

September, 1992
Supersedes Descriptive Bulletin 41-141S,
pages 1 and 2, dated November, 1990
Mailed to: E, D, C/41-100B

Frequency 50 Hz or 60 Hz
Device Number: 32

CIRCUIT SHIELD[®] Type 32 Polyphase High Speed Directional Relay



Features

- Adjustable torque angle
- Optional sector width control
- Low burden
- Built-in test
- Seismic capability to 6g ZPA
- Transient immunity
- 2 year warranty

Application

The Type 32 Relay is designed for two distinct applications: as the controlling element in directionally controlled time-overcurrent fault protection, or as a high speed reverse power relay.

For protection against phase-to-phase, or three phase faults, the Type 32 is used in conjunction with any of the Type 51 time-overcurrent relays. Various combinations of controlled time only, or time and instantaneous protection are available by selection of the connections between the 32 and 51 units. This combination represents Device Number 67.

The Type 32 can also be used to control the ABB MMCO or Micro-51 overcurrent relays when they are equipped with optional control inputs.

Since the Type 32 compares the direction of the positive-sequence voltage and current, in certain cases it may be used to provide ground fault as well as phase fault protection. The requirements for this application are that the minimum ground fault be greater than the phase overcurrent relay setting, and that the ratio of ground fault to load current be greater than three times.

If these requirements cannot be guaranteed, the application requires separate ground fault protection, such as a combination of Type 32Q (or 32D), controlling a residually connected Type 51.

The maximum torque angle of the relay is adjustable from I , lag V , between 0 and 90 degrees. 45 degrees is an appropriate setting for most applications requiring fault protection. Either line-to-line, or line-to-ground P.T. connections may be used.

For reverse power, or anti-motoring protection, the Type 32 may be used as a sensitive, three phase power directional relay. For these applications, the maximum torque angle should be set at zero degrees for a watt characteristic, with line-to-ground, or line-to-line potential transformers, connected as shown in Figure 2. An external timer Type 62T is recommended in this application.

For special applications an optional sector width adjustment can be provided, allowing the trip sector to be set anywhere from 180° to 30° wide. Some of the applications are described in the application notes (see Further Information).

Specifications

Input Circuit Ratings:

Potential	120V, nominal 160V, maximum continuous
Current	5A, nominal 10A, maximum continuous 390A, one second

Burden:

Potential	0.3VA per phase, at 120V
Current	1.0VA, phases A and C at 5A 2.0VA, phase B at 5A

Sensitivity:

.02A at 1.0V
.02 at 120V

Maximum Torque Angle:

Adjustable 0° to 90°
 I_1 , lag V_1

Installation Settings (Typical):

For line protection	45°
For reverse-power	0°

Sector Control:

Adjustable 180° to 30°

Optional

Control Power:

48/125 Vdc at .035 Adc
48/110 Vdc at .035 Adc
24/32 Vdc, 250 Vdc

Output Circuit:

2 Normally-Open Contacts

Output Circuit Rating:

Units with tripping contacts
@ 125 Vdc
30 amps, Tripping
5 amps, Continuous
1 amp, Opening Resistive
0.3 amp, Opening Inductive
Other models available
specifically for controlling
Types 51, -50H, -50D, Micro-51, MMCO
Overcurrent Relays.

Operating Time:

Pickup: 1 cycle, typical at 60 Hz
Dropout: 1 cycle, typical at 60 Hz

Operating Temperature:

Minus 20°C to plus 70°C

Seismic Capability:

More than 6g ZPA either AXIS biaxial multi-frequency vibration without damage or malfunction ANSI/IEEE C37.98

Transient Immunity:

More than 2500V, 1 MHz bursts at 400 Hz repetition rate, continuous (ANSI C37.90.1 SWC); Fast Transient Test; EMI Test.

Weight:

Unboxed — 4.6 lbs. (2.1 kg)
Boxed — 5.3 lbs. (2.4 kg)
— 0.26 cubic feet

The Type 51 series of time-overcurrent relays are provided with a standard torque control feature. They are shipped with links between terminals 9 and 10, to control instantaneous, and between 10 and 11 to control time. Removing either link allows control by an appropriate contact. Connections for directional time and instantaneous are shown in Figure 1. For non-directional instantaneous, do not remove the shorting link between 9 and 10, and omit the wired jumper from 9 to 11.

How to Order

For a complete listing of available directional relays, see TD 41-025. To place an order, or for further information, contact the nearest ABB Representative.

Further Information

List Prices: PL 41-020
Technical Data: TD 41-025
Instruction Book: IB 7.8.1.7-2
Application Notes: AN-2, AN-8, AN-9
Other Protective Relays:
Application Selector Guide, TD 41-016

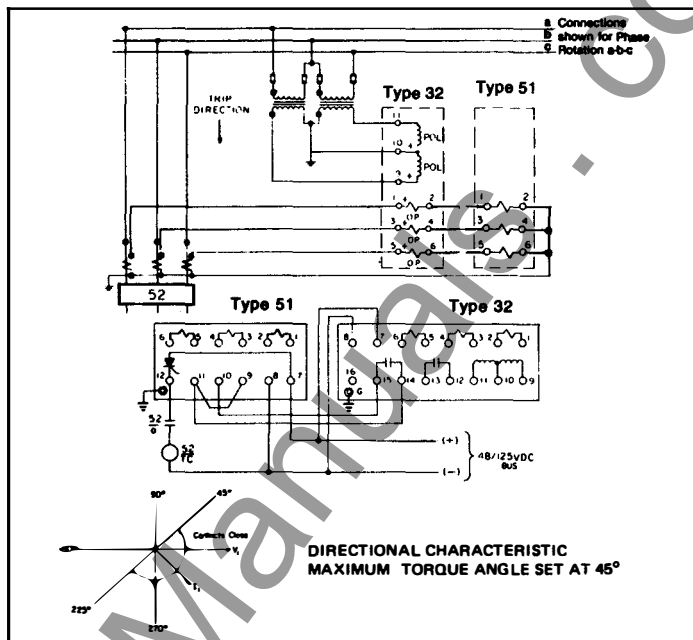


Figure 1 – Connections for Line Fault Protection

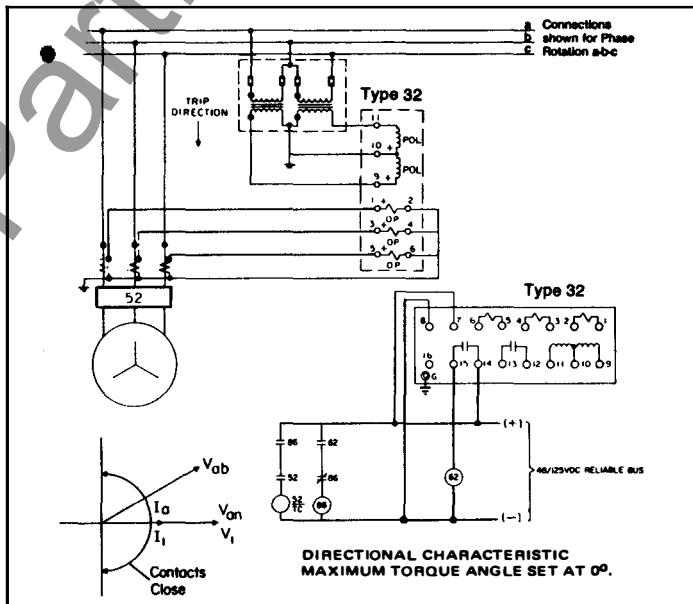


Figure 2 – Connections for Reverse Power Detection

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Mailed to: E, D, C/41-100B

Frequency 60 Hz^①

CIRCUIT SHIELD[®] Type 32 Polyphase High Speed Directional Relay

Type	Protection	Maximum Torque Angle	Sector Width	Sensitivity	Contacts	Internal Connections	Control Voltage	Catalog Number	
32	Three Phase Phase-to-Phase and Ground Fault	Adjustable 0 to 90° I ₁ lag V ₁	180°	0.02A at 1V	②	16D425A	24/32 Vdc	425P0090	
			30° - 180°			48/125 Vdc	425P0070		
						250 Vdc	425P0050		
						24/32 Vdc	425P0091		
						48/125 Vdc	425P0071		
						250 Vdc	425P0051		
						24/32 Vdc	425P0093		
			180°			0.4A at 1V	③	48/125 Vdc	425P0073
			30° - 180°			48/125 Vdc	425P0176		
						24/32 Vdc	425P0097		
						48/125 Vdc	425P0077		
						24/32 Vdc	425P0098		
48/125 Vdc	425P0078								
24/32 Vdc	425P0099								

- ① For 50 cycle applications, change letter in catalogue number from P to F for Type 32.
- ② This model preferred when directional relay will be used to control a Type 51 Relay as in directionally controlled overcurrent relay schemes. This model includes self-resetting indicator lamp.
- ③ This model required when directional relay will be used to operate lockout relay or trip circuit breaker, as in reverse power

schemes. When specified, a normally closed contact between terminals 15 and 16 will be supplied in addition to the standard (2) normally open contacts. When wiring to terminal 16, observe proper clearance of the wire termination to the ground stud terminal "G". This model includes manually reset target.

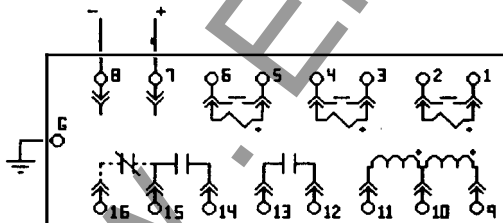
- ④ This model required when directional relay will be used to operate lockout relay or trip

circuit breaker, as in reverse power schemes. When specified, a normally closed contact between terminals 15 and 16 will be supplied in addition to the standard (2) normally open contacts. When wiring to terminal 16, observe proper clearance of the wire termination to the ground stud terminal "G". This model includes self-resetting indicator lamp.

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

Internal Connection Diagram

16D425A Type 32
Directional Relays
Drawout Test Case



NC CONTACT 15-16 SUPPLIED ONLY ON
UNITS WITH TRIPPING CONTACTS.