

MAINTENANCE AND TROUBLESHOOTING1. Motor Maintenance

All mechanical parts of the motor should be inspected regularly to ensure that no bolts or couplings have worked loose during normal operation. This can prevent some minor problems from developing into anything more serious.

2. Diagnostic LED's

**STATUS** -- This is a bi-color LED which will be green under normal operating conditions. If this LED is red it indicates a microprocessor failure. Cycling power to the drive will clear this condition only if it is temporary. If the LED remains red the unit should be returned for repair. If the unit powers up and the LED is green, the I-Drive should be ready for operation again. Intermittent occurrences of a red STATUS LED can often signify electrical noise interference. See the System Installation Recommendations section of this manual for recommended noise suppression devices. If this LED is off it indicates a loss of the low voltage power supply. Check for correct input voltages and for fuses blown. If everything checks out and the drive is still not operating or if fuses blow when power is reapplied, send the unit back for repair.

**FAULT** -- This red LED will be off under normal operating conditions. It will be red if the amplifier section of the drive is shutdown. The amplifier will shutdown itself if an over-current, short-circuit or over-temperature condition exists. This LED will also be lit if the amplifier is shutdown by the Remote Power Shutdown input or if the microprocessor shuts down the amplifier because the ERROR LED is on. If this LED comes on, first try disconnecting the indexer cable. If the LED goes off, it was probably caused by a Remote Power Shutdown. If it stays on, remove power and examine the connections to the motor to verify that no short circuits exist in the wiring or motor, winding to winding or winding to ground.

**ERROR** -- This LED is normally off and glows red when the microprocessor detects an error condition such as excess following error or exceeding the average current definition. These error conditions will cause the microprocessor to shut down the amplifiers, which will also cause the FAULT LED to go on. The RE command can be issued to determine what condition(s) exist. The error condition can be cleared by resetting the drive, either by cycling power or through the FAULT RESET input on the indexer connector.

Each of the three amplifier boards has three LED's which indicate READY, OVER-CURRENT and OVER-TEMPERATURE. If the FAULT LED is on, the front cover can be removed so you can determine which amplifier board caused the fault.

SPECIFICATIONS**System dependent:**

<u>DESCRIPTION</u>	<u>VALUE</u>	<u>UNITS</u>
Repeatability	+/- 0.088	degrees, unloaded.
Accuracy	+/- 0.23	degrees, unloaded.
Relative Accuracy	+/- 0.088	degrees, any load.
Driver Operating Temperature	0 to +50	degrees Celsius.
Motor Operating Temperature	130	degrees Celsius, max.
Storage Temperature	-40 to +85	degrees Celsius.
Humidity	0 to 95	percent, non-condensing.

**Motor dependent:**

(See Compumotor catalog for speed-torque curves)

<u>DESCRIPTION</u>	<u>I-610</u>	<u>I-620</u>	<u>UNITS</u>
Static Torque (cont.)	900	2800	ounce-inches
Static Torque (peak)	1800	5500	ounce-inches
Top Speed	60	20	revolutions/second
Rotor Inertia	135.1	270.2	ounce-inches <sup>2</sup>
Maximum Radial Load	100	150	pounds
Motor Weight	24	40	pounds
Total Shipping Weight	56	72	pounds

Physical Description

I-Drive Height: 13.50 inches (34.29 cm)  
 I-Drive Width: 15.63 inches (39.70 cm)  
 I-Drive Depth: 8.50 inches (21.59 cm)

I-Drive Weight: 28 lbs (12.7 kg) without motor  
 32 lbs (14.5 kg) without motor,  
 with shipping container

Environmental

Operating temperature: 32°F to 122°F (0°C to 50°C) when passively cooled.  
 Humidity: 0-95%, non-condensing.

Electrical

## Input power:

Configuration 1: Single phase power  
 Voltage: 105-125 VAC, single phase.  
 Frequency: 47-66 Hz.  
 Current: 20 amps maximum continuous (RMS).

Configuration 2: Three phase power  
 Voltage: 105-125 VAC, three phase.  
 Frequency: 47-66 Hz.  
 Current: 20 amps maximum continuous (RMS).

## Output power: (to motor)

Voltage: 160 VDC peak  
 Frequency: 20 kHz PWM  
 Current: 10.0 amps continuous per phase.  
 18.0 amps per phase peak.

Inputs and Outputs

Motor: 11 connection Power and Motor terminal block.

A+ PHASE A+ Positive lead of motor phase A. (blue)  
 A- PHASE A- Return lead for motor phase A. (yellow)  
 B+ PHASE B+ Positive lead of motor phase B. (brown)  
 B- PHASE B- Return lead for motor phase B. (orange)  
 C+ PHASE C+ Positive lead of motor phase C. (black)  
 C- PHASE C- Return lead for motor phase C. (red)

CHASSIS GROUND Motor case and shield ground. (black/red)

Power: 11 connection Power and Motor terminal block.

115 VAC single-phase power,

	<u>I-Drive</u>	<u>Wire color</u>
L1	120 VAC LINE	Black (blue)
L2	120 VAC NEUT	White (brown)
L3	n.c.	
GND	AC GND	Green (green with yellow)

115 VAC three-phase power,

	<u>I-Drive</u>	<u>Function</u>
L1	120 VAC 1	120 VRMS, line 1
L2	120 VAC 2	120 VRMS, line 2
L3	120 VAC 3	120 VRMS, line 3
GND	AC GND	Earth ground (green or with yellow)

**Resolver:** 9 pin D connector, female.

1	S1
2	N.C.
3	S4
4	R1
5	SHIELD
6	S2
7	S3
8	N.C.
9	R2

**Indexer:** 25 pin 'D' connector, female

1	<b>STEP+</b> Input. Optically isolated current loop input. 15 mA, 500 nS pulse, minimum; 1 MHZ maximum. Rising edge of current pulse causes one step.
14	<b>STEP-</b> Input. Return for Step+.
2	<b>DIRECTION+</b> Input. Optically isolated current loop input. 20 mA nominal. Must be held active at least 10 microseconds prior to rising current edge of STEP+.
15	<b>DIRECTION-</b> Input. Return for STEP+.
16	<b>RPS+</b> Input. Optically isolated current loop input. 20 mA nominal. Presence of current on RPS (Remote Power Shutdown) causes current to be removed from the motor phase outputs.
17	<b>RPS-</b> Input. Return for RPS+.
10	<b>SLIP FAULT+</b> Output. 20 mA nominal current output. Presence of current indicates that the motor is not



APPENDIX A

## CONNECTOR LISTING

**POWER** 11 connection Power and Motor terminal block.

	<u>Single phase</u>	<u>Three phase</u>
1	GND -- AC GND	AC GND
2	L1 -- 120 VAC LINE	120 VAC Line 1
3	L2 -- 120 VAC NEUT	120 VAC Line 2
4	L3 -- n.c.	120 VAC Line 3

**MOTOR CONNECTOR** 11 connection Power and Motor terminal block.

5	-- CHASSIS GROUND (black/red).
6	A+ -- MOTOR PHASE A+ (blue).
7	A- -- MOTOR PHASE A- (yellow).
8	B+ -- MOTOR PHASE B+ (brown).
9	B- -- MOTOR PHASE B- (orange).
10	C+ -- MOTOR PHASE C+ (black).
11	C- -- MOTOR PHASE C- (red).

**RESOLVER** 9 Pin D-connector, female.

1	-- S1
2	-- n.c.
3	-- S4
4	-- R1
5	-- SHIELD
6	-- S2
7	-- S3
8	-- n.c.
9	-- R2

**AUXILIARY** 4 Pin Entrelec

1	DRIVE FAULT+
2	DRIVE FAULT-
3	DRIVE ENABLE-
4	DRIVE ENABLE+

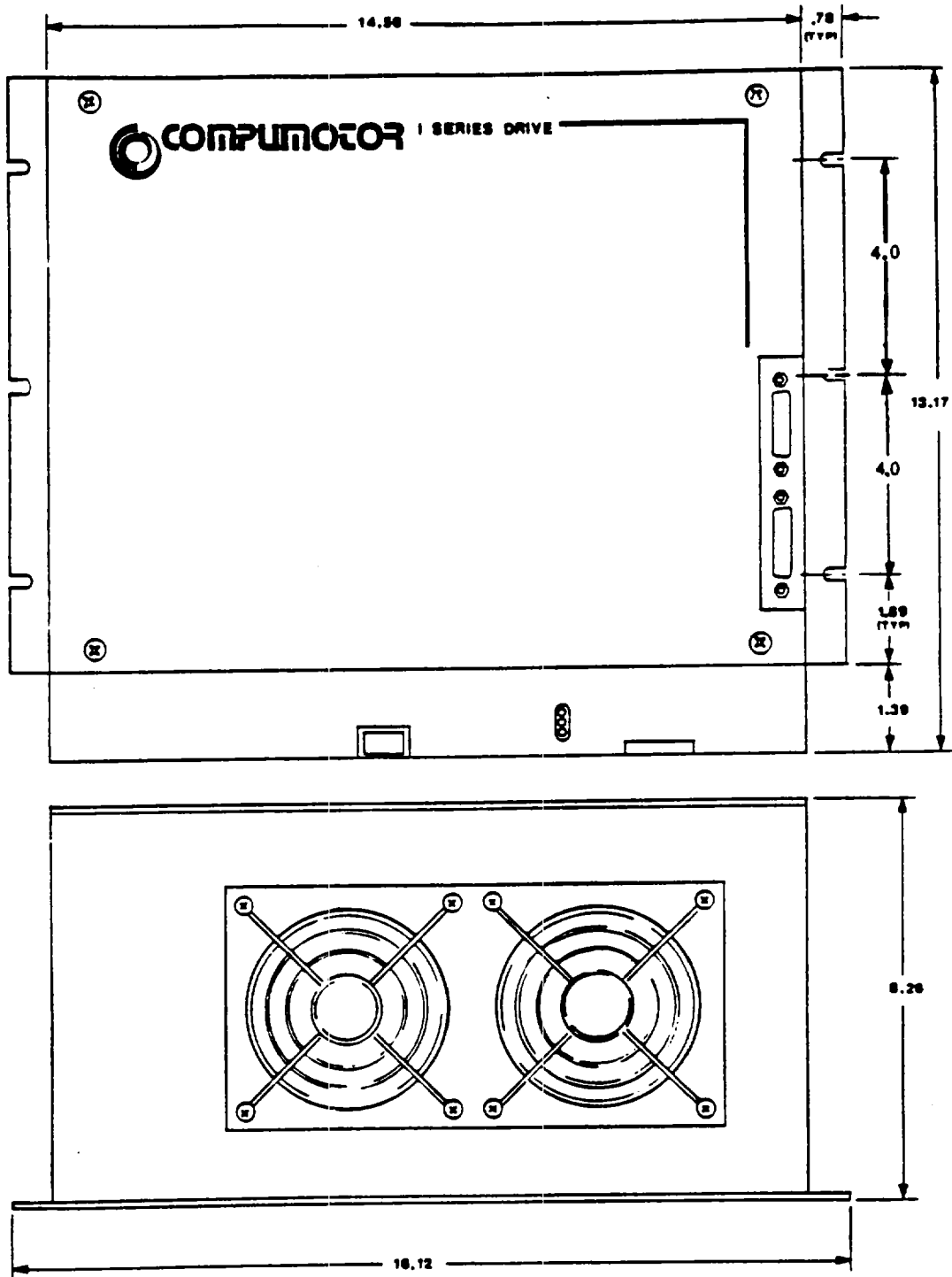
**INDEXER** 25-pin 'D' connector, female.

1	--	STEP+
2	--	DIRECTION+
3	--	n.c.
4	--	n.c.
5	--	SHIELD
6	--	n.c.
7	--	FAULT RESET+
8	--	n.c.
9	--	DRIVE FAULT+
10	--	SLIP FAULT+
11	--	n.c.
12	--	RESERVED
13	--	n.c.
14	--	STEP-
15	--	DIRECTION-
16	--	REMOTE POWER SHUTDOWN+
17	--	REMOTE POWER SHUTDOWN-
18	--	n.c.
19	--	FAULT RESET-
20	--	n.c.
21	--	DRIVE FAULT-
22	--	SLIP FAULT-
23	--	n.c.
24	--	n.c.
25	--	n.c.

**RS-232** 25-pin D connector, female.

1	--	N.C.
2	--	RECEIVE
3	--	TRANSMIT
4	--	N.C.
5	--	N.C.
6	--	N.C.
7	--	GROUND
8 - 25	--	N.C.

APPENDIX B

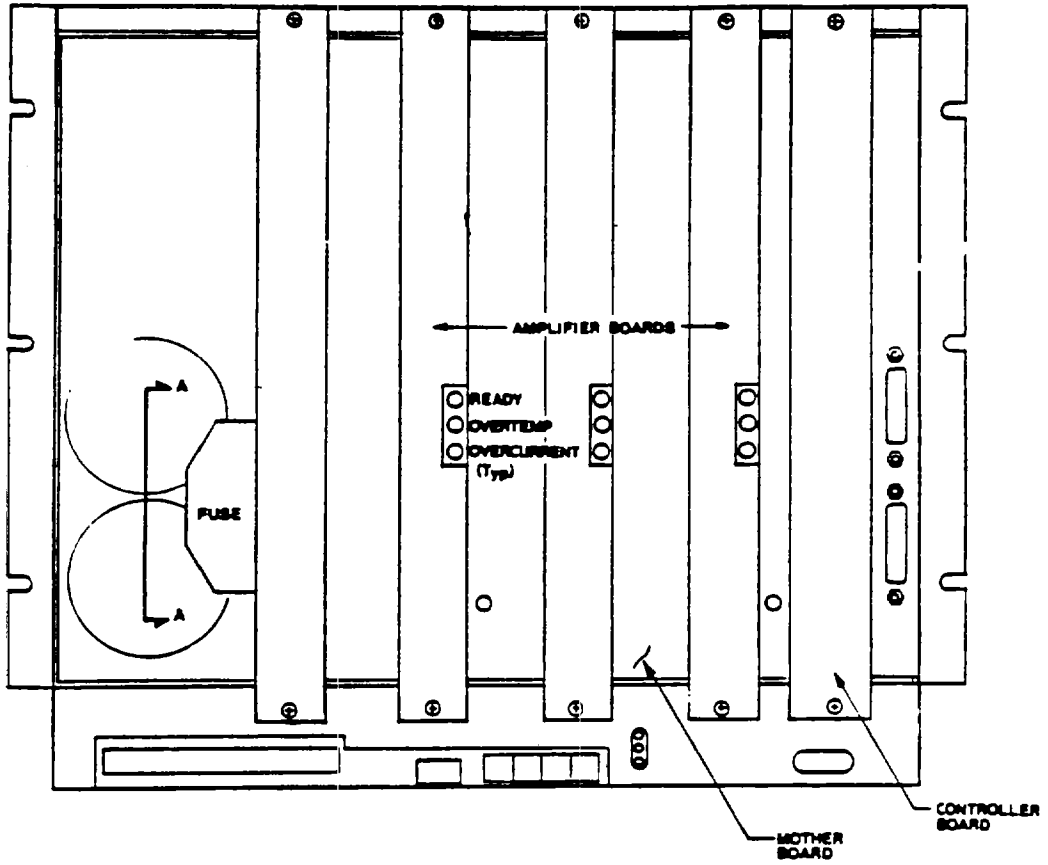


I-Series DIMENSIONAL DRAWING

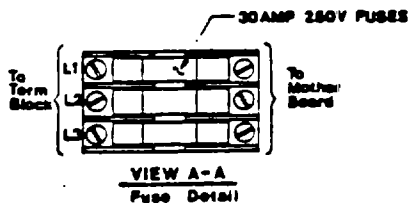




APPENDIX D



FRONT VIEW W/O COVER



**FUSE AND INTERNAL COMPONENT LOCATION DRAWING**



APPENDIX E**SUMMARY OF ERROR CONDITIONS**

The following summaries list all the abnormal conditions one may encounter with the I-Drive. Under each condition is a list of the indicators for that condition.

**Operation Error Conditions****SLIP FAULT:**

Indexer SLIP FAULT output = ACTIVE

**SHUTDOWN:**

Indexer FAULT OUTPUT = ACTIVE  
DRIVE FAULT LED = ON

**ERRORS AND FAULTS:**

Indexer FAULT OUTPUT = ACTIVE  
Auxiliary FAULT OUTPUT = ACTIVE  
DRIVE FAULT LED = ON  
ERROR LED = ON  
"RE" messages --  
    "Temp. and/or current limits exceeded"  
    "Maximum following error exceeded"  
    "Average current limit exceeded"  
    "STEP pulses detected during enable"

**Hardware Error Conditions****POWER/FUSES:**

STATUS LED = OFF

**MICROPROCESSOR:**

STATUS LED = RED

**CONTROLLER:**

Indexer FAULT OUTPUT = ACTIVE  
Auxiliary FAULT OUTPUT = ACTIVE  
DRIVE FAULT LED = ON  
ERROR LED = ON  
"RE" Messages --  
    "RAM failed initialization"  
    "EPROM failed CRC check"  
    "EAROM failed CRC check"

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