



B3 Xenon Power Supply Owner's Manual

September 2017

Version 0.01

Strong Lighting
10533 Chandler Rd, Suite 101
La Vista, NE 68128

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Document Revisions

Date	Version Number	Document Changes
09/10/2017	0.01	Initial Draft

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1 Introduction

This Strong Lighting switching-type power supply is designed to operate a xenon lamp in all theatrical lighting applications for Strong brand follow spots. The B3 is supplied as one of four different models (see chart). The B3 is a constant power design and will self-adjust for lamp voltage variations to maintain a constant output power.

Model Number	Description	Input Voltage	Output Range
6200320	B3 – 2K	20A 208-240 Vac Single Phase	1600 – 2000W
6200321	B3 – 2K Euro	16A 240 Vac Single Phase	1600 – 2000W
6200340	B3 – 4K	30A 208 Vac Three Phase	3000 – 4000W
6200341	B3 – 4K Euro	32A 240 Vac Single Phase	3000 – 4000W

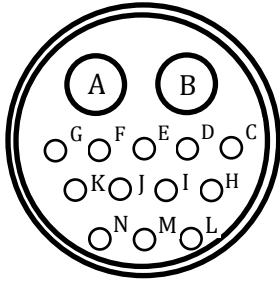
The incoming line power is transformed to a low voltage, high current DC output. The incoming AC line is filtered to eliminate noise and is then converted to DC. This DC voltage is switched on and off by a solid state switching circuit, and converted to a high frequency square wave. The square wave is fed into output transformers to provide low voltage and high current. Rectifiers convert the high frequency signal to DC, and the output is filtered to eliminate noise and ripple. Output to the xenon lamp is adjustable through use of a front panel mounted potentiometer.

The power supply also includes a stepdown transformer that reduces the incoming line to 120 VAC to power the follow spot's and blower(s) and safety circuit. A separate 10-ampere circuit breaker protects the control circuit. A 3-ampere circuit breaker is provided to protect the 24 VDC power supply internal to the B3 power supply.

Built-in protective circuits include a high temperature limit switch and under- and overvoltage detection. The thermal switch will open and interrupt power supply operation if internal temperatures exceed safe operating limits. A drop in the AC input voltage, reducing AC supply to inadequate levels, or a high voltage AC spike, will also disable the power supply until the voltage is corrected.

A multi-pin MS receptacle is standard on units supplied for use with Strong follow spotlights and is compatible with all current and legacy follow spots.

Power Supply MS Connector



Front View

Pin	Wire No.	Function	Color
A	-	DC-	Black
B	-	DC+	Red
C	2	120 VAC	Brown
D*	3	Remote	Red
E	4	120 VAC	Orange
F	5	Safety	Blue
G	6	Safety	Yellow
M	-	Ground	Green

*Not used on most modern follow spots



CAUTION: Refer all servicing of this unit to an authorized Strong Lighting equipment dealer. Switching-type Xenon power supplies employs solid state circuitry requiring sophisticated diagnostic equipment not generally available to field service personnel. Hazardous high voltages exist within the power supply cabinet.



2 Installation/Operation



CAUTION: This equipment operates at hazardous voltages, and should be operated by qualified, trained personnel only. Do not remove power supply cover panels when the unit is energized

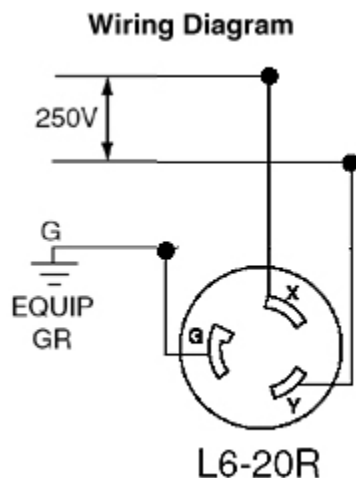


When positioning the power supply, allow several inches of clearance around the power supply cabinet to allow for an unobstructed air flow. If the intake or outlet grilles are blocked, thermal switches will shut the unit off to prevent heat damage.

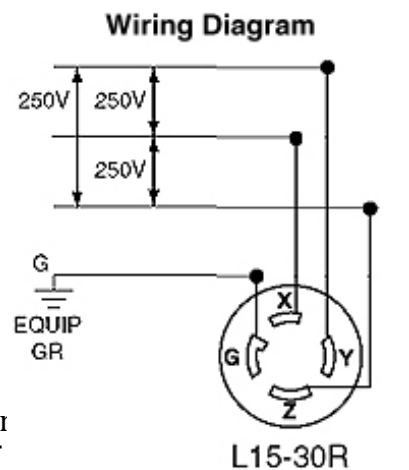
Connect the follow spot multi-pin MS plug to the power supply before connecting the input AC line voltage. Be sure to properly align the MS connectors to one another. Once aligned make sure that the fine thread coupling ring is fully engaged and hand tight.

Power leads run to the unit must be of the correct size and type to conform to local codes. Install in conduit as required. B3 Euro models are provided with a 2-meter power input tails color coded for European use. B3 models intended for US use are supplied with either a three pole or four pole twistlock connector appropriate for each model.

A three-prong, female connector, NEMA type L6-20R (Strong part No. CHBL2323) is furnished to mate to the power input receptacle mounted on a B3 – 2K. A four-prong, female connector, NEMA type L15-30R (Strong part No. 2140216) is furnished to mate to the power input male receptacle mounted on a B3 – 4K power supply.



Connect the neutral wire of the power supply to the green ground terminal. The power supply is wired by each color for installation of



In areas using 380/440 VAC three phase power (Europe, etc.), connect the unit for single phase operation only, using the brown *phase* line and the blue *neutral*. AC input as measured across these two points must not exceed 240 Vac. Attach an adequate earth ground (yellow/green wire) as required. Euro units are provided with an appropriate flexible wire tail that must be combined with an appropriate customer provided male input connector.

Output Power Adjustment

The B3 is a constant power device and as such the output power need only be adjusted when a new lamp is installed. To properly adjust the B3 power supply from the front panel potentiometer you must measure both the output current and output voltage and multiply the two to determine the output power. The output power should be adjusted to match the nominal rating of the installed lamp.

For example, in the case of a typical 2000W fixture the output voltage could read about 24 VDC to correctly adjust the power of the system you should adjust the output of the B3 to 83 amperes (Volts x Amps = Watts or $24 \times 83 = 2000$).

Check the follow spot's ammeter upon the first lamp ignition, and adjust the current control potentiometer to set the desired current that results in the required power. Rotate the potentiometer clockwise to increase current, or counterclockwise to reduce current.

Note that the metering system supplied on most follow spots is of limited overall accuracy. For the most consistent and correct adjustment of a lamp a separate clamp on DC Amp meter and a DC voltage meter should be used.

Typical Lamp Properties (check your specific lamp manufacture's requirement)

Nominal Wattage	Nominal Voltage	Typical Current	Maximum Current
2000	24	83	87
2500	28	90	95
3000	29	100	105
4000	29	135	142

A stepdown transformer for the follow spot control circuit is factory prewired internal to the B3. Wires named "2" and "4" supply 120 VAC to the follow spot from the B3 power supply via the MS connector. After completing the follow spot interlock circuit, the 120 VAC returns to the power supply on wires "5" and "6" to energize the control printed circuit board upon closure of the LAMP ON switch. In older follow spots the same circuit ("5" and "6") energizes the AC igniter. Wires "7"

and “8” supply a 220 VAC circuit that is required by some follow spots. Wires “7” and “8” are unused by other follow spots.

The DC Pulse Igniter used in newer Strong follow spots does not require the AC control voltage supplied on “5” and “6”, but will be actuated from the high DC open circuit (no load) voltage generated by the power supply. The DC voltage will fall to a lower sustaining level after the xenon lamp ignites, and the DC Pulse Igniter will cease operation when the DC voltage drops below 130 VDC.

Indicator Lights

The B3 is equipped with two or three indicator lamps depending of model (B3-2K – two, B3-4K – three). The first indicator “AC Power” illuminates when AC input power to the power supply is present and the main circuit breaker is turned on. The other indicator(s) are marked “Module” and when illuminated indicate that the internal power supply module(s) are supplying current to the lamp.

3 Maintenance

The power supply requires very little service to insure correct operation. Periodically check all electrical connections for tightness and condition, especially those in the DC output circuit. Discolored terminals may indicate a loose connection which will increase resistance and cause the connection to heat.

Clean the ventilation inlet and outlet grilles on a regular basis to insure good air flow. Thermal switches internal to the power supply module will interrupt operation of the power supply in the event of overheating.

The fan motors are permanently lubricated and do not need any additional maintenance other than cleaning. The power supply includes (4) fans in a push/pull configuration and requires operation of all fans for correct operation. In the event of a fan failure, a replacement fan must be installed immediately.

Service interruptions because of low (below 200 VAC) or high (over 240 VAC) input require adjustments to the AC supply line. To protect the equipment, voltage level protection cannot be bypassed.

4 Troubleshooting

Problem: Lamp will not light. Conditions: Follow spot blowers are not operating and B3 “AC Input” light is on and input circuit breaker is on.

1. Follow spot interlock switch is open. Depending on model there are several interlock switches on a follow spot that could be open. Consult follow spot manual.
2. Ten ampere circuit breaker is tripped. Press to reset.
3. Improper AC input connection. Check AC input voltage at circuit breaker. For proper operation the phase to phase voltage should be between 200 and 240 VAC.
4. Miss wired/defective feed of Wires “2” and “4”. Should be between 110 and 120 VAC measured at the MS connector or in the follow spot.
5. Defective stepdown transformer. Refer to Electrical Schematics to trace problem.
6. Only for Gladiator III’s: Check voltage on Wires “7” and “8”. Should be between 220 and 240 VAC.
7. Defective follow spot blower(s) or fan(s). Check for proper input voltage to each device. This could be either 120 VAC or 240 VAC depending on follow spot.

Problem: Follow spot blower(s)/fan(s) operate but the igniter is not operation when the follow spot is turned ON. Conditions: Blower(s)/fan(s) are operating, AC Input indicator on B3 is on, follow spot ON switch is on. No igniter is heard.

-
1. No return voltage on Wires "5" and "6". Possible open interlock switch, interlock connection or unplugged connection in B3 to control board.
 2. Incorrect setting of MODE switch on older follow spot. See follow spot manual. MODE switch should be in MAN position.
 3. No open circuit voltage. When the ON switch is enabled the B3 power supply generates a "No load" voltage output of between 130 and 150 VDC. This voltage must be present to "fire" the igniter. Measure for this voltage by removing the front lamp lead and making sure it is isolated from touching the lamp or the follow spot chassis. Turn the B3 and the follow spot ON and observe the voltage between the two lamp leads. If open circuit voltage is present then the igniter is defective. If there is no open circuit voltage then the interlock safety system might still be open or the B3 is defective.

Problem: Lamp fails to light. Condition: Blower(s)/fan(s) are operating, AC Input is illuminated, igniter is firing as indicated by a "ping" sound.

1. Defective Xenon lamp. Replace as required.
2. Current control on B3 turned down too low. Turn fully clockwise and retry and then readjust.
3. High voltage short. The igniter output is not going across the lamp. When the igniter voltage is going to the lamp you will see a flash of light from the lamp. If you hear the igniter working but don't see a flash from the lamp the high voltage is going somewhere else. Inspect the path from the igniter to the lamp paying special attention to the trigger wire as it passes through the reflector. Clear short and retry.

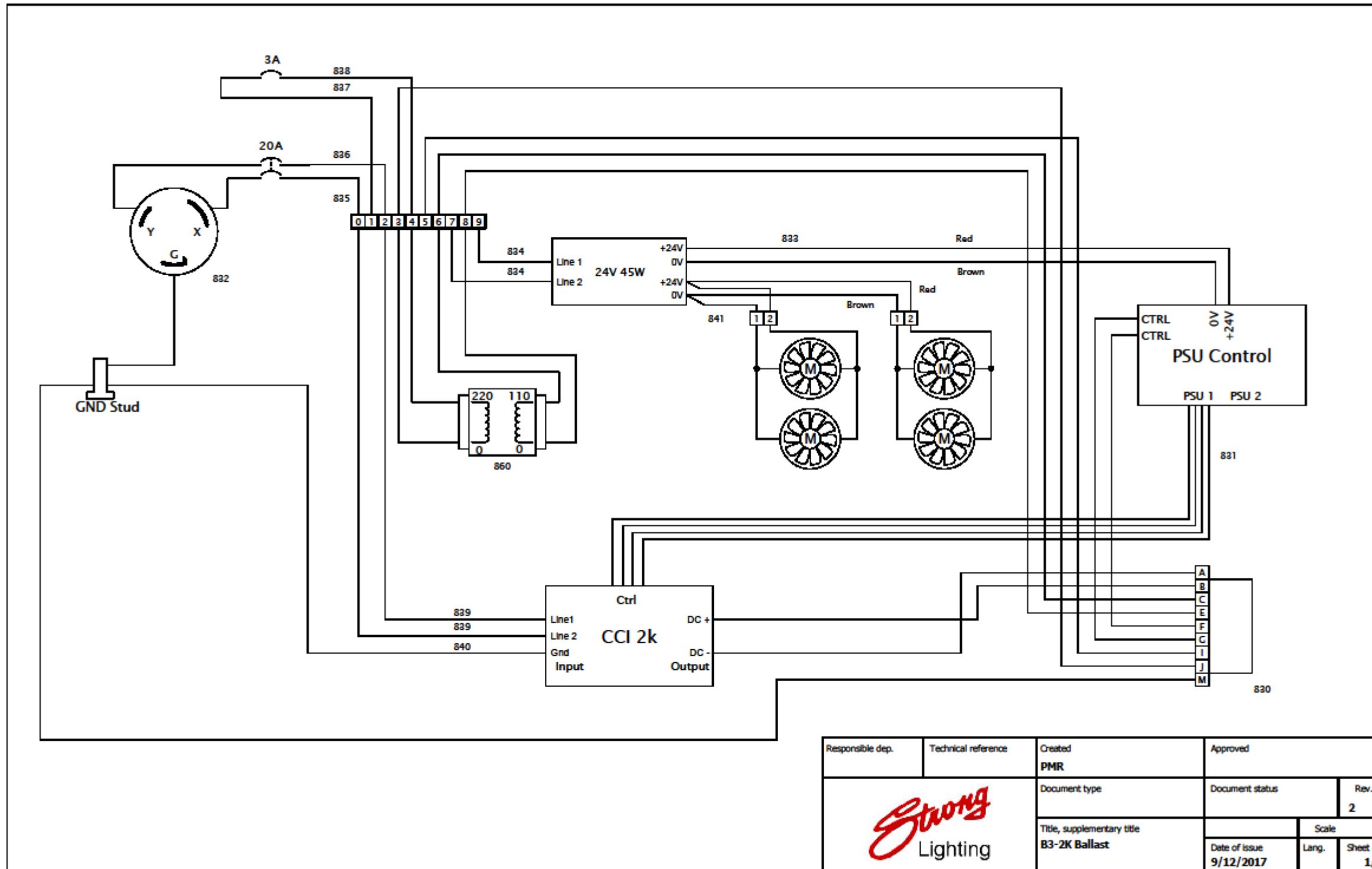
Problem: Lamp goes out during operation. Condition: Follow spot is operating normally and light suddenly goes out.

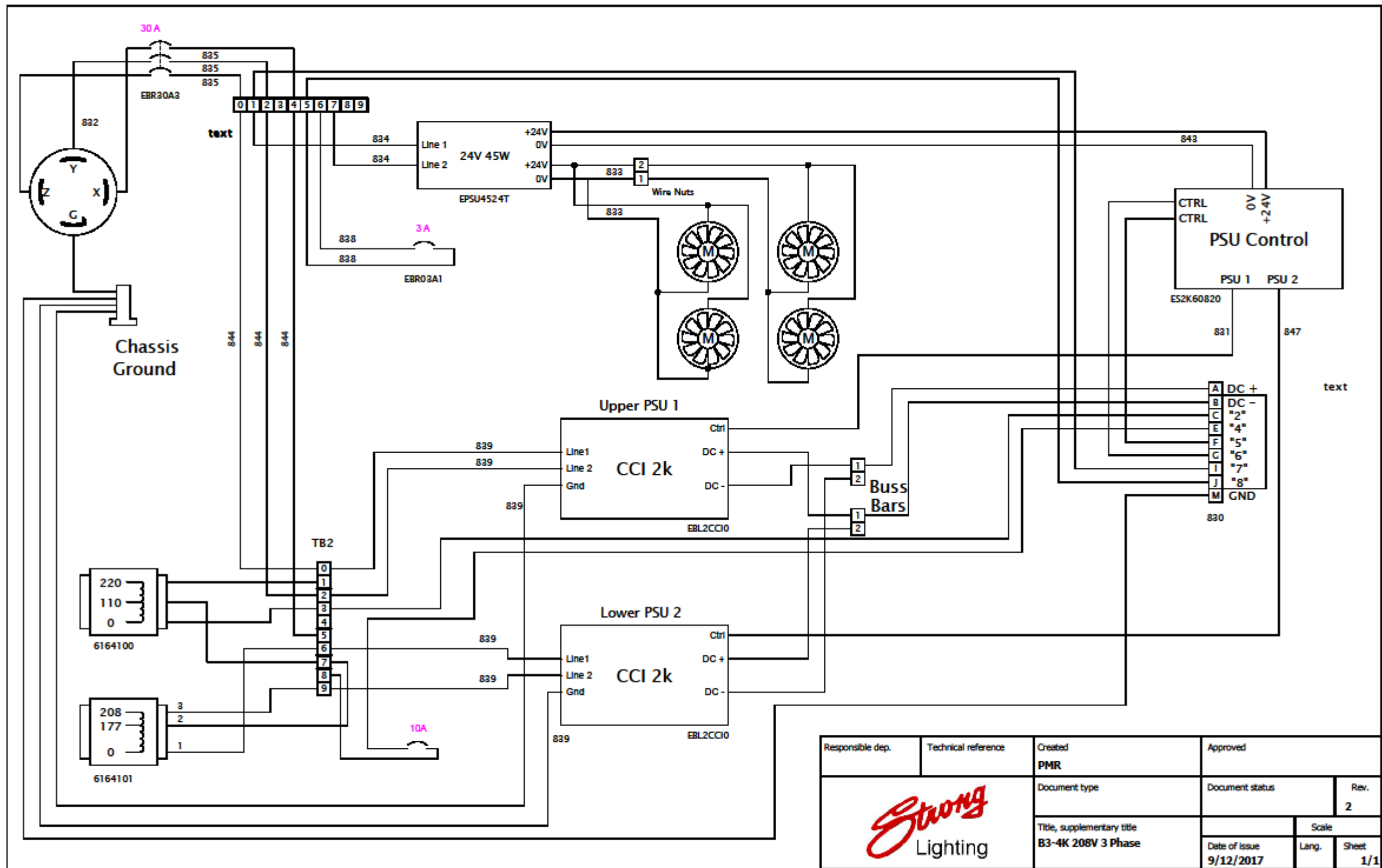
1. Defective Xenon lamp. Replace as required.
2. Fault in interlock circuit, loose access door, inadequate air movement in follow spot causes sail switch to open, etc.
3. Power supply overheat. Check for fan operation and unobstructed air flow. Allow the power supply to cool and retry. If problem continues consult factory.
4. AC power input low or high. Check AC source.

Problem: B3 will not change output power. Condition: Lamp operates but B3 will not adjust output higher or lower.

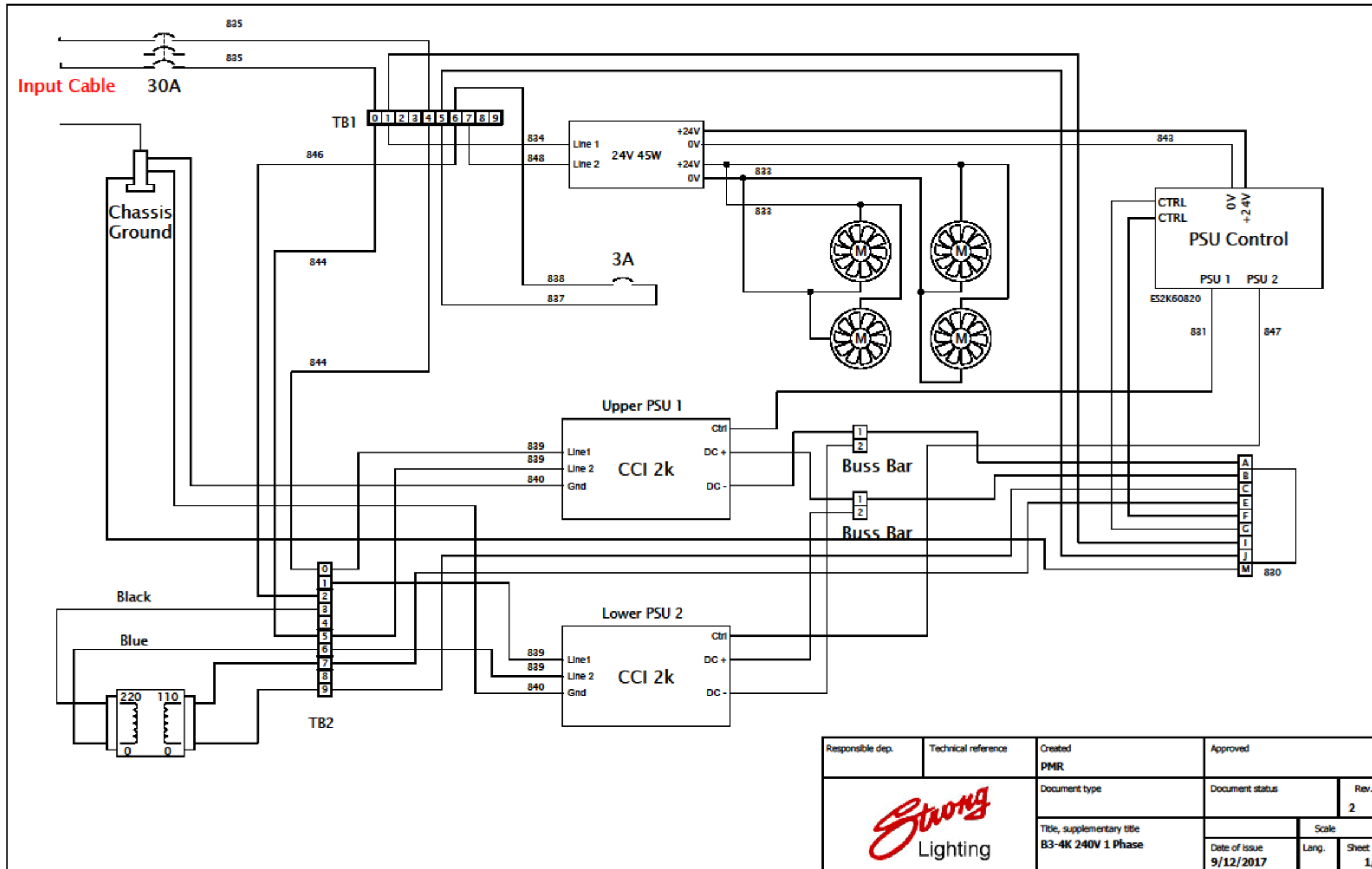
1. Defective power supply control board or defective power module. Consult factory.


5 Electrical Schematics





Responsible dep.	Technical reference	Created PMR	Approved	
	Document type	Document status		Rev. 2
	Title, supplementary title B3-4K 208V 3 Phase	Date of issue 9/12/2017		Scale Lang. Sheet 1/1



Responsible dep.	Technical reference	Created	Approved	
		PMR		
		Document type	Document status	Rev.
				2
		Title, supplementary title	Scale	
B3-4K 240V 1 Phase	Date of issue	Lang.	Sheet	
	9/12/2017		1/1	

6 Exploded View – B3-2K Twistlock

REVISIONS			DATE
REV.	DESCRIPTION		
2	DRAFT FOR MARKUP, PRODUCTION BUILDS		10/31/2016

AS2K60800
B3 2K BALLAST BOX

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
32	FSFU063214B	#6-32 X 1/4" FLAT PHIL U-CUT BLK SS	4
31	FKCS0614	#6-32 X 1/4" SCKT CAP SS	4
30	FT0612FFSS	#6-32 X 1/2 HEX STANDOFF	4
29	FSFU083212B	#8-32 X 1/2 FLAT PHIL U-CUT SS	2
28	FWFN0838	#8 NEOPRENE BOND WSHR 3/8" OD	2
27	FSPB0812	#8-32 X 1/2" PAN PHIL BLK SS	7
26	FWFS0800	#8 FLAT WASHER SS	7

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
25	FSPB0838	#8-32 X 3/8" PAN PHIL BLK SS	8
24	FSFU63212B	#6-32 X 1/2" FLAT PHIL U-CUT SS	8
23	URBRFTBLST	RUBBER FEET, BALLAST	8
22	FSFS0832134	SCREW, 8-32 X 1 3/4, FLAT SS	8
21	FN63214W	NUT, HEX, 6-32, 1/4" WASHER,	8
20	FR361225	ALU POP RVT 3/16"D X0.125-0.25	12
19	FNHTW081132SS	#8-32 HEX NUT W/ TOOTH WSHR 1	14
18	FSFU83238B	#8-32 X 3/8" FLAT PHIL U-CUT SS	40
17	EFN80320	80X32 24VDC MUFFIN FAN	2
16	EPSU4524ST	45W SINGLE OUTPUT ENCAPSULATE	1
15	HS2K60830A	ASSY, BALLAST OUTPUT CONNECTOR	1
14	CHBL2323	HBL2323-250V-2P 3W 20A-LN FE	1
13	AS2K60860A	AUTOFORMER STEPDOWN RV D	1
12	ETBL375	TERMINAL BLOCK	1
11	UBGBLST0	FINGER GUARD	2
10	77271000	SPRING LOADED HANDLE	1
9	AS2K60861A	ASSY, BREAKER PANEL	1
8	AS2K60863A	ASSY, CCI BALLAST	1
7	AS2K60862A	ASSY, EXHAUST FAN	1
6	ES2K60820A	ASSY, BALLAST CONTROL PCB	1
5	SS2K60808A	STIFFENER PLATE, HANDLE	1
4	SS2K60806C	MOUNTING BRACKET, CONNECTOR PLUG	1
3	SS2K60804A	MOUNTING PLATE, INTAKE FAN	1
2	SS2K60802A	COVER, SHELL	1
1	SS2K60801A	BASE, SHELL	1

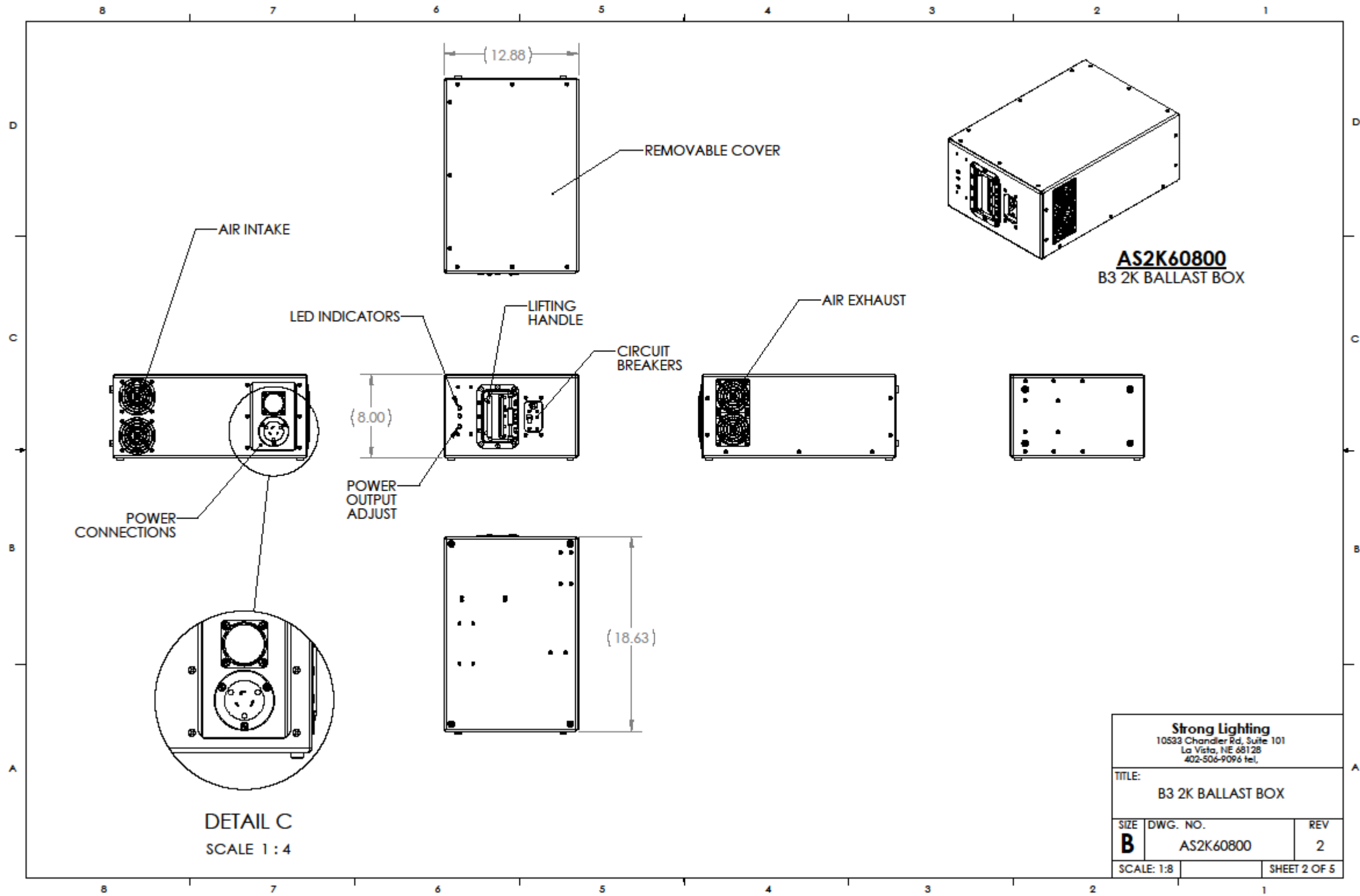
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1. ASSEMBLY STAGES DEPICTED ARE RECOMMENDATIONS ONLY.

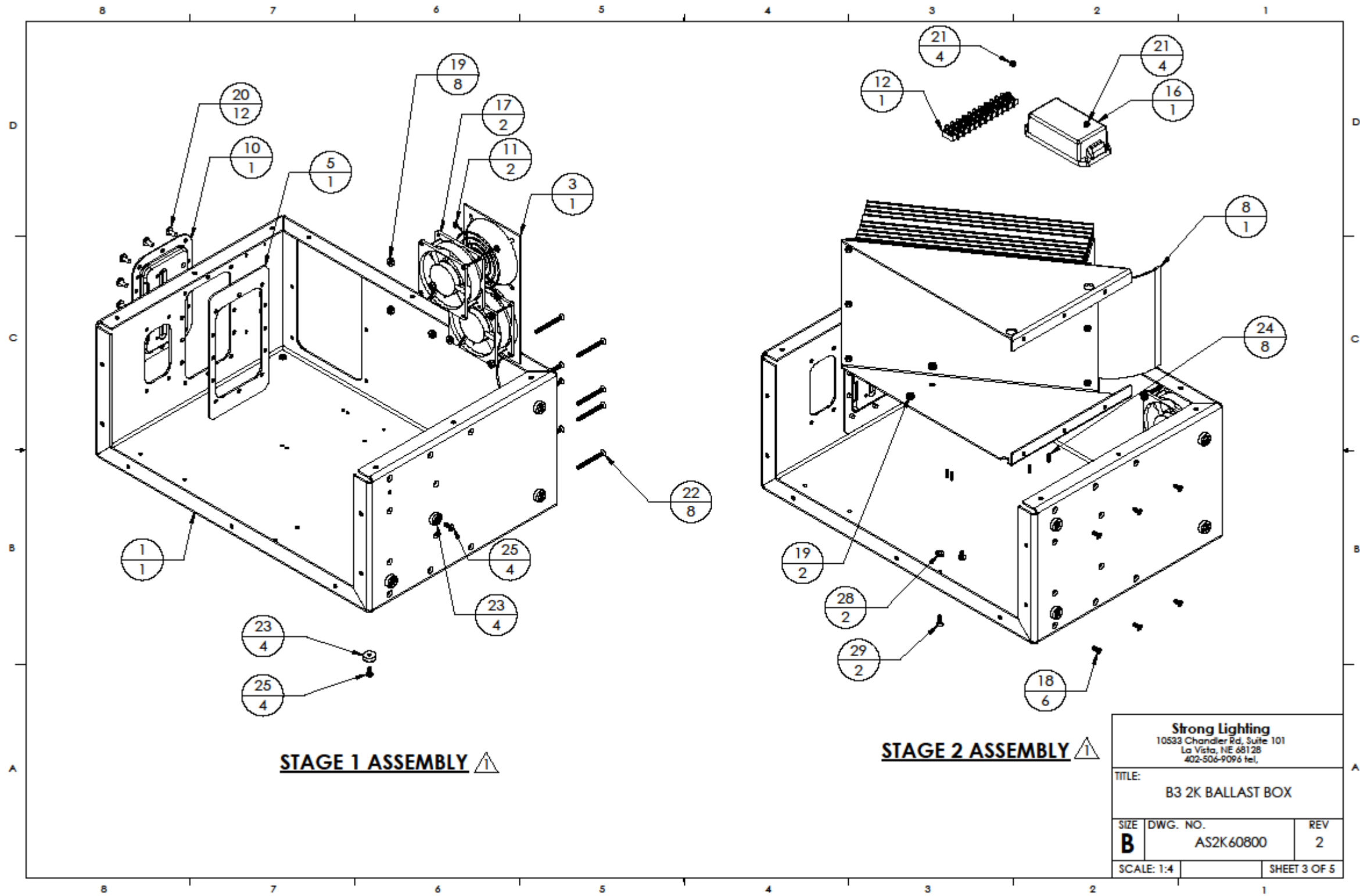
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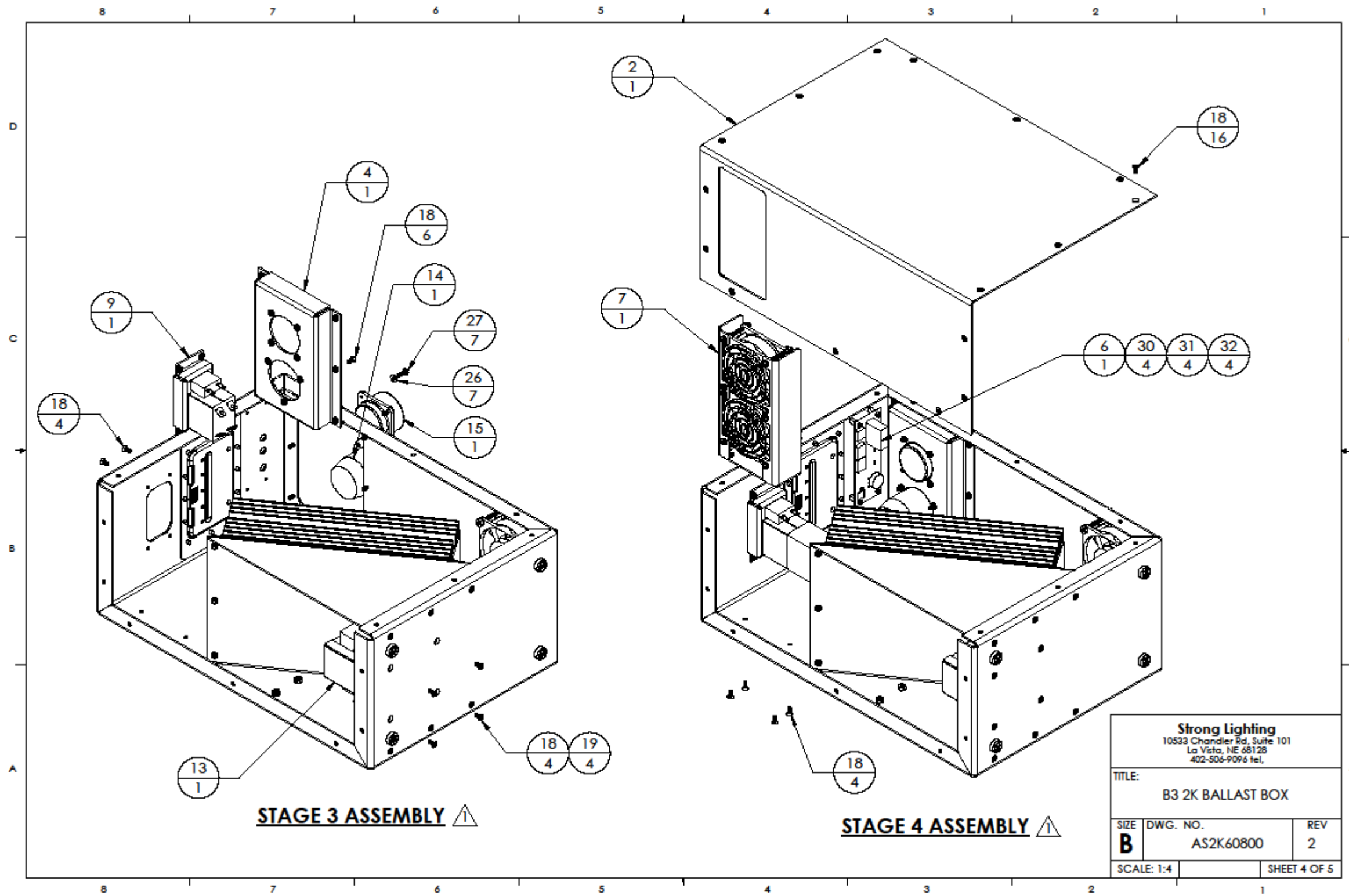
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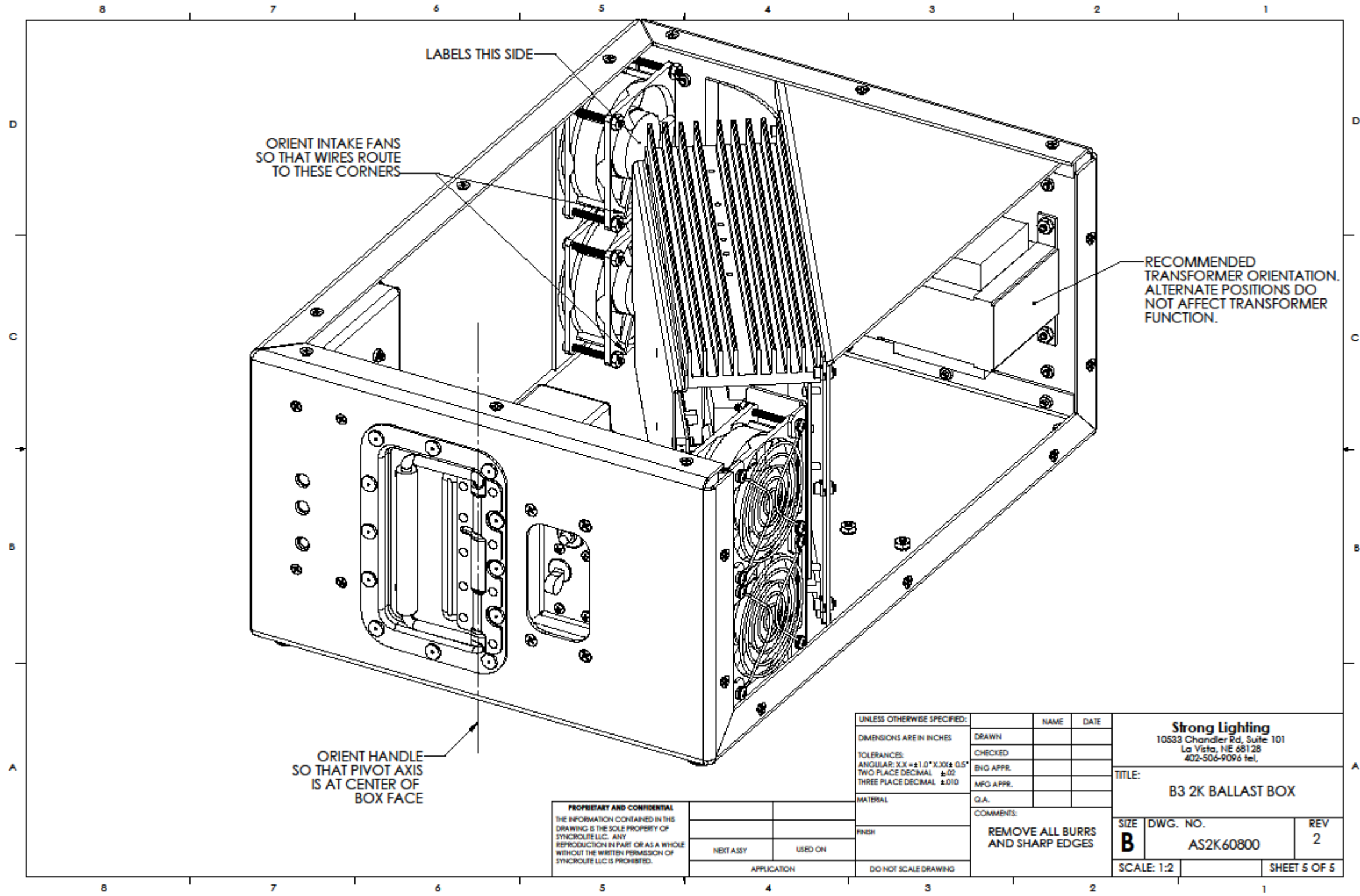
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TOLERANCES:		CHECKED	
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TWO PLACE DECIMAL ±.02		MFG APPR.	
THREE PLACE DECIMAL ±.010		Q.A.	
MATERIAL		COMMENTS:	
-		REMOVE ALL BURRS AND SHARP EDGES	

Strong Lighting 10533 Chandler Rd, Suite 101 La Vista, NE 68128 402-506-9096 tel.		
TITLE: B3 2K BALLAST BOX		
SIZE B	DWG. NO. AS2K60800	REV 2
SCALE: 1:4	SHEET 1 OF 5	







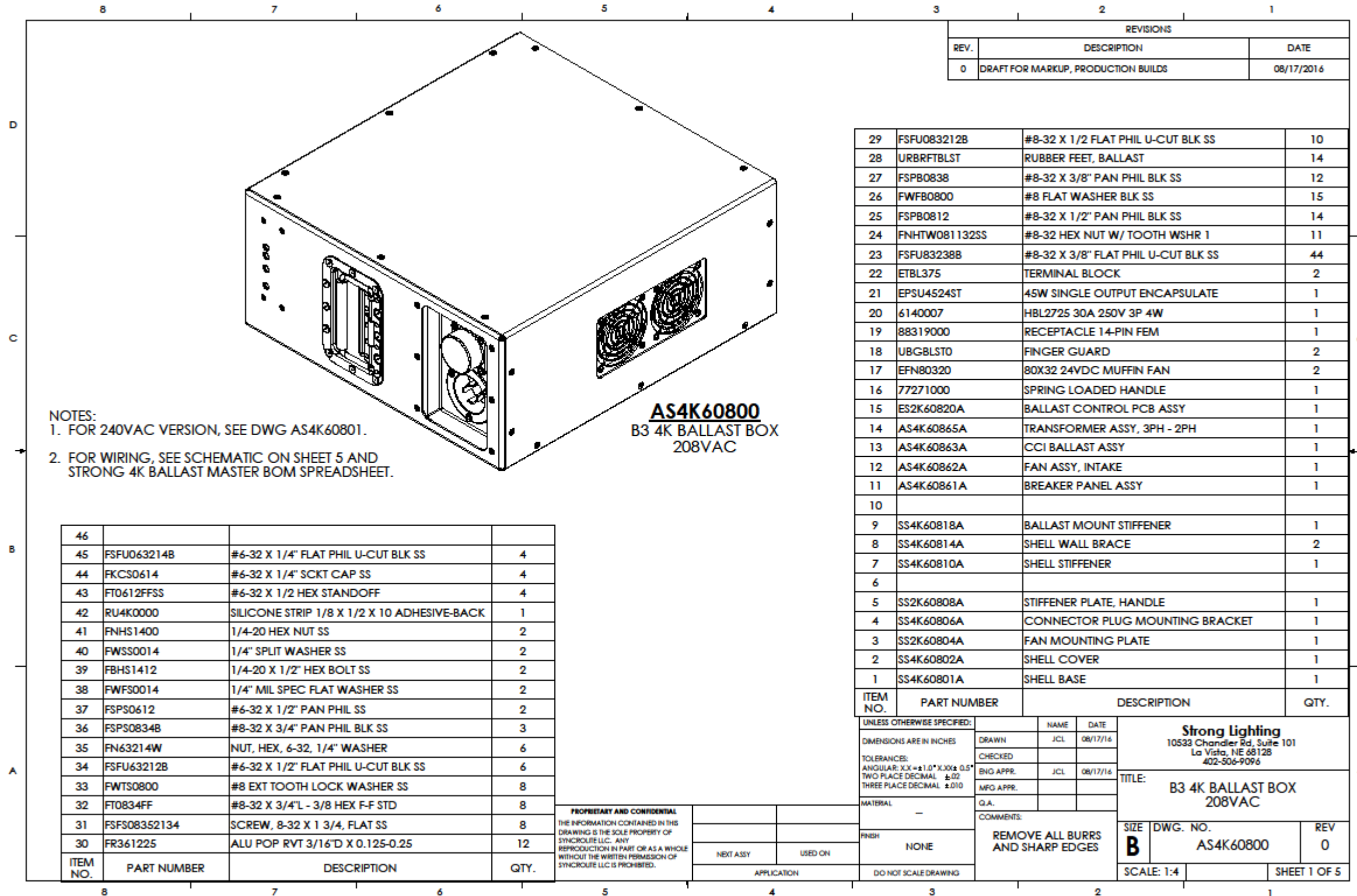


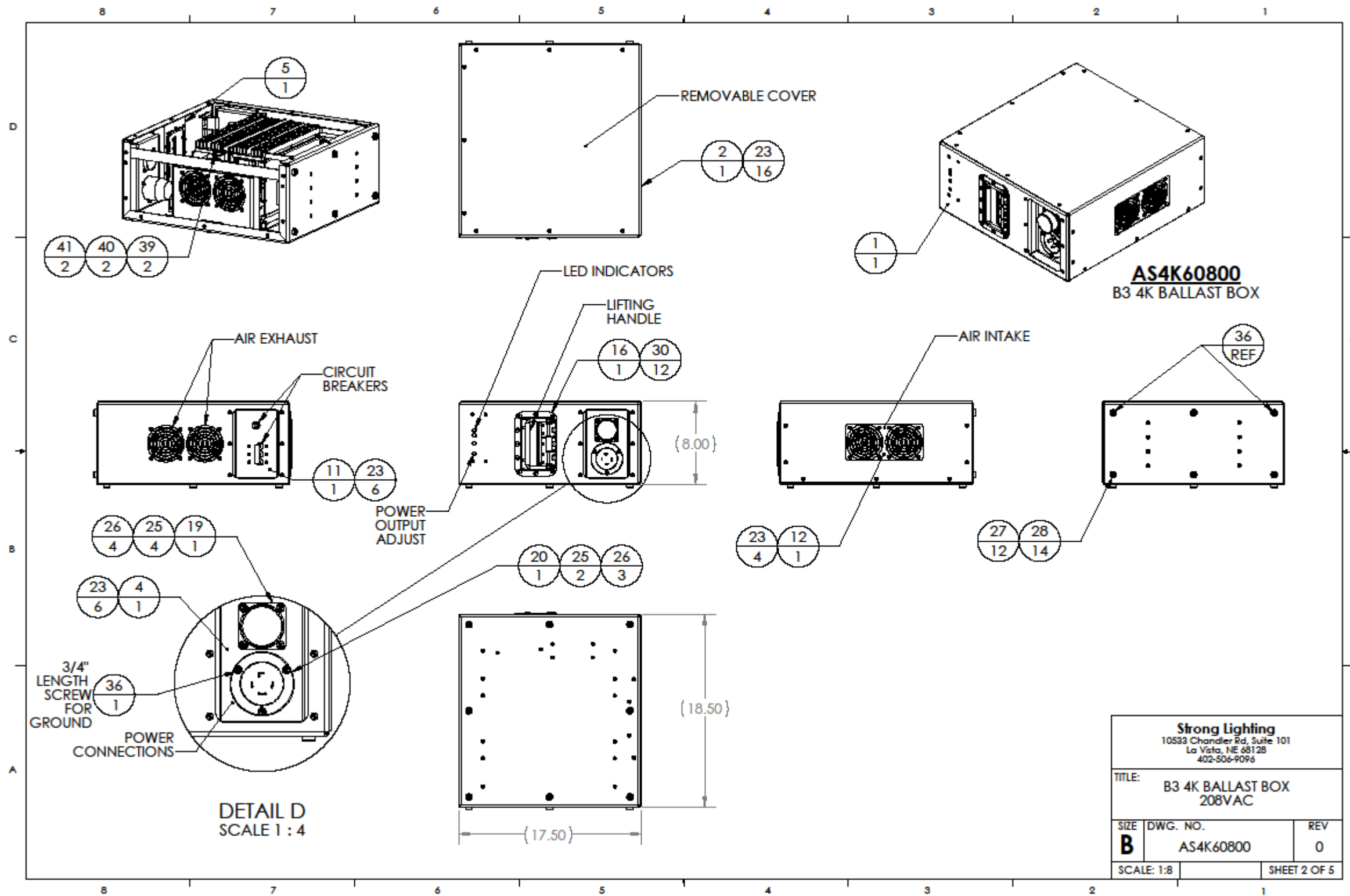
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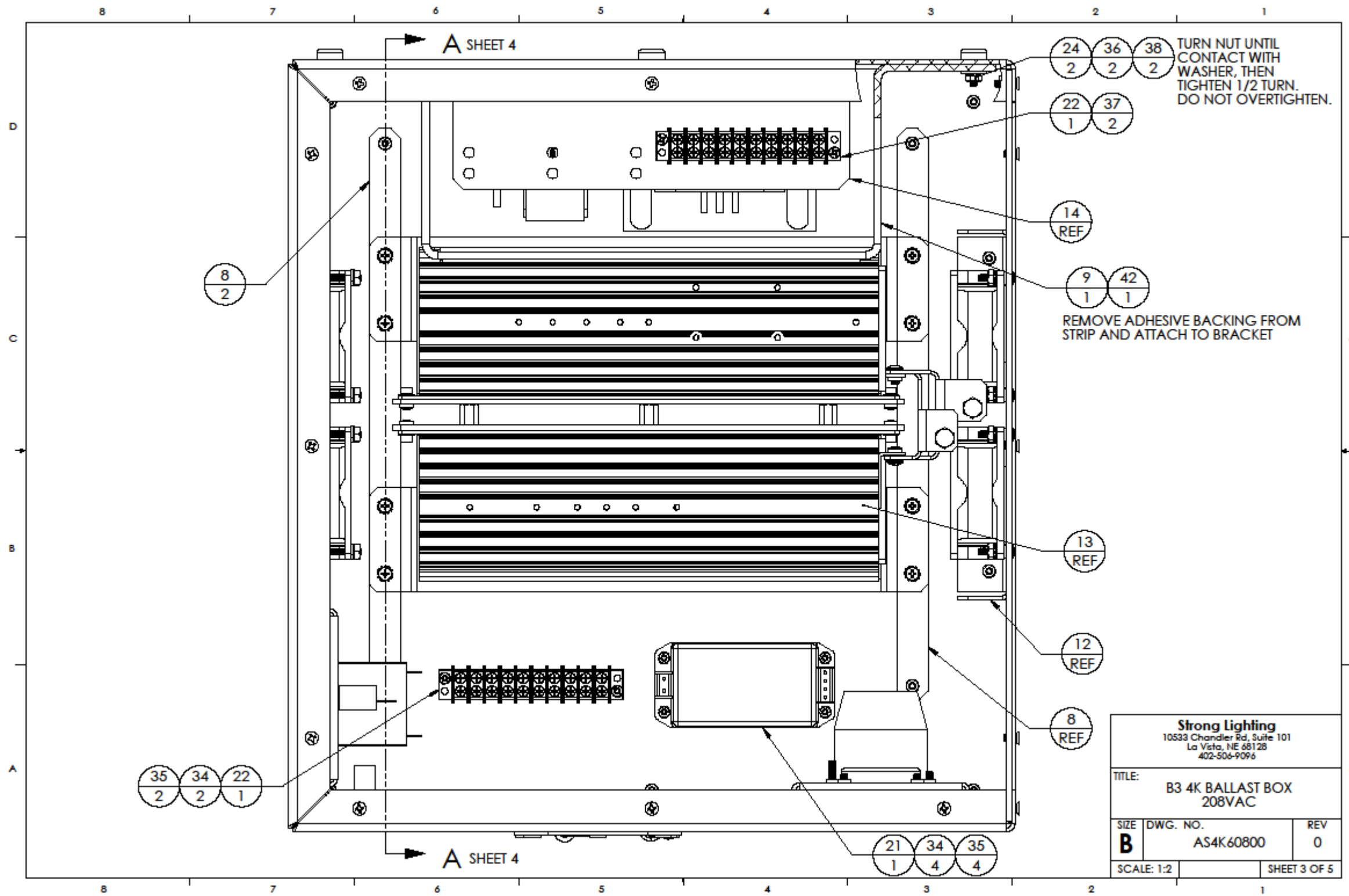
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TOLERANCES:	CHECKED		
ANGULAR: XX ±1.0° X.XX ± 0.5°	ENG APPR.		
TWO PLACE DECIMAL ±.02	MFG APPR.		
THREE PLACE DECIMAL ±.010	Q.A.		
MATERIAL	COMMENTS:		
FINISH	REMOVE ALL BURRS AND SHARP EDGES		
NEXT ASSY	USED ON		
APPLICATION			
		DO NOT SCALE DRAWING	

Strong Lighting 10533 Chandler Rd, Suite 101 La Vista, NE 68128 402-506-9096 tel.		
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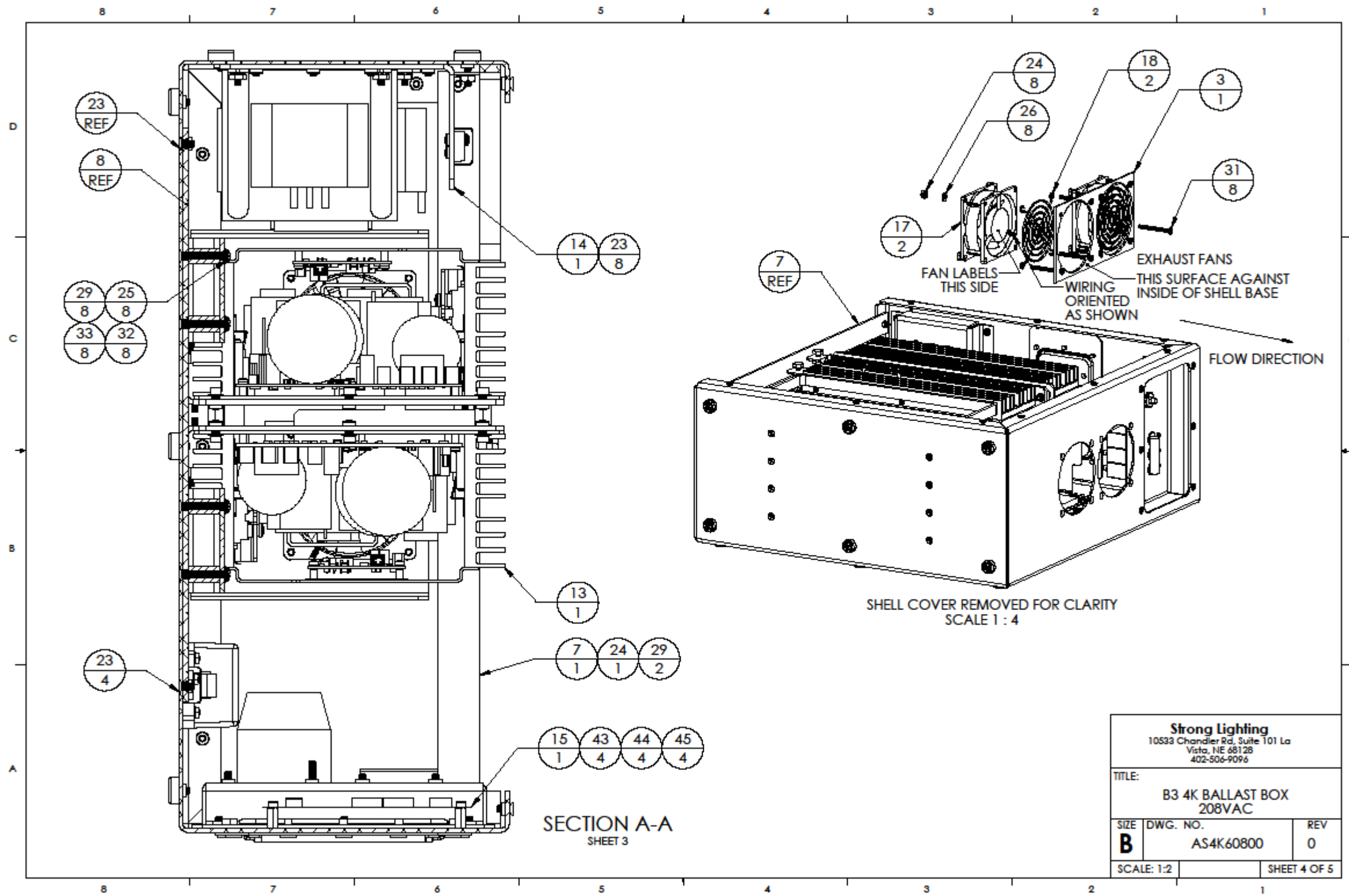
7 Exploded View – B3-4K Twistlock







Strong Lighting 10533 Chandler Rd, Suite 101 La Vista, NE 68128 402-506-9096		
TITLE: B3 4K BALLAST BOX 208VAC		
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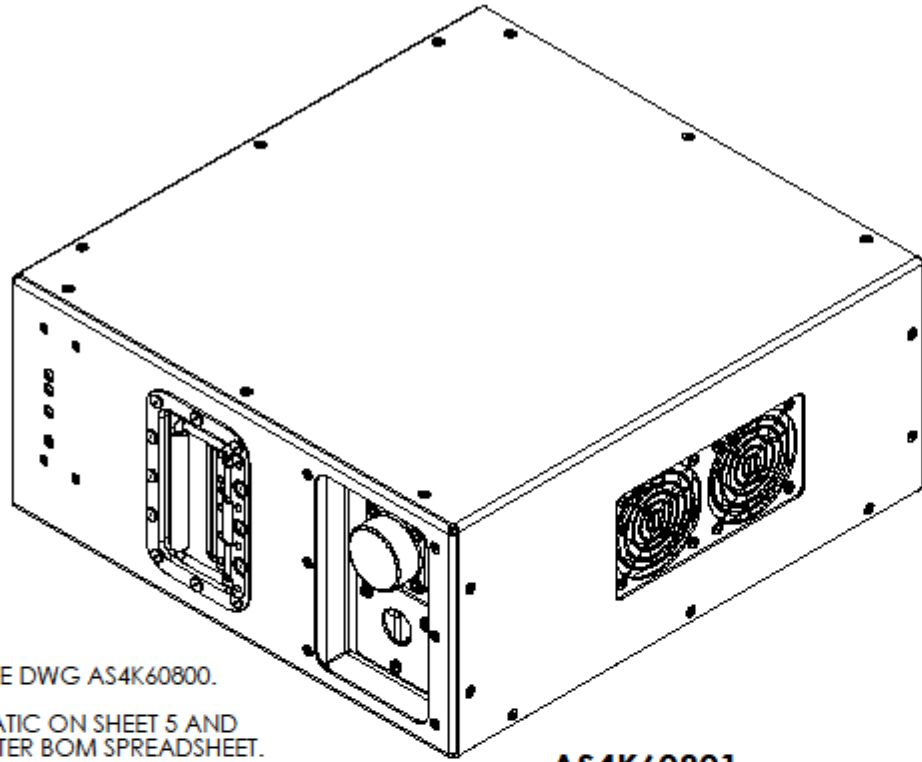


8 Exploded View – B3-4K Euro

		REVISIONS	
REV.	DESCRIPTION	DATE	
0	DRAFT FOR MARKUP, PRODUCTION BUILDS	08/17/2016	

NOTES:

- FOR 208VAC VERSION, SEE DWG AS4K60800.
- FOR WIRING, SEE SCHEMATIC ON SHEET 5 AND STRONG 4K BALLAST MASTER BOM SPREADSHEET.



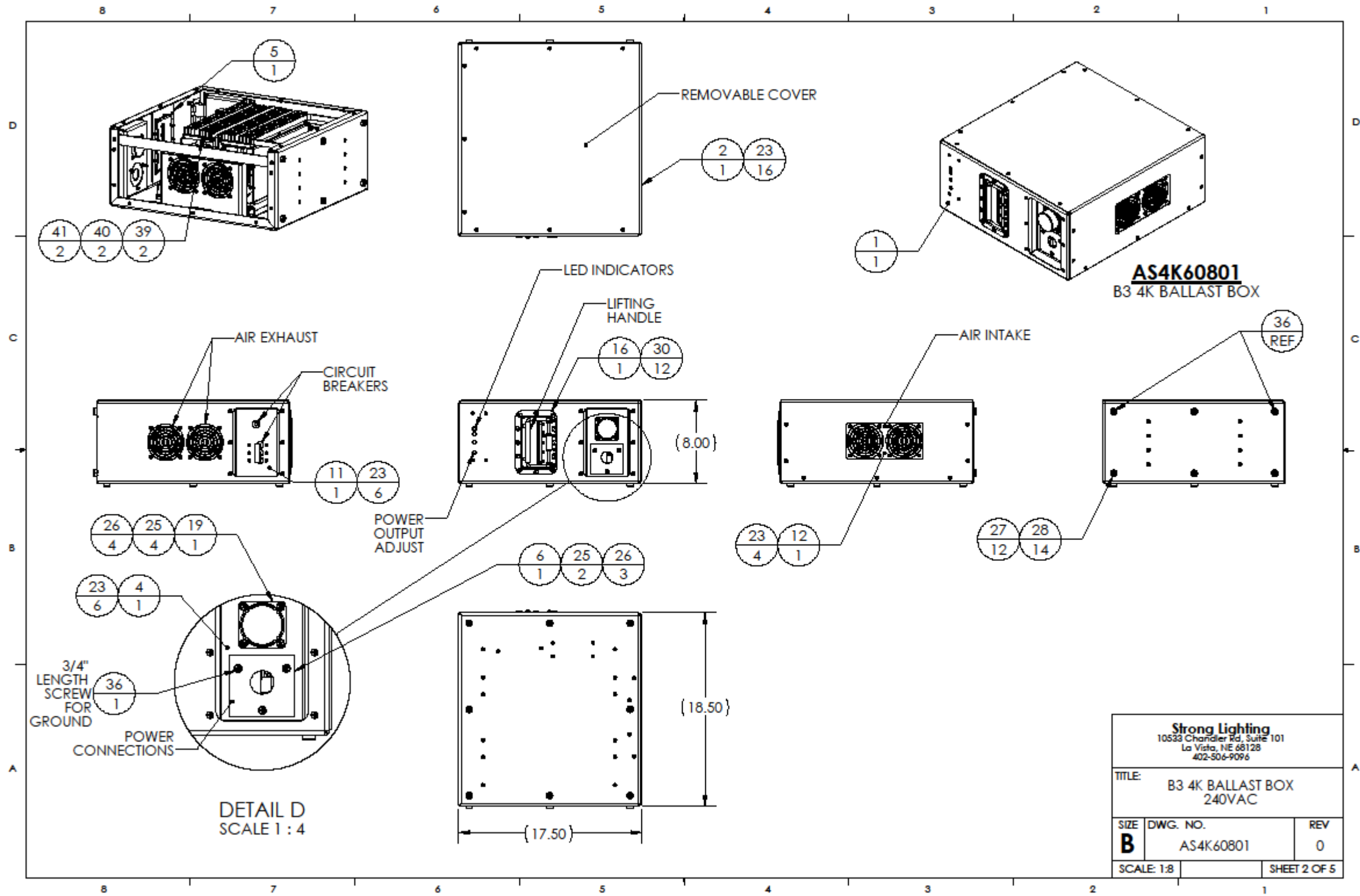
AS4K60801
B3 4K BALLAST BOX
240VAC

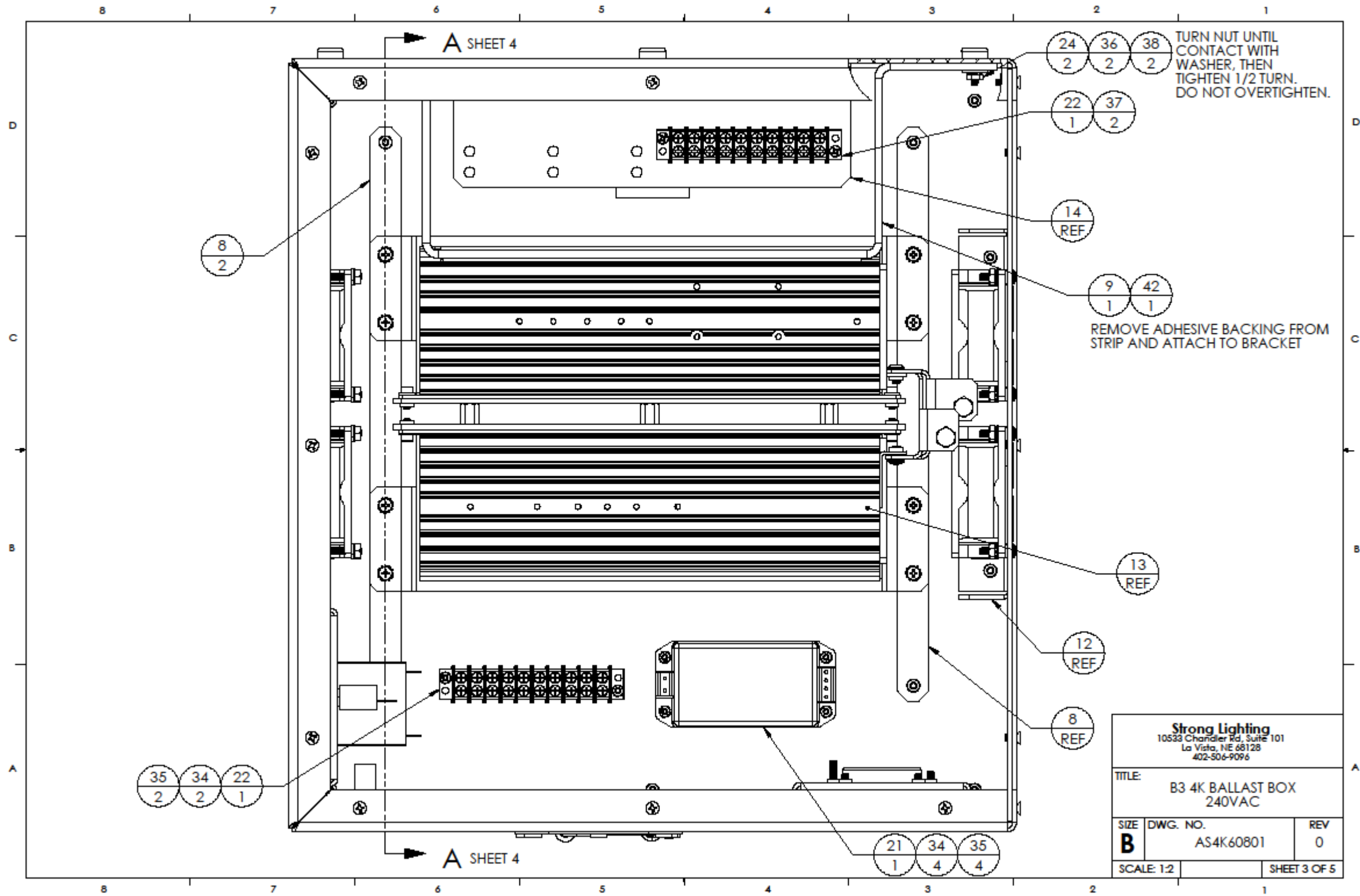
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
46			
45	FSFU063214B	#6-32 X 1/4" FLAT PHIL U-CUT BLK SS	4
44	FKCS0614	#6-32 X 1/4" SCKT CAP SS	4
43	FT0612FFSS	#6-32 X 1/2" HEX STANDOFF	4
42	RU4K0000	SILICONE STRIP 1/8 X 1/2 X 10 ADHESIVE BACK	1
41	FNHS1400	1/4-20 HEX NUT SS	2
40	FWSS0014	1/4" SPLIT WASHER SS	2
39	FBHS1412	1/4-20 X 1/2" HEX BOLT SS	2
38	FWFS0014	1/4" MIL SPEC FLAT WASHER SS	2
37	FSPS0612	#6-32 X 1/2" PAN PHIL SS	2
36	FSPS0834B	#8-32 X 3/4" PAN PHIL BLK SS	3
35	FN63214W	NUT, HEX, 6-32, 1/4" WASHER	6
34	FSFU63212B	#6-32 X 1/2" FLAT PHIL U-CUT BLK SS	6
33	FWTS0800	#8 EXT TOOTH LOCK WASHER SS	8
32	FT0834FF	#8-32 X 3/4"L - 3/8 HEX F-F STD	8
31	FSFS08352134	SCREW, 8-32 X 1 3/4, FLAT SS	8
30	FR361225	ALU POP RVT 3/16"D X 0.125-0.25	12
29	FSFU083212B	#8-32 X 1/2 FLAT PHIL U-CUT SS	10
28	URBRFTBLST	RUBBER FEET, BALLAST	14
27	FSPB0838	#8-32 X 3/8" PAN PHIL BLK SS	12
26	FWFB0800	#8 FLAT WASHER BLK SS	15
25	FSPB0812	#8-32 X 1/2" PAN PHIL BLK SS	14
24	FNHTW081132SS	#8-32 HEX NUT W/ TOOTH WSHR 1	11
23	FSFU83238B	#8-32 X 3/8" FLAT PHIL U-CUT SS	44
22	ETBL375	TERMINAL BLOCK	2
21	EPSU4524ST	45W SINGLE OUTPUT ENCAPSULATE	1
20			
19	88319000	RECEPTACLE 14-PIN FEM	1
18	UBGBLST0	FINGER GUARD	2
17	EFN80320	80X32 24VDC MUFFIN FAN	2
16	77271000	SPRING LOADED HANDLE	1
15	ES2K60820A	BALLAST CONTROL PCB ASSY	1
14			
13	AS4K60863A	CCI BALLAST ASSY	1
12	AS4K60862A	FAN ASSY, INTAKE	1
11	AS4K60861A	BREAKER PANEL ASSY	1
10	AS4K60860A	TRANSFORMER ASSY, 120V STEPDOWN	1
9	SS4K60818A	BALLAST MOUNT STIFFENER	1
8	SS4K60814A	SHELL WALL BRACE	2
7	SS4K60810A	SHELL STIFFENER	1
6	SS2K60809A	COVER PLATE	1
5	SS2K60808A	STIFFENER PLATE, HANDLE	1
4	SS4K60806A	CONNECTOR PLUG MOUNTING BRACKET	1
3	SS2K60804A	FAN MOUNTING PLATE	1
2	SS4K60802A	SHELL COVER	1
1	SS4K60801A	SHELL BASE	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
46			
45	FSFU063214B	#6-32 X 1/4" FLAT PHIL U-CUT BLK SS	4
44	FKCS0614	#6-32 X 1/4" SCKT CAP SS	4
43	FT0612FFSS	#6-32 X 1/2" HEX STANDOFF	4
42	RU4K0000	SILICONE STRIP 1/8 X 1/2 X 10 ADHESIVE BACK	1
41	FNHS1400	1/4-20 HEX NUT SS	2
40	FWSS0014	1/4" SPLIT WASHER SS	2
39	FBHS1412	1/4-20 X 1/2" HEX BOLT SS	2
38	FWFS0014	1/4" MIL SPEC FLAT WASHER SS	2
37	FSPS0612	#6-32 X 1/2" PAN PHIL SS	2
36	FSPS0834B	#8-32 X 3/4" PAN PHIL BLK SS	3
35	FN63214W	NUT, HEX, 6-32, 1/4" WASHER	6
34	FSFU63212B	#6-32 X 1/2" FLAT PHIL U-CUT BLK SS	6
33	FWTS0800	#8 EXT TOOTH LOCK WASHER SS	8
32	FT0834FF	#8-32 X 3/4"L - 3/8 HEX F-F STD	8
31	FSFS08352134	SCREW, 8-32 X 1 3/4, FLAT SS	8
30	FR361225	ALU POP RVT 3/16"D X 0.125-0.25	12

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NEXT ASSY	USED ON	MATERIAL	FINISH
APPLICATION	DO NOT SCALE DRAWING	NONE	NONE

UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN INCHES	DRAWN	NAME	DATE
TOLERANCES:	CHECKED	JCL	08/17/16
ANGULAR: 3X ± 1.0 XXX 0.5	ENG APPR.	JCL	08/17/16
TWO PLACE DECIMAL .02	MFG APPR.		
THREE PLACE DECIMAL .010	Q.A.		
Strong Lighting 10533 Chandler Rd, Suite 101 La Vista, NE 68128 402-506-9096			
TITLE: B3 4K BALLAST BOX 240VAC			
SIZE	DWG. NO.	REV	
B	AS4K60801	0	
SCALE: 1:4	SHEET 1 OF 5		





Strong Lighting 10533 Chandler Rd, Suite 101 La Vista, NE 68128 402-506-9096		
TITLE: B3 4K BALLAST BOX 240VAC		
SIZE	DWG. NO.	REV
B	AS4K60801	0
SCALE: 1:2		SHEET 3 OF 5

