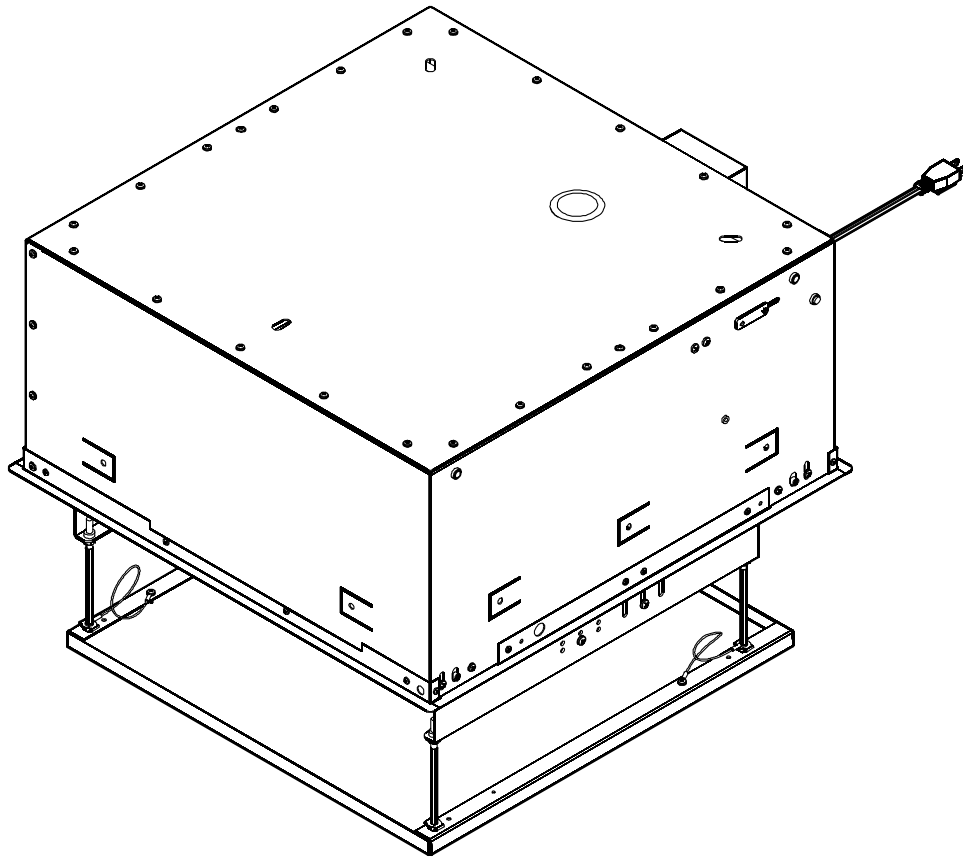


INSTALLATION INSTRUCTIONS



SMART-LIFT™ Electric Ceiling Lift

This device complies with part 15 of the FCC rules. Operation is subject to the following 2 conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio or television communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment to an outlet on a circuit other than that to which the receiver is connected

Consult the dealer or an experienced radio/TV technician for help



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SL151

DISCLAIMER

Milestone AV Technologies, and its affiliated corporations and subsidiaries (collectively, "Milestone"), intend to make this manual accurate and complete. However, Milestone makes no claim that the information contained herein covers all details, conditions or variations, nor does it provide for every possible contingency in connection with the installation or use of this product. The information contained in this document is subject to change without notice or obligation of any kind. Milestone makes no representation of warranty, expressed or implied, regarding the information contained herein. Milestone assumes no responsibility for accuracy, completeness or sufficiency of the information contained in this document.

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IMPORTANT SAFETY INSTRUCTIONS



WARNING alerts you to the possibility of serious injury or death if you do not follow the instructions.



CAUTION alerts you to the possibility of damage or destruction of equipment if you do not follow the corresponding instructions.



WARNING: FAILURE TO READ AND FOLLOW THE FOLLOWING INSTRUCTIONS CAN RESULT IN SERIOUS PERSONAL INJURY, DAMAGE TO EQUIPMENT OR VOIDING OF FACTORY WARRANTY. It is the installer's responsibility to make sure all components are properly assembled and installed using the instructions provided.

IMPORTANT ! : Model SL151 is suitable for use in Other Environmental Air Space in Accordance with Section 300.22(C) of the National Electrical Code.

When using an electrical mounting system, basic precautions should always be followed, including the following:

READ ALL INSTRUCTIONS BEFORE USING THIS PRODUCT!!!!



DANGER: TO REDUCE THE RISK OF ELECTRIC SHOCK:

1. Always turn off power at source before cleaning.



WARNING: TO REDUCE THE RISK OF BURNS, FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS:

- Always turn off power at source before putting on or taking off parts.
- Use this mounting system only for its intended use as described in these instructions. Do NOT use attachments not recommended by the manufacturer.
- Never operate this mounting system if it has a damaged test cord or test plug. If it is not working properly during testing, return the mounting system to a service center for examination and repair.
- Keep the test power cord away from heated surfaces.
- Never operate the mounting system with the air openings blocked. Keep the air openings free of lint, hair, and the like.
- Never drop or insert any object into any opening.
- Do not use outdoors unless marked for outdoor use.
- Route cords and cables as shown in the installation instructions.
- To disconnect, turn all controls to the off position, then turn off power at source.



WARNING: RISK OF ELECTRIC SHOCK!

Connect this mounting system to a properly grounded outlet only. See Grounding Instructions.



CAUTION: Changes or modifications to this unit not expressly approved by the manufacturer can void the units FCC compliance rating and make the unit illegal to operate.



WARNING: Failure to provide adequate structural strength for this component can result in serious personal injury or damage to equipment! It is the installer's responsibility to make sure the structure to which this component is attached can support five times the combined weight of all equipment. Reinforce the structure as required before installing the component.



WARNING: Exceeding the weight capacity can result in serious personal injury or damage to equipment! It is the installer's responsibility to make sure the weight of all components attached to the SL151 does not exceed 35 lbs (15.9 kg).

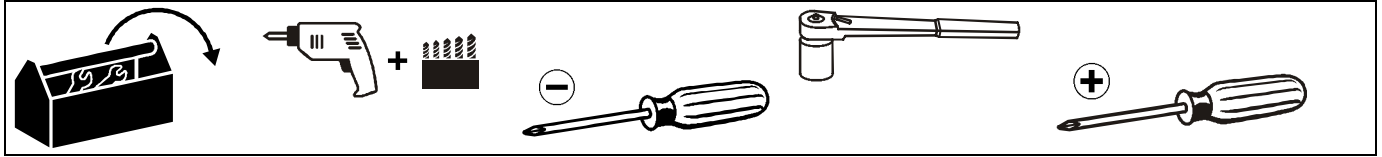


WARNING: RISK OF INJURY! Do not place video equipment such as televisions or computer monitors on the ceiling panel of the SL151.

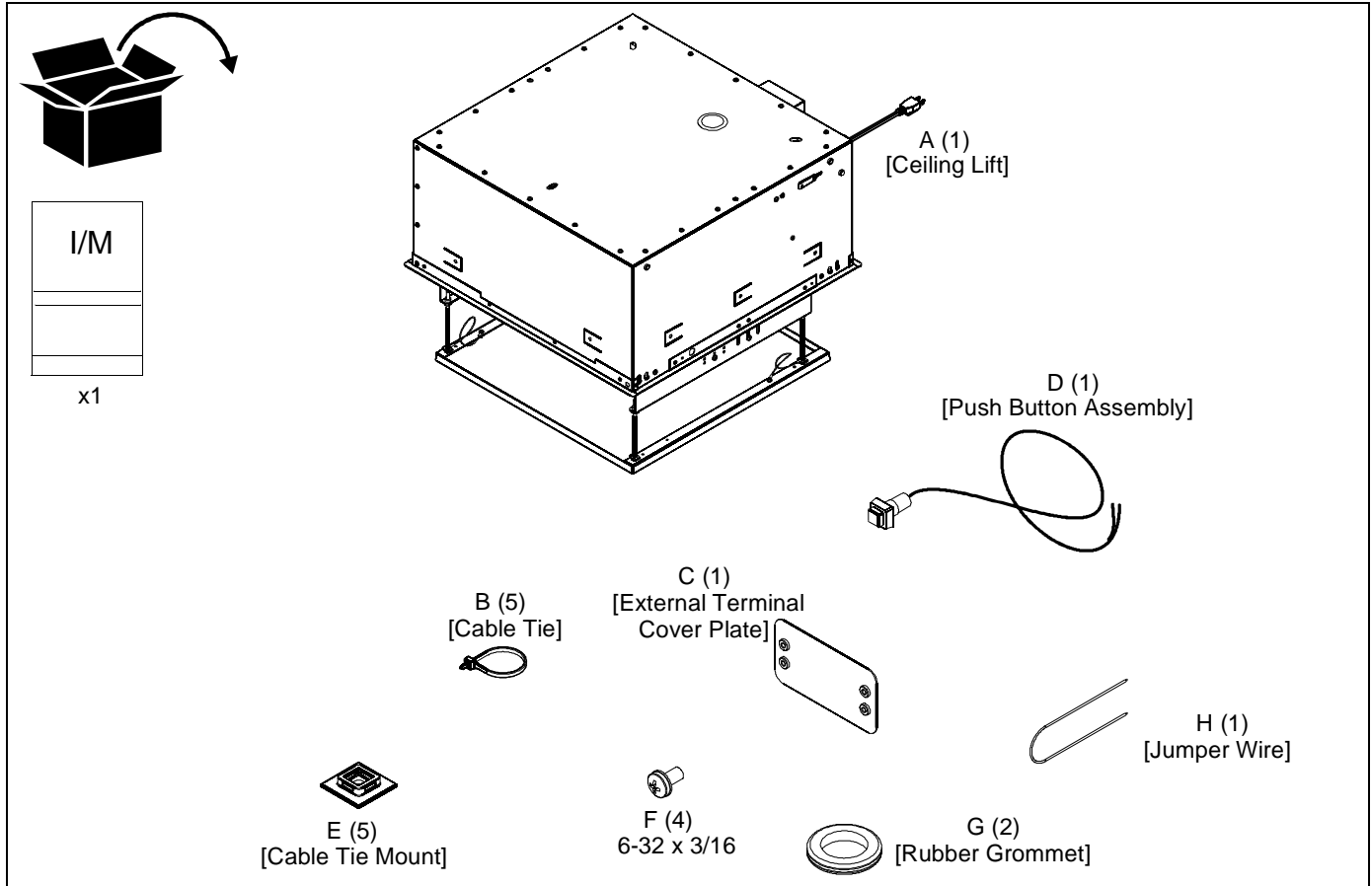
NOTE: This system has no user serviceable parts.

--SAVE THESE INSTRUCTIONS--

TOOLS REQUIRED FOR INSTALLATION



PARTS



LEGEND

	Tighten Fastener		Phillips Screwdriver
	Apretar elemento de fijación		Marcar con lápiz
	Befestigungsteil festziehen		Stiftmarkierung
	Apertar fixador		Marcar com lápis
	Serrare il fissaggio		Segno a matita
	Bevestiging vastdraaien		Potloodmerkten
Serrez les fixations	Marquage au crayon		
	Loosen Fastener		Adjust
	Aflojar elemento de fijación		Ajustar
	Befestigungsteil lösen		Einstellen
	Desapertar fixador		Ajustar
	Allentare il fissaggio		Regolare
	Bevestiging losdraaien		Afstellen
Desserrez les fixations	Ajuster		

DIMENSIONS

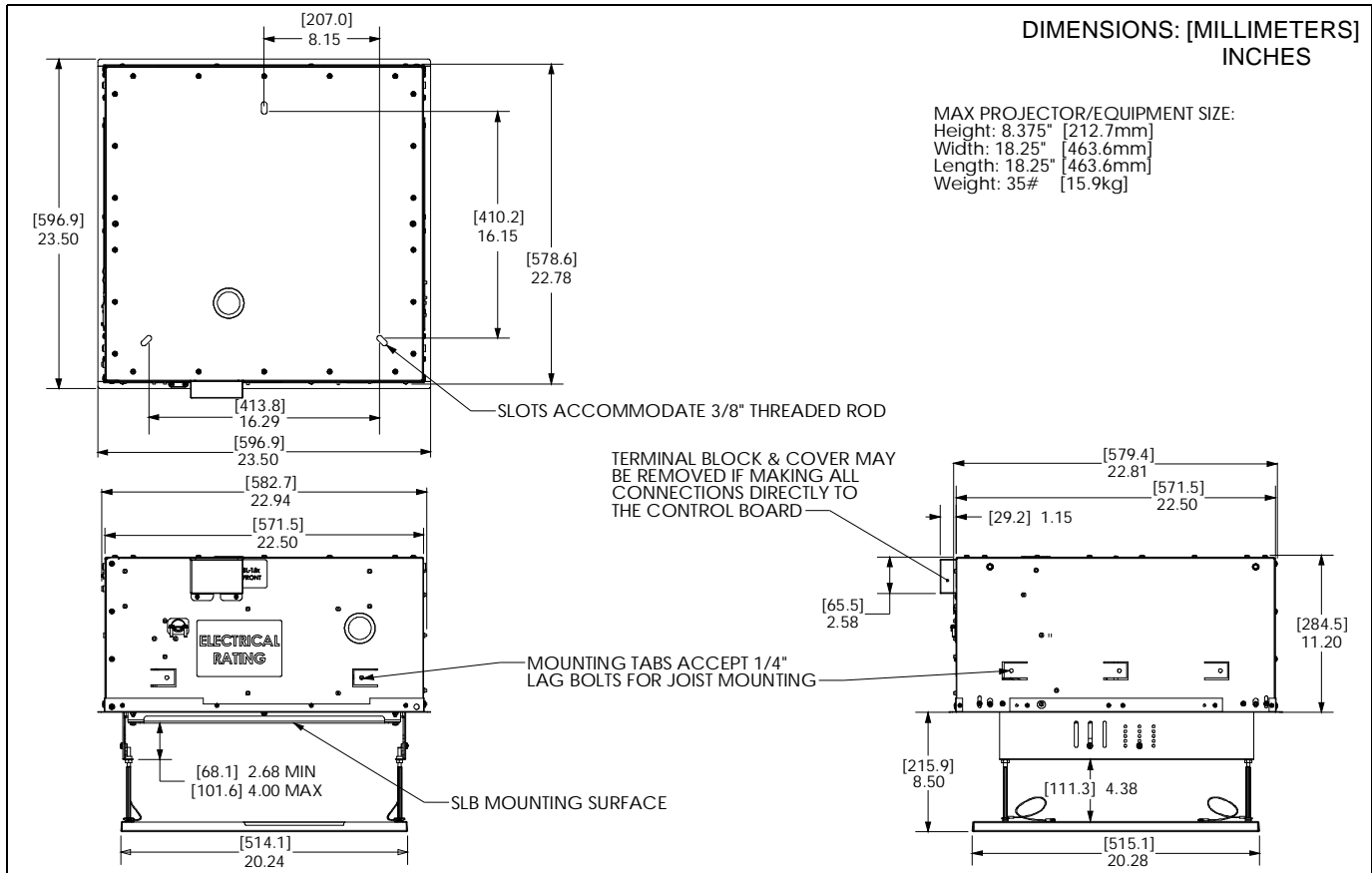


TABLE OF CONTENTS

Disclaimer.....	2	Adjustments.....	7
Tools Required For Installation.....	3	Connecting Control Wiring.....	8
Parts.....	3	Connecting To Power Supply.....	8
Legend.....	3	Wiring Options.....	9
Dimensions.....	4	Re-Attaching Ceiling Panel.....	9
Installation Requirements.....	5	Table 1: Wiring Table.....	10
Power Requirements.....	5	Table 2: Internal Terminal Descriptions.....	11
Pre-test Lift Before Installation.....	5	Internal/External Wiring Terminal	
Power Requirements And Wiring.....	5	Descriptions.....	12
Grounding Instructions.....	6		
Removing Ceiling Panel.....	6		
Installing in Ceiling.....	6		
-Installing In A Suspended Ceiling.....	6		
-Installing In A Wood Framework (Joists)....	7		
Installing Projector On SL151.....	7		

INSTALLATION REQUIREMENTS

The SL151 has been designed to be mounted either recessed into a ceiling, or flush-mounted in a finished ceiling.

Power Requirements

The SL151 requires 120VAC, 60 Hz and 12 amps power to operate.

IMPORTANT ! : Installation and maintenance of this product must be completed by a qualified service technician.

Pre-Test Lift before Installation

- Carefully inspect the SL151 for any shipping damage. If any damage is apparent, do NOT continue with the installation. Instead, contact Chief for further instructions.
- Place SL151 upside down on clean surface. (See Figure 1)

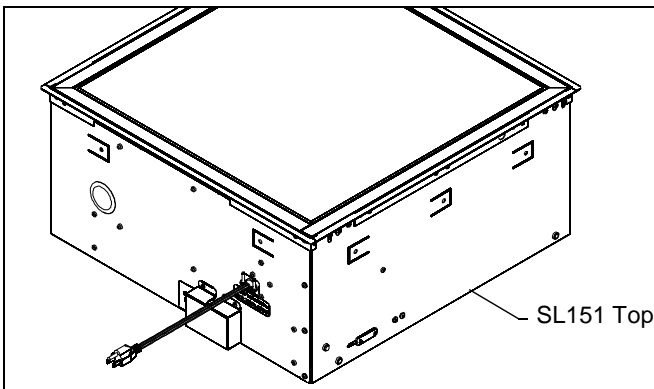


Figure 1

- Remove and save two screws holding side electrical cover in place. (See Figure 2)
- Remove electrical cover. (See Figure 2)

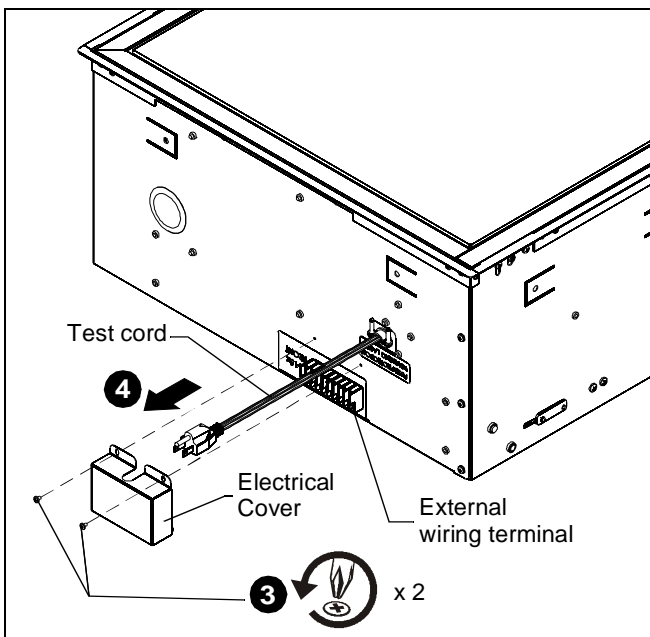


Figure 2

- Place the jumper wire (H) on the external wiring terminal contacts labeled **2** and **5**, and wire the push button assembly (D) to contacts **1** (red) and **6** (black). (See Figure 3).

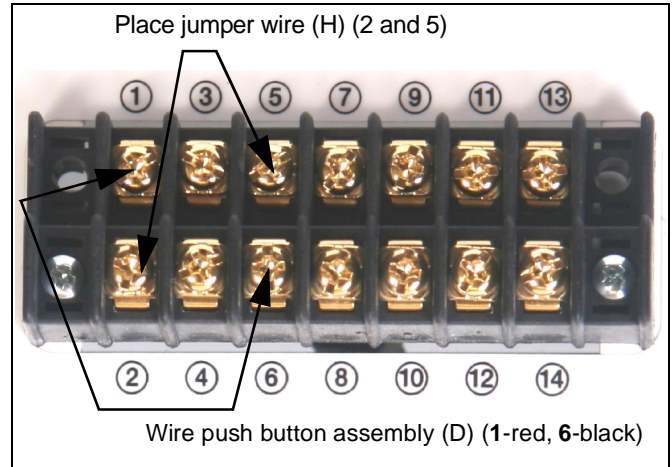


Figure 3

- Plug in the SL151 test cord. (See Figure 2)

NOTE: (See Figure 2) for location of external wiring terminal. (See Figure 4) for location of internal wiring terminal.

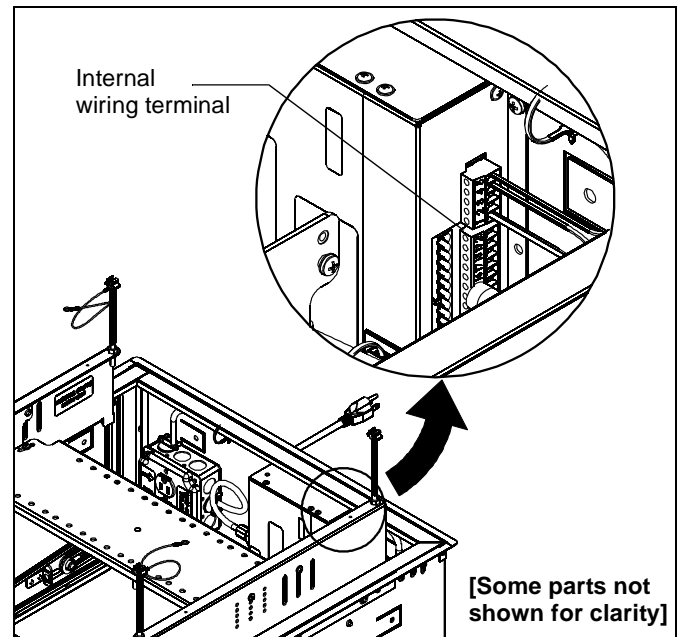


Figure 4

Power Requirements and Wiring

The SL151 requires 120VAC, 60 Hz and 12 amps power to operate.

IMPORTANT ! : This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

Grounding Instructions

This product is equipped with a test cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.



WARNING: RISK OF ELECTROCUTION! All electrical wiring required for installation should be installed by a qualified electrician.



WARNING: PINCH HAZARD! FINGERS OR HANDS BETWEEN MOVING PARTS CAN LEAD TO SEVERE PERSONAL INJURY! Keep fingers and hands away from mount when operating.

7. Press the push button to test the SL151 while it is still in the pre-test position.
 - Press when the lift is at its extended position and it will retract.
 - Press when the lift is at its retracted position and it will extend.
 - Press while the lift is moving and it will stop.
 - Leave SL151 in the open position.

Removing Ceiling Panel

1. Remove and save screws attaching guide wires to ceiling panel. (See Figure 5)

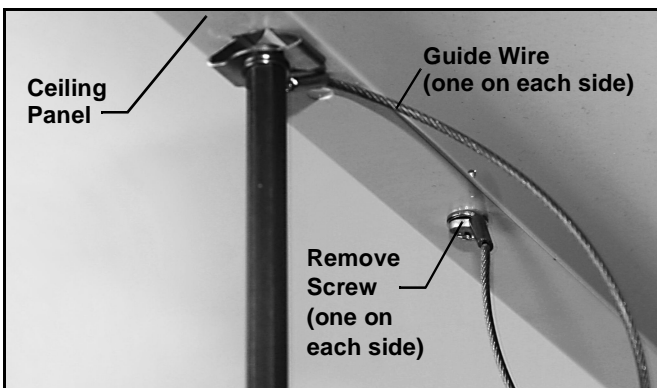


Figure 5

2. Lift up on each corner of ceiling panel to remove pan from clips. (See Figure 6) and (See Figure 7)

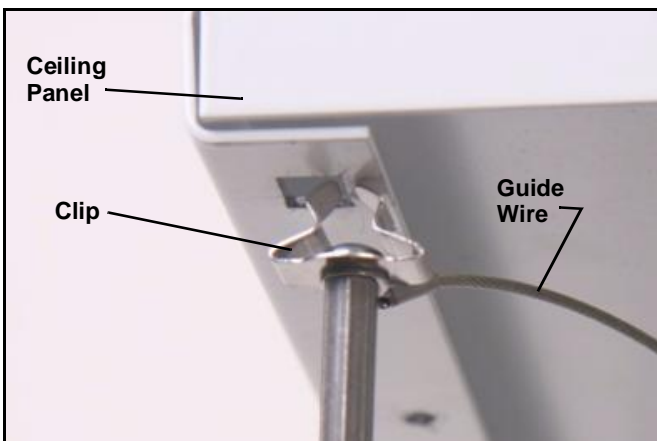


Figure 6



Figure 7

INSTALLING IN CEILING



WARNING: IMPROPER INSTALLATION CAN LEAD TO LIFT FALLING CAUSING SEVERE PERSONAL INJURY OR DAMAGE TO EQUIPMENT! It is the installers responsibility to make certain the structure to which the lift is being mounted is capable of supporting five times the weight of the lift and all attached equipment. Reinforce the structure as required before installing the lift.

NOTE: The following instructions assume a suitable mounting structure and surface exists prior to installation and all power and signal wires and cables have been properly installed.

Installing in a Suspended Ceiling

NOTE: The SL151 may be suspended from three 3/8 in. diameter x 8 in. length (minimum) Grade 2 or better threaded rods (not provided) which are secured to a 1-5/8" x 1-5/8" 12ga metal framing channel (spanning a maximum of 5 feet--not provided) by Grade 2 or better 3/8" channel nuts (not provided).

1. Turn SL151 over and place onto threaded rods, inserting the rods into the three slots on top of the SL151 housing. (See Figure 8)
2. Secure the threaded rods to the SL151 with Grade 2 or better 3/8 in. jam nuts (not provided) and washers (one of each on inside and one of each on outside-not provided).

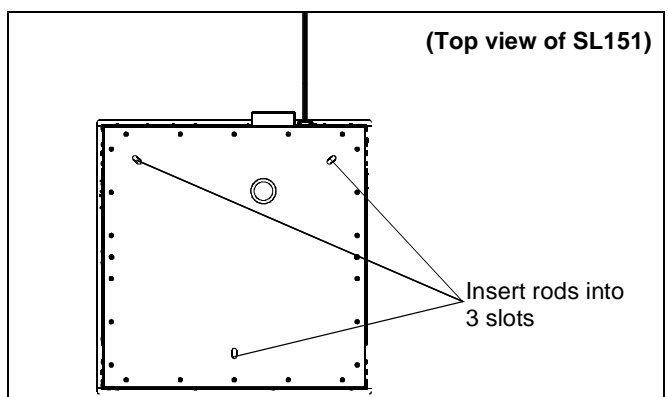


Figure 8

Installing in a Wood Framework (Joists)

1. Use 1/4" x 1-1/2" (minimum) Grade 2 lag screws (not provided) to secure SL151 to the joists or wood framework, using the mounting tabs located on the sides of the SL151 housing. (See Figure 9).

NOTE: There are mounting tabs on each side and end of the SL151. The SL151 only requires support on two opposing sides.

IMPORTANT ! : Wood framework must be constructed of nothing larger than 2x6 wood studs across the rear of the SL151. **The rear of the SL151 is the side with the test cord.** There are no size limitations for the wood framework on the other three sides of the SL151.

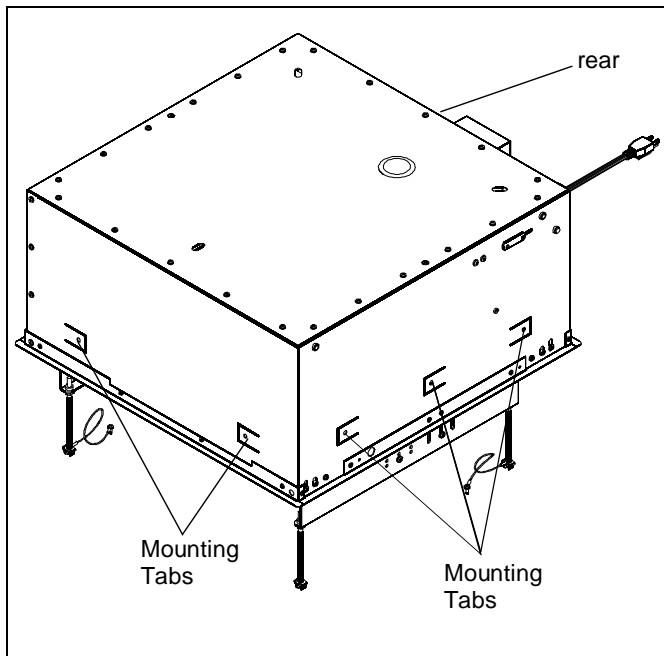


Figure 9



CAUTION: The lift **MUST** be installed square and parallel. Avoid stressing or bending the lift during installation.

2. Use the provided push button (D) to operate the SL151 up and down, ensuring that all clearances are adequate.

Installing Projector on SL151

NOTE: The projector is secured from the top by an SLB bracket (a Listed accessory).

1. Attach the SLB bracket to the projector following the instructions included with the bracket.
2. Attach the bracket with the projector to the SL151, adjusting left or right by using the various attachment points in the SL151. (See Figure 10)

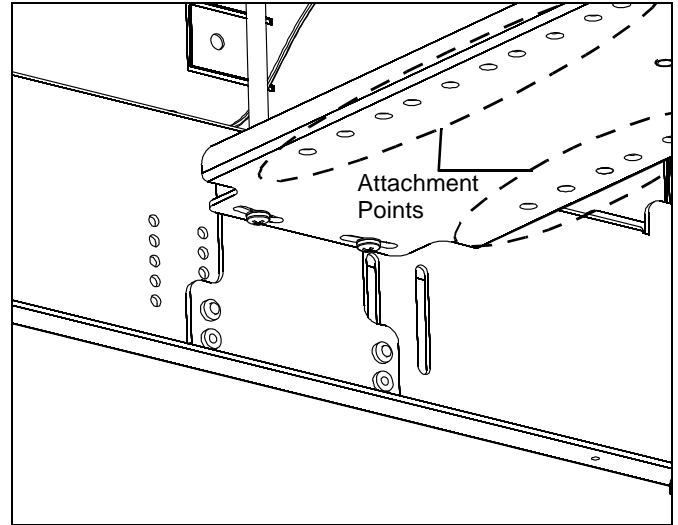


Figure 10

Adjustments

1. FORWARD/BACKWARD

- To shift projector mounting bracket backward or forward, remove and save two screws on each side.
- Move mounting bracket forward or backward as required.
- Reinstall and tighten screws. (See Figure 11)

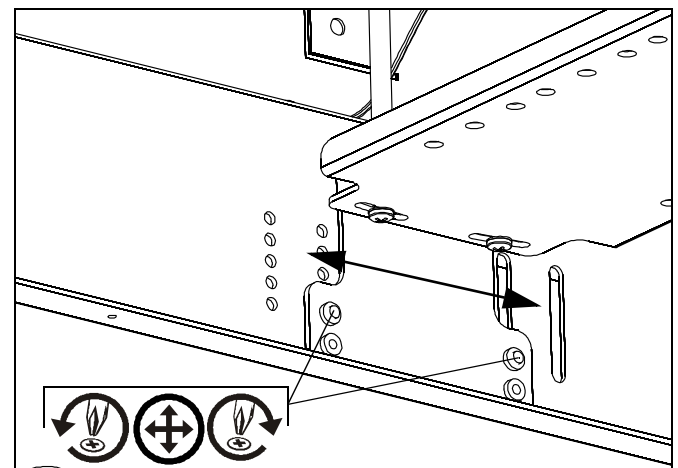


Figure 11

2. YAW (Rotation)

- Adjust one or the other side of the bracket backward or forward by loosening two screws on each side. (See Figure 12)
- Adjust bracket as required.
- Tighten screws. (See Figure 12)

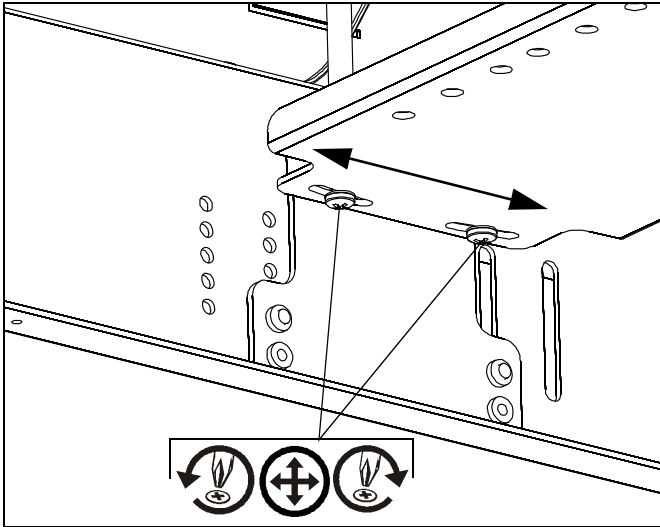


Figure 12

3. PITCH

- Remove and save back screw on each side.
- Adjust vertically, as required.
- Reinstall and tighten screws. (See Figure 13)

4. VERTICAL

- Remove and save front screw on each side.
- Adjust vertically, as required.
- Reinstall and tighten screws. (See Figure 13)

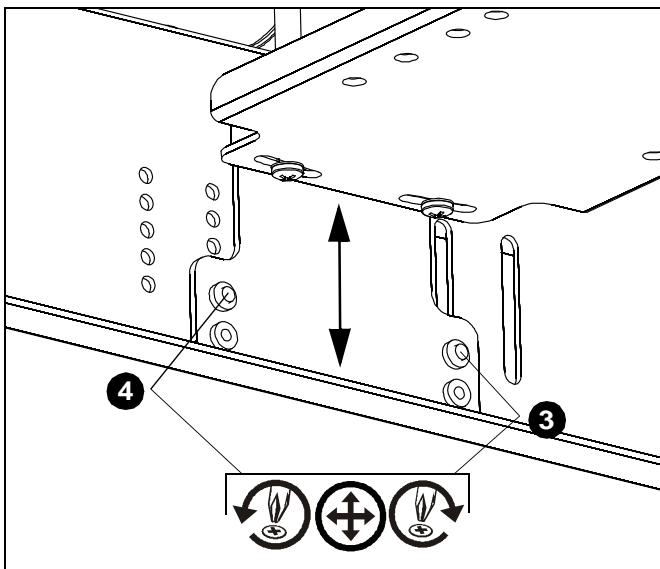


Figure 13

5. ROLL (Horizontal Tilt)

- Shift bracket up or down in the side holes on one side or the other by removing screws.
- Adjust and tighten screws on bracket. (See Figure 13)

Connecting Control Wiring



WARNING: All wiring should be performed by a licensed electrician following all local codes and ordinances.

1. Unplug the SL151's test cord (used for testing).
2. Remove the jumper wire and supplied push button wiring (previously installed in the **Pre-Test Lift before Installation** section) from the external terminal block. (See Figure 3)
3. Connect control wiring following instructions included with the controller and information in Table 1: Wiring Table

NOTE: Any knockouts removed in the SL151 must be replaced with a supplied rubber grommet (G).

4. Feed the video and/or communications cables through the knockout in the rear or top of the lift and connect it to the projector.

NOTE: Ensure there is enough slack in the cables to allow for up and down movement of the lift.

5. Secure cables as necessary using supplied mounting pads (E) and cable ties (B).



CAUTION: KEEP SL151 OPEN WHILE PROJECTOR IS RUNNING OR IN COOLING MODE! Premature bulb failure or damage to electrical components may occur if lift closes.

NOTE: If SL151 is cycled up and down repeatedly the motor's thermal overload protection will stop operation. Operation will resume when the thermal overload resets (usually within 3 to 5 minutes).

Connecting to Power Supply

IMPORTANT ! : This product must be connected to a grounded metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the product.



WARNING: FAILURE TO DISCONNECT AND TERMINATE POWER LEADS PROPERLY MAY RESULT IN PERSONAL INJURY OR EQUIPMENT DAMAGE!! Licensed electrician must disconnect and terminate the leads to the power cord receptacle, and must hard wire the SL151 to a 12-amp power source.

1. Disconnect and remove power inlet from interior junction box.
2. Hardwire unit to a 120V 60Hz 12-amp power source.

NOTE: This unit was designed to have conduit run directly into the back of the interior junction box.

NOTE: If installing the SL151 in a drywall ceiling, remove the outside terminal block and cover with plate (C), using four 6-32 x 3/16" Phillips pan head screws (F).

Wiring Options

NOTE: Refer to Table 1: Wiring Table and (See Figure 16) for information on all wiring options.

NOTE: Refer to Table 2: Terminal Descriptions and (See Figure 16) for terminal descriptions, functions and wiring options.

Re-Attaching Ceiling Panel

1. Line up rectangular holes in ceiling panel with clips on ends of rods, and re-attach the ceiling panel. (See Figure 14)



CAUTION: Damage to equipment could result if clips are not lined up properly with rectangular holes.

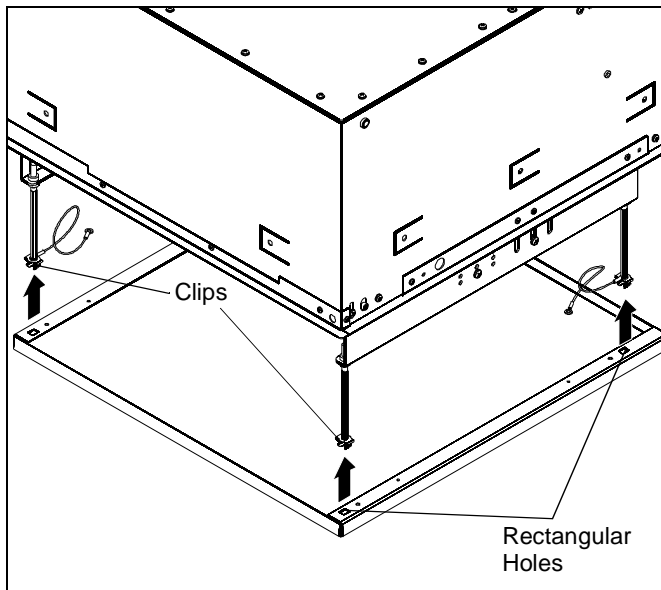


Figure 14

2. Carefully insert clips into rectangular holes in ceiling panel.
3. Reattach guide wires (two places) to ceiling panel, using screws removed earlier. (See Figure 15)

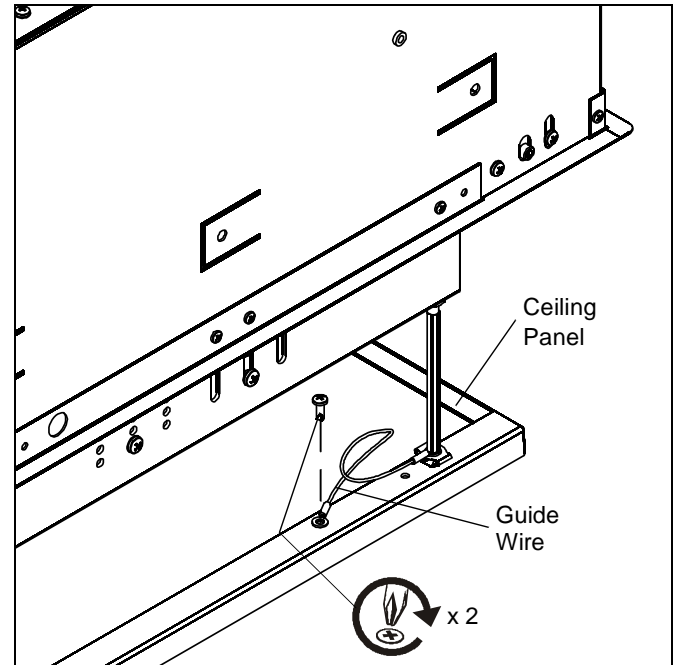


Figure 15

Table 1: WIRING TABLE

Accessory\Product	SL-150/151 Internal	SL-150/151 External
Pushbutton (Supplied on some models) (Momentary SPST)	Red	1 (24V AC)
	Black	5 (Extend/Retract)
	Other	Jumper 2 & 6
ASP-401	Up	12 (retract)
	Down	11 (extend)
	Open	N/A
	Close	N/A
	Left	N/A
	Right	N/A
	Common	13 (ground)
12V Trigger (will actually work with 5-30V AC or DC)	12V+	7 (trigger +)
	Ground	8 (trigger -)
IR-10	+12V	4 (12V DC)
	GND	3 (ground)
	C1	12 (retract)
	C2	11 (extend)
	C3	No Connection
	COMM	13 (ground)
RC-10	(radio power) - Red	1 (24V AC)
	(relay) - Black	6 (Extend/Retract - Comm)
	(24V) - White	2 (24V AC - Comm)
	Other	Jumper 1 & 5
Low Voltage Wall Switch or Relay Control	Up	12 (retract)
	Down	11 (extend)
	Service	N/A
	Open	N/A
	Close	N/A
	Sequence (Show Mode)	N/A
	Stop	N/A
	Left	N/A
	Right	N/A
	Common	13 (ground)
Error Reversing (contact between error input and common indicates an error and unit reverses direction)	Extend Error	14 (extend error)
	Retract Error	15 (retract error)
	Common	13 (ground)
Relay Contacts (relay closes when unit reaches end of travel)	Extend Relay a	16 (extend relay in)
	Extend Relay b	17 (extend relay out)
	Retract Relay a	18 (retract relay in)
	Retract Relay b	19 (retract relay out)
Serial	RS-485 +	N/A
	RS-485 -	N/A
	RS-485 Signal Return (Ground)	
Equipment Current Sense	N/A	N/A

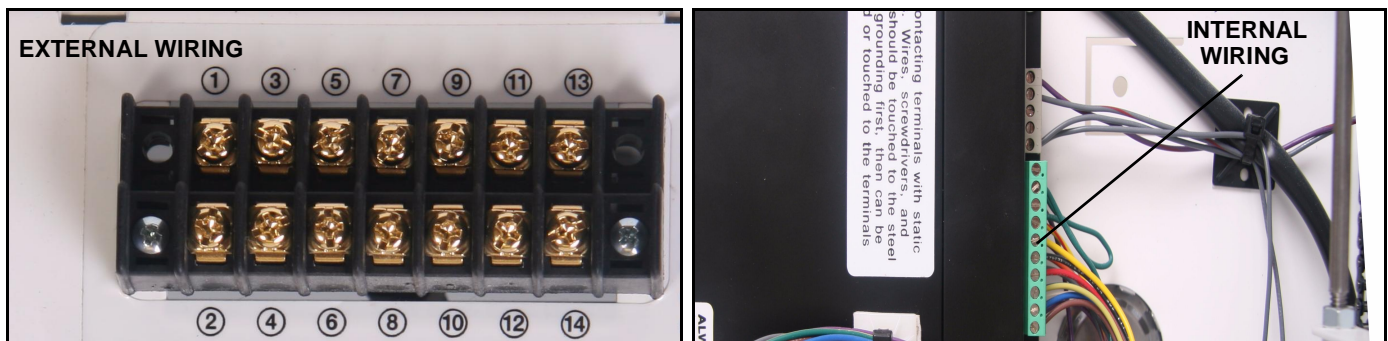


Figure 16

NOTE: The numbers listed in the **SL151 Internal** and **SL151 External** columns refer to the corresponding numbers located where indicated in the wiring pictures. (See Figure 16)

Table 2: INTERNAL TERMINAL DESCRIPTIONS

TERMINAL NUMBER	FUNCTION	DESCRIPTION	WIRING OPTIONS
1	24 VOLT AC	24 volt AC output	This is an internal power supply for powering external devices & Remote Controllers.
2	24 VOLT AC COMMON	24 volt AC common	
3	GROUND	Ground	
4	12 VOLT DC	12 volt DC	This is an internal power supply for powering external devices &/or used for initiating specific functions
5	ISOLATED EXTEND/RETRACT +	Initiates movement if lift is static, or stops movement if lift is in motion. Direction of travel will be opposite of last direction of travel.	Operating range is 5 – 30 Volts AC or DC
6	ISOLATED EXTEND/RETRACT -	Used in conjunction with Extend/Retract when using an external power source to initiate movement.	NOT TO BE USED AS GROUND FOR FUNCTION OTHER THAN EXTEND/RETRACT TERMINAL 5.
7	ISOLATED VOLTAGE SENSE +	When control senses voltage, unit will extend. When control senses cessation of voltage, unit will retract.	Operating range is 5 – 30 Volts AC or DC
8	ISOLATED VOLTAGE SENSE -	Used in conjunction with Voltage Sensor when using an external power source to initiate movement.	NOT TO BE USED AS GROUND FOR FUNCTION OTHER THAN VOLTAGE SENSOR TERMINAL 7.
9	SERVICE EXTEND	Extends unit to maximum limit, bypassing normal-use travel setting. Often used for servicing projectors in ceiling lifts.	Feature not available on all models.
10	GROUND	Ground	
11	EXTEND	Extends unit to preset travel limit when momentarily connected to ground.	If using Latching Switch, be sure to disengage Switch prior to initiating any other function.
12	RETRACT	Retracts unit to preset travel limit when momentarily connected to ground.	If using Latching Switch, be sure to disengage Switch prior to initiating any other function.
13	GROUND	Ground	
14	EXTEND ERROR	Immediately reverses direction of travel when triggered while unit is extending.	momentary connection to ground initiates error mode
15	RETRACT ERROR	Immediately reverses direction of travel when triggered while unit is retracting.	momentary connection to ground initiates error mode
16	EXTEND LIMIT RELAY +	Closes set of internal dry contacts when unit reaches full extension.	
17	EXTEND LIMIT RELAY -		
18	RETRACT LIMIT RELAY +	Closes set of internal dry contacts when unit reaches full retraction.	
19	RETRACT LIMIT RELAY -		
20	GROUND	Ground	

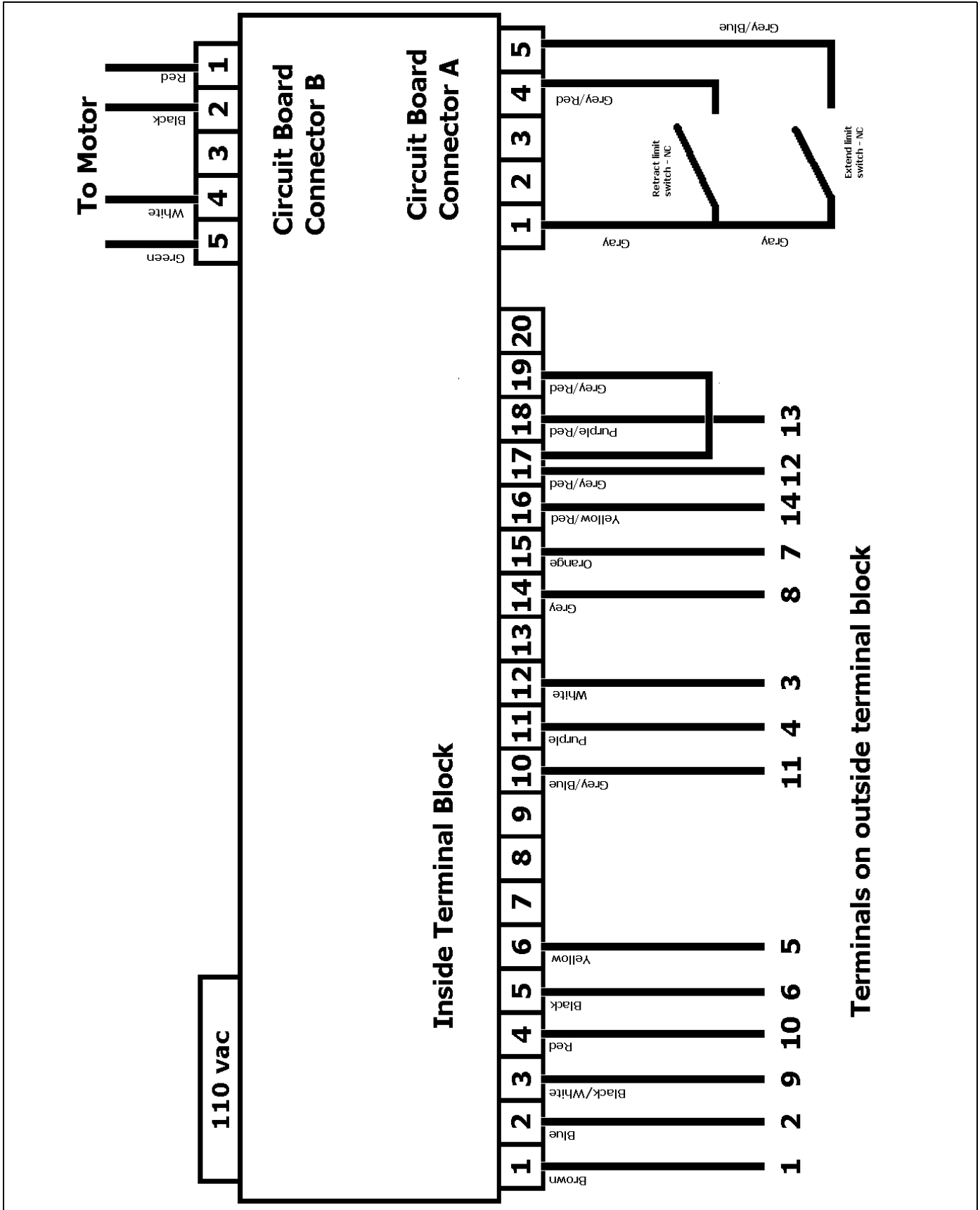


Figure 17



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