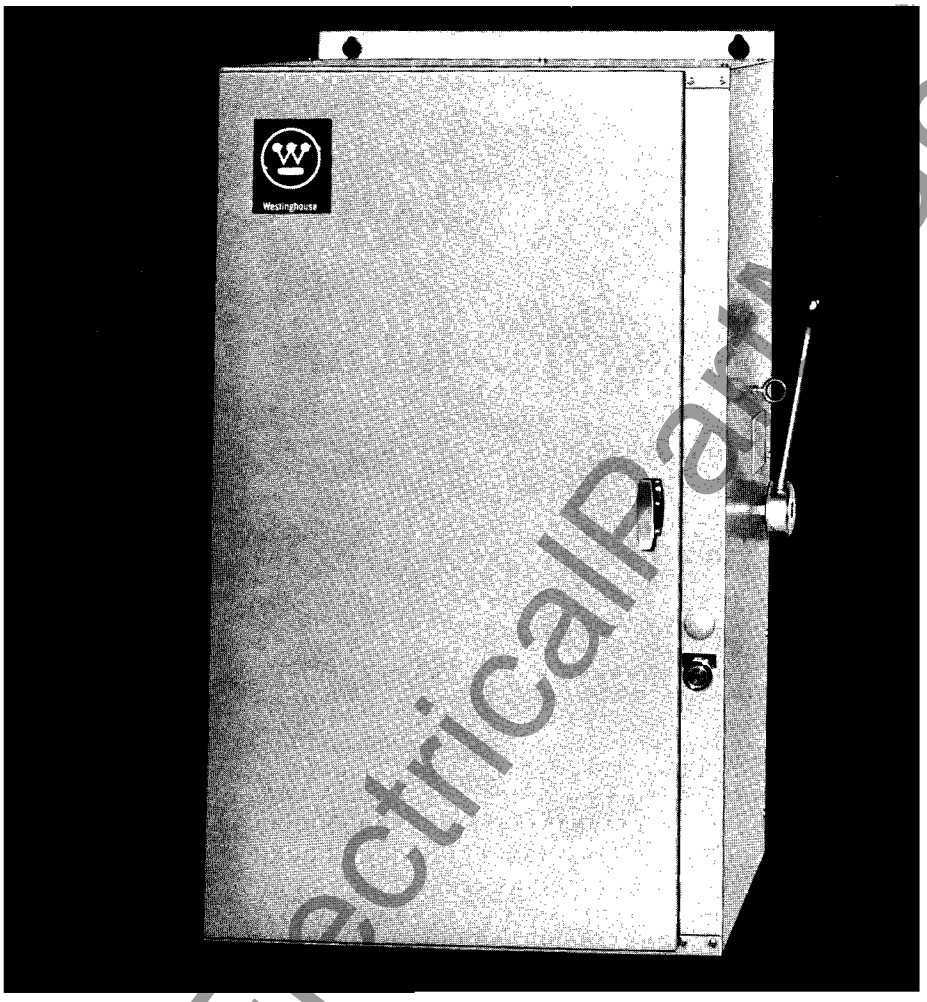
Westinghouse Electric Corporation
General Control Division
Buffalo, N. Y. 14240

November 15, 1976
Supersedes DB 9150 dated
June, 1972
E, D, C/1798/DB

Class 10-600 Type JF Autostarter,
5 to 300 Hp
230 to 575 Volts, 60 Hertz and Below

Ac Manual Non-Reversing Reduced Voltage Starters



Application

Manual autostarters, type JF, are designed for application wherever across-the-line starting current of squirrel-cage induction motors is likely to exceed local power company restrictions or interfere with plant operations. They provide the least expensive method of keeping current inrush within limits and still give a maximum starting torque. The class 10-600 autostarter is simple and safe to operate, adjustable to the application, and provides protection against overload or low voltage.

Accessory equipment including time delay low voltage protection, an electrical interlock, an ammeter, etc., can be supplied for use with this starter.

Features — Benefits

Positive Operation: A unique sequence mechanism assures proper operation which provides a smooth acceleration of the motor. The operating handle cannot be moved to the "run" position prior to moving it to the "start" position.

Longer Contact Life: All sizes of starters employ double air-break silver alloy contacts which reduce pitting, burning and sticking to a minimum. The larger sizes employ de-ion arc quenchers where additional interrupting capacity is required.

Overload Safety Assured: Automatic reset overload protection is provided by three bi-metallic actuated overload relays which are specifically designed to retain their precise setting after years of operation.

Low Voltage Protection: Starter automatically returns to the "off" position in the event of low voltage or voltage failure providing protection for motor, machine and operator.

Ratings

Horsepower	Voltage	Starter Size	
		50 and 60 Hertz	25 Hertz
5-15	230/460/575	2	2
20-25	230	3	3①
20-25	460/575	2	3①
30	230/460/575	3	3①
40-50	230	4	4
40-50	460/575	3	3①
60-75	230	5	5
60-100	460/575	4	4
100-125	230	5M	5M
125-150	460/575	5	5M
150	230	5MM	5MM
200-250	460/575	5M	..
300	460/575	5MM	..

① Size 4 enclosure.

Design Features

Standard NEMA Construction

All standard type JF autostarters are furnished in a shallow, wall mounted NEMA 1 general purpose enclosure with all components front mounted. Refer to drawing on page 4 for dimensions.

The fabricated steel operating handle projects from the right-hand side of the cabinet at a convenient height for easy operation and may be padlocked in the "off" position. All positions are clearly marked for "start", "run" and "off". The stop button, which electrically trips the starter, is located in the front flange. Time delay undervoltage protection is optional on all size starters. Heaters for thermal overload relays are included with all starters.

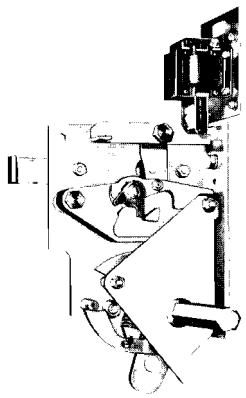
Adequate space is provided for running wiring from any entrance point to the bottom of the enclosure where rigid, solderless type, pressure connectors hold the leads without binding. This speeds installation and provides a positive low resistance connection for either solid or stranded conductor in a range of sizes to cover the full range of the starter. A lifting eye is also provided in the larger sizes for easier handling and installation.

1 Autotransformer

The autotransformers are conservatively rated, two-coil type, connected open delta and are mounted wired as an integral part of the starter in all sizes. Simple construction with steel laminations and copper coils impregnated with a moisture-resistance insulating compound assure long life. The autotransformer is designed and applied in accordance with the standards of the National Electrical Manufactures Association which permits a cycle of one 15-second start out of each four minutes for a total of four starts followed by a two-hour rest period. Taps for starting voltages of 65% and 80% of the line voltage are available on all sizes. Starters larger than 50 hp also provide a 50% tap. Starter is shipped connected to 65% tap. The transformer is completely disconnected from the line and motor when the motor is stopped or running.

2 Sequence and Holding Mechanism

Standard Mechanism
(In "run" position)

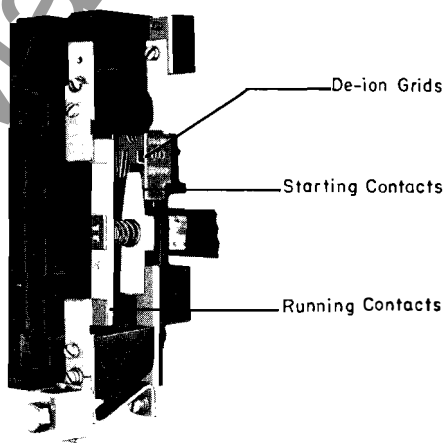


Years of successful trouble-free operation have been engineered into the unique mechanism which governs the starting sequence and opens the contacts in event of overload or undervoltage conditions. This mechanism requires that the starter handle be placed in the "start" position prior to being placed in the "run" position and also that the transfer from "start" to "run" be made quickly to avoid a serious second inrush. The acceleration period is dependent only on the judgment of the operator to account for possible changing motor and load conditions and is limited only by the duty cycle of the auto-transformer. On long accelerations the operator must be cautioned not to relax his pressure on the handle. He must maintain sufficient contact pressure to avoid burning or pitting of the contacts. A notch position is provided to indicate the maximum hand relaxation allowed to maintain sufficient contact pressure on the start contacts. If the handle is released at any time in the starting sequence, it will return to the "off" position. The heart of the mechanism is a ferrous casting gravity latch which will not become distorted. Low friction needle bearings are used to assure lasting protection and positive operation. The starter is held in the "run" position by a solenoid operated latch which uses an encapsulated coil to eliminate the common causes of coil failure.

3 Overload Relays

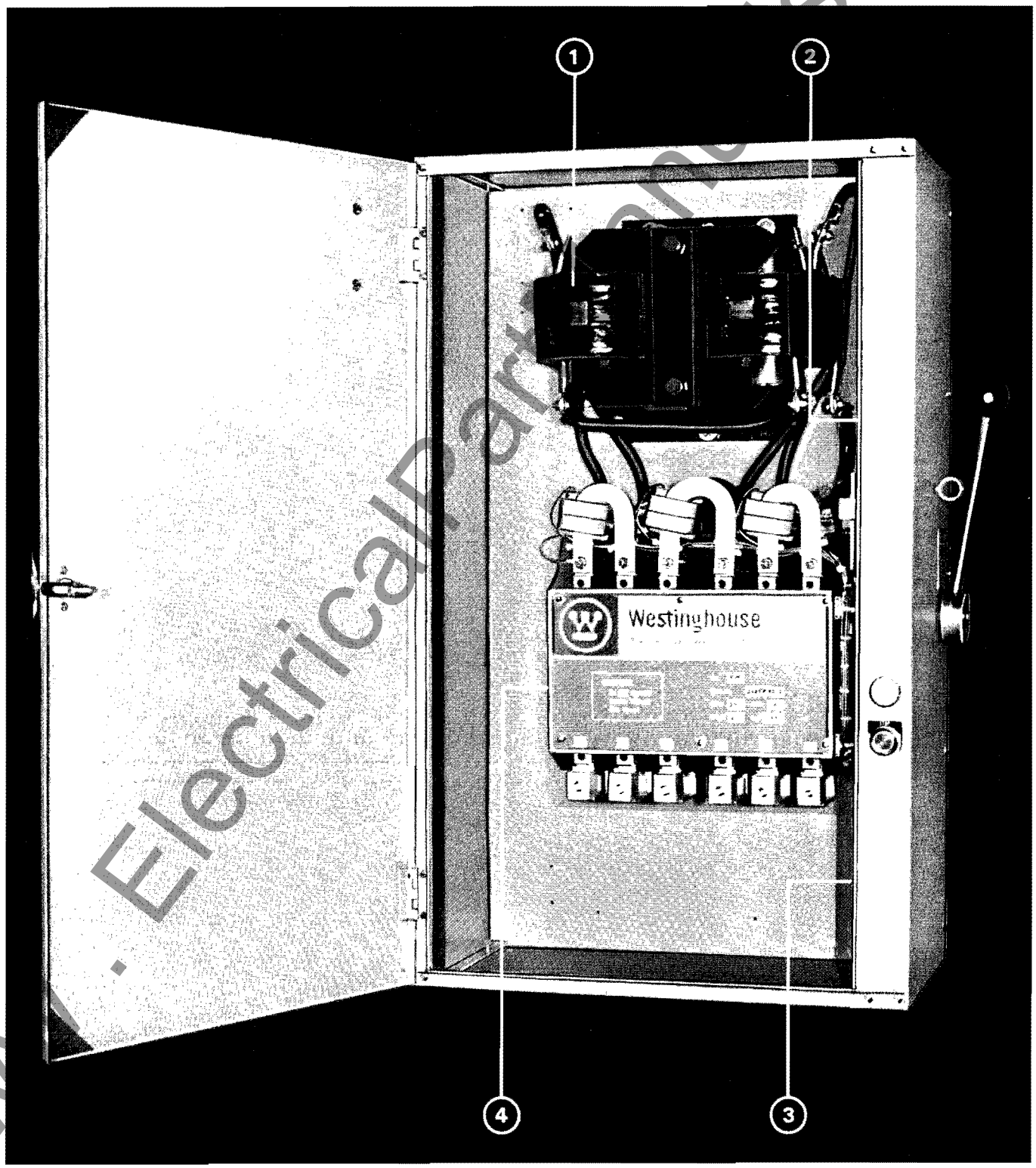
The automatic reset, thermal overload relays use a bi-metallic principle which assures accurate and dependable snap action of relay contacts. Heater elements are easily changed in the field to suit any motor within the horsepower rating of the starter. Overloads in sizes 2 through 4 carry full motor current, eliminating the need for current transformers. Sizes 5 to 5MM use current transformers. The overload relays are not in the circuit during the starting sequence.

4 Air Break Contacts



The entire line of type JF autostarters, through size 5MM, employ air break contacts. With these new double break silver alloy contacts, the high interrupting capacity in air eliminates the need for oil immersion even in the largest size. For additional interrupting capacity and longer contact life, the size 4, 5, 5M, and 5MM have de-ion arc quenchers on the start and run contacts. This is the same principle used successfully for years on the Westinghouse magnetic a-c Life-Line contactor.

Both moving and stationary contacts are easily removable from the front for servicing. Long contact life is assured by the use of a silver alloy material whose oxide has the same current carrying capacity as the original material.



Modifications
To meet special requirements or operating conditions, the modifications described below are available for all starter sizes.

Time Delay Undervoltage Protection: In cases of voltage failure or low voltage, the starter automatically returns to the off position. On applications where wide voltage fluctuations prevail and it is undesirable to have motor stoppages due to momentary dips, adjustable time delay under voltage protection can be provided an as optional feature on all sizes. The time delay can be adjusted for instantaneous release.

Electrical Interlock: One type L-60 electrical interlock may be added to the starter for operating external circuits which operate in conjunction with the starter. The interlock is easily converted from normally open to normally closed by the simple movement of a cam. The interlock will operate in the "run" position.

Emergency Pushbutton: Emergency stop pushbutton may be located remote from the starter.

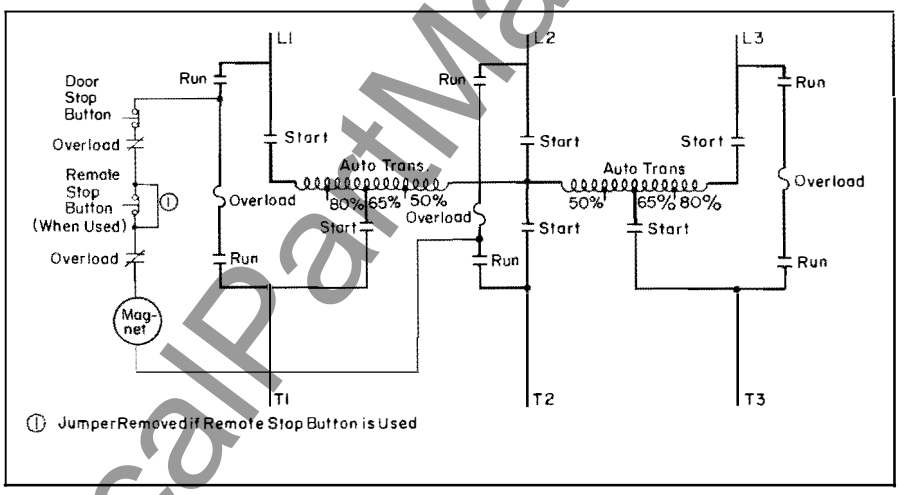
Ammeter: An ammeter mounted in the cover and the necessary current transformer will be provided where application requirements make this a desirable feature.

Control Transformer: Transformer provides 120 volt control power.

Operation
Start: Pulling the handle forward starts and accelerates the motor by connecting the auto-transformer to the line and the motor to its reduced voltage taps. If released, the handle will return to the "off" position, disconnecting the motor.

Run: Pushing the handle back breaks the starting connections, then makes across-the-line running connections and inserts the overload and low voltage protection in the circuit.

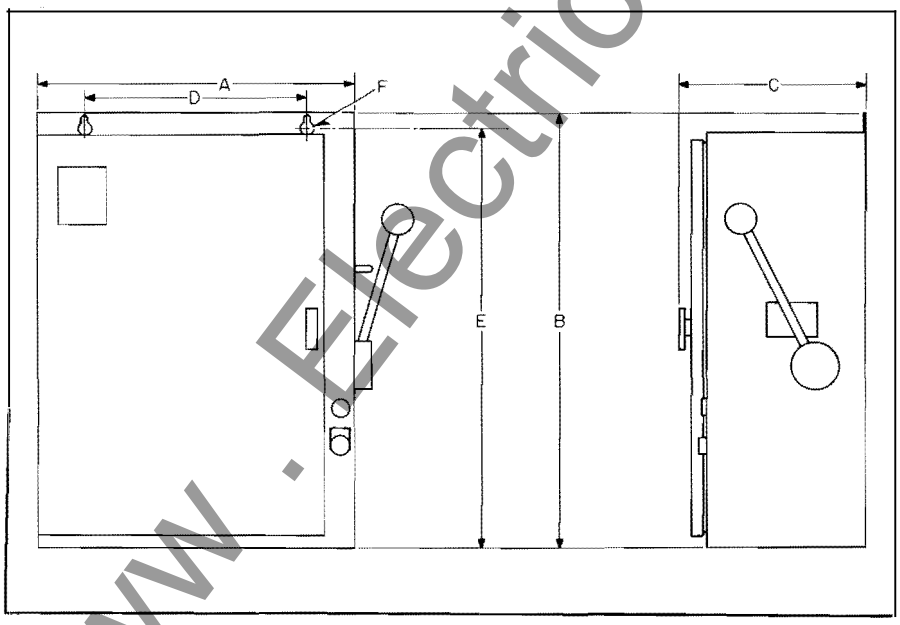
Stop: The motor is stopped by depressing the stop button on the front of the enclosure. The handle will return to the "off" position automatically. A remote stop button may also be used where required.



Special Enclosures:
NEMA 4 watertight or NEMA 12 enclosures are available where environmental conditions require this added protection. For mild dust conditions, a neoprene gasket can be added to the door of the standard NEMA 1 general purpose enclosure.

Further Information
See Price List 9120

Dimensions in Inches
For reference only



Size	NEMA 1 Enclosure						
	A	B	C	D	E	F Diam.	Approx. Wt., Lbs.
2	18	29¼	11 1/16	14	28	⅜	115
3	18	29¼	11 1/16	14	28	⅜	165
4	24	43¼	13 1/16	20	42	9/16	325
5	24	43¼	13 1/16	20	42	9/16	375
5M	24	43¼	13 1/16	20	42	9/16	450
5MM	28	64①	21	..	..	..	800

① 64 inch enclosure is floor mounted.

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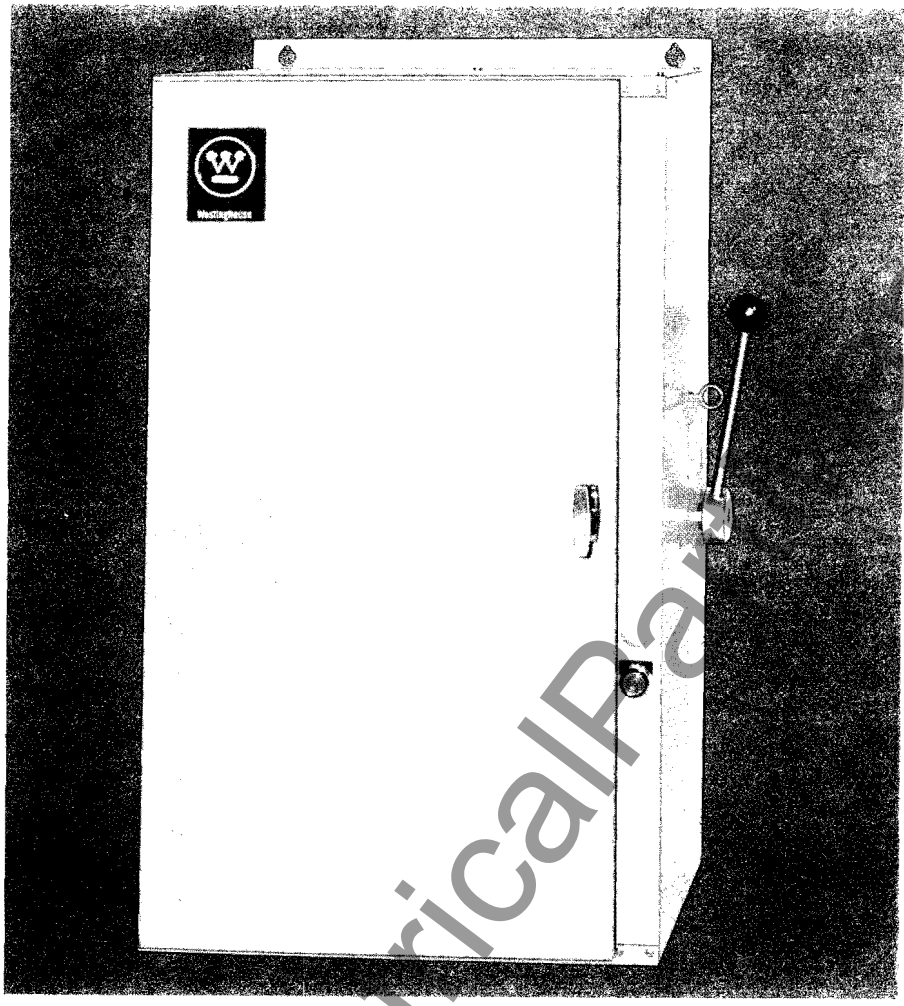

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Features — Benefits

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Longer Contact Life: All sizes of starters employ double air-break silver alloy contacts which reduce pitting, burning and sticking to a minimum. The larger sizes employ de-ion arc quenchers where additional interrupting capacity is required.

Overload Safety Assured: Automatic reset overload protection is provided by three bi-metallic actuated overload relays which are specifically designed to retain their precise setting after years of operation.

Low Voltage Protection: Starter automatically returns to the "off" position in the event of low voltage or voltage failure providing protection for motor, machine and operator.

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Adequate space is provided for running wiring from any entrance point to the bottom of the enclosure where rigid, solderless type, pressure connectors hold the leads without binding. This speeds installation and provides a positive low resistance connection for either solid or stranded conductor in a range of sizes to cover the full range of the starter. A lifting eye is also provided in the larger sizes for easier handling and installation.

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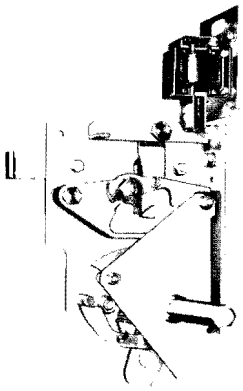

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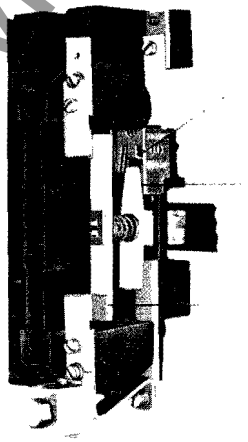

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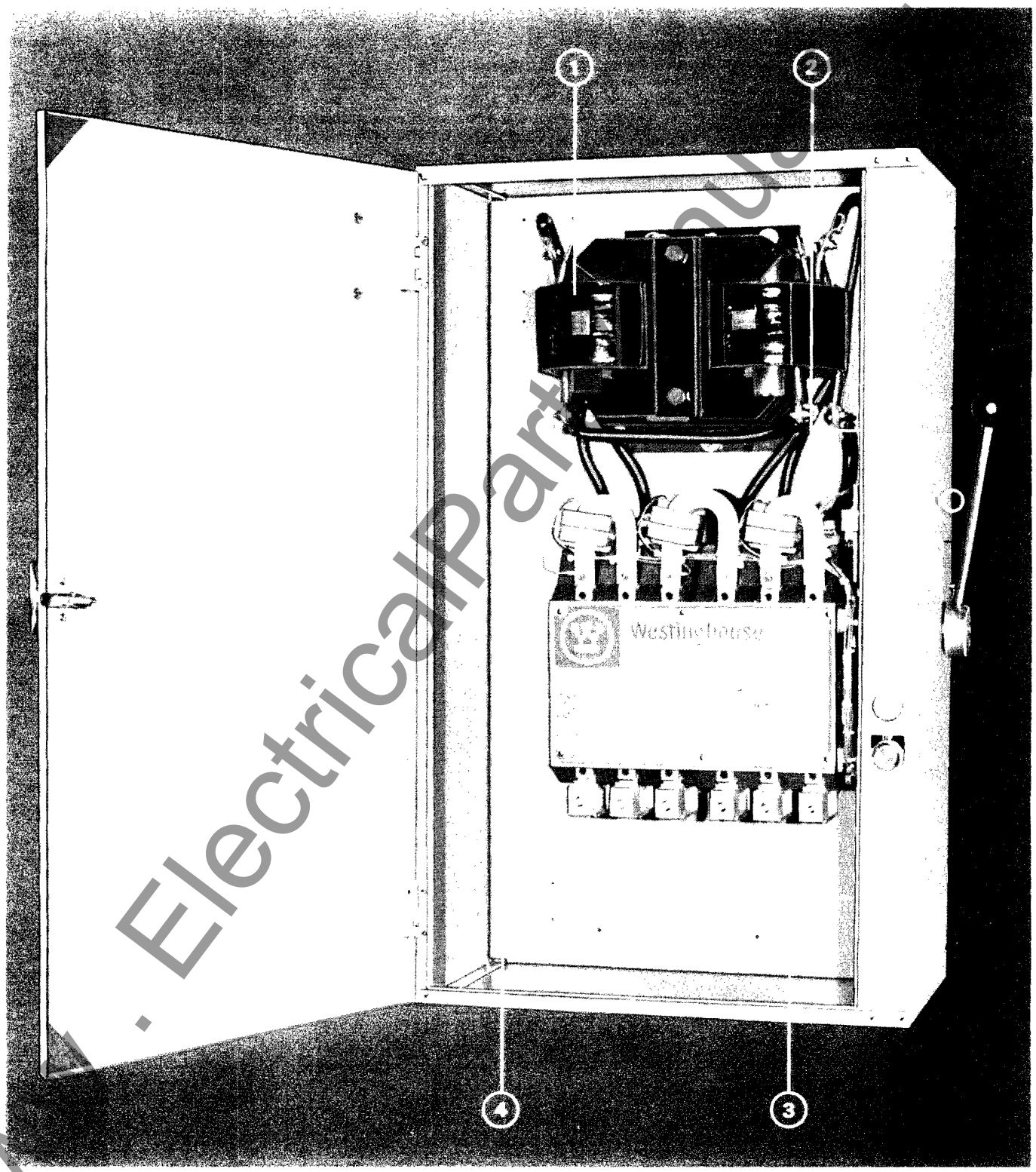

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Run: Pushing the handle back breaks the starting connections, then makes across-the-line running connections and inserts the overload and low voltage protection in the circuit.

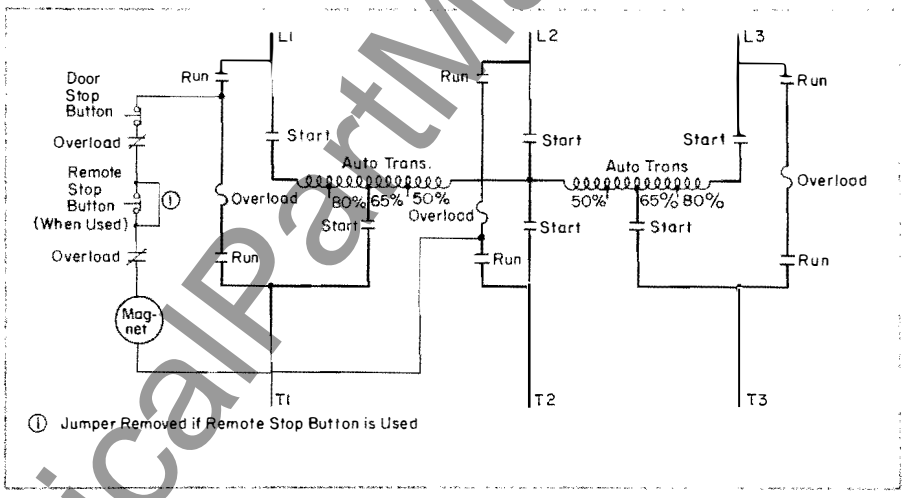
Stop: The motor is stopped by depressing the stop button on the front of the enclosure. The handle will return to the "off" position automatically. A remote stop button may also be used where required.

Special Enclosures:

NEMA 4 watertight or NEMA 12 enclosures are available where environmental conditions require this added protection. For mild dust conditions, a neoprene gasket can be added to the door of the standard NEMA 1 general purpose enclosure.

Further Information

See Price List 9120



① Jumper Removed if Remote Stop Button is Used

Dimensions in Inches

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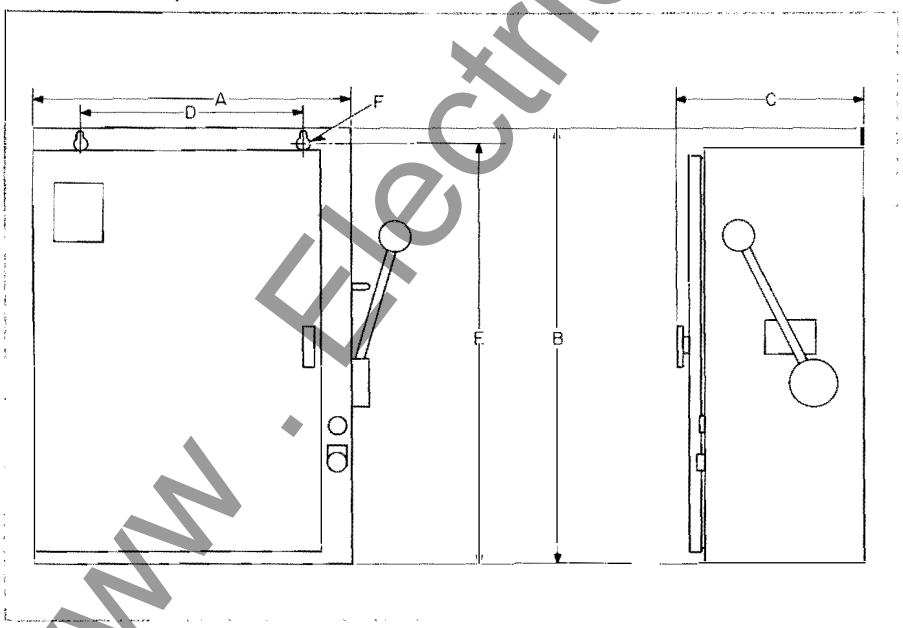

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5M	24	43¼	13⅛	20	42	⅜	450
5MM	28	64①	21	..	..	..	800

① 64 inch enclosure is floor mounted.

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