ABB Power T&D Company Inc.
Relay Division
Coral Springs, FL
Allentown, PA

October 1993
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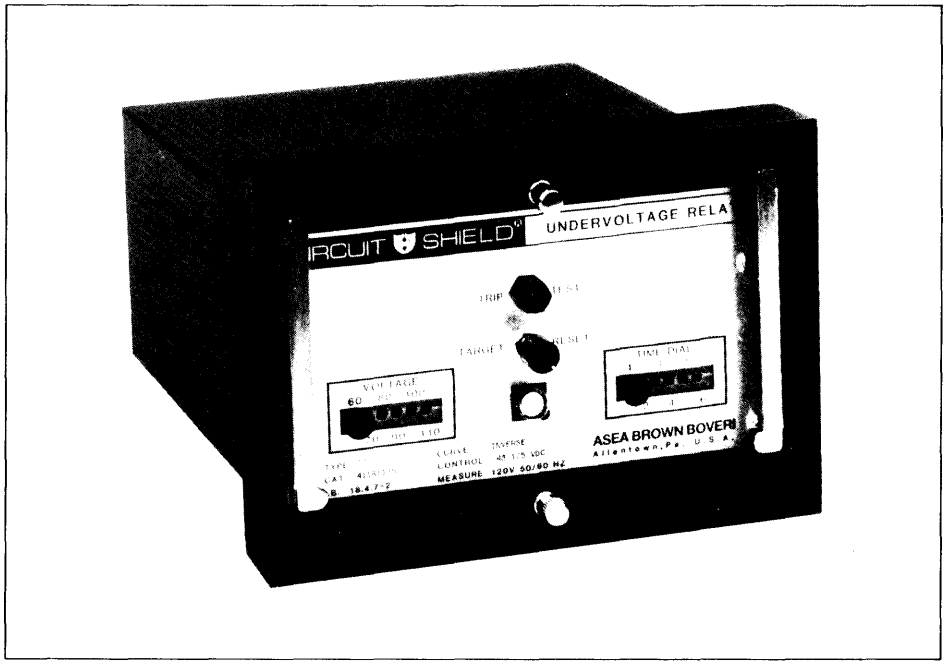
Mailed to: E, D, C/41-200B

Device Number: 27 Undervoltage
Device Number: 59 Overvoltage

CIRCUIT SHIELD®

Types 27, 27D, 27H Types 59, 59D, 59H Undervoltage and Overvoltage Relays



Application

Circuit-Shield Voltage Relays provide a wide range of protective functions, including undervoltage protection of motors, overvoltage protection, and automatic bus transfer. 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.

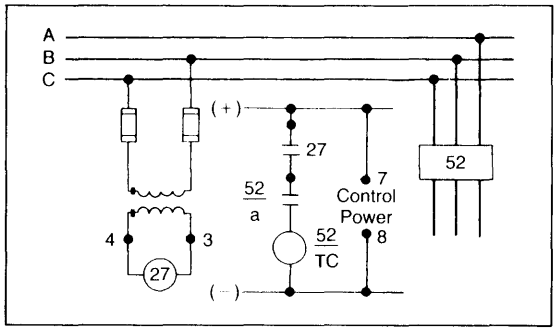
All types are frequency compensated for reliable operation from 20 to 400 Hz, and have a dual nominal frequency rating of 50 or 60 Hz.

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.

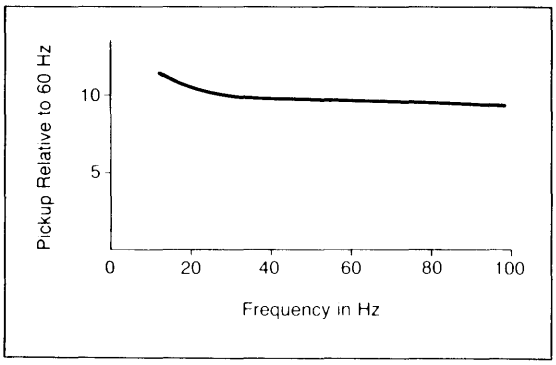
The operating characteristics of each relay in this series is indicated as follows: H suffix for high speed; D suffix for definite time; no suffix for inverse time.

Features

- Frequency compensation to 20 Hz
- Inverse, definite time, or high speed
- Accurate, repeatable characteristics
- Low burden
- Seismic capability to 6g ZPA
- Transient immunity
- Drawout construction
- 2 year warranty



Typical Circuit Shield Undervoltage Relay Application



Frequency Response

Specifications:

	27 27D 27H	27D 27H	59 59D 59H	59D 59H
PICKUP TAPS (volts)			100 110 120 130 140 150	60 65 70 75 80 90
DROPOUT TAPS (volts)	60 70 80 90 100 110	30 35 40 45 50 55	15 18 21 24 27 30	

Input Circuit Rating: 160V, 50/60 Hz continuous, 300V, 10 sec.

Burden: 1.2 VA, 1.0 P.F. at 120V

Control Power: 48/125 Vdc, 48/110 Vdc, 24/32 Vdc, 0.08A max.

Output Circuit Rating: @ 125 Vdc
30 Amps Tripping Duty
5 Amps Continuous
1 Amp, Opening Resistive
0.3 Amp, Opening Inductive

Temperature: Minus 20° to plus 70°C

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

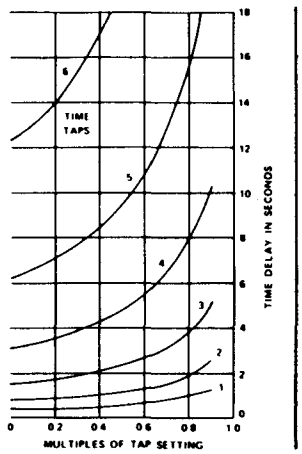
Transient Immunity: More than 2500V, 1 MHz bursts at 400Hz repetition rate, continuous (ANSI C37.90a SWC); fast transient test; EMI test

Operating Time: Models available:
- high speed
- inverse time delay (see curves)
- definite time delay, ranges 0.1 – 1.0 seconds, and 1.0 – 10 seconds

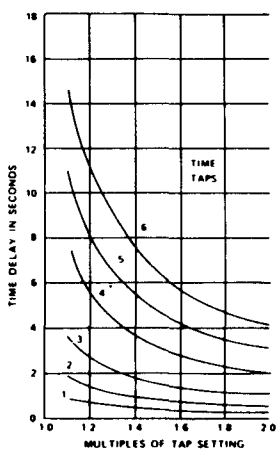
Weight: Unboxed – 4.0 lbs. (1.8 kg)
Boxed – 4.7 lbs. (2.1 kg)

Volume: Boxed – 0.26 cubic feet

Time-Voltage Characteristics

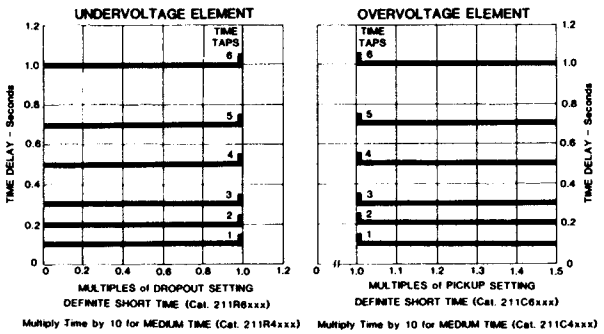


TYPE 27



TYPE 59

Time-Voltage Characteristics



How To Specify

Voltage relay shall be Asea Brown Boveri Type 27, 59 or approved equal, drawout 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.

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 24, 32, 48, 110 Vdc or 125 Vdc control power. For 120 Vac potential applications, and 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 18.4.7-2
Other Protective Relays:
Application Selector Guide, TD 41-016

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CIRCUIT SHIELD ®

Types 27, 27D, 27H Types 59, 59D, 59H Undervoltage and Overvoltage Relays

Single Phase Undervoltage Relays

Type	Max. Voltage Rating	Pickup Tap Range	Dropout Curve	Time	Range	Output Contacts	Internal Connections	① Control Voltage	Catalog Number
27	160 V 20-400 Hz	60-110 V	Inverse	0.4-12 sec.	97% of pickup fixed	2-C	16D210A	48/125 Vdc	411R1175
								48/110 Vdc	411R1105
								120 Vac	411B1165
27D			Definite	0.1-1 sec.				24/32 Vdc	411R6195
								48/125 Vdc	411R6175
								48/110 Vdc	411R6105
								120 Vac	411B6165
				1-10 sec.				24/32 Vdc	411R4195
								48/125 Vdc	411R4175
								48/110 Vdc	411R4105
								120 Vac	411B4165
		30-55 V		0.1-1 sec.				24/32 Vdc	411R6295
								48/125 Vdc	411R6275
								48/110 Vdc	411R6205
				1-10 sec.				24/32 Vdc	411R4295
								48/125 Vdc	411R4275
								48/110 Vdc	411R4205
27H		60-110 V	Inst.	—				24/32 Vdc	411R0195
								48/125 Vdc	411R0175
								48/110 Vdc	411R0105
								120 Vac	411B0165
		30-55 V						24/32 Vdc	411R0295
								48/125 Vdc	411R0275
								48/110 Vdc	411R0205
		15-30 V						48/125 Vdc	411R0575

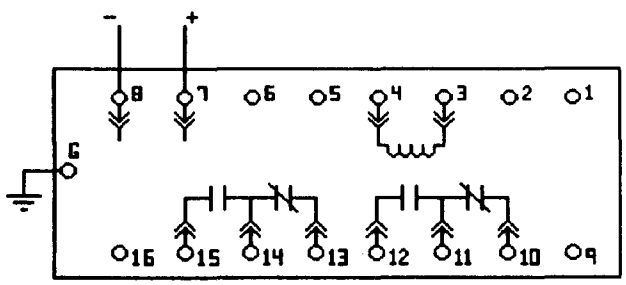
① For other voltages contact the nearest ABB Representative.

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

Internal Connection Diagram

Note: Refer to Instruction Book IB 18.4.7-2 for contact logic data.

16D210A
Single Phase Voltage Relays
Drawout Test Case



Single Phase Overvoltage Relays

Type	Max. Voltage Rating	Pickup Tap Range	Curve	Time	Range	Output Contacts	Internal Connections	① Control Voltage	Catalog Number
59	160 V 20-400 Hz	100-150 V	Inverse	0.2-4 sec.	97% of pickup fixed	2-C	16D210A	48/125 Vdc	410C1175
								48/110 Vdc	410C1105
								120 Vac	410C1165
59D			Definite	0.1-1 sec.				24/32 Vdc	411C6195
								48/125 Vdc	411C6175
								48/110 Vdc	411C6105
								120 Vac	411C6165
				1-10 sec.				24/32 Vdc	411C4195
								48/125 Vdc	411C4175
								48/110 Vdc	411C4105
								120 Vac	411C4165
		60-90 V		0.1-1 sec.				48/125 Vdc	411C6275
								48/110 Vdc	411C6205
				1-10 sec.				24/32 Vdc	411C4295
								48/125 Vdc	411C4275
								48/110 Vdc	411C4205
59H		100-150 V	Inst.					24/32 Vdc	411C0195
								48/125 Vdc	411C0175
								48/110 Vdc	411C0105
								120 Vac	411C0165
		60-90 V						24/32 Vdc	411C0295
								48/125 Vdc	411C0275
								48/110 Vdc	411C0205
								120 Vac	411C0265

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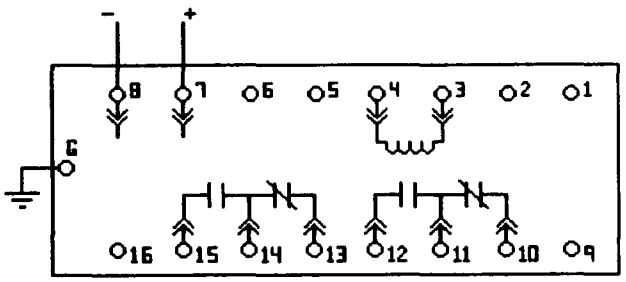

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