



Product Data

Restricted To Square D Personnel

Bulletin **C856**

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Date Dec., 1976

File 8198

Subject

COMPETITIVE HIGH VOLTAGE STARTERS COMPARED WITH SQUARE D CLASS 8198 ISO-FLEX STARTER

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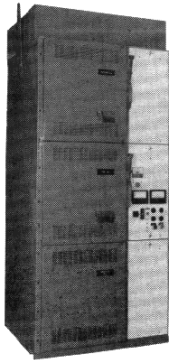
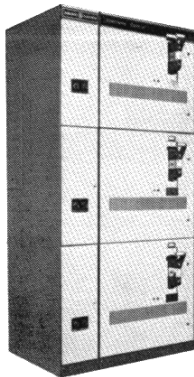
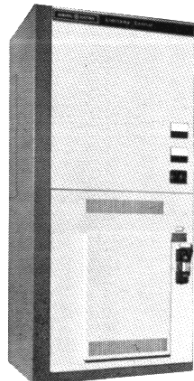
This publication provides a comparison of the Square D ISO-FLEX High Voltage Starter, introduced in 1976, with its competition. For reference, a comparison is also made with the previous Class 8198 High Voltage Starters supplied from 1964 to 1977.

The basis for this comparison is the full voltage, non-reversing starter which constitutes about 80% of the starter market.

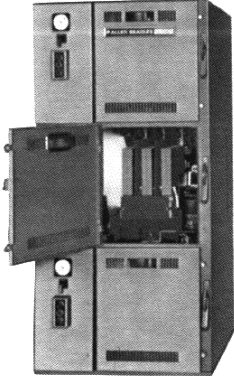
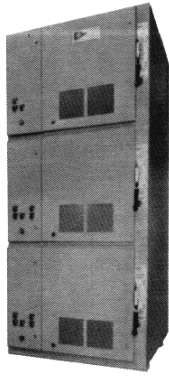
General Electric and Westinghouse are the major suppliers of high voltage starters. Square D, along with Allis-Chalmers, ITE Imperial, Allen-Bradley, and Nelson share in this very competitive market. During the last two years ITE Imperial, Allen-Bradley, and Nelson each have entered new design concepts in addition to Square D. Allis-Chalmers is continuing to market basically the same high voltage starter which they introduced in 1961.

Suppliers not listed in this Product Data include Cutler-Hammer, who announced in early 1976 they no longer would be a supplier of high voltage starters; Electric Machinery, who is active but not considered as a competitor to those listed above; Toshiba, a Japanese Company, who within the last two years began assembling vacuum contactors in the United States; and numerous assembly shops who custom build starters using contactors and other components supplied by the major suppliers.

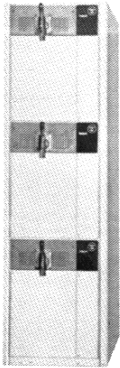
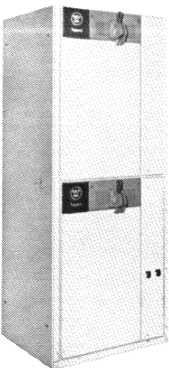
V. C. Maury/CVM

| STARTER FEATURES | SQUARE D "ISO-FLEX" | GENERAL ELECTRIC "LIMIT AMP" | GENERAL ELECTRIC "LIMIT AMP" |
|---|--|--|--|
| |  |  |  |
| CURRENT (OPEN) AND VOLTAGE RATINGS | 400A 5000V | 400A 5000V | 700A 5000V |
| MINIMUM DIMENSIONS W x H x D (INCHES) | 2 & 3 high—42 x 90 x 35 | 1 high—34 x 90 x 30 2 & 3 high—44 x 90 x 30 | 1 high—42 x 90 x 30 |
| MAXIMUM NUMBER OF STARTERS PER VERTICAL SECTION | 3 | 3 | 1 |
| CONTROL VOLTAGE | 120 VAC | 230 VAC | 230 VAC |
| HORIZONTAL POWER BUS LOCATION MAXIMUM RATING | Top—Adds 10" to height 2000 Amp | Middle Rear of 90" Enclosure 2000 Amp | Middle Rear of 90" Enclosure 2000 Amp |
| VERTICAL SECTION POWER WIRING (BUS OR CABLE) | Bus | Bus | Bus |
| POWER FUSES LOCATION | Front of Contactor | Front of contactor | Front of contactor |
| FUNCTION OF OPERATING OR DRAWOUT HANDLE | Drawout handle draws out contactor disconnecting both line and load. Primary of control potential transformer is also disconnected. | Operating handle disconnects and grounds line side of contactor. Secondary of control potential transformer is disconnected. | Operating handle disconnects and grounds line side of contactor. Secondary of control potential transformer is disconnected. |
| UL LISTED STANDARD #347 | Anticipated in 1977 | Yes | Yes |

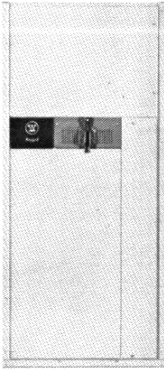
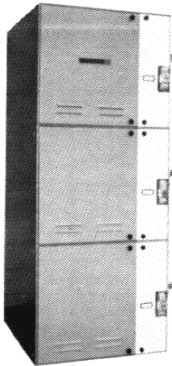
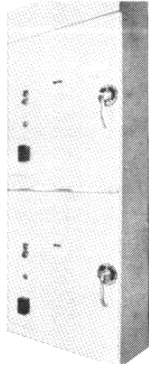
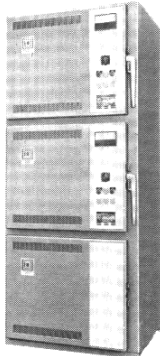
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| ALLEN-BRADLEY "CENTERLINE--HVC" | ITE IMPERIAL "SERIES 7850" |
|--|---|
|  |  |
| <p>400A 5000V</p> | <p>400A 5000V</p> |
| <p>1 & 2 high— 36 x 91½ x 36 3 high— 44 x 91½ x 36</p> | <p>1 high & 2 high narrow 29 x 90 x 36 2 high wide & 3 high 40 x 90 x 36</p> |
| <p>3</p> | <p>3</p> |
| <p>120VAC</p> | <p>120VAC</p> |
| <p>Middle rear of 90" enclosure 2000 Amp</p> | <p>Top, middle, or bottom rear of 90" enclosure 2400 Amp</p> |
| <p>Cable</p> | <p>Cable</p> |
| <p>Behind contactor</p> | <p>Front of contactor</p> |
| <p>Operating handle disconnects and grounds line side of contactor</p> | <p>Operating handle disconnects line and load. Primary of control potential transformer is also disconnected.</p> |
| <p>No</p> | <p>No</p> |

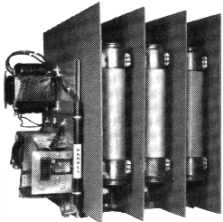
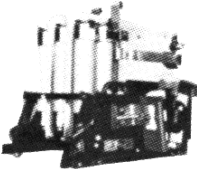
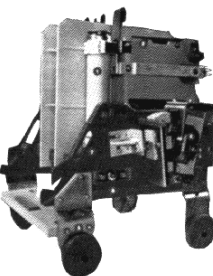
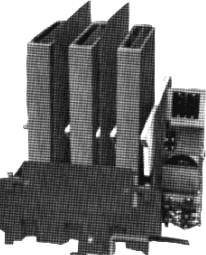
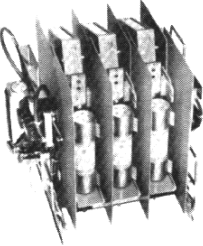
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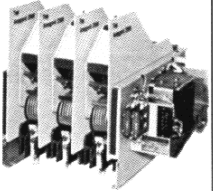
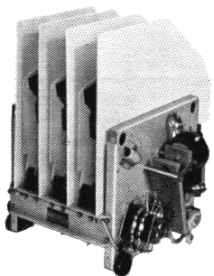
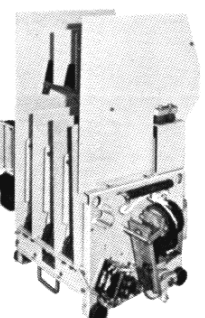
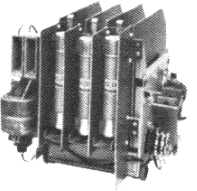
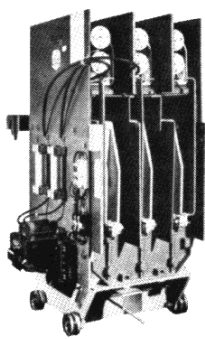
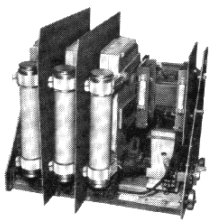
| WESTINGHOUSE "AMPGARD" | WESTINGHOUSE "AMPGARD" |
|--|---|
|  |  |
| 200A 2500/5000V 2 & 3 high—26 x 90 x 30 | 400A 5000V 1 & 2 high—36 x 90 x 30 |
| 2500V—3 5000V—2 | 2 |
| 120VAC | 120VAC |
| Top—Adds 10" to height 3000 Amp | Top—Adds 10" to height 3000 Amp |
| Bus | Bus |
| Top rear of contactor | Top rear of contactor |
| Operating handle disconnects and grounds line side of contactor | Operating handle disconnects and grounds line side of contactor |
| No | No |

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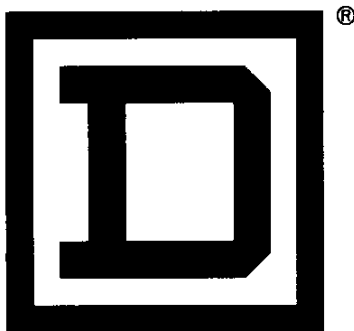
| WESTINGHOUSE "AMPGARD"  | NELSON "CLASS 1041"  | ALLIS CHALMERS "SPACE MAKER II"  | SQUARE D CLASS 8198 1964-1976 DESIGN  |
|--|---|--|---|
| 700A 5000V | 400A 5000V | 400A 5000V | 400A 5000V |
| 1 high—40 x 90 x 30 | 3 high—40 x 90 x 36 | 2 high—36 x 90 x 32 | 2 high—39 x 91½ x 32 3 high—37 x 91½ x 32 |
| 1 | 3 | 2 | 3 |
| 120VAC | 120 or 230VAC | 230VAC | 120VAC |
| Top—Adds 10" to height 3000 Amp | Top—Adds 10" to height 2000 Amp | Top—Adds 10" to height 2000 Amp | Top—Adds 10" to height 2000 Amp |
| Bus | Bus | Cable | Cable |
| Top of contactor | Front of contactor | Top of contactor | Front of contactor |
| Operating handle disconnects and grounds line side of contactor | Operating handle disconnects line and load. Primary of control potential transformer is also disconnected. | Operating handle disconnects line and load. Primary of control potential transformer is also disconnected. | Drawout handle draws out contactor disconnecting both line and load. Primary of control potential transformer is also disconnected. |
| No | No | No | No |

Restricted To Square D Personnel

| CONTACTOR FEATURES (AIR BREAK) | SQUARE D CLASS 8110 FOR USE IN "ISO-FLEX" | GENERAL ELECTRIC | GENERAL ELECTRIC | ALLEN- BRADLEY | ITE IMPERIAL |
|---|---|---|--|---|---|
| |  |  |  |  |  |
| CURRENT (OPEN) AND VOLTAGE RATINGS | 400A 5000V | 400A 5000V | 700A 5000V | 400A 5000V | 400A 5000V |
| INTERRUPTING CAPACITY | 50 MVA | 50 MVA | 80 MVA | 50 MVA | 50 MVA |
| BASIC IMPULSE LEVEL | 60 KV | 60 KV | 60 KV | 60 KV | 60 KV |
| TYPE | Clapper | Clapper | Clapper | Clapper | Clapper |
| POWER FUSES PART OF CONTACTOR | Yes | Yes | Yes | No | Yes |
| CONTROL POTENTIAL TRANSFORMER PART OF CONTACTOR | Yes | No | No | No | No |
| COIL | Encapsulated DC Economizing reactor | Encapsulated AC Split winding | Encapsulated AC Split winding | Encapsulated DC Economizing capacitor | Encapsulated DC 2 winding 3 lead |
| OTHER TYPES AVAILABLE | Mechanical latched air break | Mechanical latched air break Vacuum break | | | Mechanical latched air break |
| REMARKS | Not inter- changeable with 1964-1976 design | | | | |

| WESTING- HOUSE | WESTING- HOUSE | WESTING- HOUSE | NELSON | ALLIS- CHALMERS | SQUARE D CLASS 8110 1964-1976 DESIGN |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| 200A 2500/5000V | 400A 5000V | 700A 5000V | 400A 5000V | 400A 5000V | 400A 5000V |
| 25 MVA | 50 MVA | 75 MVA | 50 MVA | 50 MVA | 50 MVA |
| 45 KV | 60 KV | 60 KV | 60 KV | 60 KV | 60 KV |
| Clapper | Clapper | Clapper | Clapper | Vertical lift | Clapper |
| No | No | No | Yes | Yes | Yes |
| Yes | Yes | Yes | Yes | Yes | Yes |
| Taped DC Economizing resistor | Encapsulated DC Economizing resistor | Encapsulated DC Economizing resistor | Encapsulated DC Economizing resistor | Encapsulated DC 2 winding 3 lead | Taped DC Economizing resistor |
| | Vacuum break | | Vacuum break Oil immersed (200A only) | | Mechanical latched air break |
| | Air and vacuum break inter- changeable | | Air and vacuum break inter- changeable (Modified Westinghouse contactor) | | Not inter- changeable with Iso-Flex starter |

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SQUARE **D** COMPANY

COLUMBIA HEADQUARTERS SALES DEPT.

RESTRICTED TO SQUARE D PERSONNEL ONLY