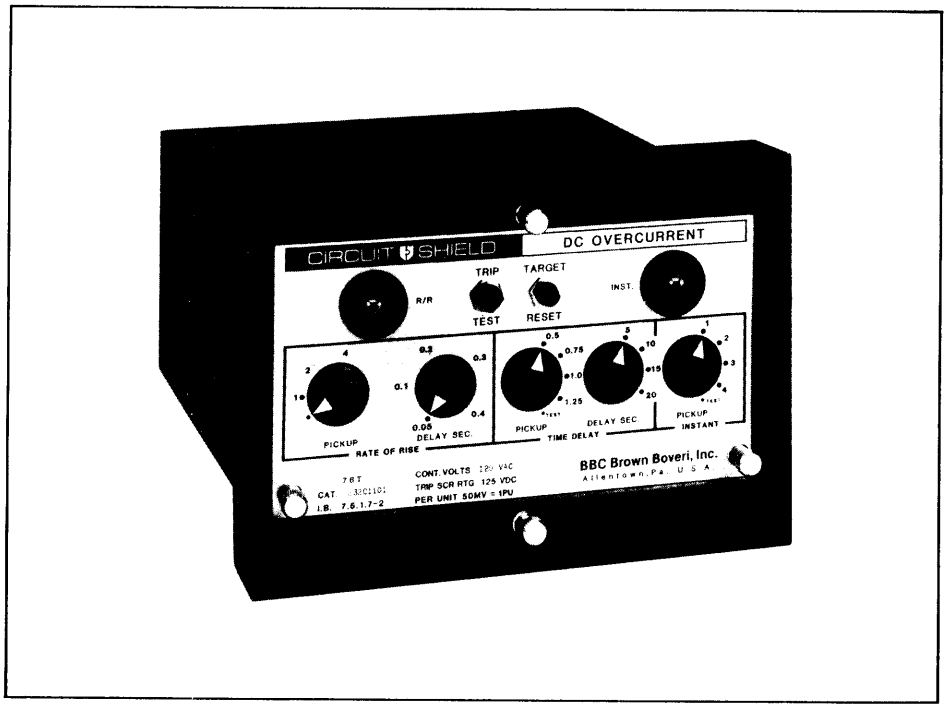
ABB Power T&D Company Inc.
Relay Division
Coral Springs, FL
Allentown, PA

September, 1990
Supersedes Bulletin 7.5.2-1B,
pages 1-2, dated October, 1989
Mailed to: E, D, C/41-100B

Transit
Device Number: 76

CIRCUIT SHIELD®

Type 76T DC Overcurrent Relay



Features

- Use with shunt operated circuit breakers
- Use with standard shunts
- Low burden – no calibrated leads
- Calibrated front panel settings
- Discriminates between faults and train starts
- 2 year warranty

Application

The Type 76T relay is designed especially for use with circuit breakers to control DC power to third rails on medium and heavy duty traction power for transit systems or in industrial DC distribution circuits. This DC millivolt relay is used in conjunction with a shunt to provide overcurrent protection. The Type 76T has a very low burden on the shunt due to the solid state design of the input circuit. Installation is easy and economical since standard #14 uncalibrated leads may be used with 50 mV shunts.

Several Type 76T models are available to provide various protective functions. The relay can be supplied with an instantaneous unit which will provide fast tripping on high magnitude faults that, for example, may be encountered close to a rectifier transformer unit. Another available protective function is a rate-of-rise detector which has the ability to discriminate between the rate-of-rise current of vehicle motor starting characteristics from that of a low magnitude fault current occuring at a long track distance from the relay. The other feature of the Type 76T is that it can be supplied with a definite time delay unit that will provide overload protection.

Basic relays are unidirectional and can be used for reverse or forward trips (depending on shunt lead connections). Bidirectional relays with short definite time delay are available.

A built-in test pushbutton is provided. Instantaneous and rate-of-rise functions have memory type targets.

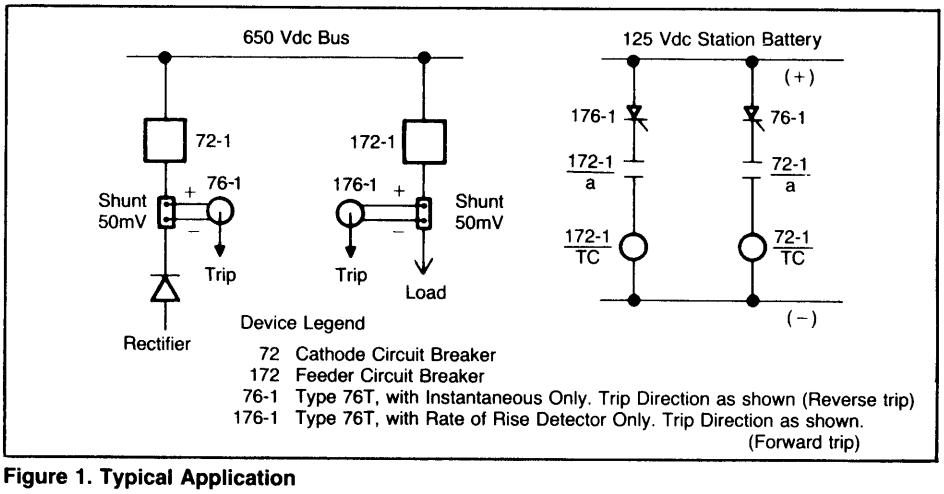


Figure 1. Typical Application

Specifications:

Burden on Shunt:	10,000 ohms
Nominal Input Level:	50 mVDC
Maximum Continuous:	More than 100 × nominal
Functions	
Rate-of-Rise Pickup:	Continuously adjustable from 1.0 to 4.0 P.U. (1 P.U. = 50 mV/sec.)
TD:	Continuously adjustable from 0.5 to 0.4 sec.
Long Time Pickup:	0.5, 0.75, 1.0, 1.25 P.U. (P.U. = 50 mv)
TD:	5, 10, 15, 20 sec.
Instantaneous Pickup:	1, 2, 3, 4 P.U. (1 P.U. = 50 mV)
TD:	No intentional delay. (approximately 10 msec.)
Short Time Pickup:	0.2, 0.5, 0.8, 1.0, 1.2, 1.6, 2.0 P.U. or 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0 P.U. (1 P.U. = 50 mV)
TD:	0.1 sec.
Control Power:	120Vac Reliable Source at 0.05 Amps, 50/60 Hz. 240 Vac models are available.
Dielectric:	Shunt Input — 4 kV, (For applications to DC circuits rated 1000 Vdc and below), Control circuits — 2000 volts AC RMS, 60 sec.
Output Circuit:	One thyristor, and one Normally Open Self-Reset Contact
Output Circuit Rating at 125 Vdc:	30 amps DC for 0.1 second 5 amps DC for 1 second 1 amp DC continuous Contact Output: 30 amp tripping duty 5 amps continuous 1 amp opening resistive 0.3 amps opening inductive
Temperature:	
Nominal	25°C Ambient
Additional ±5% Tolerance Must Operate	−15°C to +55°C −40°C to +70°C
Tolerance:	
Rate of Rise Pickup	±10% of Dial Setting
Seismic Capability:	More than 6g ZPA either Axis biaxial broadband multifrequency vibration without damage or malfunction. (ANSI/IEEE C37.98)
Transient Immunity:	More than 2500 V, 1 MHz bursts at 400 Hz repetition rate, continuous (ANSI C37.90.1 SWC); Fast Transient Test; EMI Test.

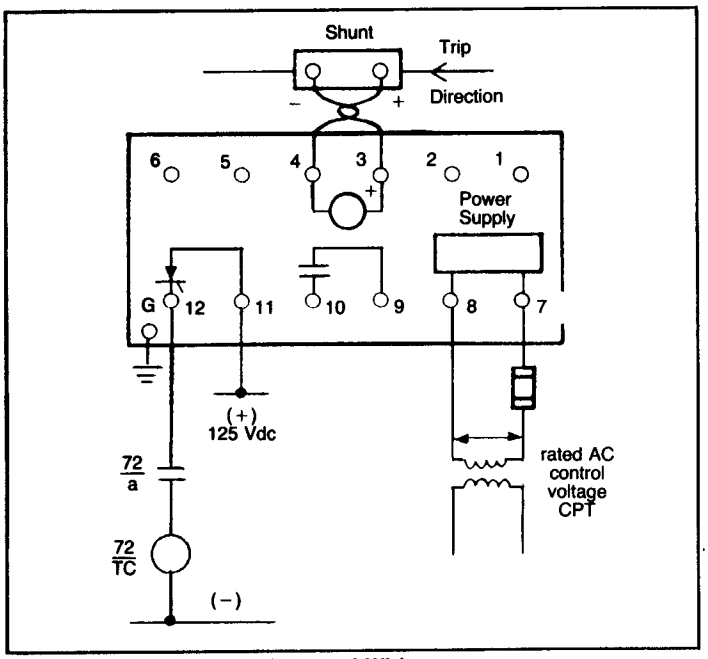


Figure 2. Internal Connections and Wiring

How To Specify

DC overcurrent relay shall be Asea Brown Boveri Type 76T or approved equal, drawout case. Relay shall operate from a standard shunt and present a maximum burden of 10,000 ohms to the shunt. A magnetic operation indicator which retains position on loss of control power shall be provided.

How To Order

For a complete listing of available versions of the Type 76T relay for instantaneous DC overcurrent protection see TD 41-025.

Further Information

List Prices: PL 41-020
Technical Data: TD 41-025
Instruction Book: IB 7.5.1.7-2①
Other Protective Relays:
Application Selector Guide, TD 41-016

① Available upon request, only from Allentown Plant.

Printed in U.S.A.

September, 1990
Supersedes Section 7.5.0.3, Type 76T on pages 2 and 3, dated January 1, 1990
Mailed to: E, D, C/41-100B

Transit and Industrial, Shunt Operated
AC Control Power
125 Vdc Tripping Power

CIRCUIT SHIELD®

Type 76T DC Overcurrent Relay

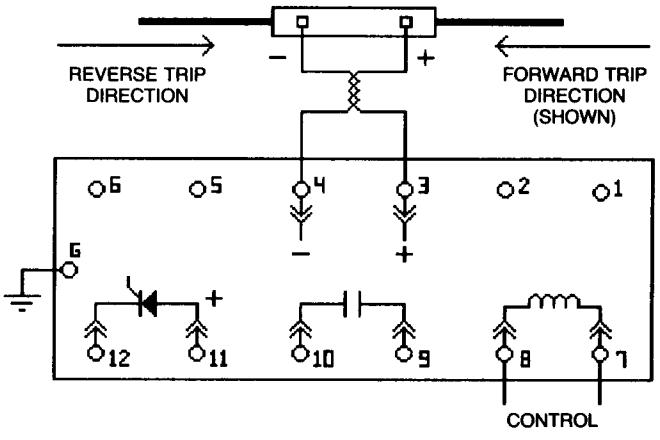
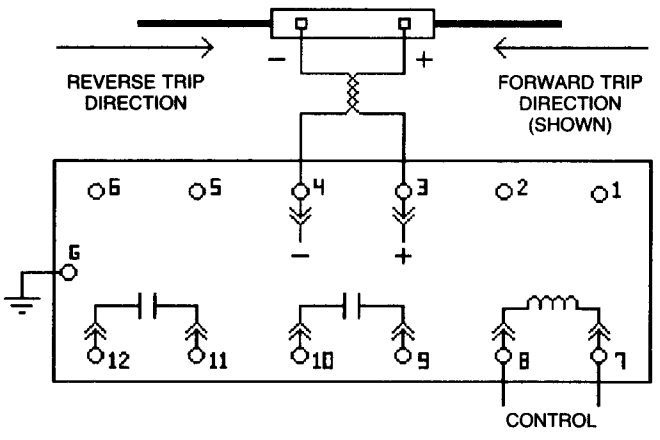
Type	Functions: Direction	Inst.	Rate-of-Rise	Long Time	Short Time	Control Voltage	Catalog Numbers
76T	Unidirect	50-200 mv	—	—	—	120 Vac	232C1004
		—	—	yes	—	50/60 Hz	232C1011
		50-200 mv	—	yes	—		232C1014
		50-200 mv	yes	—	—		232C1104
		—	yes	—	—		232C1101
		50-200 mv	yes	yes	—		232C1114
		—	yes	yes	—		232C1111
		—	—	—	10-100 mv		232U1027
		—	—	—	10-100 mv①		232U1028
		—	yes	—	—	240 Vac	232C3101
	Bidirect	—	—	—	10-100 mv	120 Vac	232D1027
		—	—	—	25-200 mv (for)/ 10-100 mv (rev)		232D1037

Notes: Rate-of-Rise Function: 10-200 mv/sec pickup, 0.05-0.4 second delay.
Long-Time Function: 25-62 mv pickup, 5-20 second delay.
Short-Time Function: approximately 0.1 second delay.
(① = high dropout/pickup ratio unit)
Internal Connections: 12D232A all units except catalog 232U and 232D which are diagram 12D232B. (Std. Cases)

For Type 76T Hall-effect Sensor Operated: Consult Factory
Consult factory for relays with control voltage other than listed.

Internal Connection Diagrams

12D232A Type 76T
DC Overcurrent Relay
Standard Case



16D232B Type 76T
DC Overcurrent Relay
Standard Case