Protector Trip Relays

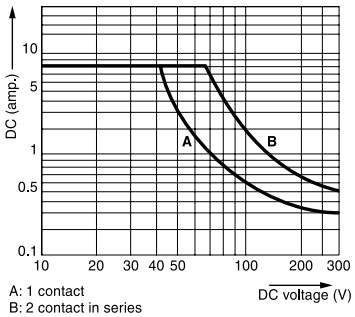
250 Series DIN Rail and Wall Mounted

Protectors

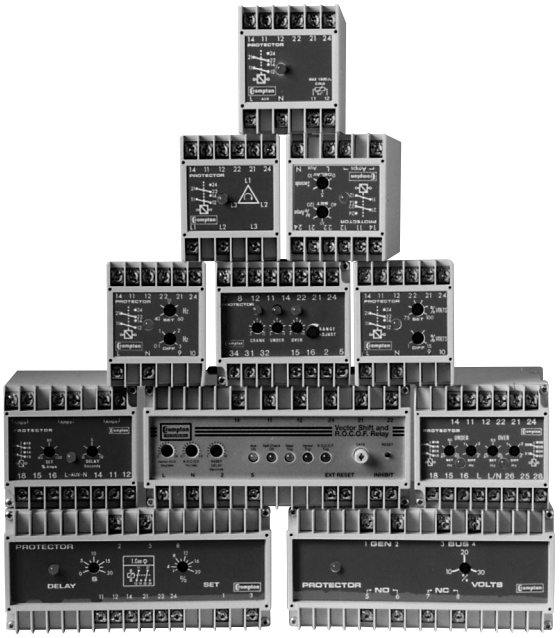
Our protector trip relays offer continuous surveillance of electrical parameters. When the monitored parameter moves outside the set point limit, the relay operates.

- *A.C. and D.C. voltage*
- *A.C. and D.C. current*
- *Frequency*
- *Phase sequence*
- *Phase failure*
- *Phase balance*
- *Thermistor*
- *Thermocouple*
- *Transducer*
- *Millivolt trips*
- *Hot spot relays*
- *Speed sensing*
- *Synchro-check relays*
- *Reverse power*
- *R.O.C.O.F. vector shift*

Max. D.C. Load Breaking Capacity
with resistive load



A: 1 contact
B: 2 contact in series



Over half a million Protector units have been tried and tested, in many industrial environments.

Successfully used in alarm protection and control functions, typically in 3 phase electrical power systems, control panels & gensets.

Specification

Safety Requirements:	U.S. Standard, IEC 414
Temperature Range:	0°C to 60°C (0°C to +40°C for UL approval)
Storage Temperature:	-20°C to 70°C
Temp. Co-efficient:	0.05% per °C
Interference Immunity:	Electrical stress surge withstand and non function to ANSI/IEEE C37 90a
Enclosure Code:	IP50 to BS5490, IEC 529
Calibrated at:	23°C
Auxiliary:	
A.C. 50/60Hz:	110, 120, 230, 240, 400 or 415, or 440V + 20%
D.C.:	12, 24, 48, 110, 125, 135V (maximum 156V D.C.) + 15% Maximum ripple 15%
Burden:	4VA maximum
Output Relay Type:	D.P Changeover
Ratings:	
A.C.:	240V, 5A non-inductive
D.C.:	24V, 5A resistive
Operations:	0.2 million at the above loads
Reset:	Automatic
Weight:	252 case - approx 0.4Kg 253 case - approx 0.6Kg 256 case - approx 1.0Kg
Approvals:	File Number E113067 (where applicable)
	File Number LR52592 (where applicable)
	Bureau Veritas (BV) File No: 2650H-07427-A0 PRSOBV (where applicable)
	ABS American Bureau of Shipping (where applicable)

Casing

All products can be DIN rail or wall mounted.

253 and 256 cases have screw holes to facilitate wall mounting.

252 cases are supplied with an adaptor plate for wall mounting.

All products are supplied with a clear terminal cover/anti-tamper cover, manufactured from flame retardent polycarbonate.

Ordering Information

Please quote:

1. Product Code
2. Function i.e. Under or Over
3. Relays normally de-energize on under trip and energize on over trip. Please specify standard or non standard trip, because standard relays are configured for a fail safe.
4. System Voltage and/or Currents where applicable
5. System Frequency
6. Auxiliary Voltage where required
7. Preset Differential where required
8. Time delay where applicable
9. On temperature trips quote temperature span & sensor type and set points and trip temperatures

Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - A.C. Current

Features

- *Adjustable setpoint*
- *Adjustable differential*
- *Internal time delay*
- *LED trip indication*
- *2 pole relay contacts*

Application

- *General application for any electrical load, monitoring for under load and over load conditions*
- *Motors - to monitor for conditions such as overload, locked rotor and short circuit*
- *Gensets - to ensure load current is within generator capacity*
- *Machinery - detecting broken drive belts on machinery*

The Crompton A.C. current protectors provide continuous surveillance of the monitored circuit. When the current moves outside the setpoint limit, the relay operates.

An illuminated LED indicates when the relay is energized.

For 3 phase systems, the sequence of connection is not important.

The Protector can be used to monitor:

- ***Over and Under current conditions***
- ***Load detection***
- ***Monitoring of electric heating systems***

Introduction

Crompton A.C. Current Protectors provide continuous surveillance of the monitored circuit. These products offer user adjustable trip point (setpoint) and time delay settings. The setpoint adjustment range is between 40% and 120% of the nominal current. Input currents can be via current transformers or direct up to 10A. An internal differential setting of 1% reduces nuisance tripping if the measured signal is noisy or unstable. When the measured current moves outside the setpoint limit, the relay will operate, giving an alarm or initiation signal. As soon as the monitored signal moves outside of the setpoint limit, a trip will occur. An adjustable time delay is provided to prevent the relay from tripping for a predetermined period to prevent nuisance tripping. The units draw their operating power from a separate auxiliary supply input. Single phase and three phase products are available. Three phase products monitor the current level for each phase, and are not phase sequence sensitive. Combined units offer under and over current trips in one compact unit. Single function units are also available.

Product Function

Over current models: When the monitored current exceeds the setpoint, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored current falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes.

Under current models: When the monitored current falls below the setpoint, the relay will de-energize and the red LED will extinguish to indicate the trip condition. The relay will automatically reset once the monitored current rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes.

Product customisation options

Please contact the factory.

- Adjustment ranges - different adjustment ranges are possible for the setpoint and differential controls
- Relay operation - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - A.C. Current

Specification

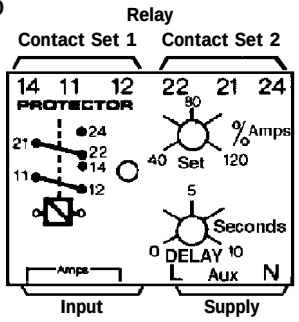
Approvals:	U.L. recognized up to 300V CSA approved up to 240V
Nominal current:	1A or 5A from C.T. secondary other values between 0.2 and 10A to order
Frequency:	50, 60 or 400 Hz
C.T. Burden:	0.5VA per phase
Overloads:	2 x rating continuously 10 x rating for 3 seconds
Set Point Repeatability:	0.5% of full span
Differential:	Preset at 1% Other values 1 to 10% to order
Range:	40 to 120% of nominal current. Customised adjustment range to order
Time Delay:	0 to 10 seconds adjustable other values to order
Auxiliary Supply:	
A.C. 50/60Hz:	100, 110, 120, 208, 220, 240, 480V, ±20%
D.C.:	12, 24, 48, 110 or 125V, ±15% maximum ripple 15%
Burden:	4VA maximum

Product Code Examples

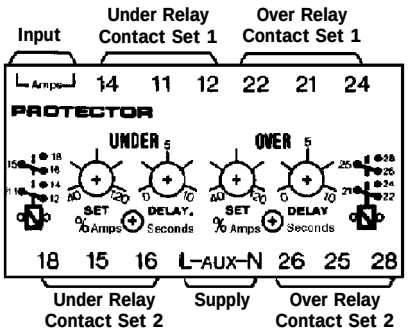
A.C. Current	A.C. Input	A.C. Aux Power	Protection	ANSI No.	Catalogue No.
Single Phase	5A	120V	Under current 40-120%	37	252-PAUU-LSBX-C6-DG-D1-EB
Single Phase	5A	120V	Over current 40-120%	51	252-PAOU-LSBX-C6-DG-D1-EA
Single Phase	5A	120V	Under & over current (2 output relays)	37/51	253-PADU-LSBX-C6-DG-D1-EC
3 Phase 3/4 Wire	5A	120V	Under current	37	253-PAVU-LSBX-C6-DG-D1-EB
3 Phase 3/4 Wire	5A	120V	Over current	51	253-PAPU-LSBX-C6-DG-D1-EA

Connection Diagrams

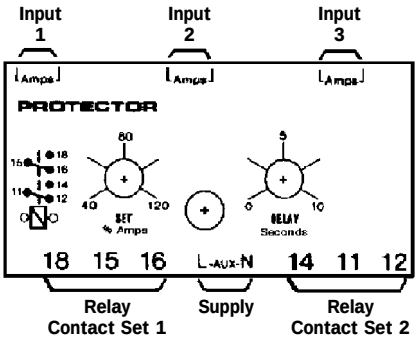
252-PAU
252-PAO



253-PAD



253-PAP
253-PAV



Note: The neutral connection is always required on 4 wire products.

Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - A.C. Voltage with Adjustable Differential

Features

- *Adjustable setpoint*
- *Adjustable differential*
- *Internal time delay*
- *LED trip indication*
- *2 pole relay contacts*

Application

- *Gensets - to monitor correct operation of the AVR (Automatic Voltage Regulator) and excitation system*
- *Motors - some electric motors are voltage sensitive, and can overheat and burn out when operated at low voltages*
- *UPS supplies - when the main A.C. supply falls outside the acceptable operating voltage window, the relay can initiate a change over to an alternate or standby supply*

The Crompton A.C. Voltage Protectors provide continuous surveillance of the monitored circuit. When the measured voltage moves outside the setpoint limit, the relay will operate giving an alarm or initiation signal.

An illuminated LED indicates when the relay is energized. The 3 phase, 3 or 4 wire models, protect each phase independently. The Protector can be used to protect for:

- ***Under and Over voltage detection***
- ***Start standby generators***
- ***Operation of mains failure units***
- ***Switching standby supplies***

Introduction

Crompton A.C. Voltage Protectors provide continuous surveillance of the monitored voltage circuit. These products offer user adjustable trip point (setpoint) and differential (hysteresis) settings. The setpoint adjustment range is 25%, operating between 75% and 100% of the nominal supply for under voltage units, and between 100% and 125% for the over voltage units. The differential setting adjustment range is 15%, and it can be used to reduce nuisance tripping if the measured signal is noisy or unstable. When the measured Voltage moves outside the setpoint limit, the relay will operate, giving an alarm or initiation signal.

As soon as the monitored signal moves outside of the setpoint limit, a trip will occur.

A fixed time delay is available as a factory option, preventing the relay from tripping for a predetermined period to prevent nuisance tripping.

The units draw their operating power from the measuring inputs, although a separate auxiliary supply input option is available on some models. Single phase and three phase products are available. Three phase products monitor the voltage level for each phase, and are not phase sequence sensitive.

Combined units offer under and over voltage trips in one compact unit. Single function units are also available.

Product Function

Over voltage models: When the monitored voltage exceeds the setpoint, the time delay is started. When the time has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored voltage falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes. The time delay is not active when resetting.

Under voltage models: When the monitored voltage falls below the setpoint, the time delay is started. When the time has elapsed, the relay will de-energize and the red LED will extinguish to indicate the trip condition. The relay will automatically reset once the monitored voltage rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes. The time delay is not active when resetting.

Product customisation options

Please contact the factory.

- **Time delay** - internal fixed time delay before a trip occurs
- **Separate auxiliary supply** - sometimes required to maintain a time delay or energised relay when the monitored signal fails
- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and differential controls
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - A.C. Voltage with Adjustable Differential

Specification

Approvals: U.L. recognized up to 300V
CSA approved up to 240V

Nominal Voltage: 100, 110, 120, 208, 220, 280, 270, 400, 415, 440V

System Frequency: 45/65Hz or 360/440Hz

Overload: 1.2 x continuously
1.5 x for 10 x 10 seconds

Setpoint Repeatability: Better than 0.5%

Differential: Adjustable range 1-15%

Range Adjustment: Under Voltage: 75 to 100%
Over Voltage: 100 to 125% of nominal input voltage

Time Delay Option: Factory preset internal delay up to 30 seconds. Specify at time of ordering

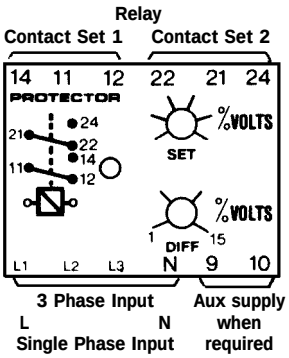
Burden: 3VA approx.

Product Code Examples

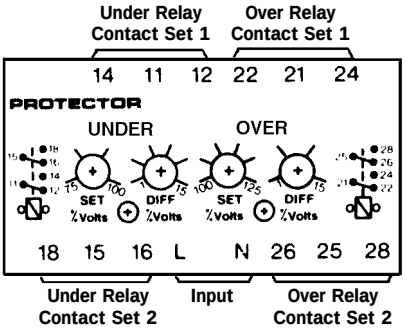
A.C. Voltage	Protection	ANSI No.	Catalogue No.
Single Phase 120V L-N	Under Voltage 75-100%	27	252-PVUU-PQBX-C6-EB
	Over Voltage 100-125%	59	252-PVOU-PQBX-C6-EA
	Over and Under Voltage (2 output relays)	27/ 59	253-PVBU-PQBX-C6-EC
3 Phase 3 Wire 120V L-L	Under Voltage 75-100%	27	252-PVKU-PQBX-C6-EB
	Over Voltage 100-125%	59	252-PVAU-PQBX-C6-EA
	Over and Under Voltage (2 output relays)	27/ 59	253-PVMU-PQBX-C6-EC
3 Phase 4 Wire 120V L-N	Under Voltage 75-100%	27	252-PVVU-PQBX-C6-EB
	Over Voltage 100-125%	59	252-PVPU-PQBX-C6-EA
	Over and Under Voltage (2 output relays)	27/ 59	253-PVEU-PQBX-C6-EC

Connection Diagrams

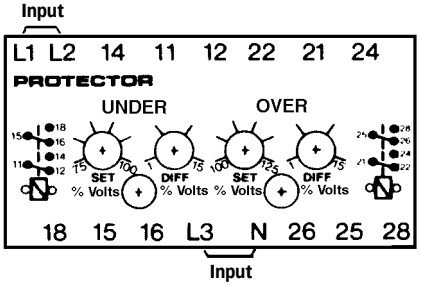
252-PVU
252-PVO
252-PVV
252-PVP
252-PVK
252-PVA



253-PVB



253-PVE
253-PVM



Note: The neutral connection is always required on 4 wire products.

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - A.C. Voltage with Adjustable Time Delay

Features

- *Adjustable setpoint*
- *Adjustable time delay*
- *Internal differential*
- *LED trip indication*
- *2 pole relay contacts*

Application

- *Gensets - to monitor correct operation of the AVR (Automatic Voltage Regulator) and excitation system*
- *Motors - some electric motors are voltage sensitive, and can overheat and burn out when operated at low voltages*
- *UPS supplies - when the main A.C. supply falls outside the acceptable operating voltage window, the relay can initiate a change over to an alternate or standby supply*

The Crompton A.C. Voltage Protectors provide continuous surveillance of the monitored circuit.

When the measured voltage moves outside the setpoint limit, the relay will operate after the selected time delay, giving an alarm or initiation signal. Relays normally energize on overvolts and de-energize on undervolts. An illuminated LED indicates when the relay is energized. The Protector can be used to protect for:

- ***Under and Over voltage***
- ***Start up standby generators***
- ***To operate mains failure units***
- ***Switching standby supplies***
- ***Protecting computer supplies***
- ***Where close voltage control is required***

Introduction

Crompton A.C. Voltage Protectors provide continuous surveillance of the monitored voltage circuit. These products offer user adjustable trip point (setpoint) and time delay settings. The setpoint adjustment range is 25%, operating between 75% and 100% of the nominal supply for under voltage units, and between 100% and 125% for the over voltage units. The time delay setting adjustment range is typically 0 to 10 seconds, although longer delays are available.

As soon as the monitored signal moves outside of the setpoint limit, the time delay is activated, after which a trip will occur.

The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping.

The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable.

The units draw their operating power from the measuring inputs, although a separate auxiliary supply input option is available on some models. Single phase and three phase products are available. Three phase products monitor the voltage level for each phase, and are not phase sequence sensitive.

Product Function

Over voltage models: When the monitored voltage exceeds the setpoint, the time delay is started. When the time has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored voltage falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes. The time delay is not active when resetting.

Under voltage models: When the monitored voltage falls below the setpoint, the time delay is started. When the time has elapsed, the relay will de-energize and the red LED will extinguish to indicate the trip condition. The relay will automatically reset once the monitored voltage rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes. The time delay is not active when resetting.

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - A.C. Voltage with Adjustable Time Delay

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and differential controls
- **Separate auxiliary supply** - sometimes required to maintain a time delay or energised relay when the monitored signal fails
- **Differential** - internally fixed value between 1% and 15%
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Specification

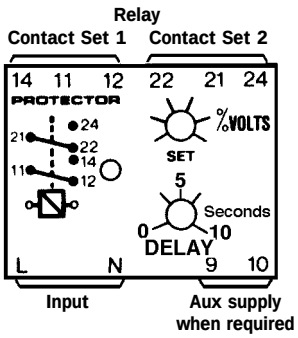
Nominal Voltage:	100, 110, 208, 220, 240, 277, 400, 415, 440, 480V
System Frequency:	45/65Hz or 360/440Hz
Overload:	1.2 x continuously 1.5 x for 10 x 10 seconds
Burden:	3 VA
Setpoint Repeatability:	Better than 0.5%
Differential:	Preset at 1% Other values 1% to 10% order
Range:	Adjustable Under Voltage 75 to 100% Over Voltage 100 to 125% of nominal input voltage
Time Delay:	Adjustable up to 10 seconds

Product Code Examples

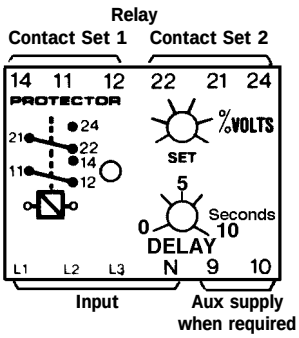
A.C. Voltage	Input	Protection	ANSI No.	Catalogue No.
Single Phase	120V L-N	Under voltage 75-100%	27	252-PVZU-PQBX-C6-EB-T1
Single Phase	120V L-N	Over voltage 100-125%	59	252-PVHU-PQBX-C6-EA-T1
3 Phase 3 Wire	120V L-L	Under voltage 75-100%	27	252-PVJU-PQBX-C6-EB-T1
3 Phase 3 Wire	120V L-L	Over voltage 100-125%	59	252-PVCU-PQBX-C6-EA-T1
3 Phase 4 Wire	120V L-N	Under voltage 75-100%	27	252-PVXU-PQBX-C6-EB-T1
3 Phase 4 Wire	120V L-N	Over voltage 100-125%	59	252-PVSU-PQBX-C6-EA-T1

Connection Diagrams

252-PVZ
252-PVH



252-PVX
252-PVS
252-PVC
252-PVJ

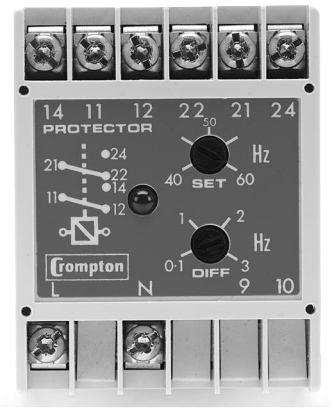


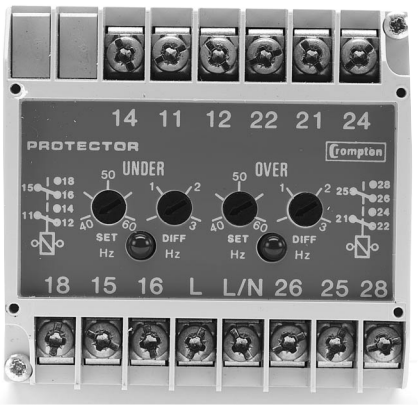
Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Frequency





Features

- *Adjustable setpoint*
- *Adjustable differential*
- *LED trip indication*
- *2 pole relay contacts*

Application

- *Gensets - use these relays to monitor correct operation of the engine speed controller (governer)*
- *Motors - synchronous motors rotate at speeds proportional to line frequency. Use these relays to ensure correct running speed*
- *Standby supplies - when the main A.C. supply falls outside the acceptable working frequency, these relays can initiate a change over to an alternate or standby supply*

The Crompton frequency Protectors give continuous surveillance of the monitored circuit. When the frequency moves outside the set point limit the relay will operate giving an alarm, control or tripping signal.

An illuminated LED indicates when the relay is energized.

Since speed is proportional to the frequency, this protection can be used to protect for:

- ***Over and Underspeed***
- ***Standby supplies for Industrial, Hospital or Marine use***
- ***Mains supplies***
- ***Computer supplies***
- ***Other control gear***

Introduction

Crompton Frequency Protectors provide continuous surveillance of the monitored circuit. These products offer user adjustable frequency trip point (setpoint) and differential (hysteresis) settings. The setpoint adjustment range is centred around the nominal 50Hz, 60 Hz or 400Hz system frequency. The differential setting adjustment can be used to reduce nuisance tripping if the measured signal is noisy or unstable.

When the measured Frequency moves outside the setpoint limit, the relay will operate, giving an alarm or initiation signal.

As soon as the monitored frequency moves outside of the setpoint limit, a trip will occur. The units draw their operating power from the measuring inputs.

Combined units offer under and over frequency trips in one compact unit. Single function units are also available.

Product Function

Over frequency models: When the monitored frequency exceeds the setpoint, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored frequency falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes.

Under frequency models: When the monitored frequency falls below the setpoint, the relay will de-energize and the red LED will extinguish to indicate the trip condition. The relay will automatically reset once the monitored frequency rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes.

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Frequency

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and differential controls
- **Time Delay** - internal fixed time delay before a trip occurs
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Specification

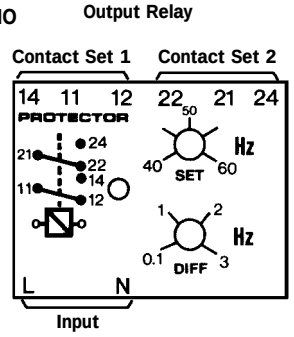
Approvals:	U.L. recognized up to 300V
Nominal frequency:	50, 60 or 400Hz
System Voltage:	100, 110,120, 208, 220, 230, 240, 277, 380, 400, 415, 440 or 480V ±20%
Overload:	1.2 x continuously 1.5 x for 10 x 10 seconds
Burden:	3VA
Setpoint Repeatability:	Better than 0.5%
Ranges (50Hz):	40/60Hz adjustable
Ranges (60Hz):	50/70Hz adjustable
Differential:	0.1 to 3.0Hz adjustable
Range (40Hz):	360/440Hz adjustable
Differential:	10 to 30Hz adjustable

Product Code Examples

Frequency Relay	Input	Protection	ANSI No.	Catalogue No.
Single Phase	120V A.C.	Under frequency 55-65Hz	81U	252-PHUU-PQBX-C6-EB
Single Phase	120V A.C.	Over frequency 55-65Hz	810	252-PHOU-PQBX-C6-EA
Single Phase	120V A.C.	Under & Over (2 output relays)	810/U	253-PHDU-PQBX-C6-EC

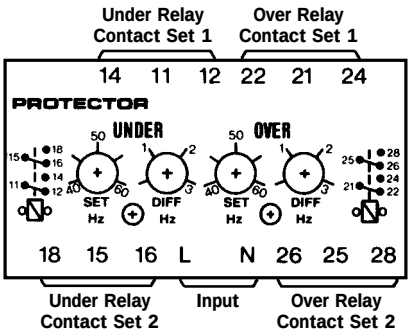
Connection Diagrams

252-PHU
252-PHO



Under or Over Frequency

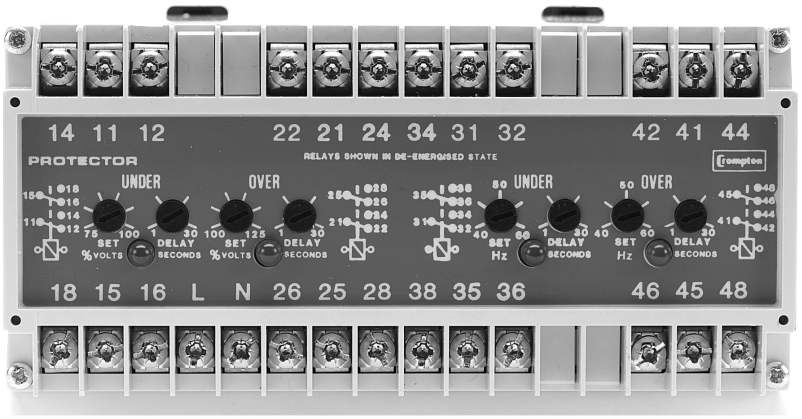
253-PHD



Combined Under and Over Frequency

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Combined Under/Over Voltage and Frequency



Features

- *Adjustable setpoint*
- *Adjustable time delay*
- *Internal differential*
- *LED trip indication*
- *2 pole relay contacts*

Application

- *Gensets - to monitor correct operation of the AVR (Automatic Voltage Regulator) and excitation system and the engine speed controller (governer)*
- *Motors - some electric motors are voltage sensitive, and can overheat and burn out when operated at low voltages. Synchronous motors rotate at speeds proportional to line frequency. Use these relays to ensure correct running speed*
- *UPS supplies - when the main A.C. supply falls outside the acceptable operating voltage window, the relay can initiate a change over to an alternate or standby supply*

The Crompton combined voltage & frequency Protectors give continuous surveillance of the monitored circuit. When the voltage or frequency moves outside the set point limit the respective relay will operate giving an alarm, control or tripping signal.

An illuminated LED indicates when the relay is energized.

This protector can be used to protect for:

- ***Over and Underspeed***
- ***Over and Under voltage***

Introduction

The Crompton combined Voltage and Frequency Protectors provide the most popular relay functions in one convenient package. The products offers user adjustable trip point (setpoint) for voltage and frequency, plus adjustable time delay settings. The setpoint adjustment range is 25%, operating between 75% and 100% of the nominal supply for under voltage, and between 100% and 125% for over voltage. The frequency setpoint adjustment range is centred around the nominal 50Hz, 60 Hz or 400Hz system frequency.The time delay setting adjustment range is typically 0 to 10 seconds, although longer delays are available.

As soon as the monitored signal moves outside of the setpoint limit, the time delay is activated, after which a trip will occur. The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping.

The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable.

The product is available for single phase systems only, and draws its operating power from the measuring input.

Product Function

Over voltage & frequency: When the monitored value exceeds the setpoint and the time delay has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition.

Under voltage & frequency: The relay will de-energize after the time delay has elapsed, and the red LED will extinguish to indicate the trip condition.

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Combined Under/Over Voltage and Frequency

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and time delay controls
- **Differential** - internally fixed value between 1% and 15%
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Specification

Approvals: U.L. recognized

Nominal Voltage: 120V A.C.

Voltage Range: Over voltage100 to 125%
Under voltage 75 to 100%

Differential: Fixed internally at 1%

Time Delay: Adjustable between 1 and 30 seconds

Frequency Ranges: 40-60Hz (50Hz) or
50-70Hz (60Hz)

Differential: Fixed internally at 0.1Hz

Time Delay: Adjustable between
1 and 30 seconds

Set Point Repeatability: Better than 0.5%

Voltage Withstand: 1.2 x continuously
1.5 x for 10 second
x 10 operations to BS6253

Relays:

4 relays -Under voltage
Over voltage
Under frequency
Over frequency

All 4 relays are DP changeover
A.C. 240V 5A non inductive
D.C. 24V 5A resistive

Operations: 0.2 million at the above loads

Reset: Automatic

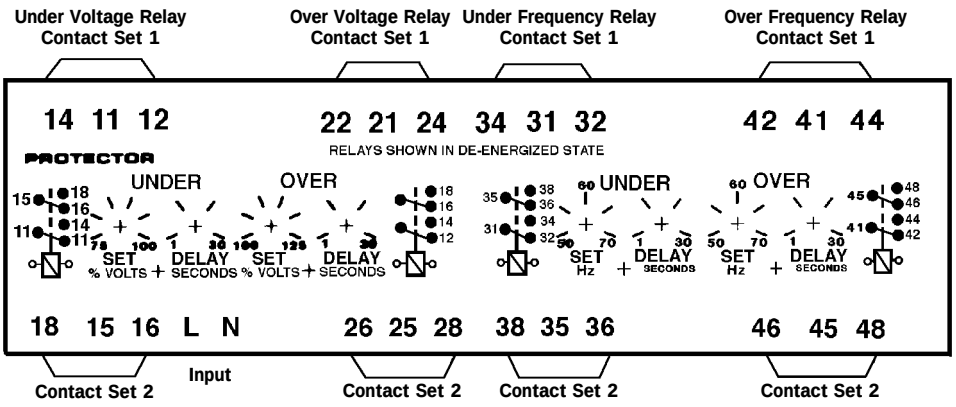
LEDS: Indicate condition of relay, i.e. illuminated when relays energize. Relays will be energized when the voltage/frequency is within the setpoint. Relays de-energize on trip point when the voltage/frequency goes over or under the set point.

Product Code Example

Frequency Relay	Input	Protection	ANSI No.	Catalogue No.
Single Phase	120V 60Hz	Over & Under Voltage Over & Under frequency (50-70Hz) (4 independent double pole change over relays; fixed differential and adjustable time delay (factory set) between 1 & 30 seconds; specify time delay when ordering)	27/59 810/U	256-PHVU-PQBX-C6

Connection Diagram

256-PHV

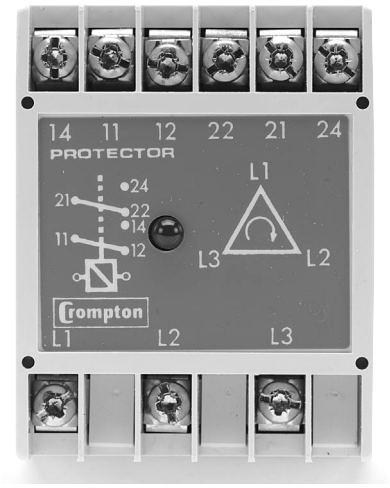


Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Phase Sequence and Phase Failure

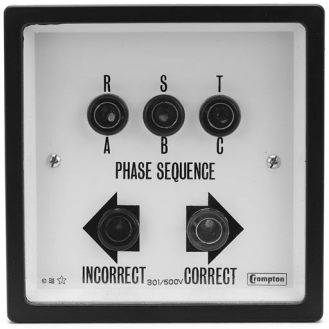


The Crompton phase sequence and phase failure protector relays are designed to monitor the correct phase rotation or sequence of three phase, 3 or 4 wire, supply systems for protection against incorrect phase sequence, loss of one phase and under voltage.

Application:

- ***Portable pumps***
- ***Portable compressors***
- ***Motor driven mixing equipment***
- ***Motors - Single Phasing***
- ***Gensets - correct engine rotation***
- ***All portable equipment***
- ***All rotating machines***

We also manufacture front of panel mounting phase sequence indicators



Introduction

Rotating machines are particularly vulnerable to incorrect phase sequence. Three phase motors can rotate in the wrong direction, potentially leading to physical damage or the risk of injury to personnel, yet voltage and current readings may appear normal. If one phase is lost because of a blown fuse, electric motors can continue to operate (single phasing) which can result in severe electrical or mechanical damage.

For permanent installations, this relay should be used to monitor the incoming supply, protecting all equipment against incorrect connection at initial installation or after maintenance work. Rotating machines that cannot tolerate reverse rotation or pose significant risk to personnel under this condition should be individually protected with this relay. The possibility of incorrect supply connection is much more likely in portable equipment or marine applications

Product Function

The protector continuously monitors the three phase supply. With the correct phase sequence applied, the front panel LED will illuminate and the output relay will be energized. An incorrect sequence or missing phase will de-energize the relay, and the LED will be extinguished. If the supply drops below 85% of its nominal voltage, this condition will also cause a trip.

Important note: If one phase is lost due to a blown fuse, some loads can re-generate the missing voltage. This relay can be used as a phase failure relay providing the regenerated voltage in the open phase is less than 70% of the nominal supply voltage. If there is the possibility of a higher regenerated voltage, the phase balance relay 252-PSF should be used.

Protection against

- Incorrect phase sequence
- Loss of one phase
- Under voltage

Protection for

- Portable electrical equipment
- Incorrect sequence connection
- Loss of one phase (which can result in severe electrical/ mechanical damage or physical/personnel damage due to reverse rotation of motor driven equipment)

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Phase Sequence and Phase Failure

Specification

Approvals: U.L. recognized up to 300V
CSA Approved up to 240V

Nominal Voltage: 100, 110, 120, 208, 220, 230, 240, 277, 380, 400, 415, 440 & 480V

System Frequency: 50, 60, or 400Hz (specify)

Burden: 3VA approx.

Overload: 1.2 x continuously
1.5 x for 10 x 10 seconds to Symmetric

Undervoltage Protection: Preset at 85% of nominal

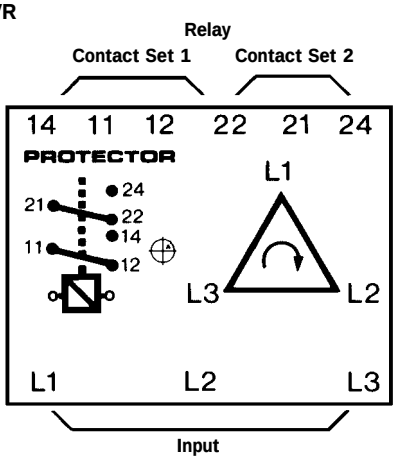
Weight: Approximately 0.4kg

Product Code Examples

Relay	Input	Protection	ANSI No.	Catalogue No.
3 Phase 3 or 4 wire	120V L-L 60 Hz	Phase sequence, under voltage	47	252-PVRU-PQBX-C6
3 Phase 3 or 4 wire	415V L-L 60 Hz	Phase sequence, under voltage	47	252-PVRU-SBBX-C6

Connection Diagrams

252-PVR



Note: No neutral connection is required

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Phase Balance

Application:

- Motor protection
- Motors - Single Phasing
- Gensets - correct engine rotation
- All portable equipment
- All rotating machines

We also manufacture front of panel mounting phase sequence indicators

The Crompton Protector Phase Balance module provides continuous surveillance of a 3 phase, 3 or 4 wire system and protects against:

- ***Phase Loss, Reversal or Sequence***
- ***Phase Unbalance***
- ***System Under Voltage***

Introduction

This Crompton Protector is designed to comprehensively monitor the three phase supply. It monitors the correct phase rotation or sequence of three phase supply systems. Rotating machines are particularly vulnerable to incorrect phase sequence. Three phase motors can rotate in the wrong direction, potentially leading to physical damage or the risk of injury to personnel, yet voltage and current readings may appear normal. If one phase is lost because of a blown fuse, electric motors can continue to operate (single phasing) which can result in severe electrical or mechanical damage.

This relay has the added advantage that it will detect the phantom or regenerated phase that can be caused by a single phase failure on some equipment or when running motors at low load levels.

An unbalanced supply voltage can lead to temperature rises in motors. An unbalance voltage as little as 10% can increase operating temperature to150% of normal.

For permanent installations, this relay should be used to monitor the incoming supply, protecting all equipment against incorrect connection at initial installation or after maintenance work. Rotating machines that cannot tolerate reverse rotation or pose significant risk to personnel under this condition should be individually protected with this relay. The possibility of incorrect supply connection is much more likely in portable equipment or marine applications.

Product Function

The protector continuously monitors the three phase supply. With the correct phase sequence applied and all three voltages are balanced within the required limits, the front panel LED will illuminate and the output relay will be energized. An incorrect sequence, missing phase, out of balance or under voltage condition will de-energize the relay, and the LED will be extinguished.

The setpoint control allows adjustment of the voltage matching between 5% and 15%.

The time delay function operates only for the voltage unbalance condition. The delay can be used to prevent nuisance tripping due to short term unbalance situations. Incorrect phase rotation, a missing phase or an under voltage condition trip the relay immediately.

Protection against:

- Incorrect phase sequence
- Loss of one phase
- Under voltage
- Unbalanced voltage
- A phantom or regenerated phase voltage

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Phase Balance

Specification

Approvals: U.L. recognised
CSA approved up to 480V.

System: 3 phase, 3 or 4 wire
Frequency: 50 or 60Hz

Nominal Voltage: 100, 110, 120, 208, 277, 220, 230, 240, 380,400, 415, 440 & 480V

Burden: 3VA approx.

Voltage Withstand: 1.2 x continuously
1.5 x for 10 x 10 seconds

Set Points:
Unbalance: Adjustable 5% to 15%

Time Delay: Up to 10 seconds adjustable

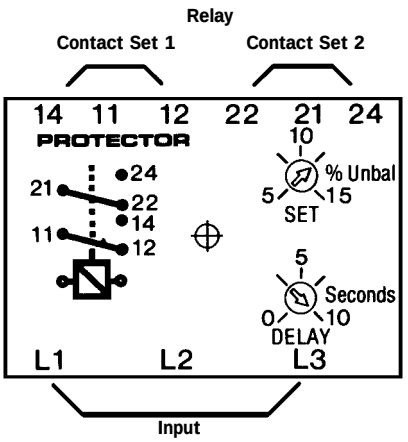
Under Voltage (Type 252-PSG only):
Internally preset at 15% of nominal voltage (other values between 10% and 30% available on request)
(not operative if voltage falls below 70% of the nominal voltage or set point on type 252-PSG)

Product Code Examples

Relay	Input	Protection	ANSI No.	Catalogue No.
3 Phase 3 or 4 Wire	120V L-L 60Hz	Phase loss & unbalance	47	252-PSFU-PQBX-C6
	480V L-L 60Hz	Phase loss & unbalance	47	252-PSFU-SEBX-C6
	120V L-L 60Hz	Phase loss, unbalance, under voltage	47/27	252-PSGU-PQBX-C6-T1-IA
	480V L-L 60Hz	Phase loss, unbalance, under voltage	47/27	252-PSGU-SEBX-C6-T1-IA

Connection Diagrams

252-PSF
252-PSG



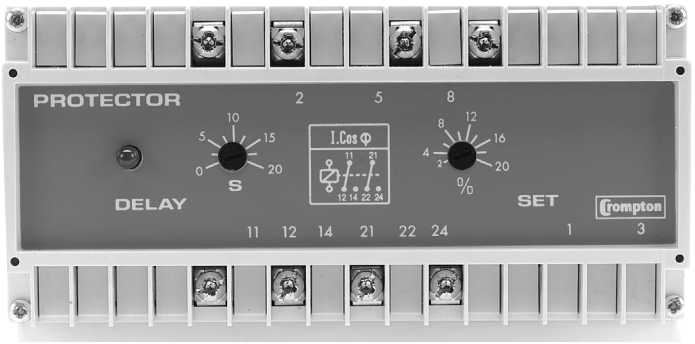
Note: No neutral connection is required

Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Reverse Power (Current)



Application:

- ***Generator Set protection - for detecting loss of the prime mover (engine) and preventing motoring***
- ***Feeder protection - to detect reverse power under fault conditions***

The Crompton Reverse Power Protector provides continuous surveillance for A.C. generators operating in parallel or for boosting mains supplies.

On site adjustment of the trip point and time delay ensures accurate protection against 'motoring' in the event of engine failure and prevents tripping from surges during synchronising.

Introduction

The Crompton reverse power Protectors provides continuous surveillance of a.c. generators against motoring.

Reverse power relays are used to detect the failure of the prime mover (engine) when active energy (Watts) flows into the generator causing rotation - the set will operate like an electric motor, which can cause significant mechanical damage. This relay offers an adjustable reverse power setpoint between 2% and 20% of nominal power, and time delay adjustment range of 0 to 20 seconds.

As soon as the reverse power level increases above the setpoint limit, the time delay is activated, after which a trip will occur. The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping.

The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable.

These units are powered from the measuring supply.

Product Function

The protector relay approximates the power level in the system by measuring current and power factor, but does not actually measure the system voltage. When the reverse power level exceeds the setpoint, the time delay is started. When the time has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the power level falls below the setpoint minus the differential, the LED will extinguish and the relay de-energizes. The time delay is not active when resetting.

The reverse power level will trip as expected at the calibrated point for unity power factor, however, the system power factor does effect the trip point calibration. The relay becomes more sensitive at lagging power factors, as almost all systems exhibit inductance. At leading power factors, this relay is less sensitive.

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and time delay controls
- **Relay operation** - standard models are fail safe, but the relays can be customised to de-energise on trip

Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Reverse Power (Current)

Setting up Instructions

The "% set" potentiometer trimmer on the front label is calibrated as a percentage of the input current rating e.g. of 5A, and not of the forward kW.

Adjust the "% set" trimmer to the required tripping value, 7.5% to 10% is normal. Setting accuracy can be checked by reversing the current lead connections and, with forward power, measuring the trip point value on a suitable ammeter (reconnect leads on completion).

Adjust the 'Delay' to the required time delay. 10 seconds is normally adequate.

Specification

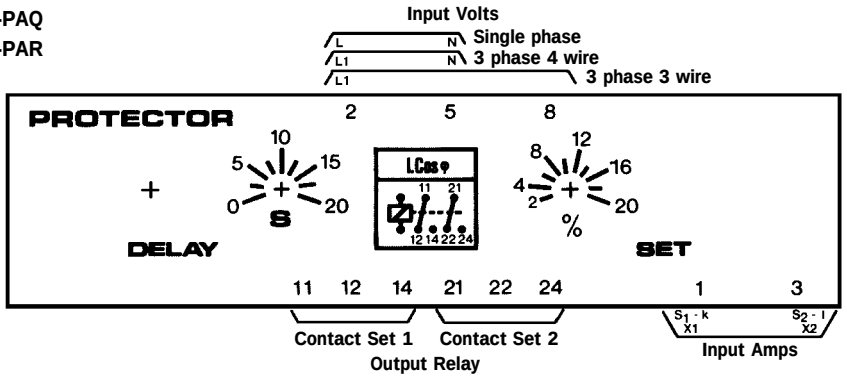
Approvals:	U.L. recognized up to 300V. CSA approved up to 240V.
Nominal Voltage:	100, 110, 120, 220, 230, 240, 277, 380, 400, 415, 440 or 480V
Overload:	1.2 x continuously 1.5 x for 10 x 10 seconds
Burden:	3VA maximum
Nominal Current:	5A or 2, 3, 4, 6, 8 & 10A
Overload:	2 x continuously 10 x for 3 seconds
Burden:	2VA maximum
Frequency:	50 or 60 or 400Hz on request
Setpoint Adjustments:	Reverse power 2-20%
Delay adjusstment:	Time delay: 0/20 seconds
Repeatability:	0.5%
Hysteresis:	1%
Monitoring Range:	
Power Factor:	0.5 inductive/unity/ 0.2 capacitive
Current:	20% - 100% of nominal input

Product Code Examples

Relay	Input	Protection	ANSI No.	Catalogue No.
Single Phase or 3ph 4W	5A, 120V, 60Hz	Reverse Power 2-20%	32	256-PASU-LSBX-PQ-C6-EA
3 Phase 3 Wire	5A, 120V, 60Hz	Reverse Power 2-20%	32	256-PATU-LSBX-PQ-C6-EA
Single Phase or 3Ph 4W Push to Test	5A, 120V, 60Hz	Reverse Power 2-20%	32	256-PAQU-LSBX-PQ-C6-EA
3 Phase 3 Wire Push to Test	5A, 120V, 60Hz	Reverse Power 2-20%	32	256-PARU-LSBX-PQ-C6-EA

Connection Diagram

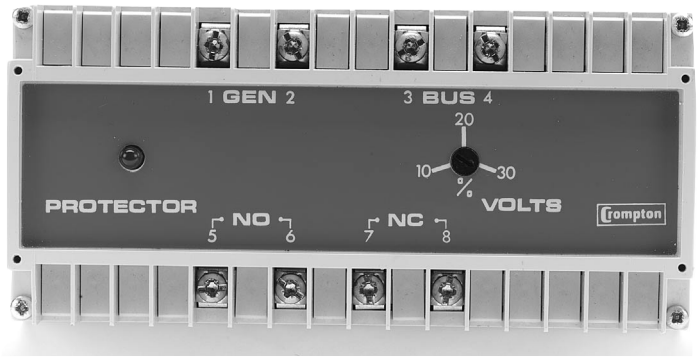
256-PAS
256-PAT
256-PAQ
256-PAR



Note: Only one CT connection is required.

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Synchro - Check (Paralleling)



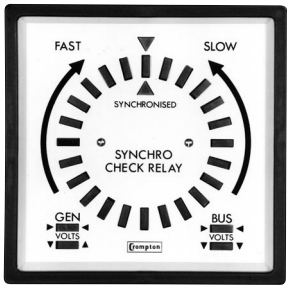
Protection ensures

- *Frequency matching*
- *Voltage matching*
- *Phase angle matching*

Application

- *Co-generation*
- *Generator sets*
- *Gen-Bus synchronising*
- *Bus-Bus synchronising*
- *Assists in manual synchronising*
- *Monitors auto synchronising systems*

We also manufacture front of panel mounting electro-mechanical or electronic synchroscopes, and synchro check relays



The Crompton Synchro check relay can be used to assist in the semi-automatic paralleling of two ac power systems.

The volt-free relay contacts change state when the voltage level, phase relationship and frequency are within the selected synchronising limits.

Introduction

As part of a manual control system, the operator will make adjustments the Voltage (excitation) and frequency (engine speed) using a synchroscope or lamps, and will then attempt to manually close the breaker. This synch check protector will qualify that the two systems are closely matched before permitting the breaker to close.

As part of an automatic synchronising arrangement, this relay can be used as an independent backup or checking device to ensure the two systems are suitably matched before the breaker can close.

Connecting two electrical systems that are not closely matched can cause expensive damage and disturbance to the electrical system. Using this relay will ensure that damage will not occur.

Product Function - 256-PLL

The relay continuously monitors the Voltage, phase displacement and frequency of two supplies. A single setpoint adjustment permits selection of suitable matching, and a red LED illuminates when the relay is energized, indicating that the two supplies are well matched - OK to close the breaker.

The relay contacts can be used in the main breaker circuit to disable a close command until both gensets are within acceptable limits.

Operating power is taken from the generator supply.

Additional Feature - 256-PLD

This version operates as explained above, but includes a dead bus detection function.

If there is a requirement for a continuous supply or emergency power, then the generator can be connected without synchronizing, to ensure continuity of supply. The absence of bus voltage will cause the relay to energize.

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Synchro - Check (Paralleling)

Specification

Approvals: U.L. recognized up to 300V.

Nominal Voltage: 100, 110, 120, 208, 220, 230, 240, 277, 380, 400, 415, 440 & 480V

Voltage tolerance: -25% to +30% of the nominal voltage

Frequency: 45 or 50 or 55 or 60 or 65Hz

Burden maximum: Bus 2VA, Generator 4VA

Setpoint Synchronising:

Set point: 10% to 30% of the nominal voltage

Adjustment: (6° to 20° electrical)

Weight: Approximately 0.85kg

Output Relay:

Relay contacts: 1 pair NO*, 1 pair NC*

*2 pair NO and 2 pair NC available on request.

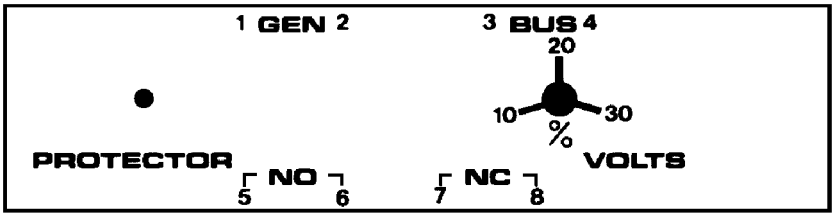
Product Code Examples

Relay	Input	Protection	ANSI No.	Catalogue No.
Single Phase or 3 Phase	120V, 60Hz	Phase Angle & Voltage	25	Live bus 256-PLLU-PQBX-C6
3 or 4 Wire	120V, 60Hz		25	Dead Bus 256-PLDU-PQBX-C6

Connection Diagrams

256-PLL
256-PLD

System	Generator Connections 1 2	Busbar Connections 3 4
3 phase 4 wire	L1 N	L1 N
3 phase 3 wire	L1 L2	L1 L2
1 phase 2 wire	L1 N	L1 N



Normally Open Contacts

Normally Closed Contacts

Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

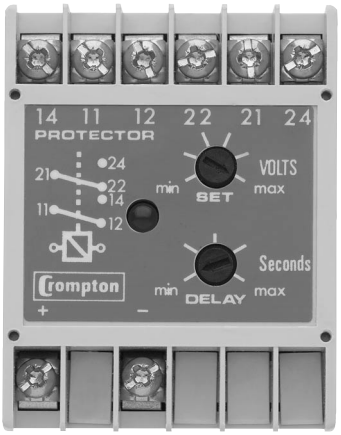
250 Series DIN Rail and Wall Mounted - D.C. Voltage

Features

- *Adjustable setpoint*
- *Adjustable time delay*
- *Internal differential*
- *LED trip indication*
- *2 pole relay contacts*

Application:

- *Battery Supplies - to monitor correct terminal voltage and detect under or over voltage conditions*
- *Battery Chargers - to monitor charging voltage is correct*



The Crompton D.C. voltage Protectors provide continuous surveillance of the monitored circuit. When the measured voltage moves outside the set-point limits, the relay will operate after the selected time delay or differential, giving an alarm and/or initiation signal. The protectors can protect for:

- ***Under voltage***
- ***Over voltage***
- ***Battery level control***
- ***No external power***

Introduction

Crompton D.C. Voltage Protectors provide continuous surveillance of the monitored voltage circuit, typically a battery supply or charging circuit. These products offer user adjustable trip point (setpoint) and time delay settings. The time delay setting adjustment range is typically 0 to 10 seconds, although longer delays are available.

As soon as the monitored signal moves outside of the setpoint limit, the time delay is activated, after which a trip will occur.

The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping.

The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable.

The units draw their operating power from the measuring inputs

Product Function

Over voltage models: When the monitored voltage exceeds the setpoint, the time delay is started. When the time has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored voltage falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes. The time delay is not active when resetting.

Under voltage models: When the monitored voltage falls below the setpoint, the time delay is started. When the time has elapsed, the relay will de-energize and the red LED will extinguish to indicate the trip condition. The relay will automatically reset once the monitored voltage rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes. The time delay is not active when resetting.

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and time delay controls
- **Differential** - Internally fixed value between 1% and 15%
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - D.C. Voltage

Specification

Model 252-PDU, 253-PDC

D.C Voltage: minimum 18 to maximum 20V D.C.
minimum 20 to maximum 32V D.C.

Time Delay: Externally adjustable, specify either:
0-10 seconds, 0-20 seconds,
0-30 seconds, 0-40 seconds,
0-100 seconds

Differential: Preset to 1%
(Any value between 1 and 15%)

Model 252-PDE

D.C. Voltage: minimum 18 to maximum 20V D.C.
minimum 20 to maximum 32V D.C.

Time Delay: Optional preset up to 30 seconds
(specify) 10 seconds standard)

Differential: Externally adjustable range
1-15%

All models:

Burden: <3VA

Overload: 1.2 x continuously Setpoint

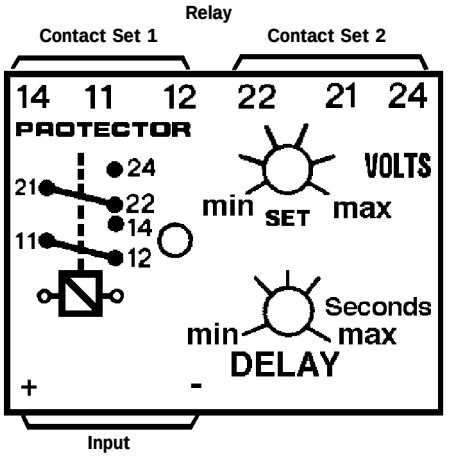
Repeatability: Better than 0.5%

Product Code Examples

Frequency Relay	D.C. Input	Protection	ANSI No.	Catalogue No.
D.C. relay	18-20V	Under Voltage External time delay	27	252-PDUU-NABX-T1-EB
D.C. relay	18-20V	Under Voltage Differential	27	252-PDEU-NABX-EB
D.C. relay	24V	Over and Under Voltage (2 output relays)	27/59	253-PDCU-BDBX-T1-EC-BD
D.C. relay	18-20V	Over Voltage External time delay	27	252-PDOU-NABX-T1-EB

Connection Diagrams

252-PDU
252-PDE



Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Thermistor Trip

The Crompton thermistor trip relay continuously monitors the working temperature inside equipment.

When the temperature exceeds a safe limit, the relay can be used to shunt equipment down until it has cooled down again. The protector can be used to protect:

- ***Motors***
- ***Transformers***
- ***Generators***

Application

The Crompton Thermistor Trip Relay, when used in conjunction with positive temperature co-efficient thermistors, will give full protection against:

- ***Sustained overload***
- ***Single phasing***
- ***Locked rotor***
- ***Blocked ventilation***
- ***High ambient temperature***

Introduction

Many motors and transformers are supplied with thermistor temperature sensors already fitted.

Thermistors are low cost over-temperature sensors.

Product Function

The protector operates by de-energizing a relay when the thermistors detect a critical temperature condition. An illuminated green LED indicates when the temperature is within normal working limits.

Any number of thermistors may be used in series connection providing the resistance at normal working temperature is less than 1500 ohms.

There are no user adjustments on this relay.

Product Code Examples

Relay	Input	A.C. Aux Power	Reset	ANSI No.	Catalogue No.
P.T.C. Thermistors	1500 Ohms	120V	49	Manual.	252-PMMU-STBX-DG
	1500 Ohms	120V	49	Auto.	252-PMTU-STBX-DG

Specification

Approvals: This model is U.L. recognized
Model 252 - PMMU is CSA approved.

Input: Positive temperature coefficient thermistors (series connected 1500Ω maximum at normal temperature)

Range: Trip 2500-3500Ω
Reset 1500-2300Ω

Status: Normally energized - green LED illuminated. Relay is de-energized above trip point

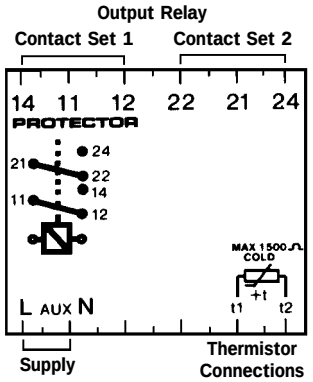
Reset: Model 252-PMT: Automatically resets when temperature returns to normal
Model 252-PMM: fitting a link between terminals R1 and R2 will latch the product in its tripped state when an over temperature condition is detected. The relay can be reset by pressing the front panel reset switch, opening the R1 - R2 link, or interrupting the auxiliary supply.

Auxiliary Supply:
A.C. 50/60Hz 110, 120, 220, 230 & 240V ±20%

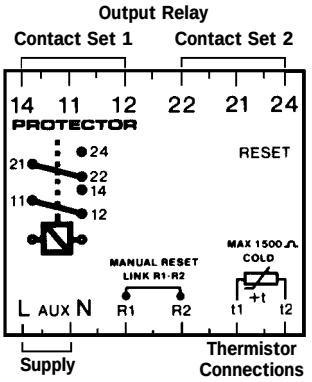
Burden: 2VA approx.

Connection Diagrams

252-PMT



252-PMM



Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Hot Spot 3

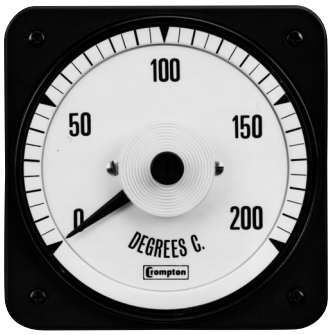
Protection against

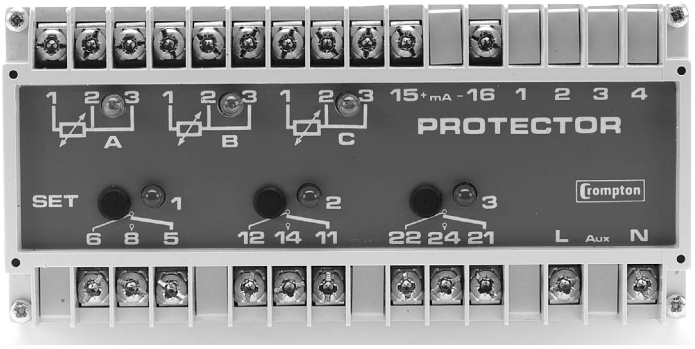
- Ineffective cooling
- Blocked ventilation
- Overloads
- Worn bearings
- Loss of one phase
- Under voltage
- Unbalanced voltage

Application

- Motor protection
- Transformer protection
- Gensets protection
- Heating equipment

Select an analog or digital indicator from our range.





The Crompton Hot Spot 3 relay accepts up to three inputs from resistance temperature detectors (RTD) and provides up to three user adjustable trip points which can be used to initiate alarms, cooling systems or shutdown.

The relay can be used to protect:

- ***Electric motor windings***
- ***Transformers***
- ***Generator windings***
- ***Bearing temperature***

Introduction

This Crompton Hot Spot Protector monitors three temperature zones. RTD temperature sensors are often fitted inside electric motors to detect hot spots in the windings or the bearings. RTD sensors are popular because they offer a good accuracy for a reasonable price. The same sensors can be used inside transformers, generator sets, gas turbines or as part of a process control system.

Hot spots can be caused by many conditions, such as overloads, over voltage, unbalanced supply, worn bearings, ineffective cooling, poor ventilation, shorted turns, insulation breakdown, single phasing etc.

This product offers up to three user adjustable setpoints and relay contacts. These can be used to raise alarms, switch on cooling systems or shut down the effected equipment.

The product features a 1mA analog output signal for remote temperature indication.

Product Function

The protector continuously monitors the three RTD temperature sensors. The highest temperature is indicated with a yellow LED, and can be accurately measured or displayed using the 0/1mA analog output signal. The temperature is compared with the user adjustable setpoints. When the measured temperature exceeds the setpoint, the relay will de-energize, and a red LED illuminated to indicate the trip condition. When the temperature drops below the setpoint, the relay will reset to the energized condition, and the LED will extinguish.

Three product models offer one, two or three adjustable setpoints.

Information Required

When ordering please supply the following information:

- The type of temperature sensor being used, e.g. Platinum PT100
- The maximum temperature or meter scale, e.g. 100% = 1mA = 150°C
- The setpoint adjustment range, e.g. 0°C to 150°C.

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Hot Spot 3

Specification

Approvals: U.L. recognized

Input: Up to 3 inputs, 2 or 3 wire RTD sensors either 10Ω Copper or 100Ω Platinum minimum span 100°C

Auxiliary Supply: A.C 50/60Hz, 110, 120, 220, 230 & 240V ±20% (specify)
D.C. - contact factory

Output Relay(s):
Relay differential: Standard 2% of range
Type: SP changeover

Rating:
A.C: 240V, 5A non-inductive
D.C: 24V,5A resistive

Operations: 0.2 million at the above loads

Reset: Automatic

Standard: de-energize at set point with rising temperature

Indicator O/P: 1mA into 0/4kΩ load

Burden: 4VA maximum

Product Code Examples

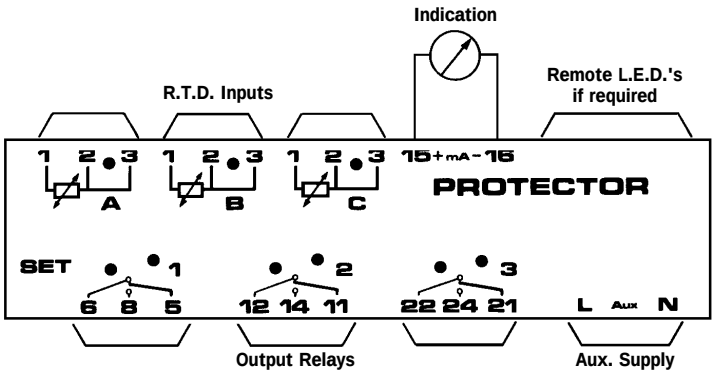
Relay	Protection	ANSI No.	A.C. Aux power	Catalogue No.
3 RTD inputs	3 trip points	49	120V	256-PRAU-R*-BX-DG-RO-LI
3 RTD inputs	2 trip points	49	120V	256-PRBU-R*-BX-DG-RO-LI
3 RTD inputs	1 trip point	49	120V	256-PRCU-R*-BX-DG-RO-LI
Optional indicating instrument				•077-05KA-FA

• (specify scale)

R * Specify type and temperature range

Connection Diagrams

256-PRA
256-PRB
256-PRC



Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

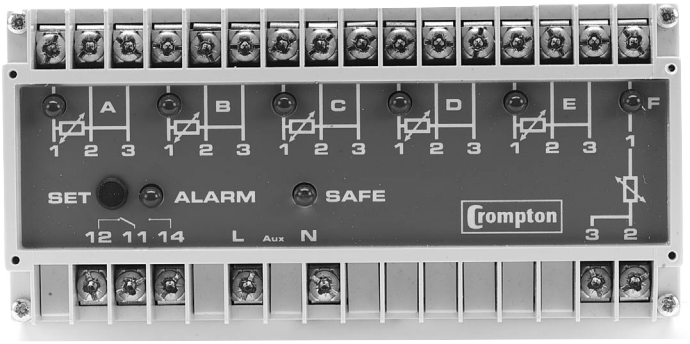
250 Series DIN Rail and Wall Mounted - Hot Spot 6

Protection against

- *Ineffective cooling*
- *Blocked ventilation*
- *Overloads*
- *Worn bearings*
- *Loss of one phase*
- *Under voltage*
- *Unbalanced voltage*

Application

- *Motor protection*
- *Transformer protection*
- *Gensets protection*
- *Heating equipment*



The Crompton Hot Spot 6 is a temperature trip relay accepting up to six inputs from resistance temperature detector (RTD) elements and provides one user adjustable trip point which can be used to initiate alarms, cooling or shutdown when the monitored temperature exceeds the set limit.

The relay can be used to protect:

- ***Electric motor windings***
- ***Transformers***
- ***Generator windings***
- ***Bearing temperature***

Introduction

This Crompton Hot Spot Protector monitors six temperature zones. RTD temperature sensors are often fitted inside electric motors to detect hot spots in the windings or the bearings. RTD sensors are popular because they offer a good accuracy for a reasonable price. The same sensors can be used inside transformers, generator sets, gas turbines or as part of a process control system.

Hot spots can be caused by many conditions, such as overloads, over voltage, unbalanced supply, worn bearings, ineffective cooling, poor ventilation, shorted turns, insulation breakdown, single phasing etc.

This product monitors six sensors and offers a user adjustable setpoint and relay contacts. This can be used to raise alarms, switch on cooling systems or shut down the effected equipment.

Product Function

The protector continuously monitors the six RTD temperature sensors. The highest of the six temperatures is indicated with a red LED. This temperature is compared with the user adjustable setpoint. When the measured temperature exceeds the setpoint, the relay will de-energize, and a red LED illuminated to indicate the trip condition. When the temperature drops below the setpoint, the relay will reset to the energized condition, and a green LED will illuminate to indicate 'Safe'.

Information Required

When ordering please supply the following informaton:

- The type of temperature sensor being used, e.g. Platinum PT100
- The setpoint adjustment range, e.g. 0°C to 150°C.

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Hot Spot 6

Specification

Approvals: U.L. recognized

Input: Up to six RTD sensors e.g. 100Ω platinum (PT100) or 10Ω copper

Ambient Temperature: 0 to 60°C

Trip Point Range of Adjustment: 100°C (e.g. 50 to 150°C, 100 to 200°C etc)

User Adjustment: Screwdriver adjustable, multi-turn potentiometer, access on front panel. Approximately 5°C per turn. Turn anti-clockwise to raise trip point.

Operating Time: <100ms

Repeatability: Within 1°C

Reset: Automatic. Relay differential (pull-in to drop-out) 4°C nominal

Auxiliary Supply: a.c. 50/60Hz, 110, 120, 220, 230 & 240V ±20% (specify)

Burden: 6VA maximum

Output Relay:

Type: Single pole changeover

Rating:

A.C: 240V, 5A non-inductive

D.C: 24V, 5A resistive

Operations: 0.2 million at the above loads

Reset: Automatic

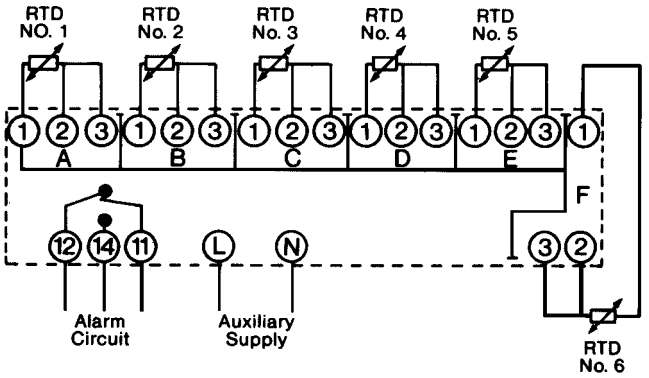
Product Code Example

Relay	Protection	ANSI No.	Catalogue No.
6 RTD inputs	Preset trip point 80-180 degree C	49	256-PCCU-R*BX-DG-AS

R * Specify type and temperature range

Connection Diagrams

256-PCC



When used for less than 6 RTD inputs the unused terminals 1, 2 & 3 must be linked together.

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - D.C. Millivolts / Thermocouple

The Crompton millivolt protectors accept inputs from current shunts or thermocouples, and the user adjustable trip can be set to initiate an alarm when the input exceeds the desired level.

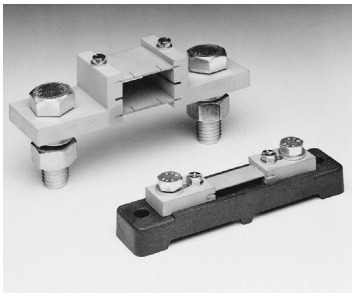
Application using current shunts

- ***Use with current shunts to monitor battery charging currents***
- ***Monitor current drain***
- ***Under / over current***

Application using thermo-couples

- ***Under / over temperature***
- ***Detect hotspots***

Use these protector relays with our Current Shunts.



Introduction

Crompton millivolt Protectors provide continuous surveillance of high DC currents when used with current shunts, or can be used to monitor temperatures using thermocouples. All industry standard shunts are supported, and all popular therocouples are supported. The relays offers user adjustable trip point (setpoint) and time delay settings. The time delay setting adjustment range is typically 0 to 10 seconds, although longer delays are available.

As soon as the monitored signal moves outside of the setpoint limit, the time delay is activated, after which a trip will occur. The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping.

The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable.

These units require an auxiliary power supply.

Product Function

'Over' models: When the monitored signal exceeds the setpoint, the time delay is started. When the time has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored signal falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes.
The time delay is not active when resetting.

'Under' models: When the monitored signal falls below the setpoint, the time delay is started. When the time has elapsed, the relay will de-energize and the red LED will extinguish to indicate the trip condition.
The relay will automatically reset once the monitored signal rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes. The time delay is not active when resetting.

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and time delay controls
- **Differential** - Internally fixed value between 1% and 15%
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Information Required

When ordering please supply the following information:

- The rated shunt output, eg. 75mV
- The auxiliary supply voltage.
- The type of thermocouple, eg. Type K.
- The nominal operating temperature, e.g. 150°C

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - D.C. Millivolts / Thermocouple

Specification

Approvals: U.L. recognized
D.C. Millivolts models are CSA approved

Input d.c. millivolts: Spans 10mV (minimum), 50mV, 60mV, 75mv, 100mV, 150mV.

Thermocouple: Types J, K, R, S, T
Minimum Span 10mV
Maximum Span 50mV

Thermocouple Break Protection (TBP):
Upscale drive is standard

Cold Junction Compensation (CJC):
Available on application

Overload: 10 x continuously

Input Impedance: Approximately 50kΩ

Source Impedance: Maximum 100Ω

Setpoint Repeatability: 0.5% of span

Hysteresis: 2% of span

Adjustment: Low trip 0-80%
High trip 40-120%

Time Delay: Up to 10 seconds adjustable

Auxiliary Supply:

A.C. 50/60Hz: 120V or 240V (±20%)

D.C. voltage: 12V or 24V (±20%)

Burden: 3VA maximum

Voltage Withstand: 1.2 x continuously
1.5 x for 10 x 10seconds to B.S. 6253

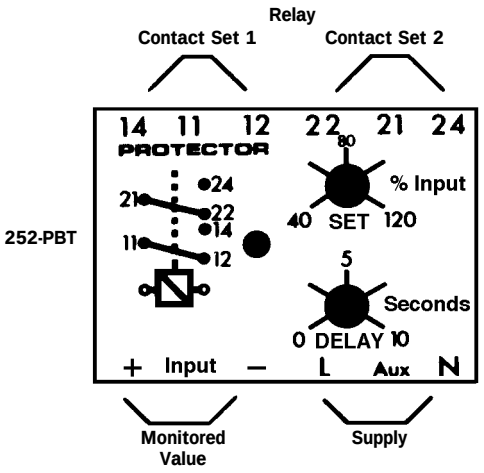
Product Code Examples

Relay	Input	Protection	ANSI No.	A.C. Aux Power	Catalogue No.
D.C. Millivolt	50mV	High trip	74	120V	252-PBTU-ECBX-DG-T1-EA
D.C. Millivolt	50mV	Low trip	74	120V	252-PBSU-ECBX-DG-T1-EB
D.C. Millivolt	100mV	High trip	74	120V	252-PBTU-GBBX-DG-T1-EA
	100mV	Low trip	74	120V	252-PBSU-GBBX-DG-T1-EB
Thermocouple	Type J, K, R, S, T	High trip	49	120V	252-PTOU-T*BX-DG-T1-EA
	Type J, K, R, S, T	Low trip	49	120V	252-PTUU-T*-BX-DG-T1-EB

T * Specify type and temperature range

Connection Diagrams

252-PBT
252-PBS
252-PTU
252-PTO



Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - D.C. Transducer

Application

- Forward / Reverse Watts
- Under / Over Watts
- Forward / Reverse VAr
- Under / Over VAr
- Under / Over VA
- Power Factor Monitoring and Control

The Crompton D.C. transducer protector accepts standard process signals and monitors that these are inside the set limits.

Use these protector relays with our Paladin transducers.

Introduction

Crompton transducer Protectors provide continuous surveillance of the DC process voltage or current signal. Combining the protection relay with a measuring transducer can form specialised control products when ever self contained relays are not available. The relay offers user adjustable trip point (setpoint) and time delay settings. The time delay setting adjustment range is typically 0 to 10 seconds, although longer delays are available.

As soon as the monitored signal moves outside of the setpoint limit, the time delay is activated, after which a trip will occur. The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping.

The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable.

These units require an auxiliary power supply.

Product Function

'Over' models: When the monitored signal exceeds the setpoint, the time delay is started. When the time has elapsed, the relay will energize and the red LED will illuminate to indicate the trip condition. The relay will automatically reset once the monitored signal falls below the setpoint minus the differential. When reset, the LED will extinguish and the relay de-energizes.
The time delay is not active when resetting.

'Under' models: When the monitored signal falls below the setpoint, the time delay is started. When the time has elapsed, the relay will de-energize and the red LED will extinguish to indicate the trip condition.
The relay will automatically reset once the monitored signal rises above the setpoint plus the differential. When reset, the LED will illuminate and the relay energizes. The time delay is not active when resetting.

Product customisation options

Please contact the factory.

- **Adjustment ranges** - different adjustment ranges are possible for the setpoint and time delay controls
- **Differential** - Internally fixed value between 1% and 15%
- **Relay operation** - standard models are fail safe, but the relays can be customised to energise or de-energise on trip

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - D.C. Transducer

Specification

Approvals: U.L. recognized
CSA Approved.
(up to 24V D.C.)

Input:

Current D.C.: 0-1, 0-5, 0-10, 0-20, 4-20mA
Volt drop 1V

Voltage D.C.: 1V to 50V, input resistance 10kΩ/V

Voltage Withstand: 1.2 x continuous
1.5 x for 10 x 10s

Setpoint Repeatability: 0.5% of span

Hysteresis: 2% preset

Adjustment: Low trip 0-80%
High trip: 40-120%

Time Delay: Up to 10 seconds adjustable

Auxiliary Supply:

A.C. 50/60Hz: 120V or 240V±20%

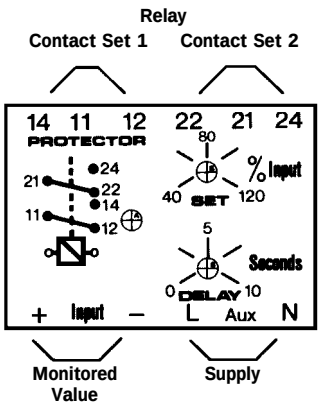
Burden: 3VA maximum

Product Code Examples

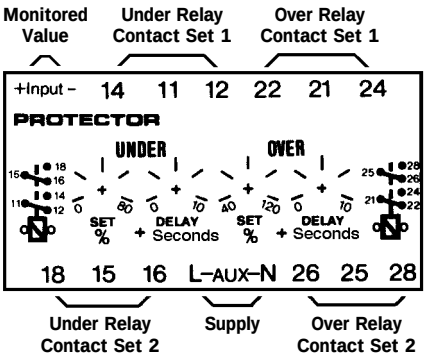
Relay	Input	Protection	ANSI No.	A.C. Aux Power	Catalogue No.
Transducer	1mA	Low trip (falling signal) 0-80%	74	120V	252-PBAU-FABX-DG-T1-EB
	1mA	High trip (rising signal) 40-120%	74	120V	252-PBBU-FABX-DG-T1-EA
	1mA	Low & High (2 output relays)	74	120V	253-PBVU-FABX-DG-T1-EC
Transducer	4/20mA	Low trip (falling signal) 0-80%	74	120V	252-PBAU-HGBX-DG-T1-EB
	4/20mA	High trip (rising signal) 40-120%	74	120V	252-PBBU-HGBX-DG-T1-EA
	4/20mA	Low & High (2 output relays)	74	120V	253-PBVU-HGBX-DG-T1-EC
Transducer	10V	Low trip (falling signal) 0-80%	74	120V	252-PBAU-MTBX-DG-T1-EB
	10V	High trip (rising signal) 40-120%	74	120V	252-PBBU-MTBX-DG-T1-EA
	10V	Low & High (2 output relays)	74	120V	253-PBVU-MTBX-DG-T1-EC

Connection Diagrams

252-PBB
252-PBA



253-PBV



Crompton INSTRUMENTS

Protector Relays

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Speed Sensing

Protect against

- *Open circuit sensor detection - a break in the sensor lead will de-energise the over-speed relay*
- *Zero reset cranking - the crank relay will only reset when the input frequency falls below 20% of the crank set point*
- *Under speed alarm or load shedding*
- *Over speed alarm or shutdown*

Applications

- *Engine monitoring*
- *Generator set protection*
- *Gas turbine monitoring*
- *Monitor the engine governer*

Select an analog or digital speed indicator from our range.

The Crompton speed sensing relay monitors rotating equipment and provides three output contacts which can be used to initiate alarm or shutdown signals. The relay also provides a tachometer output for speed indication.

Introduction

The Crompton speed sensing protector monitors the speed of rotation using a low cost magnetic pickup. Speed sensors are often used in generator set engines, gas turbines, motors, gear boxes or any rotating machines.

The relay will detect under speed, over speed and stopped conditions, and the setpoint relays can be used to raise an alarm or shut down the equipment. There are three setpoint adjustments and relay contacts.

The product also offers an analog output that can be used to monitor or display the speed.

The product operates from the 12V or 24V dc battery supply, and speed is measured and calculated from the number of sensor pulses per revolution. Since the sensor is magnetic, and rotating steel component can be used, such as the flywheel which has gear teeth. This will result in a large number of pulses per revolution, and lead to greater accuracy.

Product Function

The protector continuously monitors the rotations speed, and updates the analog output signal. An output of 0.75 mA indicates normal speed (100%) while 1mA indicates 133% of nominal speed. The calibration point can easily be user adjusted.

Three setpoint control adjustments allow setting of the desired speed limits for cranking, under speed and over speed.

Cranking relay - will detect if the the engine is running or stopped. This relay can be used to ensure the cranking motor is disconnected once the engine has started running. Set the cranking setpoint just above the cranking motor speed. A red LED illuminates when the relay is energized, indicating a trip condition.

Under speed relay - will detect when the normal running speed has been achieved. This can be used to enable the generator's electrical protection. It can also be used to trigger load shedding. A red LED illuminates when an under speed condition exists.

Over speed relay - will detect a stuck throttle or overshoot, and can be used to shut down the engine. A red LED indicates over speed trip.

Fail safe operation - the relay will detect an open circuit speed sensor, and de-energize the overspeed relay.

Information Required

When ordering please supply the following information:

- The number of pulses per revolution, e.g. flywheel teeth = 30
- The nominal running speed, e.g. 3600 RPM.
- The DC battery supply, e.g. 24 Vdc

Crompton INSTRUMENTS

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Speed Sensing

Application

The Protector Speed Sensing Relay provides three user adjustable trip levels with LED relay state indication and a speed indicator output signal. The trip functions provided are:

SP1 - disengages the crank starter

SP2 - energizes protection or under-speed alarm

SP3 - alarms or trips on overspeed

Specification

Approvals:	U.L. recognized
Input:	
Pulse:	5V-75V peak to peak
Frequency:	0-1kHz minimum range 0-10kHz maximum range (speed of rotation r.p.m. x number of teeth ÷60)
Open circuit protection:	Overspeed relay de-energizes
Setpoints:	
Setpoint SP1 (crank):	10%-50%
Setpoint SP2 (under):	50%-100%
Setpoint SP3 (over):	100%-130%
Repeatability:	0.5% of span
Hysteresis:	2% (SP2, SP3) SP1 resets at 20% of setting
Auxiliary Supply:	
D.C. voltage:	12V or 24V (±20%)
Burden:	3VA
Output:	
Calibration Signal:	0-1mA into 0-1,000 ohms
Calibration value:	0.75mA = 100% 1mA = 133% of nominal speed

Product Code Examples

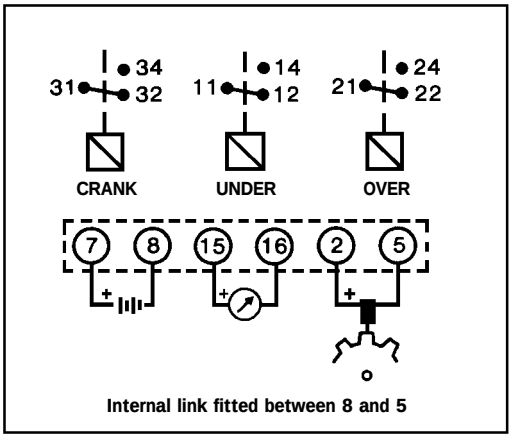
Relay	Protection	ANSI No.	A.C. Aux power	Catalogue No.
5V to 75V peak to peak	3 trip points	12/14	12V	253-PH3U-BGBX-FS-V2
(specify rev/min and flywheel teeth number)	(specify SP1, SP2, SP3)	12/14	24V	253-PH3U-BGBX-FS-V4

Accessories

Magnetic Speed Sensor, STD length 1.125", thread 5/8-18 UNF	CMS3010AN
Magnetic Speed sensor, long reach 4.00" thread 5/8-18 UNF	CM3010AN40
Mating Output connector & clamp - 2 pin (*4) or 3 pin (*3) Specify *	CMS3106-10SL-*S

Connection Diagrams

253-PH3



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Crompton INSTRUMENTS

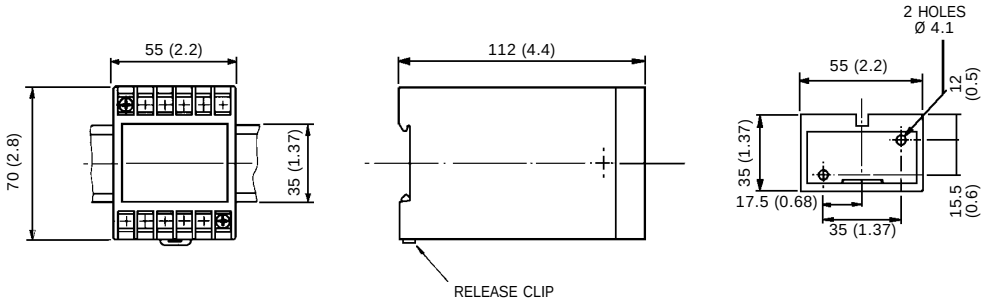
Protector Relays

Protector Trip Relays

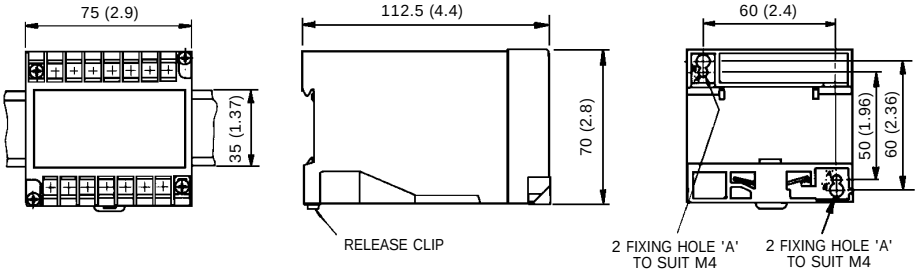
250 Series DIN Rail and Wall Mounted - Dimensions

DIN Rail and Wall Mounted

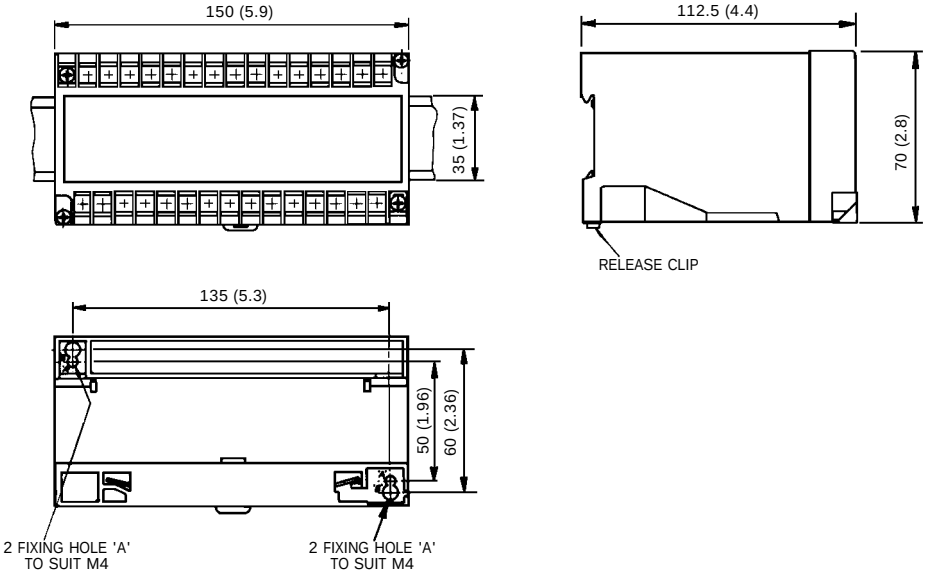
Model 252



Model 253



Model 256



Crompton INSTRUMENTS

Protector Relays