

# MVTT 14/15



## Static Digital Time Delay Relays

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

## Key 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)



### 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.



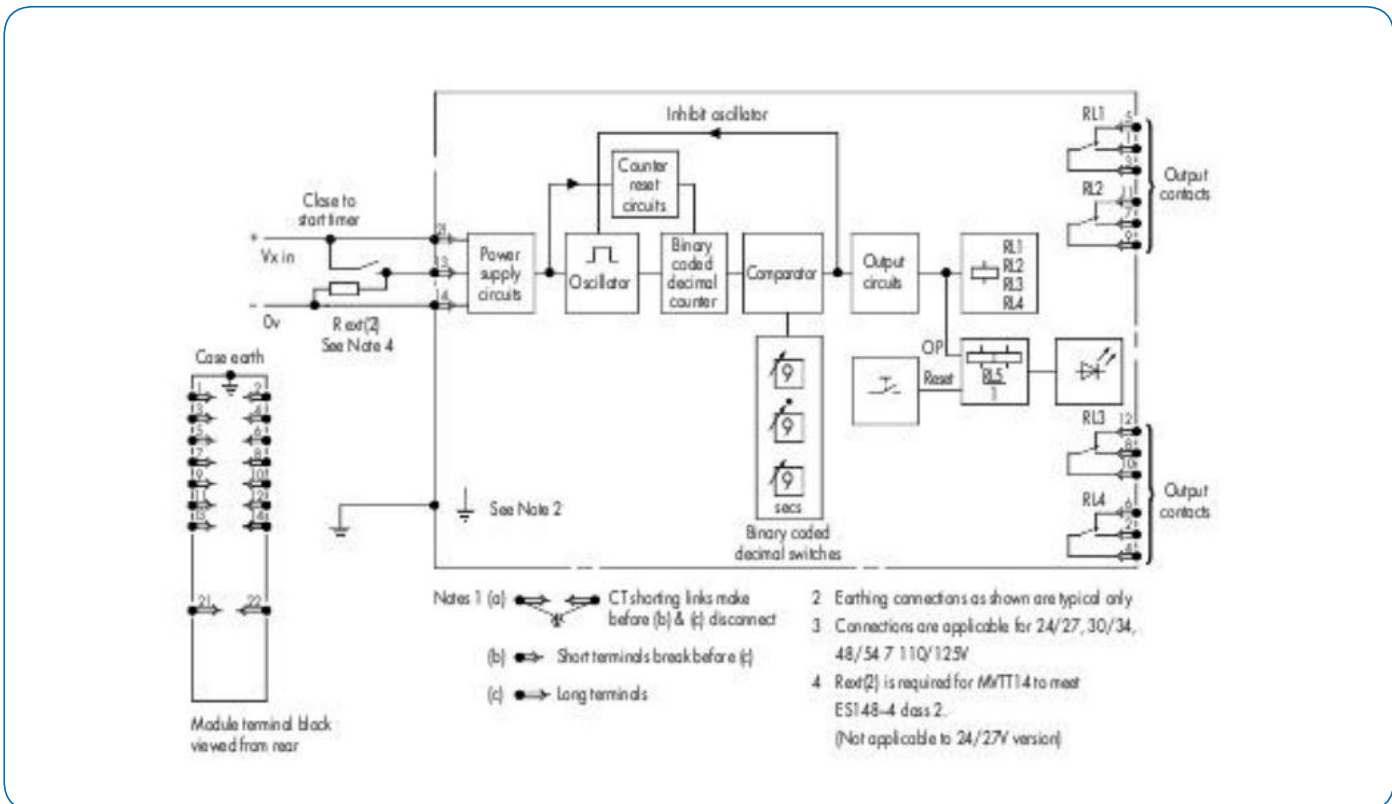


Figure 2 Application diagram: digital time delay relay type MVTT 14 (dc version)

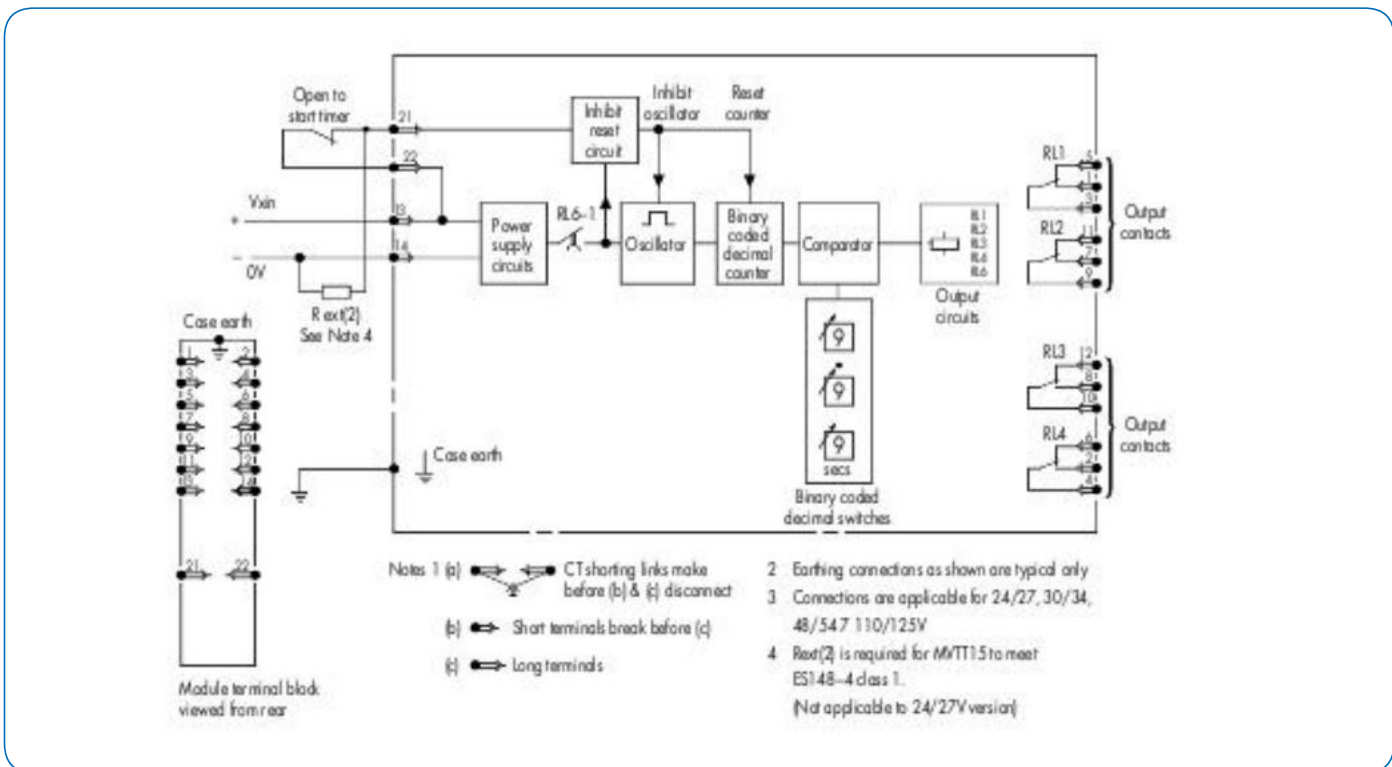


Figure 3 Application diagram: digital time delay relay type MVTT 15 (dc version)

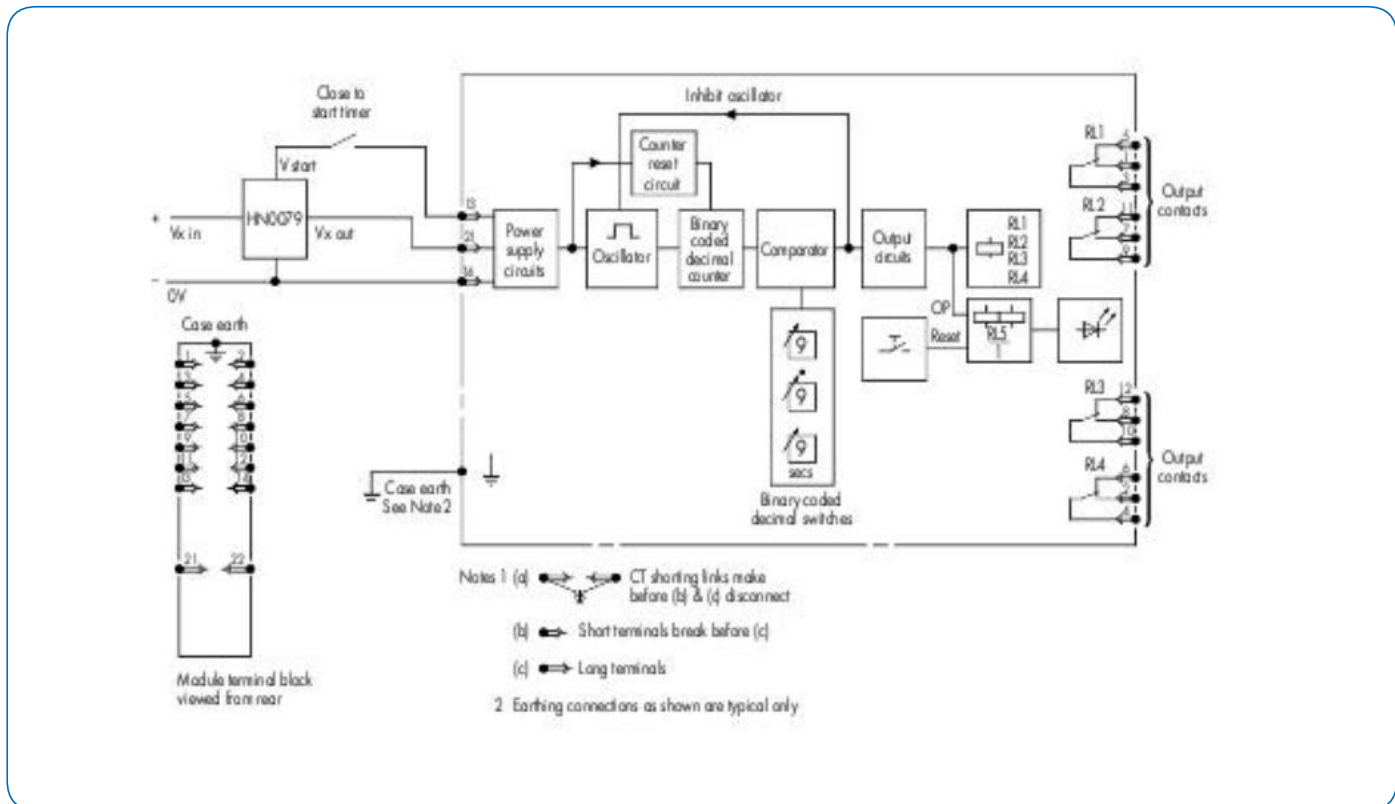


Figure 4 Application diagram: digital time delay relay type MVTT 14 220V (dc version)

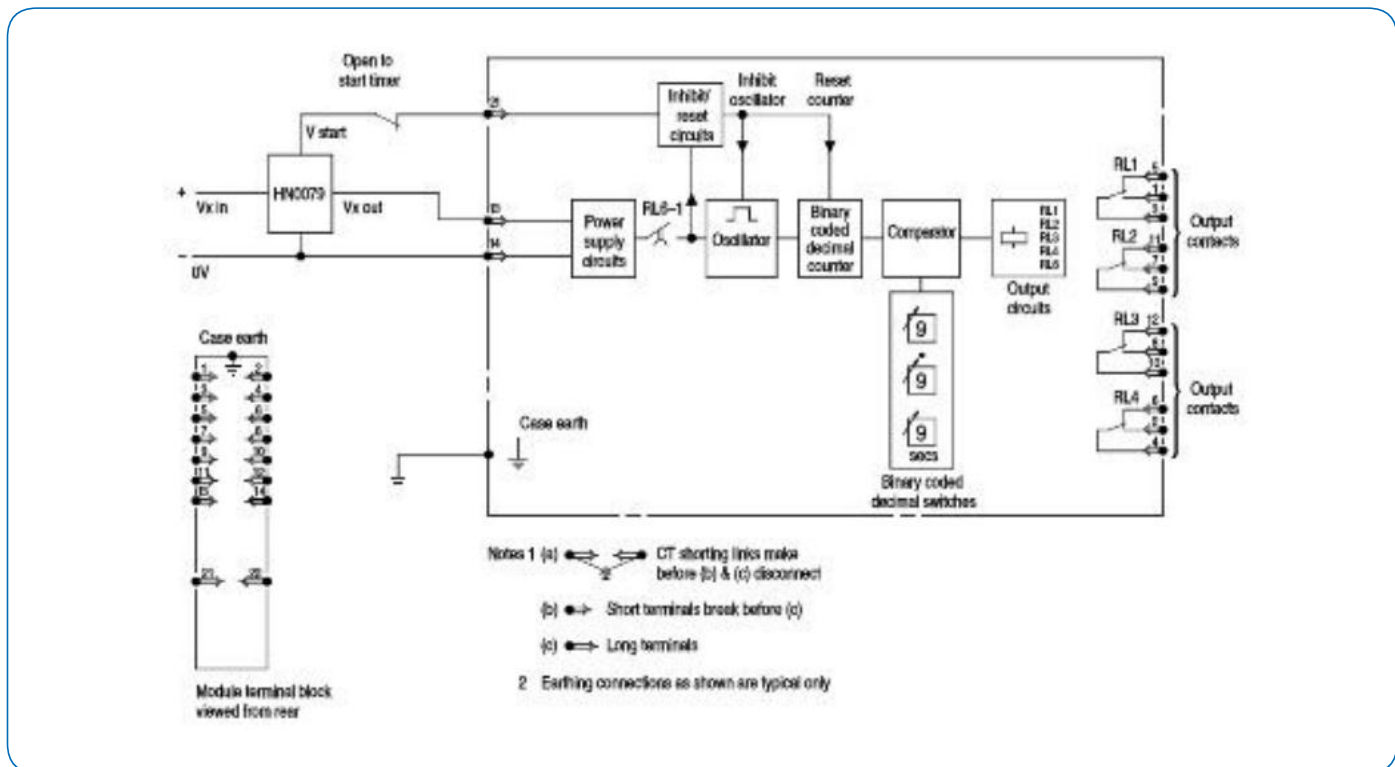


Figure 5 Application diagram: digital time delay relay, type MVTT 15 220V (dc version)

## 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          |

### Standard Setting Ranges

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

### DC Burden (mA)

| Rated Voltage Vx | Output Elements |            | Output Elements |          |
|------------------|-----------------|------------|-----------------|----------|
|                  | MVTT 14         | Unoperated | MVTT 14         | Operated |
|                  |                 | MVTT 15    |                 | 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       |

### Contact Ratings

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

### 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 MVTT 14 (delay on pick-up) only.

### Accuracy

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

### Contacts

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

### High Voltage Withstand

- Dielectric withstand  
IEC 255-5:1977  
2 kV rms for 1 minute between all terminals and case earth.  
2 kV rms for 1 minute between all terminals of independent circuits, with terminals on each independent circuit connected together.  
1 kV rms for 1 minute across normally open contacts.
- High voltage impulse  
IEC 255-5:1977  
Three positive and three negative impulses of 5 kV peak, 1.2/50 ms,  
0.5 J 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 10 ms 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  
2.5 kV peak between independent circuits and between independent circuits and case earth  
1.0 kV 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  
4 kV discharge in air with cover in place  
IEC 801-2:1991 Level 2  
4 kV point contact discharge with cover removed
- Fast transient disturbance  
IEC 255-22-4:1992 Class IV  
4 kV, 2.5 kHz applied directly to auxiliary supply  
IEC 801-4:1988 Level 4  
4 kV, 2.5 kHz applied directly to all inputs
- Surge immunity  
IEC 1000-4-5:1995 Level 3  
2 kV peak 1.2/50  $\mu$ s between all groups and case earth  
2 kV peak, 1.2/50 $\mu$ 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  
IEC 529  
IP50 (dust protected)
- Vibration  
IEC 255-21-1  
0.5 g between 10 and 300 Hz

### 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

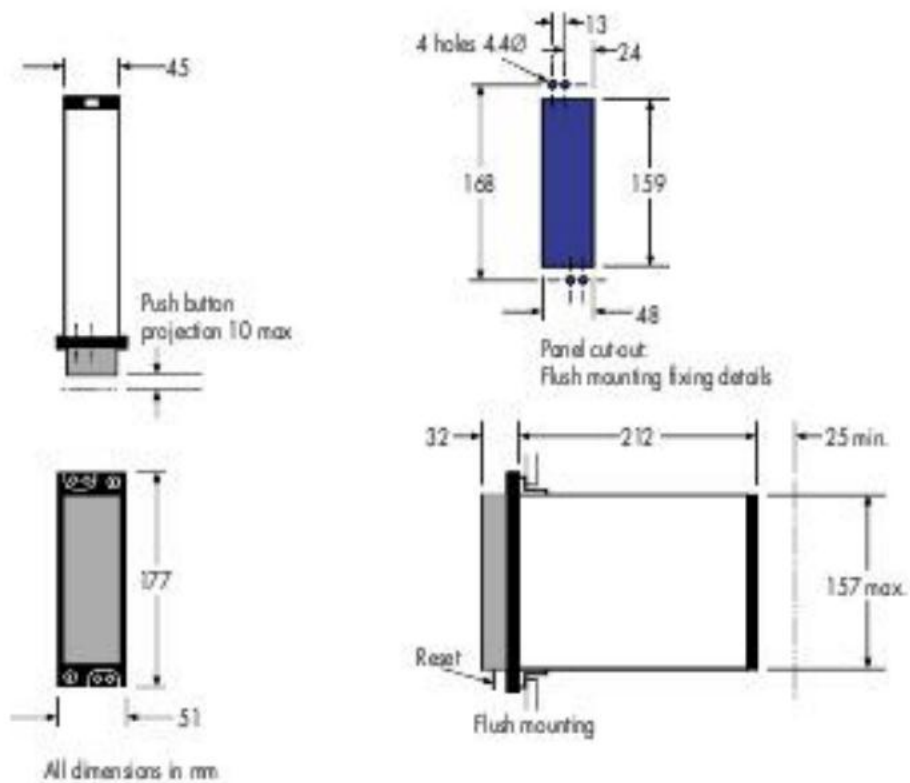


Figure 6 Case outline size 2

For more information please contact  
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