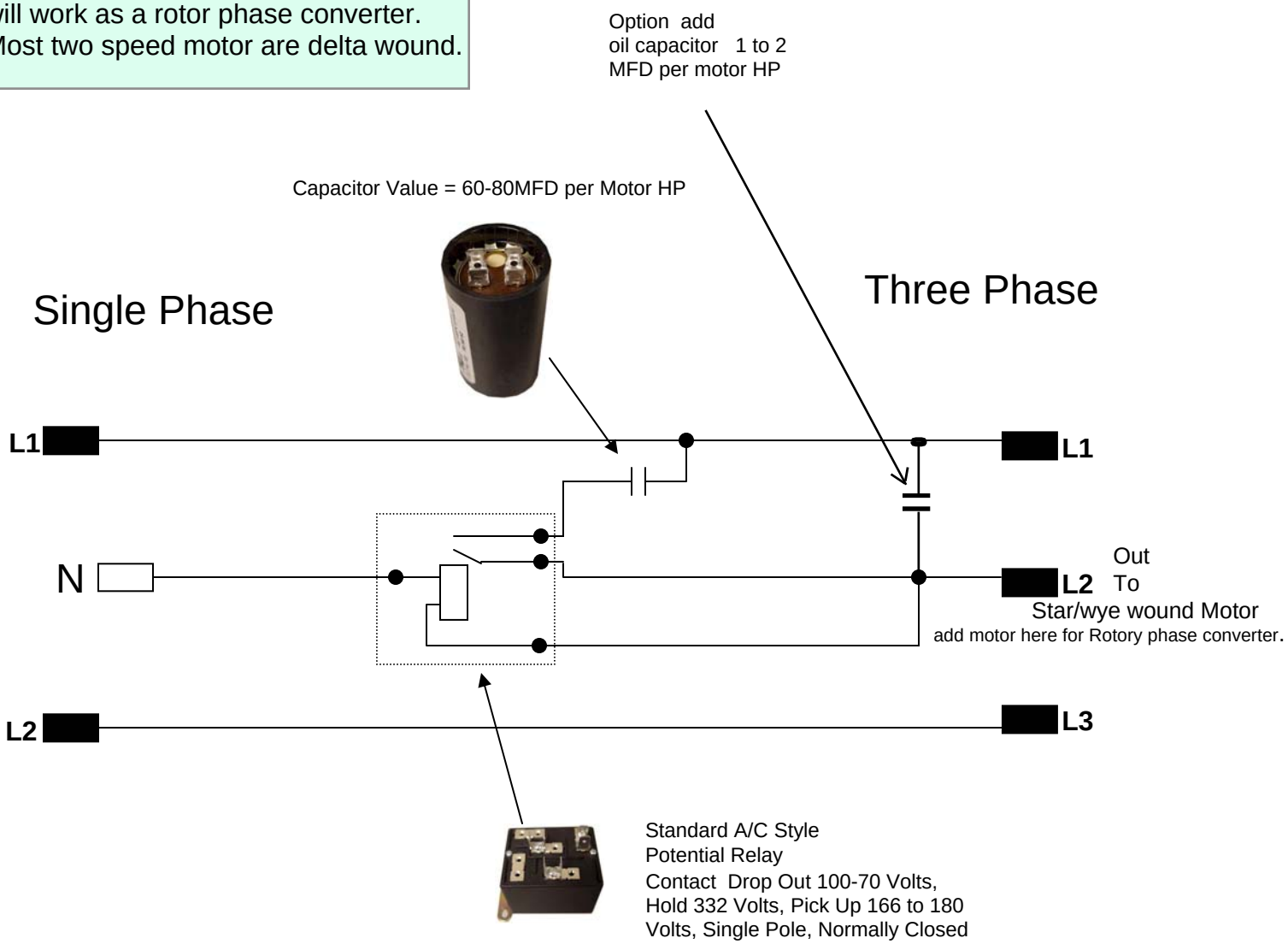
This work for star wound motors. If using a delta wound motor use a star motor of same size on L1,L2,L3. This will work as a rotor phase converter. Most two speed motor are delta wound.

For a ***rotory phase converter*** add a motor (wye/star wound)

PHASE-A-MATIC Design is just adding a Baldor Electric with shaft cut off w/static box converter set on top of motor



The potential relay contacts are closed at start-up, the contacts remain closed for less than a second to allow the capacitor to feed the L2 output. This causes the motor pole connected to L2 to become magnetic slightly behind the L1 pole, allowing the motor to start rotation. Once the motor rotation is started, the potential relay opens, and allows the motor to operate on the single phase feed. You may experience tripping of the overload devices protecting the motor, if this happens, increase the overload value 60% to allow operation.

Notes:

1. This is a Motor-Start capacitor, these are designed for use with alternating current (AC). The capacitor should be chosen for about 70 to 100uF per horsepower. A larger capacitor can give more starting torque, but may prevent the potential relay from operating properly. Be sure the capacitor is rated for at least 220 VAC.

2. The relay is a Potential Relay. The Grainger part 6X550 is recommended. Other values can be used, but it may be necessary to disassemble the relay and adjust it. Potential relays can be found in discarded air-conditioner units.

3. The resistor is 15,000 ohms and rated for 2 Watts. These can be purchased at EPO, Ace Electronics, or Grainger. If the resistor is not used, the relay will chatter when the power is disconnected. The value of the resistor can range anywhere between 10,000 and 20,000 ohms, just be sure it is rated for at least 2 Watts.

4. In the top drawing, the potential relay uses AC Neutral as a reference. DO NOT USE SAFETY GROUND INSTEAD OF AC NEUTRAL, IT CAN KILL YOU!

5. The bottom drawing uses a dual primary (120/240V) transformer to generate a reference. This is handy if the AC Neutral is not available. Any small transformer will work. EPO or Ace Electronics would probably have these. The voltage on the secondary is not important since it is not used.

Conduit Box For ease of making connections, an oversize conduit box is provided. Most conduit boxes can be rotated 360° in 90° increments. Auxiliary conduit boxes are provided on some motors for accessories such as space heaters, RTD's etc.

AC Power Motors with flying lead construction must be properly terminated and insulated.
Connect the motor leads as shown on the connection diagram located on the name plate or inside the cover on the conduit box. Be sure the following guidelines are met:

1. AC power is within ±10% of rated voltage with rated frequency. (See motor name plate for ratings).
   OR
2. AC power is within ±5% of rated frequency with rated voltage.
   OR
3. A combined variation in voltage and frequency of ±10% (sum of absolute values) of rated values, provided the frequency variation does not exceed ±5% of rated frequency.

Performance within these voltage and frequency variations are shown in Figure 2-4.

Figure 2-3 Accessory Connections

HEATERS H1 — H2 H1 — H2	One heater is installed in each end of motor. Leads for each heater are labeled H1 & H2. (Like numbers should be tied together).
THERMISTORS TD1 — TD2	Three thermistors are installed in windings and tied in series. Leads are labeled TD1 & TD2.
WINDING RTDS RED RED WHITE	Winding RTDs are installed in windings (2) per phase. Each set of leads is labeled 1TD1, 1TD2, 1TD3, 2TD1, 2TD2, 2TD3 etc.
BEARING RTD RED RED WHITE	* One bearing RTD is installed in Drive endplate (PUEP), leads are labeled RTDDE. * One bearing RTD is installed in Opposite Drive endplate (FREP), leads are labeled RTDODE. * Note RTD may have 2–Red/1–White leads; or 2–White/1–Red Lead.

Rotation All three phase motors are reversible. To reverse the direction of rotation, disconnect and lock out power and interchange any two of the three line leads for three phase motors. For single phase motors, check the connection diagram to determine if the motor is reversible and follow the connection instructions for lead numbers to be interchanged. Not all single phase motors are reversible.

Adjustable Frequency Power Inverters used to supply adjustable frequency power to induction motors produce wave forms with lower order harmonics with voltage spikes superimposed. Turn–to–turn, phase–to–phase, and ground insulation of stator windings are subject to the resulting dielectric stresses. Suitable precautions should be taken in the design of these drive systems to minimize the magnitude of these voltage spikes. Consult the drive instructions for maximum acceptable motor lead lengths, and proper grounding.

Note: Main power leads for CE Marked Motors may be marked U,V,W – for standard configurations, please consult connection diagrams.

Caution: **The space heaters are designed to operate at or below the maximum surface temperature stated on the nameplate. If the marked ambient and/or voltage are exceeded this maximum surface temperature can be exceeded and can damage the motor windings. If applied in a division 2 or zone 2 environment this excessive temperature may cause ignition of hazardous materials.**

Connection Diagrams

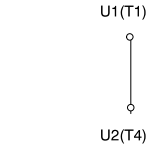
AC Motor Connection Diagram

IEC VERSUS NEMA LEAD MARKING

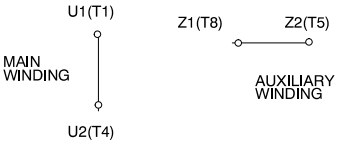
EXAMPLE COMPARISIONS OF IEC AND NEMA LEADING MARKINGS FOR COMMON CONNECTION TYPES ARE SHOWN BELOW.

SINGLE PHASE MOTORS

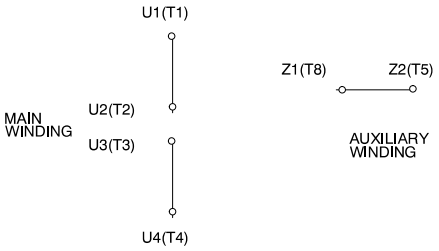
SINGLE VOLTAGE NON REVERSIBLE



SINGLE VOLTAGE REVERSIBLE



DUAL VOLTAGE REVERSIBLE



AC Motor Connection Diagram

THREE PHASE

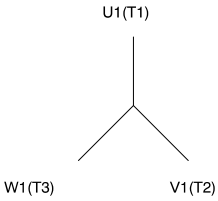
FOR SINGLE WINDING 3 PHASE MOTORS, LEAD MARKINGS CAN BE DIRECTLY TRANSLATED BETWEEN IEC AND NEMA DESIGNATIONS. FOR THESE MOTORS, THE LEAD MARKINGS ARE EQUIVALENT AS FOLLOWS:

U1=T1	U2=T4	U5=T7	U6=T10
V1=T2	V2=T5	V5=T8	V6=T11
W1=T3	W2=T6	W5=T9	W6=T12

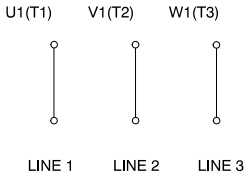
EXAMPLES OF COMMON CONNECTIONS ARE GIVEN BELOW.

THREE LEADS

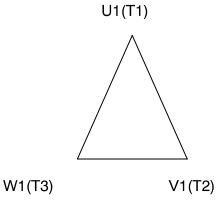
WYE CONNECT



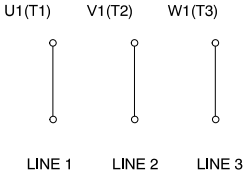
WIRING DIAGRAM



DELTA CONNECT



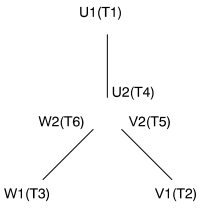
WIRING DIAGRAM



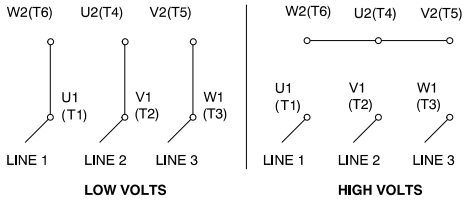
AC Motor Connection Diagram

SIX LEADS

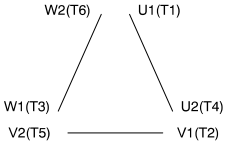
DELTA-WYE CONNECT



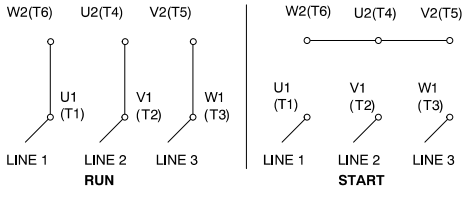
DUAL VOLTAGE-HIGH TO LOW VOLTAGE RATIO 1.73:1



WYE-DELTA CONNECT



WYE START-DELTA RUN SINGLE VOLTAGE



AC Motor Connection Diagram

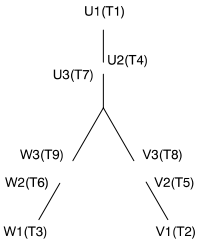
This is the one that works on Static Three Phase Converter

NINE LEADS

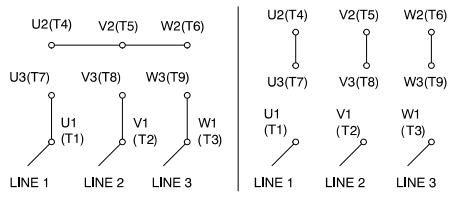
DUAL VOLTAGE-HIGH TO LOW VOLTAGE RATIO 2:1

All other use Rotary Phase Converter (Just a motor with a wye/star winding)

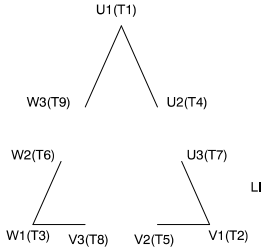
WYE CONNECT



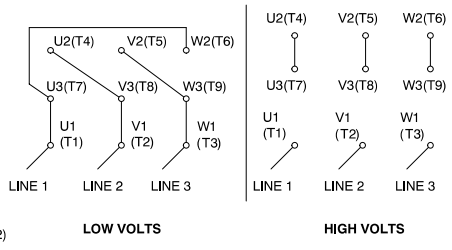
WIRING DIAGRAM



DELTA CONNECT



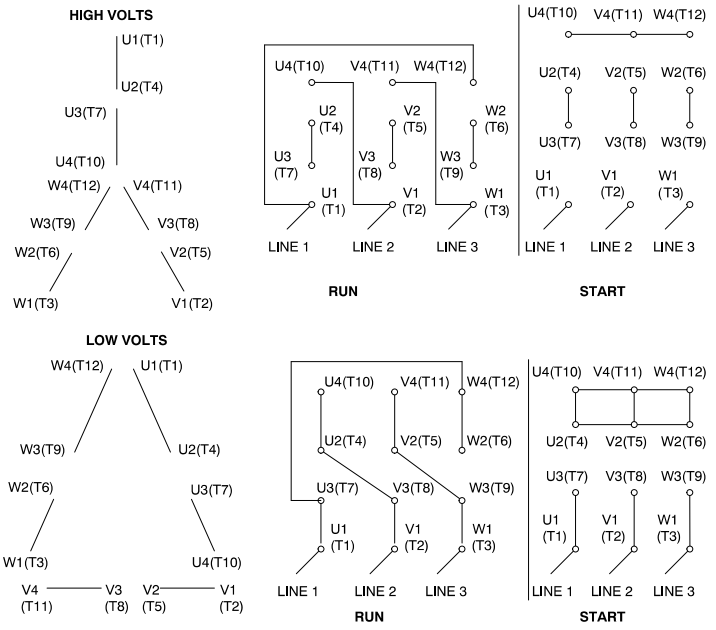
WIRING DIAGRAM



AC Motor Connection Diagram

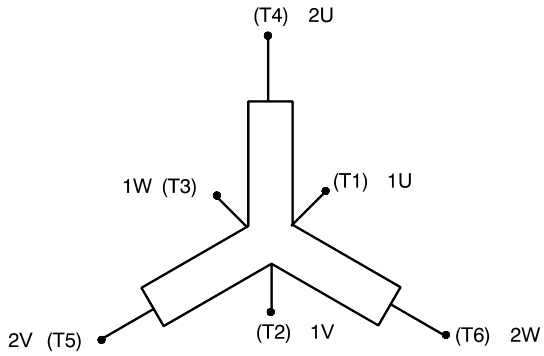
TWELVE LEADS

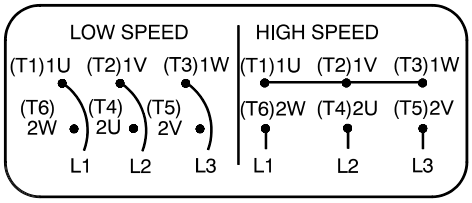
DUAL VOLTAGE WYE START – DELTA – RUN



AC Motor Connection Diagram

SINGLE WINDING MULTI–SPEEDS CONSTANT TORQUE

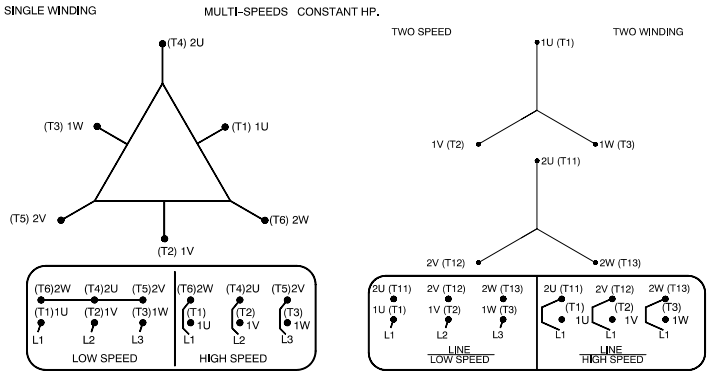




(N.P. 1634–DE)

AC Motor Connection Diagram

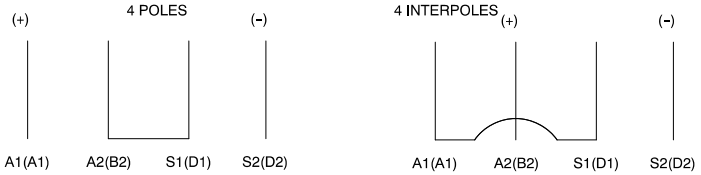
SINGLE WINDING MULTI–SPEEDS CONSTANT HP.



TWO SPEED TWO WINDING

DC Motor Connection Diagram

WIRING DIAGRAM TYPE "T" MOTOR



COUNTERCLOCKWISE ROTATION CLOCKWISE ROTATION

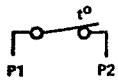
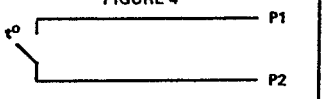
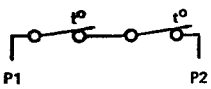
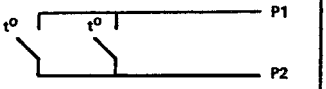
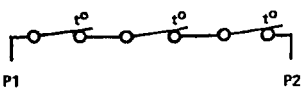
ROTATION – FACING COMMUTATOR END

COMPARISON OF IEC AND NEMA LEAD MARKINGS
FOR DIRECT CURRENT MOTORS

A1--A1
A2--B2
S1--D1

S2--D2

MOTOR WINDING THERMOSTATS		
CONTACTS _____ @ _____ °C		
FIGURE NUMBER _____		
CONTACT RATING		
VOLTS	**CONTINUOUS AMPERES**	**INRUSH AMPERES**
110 - 120	3.0	30
220 - 240	1.5	15
440 - 480	0.75	7.5
550 - 600	0.60	6.0

THERMOSTATS	
NORMALLY CLOSED	**NORMALLY OPEN**
FIGURE 1 	**FIGURE 4** 
FIGURE 2 	**FIGURE 5** 
FIGURE 3 	**FIGURE 6**