

# For the perfect combination in Commercial Refrigeration

**RANCO®**

**PARAGON®**

**eliwell™**



## ID-Digifrost Line

Eliwell pioneered the market for electronic controllers in Europe. The industry standard dimension of 32mm x 74mm (approximately 1.26" x 2.91") was defined by Eliwell. The Digifrost Line contains safety and reliability features, in particular the HACCP (Hazard Analysis of Critical Control Point) option, which allows users to record temperature alarm events and their duration.

The Digifrost family offers a range of controllers from single input, single relay output to three inputs with four relay outputs. The LX models are Televis enabled. Maximum versatility is provided through an extensive list of parameter settings allowing users to customize the controller to their application.

### Features

- Eliwell's expertise, a leading manufacturer in the production of electronic devices for the refrigeration industry
- Quick and easy installation
- 115V or 230V power supply available on most models
- Standard Copy Card for fast parameter programming in similar lines
- PTC or NTC selectable temperature probes are standard
- Front panel protection of IP65 (European standard for dust and moisture protection)
- Specific models to directly control compressors up to 2 hp
- Specific models for HACCP applications (temperature event data recording)
- Connection to Televis



**NTC/PTC probe**  
Selectable input for NTC/PTC probe.



**HACCP**  
Alarm recording according to European regulations for food preservation.



**Compressor 2 hp**  
Direct management for compressors up to 2 hp (power).



**TELEVIS**  
Models provided with a TTL output for Copy Card and Televis.



**Compressor 1 hp**  
Direct management for compressors up to 1 hp (power).



**TTL output**  
Allows fast program transfer.



**Real Time Clock**  
"Fixed time event" management through internal clock.



**Link**  
Network to synchronize instruments' functions.



**Alarm output**  
Alarm output, available on relay or at 12 V for external repetition of the alarm.



**Modbus**  
Serial Communication Protocol.



**Digital input**  
Models with voltage-free Digital Input.



# ID-Digifrost Selection Guide

ID	ID 961	ID 961 A	ID 961 LX	ID 970	ID 970 LX	ID 971	ID 971 LX	ID 974	ID 974 LX	ID 975 LX	ID 983 LX	ID 985 LX
<b>Analog Inputs</b>	1	1	1	1	1	2	2	2	2	2	3	3
1 NTC temp. probe	S	S	X	S	X							
1 PTC temp. probe	X	X	S	X	S							
2 NTC temp. probes						S	X	S	X	X		
2 PTC temp. probes						X	S	X	S	S		
3 NTC temp. probes											X	X
3 PTC temp. probes											S	S
<b>Relay Outputs</b>	1	2	1	2	2	2	2	3	3	4	2	4
Compressor	X	X	X	X	X	X	X	X	X	X	X	X
Defrost				X	X	X	X	X	X	X	X	X
Evaporator Fans					O		O	X	X	X		X
Alarm		X			O		O		O	X		X
Auxiliary Output					O		O		O	O	O	O
<b>Digital Inputs</b>			1		1		1		1		2	2
1 Programmable Input			X		X		X		X		X	X
2 Programmable Inputs											X	X
<b>Functions</b>												
Removable Connectors (only male)	O	O	O	O	O	O	O	O	O	O	O	O
Relay 1 hp	O	O	O	O	O	O	O	O	O			
Relay 2 hp	O	O	O	O	O	O	O					
Buzzer	O	O	O	O	O	O	O	X	O	O	O	O
Televis			X		X		X		X	X	X	X
Copy Card	X	X	X	X	X	X	X	X	X	X	X	X
HACCP			O						O			O
LINK											X	X
RTC											X	X
Modbus											O	O

- Key
- X Default
  - O Optional
  - S Selectable
  - Not available



# IC-Universal Controllers

The IC Universal Controllers are a complete range of multifunction devices for use on a wide variety of control applications in light industrial applications. All versions of the device measure 32mm x 74mm (approximately 1.26" x 2.91"). The IC is a single or dual stage controller allowing a wide variety of inputs such as temperature, humidity, pressure, and generic voltage or current inputs. The LX models are Televis enabled. Maximum versatility is provided through an extensive list of parameter settings so you can customize the controller to your application.

## Features

- Quick and easy installation
- 115V or 230V power supply available on all models
- Standard Copy Card for fast parameter programming in similar controllers
- PTC or NTC selectable temperature probes are standard
- Front panel protection of IP65 (European standard for dust and moisture protection)
- Digital input
- Connection to Televis



**NTC probe input**  
Instruments with NTC probe input.



**Alarm output**  
Alarm output, available on relay or at 12 V for external repetition of the alarm.



**Pt100 probe input**  
Instruments with Pt100 probe input.



**Digital input**  
Models with voltage-free Digital Input.



**Temperature version**  
Instruments available in the temperature control version.



**PID control**  
PID control, typical function for temperature control in the "warm" sector.



**Pressure version**  
Instruments available in the pressure control version.



**TELEVIS**  
Models provided with a TTL output for Copy Card and Televis.



**Humidity version**  
Instruments available in the relative humidity control version.



**TTL output**  
Allows fast program transfer.

Key

X	Default
O	Optional
S	Selectable
-	Not available

IC	IC 901 / IC 902	IC 901 A	IC 912 LX
<b>Analog Inputs</b>	<b>1</b>	<b>1</b>	<b>1</b>
Temp. NTC sensor	S	S	S
Temp. NTC sensor	X	X	X
<b>Relay Outputs</b>	<b>1</b>	<b>2</b>	<b>1</b>
Single Stage	X	X	X
Alarm		X	
<b>Digital Inputs</b>			<b>1</b>
Digital Input			(LX)
<b>Functions</b>			
Removable Connectors (only male)	O	O	O
Relay 1 hp	O	O	
Relay 2 hp	O	O	
Buzzer		X	
Televis			(LX)
Copy Card	X	X	X
Soft Start			(LX)



# Televis Remote Monitoring

The Televis system allows the monitoring and controlling of a refrigeration system, either locally through an on-site PC or remotely via modem.

Through the Televis system's on-screen display, the user can easily and efficiently monitor and control system parameters and alarm indications.

## Real-time Virtual Display (RVD)

The Real-time Virtual Display allows the user to view information from a selected controller on their PC screen. Most Eliwell controllers are ready for connection to the system using an optically insulated RS485 line which provides high immunity from disturbances.

The Televis system is capable of automatically recognizing all the controllers connected to the PC. Therefore, when any modifications to the system structure are made, it will reconfigure the display to show the new structure.

## Layout

The layout mode graphically shows the physical arrangement of the controllers inside a facility and displays basic information for each device.

By knowing the location alone, the user can find and access all the controllers at that facility. The program can manage up to 100 different layout sheets.

## Global Commands

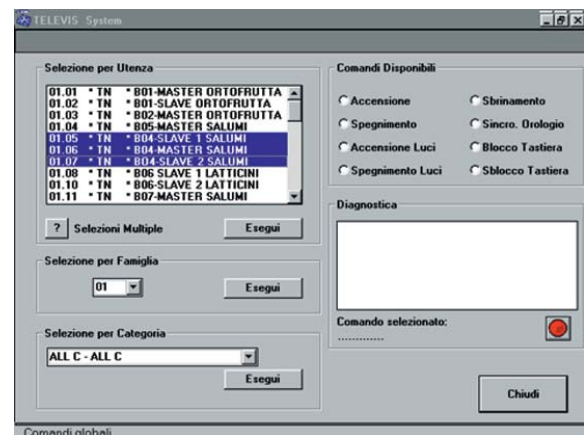
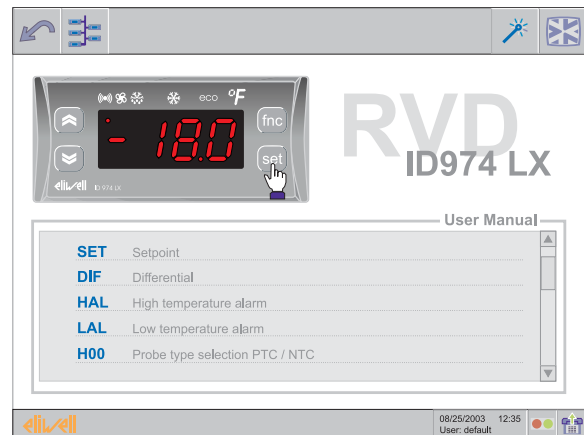
This function allows commands to be sent to multiple controllers in a single operation. For example, several devices can be turned on or off, or lights controlled by a device can be turned on or off. A diagnostic section informs the user about the specific results of a command execution for each controller selected.

## Alarm Management

Televis continuously queries the controllers connected to it; collecting data as well as any indicated alarms.

Intuitive panels display the alarm status in real time, presenting a complete view of the system state to the user.

In the event an alarm is received or a general abnormal situation is sensed, Televis will automatically relay a detailed warning to pre-selected addresses either via fax or text messages as configured during setup.





## Commercial Defrost Controls

The Paragon 9045-00 and 9145-00 Universal Defrost Timers are the only multi-voltage defrost timers engineered to refrigeration standards!

Our product is certified to UL873 standards for temperature-indicating and regulating equipment, as refrigeration controllers; switches rated to 30,000 cycles. Competitive offerings are certified to UL917 standards for safety for clock-operated switches with switches rated to 6,000 cycles. At four defrosts per day, the Paragon Universal Defrost Timer switches last 16 years longer!

Proudly made in the USA - we offer a real-time clock and 100 hours of power loss protection for both time and defrost schedule. To accommodate the applications your customers need, we offer mechanism-only models designed to fit in the standard Paragon enclosures.

### 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
- Made in the U.S.A.
- Certified to UL873 Standard for Temperature-Indicating and Regulating Equipment, as Refrigeration Controllers
- Withstands the most rigorous refrigeration applications
- 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



### Input Power

120/208-240V AC, 60 Hz (+10, -15%)

### Operating Voltage

102V AC min. to 132 max. @ 60 Hz

176.8V AC min. to 264V AC max. @ 60 Hz

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



Listed Product – Models 9045-00 and 9145-00



Recognized Component – Models 9045-00M and 9145-00M



# Commercial Defrost Controls

9145 Terminal Data*							
Terminal	A	B	C	D	E	F	G
Relay Contact	SPDT NC Contact	SPDT NO Contact	SPDT Common Contact	SPST NO Contact	SPST Common Contact	L2/N Power in to timer	Defrost Termination Device Input L2/N side
Relay Rating	15 A resistive @ 120V AC to 240V AC 1/4 HP @ 120V AC, 1/2 HP @ 208V AC to 240V AC	30 A resistive @ 120V AC to 240V AC 1 HP @ 120V AC 2 HP @ 208V AC to 240V AC			30 A resistive @ 120V AC to 240V AC 1 HP @ 120V AC, 2 HP @ 208V AC to 240V AC		
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 Common Contact	L1 Power in to Timer	SPST #2 NO Contact	SPST #2 Common Contact	L2/N Power in to Timer	No Connection
Relay Rating	30 A resistive@ 120V AC to 240V AC 1 HP @ 120V AC, 2 HP @ 208V AC to 240V AC				30 A resistive @ 120V AC to 240V AC 1 HP @ 120V AC, 2 HP @ 208V AC to 240V AC		
Device Connections	Compressor (Typical)				Defrost Device (Typical)		

**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

## Commercial Defrost Controls

Designed for commercial freezers and refrigerators, Paragon commercial defrost controls provide automatic defrost capability. They accommodate various types of defrost systems including electric defrost heaters, hot gas and compressor off cycle.

### Features

#### Time initiated, temperature or pressure terminated

- High-amp switch contacts, 40 amps, 2 hp
- Positive slider bar switch design, assures positive electrical contact and wipes the contact surface of contaminants
- Designed for defrost termination using an external temperature or pressure device
- Safety back-up — mechanical time-driven defrost termination
- Heavy-duty synchronous design drive motor
- Choice of three contact arrangements
- Adjustable frequency of defrost initiation from 1 to 6 cycles per day with a minimum of 4 hours between successive operations
- Adjustable back-up defrost termination from 4 to 110 minutes in 2 minute increments
- Enclosure construction of heavy-duty steel with knockouts on the bottom, back and sides. Hasp and staple for padlock is part of the enclosure

#### Time initiated, time terminated

- High-amp switch contacts, 40 amps, 2 hp
- Positive slider bar switch design, assures positive electrical contact and wipes the contact surface of contaminants
- Choice of three contact arrangements



8041-00



8145-00

- Heavy-duty synchronous design drive motor
- Adjustable frequency of defrost initiation from 1 to 6 cycles per day with a minimum of 4 hours between successive operations
- Adjustable defrost cycle from 4 to 110 minutes in 2 minute increments
- Accuracy of defrost duration is +/- 2 minutes
- Enclosure construction of heavy-duty steel with knockouts on the bottom, back and sides. Hasp and staple for padlock is part of the enclosure

### Applications

- Defrost controls for commercial freezers and refrigerators



Models			
Model Number		Time Initiated, Time Terminated	Time Initiated, Temperature or Pressure Terminated
120V AC	208/240V AC		
8041-00	8041-20	•	
8045-00	8045-20	•	
8047-00	8047-20	•	
8141-00	8141-20		•
8143-00	8143-20		•
8145-00	8145-20		•



## ERC-2 Electronic Refrigeration Control

The ERC-2 Electronic Refrigeration Control is a microprocessor-based electronic controller designed to manage both the temperature and the defrost functions of a commercial refrigeration unit.

### Features

- Real-time clock for defrost control
- Integrated control
- Temperature control function
- Defrost control function
- 4 relay outputs 120-240V AC 50/60 Hz
- Compressor
- Defrost
- Evaporator fan
- Alarm
- Digital display module
- Keypad programming
- Two temperature sensors (supplied)
- Terminate defrost cycle
- Refrigeration cycle
- Safe Mode Operation
- Continues operation based on performance average in the event sensor fails
- Power Failure Recovery
- All settings retained in memory
- Time-of-day carried over for 100 hours



### Input Power

120/208-240V AC, 50 or 60 cycles

**C** **UL** **US** recognized component

NSF certified

Rating equivalent to UL and CSA



# ETC Electronic Temperature Control

These controls offer a fully-featured electronic replacement for electrical-mechanical temperature controls used in many commercial refrigeration applications. With its wide temperature range, one- and two-stage capability, selectable heating/cooling modes and multi-voltage input, the ETC is designed to provide application flexibility. Models available include 120/208-240V AC and 24V AC, as well as single stage and two stage.

## Features

- Wide temperature range (-30°F to 220°F)
- Wide differential adjustment (1°F to 30°F)
- LCD read-out for sensor temperature, control settings, and relay status
- High amp output relay (FLA 16 Amps @ 120V and 8 Amps @ 208/240V AC) single stage
- EEPROM memory retains control settings during power outages
- Keypad lockout to prevent end-user alteration of settings
- Extend 8 ft. lead with sensor up to 400 ft. using 18 or 22-gauge thermostat wire
- Easy 4-step set-up
- Heavy-duty relay 1hp rated
- Selectable °F or °C heating/cooling modes
- Single and two-stage models
- NEMA 1 case and cover
- NEMA 4X models available

## Applications

- Walk-in and reach-in refrigerators
- Milk coolers
- Refrigerated display cases
- Any refrigeration system requiring temperature control
- Staging heating/cooling



Relay Electrical Ratings				
Single Stage Models			Two Stage Models	
120V	208/240V	NO Contact	120V	208/240V
16A	8A	Full-load amps	9.8A	4.9A
96A	48A	Locked rotor amps	58.8A	29.4A
15A	8A	Resistive amps	9.8A	4.9A
1 hp	1 hp	Horsepower	1/2 hp	1/2 hp
120V	208/240V	NC Contact	120V	208/240V
5.8A	2.9A	Full-load amps	5.8A	2.9A
34.8A	17.4A	Locked rotor amps	34.8A	17.4A
5.8A	2.9A	Resistive amps	5.8A	2.9A
1/4 hp	1/4 hp	Horsepower	1/4 hp	1/4 hp

Models		
Model Number	Voltage	Stage
ETC-111000-000	120/208/240V AC	1
ETC-112000-000	24V AC	1
ETC-211000-000	120/208/240V AC	2
ETC-212000-000	24V AC	2

## Temperature Controls

Ranco O series temperature controls offer a wide selection of controls customized to allow users exact adjustments within manufacturers' limits. The Ranco O series features heavy duty plated steel frames, non-conductive covers with front-located captive cover screws, raised screw terminals for fully accessible wiring, and large easy-to-read scales.

### Specifications

Ranco O series Temperature Controls require seven revolutions of adjusting screws to span the complete operating range, affording maximum accuracy of adjustment.

### Ranges

Temperature ranges shown in the selection chart are tailored to specific applications. The standard 3° to 20°F adjustable differential allows controls to be used both for air sensing at the narrow differential settings, and evaporator coil sensing at wider differential settings, while the 2°F fixed differential controls are used for close control on air-sensing applications or bulb well sensing in chillers.

The 7° to 55°F differential is provided for coil sensing on wide temperature difference coils in medium temperature applications. Manual reset controls are provided for freeze protection on coils and chillers.



O16 Series Specifications				
Model Number	Range (°F)	Differential (°F)	Switch	Capillary Length
<b>LOW</b>				
O16-588	-15 to 40	1.5 Fixed	SPDT	72"
<b>MEDIUM</b>				
O16-601	22.5 to 47.5	2.5 Fixed	SPDT	36" with 3/8 x 6" Remote Bulb
O16-111	0 to 55	3 to 20		72"
O16-104				72" with Remote Bulb
O16-264				96"
O16-263				Manual Reset



O10 Series Specifications				
Model Number	Range (°F)	Differential (°F)	Switch	Capillary Length
<b>EXTRA LOW</b>				
O10-1000	-55 to 0	3 to 20	SPST - Opens Low	72"
O10-1419	-35 to 15			72" with Remote Bulb
O10-1433				72" with Remote Bulb
<b>LOW</b>				
O10-1072	-15 to 40	3 to 20	SPST - Opens Low	72" with Remote Bulb
O10-1408				72" with Remote Bulb
<b>MEDIUM</b>				
O10-1416	0 to 55	3 to 20	SPST - Opens Low	72"
O10-1418				Air Coil
O10-1409				72" with Remote Bulb
O10-1010		7 to 55		48"
O10-1473		2 Fixed		72" with Remote Bulb
O10-1490				72" with Remote Bulb
<b>HIGH</b>				
O10-1802	25 to 75	3 to 20	SPST - Opens Low	Air Coil
O10-1410				72" with Remote Bulb
O10-1491				2 Fixed

## Temperature Controls

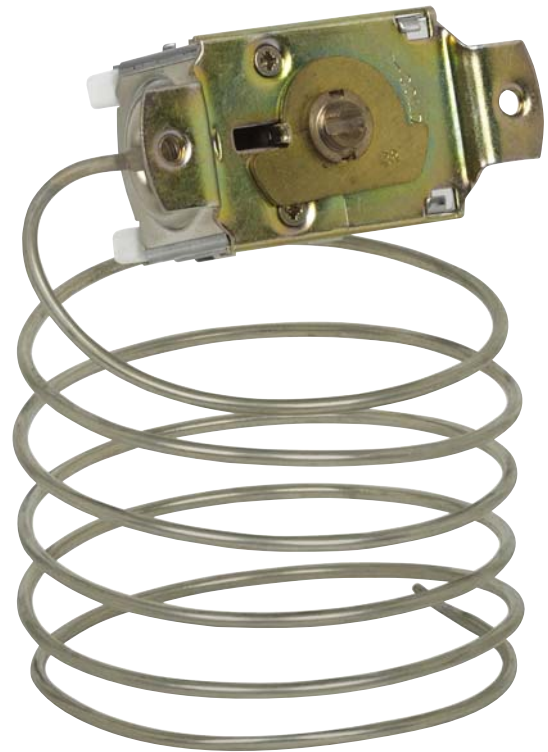
Ranco A Series Temperature Controls are designed to switch electrical components of refrigeration systems in response to sensed temperatures.

### Features

- Laser-welded stainless steel bellows
- Fixed or adjustable temperature settings
- High-amperage contacts
- Pneumatic action provided by vapor-filled capillary or capillary with bulb sensing elements
- Constant ON or OFF positions available
- Choice of mounting brackets, adjustment ranges and cams, and slotted or flatted shafts
- Standard 1/4" quick-connect terminals with optional screw terminals

### Operation

Ranco temperature controls utilize high quality, laser-welded, bellows type sensing elements that provide precise input to the control mechanism. This input, in the form of linear movement or force, is translated to electrical switch action through a set of mechanical levers and springs. The result is an accurate and reliable thermostat capable of switching high amperage circuits at an affordable price.



A22 and A30 Series Specifications											
Controls Type	Switch	Temp. Range °F	Adj. Range °F	Differential		Sensing Element Style	Voltage	AC Full Load Amps	AC Locked Rotor Amps	Pilot Duty (V AC)	Resistive Load Amps
				Min. °F	Max. °F						
A22	SPDT/ SPST	0 to 100	5 to 30	4.5	25	Capillary only or with bulb	120	20	80	500	25
							240	20	80	500	25
							277	16	60	500	-
							24	-	-	240	-
A30	SPST	0 to 100	5 to 30	5	25	Capillary only or with bulb	120	20	80	240	-
							240	20	80	240	-
							277	16	60	240	16

## Low Pressure Controls

### Features

- Controls available for all refrigerant types
- High-amp rated switch (SPST) design (O10-1402/O10-1483)
- Super Cap® capillary protection system – provides 10 times more vibration protection than control with traditional capillary designs
- Non-conductive front cover with captive screw
- Adjustable differential
- Adjustable range
- Easy-to-read scale plate
- Vibration cone (absorbs and reduces vibration away from brazed joint)
- Low mass copper alloy capillary tube (reduces capillary stress caused by equipment vibration)



### NOTE:

The **O16-624** has the range and differential required to cover all the refrigerants shown in the below matrix provided the full load amps do not exceed **17 amps**.



Specifications			
Model Number	O10-1402	O10-1483	O16-624
Range	(12") to 50 PSIG	(10") to 100 PSIG	(12") to 80 PSIG
Differential	5 to 35 PSI	10 to 40 PSI	5 to 38 PSI
Switch	SPST	SPST	SPST
Switch Action	Opens Low	Opens Low	Opens Low
Capillary Connections	36" with Flare Nut	36" with Flare Nut	36" with Flare Nut
Lowest Events	20V AC	20V AC	20V AC

Switch Rating Chart		
Model Number	O10-1402 / O10-1483	O16-624
Full Loaded Amps @ 120/240V AC	24 Amps	17 Amps
Locked Rotor Amps @ 120/240V AC	144 Amps	102 Amps
Pilot Duty Rating @ 120/240V AC	720 Volt/Amps	720 Volt/Amps



## Dual Function Pressure Controls

Ranco dual pressure controls combine the functions of a single high-pressure limit control and a single low-pressure control in one unit with a single pole, single throw (SPST) switch.

### Features

- Convertible feature allows selection of manual or reset function when operating at high pressure (O12-4833/O12-4834)
- A wide range of high-pressure manual or automatic reset controls can be replaced with either the O12-4833 or O12-4834 models
- A high-pressure limit is combined with suction pressure sensing to provide temperature control and/or pumpdown
- High-limit adjustment screw
- Low-pressure differential adjusting screw
- Low-pressure range adjusting screw
- Selector screw for manual or automatic
- Reset button
- Low-pressure scale plate
- High-impact plastic cover with center mount screw
- High-pressure scale plate
- Super Cap® capillary protection system
- Color-coded for easy identification of pressure line
- High-side capillary flare nut (silver)
- Low-side capillary flare nut (brass)



Specifications			
<b>Model Number</b>	<b>O12-4833</b>	<b>O12-4834</b>	<b>O12-1594</b>
Low Pressure Range	(12") to 50 PSIG	(10") to 100 PSIG	(10") to 100 PSIG
Differential	5 to 35 PSI	10 to 40 PSI	Fixed to 10 PSI
High Pressure Range	150 to 450 PSIG	150 to 450 PSIG	150 to 450 PSIG
Differential	Fixed @ 70 PSI drop	Fixed @ 70 PSI drop	Fixed @ 70 PSI drop
Reset, Low	-	-	Manual
Reset, High	Automatic or Manual	Automatic or Manual	Manual
Capillary Connections	48" with Flare Nut	48" with Flare Nut	36" with Flare Nut
Switch Ratings	SPST	SPST	SPST
Full load amps	120/240V AC, 24 amps	120/240V AC, 24 amps	120/240V AC, 24 amps
Locked rotor amps	120/240V AC, 144 amps	120/240V AC, 144 amps	120/240V AC, 144 amps
Pilot duty volt amps	120/240V AC, 720 VA	120/240V AC, 720 VA	120/240V AC, 720 VA



# Fan Cycle Head Pressure Controls

These components control the starting and stopping of the condenser fan motor to maintain the system head pressure. During periods of low ambient temperature (below 50°F refrigeration and 60°F air conditioning) the surrounding air removes the heat from the condenser too rapidly causing the system pressure to become unstable.

The fan cycle head pressure control corrects the system instability by cycling the condenser fan based on system pressure. This solves issues related to short cycling of the compressor, low refrigerant flow and evaporator frosting.

## Features

- Affordable solution for controlling head pressure
- Model O10-2054 offers high amp contacts, handling most load requirements
- Model O16-108 offers SPDT design, ideal for:
  - Fan cycling control
  - High-limit control with alarm (unused terminal can be wired to an alarm to signal a high-pressure cut-out)



Specifications		
Model Number	O10-2054	O16-108
Range	100 to 400 PSIG	100 to 400 PSIG
Differential	40 to 150 PSI	40 to 150 PSI
Capillary	36" with flare nut	36" with flare nut
Switch Ratings	SPST	SPST
Full load amps	120/240V AC, 24 amps	120/240V AC, 17 amps
Locked rotor amps	120/240V AC, 144 amps	120/240V AC, 102 amps
Pilot duty volt amps	120/240V AC, 720 VA	120/240V AC, 720 VA
High Amp Switch	Direct Load	

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