

See The Difference

Make The Connection
with Invensys Controls

Thermostats

HVAC Controls

Commercial Refrigeration Controls



Invensys®
Controls

Innovation you expect.

Robertshaw®

9725i2

DELUXE
UNIVERSAL
PROGRAMMABLE
THERMOSTAT



GAS



ELECTRIC



OIL



HEAT PUMP



Even More Homeowner Friendly™

Features and Benefits

Would You Like
To Run the
Setup Wizard?

No Yes

Set-up Wizard **NEW**
Helps speed through the installation process with step-by-step setup and programming instructions.

Select Language

English
Español
Français

Back Next

Trilingual Display Option
Set to your customers' language of choice – English, Spanish or French

Mon To Sun Program

		HEAT	COOL
Wake	6:00 AM	70	78
Morn	8:00 AM	62	85
Eve	5:00 PM	70	78
Night	10:00 PM	62	82

Exit Select

Convenient Displays
View a full day of programming at once for quick review or easy adjustment.

Tech Support

Model 9725i vX.X
ABC HEAT
555-1234

Back

Contractor ID Feature
Set it yourself or custom order with your information preloaded. Your name and phone number remind your customers when service is needed.

Daylight Saving Time Adjustment

Automatically adjusts to correct time regardless of seasonal changes.

Adjustable Backlighting

NEW

Choose to have backlighting on at all times or only when programming. You can also adjust the brightness and contrast for improved readability.

Time of Day Zoning

NEW

When coupled with a remote sensor (part #9020i), you can control the temperature in remote locations given different scheduled events.

Menu Driven Display

Universal Staging

up to 3 Heat / 2 Cool

Programming Made Even Easier

Do you want to spend less time installing and setting up thermostats?

The new 9725i2 makes installation even easier with our new Setup Wizard. The Setup Wizard allows you to spend 50% less time setting up the thermostat over competitive models. Plus everything is in plain language so there are no complicated codes or button combinations to memorize.

We've also made programming even easier for your customers. Menus are easier to navigate. We've even added additional convenience features such as Automated Time adjustment for Daylight Saving Time, along with new indoor air quality reminders.

The new 9725i2 is so user friendly, it sets a higher standard in efficiency and simplicity for programmable thermostats. It is truly programming made even easier.

Three Levels of Security

NEW

Secure protection against unwanted changes to the programming menus, temperature or set-up functions with your own 4-digit PIN.

Auto Changeover

Automatically adjusts between heating and cooling cycles to maintain optimal comfort.

Worry-Free Memory Storage

Even during power outages, the thermostat maintains set point and programmed parameters.

Adjustable Temperature Offset

Change the displayed temperature from the actual sensed temperature.

Adjustable Temperature Differential

Maintains optimal customer comfort.

Intermittent Fan

Maintains optimal air filtration and circulation with minimal energy use.



24 VAC POWERED

Five Year Warranty

Robertshaw®

9725i2

**DELUXE
UNIVERSAL
PROGRAMMABLE
THERMOSTAT**



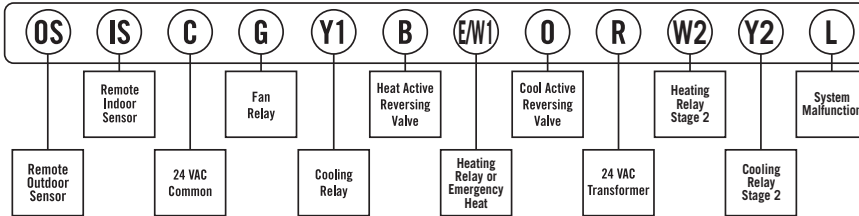
GAS ELECTRIC OIL HEAT PUMP

THE ROBERTSHAW 9725i2 REPLACES:

White-Rodgers Co.*	1F92-71, 1F93-380, 1F94-71, 1F95-377
Honeywell, Inc.*	TH8320U1006
Carrier Corp.*	P274-1300, P274-2100, P374-1000, P374-1100, P474-1050

* Verify specific application requirements before substitution.

Terminal Designations



**Optional Sensors:
9020i REMOTE INDOOR
9025i REMOTE OUTDOOR**

Specifications

Electrical rating: 24 Volt AC (18-30 VAC)

1 amp maximum load per terminal (relay outputs)

3 amp total maximum load (all terminals combined)

Temperature control range: 45° - 90°F (7° - 32°C)

Accuracy: +/-1.0°F (+/-0.5°C)

Power Source: 24 VAC

Auto Changeover deadband: Selectable 2° to 8°F

Temporary temperature override: 3 hour maximum or next setpoint

Remote sensor capable: 1 indoor and 1 outdoor sensor

System configurations: Multi-stage gas, oil or electric heating/cooling systems

Terminations: R, E/W1, W2, Y1, Y2, B, O, G, C, IS, OS, L

Shipping Information

Indiv. Ctn. Dim.: 6.625" x 4.25" x 1.625"

Master Ctn. Qty.: 6

Master Ctn. Dim.: 9.25" x 5.625" x 7.5"

Master Ctn. Cu. Ft.: .23

Master Ctn. Wt.: 3.5 lbs.

Max. Pallet Qty.: 1260

Max. Pallet Wt.: 785 lbs.

Item 9020i and 9025i Remote Sensors

Indiv. Ctn. Dim.: 2.625" x 1.5625" x 4.4375"

Master Ctn. Qty.: 6

Master Ctn. Dim.: 5.625" x 5.125" x 5.125"

Master Ctn. Cu. Ft.: .09

Master Ctn. Wt.: .78 lbs.

Other Multi-Stage Heat / Cool Thermostats

9615: Programmable, 7 Day

9415: Non-Programmable

Patent Information

This product is covered by one or more of the following U.S. patents. Foreign patent rights may be pending. 4967382, 5803357, 6502758, 7000849, D301207, D462940

Invensys®

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M-F 7:00 a.m. - 5:30 p.m. CST

www.about-i-series.com

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	Invensys i2-Series	Honeywell Vision Pro	Carrier Infinity	White-Rodgers 1F97-371
Menu Driven (Ease of Programming)	X			
Installation Wizard	X			
Displays Complete Program	X			
Adjustable Backlighting	X			
Cooling System Monitor	X			
Heating System Monitor	X			
Multi-Language	X			
1/2 Degree Resolution	X			
Time of Day Zoning	X			
Adjustable Timed Upstaging	X			
5/2 Program	X			X
24 Hour Programming	X			X
7-Day Programming	X	X	X	
Large Display	X	X	X	
Adjustable Timed Override/Hold	X	X		
Automatic Daylight Saving Time Adjustment	X	X		
Adjustable Temperature Limits	X	X		
High/Low Balance Points	X	X		
LED Status Indicators	X	X		
Adjustable Differential	X	X		
Adjustable Compressor Short Cycle Protection	X	X		
Adjustable Residual Cooling	X	X		
Fossil Fuel Kit required on HP units	No	No	Yes	Yes
Battery Free Memory Retention	X		X	
Manual Override	X	X	X	X
Resume	X	X	X	X
Auto Changeover	X	X	X	X
Gas/Electric	X	X	X	X
Single Stage Heat Pump Compatible	X	X	X	X
Line Powered	X	X	X	X
Programmable Fan	X	X	X	X
Intermittent Fan	X		X	
°F and °C	X	X	X	X
12 or 24 Hour	X	X		X
Air Filter Monitor	X	X	X	X
Humidifier Pad Monitor	X	X	X	
UV Light Monitor	X	X	X	
Vacation Setting	X	X	X	X
O & B Terminals	X	X	Partial	X
Events per day	2, 4, 6	4	4	2, 4
Remote Outdoor Sensor	X	Combo	X	X
Remote Indoor Sensor	X		X	X
Energy Efficient Recovery	X	X	X	X
Pre-set Program	X	X	X	X
Hidden Service Level	X	X	X	
Security Key Pad	X			X
Temperature Recalibration	X	X	X	
Customizable Contractor ID	X			Factory Only

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Menu Driven Display
Universal Staging
up to 3 Heat / 2 Cool

Comfort Made Even Easier

Do you want to spend less time installing and setting up thermostats?

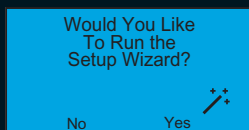
The new Robertshaw® 9825i2 thermostat makes controlling your customers' comfort even easier. We've combined humidity and temperature control in one easy to install, easy to program thermostat. This versatile thermostat provides control over both humidification and dehumidification. When used in conjunction with our 9025i outdoor sensor, the 9825i2 automatically controls indoor humidity levels maintaining optimal comfort while minimizing condensation on windows. Your customers will enjoy maximum comfort and energy savings and you will benefit from the time and effort saved by installing a single device that does the work of two.

The new Setup Wizard allows you to spend 50% less time setting up the thermostat over competitive models. Everything is in plain language so there are no complicated codes or button combinations to memorize. Plus with our new universal design, one unit does the job of many saving time and money.

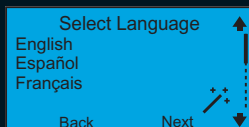
The new 9825i2 is so user friendly it sets a higher standard in efficiency and simplicity for programmable thermostats. It is truly comfort made even easier.

Even More Homeowner Friendly

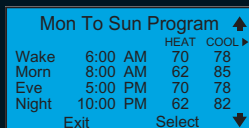
Features and Benefits



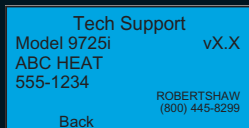
Set-up Wizard *NEW*
Helps speed through the installation process with step-by-step setup and programming instructions.



Trilingual Display Option
Set to your customers' language of choice – English, Spanish or French



Convenient Displays
View a full day of programming at once for quick review or easy adjustment.



Contractor ID Feature
Set it yourself or custom order with your information preloaded. Your name and phone number remind your customers when service is needed.

Automatic Daylight Saving Time
Automatically adjusts to correct time regardless of seasonal changes.

Brighter, Adjustable Backlighting *NEW*
Choose to have backlighting on at all times or only when programming. You can also adjust the brightness and contrast for improved readability.

Nightlight Option *NEW*
Leave the backlight on to have a convenient, comforting nightlight to illuminate the area.

Time of Day Zoning *NEW*
When coupled with a remote indoor sensor (part #9020i), you can control the temperature in remote locations given different scheduled events.

Three Levels of Security *NEW*
Secure protection against unwanted changes to the programming menus, temperature or set-up functions with your own 4-digit PIN.

Auto Changeover
Automatically adjusts between heating and cooling cycles to maintain optimal comfort.

Worry-Free Memory Storage
Even during power outages, the thermostat maintains set point and programmed parameters.

Adjustable Temperature Offset
Change the displayed temperature from the actual sensed temperature.

Adjustable Temperature Differential
Maintains optimal customer comfort.

Intermittent Fan
Maintains optimal air filtration and circulation with minimal energy use.



24 VAC POWERED

Five Year Warranty

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9825i2

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THERMOSTAT**



GAS ELECTRIC OIL HEAT PUMP

THE ROBERTSHAW 9825i2 REPLACES:

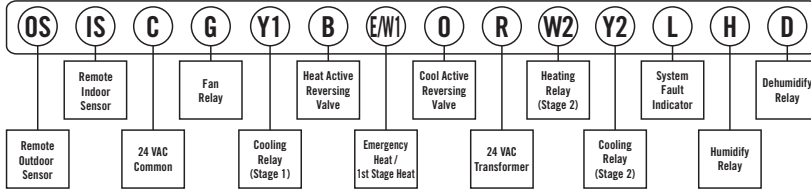
White-Rodgers Co.*	1F95-391, 1F95-1277
Honeywell, Inc.*	TH8321
Carrier Corp.*	P274-1300, P274-2100, P374-1000, P374-1100, P474-1050

* Verify specific application requirements before substitution.



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9025i REMOTE OUTDOOR**

Terminal Designations



Specifications

Electrical rating: 24 Volt AC (18-30 VAC)

1 amp maximum load per terminal (relay outputs)

4 amp total maximum load (all terminals combined)

Temperature control range: 45° - 90°F (7° - 32°C)

Accuracy: +/-1.0°F (+/-0.5°C)

Power Source: 24 VAC

Auto Changeover deadband: Selectable 2° to 8°F

Temporary temperature override: From 10 minutes to 365 days

Remote sensor capable: 1 indoor and 1 outdoor sensor

System configurations: Multi-stage gas, oil or electric heating/cooling systems

Terminations: OS, IS, C, G, Y1, B, E/W1, O, R, W2, Y2, L, H, D

Shipping Information

Indiv. Ctn. Dim.: 6.625" x 4.25" x 1.625"

Master Ctn. Qty.: 6

Master Ctn. Dim.: 9.25" x 5.625" x 7.5"

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Other Multi-Stage Heat / Cool Thermostats

9615: Programmable, 7 Day

9415: Non-Programmable

Patent Information

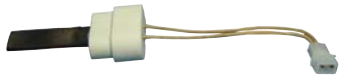
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Controls**

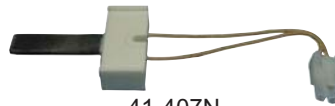
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	Robertshaw 9825i2	Honeywell TH8321	White-Rodgers 1F95-391
Menu Driven (Ease of Programming)	X		
Installation Wizard	X		
Displays Complete Program	X		
Adjustable Backlighting	X		
Cooling System Monitor	X		
Heating System Monitor	X		
Multi-Language; capable of up to 3 languages	X		
1/2 Degree Resolution	X		
Time of Day Zoning	X		
LED Status Indicators	X		
Integrated Fossil Fuel Kit Converter for Heat Pump Application	X		
Events per Day: 2, 4, 6	X		
5/2 Program	X		
24 Hour Program	X		
Intermittent Fan	X		
Remote Outdoor Sensor	X		
Customizable Contractor ID	X		
Adjustable Residual Cooling	X	X	
12 or 24 Hour	X	X	
Dehumidification	X	X	
Humidification	X		X
5/1/1 Program	X		X
7-Day Program	X	X	X
Stages: 1H/1C	X	X	X
Stages: 2H/2C	X	X	X
Large Display	X	X	X
Adjustable Timed Override	X	X	X
Adjustable Timed Hold	X	X	X
Automatic Daylight Saving Time Adjustment	X	X	X
Adjustable Temperature Limits	X	X	X
High/Low Balance Points	X	X	X
Adjustable Differential	X	X	X
Adjustable Compressor Short Cycle Protection	X	X	X
Battery Free Memory Retention	X	X	X
Manual Override	X	X	X
Resume	X	X	X
Auto Changeover	X	X	X
Gas/Electric	X	X	X
Single Stage Heat Pump Compatible	X	X	X
Line Powered	X	X	X
Programmable Fan	X	X	X
°F and °C	X	X	X
Air Filter Monitor	X	X	X
Humidifier Pad Monitor	X	X	X
UV Light Monitor	X	X	X
Vacation Setting	X	X	X
O & B Terminals	X	X	X
4 Hour Reserve	X	X	X
Remote Indoor Sensor	X	X	X
Energy Efficient Recovery	X	X	X
Pre-set Program	X	X	X
Hidden Service Level	X	X	X
Security Key Pad	X	X	X
Temperature Recalibration	X	X	X



41-401N



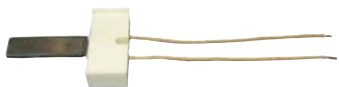
41-407N



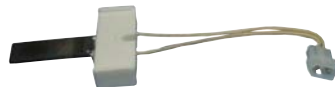
41-402N



41-408N



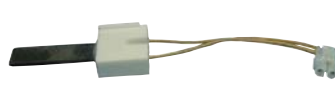
41-403N



41-409N



41-404N



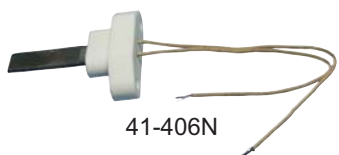
41-410N



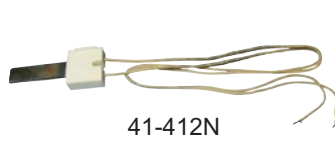
41-405N



41-411N



41-406N



41-412N

Features and Benefits

The Robertshaw Silicon Nitride Hot Surface Ignitors provide a new and resilient solution to gas ignition. The Silicon Nitride Ignitor provides exceptional improvement in durability by virtually eliminating breakage.

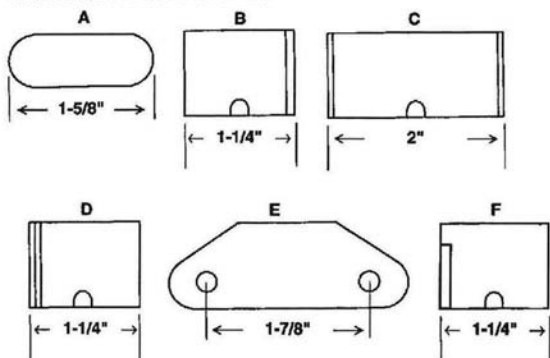
- All Robertshaw Silicon Nitride Hot Surface Ignitors are very durable, robust and resistant to rust, dirt, condensation, oils or falling debris from the heating element.
- The Robertshaw Silicon Nitride Ignitors are 120V AC. Some hot surface modules are rated for 208/240 volts input, however they step the voltage to the ignitor down to 120V AC.
- High temperature leads are enclosed with a special fiberglass insulation providing superior electrical protection.
- This ignitor is a functional upgrade or replacement to Silicon Carbide applications.
- Ignitors are boxed with mounting hardware and termination required for direct replacement.

Technical Specifications

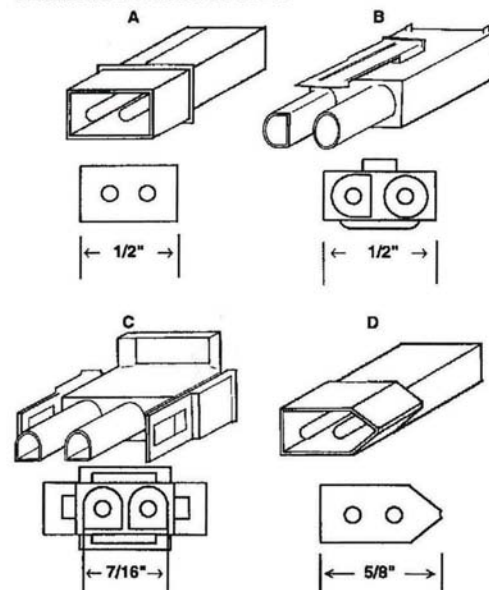
⚠ ATTENTION: Flame sensors are required for all Silicon Nitride Ignitors. Ignitor/Sensor assembly 1751-729 (24" lead) or 1751-749 (72" lead) can be used if an existing flame sensor is not present and a terminal is available on the ignition control.

Uni-Line® Part Number	Ceramic Block Style	Terminal Block Style	Lead Wire Length	Comments
41-401N	A	A	5-1/4"	Includes a gasket
41-402N	B	None	24"	
41-403N	C	None	5-1/4"	
41-404N	C	D	5-3/4"	Includes special mounting
41-405N	D	None	9"	
41-406N	E	None	9"	Includes a gasket
41-407N	C	B	5-3/4"	
41-408N	B	C	5-3/4"	
41-409N	C	D	5-3/4"	
41-410N	B	B	5-3/4"	
41-411N	B	C	5-3/4"	Includes special mounting
41-412N	F	None	24"	

CERAMIC BLOCK STYLES



TERMINAL BLOCK STYLES





E71R and E72R Controllers

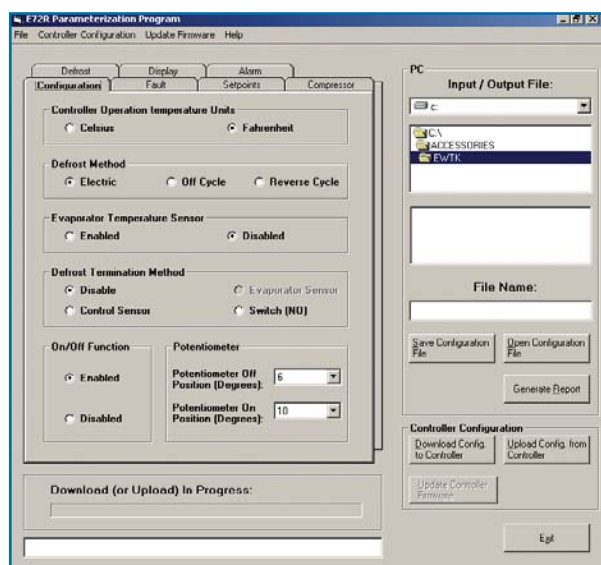
The E71R and E72R EcoCool controllers from Ranco® are microprocessor-based electronic temperature and defrost controllers for use in compressor-driven commercial freezers and refrigerators.

The E71R includes a single relay for managing compressor operation. The E72R includes one relay for managing compressor operation, and one relay for a defrost heater and optional fan.

Both controllers include intelligent software with settings that can be configured to meet a full range of commercial refrigeration applications.

Features and Benefits

- Electronic control provides consistent and accurate temperature control.
- Compressor protection features prevents short cycling.
- Smart defrost functionality is based on time and/or temperature.
- Combined defrost and temperature controls in one unit means cost savings – reducing the components, wiring, and labor required.
- LED indicators show controller status: refrigeration, defrost and alarm.
- EcoCool configuration software makes it easy to download setpoints from a PC or copy card.
- Switching mode power supply of 90 to 240V AC allows the same controller to be used on both 120V AC and 230/240V AC applications.
- Optional display shows current temperature or setpoint during controller adjustment.

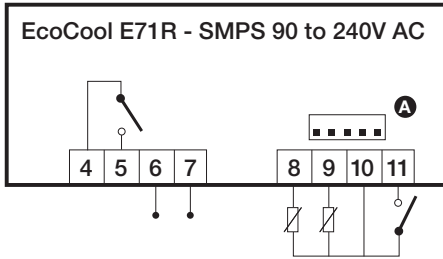


Configuration software makes setup easy.

MODELS		E71R	E72R
Application		EcoCool w/1 Relay	EcoCool w/2 Relays
FUNCTIONS	Temperature Control	Yes	Yes
	Off Cycle Defrost Control	Yes	Yes
	Electric or Reverse Cycle Defrost Control	No	Yes
	Optional Temperature Alarms	Yes	Yes
	Quick Configuration Copy Card Capability	Yes	Yes
	PC Configuration Capability	Yes	Yes
	Adjustable Parameters (Quantity)	38 parameters	38 parameters
DISPLAY / USER	Optional Remote Display	Yes	Yes
	Optional Status LEDs for Refrigeration, Defrost and Alarm	Yes	Yes
	Dial for Temperature Adjustment	Yes	Yes
OUTPUTS	Compressor Relay 1HP, 16A FLA at 120 V AC	Yes	Yes
	Defrost Relay 10A at 120 V AC	No	Yes
INPUTS	Control Temperature NTC Sensor Input	Yes	Yes
	Evaporator Temperature NTC Sensor Input	Yes	Yes
	Digital Defrost Termination Input	Yes	Yes
SPECS	Power Supply / Switching Mode	90 to 240VAC	90 to 240 VAC
	Frequency	50 or 60 Hz	50 or 60 Hz
	Consumption	< 3W	< 3W

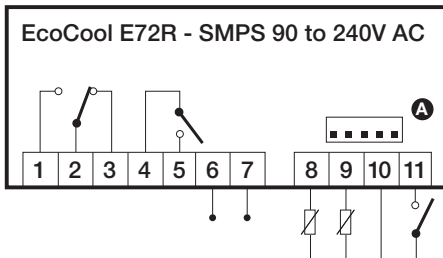


Wiring Diagrams



TERMINALS

- 4 – 5: NO Compressor / refrigeration relay
 - 6 – 7: Power Supply SMPS 90 to 240V AC
 - 8 – 10: Probe 1 Input (Control temperature)
 - 9 – 10: Probe 2 Input (Evaporator temperature)
 - 10 – 11: NO Digital Input (Optional defrost termination switch)
 - A: TTL Input - Optional Copy Card or Display Connection - male plug
- Spade Terminals 4 through 7
Screw Terminals 8 through 11



TERMINALS

- 1 – 2: NO Defrost Relay (heat)
 - 2 – 3: NC Defrost Relay (optional evaporator fan)
 - 4 – 5: NO Compressor / refrigeration relay
 - 6 – 7: Power Supply SMPS 90 to 240V AC
 - 8 – 10: Probe 1 Input (Control temperature)
 - 9 – 10: Probe 2 Input (Evaporator temperature)
 - 10 – 11: NO Digital Input (Optional defrost termination switch)
 - A: TTL Input - Optional Copy Card or Display Connection - male plug
- Spade Terminals 1 through 7
Screw Terminals 8 through 11

Accessories

NTC Sensors



- Units are available for air temperature or evaporator temperature sensing.
- Ranges for sensors are from -58°F to 230°F.
- High quality sensor is protected by a capsule made of ABS, Steel INOX AISI 304/316 or Iconel®.

Electronic Temperature Control E72R	08203-015RC
Remote Display E72R	08210-015RC
Electronic Temperature Control E72R (Hussmann)	08349-015RC
Remote Display E72R (Hussmann)	08350-015RC
Copy Card	08208-015RC
Jumper Card	08351-015RC
Cable 2m	08352-015RC
Cable 5m	08353-015RC

Copy Card



- Quick configuration accessory helps rapidly download parameters to the controllers.
- Red and green LED indicators display transmission status.
- Configurable with PC using EcoCool configuration software – download and upload

Display



- Inexpensive optional display allows user to see setpoints and status of system.
- Display shows two digits with negative sign.
- Display unit has a small footprint of 18.9" x 11.26" x 5.91" (48 x 28.6 x 15 mm)

invensys. Controls

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technicalservice@invensys.com

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Proudly made in the USA.

The Paragon® 9045-00 and 9145-00 Universal Defrost Timers are the only multi-voltage defrost timers engineered to refrigeration standards. At four defrosts per day, the Paragon Universal Defrost Timer switches last 16 years longer than competitive offerings.

Features

- Real-time clock
- Initiate 15 minute manual defrost
- System status indicators
- Lighted display
- 100 hours of power loss protection for both time and defrost schedule
- Mechanism-only versions designed to fit in the standard Paragon enclosures
- Certified to UL873 Standard for Temperature-Indicating and Regulating Equipment, as Refrigeration Controllers
- Wires directly to 120V AC, 208V AC or 230V AC power sources without jumpers or switches
- Easy programming, easy set-up, set time, set defrost start and defrost end
- Display shows defrost start time and duration

An ISO 9001 – 2000 Certified Company

1 Year
Limited
Warranty



**9145 / 9045
Series**

**UNIVERSAL
DEFROST
TIMERS**

Ordering Information

- 9145-00** Time Initiate/Temperature, Pressure Terminate Defrost Timer with Metal Enclosure
- 9145-00M** Time Initiate/Temperature, Pressure Terminate Defrost Timer – Mechanism Only
- 9045-00** Time Initiate/Time Terminate Defrost Timer with Metal Enclosure
- 9045-00M** Time Initiate/Time Terminate Defrost Timer – Mechanism Only

9145 Terminal Data*

Terminal	A	B	C	D	E	F	G
Relay Contact	SPDT NC Contact	SPDT NO Contact	SPDT COMM Contact	SPST NO Contact	SPST COMM Contact	L2/N Power in to timer	Defrost Termination Device Input L2/N side
Relay Rating	15A resistive @ 120 VAC to 240 VAC 1/4HP @ 120 VAC, 1/2HP @ 208 VAC to 240 VAC	30A resistive @ 120 VAC to 240 VAC 1HP @ 120 VAC, 2HP @ 208 VAC to 240 VAC			30A resistive @ 120 VAC to 240 VAC 1HP @ 120 VAC, 2HP @ 208 VAC to 240 VAC		
Device Connections	Fan (Typical) Compressor (Optional)	Defrost Device (Typical)	L1 Power to timer and to Defrost Termination Device		Compressor (Typical) Fan (Optional)		Defrost Termination Switch

* 9145 is a general purpose defrost timer and can be used for both Time Initiate/Time Terminate and Time Initiate/Temperature, Pressure Terminate

9045 Terminal Data*

Terminal	A	B	C	D	E	F	G
Relay Contact	SPST #1 NC Contact	SPST #1 COMM Contact	LI Power in to timer	SPST #2 NO Contact	SPST #2 COMM Contact	L2/N Power in to timer	No Connection
Relay Rating	30A resistive @ 120 VAC to 240 VAC 1HP @ 120 VAC, 2HP @ 208 VAC to 240 VAC				30A resistive @ 120 VAC to 240 VAC 1HP @ 120 VAC, 2HP @ 208 VAC to 240 VAC		
Device Connections	Compressor (Typical)				Defrost Drive (Typical)		

Specifications

Input Power

120/208–240 VAC 60 Hz (+10, -15%)

Power Consumption

6VA max, Defrost termination switch (terminal "G")
input impedance to terminal C: 85kΩ +/- 5%

Operating Voltage

102 VAC min to 132 VAC max @ 60 Hz
176.8 VAC min to 264 VAC max @ 60Hz

NOTE: No user-required adjustments to switch between the
high and low voltage.

Ambient Operating Conditions

-40°F to 131°F (-40°C to 55°C); 0 to 95% RH
(non-condensing)

Storage Temperature

-40°F to 140°F (-40°C to 60°C)

Outside Dimensions

Individual unit 4.40"W x 7.82"H x 3.80"D

Individual unit (in shipping box)
4.75"W x 8.875"H x 4.75"D

Individual Case Shipping Weight

3.2 lbs

Agency Approvals

c-UR-us Recognized Component – Models 9045-00M
& 9145-00M
c-UR-us Listed Product – Models 9045-00 & 9145-00

Invensys Controls Uni-Line[®] Technical Knowledge, Level 2 Courses NATE[®] Recognized

(North American Technicians Excellence)

For more information regarding NATE recognized courses with Invensys Controls or to request training in your area, log into our Customer Toolbox at: www.toolbox.invensyscontrols.com



Heating Basics – Ignition Controls

Course ID: 3084-0001, NATE Recognized hours: 1 hour

GAS HEATING SERVICE

Overview of ignition systems and control boards including hot surface, intermittent pilot, and direct spark ignitions. Sequence of heating events of electronics including thermostats, main gas valves, ignitors and control functions.

Heating Basics – Gas Valves

Course ID: 3084-0002, NATE Recognized hours: 1 hour

GAS FURNACE SERVICE / GAS HEATING SERVICE / HYDRONICS – GAS SERVICE

Overview of the types of gas valves used in heating systems. Includes basic characteristics of natural gas and propane, inlet and outlet pressure, pressure measurements, thermocouples, step open, slow open, and standard open gas valves.

Commercial Refrigeration Basics

Course ID: 3084-0003, NATE Recognized hours: 2 hours

AIR CONDITIONING / AIR DISTRIBUTION / HEAT PUMP / REFRIGERATION LT. COMM. / REFRIGERATION COMM. SERVICE & INSTALATION

Technical overview of basic commercial refrigeration temperature, pressure and defrost controls. Topics include refrigeration thermodynamics, reversing valves, discharge temperature control, super-heat, sub-cooling, and cut-in & cut-out modes.

Heating and Cooling Basics – Thermostat Control

Course ID: 3084-0004, NATE Recognized hours: 2 hours

AIR CONDITIONING / AIR DISTRIBUTION / HEAT PUMP / GAS HEATING / OIL HEATING SERVICE & INSTALLATION

Overview of thermostats and how they control HVAC systems. Features will be discussed such as humidity control, enthalpy control, balance point, staging, differentials, and communications with Zoning and Indoor Air Quality Products.

Ventilation Basics - Zoning and Indoor Air Quality

Course ID: 3084-0005, NATE Recognized hours: 2 hours

AIR CONDITIONING / AIR DISTRIBUTION / HEAT PUMP / GAS HEATING / OIL HEATING SERVICE & INSTALLATION

Overview of Zoning and Indoor Air Quality equipment used in HVAC systems. Zoning features include regular & bypass dampers, equipment design and setting up DIP switches. IAQ topics include ultraviolet systems, humidifiers, energy and heat recovery ventilators, and filters.