Operation and Maintenance Manual

ZOM-12000-9v1

ZGS-12000-9v1 Fixed Hoist Test Facility

1) **Purpose**
   a. The purpose of the Fixed Hoist Test Facility (FHTF) is to allow the operation, maintenance, and training of the operation and maintenance of rescue hoists in use by the 160th SOAR without the need of an aircraft.
   b. The FHTF works in conjunction with the ZGS-10000-5-2 mobile take up assembly.

2) **Scope**
   a. The FHTF provides provisions for the mechanical and electrical attachments of three different rescue hoists.
      i. BL-29900-xx
      ii. BL-27100-xx
      iii. BL-10300-151

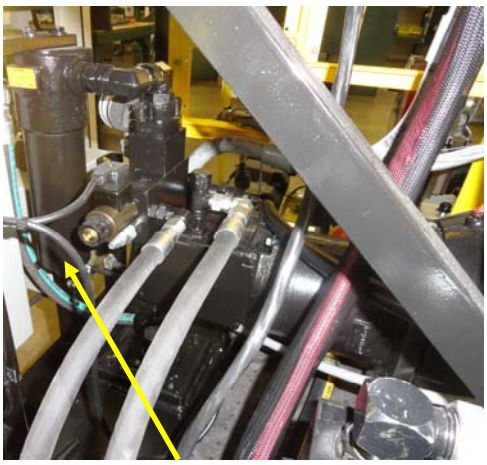
BL-27100 BL-29900 BL-10300

   b. The FHTF is intended to be used in conjunction with the ZGS-10000-5-2 Mobile Rescue Hoist Ground Equipment (RHGSE). The RHGSE has been equipped with a work platform to enable working on the hoist while in the operating position. This allows closer inspection of the hoist mechanism, setting the limit switches and installing and removing the rescue hoist cable.

c. The combined system allows operating the rescue hoists for the purpose of setting limit switches, verifying correct setup of the hoist mechanisms, changing the cable, and tensioning a new cable under load.

d. The FHTF is supplied with a hydraulic power supply that has been designed to maintain the cleanliness of the hydraulic fluid used in the hoist in order to prevent the contamination of the hydraulic system of the aircraft.
The hydraulic power supply provides 3000 psi pressure at 6 GPM. The system is equipped with a high pressure filter and a low pressure filter and self sealing quick disconnects. The high pressure filter is rated to 5 Micron (abs) and has a clogging indicator. The low pressure filter is rated is rated to 5 micron. The system also utilizes a contamination control breather that removes moisture from the air and therefore keeps water out of the hydraulic fluid. The hydraulic fluid used is the same as used in the aircraft, Mil-H-83282.

Low Pressure Filter



High Pressure Filter

e. The FHTF has been supplied with an onboard 24 Volt power supply to provide power to the Mobile RHGSE in order to allow for continual operations without having to stop and recharge the batteries on the Mobile RHGSE

f. The FHTF has the mounting brackets, interconnect cables and hydraulic lines and fittings to test all the hoists it has been designed to service.

3) Theory of Operation
    a. The system is supplied with hoist adapters and a chain hoist that are used to raise the hoist into position where two load cells attach and support the weight of the hoist and adapter and the load applied by the Mobile RHGSE.

b. The system is equipped with quick disconnects and electrical connector and cables to attach the three types of hoists. The mounting bracket moves with the hoist mount, therefor eliminating the possibility of damage to the cable or connectors if they are not disconnected before lowering or raising the mount.

c. The system is equipped with a 28 volt 5 amp power supply to provide control power to the two control boxes that operate the BL-27100 and the BL-29900 hoists.

d. The system includes the means to mount the control box for the BL-27100, and the pilot control box and the pilot control box for the BL-29900.

28 VDC power supply is inside the control box.

e. The system is equipped with a proportional control valve and a joystick controller to operate the BL-10300 hoist.

f. The system is equipped with a MS90362-1 receptacle to accept the plug that delivers 115 V 3 phase 400 hz power to the BL-29900 hoist and the BL-27100 hoist fan.

g. The system is equipped with a 30 Amp 3 phase breaker to protect the BL-29900 and the equipment wiring in the event of a hoist malfunction.

h. The system is equipped with three 2 amp circuit breakers in the event the three phase fan on the BL-27100 is to be operated. If the fan has a problem with one of its windings the breakers will protect the fan and the wiring from further damage.

i. The system is equipped with an hour meter that operates when ever the load display is on.

j. All the pins that are used to attach the various components are tethered to the component so they are not easily lost

k. The system is also equipped with a 24 volt power supply to provide power to the ZGS-10000-5-2 mobile take up while in use with the Fixed Hoist Test facility.

4) Operating Procedure

BL-27100
Start Up

1. Install the Hanging Hoist Mount, ZGS-12613-1 using the pins and retaining pins
2. Install the hoist on mount using the pins and retaining pins
3. Clean hydraulic fittings thoroughly
4. Attach hydraulic lines, (Caution) Insure the return line QD is mated completely! Failure of the heat exchanger will result if the return line QD is not fully engaged
5. Attach Electrical harness connector
6. Raise mount into position, install pins in load cells, lower chain hoist to apply the load to the lead cells
7. If the fan is to be tested attach the 400Hz power cable to the receptacle
8. If the fan is to be tested , turn on the 3 phase 400 hz power switch
9. Position the Zephyr GSE under hoist
10. Activate the hoist select switch on the motor starter panel to select the BL-27100
11. Pull out E-Stop button to turn on power
12. Press Pump Start button to start the hydraulic pump
13. Turn the Pressure switch to on, approx 3000 psi pressure should develop on the pressure gage
14. Turn the Power switch on the control box to on, the load indicator should illuminate
15. Activate the hoist select switch on the control box to select the BL-27100 hoist
16. Press the Tare button on the load display to zero out the load with no load on the cable
17. Operate the hoist using the pendant, pilot override or backup power control, (Caution) Using the backup power control overrides the limit switches in the hoist
18. Attach the rescue hoist cable to the Zephyr GSE and operate the hoist in the down direction
19. Follow the operating instructions for the Zephyr GSE while running the hoist

Shut Down

20. Disconnect the rescue hoist cable from the Zephyr GSE
21. Retract the cable to full in and insure the full up limit switch activates and the bumper compresses properly
22. Turn off the Power switch on control box
23. Turn the pressure switch to off
24. Push in E-stop button
25. Press the 3 phase 400 hz power switch to off
26. Detach the electrical harness
27. Detach the hydraulic lines
28. Raise rescue hoist mount with the chain hoist and remove the pins
29. Lower the hoist to the lowest position
30. Remove the hoist and arm from hoist mount

BL-10300
Start Up

1. Install the Clevis Pin Hoist Mount, ZGS-12608-1 using the pins and retaining pins
2. Install the BL-10300 hoist on the mount using the pins and retaining pins
3. Attach the hydraulic lines, insuring the up and down lines are attached properly
4. Attach the electrical harness connector
5. Raise the mount into position, and install pins in load cells, lower chain hoist to apply the load to the lead cells
6. Position the Zephyr GSE under the hoist
7. Pull out the E-Stop button to turn on power
8. Press the Pump Start button to start the hydraulic pump
9. Activate the hoist select switch on the motor starter panel to select the BL-10300
10. Turn the Pressure switch to on, pressure should develop on the pressure gage
11. Turn the Power switch on the control box to on, the load indicator should illuminate
12. Press the Tare button on the load display to zero out the load with no load on the cable
13. Pull up the locking ring on the Joystick controller and activate the hoist in the extend direction
14. Attach the cable to the Zephyr GSE and operate the hoist in the down direction
15. Follow the operating instructions for the Zephyr GSE while running the hoist

Shut Down

16. Disconnect the cable from the Zephyr GSE
17. Retract the cable to full in and insure the full up limit switch activates and the bumper compresses properly
18. Turn of the Power switch on control box
19. Turn the Pressure switch to off
20. Push in E-stop button
21. Raise the rescue hoist mount with the chain hoist and remove the pins
22. Lower hoist to lowest position
23. Detach the electrical harness connector
24. Detach the hydraulic lines
25. Remove the hoist from hoist mount and stow the pins properly

BL-29900
Start Up

1. Install Hanging Hoist Mount, Arm using the pins and retaining pins
2. Install hoist on mount using the pins and retaining pins
3. Attach the Electrical harness connectors
4. Raise mount into position, install the pins in the load cells, lower chain hoist to apply the load to the lead cells
5. Attach the 400Hz power cable to the receptacle
6. Turn on the 3 phase 400 hz power switch
7. Position the Zephyr GSE under hoist
8. Turn the Power switch on the control box to on, the load indicator should illuminate
9. Activate the hoist select switch on the control box to select the BL-29900 hoist
10. Press the Tare button on the load display to zero out the load with no load on the cable
11. Operate the hoist using pendant, or pilot override
12. Attach the rescue hoist cable to the Zephyr GSE and operate the hoist in the down direction
13. Follow the operating instructions for the Zephyr GSE while running the hoist

Shut Down

14. Disconnect the rescue hoist cable from the Zephyr GSE
15. Retract the cable to full in and insure the full up limit switch activates and the bumper compresses properly
16. Turn of the Power switch on the control box
17. Press the 400 hz power switch to off
18. Detach the electrical harness connectors
19. Raise the rescue hoist mount with the chain hoist and remove pins
20. Lower hoist to lowest position
21. Remove the hoist and arm from the hoist mount

5) Periodic Maintenance

a. Check the indicators on the filters
b. Clean the hydraulic disconnects
c. Calibrate the load display system as per The Users Guide for the DP25B-S Load meter using a known load of 600 lbs as per section 4.3.1 page 24.

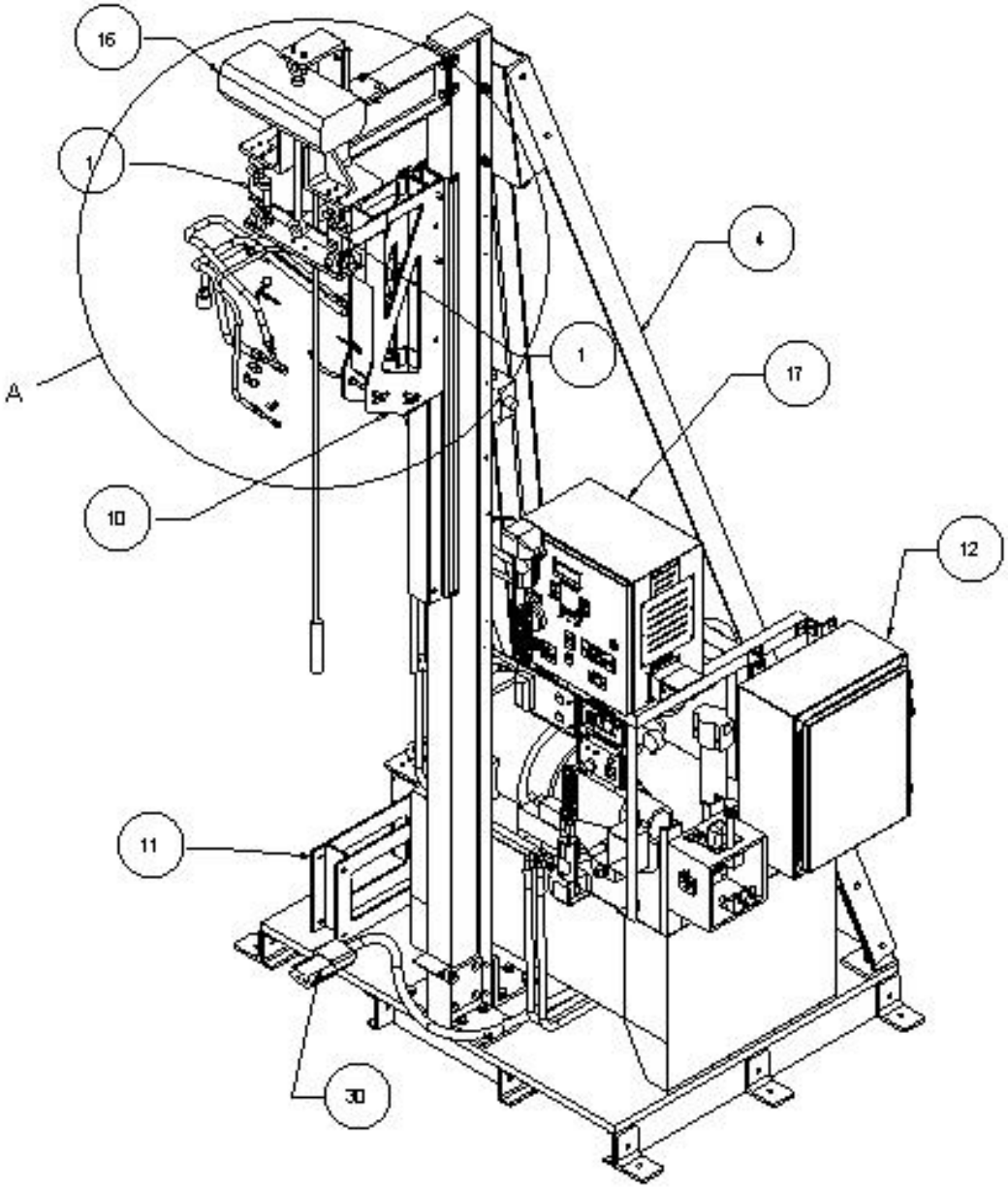
6) Recommended Spare Parts List

a.	Desiccant filler cap	D101	Air Sentry
b.	Low Pressure filter element	P16-5332	Donaldson
c.	High Pressure filter element	HEK85-20.203-AS-FG006-LC-B	Ikron
d.	Upper Capstan		
e.	Lower Capstan		

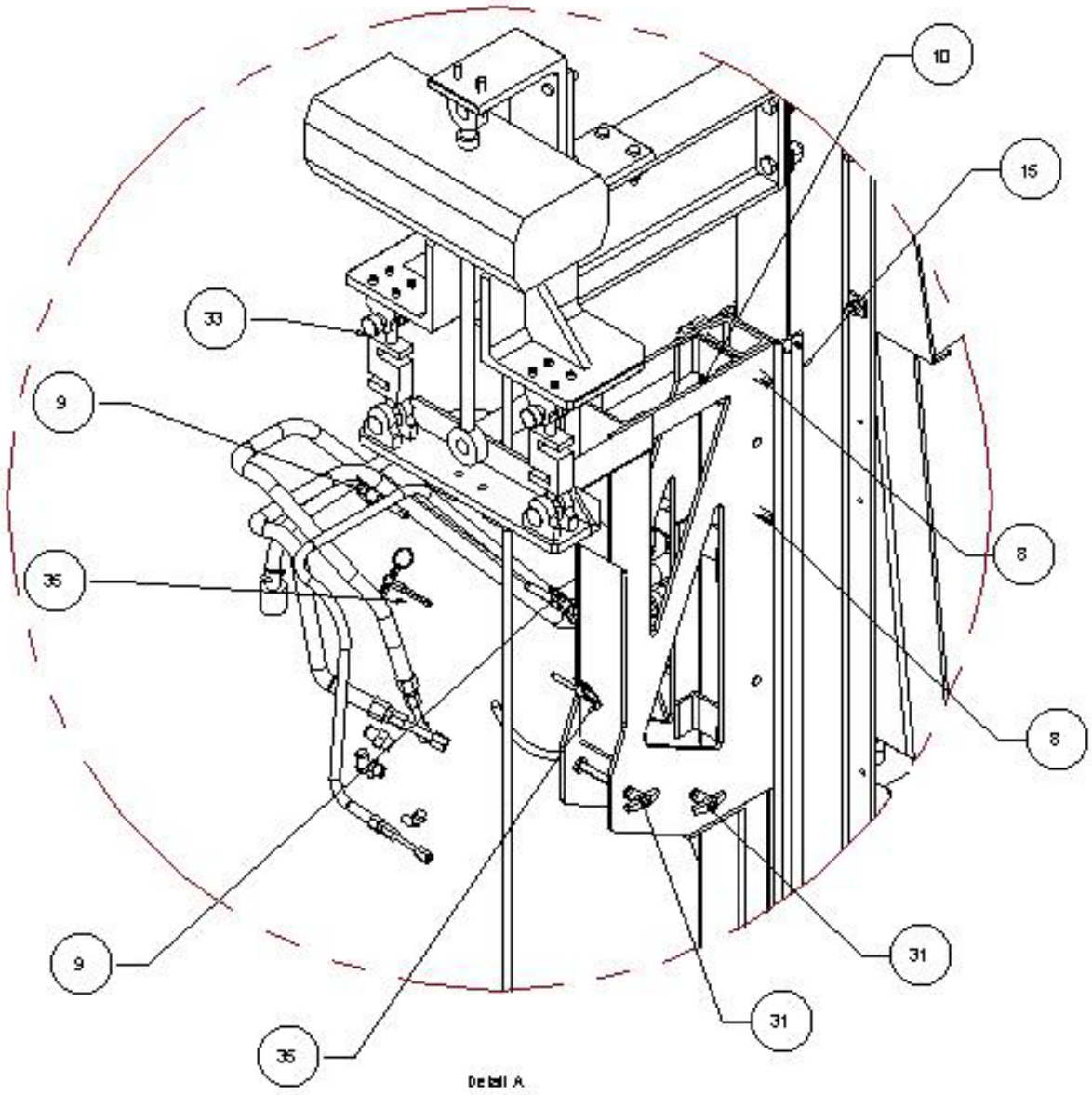
7) Trouble Shooting

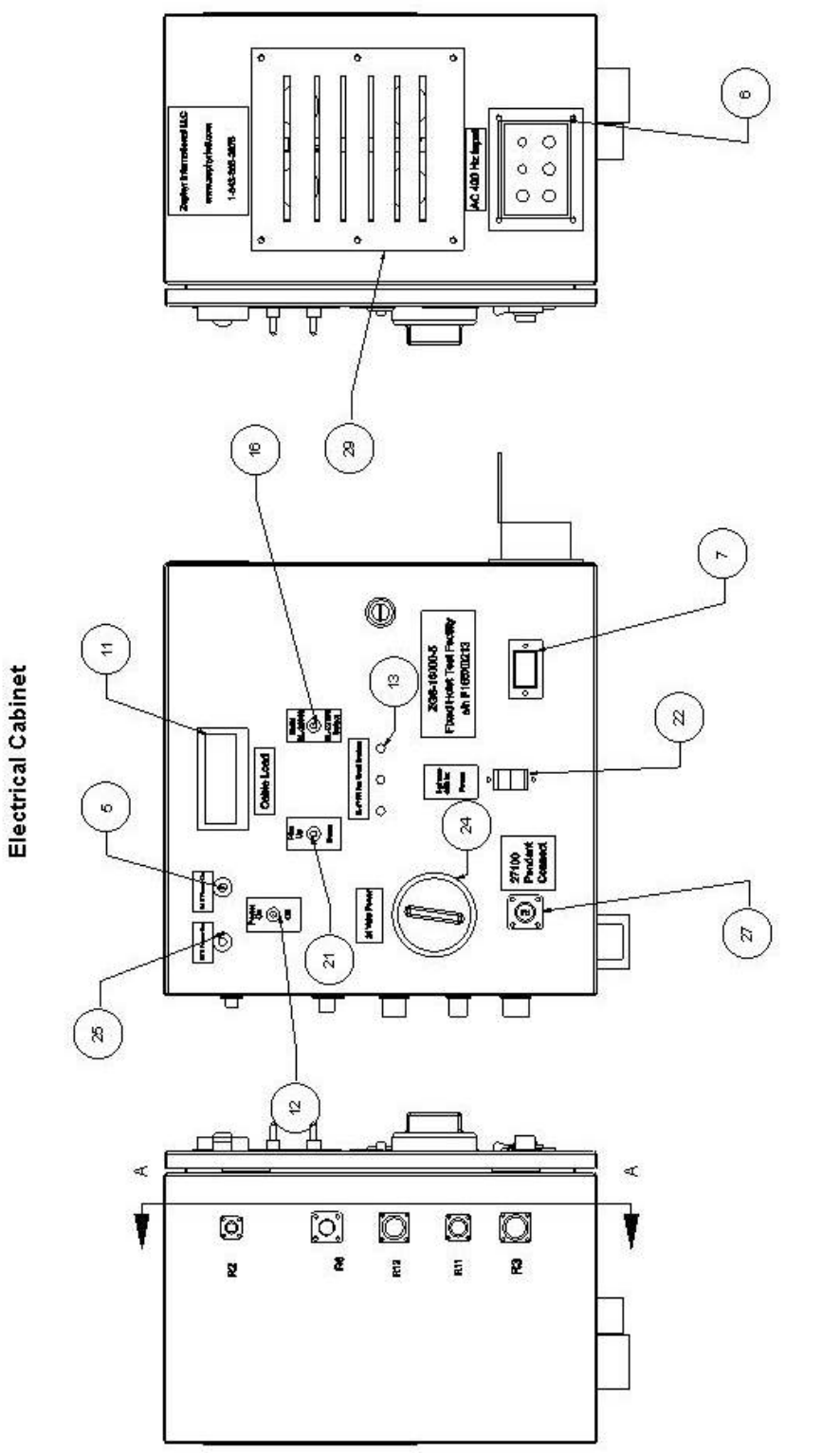
a. If hoist controls do not operate the hoist, check to insure the hoist select switch is properly positioned.
b. If hoist fails to lower, check the full out limit switches
c. If hoist fails to raise check the full in limit switches
d. If the BL-27100 comes to full out and stops abruptly, check the emergency full out limit switch is not activating before or at the same time as the full out limit switch.

8) IPB



Item Number	Quantity	Part Number	Part Name	Revision	Comment
1	2	ZGS-12126-1	S Beam Load Cell Assembly		
2	1	ZGS-12629-1	27100 Frame harness		
3	1	ZGS-12655-1	Hydraulic Hose 6		
4	1	ZGS-12600-1	Upright Assembly SOAR		
5	4	ZGS-12213-2	Cam Follower adjustable		
6	1	Reference	Crew Control Panel		
7	1	ZGS-12647-1	Hydraulic Hose 2		
8	2	CPT-150	Ball Lock Pin .5 x 4		
9	2	BLTS-070A	Quick Release Pin -BLT-070		
10	1	ZGS-12613-1	Hanging Hoist Mount Arm Mounte		
11	1	ZGS-12608-1	Clevis Mount Assembly SOAR		
12	1	ZGS-12626-1	Hydraulic Supply SOAR		
13	1	ZGS-12654-1	Hydraulic Hose 5		
14	1	ZGS-12628-1	29900 Frame Harness		
15	1	ZGS-12337-1	Slider Assembly		
16	1	ZGS-12640-1	Shop Star Hoist 110V		
17	1	ZGS-12674-1	Electrical Cabinet		
18	2	Reference	Pendant		
19	1	ZGS-12632-1	BL-10300 Harness		
20	1	ZGS-12636-1	29900 3 phase harness		
21	1		28 Volt Power Line		
22	1	ZGS-12656-1	Hydraulic Hose 7		
23	1	Reference	Pilot Control Panel		
24	1	ZGS-12657-1	Hydraulic Hose 8		
25	1	ZGS-12630-1	Junction Box to EC Box Harness		
26	1	ZGS-12635-1	Load Display Input Cable assembly		
27	1	ZGS-12653-1	Hydraulic Hose 4		
28	1	ZGS-12648-1	Hydraulic Hose 3		
29	1	ZGS-12776-1	Slider Stop		
30	1	R64G3B	28 volt Plug		
31	2		Ball Lock Pin .38 x 4		
32	1	Reference	EC-10000 box		
33	4	ZGS-12139-1	Load Cell Clevis Pin		
34	1	ZGS-12124-1	Load Cell Summing Box		
35	2	BLTS-020A	Quick Release Pin -BLT-020		
36	1	ZGS-12646-1	Hydraulic Hose 1		
37	4	ZGS-12213-1	Cam Follower		

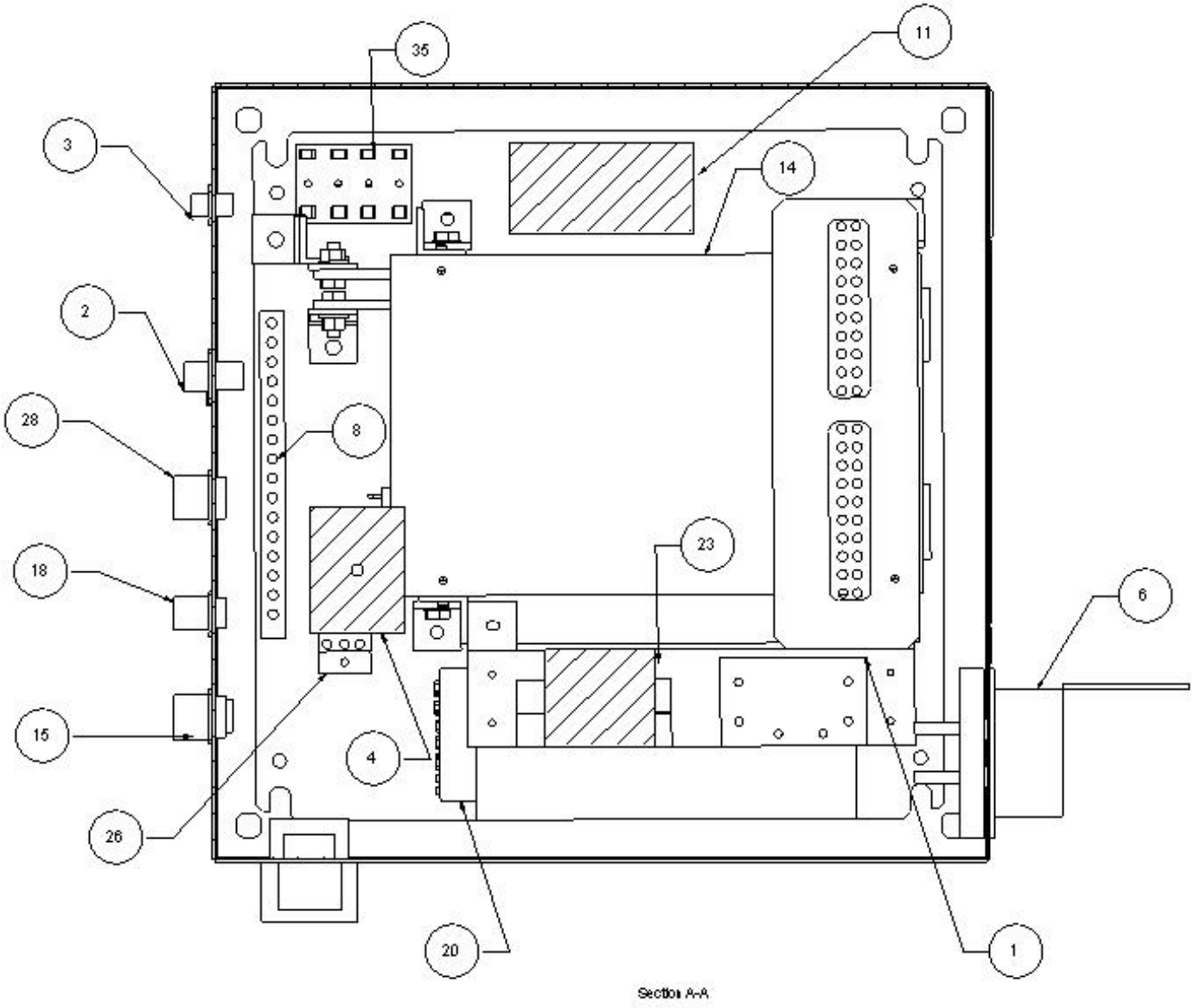




Electrical Cabinet

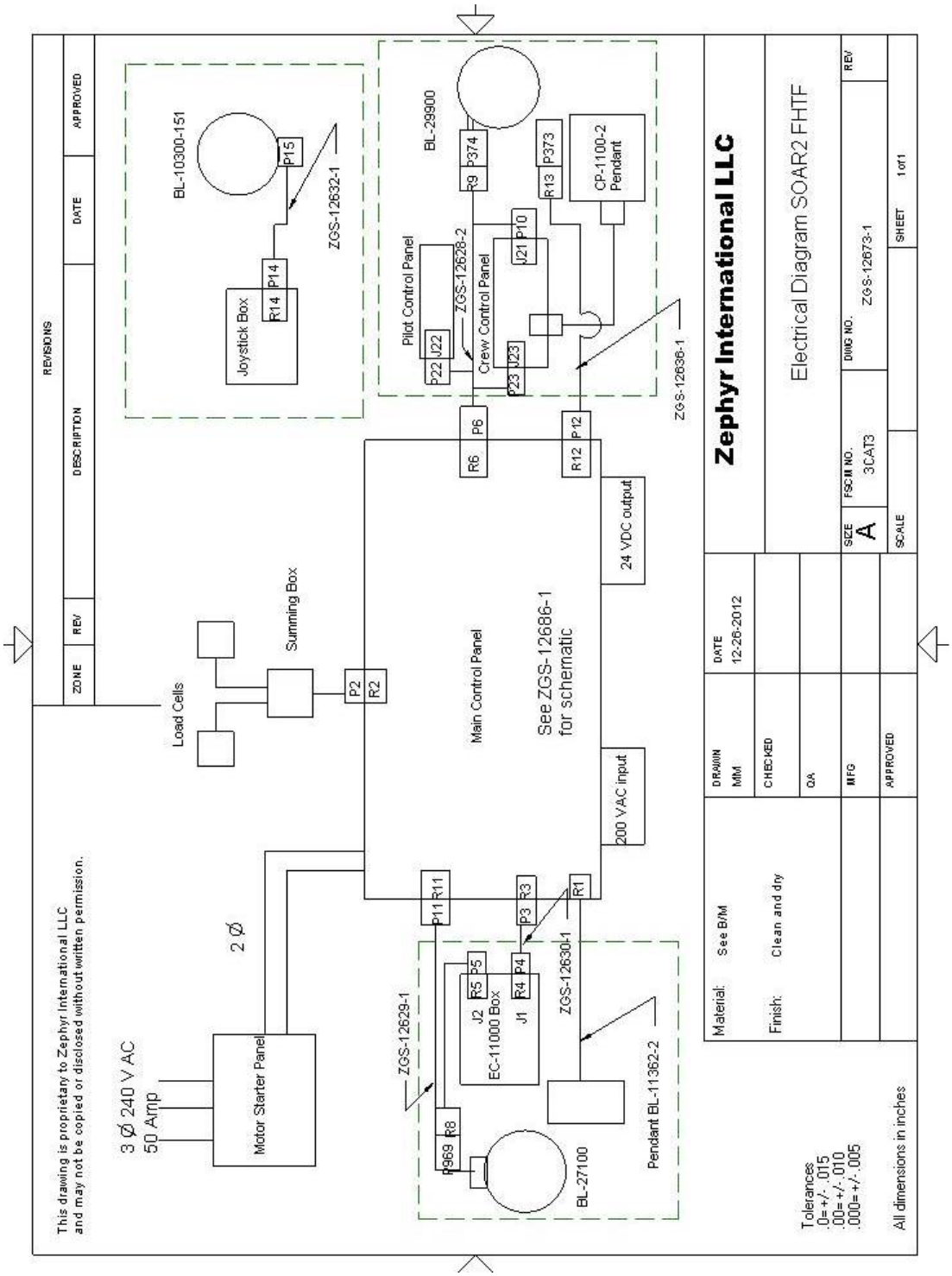
Item Number	Quantity	Part Number	Part Name	Revision	Comment
1	1	1322570CH	Power Distribution Block 2 phase		
2	1	MS3472W10-6S	MS3472W10-6S		
3	1	MS3112E8-4P	Box Receptacle, Load		
4	1	KU325N	Motor Disconnect Switch		
5	1	557-1204-203F	Indicator 28 V		
6	1	4652B	Power Receptacle		
7	1	82450-83	Hobbs Meter		
8	1	GBK1420	Ground Bar		
9	1	ZGS-12689-1	Label- 24 Volts		
10	12		.25 Flat Washer		
11	1	ZGS-12109-1	Load Cell Display Meter		
12	1	ZGS-10157-1	Power Switch		
13	3	W58XC4C12A2	Circuit Breaker 2 Amps		
14	2	ZGS-10415-1	24 Volt Power Supply		
15	1	M83723/82W1415N	MS83723 82W1415N		
16	1	2TL1-1 Honeywell	DPDT Switch		
17	2	CB 1038-1	Fuse Holder		
18	1	M83723/82W1005N	M83273 82W1005		
19	1	ZGS-12685-1	EP1616		
20	1	ZGS-12127-1	Lambda JWS150-28A		
21	1	2TL1-7 Honeywell #	DPDT Momentary Action Switch		
22	1	ZGS-12684-1	EN4SD161610Y		
23	1	IUGX666-1-49-30.0-B-21	Circuit Breaker		
24	1	OKA/KU LK10	Door Mounting Kit		
25	1	557-1605-203F	Indicator 24 V		
26	1	38049	Power Distribution Block 1 phase		
27	1	MS3472W12-10S	Pendant Receptacle		
28	1	M83723/82W1404N	M83723 82W1404N		
29	2	AVK66	Louver Plate		

Electrical Cabinet

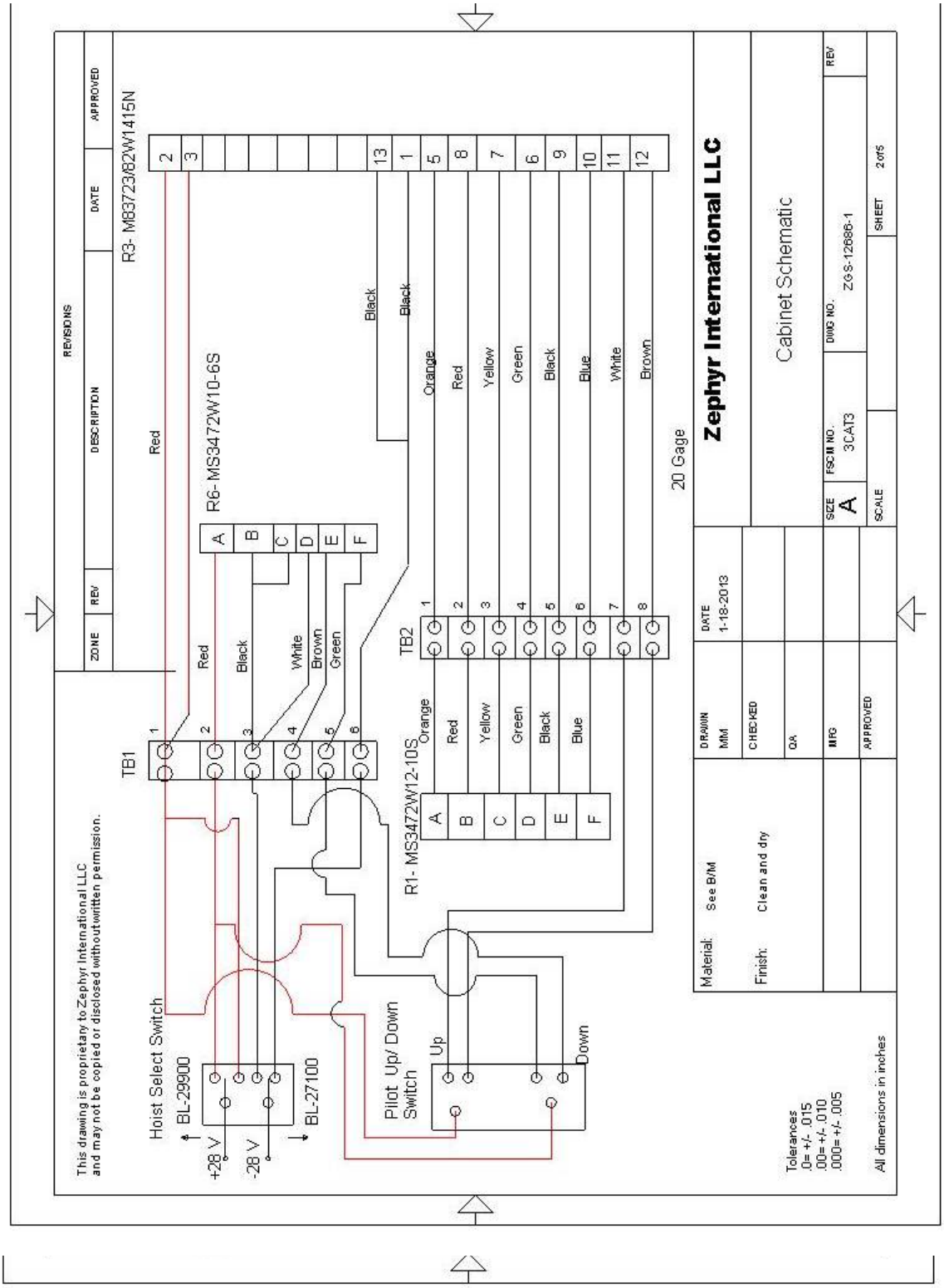


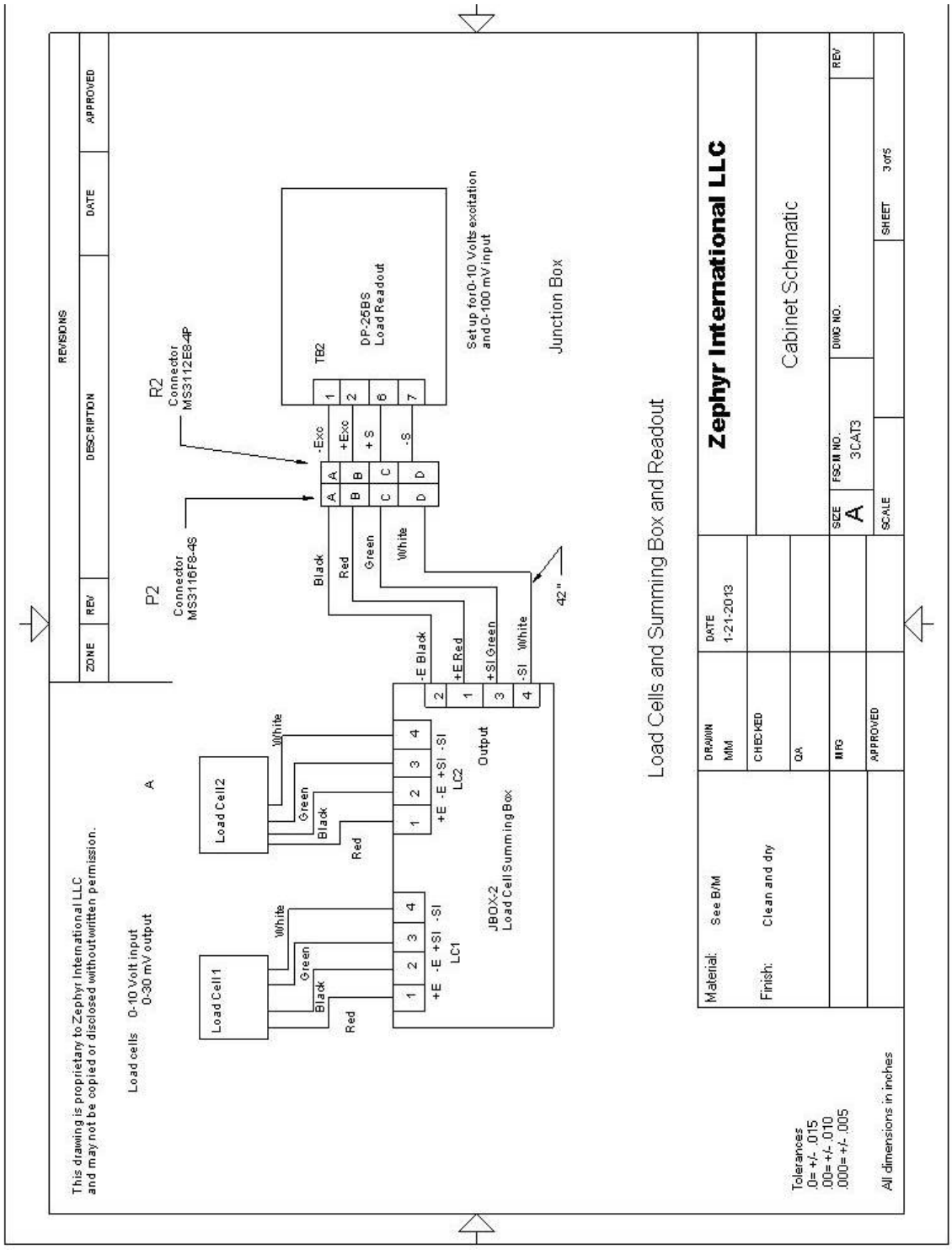
9) System Schematics

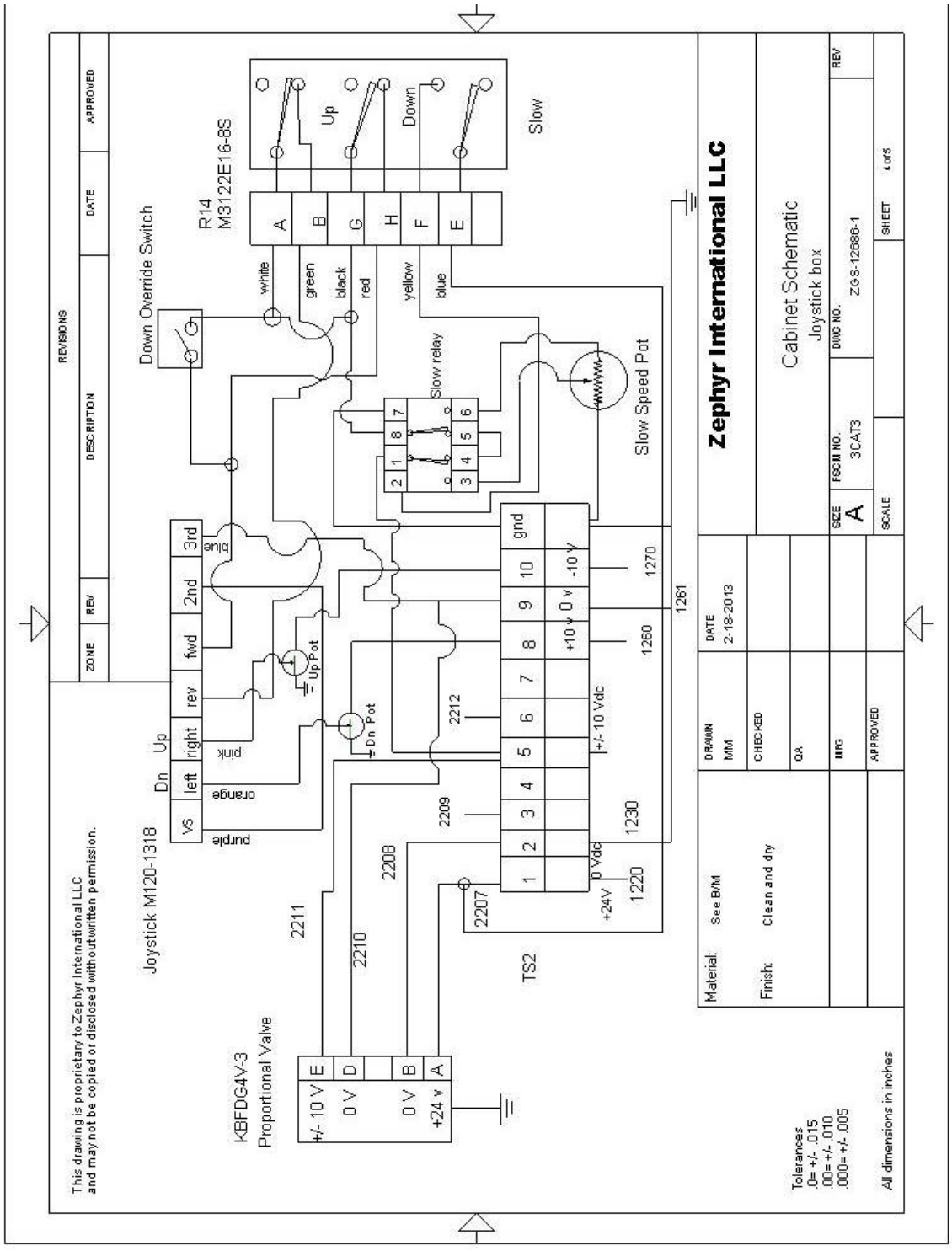
ZGS-12673-1 Electrical Block Diagram



ZGS-12686-1 Control Cabinet Wiring Schematic






Zephyr International LLC
Cabinet Schematic
Joystick box
Joystick M120-1318
Down Override Switch
R14
M3122E16-8S
Up
Down
Slow
Slow relay
Slow Speed Pot
Up Pot
Dn Pot
KBFDG4V-3
Proportional Valve
TS2
white
green
black
red
yellow
blue
orange
pink
purple
gnd
+/- 10 Vdc
0 Vdc
+24V
+/- 10 V
0 V
+24 v
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All dimensions in inches