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DspMotion® *jr*

IMC*jr* Hardware Manual

for models

IMJ-105_-1-D, IMJ-313_-X-D, IMJ-317_-X-D,
IMJ-31GD-2-D, IMJ-31TD-2-D, and IMJ-31LD-4-D

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The figures and examples in this manual are designed to demonstrate general concepts for installing and maintaining Whedco equipment with and without a DeviceNet™ network. The users should always verify interconnection requirements to and from other equipment and confirm installation and maintenance requirements for their specific application. In no case shall Whedco Incorporated be liable for actual use based on the guidelines mentioned herein.

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CHAPTER 1

Drive Specifications

Input Power

IMJ-105

The IMJ-105 is suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical amperes, 130 volts maximum when protected by RK5 class 10A fuses. Table 1.1 summarizes the IMJ-105 ***maximum continuous*** input power requirements. The actual input power and current is a function of the motor's operating point and the duty cycle.

Table 1.1 Maximum Continuous Input Current and KVA for IMJ-105

Voltage range	90 - 130 VAC, 1 phase
Frequency range	50 - 440 Hz
Current, max. continuous	10 A rms
Power, max. continuous	1.3 KVA @ 130 VAC
Fuses	No internal fuses. Use 10 A time delay branch circuit fuse.
Isolation transformer	None required. If the supply voltage is above 130 VAC, the voltage must be dropped to 120 VAC. The transformer should be sized to provide adequate power under all operating conditions. Choose a transformer rated for a minimum of 125% of the drive maximum continuous input KVA.

IMJ-31_ Series

The IMJ-31 _ Series controllers are suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical amperes, 250 volts maximum when protected by RK5 fuses listed in table 1.2b. Tables 1.2a and 1.2b summarize the IMJ-31_ Series ***maximum continuous*** input power requirements. The actual input power and current is a function of the motor's operating point and the duty cycle.

Table 1.2a Maximum Continuous Input Current and KVA for IMJ-31_ Series

Voltage range	***IMJ-313_-X-D and IMJ-317_-X-D:*** 90 – 250 VAC, 1 or 3 phase ***IMJ-31LD-4-D:*** 324 – 528 VAC, 3 phase ***IMJ-31GD-2-D and IMJ-31TD-2-D:*** 180 – 250 VAC, 3 phase
Frequency range	50 - 440 Hz
Current, max. continuous	See table 1.2b
Power, max. continuous	See table 1.2b
Fuses	No internal fuses. See table 1.2b for recommended branch circuit fuse current ratings.
Isolation transformer	None required. For IMJ-313, 317, 31GD, and 31TD models, if the supply voltage is above 250 VAC, the voltage must be dropped to 230 VAC. For the IMJ-31LD, if the supply voltage is above 528 VAC, the voltage must be dropped to 460 VAC. The transformer should be sized to provide adequate power under all operating conditions. For single-phase operation, choose a transformer rated for a minimum of 125% of the drive maximum continuous input KVA. For three-phase operation, choose a transformer rated for a minimum of 100% of the drive maximum continuous input KVA.

Table 1.2b Maximum Continuous Input Current and KVA for IMJ-31_ Series

Model	1 phase or 3 phase	Maximum Continuous Input Current	Maximum Continuous Input KVA	Recommended Branch Circuit Fuse Current Ratings RK5 Class Fuses
IMJ-313	1	7 Arms	1.6 KVA @ 230 VAC	10A time delay
IMJ-313	3	4 Arms	1.6 KVA @ 230 VAC	5A time delay
IMJ-317	1	15 Arms	3.8 KVA @ 230 VAC	15A time delay
IMJ-317	3	8 Arms	3.8 KVA @ 230 VAC	15A time delay
IMJ-31GD-2-D	3	18 Arms	8.5 KVA @ 230 VAC	20A time delay
IMJ-31LD-4-D	3	22 Arms	20 KVA @ 460 VAC	25A time delay
IMJ-31TD-2-D	3	30 Arms	14.3 KVA @ 230 VAC	30A time delay

Output Power

Table 1.3: Output Power for the IMJ-105

Voltage range	90 - 130 Vrms 2 phase
Frequency	0 – 8 KHz fundamental (16.4 KHz PWM)
Current[(a)]	5 A rms per phase

Table 1.4: Output Power for the IMJ-313 and 317 Series

Voltage range	90 - 250V rms 3 phase
Frequency	0 – 1,000 Hz fundamental (16.4 KHz PWM)
Current[(a)]	IMJ-313: 3 Arms continuous per phase, 6 Arms peak
	IMJ-317: 7.2 Arms continuous per phase, 14.4 Arms peak

Table 1.5: Output Power for the IMJ-31GD and 31TD Series

Voltage range	180 - 250V rms 3 phase
Frequency	0 – 1,000 Hz fundamental (16.4 KHz PWM)
Current[(a)]	IMJ-31GD: 16 Arms continuous per phase, 32 Arms peak
	IMJ-31TD: 28 Arms continuous per phase, 56 Arms peak

Table 1.6: Output Power for the IMJ-3LD Series

Voltage range	324 – 528V rms 3 phase
Frequency	0 – 1,000 Hz fundamental (8.2 KHz PWM)
Current[(a)]	IMJ-31LD: 20 Arms continuous per phase, 30 Arms peak

Note for tables 1.3, through 1.6: (a) The outputs are provided with internal overload protection.

Environmental

Table 1.7: Environmental Specifications for the IMJ

Operating temperature [(a)]	32 to 122 degrees F (0 to 50 degrees C)
Storage and shipping temperature	-40 to 176 degrees F (-40 to 80 degrees C)
Altitude[(b)]	1,000 m

(a) assumes heatsink orientation is vertical

(b) consult factory for maximum continuous output derating for altitudes greater than 1,000 m.

Communication

Table 1.8: Communication Specifications for the IMJ

Format	RS-232	DeviceNet™
Maximum Addressable Units	1	64
Maximum Length of Serial Data Link	50 feet	1,640 feet[a]
Baud Rate	1,200; 9,600; 19,200 or 38,400	125,000; 250,000; 500,000

(a) 1,640 feet @ 125 kbaud with 100% thick cable

Digital Inputs and Outputs

Table 1.9: IMJ Digital Inputs

Operating Range	12-24 VDC, 30 VDC maximum
Maximum Off Input Voltage	4 VDC
Minimum On input Voltage	10 VDC
Load	2K Ohms
Interface Format	optically isolated, source/sink user configurable

Table 1.10: IMJ Digital Outputs

Operating Range	12-24 VDC, 30 VDC maximum
Maximum On Resistance	35 Ohms
Maximum Load Current	100 mA
Maximum Off Leakage Current	200 nA
Interface Format	optically isolated, source/sink user configurable

Analog Inputs and Outputs

Table 1.11: IMJ Analog Inputs

Number	2
Operating Range	+/- 10 VDC
Resolution	12 bits
Input Impedance	50K Ohms

Table 1.12: IMJ Analog Outputs

Number	1
Parameter	user programmable, or velocity, current, or following error
Operating Range	+/- 10 VDC
Resolution	8 bits
Current	5 mA

Differential Inputs and Outputs

Table 1.13: IMJ Differential Encoder Inputs

Number	1
Input Voltage	5, 12, or 15 VDC
Input Format	Single-ended or differential, quadrature or pulse/direction or CW/CCW, square or sine wave
Maximum Line Count Frequency	3 MHz

Table 1.14: IMJ Differential Encoder Outputs

Number	1
Output Voltage	5 VDC
Output Format [a]	Differential, quadrature or pulse/direction or CW/CCW, square wave
Maximum Line Count Frequency	3 MHz

(a) If the EOT register is set to zero, the encoder output format equals the encoder input format; if EOT is set to a value other than zero, the output format is differential quadrature.

Position Feedback

Table 1.15: IMJ Resolver

Model	IMJ-31_ _-X-D
Number	1
Resolution	4,096 pulses per revolution
Maximum Speed	15,000 rpm
Type	control transmitter
Phase Shift	+/- 5.0 degrees @ 5 kHz
Null Voltage	< 20 mV @ 5 kHz
Transformation Ratio	0.5

DC Power Supplies

Table 1.16: IMJ DC Power Supplies

+5 volts	0.5 Amps
+12 volts	0.5 Amps

CHAPTER 2

Installation

Physical Installation

Location

Location of the IMJ is important to achieve proper performance and operating life. The IMJ is designed with "open" construction. The unit must be installed in an enclosure that protects personnel from contact with wiring terminals and provides a pollution degree 2 environment that protects the unit from:

- Corrosive gases or liquids
- Vibration
- Conductive pollution including extreme or condensing humidity and airborne metallic particles
- Accidental contact by persons using the equipment
- Temperature extremes beyond the equipment ratings.

Panel Layout

The mounting dimensions appear in Chapter 4. Choose a location in the equipment panel to meet panel electrical safety, electrical signal integrity, and temperature specifications.

Heat Load and Cooling

Table 2.1: Heat Load and Cooling

Model	Heat Load (Approximation)	Maximum
IMJ-105	20 watts + (0.3 * current setting in percent)	50 watts maximum
IMJ-313	25 watts + (35 * duty_cycle) watts	60 watts maximum
IMJ-317	35 watts + (65 * duty_cycle) watts	100 watts maximum
IMJ-31GD	50 watts + (150 * duty_cycle) watts	200 watts maximum
IMJ-31LD	60 watts + (250 * duty_cycle) watts	310 watts maximum
IMJ-31TD	60 watts + (280 * duty_cycle) watts	340 watts maximum

IMJ controllers are designed to operate at full rated current with only natural convection cooling at ambient temperatures up to 50 degrees C.

The IMJ must be installed vertically for effective cooling. Allow a minimum clearance of 3 inches above and below the unit. A minimum of 2 to 3 inches clearance is also recommended on the right and left sides of the IMJ.

Wiring

Wiring diagrams for servo and stepper models are included in Chapter 5, *User Connections*. See page 3, **Input Power**, for branch circuit power requirements and fuse and isolation transformer ratings.

General Wiring Considerations

All power, input, and output (I/O) must be in accordance with Class I, Division 2 wiring methods as defined in Article 501-4(b) of the National Electrical Code, NFPA 70 for installations within the United States, or as specified in Section 18-152 of the Canadian Electrical Code for installation within Canada.

Attach wiring connections for the main circuit according to Tables 2.2 and 2.3 while observing the following **cautions:**

- ! Use vinyl-sheathed or equivalent wire rated at 250 VAC or greater. Wire size should be determined considering ampacity and codes.
- ! **Never** connect AC main power to output terminals.
- ! **Never** allow wire leads to contact the enclosure.
- ! **Never** operate the IMJ without an earth ground.
- ! **WARNING--**When using this equipment in a Hazardous (classified) location:

    A. **WARNING--*Explosion hazard*--**substitution of components may impair suitability for Class I, Division 2;
    B. **WARNING--*Explosion hazard*--**when in hazardous locations, turn off power before replacing or wiring modules;
    C. **WARNING--*Explosion hazard*--**do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.

Table 2.2: IMJ-105 Power Terminal Connections and Wire Sizing

Terminal Symbol	Description	Connect to	Wire Size AWG	Notes
⏚	Ground	Motor ground terminal	18-16	1,2
B+	Output coil B+	Motor coil B+	18-16	1,2
A/B-	Output coil A-/B-	Motor coil A-/B-	18-16	1,2
A+	Output coil A+	Motor coil A+	18-16	1,2
⏚	Ground	Power system ground	18-16	1
NC	No connection			
L2	Drive input power	90 – 130 VAC	18-16	1
L1	Drive input power	90 – 130 VAC	18-16	1

Notes for table 2.2:
1 - AWG size for stranded copper wire. Minimum wire size required will depend on motor and load.
Consult *National Electrical Code Handbook* ampacities tables for proper wire size.
2 - Cable available from Whedco as part number **CBL-13-MP-xx** for standard and **CBL-14-MP-**xx or **CBL-15-MP-**xx for splashproof motors, where xx is the cable length in feet.

Table 2.3a IMJ-313 Power Terminal Connections and Wire Sizing

Terminal Symbol	Description	Connect to	Wire Size AWG	Notes
⏚	Ground	Motor ground terminal	18-14	1,2
T	Output phase T	Motor phase T	18-14	1,2
S	Output phase S	Motor phase S	18-14	1,2
R	Output phase R	Motor phase R	18-14	1,2
⏚	Ground	Power system ground	18-14	1
L3	Drive input power - do not connect for 1 phase input	90 - 250 VAC	18-14	1
L2	Drive input power	90 - 250 VAC	18-14	1
L1	Drive input power	90 - 250 VAC	18-14	1

Table 2.3b IMJ-317 Power Terminal Connections and Wire Sizing

Terminal Symbol	Description	Connect to	Wire Size AWG	Notes
⏚	Ground	Motor ground terminal	18-14	1,2
T	Output phase T	Motor phase T	18-14	1,2
S	Output phase S	Motor phase S	18-14	1,2
R	Output phase R	Motor phase R	18-14	1,2
⏚	Ground	Power system ground	18-14	1
2L2	Logic input power	90 - 250 VAC	18-14	1
2L1				
1L3	Drive input power - do not connect for 1 phase input	90 - 250 VAC	18-14	1
1L2	Drive input power	90 - 250 VAC	18-14	1
1L1				
EXT	External Clamp Resistor	INT	18-14	3
INT	Internal Clamp Resistor	EXT	18-14	3
DC+	High Voltage Motor Power Bus Positive	External clamp resistor	18-14	4

Notes for tables 2.3a and 2.3b:

1 - AWG size for stranded copper wire. Minimum wire size required will depend on motor and load. Consult *National Electrical Code Handbook* ampacities tables for proper wire size.

2 - Cable available from Whedco as part number **CBL-3_-MP-xx, CBL-34-DD-xx,** or **CBL-I_ -MP-xx** , where xx is the cable length in feet.

3 - The IMJs dissipate regenerated energy in an internal clamp resistor. If the application produces more regenerated power than the rating of the internal clamp resistor, the IMJ will report EC (excessive clamp dissipation). Contact Whedco to determine if an external clamp resistor is required and to receive the procedure for connecting an external clamp resistor.

4 – See *User Connections*, chapter 5, for the IMJ-317 when connecting an external clamp resistor.

Table 2.3c IMJ-31GD and IMJ-31TD Power Terminal Connections and Wire Sizing

Terminal Symbol	Description	Connect to	Wire Size AWG	Notes
R	Output phase R	Motor phase R	16-10	1,2
S	Output phase S	Motor phase S	16-10	1,2
T	Output phase T	Motor phase T	16-10	1,2
⏚	Ground	Motor ground terminal	16-10	1,2
DC+	High voltage motor power bus positive	External clamp resistor	16-10	4
INT	Internal clamp resistor	EXT	16-10	3
EXT	External clamp resistor	INT	16-10	3
DC-	High voltage motor power bus negative	No connection		
1L1	Drive input power	180 - 250 VAC	16-10	1
1L2				
1L3				
⏚	Ground	Power system ground	16-10	1
2L2	Logic input power	180 - 250 VAC	18-14	1
2L1				

Table 2.3d IMJ-31LD Power Terminal Connections and Wire Sizing

Terminal Symbol	Description	Connect to	Wire Size AWG	Notes
R	Output phase R	Motor phase R	16-10	1,2
S	Output phase S	Motor phase S	16-10	1,2
T	Output phase T	Motor phase T	16-10	1,2
⏚	Ground	Motor ground terminal	16-10	1,2
DC+	High voltage motor power bus positive	External clamp resistor	16-10	4
INT	Internal clamp resistor	EXT	16-10	3
EXT	External clamp resistor	INT	16-10	3
DC-	High voltage motor power bus negative	No connection		
1L1	Drive input power	324 – 528 VAC	16-10	1
1L2				
1L3				
⏚	Ground	Power system ground	16-10	1
COM	Logic input power	18 – 30 VDC	18-14	1
+24V				

Notes for tables 2.3c and 2.3d:

1 - AWG size for stranded copper wire. Minimum wire size required will depend on motor and load. Consult *National Electrical Code Handbook* ampacities tables for proper wire size.

2 - Cables are available from Whedco as part numbers **CBL-3C-MP-xx, CBL-3P-MP-xx, CBL-38-MP-xx,** or **CBL-IK-MP-xx, CBL-IT-MP-xx, CBL-3T-MP-xx** where xx is the cable length in feet.

3 - The IMJ-31_D dissipates regenerated energy in an internal clamp resistor. If the application produces more regenerated power than the rating of the internal clamp resistor, the IMJ-31_D will report EC (excessive clamp dissipation). Contact Whedco to determine if an external clamp resistor is required and to receive the procedure for connecting an external clamp resistor.

4 – See* User Connections, *chapter 5, for IMJ-31GD, 31LD, and 31TD when connecting an external clamp resistor.

Input Mains Wiring and Grounding

The mains input and motor output connections are made to the connector located on the bottom of the IMJ. The IMJ-105 is designed to operate with input voltages from 90 to 130 VAC. The IMJ-313 and IMJ-317 are designed to operate with input voltages from 90 to 250 VAC; and the IMJ-31GD and IMJ-31TD controllers are designed to operate with input voltages from 180 to 250 VAC. IMJ-31LD controllers are designed to operate with input voltages from 324 – 528 VAC. No isolation transformer is required. If the supply voltage is above the maximum rated value, the voltage must be dropped to a value in the operating range. See page 3, **Input Power**, for the required transformer rating if a transformer is necessary. For the IMJ-31_ Series, the maximum achievable motor speed is directly related to the input voltage. See figure 2.4 for best performance recommendations.

Table 2.4 Best Performance Recommendations

IMJ Model	Terminal connections	Connect to
IMJ-313	L1, L2, and L3	Three-phase 230 VAC
IMJ-317 IMJ-31GD IMJ-31TD	1L1, 1L2, and 1L3	Three-phase 230 VAC
IMJ-31LD	1L1, 1L2, and 1L3	Three-phase 460 VAC

All of the terminals marked with the symbol ⏚ are connected to the chassis ground. Connect the ⏚ terminal at the mains input end of the connector to the panel earth ground. Connect the ⏚ terminal near the motor output terminals to the motor frame ground wire in the motor power cable. DO NOT OPERATE THE IMJ WITHOUT AN EARTH GROUND.

Motor Power Wiring and Grounding

Motor power cables are available from Whedco Inc. for the IMJ-105 series controllers as part number **CBL-13-MP-xx** for standard and **CBL-14-MP-xx** or **CBL-15-MP-xx** for splashproof motors; for the IMJ-313 and IMJ-317 series controllers as part numbers **CBL-3_-MP-xx** or **CBL-I_ -MP-xx**; and for the IMJ-31GD, 31LD, and 31TD as part numbers **CBL-3C-MP-xx, CBL-3P-MP-xx, CBL-38-MP-xx, CBL-IK-MP-xx, CBL-IT-MP-xx,** or **CBL-3T-MP-xx** . For all cable models, xx is the length in feet. The motor cable must include a motor ground wire. The motor ground wire must connect a frame ground terminal on the controller to the frame ground pin on the motor connector.

Position Feedback Wiring

Position feedback cables are available from Whedco Inc. for the IMJ-31_ Series controllers as part number **CBL-3C-RD-xx, CBL-34-RT-xx, CBL-IT-RD-xx,** and **CBL-3T-RD-xx,** where xx is the cable length in feet. Plug the motor end of the feedback cable into the connector on the motor and the DB-type end of the cable into the DB-15 socket on the front of the controller. The best system reliability is achieved when the feedback cable is returned in a separate conduit from that housing the motor power cable. The feedback cable must be shielded. Resolver feedback cables must contain individually shielded pairs for the feedback signals. The shields must be terminated to the isolated ground pins on the DB-15 connector.

I/O Connector Wiring

The discrete inputs and outputs may be wired for either sinking or sourcing operation. The operational voltage range is 12 to 24 volts DC. The output can sink or source 100 ma maximum. The wiring to this connector should be of appropriate size and insulation quality for the application. For wiring diagrams, see Chapter 5, *User Connections.*

Motors

The IMJ-105 controllers are designed for use with stepping motors rated for 1 to 5 amperes per phase with 2 mH per phase minimum inductance. The motors must be designed to run from a 170 VDC bus. See the Whedco Servo and Stepping Motor Control Systems catalog for available motors.

The IMJ-31_ Series controllers are designed for use with AC brushless servo motors rated for 0.75 to 28 amperes per phase with 2 mH per phase minimum inductance. 460 VAC motors are compatible with the IMJ-31LD; use 230 VAC motors with the IMJ-313, 317, 31GD, and 31TD controller models. See the Whedco Servo and Stepping Motor Control Systems catalog for available motors. In general, the best system performance is achieved by choosing a motor with a continuous current rating approximately equal to or less than the continuous current rating of the IMJ.

The IMJ-31_ Series controllers are designed for use with motors that include a thermal switch or positive-temperature-coefficient (PTC) thermistor. The switch should be closed at acceptable motor operating temperatures and open at temperatures that exceed the motor's thermal rating. If a PTC is employed, it should exhibit a resistance less than 1,000 ohms at acceptable motor temperatures and above 10,000 ohms at temperatures that exceed the motor's thermal rating. All Whedco brushless AC servo motors include a PTC.

CHAPTER 3

Serial and DeviceNet™ Communication Ports

Communication Ports

This section describes how to set up the communication ports provided for serial and DeviceNet™ communication from the IMJ.

Serial Port

IMJ controllers are compatible with RS-232 serial communication standards. To wire the connectors properly, refer to the diagram entitled "Serial Port" in Chapter 5, *User Connections*, for your IMJ controller model. Whedco provides RS-232 serial communication cable CBL-H1IC-10 with each CCS for Windows software purchase. The cable end labeled "IMC or OIP" connects to the serial port on the front of the IMJ. The end labeled "RS232 Port" connects to the RS-232 serial communication port on your computer. Tighten screws to fasten the connectors.

DeviceNet™ Port

IMJ-_ _ _D-X-D controllers are ready for DeviceNet™ communication with a standard, 5- pin, open-style connector. Flying leads on the DeviceNet™ drop line connect to their appropriately labeled pins on the front of the IMJ. See the DeviceNet™ connector diagrams in Chapter 5 for proper wiring.

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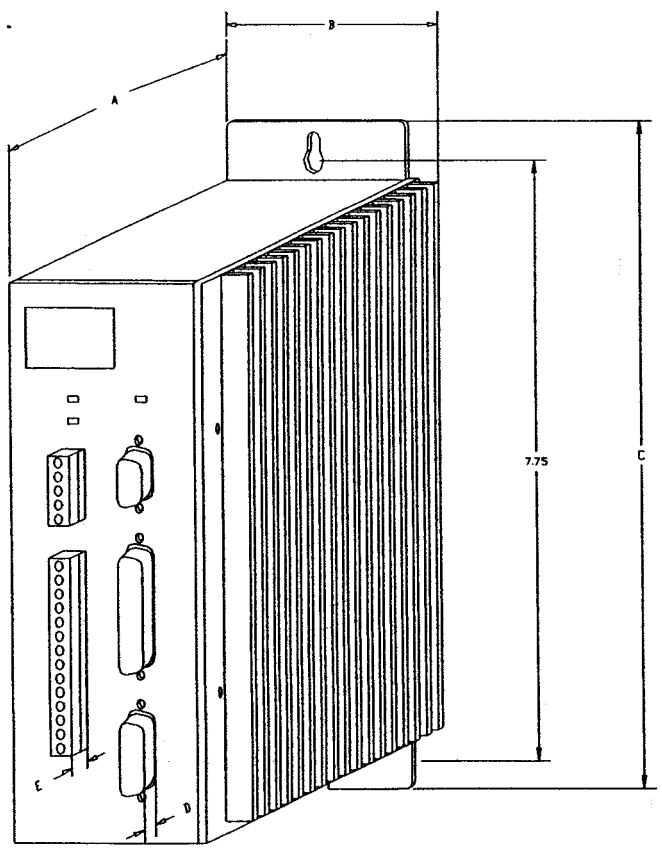
CHAPTER 4

Mechanical Drawing

Mechanical Specifications

IMJ-105_-1-D, IMJ-313_-X-D, and IMJ-317_-X-D
5 Amp stepping motor drive with controller
3 and 7.2 Amp servo motor drive with controller

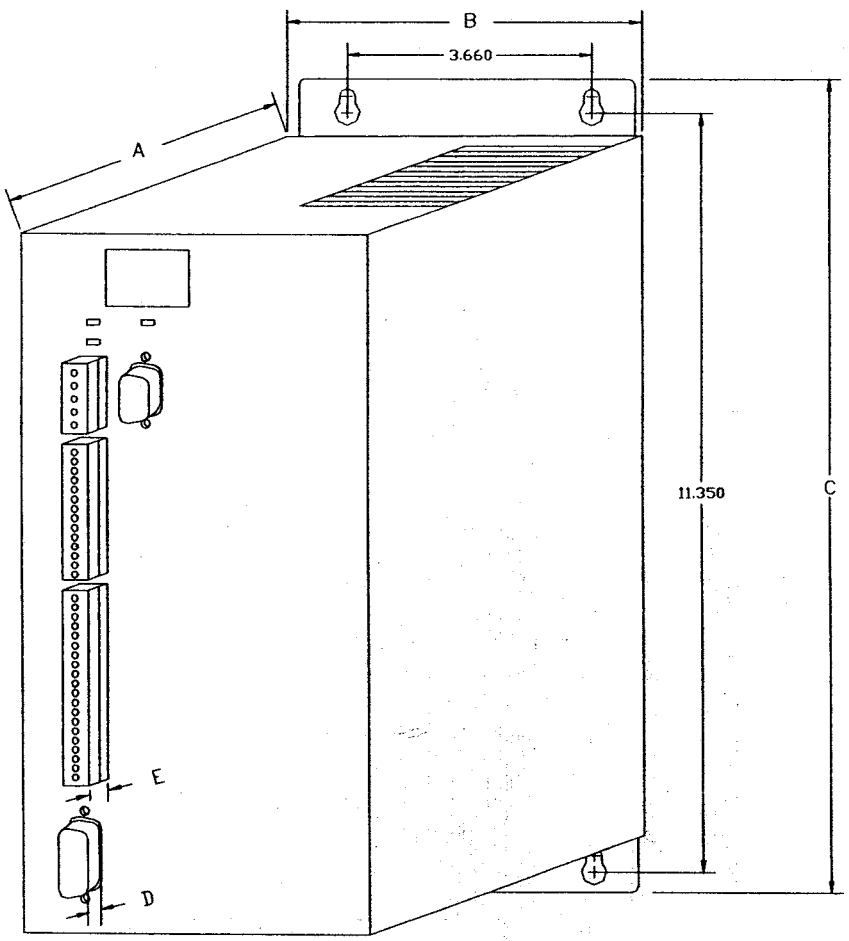
IMC*jr* Mechanical Dimensions		Servo and Stepping Motor Controller Models	
Code in Diagram	**Feature**	**IMJ-105X-1-D IMJ-313_-X-D**	**IMJ-317_-X-D**
n/a	Weight	4.0 lbs	6.0 lbs
A	Depth	6.05"	8.15"
B	Total width	3.20 "	3.45"
C	Height	8.50"	8.50"
D	Position Feedback Connector Depth	1.26" (IMJ-313_-X-D only)	1.26"
E	User I/O Connector Depth	0.75"	0.75"



Mechanical Specifications

IMJ-31GD-2-D--*16 Amp servo motor drive with controller*
IMJ-31LD-4-D--*20 Amp servo motor drive with controller*
IMJ-31TD-2-D--*28 Amp servo motor drive with controller*

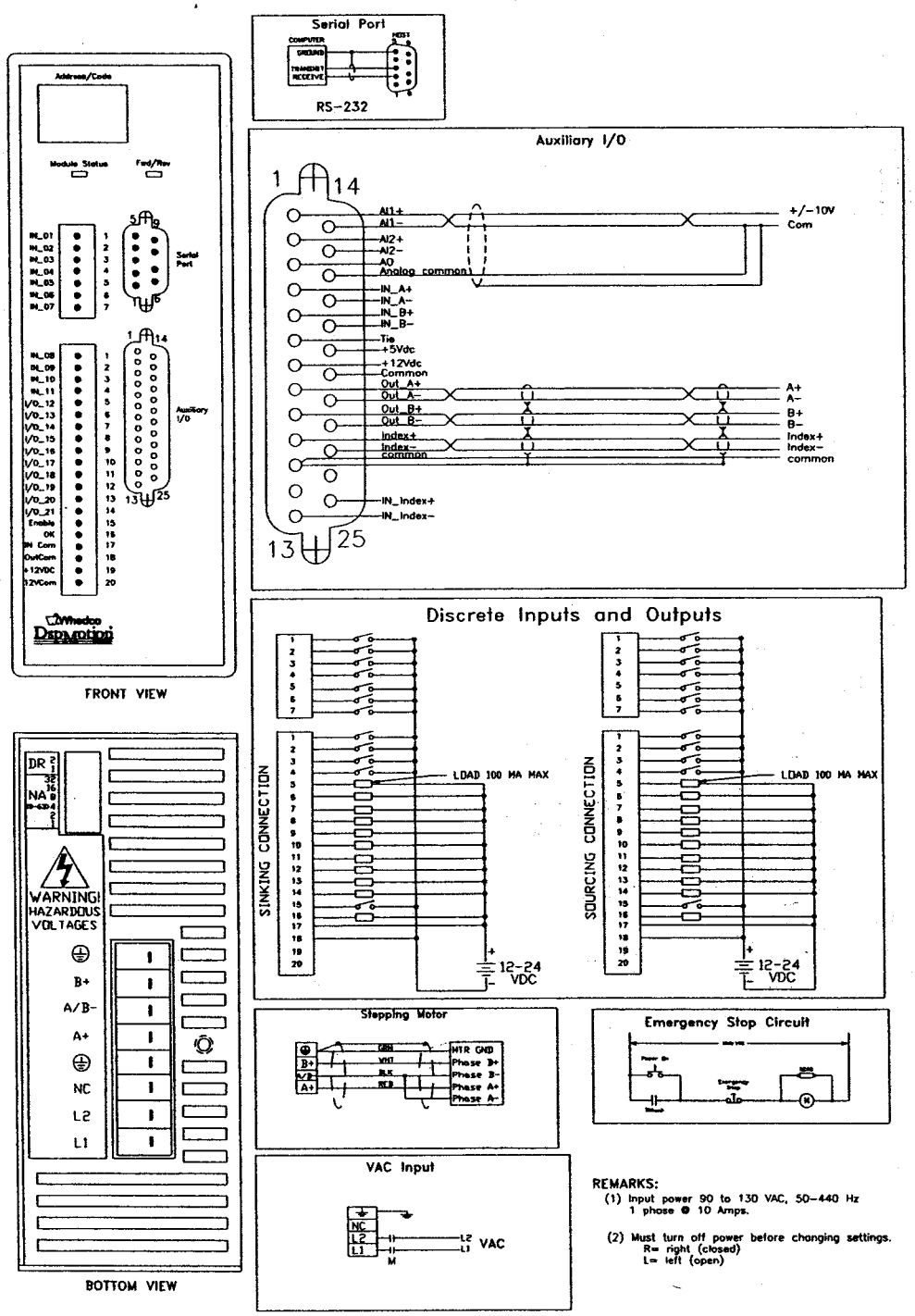
Feature	IMJ-31GD-2-D IMJ-31LD-4-D IMJ-31TD-2-D
Weight	13 lbs
Depth	10.15"
Total width	5.25"
Height	12.20"
Position Feedback Connector Depth	1.26"
User I/O Connector Depth	0.75"

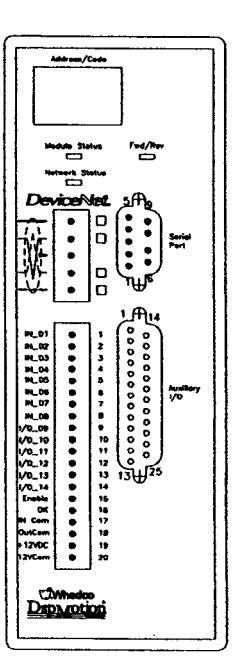


CHAPTER 5

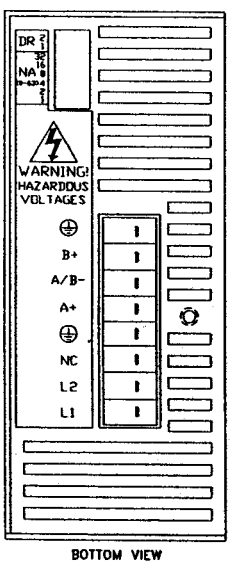
User Connections

IMJ-105E-1-D
IMC*jr* Stepping Motor Drive with Controller





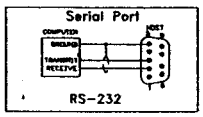
FRONT VIEW

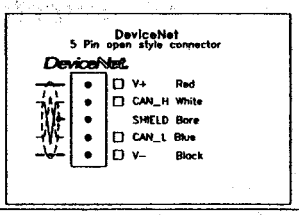


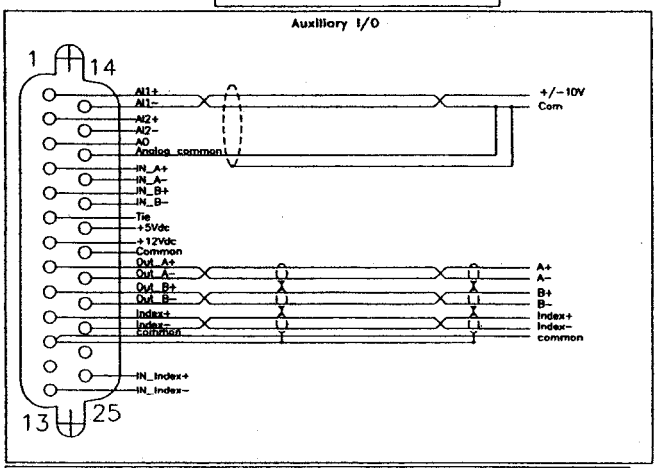
BOTTOM VIEW

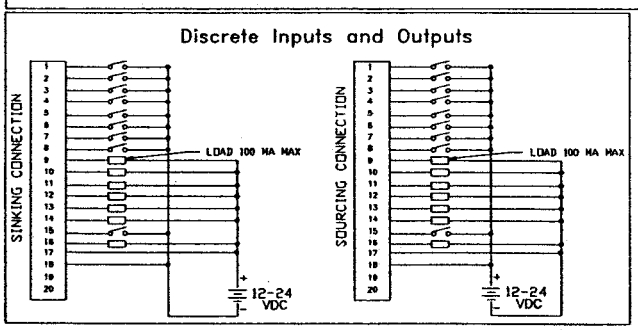
DIP Switch Orientation:

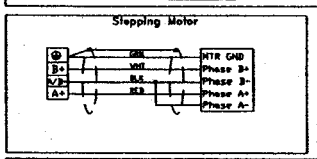
L – R

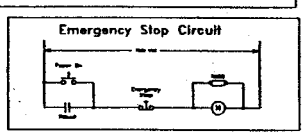


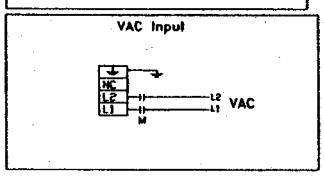












REMARKS:

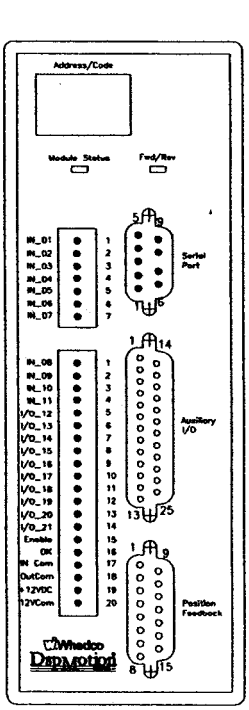
(1) Input power 90 to 130 VAC, 50–440 Hz
1 phase @ 10 Amps.

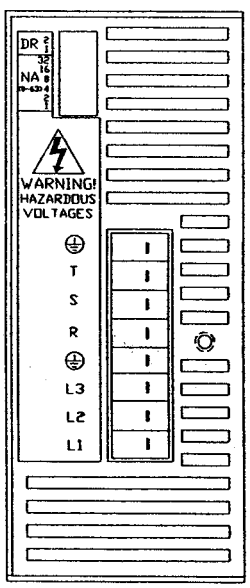
(2) Must turn off power before changing settings.
R= right (closed)
L= left (open)

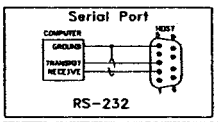
DIP Switch Positions (2)

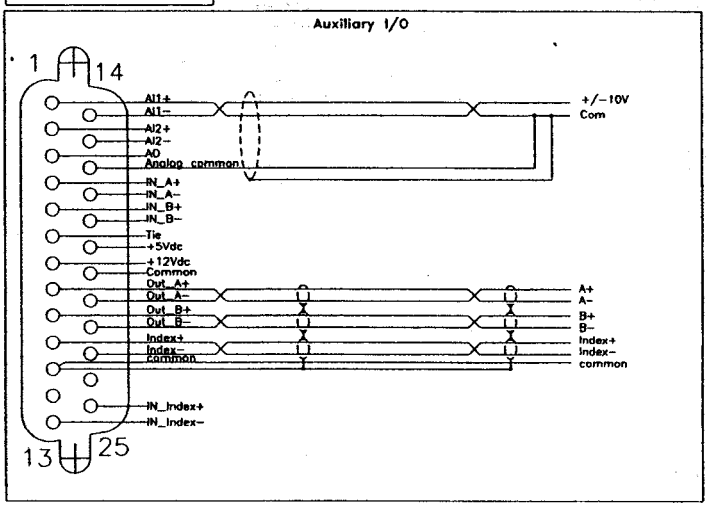
Device Net Address	1	2	4	8	16	32
(NA) 0	R	R	R	R	R	R
1	L	R	R	R	R	R
2	R	L	R	R	R	R
3	L	L	R	R	R	R
4	R	R	L	R	R	R
5	L	R	L	R	R	R
6	R	L	L	R	R	R
7	L	L	L	R	R	R
8	R	R	R	L	R	R
9	L	R	R	L	R	R
10	R	L	R	L	R	R
11	L	L	R	L	R	R
12	R	R	L	L	R	R
13	L	R	L	L	R	R
14	R	L	L	L	R	R
15	L	L	L	L	R	R
16	R	R	R	R	L	R
17	L	R	R	R	L	R
18	R	L	R	R	L	R
19	L	L	R	R	L	R
20	R	R	L	R	L	R
21	L	R	L	R	L	R
22	R	L	L	R	L	R
23	L	L	L	R	L	R
24	R	R	R	L	L	R
25	L	R	R	L	L	R
26	R	L	R	L	L	R
27	L	L	R	L	L	R
28	R	R	L	L	L	R
29	L	R	L	L	L	R
30	R	L	L	L	L	R
31	L	L	L	L	L	R
32	R	R	R	R	R	L
33	L	R	R	R	R	L
34	R	L	R	R	R	L
35	L	L	R	R	R	L
36	R	R	L	R	R	L
37	L	R	L	R	R	L
38	R	L	L	R	R	L
39	L	L	L	R	R	L
40	R	R	R	L	R	L
41	L	R	R	L	R	L
42	R	L	R	L	R	L
43	L	L	R	L	R	L
44	R	R	L	L	R	L
45	L	R	L	L	R	L
46	R	L	L	L	R	L
47	L	L	L	L	R	L
48	R	R	R	R	L	L
49	L	R	R	R	L	L
50	R	L	R	R	L	L
51	L	L	R	R	L	L
52	R	R	L	R	L	L
53	L	R	L	R	L	L
54	R	L	L	R	L	L
55	L	L	L	R	L	L
56	R	R	R	L	L	L
57	L	R	R	L	L	L
58	R	L	R	L	L	L
59	L	L	R	L	L	L
60	R	R	L	L	L	L
61	L	R	L	L	L	L
62	R	L	L	L	L	L
63	L	L	L	L	L	L

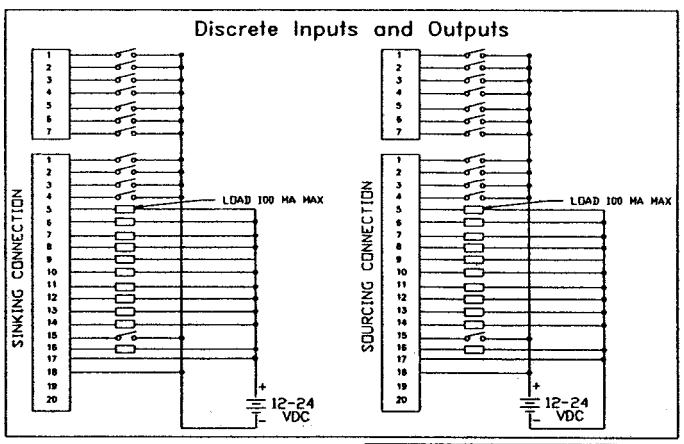
Device Net Baud Rate		1	2
(DR)	125K	R	R
	250K	L	R
	500K	R	L
	N/A	L	L

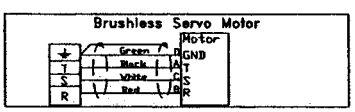


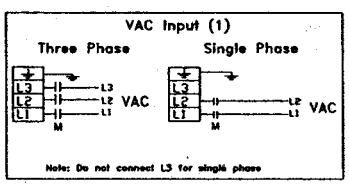




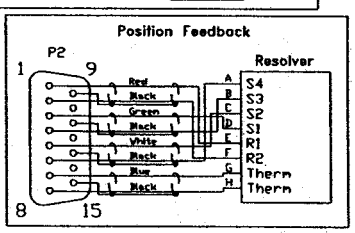


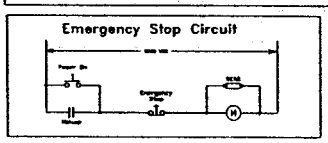






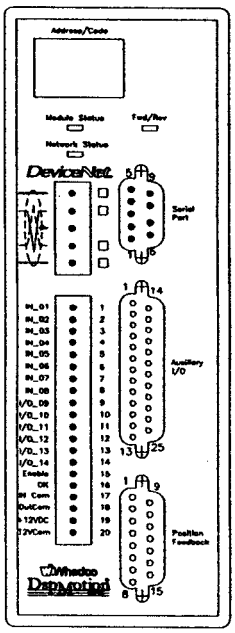
Note: Do not connect L3 for single phase



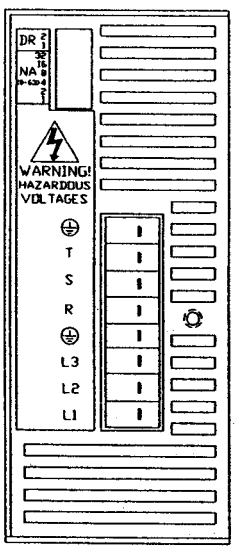


REMARKS:
(1) Input power 90 to 250 VAC, 50–440 Hz
1 phase ● 7 Amps, 3 phase ● 4 Amps

(2) Must turn off power before changing settings.
R= right (closed)
L= left (open)



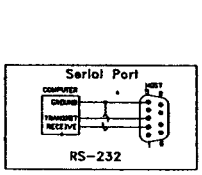
FRONT VIEW

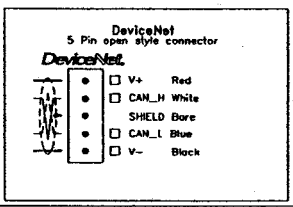


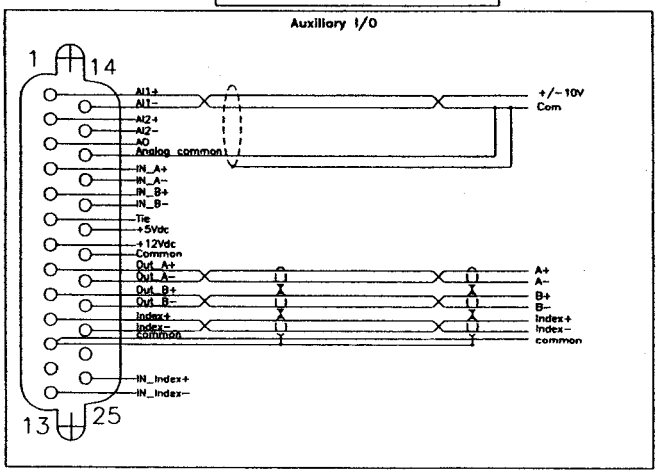
BOTTOM VIEW

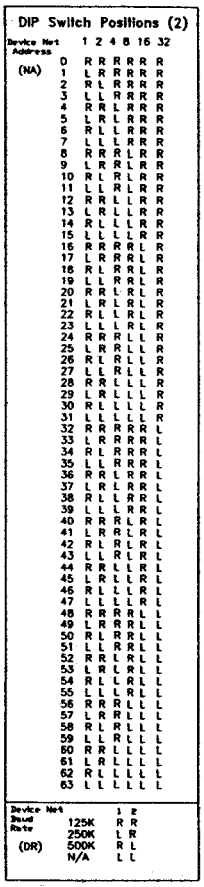
DIP Switch Orientation:

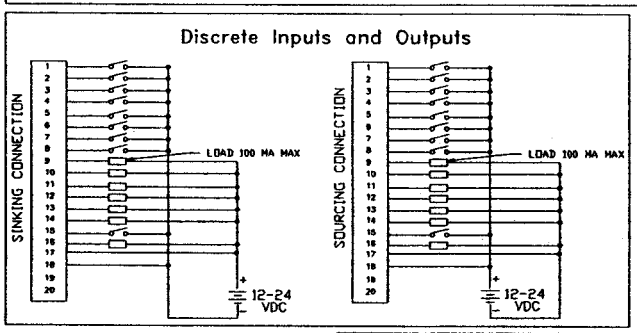
L -- R

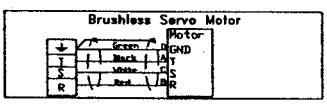


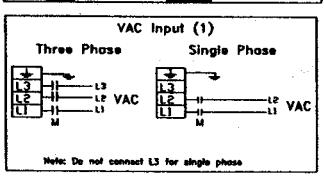


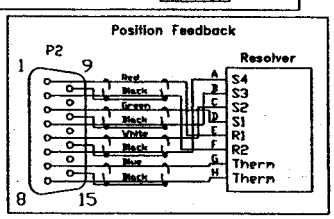


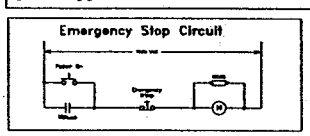






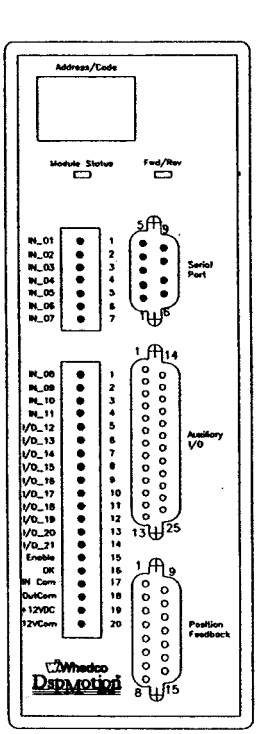




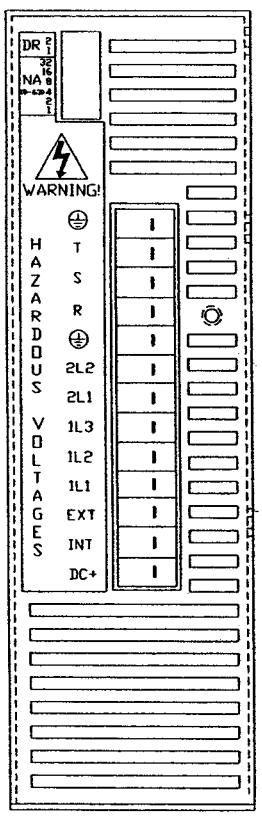


REMARKS:
(1) Input power 90 to 250 VAC, 50–440 Hz
1 phase @ 7 Amps, 3 phase @ 4 Amps

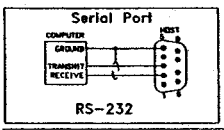
(2) Must turn off power before changing settings.
R= right (closed)
L= left (open)

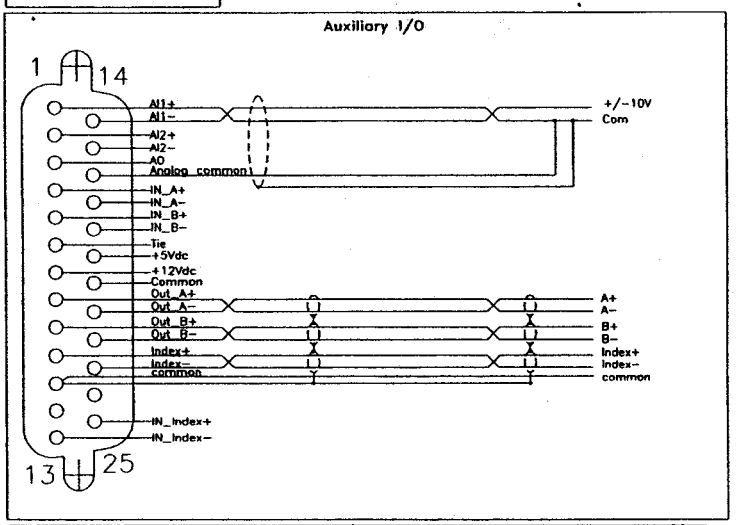


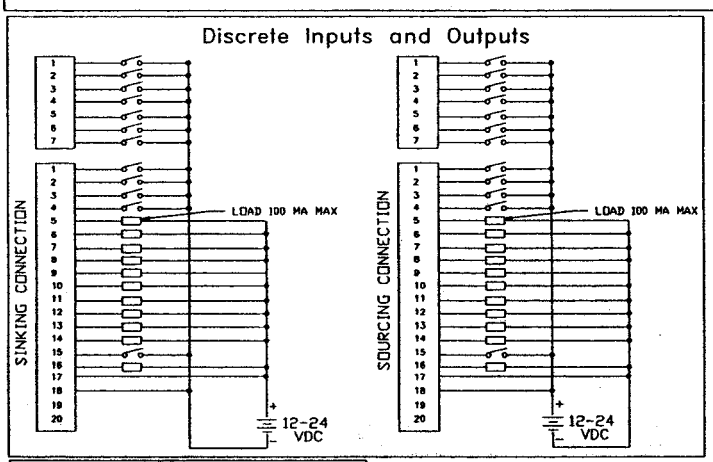
FRONT VIEW

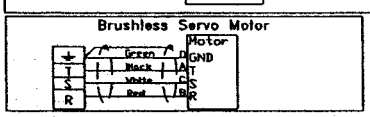


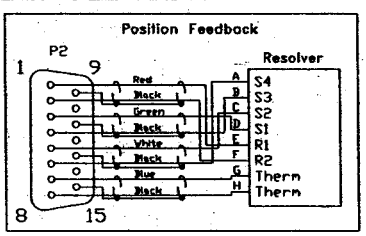
BOTTOM VIEW

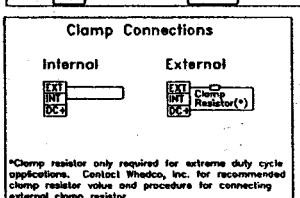


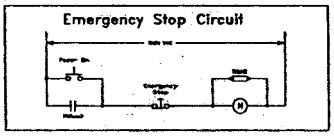


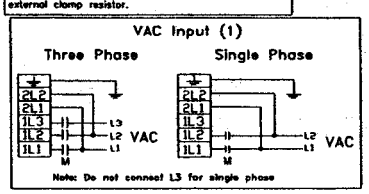




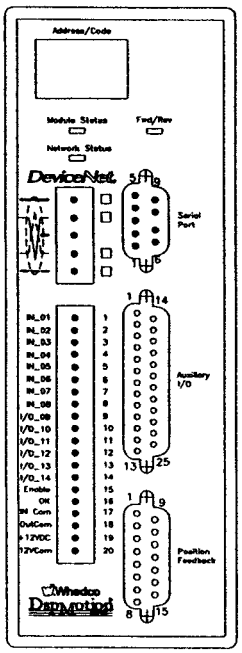




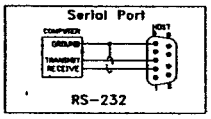


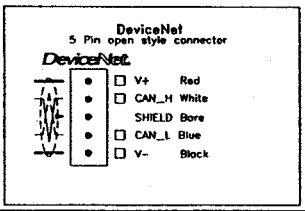


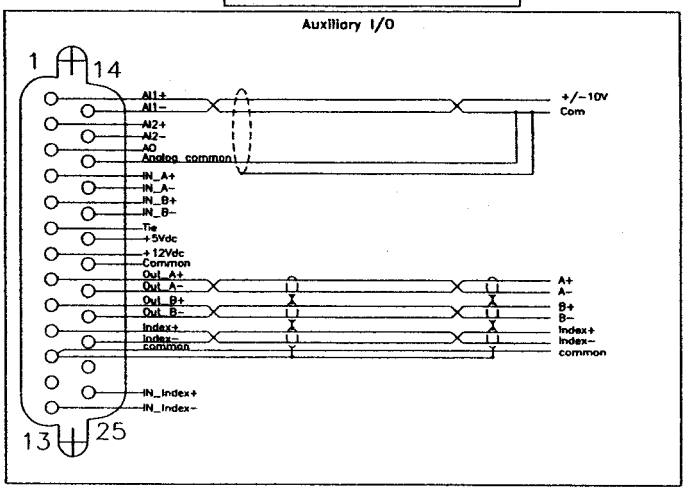
REMARKS:
(1) Input power 90 to 250 VAC, 50–440 Hz
1 phase @ 17 Amps, 3 phase @ 9 Amps

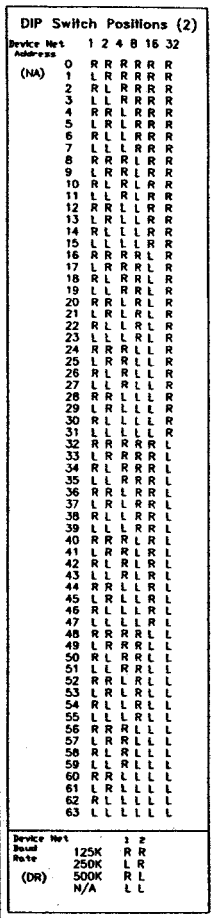


FRONT VIEW



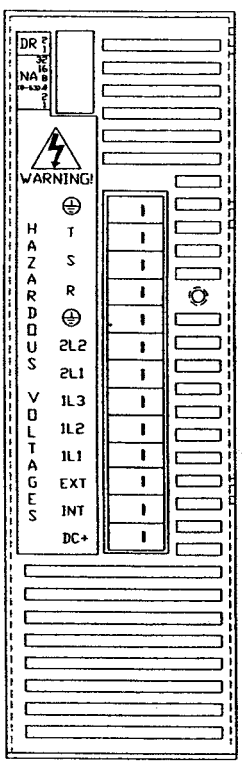




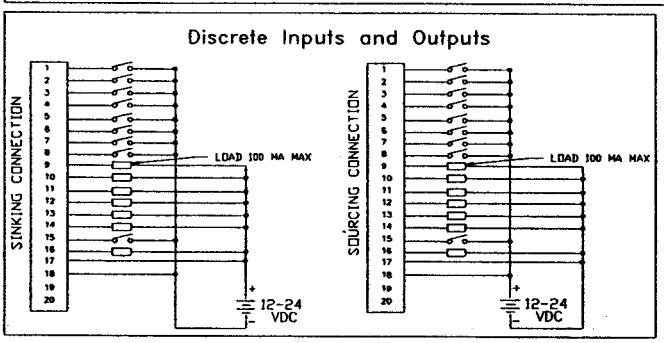


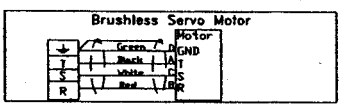
DIP Switch Orientation:

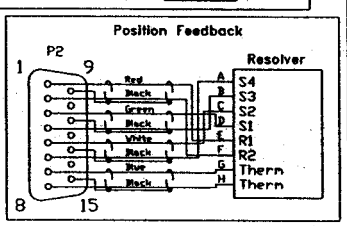
L -- R

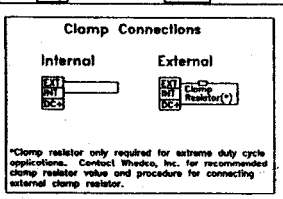


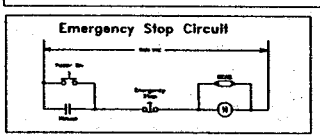
BOTTOM VIEW

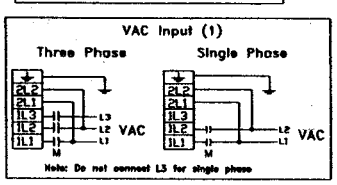








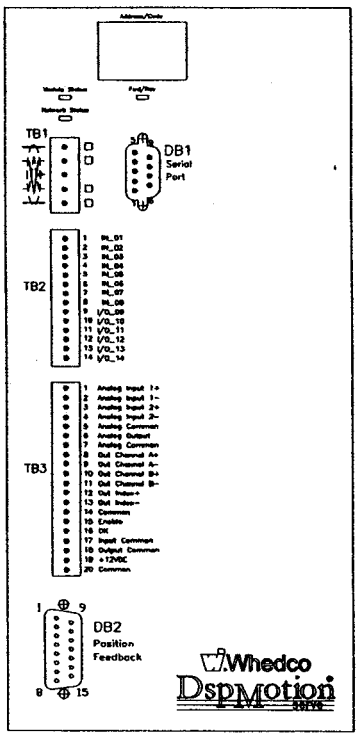




REMARKS:
(1) Input power 90 to 250 VAC, 50-440 Hz
1 phase @ 15 Amps, 3 phase @ 8 Amps

(2) Must turn off power before changing settings.
R= right (closed)
L= left (open)

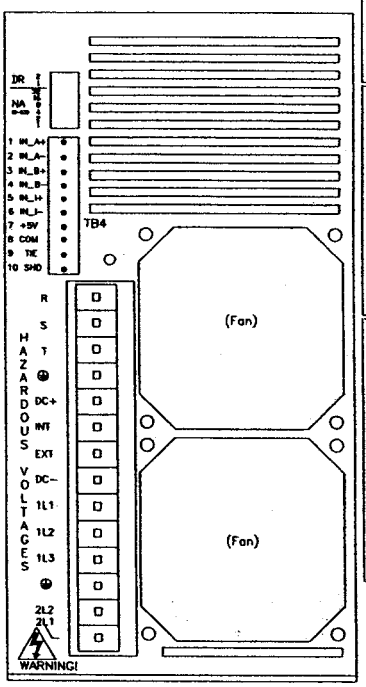
IMJ-31GD-2-D
IMJ-31TD-2-D



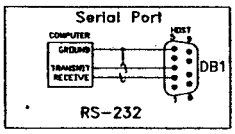
FRONT VIEW

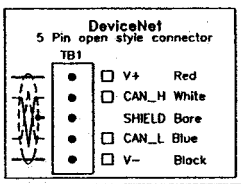
DIP Switch Orientation:

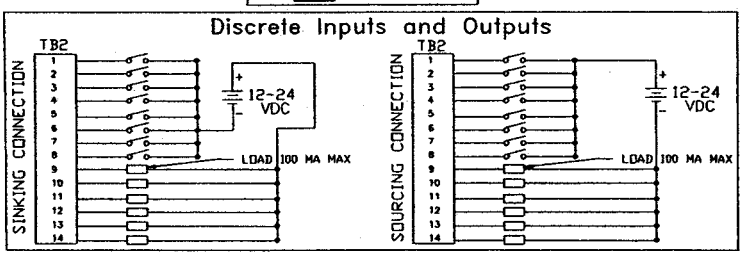
L – R

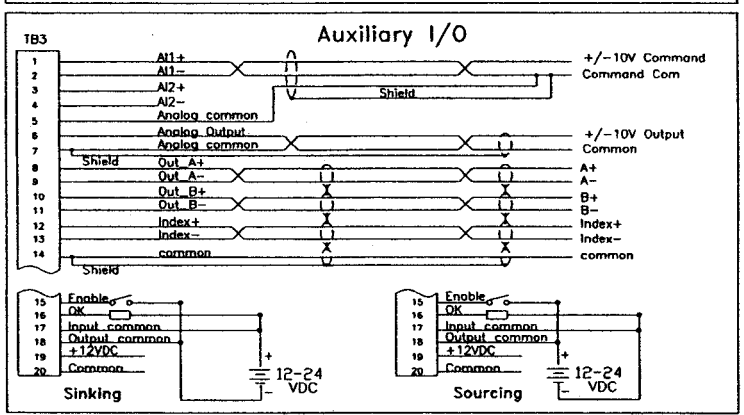


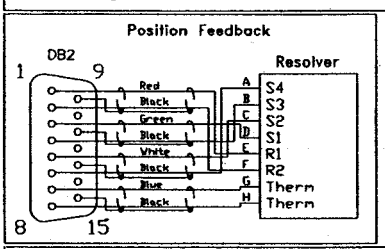
BOTTOM VIEW

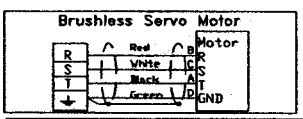


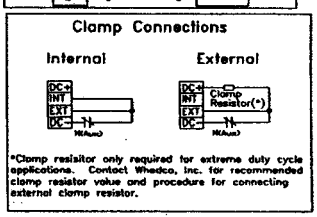


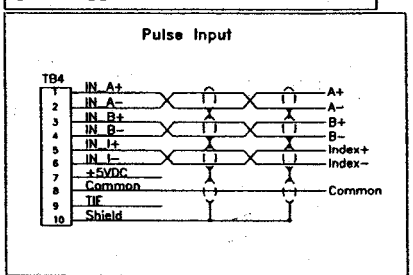


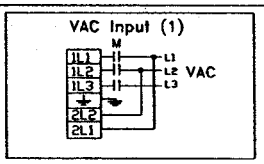


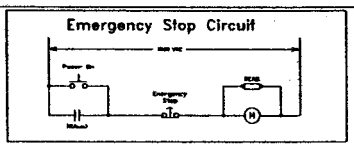












DIP Switch Positions (2)

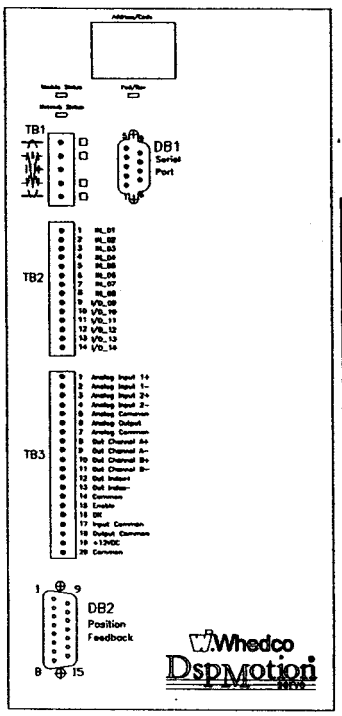
Device Net Address		1	2	4	8	16	32
(NA)	0	R	R	R	R	R	R
	1	L	R	R	R	R	R
	2	R	L	R	R	R	R
	3	L	L	R	R	R	R
	4	R	R	L	R	R	R
	5	L	R	L	R	R	R
	6	R	L	L	R	R	R
	7	L	L	L	R	R	R
	8	R	R	R	L	R	R
	9	L	R	R	L	R	R
	10	R	L	R	L	R	R
	11	L	L	R	L	R	R
	12	R	R	L	L	R	R
	13	L	R	L	L	R	R
	14	R	L	L	L	R	R
	15	L	L	L	L	R	R
	16	R	R	R	R	L	R
	17	L	R	R	R	L	R
	18	R	L	R	R	L	R
	19	L	L	R	R	L	R
	20	R	R	L	R	L	R
	21	L	R	L	R	L	R
	22	R	L	L	R	L	R
	23	L	L	L	R	L	R
	24	R	R	R	L	L	R
	25	L	R	R	L	L	R
	26	R	L	R	L	L	R
	27	L	L	R	L	L	R
	28	R	R	L	L	L	R
	29	L	R	L	L	L	R
	30	R	L	L	L	L	R
	31	L	L	L	L	L	R
	32	R	R	R	R	R	L
	33	L	R	R	R	R	L
	34	R	L	R	R	R	L
	35	L	L	R	R	R	L
	36	R	R	L	R	R	L
	37	L	R	L	R	R	L
	38	R	L	L	R	R	L
	39	L	L	L	R	R	L
	40	R	R	R	L	R	L
	41	L	R	R	L	R	L
	42	R	L	R	L	R	L
	43	L	L	R	L	R	L
	44	R	R	L	L	R	L
	45	L	R	L	L	R	L
	46	R	L	L	L	R	L
	47	L	L	L	L	R	L
	48	R	R	R	R	L	L
	49	L	R	R	R	L	L
	50	R	L	R	R	L	L
	51	L	L	R	R	L	L
	52	R	R	L	R	L	L
	53	L	R	L	R	L	L
	54	R	L	L	R	L	L
	55	L	L	L	R	L	L
	56	R	R	R	L	L	L
	57	L	R	R	L	L	L
	58	R	L	R	L	L	L
	59	L	L	R	L	L	L
	60	R	R	L	L	L	L
	61	L	R	L	L	L	L
	62	R	L	L	L	L	L
	63	L	L	L	L	L	L

Device Net Baud Rate		1	2
	125K	R	R
	250K	L	R
(DR)	500K	R	L
	N/A	L	L

REMARKS:

(1) Input power 180 to 250 VAC
3 phase 50–440 Hz @ 18 Amps for IMJ-31GD-2-D
3 phase 50–440 Hz @ 30 Amps for IMJ-31TD-2-D

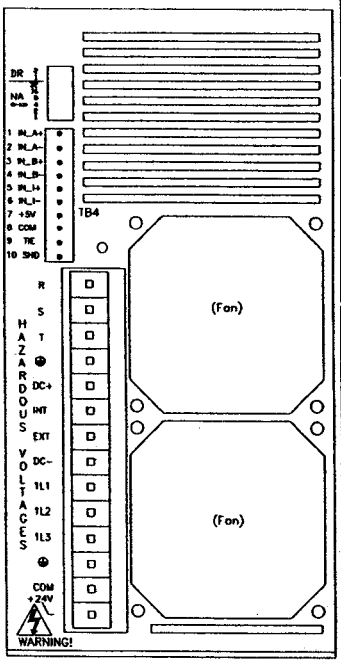
(2) Must turn off power before changing settings.
R= right (closed)
L= left (open)



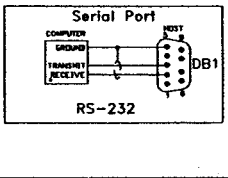
FRONT VIEW

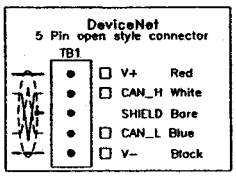
DIP Switch Orientation:

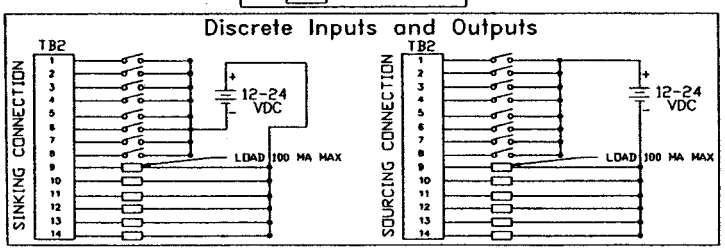
L -- R

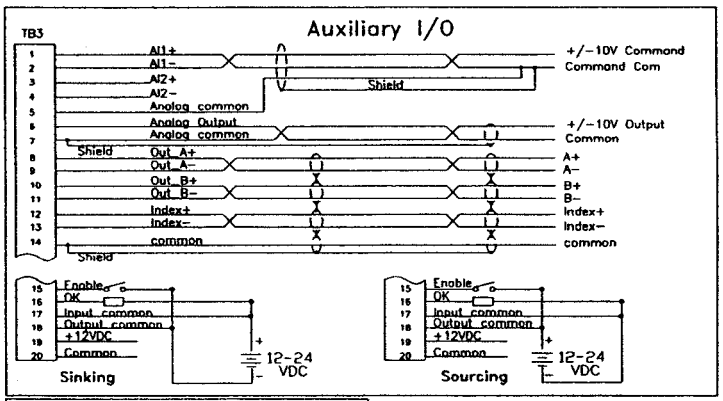


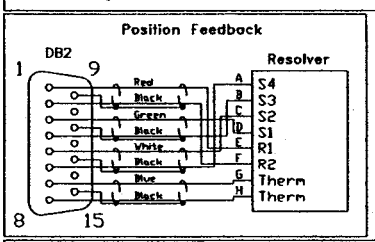
BOTTOM VIEW

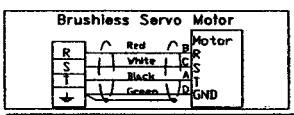


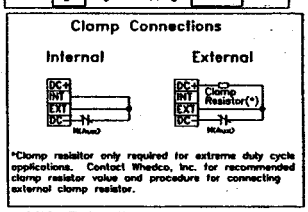


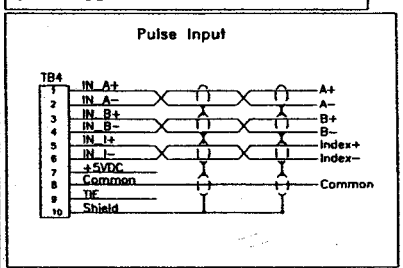


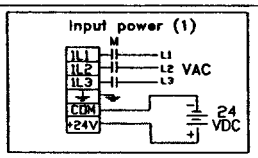


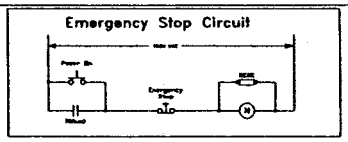












REMARKS:

(1) Input motor power 324 to 528 VAC
3 phase 50-440 Hz @ 22 Amps
Input logic power 18 to 30 VDC @ 2 Amps

(2) Must turn off power before changing settings.
R= right (closed)
L= left (open)

DIP Switch Positions (2)

Device Net Address		1	2	4	8	16	32
(NA)	0	R	R	R	R	R	R
	1	L	R	R	R	R	R
	2	R	L	R	R	R	R
	3	L	L	R	R	R	R
	4	R	R	L	R	R	R
	5	L	R	L	R	R	R
	6	R	L	L	R	R	R
	7	L	L	L	R	R	R
	8	R	R	R	L	R	R
	9	L	R	R	L	R	R
	10	R	L	R	L	R	R
	11	L	L	R	L	R	R
	12	R	R	L	L	R	R
	13	L	R	L	L	R	R
	14	R	L	L	L	R	R
	15	L	L	L	L	R	R
	16	R	R	R	R	L	R
	17	L	R	R	R	L	R
	18	R	L	R	R	L	R
	19	L	L	R	R	L	R
	20	R	R	L	R	L	R
	21	L	R	L	R	L	R
	22	R	L	L	R	L	R
	23	L	L	L	R	L	R
	24	R	R	R	L	L	R
	25	L	R	R	L	L	R
	26	R	L	R	L	L	R
	27	L	L	R	L	L	R
	28	R	R	L	L	L	R
	29	L	R	L	L	L	R
	30	R	L	L	L	L	R
	31	L	L	L	L	L	R
	32	R	R	R	R	R	L
	33	L	R	R	R	R	L
	34	R	L	R	R	R	L
	35	L	L	R	R	R	L
	36	R	R	L	R	R	L
	37	L	R	L	R	R	L
	38	R	L	L	R	R	L
	39	L	L	L	R	R	L
	40	R	R	R	L	R	L
	41	L	R	R	L	R	L
	42	R	L	R	L	R	L
	43	L	L	R	L	R	L
	44	R	R	L	L	R	L
	45	L	R	L	L	R	L
	46	R	L	L	L	R	L
	47	L	L	L	L	R	L
	48	R	R	R	R	L	L
	49	L	R	R	R	L	L
	50	R	L	R	R	L	L
	51	L	L	R	R	L	L
	52	R	R	L	R	L	L
	53	L	R	L	R	L	L
	54	R	L	L	R	L	L
	55	L	L	L	R	L	L
	56	R	R	R	L	L	L
	57	L	R	R	L	L	L
	58	R	L	R	L	L	L
	59	L	L	R	L	L	L
	60	R	R	L	L	L	L
	61	L	R	L	L	L	L
	62	R	L	L	L	L	L
	63	L	L	L	L	L	L

Device Net Baud Rate		1	2
	125K	R	R
	250K	L	R
(DR)	500K	R	L
	N/A	L	L

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