

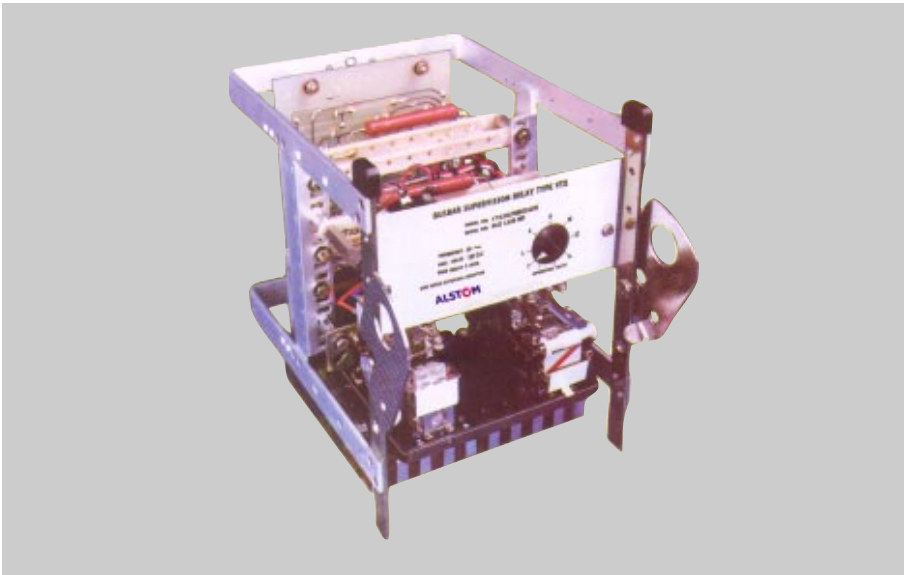


Type VTX Supervision Relay

ALSTOM

Type VTX Supervision Relay

VTX relay
withdrawn from case



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.

There are two types: Single phase VTX 11 and three phase VTX 31. The following Table gives the functional details of both the types.

Single phase used with earthfault schemes	Three phase used with phase and earthfault schemes
Will detect open circuit of current transformers	Will detect open circuit of current transformers
	Will 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 11 is shown in Figure 1. The three phase version VTX 31 is same as VTX 11 except that a three phase rectifier bridge is used to convert ac input quantities to dc signal.

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 pre-determined value and triggers the transistor T2 which in turn switches on the output transistor T3. The internal electro-mechanical 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.

Technical data

Voltage setting

2 to 14V continuously adjustable at 50 Hz.

Thermal rating

- Single phase relay:
600V ac rms at 50 Hz between the input terminals continuously on any setting.
- Three phase relay:
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.

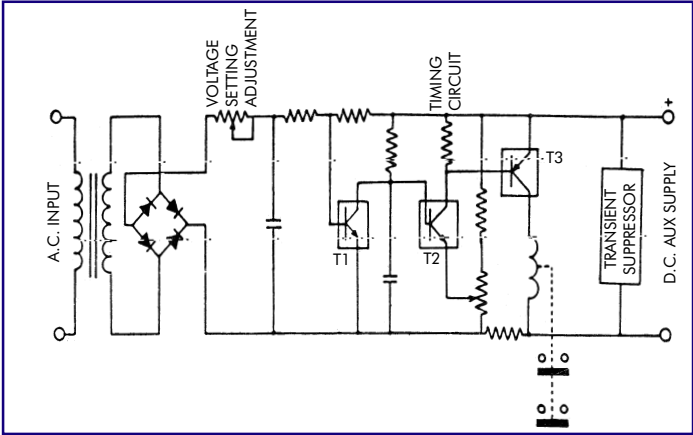


Figure 1:
Block diagram for
VTX 11 relay

Burden

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

Auxiliary voltage	30V	110V	220V
Relay unoperated (W)	1.0	3.5	7.0
Relay operated (W)	1.7	4.0	7.7

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

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

Contacts

Two pairs of normally open, self reset contacts are provided on the output attracted armature unit.

Contact ratings

	Make and carry continuously	Make and carry for 3 seconds	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 (resistive) 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.

Impulse withstand level

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

Insulation

The relay will withstand 2.5 kV rms 50 Hz for 1 second between all live parts and earth, and between all circuits not intended to be connected together. It will also withstand 1.25 kV rms 50 Hz for 1s across open contacts.

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

Single phase and three phase 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 order

- 1. Type of relay
- 2. Auxiliary dc voltage

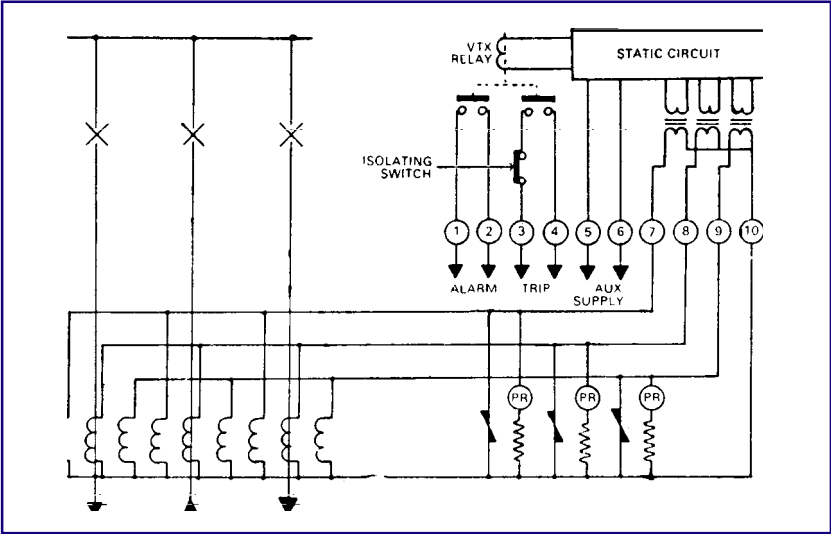


Figure 2:
Typical connection diagram of VTX 31 relay in 3 phase bus zone protection scheme for phase and earth faults.

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.



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