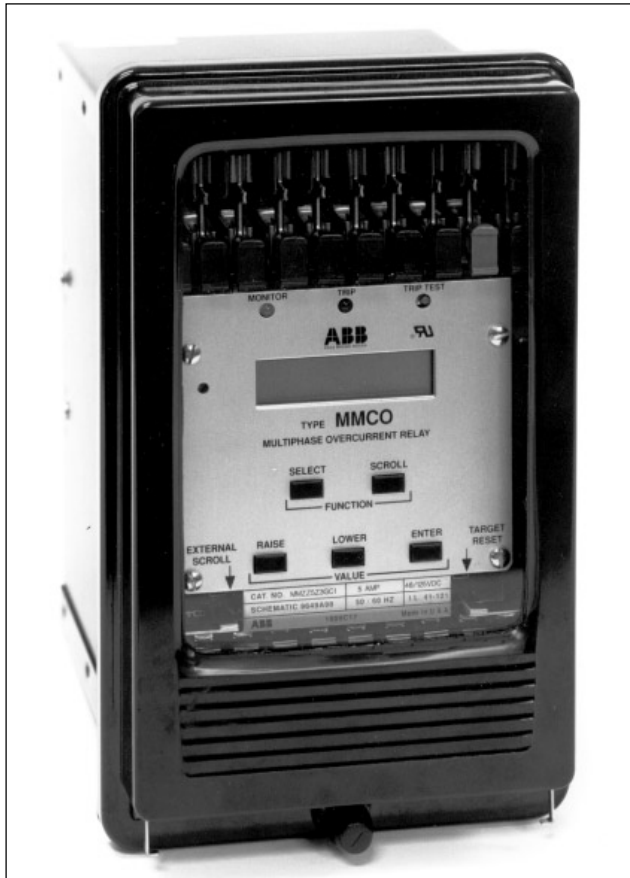




September 1996

Device Number: 50/51/50N/51N

## Type MMCO Microprocessor Time Overcurrent Relay



### Features

- Three phases plus ground, two phases plus ground, or three phase current inputs
- Available in 5A or 1A ct input versions, 50/60 Hz
- Low ct burden—microprocessor design
- No external equipment required to program or interrogate relay—LCD display, pushbuttons and levers allow manual operation
- Programmable time-current curves and instantaneous trip selection—one relay fits any application
- LED target indication initiated by trip current flow—reed relay in trip circuit seals in target
- LCD display of MMCO fault data, including trip type (TOC or IT), current in each phase, and ground current for each of the last four faults. (Time tag also, with real-time clock option)
- Self-diagnostics and alarm contact
- FT-22 Flexitest™ case with FT switches and drawout relay chassis, for in-service test and isolation capability

### Application

The MMCO is a microprocessor-based multiphase instantaneous and time overcurrent relay.

The MMCO greatly simplifies overcurrent relay selection and enhances the protective relay function. It can be programmed to fit virtually any overcurrent application, and provides valuable fault information not available from conventional relays. Communications options provide immediate retrieval of fault and status data, and the ability to reset or reconfigure the relay remotely.

The MMCO uses microprocessor technology to incorporate eight time curve families into one relay. Any traditional CO-type curve family may be selected from the relay's memory. A separate version of the MMCO can be ordered with three standard IEC curve families. Each relay provides independent phase and ground trip settings and curve selections, and accepts up to four current inputs to facilitate any usual combination of phase and ground fault protection. The MMCO can also be supplied with optically-isolated inputs for directional control by distance or directional relay contacts.

The MMCO can be programmed and interrogated manually or remotely. All trip parameters (time curve, time dial, pickup, instantaneous) are programmable, and fault data and metering current values are accessible by push button selection from a scrolling digital display. A real-time clock option allows time-tagging of fault records, and display of present time.

Fault records for the last 16 faults are stored internally, providing greatly enhanced trouble-shooting and system analysis capability. The most recent four records are manually available on the LCD display, while all 16 are accessible via the optional communications port.

For remote communications capability, the MMCO can be equipped with a WRELCOM™ interface for RS-232C communications, modem communications, or INCOM™ networking with other relays and relay systems, accessible over a single phone circuit.

Additional features of the MMCO design include: instantaneous reset; self-checking of the dc power and programmed trip parameters; LED seal-in initiated by trip current flow; and FT-22 case construction for ease of in-service testing and isolation.

## Optional Features

- Real-time clock for time-tagging fault data, and for reading present time (uses lithium battery backup)
- Remote communications with relay via WRELCOM two-way package. All MMCO relays are shipped “communications ready,” requiring only the addition of an appropriate WRELCOM “PONI.” (Refer to factory for further information on WRELCOM communications products.)
- Two optically-isolated inputs (phase and ground) for external directional control by distance or directional relay contact, or one optically-isolated input for remote reset of TRIP LED by contact input

## Specifications

### Current Input

5A rating:

16A continuous, 200A one second  
Burden: 0.005 ohms, resistive

1A rating:

5A continuous, 100A one second  
Burden: 0.025 ohms, resistive

### Frequency

50 or 60 Hertz

### Time-Overcurrent Curves

CO-type curves

Short time (CO-2)

Long time (CO-5)

Definite time (CO-6)

Moderately inverse (CO-7)

Inverse (CO-8)

Very inverse (CO-9)

Extremely inverse (CO-11)

IEC-type curves (optional model)

Standard inverse (A)

Very-inverse (B)

Extremely inverse (C)

### Time Dial Settings

63 settings for each time curve

### Time-Overcurrent Pickup

0.5 to 12A in 0.1 steps, for 5A ct input

0.1 to 2.4A in 0.01A steps, for 1A ct input

### Instantaneous Overcurrent Pickup

1 to 127A in 1A steps, for 5A ct input

0.2 to 25.4A in 0.1A steps, for 1A ct input

### Dropout Ratio

98% minimum

## Dimensions

Standard FT-22 case; refer to DB41-076 for details

## Shipping Weight

15.5 lbs.

## Power Supply

48/125 Vdc, range 38-140Vdc, 8W maximum drain  
250 Vdc, range 200-280Vdc, 10W maximum drain

## Contact Outputs

Timed trip—1 N.O. trip and 1 N.O. annunciation

Instantaneous trip—

1 N.O. trip and 1 N.O. annunciation

Self-Check Alarm—1 N.C.

## Contact Ratings

Make: 30A tripping

Break: 50W resistive up to 250Vdc

## Front Panel Indications

Input current above pickup—flashing LED

Time-overcurrent trip—LCD and solid LED

Instantaneous trip—LCD and solid LED

DC power and self-check status—LED

Metering currents, phase and ground—LCD

Phase and ground currents for last four faults—LCD

Time tags for fault data and present time—LCD

## Trip Seal-In Current

0.5A DC minimum through tripping contact circuit

## Environmental Temperature Range

Operation: -20°C to +55°C

Storage: -40°C to +70°C

## Applicable Standards

ANSI C37.90

IEC 255

UL Listed

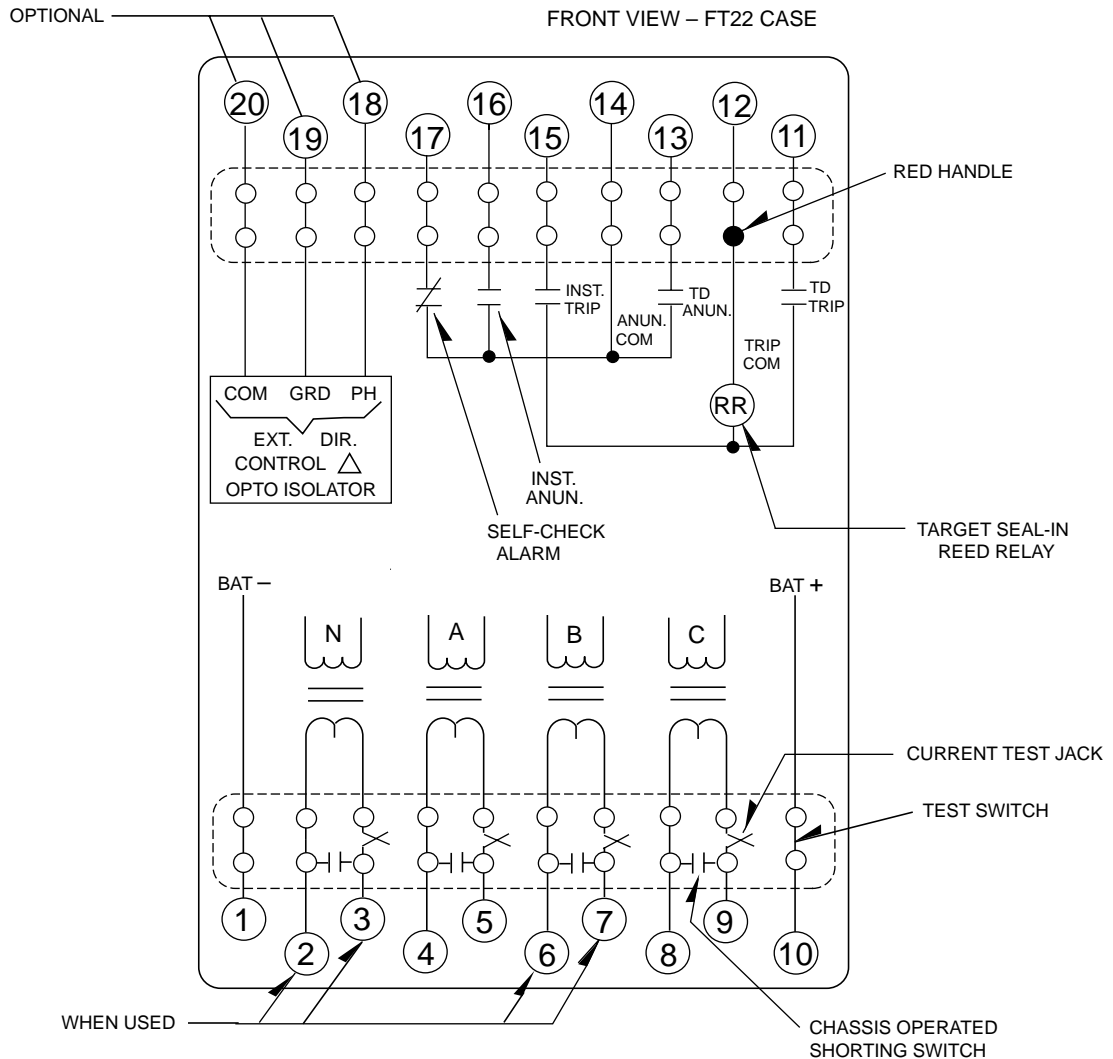
## Additional Information available on request:

WRELCOM Product Brochure 1MRW 870 096 SEN,

Instruction Book IL 41-121,

Transparent Time-Current Curves

Figure 1: MMCO Internal Connections



RR = Target Seal-In Reed Relay  
 (Low Impedance)  
 INST = Instantaneous Trip  
 TD = Time-Overcurrent Trip  
 ANUN = Annunciate/Alarm

△ = FOR REMOTE TARGET RESET OPTION: (18) = RESET, (19) = NO CONNECTION  
 = FOR DIRECTIONAL CONTROL OPTION: (18) = PHASE, (19) = GROUND

Application of dc control voltage enables the function.

Directional control may be applied to any combination of the four time and instantaneous overcurrent units by the settings process.

MMCO STYLE NUMBER SELECTION

DIGIT #

