# VTX

## Supervision Relay


**VTX relay is used for the continuous supervision of CT secondary wiring and connections of busbar protection schemes. A built in delay of 3 seconds is provided to avoid unwanted alarm during external/internal faults.The relay after operation will short the CT bus wires.**

### Features

- Consistent accuracy.
- Reliability.
- Low burden.
- Reduced maintenance.
- Immunity to transients and surges, withstands 5 KV impulse voltage test.

### Application

This relay is used for the continuous supervision of CT secondary wiring and connections of busbar protection schemes. Each protected zone of the busbar installation is equipped with an alarm relay, should the CT secondary wiring develop a fault while load current is flowing, an alarm is given after a time delay of 3 seconds. The delay is given to prevent an alarm in the case of genuine busbar fault when the busbar protection is required to operate and isolate the faulty section. Further, due to its sensitive setting requirement, the relay may be unstable under heavy external fault conditions, the time delay allows the fault to be cleared by the appropriate protection thus preventing unwanted alarms.

VTX 31 is a three phase relay used with phase and earth fault schemes, detects open circuit of current transformers and also detect broken or crossed CT Pilots.

### Description

The relay consists of three stages, pick-up voltage control stage, timing stage and output stage. The block diagram of VTX is shown in Figure 1.

Under healthy conditions of the protected circuit there is no ac input to the relay and the auxiliary dc supply causes transistor T1 to conduct, shorting out the capacitor in the timing circuit. When a voltage appears across the ac input terminals, the rectified dc output of the bridge tends to bias off the transistor T1, in case the ac input is higher than the voltage setting. With T1 off, the timing circuit capacitor begins to charge up from the stabilised dc supply. After a time delay of 3 seconds, the capacitor voltage reaches a predetermined value and triggers the transistor T2 which in turn switches on the output transistor T3.

The internal electromechanical auxiliary unit, being in the load circuit of transistor T3 picks up and initiates alarm and other functions. Continuous adjustment of the relay voltage setting is provided by a potentiometer in the bridge output circuit. Protective devices have been included in the circuitry to prevent damage due to spikes in the input voltages or reverse connection of the dc auxiliary supply.

### Customer Benefits

- High stability on external faults
- Tuned to rated frequency
- 25ms operating time at 5 times current setting

## Technical data

### Voltage setting

2 to 14V continuously adjustable at 50 Hz.

### Thermal rating

300V ac rms at 50 Hz between any phase and neutral of the input terminals continuously on any setting. The relay will also withstand 2 kV ac rms 50 Hz for three seconds on any setting.

### Auxiliary supply

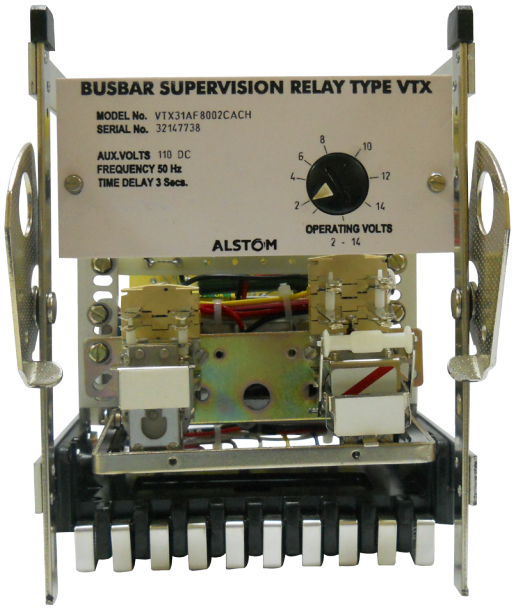
The relay can be supplied suitable for operation at 30V, 110V and 220V dc. For voltages above 30V, an external dropping resistor is used. Satisfactory operation is maintained over a range of 75% - 120%.

### Accuracy

- At rated auxiliary supply and rated frequency, the relay has an accuracy of ±5% of the setting value on any setting.
- Operating temperature range -5°C to +50°C.

### Operating time

Nominal 3 seconds.




VTX relay drawnout from case

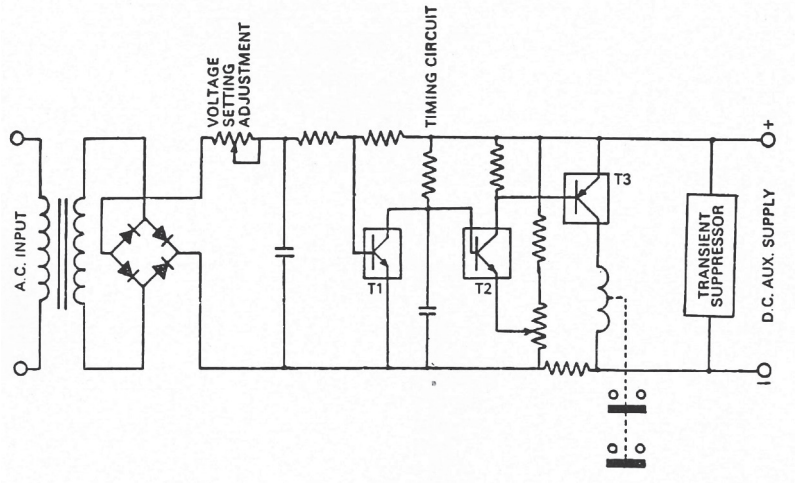



Figure 1: Block diagram for VTX relay

## Burden

Continuous burden imposed on dc auxiliary supply is as shown in the table below:

| Auxiliary voltage | Relay unoperated (W) | Relay operated (W) |
|---|---|---|
| 30V | 1.0 | 1.7 |
| 110V | 3.5 | 4.0 |
| 220V | 3.5 | 7.7 |

Approximate ac burden per phase for both types of relays on any setting is as follows:

| Applied voltage | Burden (VA) |
|---|---|
| 10V | 0.002 |
| 300V | 4.2 |
| 1414V | 86 |

## Contacts

Two pairs of normally open, self reset contacts are provided on the output attracted armature unit. Hand reset contacts are also available as option.

## Contact ratings

| | Make and carry Continuously | Make and carry for 0.5 second | Break |
|---|---|---|---|
| AC | 1250VA with maxima of 5A and 660V | 7500VA with maxima of 30A and 660V | 1250VA with maxima of 5A and 660V |
| DC | 1250W with maxima of 5A and 660V | 7500W with maxima of 30A and 660V | 100W(resisitive) 50W (inductive) with maxima of 5A and 660V |

## Operation indicator

A hand reset mechanical operation indicator is fitted as standard on the output attracted armature unit.

## Insulation

The relay meets the requirements of IS.3231: 196/IEC 255-5 Series

C-2KV for 1 minute.

## Impulse withstand level

The relay will withstand 5 kV impulse voltage test in accordance with IEC recommendations.

## High frequency disturbance

The relay meets the IEC test recommendation for the high frequency disturbance test. The relay accuracy is unaffected by repetitive 1 MHz bursts having an initial peak of 1.0 KV super-imposed across input circuits and 2.5 KV between independent circuits and earth, with a time delay of 3 to 6 microseconds, with the relay energised.

## Case

Relays are supplied in size 1 drawout (1D) cases suitable for flush mounting and are finished eggshell black and tropicalised. The drawout feature considerably simplifies maintenance and permits testing to be carried out easily and quickly. A cradle mounted isolating switch is provided which automatically isolates the trip circuit when the cradle assembly is withdrawn from the case for maintenance. This prevents any inadvertent tripping of the circuit breaker. A filter breather is fitted which equalises the pressure inside and outside the case without admitting dust.

## Information required with your order

Auxiliary dc voltage 30 V ☐ 110V ☐ 220V ☐

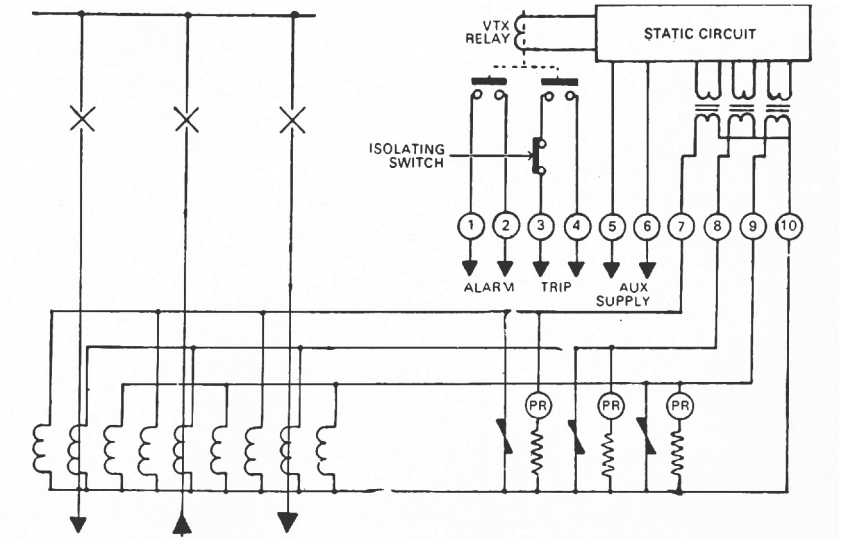



Figure 2: Typical connection diagram of VTX 31 relay in 3 phase bus zone protection scheme for phase and earth faults.

## Dimensions and weights

| Relay | Case size | Maximum overall dimensions | | | Approximate gross weight Kg |
|---|---|---|---|---|---|
| | | Height mm | Width mm | Depth* mm | |
| VTX 31 | 1D vert. | 233 | 170 | 203 | 4.5 |

* Add 76 mm for maximum length of terminal studs, alternatively,29 mm for terminal screws.
The approximate gross weights given above is inclusive of cartons, mounting appendages and terminal details.
The relays comply fully with the requirements of IS 3231 and are suitable for use in normal tropical environments.

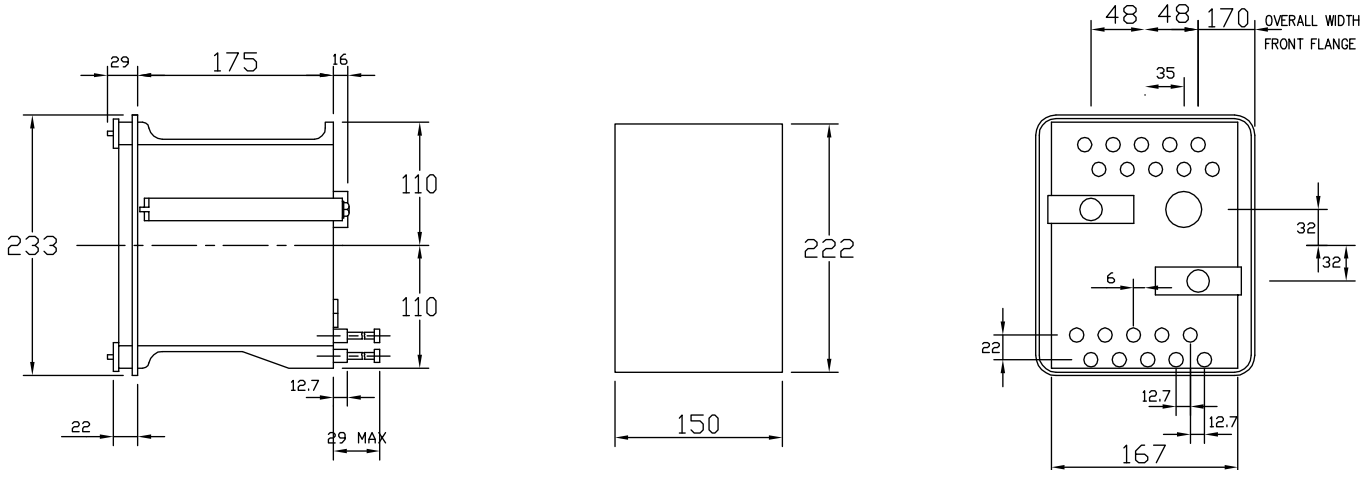



Figure 3 : Case and panel cut-out dimensions for case 1D ( All dimensions in mm)

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