate effect, it is necessary to turn power to the UniStat off for a few seconds.

It is possible to choose between an electric defrost (the compressor is deactivated and the defrost relay is activated) and a hot gas defrost (both the compressor and the defrost relay are activated); refer to Fig. 20 for the selection. The defrost termination, can take place by time (from 1 to 60 min.) or by temperature (from 0 to 86°F) if the defrost sensor is utilized (see Fig. 21 for the correct programming). If the defrost sensor is disconnected, interrupted or breaks down for any reason, the defrost terminates after a maximum time of 90 minutes if it is resistance-based, or 40 minutes if it is hot-gas based. The instrument stores the defrost state every 15 minutes to allow restart after power loss.

Compressor safety function
If the function is enabled (Fig. 18), a minimum three minute interval is ensured between deactivation and successive restart of the compressor. If the function is enabled, the compressor is not energized for three minutes after controller power up. The function is also active in hot-gas defrost mode.

Alarms and signalling
A green LED placed underneath the Set Point selection knob is utilized for signalling the status of the controller:

State	LED	Display
compressor and defrost deactivated	OFF	-
energized compressor (except hot gas defrost)	ON	-
in defrost	blinking (ON 0.5s, OFF 0.5s)	-
sensor fault	blinking (ON 0.5s, OFF 1.5s)	A1 (regulation probe) A2 (defrosting probe)
EEPROM error - set points erased	-	EE

Tab. 1

Safety-regime operation
In case of malfunction, the controller changes automatically to safety operation. The safety cycle varies according to the failure.

Malfunction	Safety operation
EEPROM failure	compressor energized with 4 min. ON, 3min. OFF cycle
air sensor failure	Set Point >14°F (-10°C) compressor energized with 4min. ON, 3 min. OFF cycle
failure	Set Point <14°F (-10°C) compressor always energized
defrost sensor failure	duration 40min. if hot gas type, 90min. if resistance type

Tab. 2

Key connection - Key versions only

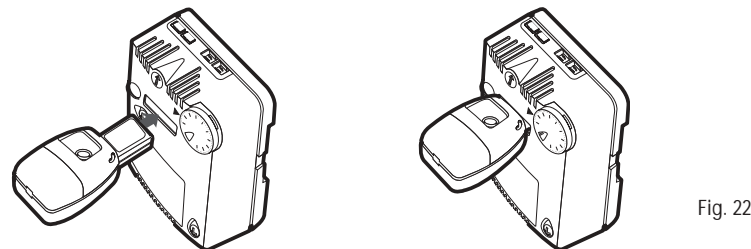


Fig. 22

Battery replacement - 958155

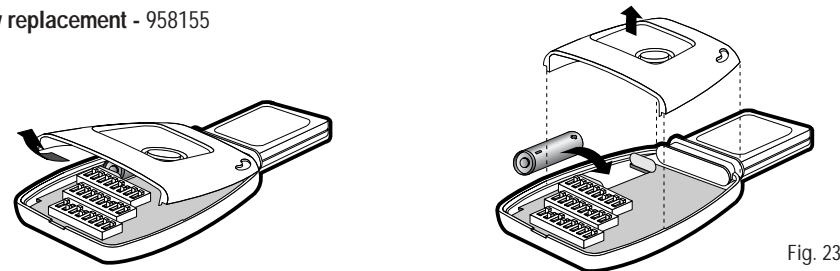
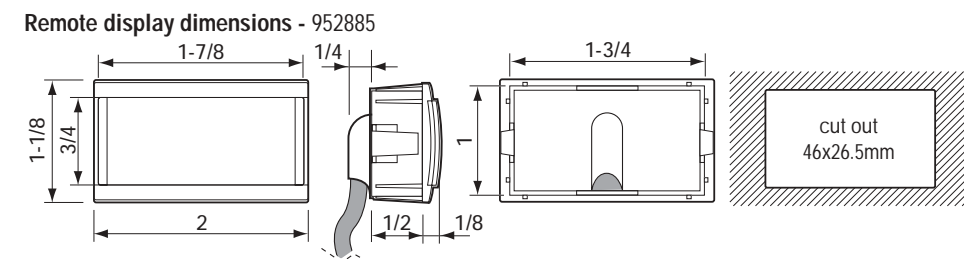
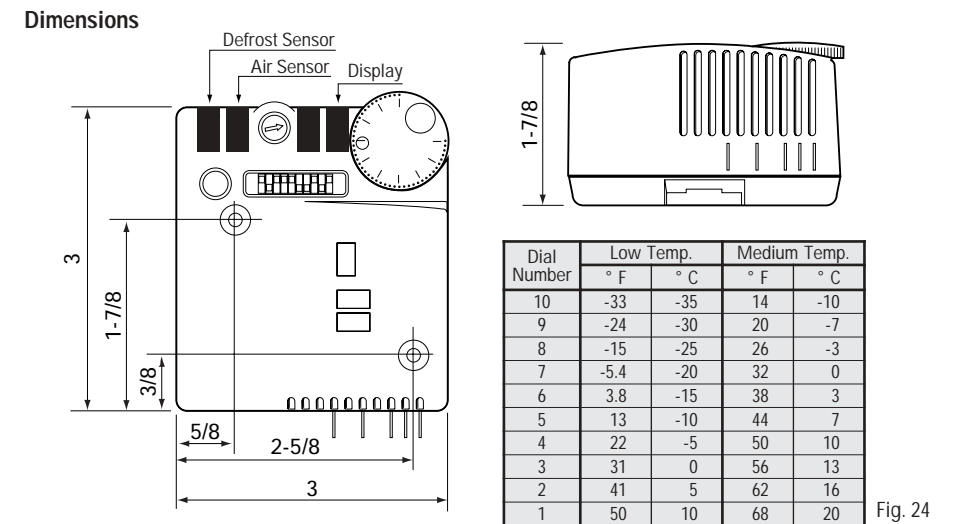
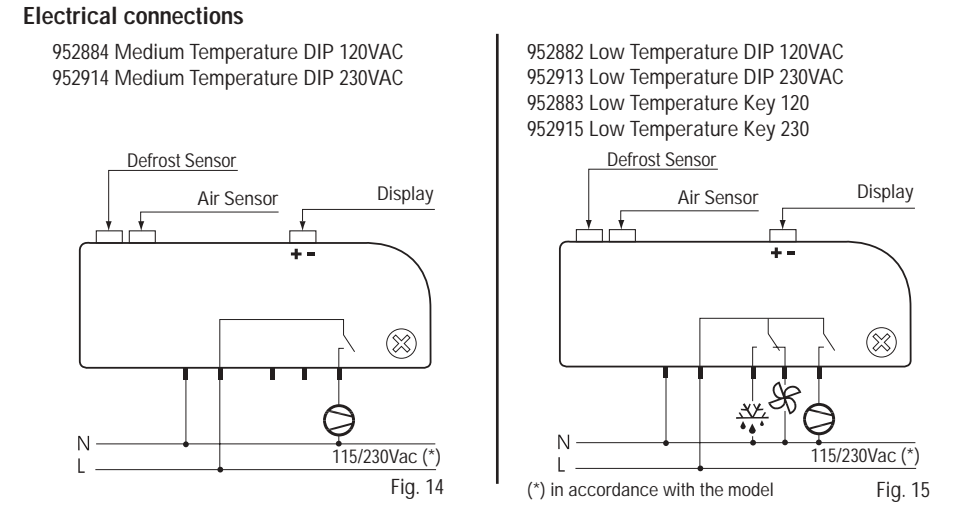
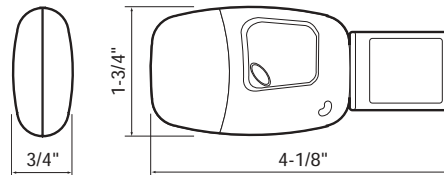


Fig. 23

Hardware key dimensions - 952887



Technical specifications

regulation interval	Low temperature version -33°F to 50°F (-35°C to 10°C) Medium temperature version 14°F to 68°F (-10°C to +20°C)
power supply by model	230Vac, +10%, -15%, 50/60Hz 115Vac, +10%, -15%, 50/60Hz
power rating	2VA
case	plastic; dimensions 76x77.5x45mm
mounting	DIN guide or wall mounting
operating conditions	30-125°F, 90%r.H. non-condensing
storage conditions	15-160°F, 90%r.H. non-condensing
accuracy	better than 2°F
connections	.250" male spade
display	2 digits and sign display (optional)
warning lights	green LED indicating the operation state
inputs	1 NTC ambient sensor + 1 NTC defrost termination sensor
sensor type	NTC 10k Ω a 25°C 952886
outputs	low temp.: 1 relay SPST-NO for comp. 2 HP/230Vac or 1 HP/115Vac (Imax=30A res. (10A)) medium temp.: 1 relay SPST-NO for comp. 2 HP/230Vac or 1 HP/115Vac (Imax=30A res. (10A)) + 1 defrost. SPDT relay 230Vac, 8 FLA/48 LRA. Imax=16A res. (4A)
environmental pollution	normal
index of protection (front panel)	IP 20
classification according to protection against electrical shock (insulation)	the device must be included in class I equipment
number of automatic cycles for each automatic action	100,000
PTI of the insulating materials	≥ 250V
electric stress period of the insulating parts	long
fire and heat resistance Category	Category D
Category (surge immunity)	Category 2
action-disconnection type	1B
software Class and structure	Class A



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952914	UniStat Medium Temperature Dip 230Vac	952887	UniStat Programming Key
952883	UniStat Low Temperature Key 120Vac	952888	UniStat Conduit Coupler

Default settings shown in bold.

SW1 "dip-switch" programming

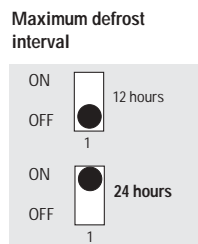


Fig. 2

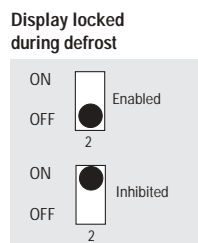


Fig. 3

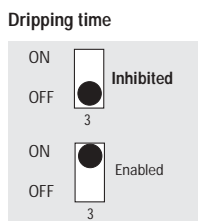


Fig. 4

Minimum set point temperature selection

4	5	6	7	8	Temperature
ON	ON	ON	ON	ON	-40°F (-40°C)
OFF	ON	ON	ON	ON	-36.4°F (-38°C)
ON	OFF	ON	ON	ON	-32.8°F (-36°C)
OFF	OFF	ON	ON	ON	-29.2°F (-34°C)
ON	ON	OFF	ON	ON	-25.6°F (-32°C)
OFF	ON	ON	OFF	ON	-22°F (-30°C)
ON	ON	ON	OFF	ON	-18.4°F (-28°C)
OFF	ON	ON	ON	OFF	-14.8°F (-26°C)
ON	ON	ON	ON	OFF	-11.2°F (-24°C)
OFF	ON	ON	ON	ON	-7.6°F (-22°C)
ON	ON	ON	ON	ON	-4°F (-20°C)
OFF	ON	ON	ON	ON	-4°F (-18°C)
ON	ON	ON	ON	ON	3.2°F (-16°C)
OFF	ON	ON	ON	ON	6.8°F (-14°C)
ON	ON	ON	ON	ON	10.4°F (-12°C)
OFF	ON	ON	ON	ON	14°F (-10°C)
ON	ON	ON	ON	ON	17.6°F (-8°C)
OFF	ON	ON	ON	ON	21.2°F (-6°C)
ON	ON	ON	ON	ON	24.8°F (-4°C)
OFF	ON	ON	ON	ON	28.4°F (-2°C)
ON	ON	ON	ON	ON	32°F (0°C)
OFF	ON	ON	ON	ON	35.6°F (2°C)
ON	ON	ON	ON	ON	39.2°F (4°C)
OFF	ON	ON	ON	ON	42.8°F (6°C)
ON	ON	ON	ON	ON	46.4°F (8°C)
OFF	ON	ON	ON	ON	50°F (10°C)
ON	ON	ON	ON	ON	53.6°F (12°C)
OFF	ON	ON	ON	ON	57.2°F (14°C)
ON	ON	ON	ON	ON	60.8°F (16°C)
OFF	ON	ON	ON	ON	64.4°F (18°C)
ON	ON	ON	ON	ON	68°F (20°C)
OFF	ON	ON	ON	ON	71.6°F (22°C)

Fig. 5

SW2 "dip-switch" programming

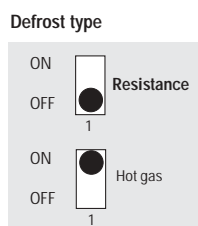


Fig. 6

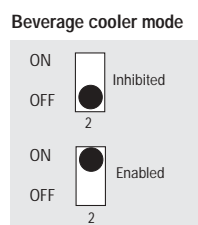


Fig. 7

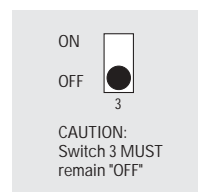


Fig. 8

Maximum set point temperature selection

4	5	6	7	8	Temperature
ON	ON	ON	ON	ON	86°F (30°C)
OFF	ON	ON	ON	ON	82.4°F (28°C)
ON	OFF	ON	ON	ON	78.8°F (26°C)
OFF	OFF	ON	ON	ON	75.2°F (24°C)
ON	ON	OFF	ON	ON	71.6°F (22°C)
OFF	ON	ON	OFF	ON	68°F (20°C)
ON	ON	ON	OFF	ON	64.4°F (18°C)
OFF	ON	ON	ON	OFF	60.8°F (16°C)
ON	ON	ON	ON	OFF	57.2°F (14°C)
OFF	ON	ON	ON	ON	53.6°F (12°C)
ON	ON	ON	ON	ON	50°F (10°C)
OFF	ON	ON	ON	ON	46.4°F (8°C)
ON	ON	ON	ON	ON	42.8°F (6°C)
OFF	ON	ON	ON	ON	39.2°F (4°C)
ON	ON	ON	ON	ON	35.6°F (2°C)
OFF	ON	ON	ON	ON	32°F (0°C)
ON	ON	ON	ON	ON	28.4°F (-4°C)
OFF	ON	ON	ON	ON	24.8°F (-6°C)
ON	ON	ON	ON	ON	21.2°F (-8°C)
OFF	ON	ON	ON	ON	17.6°F (-8°C)
ON	ON	ON	ON	ON	14°F (-10°C)
OFF	ON	ON	ON	ON	10.4°F (-12°C)
ON	ON	ON	ON	ON	6.8°F (-14°C)
OFF	ON	ON	ON	ON	3.2°F (-16°C)
ON	ON	ON	ON	ON	-4°F (-18°C)
OFF	ON	ON	ON	ON	-4°F (-20°C)
ON	ON	ON	ON	ON	-7.6°F (-22°C)
OFF	ON	ON	ON	ON	-11.2°F (-24°C)
ON	ON	ON	ON	ON	-14.8°F (-26°C)
OFF	ON	ON	ON	ON	-18.4°F (-28°C)
ON	ON	ON	ON	ON	-22°F (-30°C)
OFF	ON	ON	ON	ON	-25.6°F (-32°C)

Fig. 9

SW3 "dip-switch" programming

Defrosting duration	defrost end by temperature
5 min. (by resistance) 1 min. (by hot gas)	0 °C (+32 °F)
2 min.	+2 °C (+35 °F)
4 min.	+4 °C (+39 °F)
6 min.	+6 °C (+42 °F)
8 min.	+8 °C (+46 °F)
10 min.	+10 °C (+50 °F)
12 min.	+12 °C (+53 °F)
15 min.	+14 °C (+57 °F)
18 min.	+16 °C (+60 °F)
20 min.	+18 °C (+64 °F)
25 min.	+20 °C (+68 °F)
30 min.	+22 °C (+71 °F)
35 min.	+24 °C (+75 °F)
40 min.	+26 °C (+78 °F)
50 min.	+28 °C (+82 °F)
60 min.	+30 °C (+86 °F)

Fig. 13

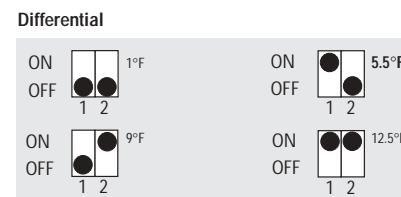


Fig. 10

Compressor safety

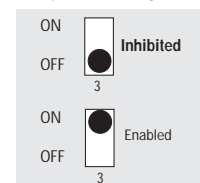


Fig. 11

Temperature unit of measurement

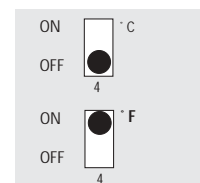


Fig. 12

Layout of programming key

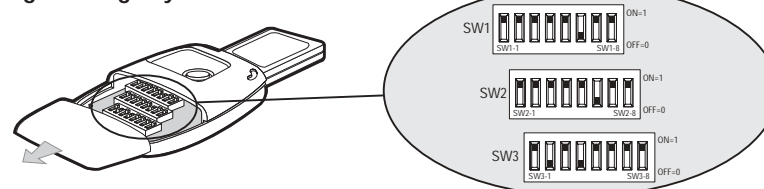


Fig. 1

General characteristics - The UniStat is an electronic thermostat and defrost timer that allows the complete management of refrigerated display cases and coldrooms. The microprocessor controlled UniStat combines the accuracy and reliability of electronics while maintaining the ease of use of mechanical controls. DIP versions allow for easy parameter change in the field while the KEY version lends itself to production environments where multiple controls must be set efficiently.

UniStats contain high power relays for the direct management of compressors, fans and defrost heaters. Defrost is initialized by setting the interval and is terminated on time as selected by the user. Defrost may also be terminated on temperature, by the addition of a defrost termination sensor. Termination temperature is also user selected. Additional features include adjustable setpoint range (KEY versions) compressor safety, drip time functions, and manual defrost.

Available versions - For all models: 2 inputs for air sensor and defrost sensor, display output.

- Medium temperature models one SPST-NO relay for compressor up to 2 HP/230Vac or 1 HP/115Vac;
- Low temperature models one SPST-NO relay for compressor up to 2 HP/230Vac or 1 HP/115Vac, 1 SPDT relay for defrost fan or heater resistance/fan.

Temperature probes, accessories and spare parts

- NTC temperature probe 10kΩ at 25°C - 952886
- programming key - 952887
- remote display - 952885
- conduit coupler kit - 952888

Mounting - UniStat is designed to be mounted on DIN bar or surface mounted with (2) #6x2" self tapping screws, included.

Optional display - Numeric readout is possible only with the display option. This is a two-digit + sign green-LED. The value being measured by the regulation sensor or alarm messages are normally displayed. When the Set Point knob is rotated (or of the def. intvl selector), the corresponding value is displayed for a few seconds, being preceded by st(or dF).

Air sensor - Must always be connected. The compressor is operated until terminal setpoint is reached.

Defrost sensor - Use of the defrost sensor is optional. If the sensor is not utilized, the defrost terminates after the set time, otherwise the defrost terminates when the sensor temperature exceeds the selected temperature. On startup, the instrument detects the sensor presence and enables its utilization permanently. To disable the sensor utilization, it is necessary to disconnect the sensor itself and then to cycle power to the instrument while keeping the "man. def." button pressed for 5 seconds.

Note: Sensor wire may be extended up to 160 feet (50 meters) using 18 AWG wire. Sensor wire must not be run alongside high voltage wiring.

Instrument programming with hardware key - The key (952887) enables you to program, without power supplied, the configuration parameters of the key versions of the electronic thermostat. After setting the parameters via the dip-switches present on the key, simply insert it in the special slit found on the instrument front and press the button (Fig. 22).

The red LED on the key will blink twice to indicate the correct programming; release the button and remove the key. Caution: If you energize the instrument and then you insert the key, the programming is downloaded automatically. Before programming the instrument, it is necessary to set the key. The key is provided with 3 dip-switch benches which, after setting, determine the instrument programming. Refer to the dip-switch programming as indicated in the nearby figures.

Set Point and regulation scale selection - Temperature is set by rotating the circular selector in correspondence with the arrow placed nearby. The selector is graduated 1 to 10 with correspondent decreasing temperature values, the temperature range is programmable on the key versions. The default range is -33°F to 50°F for low temperature models, and 14°F to 68°F for medium temperature models. It's possible to select the minimum and maximum set (and consequently Set Point range) by setting the dip-switches no. 4,

5, 6, 7 and 8 on the SW1 and SW2 benches; Fig. 5 shows DIP switch positions to set minimum set point. Fig. 9 shows DIP switch positions to set maximum set point.

Differential - It is possible to modify the differential being selected from 0.5°C (1°F) minimum to 7°C (12.5°F) maximum (see SW3, Fig. 10). As for the selection, simply shift the first two dip-switches to the ON or OFF position according to the value wanted.

Defrost management and setting - The defrost can be activated manually, by pressing the "man. def." button, or cyclically, the interval set by the "def. intvl" rotary switch at the top left with respect to Set Point selector. The interval can be selected from 1 to 12 hours at 1 hour steps (or from 2 to 24 hours at 2 hour steps; see SW1 dip-switches Fig. 2). If the selector is positioned on the 0, the cyclic defrost is disabled.

Note: manual defrosting reinitialises the time required for successive cyclic defrosting. The selections are effective starting from the successive cycle. For an immediate effect, it is necessary to interrupt the power supply to the instrument for a few seconds. It is possible to choose between a electric defrost (the compressor is deactivated and the defrosting relay is activated) and a hot gas defrost (both the compressor and the defrosting relay are activated; refer to Fig. 6 for the selection. Defrost can be terminated in two ways: via time (from 1 to 60 min.) or via temperature (from 32 to 86°F) if the defrost sensor is utilized (see Fig. 13). If the defrost sensor is disconnected, interrupted or breaks down for any reason, the defrost terminates after a maximum time of 90 minutes if it is resistance-based, 40 minutes if it is hot-gas based. The instrument stores the defrost status every 15 minutes, and after a power failure will resume defrost or refrigeration.

Compressor protection function - If the function is enabled, the compressor will have a 3 minute minimum off time. The function is also active in hot-gas defrost mode.

Drip Time - If the function is enabled (Fig. 4), the compressor will stay off for 3 minutes after defrost termination.

Beverage cooler mode - By selecting this operation mode (Fig. 2), the defrost sensor is used to control temperature, the air sensor is used for temperature display only.

Battery replacement - Remove, by gently pulling, the key upper shell; replace the battery, lean the cover against its seat and press. Battery replacement part number is 958155.

Alarms and signalling - The green LED underneath the Set Point selection knob is used for signalling operation and alarms.

State	LED	Display
compressor and defrost deactivated	OFF	-
energized compressor (except hot gas defrosting)	ON	-
in defrost	blinking (ON 0.5s, OFF 0.5s)	-
faulty sensor	blinking (ON 0.5s, OFF 1.5s)	A1 air sensor A2 defrost sensor
EEPROM error - set points erased	-	EE

Tab. 1

Safety-regime operation - In case of malfunction, the instrument changes automatically to safety operation.

Malfuncon	Safety operation
EEPROM	compressor energized with 4 min. ON, 3 min. OFF cycle
air sensor	Set Point >-10°C compressor energized with 4 min. ON, 3 min. OFF cycle
	Set Point <-10°C compressor always energized
sensor	duration 40 min. if hot gas type, 90 min. if resistance type

Tab. 2

In beverage cooler mode, the defrost probe anomaly is managed in the same manner as the fault of both sensors in standard operation.

Safety standards - The units must be installed in conformance with all applicable codes and standards.

Important note: ensure that the position of the dip no. 3, SW2 is OFF (bottom position). Activation will cause instrument programmability problems!

Technical specifications

regulation interval	programmable from -40°C to +30°C (-40°F to +86°F)
power supply by model	230Vac, +10%, -15%, 50/60Hz 115Vac, +10%, -15%, 50/60Hz
power rating	2VA
case	plastic; dimensions 76x77.5x45mm
mounting	DIN guide or wall mounting
operating conditions	30-125°F, 90%r.H. non-condensing
storage conditions	15-160°F, 90%r.H. non-condensing
accuracy	better than 2°F
connections	.250" spade
display	2 digits and sign (optional) display
warning lights	green LED indicating the operation state
inputs	1 NTC ambient sensor + 1 NTC defrosting end sensor
sensor type	NTC 10kΩ at 25°C 952886
outputs	low temp.: 1 relay SPST-NO for comp. 2 HP/230Vac or 1 HP/115Vac (Imax=30A res. (10A)) medium temp.: 1 relay SPST-NO for comp. 2 HP/230Vac or 1 HP/115Vac (Imax=30A res. (10A)) + 1 defrost. SPDT relay 230Vac, 8 FLA/48 LRA. Imax=16A res. (4A)
environmental pollution	normal
index of protection (front panel)	IP 20
classification according to protection against electrical shock (insulation)	the device must be included in class I equipment
number of automatic cycles for each automatic action	100,000
PTI of the insulating materials	≥ 250V
electric stress period	long
of the insulating parts	
fire and heat resistance Category	Category D
Category (surge immunity)	Category 2
action-disconnection type	1B
software Class and structure	Class A