

January, 1991  
Supersedes Bulletin 7.8.4-1E,  
pages 1 and 2, dated August, 1988  
Mailed to: E, D, C/41-200B

Device Number: 32

## CIRCUIT SHIELD® Type 32R Reverse Power Relay

### Application

The Type 32R is a sensitive reverse power relay used for anti-motoring protection of generators to prevent damage to the prime mover in the event of loss of input, or other abnormal system conditions. The Type 32R can be applied to the protection of diesel powered generators, gas turbines, steam turbines and hydro units.

Only one Type 32R is required in most 3 phase applications, since the power flow is usually the same in all phases.

The Type 32R provides a wide sensitivity range, adjustable from 0.025A to 0.7A. The 10 Ampere continuous rating allows full use of the relay's sensitivity. An adjustable definite time delay characteristic with a range of 1-30 seconds is provided to prevent unnecessary oper-

ation on temporary self-correcting power reversals.

For applications requiring Reverse VAR detection, or for True Directional Power Measurement type connections refer to Instruction Book.



### Features

- Adjustable sensitivity
- Adjustable time delay
- Low burden
- Built-in test
- Seismic capability to 6g ZPA
- Transient immunity
- 2 year warranty

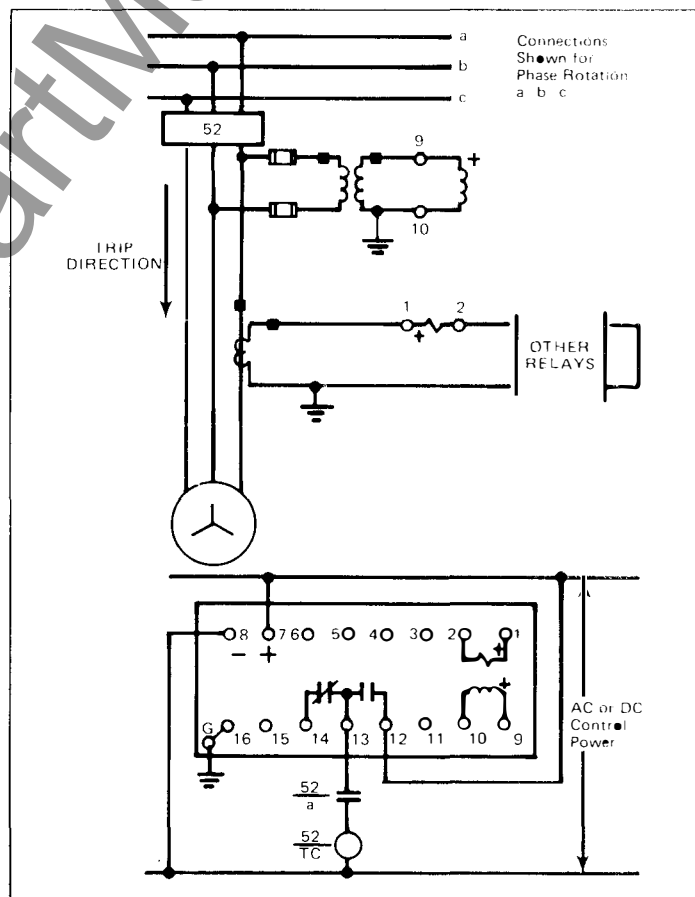


Figure 1. Connections for Reverse Power Protection of Generators

## Specifications

### Input Circuit Ratings:

**Potential:** 120 Vac, 50 or 60 Hz nominal  
160 Vac, maximum continuous  
**Current:** 10A, maximum continuous  
390A, one second

### Burden:

**Potential:** 0.3VA at 120V

**Current:** 0.9VA at 5A

**Sensitivity:** Adjustable 0.025 to 0.7A at unity power factor

**Operating Time:** Adjustable Delay  
1 to 30 seconds

**Control Power:** 48/125 Vdc at .05 Adc max.  
24/32 Vdc at .05 Adc max.  
120 Vac at .05 Aac max.

**Output Circuit:** 1-Form C Contact

**Output Circuit Rating:** Each Contact, at 125 Vdc:  
30 amps, Tripping Duty  
5 amps, Continuous  
1 amp, Opening Resistive  
0.3 amp, Opening Inductive

**Operating Temperature:** Minus 20°C to plus 70°C

**Seismic Capability:** More than 6g ZPA biaxial multi-frequency vibration without damage or malfunction. (ANSI/IEEE C37.98)

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

**Dielectric:** 2000 Vac RMS, 60 seconds all circuits to ground.

**Weight:** Unboxed - 3.8 lbs. (1.7 kg)  
Boxed - 4.5 lbs. (2.0 kg)  
Volume - 0.26 cubic feet

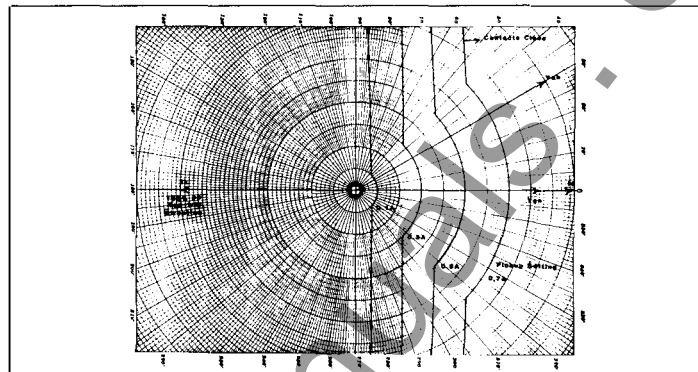


Figure 2. Type 32R Directional Characteristics

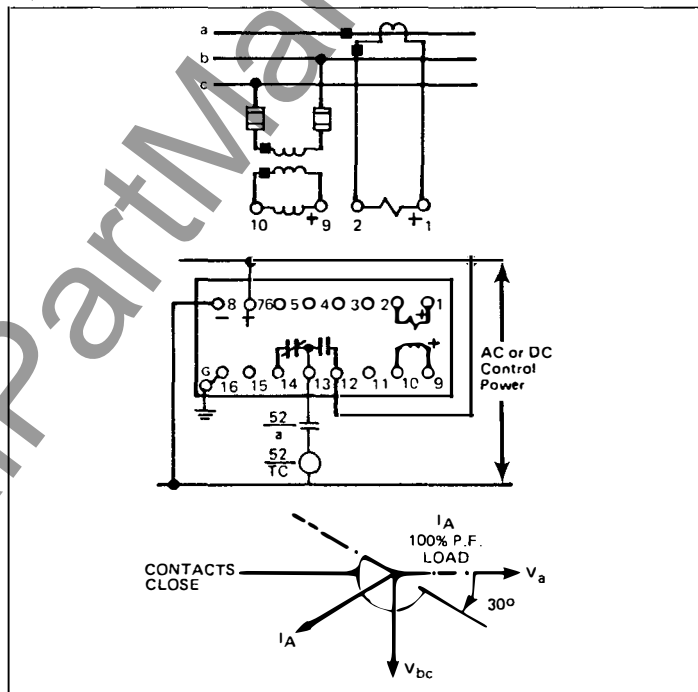


Figure 3. Type 32R Connected as Power Factor Relay

## How To Specify

Relay shall be Asea Brown Boveri Type 32R or equal. Relay shall be capable of withstanding up to 6g seismic stress without malfunction. An operation indicator shall be provided. Built-in means shall be provided to allow operational tests without additional equipment.

## How To Order

For complete listing of available reverse power and directional relays, see TD 41-025.

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

## Further Information

List Prices: PL 41-020  
Technical Data: TD 41-025  
Instruction Book: IB 7.8.1.7-1 ①  
Generator Protection Paper: TP 18.6-3 ①  
Other Protective Relays:  
Application Selector Guide, TD 41-016



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pages 2 and 3, dated January 1, 1990  
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## CIRCUIT SHIELD<sup>®</sup> Type 32R Reverse Power Relay

### Type 32R Current Directional Type

| Type | Application      | Maximum<br>Torque<br>Angle           | Time<br>Delay | Sensitivity              | Frequency | Control<br>Voltage | Catalog<br>Number |
|------|------------------|--------------------------------------|---------------|--------------------------|-----------|--------------------|-------------------|
| 32R  | Reverse<br>Power | 30 deg.<br>$I_a \text{ lag } V_{an}$ | 1-30 sec.     | 0.025-0.7A<br>adjustable | 60 Hz     | 48/125 Vdc         | 437P4671          |
|      |                  |                                      |               |                          |           | 24/32 Vdc          | 437P4691          |
|      |                  |                                      |               |                          |           | 120 Vac            | 437P4661          |
|      |                  |                                      |               |                          | 50 Hz     | 48/125 Vdc         | 437F4671          |
|      |                  |                                      |               |                          |           | 24/32 Vdc          | 437F4691          |
|      |                  |                                      |               |                          |           | 48/110 Vdc         | 437F4601          |
|      |                  |                                      |               |                          |           | 120 Vac            | 437F4661          |
|      |                  |                                      |               |                          |           |                    |                   |

Internal Connections: 16D437A

**Note:** For Applications requiring Reverse VAR Detection, refer to Instruction Book.

### Type 32R Power Measurement Type

| Type | Application      | Max.<br>Cont.<br>Current | Pickup<br>Range | Nominal<br>Rated<br>Voltage | Time<br>Delay | Catalog Number <sup>①</sup> |          |
|------|------------------|--------------------------|-----------------|-----------------------------|---------------|-----------------------------|----------|
|      |                  |                          |                 |                             |               | 60 Hertz                    | 50 Hertz |
| 32R  | Reverse<br>Power | 10A                      | 5-60 Watts      | 120 V                       | 1-30 sec.     | 437W48x0                    | 437G48x0 |
|      |                  |                          | 9-104 Watts     | 208 V                       |               | 437W78x0                    | 437G78x0 |
|      |                  |                          | 13-150 Watts    | 120 V                       |               | 437W47x0                    | 437G47x0 |
|      |                  |                          | 22-260 Watts    | 208 V                       |               | 437W77x0                    | 437G77x0 |
|      |                  | 6A                       | 1.7-20 Watts    | 120 V                       |               | 437W46x0                    | 437G46x0 |
|      |                  |                          | 3-35 Watts      | 208 V                       |               | 437W76x0                    | 437G76x0 |
|      |                  |                          |                 |                             |               |                             |          |
|      |                  |                          |                 |                             |               |                             |          |

Internal Connections: 16D437B<sup>②</sup> and 16D437C<sup>③</sup>

**Notes:** 1. Max torque angle internally adjustable 0° I lag V, or 30° I lag V, with selector link. Watts are line-to-neutral value (see Instruction Book).  
2. Definite-time; internal selector link provided for inverse delay.

<sup>①</sup> Each of the listed catalog numbers contains an x for the control voltage designation. To complete the catalog number, replace the x with the proper control voltage digit:

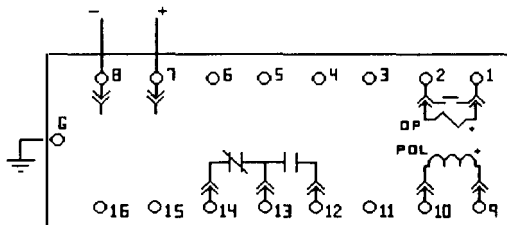
|            |   |
|------------|---|
| 24 Vdc     | 9 |
| 32 Vdc     | 8 |
| 48/125 Vdc | 7 |
| 48/110 Vdc | 0 |
| 220 Vdc    | 2 |
| 250 Vdc    | 5 |
| 120 Vac    | 6 |

<sup>②</sup> Diagram 16D437B applies to relays with control voltages 24 Vdc, 32 Vdc and 120 Vac.

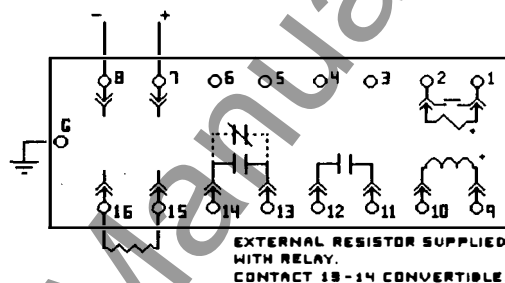
<sup>③</sup> Diagram 16D437C applies to relays with control voltages 48/125 Vdc, 48/110 Vdc, 220 Vdc and 250 Vdc.

## Internal Connection Diagrams

**16D437A Type 32R**  
**Reverse Power Relay**  
**Drawout Test Case**



**16D437B Type 32R**  
**Reverse Power Relay**  
**Drawout Test Case**



**16D437C Type 32R**  
**Reverse Power Relay**  
**Drawout Test Case**

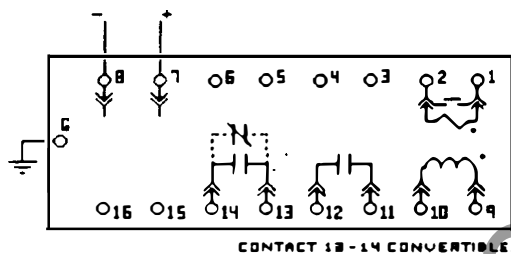


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