CIRCUIT SHIELD®

Type 32Q Negative Phase Sequence
High Speed Directional Relay

Application

The Type 32Q is used in conjunction with the Type 51 to provide directionally controlled time-overcurrent protection against ground faults. The combination of these two relays performs the function of Device Number 67N.

The Type 32Q is preferred over the Type 32D, Dual-Polarized Directional Relay for protecting lines where incorrect zero sequence polarization results from mutual induction between parallel lines, or in stations having no zero sequence polarizing quantities.

The Type 32Q is especially well suited to switchgear applications since it can be applied with two open-delta potential transformers. This can result in space and dollar savings by eliminating auxiliary potential transformers and compartments.

The Type 32Q can be used with any of the Type 51 series of time-overcurrent relays to provide any combination of time control only, time and instantaneous control, instantaneous uncontrolled, or no instantaneous.

For maximum flexibility in various applications, the maximum torque angle is front panel adjustable from 90 to 180 degrees. A setting of 135 degrees is recommended for general purpose use.

Any of the time-current characteristics available in the Type 51 series may be used, and the torque control provisions on the overcurrent relay are supplied as standard.

When instantaneous as well as time-overcurrent protection is required, specify a standard Type 51 with instantaneous attachment. These relays are provided with shorting links between terminals 9 and 10, and between 10 and 11. For directional control of both time and instantaneous, connect as shown in Figure 1, with both links removed. For directional time, and non-directional instantaneous, do not remove the link between 9 and 10 and omit the wired jumper from 9 to 11.

Features

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

Input Circuit Ratings:
- Potential: 120V, nominal
- Current: 5A, nominal
- 16A, maximum continuous
- 300A, one second
- Burden: 0.3VA per phase, at 120V
- 1.0VA, phases A and C at 5A
- 2.0VA, phase B at 5A
- Sensitivity: .02A at 1.0V
- .02A at 120V
- Maximum Torque Angle: Adjustable 90° to 180°
- 1° leads V2
- Installation Settings: For line protection
- Sector Control: Adjustable 180° to 30°
- Optional Control Power: 48/125 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, μ51, 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 C57.98
- Transient Immunity: More than 2500V, 1 MHz bursts at 400 Hz
- Weight: Unboxed — 4.5 lbs. (2.0 kg)
  Boxed — 5.2 lbs. (2.3 kg)
  — 0.26 cubic feet

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.

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

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 Ground Fault Protection

June, 1993
Frequency 60 Hz

Type 32Q Negative Phase Sequence
High Speed Directional Relay

<table>
<thead>
<tr>
<th>Type</th>
<th>Protection</th>
<th>Maximum Torque Angle</th>
<th>Sector Width</th>
<th>Sensitivity</th>
<th>Contacts</th>
<th>Internal Connections</th>
<th>Control Voltage</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>32Q</td>
<td>Ground-Fault Negative Sequence</td>
<td>Adjustable 90° to 180° l2 lead V2</td>
<td>180°</td>
<td></td>
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<td>16D425A</td>
<td>24/32 Vdc</td>
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<td></td>
<td>30° - 180°</td>
<td>0.02A at 1V</td>
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<td></td>
<td>48/125 Vdc</td>
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① For 50 cycle applications, change letter in catalogue number from Q to J for Type 32Q.
② This model required 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.

Internal Connection Diagram

16D425A Type 32Q Directional Relays Drawout Test Case

NC CONTACT 15-16 Supplied only on units with tripping contacts.