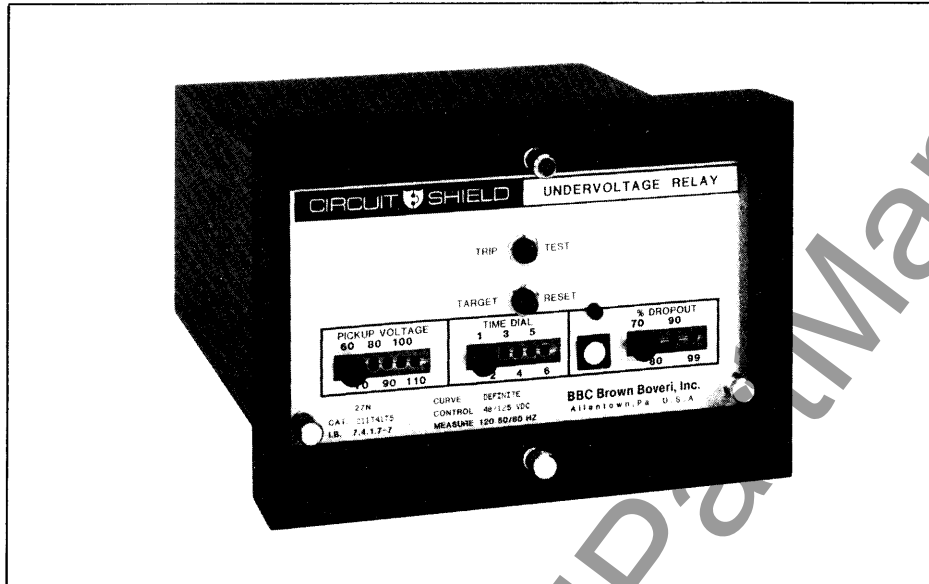


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Highly Accurate
Device Number: 27 Undervoltage
Device Number: 59 Overvoltage

CIRCUIT SHIELD[®] Type 27N and 59N Undervoltage and Overvoltage Relay



Application

The Type 27N and Type 59N Voltage Relays provide a wide range of protective functions, including undervoltage protection of motors, overvoltage protection, and automatic bus transfer. The Type 27N and Type 59N relays are primarily designed for those applications where exceptional accuracy, exceptional repeatability, and long term stability are important. In addition, inherently high seismic and transient immunity allow the use of these relays in generating stations or substations where the performance of electromechanical or other types of static relays is marginal.

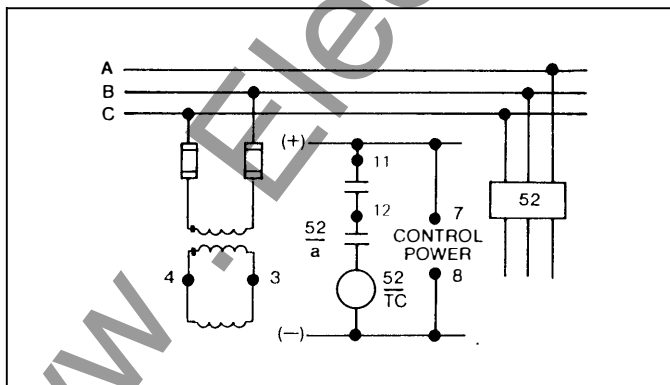
Both types have a dual nominal frequency rating of 50 or 60 Hz.

The unique design of the output circuit does not require seal-in contacts, allowing simplification of bus-transfer schemes. Operation indicators, however, are provided as standard features on all types.

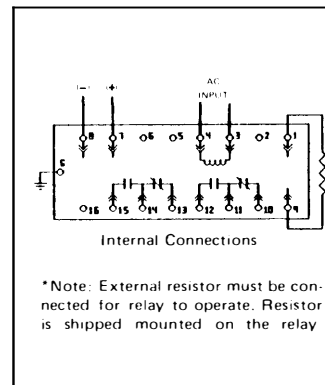
Harmonic distortion in the AC waveform can have a noticeable effect on the relay operating point and on measuring instruments used to set the relay. An internal harmonic filter module is available for those applications where waveform distortion is a factor.

Features

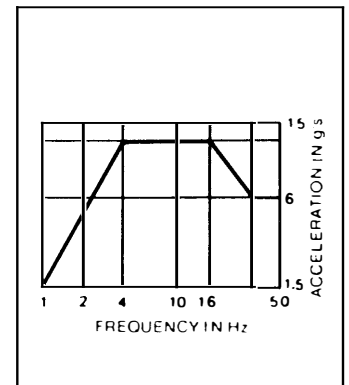
- Definite time or high speed
- Seismic capability to 6g ZPA
- Highly stable, accurate and repeatable characteristics
- Transient immunity
- Low burden
- Drawout construction
- UL recognized
- 2 year warranty



Typical Circuit Shield Voltage Relay Application



Internal Connections



Typical Seismic Test Results

Specifications

Input Circuit Rating: Type 27N 150 Vac Maximum Continuous
Type 59N 160 Vac Maximum Continuous
Less than 0.5 VA at 120 Vac

Burden:
Frequency: 50/60 Hz.

Output Circuit: Each contact at 125 Vdc:
30A Tripping Duty
5A Continuous
1A Break, Resistive
0.3A Break, Inductive.

Control Power: Rated at 48/125, 250 Vdc at 0.05 ampere maximum.

Temperature: ANSI range -20°C to $+55^{\circ}\text{C}$
Must operate -30°C to $+70^{\circ}\text{C}$

Tolerances:
(Without harmonic filter module, after 10 minute warm-up.)
Pickup and dropout settings with respect to printed dial markings (factory calibration) = $\pm 2\%$.
Pickup and dropout settings, repeatability at constant temperature and constant control voltage = $\pm 0.1\%$. (See Note)
Pickup and dropout settings, repeatability over DC control power range of 100-140 volts = $\pm 0.1\%$. (See Note)
Pickup and dropout settings, repeatability over temperature range: (See Note)
 -20°C to $+55^{\circ}\text{C} \pm 0.4\%$
 -20°C to $+70^{\circ}\text{C} \pm 0.7\%$
 0°C to $+40^{\circ}\text{C} \pm 0.2\%$

Note: The three tolerances shown should be considered independent and may be cumulative. Tolerances assume pure sine wave input signal.

Time Delay
Instantaneous model: 3 cycles or less operating time.
Definite Time models (see appropriate curve).
 $\pm 10\%$ or ± 20 milliseconds, whichever is greater.

Tolerances:
(With harmonic filter module)
All ratings are the same except: Pickup and dropout settings, repeatability over temperature range:
 0°C to $+55^{\circ}\text{C} \pm 0.75\%$
 $+10^{\circ}\text{C}$ to $+40^{\circ}\text{C} \pm 0.40\%$
 -20°C to $+70^{\circ}\text{C} \pm 1.50\%$

Reset Time: Less than 2 cycles (Type 27N),
Less than 3 cycles (Type 59N).
(The relay resets when the input voltage goes above the pickup setting - 27N, below the dropout setting - 59N.)

Seismic Capability: More than 6g ZPA either AXIS biaxial broadband multifrequency vibration without damage or malfunction ANSI/IEEE C37.98.

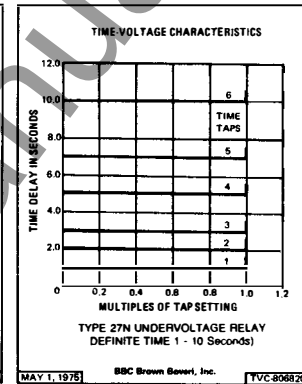
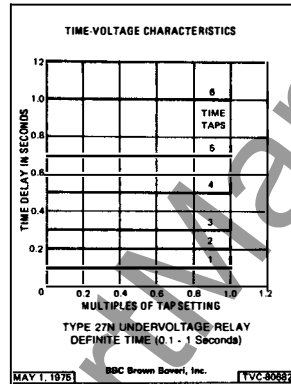
Transient Immunity: More than 2500V, 1MHz bursts at 400 Hz repetition rate, continuous (ANSI C37.90.1 SWC); Fast transient test, EMI test.

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

Weight: Unboxed - 3.7 lbs. (1.7 kg)
Boxed - 4.3 lbs. (2.0 kg)
Volume - 0.26 cubic feet

How To Specify

Voltage Relay shall be Asea Brown Boveri Type 27N, Type 59N or approved equal, draw-out case, capable of withstanding up to 6g ZPA seismic stress without damage or malfunction, at minimum voltage and time settings. A magnetic operation indicator shall be provided which retains position on loss of control power. Built-in means shall be provided to allow operational tests without additional equipment.



Note: Time delays associated with the time taps for the Type 59N Overvoltage Relay are identical to those of the Type 27N Undervoltage Relay, except the delay occurs on pickup; i.e., when voltage increases to above the pickup tap setting.

How To Order

For a complete listing of available versions of single and three phase voltage relays see TD 41-025.

Models are available for 48 to 250 Vdc control power, and 120 Vac potential transformers. For other control voltages contact the nearest ABB Representative.

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 7.4.1.7-7
Other Protective Relays:
Application Selector Guide, TD 41-016



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High Accuracy

CIRCUIT SHIELD®
Type 27N and 59N
Undervoltage and
Overtoltage Relay

Single-Phase Undervoltage Relays

| Type | Max. Voltage Rating | Pickup Tap Range | Dropout Curve | Time | Range | Output Contacts | Internal Connections | ① Control Voltage | Catalog Number |
|----------------------|-----------------------------------|------------------|---------------|------------|-----------------------------------|-----------------|----------------------|-------------------|----------------|
| 27N See Note 1 | 150V 50/60 Hz | 60-110V | Definite | 0.1-1 sec. | 70-99% of pickup adjustable | 2-C | 16D211N | 48/125 Vdc | 411T6175 |
| | | | | | | | | 48/110 Vdc | 411T6105 |
| | | | | | | | | 220 Vdc | 411T6125 |
| | | | | | | | | 250 Vdc | 411T6155 |
| | | | | | | | | 48/125 Vdc | 411T4175 |
| | | | | | | | | 48/110 Vdc | 411T4105 |
| | | | | 220 Vdc | 411T4125 | | | | |
| | | | | 250 Vdc | 411T4155 | | | | |
| | | | | 0.1-1 sec. | 30-60% of pickup adjustable | 48/125 Vdc | 411T6275 | | |
| | | | | | | | 48/110 Vdc | 411T6205 | |
| | | | | | | | 220 Vdc | 411T6225 | |
| | | | | | | | 250 Vdc | 411T6255 | |
| | | | | | | | 48/125 Vdc | 411T4275 | |
| | | | | | | | 48/110 Vdc | 411T4205 | |
| | | | | 1-10 sec. | 70-99% of pickup adjustable | 220 Vdc | 411T4225 | | |
| | | | | | | | 250 Vdc | 411T4255 | |
| | | | | | | | 48/125 Vdc | 411T0275 | |
| | | | | | | | 48/110 Vdc | 411T0205 | |
| | | | | | | | 220 Vdc | 411T0225 | |
| | | | | | | | 250 Vdc | 411T0255 | |
| | | | | Inst. | 70-99% of pickup adjustable | 48/125 Vdc | 411T0175 | | |
| | | | | | | | 48/110 Vdc | 411T0105 | |
| | | | | | | | 220 Vdc | 411T0125 | |
| | | | | | | | 250 Vdc | 411T0155 | |
| 48/125 Vdc | 411T0375 | | | | | | | | |
| 48/110 Vdc | 411T0305 | | | | | | | | |
| 70-120V | 70-99% of pickup adjustable | 220 Vdc | 411T0325 | | | | | | |
| | | | 250 Vdc | 411T0355 | | | | | |

Single-Phase Overtoltage Relays

| Type | Max. Voltage Rating | Pickup Tap Range | Dropout Curve | Time | Range | Output Contacts | Internal Connections | ① Control Voltage | Catalog Number |
|----------------------|-----------------------------------|------------------|---------------|------------|-----------------------------------|-----------------|----------------------|-------------------|----------------|
| 59N See Note 1 | 160V 50/60 Hz | 100-150V | Definite | 0.1-1 sec. | 70-99% of pickup adjustable | 2-C | 16D211N | 48/125 Vdc | 411U6175 |
| | | | | | | | | 48/110 Vdc | 411U6105 |
| | | | | | | | | 220 Vdc | 411U6125 |
| | | | | | | | | 250 Vdc | 411U6155 |
| | | | | | | | | 48/125 Vdc | 411U4175 |
| | | | | | | | | 48/110 Vdc | 411U4105 |
| | | | | 220 Vdc | 411U4125 | | | | |
| | | | | 250 Vdc | 411U4155 | | | | |
| | | | | 1-10 sec. | 70-99% of pickup adjustable | 48/125 Vdc | 411U0175 | | |
| | | | | | | | 48/110 Vdc | 411U0105 | |
| | | | | | | | 220 Vdc | 411U0125 | |
| | | | | | | | 250 Vdc | 411U0155 | |
| 48/125 Vdc | 411U0175 | | | | | | | | |
| 48/110 Vdc | 411U0105 | | | | | | | | |
| Inst. | 70-99% of pickup adjustable | 220 Vdc | 411U0125 | | | | | | |
| | | | 250 Vdc | 411U0155 | | | | | |

① For other control voltages contact nearest ABB Representative.

Note 1. Add suffix — HF to catalog number for harmonic filter module. Harmonic filter not available on instantaneous Type 27N relays.

To place an order, or for further information, contact the nearest ABB Representative.

Internal Connection Diagram

Note: Refer to Instruction Book IB 7.4.1.7-7 for contact logic data.
Instruction Book available upon request.

16D211N Single-Phase Voltage Relays Drawout Test Case

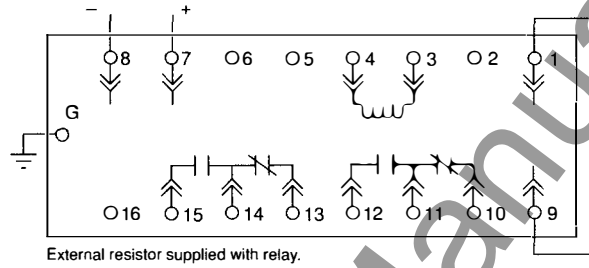


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