

June, 1993  
Supersedes Descriptive Bulletin 41-143S  
pages 1 and 2, dated November, 1990  
Mailed to: E, D, C/41-100B

Frequency 60 Hz  
Device Number: 32N

## CIRCUIT SHIELD® Type 32Q Negative Phase Sequence 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 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 paralleled 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.

### Specifications

**Input Circuit Ratings:**

Potential 120V, nominal  
160V, maximum continuous  
Current 5A, nominal  
16A, 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  
.02A at 120V

**Maximum Torque Angle:**

Adjustable 90° to 180°  
1/2 leads V<sub>2</sub>

**Installation Settings:**

For line protection 45°  
Maximum torque angle equals 180° minus the dial setting

**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 multifrequency 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 — 4.5 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

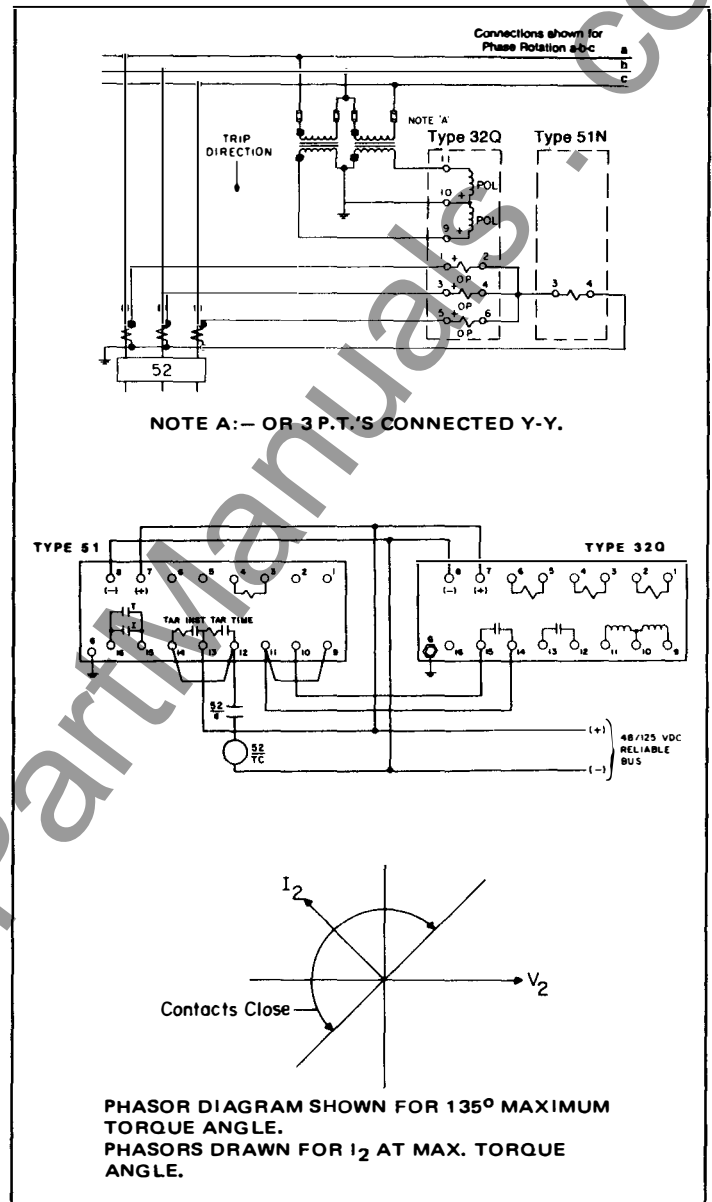


Figure 1 – Connections for Ground Fault Protection

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pages 1 and 3, dated January 1, 1990  
Mailed to: E, D, C/41-100B

Frequency 60 Hz<sup>①</sup>

## CIRCUIT SHIELD<sup>®</sup> Type 32Q Negative Phase Sequence High Speed Directional Relay

Type	Protection	Maximum Torque Angle	Sector Width	Sensitivity	Contacts	Internal Connections	Control Voltage	Catalog Number
32Q	Ground-Fault Negative Sequence	Adjustable 90° to 180° I <sub>2</sub> lead V <sub>2</sub>	180°	0.02A at 1V	②	16D425A	24/32 Vdc	425Q3090
			30° - 180°				48/125 Vdc	425Q3070
							250 Vdc	425Q3050
			180°				24/32 Vdc	425Q3091
							48/125 Vdc	425Q3071
			30° - 180°				250 Vdc	425Q3051
							24/32 Vdc	425Q3093
			180°				48/125 Vdc	425Q3073
							48/125 Vdc	425Q3176
			30° - 180°				24/32 Vdc	425Q3097
48/125 Vdc	425Q3077							
180°	0.4A at 1V	③	24/32 Vdc	425Q3097				
30° - 180°	0.02A at 1V	④	48/125 Vdc	425Q3098				
	0.1A at 1V	④	48/125 Vdc	425Q3078				
			180°				48/125 Vdc	425Q3277

① For 50 cycle applications, change letter in catalogue number from Q to J for Type 32Q.

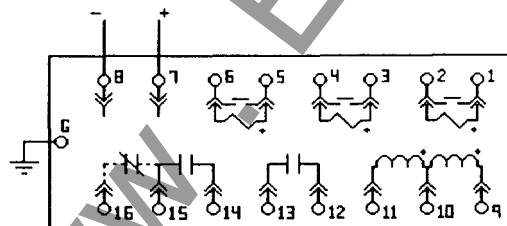
② This model preferred when directional relay will be used to control a Type 51 Relay as in directionally controlled overcurrent relay schemes. This model includes self-resetting indicator lamp.

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.

### Internal Connection Diagram

16D425A Type 32Q  
Directional Relays  
Drawout Test Case



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