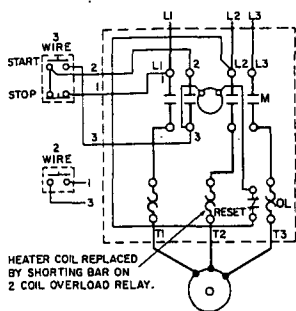
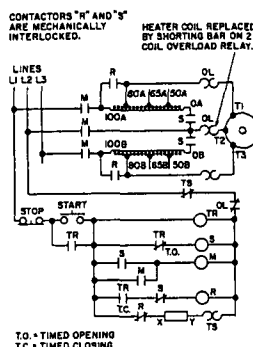


WIRING DIAGRAMS

A symbolic representation of operation and function of control devices.

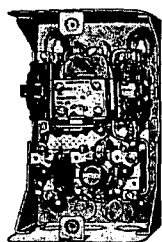


Panel Diagram—wiring, panel and pilot device layout—actual position of devices—power line bold and control lines light—circuit symbols show basic construction details.

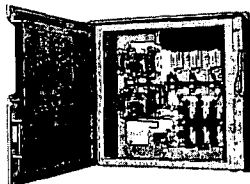


Line Diagram—connection representation but not wiring configuration—sequence and function of devices but not location—power lines bold and control lines light—symbols do not represent physical construction of device.

NON-REVERSING AND REVERSING



Non-reversing—single contactor and overload relay for each speed—single direction.



Reversing—two contactors and one overload relay for each speed—reversals of direction by internal connection of line leads to contactors—contactors electrically and mechanically interlocked to prevent line shorts and energization of both contactor coils simultaneously.

JOGGING, INCHING, PLUGGING SERVICE

Jogging or inching—momentary operation of driven machine for small movement or positioning—requires non-maintained operator and electrical control circuit—control subject to motor inrush current on each jog or inch cycle—contactor derated where service requirement demands more than 5 cycles per minute.

Plugging—plugging stop or plugging reverse—reverse power supplied to motor—motor generates braking—contactors subjected to motor inrush during plugging—requires reversing contactors—contactor derated for plugging service.

REDUCED VOLTAGE AND FULL VOLTAGE

Most applications suitable for full voltage starting—full motor inrush current during starting—maximum acceleration—simplest control construction—lowest control cost—easy maintenance—motor connected directly to power supply.

Restrictions in power supply capacity or machine design may require reduced voltage starting—motor connected to power supply at voltage lower than supply voltage—requires use of primary resistance, reactance or use of auto-transformer—special motor designs such as part winding and wye-delta considered as reduced voltage starting.

ACCESSORIES, MASTER OR PILOT SWITCHES

Primarily used with magnetic control—directs function of starter or controller—provide non-automatic, semi-automatic or automatic operating function—local or remote connection to control—device may be personally operated or respond to specified pre-determined conditions—usually enclosed—ampere rated—cover pushbuttons, limit, foot and float switches, brakes, pressure and temperature switches, relays and timers.

SENSING OR SIGNALING DEVICES

Direct magnetic control functions—differ from master or pilot devices as they monitor and compare specific circuit conditions and respond in predetermined selected manner—may require original initiation from a master switch—provide for automatic control—devices such as resistor and transistor sensitive relays, proximity limit switches etc.

REMOTE AND LOCAL CONTROL

Local Control—Controlling or sensing device, master switch or pilot device initiating operation located in same enclosure as directed electric controller.

Remote Control—controlling devices located at some other point than directed electric controller—may have more than one operating point with control devices connected in parallel or in series depending on operating sequence required.

TWO AND THREE WIRE CONTROL

Two Wire—automatic restarting—maintained contact master switch—(example, selector switch)—low voltage release (LVR)—two wires from pilot device or master switch to controller—disconnects motor from power supply on power failure—automatically restarts motor on resumption of power—operation from only one location unless latched relaying used.

Three Wire—non-automatic restarting—momentary contact master switch (example, start-stop pushbuttons)—low voltage protection (LVP)—three wires from pilot device or master switch to controller—disconnects motor from power supply on power failure—control remains disconnected when power restored—to maintain operation in running condition control requires auxiliary contact (also called holding circuit interlock)—requires personal operation by operator to initiate control operation.