



GROUP

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RDM ENGINEERING

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Operating and Installation Instructions

MODELS PM SERIES

(Production and Safety Applications)

175 PM	For Motors	0-1.75hp	(- 1.3kw)
550 PM	For Motors	1.75-5.5hp	(4kw)
1000PM	For Motors	5.5hp-10hp	(7.5kw)
1500PM	For Motors	10hp-15hp	(11kw)
2000PM	For Motors	15hp-20hp	(15kw)
3000PM	For Motors	20hp-30hp	(22kw)

Larger models see separate sheet.



DRIVLOC D.C. INJECTION BRAKING SYSTEMS
FOR A.C. MOTORS.

CAUTION!!

LIVE PARTS INSIDE. INSTALLATION
MUST ONLY BE CARRIED OUT BY A
QUALIFIED ELECTRICIAN.
READ THIS MANUAL FULLY BEFORE
COMMENCING WORK.

Principle of Operation

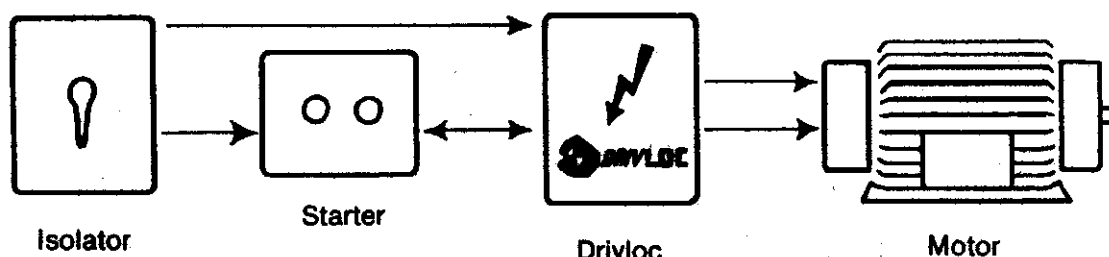
The Drivloc PM type D.C. Injection Braking Systems are designed to provide rapid reliable braking of A.C. motors. When the machine starter is de-energised, the brake unit senses the break in supply to the motor. Simultaneously, a contactor (marked 'B') activates, and supplies a precisely controlled D.C. voltage to the motor. This D.C. current creates a powerful braking force within the motor. The D.C. voltage is electronically produced by a Thyristor/Diode combination and can accurately be adjusted for duration and potential. A contactor (marked 'A') de-energises during the stop-cycle to completely isolate the motor from the starter should the start button be pressed.

Introduction and Description

The Drivloc Unit is built onto a steel back plate, fitted into an IP55 enclosure. The enclosure has fixing holes in the rear, these are exposed for fitting by removing the steel back plate.

The enclosure should be mounted in such a position that easy cable entry, via flexible or solid conduits can be made to both the isolator and starter (or control panel) of the machine. Suitable cable entries may be cut into the base of the enclosure — *with the back plate removed.*

Block Connection Schematic (PM Types).



Wiring Instructions

NOTE: To comply with H.S.E. requirements (and to prevent accidental starting of the machine) brakes should be wired in conjunction with a No Volt Release type starter.

CAUTION!! SWITCH OFF MAIN MACHINE ISOLATOR.

Direct-on-Line Motors

Disconnect the output wires from the machine starter to the motor.

Reconnect the output wires from the machine starter directly onto the terminals marked 1, 3, 5 on contactor 'A' in the Drivloc panel.

Connect from the terminals marked 2, 4, 6 on contactor 'A' in the Drivloc panel to motor (input terminal A, B, C).

Connect from the terminals marked 2, 6 on contactor 'B' in the Drivloc panel to any two motor input terminals.

Star-Delta Motors

Disconnect the output wires from the machine starter (main line) contactor to the motor (motor terminals A1, B1, C1).

Connect the output wires from the machine starter (main line) contactor directly onto the terminals marked 1, 3, 5 on contactor 'A' in the Drivloc panel.

Connect the terminals marked 2, 4, 6 on contactor 'A' in the Drivloc panel to the motor terminals A1, B1, C1.

Remove the link (where fitted) between terminals 1 and 4 on contactor 'B' in the Drivloc panel. Connect the terminals marked 4 and 6 on contactor 'B' to motor terminals A1, B1.

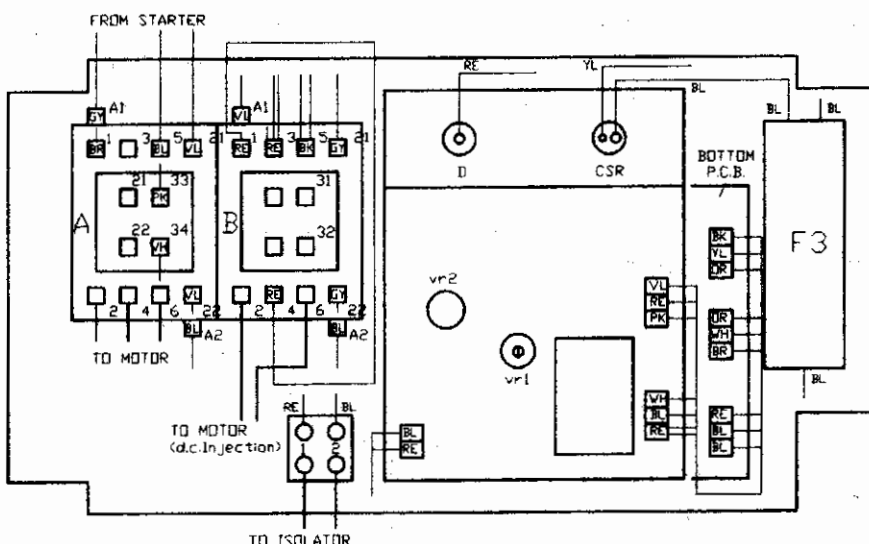
Connect from terminals marked 1 and 2 on contactor 'B' to motor terminals A2, B2. Connect spare volt free normally closed contact on Delta contactor in series with Drivloc contactor 'B' coil circuit.

NOTE: Motor terminal markings may vary. Refer to drawing.

All Motors

On three phase models connect any two phases from machine isolator directly to the terminal block marked 1, 2 in the Drivloc panel. (On single phase models connect live and neutral to these terminals 1, 2).

Connect the spare normally closed auxiliary contact on the contactor 'B' in the Drivloc panel in series with the machine starter stop circuit. (This additional connection prevents any possible damage to the machine starter should the contactor(s) fail to de-energise).



Typical Internal Layout PM Series)

WIRING COLOUR KEY

- RE - RED
- BL - BLUE
- BK - BLACK
- VL - VIOLET
- GY - GREY
- BR - BROWN
- WH - WHITE
- PK - PINK
- YL - YELLOW
- DR - ORANGE

NOTE: ALL A.C. and D.C. power cables should be suitably sized to carry full load motor current.

Setting Up and Commissioning Procedure

CAUTION!!

ALL BRAKE UNITS MUST BE SET UP IN ACCORDANCE WITH THESE PROCEDURES TO ENSURE MAXIMUM EFFICIENCY.

WARNING!!

LIVE PARTS WITHIN THE ENCLOSURE. TAKE EXTREME CARE NOT TO TOUCH ANY DISCRETE COMPONENTS OR THE THYRISTOR HEAT SINK WHEN CARRYING OUT ADJUSTMENTS WITH THE LID REMOVED.

Switch on the Main Isolator

On receipt of your Drivloc Brake Unit the D.C. voltage will be set at its lowest working value (approximately 60 volts D.C.) This voltage must be checked (and adjusted if necessary) by connecting a D.C. voltmeter or multimeter set to D.C. volts onto terminals marked 3 and 5 on contactor 'B' in the Drivloc panel. To adjust the voltage turn potentiometer VR2, this is accessed via a hole in the upper circuit board with a terminal screwdriver (clockwise to increase the voltage).

On initial switch on the D.C. sensing fail safe relay (the small relay on the lower circuit board) should have energised (a 'click' should be heard) if it did not, increase the D.C. voltage until it energises and then reduce the voltage down to 60 volts.

Once this fail safe relay has energised the unit can be checked for operation.

Press the start button on the machine starter. Contactor 'A' should energise and the machine start normally. Press the stop button on the machine starter and the brake should now activate.

Adjustments

If the braking power is insufficient then the D.C. voltage at terminals 3 and 5 on contactor 'B' should be increased **in steps of 10 volts** until adequate braking performance is achieved. The duration of injection time, adjustable by turning potentiometer VR1 on the upper circuit board, with a terminal screwdriver, must be adjusted in conjunction with the voltage adjustments to switch off the D.C. injection (contactor 'B') approximately $\frac{1}{2}$ to 1 second after the motor has come to rest.

NOTE: It may be helpful to further increase the injection time during the setting up procedure.

The D.C. injection current generally required to effectively stop a motor is around 2-3 times its full load A.C. rating.

Operating Instructions

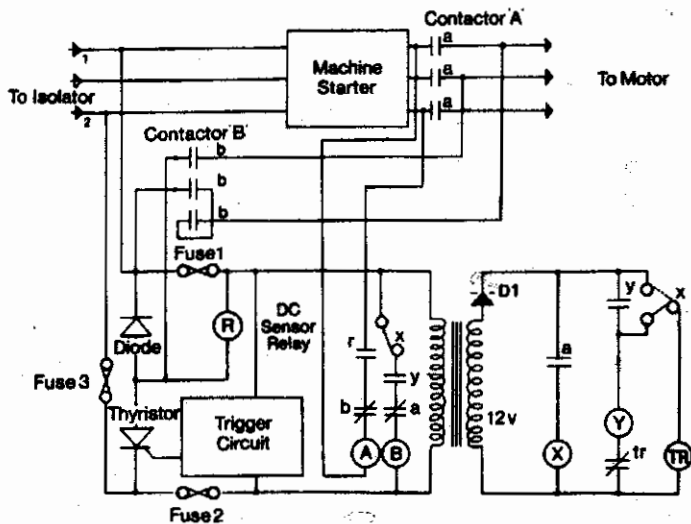
Switch on machine isolator. The machine may now be operated in the normal way. Whenever the stop button is pressed (or any trip switch connected in the machine starter stop-circuit) the brake unit will bring the machine rapidly to rest.

NOTE: The unit is fail safe, should a fault occur within the brake (or the D.C. voltage setting be too low) — the machine will not start.

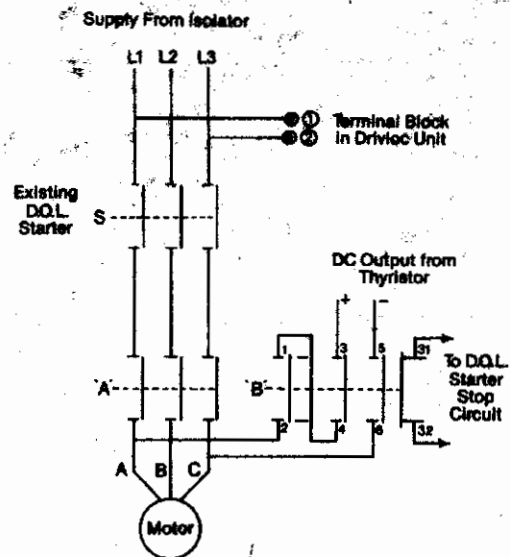
ISOLATE THE BRAKE UNIT WHEN THE MACHINE IS NOT IN USE. ALWAYS ALLOW A REASONABLE COOLING TIME BETWEEN EACH OPERATION OF THE D.C. BRAKE.

USEFUL DRAWINGS

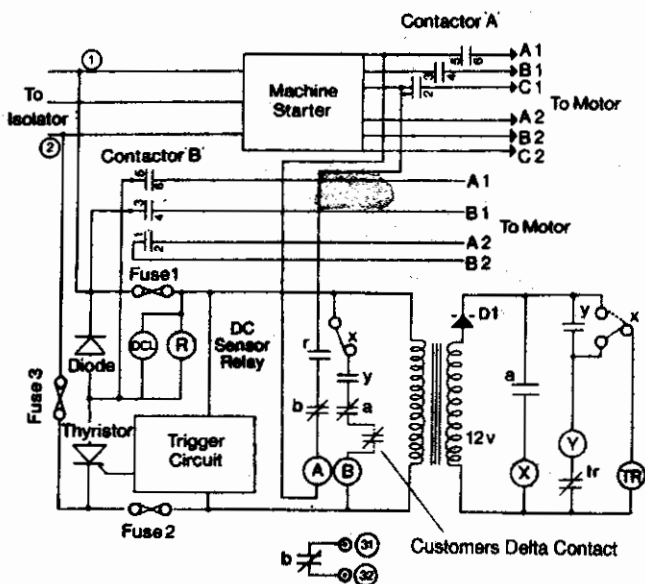
Control Circuit PM Series (D.O.L.)



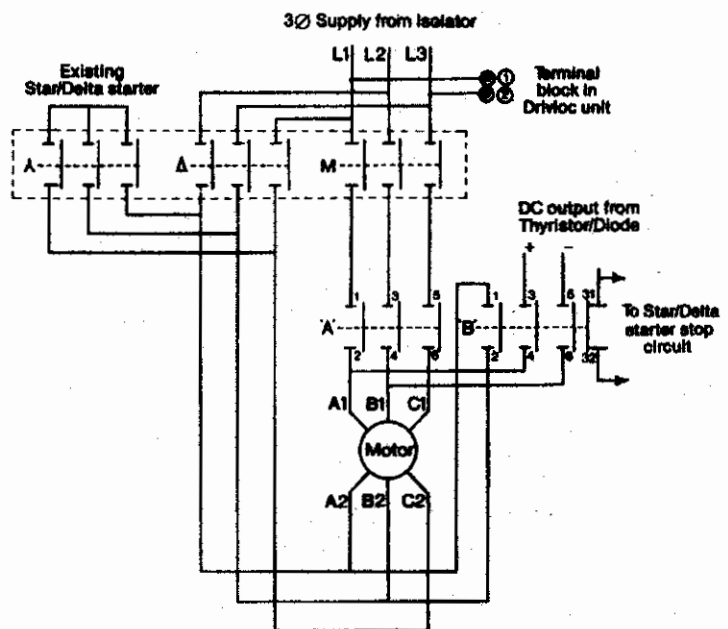
Connections PM Series (D.O.L.)



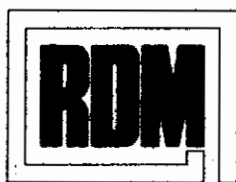
Control Circuit PM Series (Star-Delta)



Connections PM Series (Star-Delta)



Please refer to other enclosed data for information on special models.
Product as delivered may vary in detail from that shown in this leaflet.



Made in Great Britain

Product development is continuous and RDM reserve the right to make alterations in specification and manufacture without notice.

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