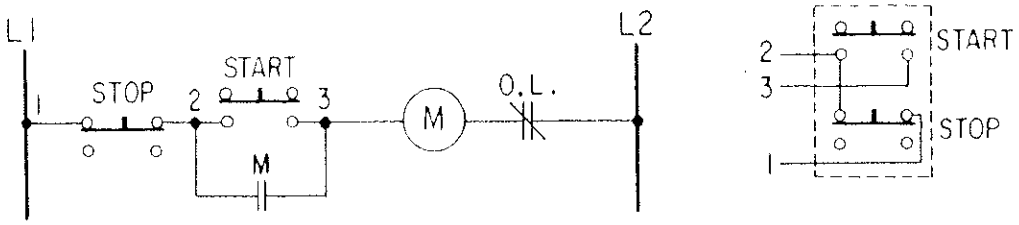
Start-Stop Control Wiring Diagrams

PUSH BUTTON STATIONS

SINGLE STATION — BASIC CIRCUIT



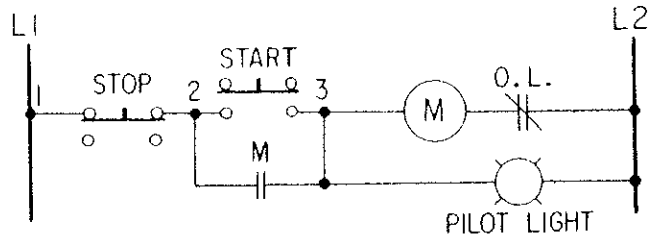
Type of Station	Catalog Number
Standard Duty	800S-2SA
Heavy Duty	800H-2HA
Oiltight	800T-2TA

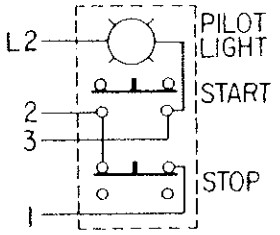
Operation — Pushing the start button energizes coil M; hold-in contacts M close, and maintain the circuit after the start button is released. Pushing the stop button breaks the circuit, de-energizing coil M; contacts M return to their normally open position.

Overload Protection — Operation of the overload relay contacts breaks the circuit, thus opens contacts M. To restart the motor the overloads must be reset and the start button must again be depressed.

Undervoltage Protection — If a power failure de-energizes the circuit, hold-in contacts M open. This protects against the motor starting automatically after the power returns. Unless otherwise stated, circuits to follow incorporate Undervoltage Protection.

SINGLE STATION — WITH MOTOR RUNNING PILOT LIGHT

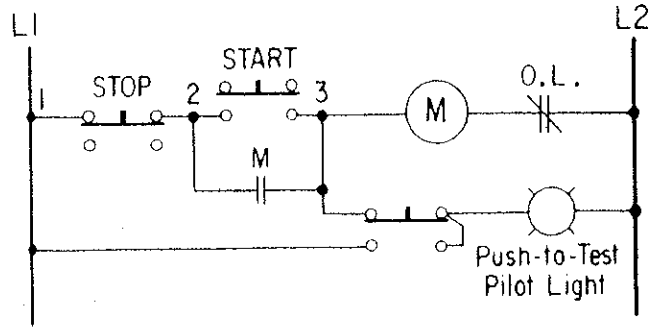


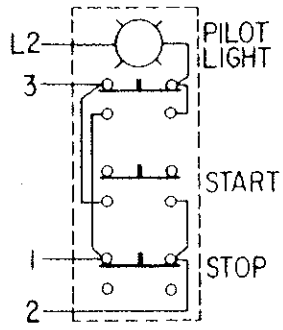


Type of Station	Catalog Number
Standard Duty	
120 or 240 V	800S-2SAP
Heavy Duty	
120 V	800H-2HAR
240 V	800H-2HAP
480 V, 60 Hz.	800H-2HAY
600 V, 60 Hz.	800H-2HAV
Oiltight	
120 V	800T-2TAR
240 V	800T-2TAP
480 V	800T-2TAY
600 V	800T-2TAV

Whenever the motor is running, the pilot light is lit. Except for this modification, the circuit and its operation is the same as the basic single station.

SINGLE STATION — WITH MOTOR RUNNING PUSH-TO-TEST PILOT LIGHT



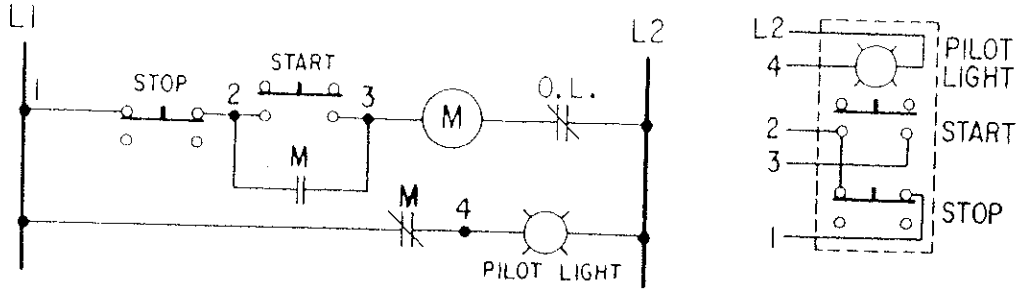


Type of Station	Catalog Number
Oiltight	
120 V, 60 Hz.	800T-3TW10
240 V, 60 Hz.	800T-3TW11
480 V, 60 Hz.	800T-3TW12
600 V, 60 Hz.	800T-3TW13

This circuit includes a running push-to-test pilot light which is wired to an independent test circuit. The bulb may be tested for burn-out easily and quickly — by simply depressing the lens.

Start-Stop Control Wiring Diagrams

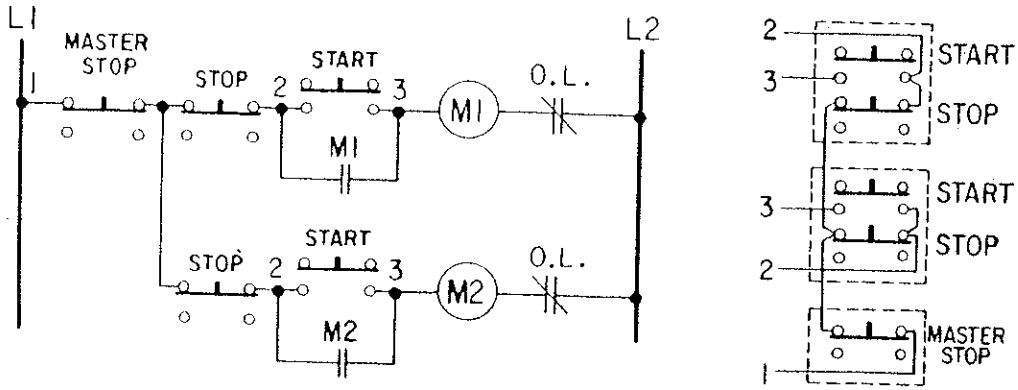
SINGLE STATION —WITH MOTOR STOPPED PILOT LIGHT



Normally closed auxiliary contacts such as the Bulletin 1495 are required. With the motor running, these contacts are open; with the motor stopped, they are closed and the pilot light is lit. Except for this modification, the circuit and its operation is the same as the basic circuit on Page 4.

Type of Station	Catalog Number
Standard Duty	
120 or 240 V	800S-2SAP
Heavy Duty	
120 V	800H-2HAR
240 V	800H-2HAP
480 V, 60 Hz.	800H-2HAY
600 V, 60 Hz.	800H-2HAV
Oiltight	
120 V	800T-2TAR
240 V	800T-2TAP
480 V	800T-2TAY
600 V	800T-2TAV

GROUP OF SINGLE STATIONS — WITH MASTER STOP BUTTON



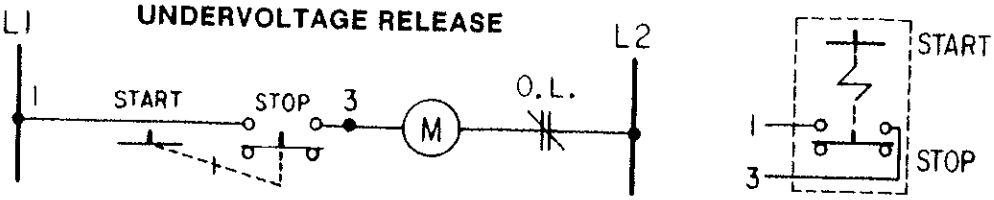
A momentary contact master stop is connected in series with a group of parallel connected circuits. Depressing the button de-energizes all of the circuits.

The circuits above are the basic start-stop circuit shown on Page 4; they could just as well be any of the preceding or following circuits which provide under-voltage protection. Two wire control or undervoltage release circuits are not applicable because they would be re-energized as soon as the master stop button is released.

Type of Station	Catalog Number
Standard Duty	800S-1SA* 800S-2SA
Heavy Duty	800H-1HAG* 800H-2HA
Oiltight	800T-1TAG* 800T-2TA

*Master

SINGLE STATION — MAINTAINED CONTACT BUTTONS



The start button mechanically maintains the contacts that take the place of hold-in contacts. Depressing the start button maintains the circuit; depressing the stop button breaks the circuit by opening the start contacts.

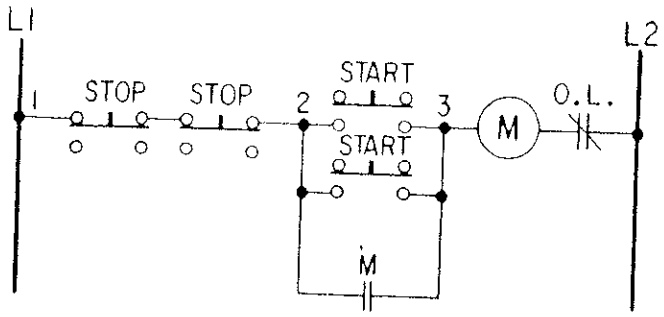
If the contactor is de-energized by a power failure or overload operation, the start contacts are unaffected. The motor restarts automatically.

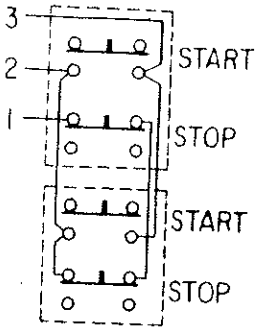
Type of Station	Catalog Number
Standard Duty	800S-2SBM
Heavy Duty	800H-2HAM
Oiltight	800T-2TAM

Start-Stop Control Wiring Diagrams

PUSH BUTTON STATIONS

MULTI-STATION — WITH MOMENTARY CONTACT PUSH BUTTONS

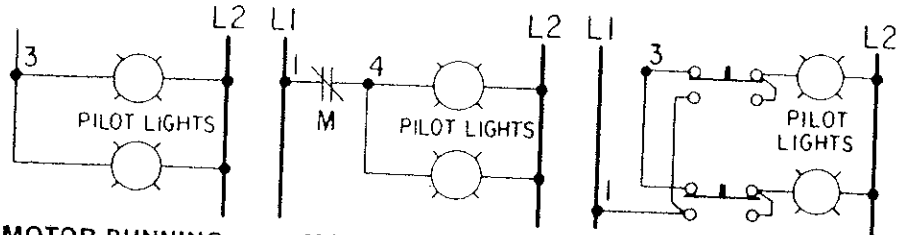




Type of Station	Catalog Number
Standard Duty	800S-2SA
Heavy Duty	800H-2HA
Oiltight	800T-2TA

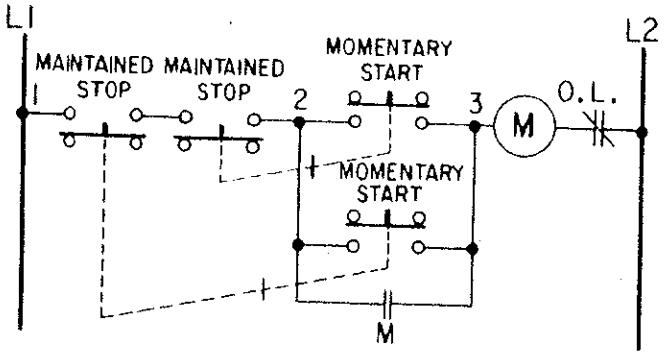
Operation — The motor may be started or stopped from a number of separate stations by connecting the start buttons in parallel and the stop buttons in series. Operation of each station is the same as with the basic circuit on Page 4.

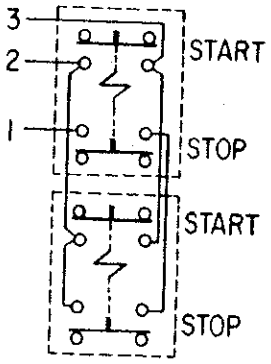
Pilot Lights — It is possible to add motor running, stopped, or push-to-test pilot lights to any or all stations by connecting the lights to the circuit as shown below. Catalog numbers of the required push button stations are listed in the appropriate pilot light circuits on Pages 4 and 5.



MOTOR RUNNING — MOTOR STOPPED — PUSH-TO TEST, RUNNING

MULTI-STATION — WITH MOMENTARY START-MAINTAINED STOP PUSH BUTTONS



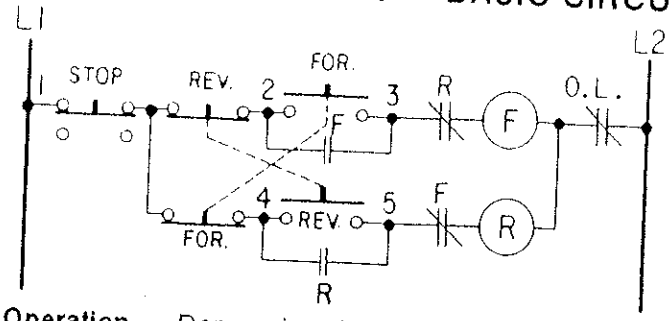


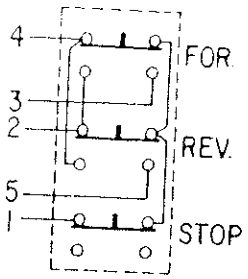
Type of Station	Catalog Number
Heavy Duty	800H-2HW10
Oiltight	800T-2TW11

This circuit is identical to the one above; the stop buttons, however, have maintained contacts which are closed mechanically, by pressing the corresponding start button. This circuit is designed to permit stopping the motor from either station — but starting the motor only from the station at which it was stopped.

The start buttons are momentary contact; hold-in contacts-M provide undervoltage protection as with the preceding circuits.

REVERSING STATION — BASIC CIRCUIT



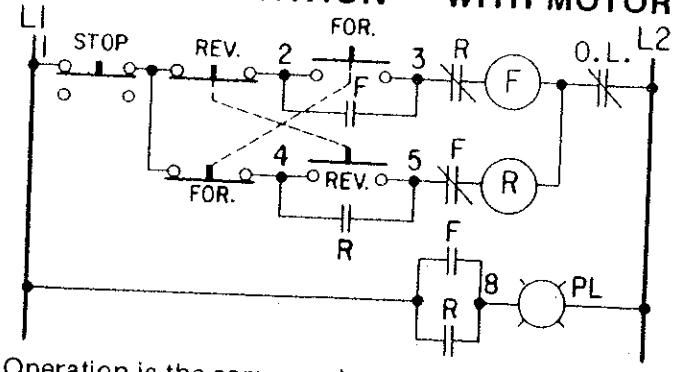


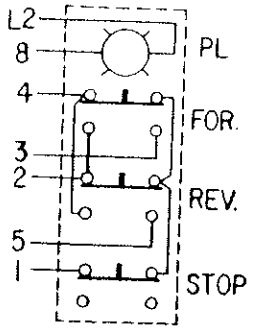
Type of Station	Catalog Number
Standard Duty	800S-3SA
Heavy Duty	800H-3HA
Oiltight	800T-3TA

Operation — Depressing the forward button begins the following sequence: 1. Coil F is energized. 2. N.O. contacts F close to hold in the forward contactor; N.C. interlock contacts F open to prevent against the reverse contactor being energized.

Changing the Direction of Rotation — Thru the use of the N.C. contacts in the forward and reverse push button units, it is unnecessary to depress the stop button before changing the direction of rotation. Depressing the reverse button while running forward 1. de-energizes the forward control circuit, and 2. energizes and holds in the reverse contactor in a manner similar to the forward operation outlined above. This results in "plug-reversing", that is, the motor acts as a brake until rotation stops, then the motor immediately starts turning in the opposite direction.

REVERSING STATION — WITH MOTOR RUNNING PILOT LIGHT

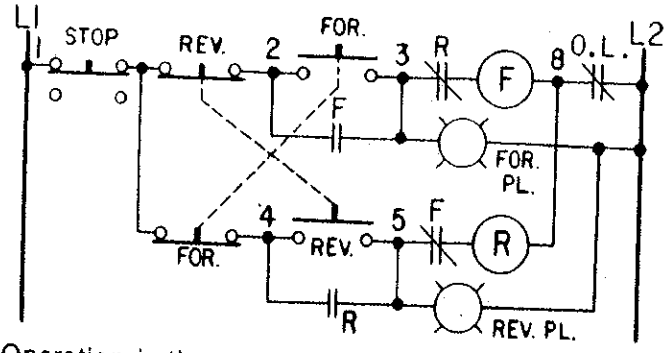


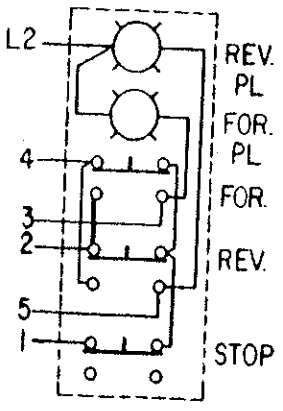


Type of Station	Catalog Number
Heavy Duty	
120 V	800H-4HW8
240 V	800H-4HW9
480 V, 60 Hz.	800H-4HW10
600 V, 60 Hz.	800H-4HW11
Oiltight	
120/110 V	800T-4TW9
240/220 V	800T-4TW10
480 V, 60 Hz.	800T-4TW11
600 V, 60 Hz.	800T-4TW12

Operation is the same as above, except that a pilot light is lit when the motor is running in either direction. Each contactor requires an additional N.O. contact.

REVERSING STATION — WITH DIRECTION INDICATING PILOT LIGHTS





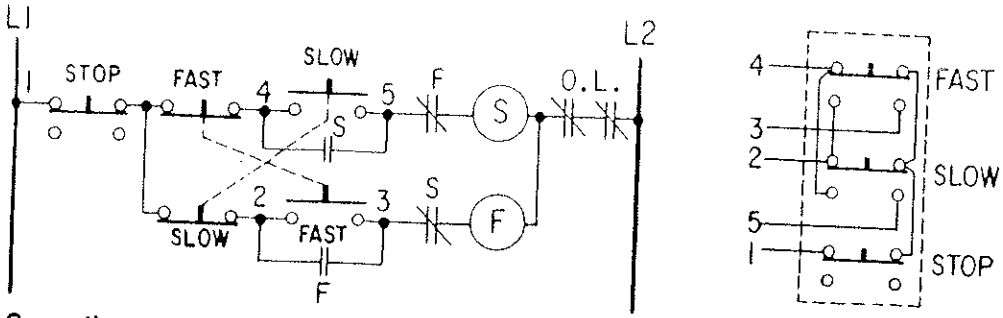
Type of Station	Catalog Number
Heavy Duty	
120 V	800H-3HA2R
240 V	800H-3HA2P
480 V, 60 Hz.	800H-3HA2Y
600 V, 60 Hz.	800H-3HA2V
Oiltight	
120 V	800T-3TA2R
240 V	800T-3TA2P
480 V	800T-3TA2Y
600 V	800T-3TA2V

Operation is the same as with the basic circuit, except that separate lights indicate in which direction the motor is running.

Two-Speed Control Wiring Diagrams

PUSH BUTTON STATIONS

TWO-SPEED STATION — BASIC CIRCUIT

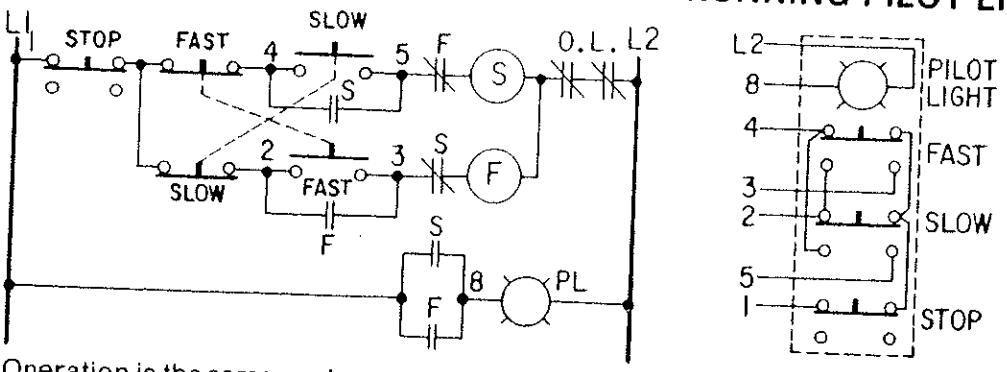


Operation — Depressing the slow button begins the following sequence: 1. Coil S is energized. 2. N.O. contacts S close to hold in the slow contactor; N.C. interlock contacts S open to prevent against the fast contactor being energized.

Changing Speeds — Thru the use of the N.C. contacts in the slow and fast push button units, it is unnecessary to depress the stop button before changing speeds. Depressing the slow button while running fast 1. de-energizes the fast control circuit, and 2. energizes and holds in the slow contactor as outlined above.

Type of Station	Catalog Number
Standard Duty	
120 V	800S-3SF
Heavy Duty	
120 V	800H-3HF
Oiltight	
120 V	800T-3TF

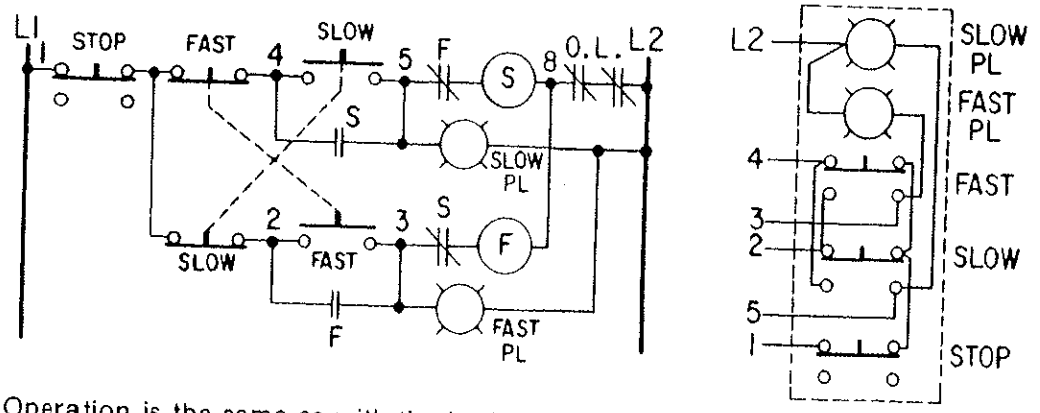
TWO-SPEED STATION — WITH MOTOR RUNNING PILOT LIGHT



Operation is the same as above, except that a pilot light is lit when the motor is running at either speed. Each contactor requires an additional N.O. contact.

Type of Station	Catalog Number
Heavy Duty	
120 V	800H-4HW12
240 V	800H-4HW13
480 V, 60 Hz.	800H-4HW14
600 V, 60 Hz.	800H-4HW15
Oiltight	
120/110 V	800T-4TW13
240/220 V	800T-4TW14
480 V, 60 Hz.	800T-4TW15
600 V, 60 Hz.	800T-4TW16

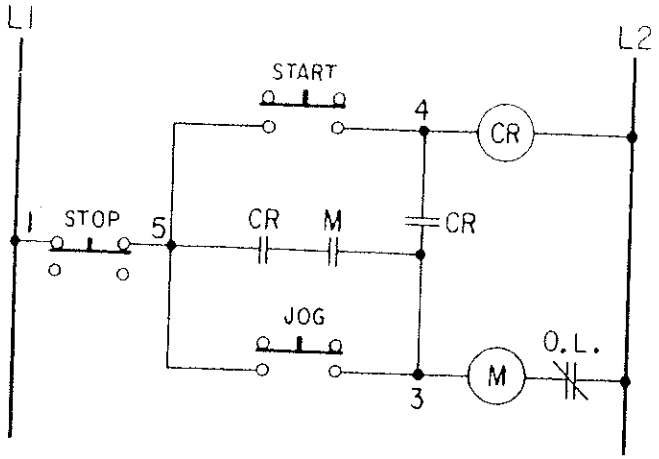
TWO-SPEED STATION — WITH SPEED INDICATING PILOT LIGHTS

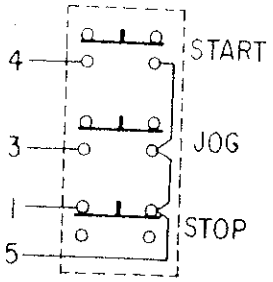


Operation is the same as with the basic circuit, except that separate lights indicate the motor speed.

Type of Station	Catalog Number
Heavy Duty	
120 V	800H-3HF2R
240 V	800H-3HF2P
480 V, 60 Hz.	800H-3HF2Y
600 V, 60 Hz.	800H-3HF2V
Oiltight	
120 V	800T-3TF2R
240 V	800T-3TF2P
480 V	800T-3TF2Y
600 V	800T-3TF2V

SEPARATE START, STOP & JOG — WITH STANDARD PUSH BUTTONS AND A JOG RELAY





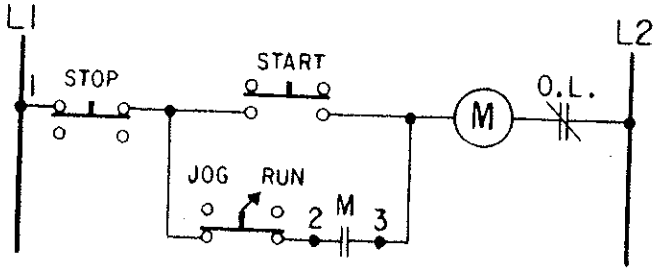
Type of Station	Catalog Number
Heavy Duty Oiltight	800H-3HG 800T-3TG

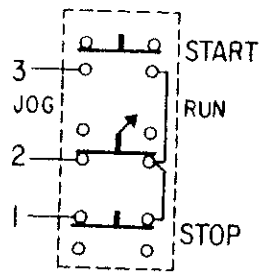
OPERATION

Depressing Start begins the following sequence: 1. coil CR is energized; 2. contacts CR close; 3. coil M is energized; 4. contacts M close to hold in the contactor.

Depressing Jog energizes coil M, but normally open contacts CR prevent against the contactor holding in; the motor will run only as long as the operator holds in the jog button.

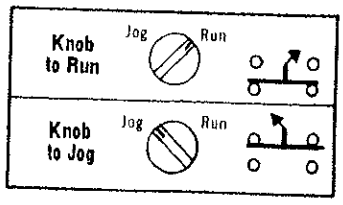
COMBINED START, JOG, SEPARATE STOP — WITH SELECTOR SWITCH





Type of Station	Catalog Number
Heavy Duty Oiltight	800H-3HW14 800T-3TW15

SELECTOR SWITCH OPERATION



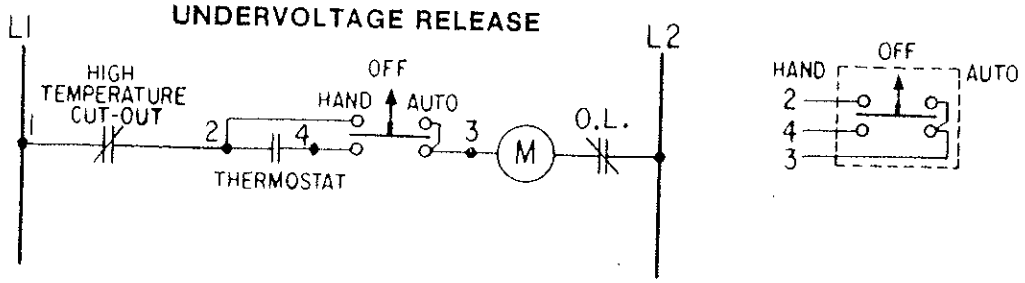
CIRCUIT OPERATION

Selector Switch to Run: Operation is the same as with the basic circuit on Page 4.

Selector Switch to Jog: Hold-in contacts M are out of the circuit; pressing the momentary contact start button jogs the motor.

Miscellaneous Wiring Diagrams

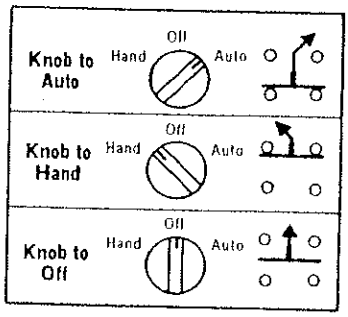
THERMOSTAT CONTROLLED MOTOR — WITH SELECTOR SWITCH



Type of Station	Catalog Number
Standard Duty	800S-R3SX
Heavy Duty	800H-R6HA
Oiltight	800T-R3TA

CIRCUIT OPERATION

SELECTOR SWITCH OPERATION

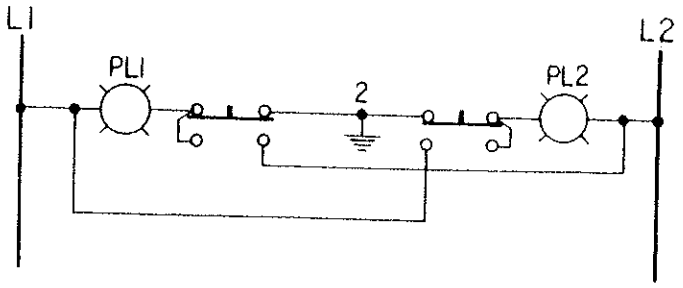


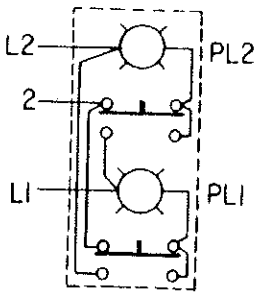
Selector Switch to Auto: When the temperature is below a preset value, the thermostat contacts are closed and contactor M is held in. Above this temperature, the contacts automatically open the circuit. A high temperature cut-out is included to open the circuit if the thermostat contacts should fail to open.

Selector Switch to Hand: The thermostat is by-passed to permit testing of the circuit or emergency operation of the motor. The high temperature cut-out should be set to operate in the event of dangerous temperatures.

Selector Switch to Off: The circuit is open.

GROUND DETECTION — WITH PUSH-TO-TEST PILOT LIGHTS





Type of Station	Catalog Number
Oiltight	
120 V, 60 Hz.	800T-2TW18
240 V, 60 Hz.	800T-2TW19
480 V, 60 Hz.	800T-2TW20
600 V, 60 Hz.	800T-2TW21

Operation — This circuit is used to detect a ground fault in ungrounded control circuits. Under normal conditions, the lights are series connected and will burn dim. When a ground fault on L1 occurs, PL1 is short circuited and PL2 is directly across the line; PL1 is out and PL2 burns brightly. Similarly, when a ground fault on L2 occurs, PL2 is out and PL1 burns brightly.

Push-to-Test Pilot Lights — Because the lights are series connected, neither will light if one of them is burned out. The push-to-test feature makes it possible to quickly identify the defective bulb by simply depressing the lens, connecting the bulb directly across L1 and L2.