

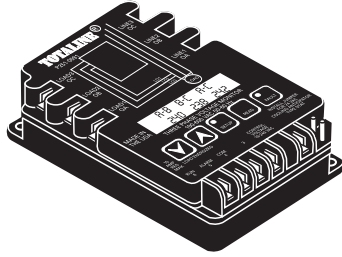
## TOTALINE® PROTECTION CONTROLS

### 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.

PART NO	VOLTS	DESCRIPTION
P251-0092-B	95-270	Single Phase Line
P251-0090	190-630	Three Phase
P251-0091	190-630	Programmable Three Phase 18-240VAC
P251-0030	190-600	Low Cost Three Phase
P251-0031	190-600	Low Cost Three Phase

### THREE PHASE PROGRAMMABLE MONITOR



PART NO
P251-0091

#### P251-0091 FEATURES / APPLICATION

- Monitors front and back side of system.
- Programmable-25-fault memory storage.
- Independent high/low voltage settings for dual voltage compressor applications.
- Identifies front & back side faults.
- High temperature LCD to 167° F
- 190-630 VAC operation
- Simultaneous voltage display-no scrolling.
- Line voltage programmable.
- Reset-auto or manual.
- Non-volatile memory.
- Monitors: voltage unbalance, high/low voltage, phase loss, reversal, incorrect sequencing, rapid short cycling.
- Does not require control voltage for operation.

#### SPECS

##### INPUT:

Voltage: 190-630VACI  
Frequency: 50/60 Hz  
Voltage Unbalance: adj. 2-25%  
Control: 18-240 VAC

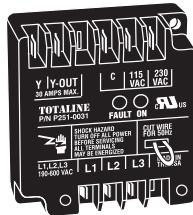
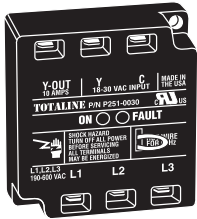
##### OUTPUT:

Relay, SPDT  
n.o.: 10 amps  
n.c.: 6 amps

##### REPLACES

Diversified: AC-2020, AC-301, 302  
Motorsaver: 455  
SSAC: QLM / QLV  
TimeMark: 265  
Wagner: WPC-800  
Watsco: EAC-800, EAC-8000

### THREE PHASELINE VOLTAGE MONITOR



#### P251-0030 & P251-0031 FEATURES / APPLICATION

- Low cost, single side 3-phase protection
- Bright LED indications for faults and loads energized
- Easy to install, no adjustments
- Wide operating range: 190-600 VAC
- Less than 1 second phase loss response
- Automatic reset from a fault condition
- Compact packaging: fits almost anywhere
- Rugged, epoxy-encapsulation for extreme conditions
- Works great with the Totaline P251-0091 for load side monitoring of part winding start and multiple compressor systems.

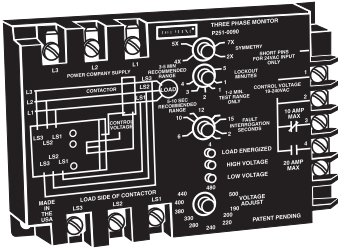
#### SPECS

Line Voltage: 190-600 VAC  
Frequency: 50/60 Hz  
Control Voltage:  
P251-0030: 18-30 VAC  
P251-0031: 115- 230 VAC  
Output:  
Relay: SPST  
P251-0030: N.O. 10 amps  
P251-0031: N.O. 30 amps  
Case Dimensions:  
3.1" x 3.2" x 1.4" h

PART NO	CONTROL VOLTAGE
P251-0030	18 - 30 VAC
P251-0031	115 - 230 VAC

## TOTALINE® PROTECTION CONTROLS

### THREE PHASE MONITOR



PART NO	CONTROL VOLTAGE
P251-0090	18 - 240 VAC

#### FEATURES / APPLICATION

- Lower cost, full performance protection.
- Monitors front and back sides of system.
- 190-630 VAC operation.
- Bright LED indicators.
- Identifies front and back side faults.
- Knob-adjustable features.
- Reset-auto or manual (1 trial).
- Built-in short cycle protection.
- Monitors: voltage unbalance, high/low voltage, phase loss, reversal, incorrect sequencing, rapid short cycling.

#### SPECS

##### Input:

Line Voltage: 190-630 VAC

Unbalance: adj. 2-25%

Control: 18-240 VAC

Frequency: 50/60 Hz

##### Output:

Relay, SPDT

n.o.: 10amps

n.c.: 6 amp

#### REPLACES

Diversified: AC-2020 AC-301, 302

Motorsaver: 455

SSAC: QLM/QLV

TmeMark: 265

Wagoner: WPC-800

WATSCO: EAC-800, EAC-8000

### SINGLE PHASE MONITOR

PART NO
P251-0092-B

#### FEATURES / APPLICATION

- Low cost single phase motor protection.
- Built-in anti-short cycle protection.
- Detects high/low voltage conditions.
- Helps prevent rapid system recycling.
- LED indicator: red for fault, green for normal conditions.
- Heavy duty SPDT, isolated relay output.
- 5-second interrogation delay prevents nuisance trips.

#### SPECS

##### Input:

Line: 95-270 VAC

##### Output:

Relay, SPDT

n.o.: 5 amps

n.c.: 5 amps

##### Time delay

Range: adj. 0-600 sec.

#### REPLACES

Diversified:

CV-100-RS

CV-200-RS15

CV-200-RS20

WATSCO:

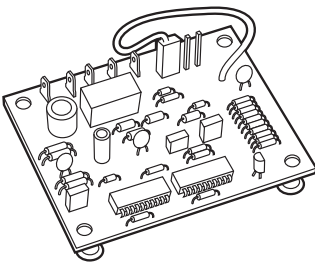
EAC-401

EAC-402

EAC-403

EAC-404

### DEFROST CONTROL



PART NO
P284-2590

#### FEATURES / APPLICATION

- Direct replacement for OEM type 621
- Low cost, time/temperature defrost.
- 24 VAC operation (18-30 VAC).
- 10 min. defrost interval. Pin-selectable interval times (30/60/90).
- Test pins reduce test time by 256x.
- HOLD input accumulates actual compressor run times.
- Sensor input for defrost terminate.
- Conformally coated.

#### SPECS

18-30 VAC

50/60 Hz

##### Output:

Relay, output

Form: SPDT

n.o.: 2 amps

Defrost: 10min. fixed

##### Time delay

Interval times:

Pin selectable

30/60/90 min.

#### REPLACES

Amana C6431001

ARCO 343214

Avion DFT100

Coleman 30130B3741

ICM DFOS

Intertherm 6208800

Janitrol B12260-06

Lennox 66G950

Ranco DT2-1000

Rheem/Ruud

47-21776-02-00

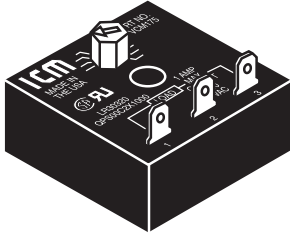
Snyder General

1052757, 1395-329

Weatherking 840-5548

## TOTALINE® PROTECTION CONTROLS

### BYPASS TIMER



**PART NO**  
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.

#### FEATURES / APPLICATION

- Designed to bypass a low pressure switch or other device during startup.
- Ideal for low ambient startups. Integral component for “winter start” kits.
- Helps to reduce nuisance lockouts.
- Universal AC voltage operation.
- Knob-adjustable time delays.
- Epoxy-encapsulated circuitry.

#### SPECS

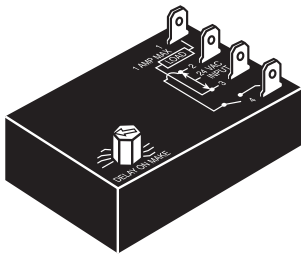
18-240 VAC  
1 Amp  
10 Amp inrush  
Knob-adjustable time  
Delays: 10-1,000 sec.

#### REPLACES

Mars: 32395  
Supco: TDP68

### 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.



**PART NO**  
P284-2395

#### FEATURES / APPLICATION

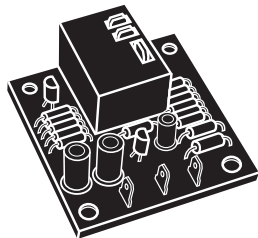
- Designed to bypass a low pressure switch or other device during startup.
- Ideal for low ambient startups. Integral component for “winter start” kits.
- Helps to reduce nuisance lockouts.
- Universal AC voltage operation.
- Knob-adjustable time delays.
- Epoxy-encapsulated circuitry.

#### SPECS

18-30 VAC  
1 Amp  
10 Amp inrush  
SPST, N.O.  
Time Delays: fixed or adj  
ON: 1-180 sec.  
OFF: 12-390 sec.

#### REPLACES

Mars: 32393  
Gemline: 1C216



**PART NO**  
P284-1216

#### FEATURES / APPLICATION

- Low cost open board design.
- High power, relay output.
- Dual function fan delay timer.
- Controls the circulating fan in heat pump and A/C and forced systems.
- OFF delay purges ducts of residual air.
- ON delay allows air to reach the proper comfort level prior to energizing the fan.

#### SPECS

Input: 18-30 VAC  
N.O. -20 amps @240 VAC  
N.C. - 10 amps @240 VAC  
Time delays fixed at:  
ON: 1 sec.  
OFF: 60 sec.

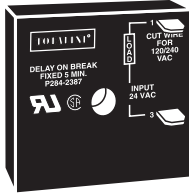
#### REPLACES

EMI  
WATSCO:  
AHBC-060  
AHBC-090

## 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.



**PART NO**  
P284-2387

#### FEATURES / APPLICATION

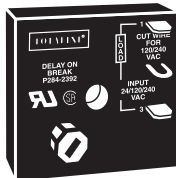
- Higher 1.5 amp power rating.
- Compressor lockout/anti-short cycle timer.
- Helps to protect compressors from damage caused by rapid short cycling
- Simple, 2-wire hookup.
- Compact 2" x 2" package.

#### SPECS

Input: 18-30 VAC  
1.5 amps  
15 amp inrush  
Voltage drop  
3.5 V typical  
4.5 V max

#### REPLACES

Diversified:  
ASC-500, SC 501,  
SC 505-5  
Gemline: IC321, IC322  
WATSCO: EAC-500,  
EAC501-180-W,  
EAC501-300-W



**PART NO**  
P284-2392

#### FEATURES / APPLICATION

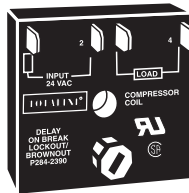
- Universal voltage operation.
- Higher 1.5 amp power rating.
- Compressor lockout/anti-short cycle timer.
- Helps to protect compressors from damage caused by rapid short cycling.
- Simple, 2-wire hookup.
- Compact 2" x 2" package.

#### SPECS

Input: 18-240 VAC  
1.5 amps  
15 amp inrush  
Voltage drop  
3.5 V typical  
4.5 V max  
knob adjustable delays  
.03-10 min

#### REPLACES

Diversified: ASC-500,  
ASC 501 ASC502,  
ASC 505-5  
Gemline: IC320  
WATSCO: EAC501-ADJ,  
EAC501-ADJ-X  
MARS: 32392  
Robertshaw: 3310-072  
Supco: TD-73



**PART NO**  
P284-2390

#### FEATURES / APPLICATION

- UL 873 recognition as compressor controller.
- Help to prevent scroll compressors from reversing.
- Fast response time: 16 ms.
- Compressor lockout/anti-short cycle timer.
- Prevents low voltage starts.
- Eliminates relay chatter due to thermostat bounce or tampering.
- Works with anticipator-type thermostats.

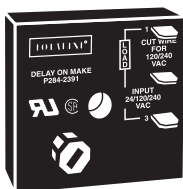
#### SPECS

Input: 18-30 VAC  
1.5 amps  
15 amp inrush  
3 or 5 min. fixed or  
10 min. adjustable  
time delays

#### REPLACES

Gemline: IC243  
MARS: 32381 & 32382  
Robertshaw: 3310-183,  
3310-305  
WATSCO: EAC-511,  
EAC-426-180, EAC-426-180,  
EAC-426-300, EAC-426-ADJ

### DELAY-ON-MAKE TIMER



**PART NO**  
P284-2391

#### FEATURES / APPLICATION

- Universal voltage operation.
- Higher 1.5 amp power rating.
- Knob-adjustable time delays.
- Work with anticipator-type thermostats.
- One model replaces many in field. Ideal for compressor staging.
- Simple 2-wire hookup.
- Compact 2" x 2" package.

#### SPECS

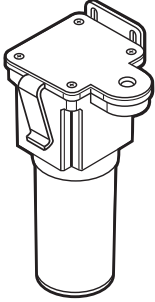
Input: 18-240 VAC  
1.5 amps  
15 amp inrush  
SPST, N.O.  
Adjustable delays  
.03-10 min.(1.8-600 sec.)  
Voltage drop:  
2.5V @ 1.5 amps.

#### REPLACES

Diversified: AC-800 fixed  
volt: ASC-00/601  
Gemline: IC310/ICS213  
Mars: 32391/32367  
Robertshaw: 3310-068  
Supco: TD-68 D-69  
WATSCO: EAC-701-ADJ.,  
-X, EAC-700-A

## TOTALINE® PROTECTION CONTROLS

### Smart Start Kits - "Current Sensing"

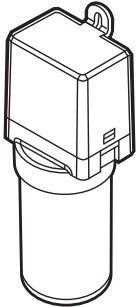


By monitoring the compressor "current" upon start-up, the Smart Start is able to engage the hard start capacitor for precisely the correct amount of time, ensuring maximum starting torque without the risk of supplying too much current into the start winding.

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

PART NO	HP Rating	Replaces
P290-0803	1/2 - 3 HP	Supco : SPP-8 Kickstart : TO-5 A-1 : WSX-1
P290-0805	3 - 5 HP	Kickstart : KS1
P290-0810	5 - 10 HP	--

### Smart Start Kits - "Voltage Sensing"

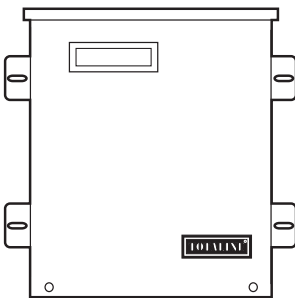


Products employ patented circuitry which monitors differential compressor auxiliary voltage, determines the state of the motor and precisely engages and disengages the start capacitor.

- Not Effected by Ambient temperature
  - Recycles instantly (less than 1 second)
  - Multi-voltage operation - either 115 or 230 VAC
- Ideally suited for:
- Water Coolers
  - Vending Machines
  - Household Refrigerators (115 or 230 VAC)
  - Commercial Refrigeration (115 or 230 VAC)
  - Air Conditioners and Heat Pumps

PART NO	VOLTAGE	Replaces	Voltages	MFD	Oper Temp Range	Max Input Voltage	Range	Recommended Range
P290-0850	90-277 VAC	Supco : SPP-5 MARS : 32701 A-1 : WSX-5	330 capacitor	44-52	-40° C to + 65° C	390 VAC	1/12 - 10 HP	1/12 - 1 HP
P290-0860	90-277 VAC	Supco : SPP-6 MARS : 32703 A-1 : WSX-6	330 capacitor	88-106	-40° C to + 65° C	390 VAC	1/12 - 10 HP	1/2 - 1 HP

## 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).

### Optional Totaline P251-0098 Pressure Transducer

### Power Ratings:

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

### SPECIFICATIONS:

#### Sensor Input Type:

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

#### Sensor Temperature:

- 40°F to 140°F (4°C to 60°C)
- Pressure Set Point: 20 to 420 psig

#### Minimum Frequency:

- 3 to 55Hz

#### Maximum Frequency:

- 8 to 60Hz

#### Current Trip:

- 4 to 24 Amps

#### Operating Characteristics:

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