ABB Power T&D Company Inc.
Relay Division
Coral Springs, FL
Allentown, PA

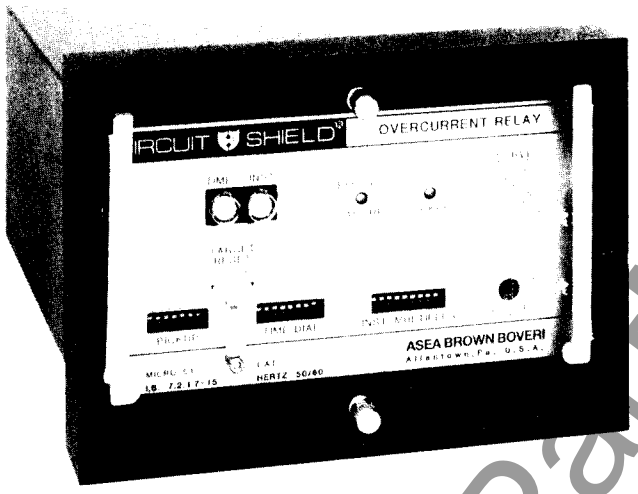
August, 1991
Supersedes Descriptive Bulletin 41-123M
pages 1 and 2, dated January, 1991
Mailed to: E, D, C/41-100C

Single Phase

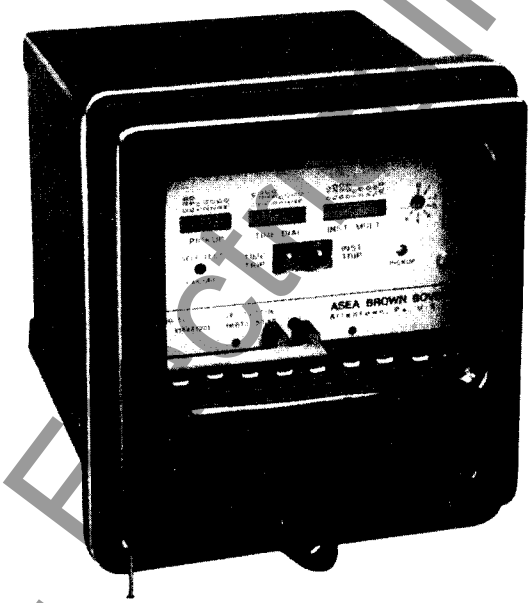
Device Number: 50/51

CIRCUIT SHIELD®

Types MICRO-51 and MICRO-51/FT Microprocessor-Based Time-Overcurrent Relays



Micro-51



Micro-51/FT

Application

Micro-51 microprocessor-based overcurrent relays are used for phase and ground overcurrent protection in utility, industrial, and commercial electrical power systems. The Micro-51 operates from conventional 5A or 1A secondary current transformers. The relay is self-powered from the current; therefore, there is no continuous drain on the control voltage supply. Settings are made by front panel switches.

Eight time-current curves are built-in, selectable on the front panel:

Inverse	Long Time Inverse
Very Inverse	Long Time Very Inverse
Extremely Inverse	Long Time Extremely Inverse
Definite Time	Short Time Inverse

Wide current tap ranges with exceptional setting resolution are offered: 1.5-12A in 0.25A increments, and 0.3-2.4A in 0.05A increments. The time dial is adjustable from 1 to 10 in increments of 0.1.

An instantaneous element is standard. Instantaneous pickup is adjustable from 1 to 20 multiples of the time-pickup, in increments of 0.1 multiples. The instantaneous unit may be disabled by setting the pickup to zero.

The Micro-51 can be set for operation on a 50 Hz or 60 Hz system by positioning an internal link.

The Micro-51 has three electrically isolated normally-open output contacts: Time trip, Inst. trip, and trip alarm.

A led is provided on the front panel to indicate when the current is above the pickup setting. Two targets are provided for Time and Instantaneous trip indication. Target operation is by trip circuit current. Reset is manual by a front panel magnetic device.

The Micro-51 has self-diagnostics that continuously perform functional checks when the input current to the relay is above a minimum level. The integrity of the ROM, RAM, EEPROM, and anaglog elements are monitored. A red led on the front panel indicates the detection of a problem.

Features

- Eight selectable curves
- Wide current tap ranges
- Exceptional setting resolution
- Self-powered, low burden
- Transient and EMI immunity
- Total-drawout construction
- Retrofit existing CO installations
- 2 year warranty

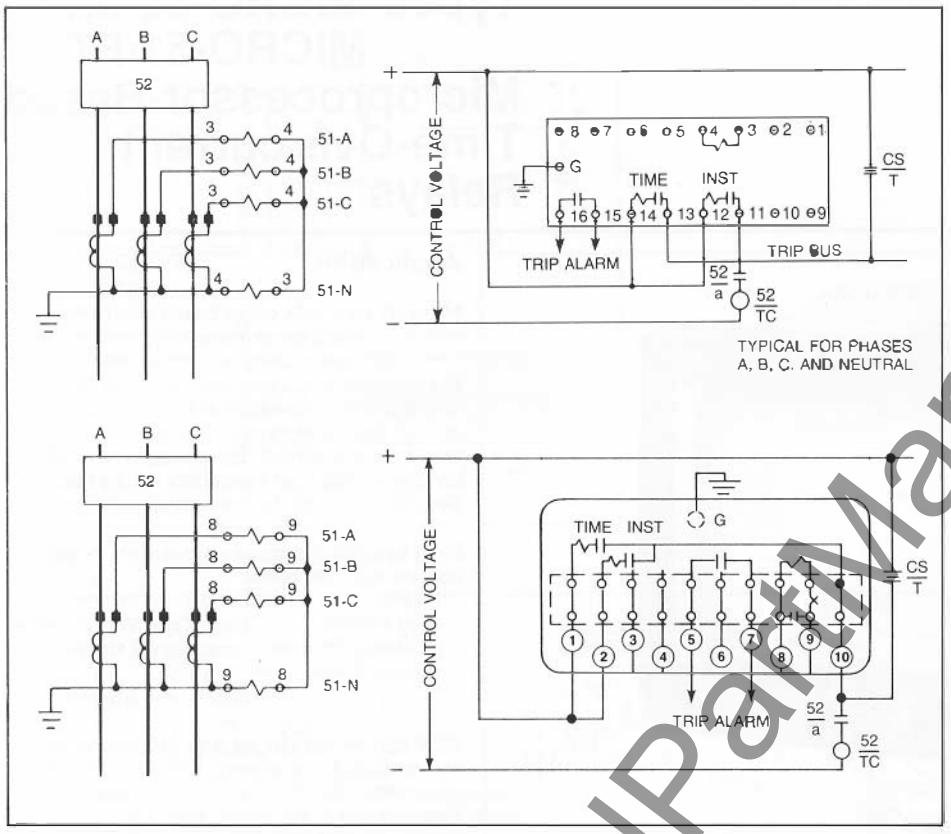


Figure 1. Typical Connections

Construction

The Micro-51 is packaged for conventional semi-flush panel mounting. An automatic ct shorting feature allows the relay to be fully withdrawn from its case. A unique, patented, rear circuit board accepts direct test connections using standard banana plugs. A test plug is available for testing the external circuits.

The Micro-51/FT is packaged in an FT-t1 case for conventional semi-flush panel mounting. The Flexitest switches provide ct shorting that allows the relay to be fully withdrawn from its case. The switches and companion test plug allow tests to be performed to the relay in its case mounted in the panel.

Retrofit Kit

The Micro-51/FT design enables the relay to be retrofitted in existing CO installations. With the same terminal connections as most CO relays, the drawout chassis can be placed into existing CO cases. This eliminates any rewiring.

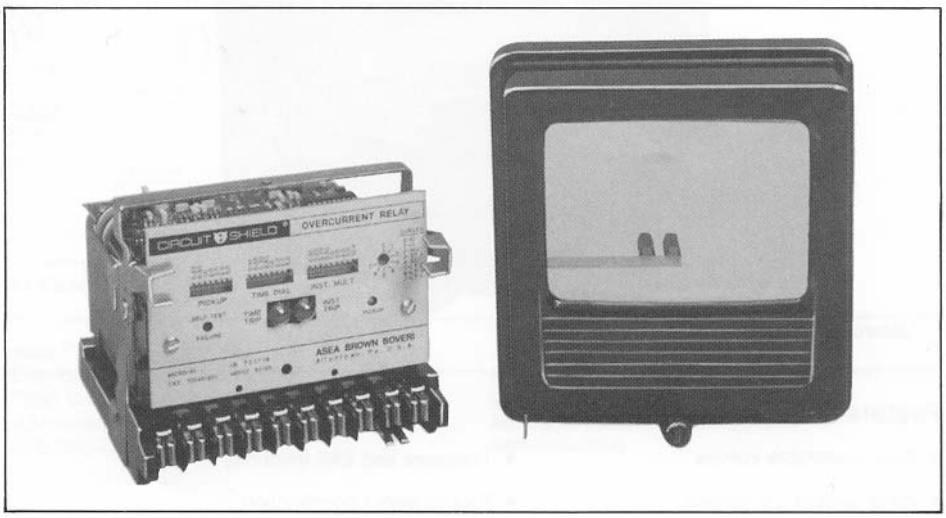


Figure 2. Retrofit Kit. Add "-R" suffix to Micro-51/FT catalog number

Specifications

Pickup:	1.5-12.0A in 0.25 amp increments. 0.3-2.4A in 0.05 amp increments. Instantaneous: 1-20 times pickup in 0.1 increments For other ranges, consult factory.
Accuracy:	Time pickup ±3%; Inst. pickup ±10%
Curves:	Switch selectable on front panel: Inverse — Definite Time Very Inverse — Long Time Inverse Extremely Inverse — Long Time Very Inverse Short Time — Long Time Ext. Inverse Time Dial — adjustable 1-10 in increments of 0.1 Accuracy: ±7% or ±1 cycle whichever is greater
Burden:	1.5-12A unit: 2.8 VA at 5A (non-linear, see IB) 0.3-2.4A unit: 2.8 VA at 1A (non-linear, see IB)
Output Contact Rating:	30 amperes tripping at 250 Vdc 5 amperes continuous 0.3 amperes break inductive at 125 Vdc
Series Target Coil Rating:	30 Amp Tripping (1 amp minimum trip circuit current req'd. to set targets) For trip circuit currents below 1 amp, .25 amps minimum, add "-ST" to catalog number for sensitive target coil.
Operating Frequency:	50 Hz or 60 Hz, selectable by internal jumper
Control Power Drain:	Zero. Unit is self-powered
Temperature Range:	Minus 20°C to Plus 70°C
Transient Immunity:	More than 2500V, 1MHz bursts at 400 Hz repetition rate continuous (ASNSI C37.90.1 SWC); Fast transient test; EMI test.
Dielectric:	2000 Vac, 60 seconds all circuits to ground
Weight: Micro-51	Unboxed: 4.7 lbs. (2.1 kg) Boxed: 5.4 lbs. (2.3 kg)
Micro-51/FT	Unboxed: 7.8 lbs. (3.5 kg) Boxed: 9.6 lbs. (4.4 kg)
Volume: Micro-51	0.26 cubic feet
Micro-51/FT	0.48 cubic feet

Testing

Conventional overcurrent relay test procedures using commercially available test sets may be used.

How To Order

For a complete listing of available overcurrent relays see TD 41-025.

To place an order or for further information, contact the nearest District Office.

How To Specify

Time overcurrent relays shall be Asea Brown Boveri Type Micro-51 Series. Relay shall be microprocessor based with eight selectable curves, self-powered, self-checking, and of total drawout construction.

Further Information

List Prices: PL 41-020
Technical Data: TD 41-025
Instruction Book: IB 7.2.1.7-15①
Test Plug: IB 7.7.1.7-8①
Other Protective Relays:
Application Selector Guide, TD 41-016

① Available upon request, only from Allentown Plant.

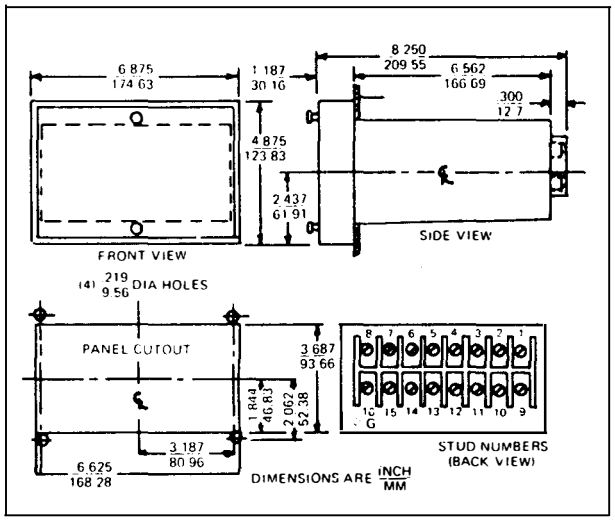


Figure 3. Outline and Drilling – Micro-51

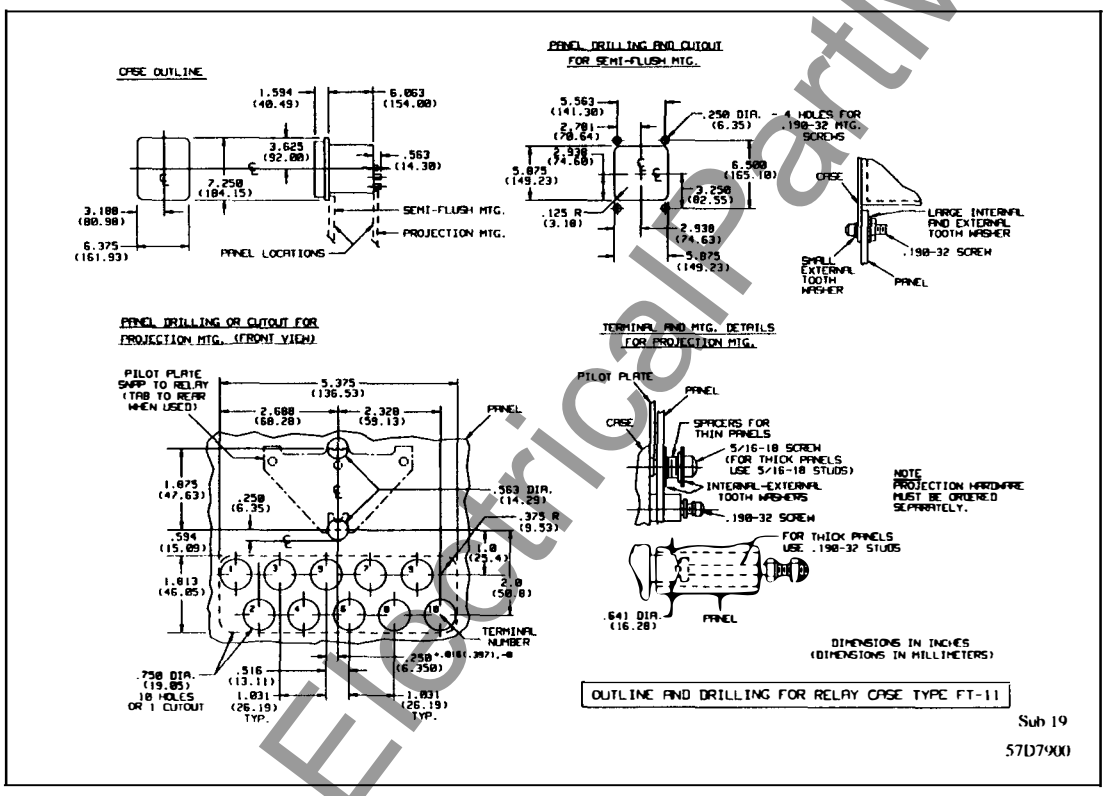


Figure 4. Outline and Drilling – Micro-51 in FT-11 Case

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Single Phase, Self-Powered,
Suitable for 50 or 60 Hertz
Switch Selectable,
Contact Output

CIRCUIT SHIELD®

Types MICRO-51 and MICRO-51/FT Microprocessor-Based Time-Overcurrent Relays

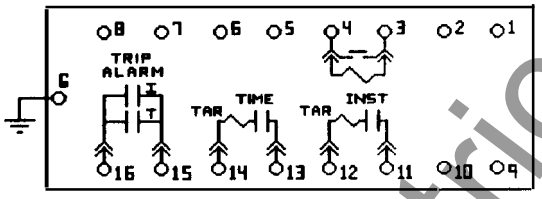
Type	Curves (8)	Continuous Rating	Time Unit Pickup Range	Instantaneous Range (in multiples of pickup setting)	Catalog Number
MICRO-51	Inverse, Very Inverse, Extremely Inverse, Short Time Inverse, Definite Time, L.T. Inv., L.T. Very Inv., L.T. Ext. Inv.	4A	0.3-2.4A	1-20	446S1101
		20A	1.5-12A	1-20	446S1201
MICRO-51/FT	Inverse, Very Inverse, Extremely Inverse, Short Time Inverse, Definite Time, L.T. Inv., L.T. Very Inv., L.T. Ext. Inv.	4A	0.3-2.4A	1-20	446F1101
		20A	1.5-12A	1-20	446F1201

Sensitive Target Coil: Add "-ST" to catalog number.
Retrofit Kit: Add "-LC" to catalog number.
Internal Connections: 16D446A, 10F446A

To place an order, or for further information, contact the nearest District Office.

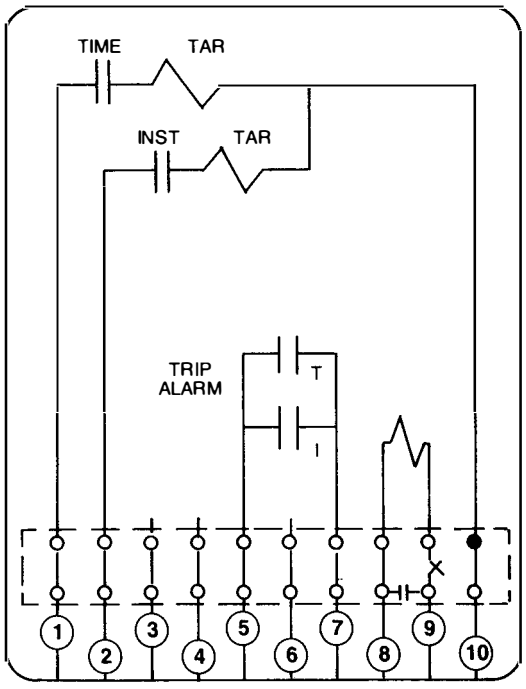
Internal Connection Diagrams

16D446A Micro-51
Time-Overcurrent Relay
Drawout Test Case



TAR = LOW IMPEDANCE SERIES TARGET COIL.

10F446A Micro-51/FT
Time-Overcurrent Relay
FT-11 Flexitest Case



TAR = LOW IMPEDANCE TARGET COIL.