

■ Type MVTT 14 and MVTT 15: Static Digital Time delay relays

Features

- 1000/1 setting range
- Time settings easily selected by means of thumbwheel switches
- Provide time delayed pick-up, or drop-off
- Compact construction
- Non-volatile trip indication (MVTT 14 only)

Application

This range of static time delay relays is particularly suitable for use in protection and control schemes and industrial process plant.

The relays can perform with consistent accuracy over a large number of operations, with little or no maintenance over long periods. Furthermore, the static circuits have been designed to perform with complete reliability in the electrically hostile environments often encountered in electrical power stations and substations and also over a very wide range of ambient temperature.

Type variations

- Model for time delayed operation on
- Pick-up MVTT 14
- Drop-off MVTT 15
- Auxiliary supplies: Five dc supply ranges are available
- Timing ranges: Five standard timing ranges are available

Figure 1

Type MVTT 14 relay removed from case



Description

Type MVTT 14 with time-delayed pick-up

As shown in Figure 2, the MVTT 14 relay is initiated by an external contact which connects the dc supply to relay terminal 13. The dc supply is permanently connected to relay terminals 21 and 14. The closure of the external contact causes the counter to be reset immediately and starts the CMOS oscillator which generates a square wave output to the binary coded decimal counter.

The required time delay is preset by adjusting the three binary coded decimal thumbwheel switches. Each thumbwheel switch output to the associated counter provides a successive decade setting of between 0 and 9.

When the comparator detects that the accumulated count has reached the set count determined by the thumbwheel settings, then the output element is energised and the internal oscillator inhibited.

The relay resets instantaneously when the external contact is reopened.

Type MVTT 15 with time delayed drop-off

As shown in Figure 3 the MVTT 15 versions have similar circuits to the MVTT 14. The dc supply is continuously applied to the relay. Closing the external initiating contact causes the relay output element to pick-up instantaneously. The drop-off time delay is initiated by opening this contact which starts the CMOS oscillator.

The output element remains in the energised state until the comparator detects that the accumulated count has reached the set count, determined by the thumbwheel settings. At this instant the output element is de-energised, thus removing the dc to the dc regulator circuit by opening the internal hold-on contact (RL 6-1).

Power supplies

Relays designed for power supplies of 220/250V dc are supplied with an external assembly for connection in series with the dc auxiliary supply to the relay.

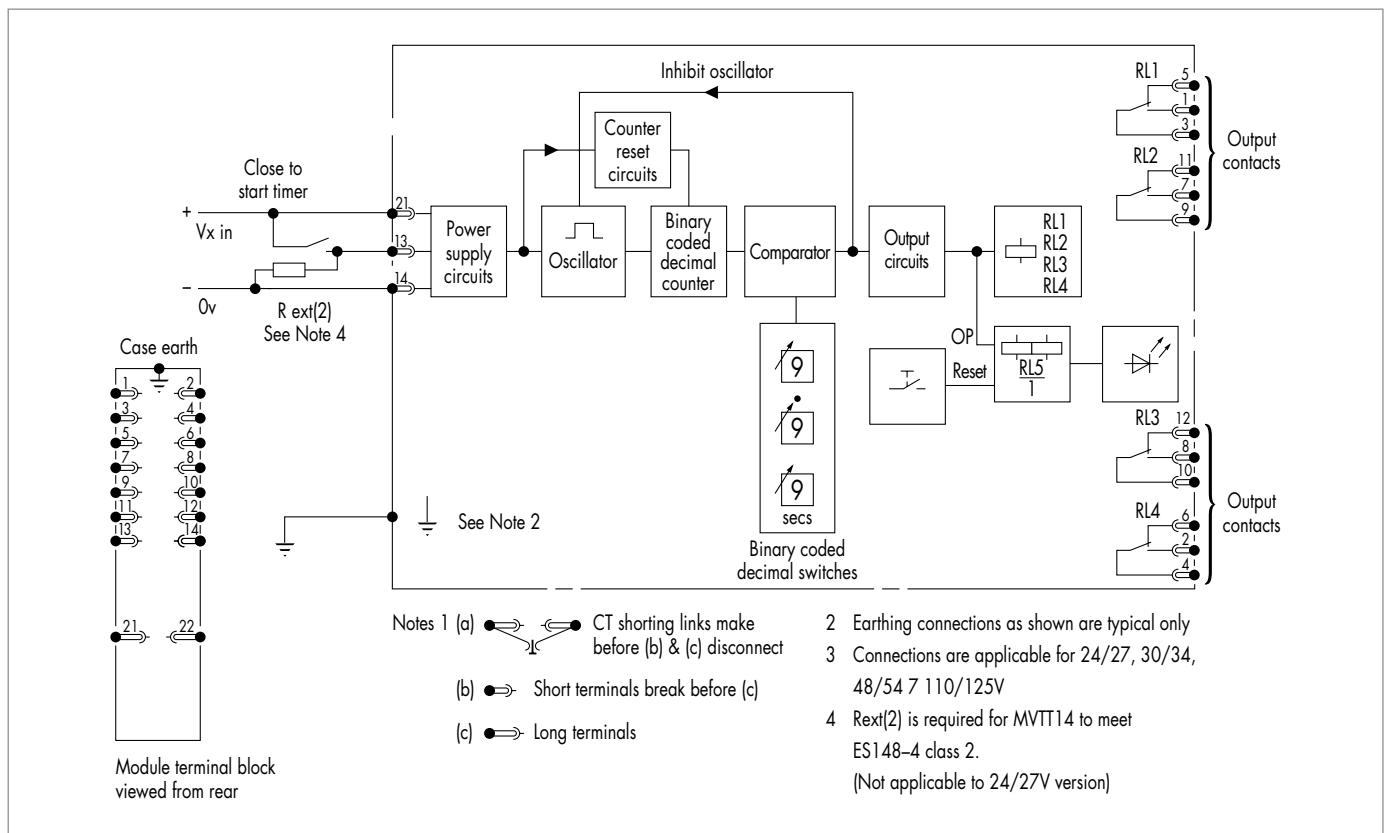


Figure 2 Application diagram: digital time delay relay type MVTT 14 (dc version)

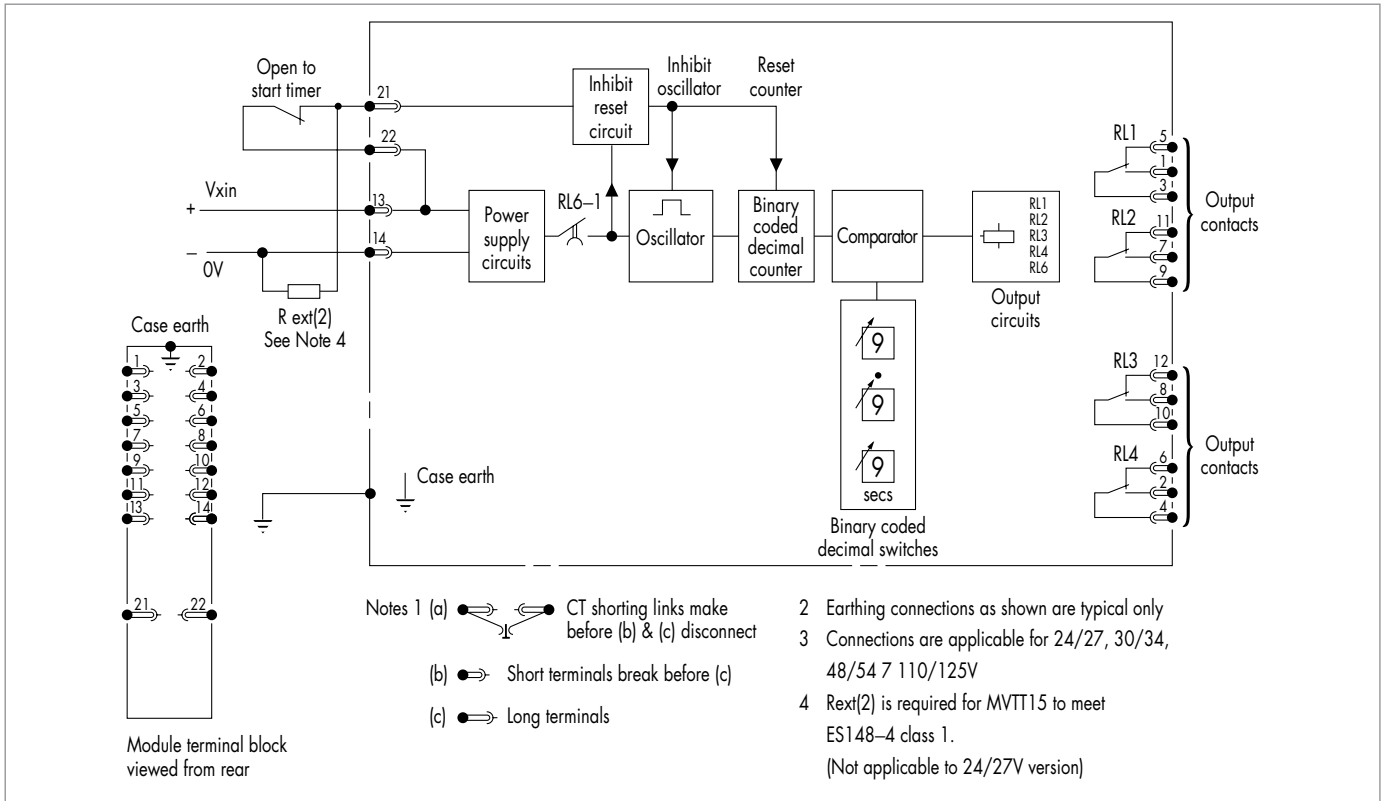


Figure 3 Application diagram: digital time delay relay type MVTT 15 (dc version)

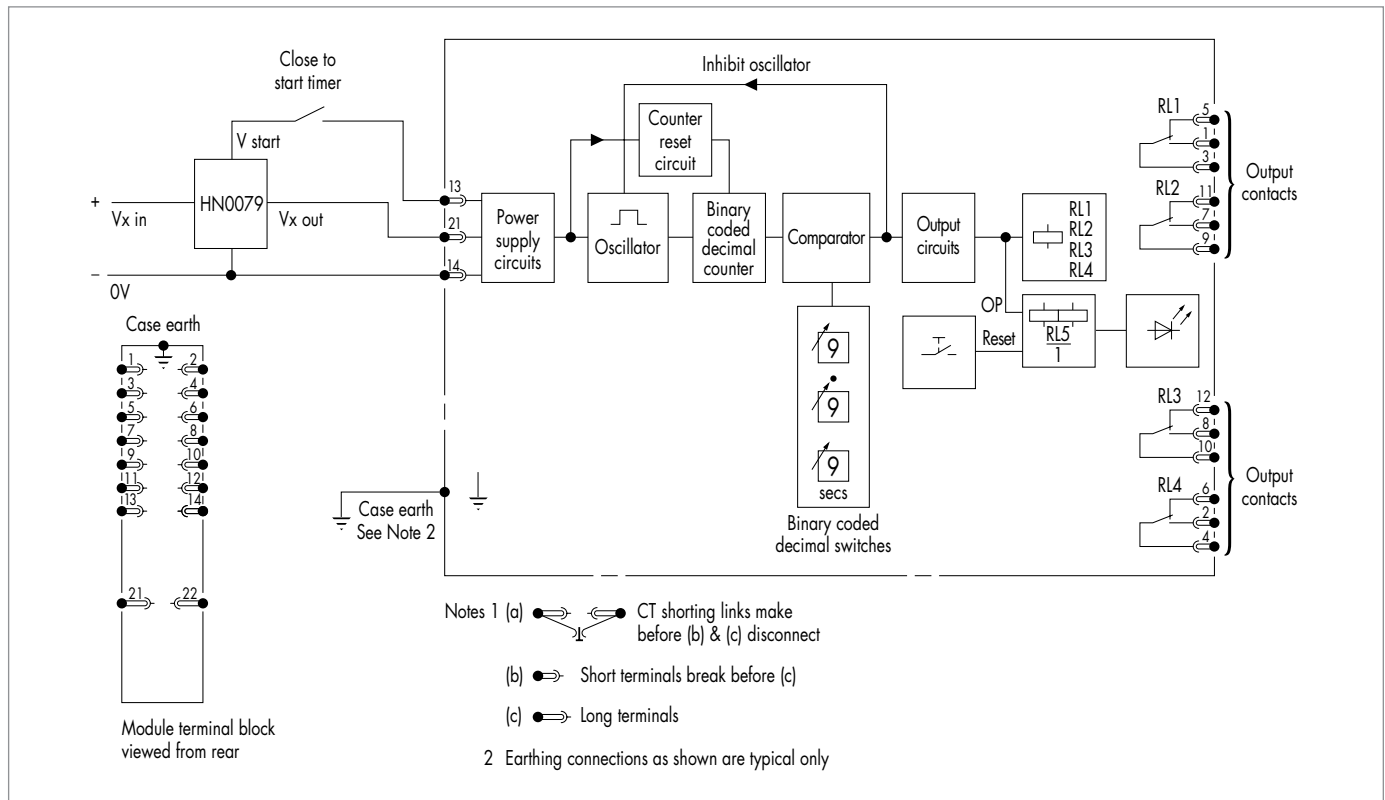


Figure 4 Application diagram: digital time delay relay type MVTT 14 220V (dc version)

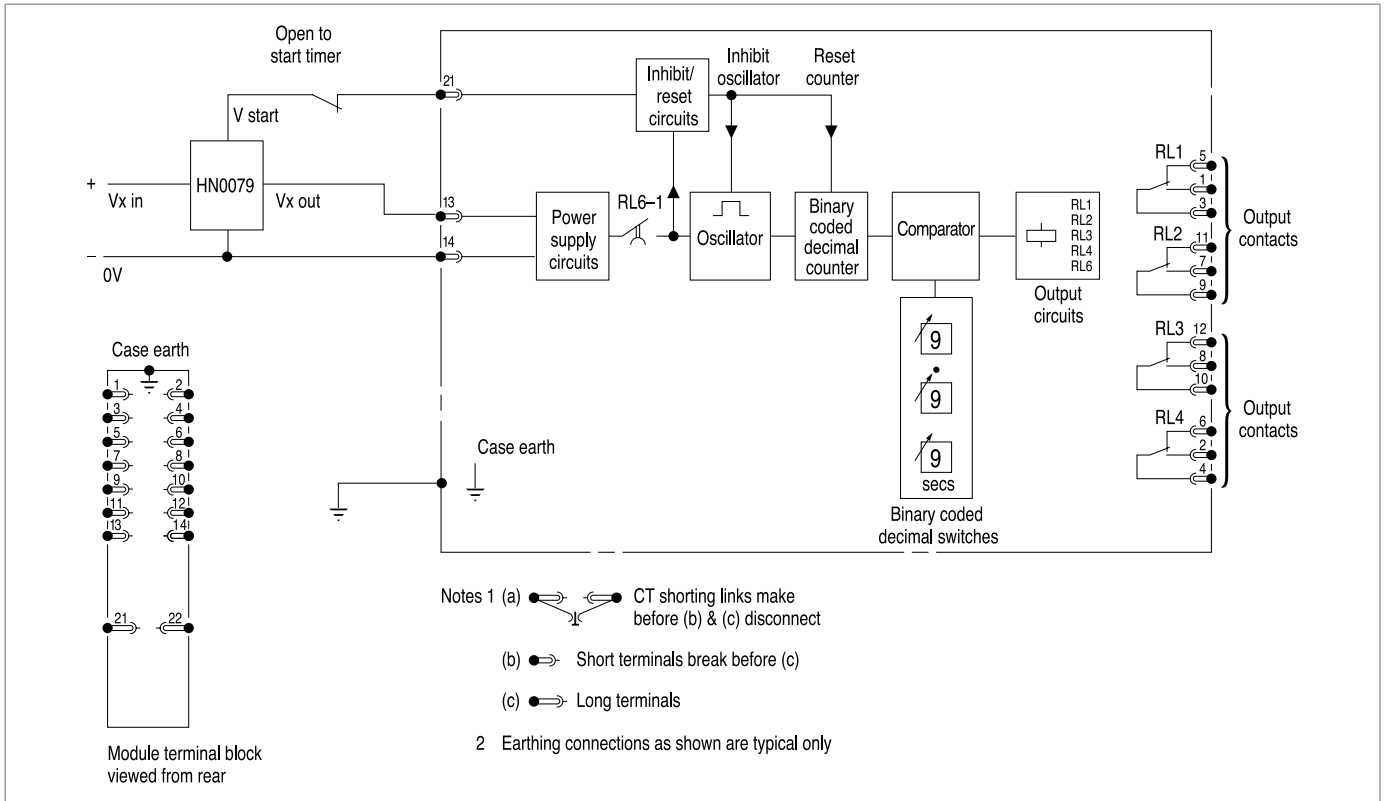


Figure 5 Application diagram: digital time delay relay, type MVTT 15 220V (dc version)

Technical Data

Voltage rating

Rating (Vx)	Operating range Vdc
24/27	19 to 32
30/34	24 to 37.5
48/54	38 to 60
110/125	87 to 150
220/250	175 to 300

Burdens

Rated Voltage Vx	DC Burden (mA)			
	Output Elements MVTT 14	Unoperated MVTT 15	Output Elements MVTT 14	Operated MVTT 15
24	15	15	120	110
30	25	25	125	120
48	25	25	85	75
110	10	10	40	35
220	65	65	65	65

Standard setting ranges

- 1ms to 1s in 1ms steps
- 10ms to 10s in 10ms steps
- 0.1s to 100s in 0.1s steps
- 1s to 1000s in 1s steps
- 10s to 10000s in 10s steps

Accuracy

- $\pm 2\%$ of setting or $+20\text{ms} - 0\text{ms}$, whichever is the greater
- Consistency $\pm 0.5\%$ or 5ms, whichever is the greater
- Disengaging time <10ms
- Resetting time <20ms

Contacts

- MVTT 14
Output element : Miniature relay
Contacts: 4 change-over
- MVTT 15
Output element : Miniature relay
Contacts: 4 change-over

Contact ratings

- Make and carry for 0.2s
 - ac 7500VA
with maxima of 30A or 300V
- Make and carry continuously
 - ac 5A
 - dc 5A
- Break
 - ac 1250VA with maxima of 5A and 300V
 - dc 50W (resistive)
25W (inductive) L/R =0.04s
with maxima of 5A or 300V

Durability

- Loaded contact
10,000 operations minimum
- Unloaded contact
100,000 operations minimum

Operation indicator

A non-volatile, hand-reset led trip indicator is supplied as standard on the MVT 14 (delay on pick-up) only.


High voltage withstand

- Dielectric withstand
IEC 255-5:1977
2kV rms for 1 minute between all terminals and case earth.
2kV rms for 1 minute between all terminals of independent circuits, with terminals on each independent circuit connected together.
1kV rms for 1 minute across normally open contacts.
- High voltage impulse
IEC 255-5:1977
Three positive and three negative impulses of 5kV peak, 1.2/50ms, 0.5J between all terminals of the same circuit (except output contacts), independent circuits, and all terminals connected together and case earth.

Electrical environment

- DC supply interruption
IEC 255-11:1979
The unit will withstand a 10ms interruption in the auxiliary supply, under normal operating conditions, without de-energising.
- AC ripple on dc supply
IEC 255-11:1979
The unit will withstand 12% ac ripple on the dc supply.
- High frequency disturbance
IEC 255-22-1:1988 Class III
2.5kV peak between independent circuits and between independent circuits and case earth
1.0kV peak across terminals of the same circuit (except metallic contacts).
Under the conditions created by this test an additional tolerance of $\pm 3\%$ is allowed.
- Electrostatic discharge
IEC 255-22-2:1989 Class II
4kV discharge in air with cover in place
IEC 801-2:1991 Level 2
4kV point contact discharge with cover removed
- Fast transient disturbance
IEC 255-22-4:1992 Class IV
4kV, 2.5 kHz applied directly to auxiliary supply
IEC 801-4:1988 Level 4
4kV, 2.5 kHz applied directly to all inputs
- Surge immunity
IEC 1000-4-5:1995 Level 3
2kV peak 1.2/50 μ s between all groups and case earth
2kV peak, 1.2/50 μ s between terminals of each group
- EMC compliance
89/336/EEC
Compliance to the European Commission Directive on EMC is claimed via the Technical Construction File route
EN 50081-2:1994
EN 50082-2:1995
Generic Standards were used to establish conformity

Product safety

 73/23/EEC

Compliance with the European Commission low voltage directive

EN 61010-1:1993/A2:1995

EN 60950:1992/A3:1995 Compliance is demonstrated by reference to generic safety standards

Atmospheric environment

- Temperature
IEC 255-6:1988
Storage and transit -25° to +70°C
Operating -25°C to 55°C
IEC 68-2-1:1990 Cold
IEC 68-2-2:1974 Dry heat
Under the conditions created by this test an additional tolerance of $\pm 3\%$ is allowed.
- Humidity
IEC 68-2-3:1969
56 days at 93% RH and 40°C
Under the conditions created by this test an additional tolerance of $\pm 3\%$ is allowed.
- Enclosure Protection
IEC 529:1989
IP50 (dust protected)

Mechanical environment

- Vibration
IEC 255-21-2:1988
Response Class 2
Endurance Class 2
- Shock and bump
IEC 255-21:1988
Shock response Class 2
Shock withstand Class 1
Bump Class 1
- Seismic
IEC 255-21:1993 Class 2

Environmental withstand

- Temperature
IEC 68-2-1/IEC 68-2-2
Storage and transport
-25°C to +70°C
Operating -25°C to +55°C
- Humidity
IEC 68-2-3
56 days (at 93% RH and 40°C)
- Enclosure protection
IEC529
IP50 (dust protected)
- Vibration
IEC 255-21-1
0.5g between 10 and 300Hz

Cases

MVTT 14 and MVTT 15 relays are housed in size 2 cases as shown in Figure 6

Information Required with Order

- Relay type
- Voltage rating
- Timing range required

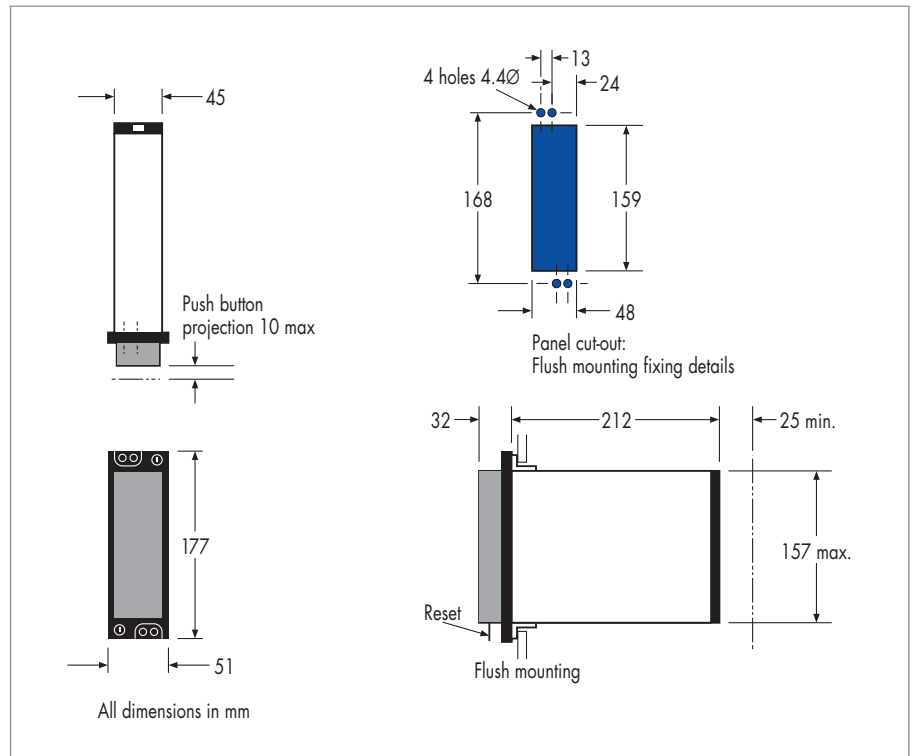


Figure 6 | Case outline size 2