

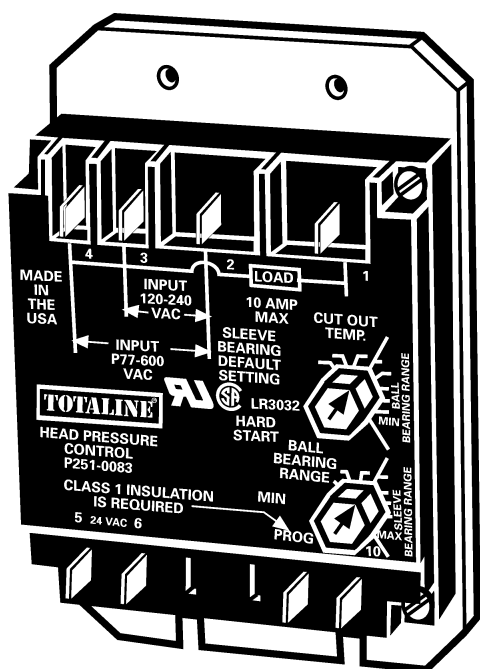
# TOTALINE® PROTECTION CONTROLS

## SOLID STATE HEAD PRESSURE CONTROL WITH OPTIONAL HEAT PUMP OVERRIDE

**Head Pressure Controls** — Temperature sensitive fan motor control which regulates head pressure at low ambients by varying the air volume through the condenser. Its unique construction permits exceptionally quick response times to changes in liquid line temperatures.

P/N	DESCRIPTION	VOLTAGE	APPLICATION
P251-0083H	HPC w/optional HP override	120-480 VAC	<ul style="list-style-type: none"> <li>Ideal for low ambient conditions found in: <ul style="list-style-type: none"> <li>Supermarkets - Frozen Storage</li> <li>Computer rooms</li> <li>Temperature/ Humidity Sensitive Environments</li> </ul> </li> </ul>
P251-0094H	Line Voltage HPC w/Optional HP Override	120 or 240 VAC	
P251-0095H	Line Voltage HPC w/Optional HP Override	480 VAC	
P251-0083C	HPC (Canada)	120-600 VAC	

P/N: P251-0083H

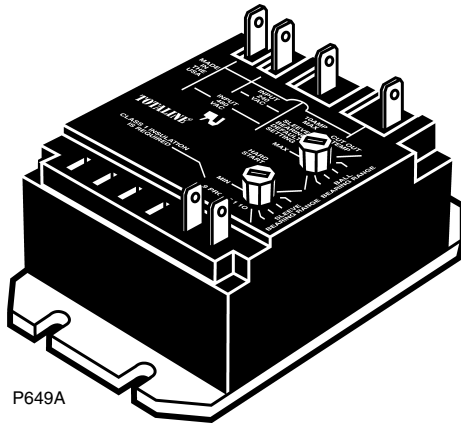


FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>Integral Heat Pump Bypass circuitry allows electronic bypass of speed control during heat pump operation.</li> <li>Eliminates overshoots common to on/off and pressure switch controls.</li> <li>Helps prevent evaporator freeze-ups, low pressure cut-outs and liquid-slugged compressors in low ambient conditions.</li> <li>One model covers 120-480 VAC.</li> <li>Features: hard start, low temperature cutoff, high temperature bypass, isolated 24 VAC supply.</li> <li>Controls up to 3 refrigerant circuits.</li> <li>Typical application: heat pumps.</li> </ul>	<p>Input</p> <ul style="list-style-type: none"> <li>Control: 18-30 VAC</li> <li>Line Input: 120-480 VAC</li> </ul> <p>Output</p> <ul style="list-style-type: none"> <li>Triac <ul style="list-style-type: none"> <li>max: 10 amps</li> <li>min: 100 ma</li> </ul> </li> <li>Range: 120-480 VAC</li> </ul>	<p>One Totaline model replaces:</p> <ul style="list-style-type: none"> <li>Hoffman: 800/800A/800AA/814-50</li> <li>Ranco: E31 Series</li> <li>Johnson Controls: P66</li> <li>ACT: FM2000</li> </ul>

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# TOTALINE® PROTECTION CONTROLS

## LINE VOLTAGE HEAD PRESSURE CONTROL WITH OPTIONAL HEAT PUMP OVERRIDE



P649A

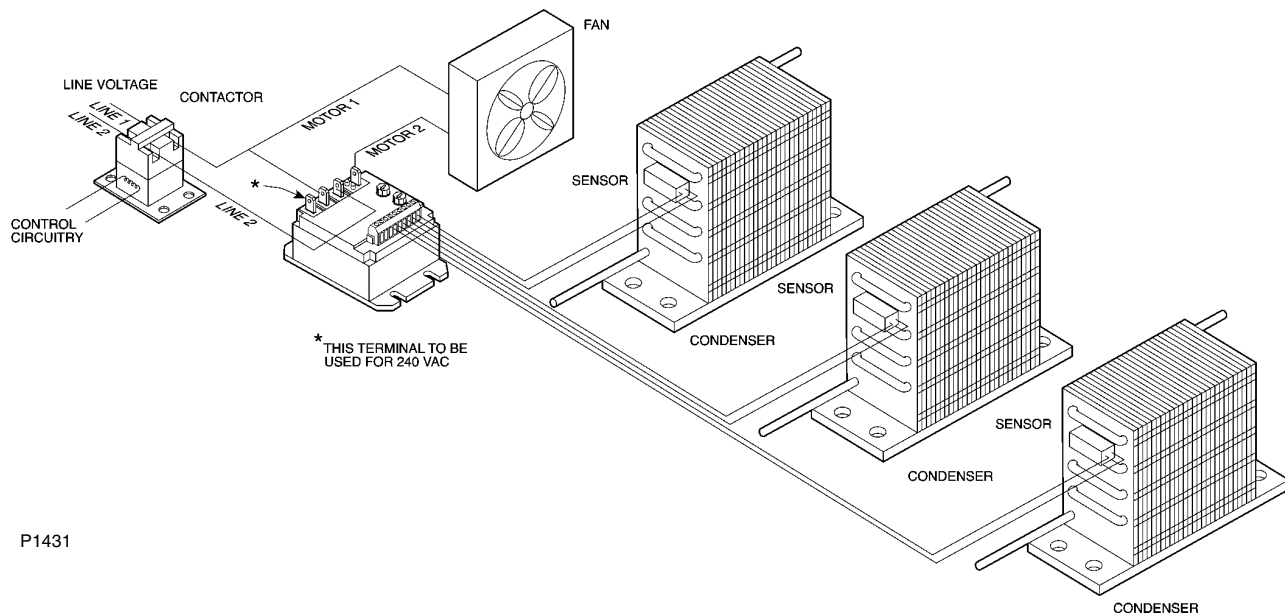
P/N: P251-0094H/P251-0095H

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>Built-in transformer eliminates cost, reduces installation time and simplifies wiring. Direct set up from line voltage.</li> <li>Helps prevent evaporator freeze-ups, low pressure cut-outs and liquid-slugged compressors in low ambient conditions.</li> <li>Features: hard start, low temperature cutoff, high temperature bypass, isolated 24 VAC supply is built into the control.</li> <li>Mechanical dimensions: 4.5" l x 3" w x 2" h.</li> <li>Ideal for heat pumps, line voltage air conditioning and refrigeration.</li> </ul>	<p>Input</p> <ul style="list-style-type: none"> <li>Frequency: 50/60 Hz</li> </ul> <p>Power Consumption: 4 VA @ 24 VAC</p> <p>Output</p> <ul style="list-style-type: none"> <li>Type: triac</li> <li>Output Voltage: P251-0094H: 120 or 208/240 VAC P251-0095H: 480 VAC</li> <li>Output Current: max: 10 amps min: 100 ma</li> </ul>	<ul style="list-style-type: none"> <li>Hoffman: 800/800A/800AA/814-50</li> <li>Ranco: E31 Series</li> <li>Johnson Controls: P66</li> </ul> <p>Integral transformer reduces inventory.</p>

### TYPICAL SYSTEM DIAGRAM FOR P251-0094H

Single unit controls up to 3 refrigerant circuits on a single remote condenser.

P/N: P251-0094H



P1431

# TOTALINE® PROTECTION CONTROLS

## MONITORS

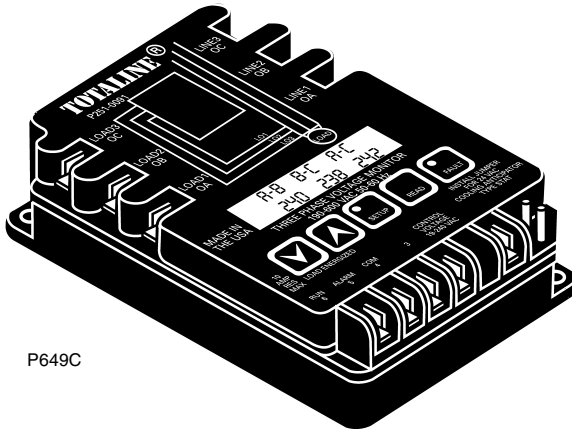
Designed to protect motors and other loads from premature failure and damage due to common voltage faults such as voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling.

P/N	DESCRIPTION	VOLTAGE
P251-0092	Single Phase Line	95-270
P251-0090	Three Phase	190-630
P251-0091	Programmable Three Phase	190-630

P/N	DESCRIPTION	VOLTAGE
P251-0030	Low Cost Three Phase	190-600
P251-0031	Low Cost Three Phase	190-600

### THREE PHASE PROGRAMMABLE MONITOR

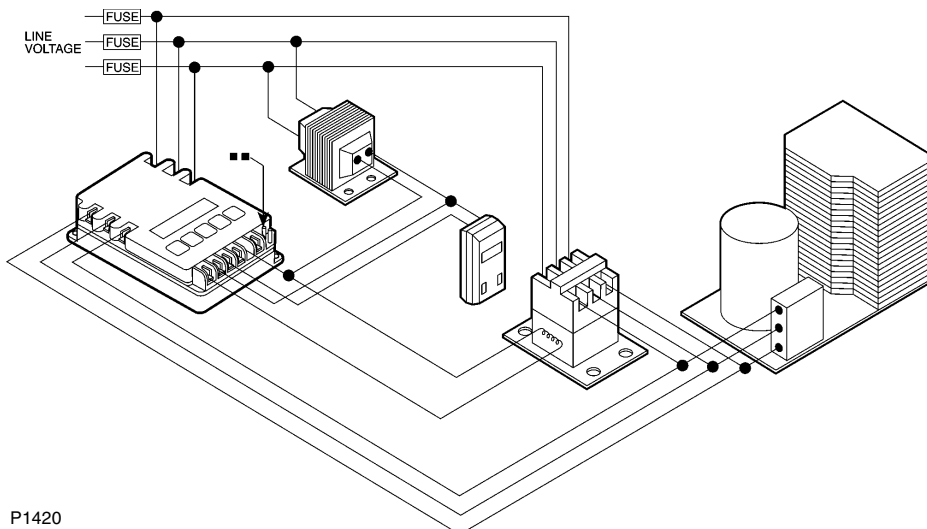
P/N: P251-0091



P649C

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>Monitors front and back side of system.</li> <li>Programmable- 25-fault memory storage.</li> <li>Independent high/low voltage settings for dual voltage compressor applications.</li> <li>Identifies front &amp; back side faults.</li> <li>High temperature LCD to 167° F.</li> <li>190-630 VAC operation.</li> <li>Simultaneous voltage display- no scrolling.</li> <li>Line voltage programmable.</li> <li>Reset- auto or manual.</li> <li>Non-volatile memory.</li> <li>Monitors: voltage unbalance, high/low voltage, phase loss, reversal, incorrect sequencing, rapid short cycling.</li> <li>Does not require control voltage for operation.</li> </ul>	<p>Input:</p> <ul style="list-style-type: none"> <li>Voltage: 190-630 VACI</li> <li>Frequency: 50/60 Hz</li> <li>Voltage Unbalance: adj. 2-25%</li> <li>Control: 18-240 VAC</li> <li>Frequency: 50/60 Hz</li> </ul> <p>Output:</p> <ul style="list-style-type: none"> <li>Relay, SPDT n.o.: 10 amps n.c.: 6 amps</li> </ul>	<ul style="list-style-type: none"> <li>Diversified: AC-2020 AC-301, 302</li> <li>Motorsaver: 455</li> <li>SSAC: QLM/QLV</li> <li>TimeMark: 265</li> <li>Wagner: WPC-800</li> <li>Watsco: EAC-800, EAC-8000</li> </ul>

### TYPICAL SYSTEM DIAGRAM FOR P251-0091

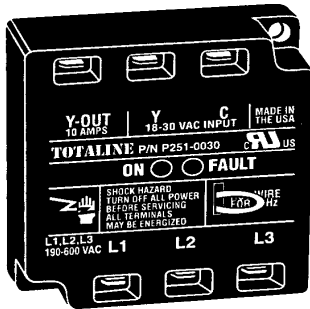


P1420

# TOTALINE® PROTECTION CONTROLS

## THREE PHASE LINE VOLTAGE MONITOR

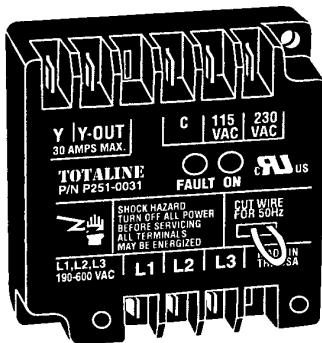
P/N: P251-0030



P2510030

FEATURES/APPLICATION	SPECS
<ul style="list-style-type: none"> <li>• Low cost, single side 3-phase protection</li> <li>• Bright LED indications for faults and loads energized</li> <li>• Easy to install, no adjustments</li> <li>• Wide operating range: 190-600 VAC</li> <li>• Less than 1 second phase loss response</li> <li>• Automatic reset from a fault condition</li> <li>• Compact packaging: fits almost anywhere</li> <li>• Rugged, epoxy-encapsulation for extreme conditions</li> <li>• Works great with the Totaline P251-0091 for load side monitoring of part winding start and multiple compressor systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Line Voltage: 190-600 VAC</li> <li>• Frequency: 50/60 Hz</li> <li>• Control Voltage: P251-0030: 18-30 VAC P251-0031: 115-230 VAC</li> <li>• Output: Relay: SPST P251-0030: N.O. 10 amps P251-0031: N.O. 30 amps</li> <li>• Case Dimensions: 3.1" x 3.2" x 1.4" h</li> </ul>

P/N: P251-0031



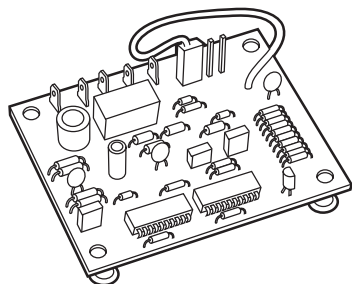
P2510031



# TOTALINE® PROTECTION CONTROLS

## DEFROST CONTROLS

P/N: P284-2590



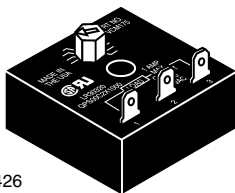
P1432

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"><li>• Direct replacement for OEM type 621.</li><li>• Low cost, time/temperature defrost.</li><li>• 24 VAC operation (18-30 VAC).</li><li>• 10 min. defrost interval.</li><li>• Pin-selectable interval times (30/60/90).</li><li>• Test pins reduce test time by 256x.</li><li>• HOLD input accumulates actual compressor run times.</li><li>• Sensor input for defrost terminate.</li><li>• Conformally coated.</li></ul>	<ul style="list-style-type: none"><li>• 18-30 VAC</li><li>• 50/60 Hz</li><li>• Relay output</li><li>• Form: SPST n.o. 2 amps</li><li>• Defrost: 10 min. fixed</li><li>• Interval times: pin-selectable 30/60/90 min.</li></ul>	<ul style="list-style-type: none"><li>• Amana C6431001</li><li>• Arco 343214</li><li>• Avion DFT100</li><li>• Coleman 30130B3741</li><li>• HeilQuaker</li><li>• ICM DFOS</li><li>• Intertherm 6208800</li><li>• Janitrol B12260-06</li><li>• Lennox 33G950</li><li>• Ranco DT2-1000</li><li>• Rheem-Ruud 47-21776-02-00</li><li>• Snyder General 1052757, 1395-329</li><li>• Weatherking 840-4-5548</li></ul>

## BYPASS TIMER

P/N: P284-2397

Designed to bypass a control or device during startup. Typically used to bypass a low pressure switch during compressor heat pump startup or to bypass an oil pressure switch upon startup. Helps to eliminate nuisance lockouts.



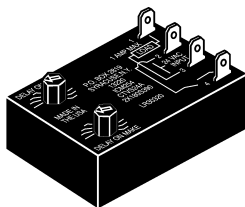
P1426

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"><li>• Designed to bypass a low pressure switch or other device during startup.</li><li>• Ideal for low ambient startups.</li><li>• Integral component for "winter start" kits.</li><li>• Helps to reduce nuisance lockouts.</li><li>• Universal AC voltage operation.</li><li>• Knob-adjustable time delays.</li><li>• Epoxy-encapsulated circuitry.</li></ul>	<ul style="list-style-type: none"><li>• 18-240 VAC</li><li>• 1 amp</li><li>• 10 amp inrush</li><li>• knob-adjustable time delays: 10-1,000 sec.</li></ul>	<ul style="list-style-type: none"><li>• Mars: 32395</li><li>• Supco: TDP68</li></ul>

## POST PURGE FAN DELAY TIMER

Controls the circulating fan in heat pump, air conditioning and forced air systems. OFF delay timing function continues to run the fan at the end of the heating/cooling cycle, thereby purging ducts of residual air and increasing system efficiency.

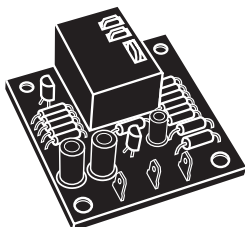
P/N: P284-2395



P1427

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"><li>• UL 873 Recognition.</li><li>• Post-Purge Fan Delay Timer.</li><li>• OFF Delay purges ducts of Residual Air at the end of the heating/cooling cycle.</li><li>• Interrogation delay eliminates nuisance trips due to thermostat bounce/tampering.</li></ul>	<ul style="list-style-type: none"><li>• 18-30 VAC</li><li>• 1 amp</li><li>• 10 amp inrush</li><li>• SPST, N.O.</li></ul> <p>Time Delays</p> <ul style="list-style-type: none"><li>• fixed or adj.: ON: 1-180 sec. OFF: 12-390 sec.</li></ul>	<ul style="list-style-type: none"><li>• MARS: 32393</li><li>• Gemline 1C216</li></ul>

P/N: P284-1216



P1428

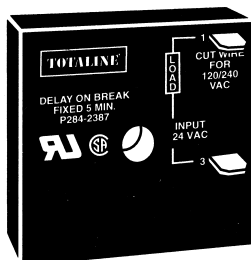
FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"><li>• Low cost open board design.</li><li>• High power, relay output.</li><li>• Dual function fan delay timer.</li><li>• Controls the circulating fan in heat pump, A/C and forced air systems.</li><li>• OFF delay purges ducts of residual air.</li><li>• ON delay allows air to reach the proper comfort level prior to energizing the fan.</li></ul>	<p>Input: 18-30 VAC</p> <ul style="list-style-type: none"><li>• N.O.-20 amps @ 240 VAC</li><li>• N.C.-10 amps @ 240 VAC</li></ul> <p>Time Delays</p> <ul style="list-style-type: none"><li>• Fixed at: ON: 1 sec. OFF: 60 sec.</li></ul>	<ul style="list-style-type: none"><li>• EMI</li><li>• Watsco AHBC-060 AHBC-090</li></ul>

# TOTALINE® PROTECTION CONTROLS

## DELAY-ON-BREAK TIMERS

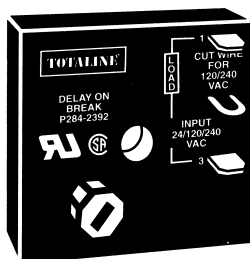
Helps to protect air conditioning, refrigeration and heat pump equipment from damage which may be caused by the rapid short-cycling of compressor.

P/N: P284-2387



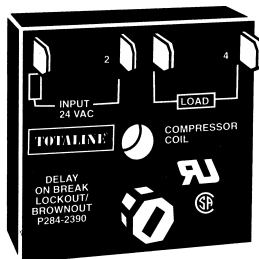
P651

P/N: P284-2392



P652

P/N: P284-2390

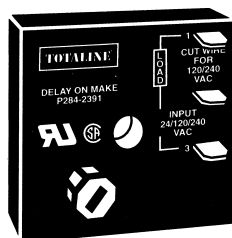


P654

## DELAY-ON-MAKE TIMER

General purpose "delay on make" timing function. Ideal for compressor staging and stagger-starting multiple units. Helps to reduce power surges in multiple compressor applications.

P/N: P284-2391



P653

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>Higher 1.5 amp power rating.</li> <li>Compressor lockout/anti-short cycle timer.</li> <li>Helps to protect compressors from damage caused by rapid short cycling.</li> <li>Simple, 2-wire hookup.</li> <li>Compact 2" x 2" package.</li> <li>Model with 6" wire leads shown at left.</li> </ul>	<ul style="list-style-type: none"> <li>18-30 VAC</li> <li>1.5 amps</li> <li>15 amp inrush</li> <li>3 or 5 min. fixed time delays</li> <li>Voltage drop: 3.5 V typical 4.5 V max</li> </ul>	<ul style="list-style-type: none"> <li>Diversified: ASC-500, 501, ASC-502 ASC-505-5</li> <li>Gemline: IC321, IC322</li> <li>Watsco: EAC-500 EAC-501-180-W EAC-501-300-W</li> </ul>

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>Universal voltage operation.</li> <li>Higher 1.5 amp power rating.</li> <li>Compressor lockout/anti-short cycle timer.</li> <li>Helps to protect compressors from damage caused by rapid short cycling.</li> <li>Simple, 2-wire hookup.</li> <li>Compact 2" x 2" package.</li> </ul>	<ul style="list-style-type: none"> <li>18-240 VAC</li> <li>1.5 amps</li> <li>15 amp inrush</li> <li>knob-adjustable delays .03-10 min. (1.8-600 seconds)</li> <li>Voltage drop: 3.5 V typical 4.5 V max</li> </ul>	<ul style="list-style-type: none"> <li>Diversified: ASC-500, 501, ASC-502 ASC-505-5</li> <li>Gemline: IC320</li> <li>Mars: 32392</li> <li>Robertshaw: 3310-072</li> <li>Supco: TD-73</li> <li>Watsco: EAC-501-ADJ. EAC-501-ADJ.-X</li> </ul>

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>UL 873 recognition as compressor controller.</li> <li>Help to prevent scroll compressors from reversing.</li> <li>Fast response time: 16 ms.</li> <li>Compressor lockout/anti-short cycle timer.</li> <li>Prevents low voltage starts.</li> <li>Eliminates relay chatter due to thermostat bounce or tampering.</li> <li>Works with anticipator-type thermostats.</li> <li>Patented: U.S. Patent No. 4,991,049.</li> </ul>	<ul style="list-style-type: none"> <li>18-30 VAC</li> <li>1.5 amps</li> <li>15 amp inrush</li> <li>3 or 5 min. fixed or 10 min. adjustable time delays</li> </ul>	<ul style="list-style-type: none"> <li>Gemline: IC243</li> <li>Mars: 32381/32382</li> <li>Supco: TL243, TL245</li> <li>Robertshaw: 3310-183 3310-305</li> <li>Watsco: EAC-511 EAC-426-180 EAC-426-300 EAC-426-ADJ.</li> </ul>

FEATURES/APPLICATION	SPECS	REPLACES
<ul style="list-style-type: none"> <li>Universal voltage operation.</li> <li>Higher 1.5 amp power rating.</li> <li>Knob-adjustable time delays.</li> <li>Work with anticipator-type thermostats.</li> <li>One model replaces many in field.</li> <li>Ideal for compressor staging.</li> <li>Simple 2-wire hookup.</li> <li>Compact 2" x 2" package.</li> </ul>	<ul style="list-style-type: none"> <li>18-240 VAC/VDC</li> <li>1.5 amps</li> <li>15 amp inrush</li> <li>SPST, N.O.</li> <li>Adjustable delays -.03-10 min. (1.8-600 sec.)</li> <li>Voltage drop: 2.5 V @ 1.5 amps</li> </ul>	<ul style="list-style-type: none"> <li>Diversified: AC-800 fixed volt: ASC-600/601</li> <li>Gemline: IC310/ IC213</li> <li>Mars: 32391/32367</li> <li>Robertshaw: 3310-068</li> <li>Supco: TD-68 D-69</li> <li>Watsco: EAC-701-ADJ., -X EAC-700-A</li> </ul>

# TOTALINE® PROTECTION CONTROLS

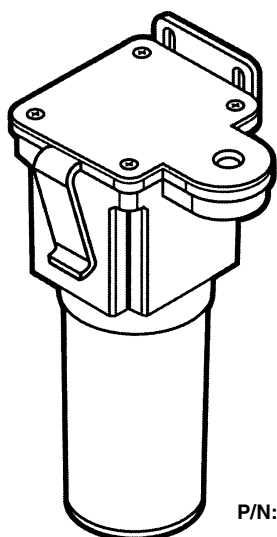
## Smart Start Kits - “Current Sensing”

By monitoring the compressor “**current**” upon start-up, the Smart Start is able to engage the hard start capacitor for precisely the correct amount of time, ensuring maximum starting torque without the risk of supplying too much current into the start winding.

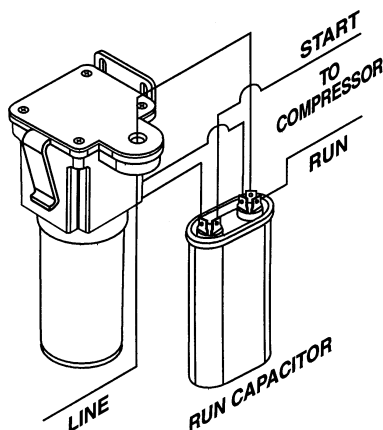
- A timed safety circuit is provided in the event the motor fails to start within 600ms.
- Current sensing Hard Start precisely increases starting torque.

P/N	HP Rating	Replaces
<b>P290-0803</b>	1/2 - 3 HP	Supco : SPP-8 Kickstart : TO-5 A-1 : WSX-1
<b>P290-0805</b>	3 - 5 HP	Kickstart : KS1
<b>P290-0810</b>	5 - 10 HP	—

- Operates from 95 - 288 VAC
- Max Input Voltage: 502 VAC
- Patented current sensing circuitry
- Self-Adjusting to voltage fluctuation
- Easy to install, 2 wires, clips or screws
- Bos starting torque
- Disengages upon start



## System Diagram



[START KITS CAN BE FOUND ON PAGE 277. CLICK HERE.](#)



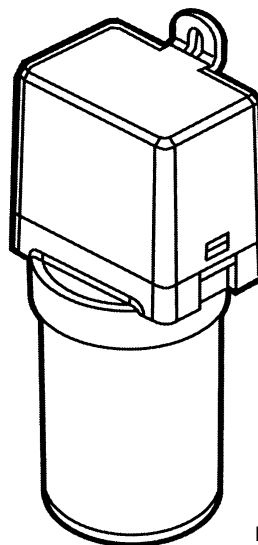
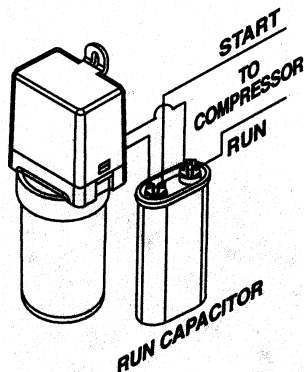
# TOTALINE® PROTECTION CONTROLS

## Smart Start Kits - “Voltage Sensing”

Products employ patented circuitry which monitors differential compressor auxiliary voltage, determines the state of the motor and precisely engages and disengages the start capacitor.

- Not Effected by Ambient temperature
- Recycles Instantly (less than 1 second)
- Multi-voltage operation - either 115 or 230 VAC

## Connection Diagram



P/N: P290-0850

P/N	Voltage	Max Input Voltage	Range	Recommended Range	Oper. Temp. Range	MFD	Voltage	Replaces
P290-0850	90-277 VAC	390 VAC	1/12 - 10 HP	1/12 - 1 HP	-40° C to + 65° C	44-52	330 capacitor	Supco : SPP-5 MARS : 32701 A-1 : WSX-5
P290-0860				1/2 - 1 HP		88-106		Supco : SPP-6 MARS : 32703 A-1 : WSX-6

Ideally suited for:

- Water Coolers
- Vending Machines
- Household Refrigerators (115 or 230 VAC)
- Commercial Refrigeration (115 or 230 VAC)
- Air Conditioners and Heat Pumps

# TOTALINE® PROTECTION CONTROLS

## TOTALINE® 3-PHASE HEAD PRESSURE CONTROLS

The Totaline P251-0096, P251-0097 3-Phase Head Pressure Controls are application specific three phase frequency inverters designed to regulate head pressure at low ambient conditions by varying the amount of airflow through the condenser, which helps to ensure sufficient pressure across the expansion valve and prevent costly downtime.

### Advantages:

- True sine wave output.
- Eliminates harmonic resonance.
- Works with standard 3-phase motor (no need to purchase expensive inverter grade motors).
- Quick installation (no need to program around noisy harmonic frequencies).
- Easy to program.
- Large LCD readout.
- Weatherproof enclosure.
- Coast feature (allows fan to continue running at minimum frequency setting).

### Power Ratings:

- **P251-0096** — 240 VAC, 1-3 Hp
- **P251-0097** — 480 VAC, 1-5 Hp

### Specifications:

#### Sensor Input Type:

- Temperature
- Pressure
- 4-20 mA
- 0-10 VCD

#### Sensor Temperature:

40° F to 140° F (4° C to 60° C)

Pressure Set Point: 20 to 420 psig

#### Minimum Frequency:

- 3 to 55 Hz

#### Maximum Frequency:

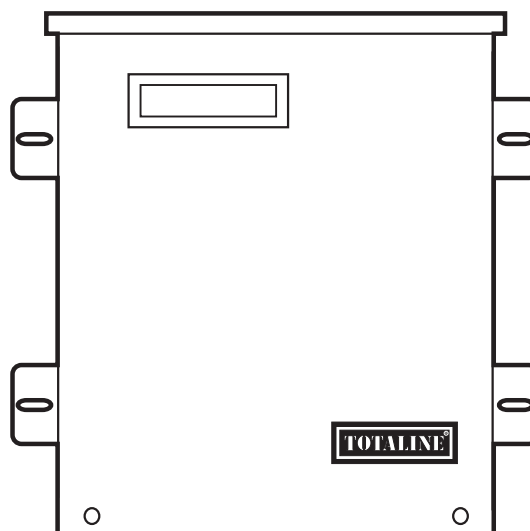
- 8 to 60 Hz

#### Current Trip:

- 4 to 24 Amps (adjustable)

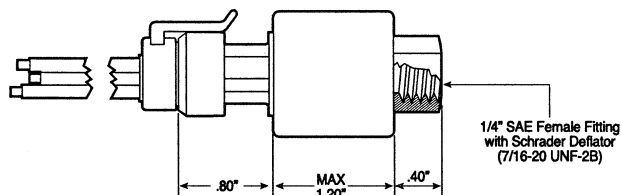
### Operating Characteristics:

- Input Voltage:
  - 240 VAC — P251-0096
  - 480 VAC — P251-0097
- Maximum Operating Temperature: 70° C



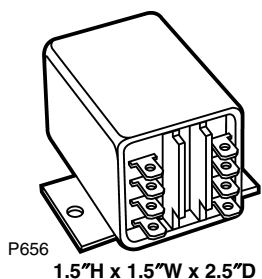
P4277

### Optional Totaline P251-0098 Pressure Transducer:

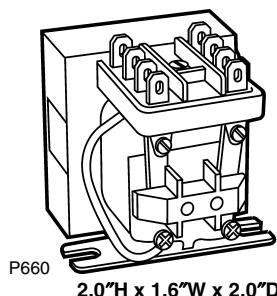


# HEAD PRESSURE CONTROL TIMING DEVICES

## TIME DELAY RELAYS



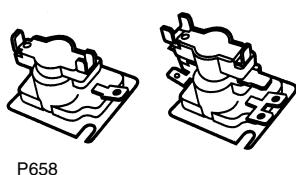
- SOLID STATE
- MUST BE MOUNTED
- WITH TERMINALS AT
- SIDE OR BOTTOM
- 3/16 IN. QUICK CONNECTS
- AIR-0-TRONICS TYPE TDS
- CONTACT ARRANGEMENT DPDT
- CONTACT RATING (FLA):  
INDUCTIVE - 120/240 V-5A  
RESISTIVE - 120/240 V-10A



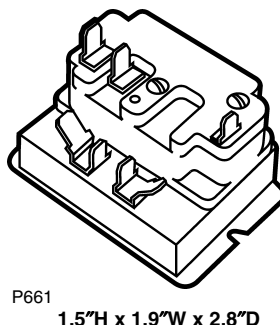
- SOLID STATE
- MUST BE WALL OR CEILING MOUNTED
- 3/16 IN. QUICK CONNECTS
- SYRACUSE ELECTRONICS TYPE TI-19
- CONTACT ARRANGEMENT DPDT
- CONTACT RATING (FLA):  
INDUCTIVE - 120/240 V-5A  
RESISTIVE - 120/240 V-10A

TIME DELAY ON (SEC)	OPERATING VOLTS	P/N
60	240	HN67SK003
90	120	HN67SK007

TIME DELAY ON (SEC)	OPERATING VOLTS	P/N
1.5	120	HN67FK001
1.5	240	HN67FK002



- SNAP ACTING
- MOUNTS IN ANY POSITION
- 1/4 IN. QUICK CONNECTS
- KLIXON TYPE 600
- CONTACT RATING: RESISTIVE - 120/240 V-30A
- COMBINATION CONTACT RATING (RESISTIVE LOAD AND BLOWER MOTOR LOAD IN SERIES WITH RELAY CONTACTS):  
INDUCTIVE - 120/240 V-7A  
RESISTIVE - 120/240 V-23A



- SNAP ACTING
- MAY BE MOUNTED IN ANY POSITION
- AMBIENT COMPENSATED
- FOR -40° F TO 200° F & 1/4 IN. QUICK CONNECTS
- CAMSTAT TYPE S106
- OPERATING VOLTS: 24
- CONTACT RATING (FLA):  
INDUCTIVE - 120 V-13.8A  
INDUCTIVE - 240 V-8A  
RESISTIVE - 120/240 V-25A  
HN67ER032, 033 - 25 VA @ 24 V

TIME DELAY (SEC)		OPERATING VOLTS	CONTACT* ARR.	P/N
ON	OFF			
35-70	15-30	24	SPST	40CF680020
1-24	45-75	24	DPST	40CF680021
25	130-300	240	SPST	HN67GA032
1-20	40-90	24	DPST	HN67QC005
30-90	1-30			
20-70	30-130	24	SPST	HN67EA032**†

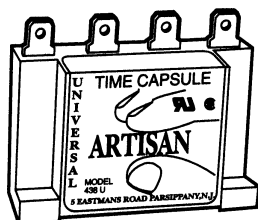
TIME DELAY (SEC)		CONTACT* ARR.	P/N
ON	OFF		
30	60	SPDT	HN67ER032
65	25	SPDT	HN67ER033

\*See contact arrangement diagrams in relay application data section.

\*See contact arrangement diagrams in Relay Application Data section.

\*\*Inductive rating for 120/240 V is 23 FLA.

†Pilot duty rating - 60 VA @ 120/240 V, 40 VA @ 24 V.

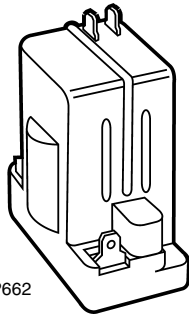


- FOR PART WIND START APPLICATIONS; WIRE IN SERIES WITH #2 CONTACTOR
- SUITABLE FOR 24-240 VOLTS
- TIME DELAY: 1.0 SECOND
- SWITCH RATING: 1 AMP
- DELAY UP TO 1000 SECONDS. CAN BE OBTAINED BY ADDING RESISTANCE BETWEEN CENTER TERMINALS; 10,000 OHMS PER SECOND OF DELAY
- MAY BE MOUNTED IN ANY POSITION

P/N: HN67ZA001

# TOTALINE® TIMING DEVICES

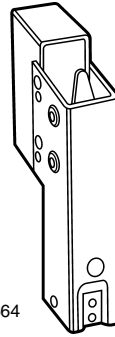
## TIME DELAY RELAYS



P662

3.5"H x 1.5"W x 2.8"D

- SOLENOID OPERATED, HYDRAULIC TIME DELAY RELAY
- BECAUSE OF HYDRAULIC DESIGN, AMBIENT FLUCTUATIONS HAVE MINIMAL EFFECT ON TIMING
- MUST BE WALL MOUNTED
- HEINEMANN TYPE C
- CONTACT RATING (FLA):  
INDUCTIVE - 120 V-3A  
INDUCTIVE - 240 V-1.5A



P664

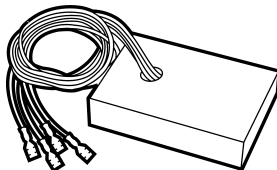
4.3"H x .8"W x 2.2"D

- USED PRIMARILY AS A FAN CONTROL
- ADJUSTABLE FOR LONGER OR SHORTER BLOWER OPERATION
- 1/4 IN. QUICK CONNECT TERMINALS
- BDP TYPE 821
- TIME DELAY (SEC):  
ON - 75  
OFF - 135
- OPERATING VOLTS: 24
- CONTACT RATING (FLA):  
INDUCTIVE - 120/240 V-15A
- CONTACT ARRANGEMENT SPST

P/N: **HN680001**

TIME DELAY ON	OPERATING VOLTS	CONTACT* ARR.	P/N
1 SEC	120	SPST	<b>HN67XZ207</b>
1 SEC	208	SPST	<b>HN67XZ212</b>
1 SEC	240	SPST	<b>HN67XZ208</b>
3 MIN	24	SPST	<b>HN67XZ210</b>
3 MIN	120	SPST	<b>HN67XZ211</b>
3 MIN	240	SPST	<b>HN67XZ209</b>

\*See contact arrangement diagrams on page 198.



P663

- SOLID STATE
- OPERATING VOLTS: 24
- LOAD CURRENT  
0.5A @ 24 V



P665

1.5"H x 1.3"W x 1.8"D

- SOLID STATE
- CIRCUITRY OF DEVICE IS CONNECTED IN SERIES WITH RELAY OR CONTACTOR COIL IT CONTROLS
- MOUNTS IN ANY POSITION
- 1/4 IN. QUICK CONNECTS
- ESSEX TYPE 133
- OPERATING VOLTS: 24
- LOAD CURRENT @ 24 V:  
0.5A
- SWITCH ARRANGEMENT SPST-N.O

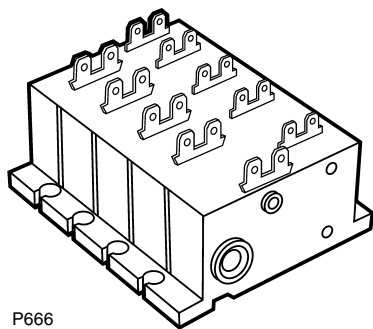
TIME DELAY OFF	P/N
15 SEC	<b>HN67SK030*</b>
60 SEC	<b>58DP680010*</b>
90 SEC	<b>HN67SK045*</b>
5 MIN	<b>HN67ZE003</b>

\*Supplied with leads.

TIME DELAY OFF	P/N
35 SEC	<b>HN67KA026</b>
60 SEC	<b>HN67KA025</b>
150 SEC	<b>HN67KA027</b>

# TOTALINE® TIMING DEVICES

## SEQUENCERS



P666

2.0"H x 3.5"W x "A" DIMENSION

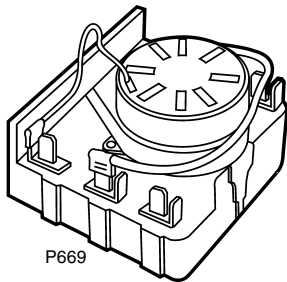
- ALL CONTACTS ARE NORMALLY OPEN
- OPERATING VOLTS: 24
- PILOT DUTY RATING OF MAIN CONTACTS IS 750 VA @ 600 VOLTS
- AUXILIARY SWITCH RATED AT 1 AMP @ 24 V (RESISTIVE)
- WHITE-RODGERS TYPE 24A50
- CONTACT RATING (FLA):  
RESISTIVE - 120/240 V - 25A  
480/600 V - 12A
- INDUCTIVE - 120 V - 16A  
240 V - 12A
- COMBINATION @ 240 V  
RESISTIVE - 20.8A  
INDUCTIVE - 5.2A

TIMING (SEC.)								“A” DIMENSION (in.)	P/N
ON TIME				OFF TIME					
MAIN SW1	MAIN SW2	MAIN SW3	AUX	MAIN SW1	MAIN SW2	MAIN SW3	AUX		
45	-	-	-	25	-	-	-	1.5	HN67680001
35	45	-	45	50	25	-	15	3.1	HN67680004
45	-	-	-	25	-	-	-	-	HN680019
18	35	-	-	90	35	-	-	-	HN680020
18	25	-	35	90	35	-	25	-	HN680022
18	35	-	35	90	35	-	25	3.1	HN67680006
18	35	-	-	90	40	-	-	2.3	HN67680007
18	-	-	18	90	-	-	90	2.3	HN67JC010

\*See contact arrangement diagrams on page 198.

# TOTALINE® TIMING DEVICES

## DEFROST TIMERS

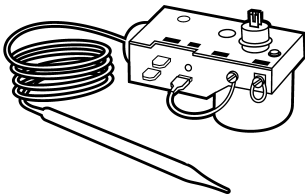


P669

3.0"H X 2.5"W X 4.0"D

- SELECT DEFROST INTERVALS OF 30, 45 OR 90 MINUTES
- OPERATION: CONTACTS 3-4 CLOSE FOR 30 SECONDS EVERY 30,45 OR 90 MINUTES. MONITORS THE DEFROST CIRCUIT TO DETERMINE IF DEFROST THERMOSTAT IS CLOSED. CONTACTS 3-5 OPEN FOR 30 SECONDS, 10 MINUTES AFTER DEFROST IS INITIATED TO PROVIDE "FAIL SAFE" RETURN TO HEATING OPERATION.
- DETAILED INSTRUCTION SHEET INCLUDED WITH TIMER
- MANUAL DEFROST FEATURE FOR SEQUENCE CHECKOUT
- OPERATING VOLTS: 208-240
- CONTACT RATING (FLA) @ 250 V: 10A
- CONTACT ARRANGEMENT SPDT
- MALLORY TYPE

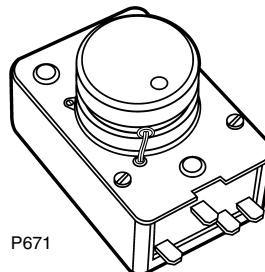
P/N: 38CQ660029



P670

2.9"H X 2.8"W X 4.2"D

- SELECT DEFROST INTERVALS OF 30, 45 OR 90 MINUTES
- OPERATION: DEFROST IS INITIATED (CONTACTS 2-1 CLOSE) WHEN BULB TEMPERATURE REACHES 26° F AND DEFROST TIME INTERVAL REACHES 30, 45, OR 90 MINUTES. DEFROST IS TERMINATED (CONTACTS 2-3 CLOSE) WHEN BULB TEMPERATURE REACHES 55° F OR AFTER 10 MINUTES HAS ELAPSED.



P671

4"H X 2.8"W X 1.5"D

- OPERATION: 60 OR 90 MINUTE CYCLE TIMERS AVAILABLE. CONTACTS 3-4 CLOSE EVERY 60/90 MINUTES FOR 20 SECONDS. CONTACTS 3-5 OPEN FOR 20 SECONDS 10 MINUTES AFTER CONTACTS 3-4 CLOSE.
- CONTACT RATING:  
INDUCTIVE - 240 V - 125VA  
RESISTIVE - 240 V - 5A
- PARAGON TYPE

- CONTACT RATING

INDUCTIVE	RESISTIVE
10A @ 120V	25A @ 120 V
10A @ 240V	25A @ 240 V
10A @ 277V	16A @ 277 V

- CONTACT RATING (FLA):  
INDUCTIVE - 120/240/277 V - 10A  
RESISTIVE - 120/240 V - 25A  
277 V -16A  
240 VA @ 120/240/277 V FOR ALL MODELS

- CAPILLARY LENGTH: 42 INCHES

- RANCO TYPE E15

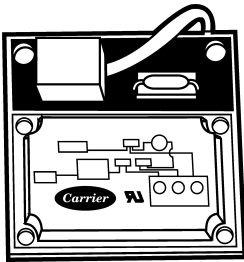
CONTACT ARR.	VOLT	HZ	P/N
SPDT	120	60	HH25UC115
SPDT	240	60	HH25UC230

CONTACT ARR.	VOLT	HZ	CYCLE (MIN.)	P/N
SPDT	120	60	60	HK25AZ098*
SPDT	120	60	90	HK25AZ092*
SPDT	208/240	60	90	HK25AZ090*

\*Superseded to HK680007.

# TOTALINE® TIMING DEVICES

## SINGLE FUNCTION TIME GUARD TIMER

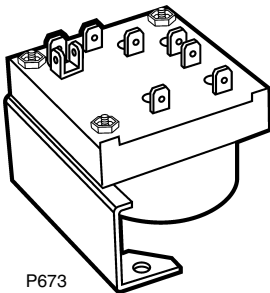
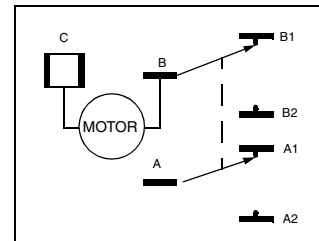
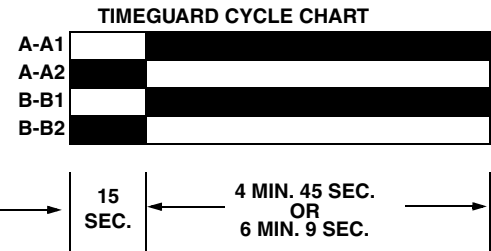


P45

3.4"H X 3.4"W X 1.7"D

- TIME GUARD II
- SOLID STATE CONTROLLED RECYCLE DELAY TIMER
- OPERATION: IN THE EVENT OF ANY POWER INTERRUPTION, TIME GUARD II PROVIDES A 5 MIN. DELAY WHICH PREVENTS RAPID CYCLING OF THE COMPRESSOR
- WIRING DIAGRAM IS PRINTED ON TIME GUARD
- OPERATING VOLTS: 24
- LOAD CURRENT @ 24 V - 1 AMP
- SWITCHING ARRANGEMENT SPST-N.O.

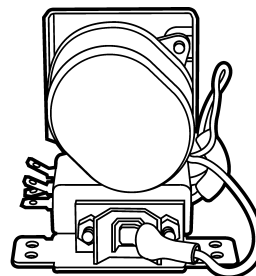
P/N: **HN67PA024**



P673

2.1"H X 2.4"W X 3.0"D

- MOTOR OPERATED
- CONTACT ARRANGEMENT DPDT
- CONTACT RATING: 125 VA
- OPERATION WHEN APPLIED IN A TIME GUARD CIRCUIT ON NORMAL START UP THE TIMER CAUSES A DELAY WHICH ALLOWS THE CONDENSER FAN TO RUN FOR 15 SEC. BEFORE THE COMPRESSOR IS ALLOWED TO START IF FOR ANY REASON, THE COMPRESSOR IS SHUT DOWN. THE TIMER WILL NOT ALLOW RESTART UNTIL SPECIFIED DELAY TIME HAS ELAPSED. SEE TIMEGUARD CYCLE CHART



P674

- MOTOR OPERATED
- RANCO TYPE T34
- CONTACT ARRANGEMENT DPDT
- CONTACT RATING (FLA):  
480 VA @ 120/240 V FOR ALL MODELS  
INDUCTIVE - 120 V - 9.8A  
INDUCTIVE - 240 V - 4.9A  
RESISTIVE - 120 V - 15A  
RESISTIVE - 240 V - 10A

- OPERATION WHEN APPLIED IN A TIME GUARD CIRCUIT ON NORMAL START UP THE TIMER CAUSES A DELAY WHICH ALLOWS THE CONDENSER FAN TO RUN FOR 15 SEC. BEFORE THE COMPRESSOR IS ALLOWED TO START IF FOR ANY REASON, THE COMPRESSOR IS SHUT DOWN. THE TIMER WILL NOT ALLOW RESTART UNTIL 4 MIN. 45 SEC. HAVE ELAPSED. SEE TIMEGUARD CYCLE CHART

DELAY TIME (MIN.)	OPERATING VOLTS	P/N
4 MIN 45 SEC	24	HK25MJ173
4 MIN 45 SEC	240	HK25MJ172
6 MIN 24 SEC	115	HK25MJ152
6 MIN 24 SEC	240	HK25MJ148

OPERATING VOLTS	P/N
24	HK25RC012
120	HK25RC011
240	HK25RC010

# TOTALINE® TIMING DEVICES

## TIME SWITCHES



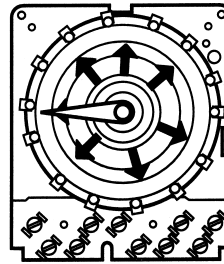
P675

12.0"H X 8.1"W X 3.9"D

- 7 DAY TIMER
- SPRING-WOUND CARRY-OVER MECHANISM TO KEEP THE TIMER ON SCHEDULE DURING A POWER FAILURE OF UP TO 16 HOURS
- MAY BE MOUNTED IN ANY POSITION
- OPERATING VOLTS: 120
- SETS OF TRIPPERS: 9

- CONTACT ARRANGEMENT (4) SPDT SWITCHES
- CONTACT RATING (FLA): 125 VA @ 24 V, 420 VA @ 120/240 V
- MOTOR - 120 V - 10A; 240 V - 5A
- LIGHTING - INDUCTIVE - 120/240 V - 15A  
TUNGSTEN - 120/240 V - 5A
- HONEYWELL TYPE S60005

P/N: **HK24FU061**



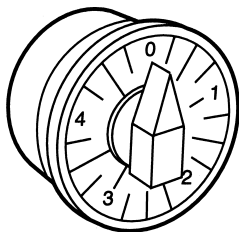
P678

8.0"H X 7.1"W X 3.9"D

- 7 DAY TIMER
- PANEL MOUNTED
- SWITCHING ARRANGEMENT  
4 POLE ... 2 POLES  
NORMALLY OPEN, 2 POLES  
NORMALLY CLOSED. ADD  
JUMPERS FOR DPDT  
SWITCHING
- MUST BE MOUNTED  
VERTICALLY
- OPERATING VOLTS: 120

- CONTACT RATING (FLA): 690 VA @ 24 V, 120/240 V  
INDUCTIVE - 120 V - 16A; 240 V - 8A  
RESISTIVE - 120/240 V - 40A
- SETS OF TRIPPERS: 7
- HONEYWELL TYPE S659

P/N: **HK24FU069**



P676

2.8"H X 2.8"W X 1.9"D

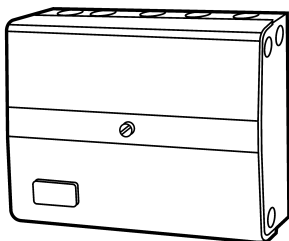
- PANEL MOUNTED MECHANICAL  
TIMER SWITCH
- 0-5 HOUR TIMING RANGE
- CIRCUIT IS BROKEN AT END OF  
TIME PERIOD ("O" MINUTES)
- SUPPLIED WITH MOUNTING  
BRACKET
- CONTACT ARRANGEMENT SPST &  
CONTACT RATING (FLA):  
RESISTIVE @ 120/240V-20A
- M.H. RHODES TYPE 71714

P/N: **HK24ZA005**

- PANEL MOUNTED MECHANICAL TIMER SWITCH
- 0-12 HOUR TIMING RANGE
- CIRCUIT IS BROKEN AT END OF TIME PERIOD  
("O" MINUTES)
- SUPPLIED WITH MOUNTING BRACKET
- CONTACT ARRANGEMENT SPDT
- CONTACT RATING (FLA): RESISTIVE @ 120/250 V -  
15A

P/N: **HK25ZZ006-115V**

## STEP CONTROLLERS



P677

- USED FOR SWITCHING  
LOADS IN A PRE-DETER-  
MINED SEQUENCE
- UNIT HAS MULTI TAPPED  
TRANSFORMER AND WILL  
ACCEPT THESE SUPPLY  
VOLTAGES: 120,208,240
- 24 VOLT CONTROL CIRCUIT
- ADJUSTABLE SWITCH  
DIFFERENTIAL
- HH82AZ091 IS NOT EQUIPPED  
WITH ENCLOSURE

NO. SWITCHES		ROT. TIMING		P/N	
8		1.5 MIN		HH82AZ209	
5		13.5 MIN		HH82AZ091	
SWITCH RATINGS (PER SWITCH)		MAX. CONNECTED LOAD (N.O. AND N.C. CONTACTS COMBINED)		MAX. CONNECTED LOAD ALL N.C. CONTACTS	
Sealed	Inrush	Resistive	Inrush	120 V	208/240 V
570 VA	5700 VA	1800 VA	10,800 VA	800 VA	1000 VA

## REPAIR PARTS FOR STEP CONTROLLER

DESCRIPTION	P/N	DESCRIPTION	P/N
• Sequence Switch .....	<b>HR64TE020</b>	• Balance Relay .....	<b>HN63DJ002</b>
• Limit. Switch.....	<b>HR54MA020</b>	• Transformer .....	<b>HT01AA247</b>
• Feedback Potentiometer .....	<b>HT24AA210</b>	• Recycle Relay:	
• Motor - 1.5 Minute .....	<b>HK25GC056</b>	Prior to Date Code 8244 .....	<b>HN61DY002</b>
• Motor - 13.5 Minute .....	<b>HK25GC057</b>	After Date Code 8249 .....	<b>HN61DY005</b>