

DON HENRY GAS TURBINE START UP

If the computer mouse sticks, hit the windows key: 

Prestart Checks:

1. Verify the main gas valves (gray valves southeast of Dispatcher Control Room) and pre-filter gas block valve (east side of east outer shed) are both OPEN.
2. Open all louvers in Auxiliary Compartment and outer sheds (east and west).
3. Diesel Engine oil level (dipstick on east side)
4. Diesel Engine fuel level (level gauge under east platform)
5. Cooling Water head tank level (small door on east side)
6. Verify P2 vent valve is open (silver-handled valve in the Stop/Speed Ratio Valve and Control Valve compartment, pictured at right).
7. Verify heaters are working:
 - o Auxiliary and Combustion Compartments' heaters working
 - o 23G breaker closed (Generator Auxiliaries Compartment)
 - o Bearing 3 heater plugged in



Factory Talk Program:

1. Before starting anything from the computer, close the Factory Talk View program and re-open it. This will restart the trending macros that have been problematic lately.
2. Silence/reset the HMI Communication alarm that comes in on the OIT panel behind you.
3. If you have to log into Factory Talk, the username is myron and the password is gt.

Auxiliary Equipment:

1. Start Auxiliary equipment (unless it's an emergency the Auxiliary equipment should be started several hours before starting the Gas Turbine).
2. Check oil flow sight glasses for flow, look for oil leaks, and check main gauges panel.
3. Test running the Diesel Engine in cold weather is no longer necessary.

Starting Auxiliary Equipment

Start Auxiliary equipment (Aux Lube Oil Pump & Hydraulic Ratchet) from Factory Talk or SCADA.

To start them from Factory Talk:

1. Go to Turbine control tab
2. Operation Select: Off
3. Master Control: Start

To start them from SCADA:

1. From the main page select the GASTRB
2. Turbine Auxil start/stop
3. You will get a pop up, press Start

Turbine Control Panel Settings

1. Determine start up mode to be used.
 - a. For starting using SCADA the Operation Select needs to be in Remote.
 - b. For Factory Talk the Operation Select needs to be in Auto.
2. Synchronizing: the generator will synch itself if Synch switch is in Auto (on Synch Panel).
3. Fuel Select: select Gas (liquid fuel lines are disconnected and cannot be used)
4. Start mode select: Normal

Generator Control Panel Settings

1. Select Drpoo for Mode Control and AVR (Auto) for Voltage Regulator Control.

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DC Oil Pump Pressure Decay Test – Complete Once Per Month for Insurance

Check back through the logbook. If the Pressure Decay Test hasn't been done yet during this calendar month, perform it now:

1. Go to the Historical Trend page in the Historical Tab.
2. At the top of the page, turn "Data Logging" ON.
3. Right click on the page and go to "Chart Properties" (bottom of the pop-up menu).
4. In the "General" tab, change the refresh rate from 1 sec to 100 ms.
5. Then click on the "X-axis" tab and change the time span from 3 days to 10 min.
6. Go to Ratchet Scheduler Page (in the Maintenance Tab) to enable emergency lube oil pump test.
7. Click DC Pump Enable; the indication should turn red.
8. Go out to the Main Gauges Panel. On the west side of the panel, toward the top, there's a black-handled valve. SLOWLY open this to bleed the Lube Oil pressure down in order to test the DC pump standby start. The valve should only open about one round for the test. Close the valve after the DC Pump has started.
 - a. The DC Pump should start when the pressure is down around 9 or 10 psi.
 - b. If there are two people present, one can watch the Pressure Decay Test screen while the other manipulates the valve.
9. Press F1 to print the lube oil trend. Place the print-out in the "DC Oil Pump Pressure Decay Test" folder (filing cabinet, top drawer).
10. Log the pressure decay test, along with the time and the pressure when the DC pump started, in the log book.
11. Change the refresh rate back to 1 sec, the X-axis back to 3 days, and turn Data Logging OFF when the test is complete.
12. On the Ratchet Scheduler page, disable the DC Pump Test and verify that the DC Pump shuts off.

Login to WebSurv for Load Numbers

1. Login to the internet-capable computer (east of entry door) with your personal username and password.
2. Double-click the "WebSurv" icon on the desktop (left side of screen, 4th from top).
 - o Username: donhenry
 - o Password: Dhpc@H@stings1
 - o This username and password are only for use at Don Henry
3. Click the GENS button (2nd column from left, near the bottom).
4. Use the DHPC GT box at the top right of the screen.
 - o You won't see a "Scheduled Interchange" (MW load setpoint) right now, but you should within several minutes after the unit comes online.
5. Open the 100 Hour Timer Countdown video link in the DH Startup Folder (middle of desktop) to keep the computer from logging you out during periods of inactivity.
 - o Open the video in a new window. If it opens as a different tab in the same window as WebSurv, drag the tab down with the mouse to move it to its own window.
6. Position the screen so you can see it from the Factory Talk station.

DON HENRY GAS TURBINE START UP

Starting the Gas Turbine

1. Call the NDS Dispatcher (ext. 3597) ~10 minutes ahead of time to verify that you are clear to start Don Henry.
 - a. Ask the Dispatcher to place the Tapchanger in MANUAL.
2. It takes ~12 minutes for the turbine to speed up and the generator breaker to close, then another couple minutes to rise to minimum load. Time the startup so Don Henry is at minimum load at the start of the hour it is supposed to be on.
3. Select the Turbine Control tab.
4. In the Start Mode Select window, select Soft.
5. In the Turbine Control Panel window, under Operation Select, select Auto.
6. Under Master Control, select Start.
7. A pop-up with red lettering will ask if you are sure you want to give the gas turbine a soft start; click **START**.
 - a. Diesel Engine will turn ON, clutch will engage, and the Warmup timer will start counting down.
 - b. When the Diesel Engine countdown is done, the turbine will start speeding up.
 - RPM indication on bottom footer
 - Shaft Speed % on Turbine Summary page
 - c. At ~20% speed, the gas valve will OPEN, and #2 and #3 Flames will come ON.
 - d. At ~70% shaft speed, the Clutch will disengage.
 - e. At ~95% speed, the Inlet Guide Vanes (IGV) will OPEN, and the Compressor Bleed Valves (CBV) will CLOSE.
 - f. Approaching 100% speed, you will hear the excitor energize behind you.
 - g. At 100% speed the Generator Breaker will close, and you will be online.
 - h. After the Gen Breaker closes, the MW output will quickly climb to ~5 MW.
 - i. Auxiliary Lube Oil pump will stop after generator breaker closes.
8. As soon as the unit is online, go to the Stop/Speed Ratio Valve & Control Valve compartment (east side of Auxiliaries Compartment) and CLOSE the P2 vent valve.
9. Follow the Scheduled Interchange load setpoint from WebSurv.
 - o If this doesn't appear within 5 minutes of starting, call the Dispatcher (ext. 3597).

Adjusting Load

1. On the Turbine Control page, select "Megawatt Control Enable".
 - o Speed Control is for running Don Henry from SCADA; MW Control is much easier for running it from Factory Talk.
2. Either click the Raise button until you reach the desired megawatt setpoint or enter a MW setpoint Target and push the Enter key.
3. If megawatt communication with SCADA is out, notify NDS Dispatcher when you adjust load. If in doubt, ask the Dispatcher whether you should or not.
4. If you are taking the Generator above 22 MW, select Base under Load Select in the Turbine Control Panel.

Graphics to Watch

- Vibration Monitor
- Exhaust Profile
- Temperature Summary
- Startup Trend
- Turbine Summary

DON HENRY GAS TURBINE START UP

SHUTTING IT DOWN

1. Call North Denver ~20 minutes before shutting down to let them know when you plan to be off. It takes them a few minutes to find out if we need to stay on longer.
2. Stay at dispatched load until the end of the hour you are supposed to be off. After the RUC is done (i.e. you are no longer scheduled to make MW), start dropping load. The downward ramp rate is 2-3 MW/min.
3. When you are at minimum load (1 MW), go to the Turbine Control Tab, and under Master Control, click STOP.
4. A green pop-up will ask if you are sure you want to stop the gas turbine; click STOP.
5. The breaker should automatically open without any Operator action. If you were at 1 MW, it should open within seconds.
6. Verify that the Auxiliary Lube Oil pump starts when the turbine speed has dropped low enough (when the lube oil pressure drops to ~13 psi). It will run for 48 hours, so don't wait around for it to turn off.
7. Verify the hydraulic ratchet begins operation after the turbine reaches zero speed.
 - The ratchet runs for ~14 seconds then stops for 3 minutes. The ratchet timer should show green and a countdown timer from 180 seconds, then will be red while it is running.
 - Do not enable the Ratchet Scheduler; the hydraulic ratchet will run itself for 48 hours after shutdown then will turn itself off.
8. After turbine has reached zero speed, retrieve and print the MW/hr reading:
 - a. Go to "Historical" and click "Stopwatch." This page will only finish updating itself after the Turbine has stopped spinning.
 - b. Press the F1 key to print.
 - c. Place the printout in the Stopwatch Folder (filing cabinet, top drawer).
9. Record the Watt-Hour Meter reading in the log book and on your log sheet.
10. Take Operation Select back to "Remote," and verify the Sync Switch is still in Auto.
11. Verify that the Dispatcher (ext. 3597) has a Gas Turbine Status READY indication.
 - If their indication shows NOT READY, Don Henry cannot start remotely.
 - Ask them to place the Tapchanger back in AUTO.
12. Finish filling out the Running Log Book entry:
 - Names of all on-site operators
 - Start and Stop times
 - If the Pressure Decay test was completed
 - Final watt-hour meter number
 - Any abnormal conditions or anything unusual that happened, etc.
13. Place your completed log sheet in the "Completed Log Sheets" folder in the top drawer of the filing cabinet.
14. Leave the pipeline and pre-filter gas valves outside open.
15. Close all but one louver in Auxiliary compartment and the east and west enclosures for winter; if summer leave them all open. Bungee strap/hook them in position open or closed.
16. Make sure all the compartment doors are shut and fastened. Make sure east and west enclosure doors are properly closed.
17. OPEN the P2 vent valve in the Stop/Speed Ratio Valve & Control Valve compartment (east side of Auxiliaries Compartment).

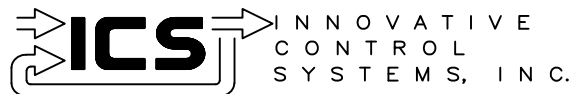
HASTINGS UTILITIES

HASTINGS, NEBRASKA

GE FRAME 5 GAS TURBINE

CABLING DIAGRAM

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE

TITLE SHEET
CABLING DIAGRAM
99174-GTB-501

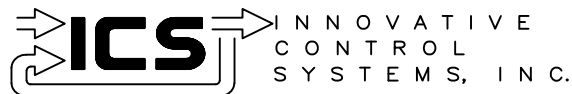
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SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-501-100-0	SHEET NO. 100 1 OF 15

99174-GTB-501

CABLING DIAGRAM

SHEET NUMBER	DESCRIPTION
100	TITLE SHEET
101	SHEET INDEX
102	CONTROL BUILDING
103	CONTROL CAB
104	ACCESSORY COMPARTMENT (RIGHT SIDE)
105	ACCESSORY COMPARTMENT (LEFT SIDE)
106	TURBINE COMPARTMENT (RIGHT SIDE)
107	TURBINE COMPARTMENT (LEFT SIDE)
108	LOAD GEAR
109	GENERATOR COLL COMPARTMENT
110	GAC
111	FUEL FORWARDING SKID
112	DUAL FUEL PURGE
113	FUEL PIT
114	BLOCK VALVE

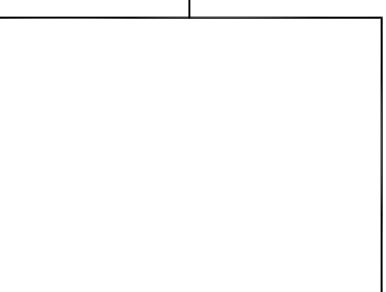
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REV	DESCRIPTION:	BY	APPROVED	DATE

SHEET INDEX
CABLING DIAGRAM
99174-GTB-501

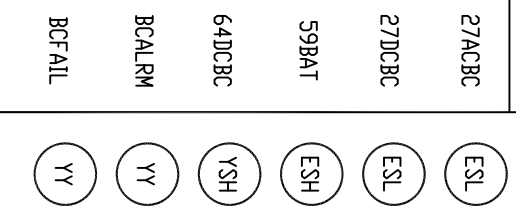
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SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-501-101-0	SHEET NO. 101 2 OF 15



208V
PANEL

622

BATTERY CHARGER

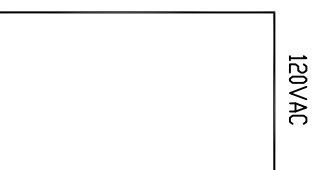


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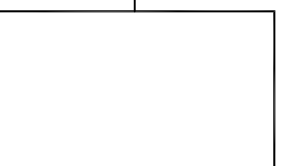
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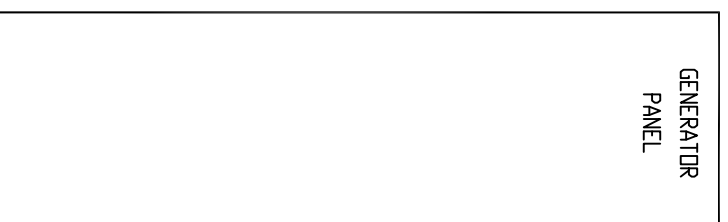
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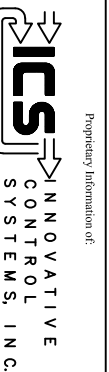
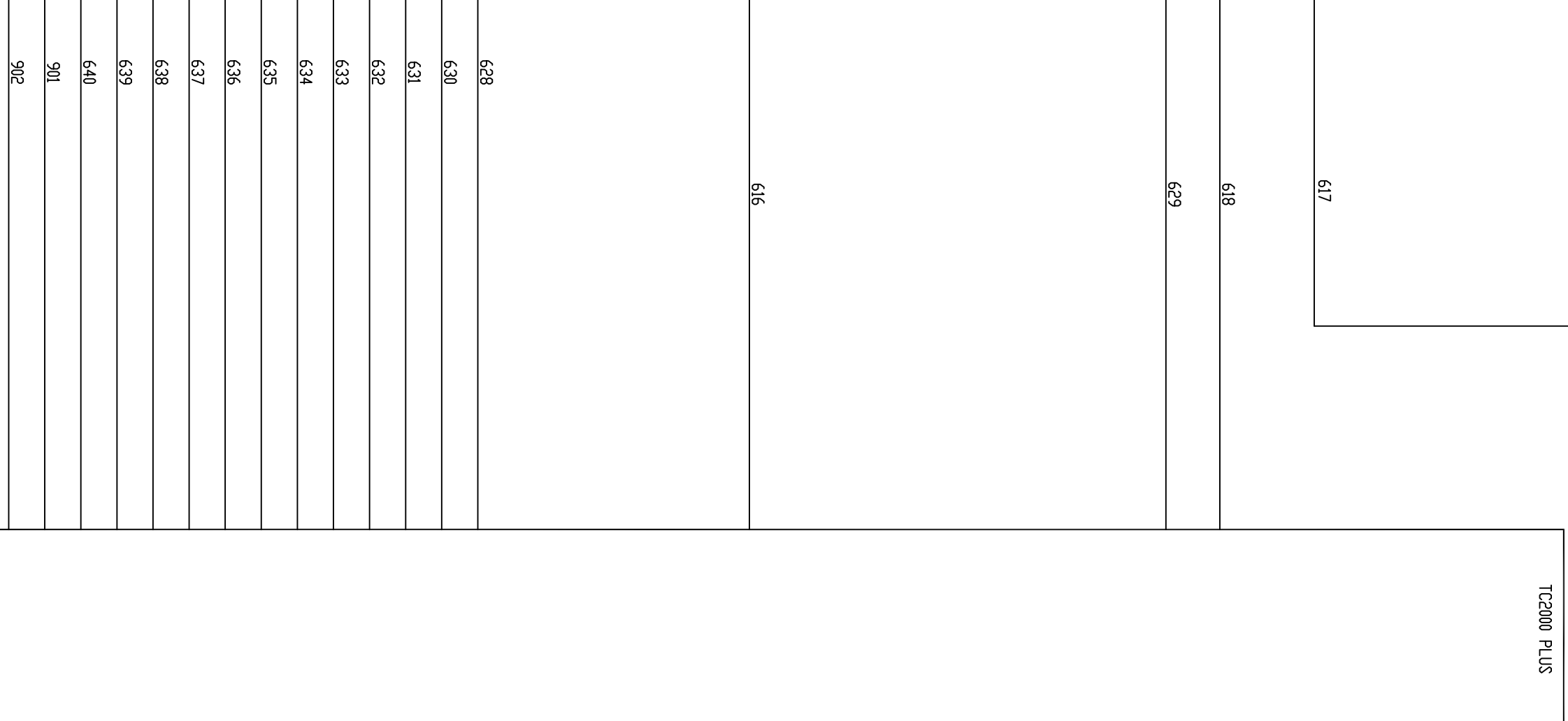
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616



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- 901
- 902



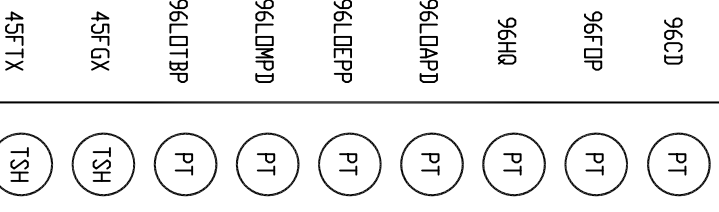
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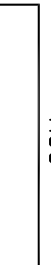
CONTROL BUILDING
CABLING DIAGRAM
99174-GTB-501

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HERRY POWER CENTER	DRAWING NO. 99174-GTB-501-102-0
APPROVED BY: [Signature]	SCALE: NTS
DRAWN BY: D. LANGLEY	SHEET NO. 102
11/29/99	3 OF 15

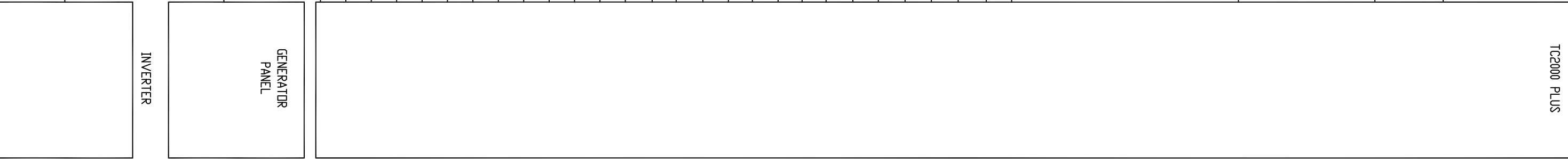
TURBINE PANEL



MCC

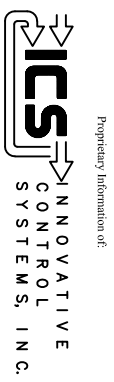


TC2000 PLUS



GENERATOR PANEL

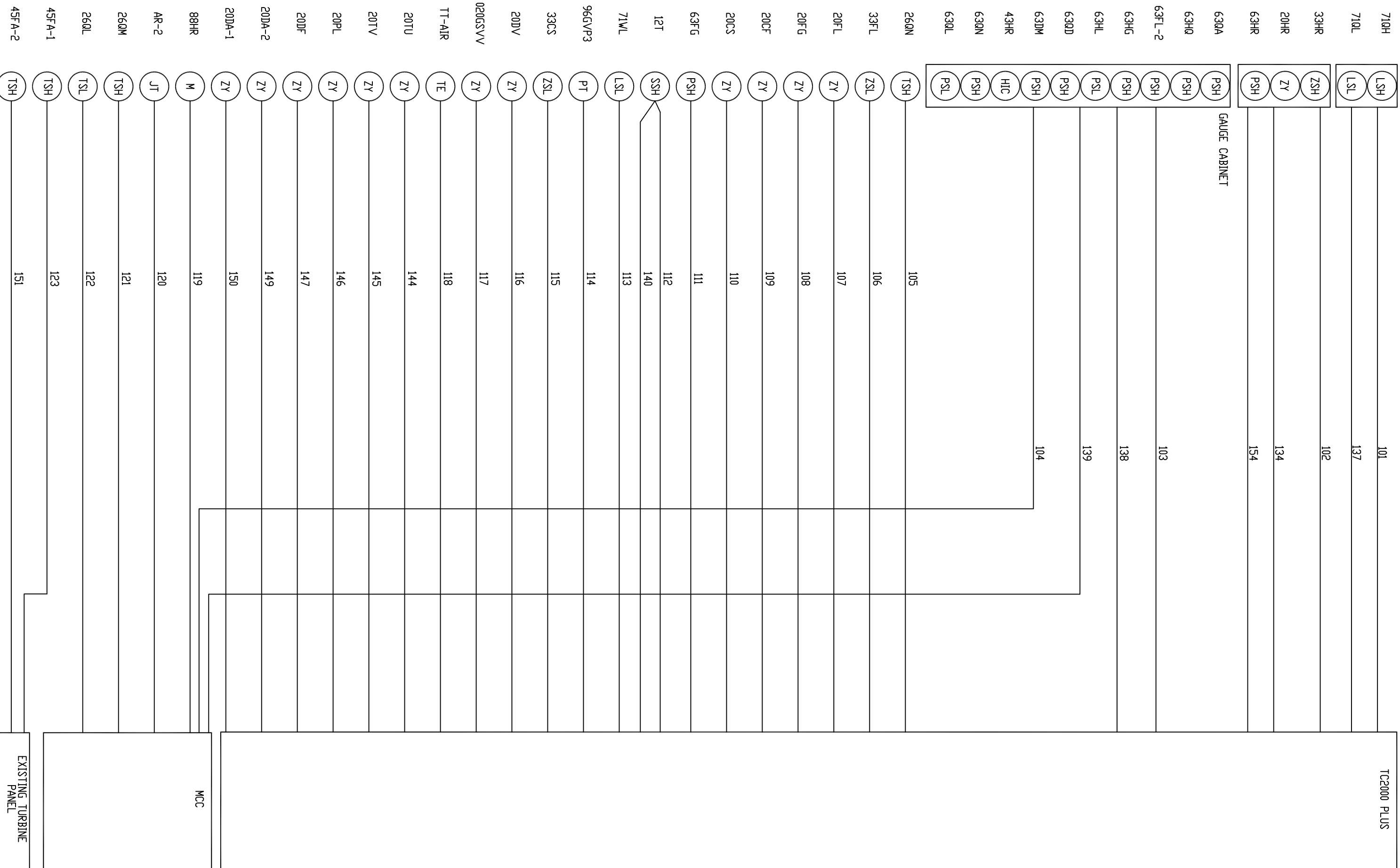
INVERTER



REV 1	MODIFIED:	CS	01/25/01
REV	DESCRIPTION:	BY	APPROVED DATE

CONTROL CAB
 CABLING DIAGRAM
 99174-GTB-501

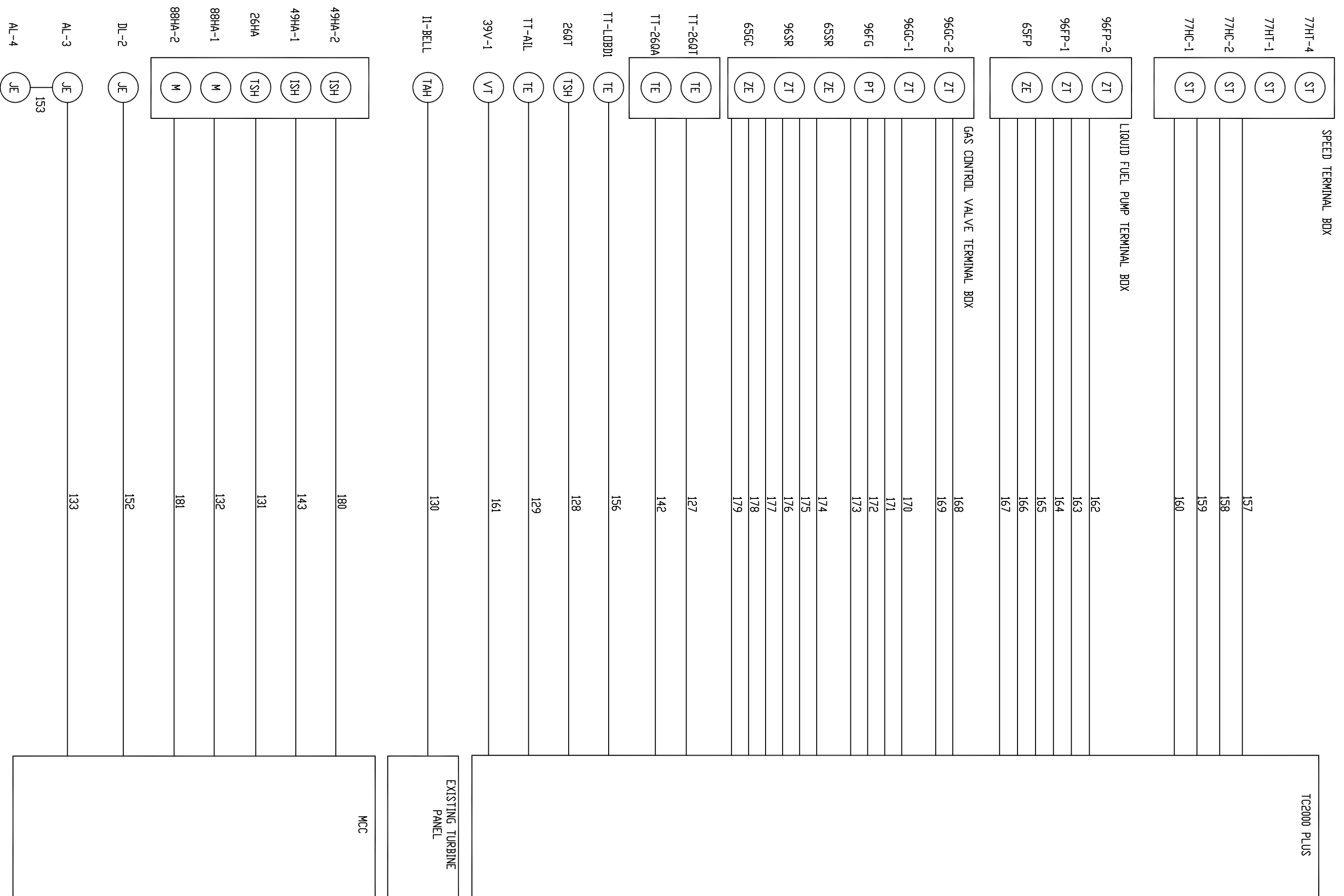
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SITE: DON HERRY POWER CENTER				SCALE: NTS
				4 OF 15



REV	DESCRIPTION	BY	APPROVED	DATE

ACCESSORY COMPARTMENT (RIGHT SIDE)
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES		SITE: DON HERRY POWER CENTER	
APPROVED BY:		DRAWING NO.	99174-GTB-501-104-0
DRAWN BY: D. LANGLEY	11/29/99	SCALE:	NTS
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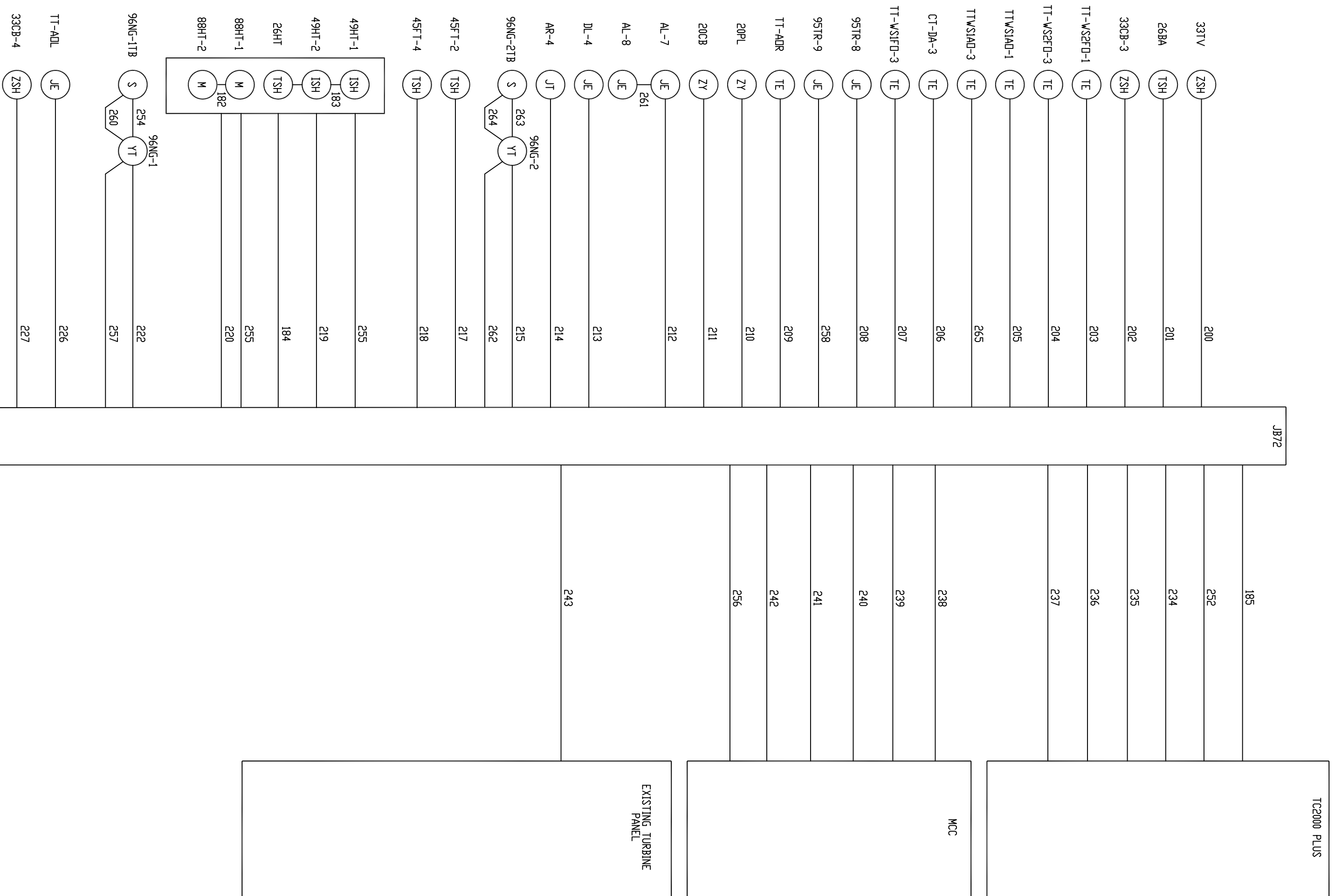


Proprietary Information of:

REV	DESCRIPTION	BY	APPROVED	DATE

ACCESSORY COMPARTMENT (LEFT SIDE)
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-501-105-0	
SITE: DON HERRY POWER CENTER		SCALE: NTS	
APPROVED BY:		SHEET NO. 105	
DRAWN BY: D. LANGLEY	11/29/99	6	OF 15

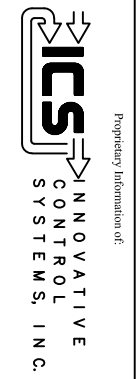
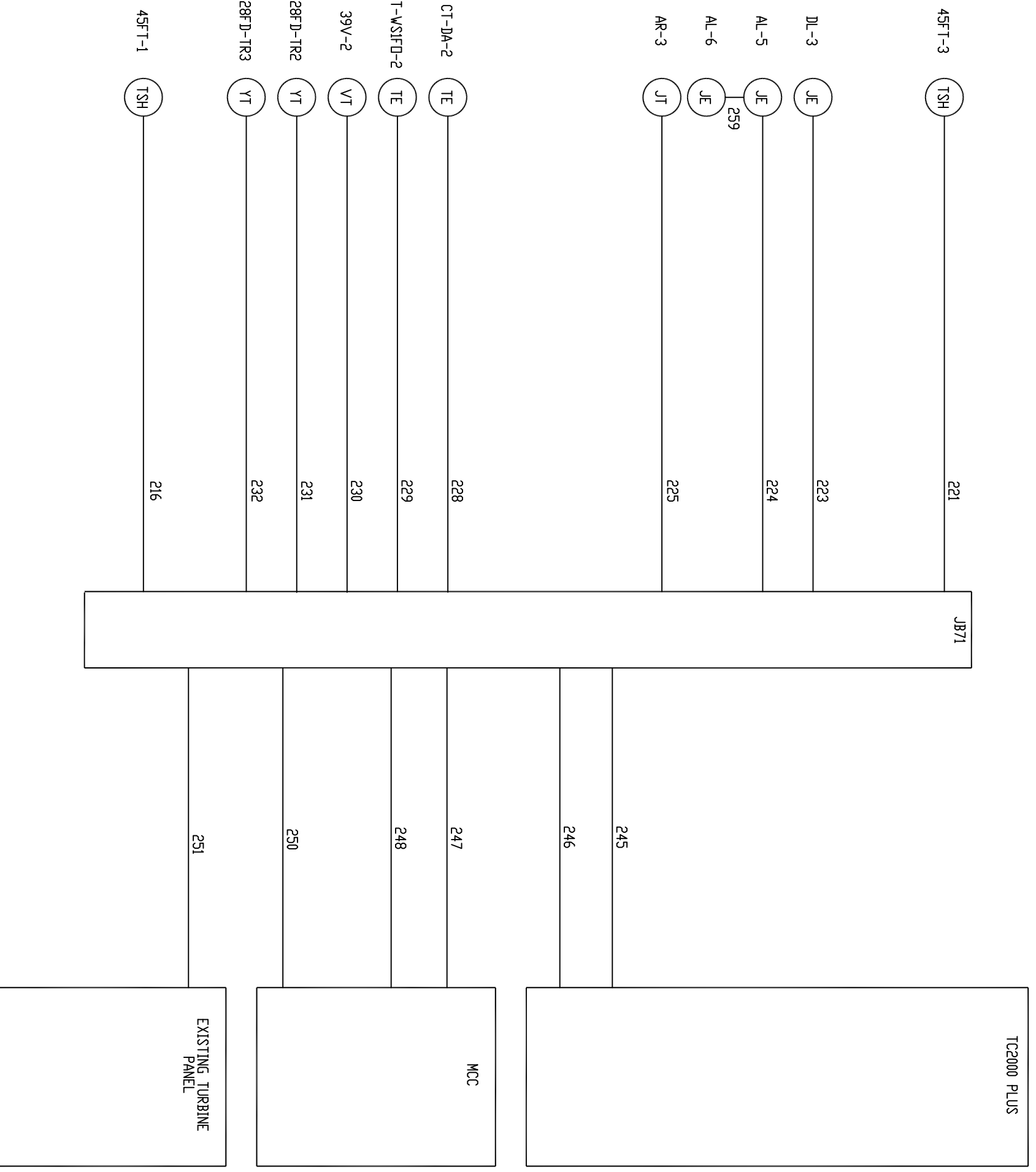


Proprietary Information of:

REV	DESCRIPTION	BY	APPROVED	DATE

TURBINE COMPARTMENT (RIGHT SIDE)
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HERRY POWER CENTER	DRAWING NO. 99174-GTB-501-106-0	SHEET NO. 106	7 OF 15
APPROVED BY: DRAWN BY: C. FISHER	11/29/99		



REV	DESCRIPTION:	BY	APPROVED	DATE

TURBINE COMPARTMENT (LEFT SIDE)
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-501-107-0	
SITE: DON HERRY POWER CENTER		SCALE: NTS	
APPROVED BY: DRAWN BY: C. FISHER	11/29/99	SHEET NO. 107	8 OF 15

TC2000 PLUS

TT-XD-1 TE 300

JB67-68
LEFT

TT-XD-2 TE 301

TT-XD-3 TE 302

TT-XD-4 TE 303

TT-XD-5 TE 304

321

TT-XD-6 TE 305

TT-XD1-1 TE 306

322

TT-XD1-3 TE 307

TT-XD1-4 TE 308

4SET-5 TSH 309

TT-L0BD2 TE 266

TT-L0BDL6 TE 324

TT-XD-7 TE 310

JB69-70
RIGHT

TT-XD-8 TE 311

TT-XD-9 TE 312

TT-XD-10 TE 313

TT-XD-11 TE 314

TT-XD-12 TE 315

323

TT-XD1-5 TE 316

TT-XD1-6 TE 317

TT-XD1-2 TE 318

TT-VS2AD-3 TE 319

TT-VS2AD-1 TE 320

EXISTING TURBINE
PANEL

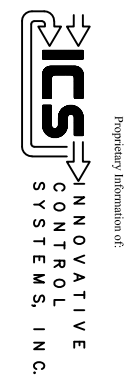
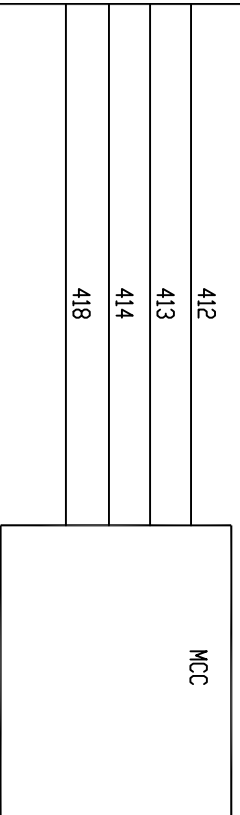
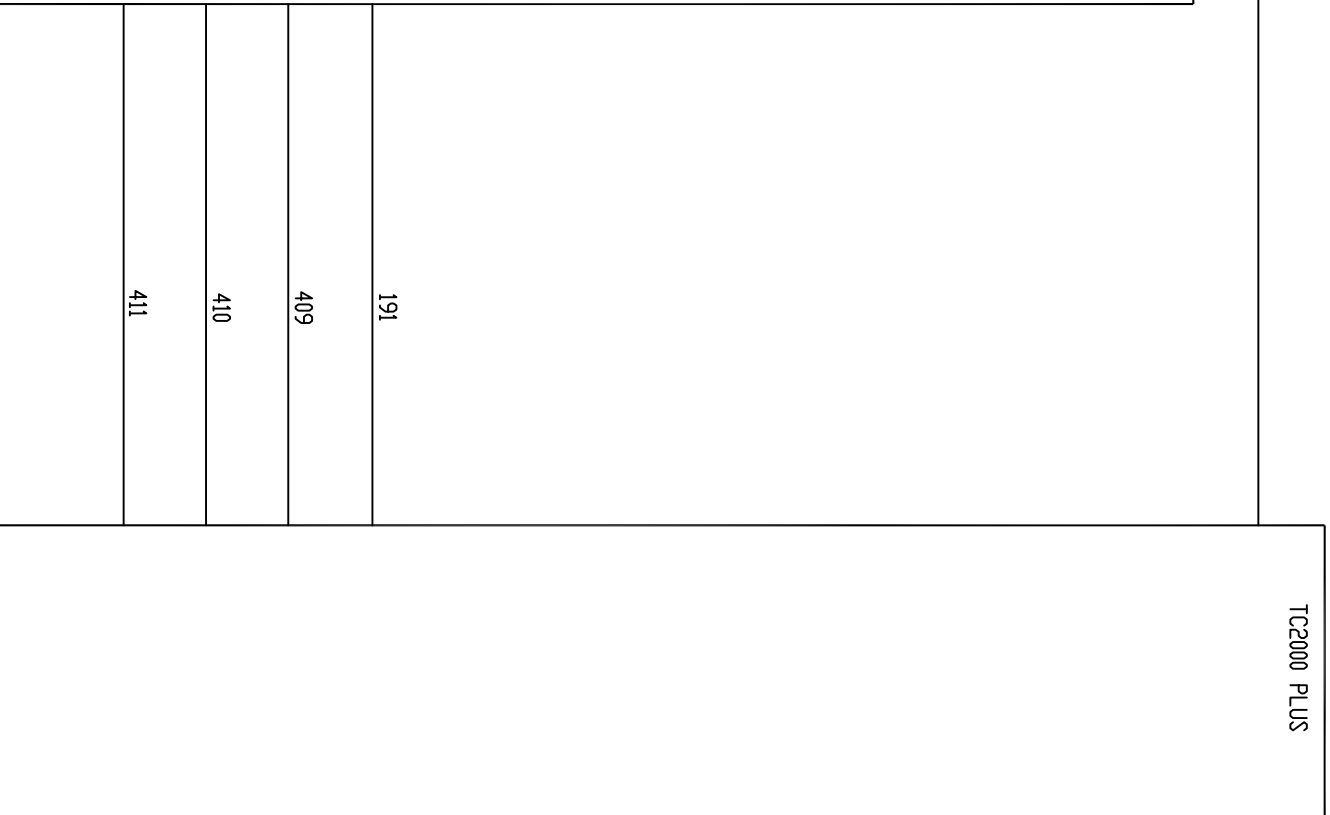
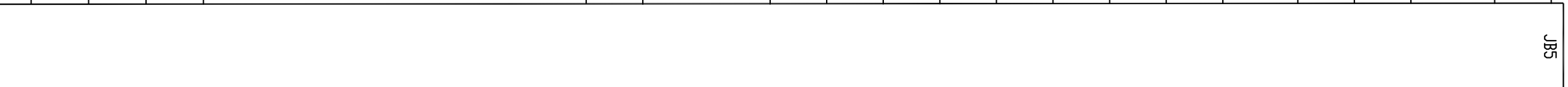
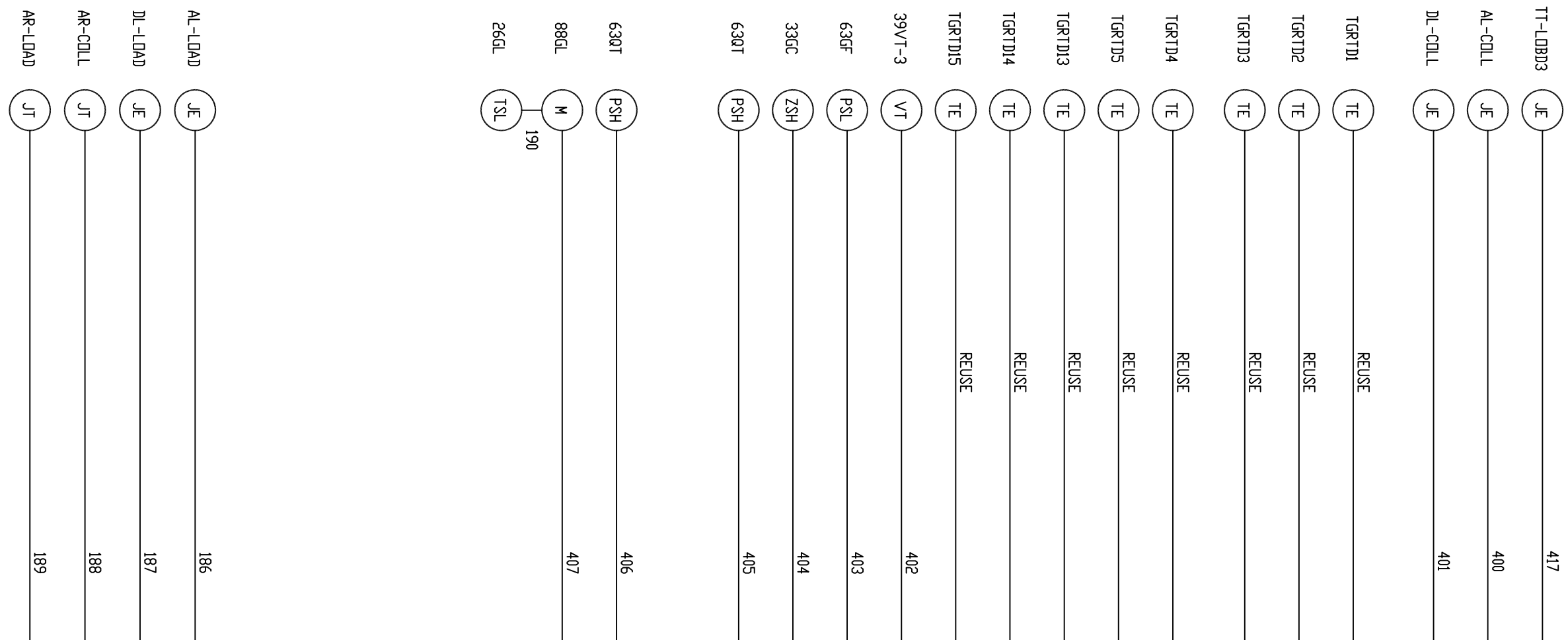


Proprietary Information of:

REV	DESCRIPTION:	BY	APPROVED	DATE

LOAD GEAR
CABLING DIAGRAM
99174-GTB-501

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-501-108-0		SCALE: NTS	
SITE: DON HERRY POWER CENTER		DRAWN BY: D. LANGLEY		SHEET NO. 108	
APPROVED BY:		11/29/99		9 OF 15	



REV	DESCRIPTION:	BY	APPROVED	DATE

GEN/COLL COMPT
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HERRY POWER CENTER	DRAWING NO. 99174-GTB-501-109-0
APPROVED BY: [Signature]	SCALE: NTS
DRAWN BY: C. FISHER	SHEET NO. 109
11/29/99	10 OF 15

52G BREAKER
 BKR TRIP
 CONTROL PWR
 BKR CLOSE
 BKR STATUS

REUSED
 (834, 842, 1141, 1152, 101, 102, 1157, 1156, 1154)

LIGHTING FUSE BOX
 AC/DC

REUSED
 (575, 572, 948, 949)

T3 ET

506

507

PPT

REUSED
 (851, 852)

RECT

REUSED
 (856)

CT45 IT

REUSED
 (700, 701)

CT4 IT

REUSED
 (707, 704)

CT5 IT

REUSED
 (705)

CT6 IT

REUSED
 (706)

CT8 IT

REUSED
 (708, 707)

CT9 IT

REUSED
 (709)

CT10 IT

REUSED
 (710)

CT11 IT

REUSED
 (717, 714)

CT2 IT

REUSED
 (715)

CT3 IT

REUSED
 (716)

CT14 IT

REUSED
 (754, 751)

PT1 ET

REUSED
 (752, 471, 753, 751)

CT15 IT

REUSED
 (1123, 1120)

CT16 IT

REUSED
 (1121)

CT17 IT

REUSED
 (1122)

PT2 ET

REUSED
 (756, 751)

SHUNT ET

REUSED
 (861, 862)

FLD VOLT SENSING ET

REUSED
 (860, 858)

SWR

REUSED
 (872, 875)

HT1 IT

REUSED
 (12M, 12P)

HT2 IT

REUSED
 (12N)

SCT CONTROL

REUSED
 (868, 869)

JB15

MCC

500

501

502

TC2000 PLUS

503

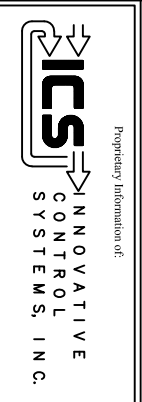
GEN. PANEL

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504

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506

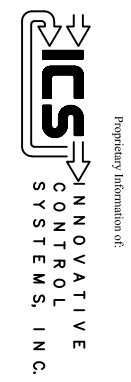
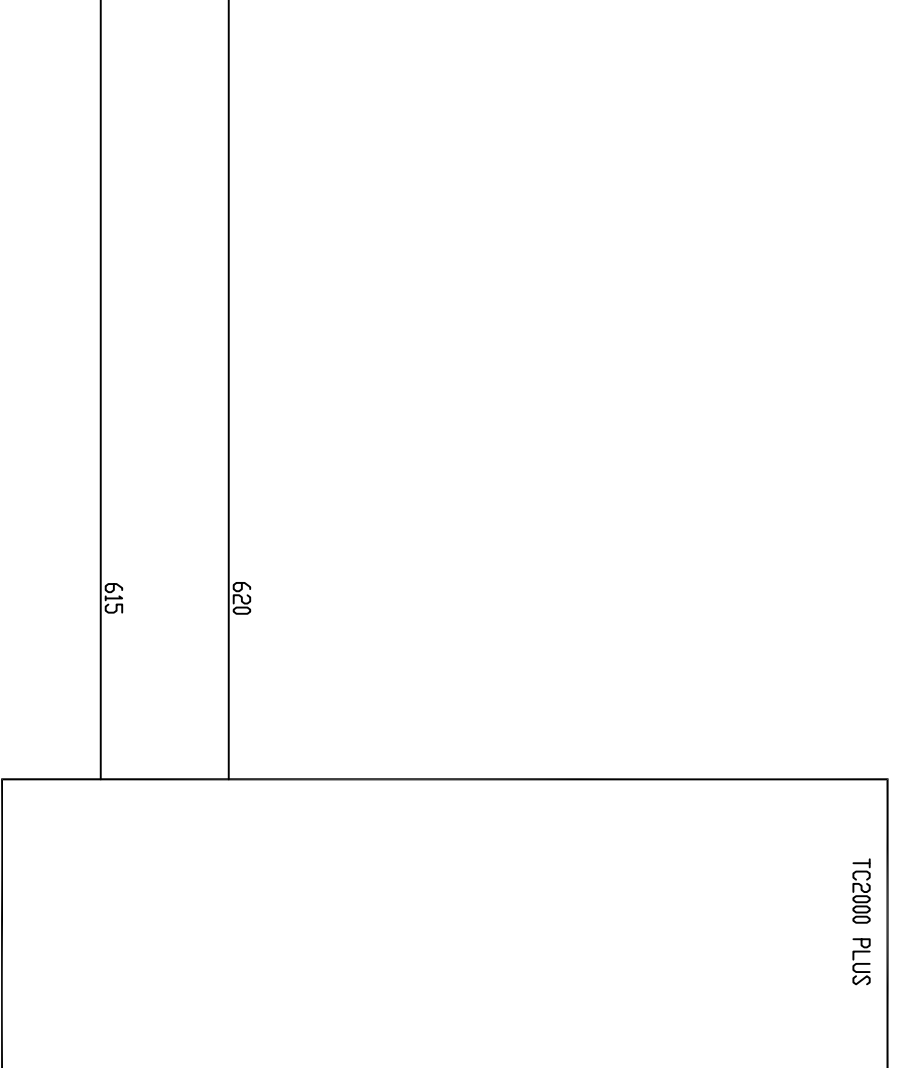
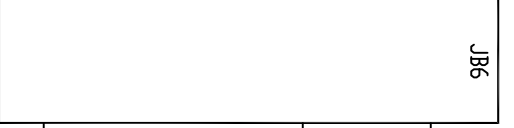


REV	DESCRIPTION	BY	APPROVED	DATE

GAC
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-501-110-0	
SITE: DON HERRY POWER CENTER	APPROVED BY: [Signature]	SCALE: NTS	SHEET NO. 11 OF 15
DRAWN BY: D. LANGLEY	DATE: 11/29/99		

- 20FD ZY REUSED
- 26FL TSL REUSED
- 63FL-1 PSL REUSED
- 26FH TSH REUSED

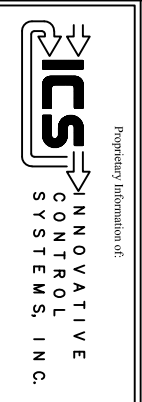
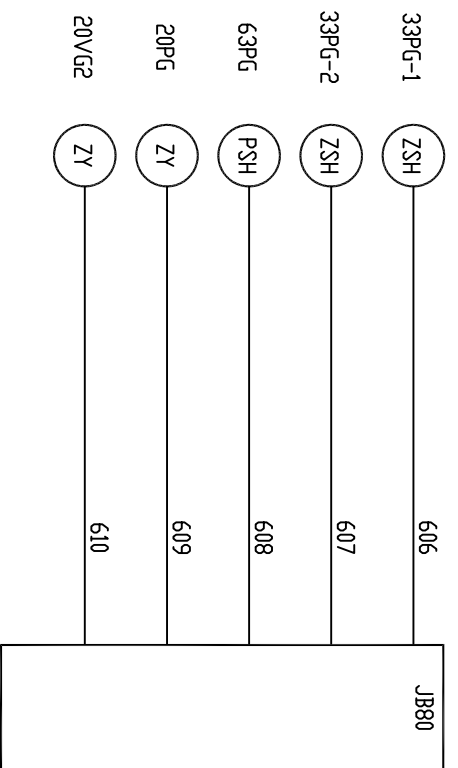


REV	DESCRIPTION:	BY	APPROVED	DATE

FUEL FWD SKID
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HERRY POWER CENTER	
APPROVED BY:	DRAWING NO.:
DRAWN BY: D. LANGLEY	99174-GTB-501-111-0
11/29/99	SCALE: NTS
	SHEET NO. 111
	12 OF 15

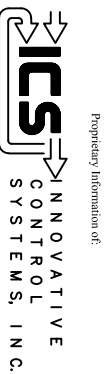
TC2000 PLUS



REV	DESCRIPTION	BY	APPROVED	DATE

DUAL FUEL PURGE
CABLING DIAGRAM
99174-GTB-501

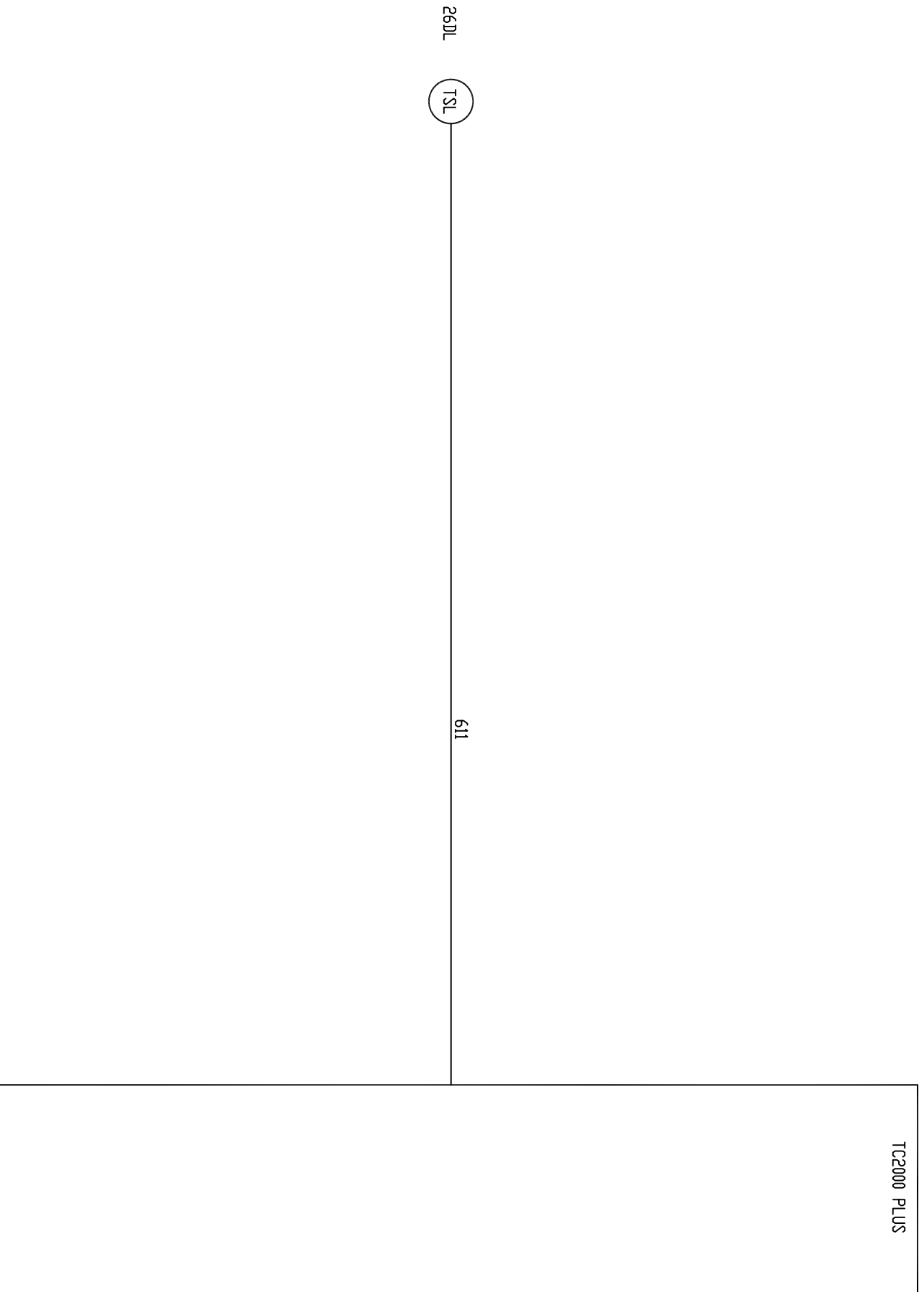
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HERRY POWER CENTER	
APPROVED BY:	11/29/99
DRAWN BY: D. LANGLEY	99174-GTB-501-112-0
DRAWING NO.	SCALE:
99174-GTB-501-112-0	NTS
SHEET NO. 112	13 OF 15

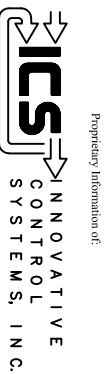


REV	DESCRIPTION:	BY	APPROVED	DATE

FUEL PIT
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HERRY POWER CENTER	DRAWING NO. 99174-GTB-501-113-0
APPROVED BY: DRAWN BY: D. LANGLEY	SCALE: NTS SHEET NO. 13 14 OF 15

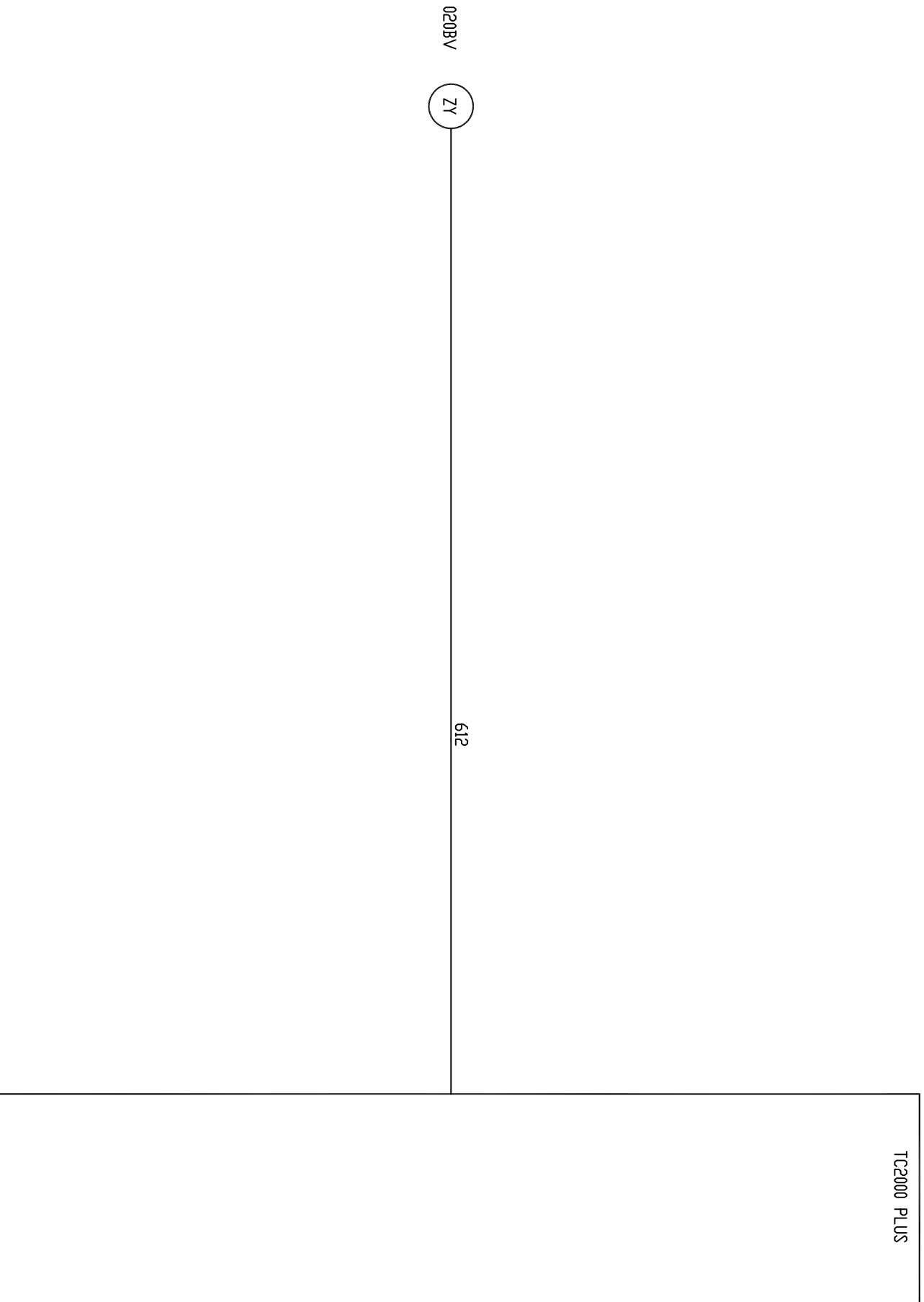




REV	DESCRIPTION:	BY	APPROVED	DATE

BLOCK VALVE
 CABLING DIAGRAM
 99174-GTB-501

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HERRY POWER CENTER	DRAWING NO. 99174-GTB-501-114-0
APPROVED BY: DRAWN BY: D. LANGLEY	SCALE: NTS SHEET NO. 114 15 OF 15



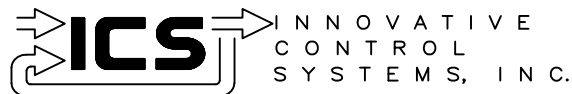
HASTINGS UTILITIES

HASTINGS, NEBRASKA

GE FRAME 5 GAS TURBINE

TURBINE DEVICE CONNECTION

Proprietary Information of:



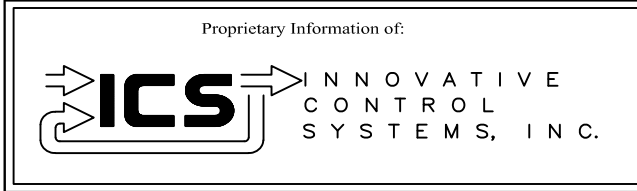
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/25/01

TITLE SHEET
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-000-1	SHEET NO. 000 1 OF 22

99174-GTB-102 143B2831 SECT. 3 TURBINE DEVICE CONNECTION

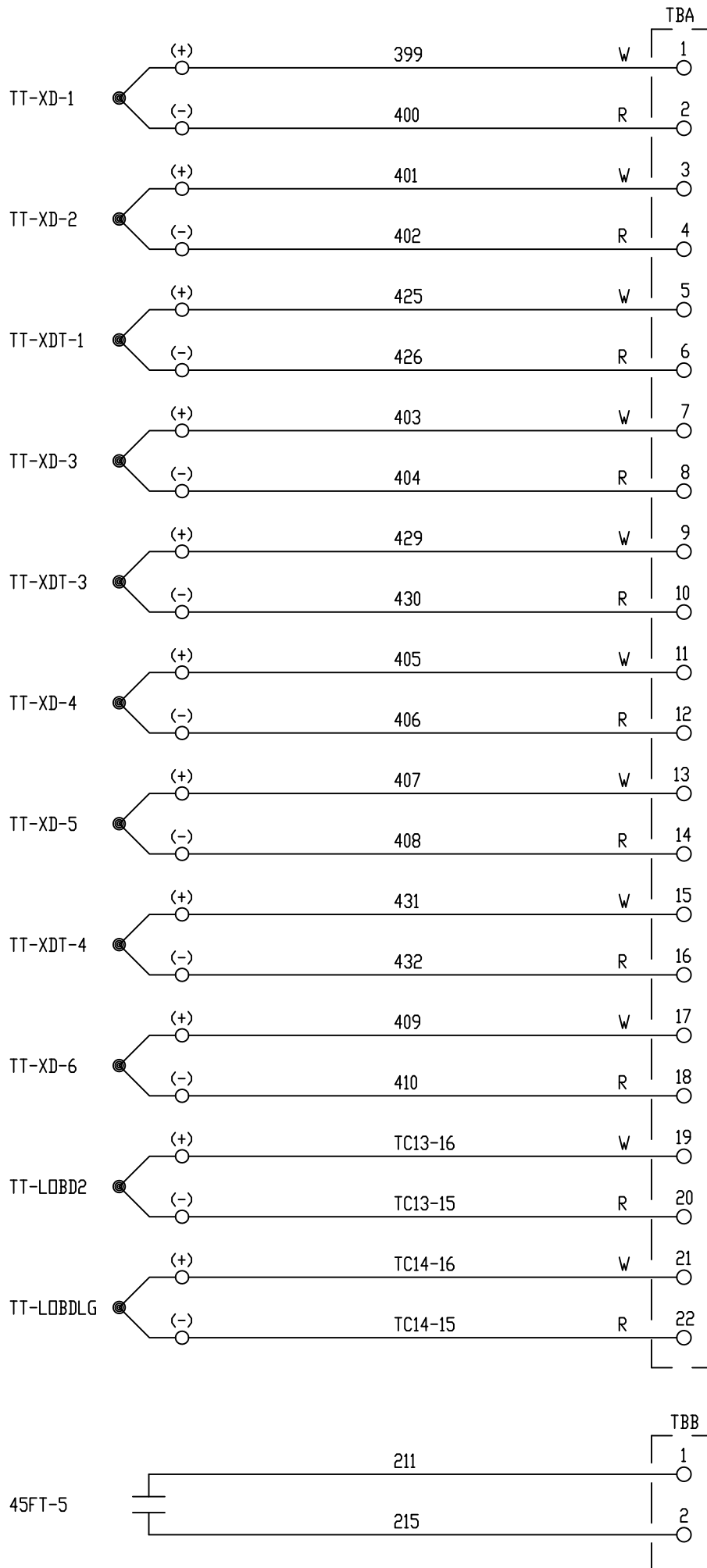
SHEET NUMBER	SHEET NUMBER	DESCRIPTION
000		TITLE SHEET
001		SHEET INDEX
010		JUNCTION BOX 67-68
011		JUNCTION BOX 69-70
012		JUNCTION BOX 71
013		JUNCTION BOX 72
014		JUNCTION BOX 80
016		JUNCTION BOX 15
016		JUNCTION BOX 15
017		JUNCTION BOX 5
018	1	JUNCTION BOX 1
019	2	JUNCTION BOX 2
020	3	JUNCTION BOX 2
021	5	J-PLUG DIAGRAM
022	6	J-PLUG DIAGRAM
023	7	JUNCTION BOX 3
024	8	SPEED TERMINAL BOX - TB2
025	9	TB3
026	10	FIELD DEVICES
027	11	FIELD DEVICES
028	12	FIELD DEVICES
029	13	FIELD DEVICES
030	14	FIELD DEVICES

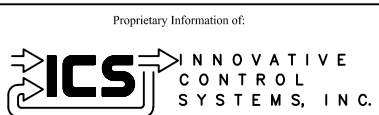
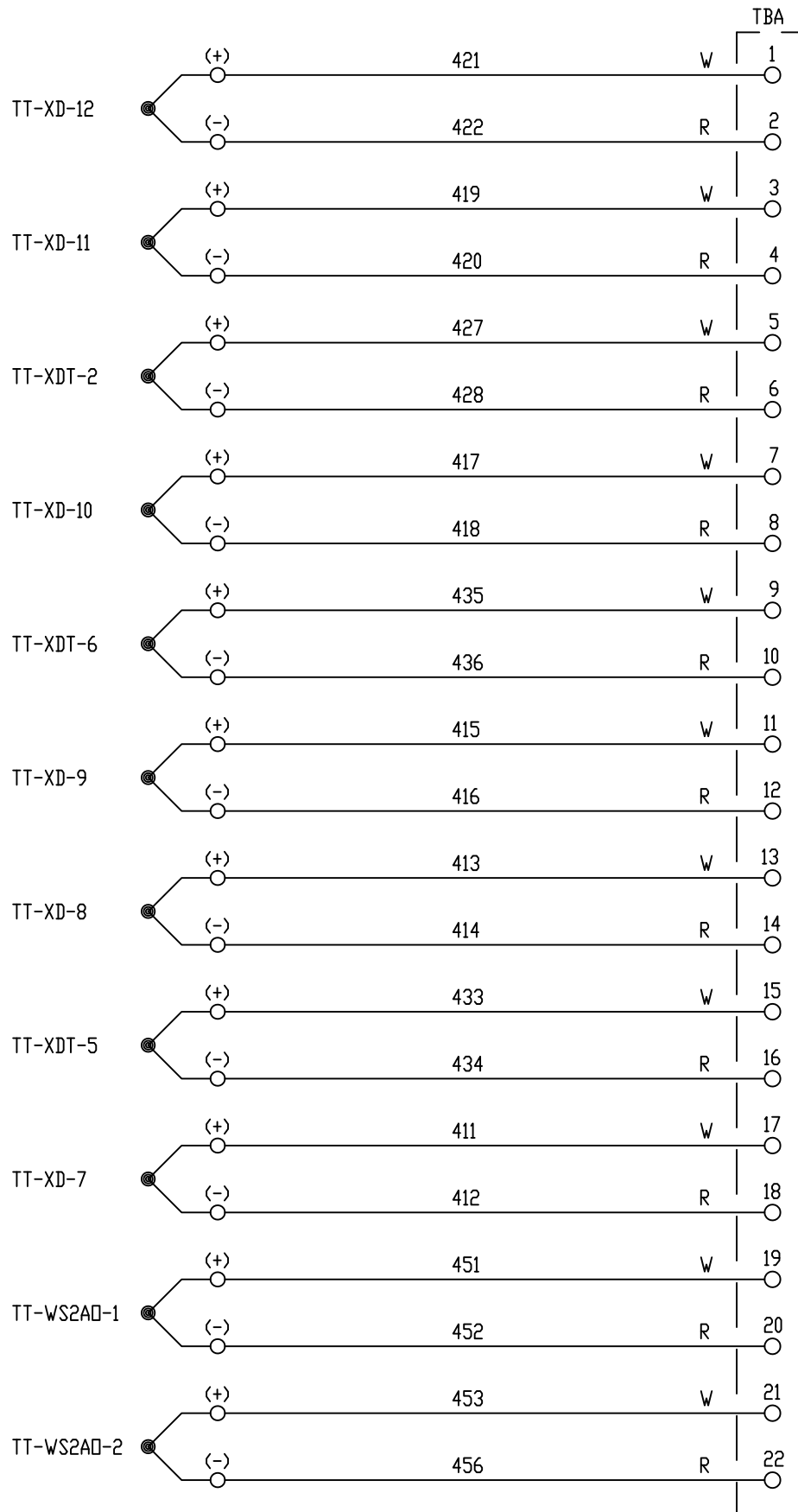


REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

SHEET INDEX
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-001-1	SHEET NO. 001 2 OF 22

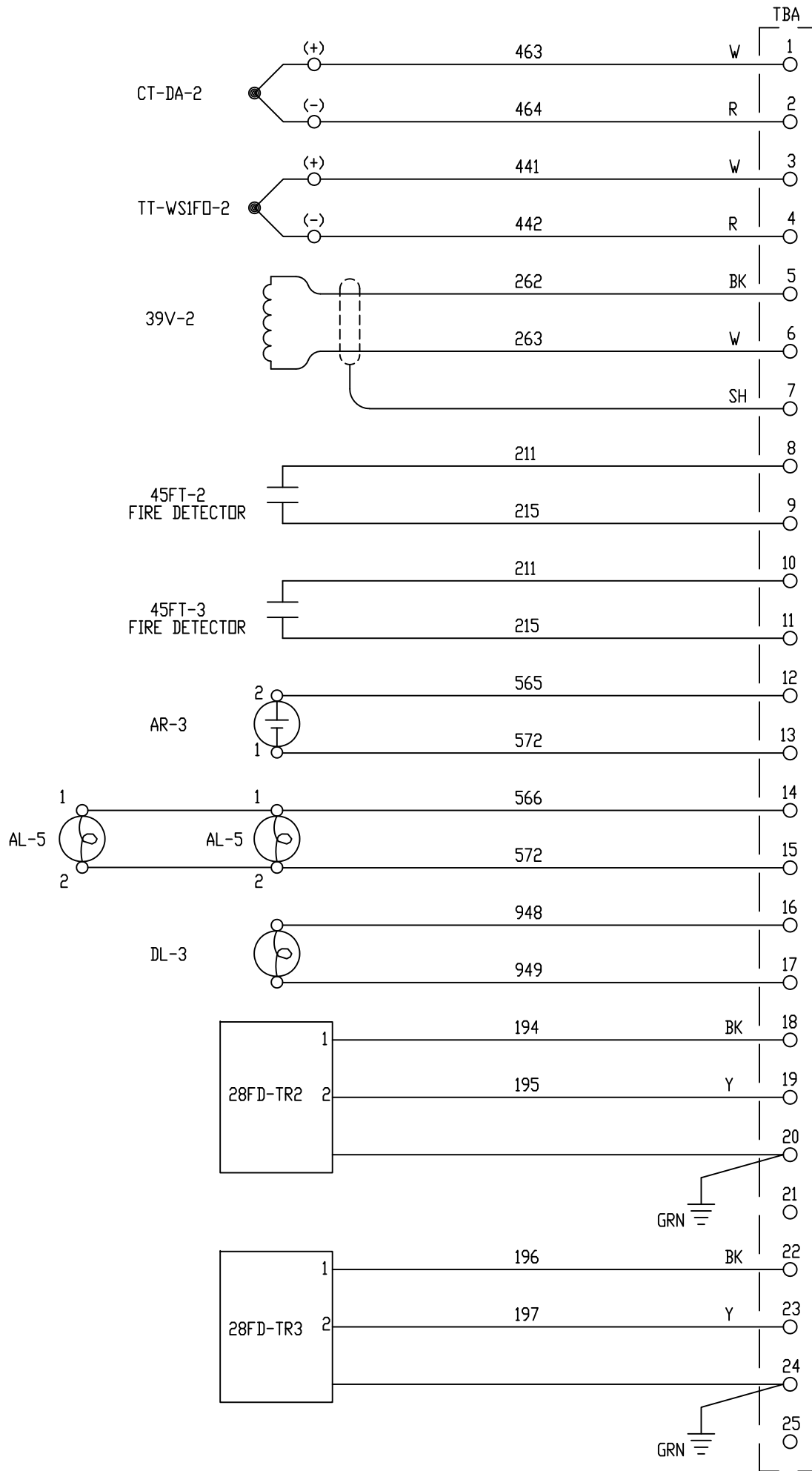




REV	DESCRIPTION	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/25/01

JUNCTION BOX 69-70
 TURBINE DEVICE CONNECTION
 99174-GTB-102

CUSTOMER: HASTING UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-011-1	SHEET NO. 011 4 OF 22



Proprietary Information of:

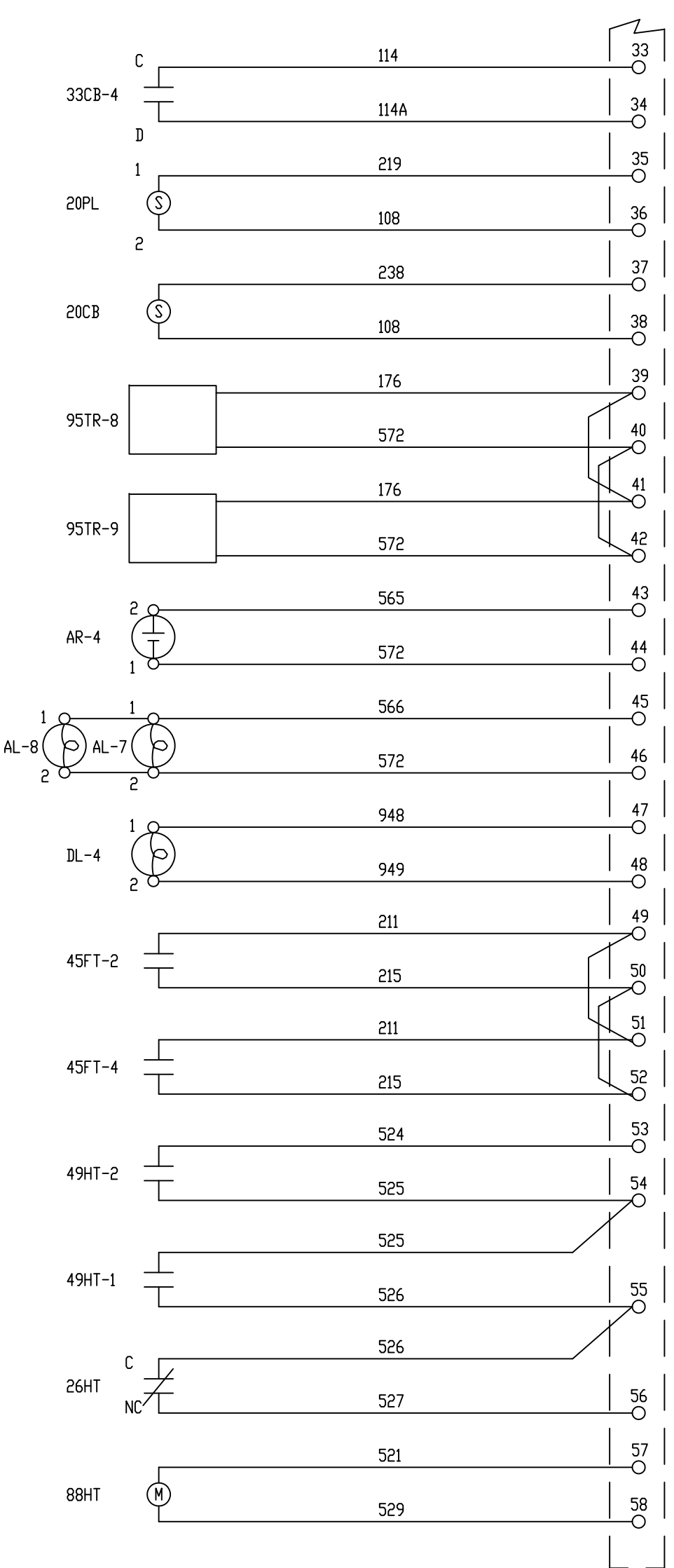
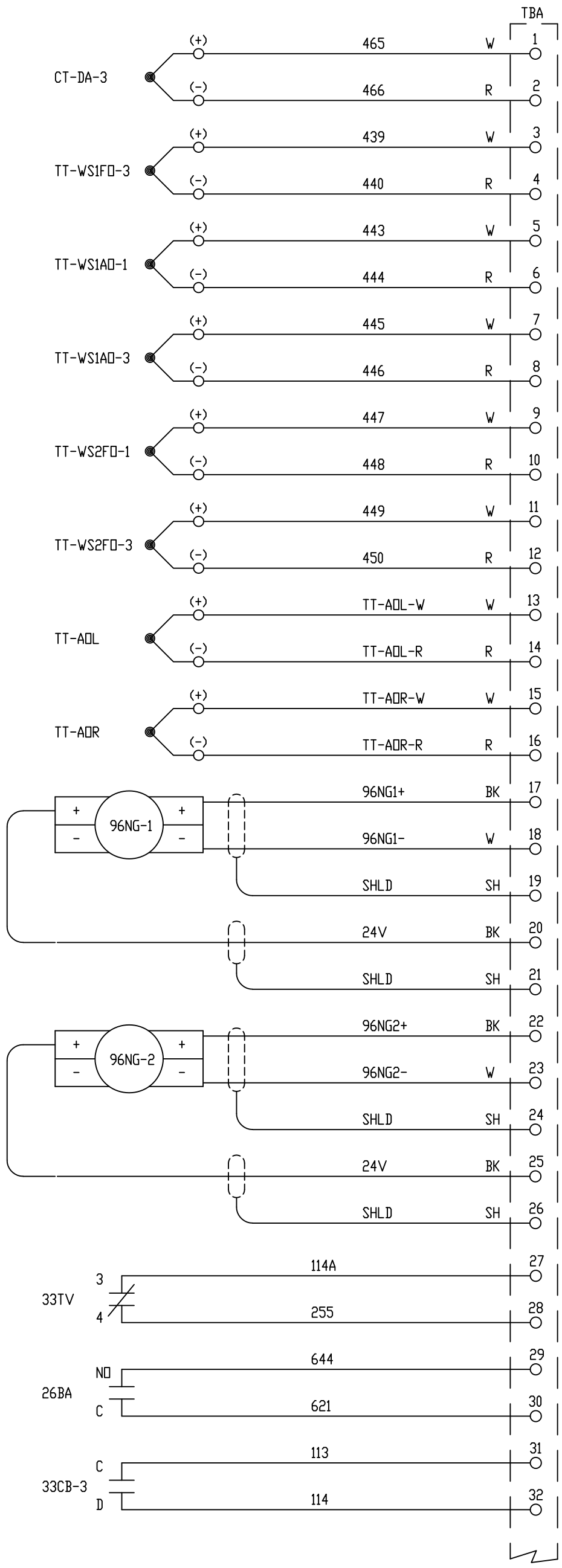


REV 1	AS BUILTS:	CS	09/10/01
REV	DESCRIPTION:	BY	APPROVED DATE

JUNCTION BOX 71
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTING UTILITIES
SITE: DON HENRY POWER CENTER

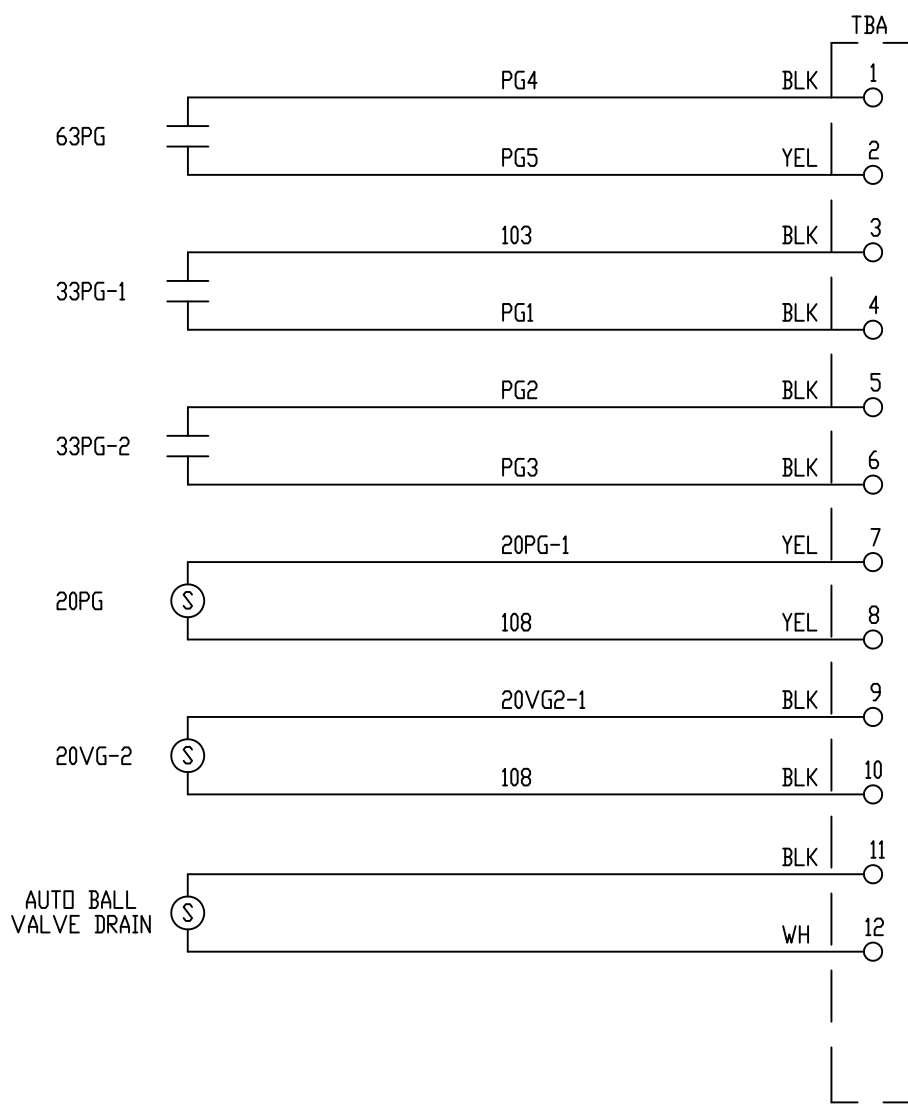
APPROVED BY:	DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	99174-GTB-102-012-1	NTS
02/17/00		SHEET NO. 012 5 OF 22



REV 1	AS BUILTS:	CS	01/25/01
REV	DESCRIPTION:	BY	APPROVED DATE

JUNCTION BOX 72
TURBINE DEVICE CONNECTION
99174-GTB-102

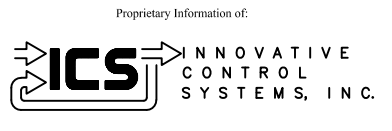
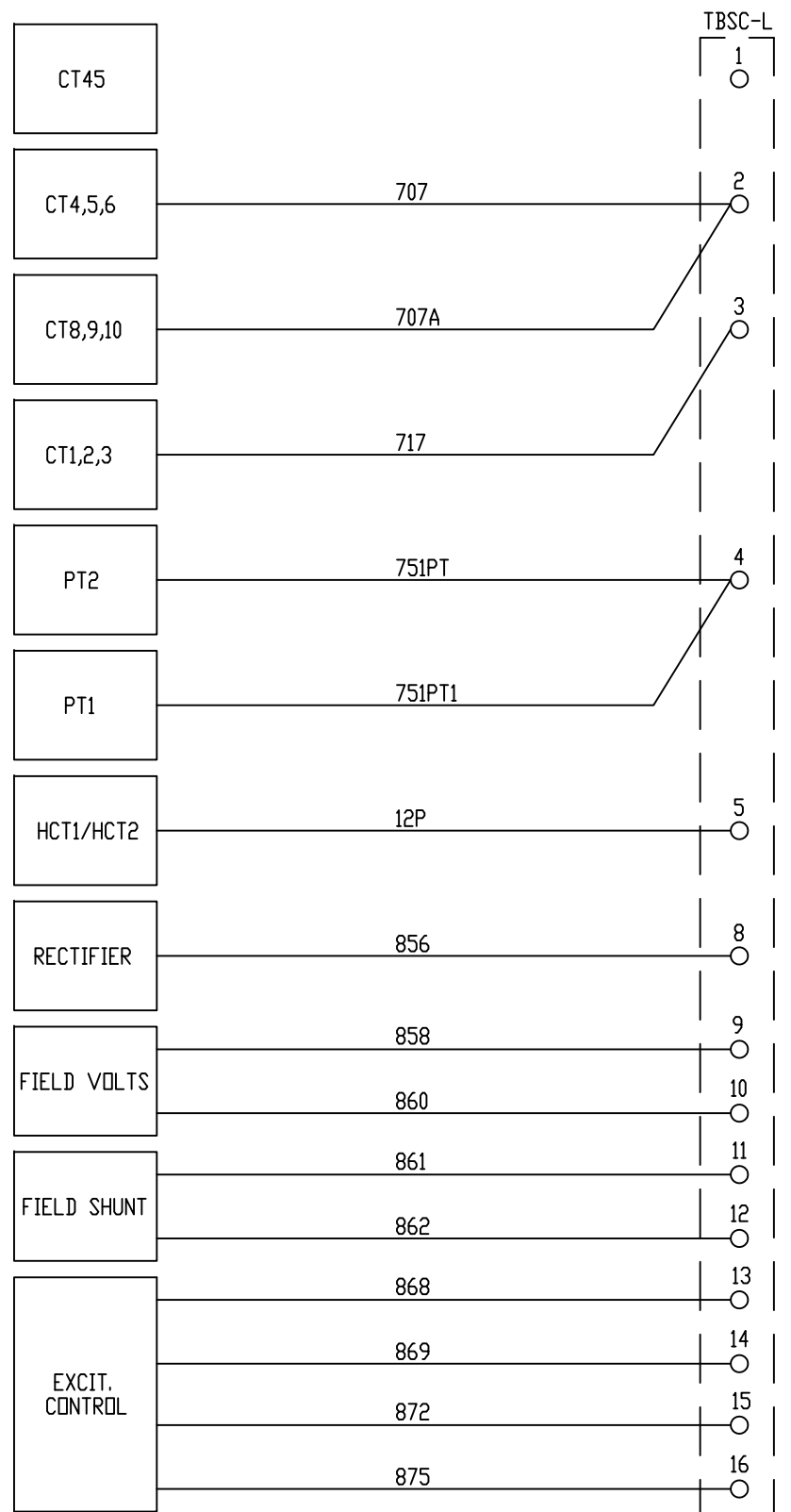
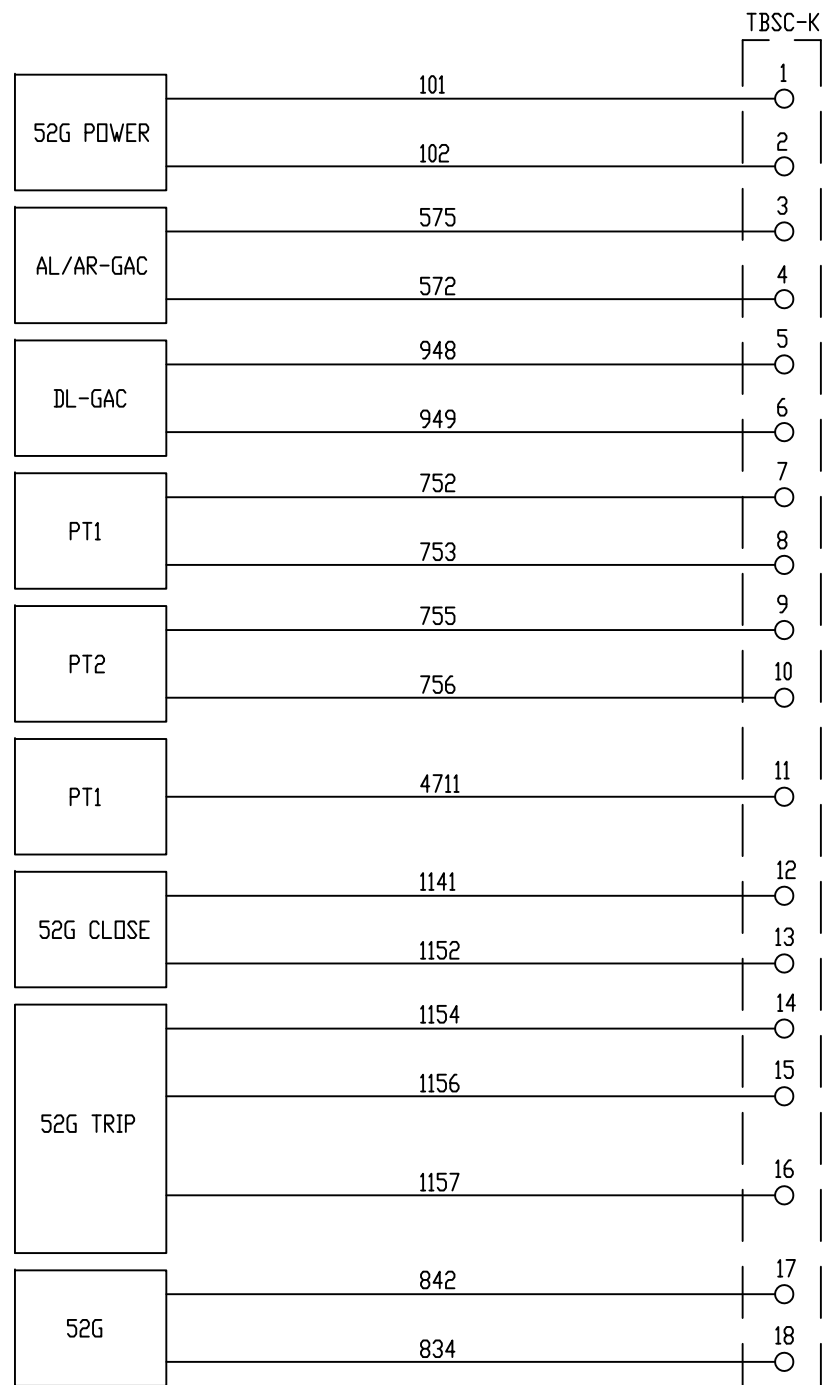
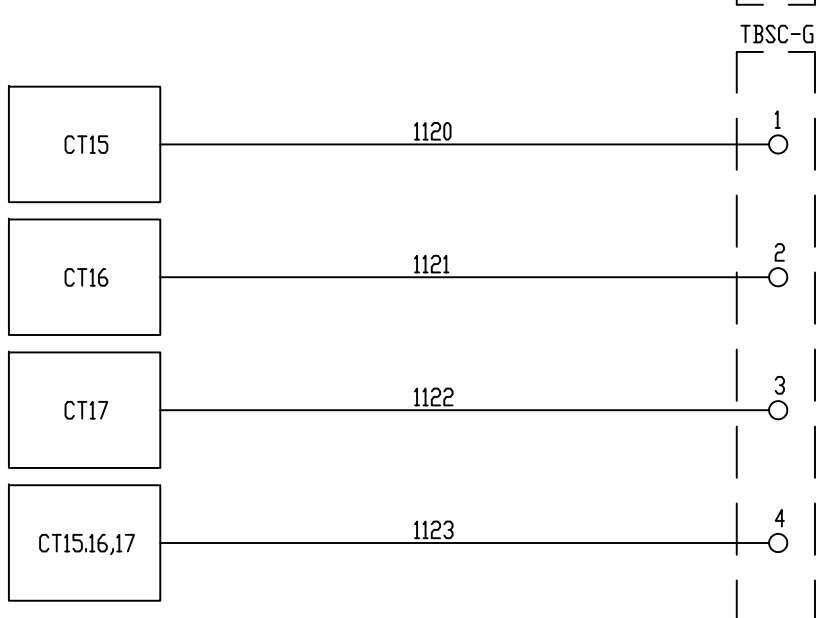
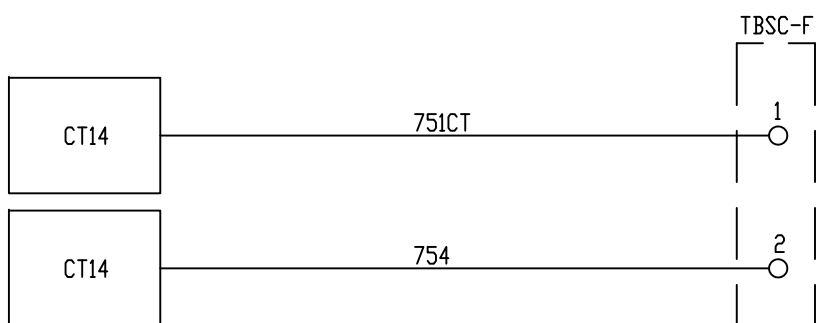
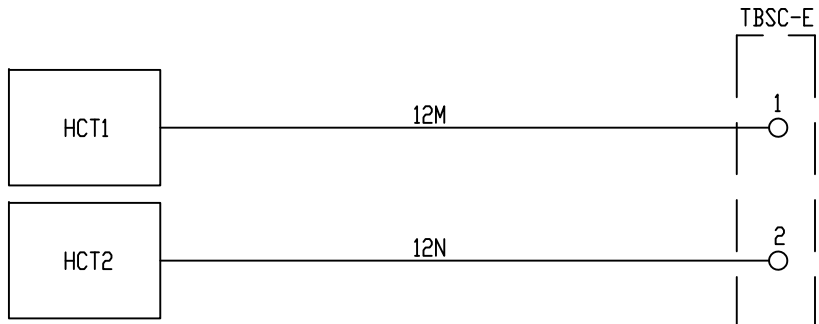
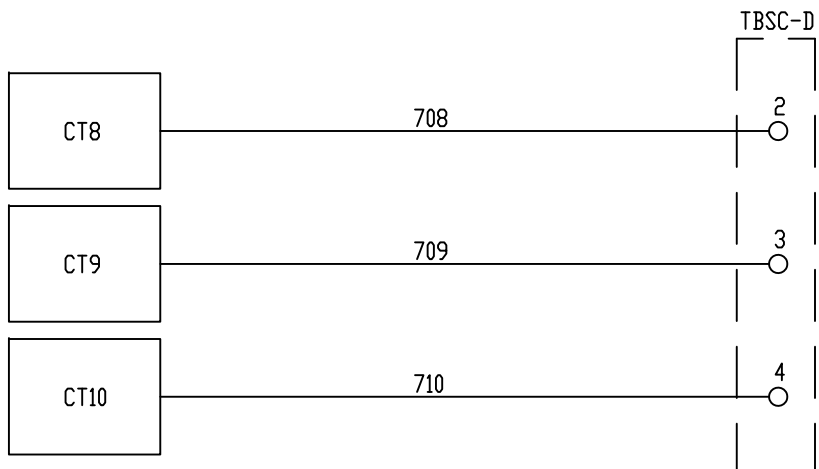
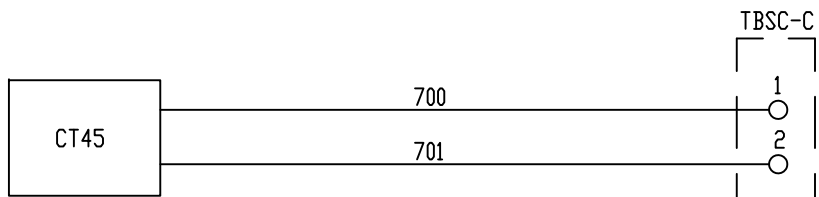
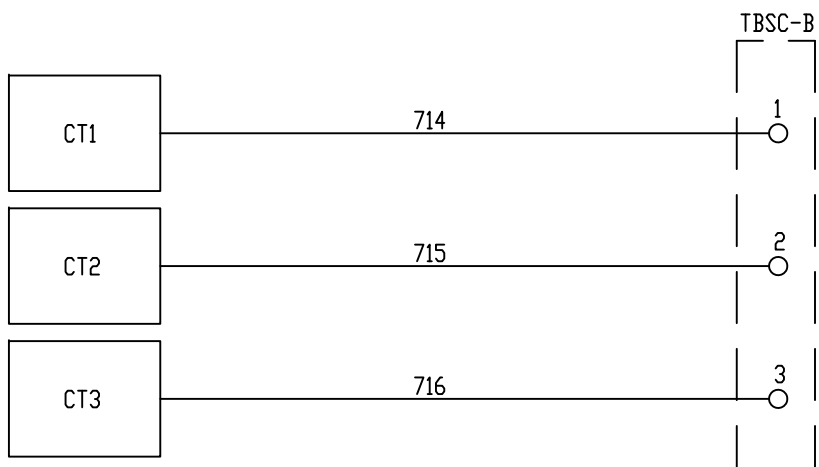
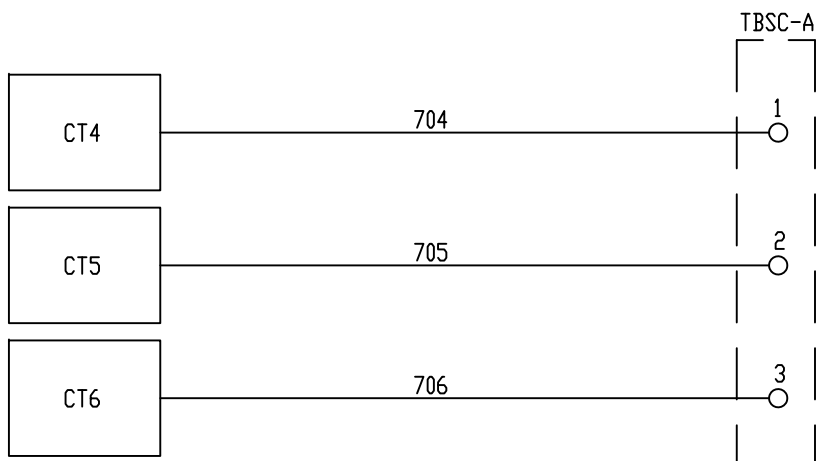
CUSTOMER: HASTING UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO.	99174-GTB-102-013-1	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00		SHEET NO. 013 6 OF 22



REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

JUNCTION BOX 80
 TURBINE DEVICE CONNECTION
 99174-GTB-102

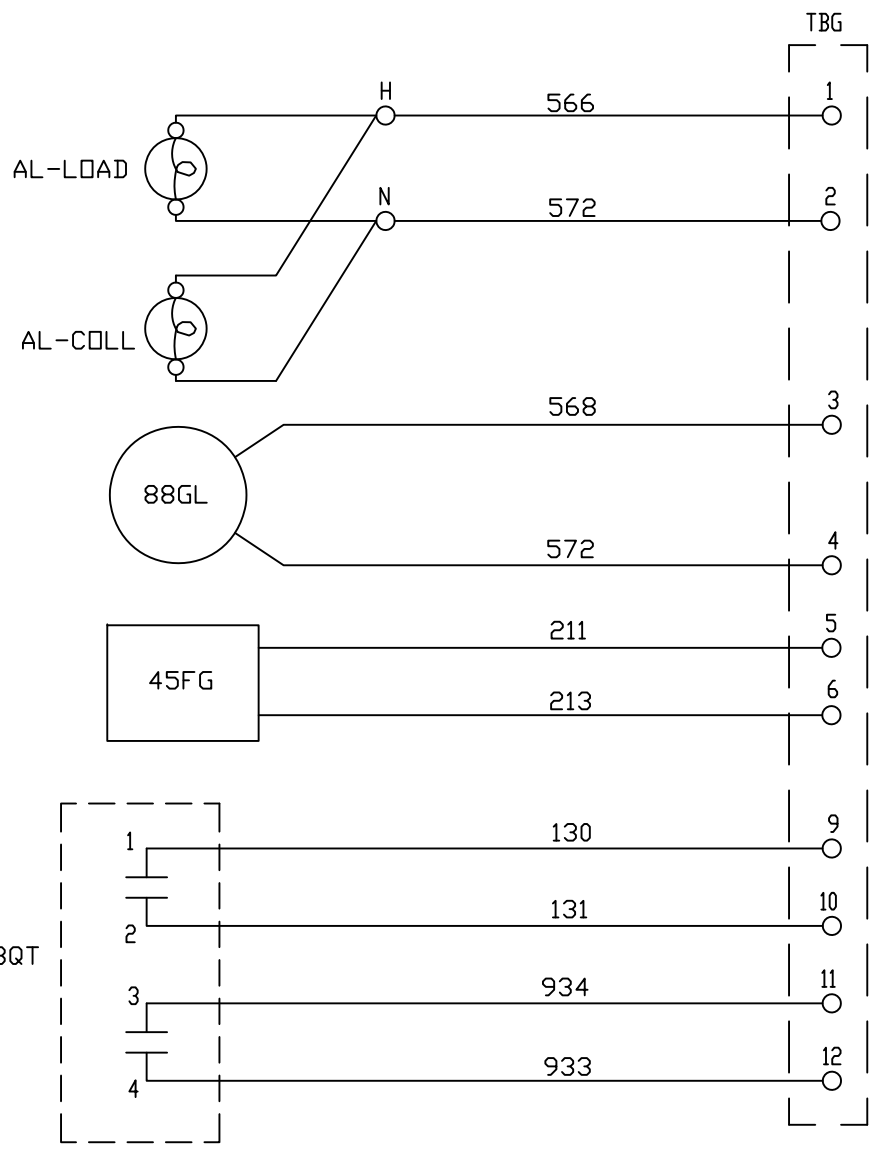
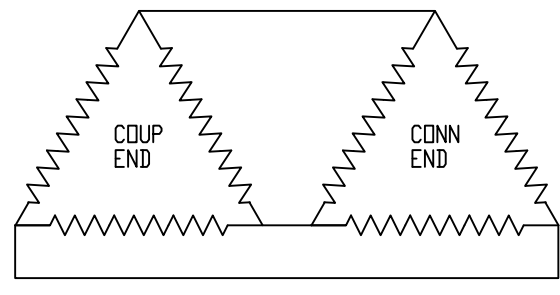
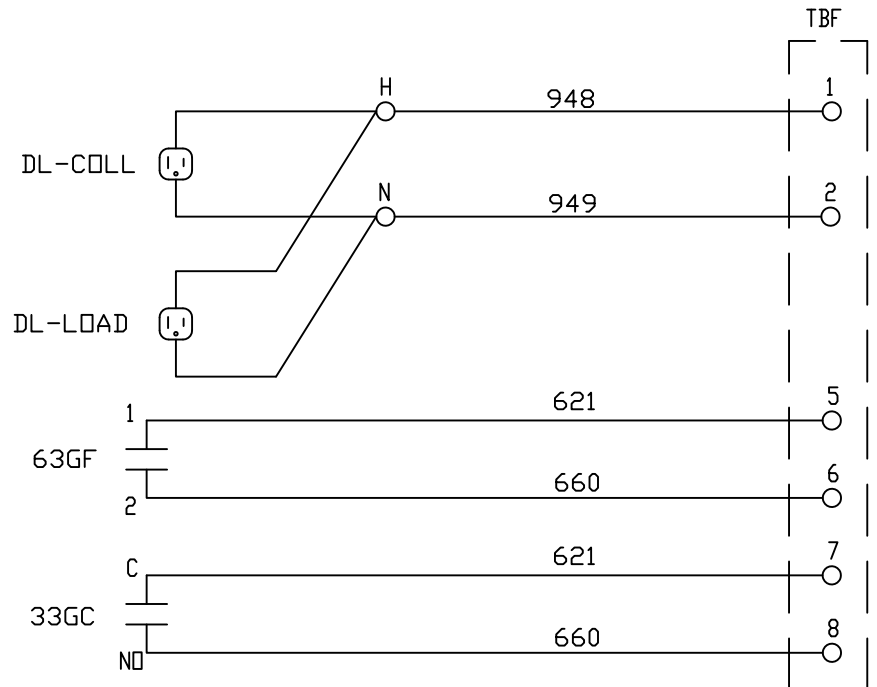
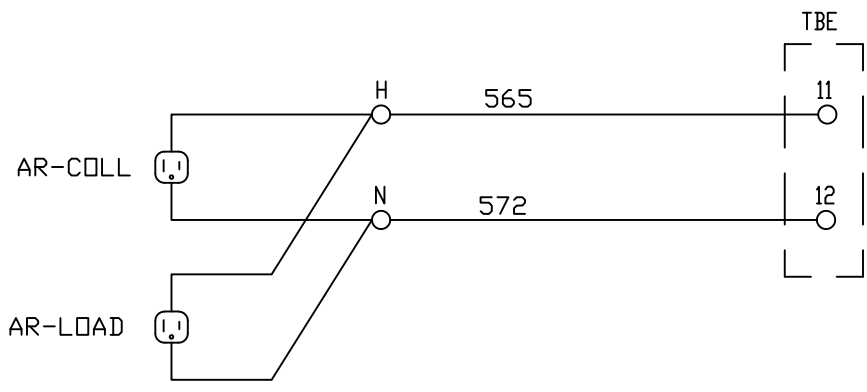
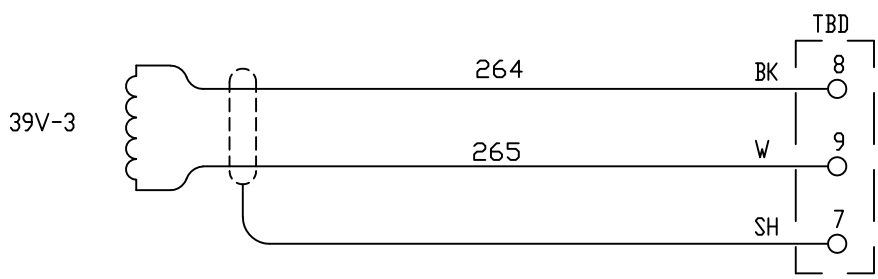
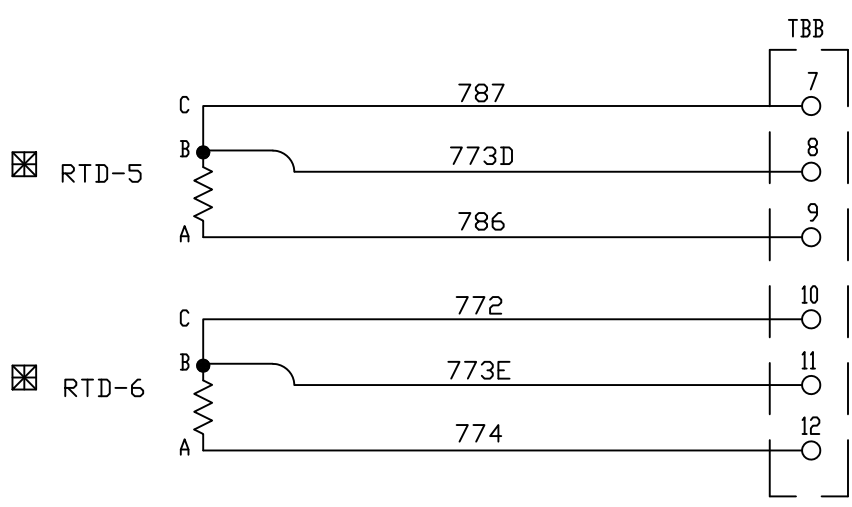
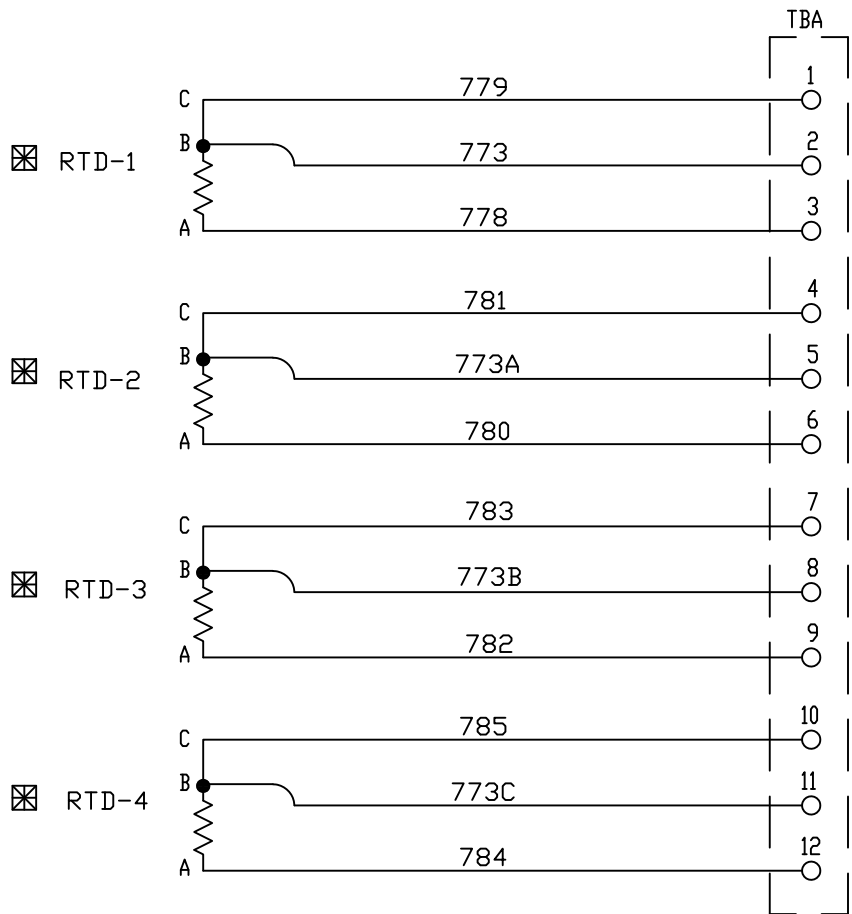
CUSTOMER: HASTING UTILITIES		
SITE: DON HENRY POWER CENTER		
APPROVED BY:	DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-014-1
		SHEET NO. 014 7 OF 22

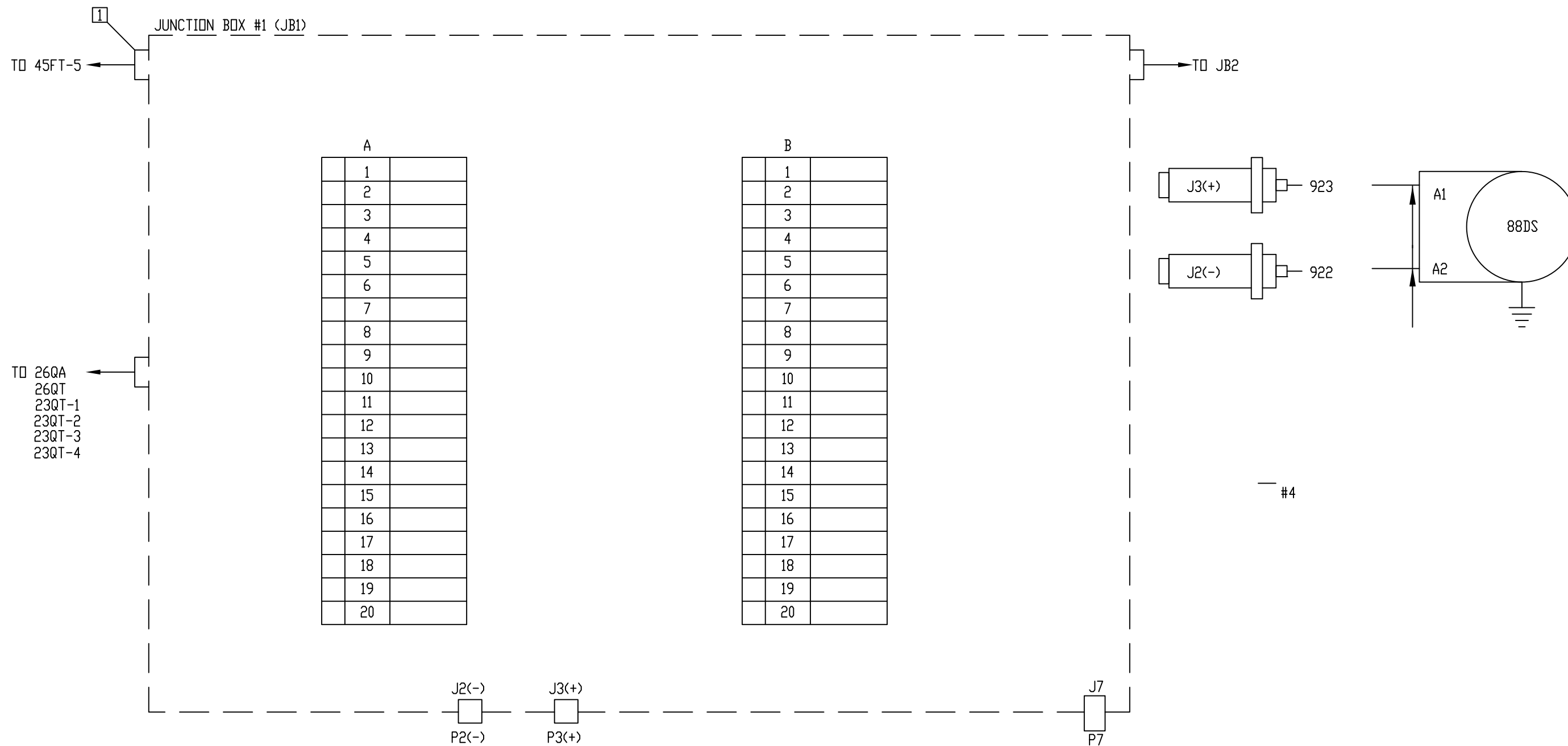


REV 1	AS BUILTS:	CS	01/25/01
REV	DESCRIPTION:	BY	APPROVED DATE


JUNCTION BOX 15
TURBINE DEVICE CONNECTION
99174-GTB-102

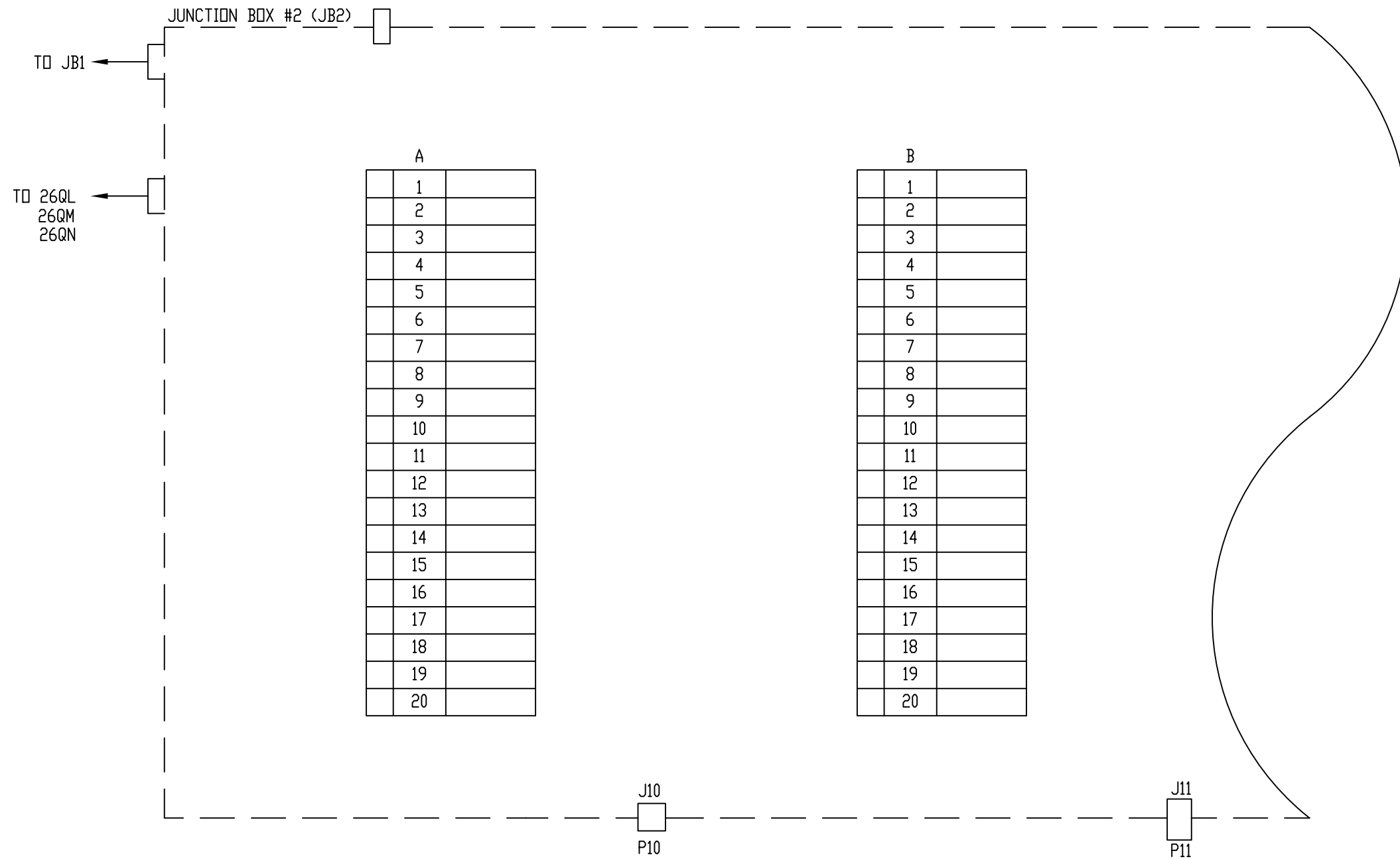
CUSTOMER: HASTING UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-016-1	SHEET NO. 016 8 OF 22





REF. G.E. 143B2831 SECT. 3 [SH. 1]

Proprietary Information of:  INNOVATIVE CONTROL SYSTEMS, INC.		AS BUILTS: CS 01/25/01			JUNCTION BOX # 1 (JB1) TURBINE DEVICE CONNECTION 99174-GTB-102		CUSTOMER: HASTINGS UTILITIES SITE: DON HENRY POWER CENTER	
REV 1	DESCRIPTION:	BY	APPROVED	DATE			APPROVED BY: DRAWN BY: C. FISHER 02/17/00	DRAWING NO. 99174-GTB-102-018-1



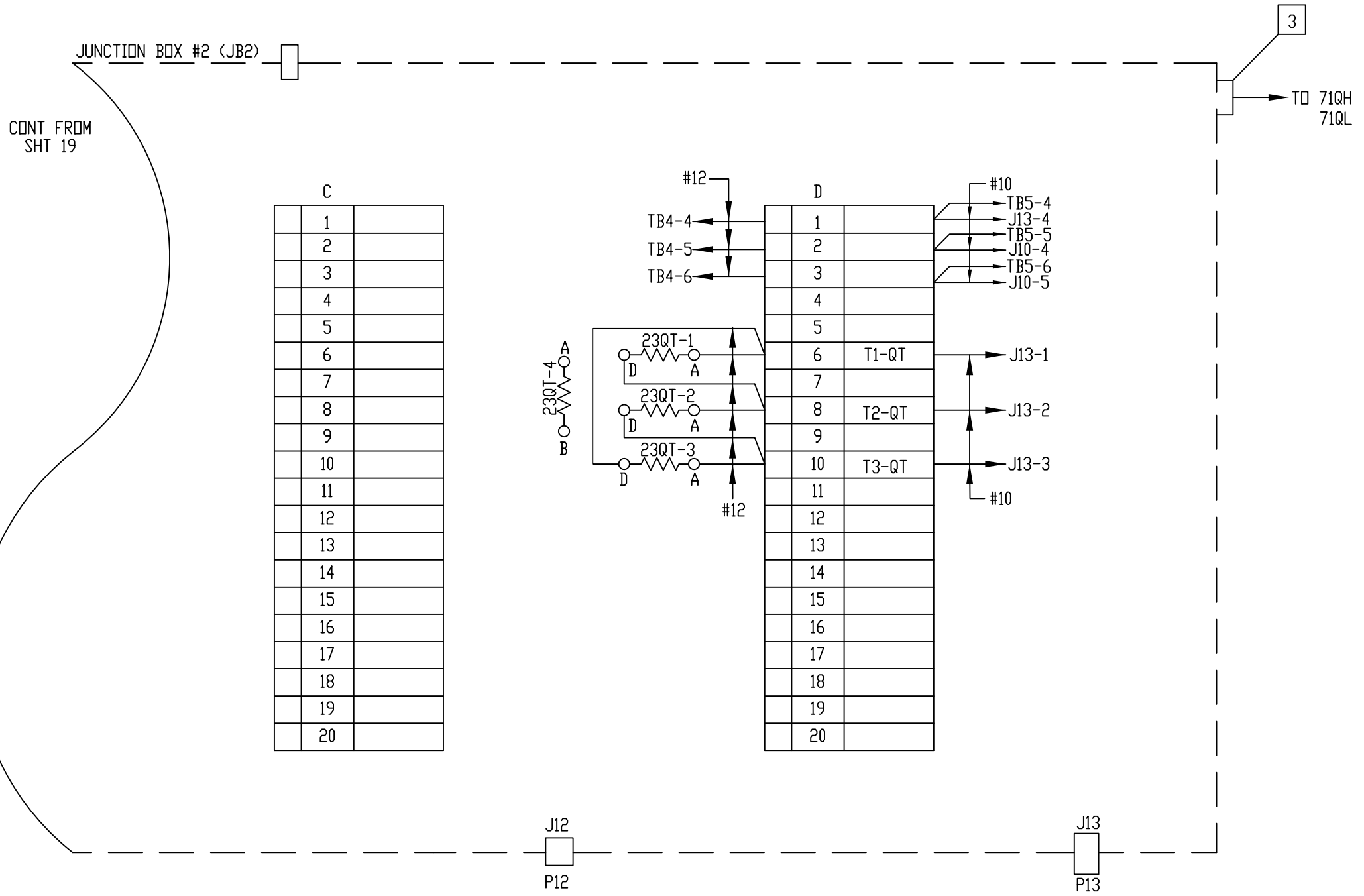
REF. G.E. 143B2831 SECT. 3 [SH. 2]

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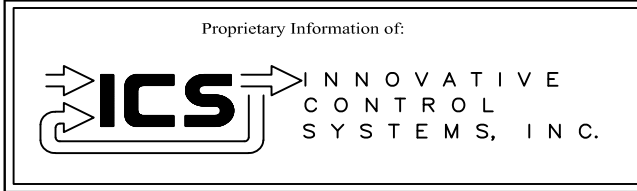
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/25/01

JUNCTION BOX # 2 (JB2)
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-102-019-1		SCALE: NTS
SITE: DON HENRY POWER CENTER		APPROVED BY:	DRAWN BY: C. FISHER	SHEET NO. 019
			02/17/00	11 OF 22



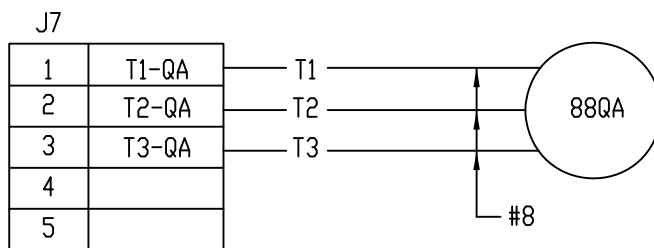
REF. G.E. 143B2831 SECT. 3 [SH. 3]



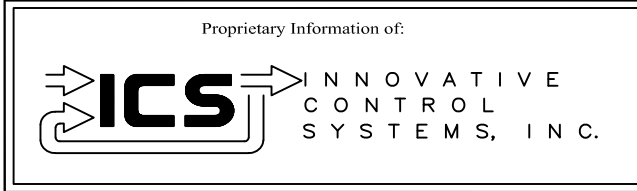
REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

JUNCTION BOX # 2 (JB2)
 TURBINE DEVICE CONNECTION
 99174-GTB-102

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-102-020-1
DRAWN BY: C. FISHER	SCALE: NTS
02/17/00	SHEET NO. 020 OF 22



REF. G.E. 143B2831 SECT. 3 [SH. 5]



REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

J-PLUG DIAGRAM
 TURBINE DEVICE CONNECTION
 99174-GTB-102

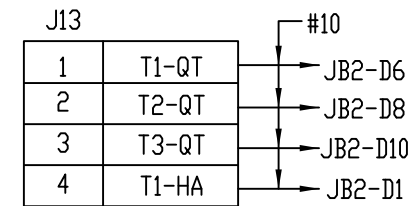
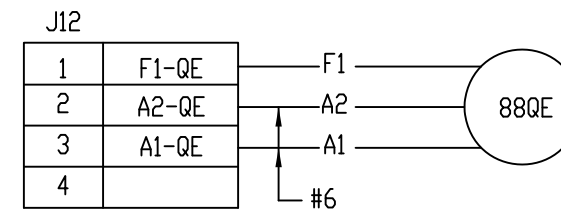
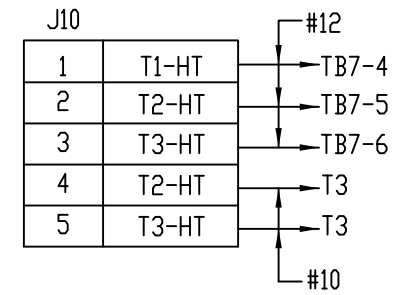
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-021-1	SHEET NO. 021 13 OF 22

J11

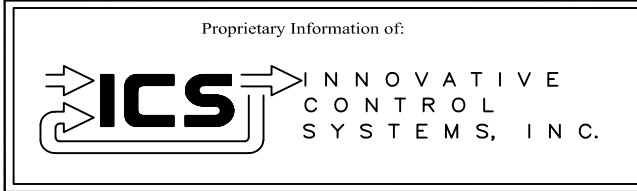
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56	T1-BA	→ P25-1
57	T2-BA	→ P25-2
58	T3-BA	→ P25-3



REF. G.E. 143B2831 SECT. 3 [SH. 6]



REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

J-PLUG DIAGRAM
TURBINE DEVICE CONNECTION }
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-022-1	SHEET NO. 022 14 OF 22

JUNCTION BOX #3 (JB3)- GAUGE PANEL

A

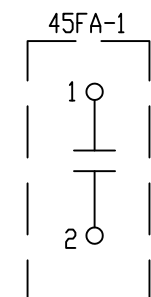
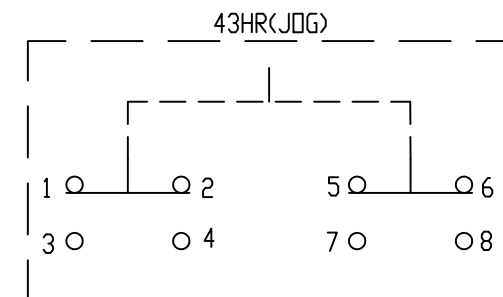
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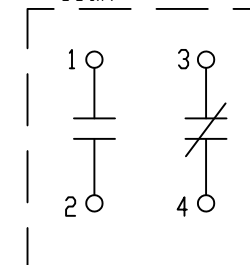
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TO JB2 ←

- 63FL-2
- 63QD
- 63DM
- 63HG
- 63HL
- 63HQ
- 63QA
- 63QL
- 63QN



REF. G.E. 143B2831 SECT. 3 [SH. 7]

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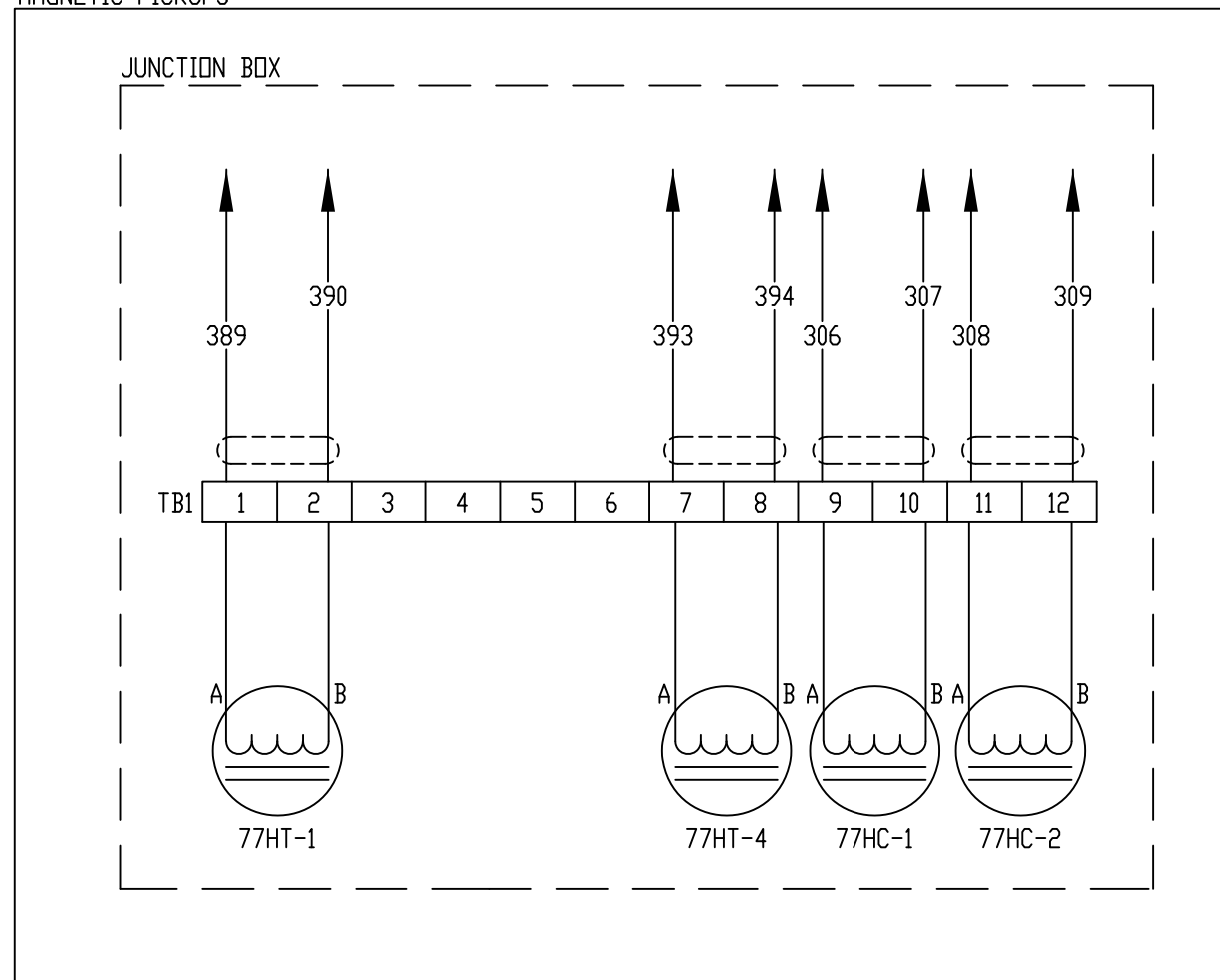
INNOVATIVE CONTROL SYSTEMS, INC.

REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

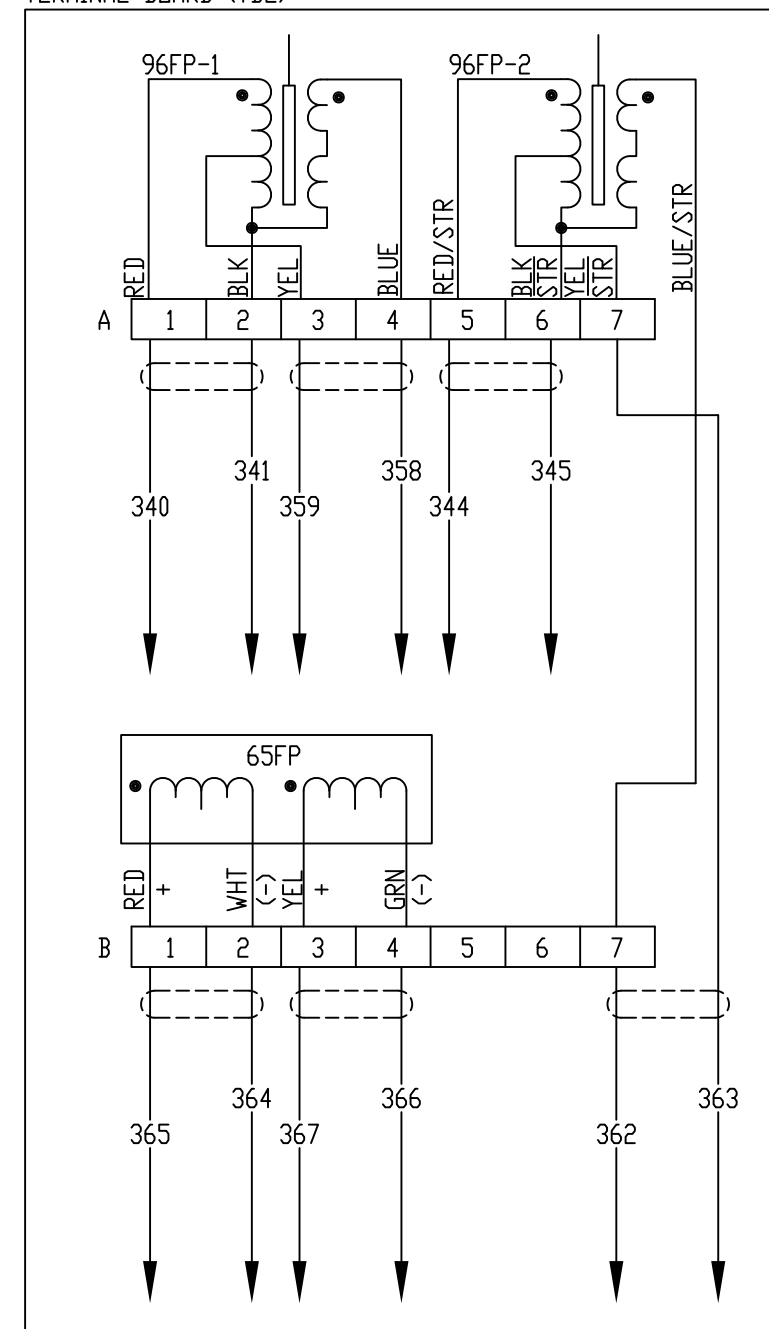
JUNCTION BOX # 3 (JB3)
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-023-1	SHEET NO. 023 15 OF 22

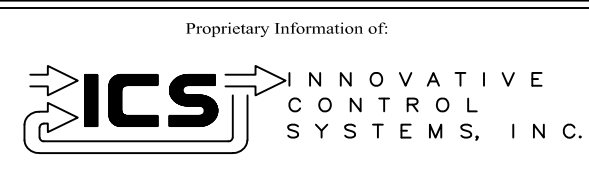
MAGNETIC PICKUPS



TERMINAL BOARD (TB2)



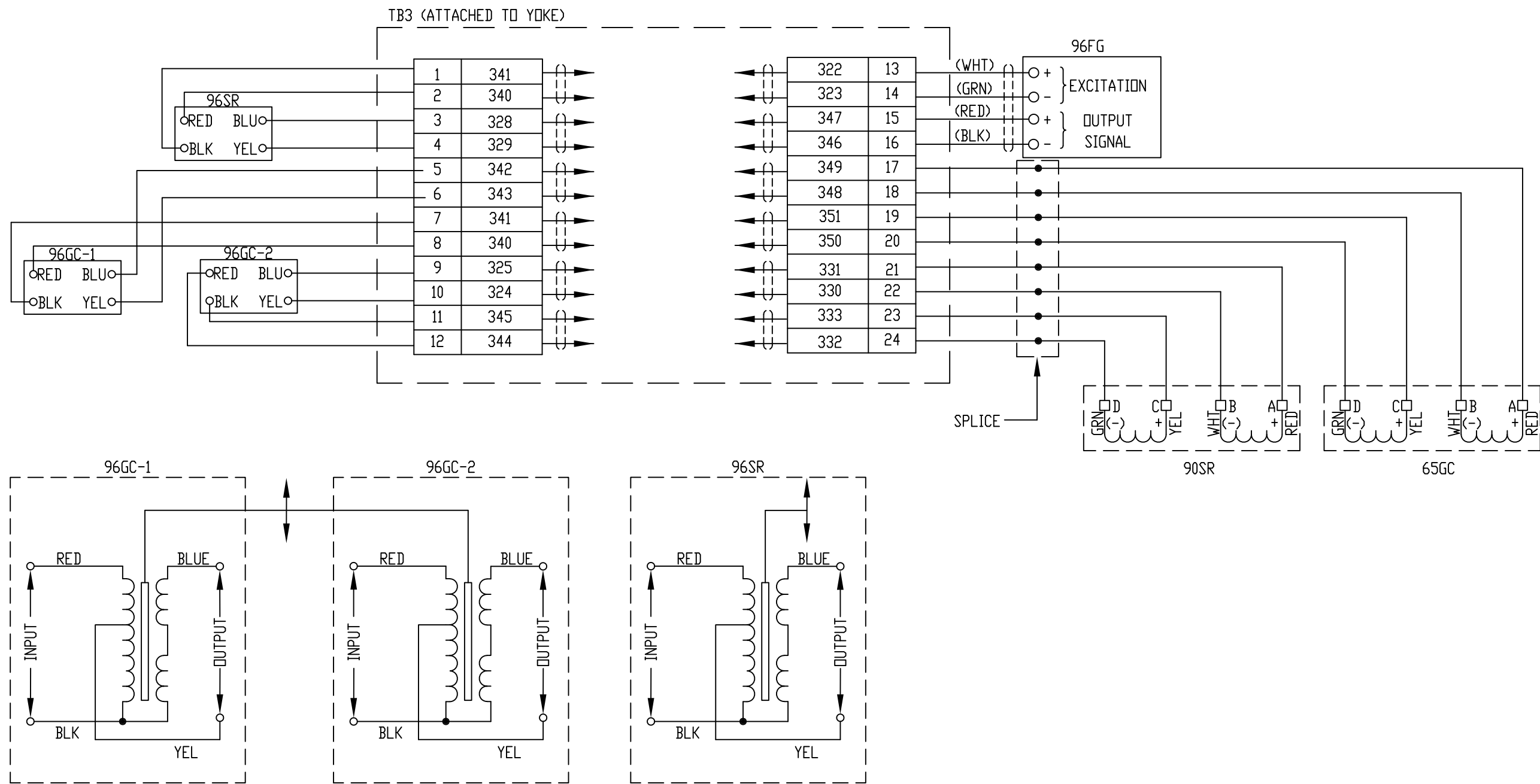
REF. G.E. 143B2831 SECT. 3 [SH. 8]



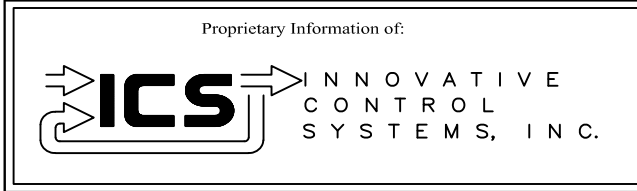
REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

SPEED TERMINAL BOX - TB2
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-102-024-1	
APPROVED BY:		DRAWN BY: C. FISHER	02/17/00
		SHEET NO. 024 OF 22	



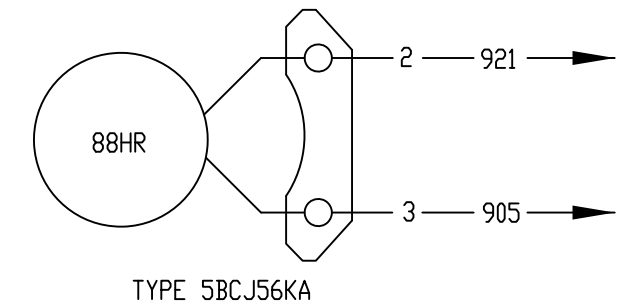
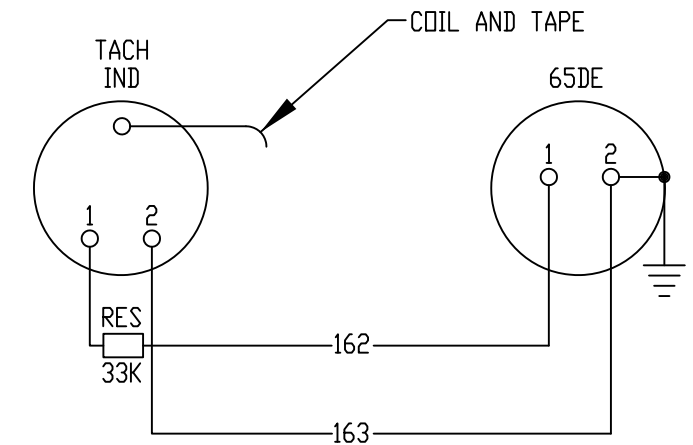
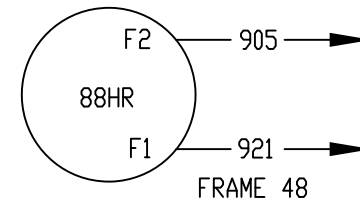
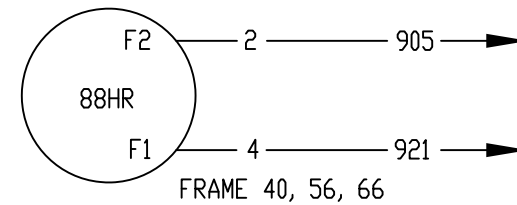
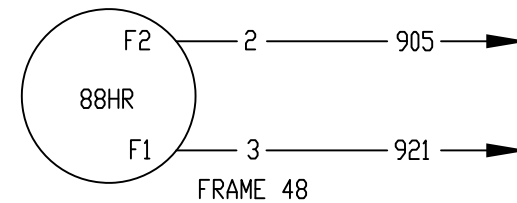
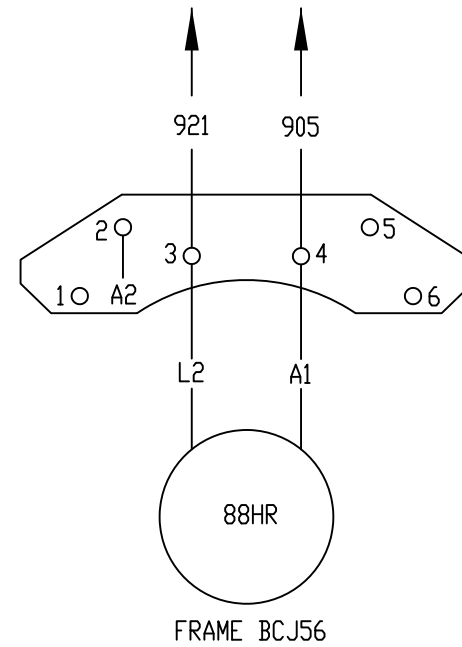
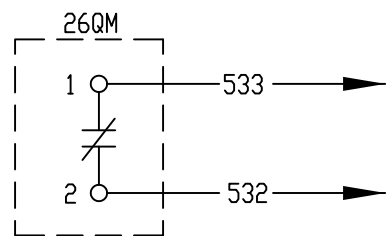
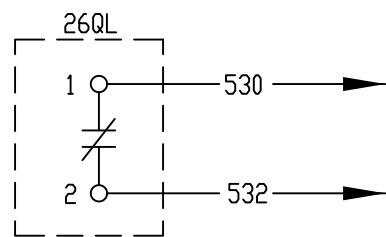
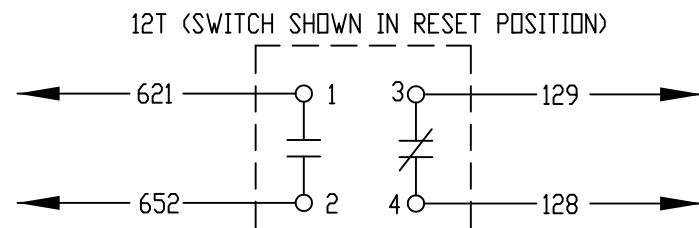
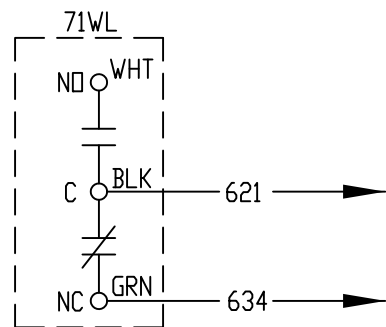
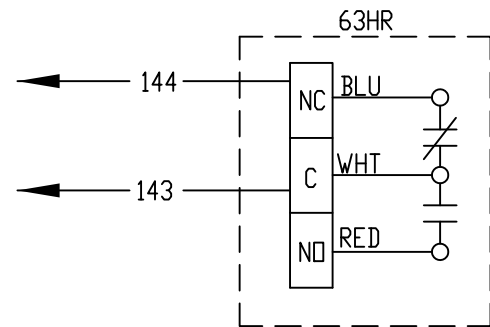
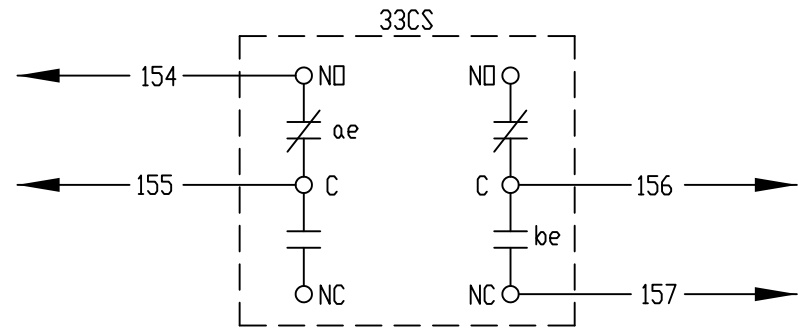
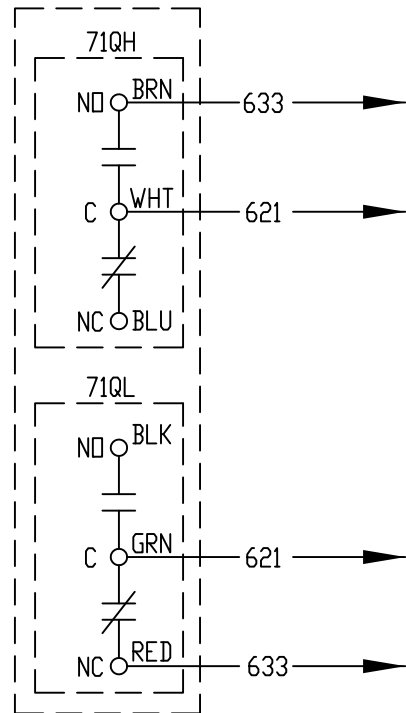
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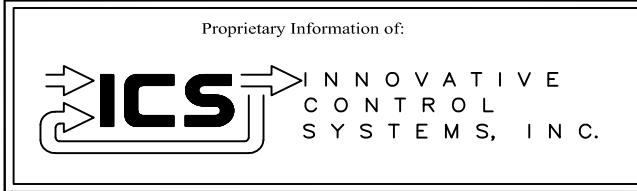
REV 1	AS BUILTS:	CS		09/10/01
REV	DESCRIPTION:	BY	APPROVED	DATE

TB3
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-102-025-1	
APPROVED BY:		DRAWN BY: C. FISHER	02/17/00
		SHEET NO. 025 17 OF 22	



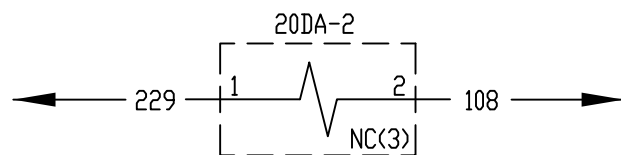
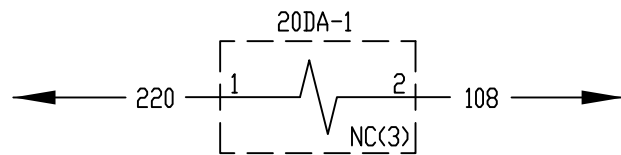
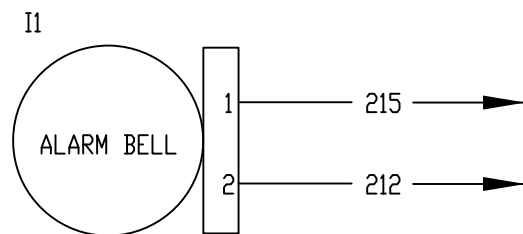
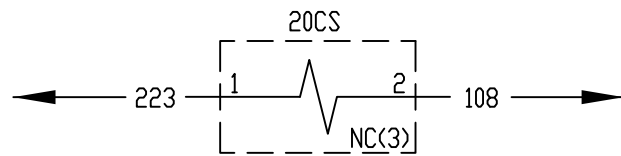
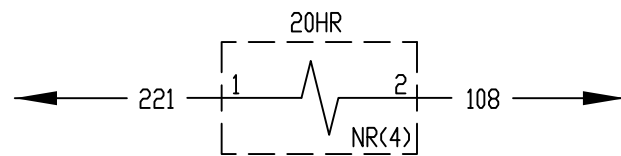
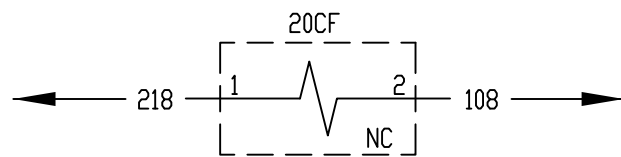
REF. G.E. 143B2831 SECT. 3 [SH. 10]



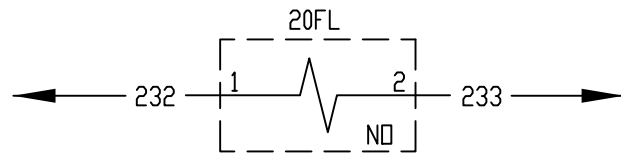
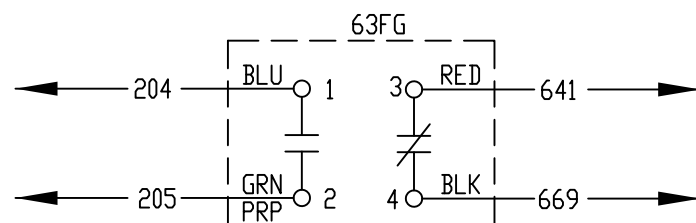
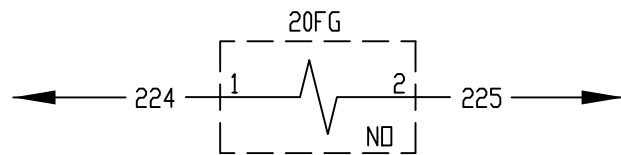
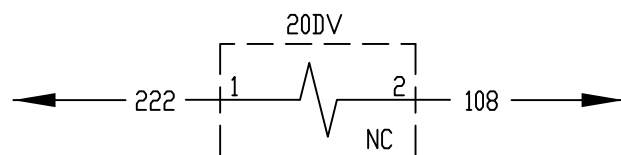
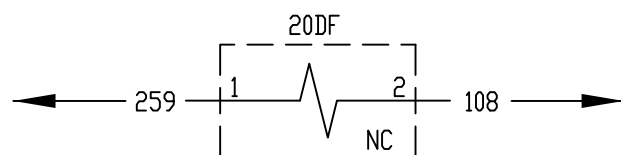
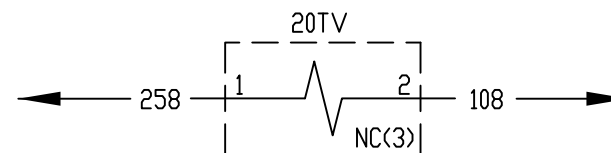
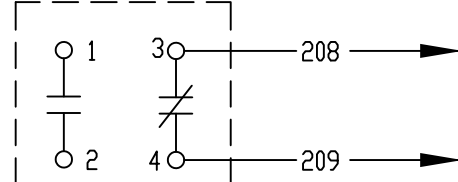
REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

FIELD DEVICES
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	02/17/00	99174-GTB-102-026-1	SHEET NO. 026 18 OF 22



33FL
(SWITCH SHOWN IN UNACTUATED POSITION)



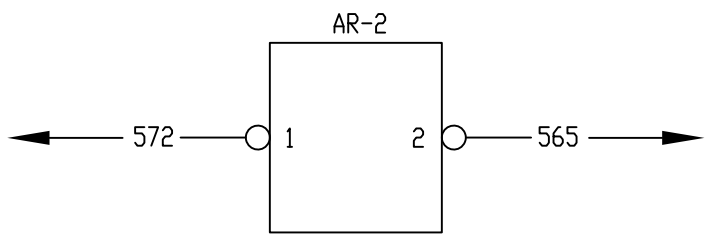
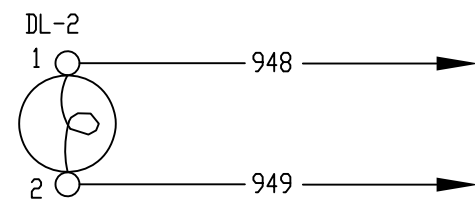
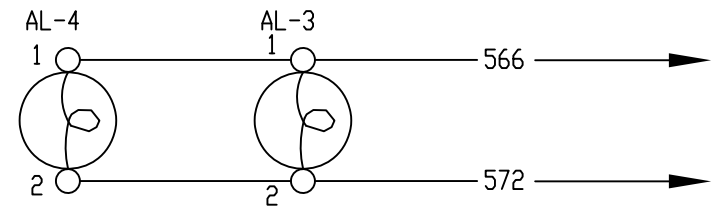
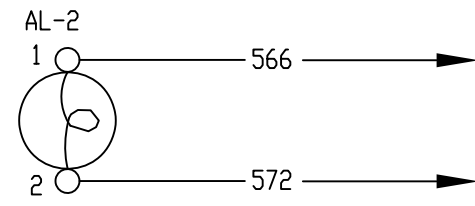
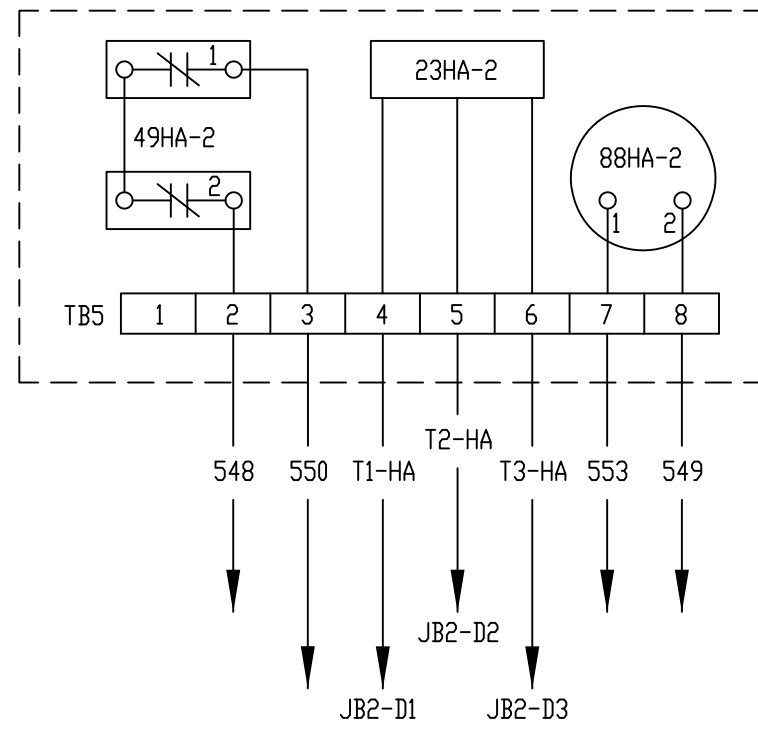
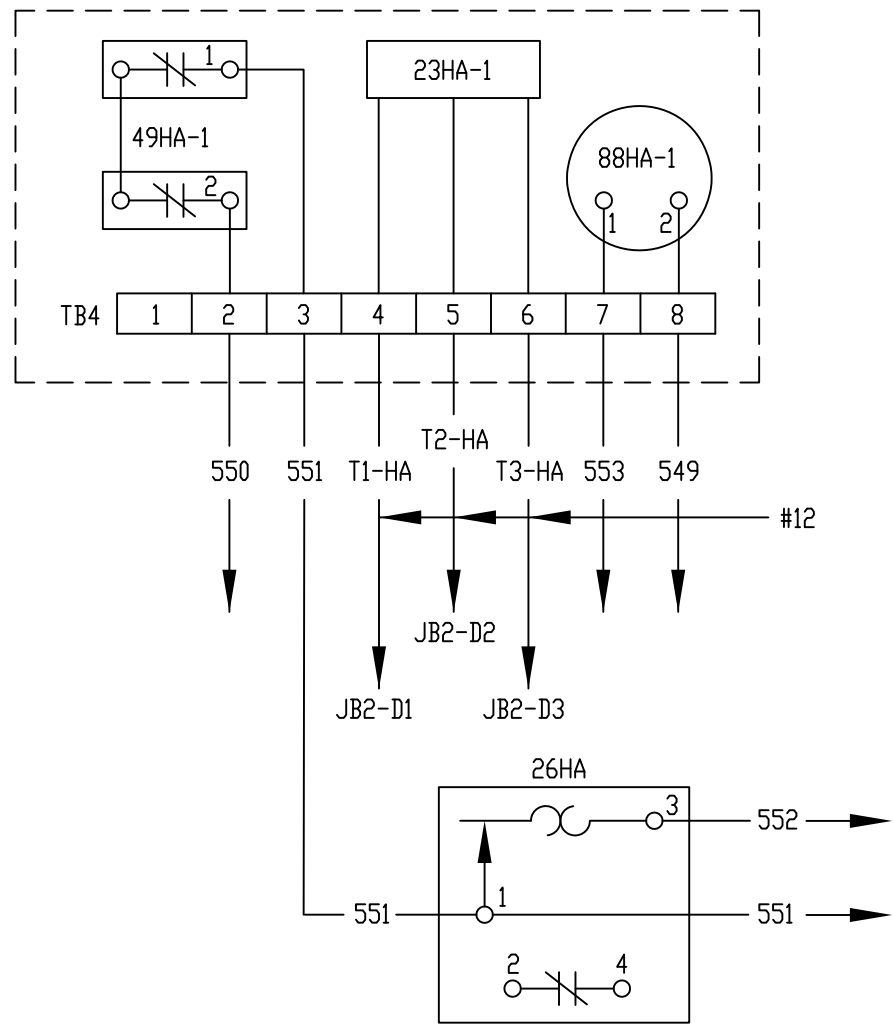
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Proprietary Information of:

REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

FIELD DEVICES
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-102-027-1	
APPROVED BY:		DRAWN BY: C. FISHER	02/17/00
		SHEET NO. 027 OF 22	



REF. G.E. 143B2831 SECT. 3 [SH. 12]

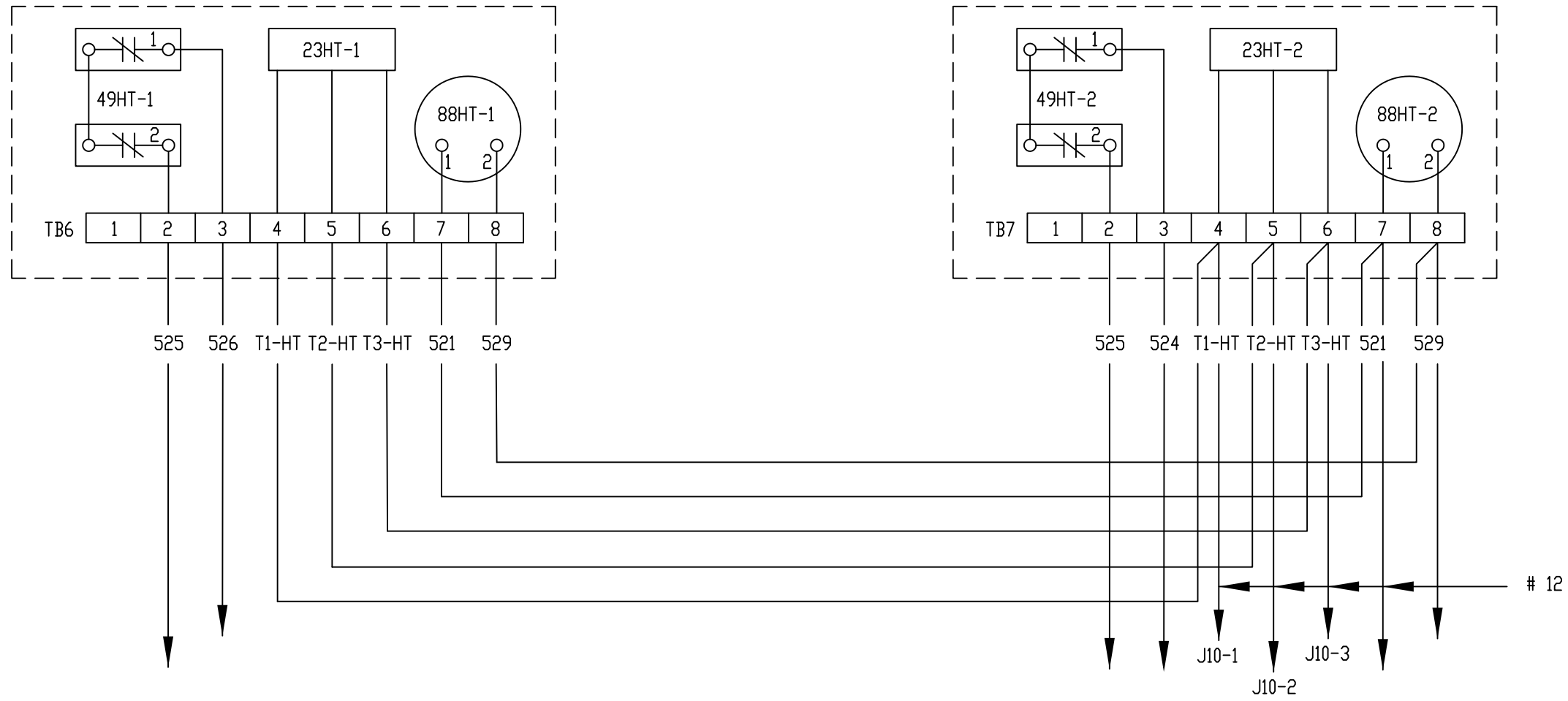
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

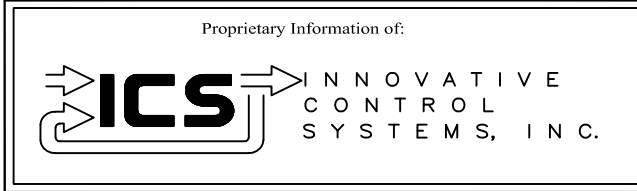
REV 1	AS BUILTS:	CS		01/25/01
REV	DESCRIPTION:	BY	APPROVED	DATE

FIELD DEVICES
 TURBINE DEVICE CONNECTION
 99174-GTB-102

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-102-028-1
DRAWN BY: C. FISHER	SCALE: NTS
02/17/00	SHEET NO. 028
	20 OF 22



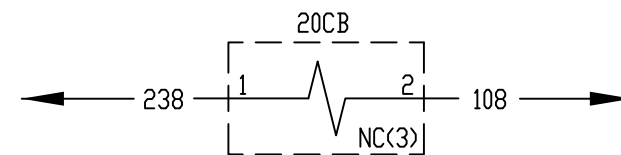
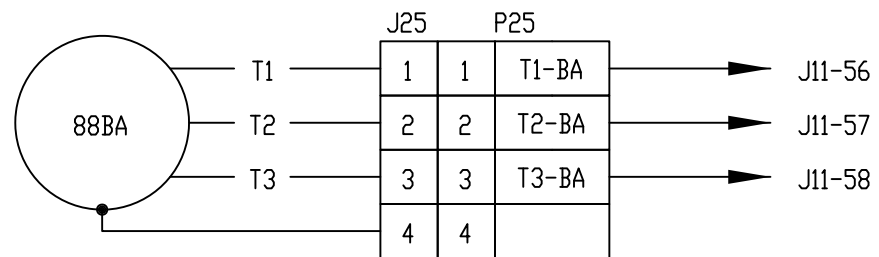
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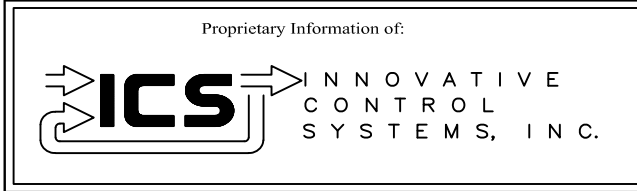
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REV	DESCRIPTION:	BY	APPROVED	DATE

FIELD DEVICES
 TURBINE DEVICE CONNECTION
 99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-102-029-1		SCALE: NTS
SITE: DON HENRY POWER CENTER		APPROVED BY:	DRAWN BY: C. FISHER	SHEET NO. 029
			02/17/00	21 OF 22



REF. G.E. 143B2831 SECT. 3 [SH. 14]



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/25/01

FIELD DEVICES
TURBINE DEVICE CONNECTION
99174-GTB-102

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-102-030-1		SCALE: NTS
SITE: DON HENRY POWER CENTER		APPROVED BY:	DRAWN BY: C. FISHER	SHEET NO. 030
			02/17/00	22 OF 22

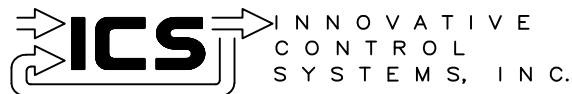
HASTINGS UTILITIES

HASTINGS, NEBRASKA

GE FRAME 5 GAS TURBINE

GENERATOR PROTECTION SYSTEM

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

TITLE SHEET
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00	99174-GTB-103-000-2	SHEET NO. 000 1 OF 39

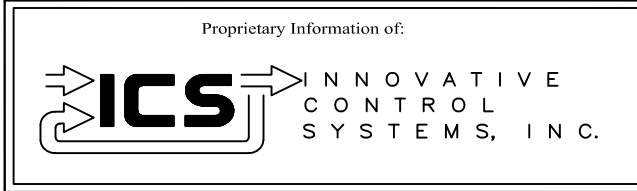
99174-GTB-103

GENERATOR PROTECTION SYSTEM

SHEET NUMBER	E2 REF. DWG	DESCRIPTION
000		TITLE SHEET
001		SHEET INDEX
002		GENERATOR PANEL LAYOUT
003		GENERATOR PANEL LAYOUT (REAR)
004		GENERATOR PANEL LAYOUT (LEFT)
005		GENERATOR PANEL LAYOUT (RIGHT)
006		GENERATOR PANEL POWER DISTRIBUTION
010		SCADA METER INTERNAL WIRING
EA04	9944T1562	DEVICE CONNECTIONS & ARRANGEMENTS
E001	9944T1562	GENERATOR POWER 3 LINE
E002	9944T1562	GENERATOR POWER 3 LINE
E002A	9944T1562	GENERATOR POWER 3 LINE
E003	9944T1562	STATION SERVICE POWER 3 LINE
E004	9944T1562	MANUAL/AUTO SYNCHRONIZING
E005	9944T1562	GENERATOR FIELD/EXCITATION
E006A	9944T1562	DECS-300 POWER
E006B	9944T1562	DECS-300 RECTIFIER CHASSIS
E006C	9944T1562	DECS-300 FIRING CIRCUIT
E006D	9944T1562	DECS-300 CONTROL OUTPUTS
E006E	9944T1562	DECS-300 CONTROL INPUTS
E006F	9944T1562	DECS-300/125VDC RELAY CONTROL
E007	9944T1562	125VDC EXCITATION CONTROL
E009A	9944T1562	125VDC AUXILIARY CONTROL
E009B	9944T1562	125VDC AUXILIARY CONRTOL
E010	9944T1562	GENERATOR FIELD GROUND DETECTION
E011	9944T1562	"CLOSE" CIRCUIT
E012	9944T1562	"TRIP" CIRCUIT
E013	9944T1562	GENERATOR LOCKOUT RELAY
E014	9944T1562	PLC ALARM INPUTS
E015	9944T1562	CONTROL STATUS INPUT TO PLC
E016A	9944T1562	CONTROL OUTPUTS FROM PLC
E016B	9944T1562	CONTROL OUTPUTS FROM PLC
E016C	9944T1562	CONTROL OUTPUTS FROM PLC
E017	9944T1562	SEL-300 AND M-3420 CONNECTION DIAGRAM
E018	9944T1562	TERMINAL BLOCK CONNECTION DIAGRAM
E019	9944T1562	TEST SWITCH CONNECTION DIAGRAM
E020	9944T1562	GUAGE, SWITCH, & AUX. RELAY DIAGRAM
E021	9944T1562	DECS-300 CONNECTION DIAGRAM
EA06	9944T1562	SYSTEM ONE-LINE

- △ GENERATOR AUXILLARY COMPARTMENT
- ⊠ GENERATOR COMPARTMENT DEVICE
- ⊗ GENERATOR CONTROL PANEL DEVICE

ANY DEVICE LOCATED IN THE GENERATOR PANEL IS NOT IDENTIFIED WITH THE ⊗ SYMBOL THRU OUT THE PRINTS.

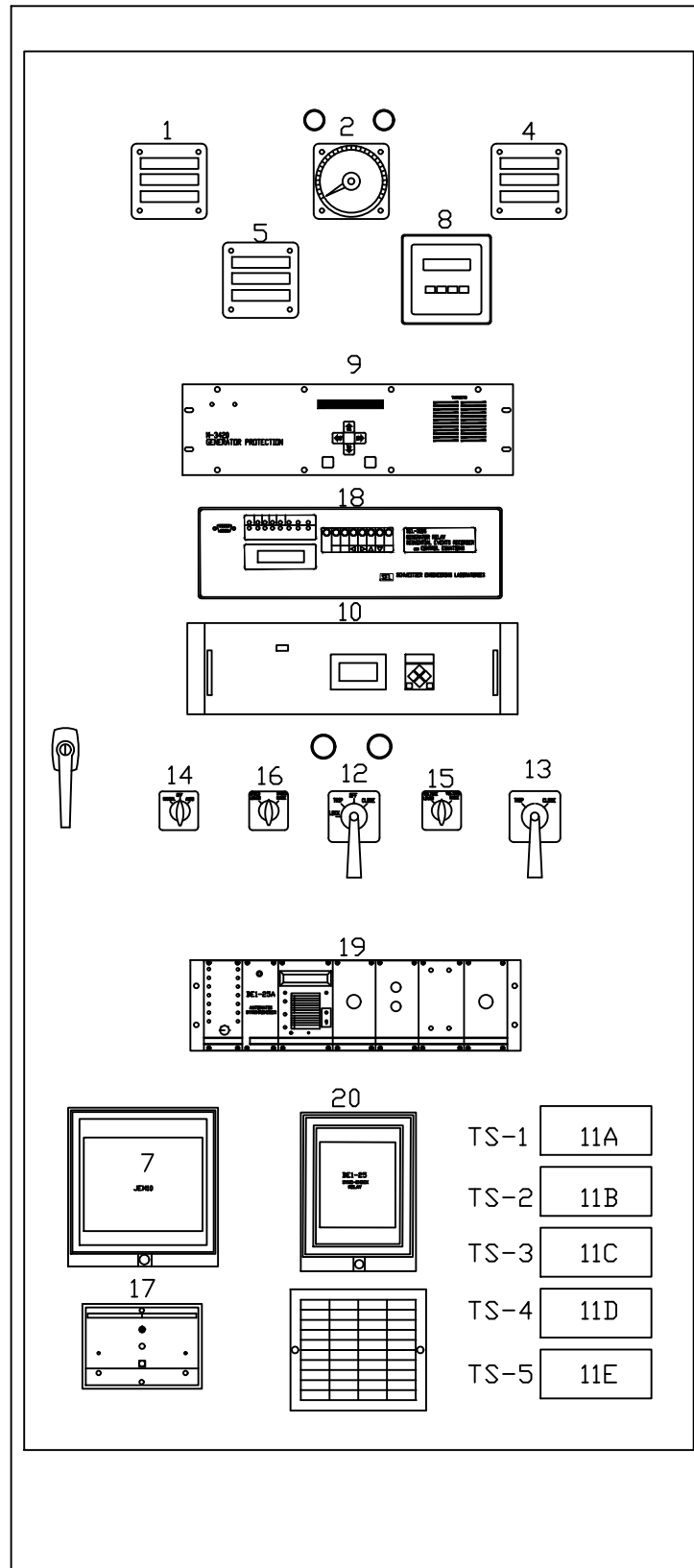


REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00


INDEX SHEET
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00	99174-GTB-103-001-2	SHEET NO. 001 2 OF 39

- 1- BUS VOLTAGE METER, GENRATOR VOLTAGE METER
- 2- SYNCHRONIZING SCOPE & LIGHTS
- 4- GENERATOR FREQUENCY METER
- 5- MW METER, MVAR METER
- 7- SCIENTIFIC COLUMBUS WATT-HR METER
- 8- POWER MONITORING INTERFACE
- 9- GENERATOR PROTECTION RELAY #1 3420
- 10- DECS-300 EXCITATION CONTROL
- 11A-11E- GENERATOR TEST SWITCHES
- 12- GENERATOR BREAKER CONTROL SWITCH
- 13- GENERATOR PROTECTION LOCKOUT
- 14- MAN/AUTO SYNCH SELECTOR SWITCH
- 15- GENERATOR VOLTAGE RAISE/LOWER SWITCH
- 16- TURBINE SPEED RAISE/LOWER SWITCH
- 17- MACHINE FIELD GROUND PROTECTION RELAY
- 18- SEL-300G GENERATOR RELAY
- 19- AUTO SYNCHRONIZER
- 20- SYNCH CHECK RELAY



Proprietary Information of:



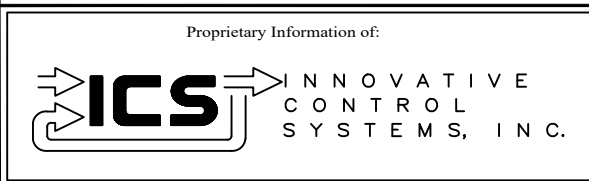
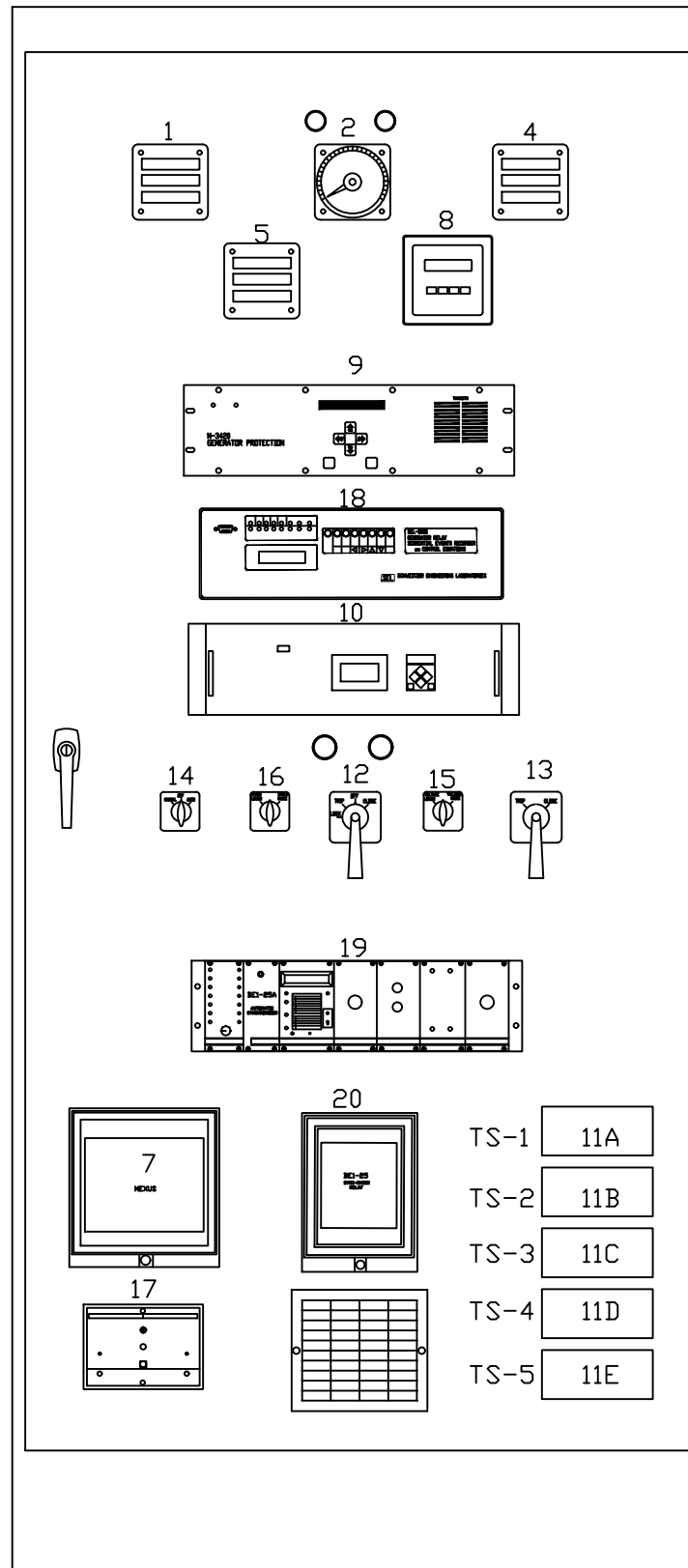
INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
1	AS BUILTS:	CF		09/10/01

GENERATOR PANEL LAYOUT
GENERATOR PROTECTION SYSTEM
 99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-103-GTB-002-1	SHEET NO. 002 3 OF 39

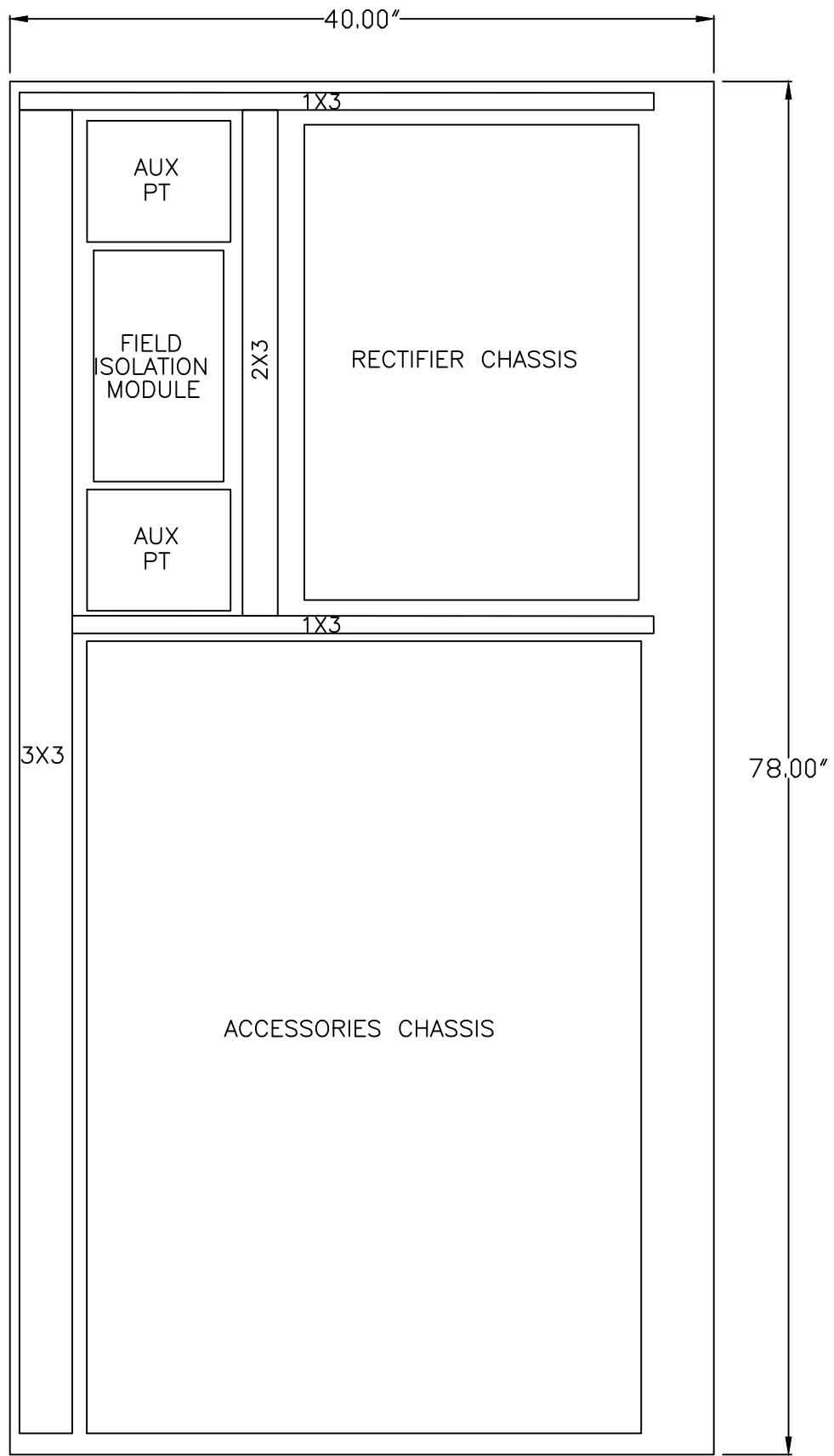
- 1- BUS VOLTAGE METER, GENRATOR VOLTAGE METER
- 2- SYNCHRONIZING SCOPE & LIGHTS
- 4- GENERATOR FREQUENCY METER
- 5- MW METER, MVAR METER
- 7- SCIENTIFIC COLUMBUS WATT-HR METER
- 8- POWER MONITORING INTERFACE
- 9- GENERATOR PROTECTION RELAY #1 3420
- 10- DECS-300 EXCITATION CONTROL
- 11A-11E- GENERATOR TEST SWITCHES
- 12- GENERATOR BREAKER CONTROL SWITCH
- 13- GENERATOR PROTECTION LOCKOUT
- 14- MAN/AUTO SYNCH SELECTOR SWITCH
- 15- GENERATOR VOLTAGE RAISE/LOWER SWITCH
- 16- TURBINE SPEED RAISE/LOWER SWITCH
- 17- MACHINE FIELD GROUND PROTECTION RELAY
- 18- SEL-300G GENERATOR RELAY
- 19- AUTO SYNCHRONIZER
- 20- SYNCH CHECK RELAY



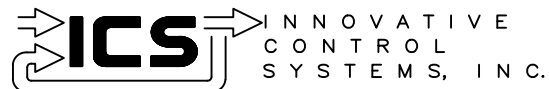
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	REPLACED JEM-10 WITH NEXUS	NJB		06/24/2016
REV 1	AS BUILTS:	CF		09/10/01

GENERATOR PANEL LAYOUT
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-103-GTB-002-2	SHEET NO. 002 3 OF 39



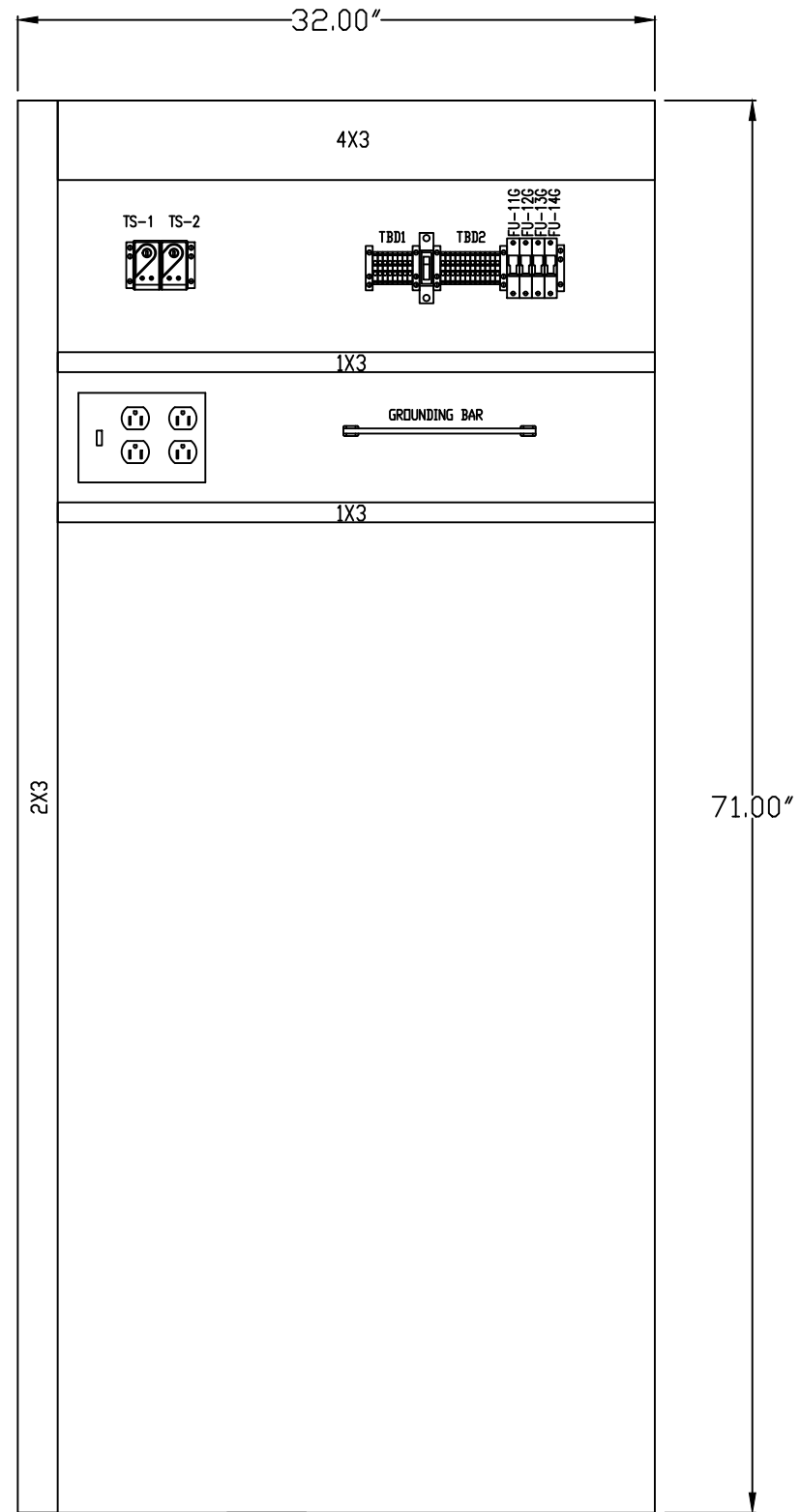
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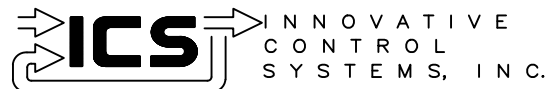
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

GENERATOR PANLE (REAR)
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-103-GTB-003-1	SHEET NO. 003 4 OF 39



Proprietary Information of:



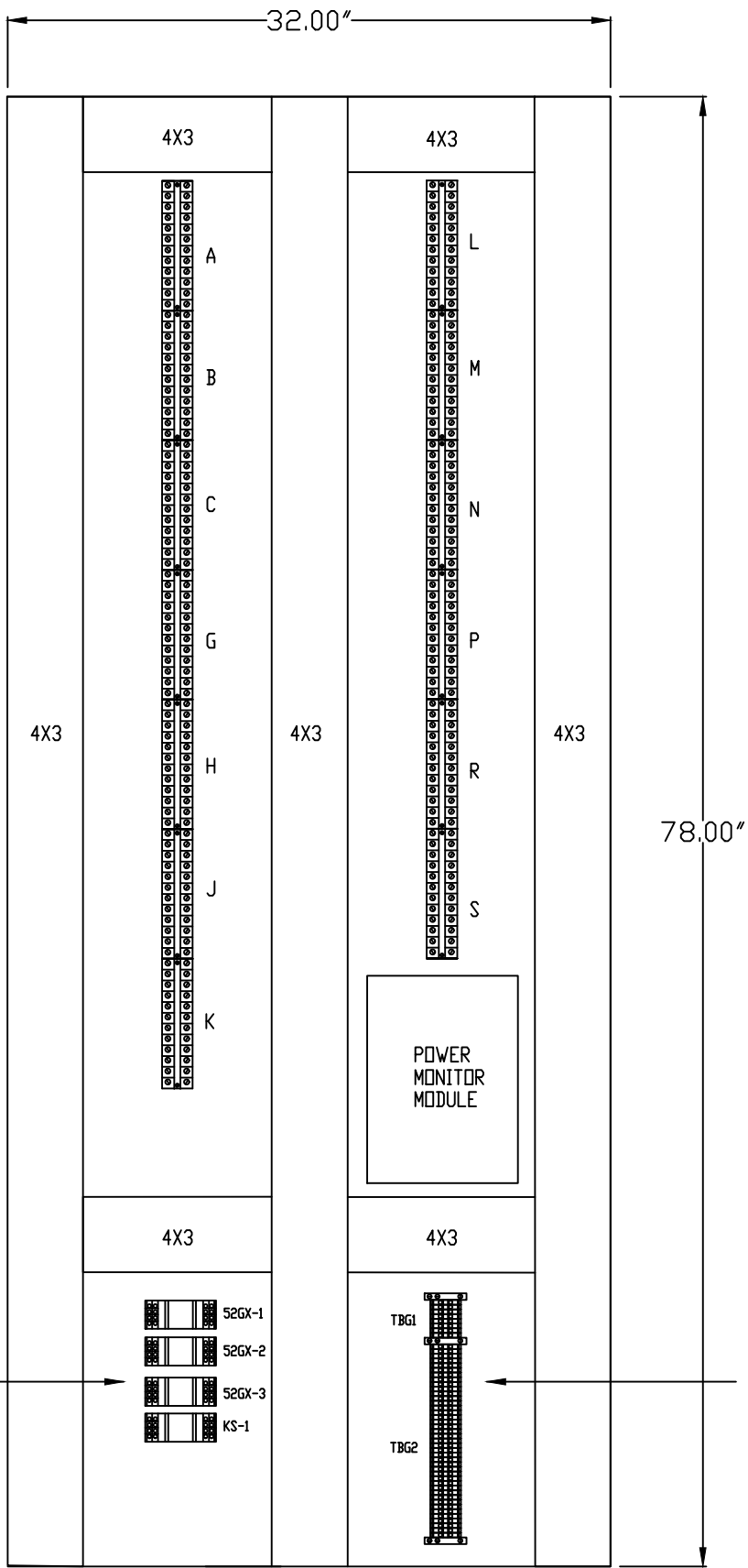
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

GENERATOR PANEL (LEFT)
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

CUSTOMER: HASTINGS UTILITIES

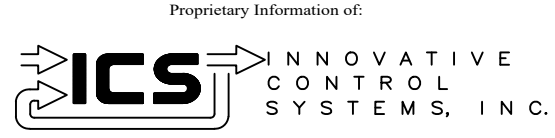
SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-103-GTB-004-1	NTS
			SHEET NO. 004
			5 OF 39



AUX. RELAYS

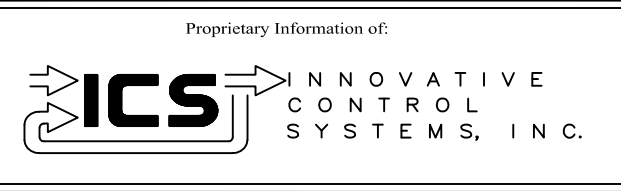
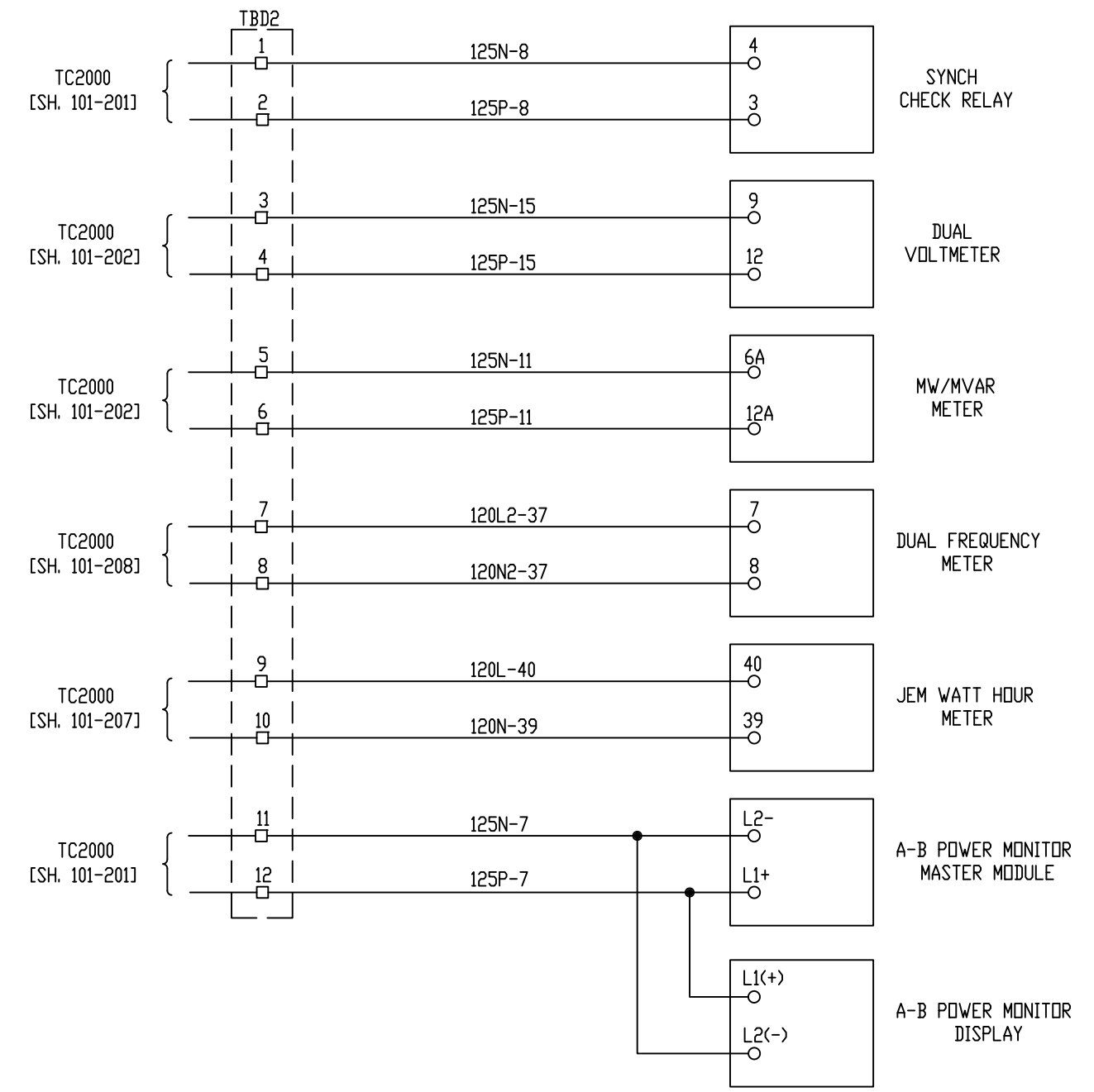
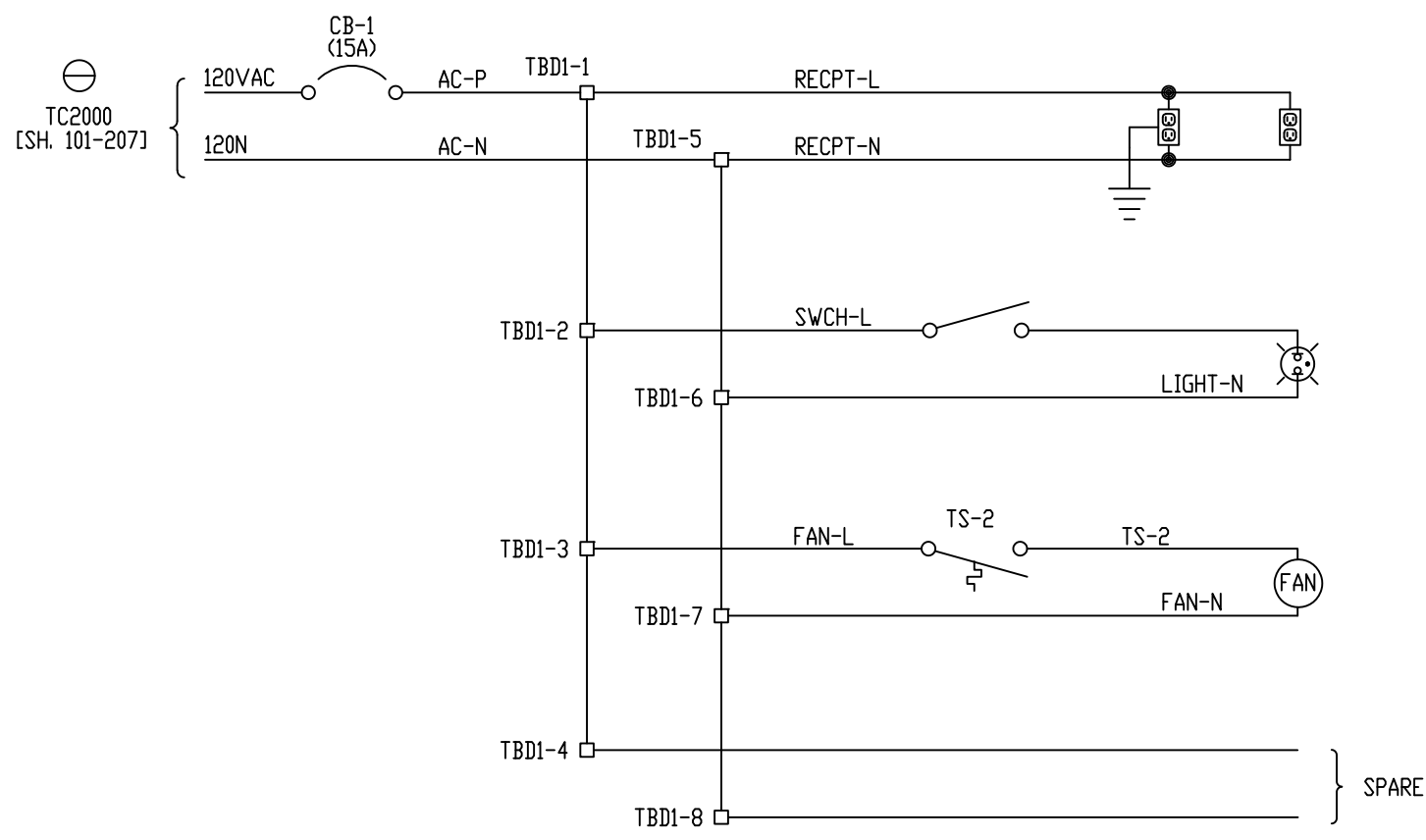
SCADA



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR PANEL (RIGHT)
TURBINE GENERATOR CONTROLLER
99174-GTB-103

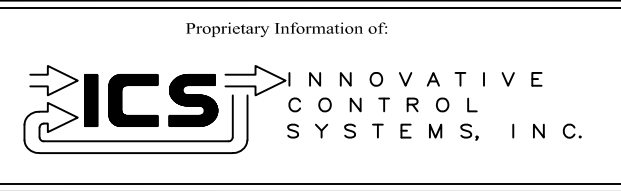
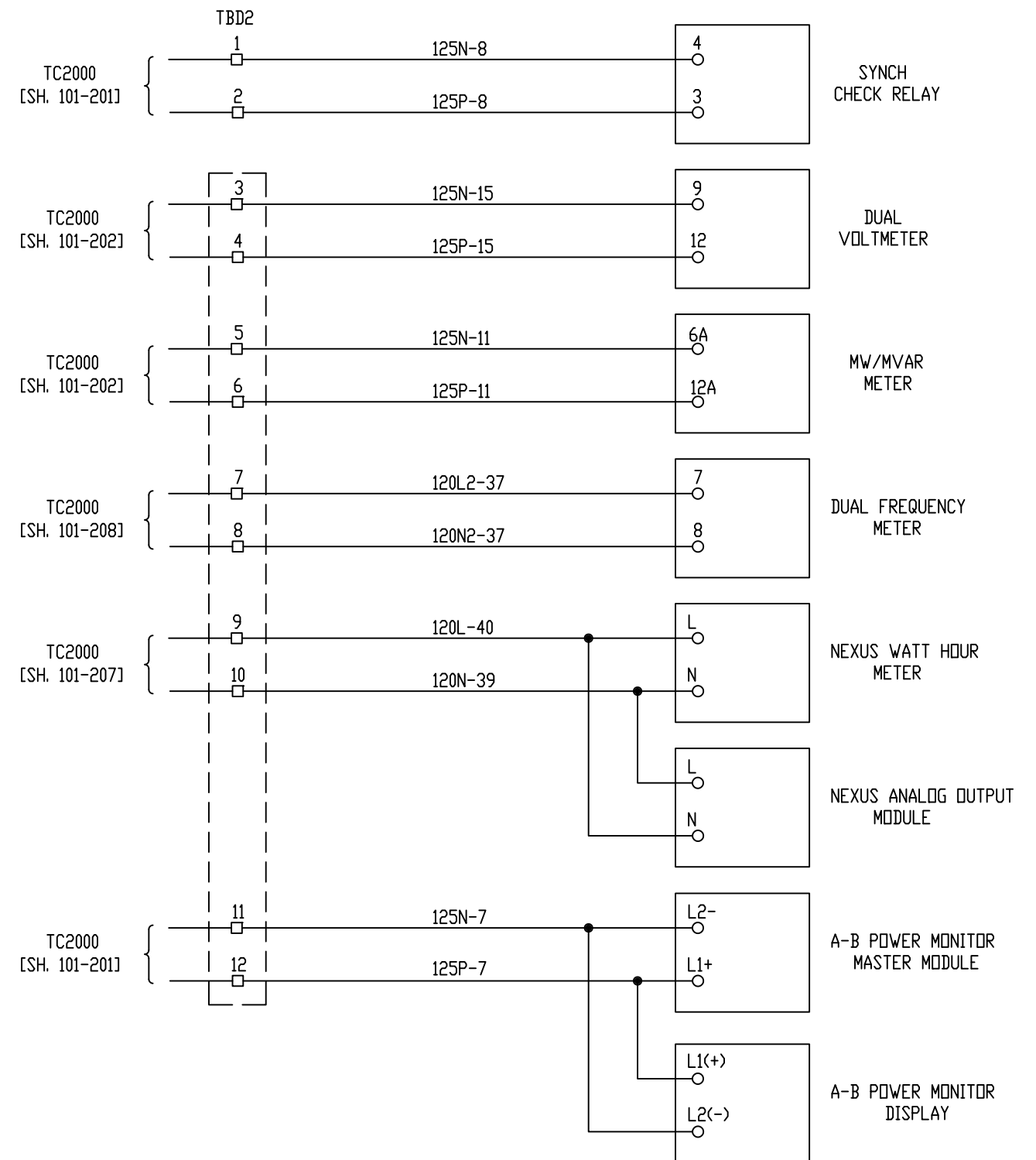
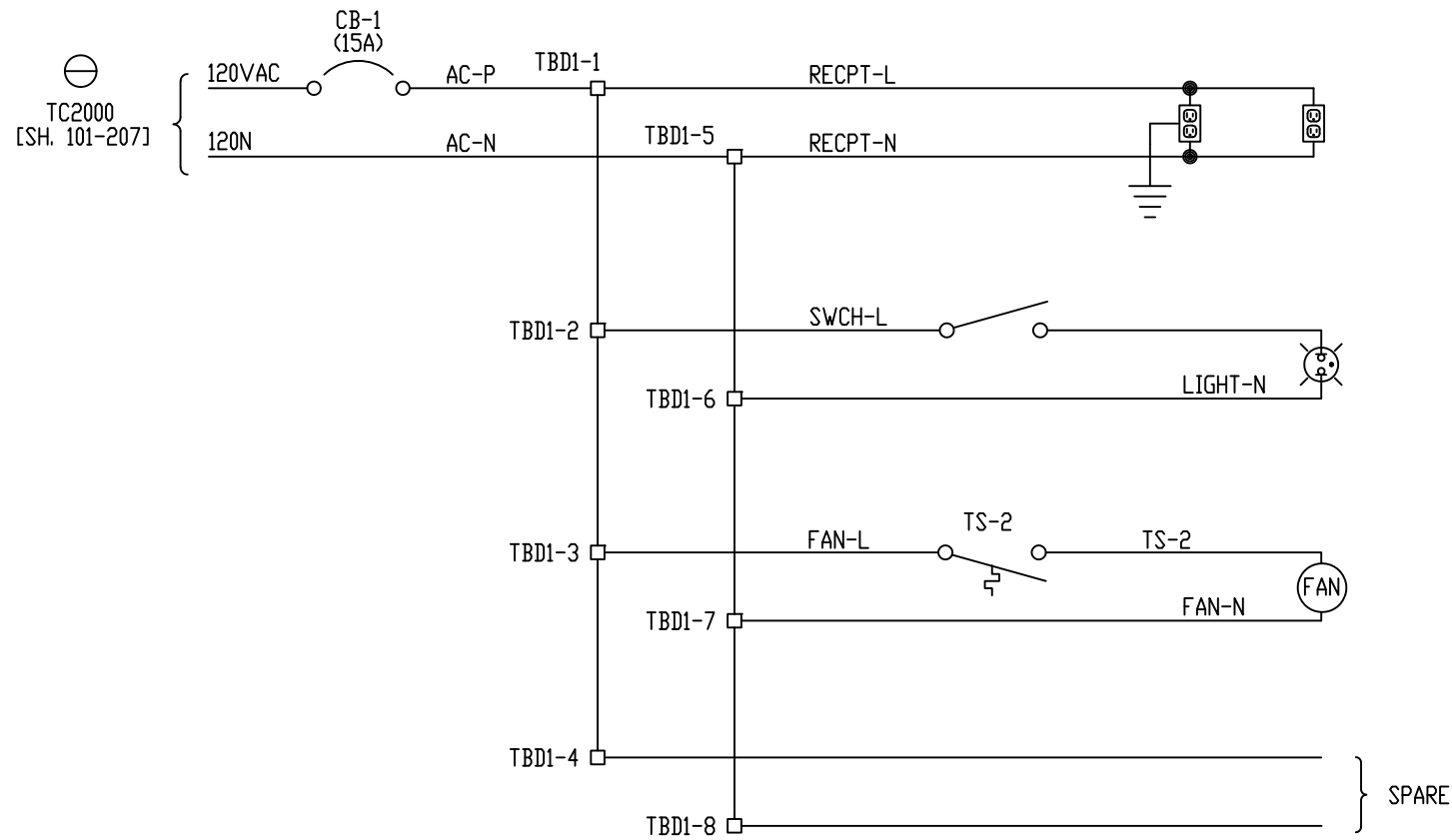
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-103-GTB-005-2	NTS
			SHEET NO. 005 6 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		09/10/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR PANEL POWER DISTRIBUTION
GENERATOR PROTECTION SYSTEM
99174-GTB-103

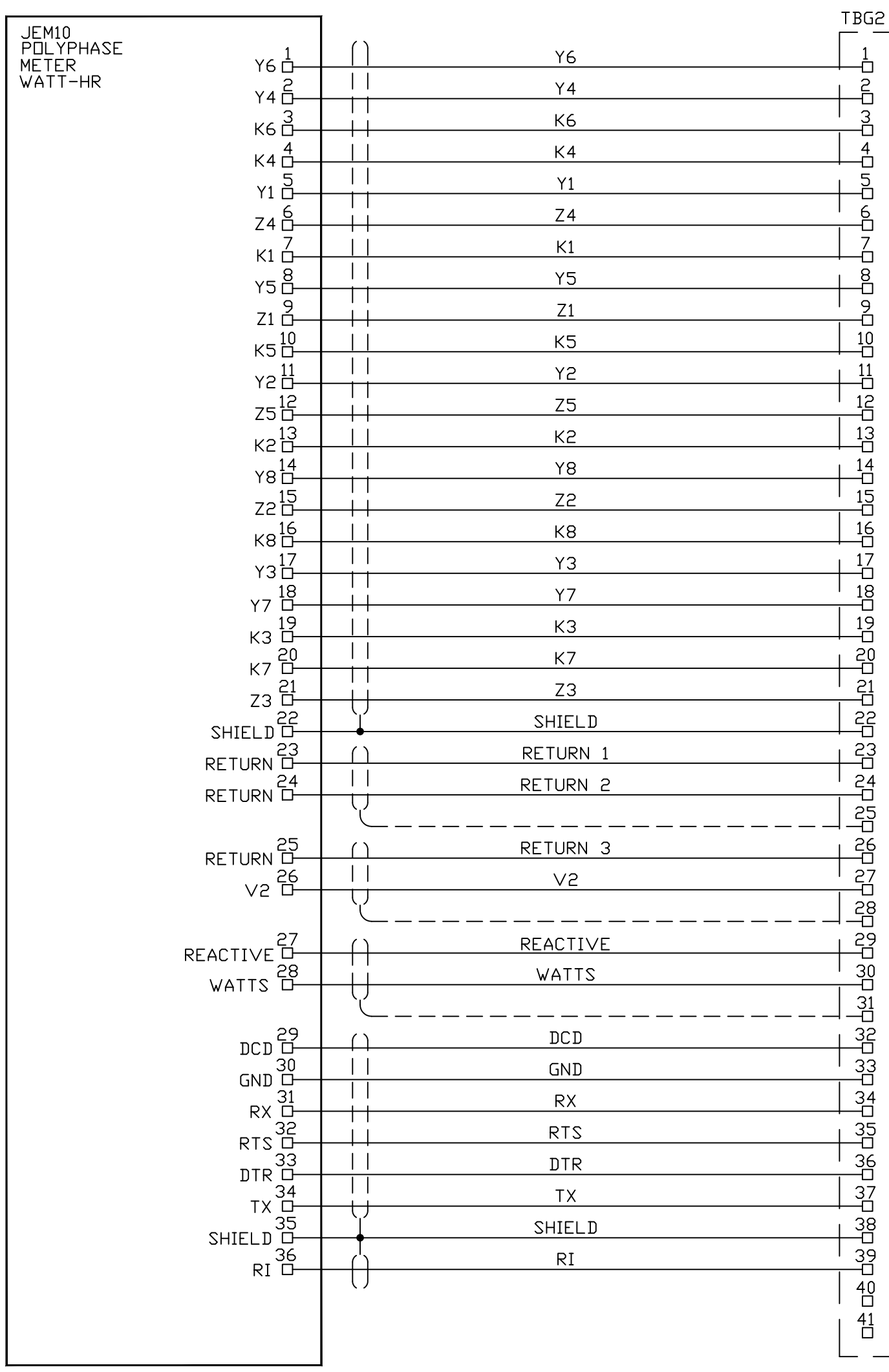
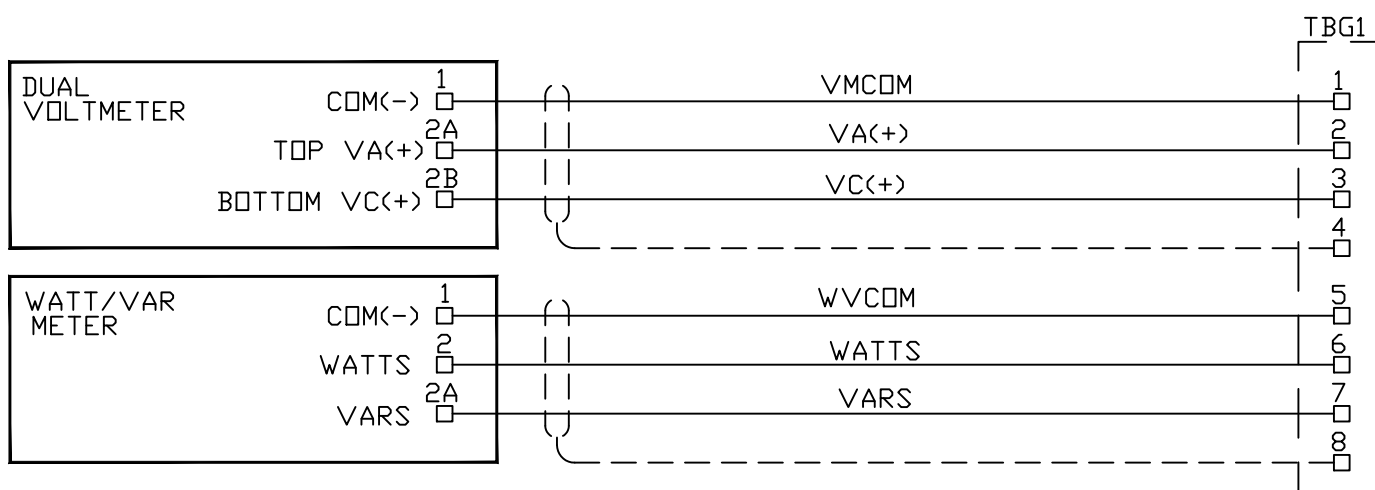
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00	99174-GTB-103-006-2	SHEET NO. 006 7 OF 39

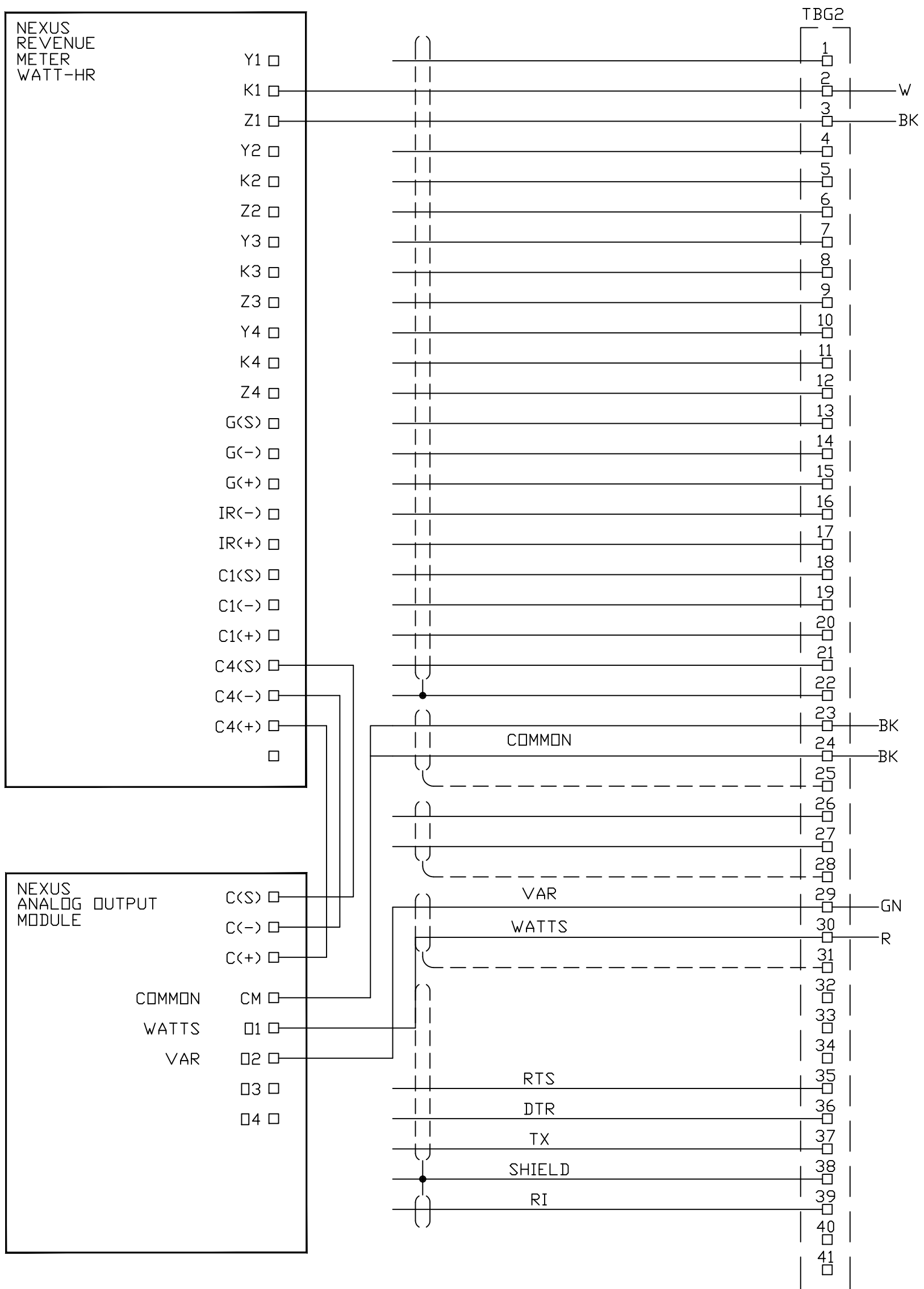
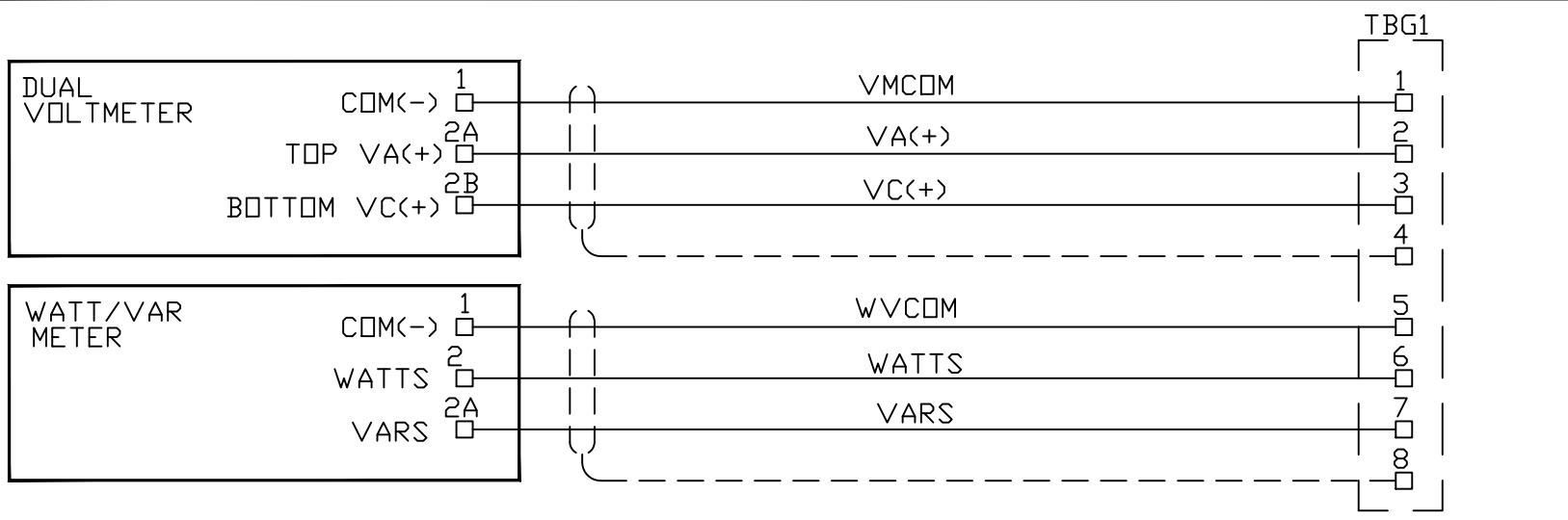


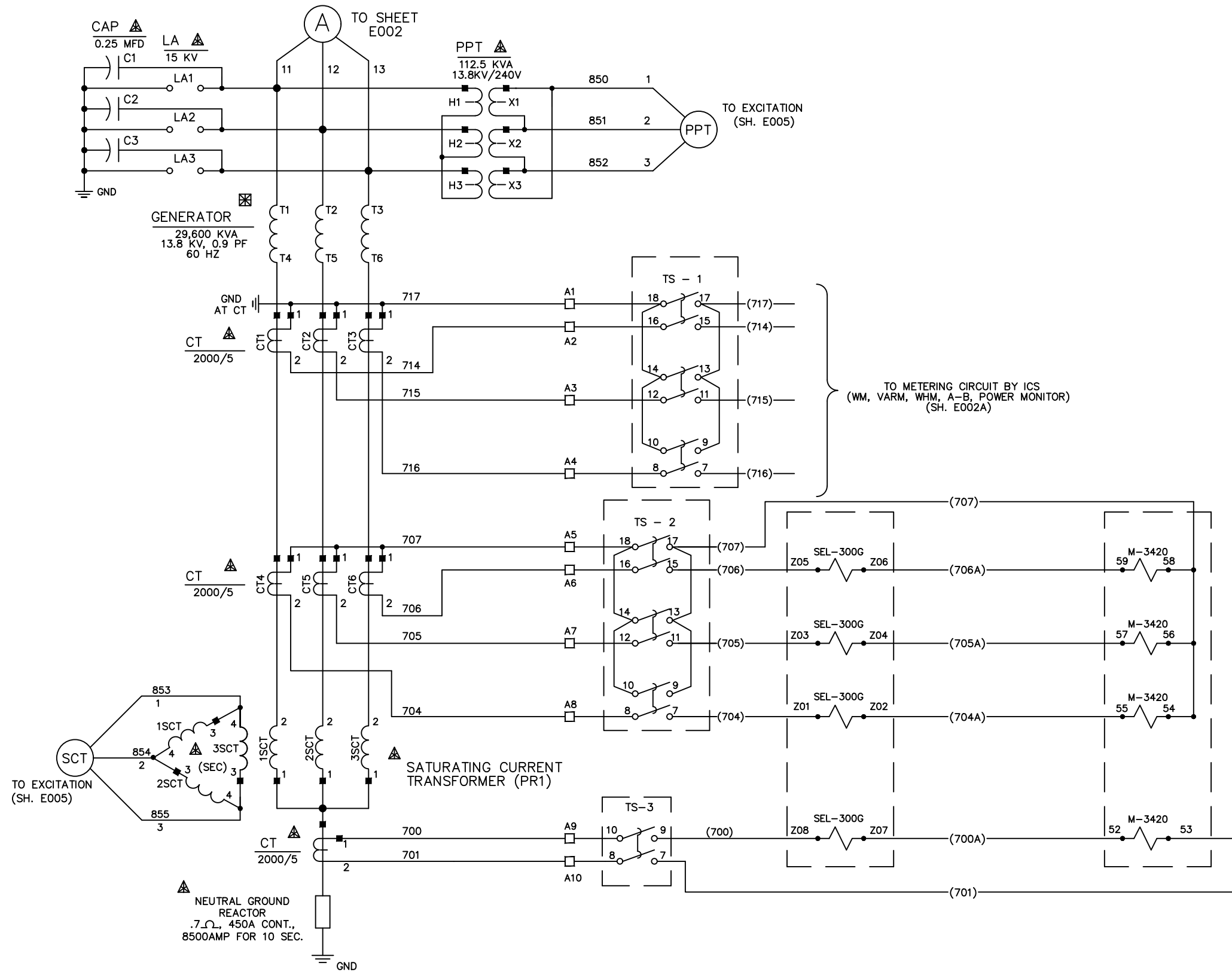
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	REPLACED JEM-10 WITH NEXUS	NJB		06/24/2016
REV 2	MODIFICATIONS:	CS		09/10/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR PANEL POWER DISTRIBUTION
GENERATOR PROTECTION SYSTEM
 99174-GTB-103

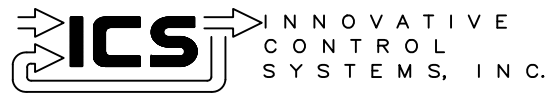
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00	99174-GTB-103-006-3	SHEET NO. 006 7 OF 39







Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR POWER 3 LINE
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

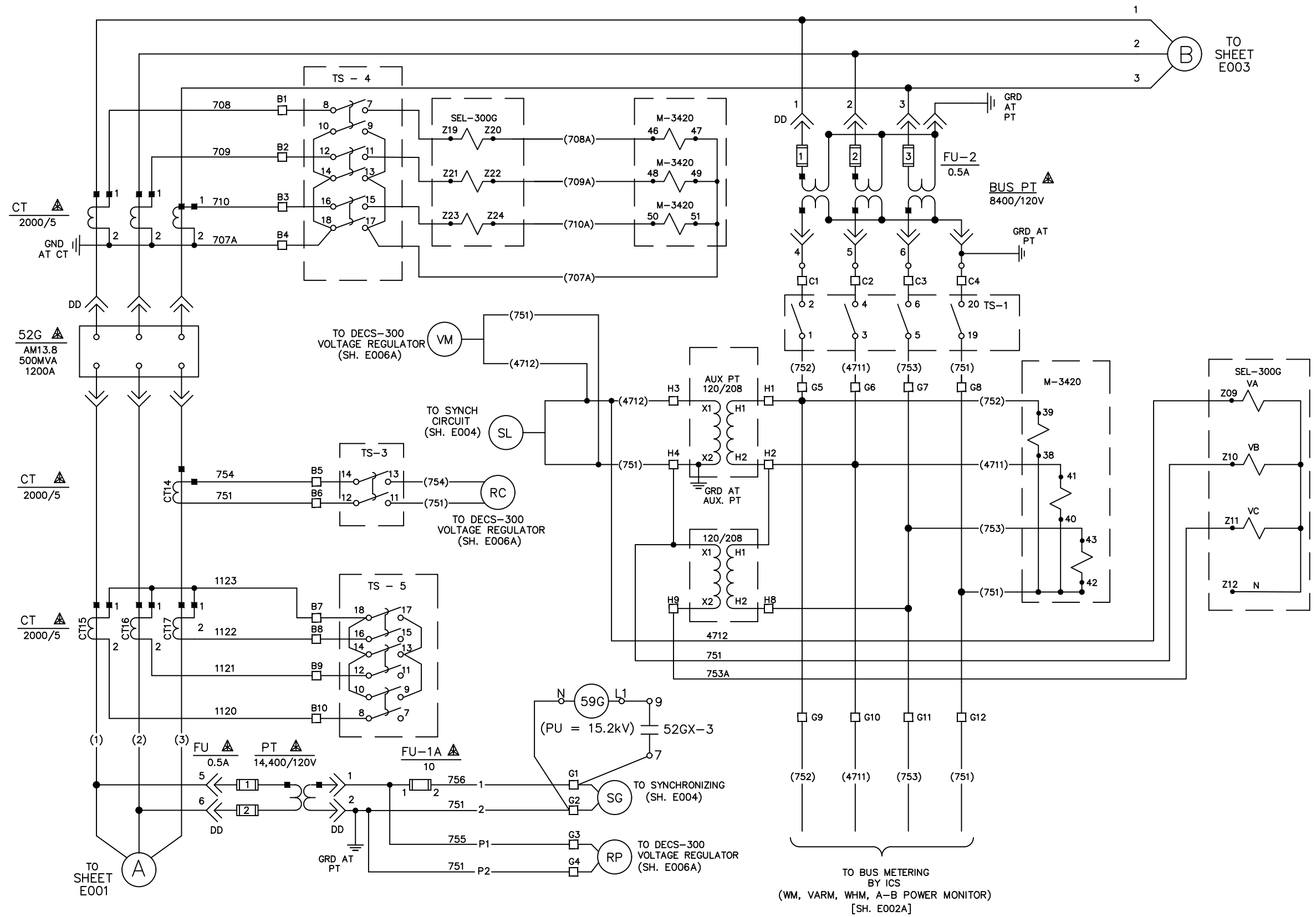
APPROVED BY:

DRAWING NO.
9944T1562

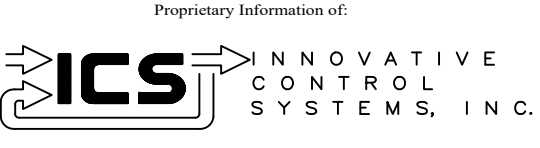
SCALE:
NTS
SHEET NO. E001
10 OF 39

DRAWN BY: C. FISHER

01/17/00



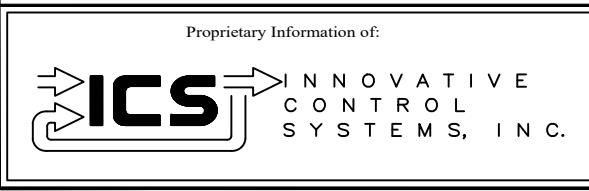
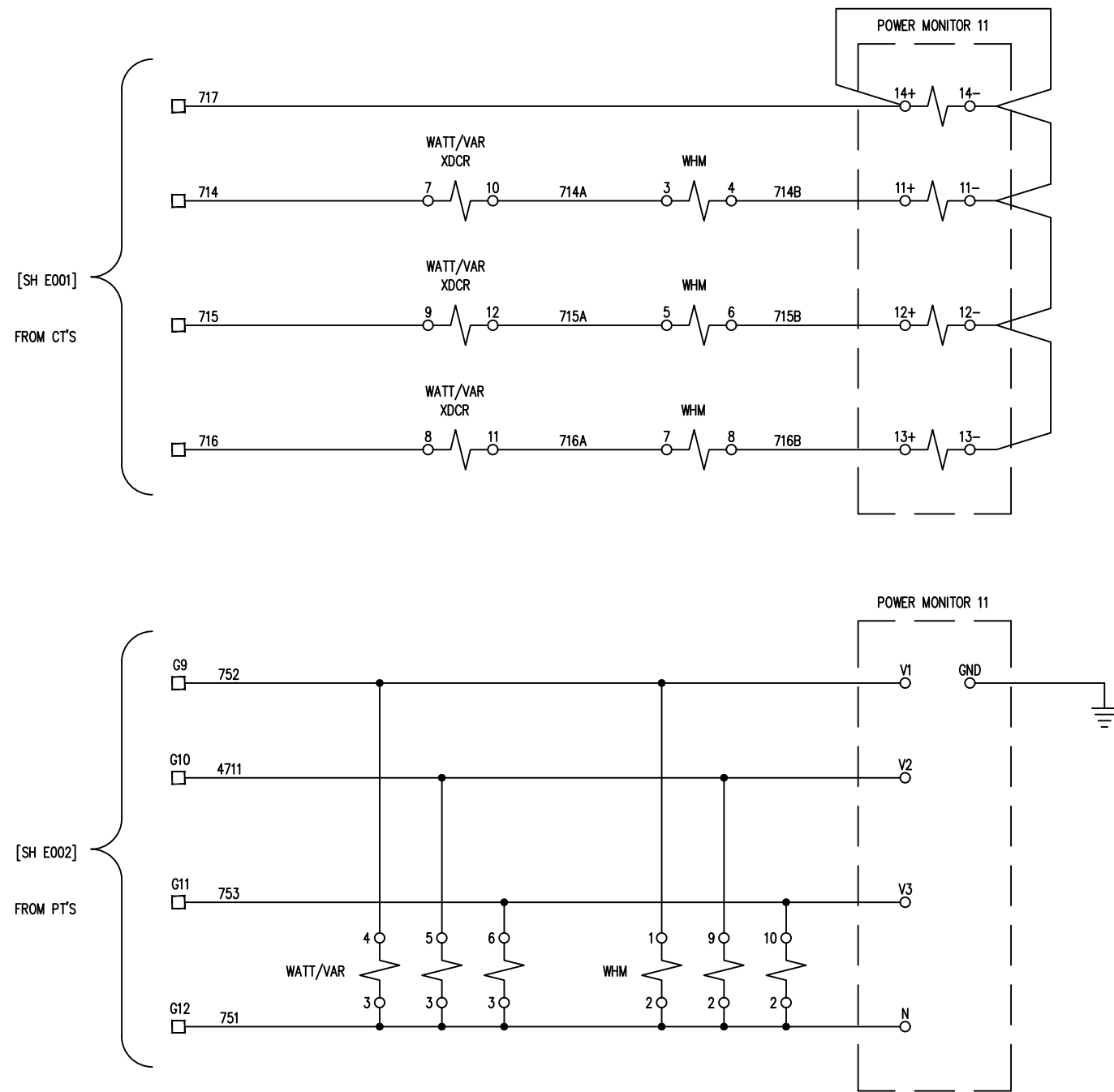
TO SHEET E003



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

GENERATOR POWER 3 LINE
GENERATOR PROTECTION SYSTEM
99174-GTB-103

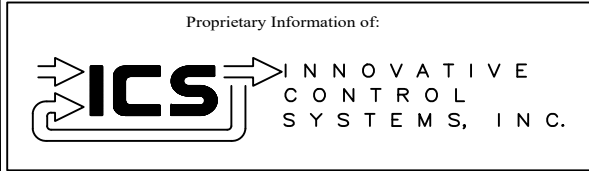
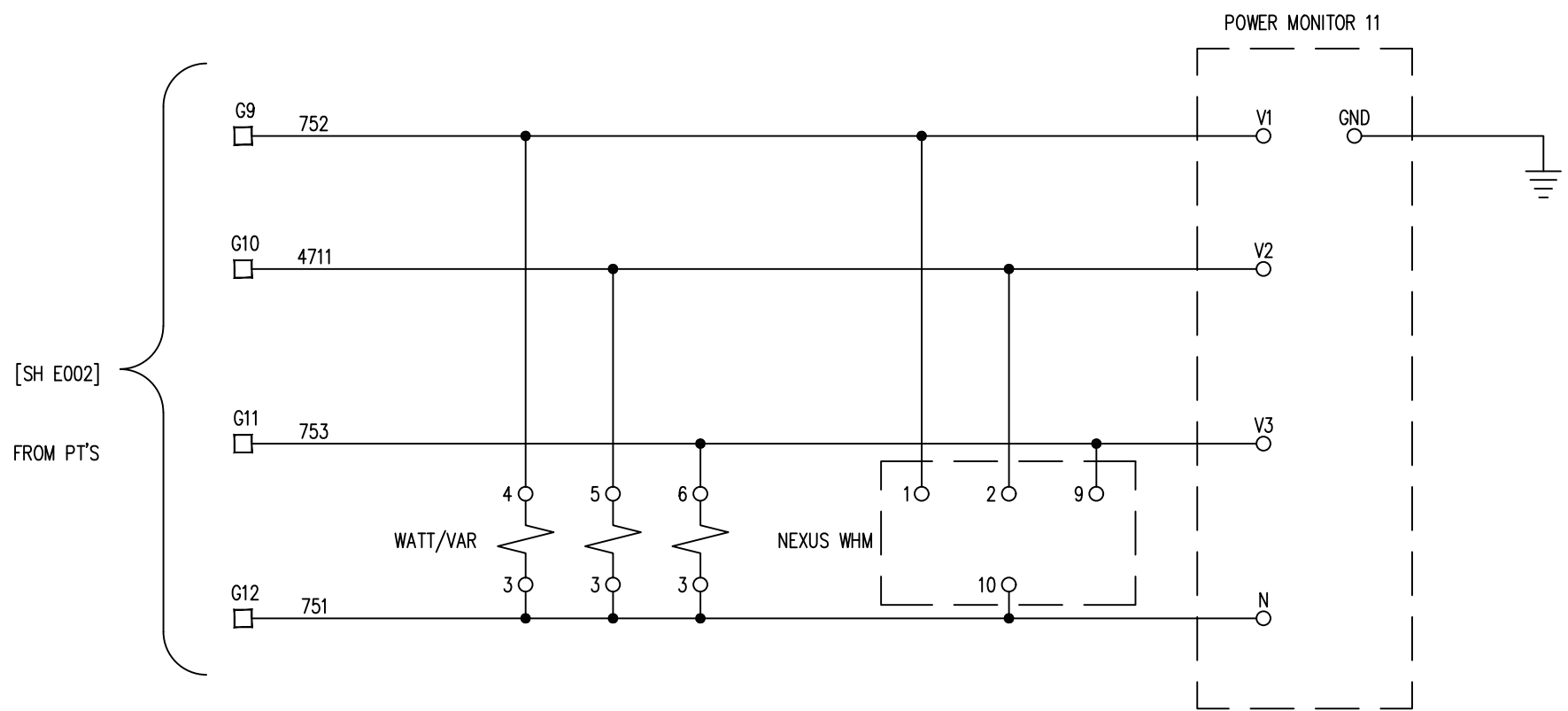
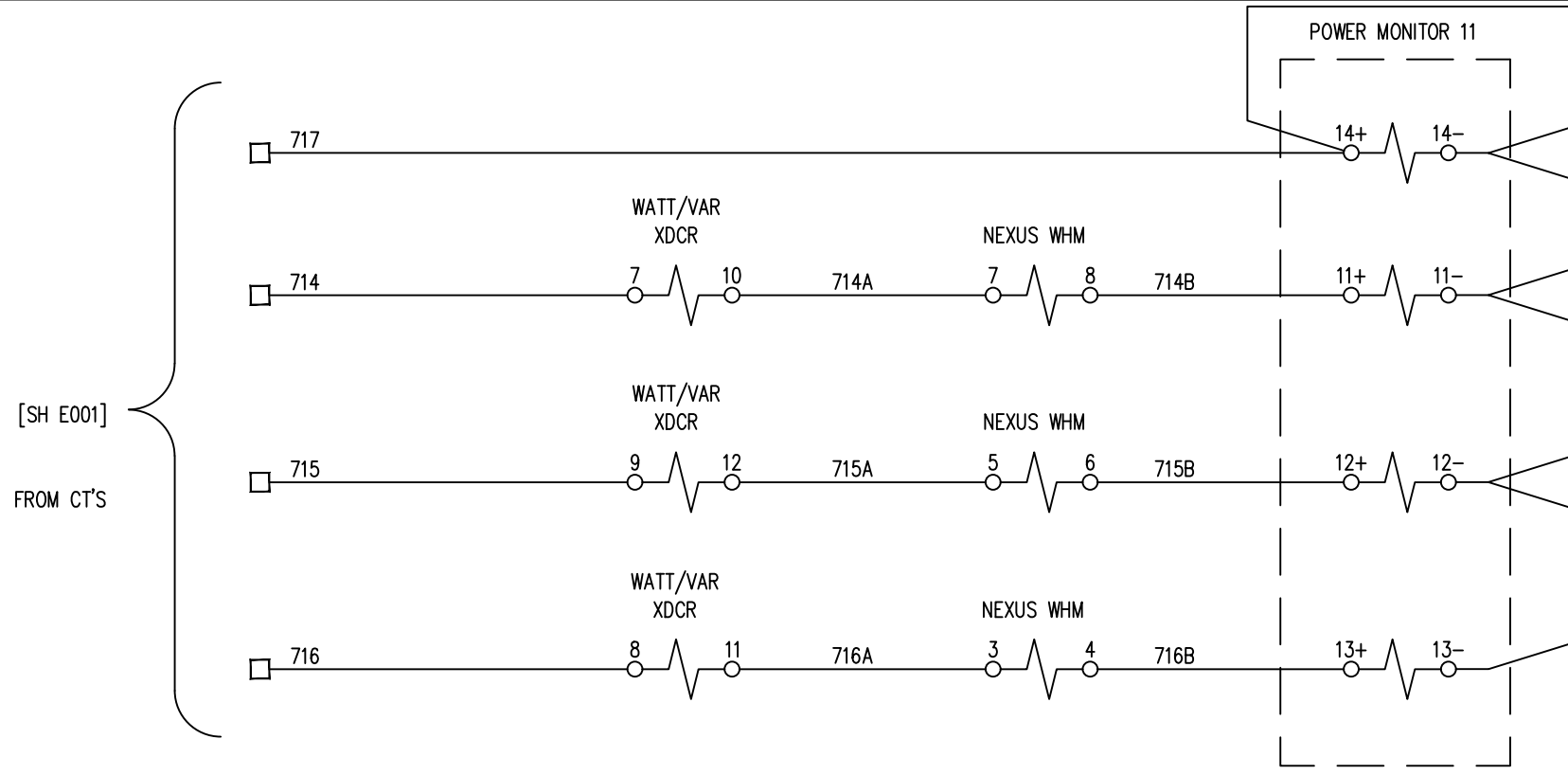
CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 9944T1562	
SITE: DON HENRY POWER CENTER		SCALE: NTS	
APPROVED BY:		DRAWN BY: C. FISHER	01/17/00
		SHEET NO. E002 11 OF 39	



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR POWER 3 LINE
GENERATOR PROTECTION SYSTEM
99174-GTB-103

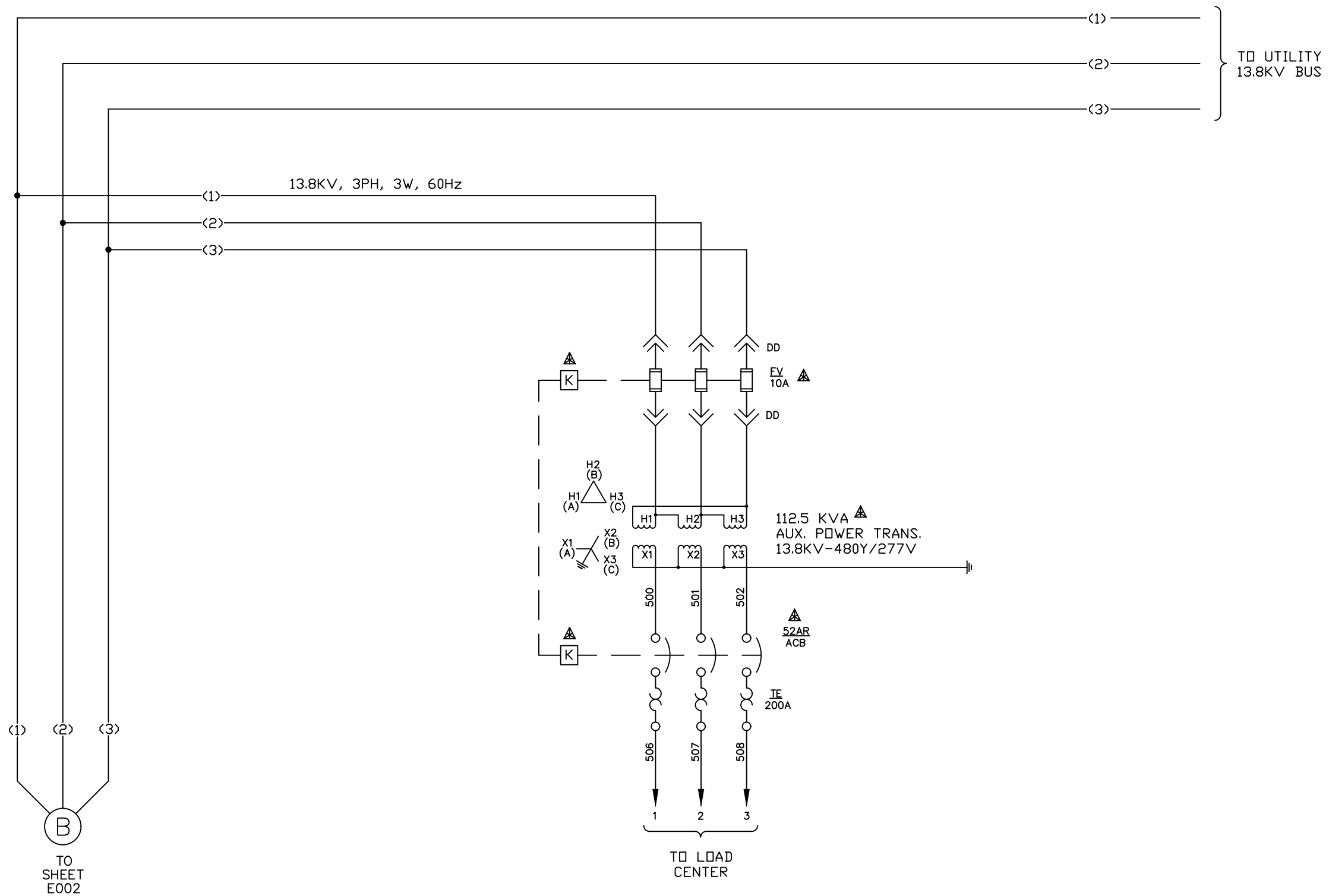
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E002A
			12 OF 39



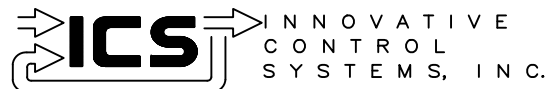
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	REPLACED JEM-10 WITH NEXUS	NJB		06/24/2016
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR POWER 3 LINE
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO. 9944T1562	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00		SHEET NO. E002A 12 OF 39



Proprietary Information of:



REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

STATION SERVICE POWER 3 LINE
GENERATOR PROTECTION SYSTEM
99174-GTB-103

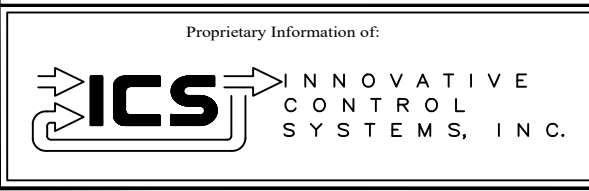
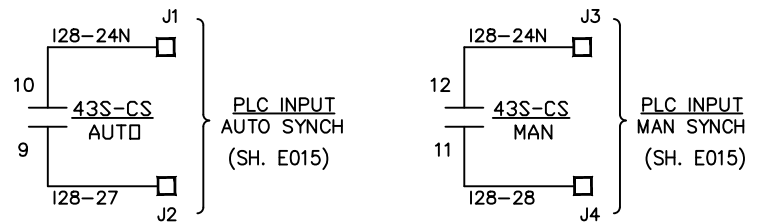
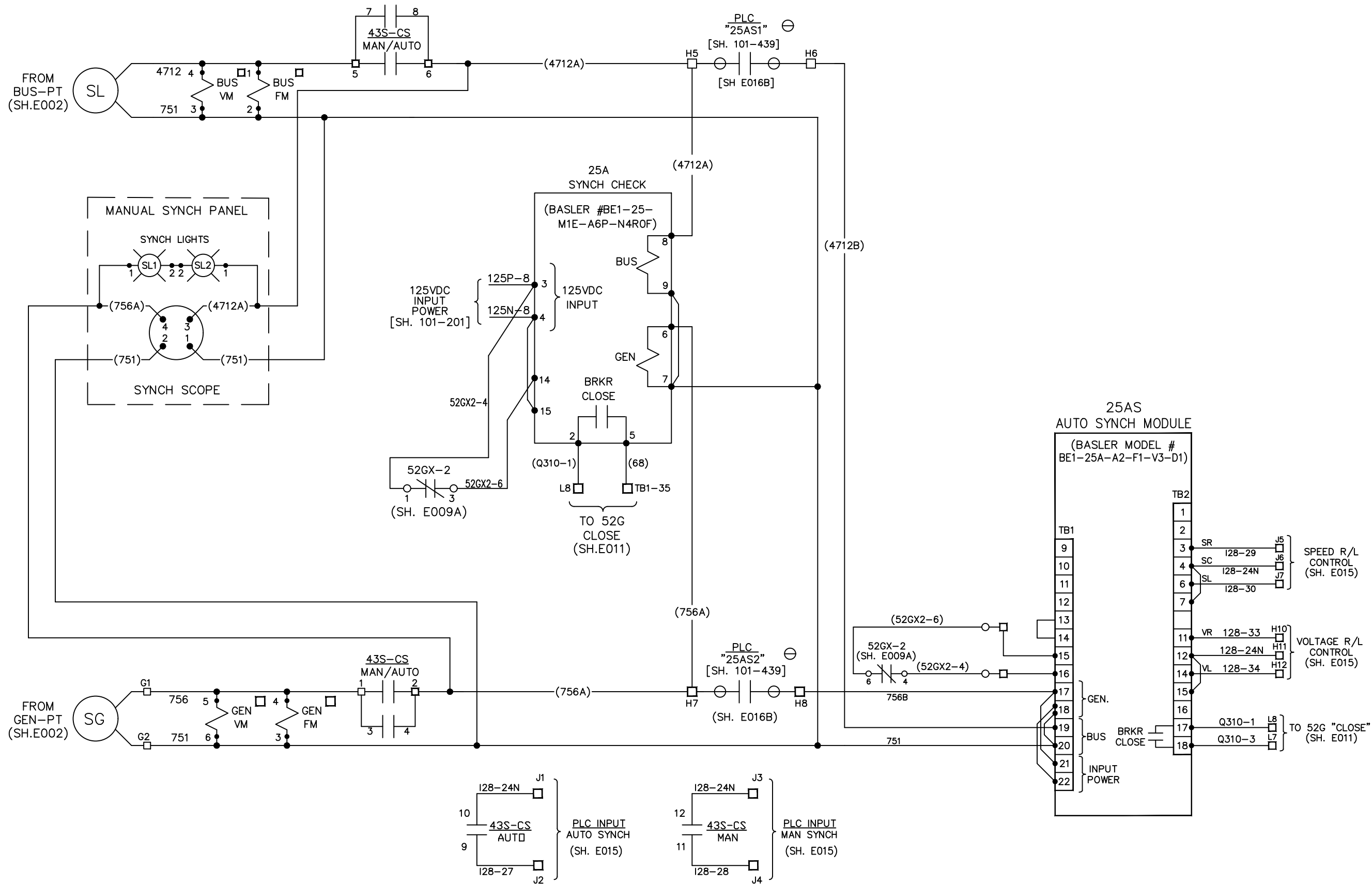
CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:
DRAWN BY: C. FISHER 01/17/00

DRAWING NO.
9944T1562

SCALE:
NTS
SHEET NO. E003
13 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

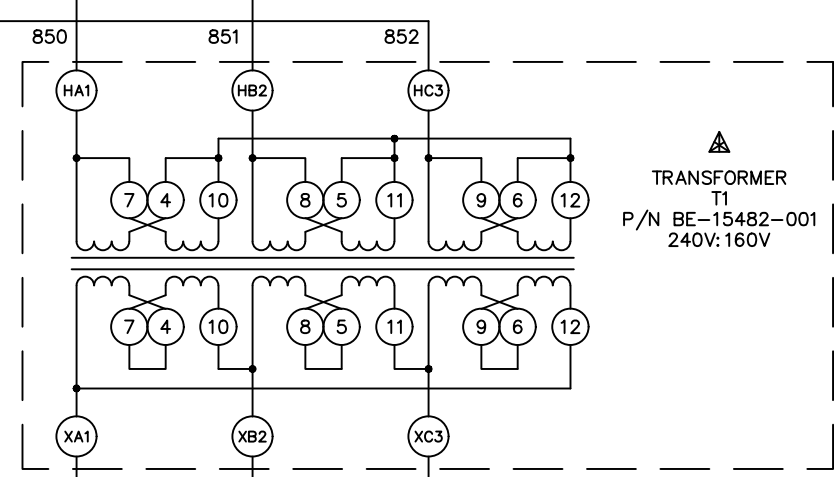
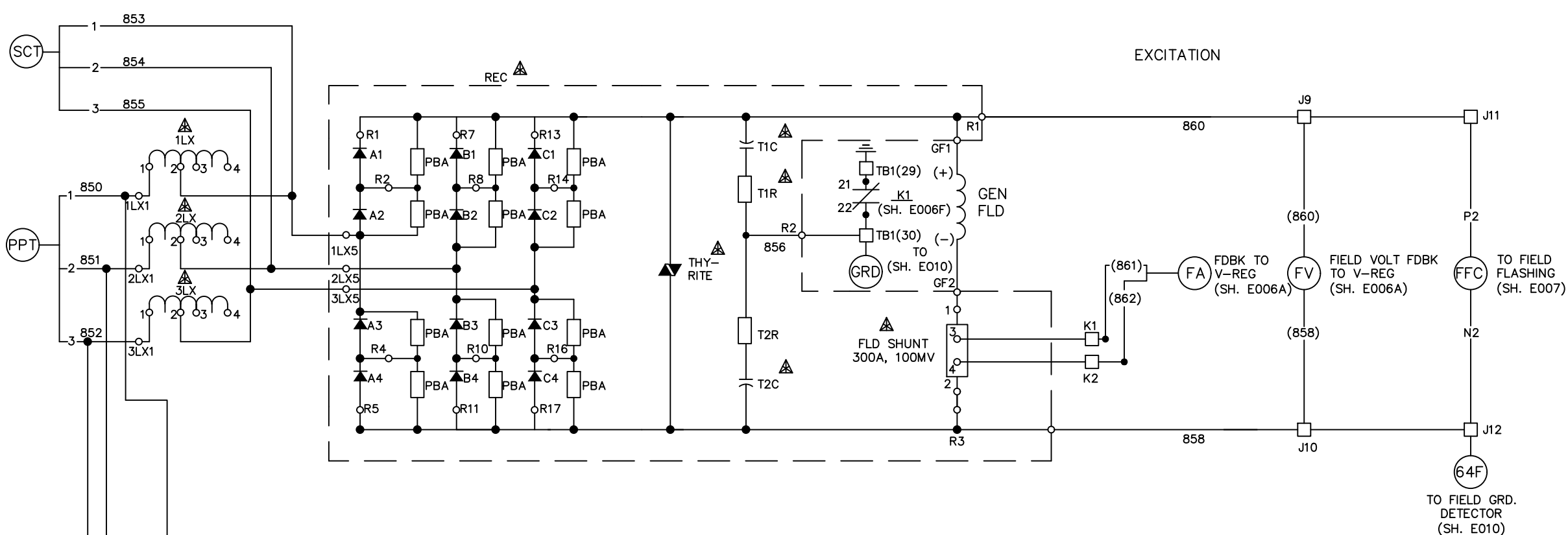
**MANUAL/AUTO SYNCHRONIZING
GENERATOR PROTECTION SYSTEM**
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E004 14 OF 39

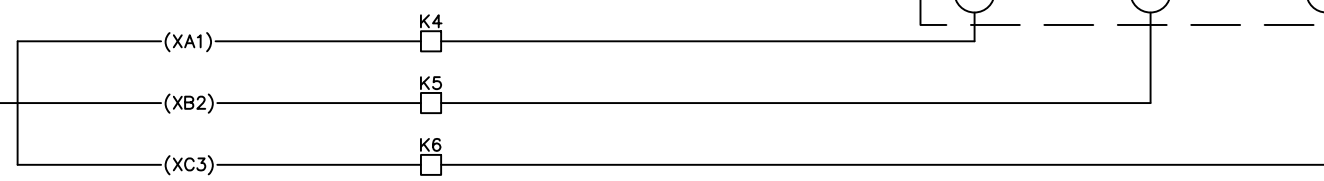
FROM SATURABLE CURRENT TRANSFORMER (SH. E001)

FROM POWER POTENTIAL TRANSFORMER (SH. E001)

EXCITATION



ES
EXCITATION POWER TO DECS-300 (SH. E006B)



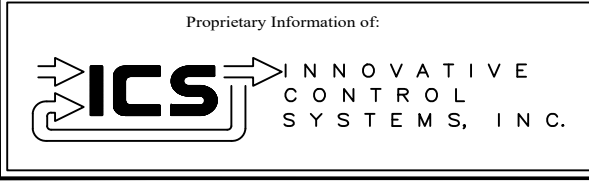
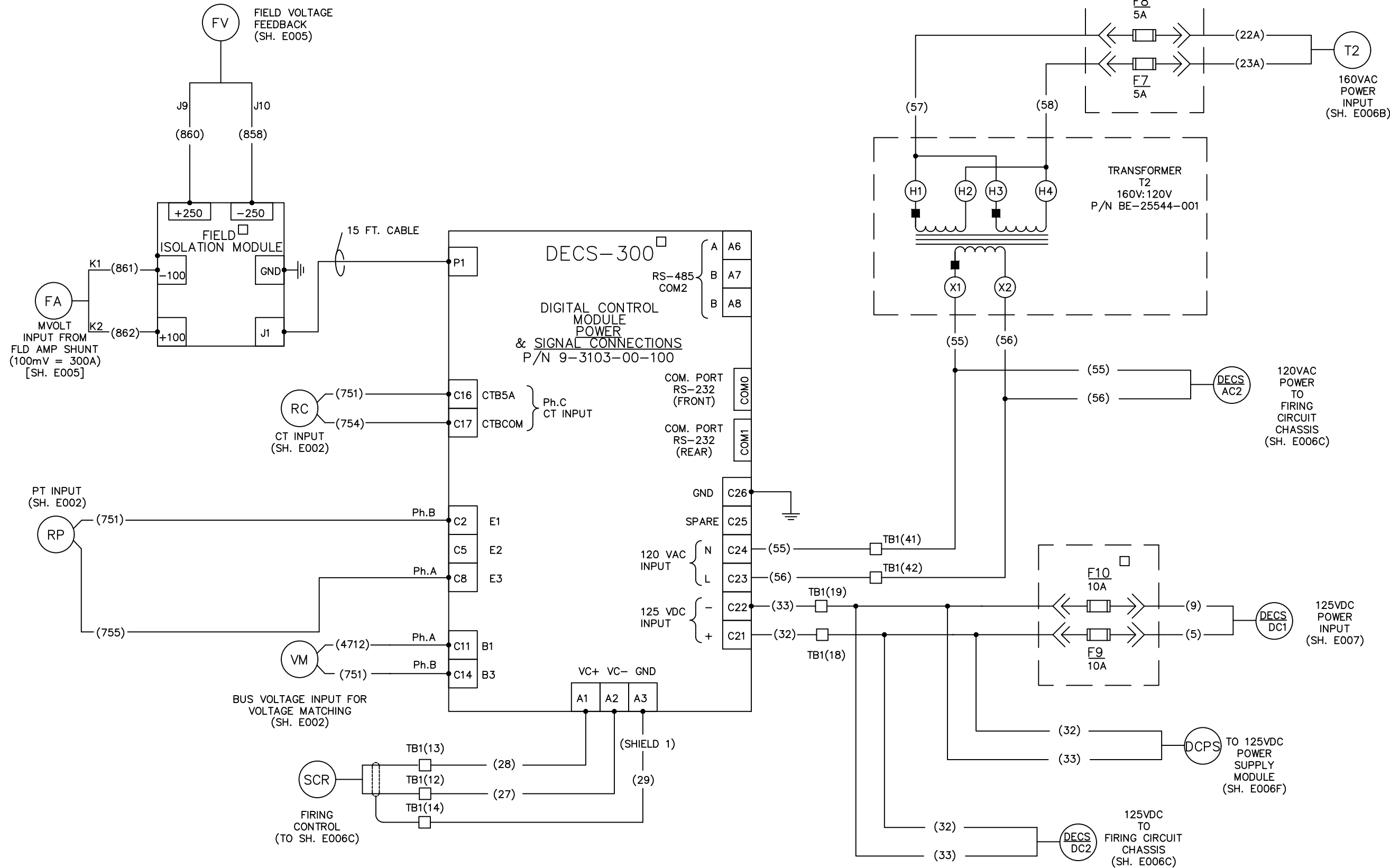
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR FIELD/EXCITATION
GENERATOR PROTECTION SYSTEM
99174-GTB-103

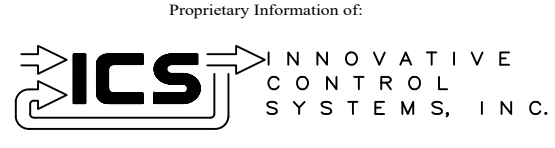
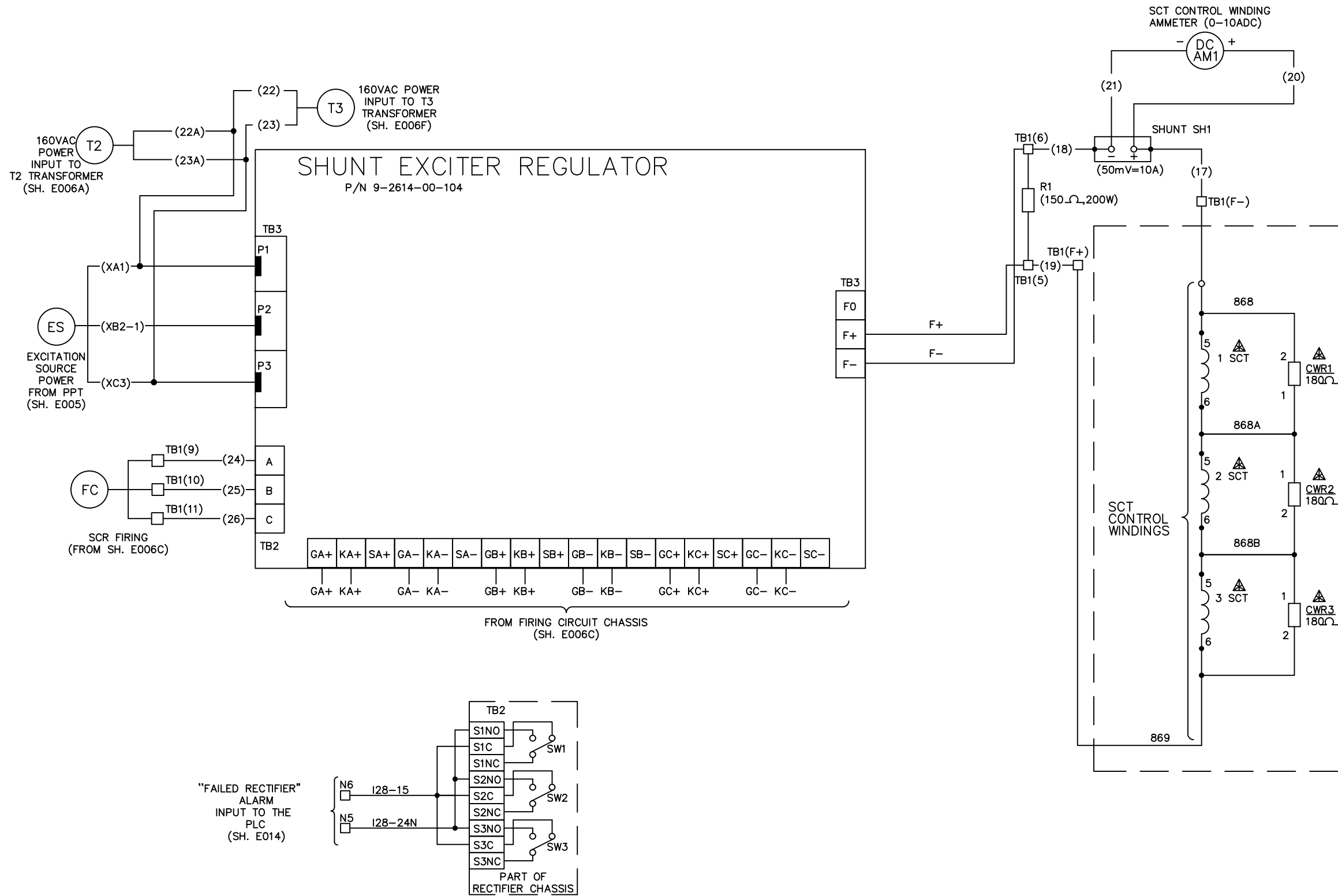
CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 9944T1562		SCALE: NTS
SITE: DON HENRY POWER CENTER		DRAWN BY: C. FISHER		SHEET NO. E005
APPROVED BY:		01/17/00		15 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

DECS-300 POWER
GENERATOR PROTECTION SYSTEM
99174-GTB-103

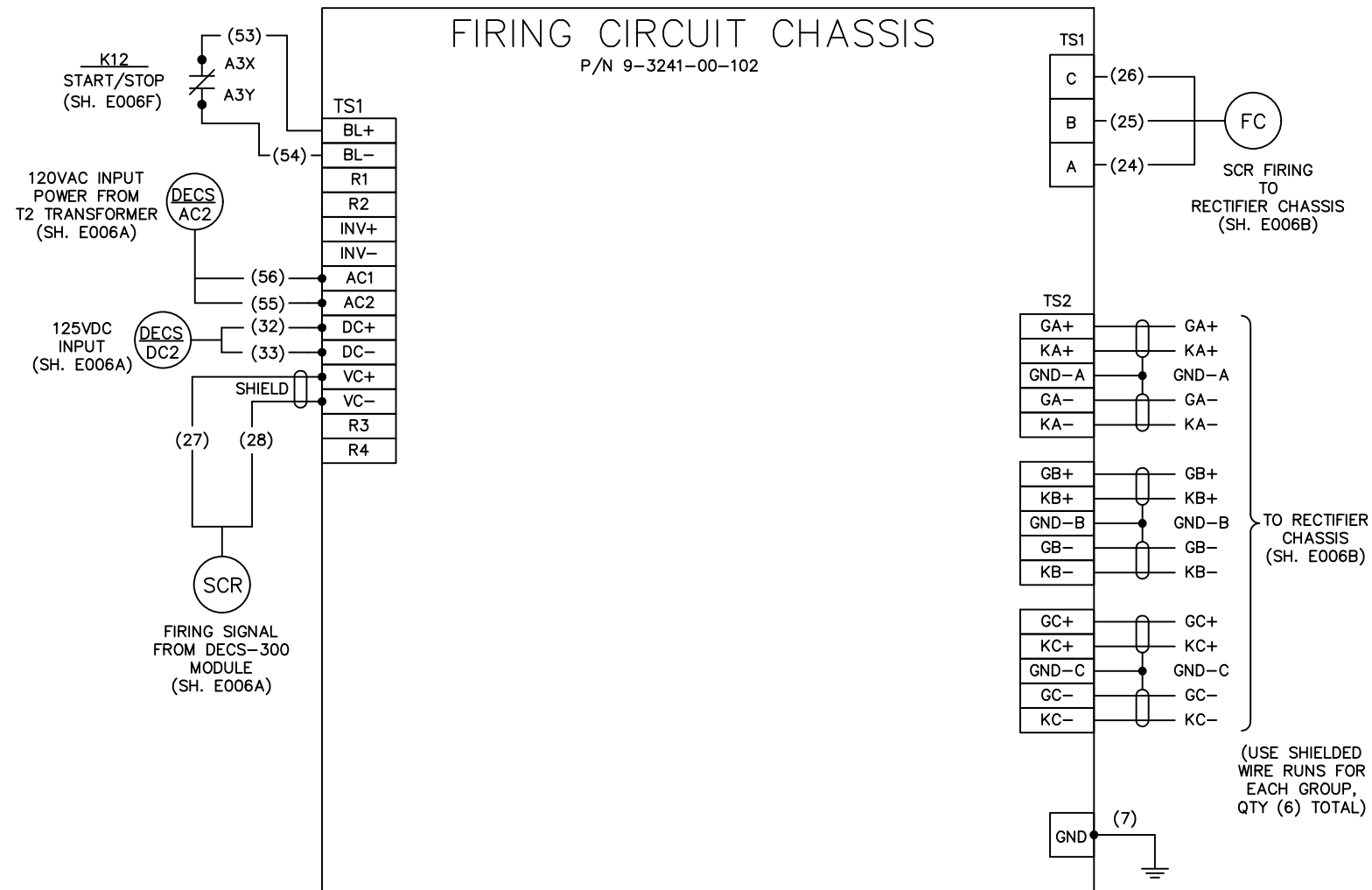
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO. 9944T1562	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00		SHEET NO. E006A 16 OF 39



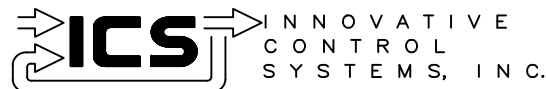
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

DECS-300 RECTIFIER CHASSIS
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E006B 17 OF 39



Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

DECS-300 FIRING CIRCUIT
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:

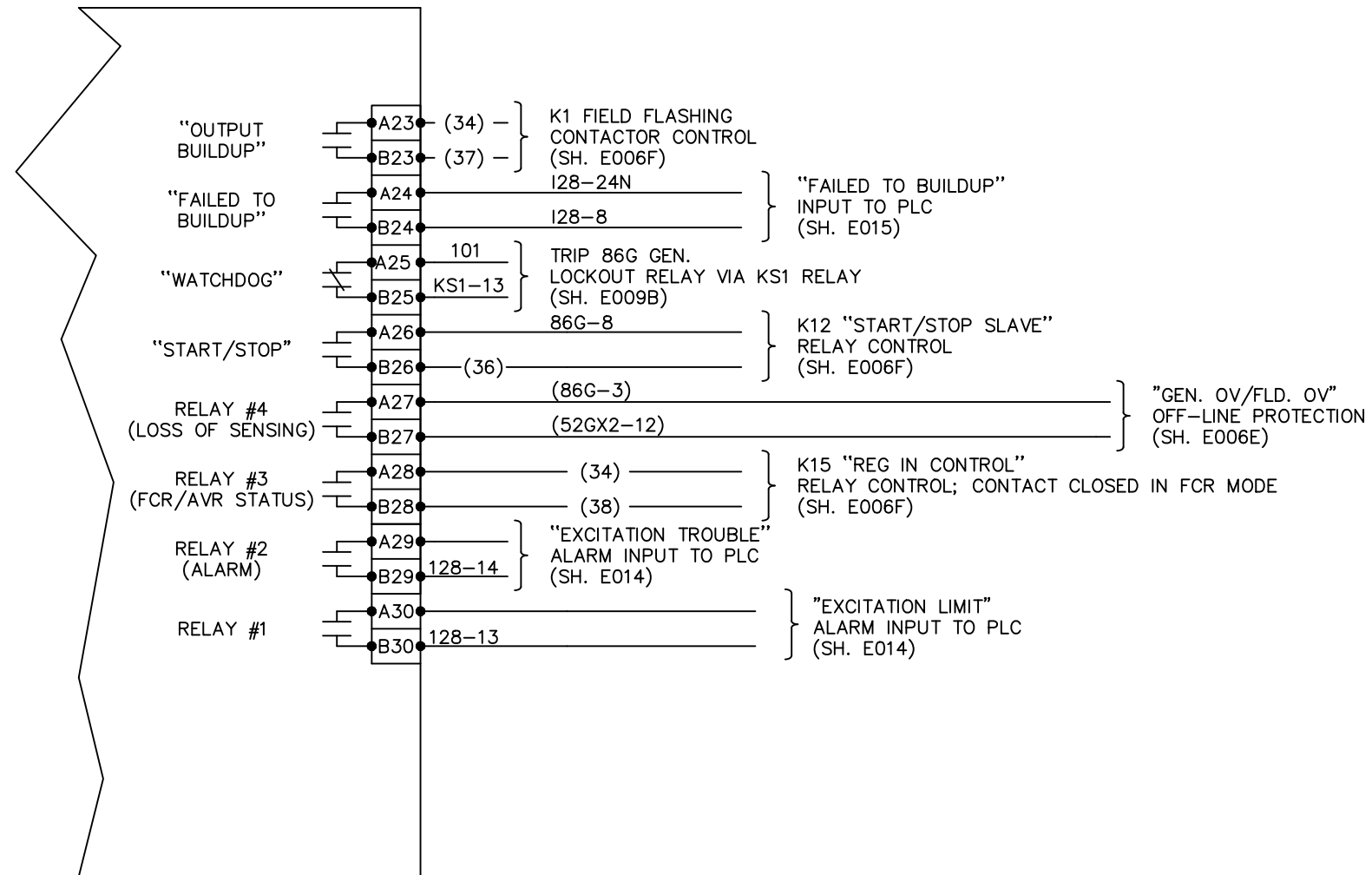
DRAWING NO.
9944T1562

SCALE:
NTS
SHEET NO. E006C
18 OF 39

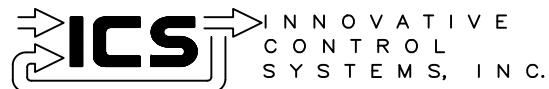
DRAWN BY: C. FISHER

01/17/00

DECS-300
DIGITAL CONTROL MODULE



Proprietary Information of:



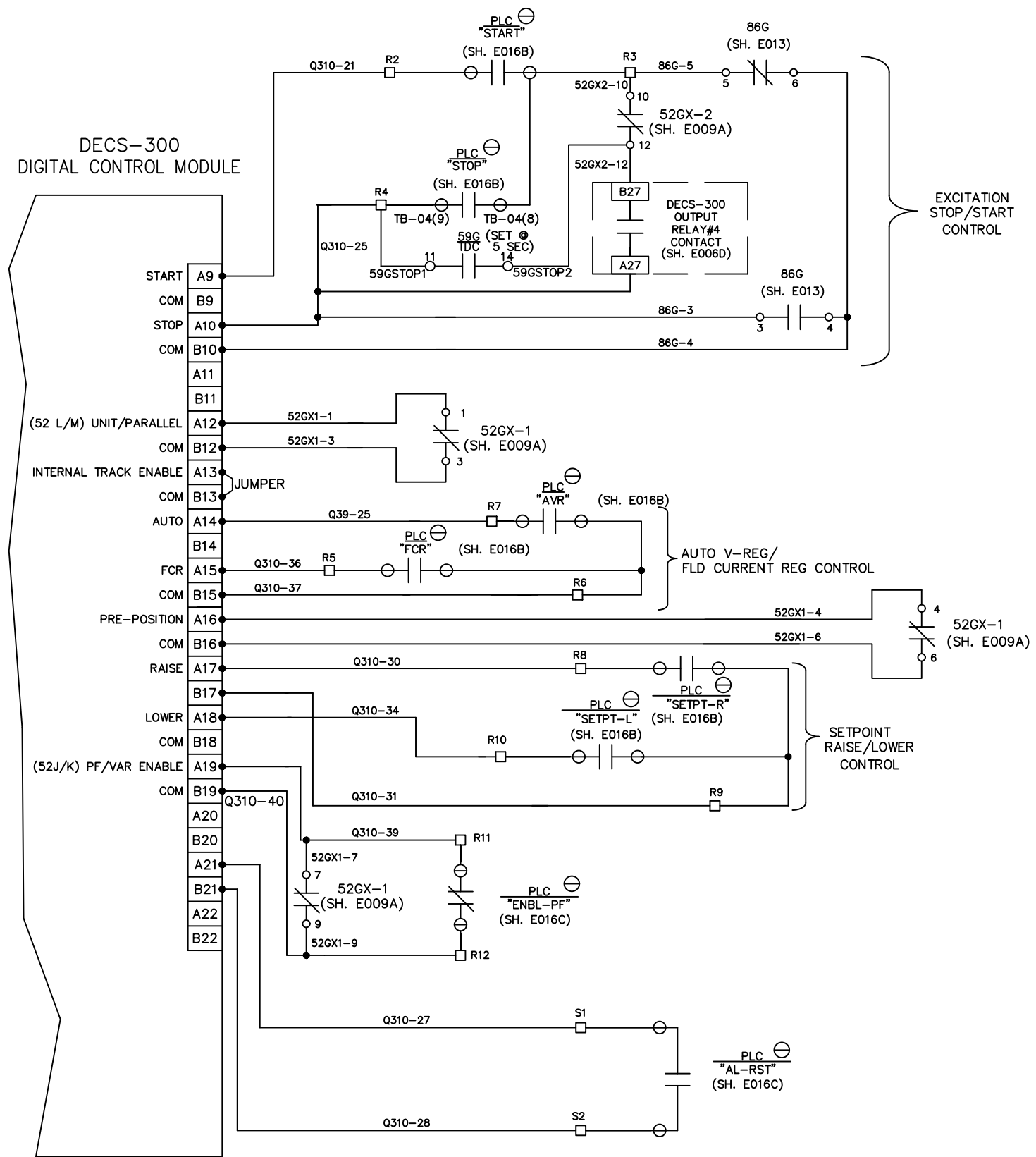
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REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

DECS-300 CONTROL OUTPUTS
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO. 9944T1562	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00		SHEET NO. E006D 19 OF 39



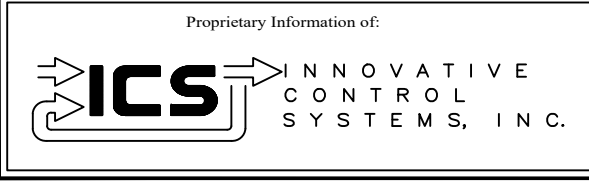
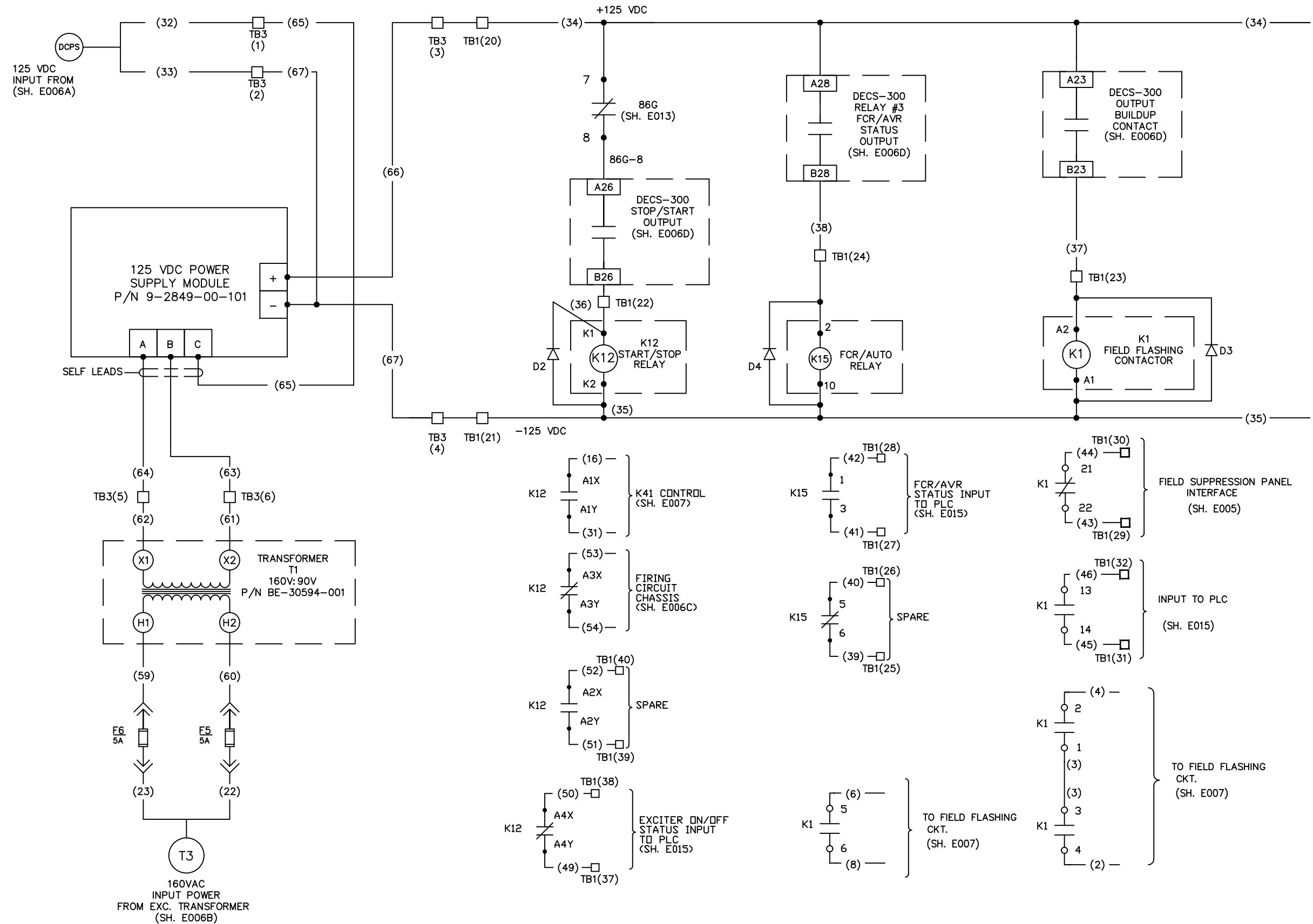
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

DECS-300 CONTROL INPUTS
GENERATOR PROTECTION SYSTEM
99174-GTB-103

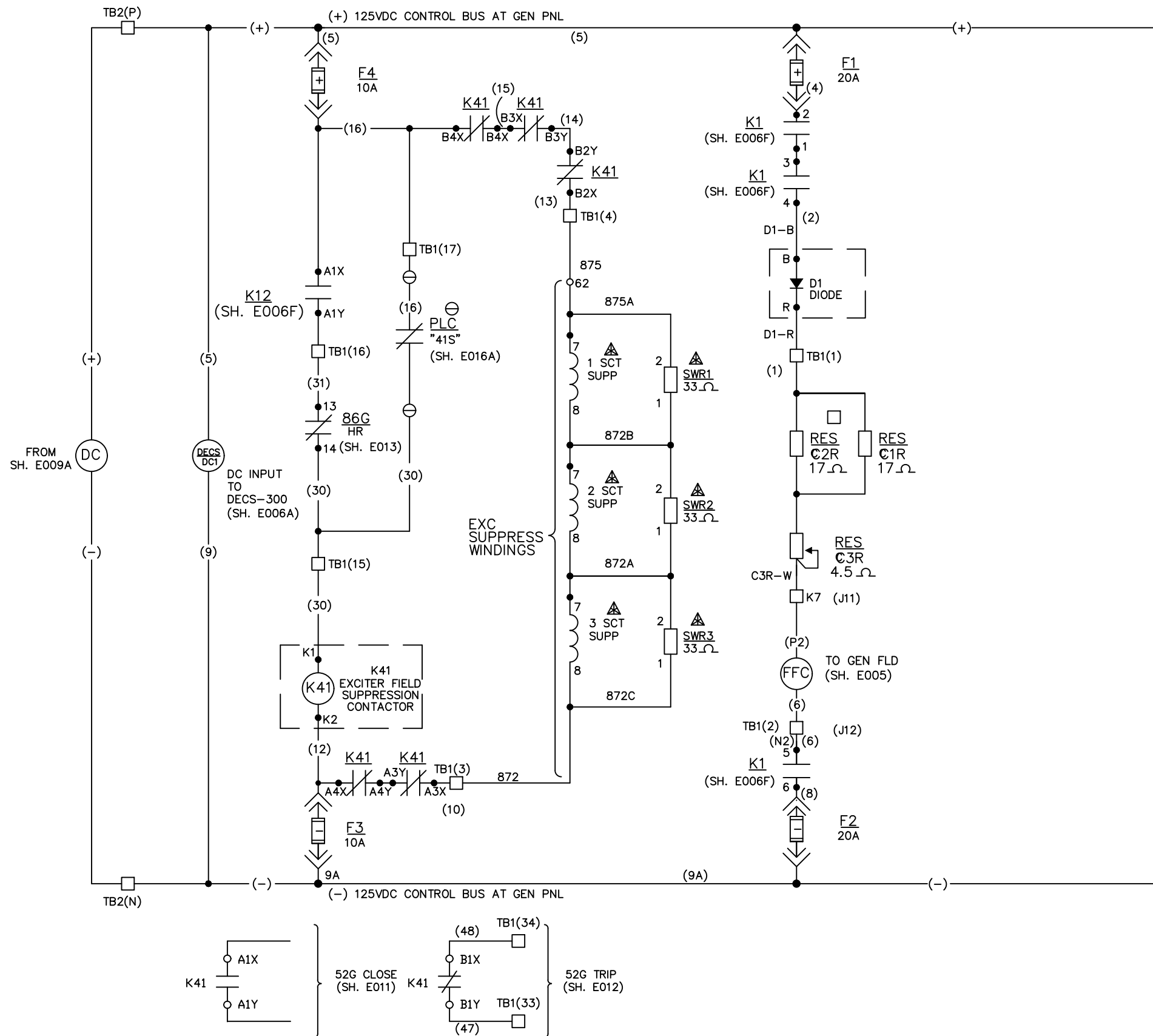
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO. 9944T1562	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00		SHEET NO. E006E 20 OF 39



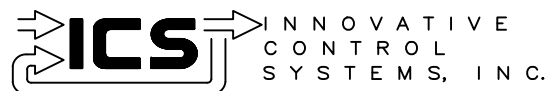
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REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

DECS-300/125VDC RELAY CONTROL
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 9944T1562	
APPROVED BY:		DRAWN BY: C. FISHER	01/17/00
		SHEET NO. E006F 21 OF 39	



Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

125VDC EXCITATION CONTROL
GENERATOR PROTECTION SYSTEM
99174-GTB-103

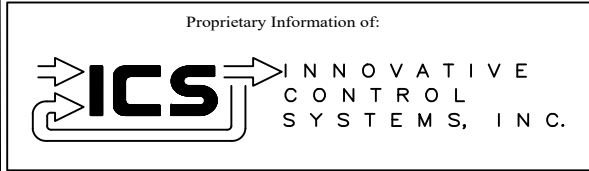
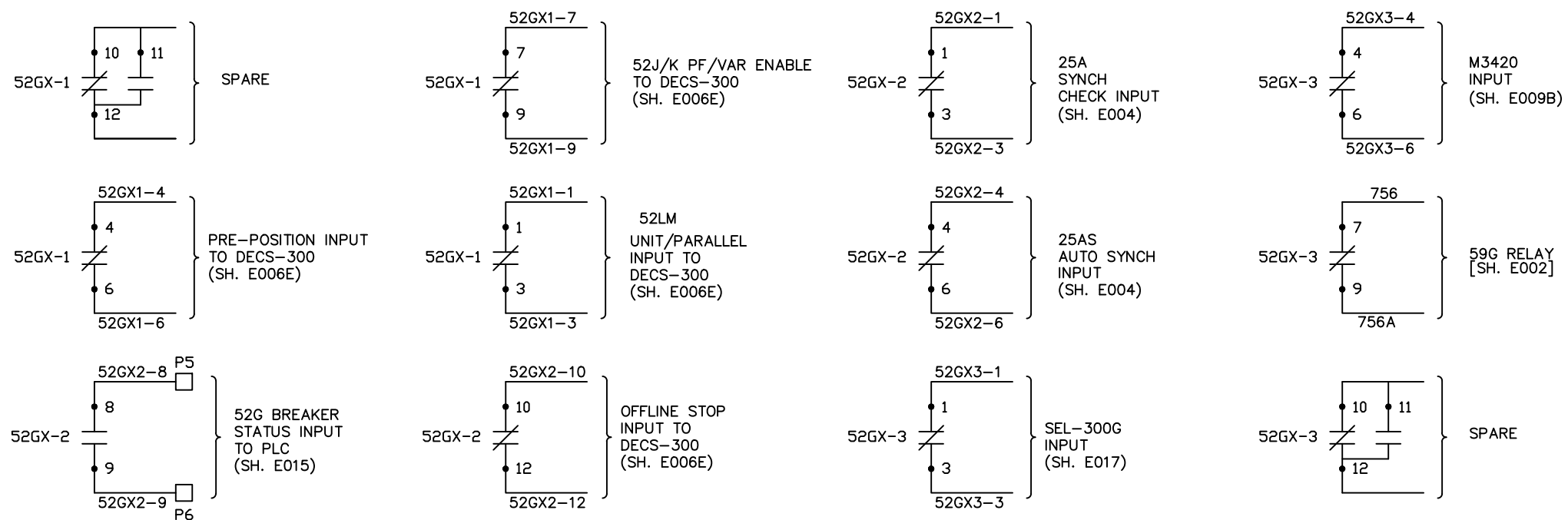
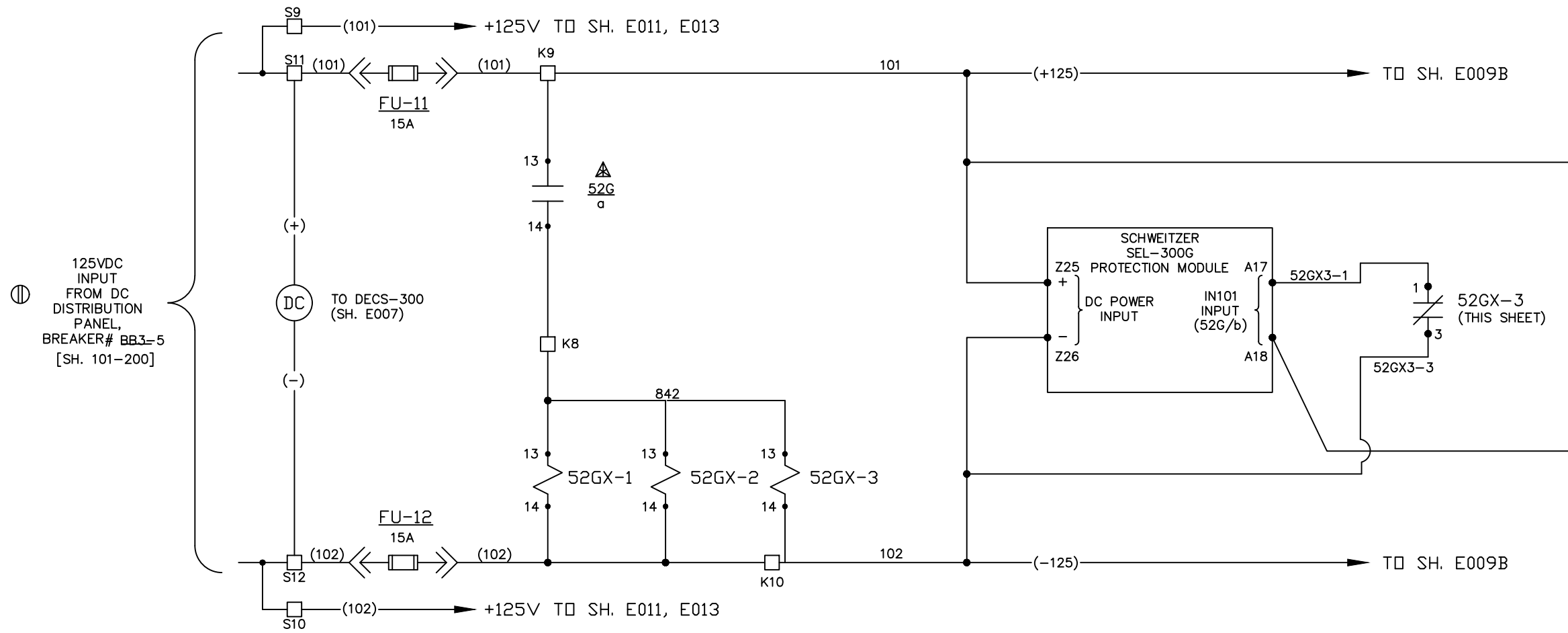
CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY: _____
DRAWN BY: C. FISHER 01/17/00

DRAWING NO. 9944T1562

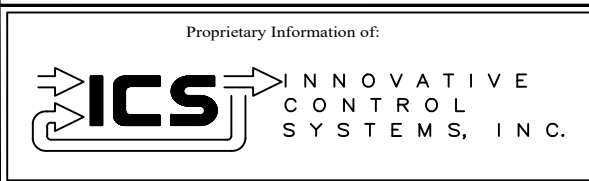
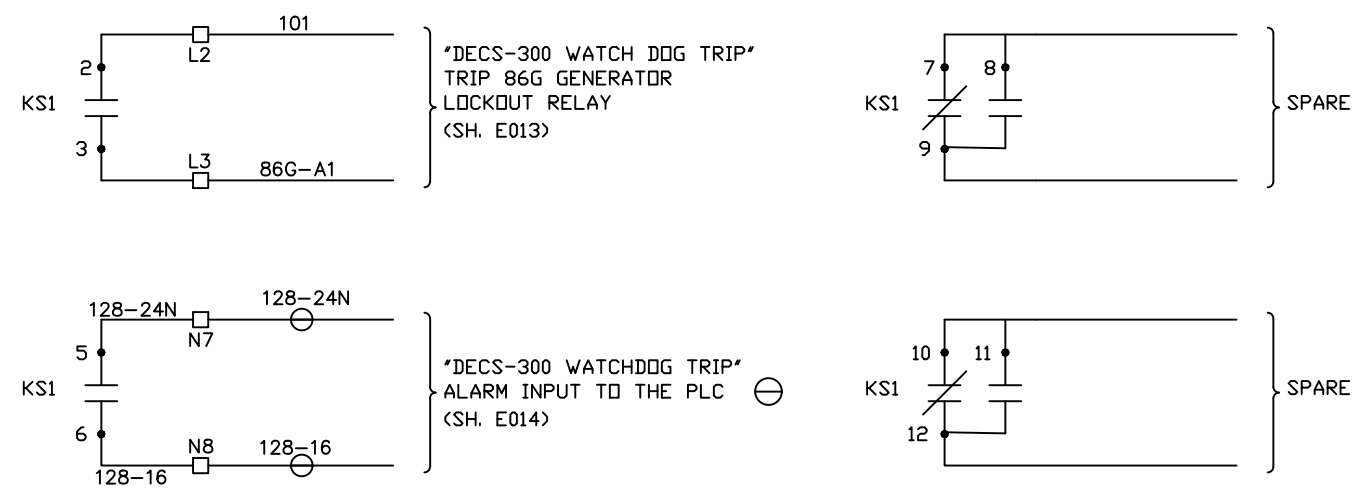
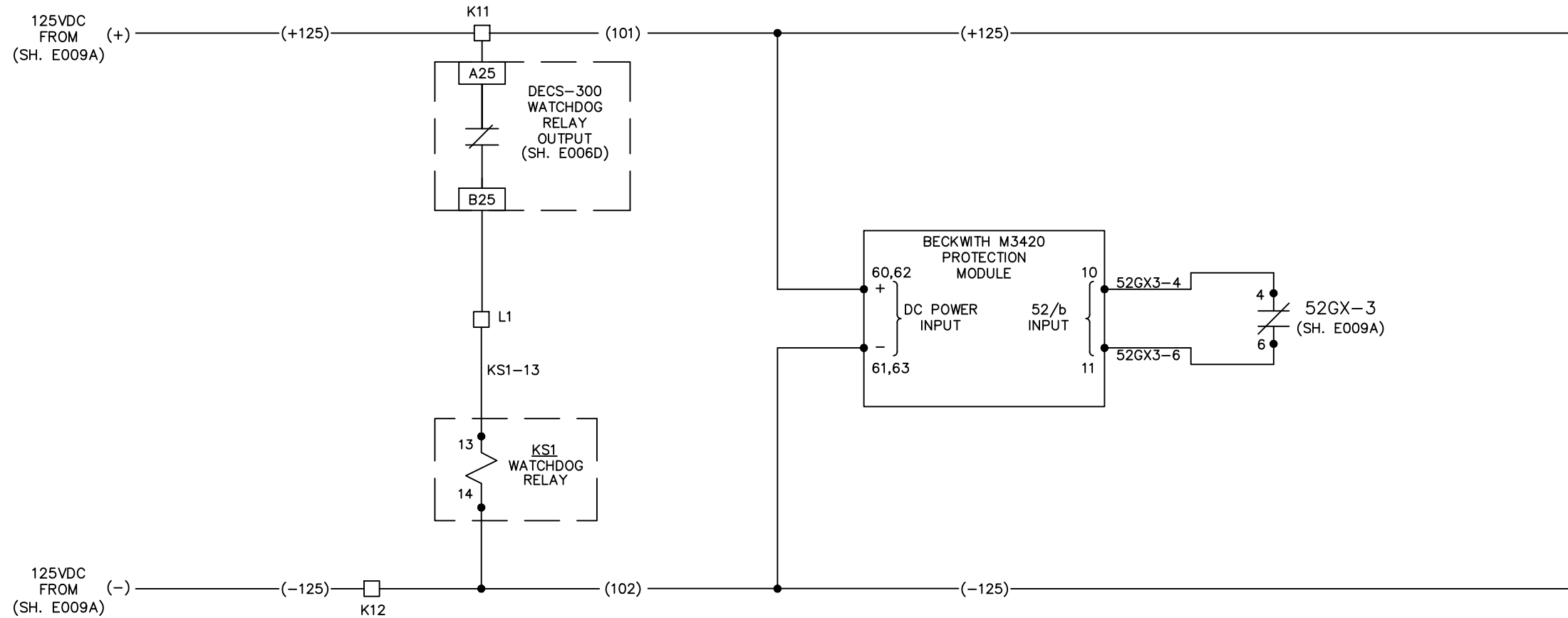
SCALE: NTS
SHEET NO. E007
22 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

125VDC AUXILIARY CONTROL
GENERATOR PROTECTION SYSTEM
99174-GTB-103

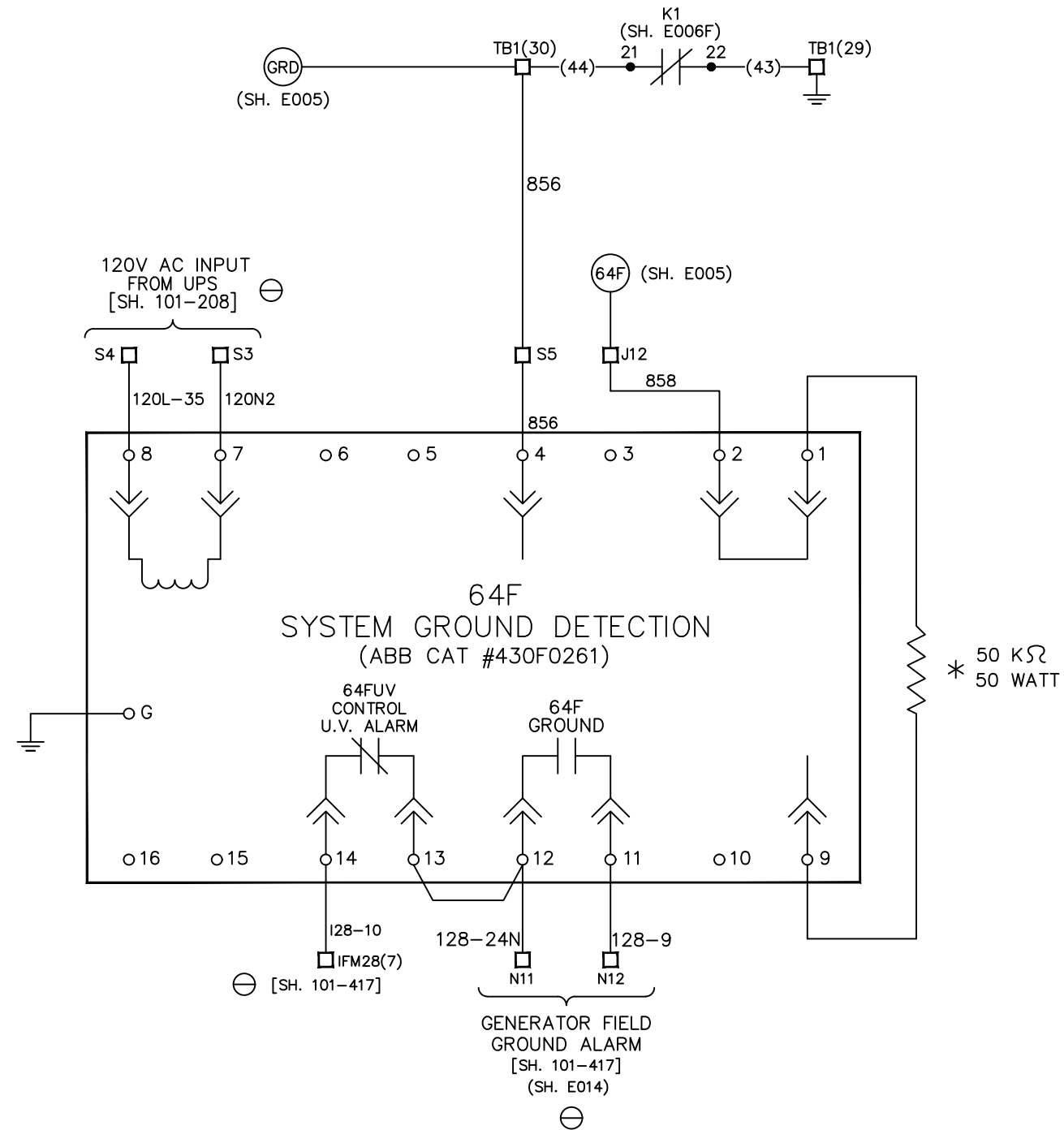
CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 9944T1562	
SITE: DON HENRY POWER CENTER		SCALE: NTS	
APPROVED BY:		DRAWN BY: C. FISHER	01/17/00
		SHEET NO. E009A 23 OF 39	



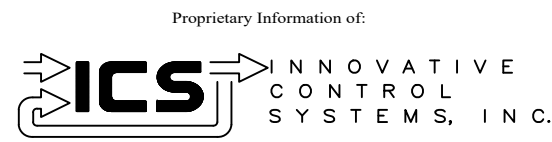
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

125VDC AUXILIARY CONTROL
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00	9944T1562	SHEET NO. E009B 24 OF 39



* EXTERNAL RESISTOR SUPPLIED WITH RELAY.



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

GEN. FIELD GND. DETECTION
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E010 25 OF 39

TO SHEET
E009A



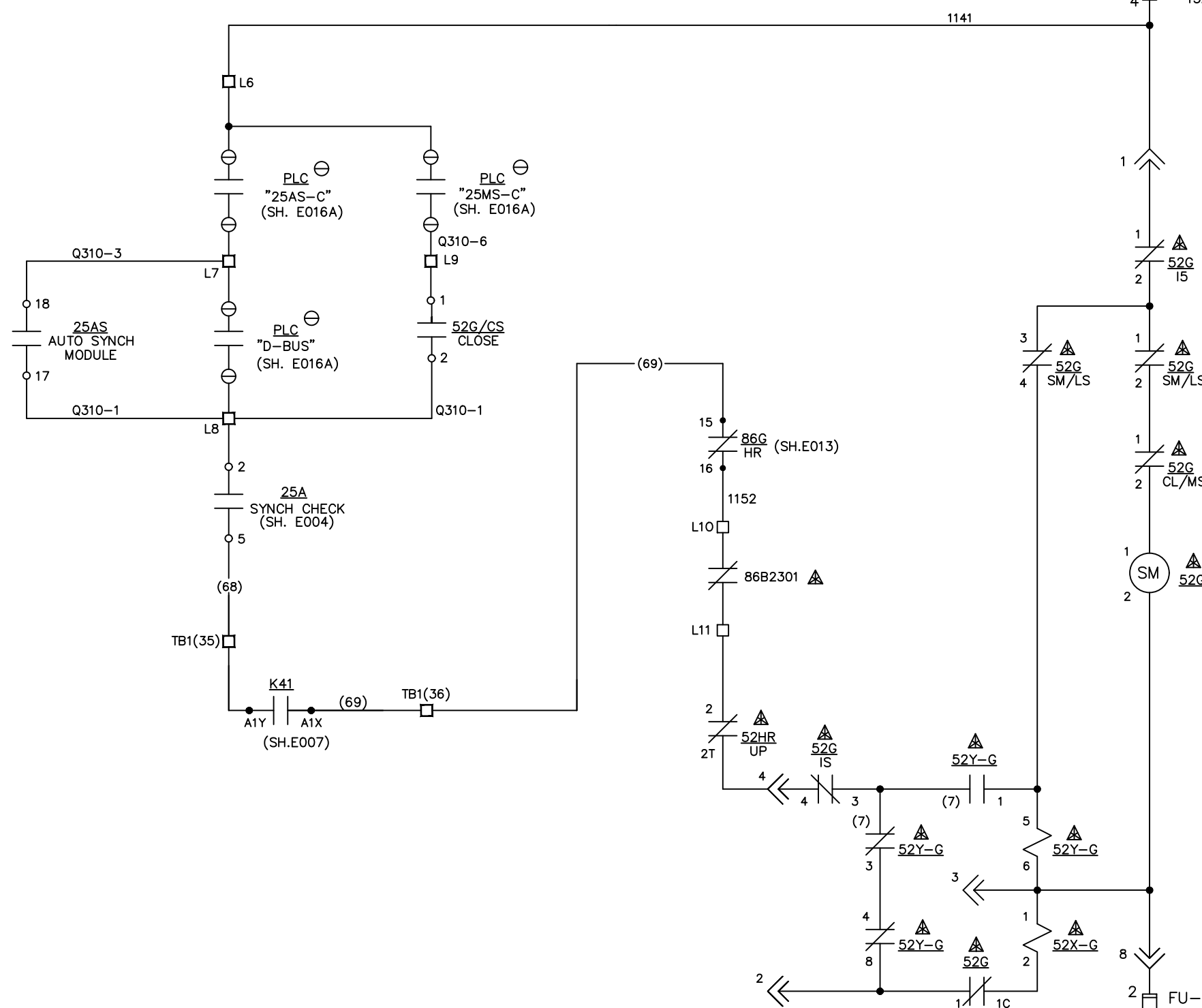
(101)

(+) 125V DC CONTROL BUS

(101)

(101)

TO SHEET
E012



52G LIMIT SWITCH FOR SPRING CHARGING MOTOR CONTACTS (1-2) (3-4) OPEN & (5-6) CLOSED WHEN SPRINGS ARE FULLY CHARGED.

52X-G SPRING RELEASE COIL OPERATES LATCH WHICH RELEASES CLOSING SPRINGS TO CLOSE 52G.

52G INTERLOCK SWITCH CLOSED IS WHEN 52G IS IN FULLY RAISED & FULLY LOWERED POSITION.

52G CLOSING LATCH MONITORING SWITCH IS CLOSED WHEN LATCH IS CAPABLE OF BLOCKING FULLY CHARGED CLOSING SPRINGS.

TO SHEET
E009A



(102)

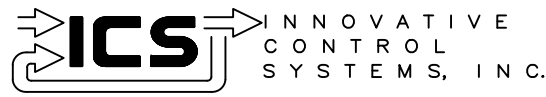
(-) 125V DC CONTROL BUS

(102)

(102)

TO SHEET
E012

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

"CLOSE" CIRCUIT
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:

DRAWING NO.

SCALE:
NTS

DRAWN BY: C. FISHER

01/17/00

9944T1562

SHEET NO. E011
26 OF 39

TO SHEET
E009A



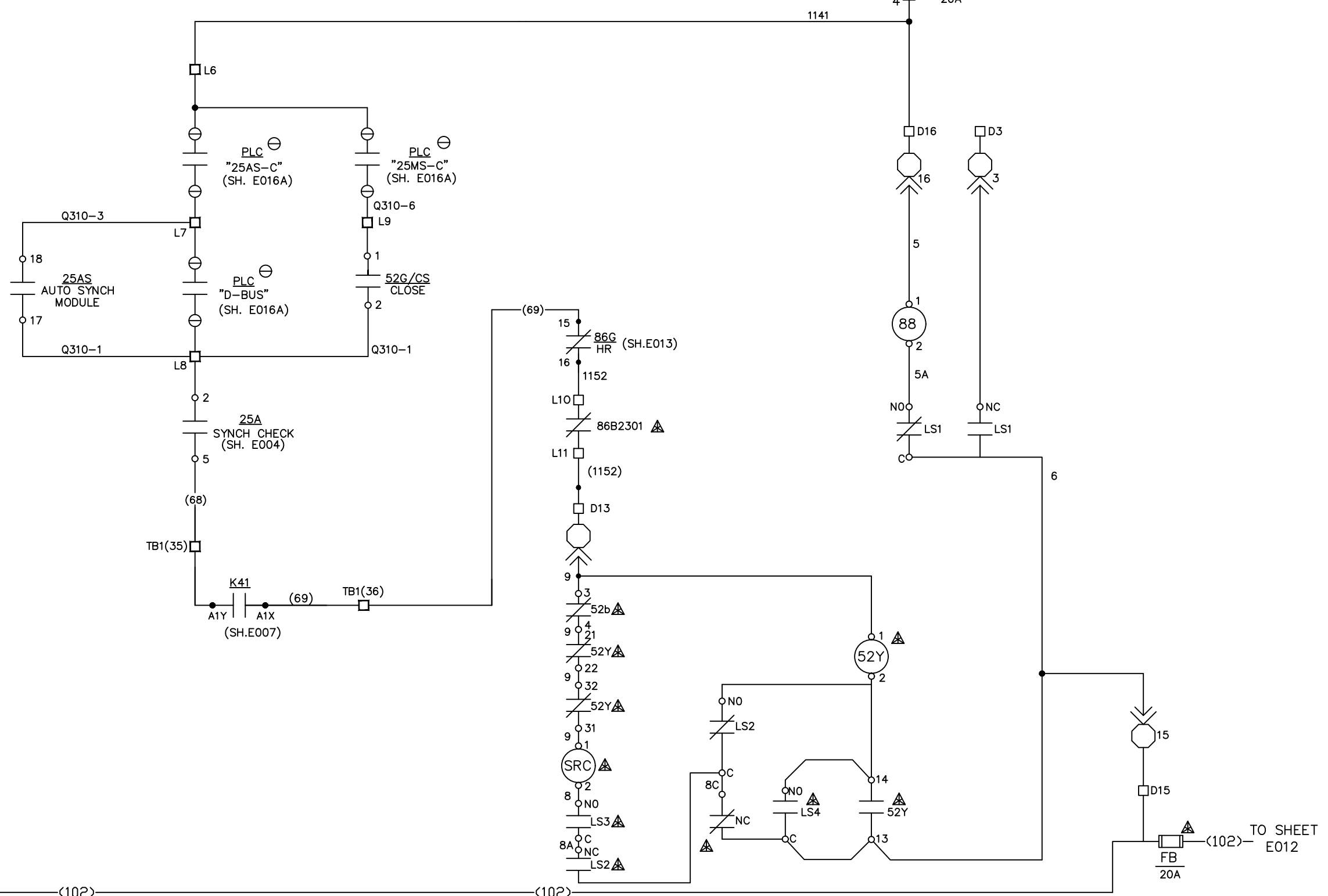
(101)

(+) 125V DC CONTROL BUS

(101)

(101)

TO SHEET
E012



TO SHEET
E009A



(102)

(-) 125V DC CONTROL BUS

(102)

TO SHEET
E012

FB
20A

Proprietary Information of:

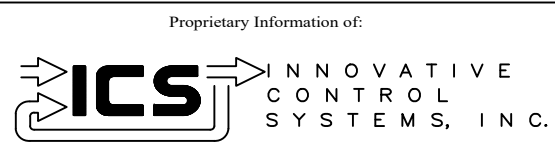
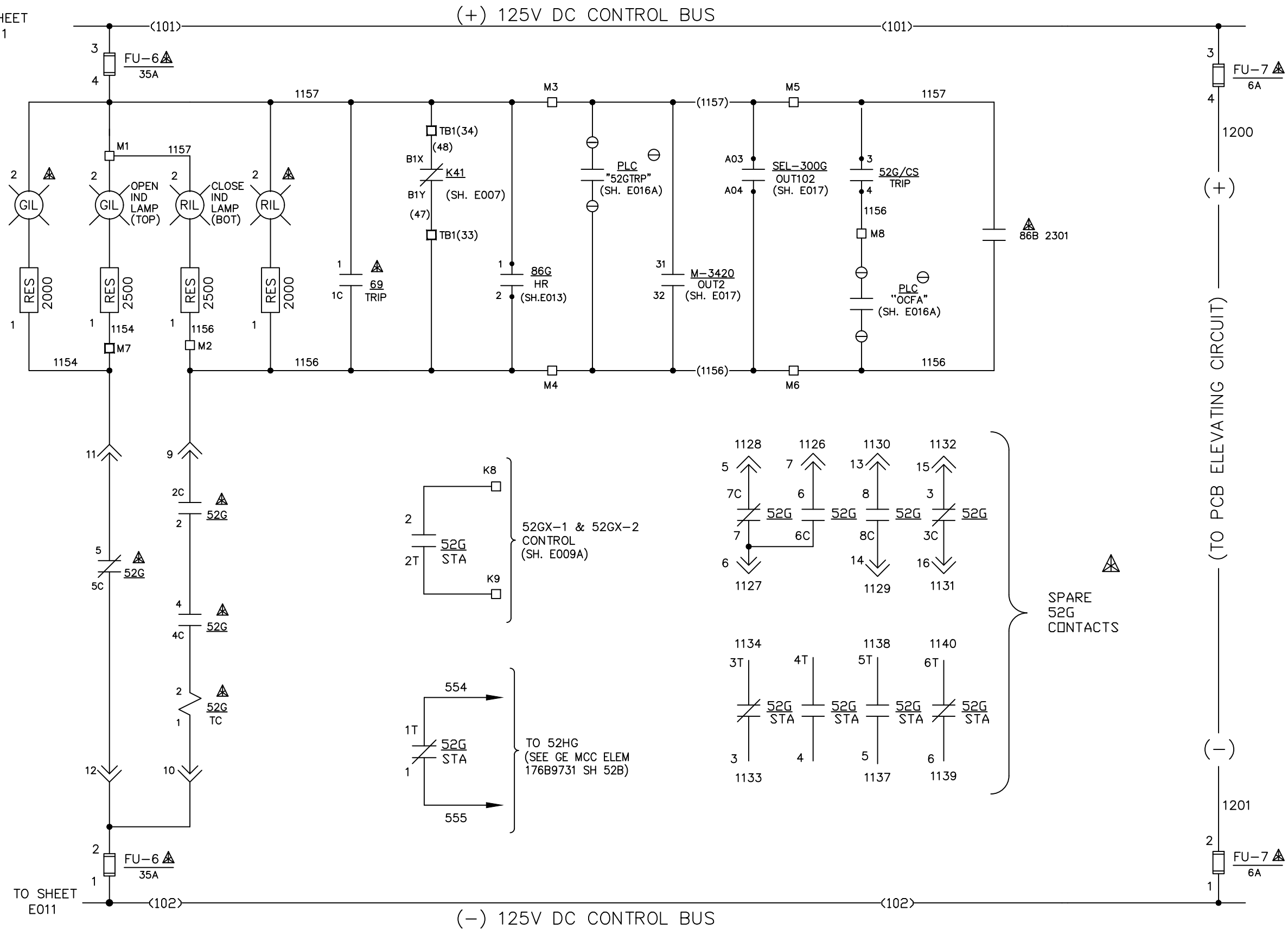
INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	MODIFICATIONS:	JL		10/09/03
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

**GT BREAKER "CLOSE" CIRCUIT
GENERATOR PROTECTION SYSTEM
99174-GTB-103**

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 9944T1562
DRAWN BY: C. FISHER	01/17/00
SCALE: NTS	SHEET NO. E011
	26 OF 39

TO SHEET
E011



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

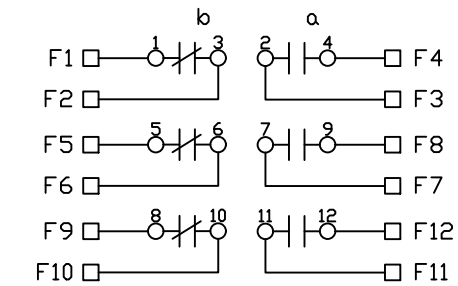
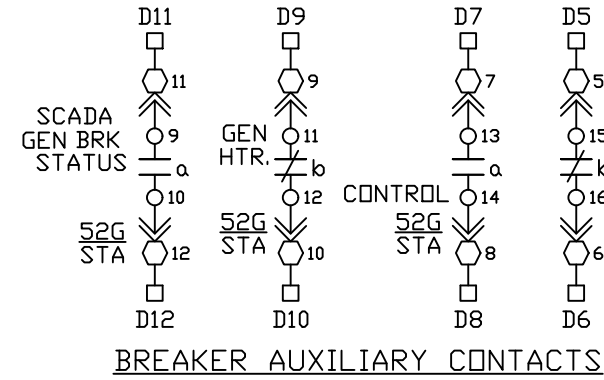
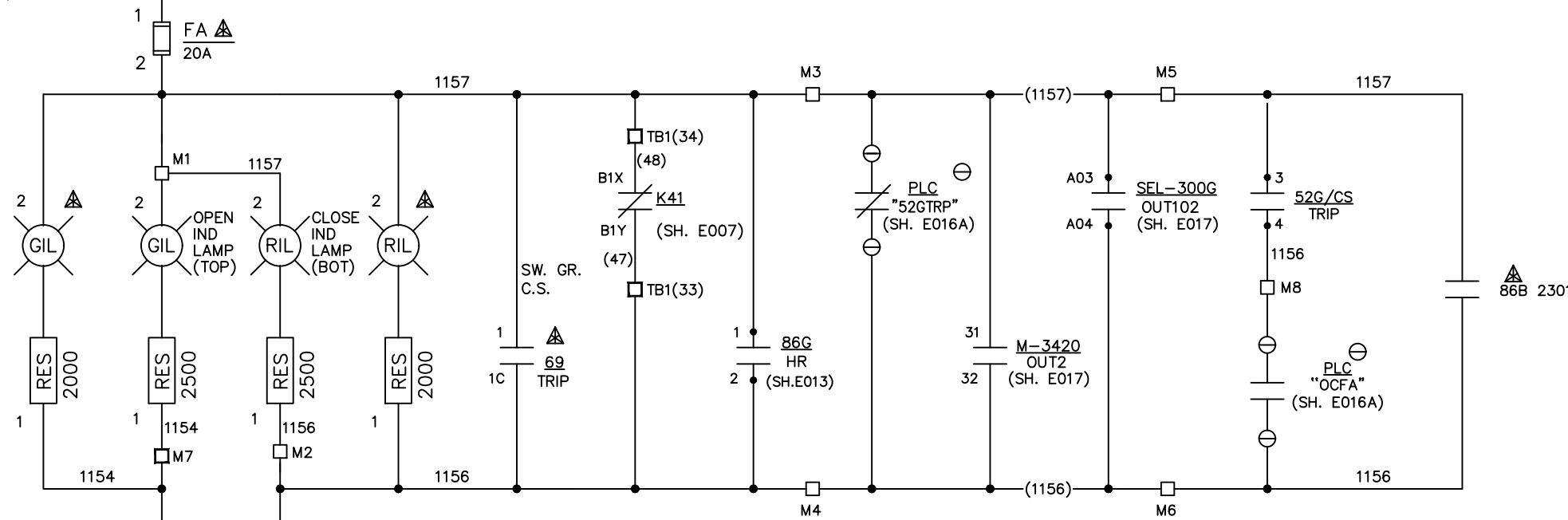
"TRIP" CIRCUIT
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E012 27 OF 39

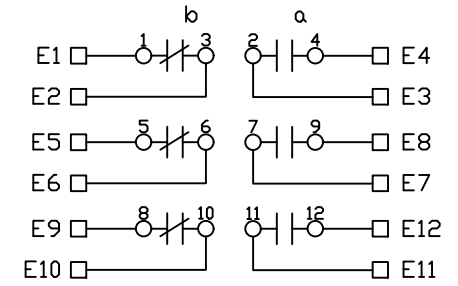
TO SHEET
E011

(+) 125V DC CONTROL BUS

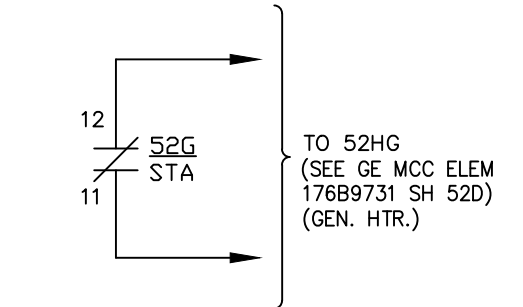
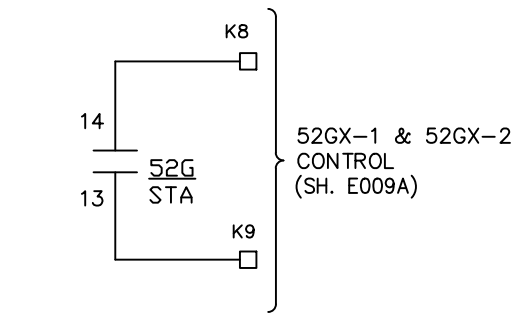
(101)



MOC-2
MOC AUXILIARY CONTACTS



MOC-1
MOC AUXILIARY CONTACTS



CONTACTS HANDLE END		CLOSE	NAC	NAT	TRIP	USED
1	1c				X	X
2	2c	X				X
3	3c		X	X		
4	4c		X	X		
5	5c	X	X			
6	6c	X	X			

SPRING RTN.

BREAKER CONTROL SWITCH DEVELOPMENT

(+) (TO PCB ELEVATING CIRCUIT) (-)

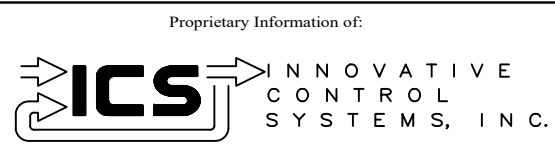
1201

2
1
FU-7
6A

(-) 125V DC CONTROL BUS

(102)

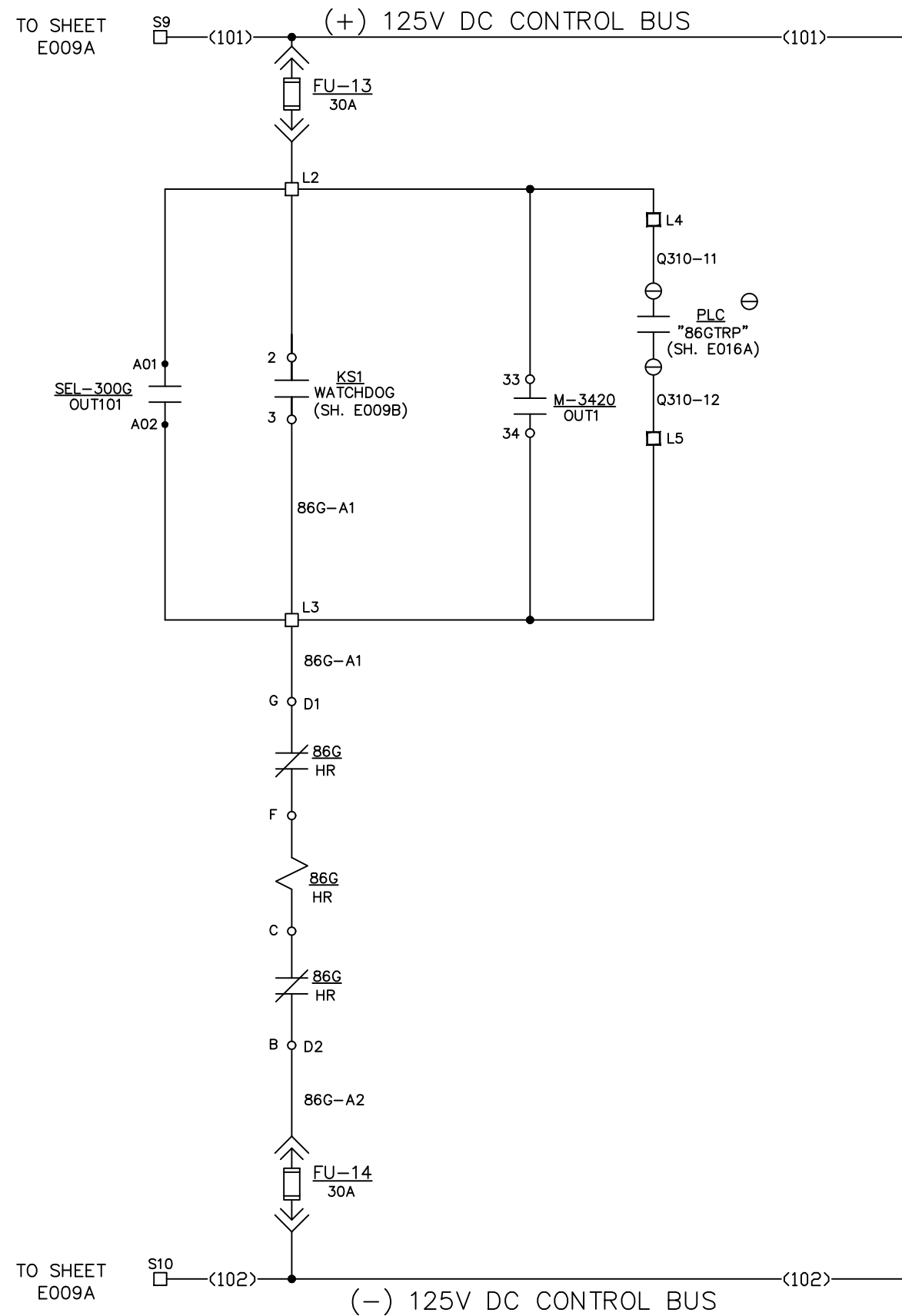
TO SHEET
E011



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	MODIFICATIONS:	JL		10/09/03
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

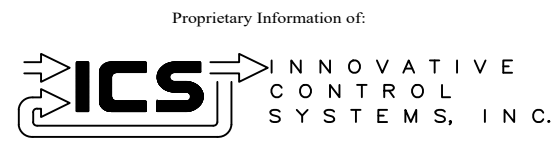
GT BREAKER "TRIP" CIRCUIT
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 9944T1562		SCALE: NTS
SITE: DON HENRY POWER CENTER		DRAWN BY: C. FISHER		SHEET NO. E012
APPROVED BY:		01/17/00		27 OF 39



86G GENERATOR DIFF. LOCKOUT RELAY

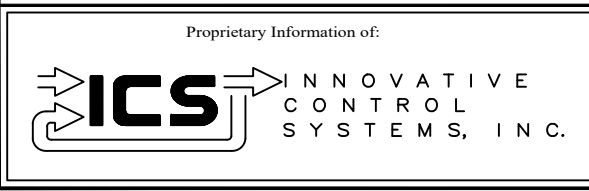
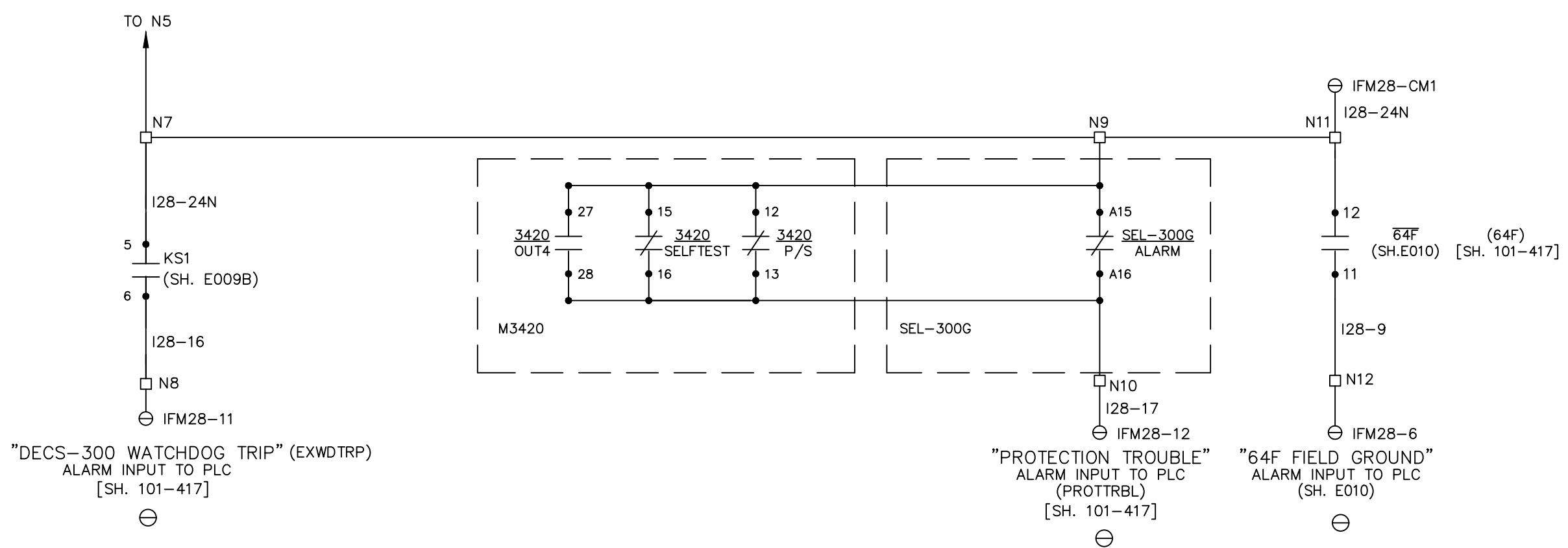
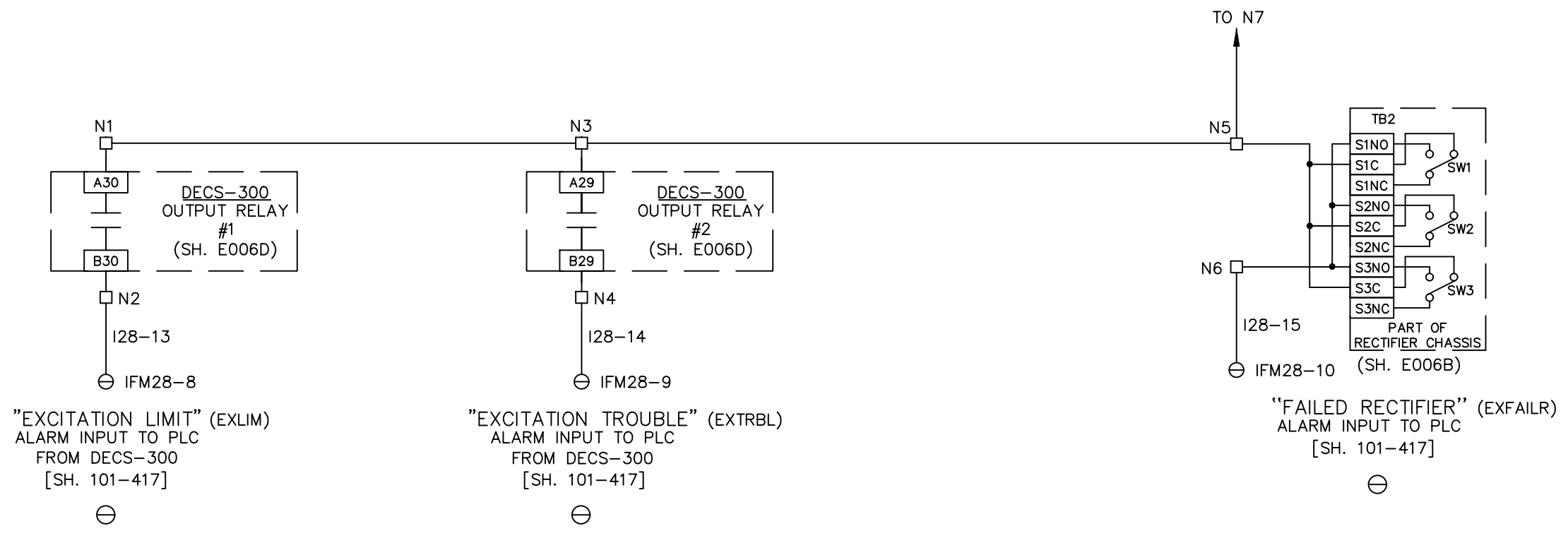
86G CONTACTS ASSIGNMENT		
POSITION	CIRCUIT	SHEET
1 — — 2	52G TRIP	E012
3 — — 4	DECS STOP	E006E
5 — /— 6	DECS START	E006E
7 — /— 8	K12 CONTROL	E006F
9 — — 10	TURBINE PLC	E015
11 — — 12	SPARE	
13 — /— 14	K41 CONTROL	E007
15 — /— 16	52G CLOSE	E011
17 — — 18	SPARE	
19 — — 20	SPARE	
21 — /— 22	MASTER PROTECTION	E015
23 — /— 24	SPARE	



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

GENERATOR LOCKOUT RELAY
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

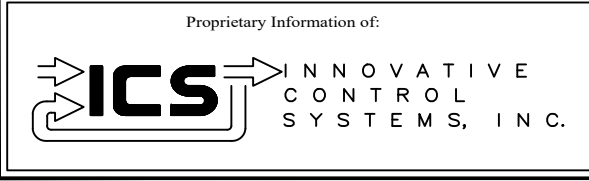
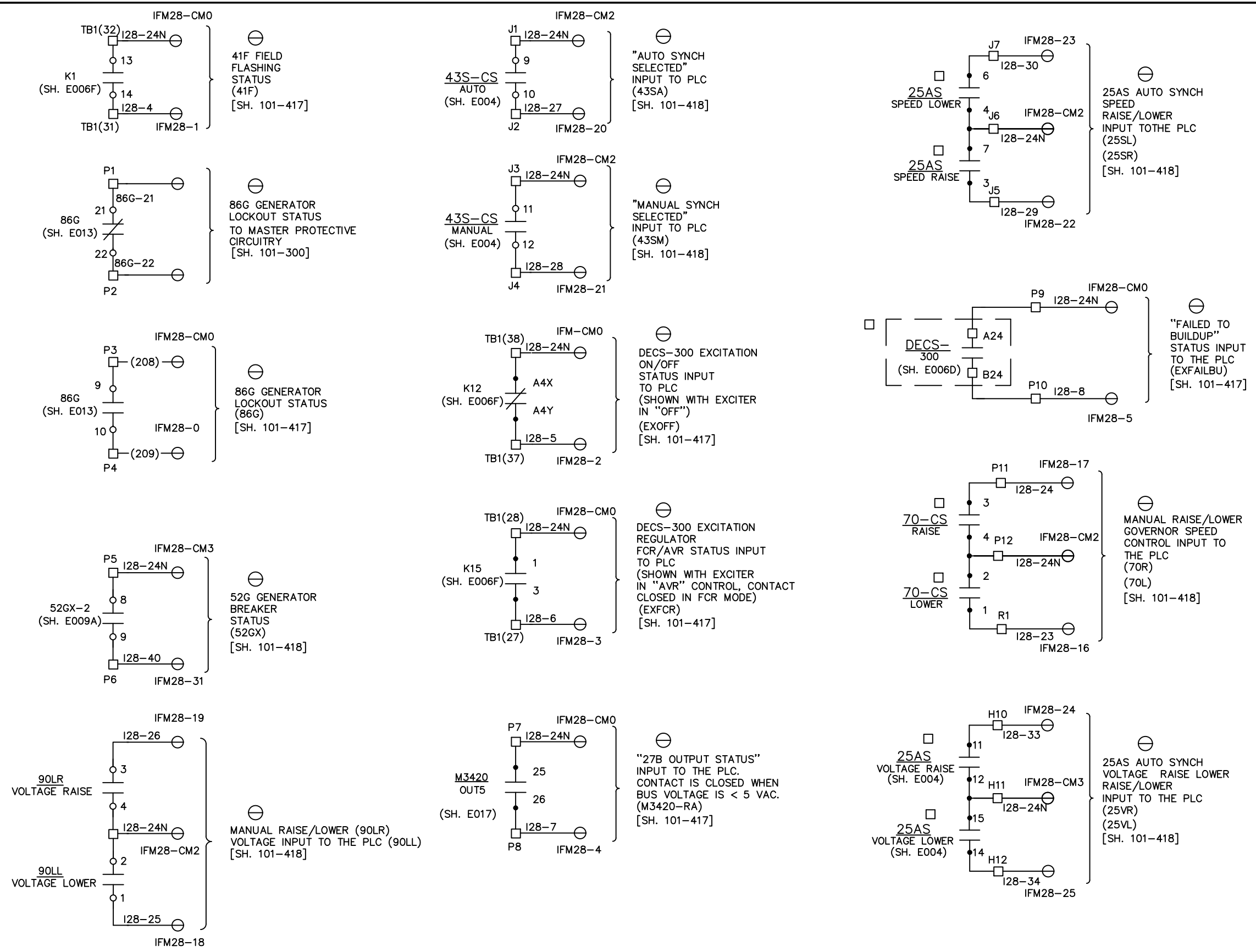
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E013 28 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CF		04/17/00

PLC ALARM INPUTS
GENERATOR PROTECTION SYSTEM
99174-GTB-103

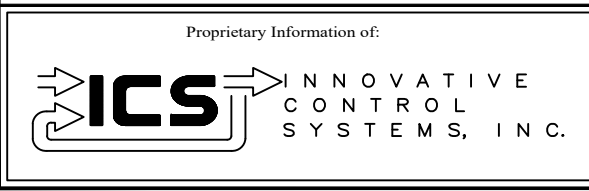
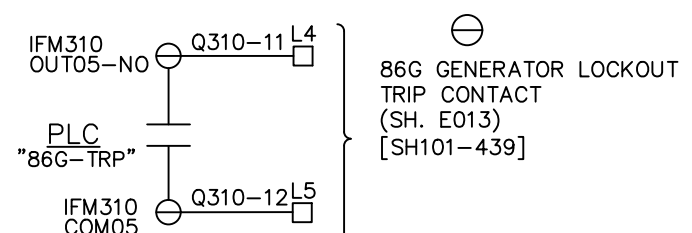
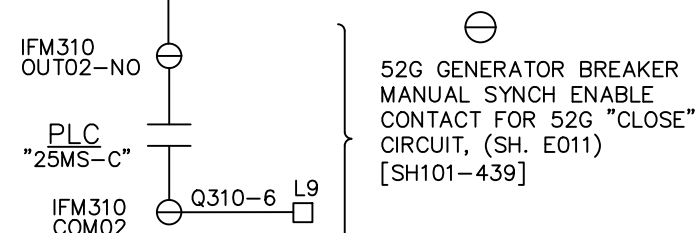
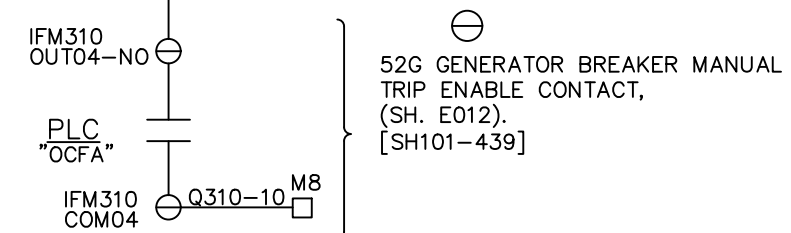
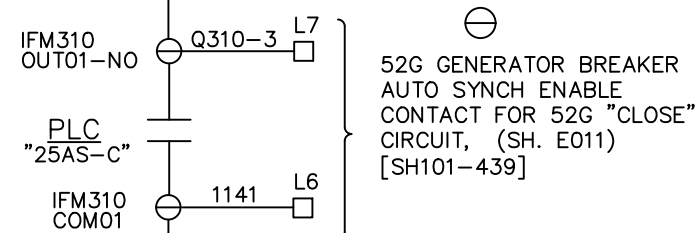
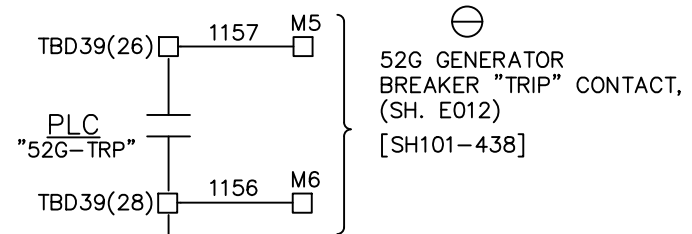
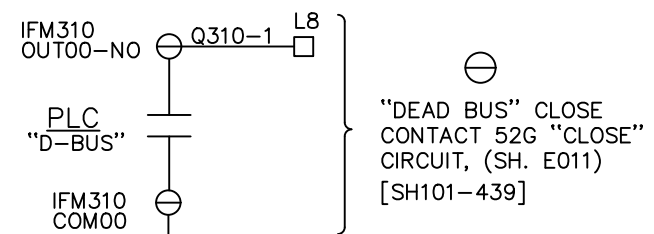
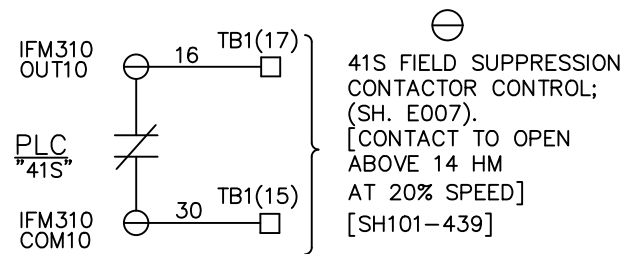
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E014 29 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CONTROL STATUS INPUT TO PLC
GENERATOR PROTECTION SYSTEM
99174-GTB-103

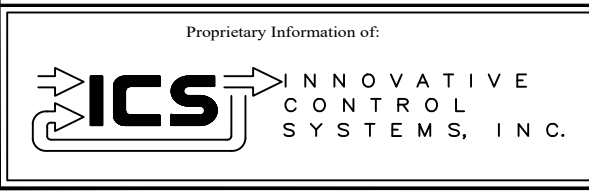
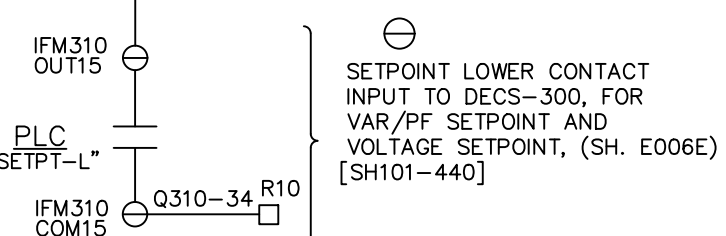
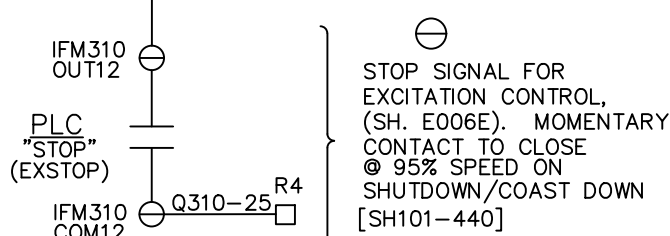
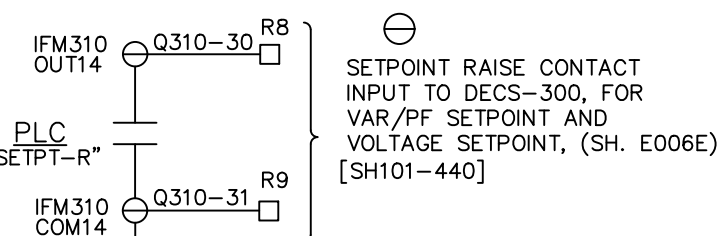
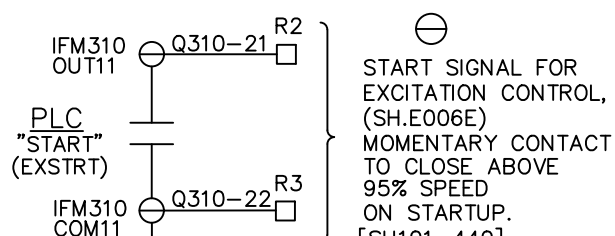
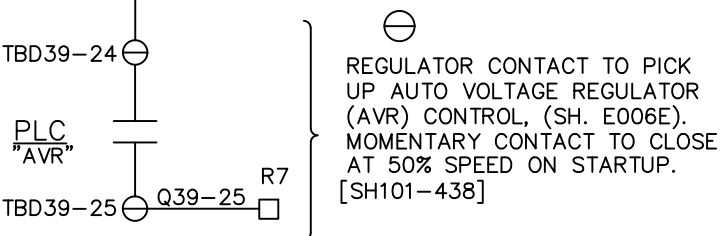
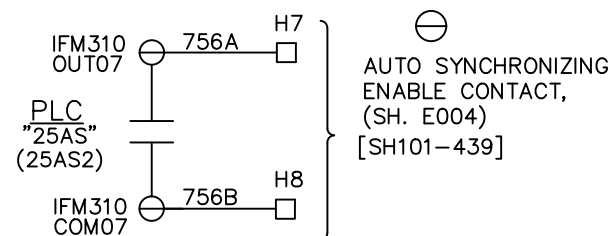
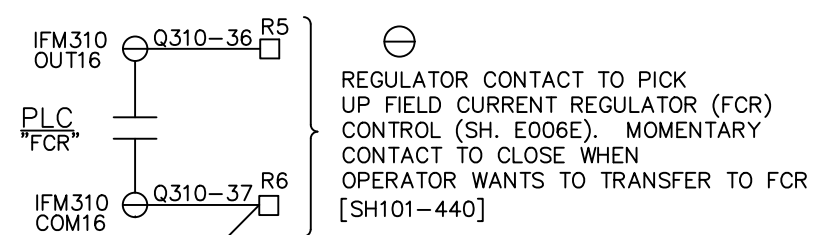
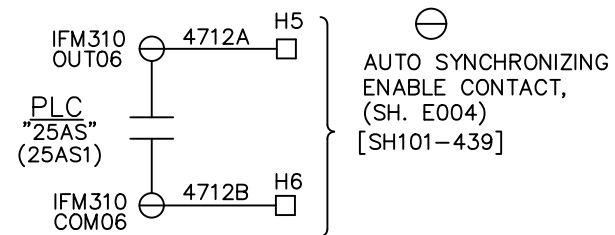
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E015 30 OF 39



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CF		04/17/00

CONTROL OUTPUTS FROM PLC
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

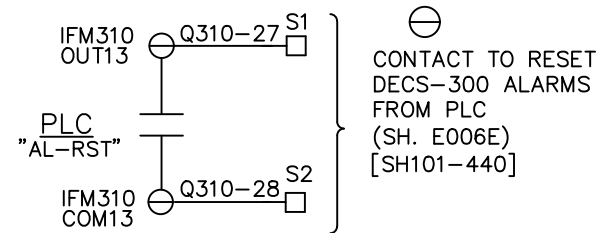
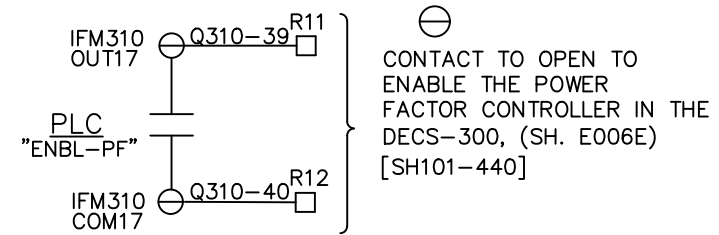
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO. 9944T1562	SCALE: NTS
DRAWN BY: C. FISHER	01/17/00		SHEET NO. E016A 31 OF 39



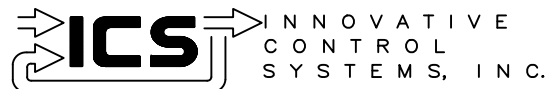
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CONTROL OUTPUTS FROM PLC
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	01/17/00	9944T1562	NTS
			SHEET NO. E016B 32 OF 39



Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CS		02/19/01
REV 1	AS BUILTS:	CF		04/17/00

CONTROL OUTPUTS FROM PLC
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES

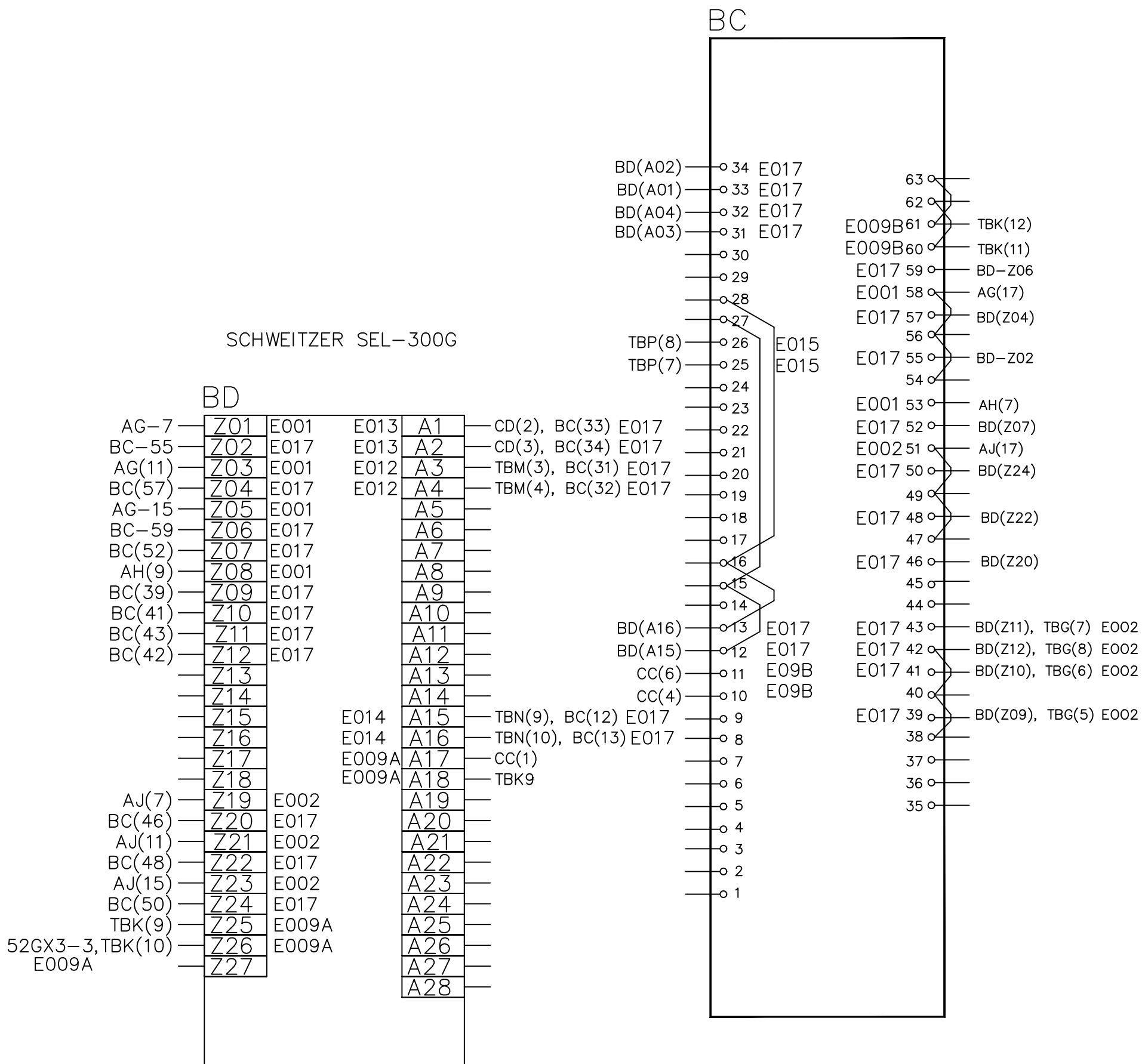
SITE: DON HENRY POWER CENTER

APPROVED BY: _____
DRAWN BY: C. FISHER 01/17/00

DRAWING NO. 9944T1562

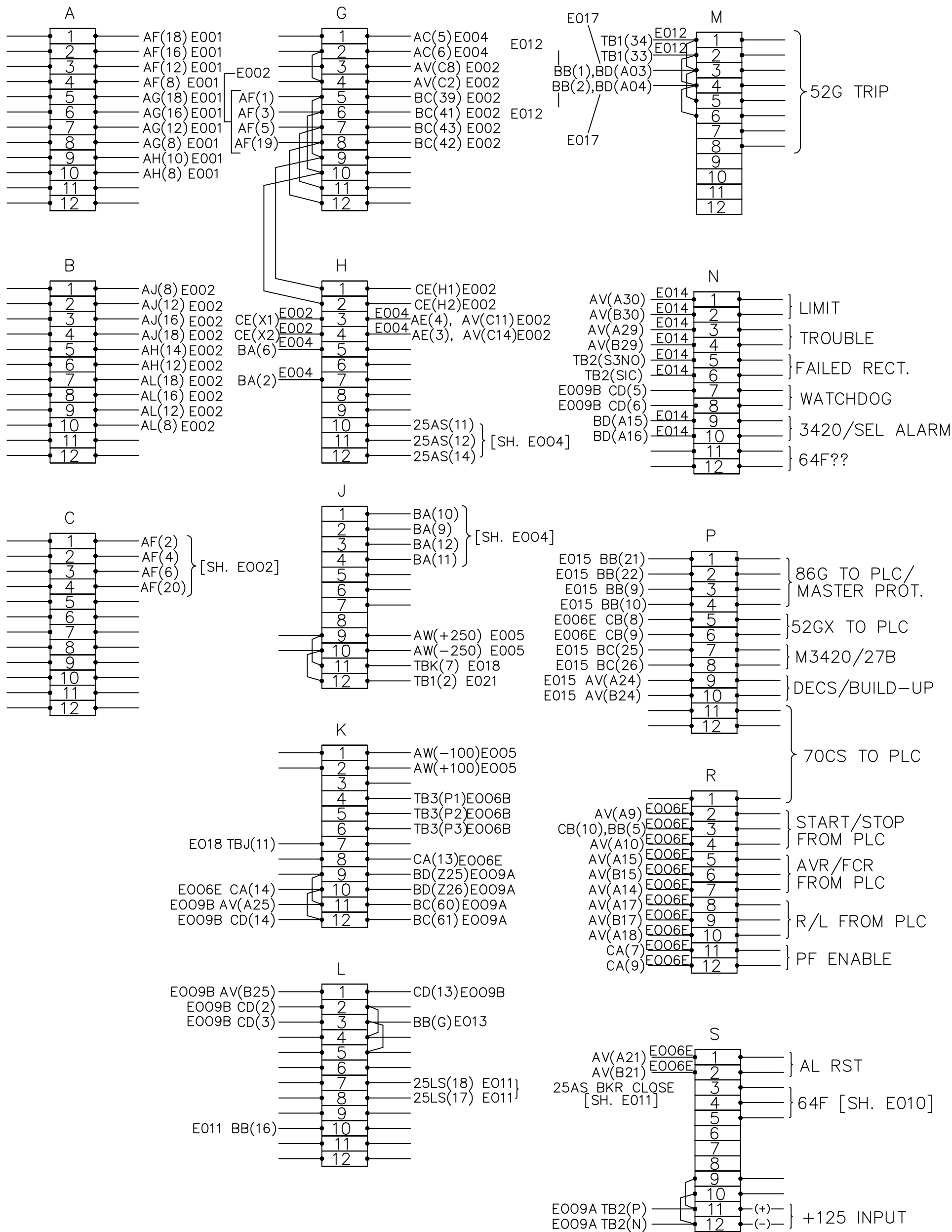
SCALE: NTS
SHEET NO. E016C
33 OF 39

M-3420



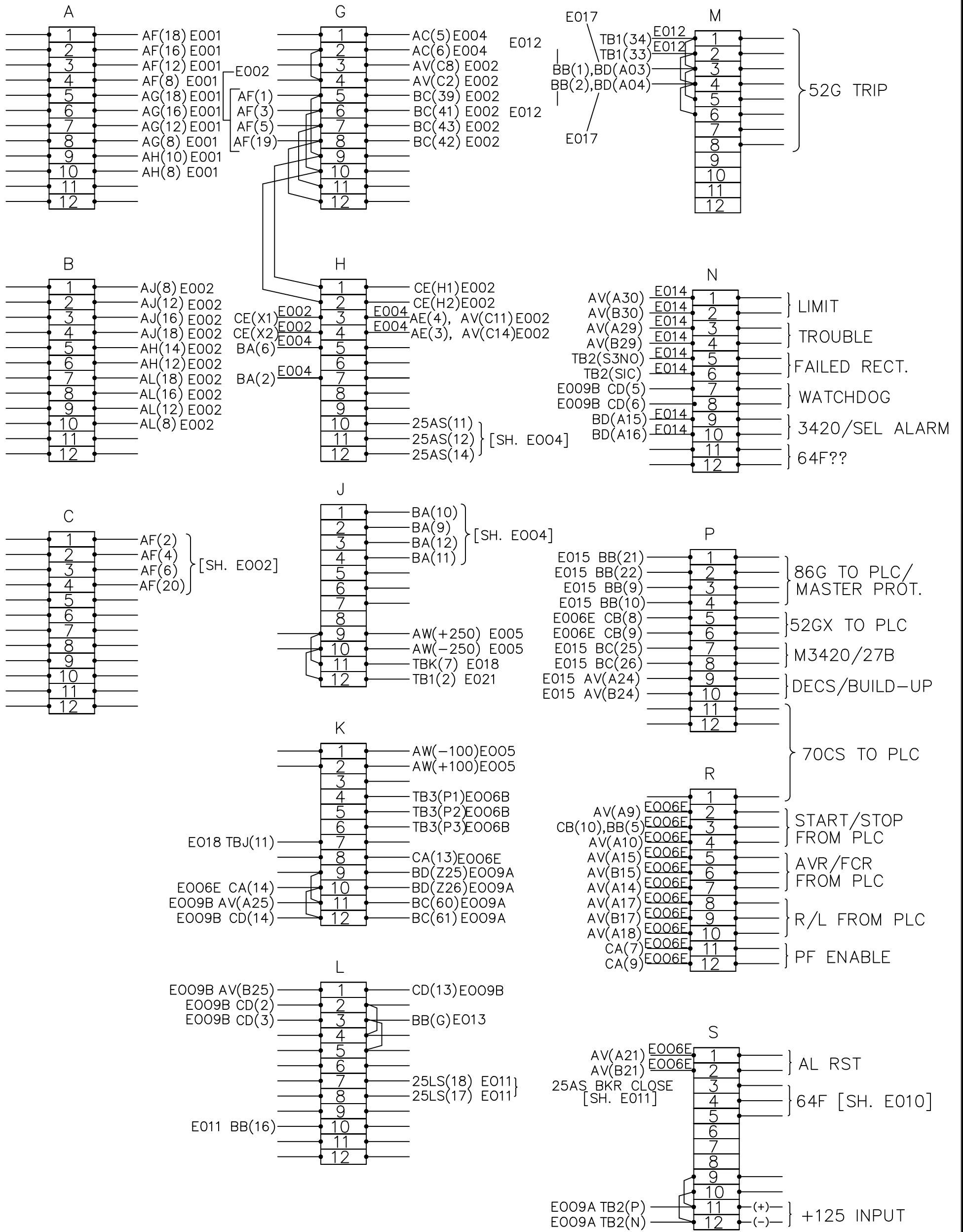
NOTE: ALL TEXT DENOTED E0** ARE SHEET NUMBERS.

ALARMS



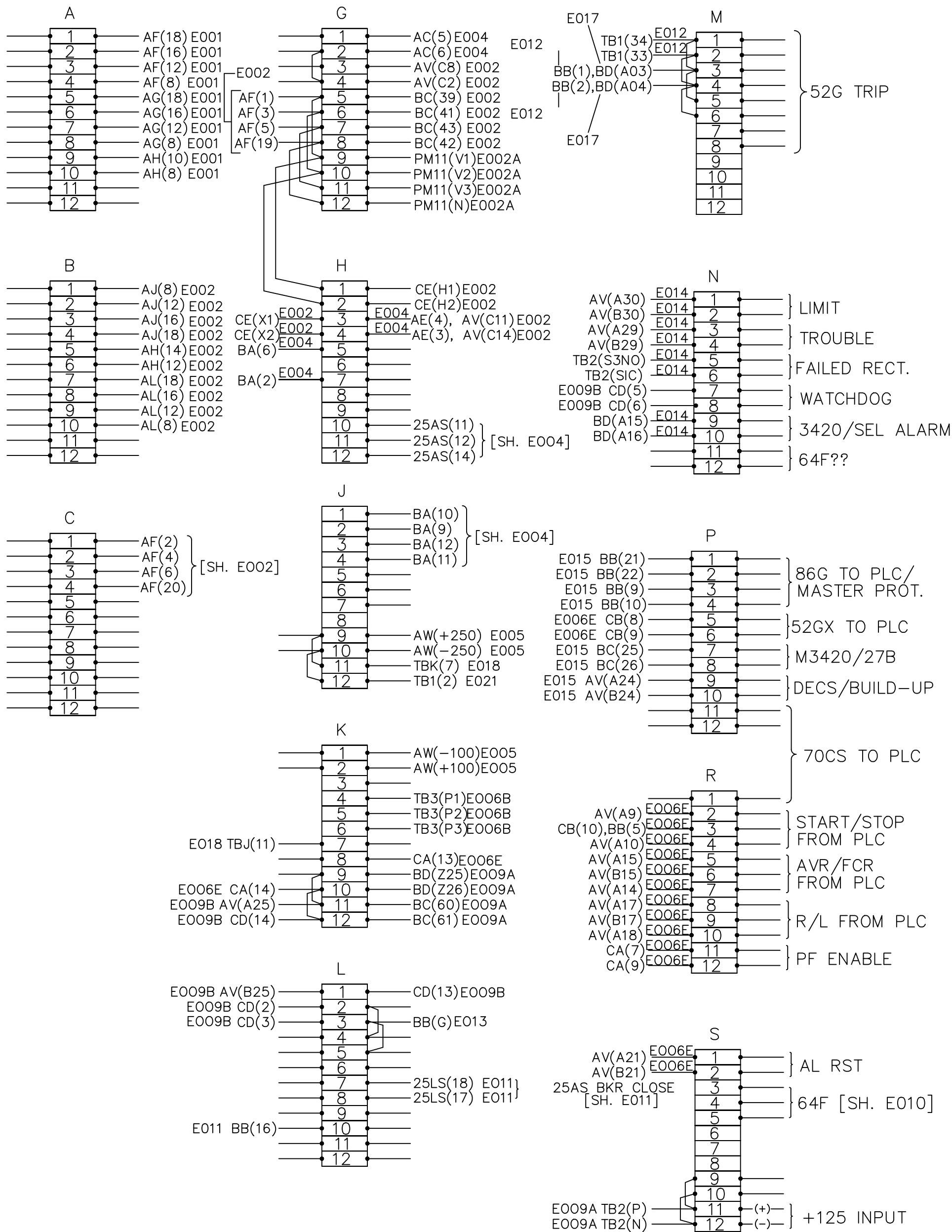
NOTE: ALL TEXT DENOTED E0** ARE SHEET NUMBERS.

ALARMS



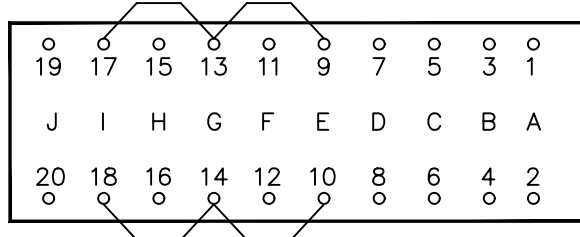
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ALARMS



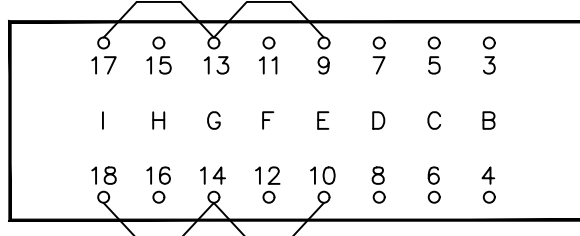
NOTE: ALL TEXT DENOTED E0** ARE SHEET NUMBERS.

AF TS-1



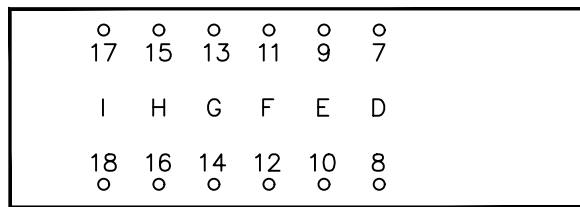
- 6- TBC(3) E002
- 8- TBA(4) E001
- 10-
- 12- TBA(3) E001
- 14-
- 16- TBA(2) E001
- 18- TBA(1) E001
- 5- TBG(7) E002
- 7- W/V(8)E002A
- 9-
- 11- W/V(9)E002A
- 13-
- 15- W/V(7)E002A
- 17- PM11(14+)E002A
- 1- TBG(5) E002
- 2- TBC(1) E002
- 3- TBG(6) E002
- 4- TBC(2) E002
- 19- TBG(8) E002
- 20- TBC(4) E002

AG TS-2



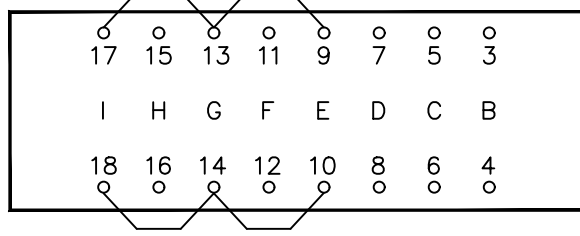
- 15- BD(Z05)E001
- 16- TBA(6) E001
- 17- BC(58) E001
- 18- TBA(5) E001
- 11- BD(Z03)E001
- 12- TBA(7) E001
- 9-
- 10-
- 7- BD(Z01)E001
- 8- TBA(8) E001
- 5-
- 6-

AH TS-3



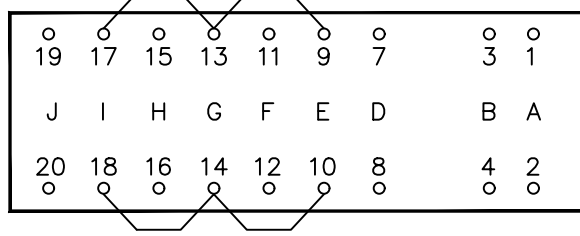
- 14- TB(5)E002
- 16-
- 17-
- 18-
- 13- AV(C-17)E006A
- 9- BD(Z08)E001
- 10- TBA-9 E001
- 11- AV(C16)E006A
- 12- TBB(6) E002
- 7- BC(53) E001
- 8- TBA(10)E001
- 9- BD(Z08)E001
- 10- TBA(9) E001

AJ TS-4



- 15- BD(Z23)E002
- 16- TBB(3) E002
- 17- BC(51) E002
- 18- TBB(4) E002
- 9-
- 10-
- 11- BD(Z21)E002
- 12- TBB(2) E002
- 7- BD(Z19)E002
- 8- TBB(1) E002
- 5-
- 6-

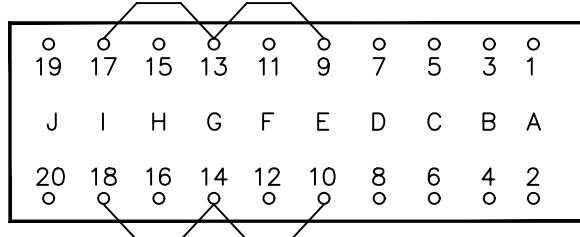
AL TS-5



- 8- TBB(10)E002
- 10-
- 12- TBB(9) E002
- 14-
- 16- TBB(8) E002
- 18- TBB(7) E002
- 7-
- 9-
- 11-
- 13-
- 15-
- 17-
- 1-
- 2-
- 3-
- 4-
- 19-
- 20-

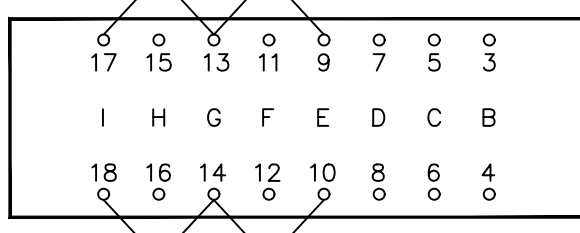
NOTE: ALL TEXT DENOTED EO** ARE SHEET NUMBERS.

AF TS-1



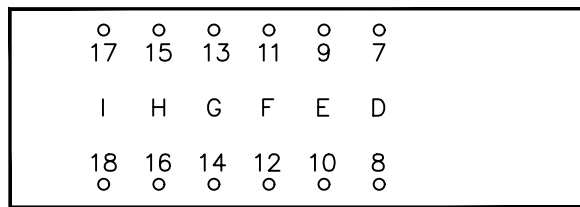
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- 8- TBA(4) E001
- 10-
- 12- TBA(3) E001
- 14-
- 16- TBA(2) E001
- 18- TBA(1) E001
- 5- TBG(7) E002
- 7- W/V(8)E002A
- 9-
- 11- W/V(9)E002A
- 13-
- 15- W/V(7)E002A
- 17- PM11(14+)E002A
- 1- TBG(5) E002
- 2- TBC(1) E002
- 3- TBG(6) E002
- 4- TBC(2) E002
- 19- TBG(8) E002
- 20- TBC(4) E002

AG TS-2



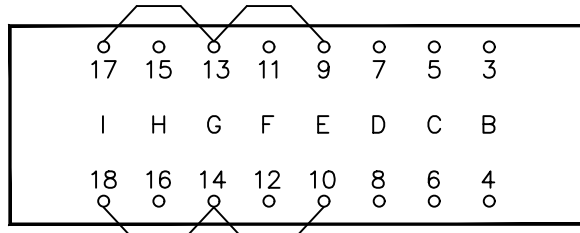
- 15- BD(Z05)E001
- 16- TBA(6) E001
- 17- BC(58) E001
- 18- TBA(5) E001
- 11- BD(Z03)E001
- 12- TBA(7) E001
- 9-
- 10-
- 7- BD(Z01)E001
- 8- TBA(8) E001
- 5-
- 6-

AH TS-3



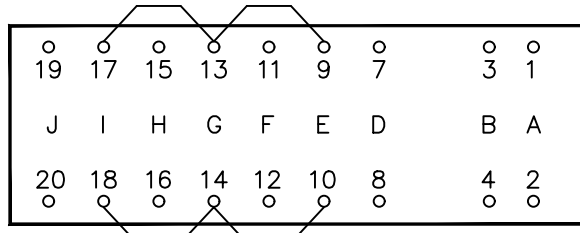
- 14- TB(5)E002
- 16-
- 17-
- 18-
- 13- AV(C-17)E006A
- 9- BD(Z08)E001
- 10- TBA-9 E001
- 11- AV(C16)E006A
- 12- TBB(6) E002
- 7- BC(53) E001
- 8- TBA(10)E001
- 9- BD(Z08)E001
- 10- TBA(9) E001

AJ TS-4



- 15- BD(Z23)E002
- 16- TBB(3) E002
- 17- BC(51) E002
- 18- TBB(4) E002
- 9-
- 10-
- 11- BD(Z21)E002
- 12- TBB(2) E002
- 7- BD(Z19)E002
- 8- TBB(1) E002
- 5-
- 6-

AL TS-5

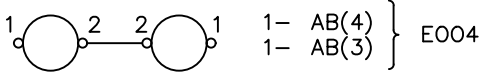


- 8- TBB(10)E002
- 10-
- 12- TBB(9) E002
- 14-
- 16- TBB(8) E002
- 18- TBB(7) E002
- 7-
- 9-
- 11-
- 13-
- 15-
- 17-
- 1-
- 2-
- 3-
- 4-
- 19-
- 20-

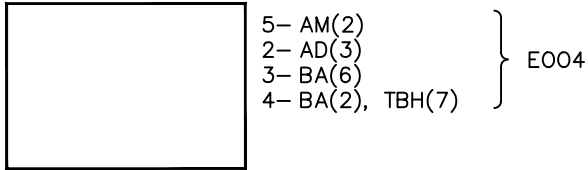
NOTE: ALL TEXT DENOTED EO** ARE SHEET NUMBERS.

 <small>Proprietary Information of:</small> INNOVATIVE CONTROL SYSTEMS, INC.	REV 3	REPLACE JEM-10 WITH NEXUS	NJB	06/24/2016	TEST SWITCH CONNECTION DIAGRAM GENERATOR PROTECTION SYSTEM 99174-GTB-103	CUSTOMER: HASTINGS UTILITIES		
	REV 2	MODIFICATIONS:	CS	02/19/01		SITE: DON HENRY POWER CENTER		
	REV 1	AS BUILTS:	CF	04/17/00		APPROVED BY:	DRAWING NO.	SCALE:
	REV	DESCRIPTION:	BY	APPROVED		DATE	9944T1562	NTS
					DRAWN BY: D. LANGLEY	01/17/00	SHEET NO. E019 36 OF 39	

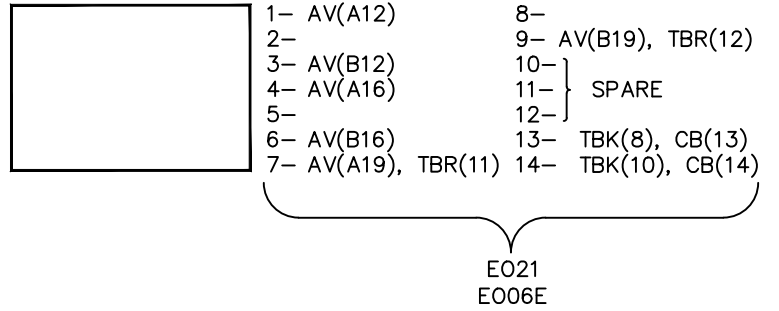
AA
SYNC LIGHTS



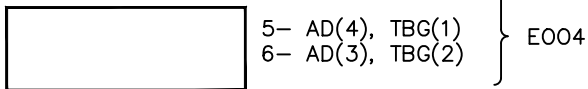
AB SYNCH SCOPE



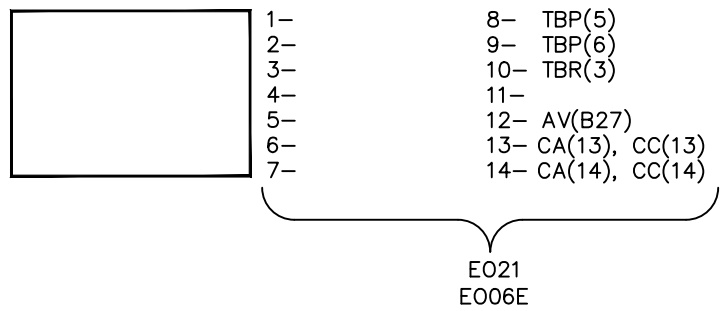
CA 52GX-1



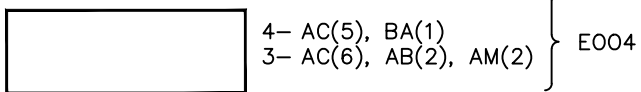
AC GEN VM



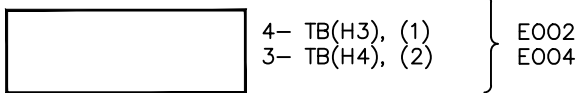
CB 52GX-2



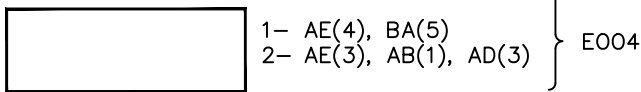
AD GEN FM



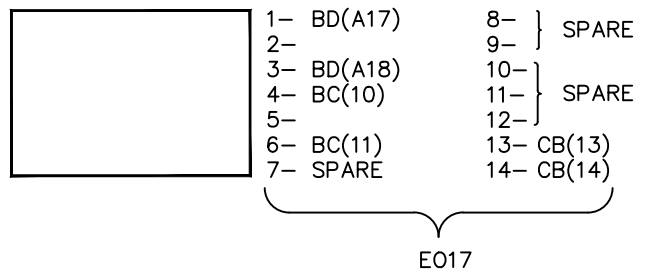
AE BUS VM



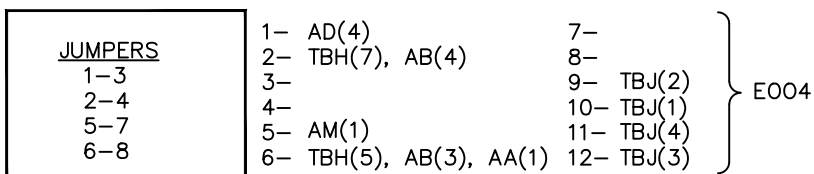
AM BUS FM



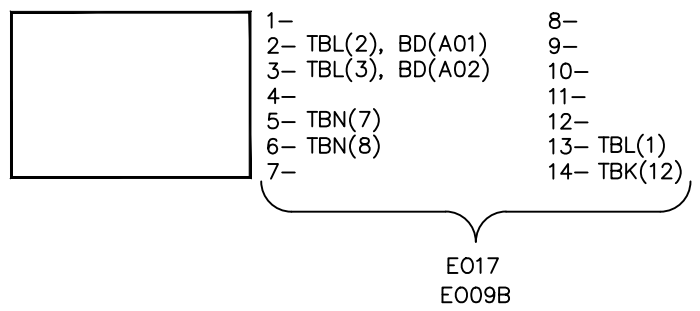
CC 52GX-3



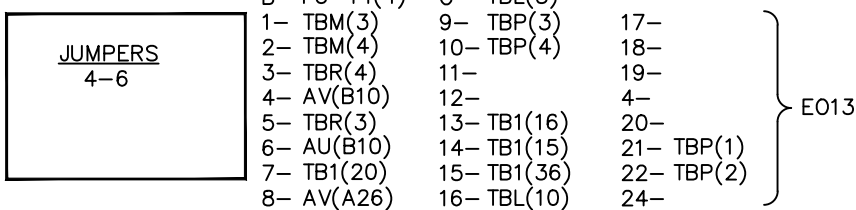
BA 43S-CS



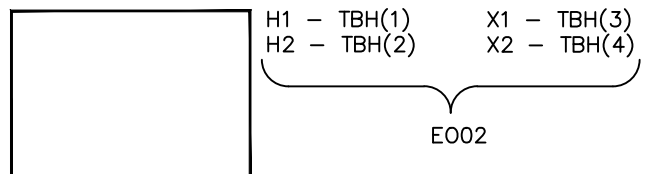
CD KS-1



BB 86G

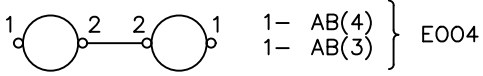


CD AUX PT - 208/120V

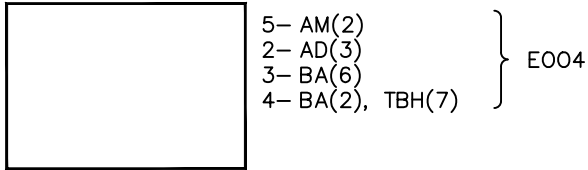


NOTE: ALL TEXT DENOTED EO** ARE SHEET NUMBERS.

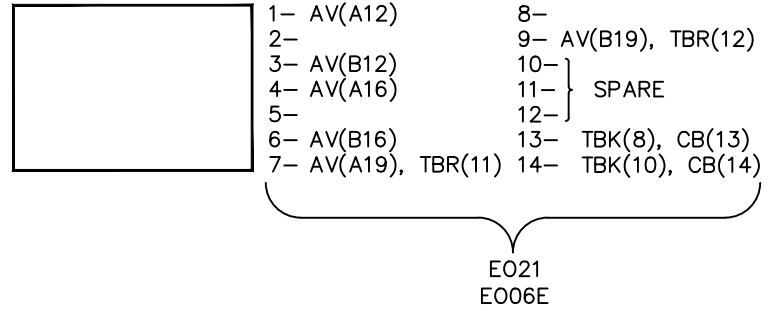
AA
SYNC LIGHTS



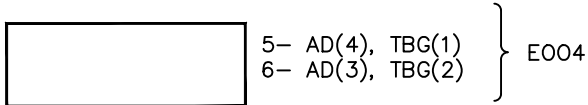
AB SYNCH SCOPE



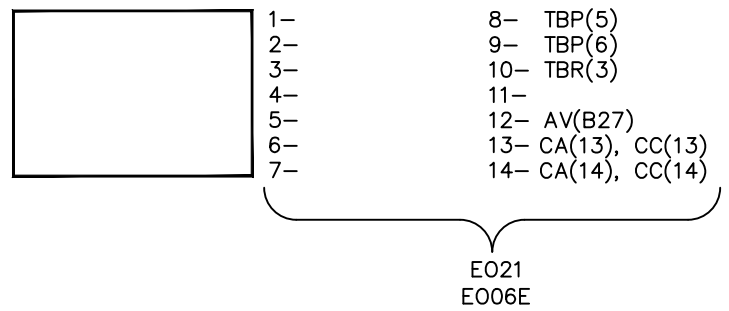
CA 52GX-1



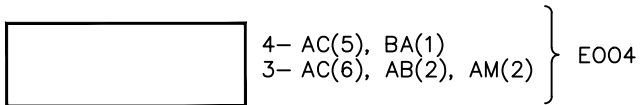
AC GEN VM



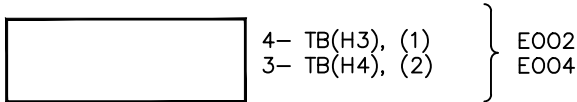
CB 52GX-2



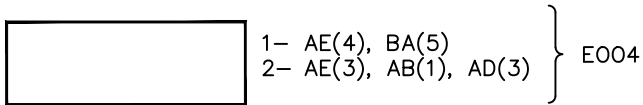
AD GEN FM



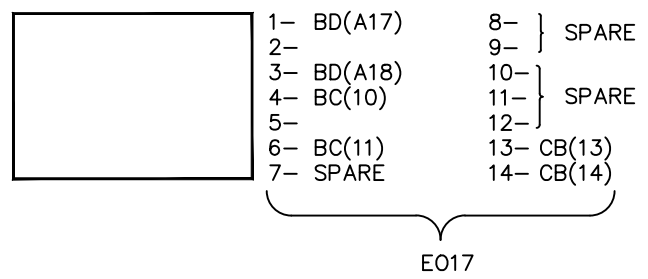
AE BUS VM



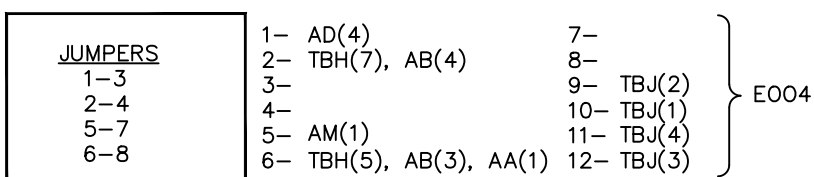
AM BUS FM



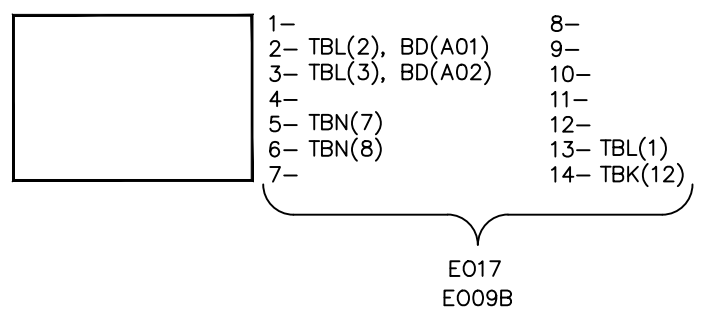
CC 52GX-3



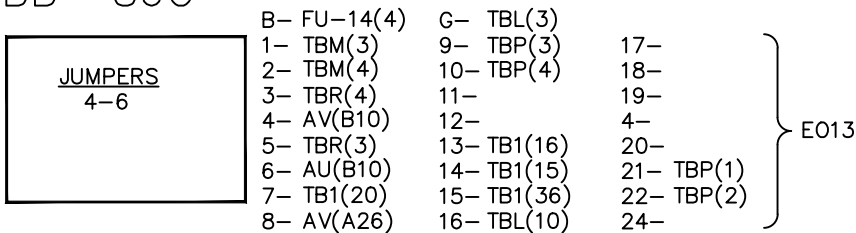
BA 43S-CS



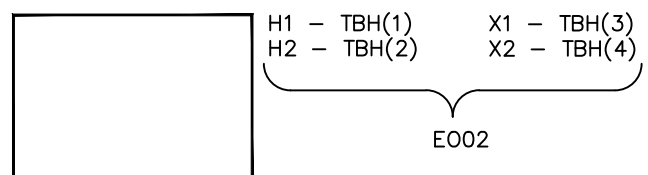
CD KS-1



BB 86G



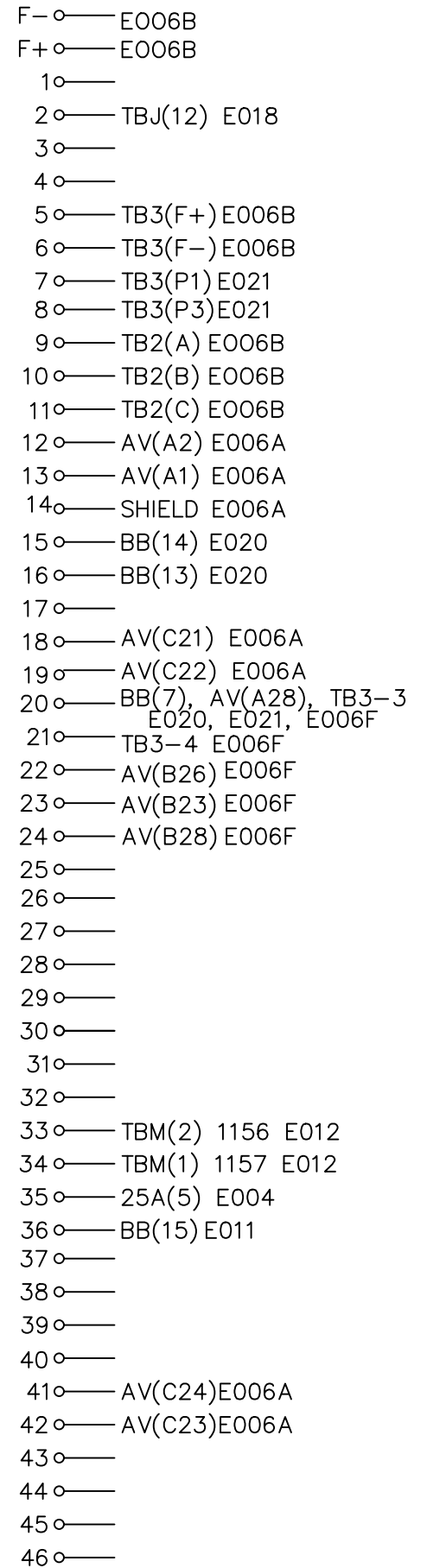
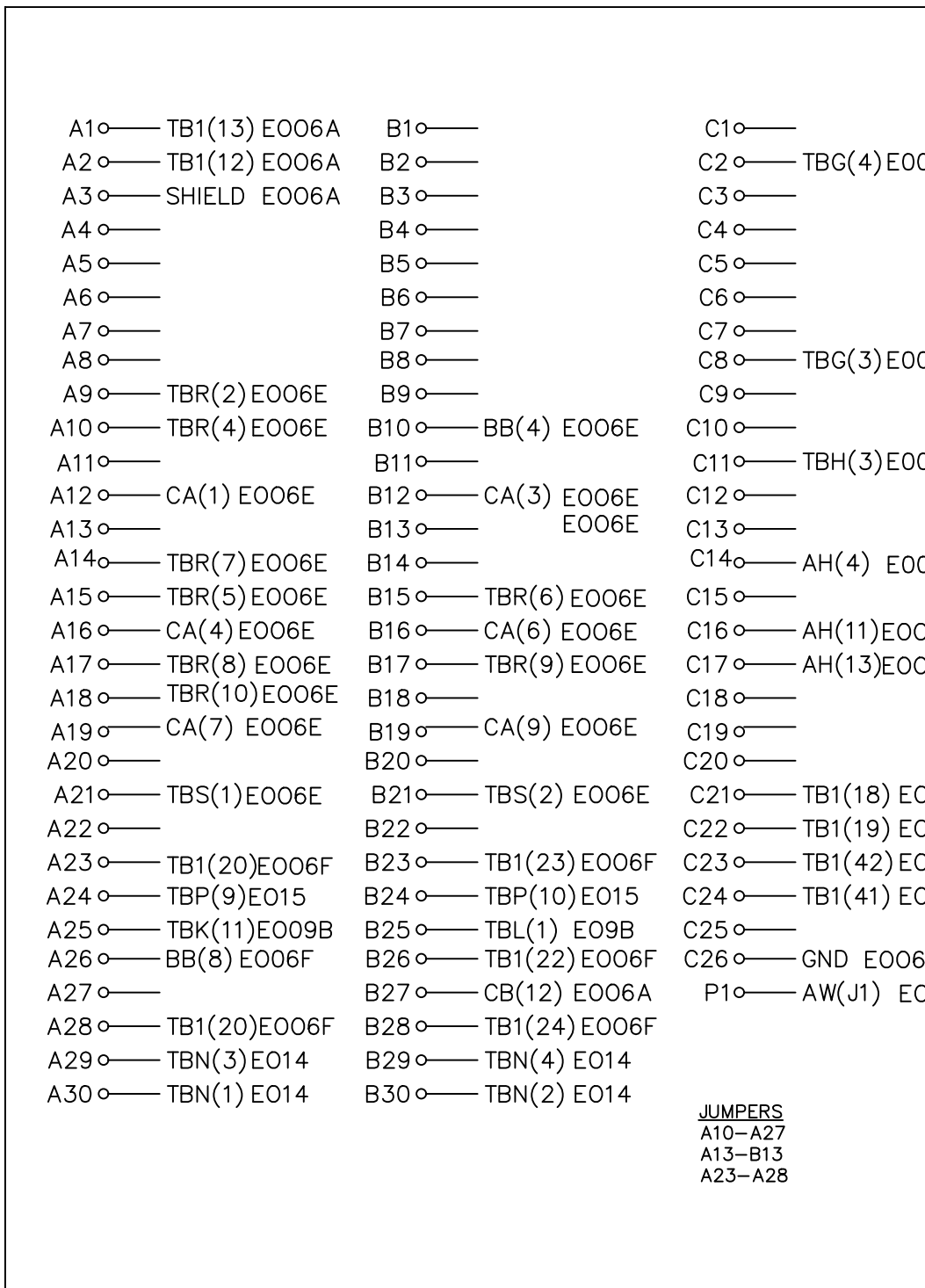
CD AUX PT - 208/120V



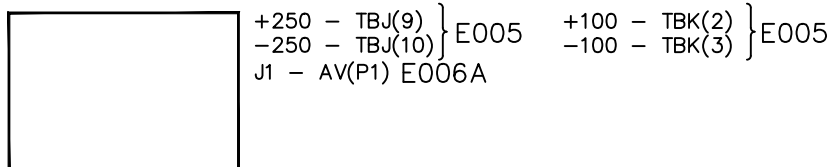
NOTE: ALL TEXT DENOTED EO** ARE SHEET NUMBERS.

AV DECS-300

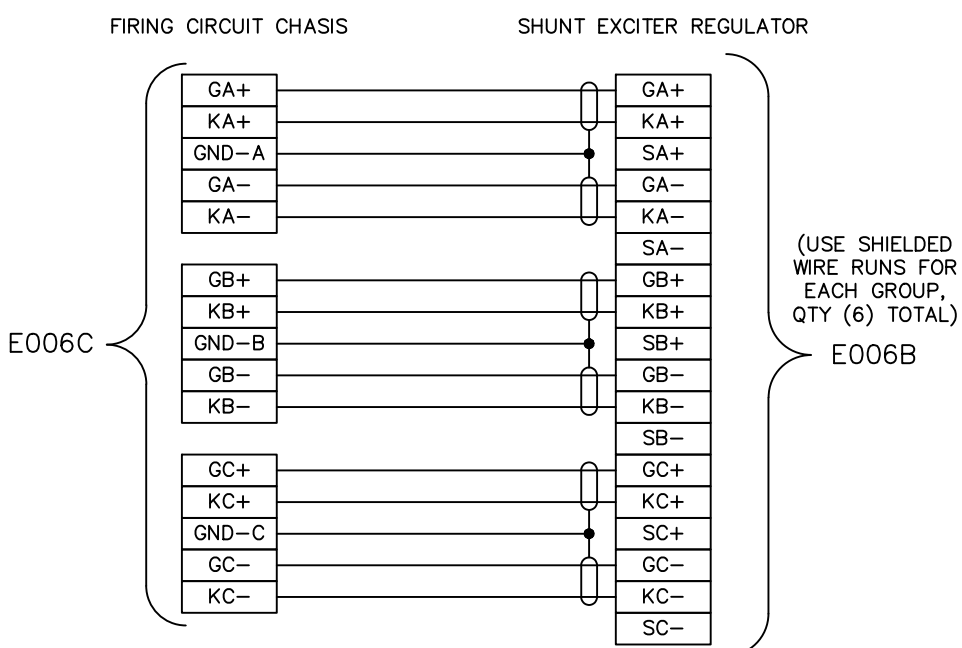
TERMINAL BLOCK 1



AW FIELD ISOLATION MODULE

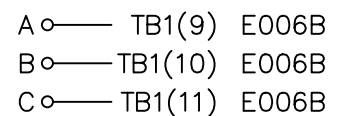


SCR FIRING CONNECTION DIAGRAM

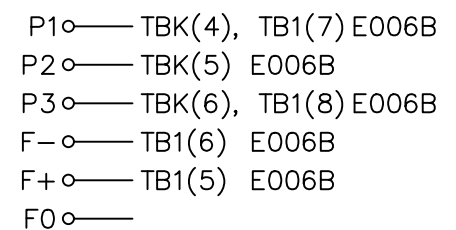


NOTE: ALL TEXT DENOTED WITH E0** ARE SHEET NUMBERS.

TERMINAL BLOCK 2



TERMINAL BLOCK 3



43S-CS SYNCHRONIZING
CONTROL SWITCH

CONTACT	POSITION		
	MANUAL	OFF	AUTO
1 ——— ——— 2			X
3 ——— ——— 4	X		
5 ——— ——— 6			X
7 ——— ——— 8	X		
9 ——— ——— 10			X
11 ——— ——— 12	X		

(SH. E004)
KRAUS & NAIMER MODEL XXXX

X — DENOTES CONTACT CLOSED

86G GENERATOR LOCKOUT
RELAY

CONTACT	POSITION	
	TRIP	RESET
1 ——— ——— 2	X	
3 ——— ——— 4	X	
5 ——— ——— 6		X
7 ——— ——— 8		X
9 ——— ——— 10	X	
11 ——— ——— 12	X	
13 ——— ——— 14		X
15 ——— ——— 16		X
17 ——— ——— 18	X	
19 ——— ——— 20	X	
21 ——— ——— 22		X
23 ——— ——— 24		X

(SH. E013)
KRAUS & NAIMER MODEL XXXX

52G-CS GENERATOR BREAKER
CONTROL SWITCH

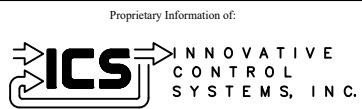
CONTACT	POSITION			
	LCO	TRIP	OFF	CLOSE
1 ——— ——— 2				X
3 ——— ——— 4	X	X		
5 ——— ——— 6	X			
7 ——— ——— 8	X			

(SH. E011 & E012)
KRAUS & NAIMER MODEL XXXX

70-CS GOVERNEOR
RAISE/LOWER
CONTROL SWITCH

CONTACT	POSITION		
	LOWER	OFF	RAISE
1 ——— ——— 2	X		
3 ——— ——— 4			X

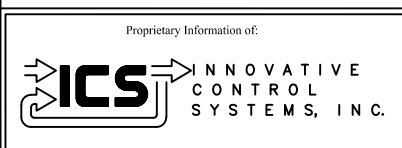
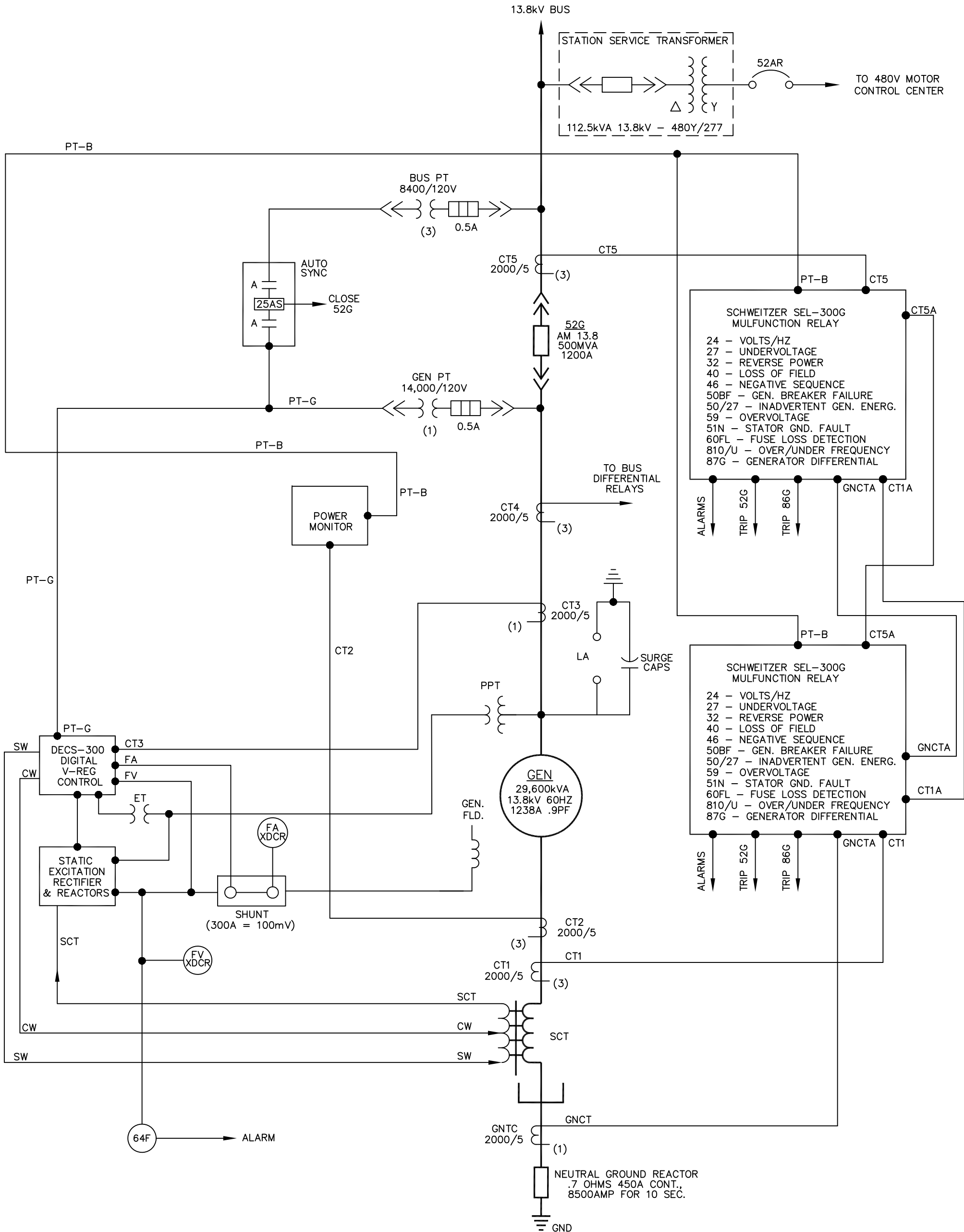
(SH. E015)
KRAUS & NAIMER MODEL XXXX



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CF		04/17/00

DEVICE CONNECTIONS & ARRANGMENTS
GENERATOR PROTECTION SYSTEM
99174-GTB-103

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: D. LANGLEY	01/17/00	9944T1562	NTS
		SHEET NO. EA04 9 OF 39	



REV	DESCRIPTION	BY	APPROVED	DATE

SYSTEM ONE LINE
 GENERATOR PROTECTION SYSTEM
 99174-GTB-103

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 9944T1562
DRAWN BY: D. LANGLEY 01/17/00	SCALE: NTS SHEET NO. EA06 39 OF 39

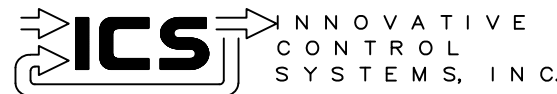
HASTINGS UTILITIES

HASTINGS, NEBRASKA

GE FRAME 5 GAS TURBINE

MOTOR CONTROL CENTER INTERFACE

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00

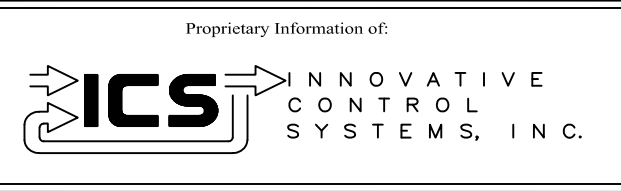
TITLE SHEET
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-008-2	SHEET NO. 008 1 OF 22

99174-GTB-104

MOTOR CONTROL CENTER INTERFACE

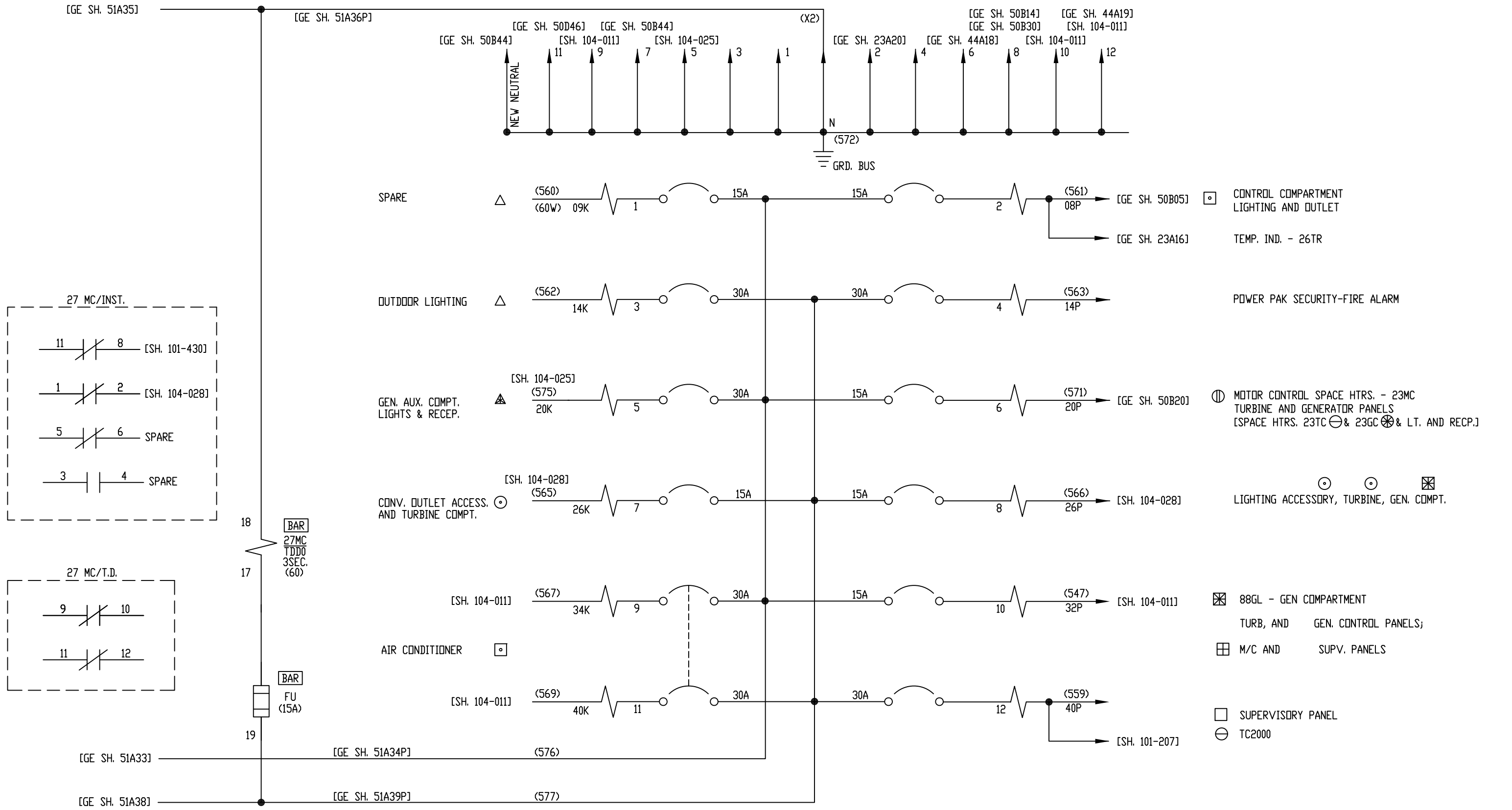
SHEET NUMBER	GE REF. DWG	DESCRIPTION
008		TITLE SHEET
009		SHEET INDEX
009A		DEVICE DESCRIPTION INDEX
010	50A	PANEL BOARD MAINS
011	50C	RECEPTICLES AND HEATERS
012	51C	WATT HOUR METER
013	52A	AUXILIARY LUBE OIL PUMP
014	52A	LUBE OIL SYSTEM HEADER
015	52A	DISTILLATE FUEL FORWARDING PUMP
016	52A	FUEL HEATER
017	52B	CONTROL COMPARTMENT SPACE HEATER
018	55B	HYDRAULIC RATCHET PUMP MOTOR
019	55B	DIESEL ENGINE STARTER MOTOR
020	56A	EMERGENCY LUBE OIL PUMP
021	56B	EMERGENCY FUEL FORWARDING PUMP
022	52B	TURBINE COMPARTMENT SPACE HEATER
023	52B	ACCESSORY COMPARTMENT SPACE HEATER
024	52B	COOLING AIR FAN
025	52D	GENERATOR AUXILIARIES COMPARTMENT
026	55A	125VDC DISTRIBUTION PANEL
027	05C	HEATER FOR GAS TURBINE DIESEL
028	50B	LIGHTS AND RECEPTICLES



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		12/28/01
REV 1	AS BUILTS:	CF		04/17/00

SHEET INDEX
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-009-2	SHEET NO. 009 2 OF 22



ALL REFERENCES TO GE DRAWING ARE TO DWG. 176B9731

240/120VAC - 1 Ø PANELBOARD
PANEL BOARD MAINS (100A)
UNIT A04

GE REF. DWG 50A

Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

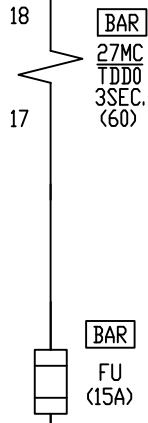
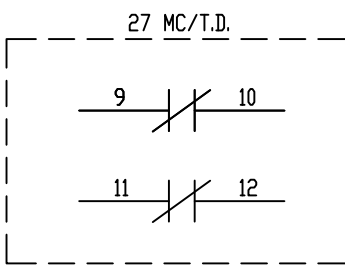
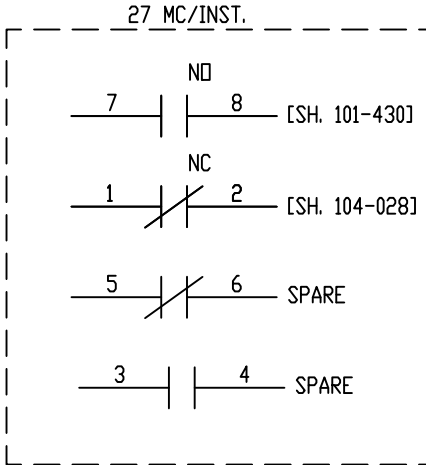
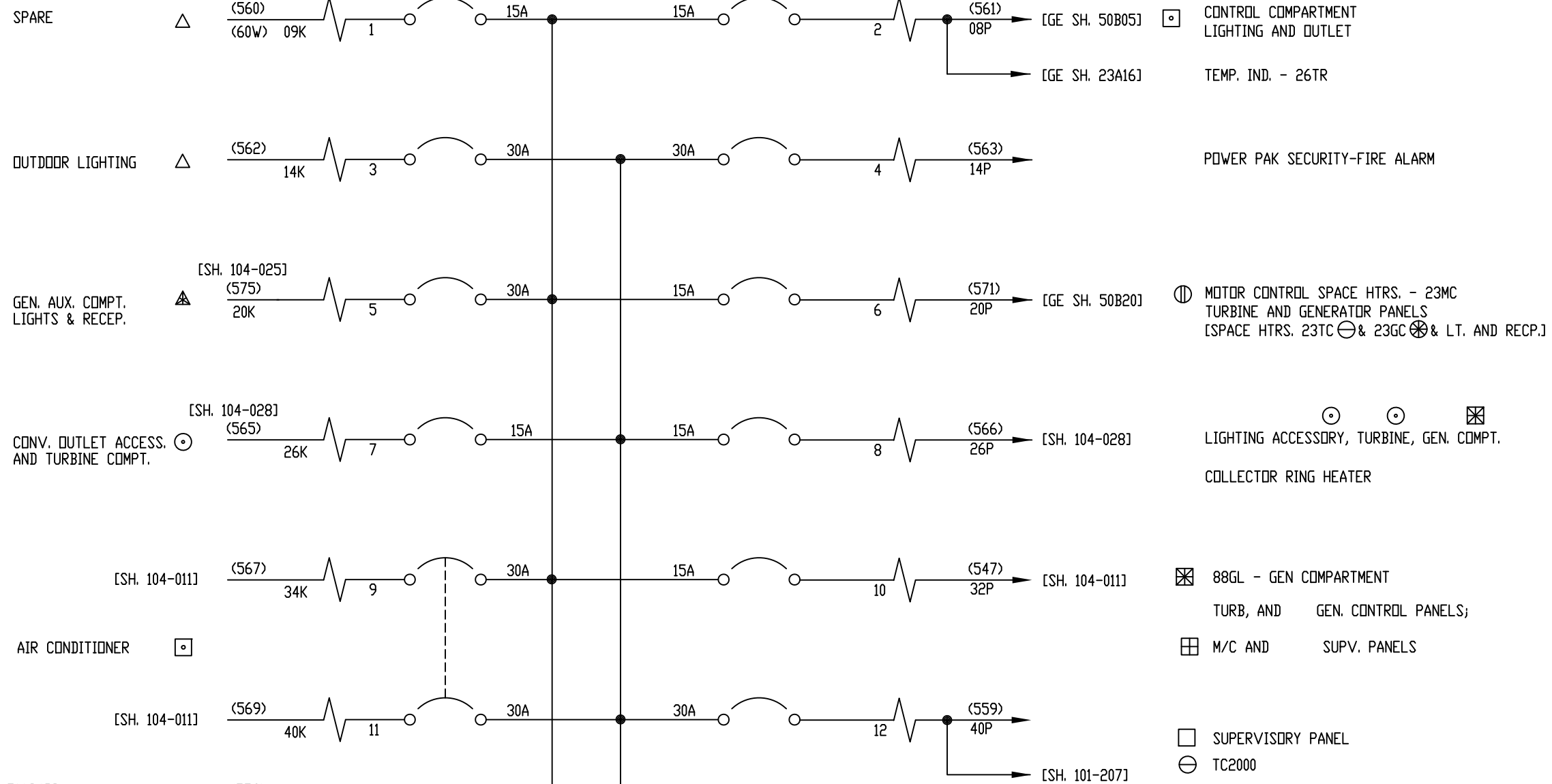
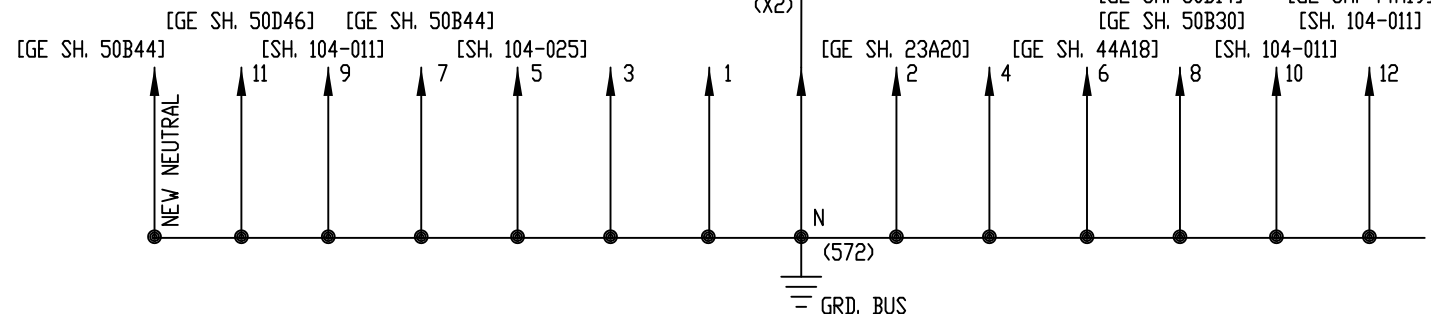
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REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

PANEL BOARD MAINS
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-104-010-2	
APPROVED BY:		DRAWN BY: C. FISHER	12/30/99
		SHEET NO. 010 4 OF 22	

[GE SH. 51A35]

[GE SH. 51A36P]



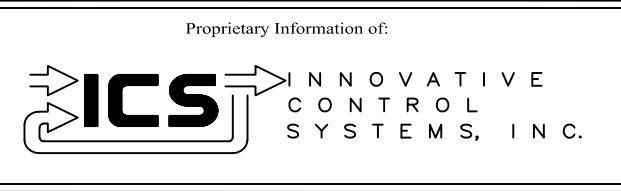
[GE SH. 51A33]
[GE SH. 51A38]

[GE SH. 51A34P]
[GE SH. 51A39P]

240/120VAC - 1 Ø PANELBOARD
PANEL BOARD MAINS (100A)
UNIT A04

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

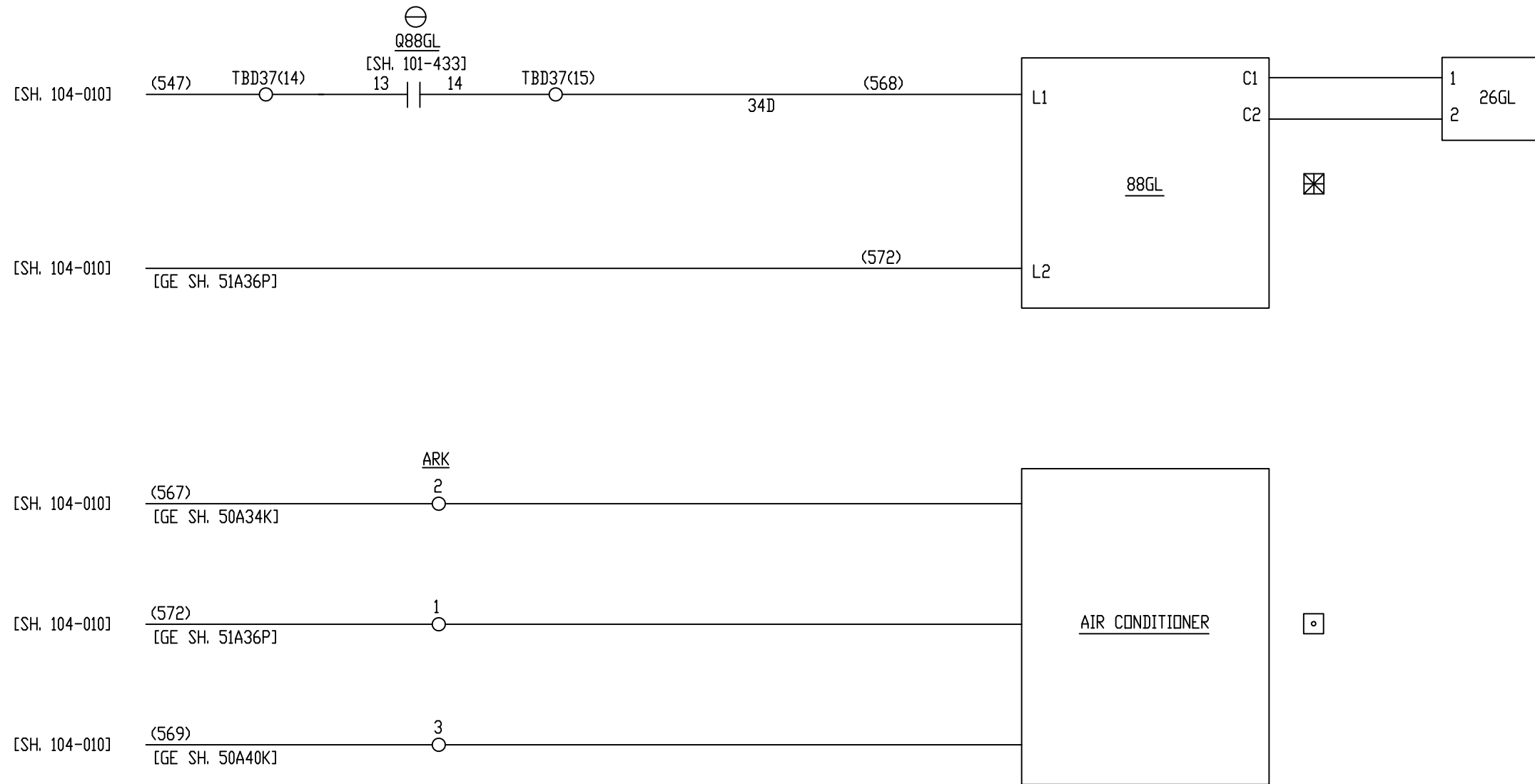
120 VAC PANELBOARD
GE REF. DWG 50A



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

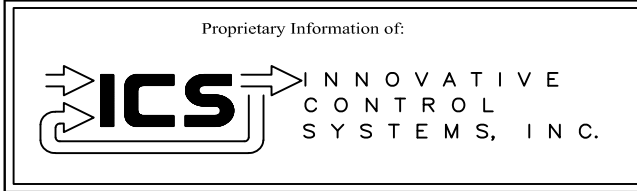
PANEL BOARD MAINS
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-010-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 010 4 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

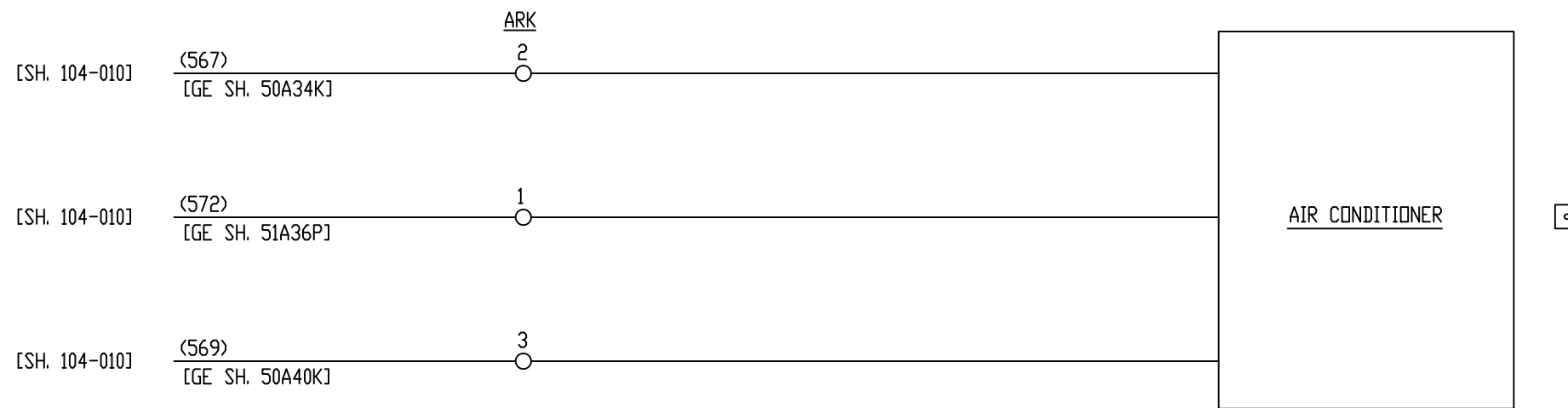
GE REF. DWG 50C



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00

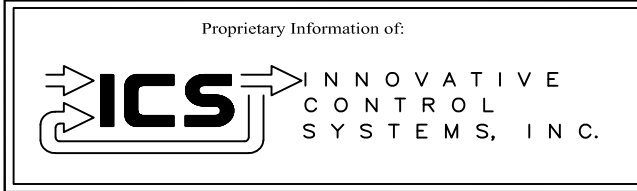
RECEPTACLES AND HEATERS
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-011-2	SHEET NO. 011 5 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

GE REF. DWG 50C

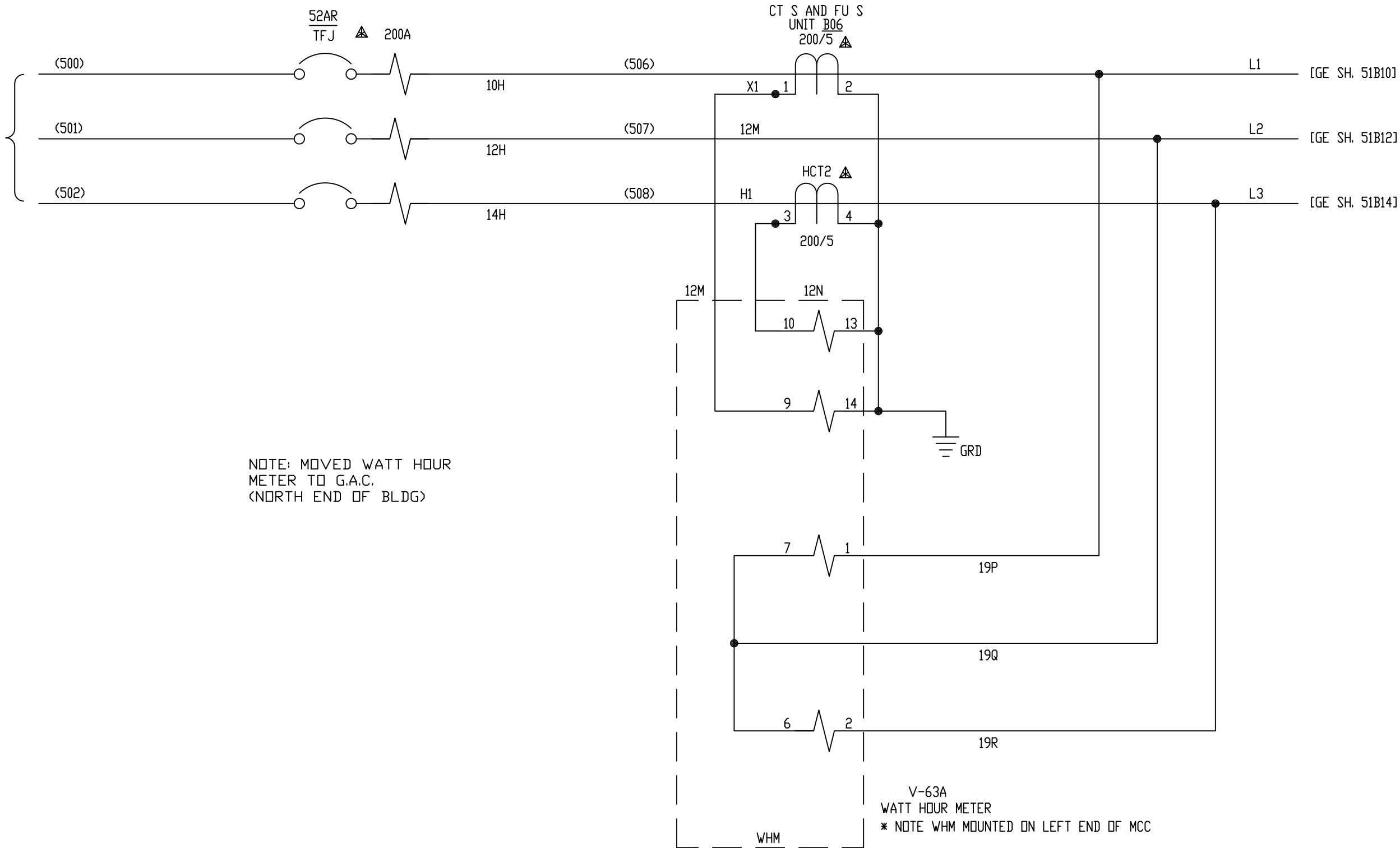


REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00

RECEPTACLES AND HEATERS
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-011-2	SHEET NO. 011 5 OF 22

AUX. POWER TRANSFORMER
112.5KVA
480V, 3Ø 60HZ



NOTE: MOVED WATT HOUR
METER TO G.A.C.
(NORTH END OF BLDG)

V-63A
WATT HOUR METER
* NOTE WHM MOUNTED ON LEFT END OF MCC

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

GE REF. DWG 51C

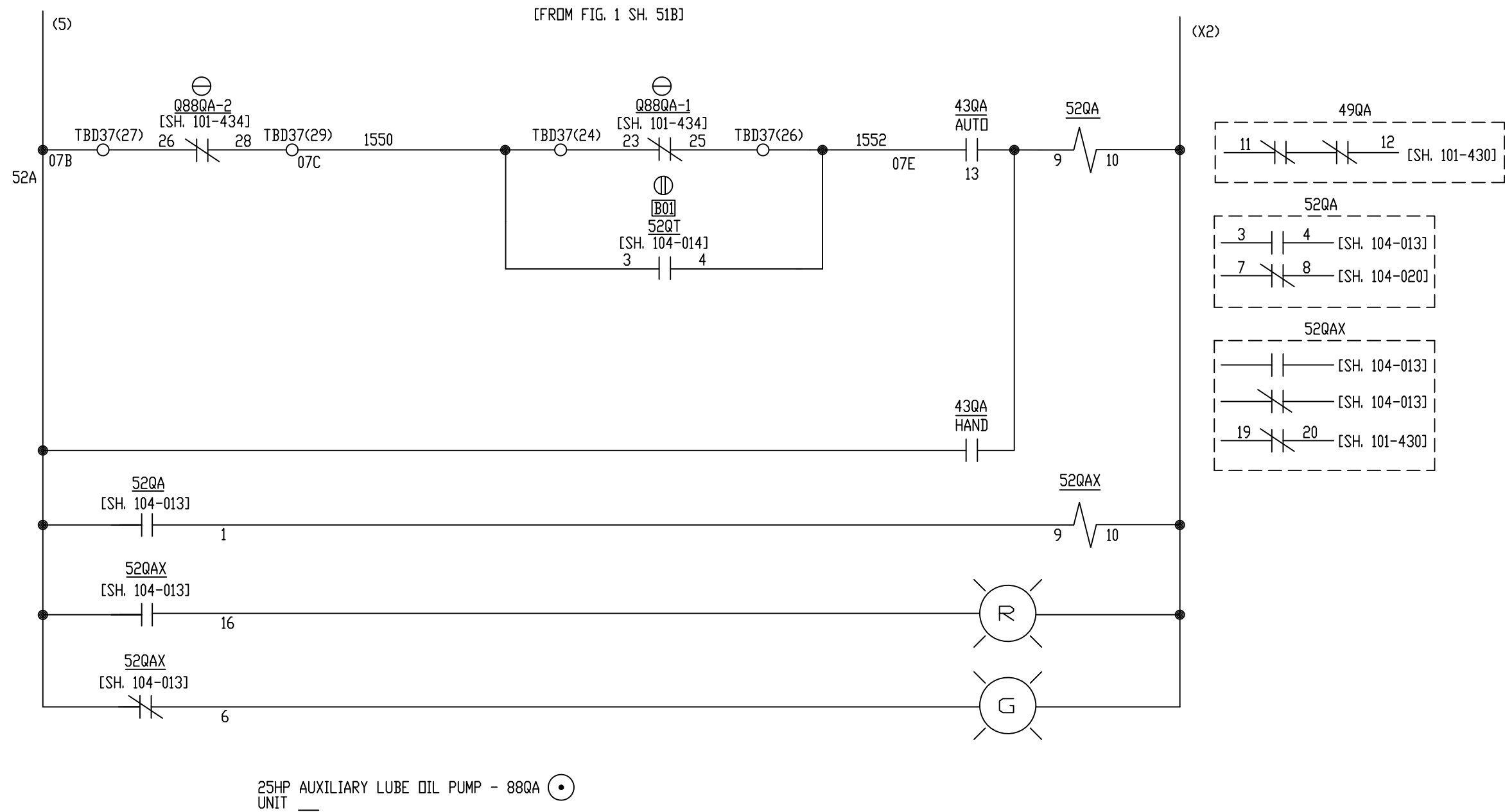
Proprietary Information of:

INNOVATIVE
CONTROL
SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

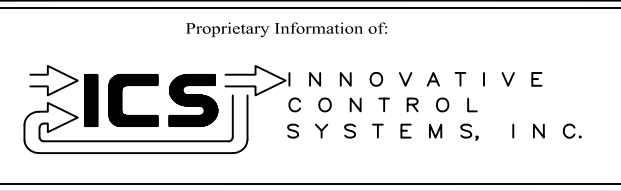
WATT HOUR METER
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-012-2	SHEET NO. 012 6 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

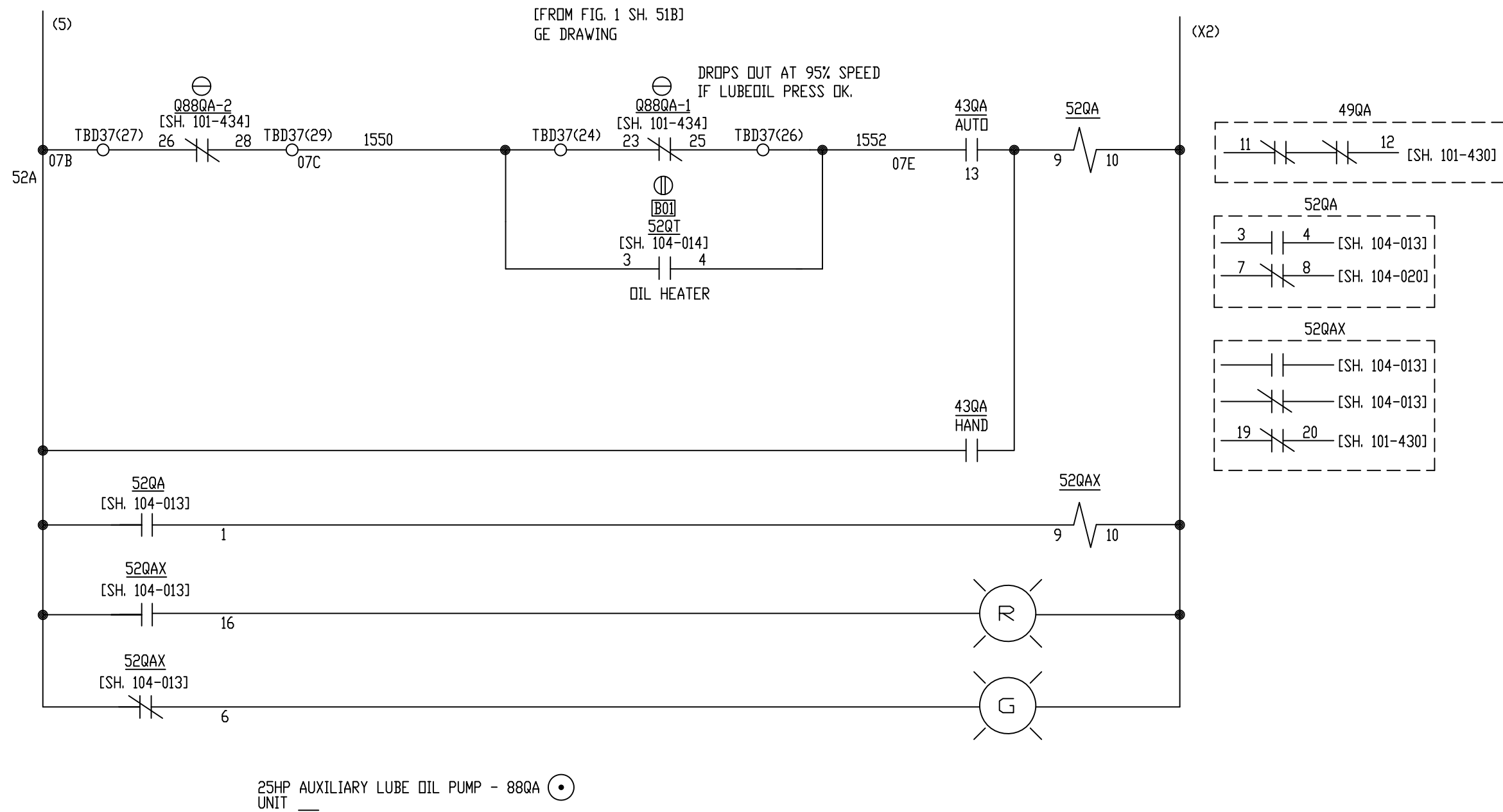
GE REF. DWG 52A



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

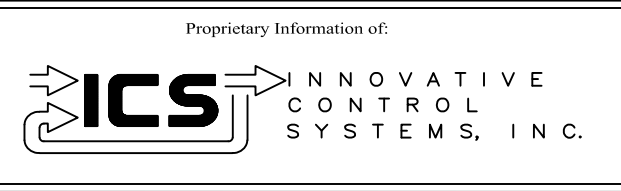
AUXILIARY LUBE OIL PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	SCALE: NTS
DRAWN BY: C. FISHER	DRAWING NO. 99174-GTB-104-013-2
12/30/99	SHEET NO. 013 7 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

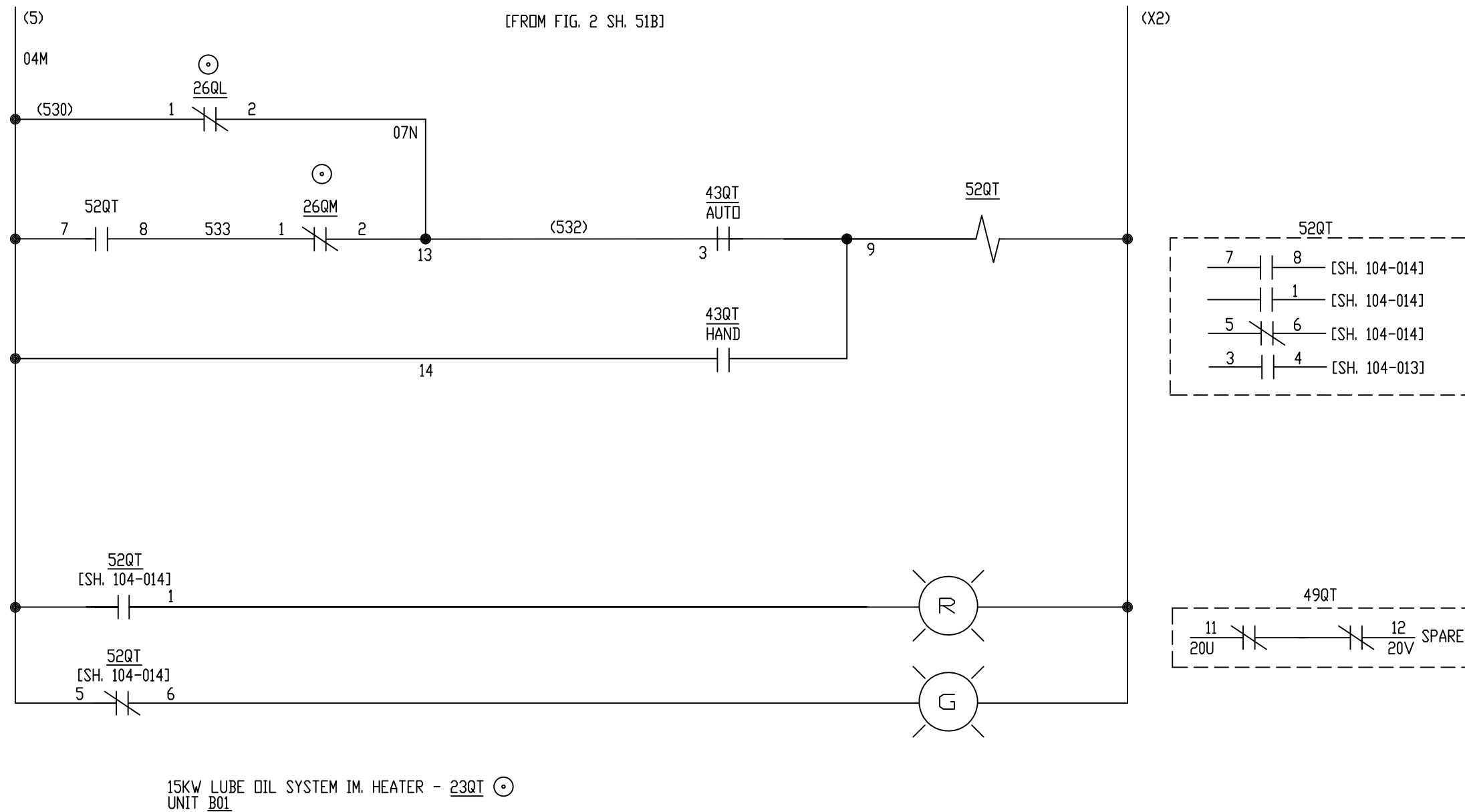
GE REF. DWG 52A



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV				

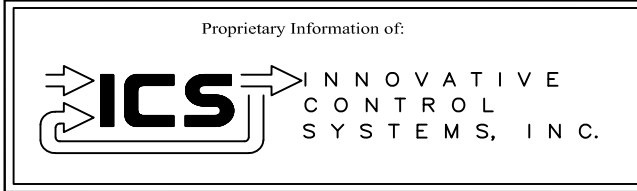
AUXILIARY LUBE OIL PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-013-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 013 7 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

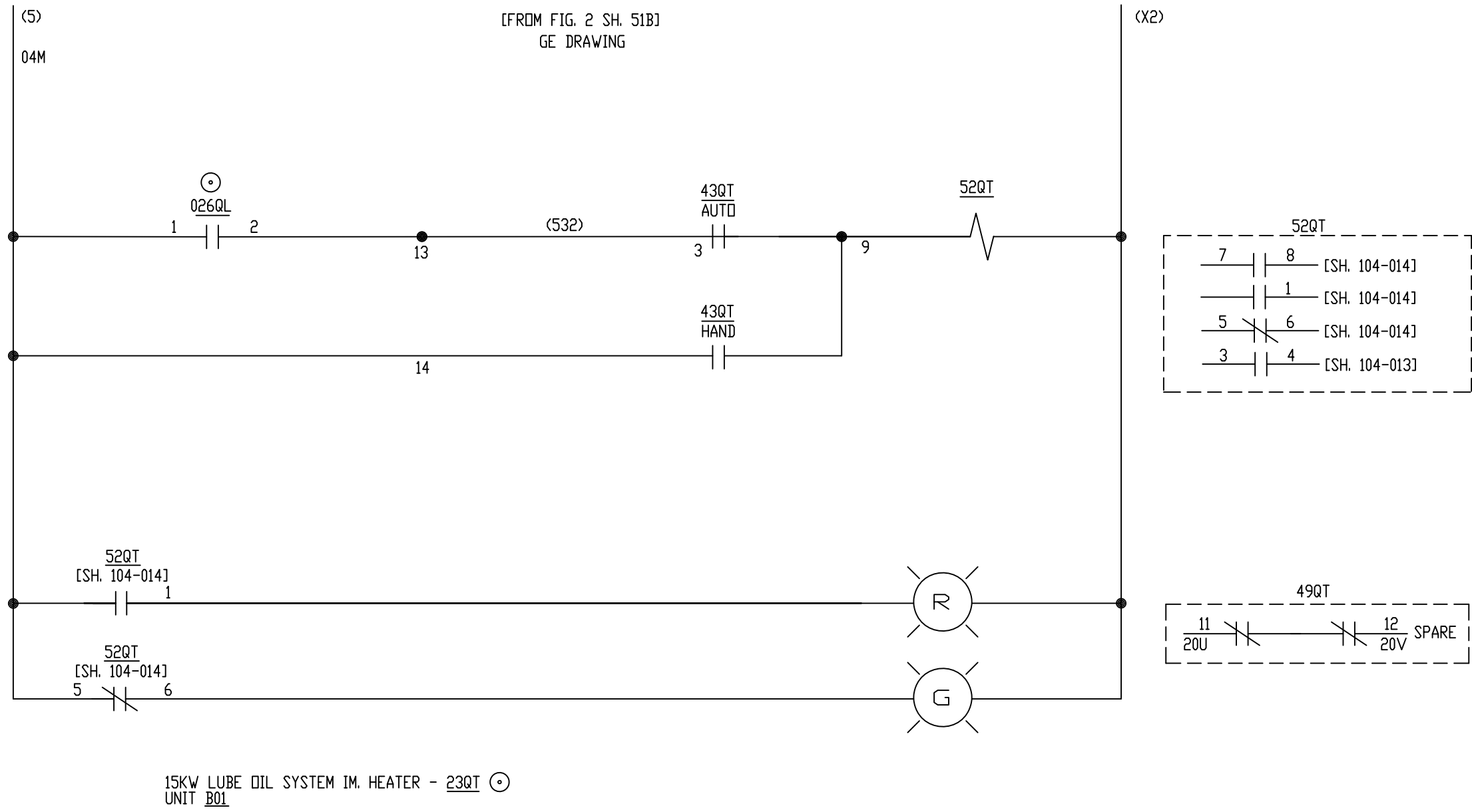
GE REF. DWG 52A



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

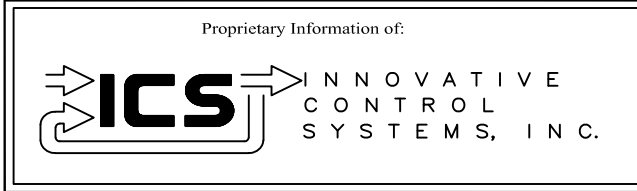
LUBE OIL SYSTEM HEATER
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-014-2	SHEET NO. 014 8 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

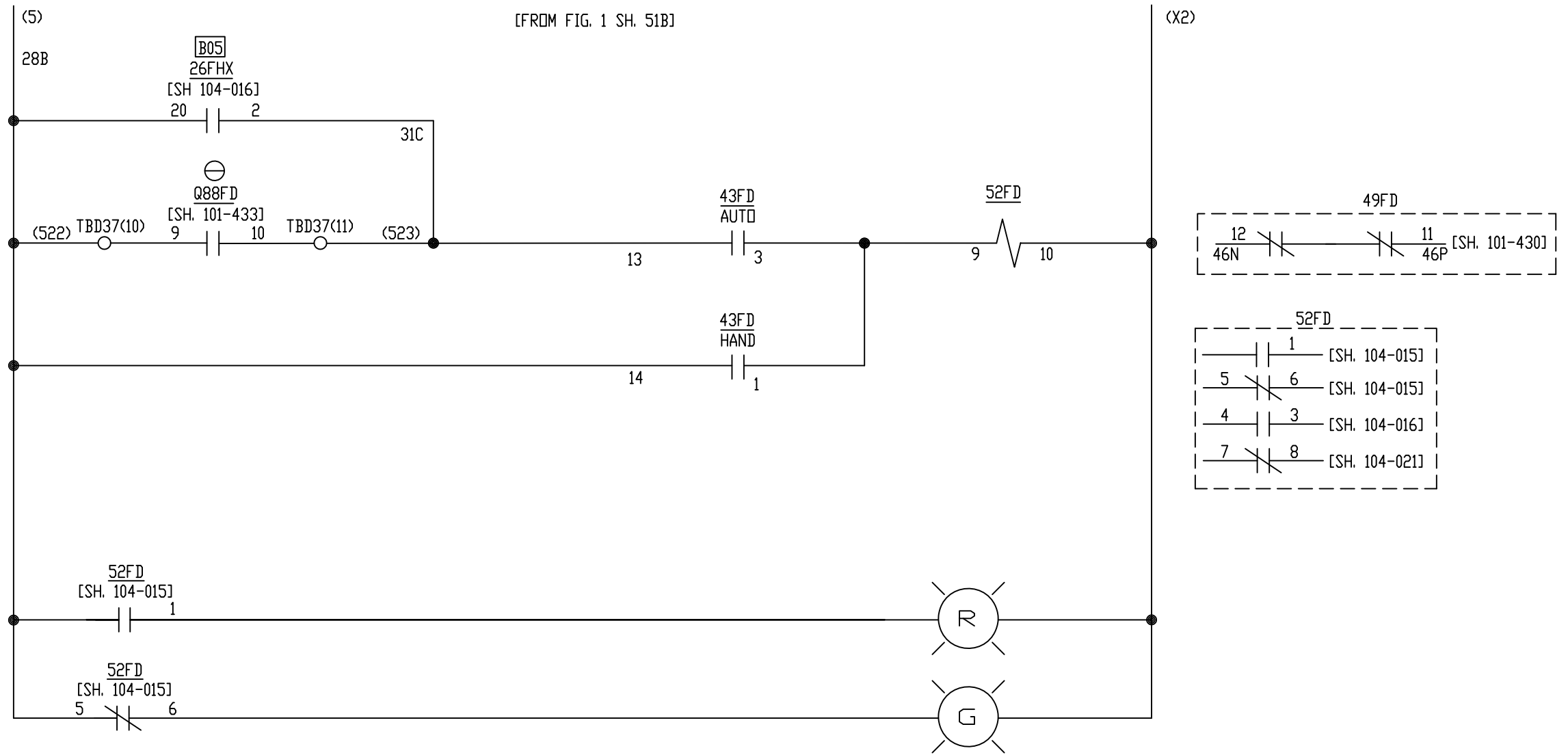
GE REF. DWG 52A



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

LUBE OIL SYSTEM HEATER
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

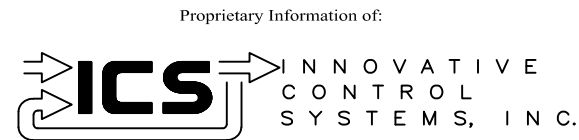
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-014-2	SHEET NO. 014 8 OF 22



5HP DISTILLATE FUEL FORWARDING PUMP - 88FD △
UNIT B03

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

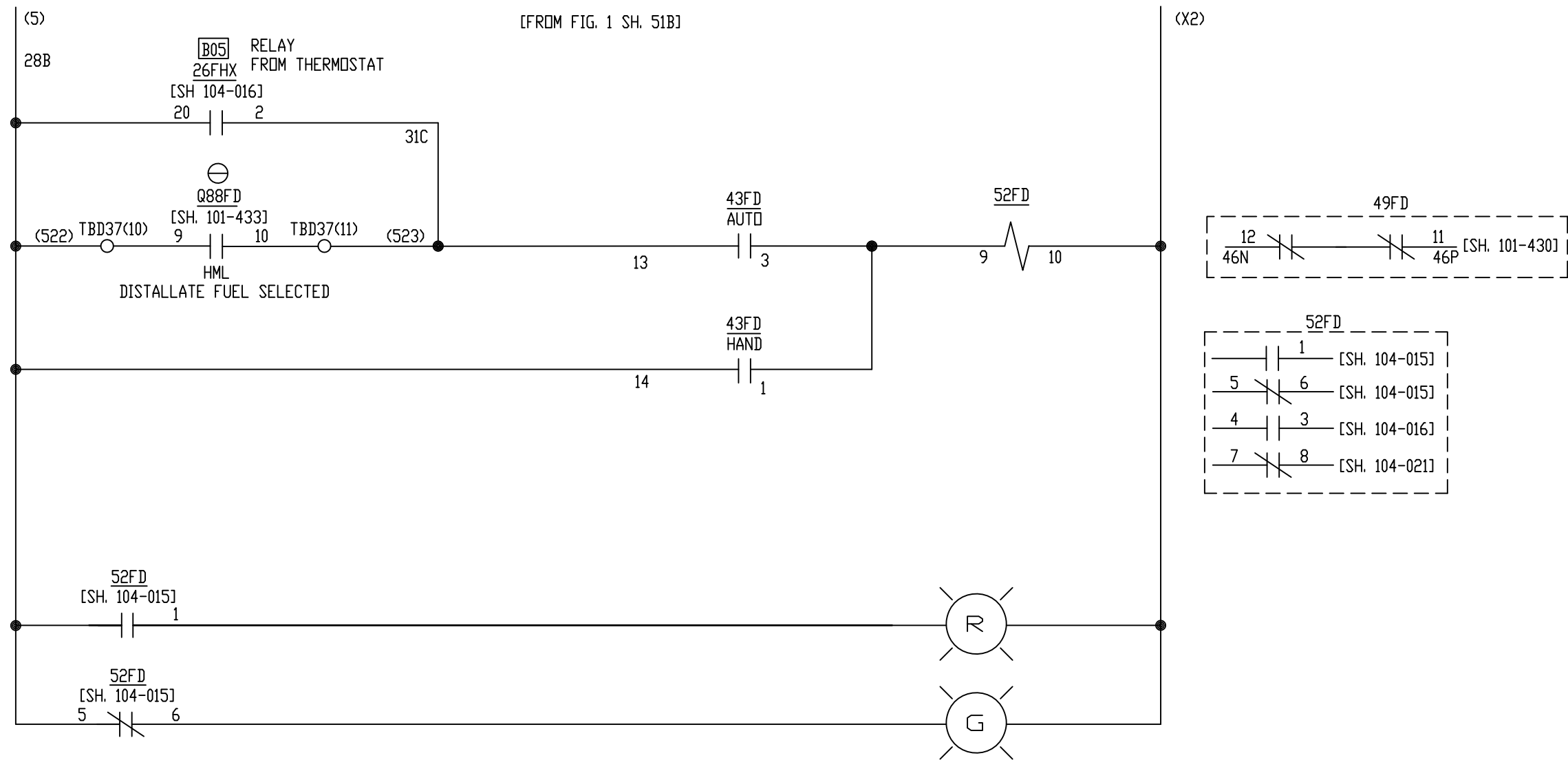
GE REF. DWG 52A



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

DISTILLATE FUEL FORWARDING PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

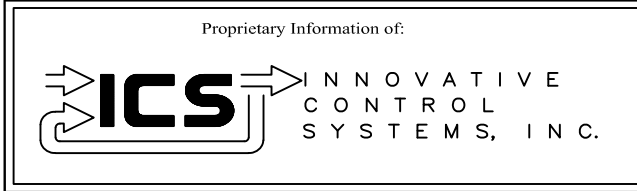
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-015-2	SHEET NO. 015 9 OF 22



5HP DISTILLATE FUEL FORWARDING PUMP - 88FD △
UNIT B03

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

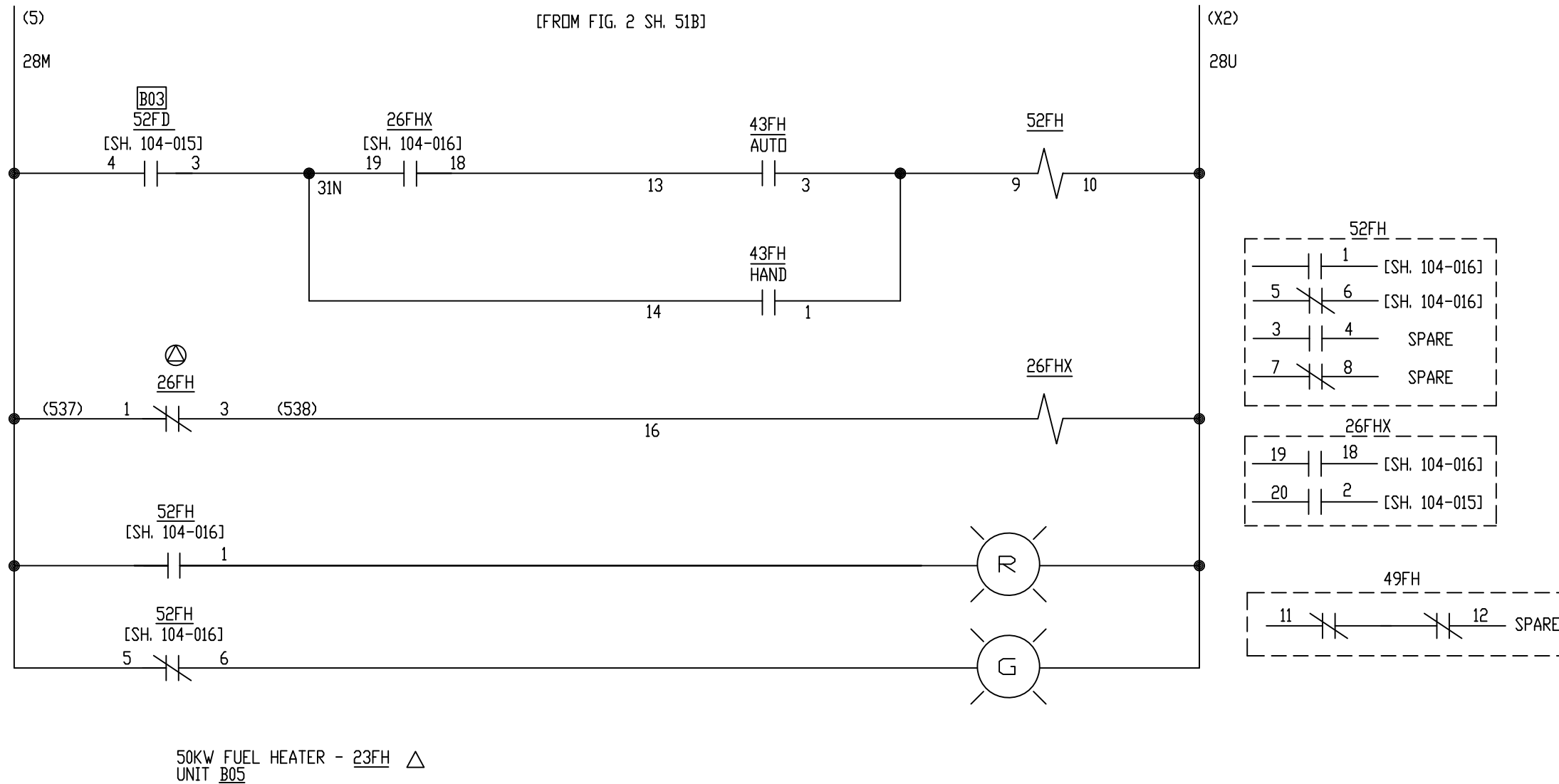
GE REF. DWG 52A



REV	DESCRIPTION:	BY	APPROVED	DATE
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REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

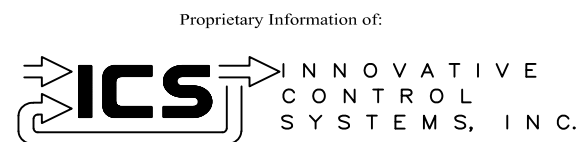
DISTILLATE FUEL FORWARDING PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-015-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 015 9 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

GE REF. DWG 52A



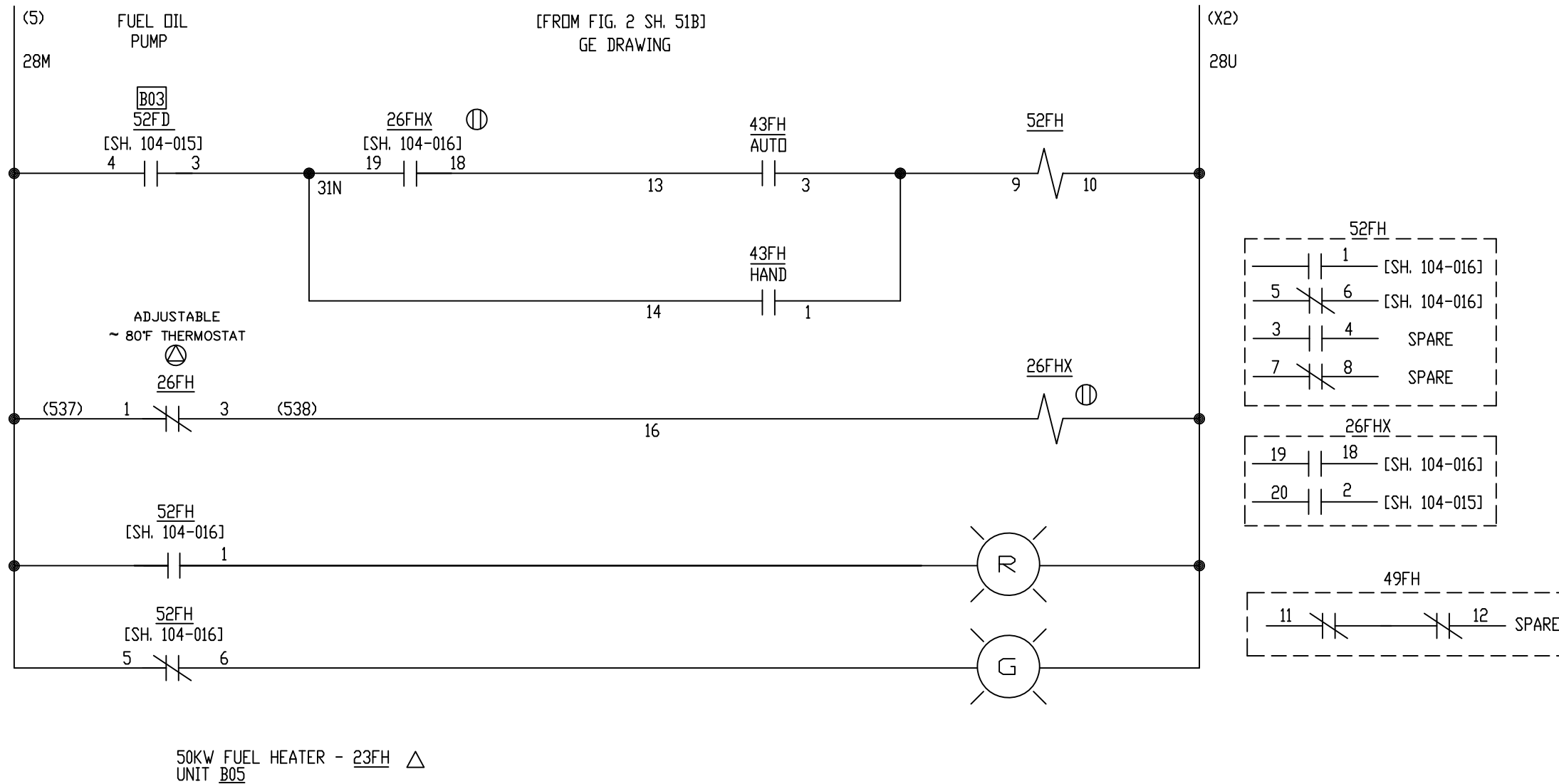
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REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

FUEL HEATER
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

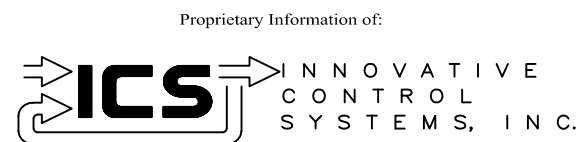
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-016-2	NTS
			SHEET NO. 016
			10 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

NOTE: 26FL: HIGH FUEL OIL TEMP
SET AT 150°F

GE REF. DWG 52A



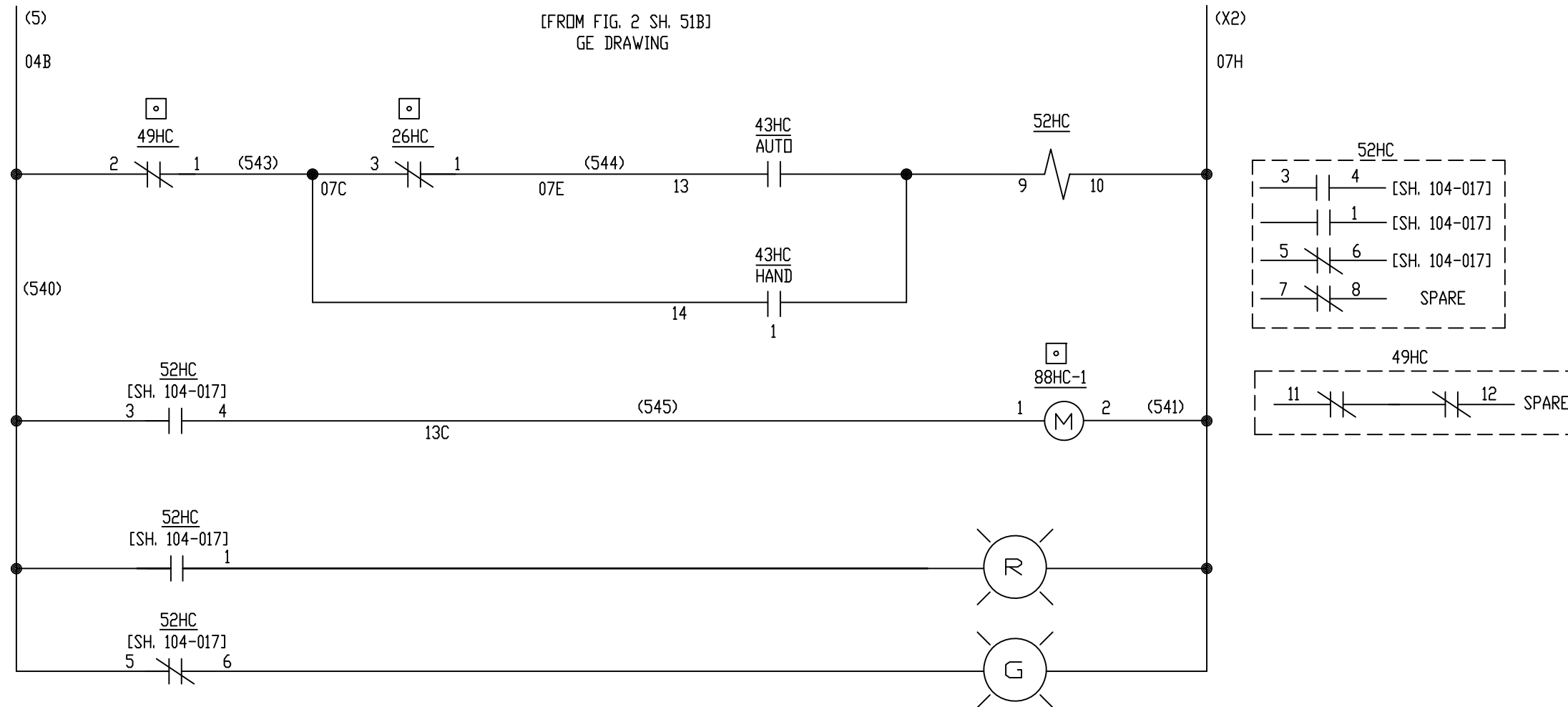
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REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

FUEL HEATER
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

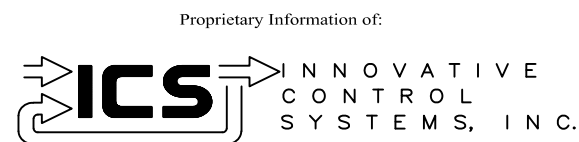
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-016-2	NTS
			SHEET NO. 016
			10 OF 22



5KW CONTROL COMPARTMENT SPACE HTR. - 23HC
UNIT A01

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

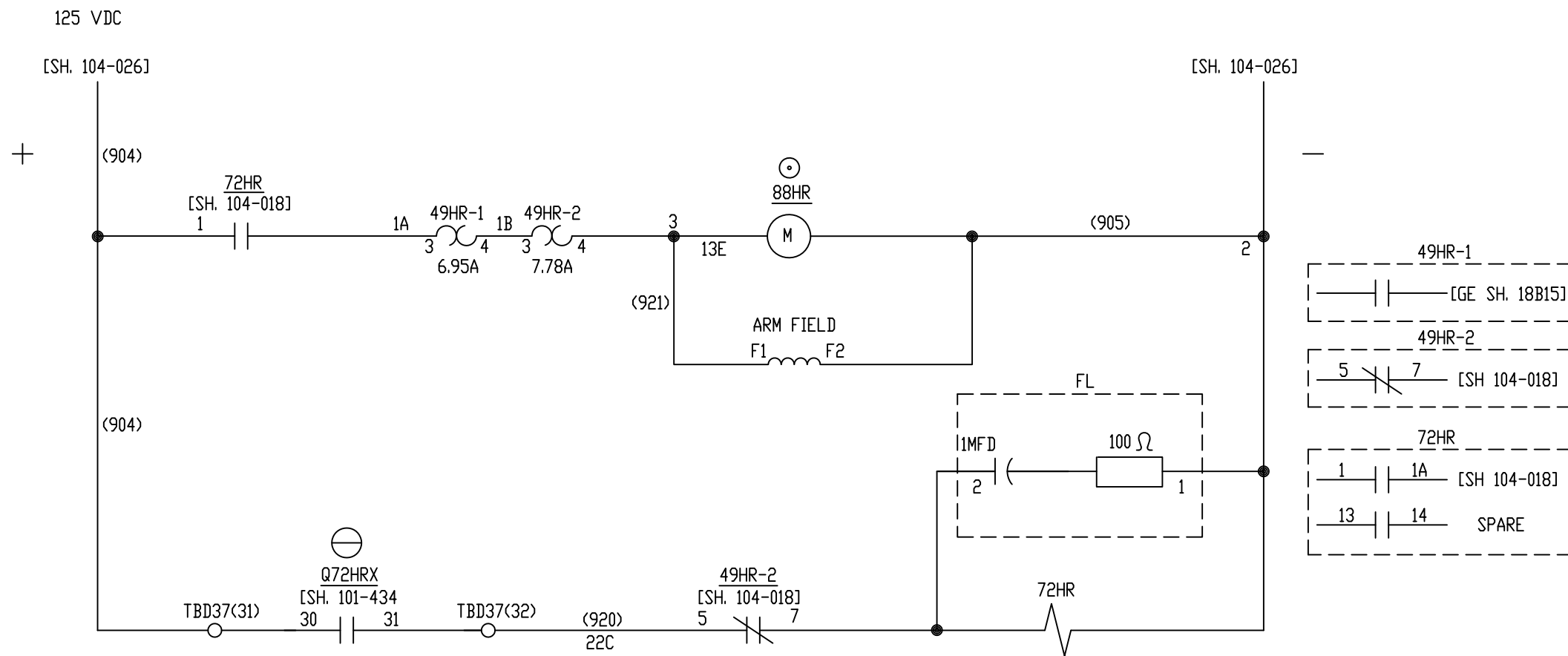
GE REF. DWG 52B



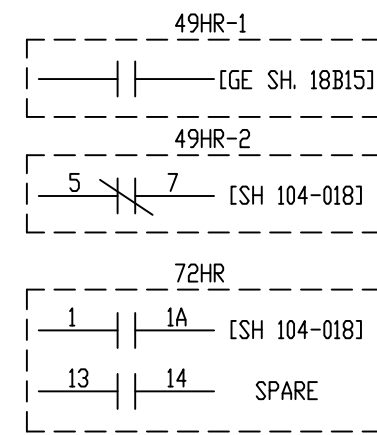
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REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CONTROL COMPARTMENT SPACE HTR.
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-017-2	SHEET NO. 017 11 OF 22

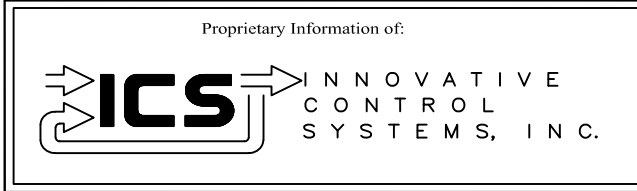


3/4HP HYDRAULIC RATCHET PUMP MOTOR - 88HR ⊕
UNIT BA2



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

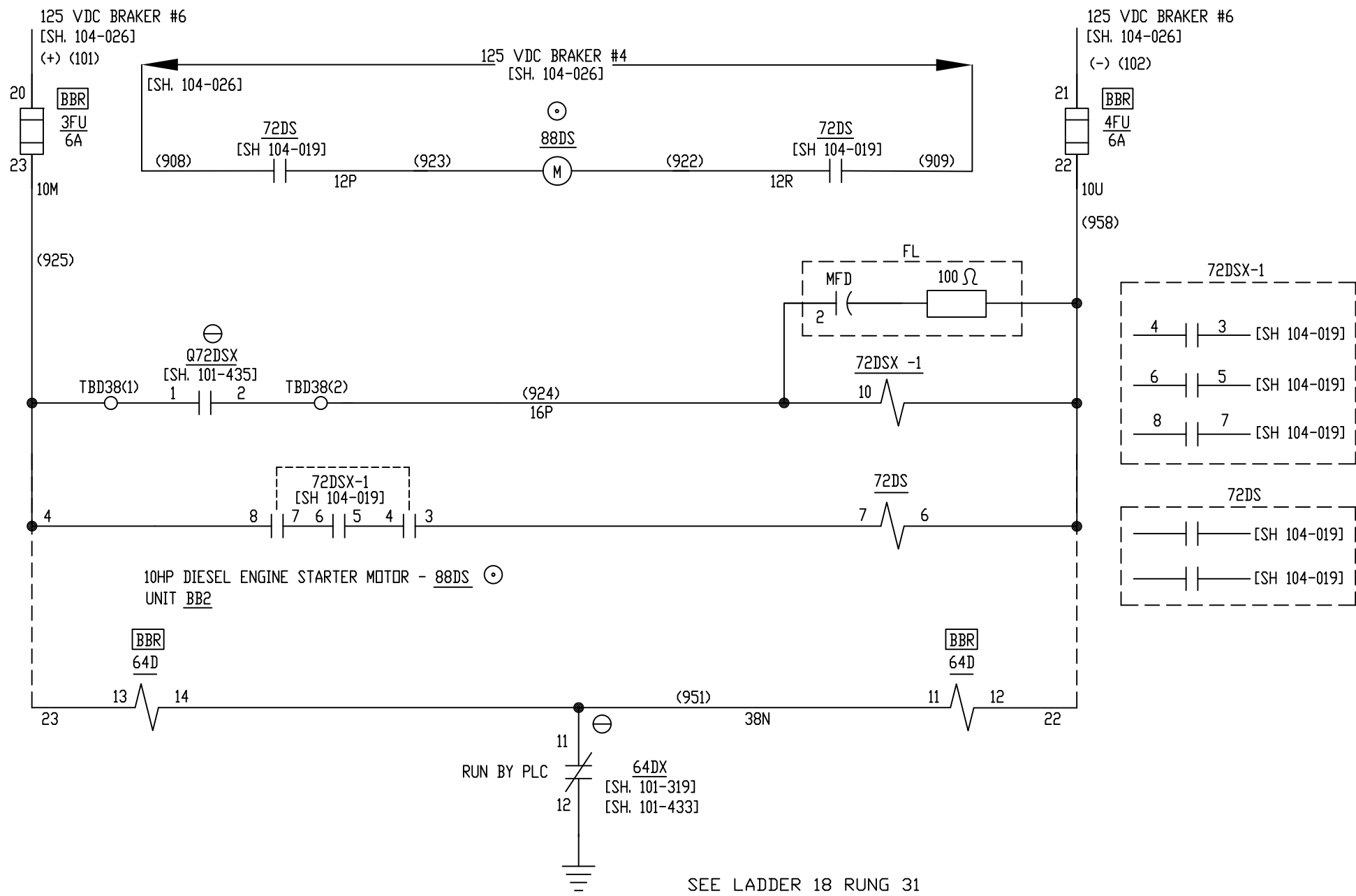
GE REF. DWG 55B



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

HYDRAULIC RATCHET PUMP MOTOR
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-018-2	SHEET NO. 018 12 OF 22



SEE LADDER 18 RUNG 31
AND
LADDER 81 RUNG 10

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

GE REF. DWG 55B

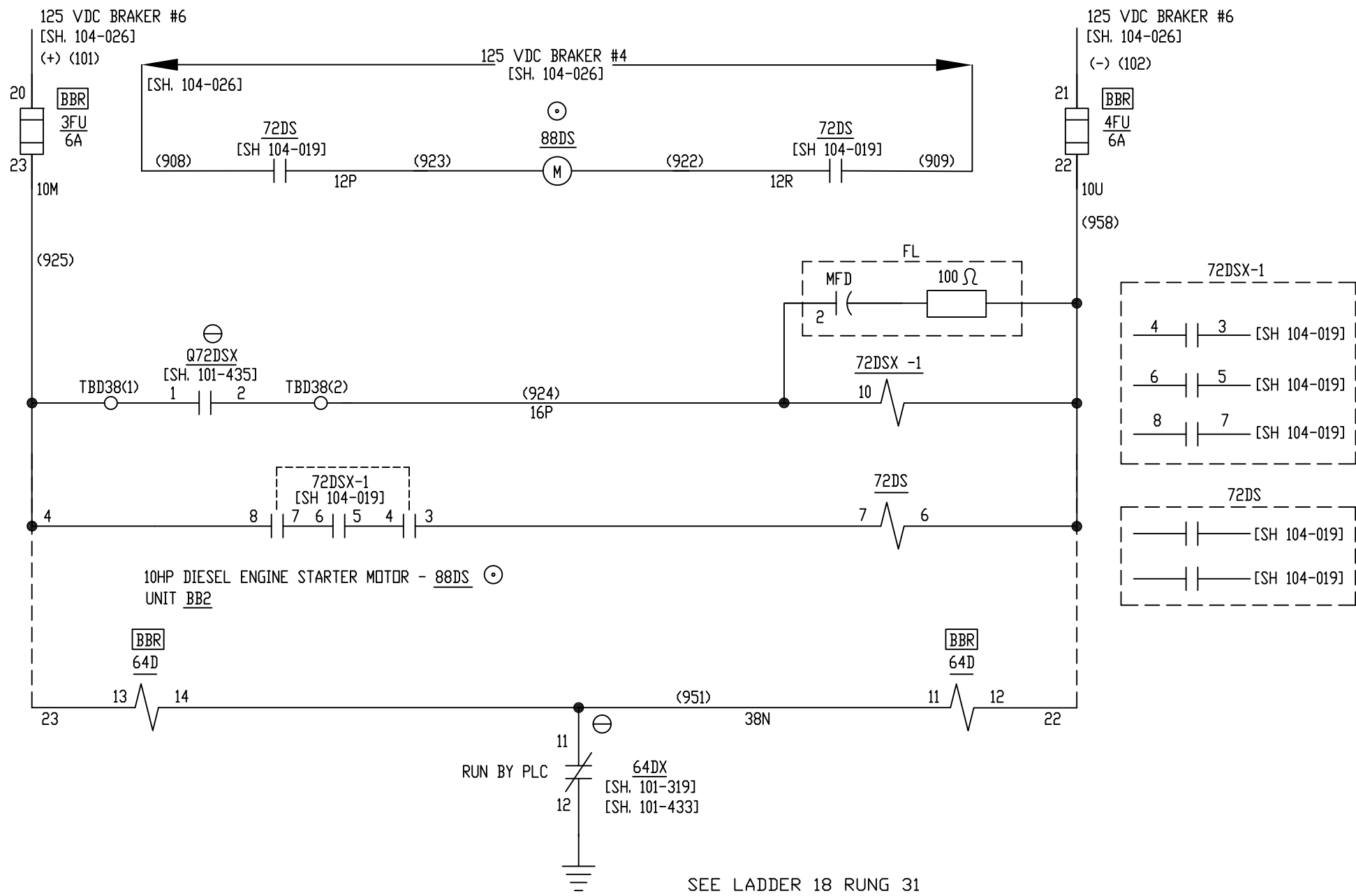
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

**DIESEL ENGINE STARTER MOTOR
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104**

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-019-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 019 13 OF 22



SEE LADDER 18 RUNG 31
AND
LADDER 81 RUNG 10

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

GE REF. DWG 55B

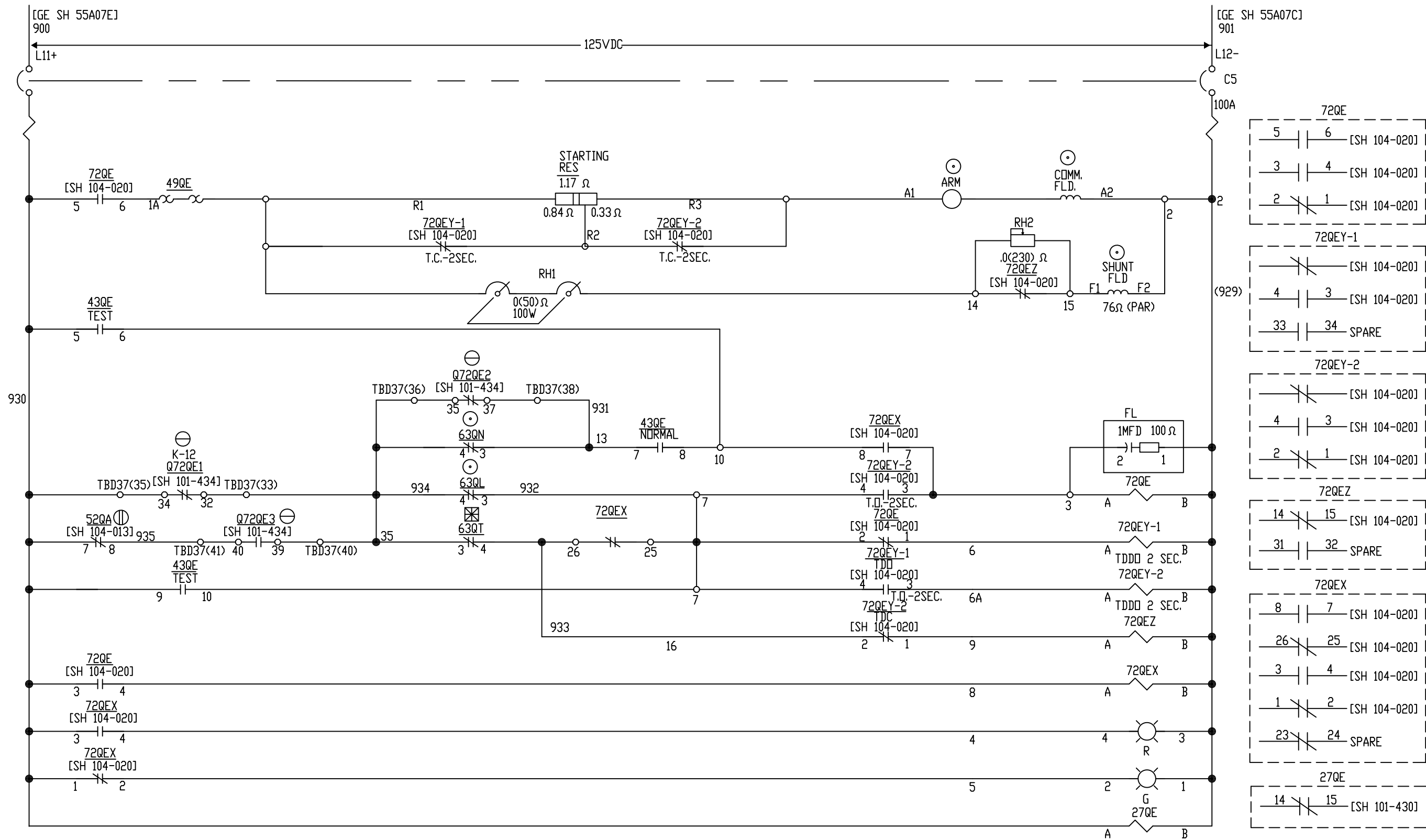
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00

**DIESEL ENGINE STARTER MOTOR
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104**

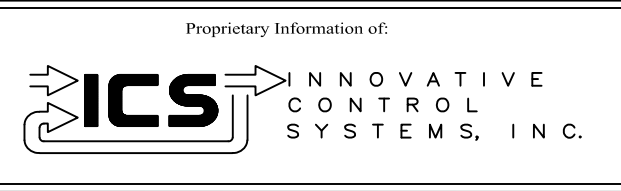
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-019-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 019 13 OF 22



SHP EMERGENCY LUBE OIL PUMP - 88QE
UNIT BA3

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

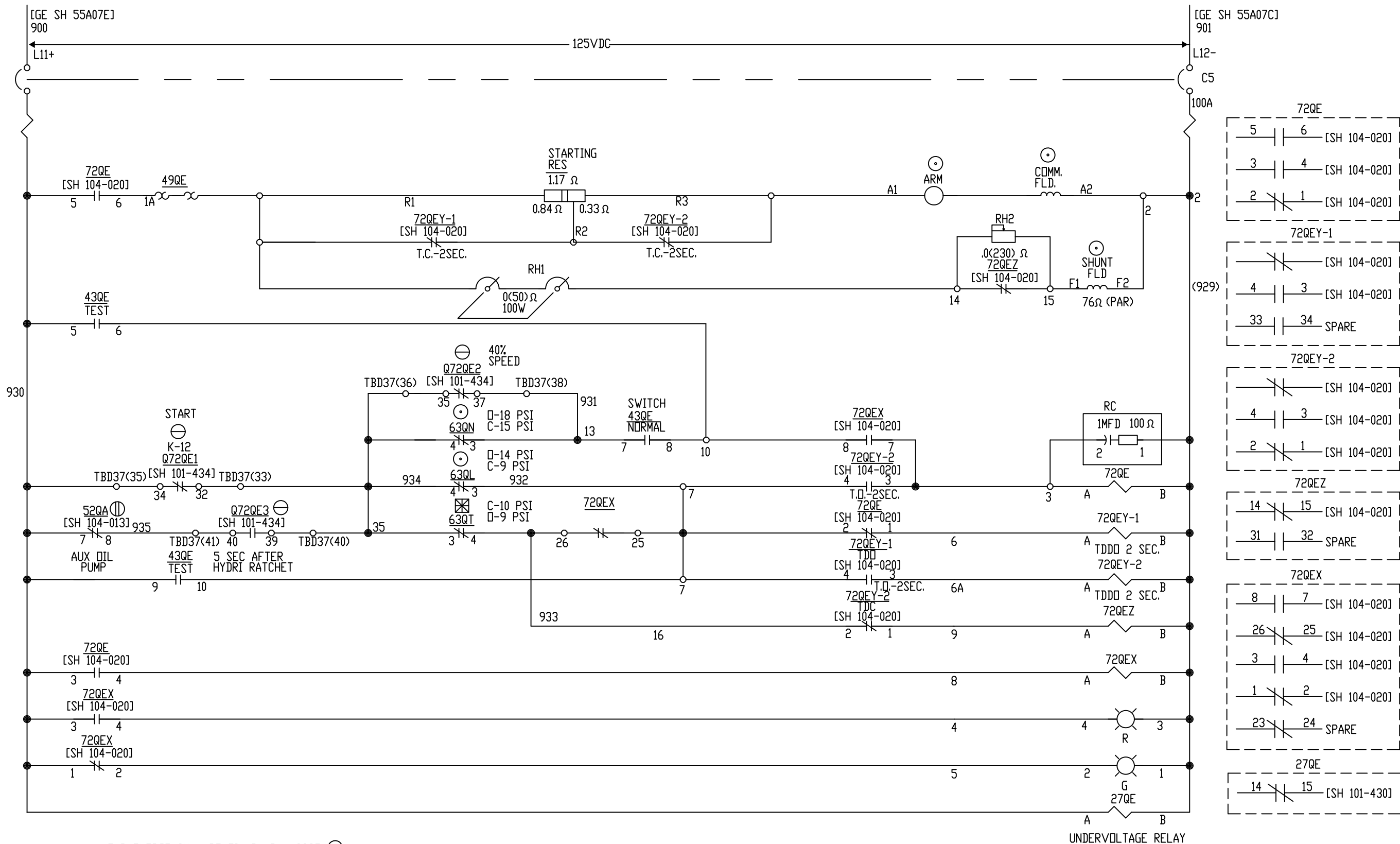
GE REF. DWG 56A



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

EMERGENCY LUBE OIL PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

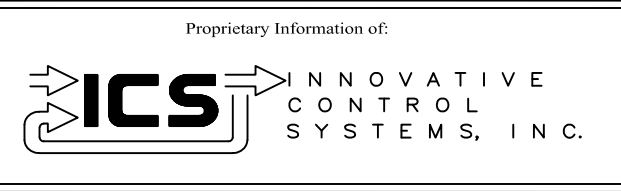
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-104-020-2	
APPROVED BY:		DRAWN BY: C. FISHER	12/30/99
		SHEET NO. 020 OF 22	



SHP EMERGENCY LUBE OIL PUMP - 88QE
UNIT BA3

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

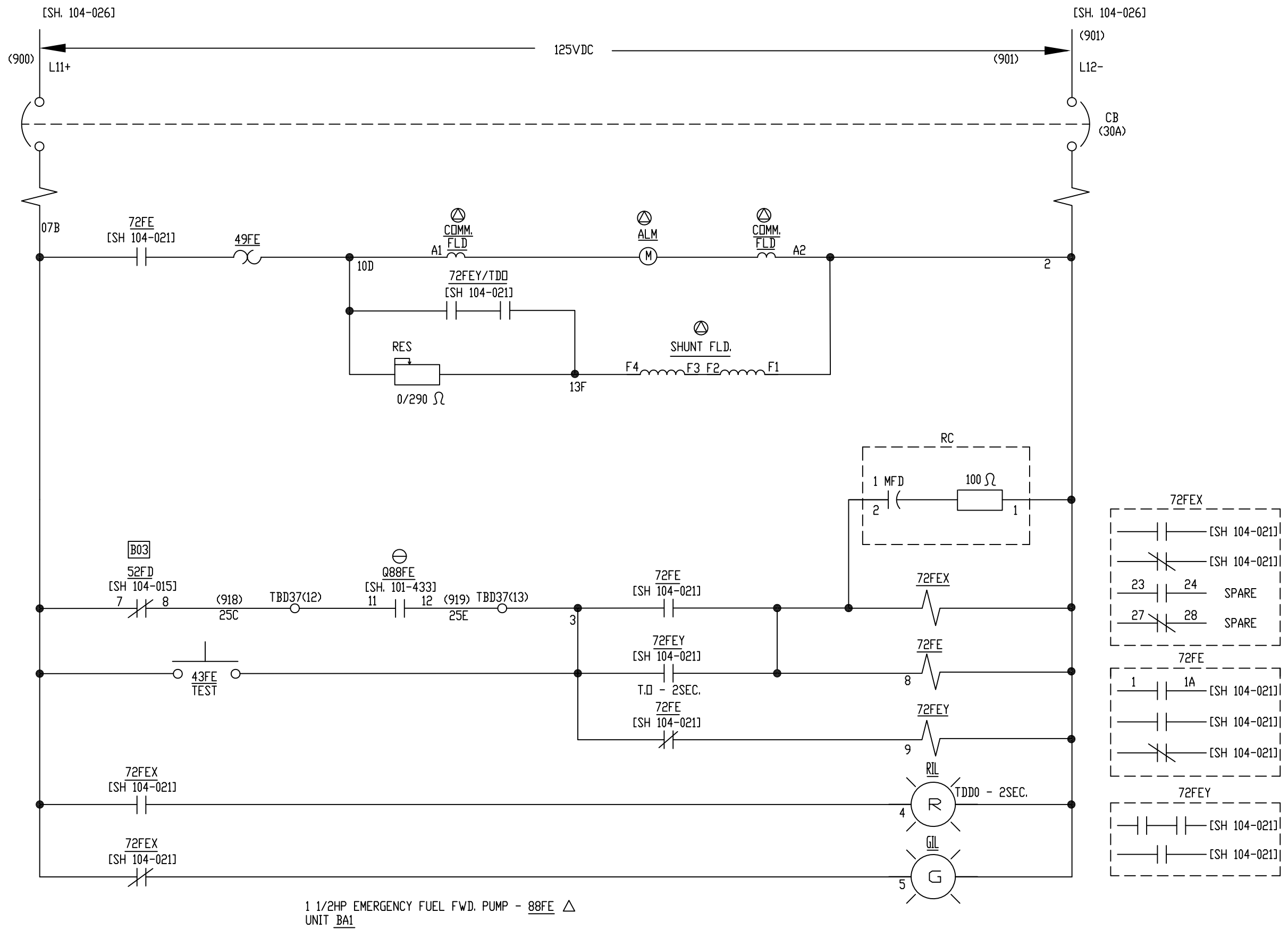
GE REF. DWG 56A



REV	DESCRIPTION:	BY	APPROVED	DATE
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REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV				

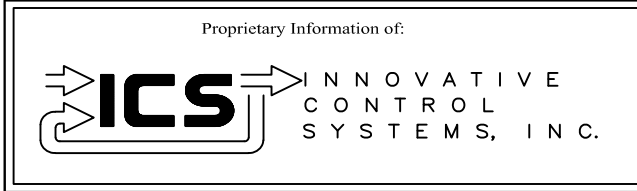
EMERGENCY LUBE OIL PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-020-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 020 14 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

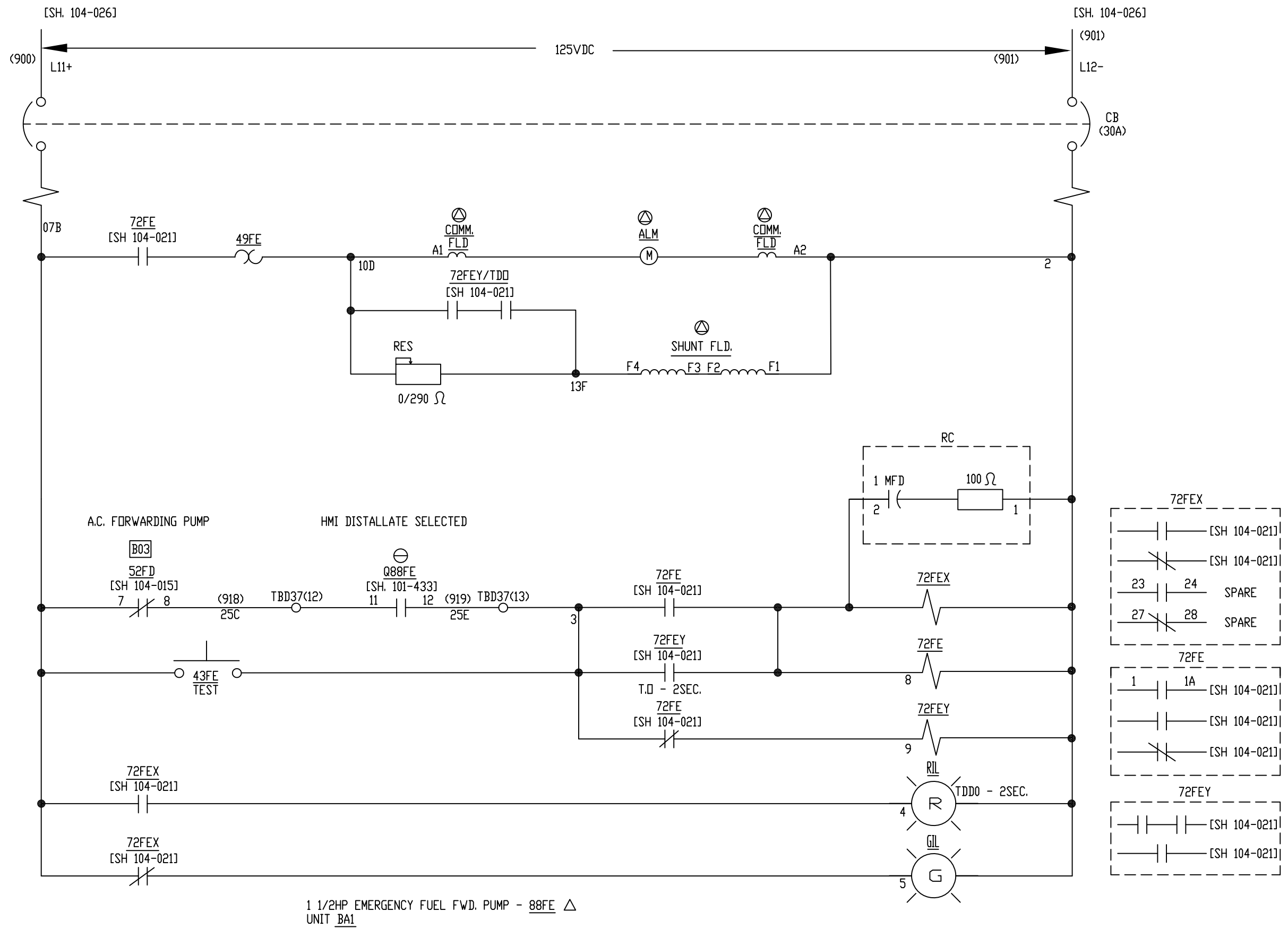
GE REF. DWG 56B



REV	DESCRIPTION:	BY	APPROVED	DATE
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REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

EMERGENCY FUEL FORWARDING PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

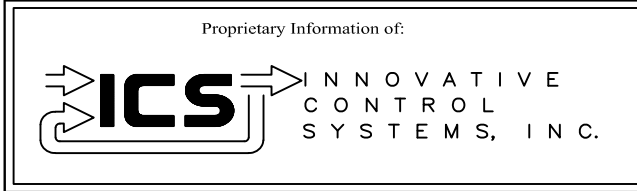
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-021-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 021 15 OF 22



1 1/2HP EMERGENCY FUEL FWD. PUMP - 88FE Δ
UNIT BA1

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

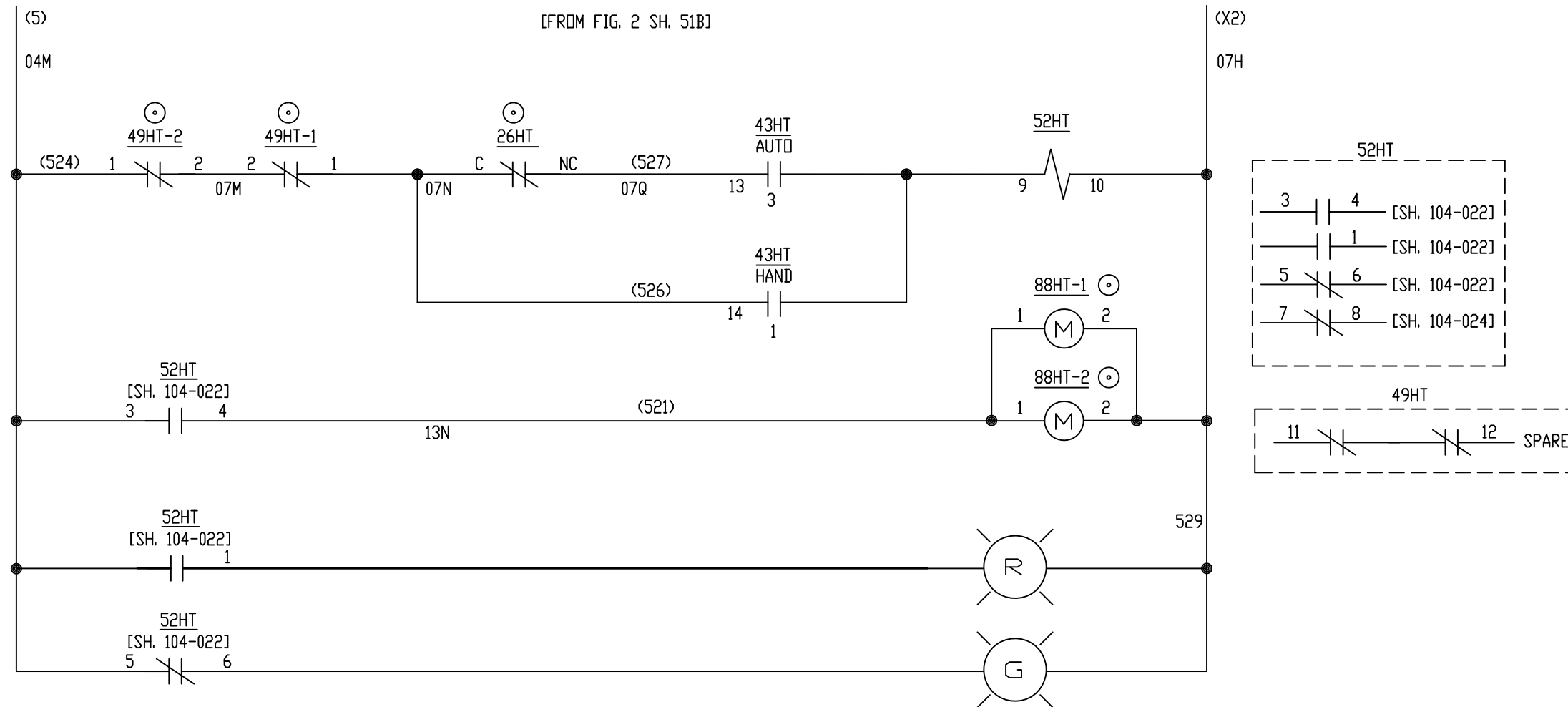
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REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV				

EMERGENCY FUEL FORWARDING PUMP
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

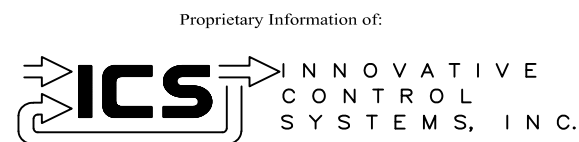
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-021-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 021 15 OF 22



10KW TURBINE COMPARTMENT SPACE HTR. - 23HT
UNIT A03

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

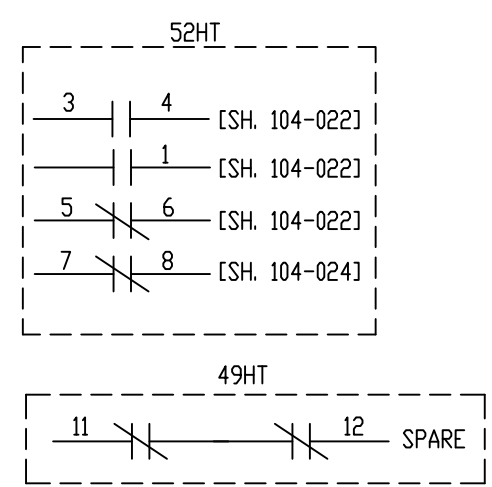
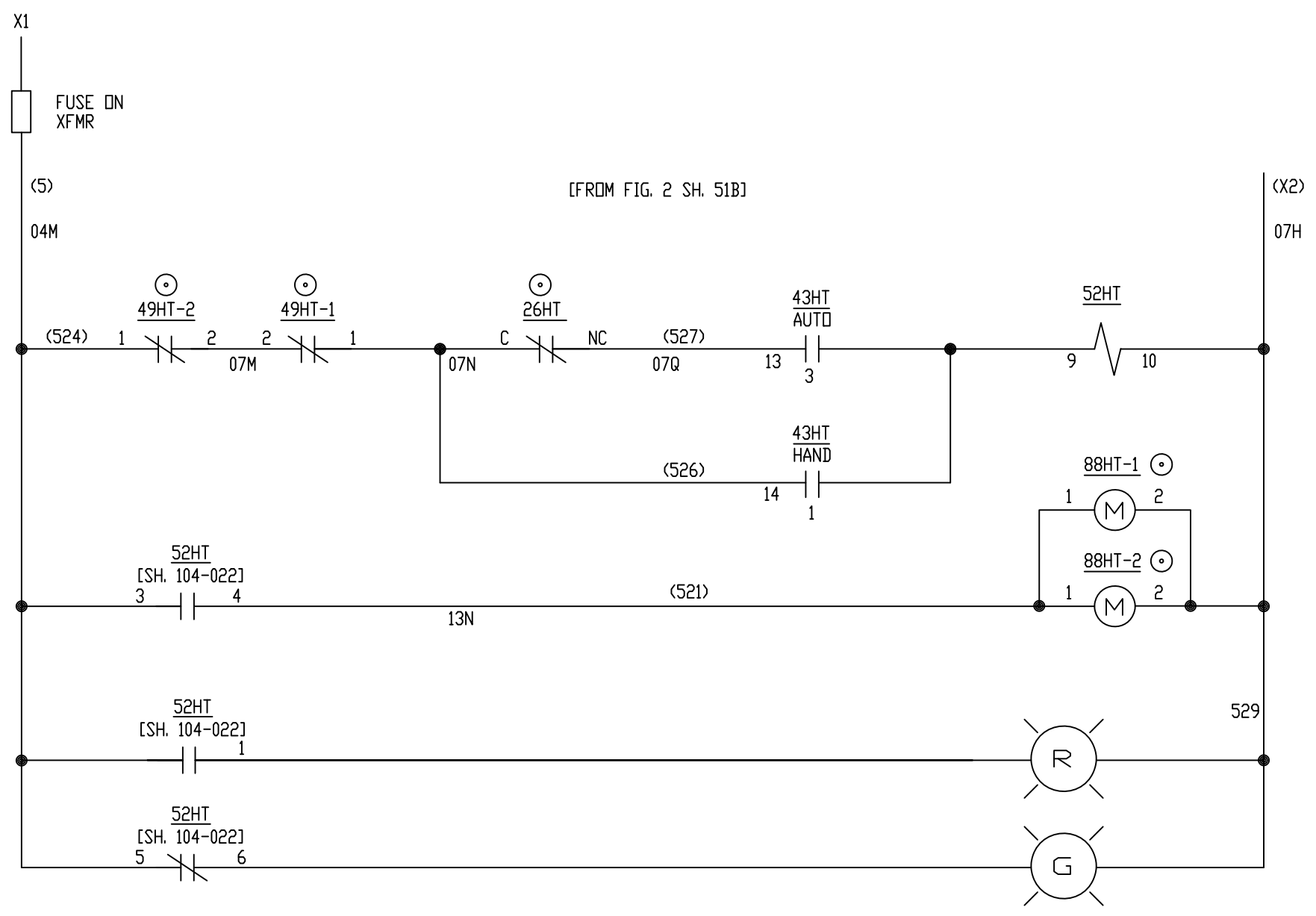
GE REF. DWG 52B



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

TURBINE COMPARTMENT SPACE HTR.
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

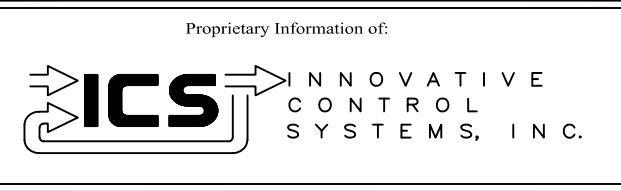
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-022-2	SHEET NO. 022 16 OF 22



10KW TURBINE COMPARTMENT SPACE HTR. - 23HT
UNIT A03

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

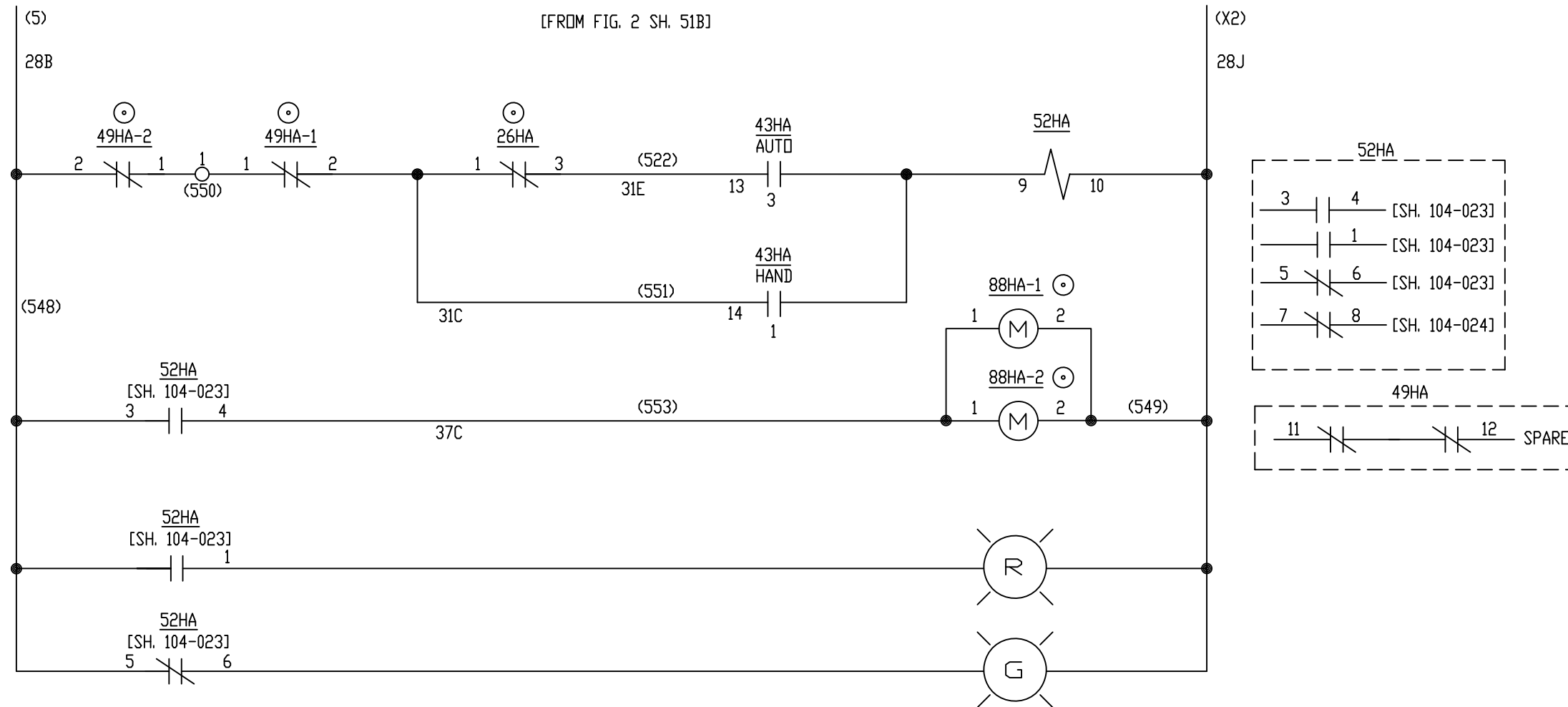
GE REF. DWG 52B



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV				

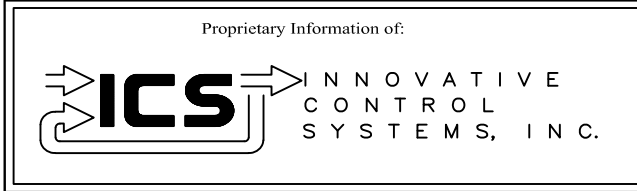
TURBINE COMPARTMENT SPACE HTR.
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-022-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 022 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

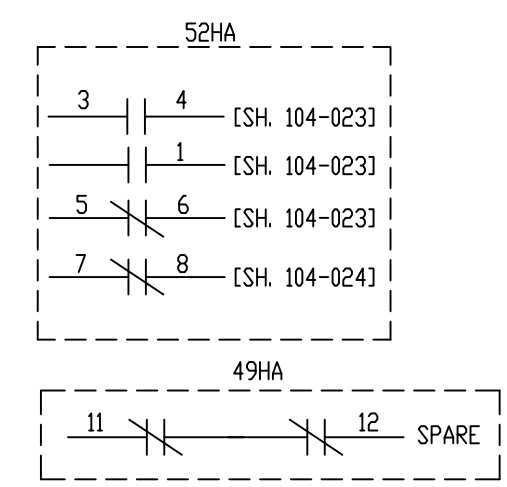
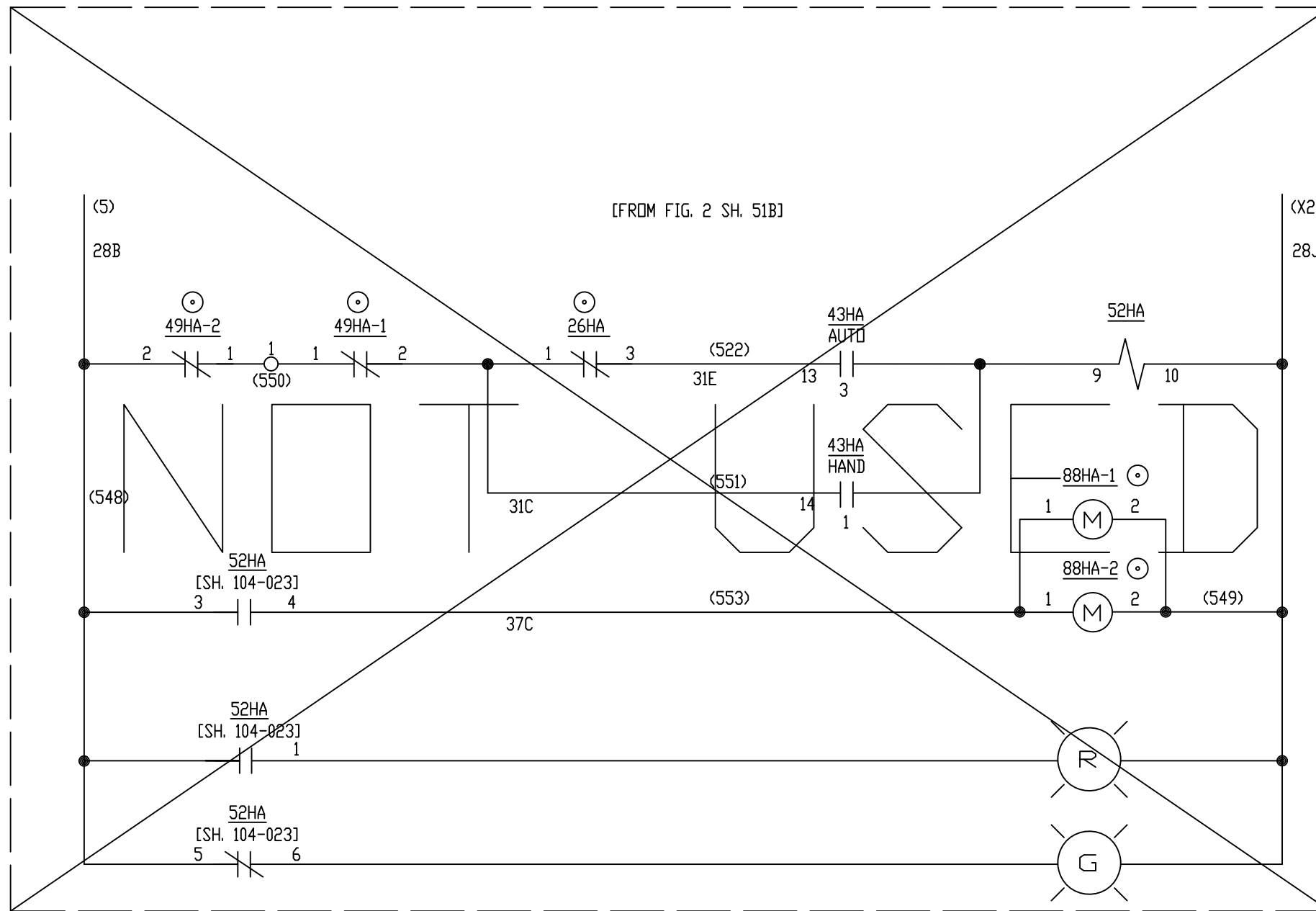
GE REF. DWG 52B



REV	DESCRIPTION:	BY	APPROVED	DATE
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REV 1	AS BUILTS:	CF		04/17/00
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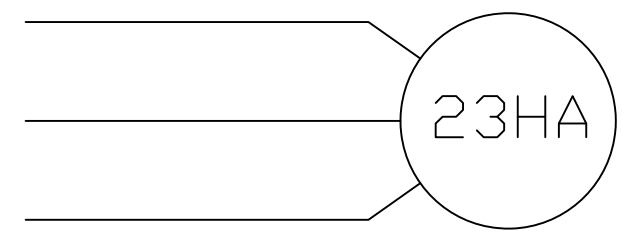
ACCESSORY COMPARTMENT SPACE HTR.
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-023-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 023 17 OF 22



10kW ACCESSORY COMPARTMENT SPACE HTR. - 23HA ☉
UNIT A02

480V
BRK 1 WEST
BRK 3 EAST



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

NOTE: NEW COMPARTMENT HEATERS HAVE BUILT-IN THERMOSTATS

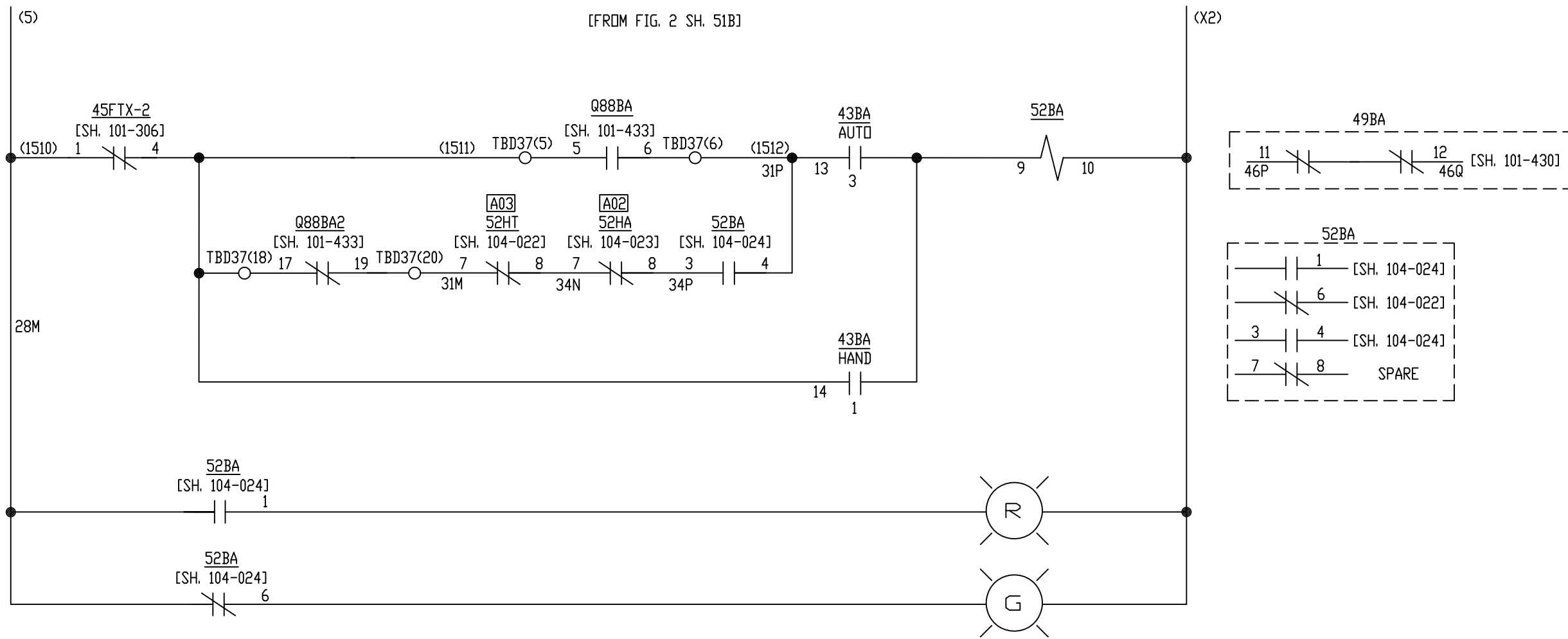
GE REF. DWG 52B

Proprietary Information of:

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV				

ACCESSORY COMPARTMENT SPACE HTR.
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

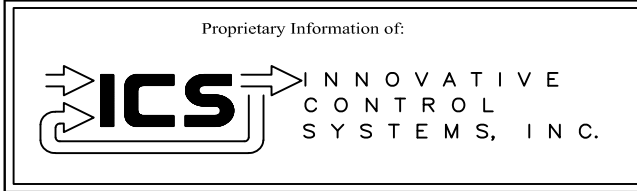
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	SCALE: NTS
DRAWN BY: C. FISHER	DRAWING NO. 99174-GTB-104-023-2
12/30/99	SHEET NO. 023 17 OF 22



7.5HP COOLING AIR FAN - 88BA
UNIT BB1

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

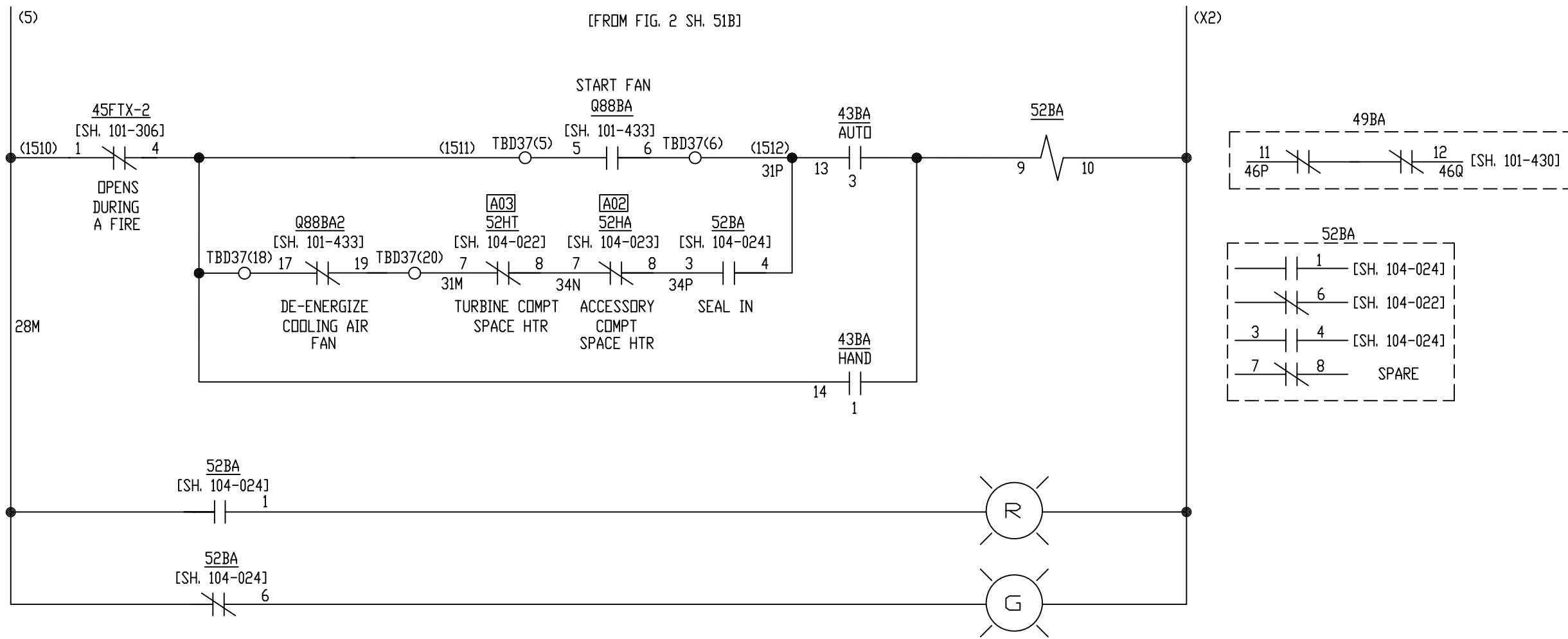
GE REF. DWG 52B



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

COOLING AIR FAN
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-104-024-2	
APPROVED BY:		DRAWN BY: C. FISHER	12/30/99
		SHEET NO. 024 18 OF 22	



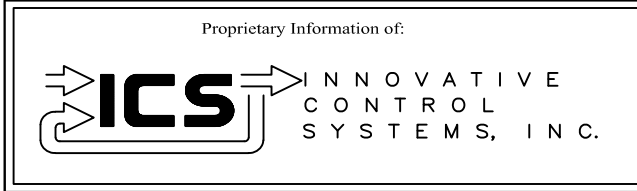
7.5HP COOLING AIR FAN - 88BA ⊖
UNIT BB1

120° F
IN TURBINE
COMPARTMENT

ZERO SPEED SHUTS OFF FAN
THERMOSTAT LOW TEMP SHUTS OFF FAN

ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

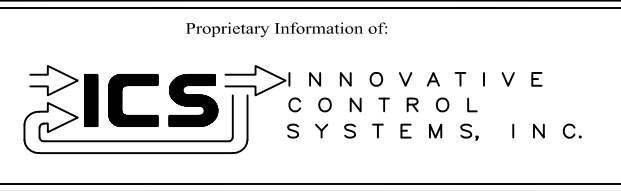
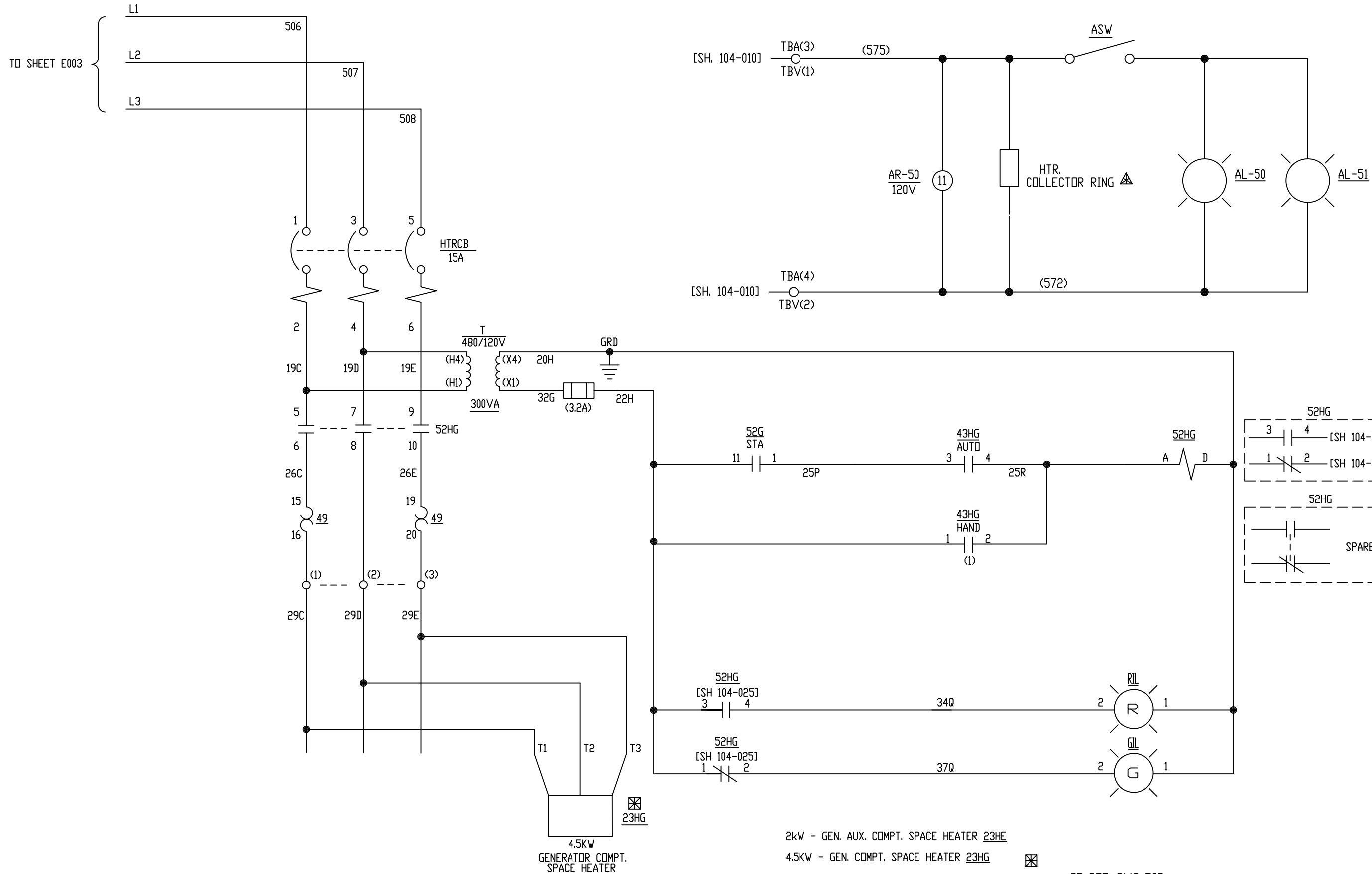
GE REF. DWG 52B LADDER 76



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

COOLING AIR FAN
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

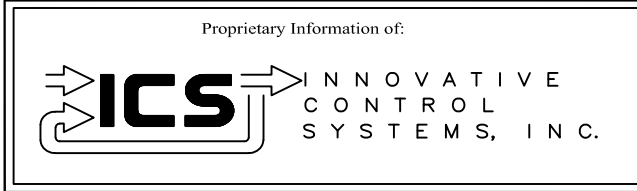
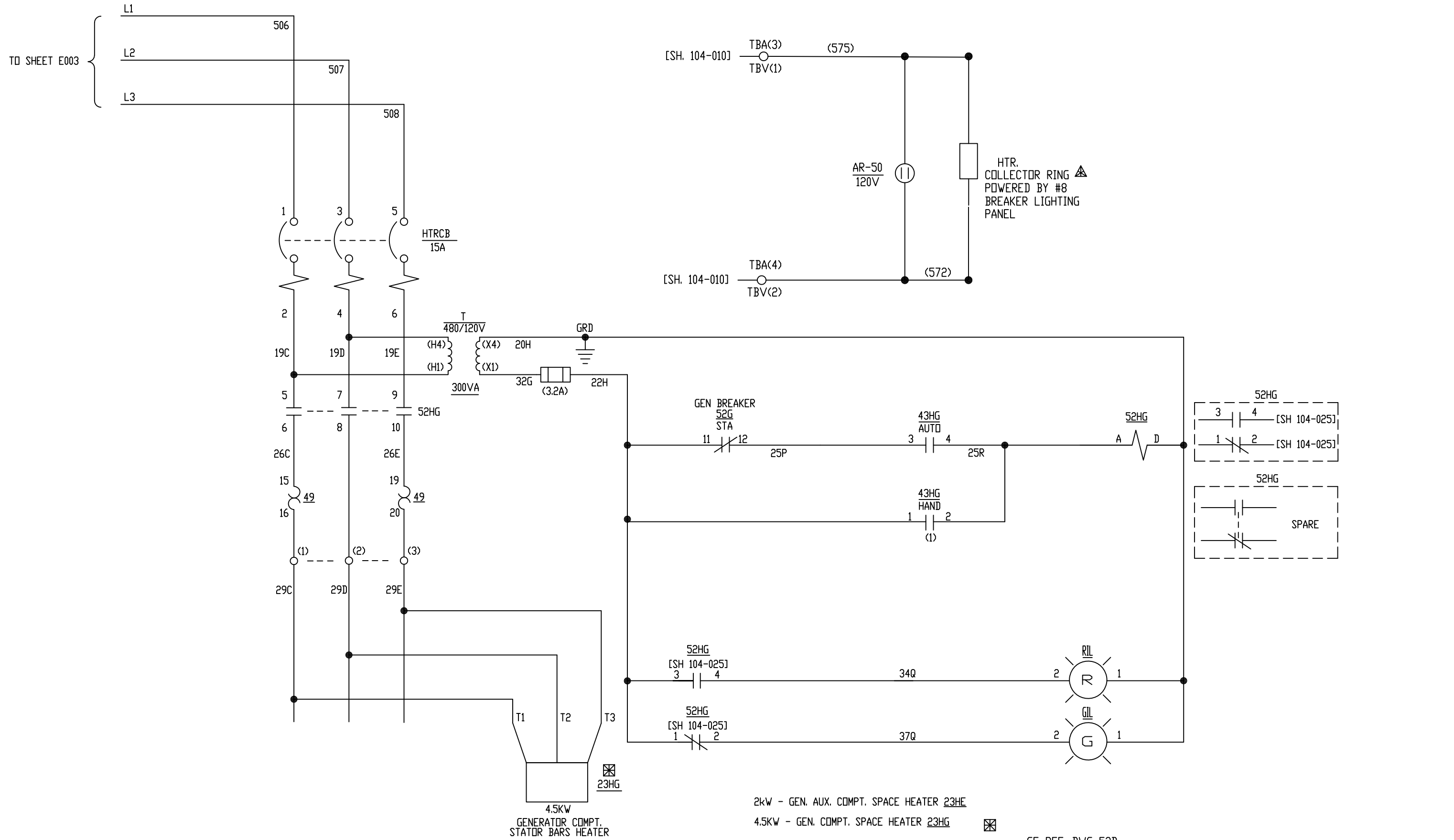
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-024-2	SHEET NO. 024 18 OF 22



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

GENERATOR AUXILIARIES COMPARTMENT
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

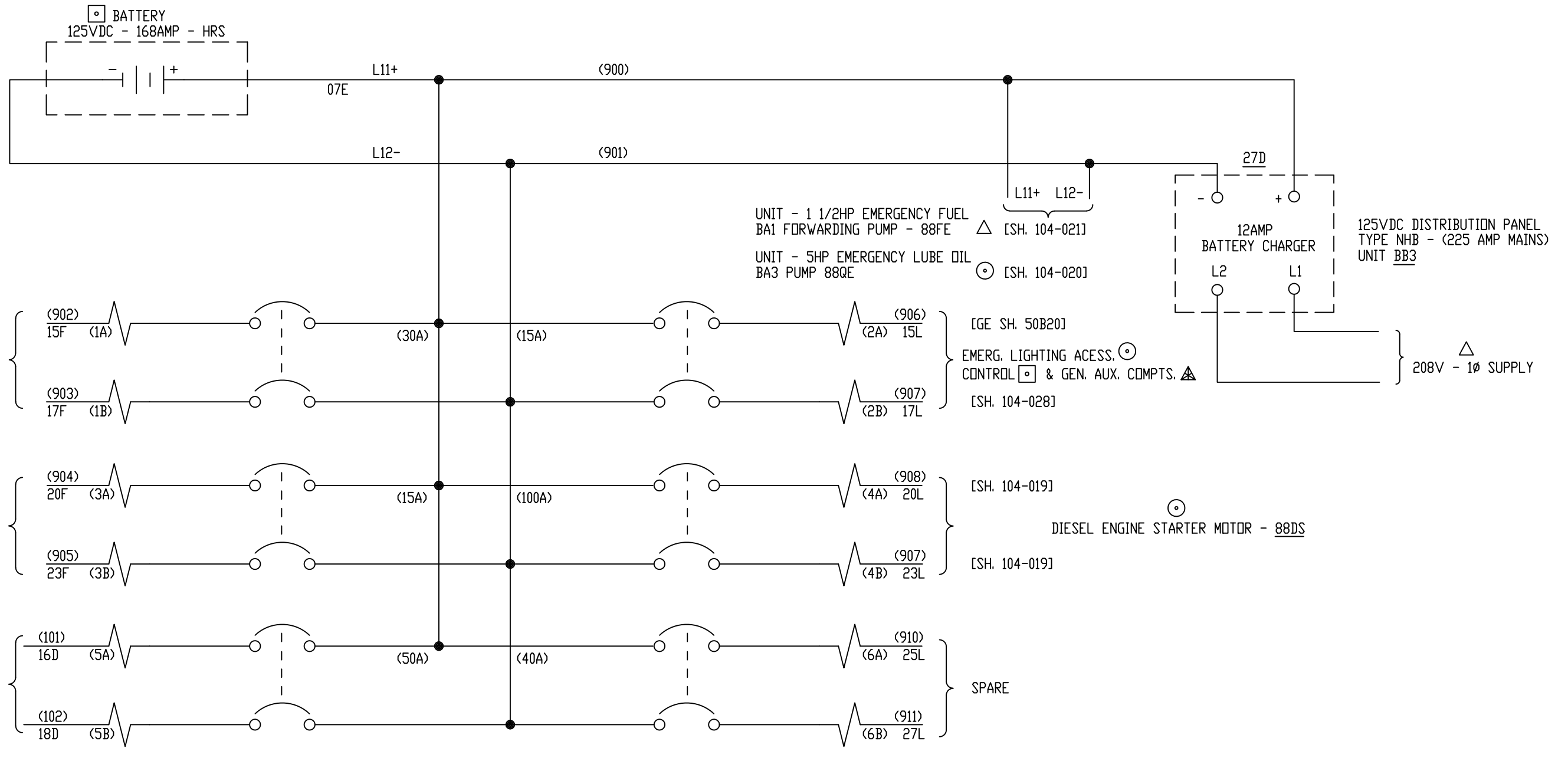
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-104-025-2	
APPROVED BY:		DRAWN BY: C. FISHER	12/30/99
		SHEET NO. 025 OF 22	



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

GENERATOR AUXILIARIES COMPARTMENT
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-025-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 025 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

GE REF. DWG 55A

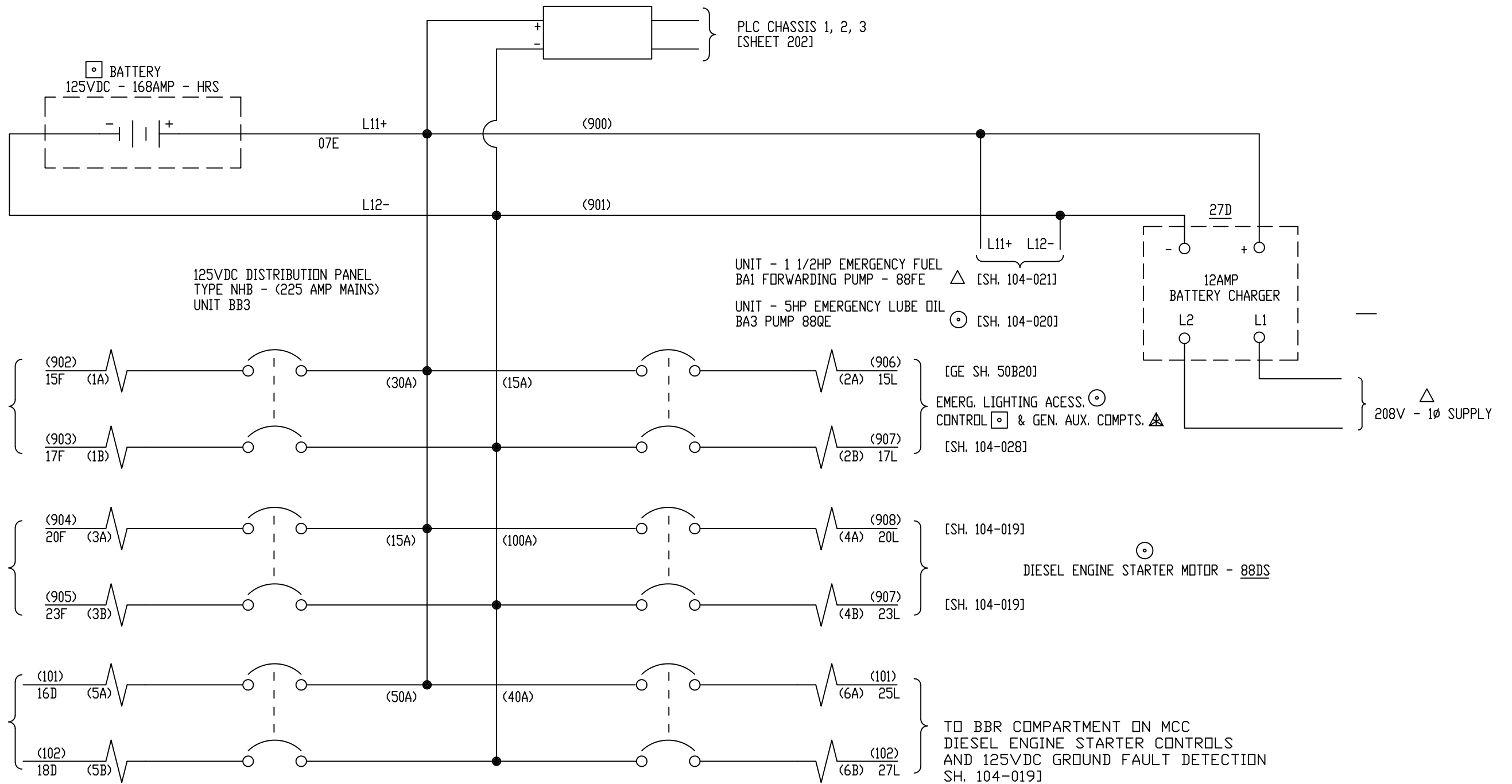
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

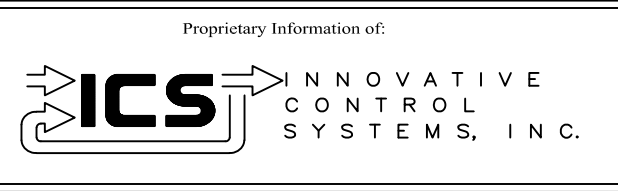
125VDC DISTRIBUTION PANEL
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-104-026-2	
APPROVED BY:		DRAWN BY: C. FISHER	12/30/99
		SHEET NO. 026 OF 22	



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

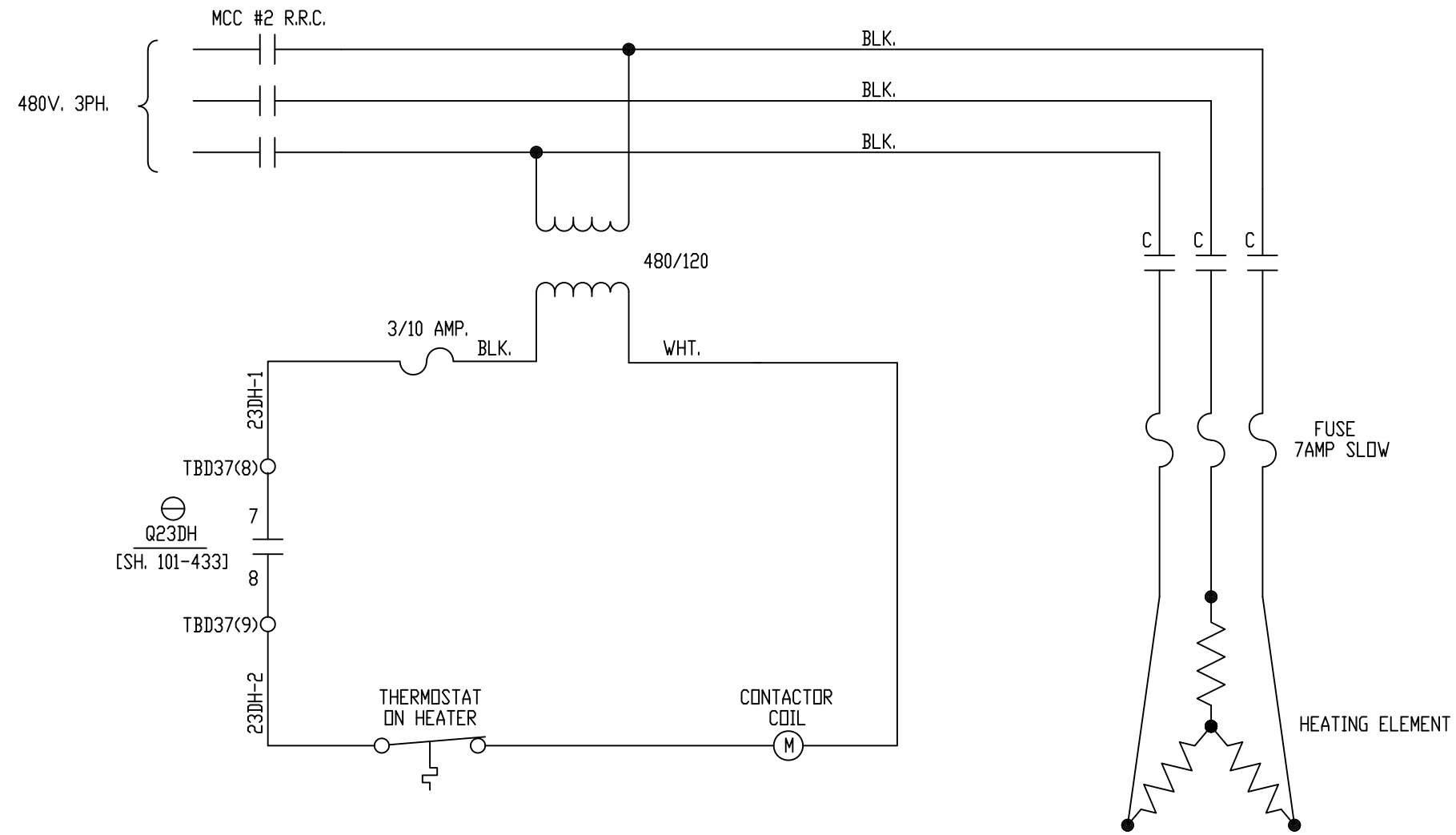
GE REF. DWG 55A



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV				

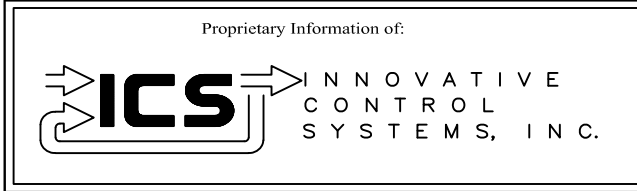
125VDC DISTRIBUTION PANEL
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-026-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 026 20 OF 22



ALL REFERENCES TO GE DRAWING
ARE TO DWG. 176B9731

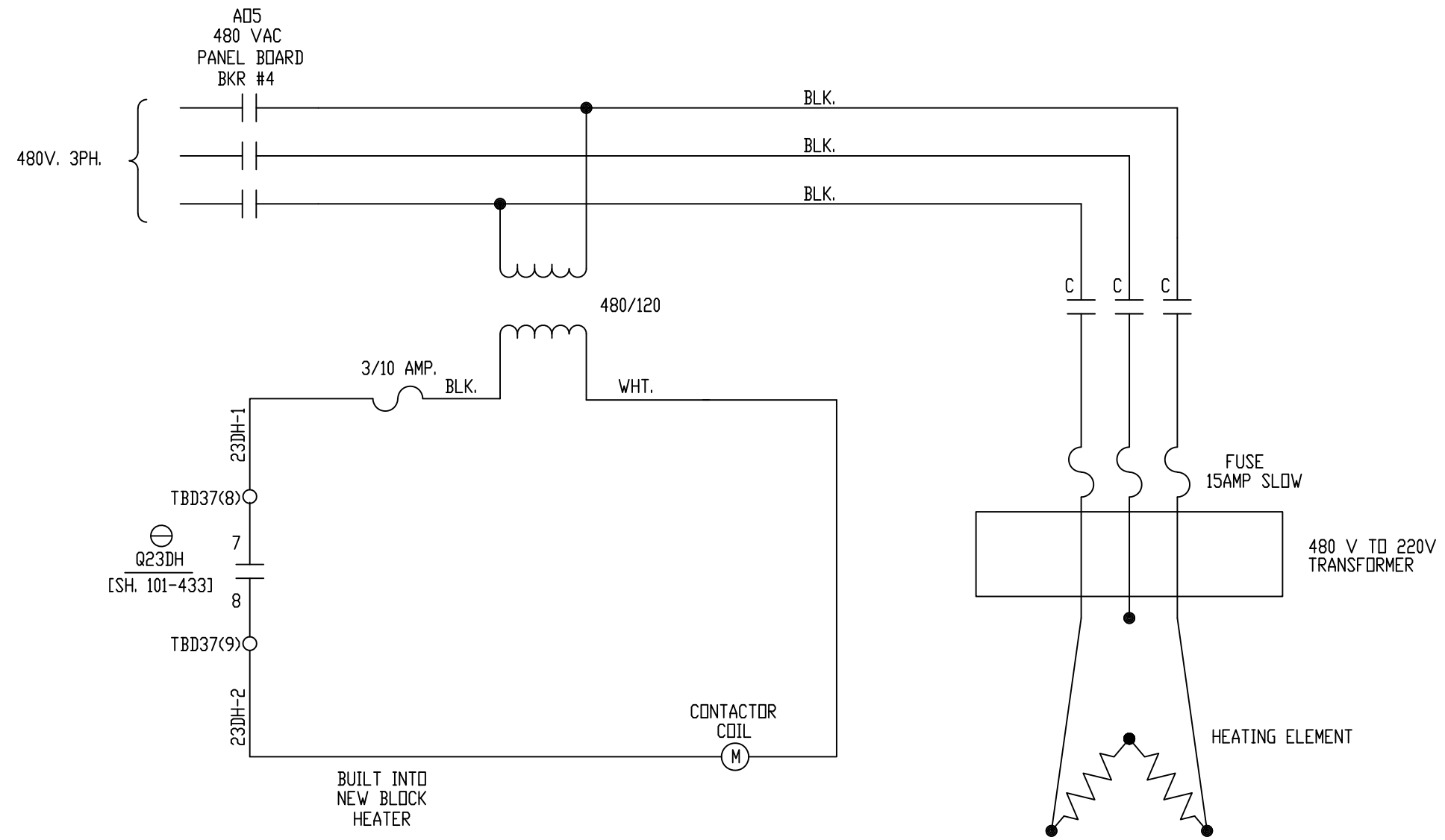
GE REF. DWG 05C



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00

WIRING-HEATER FOR GAS TURBINE DIESEL
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

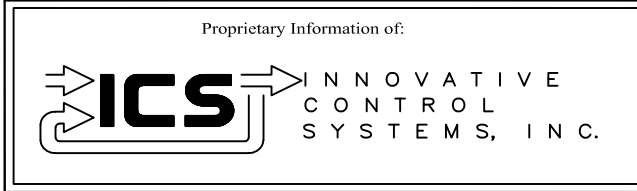
CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 99174-GTB-104-027-2		SCALE: NTS
SITE: DON HENRY POWER CENTER		APPROVED BY:	DRAWN BY: C. FISHER	SHEET NO. 027
		12/30/99		21 OF 22



NOTE: FUSES AND CONTACTOR LOCATED IN MCC PANEL BB5

ALL REFERENCES TO GE DRAWING ARE TO DWG. 176B9731

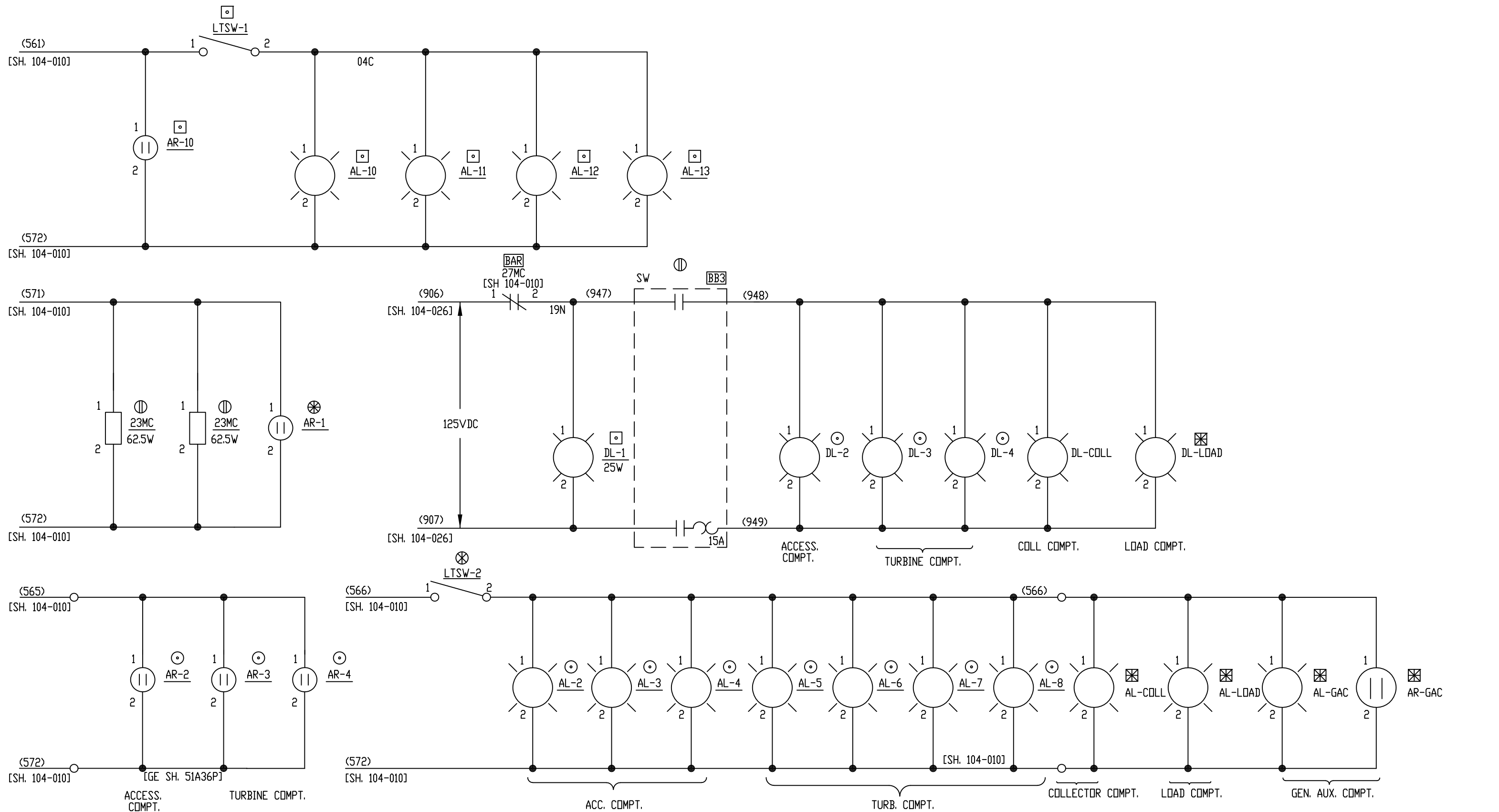
GE REF. DWG 05C



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

WIRING-HEATER FOR GAS TURBINE DIESEL MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	12/30/99	99174-GTB-104-027-2	SHEET NO. 027 21 OF 22



ALL REFERENCES TO GE DRAWING ARE TO DWG. 176B9731

GE REF. DWG 50B

Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/25/01
REV 1	AS BUILTS:	CF		04/17/00
REV	DESCRIPTION:	BY	APPROVED	DATE

LIGHTS AND RECEPICLES
MOTOR CONTROL CENTER INTERFACE
99174-GTB-104

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-104-028-2
DRAWN BY: C. FISHER	SCALE: NTS
12/30/99	SHEET NO. 028
	22 OF 22

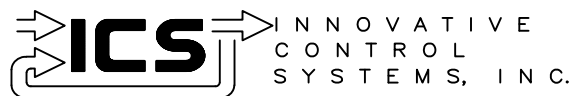
HASTINGS UTILITIES

HASTINGS, NEBRASKA

GE FRAME 5 GAS TURBINE

PIPING & INSTRUMENTATION DIAGRAM

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/22/01

TITLE SHEET
PIPING & INSTRUMENTATION DIAGRAM

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:
DRAWN BY: C. FISHER 05/30/00

DRAWING NO.

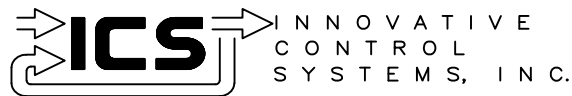
SCALE: NTS
SHEET 1 OF 16

99174-GTB-105

PIPING & INSTRUMENTATION DIAGRAM

SHEET NUMBER	GE REF. DWG	DESCRIPTION
000		TITLE SHEET
001		SHEET INDEX
100	143B603	DIAGRAM, SCHEM. PP, CONTROL OIL
101	164B1061	DIAGRAM, SCHEM. PP, FUEL OIL DISTILLATE
102	164B4249	DIAGRAM - SCHEM. PP, LUBE OIL PUMP
103	164B1060	GAS FUEL PIPING SCHEMATIC
104	164B1122	COOLING & SEALING AIR PIPING DIAGRAM
105	164B1102	DIAGRAM, SCHEM. PP, HEATING & VENTILATION

Proprietary Information of:



REV 1	AS BUILTS:	CS		01/22/01
REV	DESCRIPTION:	BY	APPROVED	DATE

INDEX SHEET
 PIPING & INSTRUMENTATION DIAGRAM
 99174-PNID-105

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	05/30/00	99174-PNID-105-001-1	SHEET NO. 001 2 OF 2

Drawing No.	Description	Packet Order
	Title Page	Sheet 1 of 16
143B2931 Sheet 1	Table of Contents and Legend	Sheet 2 of 16
143B2931 Sheet 2	Device Summary (Electrical)	Sheet 3 of 16
143B2931 Sheet 3	Device Summary (Electrical)	Sheet 4 of 16
143B2931 Sheet 4	Device Summary (Regulating & Relief Valves)	Sheet 5 of 16
164B4249	Lube Oil	Sheet 6 of 16
164B1122	Cooling and Sealing Air	Sheet 7 of 16
143B603	Control Oil	Sheet 8 of 16
164B3968	Cooling Water	Sheet 9 of 16
164B1023	Starting Means	Sheet 10 of 16
164B1060	Fuel Gas	Sheet 11 of 16
164B1061	Fuel Oil Distillate	Sheet 12 of 16
164B1067	CO2 Fire Protection	Sheet 13 of 16
164B4238	Liquid Fuel Forwarding System	Sheet 14 of 16
164B1057	Hydraulic Supply	Sheet 15 of 16
164B1102	Heating and Ventilation	Sheet 16 of 16

Legend for Description of Miscellaneous Abbreviations & Symbols Appearing on Listed Drawings	
Abbr.	Description
CEC	Additional Contact
	Normally Closed
	Electrically Common
CES	Additional Contact
	Normally Closed
	Electrically Separate
LVDT	Linear Variable Differential
	Transformer (Position Transmitter)
NC	Normally Closed
ND	Normally Disengaged
NO	Normally Open
NR	Normally Retracted
OEC	Additional Contact
	Normally Open
	Electrically Common
OES	Additional Contact
	Normally Open
	Electrically Separate
SP	Single Pole

Abbr. Symb.	Description
D	Diff. Not Adjustable
(3)	3-way (Valve)
(4)	4-way (Valve)
()	Number is of secondary importance
>	Greater Than
<	Less Than

						PP-DEVICE SUM. PIPING & INSTRUMENTATION DIAGRAM 143B2931		CUSTOMER: HASTINGS UTILITIES	
								SITE: DON HENRY POWER CENTER	
1	AS BUILTS	BT		06/10/21			APPROVED BY:	DRAWING NO.	SCALE:
REV	DESCRIPTION:	BY	APPROVED	DATE				143B2931	NTS
							DRAWN BY: BT	06/10/21	SHEET
									2 OF 16

Pressure Switches				
Symbol	Description	Setting in PSIG		Normal Contact Condition at Zero Absolute
		Open	Close	
63DM	Diesel Engine - Minimum Speed	8±.5	5±.5	NC-OES
63FG	Fuel Gas Pressure - Upstream	(175±3)	165±2	NC-OES
63FL-1	Fuel Forwarding Pump Suction High	(92±1)	100±1	NO-CES
63FL-2	Liquid Fuel Pressure - Upstream	(16±.5)	12±.5	NC-OES
63HG	Hydraulic Trip Circuit Pressure	20±1	(25±1)	NO-CES
	Gas Fuel Stop Valve			
63HL	Hydraulic Trip Circuit Pressure	20±1	(25±1)	NO-CES
	Liquid Fuel Stop Valve			
63HQ	Low Hydraulic Supply	(1150±45)	(1050±10)	NC-CES
63HR	Hydraulic Ratchet Pressure	300	70	NC-OES
63PG	No Gas Pressure at Purge Block Valve Intmdt.			
63QA	Low Lube Oil Pressure - Alarm	(16±1)	12±1	NC-OES
63QD	Diesel Engine Lube Oil Pressure	4.5±.5	(7.5±.5)	NO-CES
63QL	Low Lube Oil Pressure - Emergency Pump Start	(9±1)	6±1	NC-OES
63QN	Normal Lube Oil Pressure - Emergency Pump Stop	18±1	(15±1)	NC-OES
63QT	Low Lube Oil Pressure - Trip	8±1	(11±1)	NO-CES

Temperature Switches				
Symbol	Description	Setting in °F		Normal Contact Condition at Zero Absolute
		Open	Close	
26BA	High Turbine Compartment Temp - Alarm	350±2	D	NC-OEC
26FH	Fuel Heater Outlet Temperature Control	(later)	D	NC-SP
26FL	Liquid Fuel Temp High - Alarm	D	150±2	NO-SP
26HA	Accessory Compartment Thermostat	50±2	D	NC-OEC
26HT	Turbine Compartment Thermostat	20±2	D	NC-OEC
26QA	Lube Oil Header - High Temp Alarm	D	165±3	NO-SP
26QL	Lube Oil Tank Temperature - Low	D	55±1	NC-SP
26QM	Lube Oil Tank Temperature - Moderate	60±1	D	NC-SP
26QN	Lube Oil Tank Temperature - Normal	D	50±1	NO-SP
26QT	Lube Oil Header - High Temp Trip	175±3.5	D	NC-SP
TT-AIL	Air Inlet Temperature - Left Side			
TT-AIR	Air Inlet Temperature - Right Side			
TT-AOL	Air Outlet Temperature - Left Side			
TT-AOR	Air Outlet Temperature - Right Side			

					PP-DEVICE SUM. PIPING & INSTRUMENTATION DIAGRAM 143B2931		CUSTOMER: HASTINGS UTILITIES	
							SITE: DON HENRY POWER CENTER	
1	AS BUILTS	BT		06/10/21	APPROVED BY:		DRAWING NO.	SCALE: NTS
REV	DESCRIPTION:	BY	APPROVED	DATE	DRAWN BY: BT	06/10/21	143B2931	SHEET 3 OF 16

Miscellaneous Devices		
Symbol	Description	Rating
12T	Turbine Overspeed - Alarm & Trip	---
23FH	Fuel Heater	50KW 480V EA
		3 PH 60 HZ
23HA-1	Space Heater - Accessory Compartment	10KW 480V
		3 PH 60 HZ
23HA-2	Space Heater - Accessory Compartment	7.5KW 480V
		3 PH 60 HZ
23HT-1	Space Heater - Turbine Compartment	7.5KW 480V
		3 PH 60 HZ
23HT-2	Space Heater - Turbine Compartment	7.5KW 480V
		3 PH 60 HZ
23QT	Immersion Heaters (3) - Lube Oil Tank	5KW Each
		440 V AC
33CB-3	10th Stage Compressor Bleed Valve - Limit Switch	SP-DT
33CB-4	10th Stage Compressor Bleed Valve - Limit Switch	SP-DT
33CS	Starting Clutch Disengaged	---
33FL	Liquid Fuel Stop Valve - Limit Switch	---
33HR	Hydraulic Ratchet - Limit Switch	---
33PG-1	Gas Purge Valve #1 Closed	
33PG-2	Gas Purge Valve #2 Closed	
33TV	Turbine Compressor Inlet Guide Vanes - Limit Switch	---
43HR	Hydraulic Ratchet Control Switch (Jog Button)	---
45CP	CO2 Pressure Operated Switch	---
45CR	Fire Protection - CO2 Release	---
45FA-1	Fire Detector - Accessory Compartment	325°F
45FA-2	Fire Detector - Accessory Compartment	275°F
45FG-1	Fire Detector - Generator	---

45FT-1	Fire Detector - Turbine Compartment	450°F
45FT-2	Fire Detector - Turbine Compartment	450°F
45FT-3	Fire Detector - Turbine Compartment	600°F
45FT-4	Fire Detector - Turbine Compartment	600°F
45FT-5	Fire Detector - Turbine Compartment	450°F
49HA-1	Accessory Compartment Space Heater Blower - Overload	---
49HA-2	Accessory Compartment Space Heater Blower - Overload	---
49HT-1	Turbine Compartment Space Heater Blower - Overload	---
49HT-2	Turbine Compartment Space Heater Blower - Overload	---
65FP	Liquid Fuel Pump - Control Servo Valve	---
65GC	Gas Control Valve - Control Servo Valve	---
90SR	Stop/Ratio Valve - Control Servo Valve	---
96CD	Compressor Discharge Pressure	
96FG	Fuel Gas - Pressure Transmitter	---
96FOP	Fuel Oil Pressure After Main Filters	
96FP-1	Liquid Fuel Pump LVDT	---
96FP-2	Liquid Fuel Pump LVDT	---
96GC-1	Gas Control Valve LVDT	---
96GC-2	Gas Control Valve LVDT	---
96GVP3	Gas Valve P3 Pressure - Manifold	
96HQ	Hydraulic Trip Pressure	
96LOAPD	Lube Oil Aux Pump Discharge Pressure	
96LOEPP	Lube Oil Emergency Pump Pressure	
96LOMPD	Lube Oil Main Pump Discharge Pressure	
96LOTBP	Lube Oil Turbine Bearing Pressure	
96NG-1	Natural Gas Detector - Left	
96NG-2	Natural Gas Detector - Right	
96SR	Stop/Speed (Pressure) Ratio Valve LVDT	---

Solenoid Devices		
Symbol	Description	Normal Condition De-energized
20CB	Compressor Bleed Valve	(3) B to C OPEN
		A Closed
20CF	Fuel Clutch	NO
20CS	Starting Clutch Valve	(3) B to T OPEN
		P Closed
20DA-1	Diesel Engine Acceleration Solenoid	NR (4)
20DA-2	Diesel Engine Acceleration Solenoid	(4) NR
20DT	Diesel Engine Trip Solenoid Valve	NC
20DV	Diesel Engine Stop Valve	NC
20FD	Distillate Fuel Stop Valve	NC
20FG	Gas Fuel Stop Valve	NO
20FL	Liquid Fuel Stop Valve	NO
20HR	Hydraulic Ratchet Stroke Valve	NR (4)
20PG	Control Air to Gas Purge Valves #1 & #2	
20PL	Liquid Fuel System Purge Valve	(3) B to C OPEN
		A Closed
20TV	Turbine Compressor Inlet Guide Vanes Solenoid Valve	(4) NR
20VG2	Gas Purge Vent Valve to Roof	

Liquid Level Control			
Symbol	Description	Setting	Normal Contact as Shipped
71QH	High Lube Oil Level	See Lube Oil Diagram	NO-CEC
71QL	Low Lube Oil Level	See Lube Oil Diagram	NC-OEC
71WL	Low Cooling Water Level	See Cooling Water Diagram	NC-OEC

						PP-DEVICE SUM. PIPING & INSTRUMENTATION DIAGRAM 143B2931		CUSTOMER: HASTINGS UTILITIES	
								SITE: DON HENRY POWER CENTER	
1	AS BUILTS	BT		06/10/21			APPROVED BY:	DRAWING NO.	SCALE: NTS
REV	DESCRIPTION:	BY	APPROVED	DATE			DRAWN BY: BT	143B2931	SHEET 4 OF 16

Electric Motors		
Symbol	Description	Rating
88BA	Ventilating Air Fan Motor	7.5 HP 3600 RPM
		230/460 V 3 PH 60 HZ
88DS	Diesel Engine Start	10 HP 2500 RPM 125 V DC
88FD	Distillate Fuel Forwarding Pump	5 HP 1600 RPM
		230/460 V 3 PH 60 HZ
88FE	Emergency Fuel Forwarding Pump	1.5? HP 1750/2700 RPM
		120 VDC Operate at later RPM
88HA-1	Accessory Compartment Space Heater - Blower Motor	1/40 HP 115 V
		1 PH 60 HZ
88HA-2	Accessory Compartment Space Heater - Blower Motor	1/40 HP 115 V
		1 PH 60 HZ
88HR	Hydraulic Ratchet Pump	.75 HP 1725 RPM 115 V DC
88HT-1	Turbine Compartment Space Heater - Blower Motor	1/40 HP 115 V
		1 PH 60 HZ
88HT-2	Turbine Compartment Space Heater - Blower Motor	1/40 HP 115 V
		1 PH 60 HZ
88QA	Auxiliary Lube Oil Pump	25 HP 3600 RPM
		230/460 V 3 PH 60 HZ
88QE	Emergency Lube Oil Pump	5 HP 1750 RPM
		120 V DC

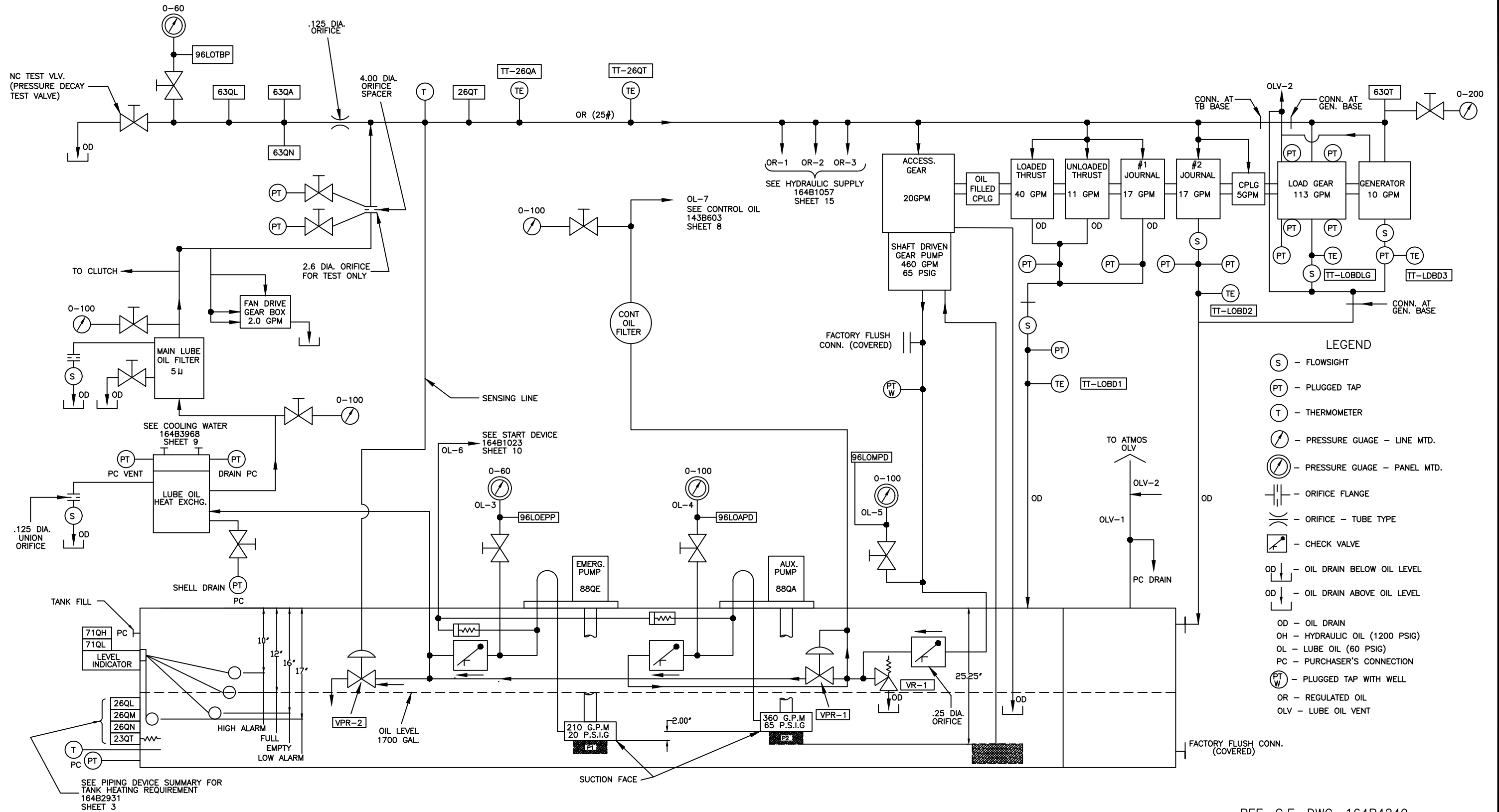
Pressure Regulating Valves			
Symbol	Description	Condition at 0 PSIG	Setting PSIG
VPR-1	Hydraulic Trip Pressure		Crack at 50±2
VPR-2	Bearing Header Pressure		25±2
VPR-4	Water Bypass Regulator		Crack at 30±1
VPR-6	Sequence Valve		175±10
VPR-7	Diesel Water Inlet	N.O.	21.5±.5
VPR-8	Diesel Water Outlet	A to B OPEN	18.5±.5
		C Closed	
VPR-9	Fuel Oil Supply		52±1
VPR-10	For Gas Purge Valves		

Temperature Regulating Valves		
Symbol	Description	Setting
VTR-1	Lube Oil Bearing Header Temperature	130±3°F

Flow Control Valves		
Symbol	Description	
FCV-1	Hydraulic Oil Flow Control Valve for IGV Operating Cylinder	


Pressure Relief Valves		
Symbol	Description	Setting PSIG
VR-1	Main Lube Oil Pump	Crack at 65±2
VR-2	Hydraulic Supply Pump	1350±25
VR-3	Hydraulic Ratchet Pump	1500±50
VR-4	Turbine Fuel Oil Pump	Crack at 1350±50
VR-6	Ratchet Reversing Pressure Valve	350±10
VR-13	Diesel Lube Oil Pressure	155±5
VR-A	Fuel Heater	85±2

				PP-DEVICE SUM. PIPING & INSTRUMENTATION DIAGRAM 143B2931		CUSTOMER: HASTINGS UTILITIES	
						SITE: DON HENRY POWER CENTER	
1	AS BUILTS	BT		06/10/21		APPROVED BY:	
REV	DESCRIPTION:	BY	APPROVED	DATE		DRAWN BY: BT	06/10/21
						DRAWING NO.	143B2931
						SCALE:	NTS
						SHEET	5 OF 16



REF. G.E. DWG. 164B4249

Proprietary Information of:

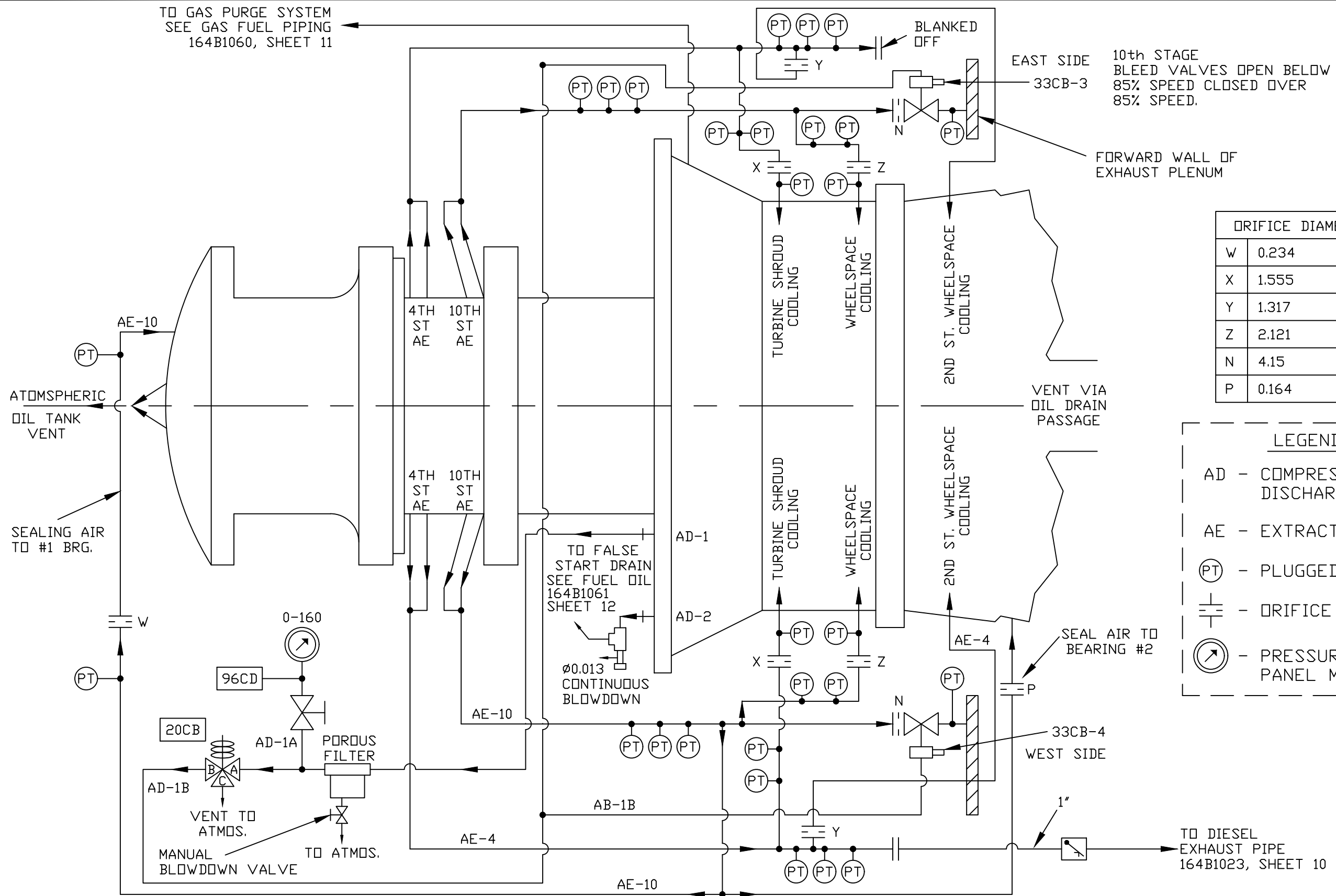


INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/22/01

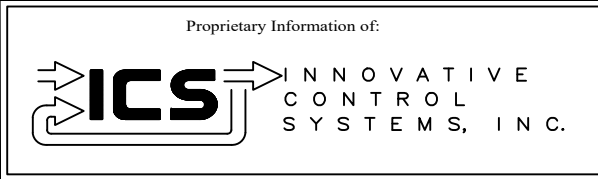
DIAGRAM SCHEM. PP, LUBE OIL PUMP PIPING & INSTRUMENTATION DIAGRAM
164B4249

CUSTOMER: HASTINGS UTILITIES		DRAWING NO. 164B4249		SCALE: NTS
SITE: DON HENRY POWER CENTER		DRAWN BY: C. FISHER		SHEET 6 OF 16
APPROVED BY:		05/30/00		



ORIFICE DIAMETERS	
W	0.234
X	1.555
Y	1.317
Z	2.121
N	4.15
P	0.164

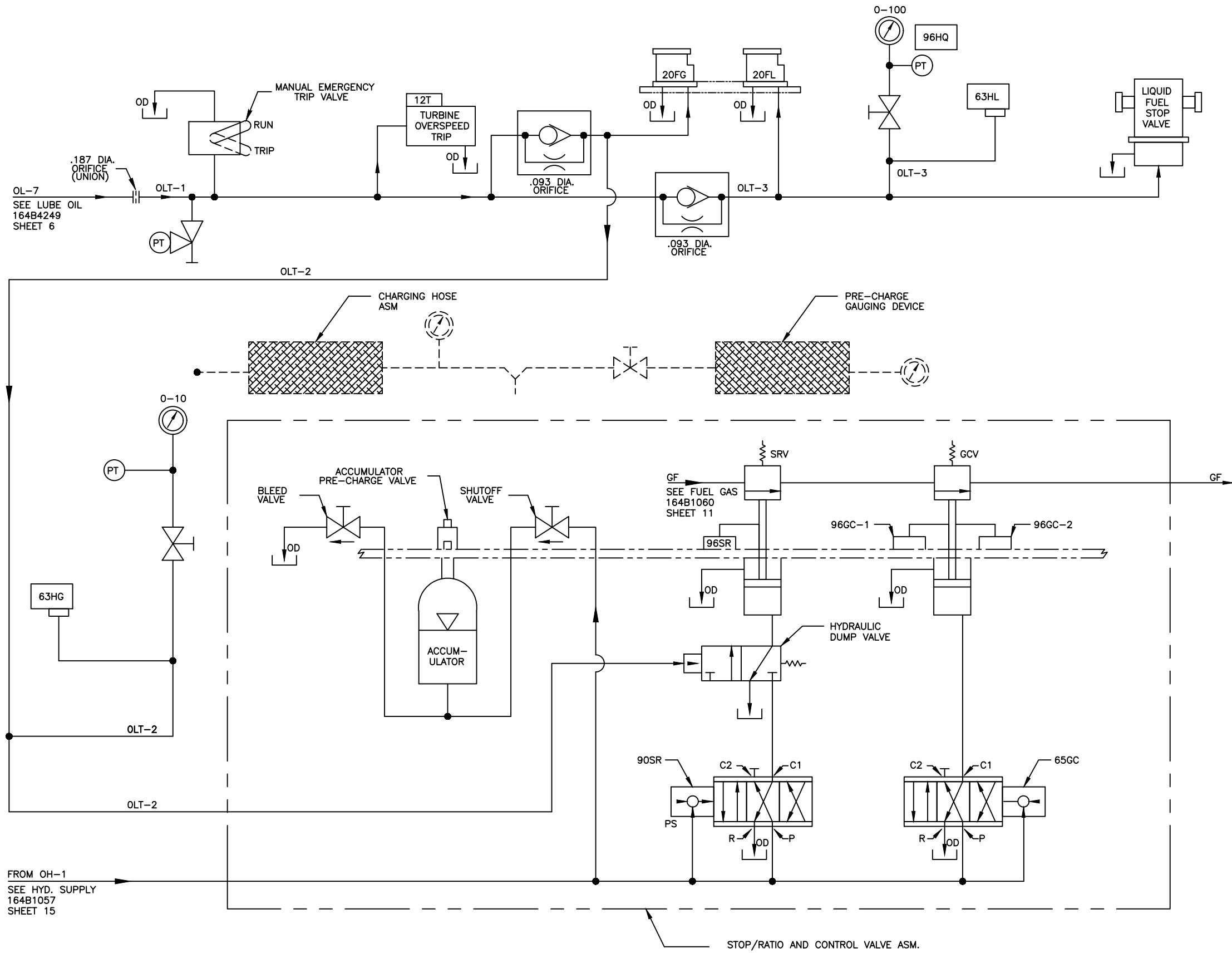
LEGEND	
AD	COMPRESSOR DISCHARGE AIR
AE	EXTRACTION AIR
⊕	PLUGGED TAP
⊖	ORIFICE FLANGE
⊙	PRESSURE GAUGE PANEL MOUNTED



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	UPDATES	BT	AB	08/05/21
REV 1	AS BUILTS:	CS		01/22/01

COOLING & SEALING AIR PIPING SCHM.
PIPING & INSTRUMENTATION DIAGRAM
164B1122

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO. 164B1122	SCALE: NTS
DRAWN BY: C. FISHER	05/30/00		SHEET 7 OF 16



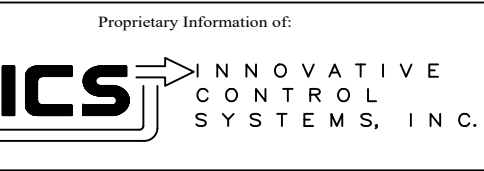
LEGEND

GCV - GAS CONTROL VALVE
 SRV - SPEED RATIO VALVE
 OH - HYDRAULIC OIL (1200 PSIG)
 OL - LUBE OIL (60 PSIG)
 OLT - TRIP OIL (60 PSIG)
 P - PRESSURE CONNECTION
 R - RETURN LINE TO TANK
 PS - PRESSURE LINE TO SERVO
 OD - OIL DRAIN ABOVE OIL LEVEL

- PRESSURE GAUGE - PANEL MTD.
 - ORIFICE - TUBE TYPE
 - PLUGGED TAP

NOTES:

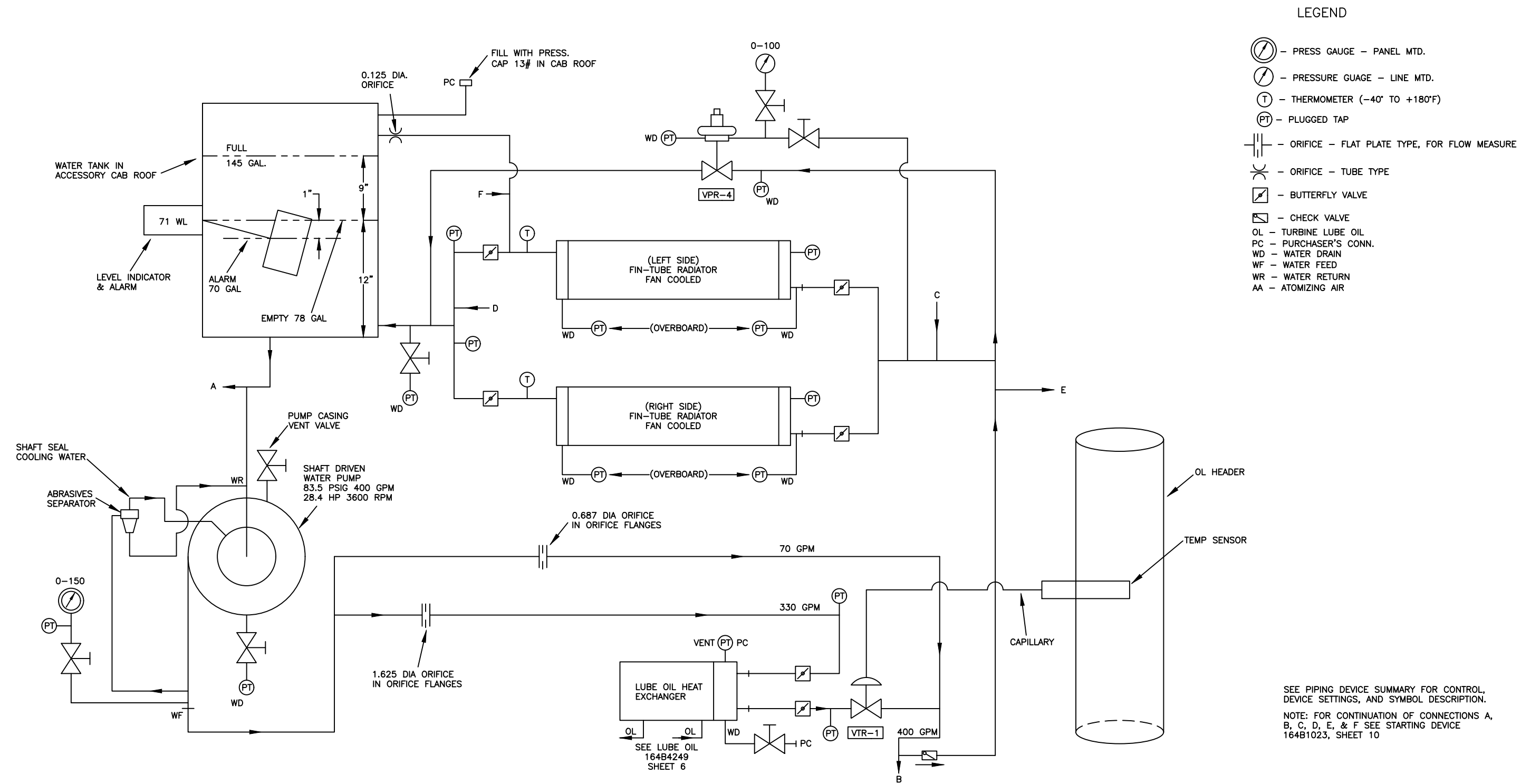
1. SEE GEK 28101 FOR EXPLANATION OF GRAPHIC SYMBOLS.
 2. SEE PIPING DEVICE SUMMARY FOR OTHER SYMBOL DESCRIPTION AND SETTINGS.



REV 1	AS BUILTS:	CS		01/22/01
REV	DESCRIPTION:	BY	APPROVED	DATE

DIAGRAM, SCHEM PP, CONTROL OIL PIPING & INSTRUMENTATION DIAGRAM
 143B603

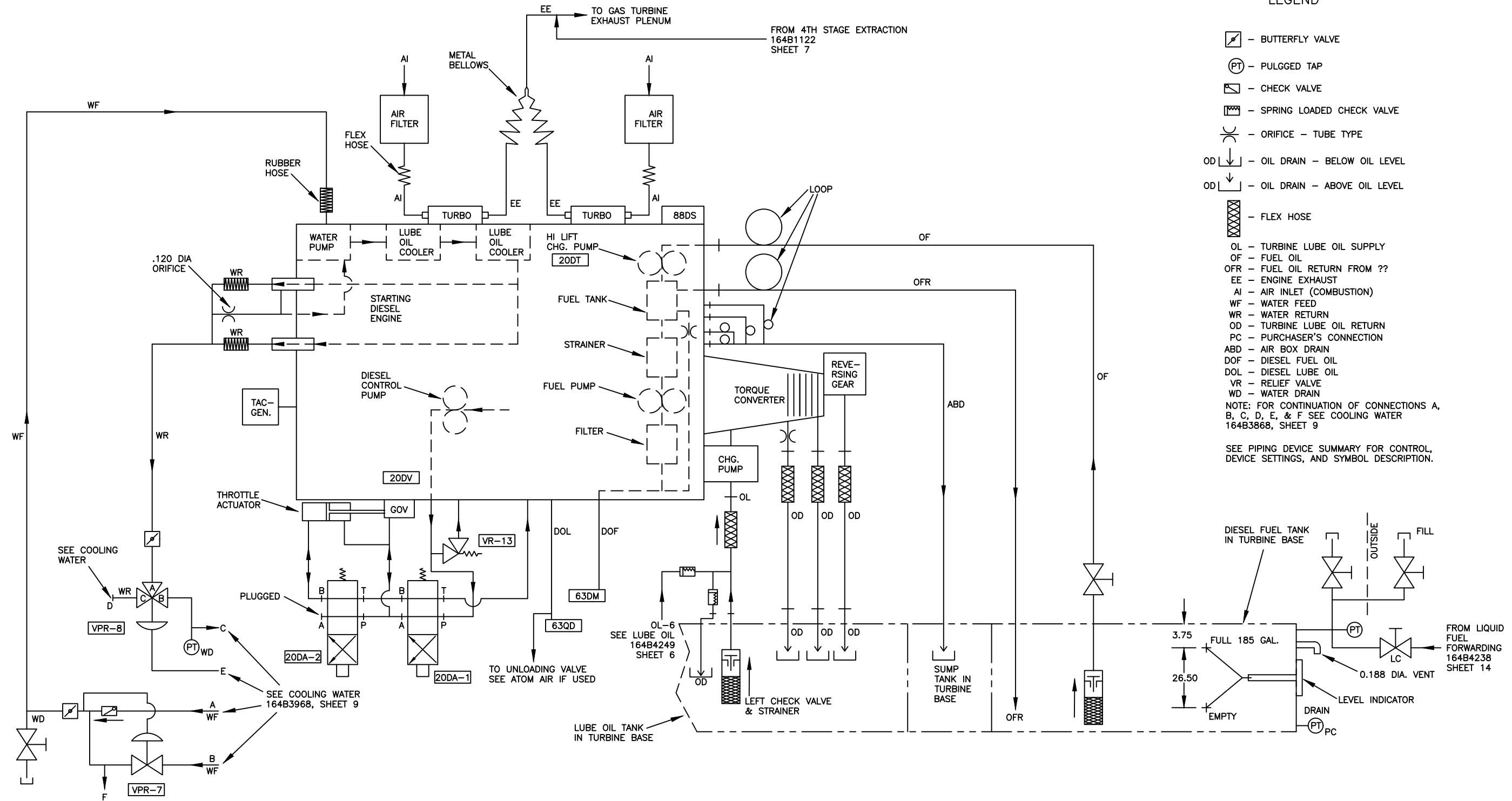
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	05/30/00	143B603	NTS
			SHEET 8 OF 16



- LEGEND**
- PRESS GAUGE - PANEL MTD.
 - PRESSURE GAUGE - LINE MTD.
 - THERMOMETER (-40° TO +180°F)
 - PLUGGED TAP
 - ORIFICE - FLAT PLATE TYPE, FOR FLOW MEASURE
 - ORIFICE - TUBE TYPE
 - BUTTERFLY VALVE
 - CHECK VALVE
 - OL - TURBINE LUBE OIL
 - PC - PURCHASER'S CONN.
 - WD - WATER DRAIN
 - WF - WATER FEED
 - WR - WATER RETURN
 - AA - ATOMIZING AIR

SEE PIPING DEVICE SUMMARY FOR CONTROL, DEVICE SETTINGS, AND SYMBOL DESCRIPTION.
 NOTE: FOR CONTINUATION OF CONNECTIONS A, B, C, D, E, & F SEE STARTING DEVICE 164B1023, SHEET 10

PP-CLG WATER PIPING & INSTRUMENTATION DIAGRAM 164B3968					CUSTOMER: HASTINGS UTILITIES SITE: DON HENRY POWER CENTER			
1	AS BUILTS	BT		06/10/21				
REV	DESCRIPTION:	BY	APPROVED	DATE				
PP-CLG WATER PIPING & INSTRUMENTATION DIAGRAM 164B3968					APPROVED BY:		DRAWING NO. 164B3968	SCALE: NTS
					DRAWN BY: BT	06/10/21		SHEET 9 OF 16

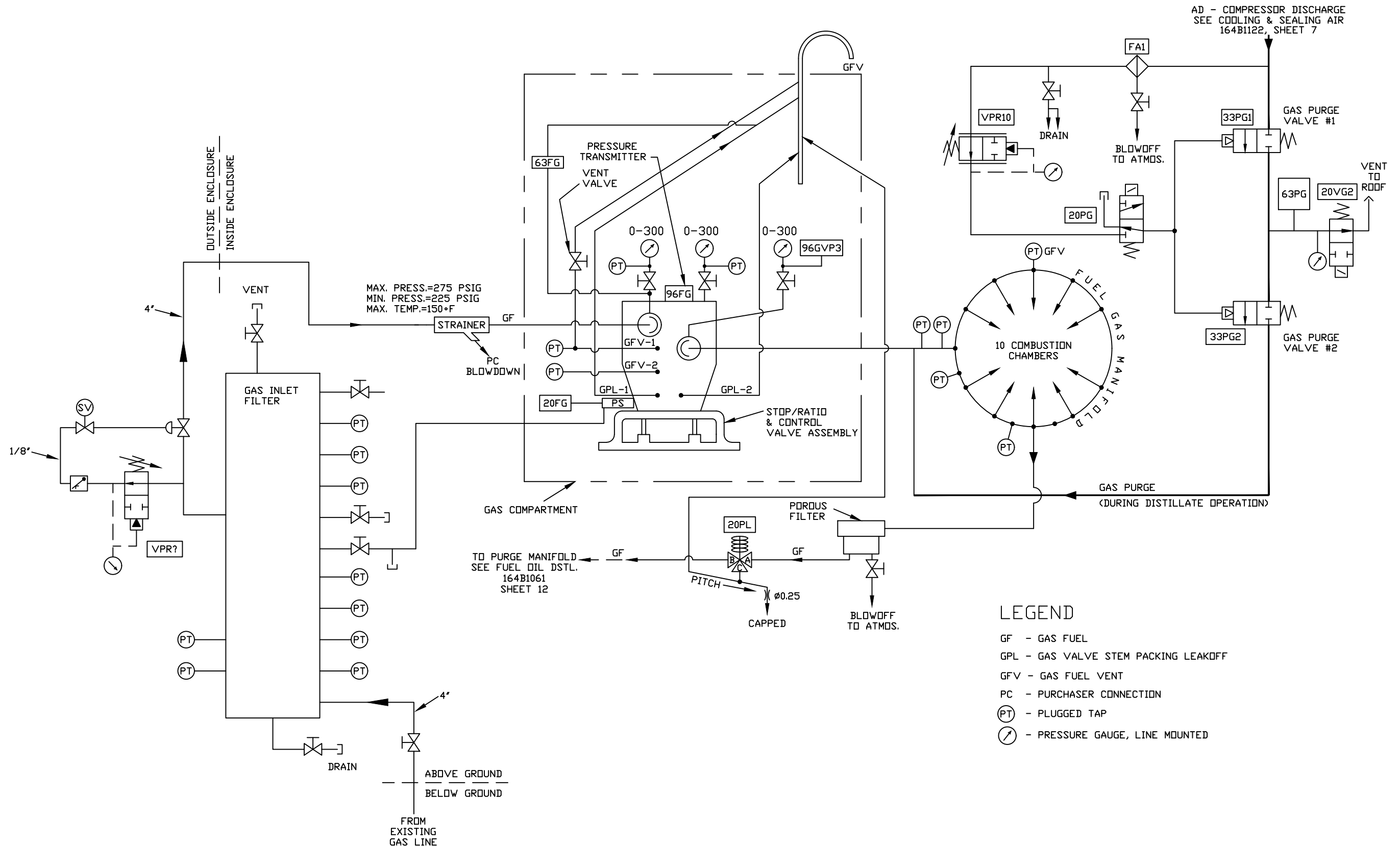


- LEGEND**
- BUTTERFLY VALVE
 - PLUGGED TAP
 - CHECK VALVE
 - SPRING LOADED CHECK VALVE
 - ORIFICE - TUBE TYPE
 - OIL DRAIN - BELOW OIL LEVEL
 - OIL DRAIN - ABOVE OIL LEVEL
 - FLEX HOSE
 - OL - TURBINE LUBE OIL SUPPLY
 - OF - FUEL OIL
 - OFR - FUEL OIL RETURN FROM ??
 - EE - ENGINE EXHAUST
 - AI - AIR INLET (COMBUSTION)
 - WF - WATER FEED
 - WR - WATER RETURN
 - OD - TURBINE LUBE OIL RETURN
 - PC - PURCHASER'S CONNECTION
 - ABD - AIR BOX DRAIN
 - DOF - DIESEL FUEL OIL
 - DOL - DIESEL LUBE OIL
 - VR - RELIEF VALVE
 - WD - WATER DRAIN
- NOTE: FOR CONTINUATION OF CONNECTIONS A, B, C, D, E, & F SEE COOLING WATER 164B3968, SHEET 9
- SEE PIPING DEVICE SUMMARY FOR CONTROL, DEVICE SETTINGS, AND SYMBOL DESCRIPTION.

1	AS BUILTS	BT		06/10/21
REV	DESCRIPTION:	BY	APPROVED	DATE

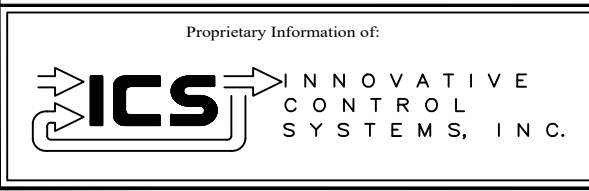
STARTING DEV. 500/600HP DIESEL
 PIPING & INSTRUMENTATION DIAGRAM
 164B1023

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: BT	06/10/21	164B1023	NTS
			SHEET
			10 OF 16



LEGEND

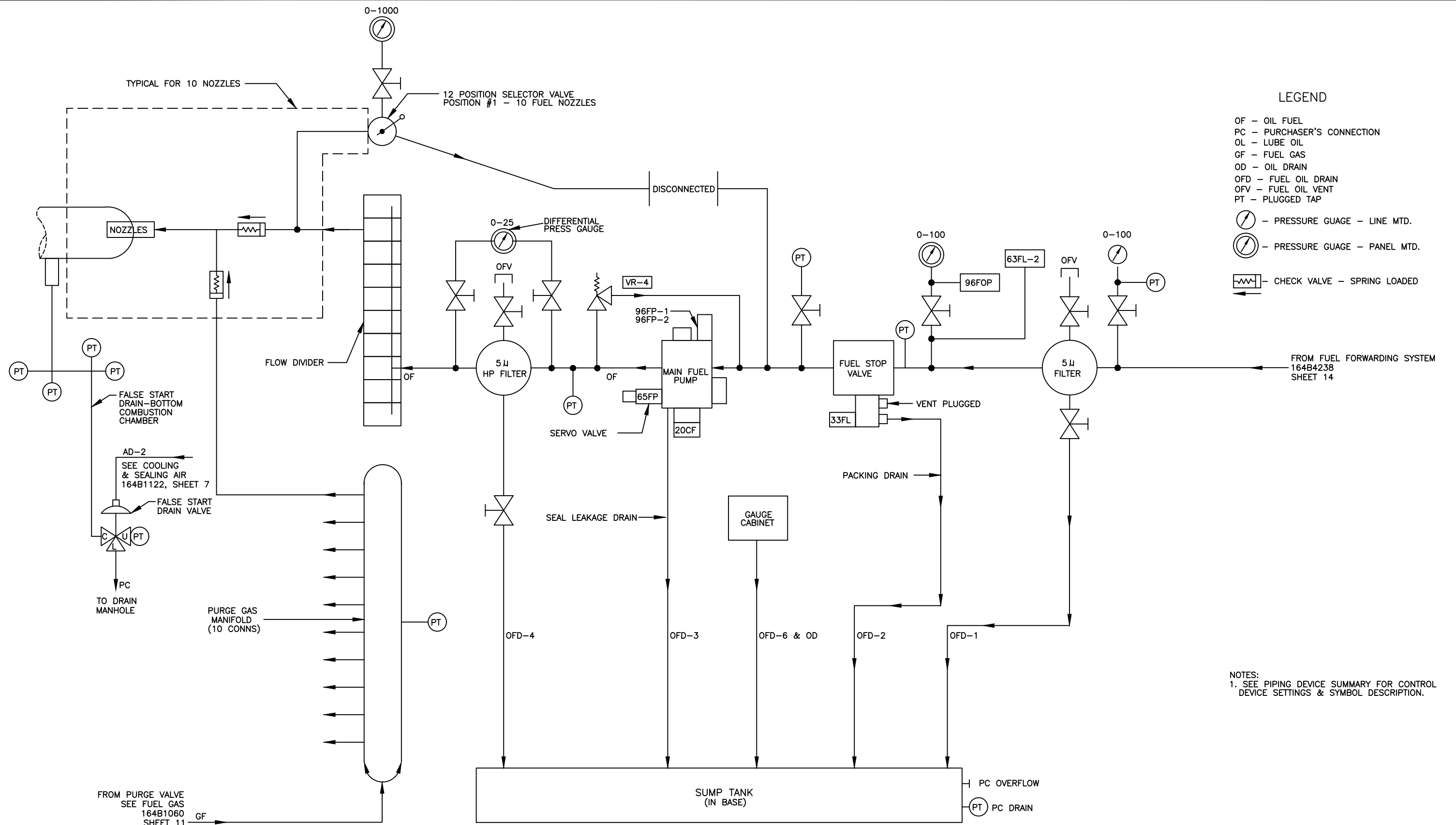
- GF - GAS FUEL
- GPL - GAS VALVE STEM PACKING LEAKOFF
- GFV - GAS FUEL VENT
- PC - PURCHASER CONNECTION
- PT - PLUGGED TAP
- PG - PRESSURE GAUGE, LINE MOUNTED



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	UPDATES	BT	AB	08/05/21
REV 1	AS BUILTS:	CS		01/22/01

**GAS FUEL PIPING SCHEMATIC
PIPING & INSTRUMENTATION DIAGRAM
164B1060**

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	05/30/00	164B1060	NTS
			SHEET 11 OF 16



- LEGEND**
- OF - OIL FUEL
 - PC - PURCHASER'S CONNECTION
 - OL - LUBE OIL
 - GF - FUEL GAS
 - OD - OIL DRAIN
 - OFD - FUEL OIL DRAIN
 - OFV - FUEL OIL VENT
 - PT - PLUGGED TAP
- PRESSURE GAUGE - LINE MTD.
 - PRESSURE GAUGE - PANEL MTD.
 - CHECK VALVE - SPRING LOADED

NOTES:
 1. SEE PIPING DEVICE SUMMARY FOR CONTROL DEVICE SETTINGS & SYMBOL DESCRIPTION.

FROM FUEL FORWARDING SYSTEM
 164B4238
 SHEET 14

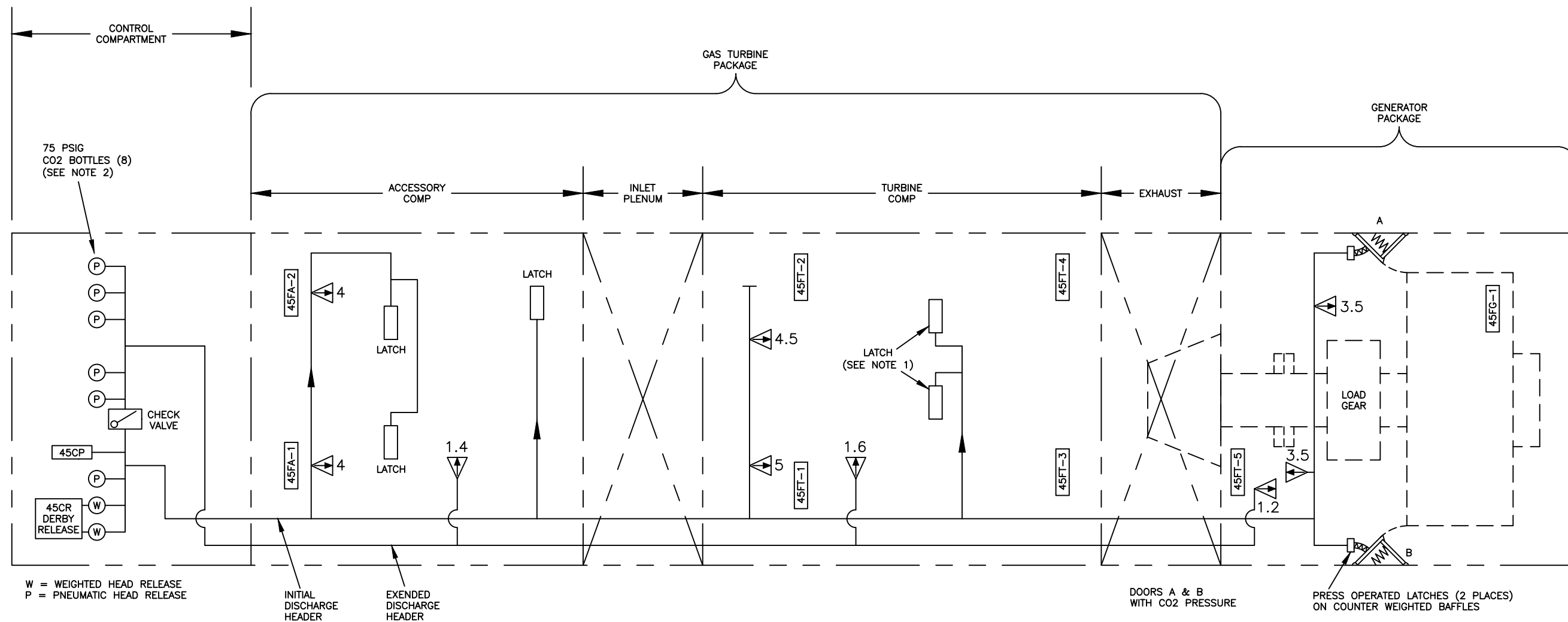
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	UPDATES	BT	AB	08/05/21
REV 1	AS BUILTS:	CS		01/22/01

**DIAGRAM SCHEM. PIPING FUEL OIL DIST.
 PIPING & INSTRUMENTATION DIAGRAM
 164B1061**

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO. 164B1061	SCALE: NTS
DRAWN BY: C. FISHER	05/30/00		SHEET 12 OF 16



W = WEIGHTED HEAD RELEASE
P = PNEUMATIC HEAD RELEASE

INITIAL DISCHARGE HEADER
EXTENDED DISCHARGE HEADER

DOORS A & B WITH CO2 PRESSURE

PRESS OPERATED LATCHES (2 PLACES) ON COUNTER WEIGHTED BAFFLES

SEE PIPING DEVICE SUMMARY FOR CONTROL, DEVICE SETTINGS, AND SYMBOL DESCRIPTION.

- NOTE:
1. TURBINE COMPARTMENT MAY HAVE 1 LATCH INSTEAD OF 2.
 2. CO2 BOTTLES FURNISHED BY PURCHASER OR BY G.E. CO. AS DEFINED IN CONTRACT.

LEGEND

- 3+ - SIZE OF NOZZLE
 - DISCHARGE NOZZLE

REV	DESCRIPTION:	BY	APPROVED	DATE
1	AS BUILTS	BT		08/17/21

FIRE PROT
PIPING & INSTRUMENTATION DIAGRAM
164B1067

CUSTOMER: HASTINGS UTILITIES

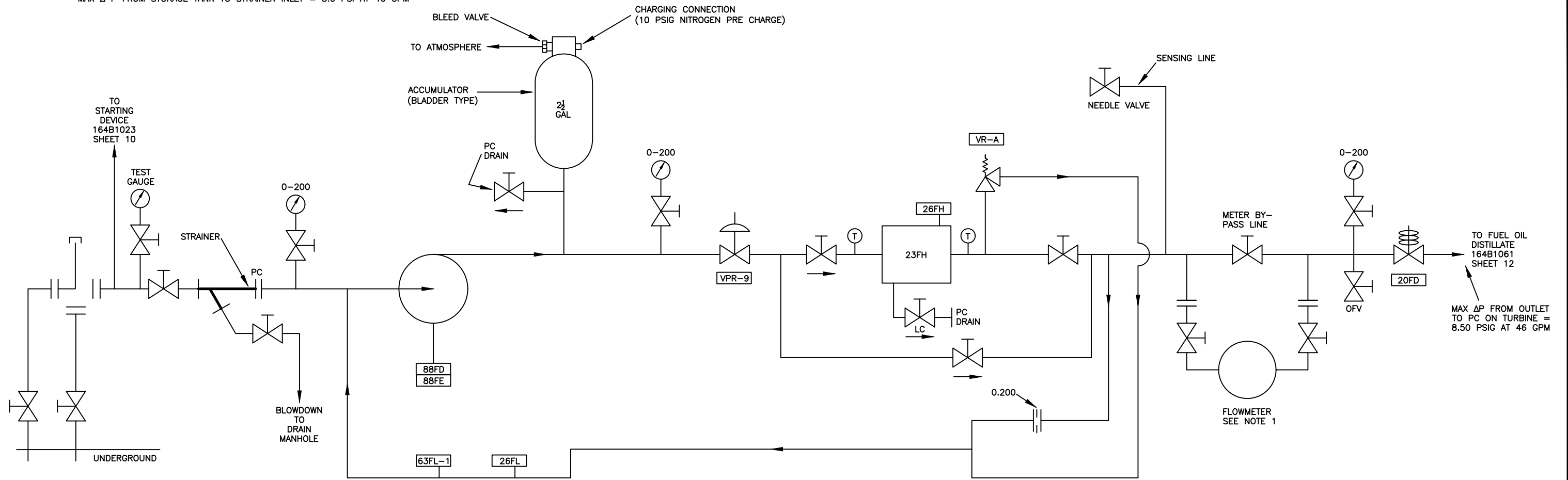
SITE: DON HENRY POWER CENTER

APPROVED BY:
DRAWN BY: BT

DRAWING NO.
164B1067

SCALE:
NTS
SHEET
13 OF 16

FLOW = 1.5 TO 46 GPM
 MIN HEAD = 1 FT ABOVE PUMP \varnothing
 MAX HEAD = 40 FT ABOVE PUMP \varnothing
 MAX Δ P FROM STORAGE TANK TO STRAINER INLET = 3.0 PSIG AT 46 GPM

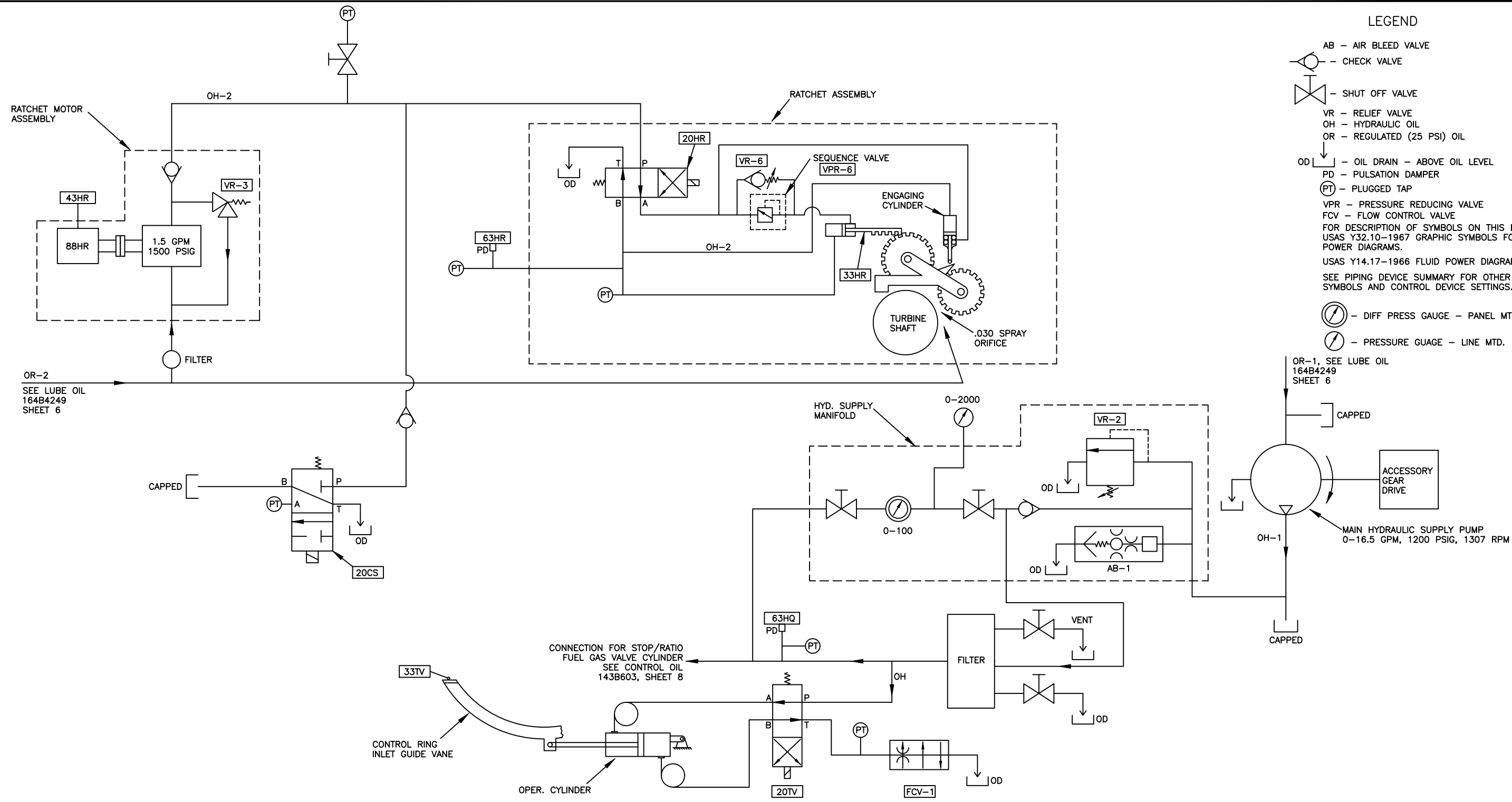


LEGEND

- OF - OIL FUEL
- OFD - OIL FUEL DRAIN
- OFV - OIL FUEL VENT
- PC - PURCHASER'S CONNECTION
- \odot - THERMOMETER
- \odot - PRESSURE GAUGE - LINE MTD.
- \parallel - ORIFICE - FLAT PLATE TYPE

- NOTES:
1. SEE REQUISITION IF SUPPLIED
 2. SEE PIPING DEVICE SUMMARY FOR CONTROL DEVICE SETTINGS AND SYMBOL DESCRIPTION
 3. PRESSURE LIMITS AT TURBINE PC WITH AC PUMP IN OPERATION
 MAX PRESS 55 PSIG MIN PRESS 30 PSIG AT FLOW RATE 1.5 TO 46 GPM
 4. RECOMMENDED THAT CUSTOMER INSTALL SHUT OFF VALVE AT TURBINE PC FOR SERVICING OF PRIMARY OIL BASE FILTER

LIQ FUEL FWD PIPING & INSTRUMENTATION DIAGRAM 164B4238					CUSTOMER: HASTINGS UTILITIES SITE: DON HENRY POWER CENTER			
REV	DESCRIPTION:	BY	APPROVED	DATE				
1	AS BUILTS	BT		05/13/21				
						APPROVED BY: DRAWN BY: BT	DRAWING NO. 164B4238	SCALE: NTS SHEET 14 OF 16



- LEGEND**
- AB - AIR BLEED VALVE
 - CV - CHECK VALVE
 - SV - SHUT OFF VALVE
 - VR - RELIEF VALVE
 - OH - HYDRAULIC OIL
 - OR - REGULATED (25 PSI) OIL
 - OD - OIL DRAIN - ABOVE OIL LEVEL
 - PD - PULSATION DAMPER
 - PT - PLUGGED TAP
 - VPR - PRESSURE REDUCING VALVE
 - FCV - FLOW CONTROL VALVE
 - FOR DESCRIPTION OF SYMBOLS ON THIS DWG SEE: USAS Y32.10-1967 GRAPHIC SYMBOLS FOR FLUID POWER DIAGRAMS.
 - USAS Y14.17-1966 FLUID POWER DIAGRAMS.
 - SEE PIPING DEVICE SUMMARY FOR OTHER SYMBOLS AND CONTROL DEVICE SETTINGS.
 - PT - DIFF PRESS GAUGE - PANEL MTD.
 - PT - PRESSURE GAUGE - LINE MTD.

OR-2
SEE LUBE OIL
164B4249
SHEET 6

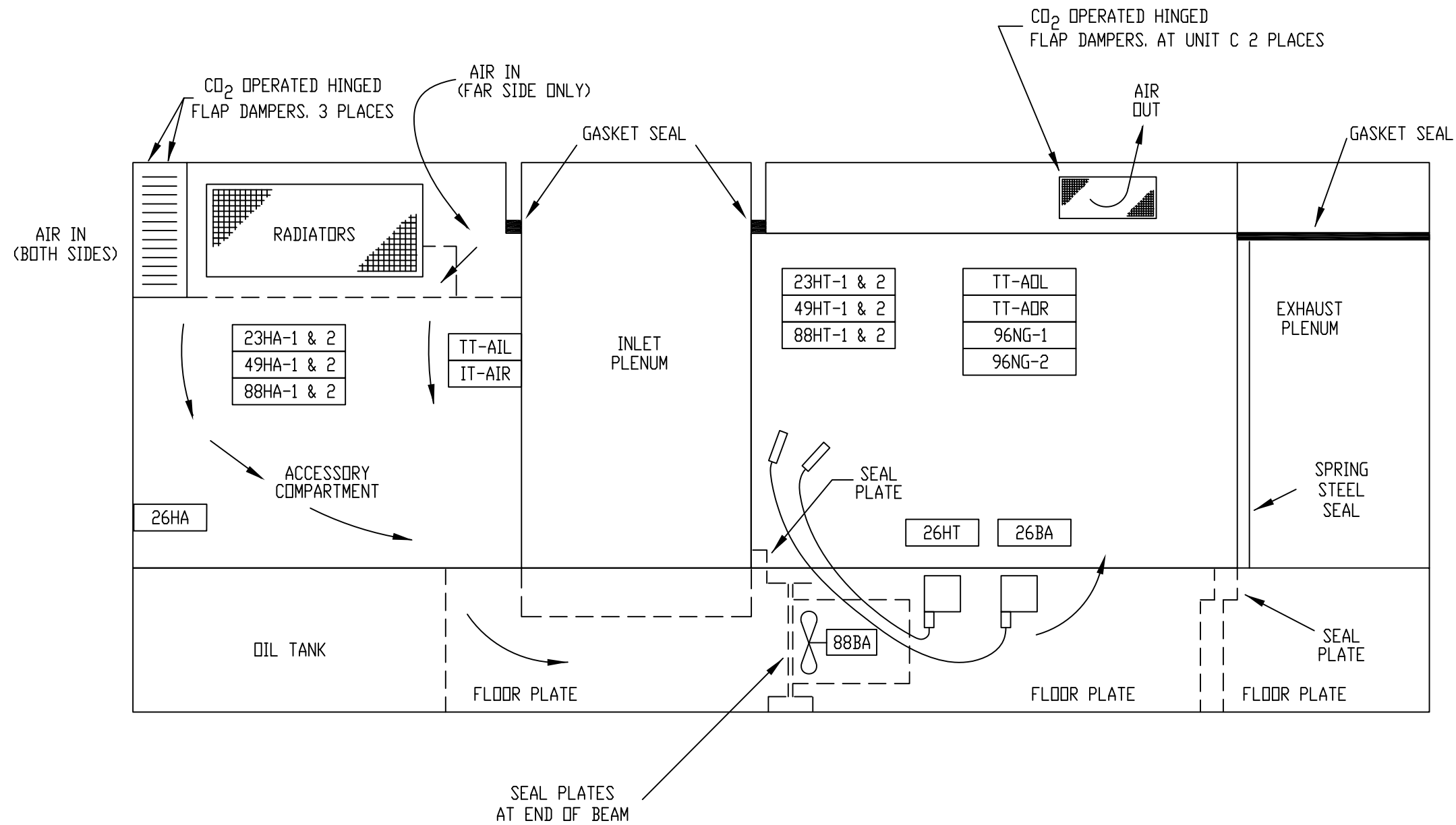
OR-1, SEE LUBE OIL
164B4249
SHEET 6

CONNECTION FOR STOP/RATIO
FUEL GAS VALVE CYLINDER
SEE CONTROL OIL
143B603, SHEET 8


HYDRAULIC SUPPLY
PIPING & INSTRUMENTATION DIAGRAM
164B1057

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 164B1057	
APPROVED BY:		DRAWN BY: BT	05/12/21
		SHEET 15 OF 16	

1	AS BUILTS	BT		05/25/21
REV	DESCRIPTION:	BY	APPROVED	DATE



Proprietary Information of:



INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 1	AS BUILTS:	CS		01/22/01
REV	DESCRIPTION:	BY	APPROVED	DATE

DIAGRAM, SCHEM. PP, HEATING & VENT.
PIPING & INSTRUMENTATION DIAGRAM
164B1102

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 164B1102	
APPROVED BY:		DRAWN BY: C. FISHER	05/30/00
		SHEET 16 OF 16	

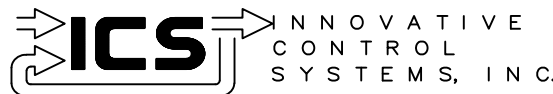
HASTINGS UTILITIES

HASTINGS, NEBRASKA

GE FRAME 5 GAS TURBINE

TURBINE GENERATOR CONTROLLER

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

TITLE SHEET
TURBINE GENERATOR CONTROLLER
99174-GTB-101

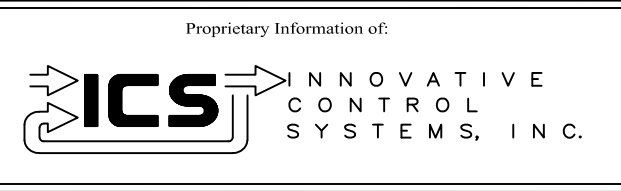
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-000-2	NTS
			SHEET NO. 000
			1 OF 11

99174-GTB-101 TURBINE GENERATOR CONTROLLER

SHEET NUMBER	DESCRIPTION
000	TITLE SHEET
001	SHEET INDEX
001A	DEVICE DESCRIPTION INDEX
001B	DEVICE DESCRIPTION INDEX
001C	DEVICE DESCRIPTION INDEX
002	SYMBOL LEGEND
003	PLC DIGITAL MODULE KEY
004	PLC ANALOG MODULE KEY
005	CONTROL SYSTEM ARCHITECTURE
006	TURBINE SITE LAYOUT
100	PANEL LAYOUT
101	PANEL INTERIOR LAYOUT
200	125 VDC DISTRIBUTION
201	125 VDC DISTRIBUTION
202	125 VDC DISTRIBUTION
204	24 VDC DISTRIBUTION
205	24 VDC DISTRIBUTION
206	24 VDC DISTRIBUTION
207	120 VAC DISTRIBUTION
208	120 VAC DISTRIBUTION
209	DC TO AC INVERTER
300	MASTER PROTECT CIRCUIT
301	MASTER PROTECT CIRCUIT
302	DEAD COMPUTER RELAY
304	FLAME DETECTION
305	IGNITION CIRCUIT
306	FIRE PROTECTION
307	LIQUID FUEL CONTROL
308	GAS FUEL CONTROL
309	SPEED RATIO VALVE CONTROL
309a	PLC ANALOG OUTPUTS P2 PRESS. CONTROL
310	SOLENOIDS
311	SOLENOIDS
312	SOLENOIDS
313	SOLENOIDS
314	SURGE SUPPRESSOR SCHEMATIC
318	BUS CABLE LAYOUT
319	GROUND DETECTION CIRCUIT
400	CHASSIS 1
401	CHASSIS 1 SLOT 0/1 CONFIGURABLE FLOW METER
402	CHASSIS 1 SLOT 2- ANALOG OUTPUT MODULE

99174-GTB-101 TURBINE GENERATOR CONTROLLER

SHEET NUMBER	DESCRIPTION
403	CHASSIS 1 SLOT 3 HI RES THERMOCOUPLE MODULE
404	CHASSIS 1 SLOT 4 HI RES THERMOCOUPLE MODULE
405	CHASSIS 1 SLOT 5 HI RES THERMOCOUPLE MODULE
406	CHASSIS 1 SLOT 6- ANALOG INPUT MODULE
407	CHASSIS 1 SLOT 7- ANALOG INPUT MODULE
408	CHASSIS 1 SLOT 8- ANALOG INPUT MODULE
409	CHASSIS 2
410	CHASSIS 2 SLOT 0- THERMOCOUPLE MODULE
411	CHASSIS 2 SLOT 1- THERMOCOUPLE MODULE
414	CHASSIS 2 SLOT 4- 3 WIRE RTD MODULE
415	CHASSIS 2 SLOT 5- 3 WIRE RTD MODULE
417	CHASSIS 2 SLOT 8- 24VDC DIGITAL INPUT MODULE
418	CHASSIS 2 SLOT 8- 24VDC DIGITAL INPUT MODULE
419	CHASSIS 2 SLOT 10- 24VDC DIGITAL INPUT MODULE
420	CHASSIS 2 SLOT 10- 24VDC DIGITAL INPUT MODULE
421	CHASSIS 2 SLOT 12- 24VDC DIGITAL INPUT MODULE
422	CHASSIS 2 SLOT 12- 24VDC DIGITAL INPUT MODULE
423	CHASSIS 2 SLOT 13- 24VDC DIGITAL OUTPUT MODULE
424	CHASSIS 2 SLOT 13- 24VDC DIGITAL OUTPUT MODULE
425	CHASSIS 3
426	CHASSIS 3 SLOT 0- 125VDC DIGITAL INPUT MODULE
427	CHASSIS 3 SLOT 1- 125VDC DIGITAL INPUT MODULE
428	CHASSIS 3 SLOT 2- 125VDC DIGITAL INPUT MODULE
429	CHASSIS 3 SLOT 3- 125VDC DIGITAL INPUT MODULE
430	CHASSIS 3 SLOT 4- 125VDC DIGITAL INPUT MODULE
433	CHASSIS 3 SLOT 7- RELAY OUTPUT MODULE
434	CHASSIS 3 SLOT 7- RELAY OUTPUT MODULE
435	CHASSIS 3 SLOT 8- RELAY OUTPUT MODULE
436	CHASSIS 3 SLOT 8- RELAY OUTPUT MODULE
437	CHASSIS 3 SLOT 9- RELAY OUTPUT MODULE
438	CHASSIS 3 SLOT 9- RELAY OUTPUT MODULE
439	CHASSIS 3 SLOT 10- RELAY OUTPUT MODULE
440	CHASSIS 3 SLOT 10- RELAY OUTPUT MODULE
PT-216	CO2 SYSTEM WIRING DIAGRAM



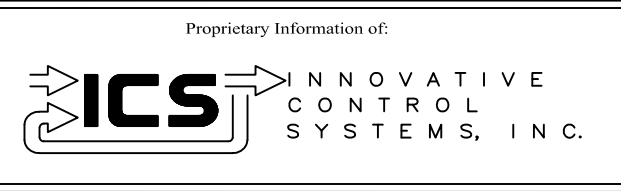
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

SHEET INDEX
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-001-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 001 2 OF 11

TAGNAME	DEVICE DESCRIPTION	SHEET NUMBER
12T	OVERSPEED MECHANICAL BOLT TRIPPED	426
20BV	GAS SUPPLY BLOCK VALVE	310
20DF	OPEN DIESEL ENGINE FUEL STOP VALVE ONE	311
20GSVV	CLOSE GAS SUPPLY VENT VALVE	310
25AS1	PLACE BUS PT VOLTAGE ON AUTO SYNC	439
25AS2	PLACE GEN PT VOLTAGE ON AUTO SYNC	439
25AS-C	ENABLE AUTOSYNC OF GEN BKR	439
25MS-C	ENABLE MANUAL GEN BKR CLOSE	439
25SL	AUTOSYNC: SPEED LOWER	418
25SR	AUTOSYNC: SPEED RAISE	418
25VL	AUTOSYNC: VOLTAGE LOWER	418
25VR	AUTOSYNC: VOLTAGE RAISE	418
26BA	HIGH TURBINE COMPARTMENT TEMP-ALARM	427
26DL	FUEL PIT FULL	427
26FL	LIQUID FUEL TEMPERATURE HIGH ALARM	428
26QN	LUBE OIL TEMPERATURE NORMAL	428
26QT	LUBE OIL TEMPERATURE < TRIP	428
27ACBC	BATTERY CHGR LOSS OF AC	429
27DCBC	BATTERY CHGR DC UNDERVOLTAGE	429
27MC	MCC AC UNDERVOLTAGE	430
27PS1	24V POWER SUPPLY OK	420
27QE	DC OIL PUMP MOTOR VOLT OK	430
28FD-2	FLAME DETECTED CAN # 2	420, 304
28FD-3	FLAME DETECTED CAN #3	420, 304
33CB-3	COMPRESSOR BYPASS LIMIT SWITCH	427
33CB-4	COMPRESSOR BYPASS LIMIT SWITCH	427
33CS	STARTING CLUTCH DISENGAGED	426
33FL	LIQUID FUEL STOP VALVE LIMIT SWITCH	426
33GC	GENERATOR CO2 DOOR CLOSED	429
33HR	HYDRAULIC RATCHET RETRACTED	426
33PG-1	GAS PURGE VALVE #1 CLOSED	427
33PG-2	GAS PURGE VALVE #2 CLOSED	427
33TV	COMPRESSOR INLET GUIDE VANES LIMIT SW.	427
39V-1	No. 1 TURBINE BEARING VIBRATION	406
39VT-1-P	No. 1 TURBINE BEARING VIBRATION	406
39V-2	TURBINE COMPRESSOR CASE VIBRATION	407
39VT-2-P	TURBINE COMPRESSOR CASE VIBRATION	407
39V-3	GENERATOR BEARING VIBRATION	408
39VT-3-P	GENERATOR BEARING VIBRATION	408
41F	FIELD FLASHING	417
43DE	START DIESEL	430

TAGNAME	DEVICE DESCRIPTION	SHEET NUMBER
43HR	HYDRAULIC RATCHET JOG ON	428
43SA	AUTO-SYNCRONIZING MODE SELECT	418
43SIL	TC2000 ALARM SILENCE	420
43SM	MANUAL SYNCRONIZING MODE SELECT	418
45FGX	FIRE IN GENERATOR COMPARTMENT	420
45FTX	FIRE IN TURBINE COMPARTMENT ON CONTROL CAB	420
49BA	COOLING AIR FAN NOT OVERLOAD	430
49FD	DISTILLATE FUEL FWD. PUMP NOT OVERLOAD	430
49FE	EMER FUEL FWD PUMP OVERLOAD	430
49HR-1	RATCHET MOTOR OVERLOADED	430
49QA	AUX LUBE OIL MTR NOT OLOAD	430
49QE	DC LUBE OIL PMP MTR NOT OLOAD	430
4B	SOFTWARE MASTER PROTECT INPUT	420
52G-TRP	GEN BREAKER TRIP (not)	439
52GX-1	GENERATOR BREAKER CLOSED	418
52QAX	AUX. LUBE OIL PUMP NOT RUNNING	430
52QC	COOLDOWN LUBE PUMP ON	430
59BAT	BATTERY CHGR OVERVOLTAGE	429
5E	TC2000 EMERGENCY STOP	420
63DM	DIESEL ENGINE MINIMUM SPEED	428
63FG	FUEL GAS PRESSURE UPSTREAM	426
63FL-1	FUEL FORWARDING PUMP SUCTION HIGH	428
63FL-2	LIQUID FUEL PRESSURE UPSTREAM	428
63GF	GENERATOR AIR INLET FILTER EXCESSIVE DROP	429
63HG	GAS STOP VLV HYD TRIP PRESSURE	428
63HL	LIQUID STOP VLV HYD. TRIP PRESSURE	428
63HQ	LOW HYDRAULIC SUPPLY	428
63HR	RATCHET PUMP PRESSURE OK	426
63PG	NO GAS PRESS. AT PURGE BLOCK VALVE INTMDT.	427
63QA	LOW LUBE OIL PRESSURE -- ALARM	428
63QD	DIESEL ENGINE LUBE OIL PRESSURE OK	428
63QT	NORMAL LUBE OIL PRESSURE --	429
64DCBC	GROUND DETECTED AT BATTERY CHGR	429
64DX	GROUND DETECTION	319
64F	GENERATOR FIELD GROUND	417
64FUV	64F RELAY VOLTAGE NOT OK	417
65FP	LIQ. FUEL POSITION REFERENCE	402
65GC	GAS FUEL POSITION REFERENCE	402
65P2	PARKER BD101	309,402,606
65SR	SPEED RATIO VALVE POSITIONER	402
70L	LOWER SPEED SETPOINT	418
70R	RAISE SPEED SETPOINT	418



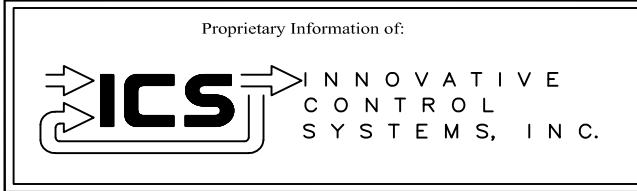
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REV 2	MODIFICATIONS:	CF		12/28/01
REV 1	AS BUILTS:	CF		04/14/00

DEVICE DECRPTION INDEX
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-001A-2	SHEET NO.001A 3 OF 11

TAGNAME	DEVICE DESCRIPTION	SHEET NUMBER
71QH	LUBE OIL TANK LEVEL HIGH	426
71QL	LUBE OIL TANK LEVEL HIGH	426
71WL	COOLING WATER LEVEL LOW	426
72QEX	EMERGENCY LUBE PUMP NOT ON	430
77HC-1	MAG SPEED PICKUP #3	401
77HC-2	MAG SPEED PICKUP #4	401
77HT-1	MAG SPEED PICKUP #1	401
77HT-4	MAG SPEED PICKUP #2	401
86G	86G GENERATOR LOCKOUT	417
86G-TRP	TRIP 86G	439
90LL	LOWER VOLTAGE SWITCH	418
90LR	RAISE VOLTAGE SWITCH	418
95TR-8	IGNITION TRANSFORMER	305
95TR-9	IGNITION TRANSFORMER	305
96CD	COMPRESSOR DISCHARGE PRESSURE	406
96FG	FUEL GAS PRESSURE - P2 INTERVALVE	406
96FDP	FUEL OIL PRESSURE AFTER MAIN FILTERS	406
96FP-1	LIQUID FUEL SYSTEM FUEL PUMP POSN 1	406
96FP-2	LIQUID FUEL SYSTEM FUEL PUMP POSN 2	406
96GC-1	GAS CONTROL VALVE POSITION 1	407
96GC-2	GAS CONTROL VALVE POSITION 2	407
96GFU	NATURAL GAS UNCORRECTED FLOW	407
96GP	NATURAL GAS PRESSURE	407
96GT	NATURAL GAS TEMPERATURE	407
96GVP3	GAS VALVE P3 PRESSURE - MANIFOLD	408
96HQ	HYDRAULIC TRIP PRESSURE	408
96LOAPD	LUBE OIL AUX PUMP DISCHARGE PRESSURE	408
96LOEPP	LUBE OIL EMERGENCY PUMP PRESSURE	408
96LOMPD	LUBE OIL MAIN PUMP DISCHARGE PRESSURE	408
96LOTBP	LUBE OIL TURBINE BEARING PRESSURE	406
96NG-1	NATURAL GAS DETECTOR - LEFT	407
96NG-2	NATURAL GAS DETECTOR - RIGHT	407
96SR	SPEED RATIO VALVE POSITION	408
ALBZ	RING ALARM BUZZER	424
AL-RST	RESET DECS 300 ALARMS	440
AVR	ENABLE AVR	438
BASEHR	BASE HOURS	424
BCALRM	BATTERY CHGR COMMON ALARM	429
BCFAIL	BATTERY CHGR TROUBLE	429
CT-DA-2	COMPRESSOR DISCHARGE TEMPERATURE LEFT	410
CT-DA-3	COMPRESSOR DISCHARGE TEMPERATURE RIGHT	411

TAGNAME	DEVICE DESCRIPTION	SHEET NUMBER
D-BUS	DEAD BUS CLOSE ENABLE	439
DCR-OK	DEAD COMPUTER RELAY OK	420
DCR	DEAD COMPUTER RELAY	302
ENBL-PF	ENERGIZE TO ENABLE PF CONTROL	440
EXFAILBU	EXCITER FAILED BUILD UP	417
EXFAILR	FAILED RECTIFIER	417
EXFCR	EXCITER IN MANUAL VOLTAGE REGULATOR (FCR)	417
EXLIM	DECS 300 EXCITATION LIMIT	417
EXOFF	EXCITER OFF	417
EXSTOP	EXCITER STOP	440
EXSTRT	EXCITER START	439
EXTRBL	EXCITATION TROUBLE	417
EXWDTRP	DECS-300 WATCHDOG TRIP	417
FAST-CNT	FAST LOAD STARTS	424
FCR	TRANSFER TO FCR	440
FHOURS	FIRED HOURS	424
FIELD-4	FIELD MASTER PROTECT OK	420
FIRE-CNT	FIRED LOAD STARTS	424
NEXUS	WATT HOUR METER	207
M3420-RA	27B OUTPUT STATUS	417
MAN-CNTR	MANUALLY INITIATED STARTS	424
Q20BV	OPEN BLOCK VALVE	423
Q20CB	COMPRESSOR BYPASS SOLENOID VALVE	423
Q20CF	FUEL CLUTCH SOLENOID VALVE	423
Q20CS	ENGAGE STARTING CLUTCH	423
Q20DA-1	ACCELERATE DIESEL ENGINE INTERMEDIATE	423
Q20DA-2	ACCELERATE DIESEL ENGINE FAST LOAD	423
Q20DF	OPEN DIESEL ENGINE FUEL STOP VALVE 1	423
Q20DT	DIESEL ENG FUEL SUPPLY VALVE	424
Q20DV	OPEN DIESEL ENGINE FUEL STOP VALVE 2	423
Q20FD	DISTILLATE FUEL STOP VALVE SOLENOID	423
Q20FG	OPEN GAS FUEL STOP VALVE	423
Q20FL	OPEN LIQUID FUEL STOP VALVE	423
Q20GSVV	CLOSE GAS SUPPLY VENT VALVE	423
Q20HR	REVERSE RATCHET DIRECTION	423
Q20PG	ENERGIZE TO OPEN VALVE 20PG	424
Q20PL	OPEN LIQUID FUEL SYS PURGE VALVE	423
Q20TU	TORQUE UNLOADER SOLENOID	423
Q20TV	INLET GUIDE VANES SOLENOID VALVE	424
Q20VG2	ENERGIZE TO CLOSE VALVE 20VG2	424
Q2TVX	ENERGIZE SPARK PLUGS	424



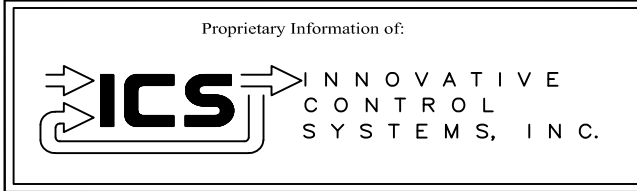
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REV 2	MODIFICATIONS:	CF		12/28/01
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DEVICE DESCRIPTION INDEX
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-001B-2	SHEET NO. 001B 4 OF 11

TAGNAME	DEVICE DESCRIPTION	SHEET NUMBER
Q41S	FIELD SUPPRESSION CONTACTOR	439
Q64DX	REMOVE GROUND REFERENCE	433
Q88BA	START COOLING AIR FAN	433
Q88BA-1	SECURE COOLING AIR FAN ON FIRE	433
Q88BA2	STOP COOLING AIR FAN	433
Q88FD	DISTILLATE FUEL FORWARDING PUMP	433
Q88FE	EMERG. DC FUEL FORWARDING PUMP	433
Q88GL	OPEN GENERATOR LOUVERS	433
Q88QA-1	AUXILLARY LUBE OIL PUMP CONTACT 1	434
Q88QA-2	AUXILLARY LUBE OIL PUMP CONTACT 2	434
QCFA	ENABLE MAN GEN BREAKER TRIP	439
QDCRR	DEAD COMPUTER RELAY RESET	433
PEAKHR	PEAK HOURS	424
PROTRBL	GENERATOR PROTECTION TROUBLE	417
Q23DH	STARTING DIESEL HEATERS	433
Q72DSX	DIESEL ENGINE STARTER MOTOR	435
Q72HRX	HYDRAULIC RATCHET PUMP	434
Q72QE1	RUN 88QE EMERG LUBE OIL PUMP	434
Q72QE2	RUN 88QE EMERG LUBE OIL PUMP	434
Q72QE3	RUN 88QE EMERG LUBE OIL PUMP	434
QDCR	DEAD COMPUTER RELAY	424
QK1	SOFTWARE MASTER PROTECT	423
R301424X	LUBE OIL TROUBLE REMOTE ALARM	437
R30-36X	EXHAUST TROUBLE REMOTE ALARM	437
R30T	TURBINE TRIPPED REMOTE ALARM	437
R52G	GENERATOR BREAKER POSITION	437
R70R	REMOTE RAISE SPEED SETPOINT	427
R70L	REMOTE LOWER SPEED SETPOINT	427
R88QA	AUX LUBE OIL PUMP ON - REMOTE INDICATION	437
R88QE	EMER LUBE OIL PUMP ON - REMOTE INDICATION	437
R90LL	REMOTE LOWER VOLTAGE	427
R90LR	REMOTE RAISE VOLTAGE	427
RBCT	BATTERY CHARGER TROUBLE REMOTE ALARM	437
RCMMLM	ALARM FUNCTION REMOTE ALARM	437
RREMOTE	TURBINE CONTROL IN REMOTE	437
RSTART	REMOTE START SIGNAL	427
RSTOP	REMOTE STOP SIGNAL	427
RTASTOP	REMOTE AUX LUBE OIL PUMP STOP	427
RTASTRT	REMOTE AUX LUBE OIL PUMP START	427
RTURB	TURBINE OPERATING	437
SETPT-L	SETPOINT LOWER TO DECS-300	440
SETPT-R	SETPOINT RAISE TO DECS-300	440
TGRTD1	RTD # 1 GEN ARMATURE PHASE T2	414
TGRTD13	GENERATURE RTD # 13 COLD GAS	415
TGRTD14	GENERATURE RTD # 14 COLD GAS	415
TGRTD15	GENERATURE RTD # 15 HOT GAS	415

TAGNAME	DEVICE DESCRIPTION	SHEET NUMBER
TGRTD2	RTD # 2 GEN ARMATURE PHASE T3	414
TGRTD3	RTD # 3 GEN ARMATURE PHASE T1	414
TGRTD4	RTD # 4 GEN ARMATURE PHASE T5	414
TGRTD5	RTD # 5 GEN ARMATURE PHASE T6	414
TGRTD6	RTD # 6 GEN ARMATURE PHASE T4	414
TOT-CNT	TOTAL STARTS	424
TS-1G	GENERATOR PANEL TEMP OK	417
TS-201H	TC2000 PANEL TEMP HIGH	420
TT-26QA	LUBE OIL TEMPERATURE 26QA	410
TT-26QT	LUBE OIL TEMPERATURE 26QT	411
TT-AIL	AIR INLET TEMPERATURE LEFT SIDE	410
TT-AIR	AIR INLET TEMPERATURE RIGHT SIDE	411
TT-AOL	AIR OUTLET TEMPERATURE LEFT SIDE	410
TT-AOR	AIR OUTLET TEMPERATURE RIGHT SIDE	411
TT-LOBD1	#1 LUBE OIL BEARING DRAIN	403
TT-LOBD2	#2 LUBE OIL BEARING DRAIN	403
TT-LOBD3	#3 LUBE OIL BEARING DRAIN	404
TT-LOBDLG	LOAD GEAR LUBE OIL BEARING DRAIN	404
TT-WS1-AD-1	WHEELSPACE TEMP 1st STAGE AFT OUTER #1	410
TT-WS1-AD-3	WHEELSPACE TEMP 1st STAGE AFT OUTER #3	411
TT-WS1-FD-2	WHEELSPACE TEMP 1st STAGE FWD OUTER #2	410
TT-WS1-FD-3	WHEELSPACE TEMP 1st STAGE FWD OUTER #3	411
TT-WS2-AD-1	WHEELSPACE TEMP 2nd STAGE AFT OUTER #1	410
TT-WS2-AD-3	WHEELSPACE TEMP 2nd STAGE AFT OUTER #3	411
TT-WS2-FD-1	WHEELSPACE TEMP 2nd STAGE FWD OUTER #1	410
TT-WS2-FD-3	WHEELSPACE TEMP 2nd STAGE FWD OUTER #3	411
TT-XD-01	TURBINE EXHAUST THERMOCOUPLE #1	403
TT-XD-02	TURBINE EXHAUST THERMOCOUPLE #2	405
TT-XD-03	TURBINE EXHAUST THERMOCOUPLE #3	404
TT-XD-04	TURBINE EXHAUST THERMOCOUPLE #4	405
TT-XD-05	TURBINE EXHAUST THERMOCOUPLE #5	404
TT-XD-06	TURBINE EXHAUST THERMOCOUPLE #6	405
TT-XD-07	TURBINE EXHAUST THERMOCOUPLE #7	403
TT-XD-08	TURBINE EXHAUST THERMOCOUPLE #8	404
TT-XD-09	TURBINE EXHAUST THERMOCOUPLE #9	403
TT-XD-10	TURBINE EXHAUST THERMOCOUPLE #10	404
TT-XD-11	TURBINE EXHAUST THERMOCOUPLE #11	403
TT-XD-12	TURBINE EXHAUST THERMOCOUPLE #12	405
TT-XDT-1	TURBINE EXHAUST DUCT TRIP #1	404
TT-XDT-2	TURBINE EXHAUST DUCT TRIP #2	403
TT-XDT-3	TURBINE EXHAUST DUCT TRIP #3	403
TT-XDT-4	TURBINE EXHAUST DUCT TRIP #4	405
TT-XDT-5	TURBINE EXHAUST DUCT TRIP #5	405
TT-XDT-6	TURBINE EXHAUST DUCT TRIP #6	404



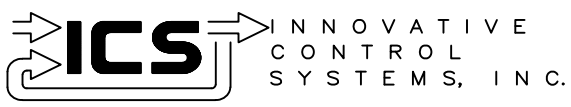
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REV 2	MODIFICATIONS:	CF		12/28/01
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DEVICE DECRPTION INDEX
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-001C-2	SHEET NO. 001C 5 OF 11

SYMBOL	FOR COMPONENTS MOUNTED IN OTHER EQUIPMENT
⊙	DEVICE MOUNTED ON GAS TURBINE
◻	CONTROL COMPARTMENT DEVICE
⊖	TURBINE CONTROL PANEL DEVICE
⊕	MOTOR CONTROL CENTER DEVICE
⊗	GENERATOR CONTROL PANEL DEVICE
⊠	GENERATOR COMPARTMENT DEVICE
⊡	GENERATOR AUXILIARY COMPARTMENT
⊗	STATION CONTROL PANEL
⊕	AUXILIARY STATION CONTROL PANEL
□	SUPERVISORY CONTROL PANEL DEVICE (SCADA RTU)
⊠	MASTER CONTROL PANEL (REMOTE FROM THE MAIN TURBINE CONTROL PANEL)
⊡	SWITCHGEAR PANEL (METAL CLAD) DEVICE
⊡	LOAD CENTER DEVICE
▣	STATIC EXCITATION CUBICLE DEVICE
▣	EXCITATION CUBICLE DEVICE
□	CO2 HOUSE
△	PURCHASER'S EQUIPMENT
⊠	HRSG STEAM TURBINE
⊡	POWER CAB
⊕	AUXILIARY TURBINE CONTROL PANEL
⊖	MECHANICAL AUXILIARY SKID
⊡	PROTECTIVE RELAY CABINET
⊡	STARTER PACKAGE
⊗	GE EQUIPMENT SEPARATE FROM PACKAGE
●	SYNCHRONIZATION CONTROL PANEL
⊡	MAIN TRANSFORMER

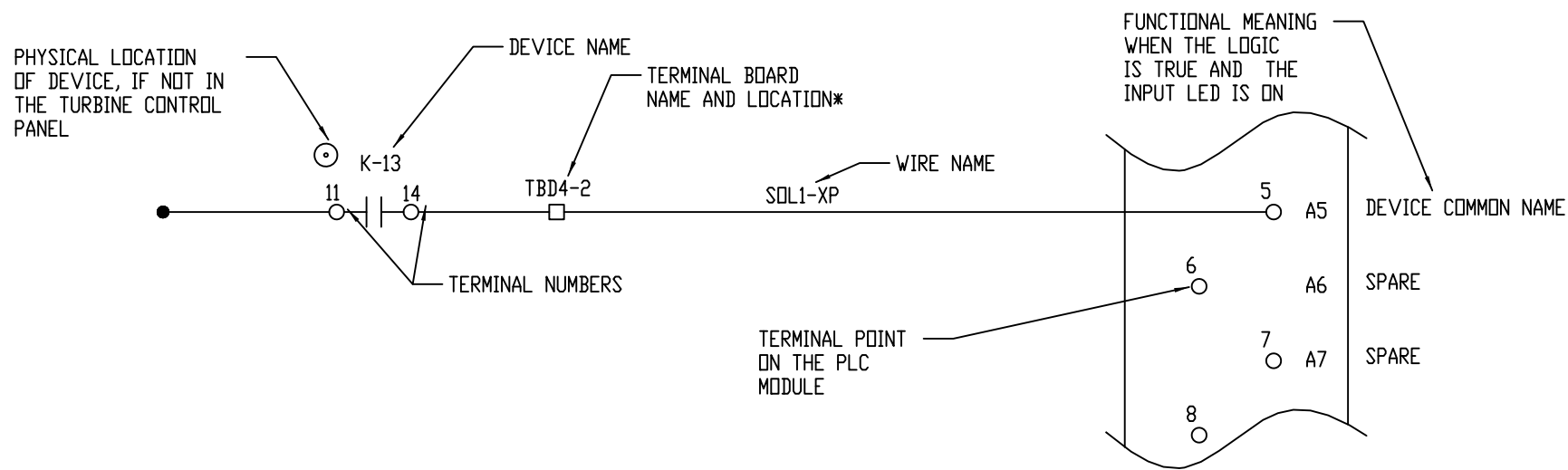
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REV 1	AS BUILTS:	CF		04/14/00

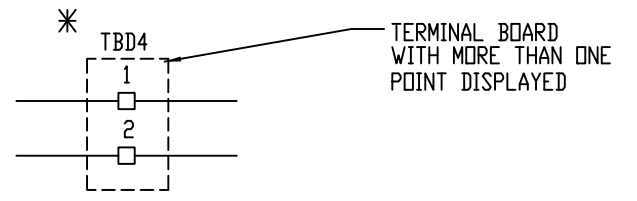
SYMBOL LEGEND
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-002-2	SHEET NO. 002 6 OF 11

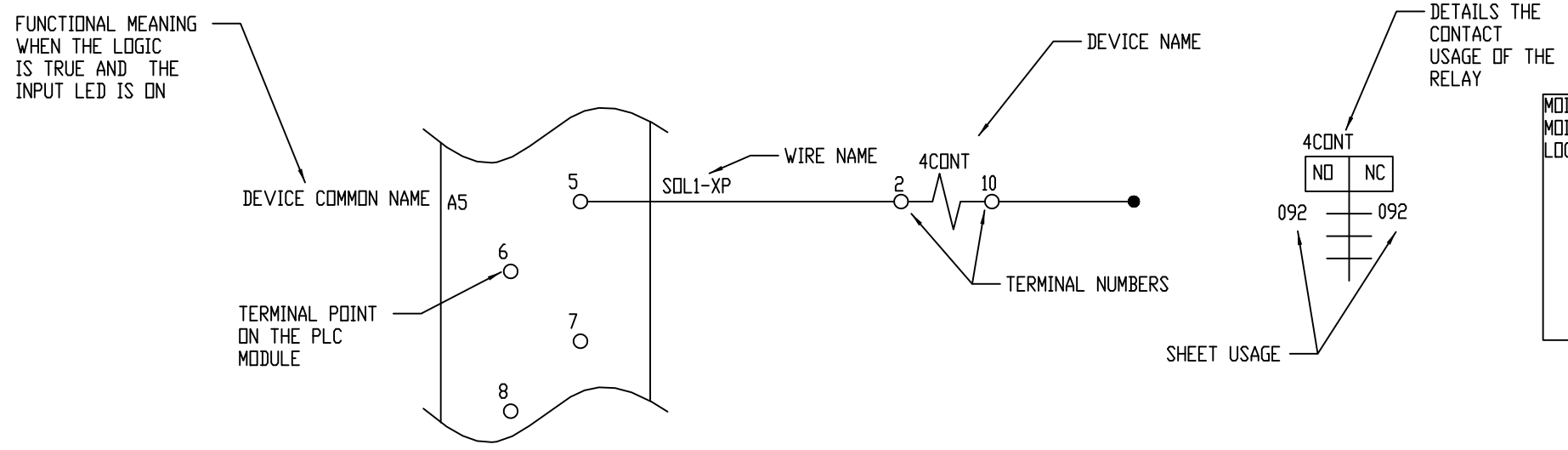


MODULE TYPE: 125VDC INPUT, 16PT GROUPED
 MODULE PART No: IC670MLD642
 LOCATION: RACK 2, SLOT 4

REFERENCE ADDRESSES		
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AI	00000	00000
AQ	00000	00000

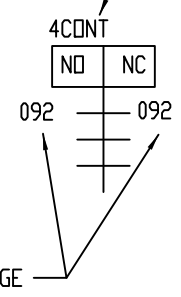


INPUT MODULE

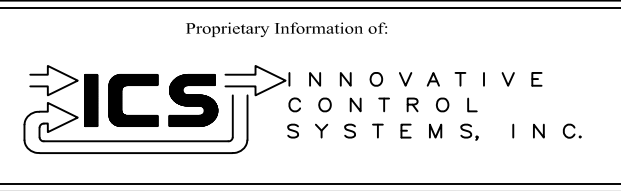


MODULE TYPE: 24VDC OUTPUT, 32PT, GROUPED
 MODULE PART No: IC670MLD750
 LOCATION: RACK 2, SLOT 4

REFERENCE ADDRESSES		
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Q	00001	00032
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AQ	00000	00000



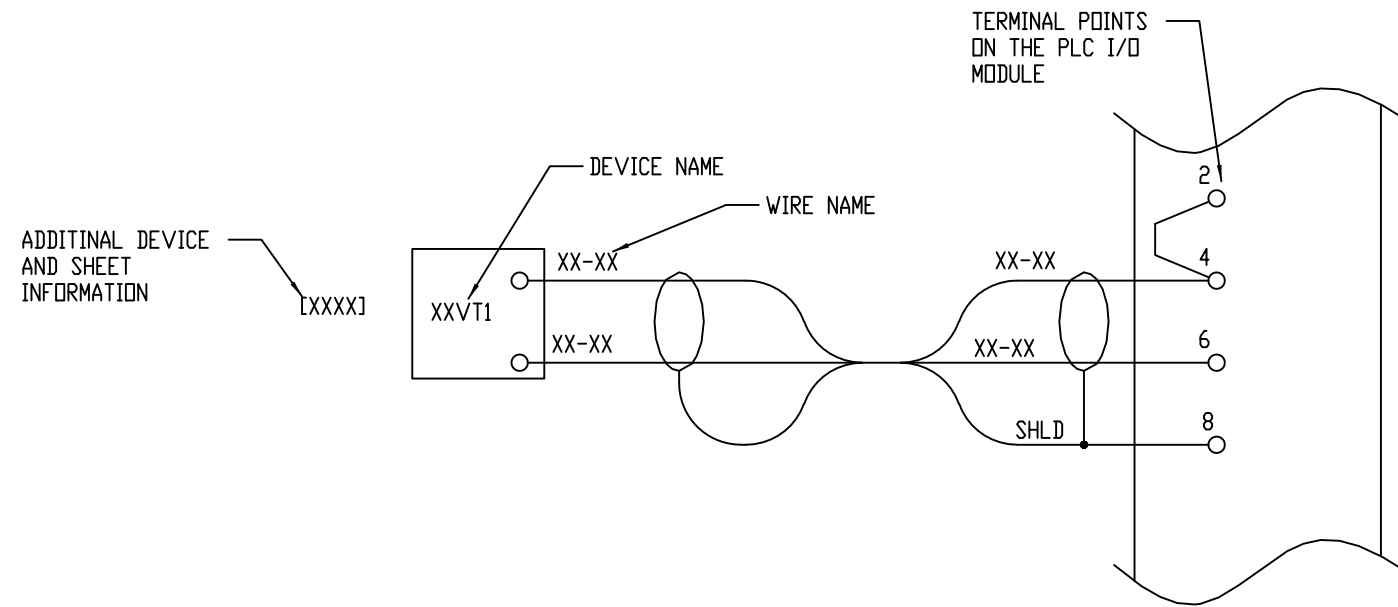
OUTPUT MODULE



REV	DESCRIPTION:	BY	APPROVED	DATE
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REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

PLC DIGITAL MODULE KEY
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-003-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 003 OF 11	



CHANNEL DESCRIPTION AND INPUT SCALING

CHANNEL X
ITEM DESCRIPTION
INPUT REQUIREMENTS

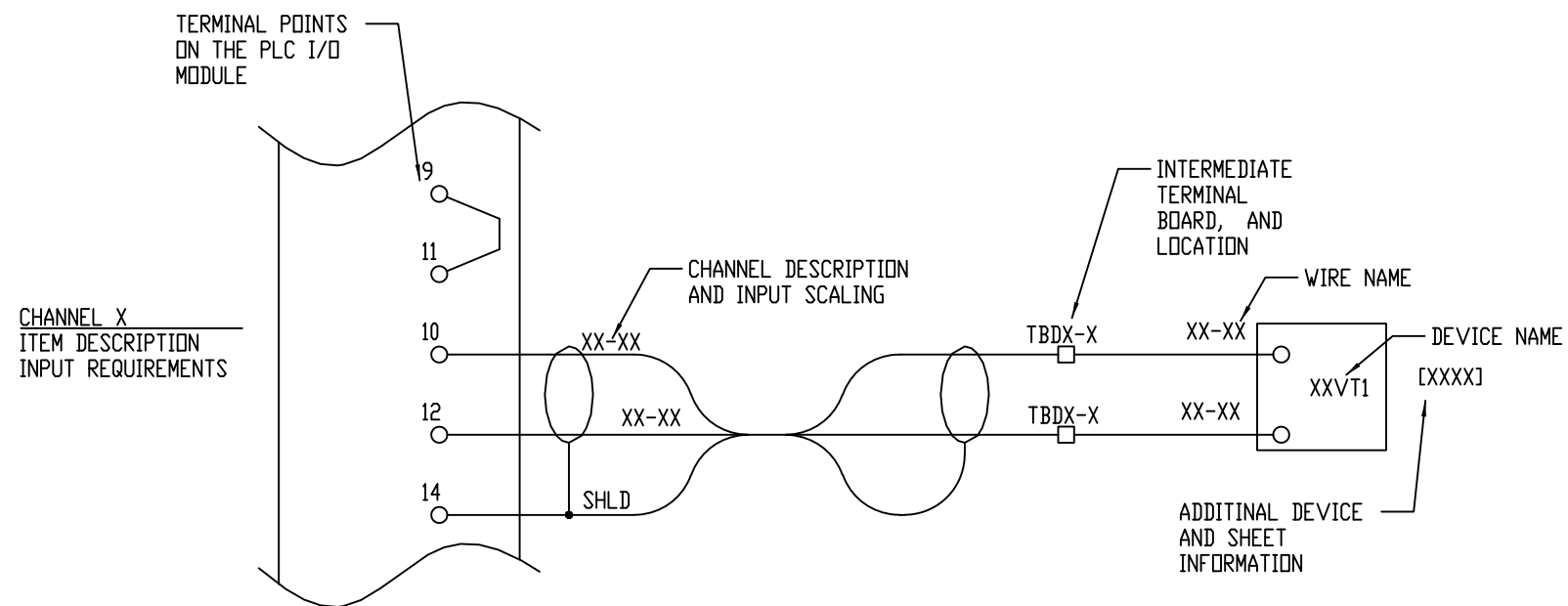
MODULE TYPE: ANALOG INPUT, 8PT
MODULE PART No: IC670MLD230
LOCATION: RACK 2, SLOT 4

REFERENCE ADDRESSES		
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Q	00000	00000
AI	00128	00008
AQ	00000	00000

MODULE TYPE, MODULE PART NUMBER, MODULE LOCATION

SOFTWARE REFERENCE STARTING REFERENCE ADDRESS LENGTH

ANALOG INPUT MODULE KEY



CHANNEL X
ITEM DESCRIPTION
INPUT REQUIREMENTS

MODULE TYPE: ANALOG OUTPUT, 4PT
MODULE PART No: IC670MLD320
LOCATION: RACK 2, SLOT 4

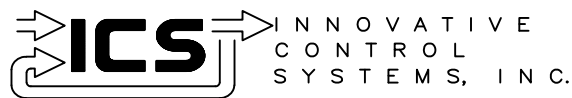
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Q	00000	00000
AI	00000	00000
AQ	00001	00004

MODULE TYPE, MODULE PART NUMBER, MODULE LOCATION

SOFTWARE REFERENCE STARTING REFERENCE ADDRESS LENGTH

ANALOG OUTPUT MODULE KEY

Proprietary Information of:



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REV 2	MODIFICATIONS:	CF		01/18/01
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REV	DESCRIPTION:	BY	APPROVED	DATE

PLC ANALOG MODULE KEY
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:

DRAWING NO.

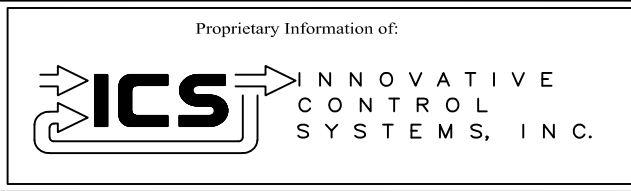
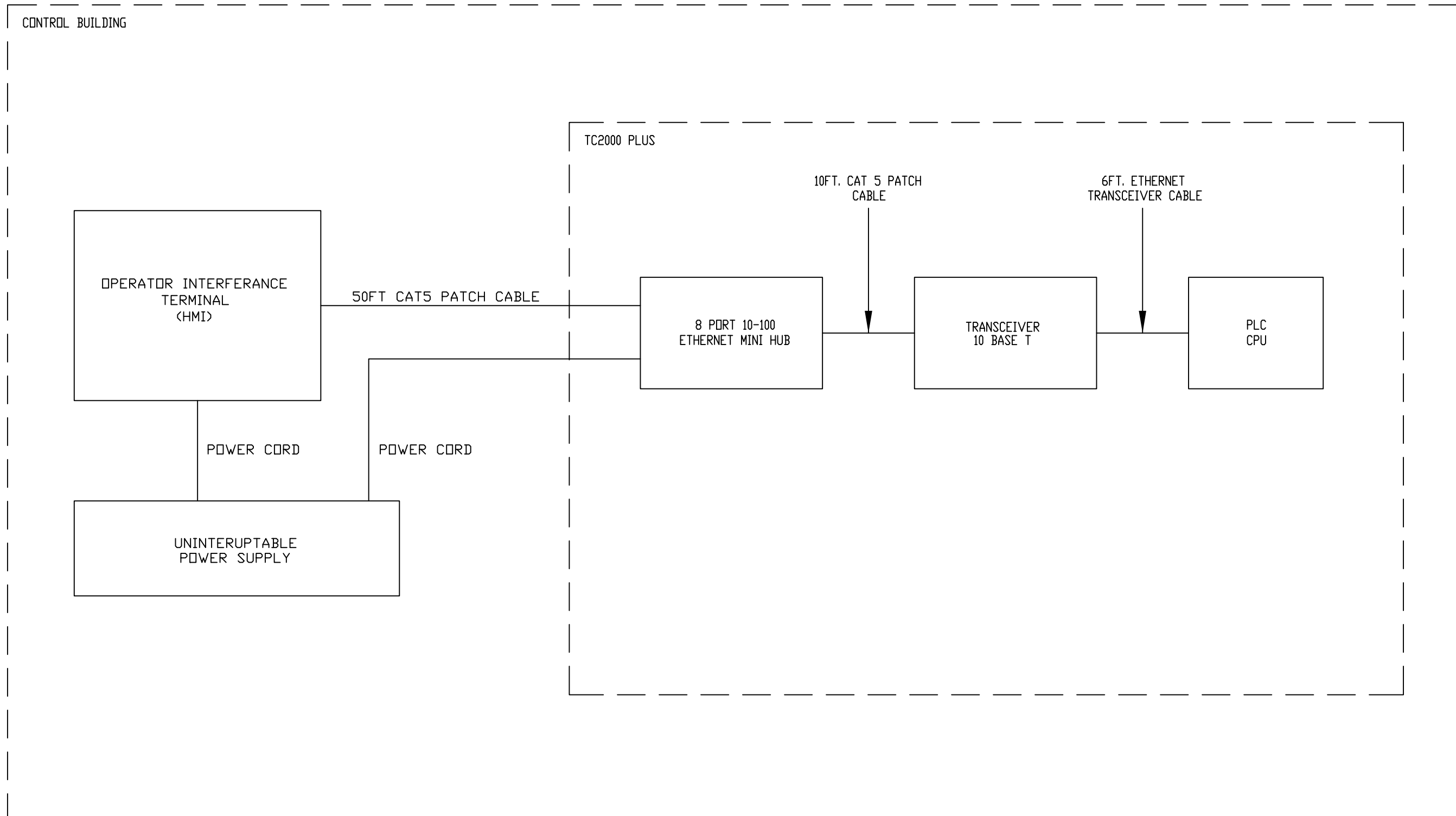
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DRAWN BY: C. FISHER

11/29/99

99174-GTB-101-004-2

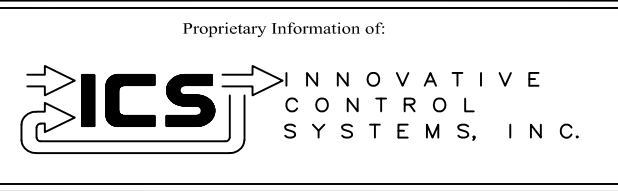
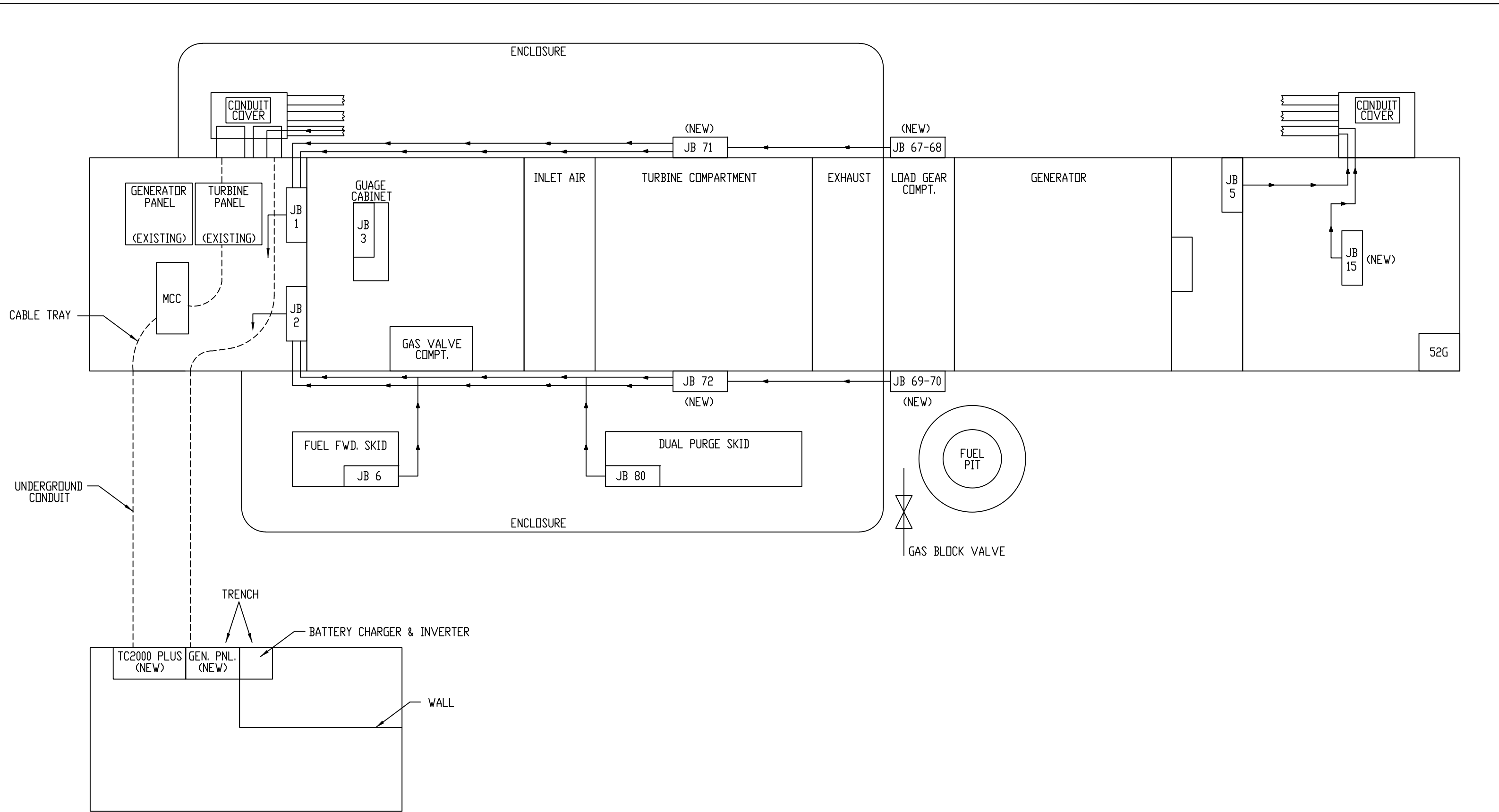
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REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CONTROL SYSTEM ARCHITECTURE
TURBINE GENERATOR CONTROLLER
99174-GTB-101

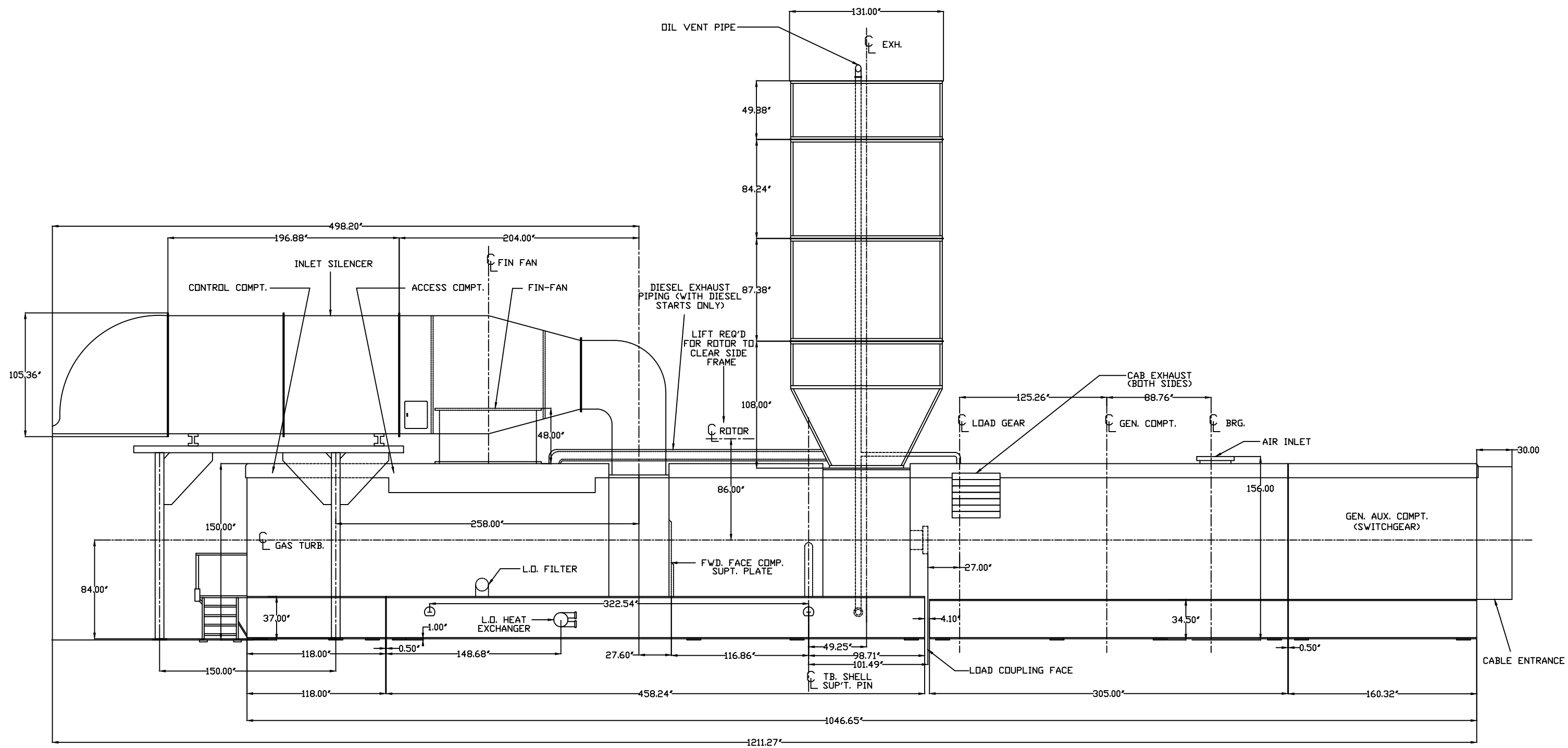
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SITE: DON HENRY POWER CENTER		99174-GTB-101-005-2		NTS
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99	SHEET NO. 005
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REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

TURBINE SITE LAYOUT
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	01/26/00	99174-GTB-101-006-2	SHEET NO. 006 OF 11



Proprietary Information of:



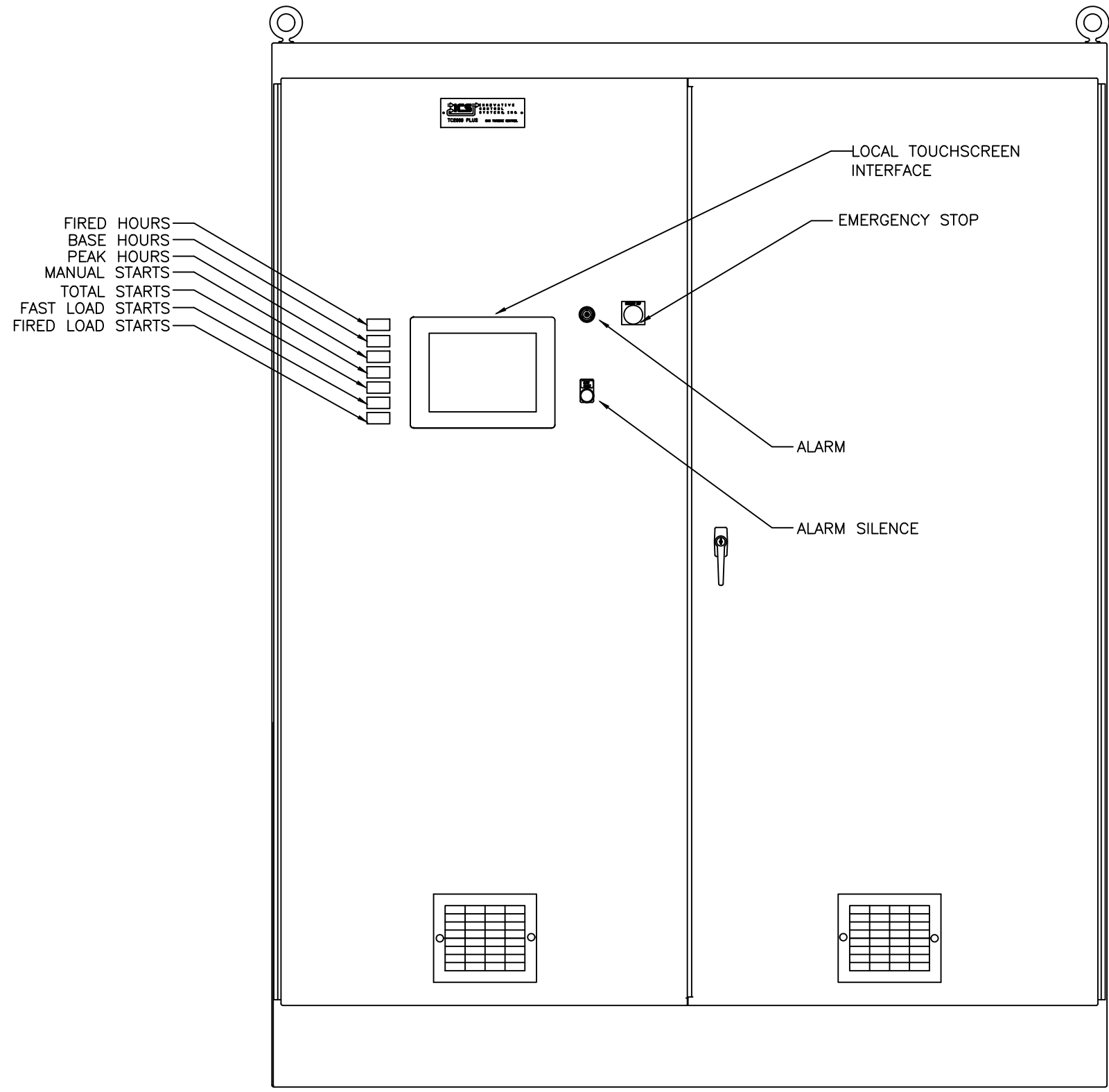
INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00


FRAME 5 GAS TURBINE
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES
 SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	06/14/00	99174-GTB-101-007-2	NTS
			SHEET NO. 007
			11 OF 11



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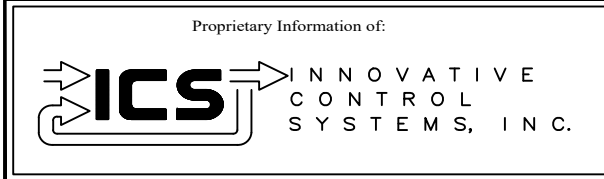
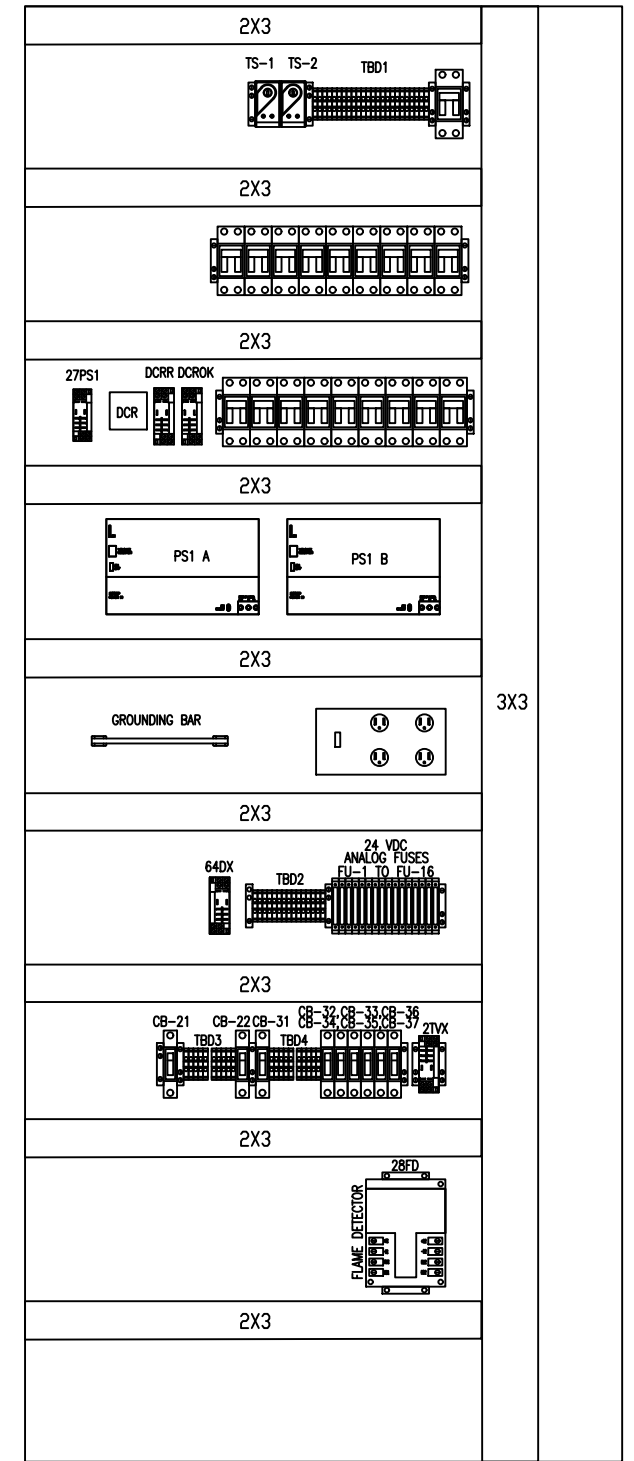
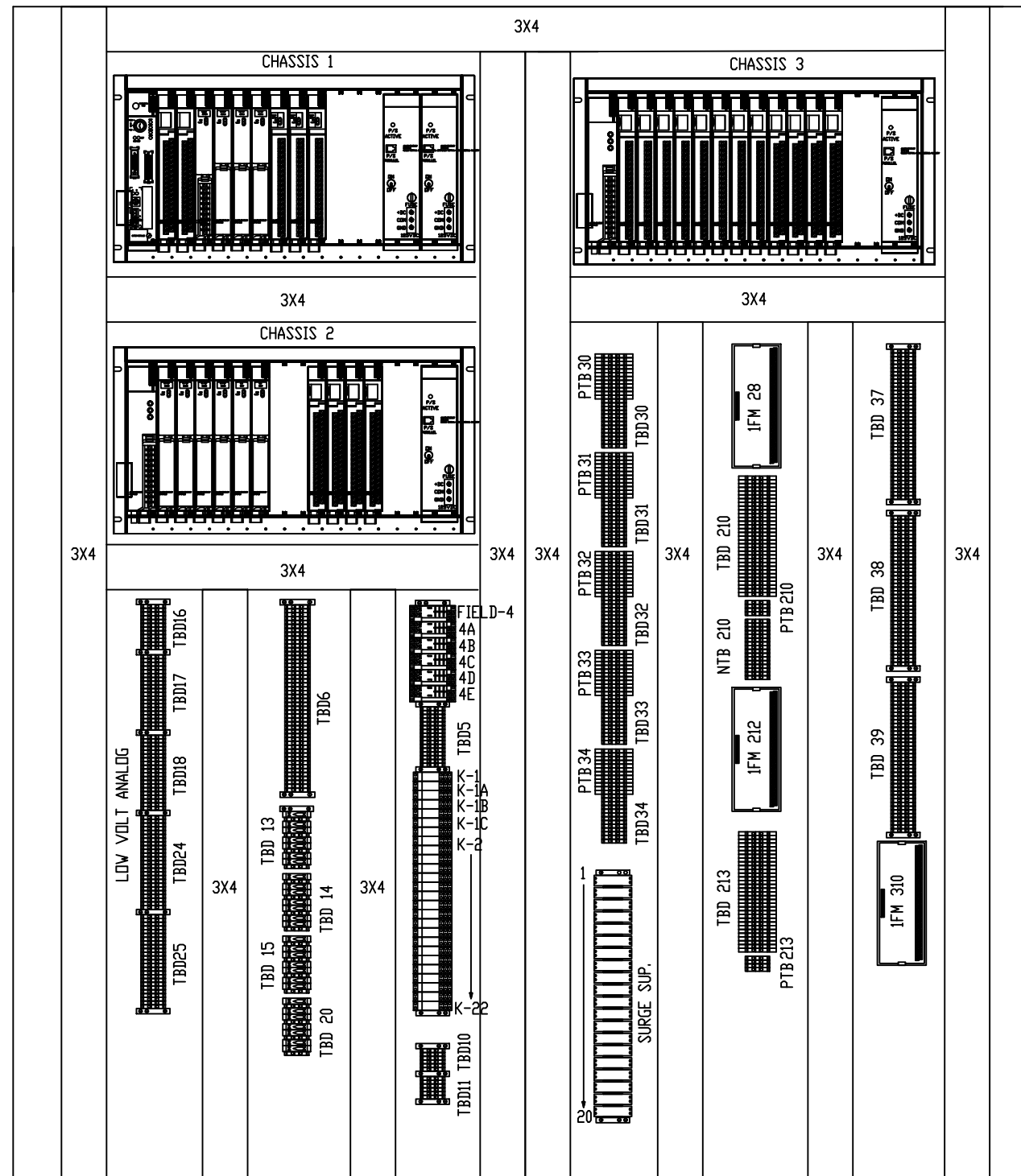
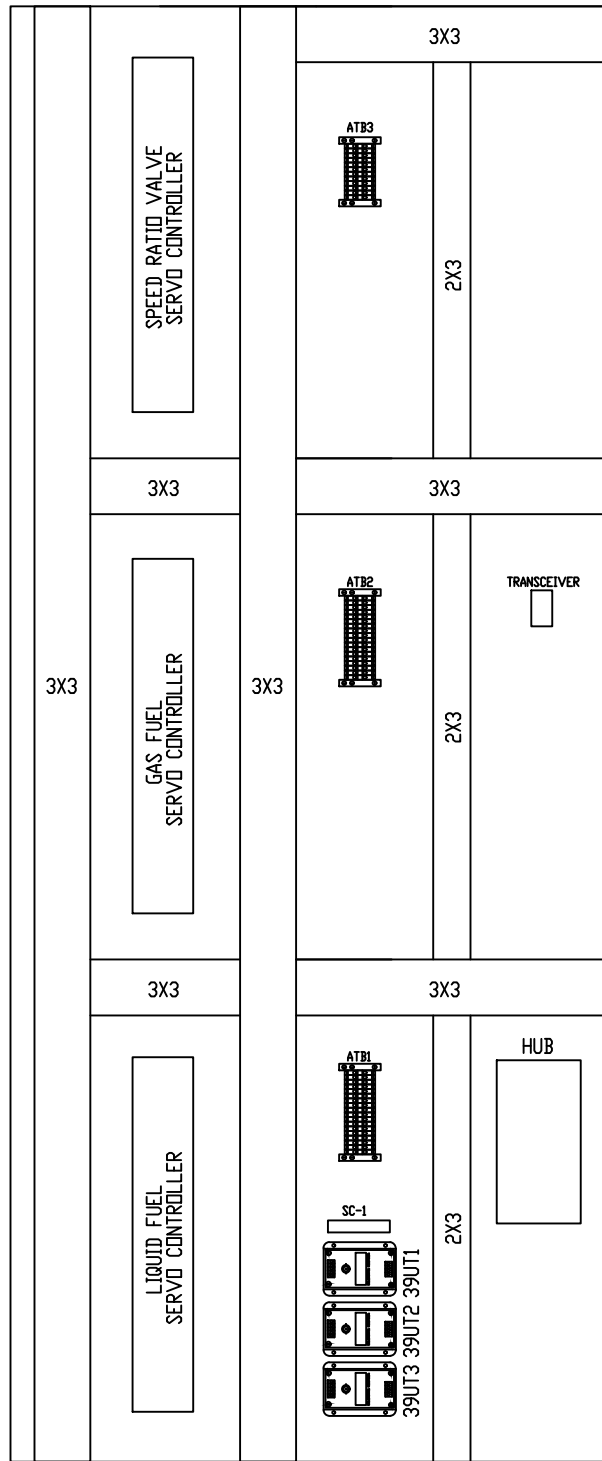


INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

PANEL LAYOUT(FRONT)
TURBINE GENERATOR CONTROLLER
99174-GTB-101

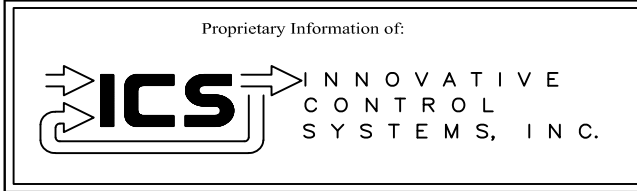
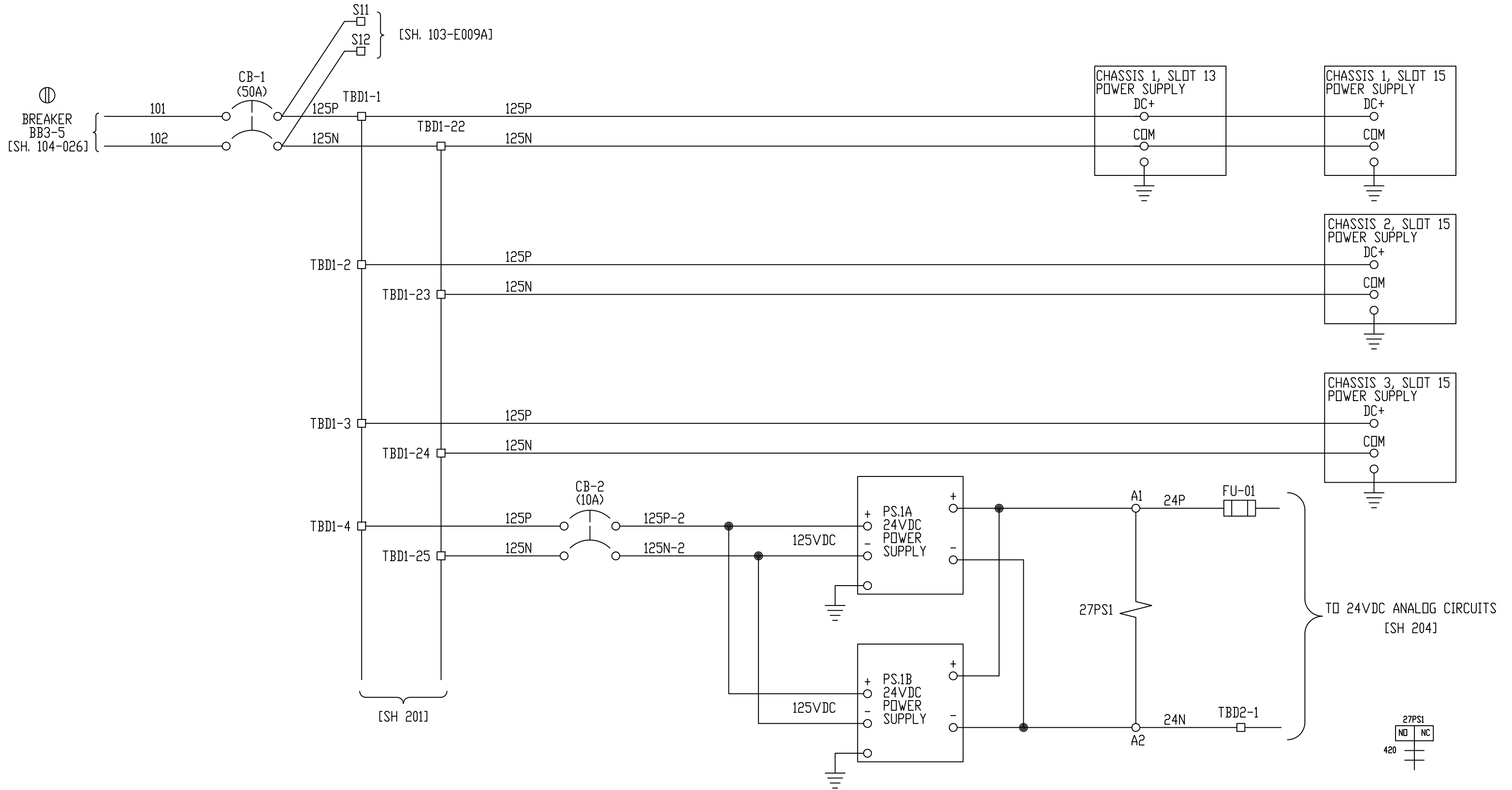
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-101-GTB-100-2	NTS
			SHEET NO. 100
			1 OF 2



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

PANEL LAYOUT(INTERIOR)
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

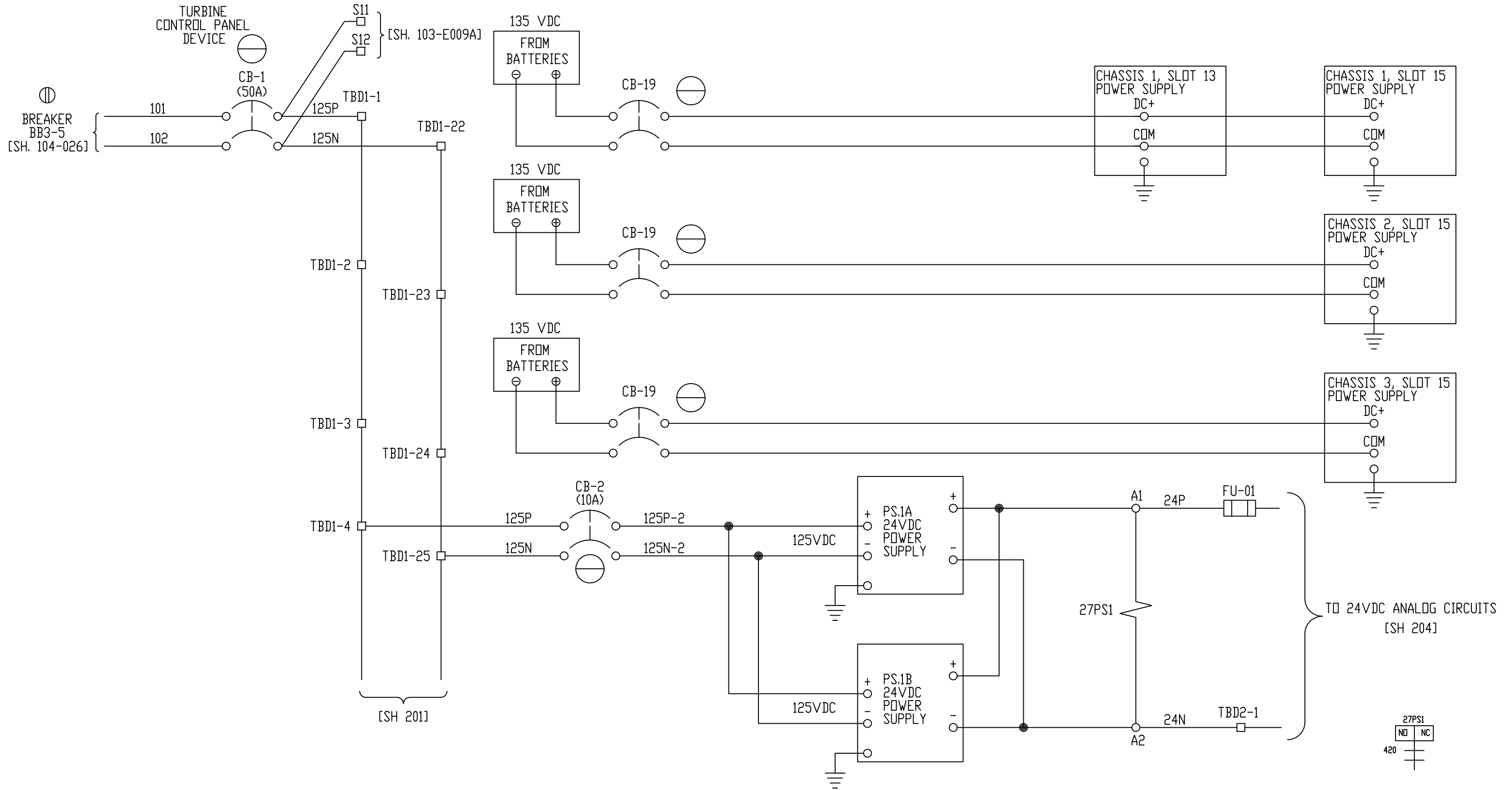
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SITE: DON HENRY POWER CENTER		99174-101-GTB-101-2		NTS
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99	SHEET NO. 101
				2 OF 2



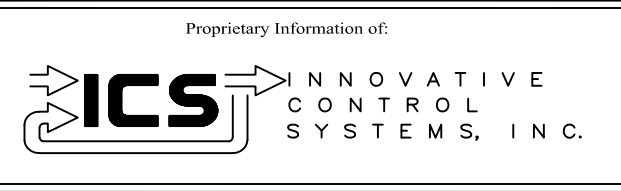
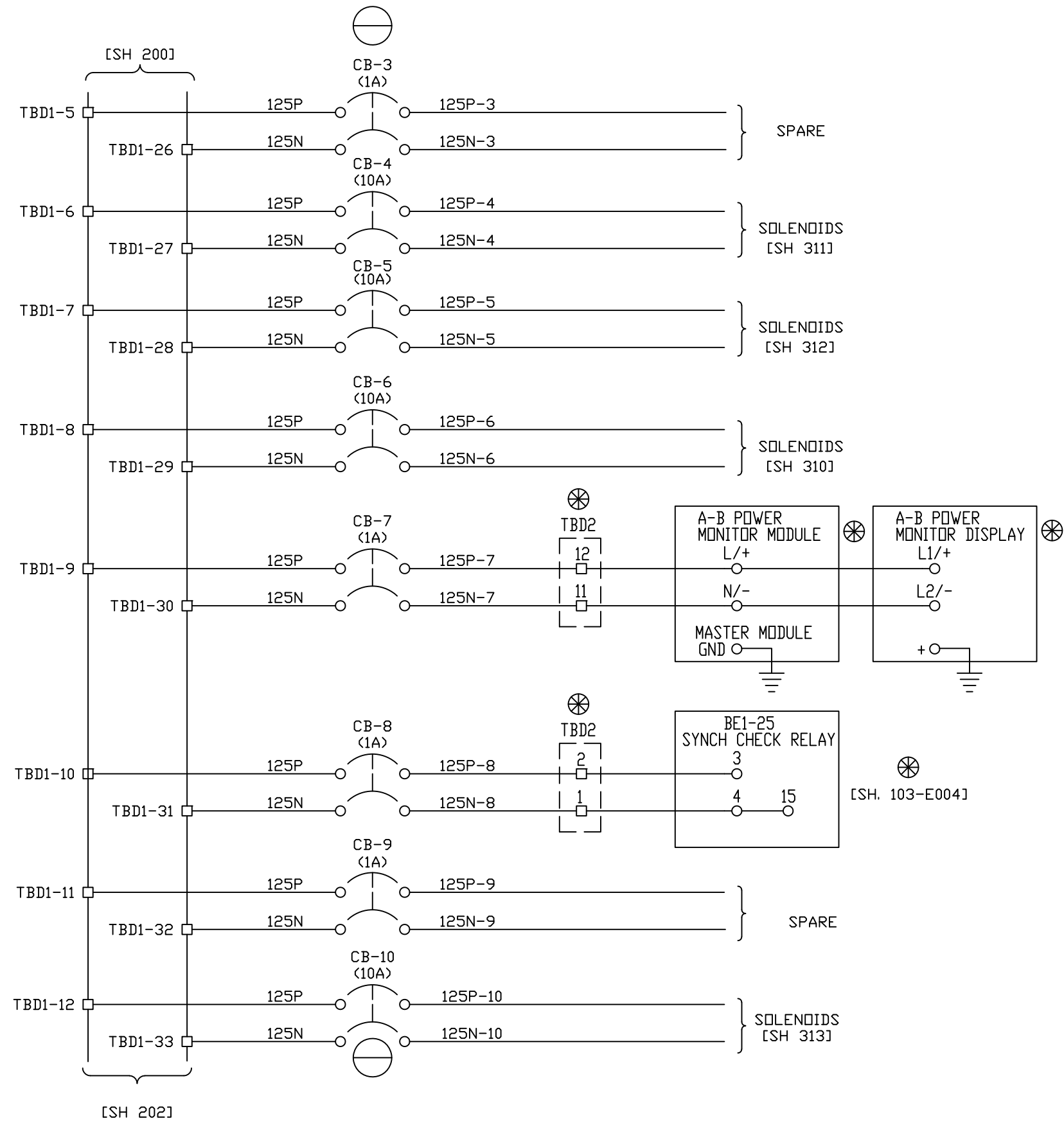
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REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

125VDC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-200-2	SHEET NO. 200 1 OF 9



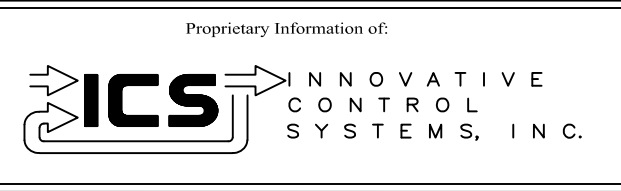
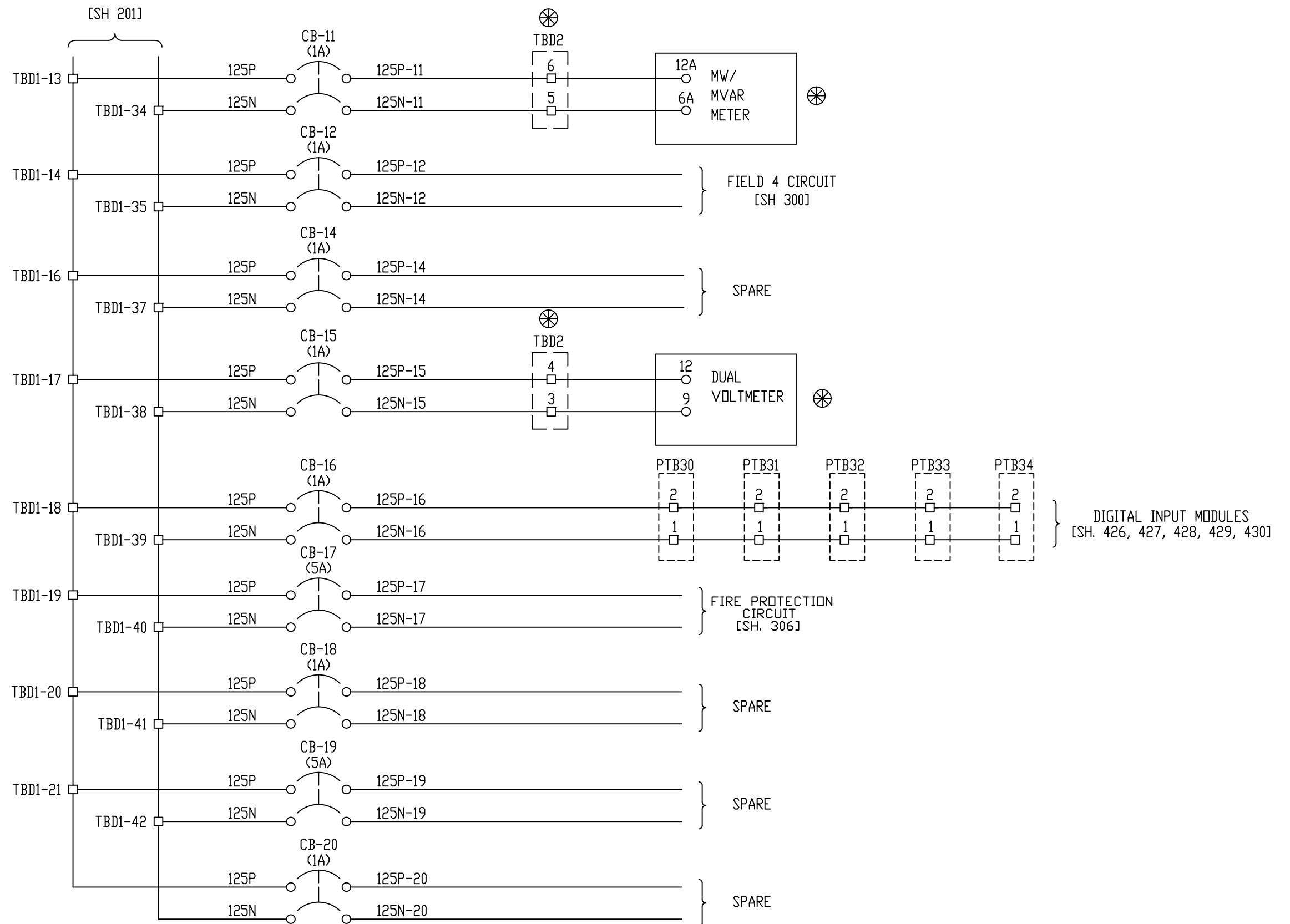
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	REV 2	MODIFICATIONS:	CF		01/18/01		SITE: DON HENRY POWER CENTER		
	REV 1	AS BUILTS:	CF		04/14/00		APPROVED BY:	DRAWING NO.	SCALE:
	REV	DESCRIPTION:	BY	APPROVED	DATE		DRAWN BY: C. FISHER	99174-GTB-101-200-2	NTS
							11/29/99	SHEET NO. 200	1 OF 9



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

125VDC PANEL POWER DISTRIBUTION
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

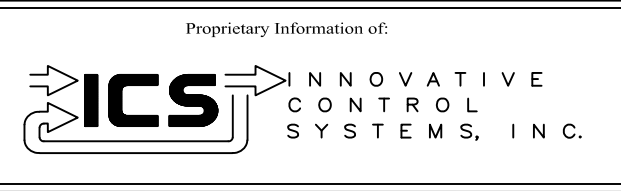
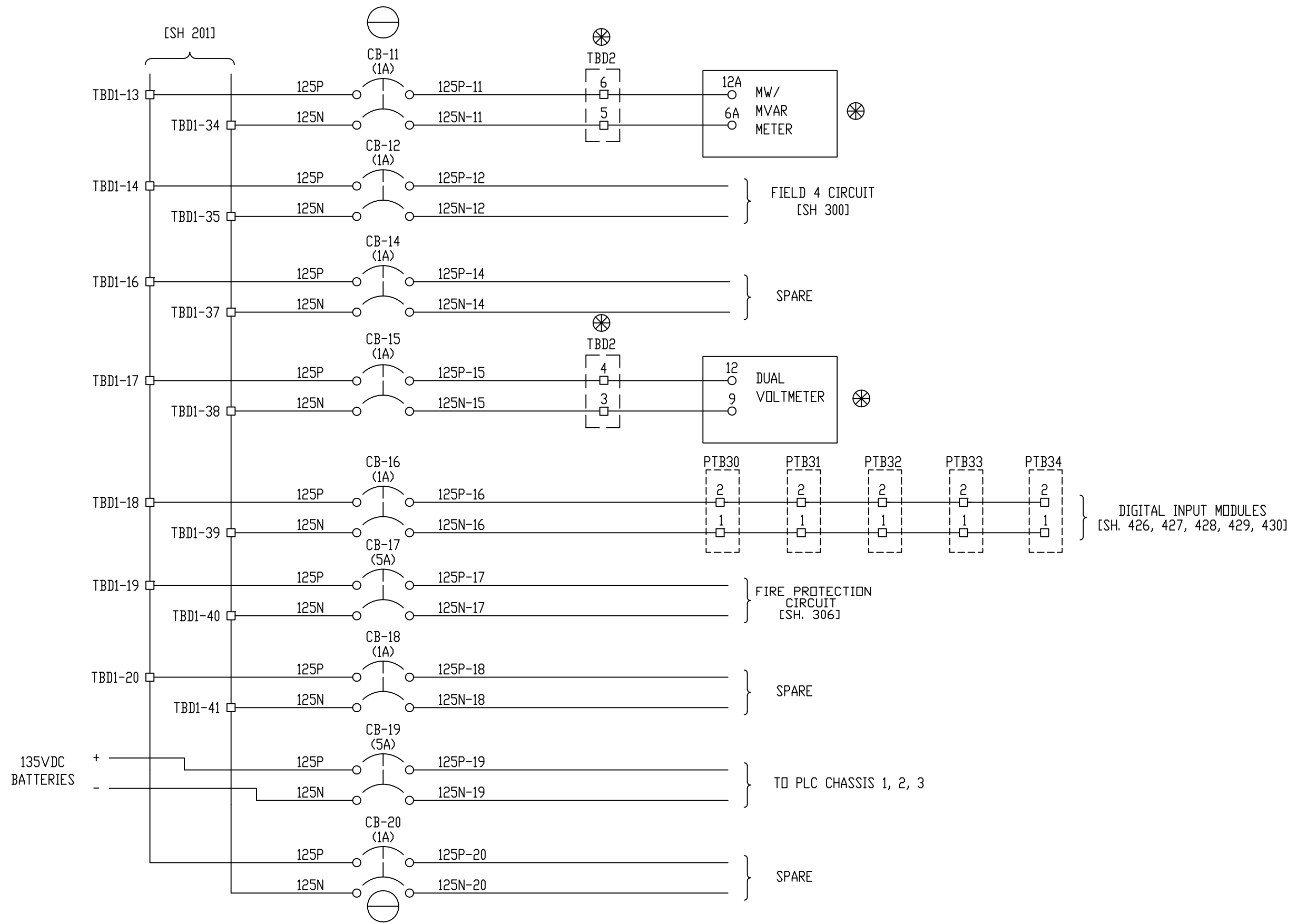
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-201-2	SHEET NO. 201 2 OF 9



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

125VDC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

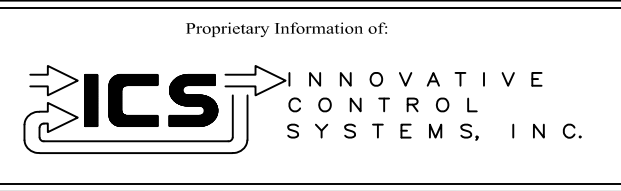
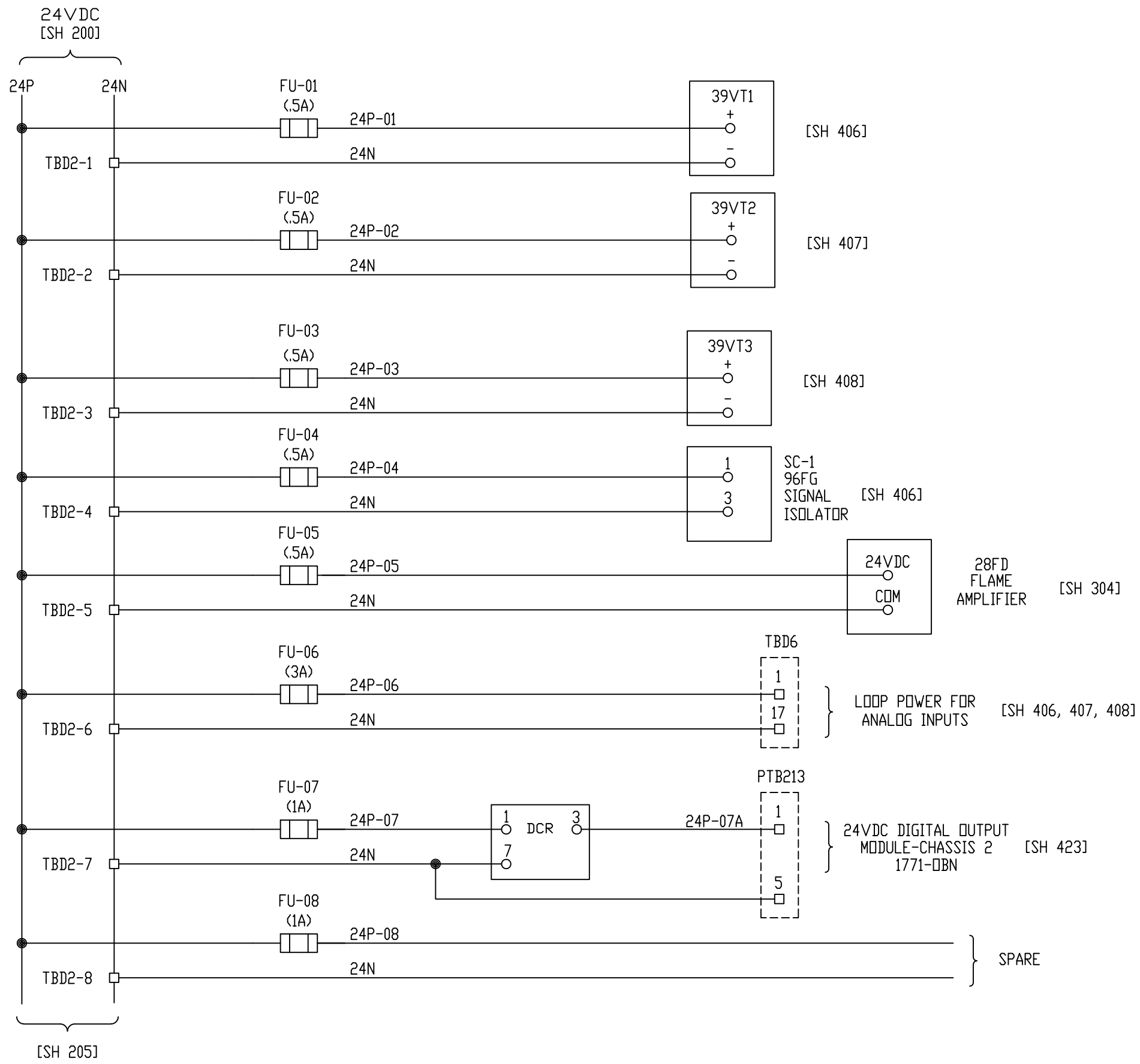
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-202-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 202 OF 9	



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

125VDC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

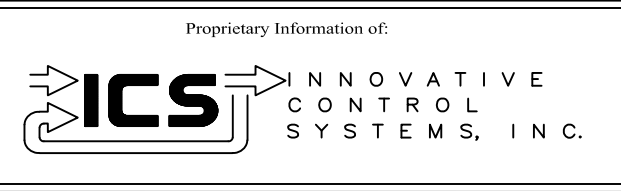
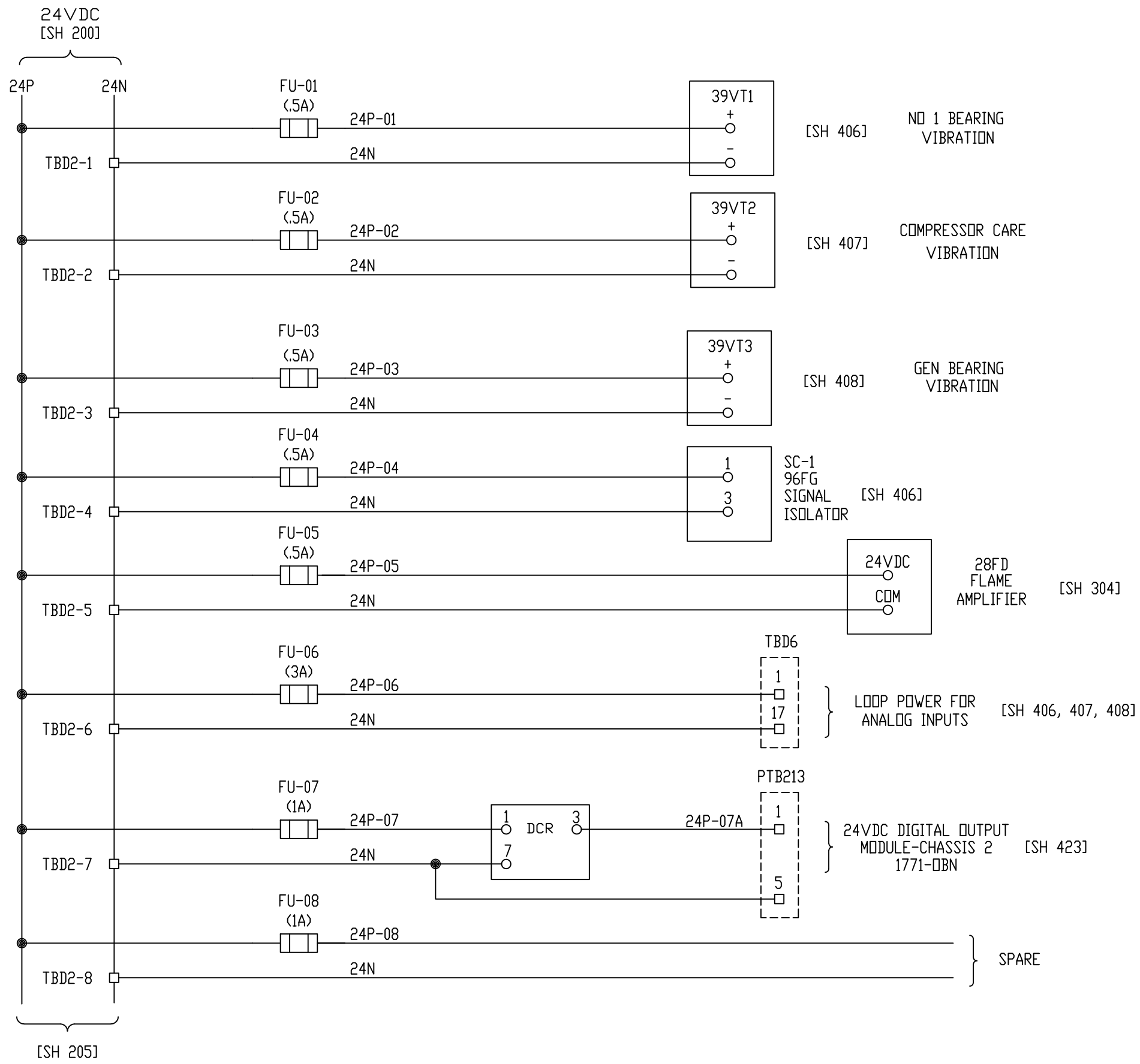
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-202-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 202 3 OF 9



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

24VDC PANEL POWER DISTRIBUTION
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

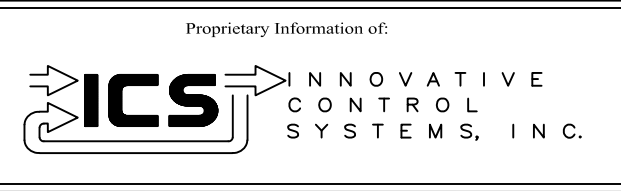
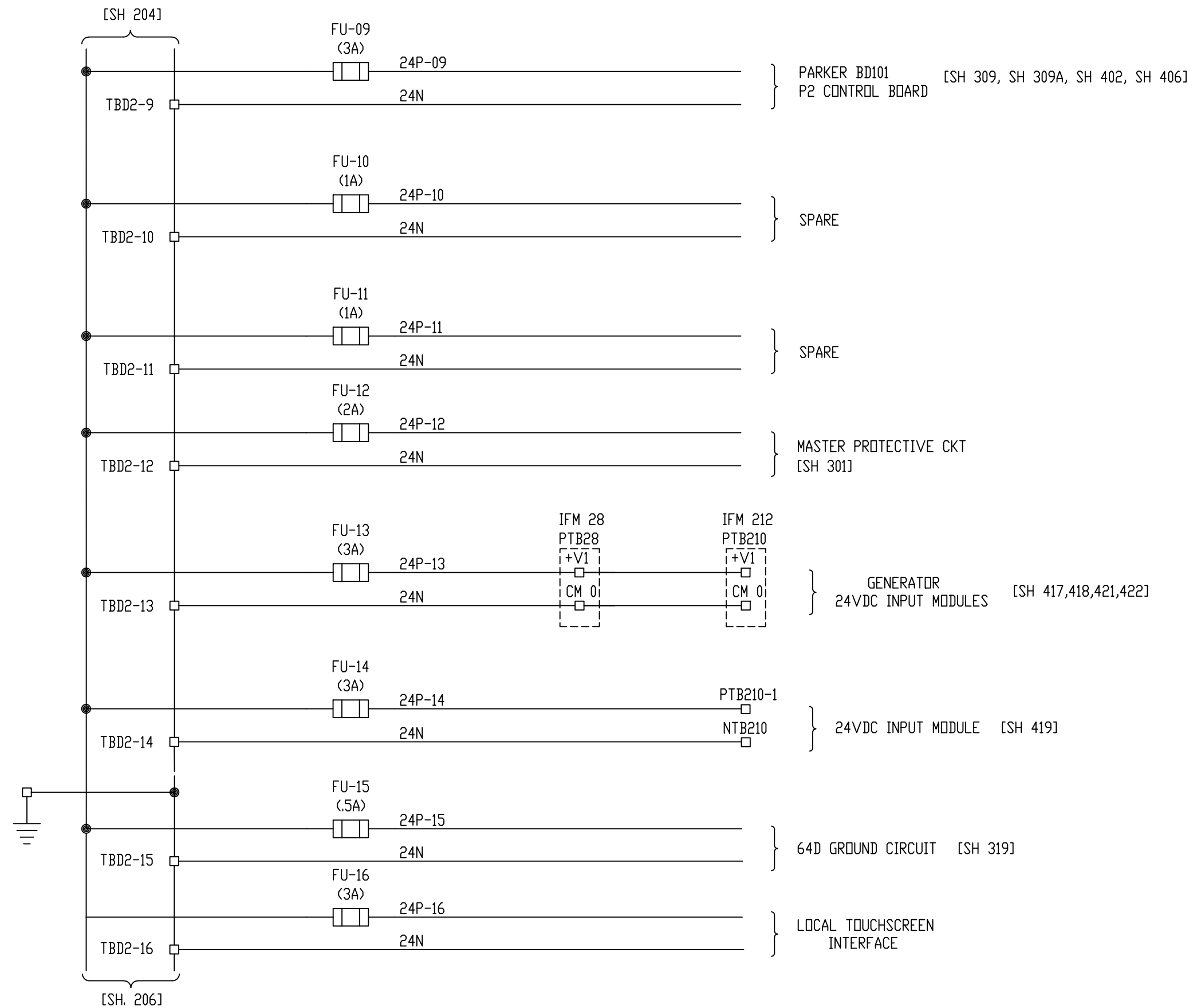
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		SHEET NO. 204	
APPROVED BY:		DRAWING NO.	99174-GTB-101-204-2
DRAWN BY: C. FISHER	11/29/99		4 OF 9



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

24VDC PANEL POWER DISTRIBUTION
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

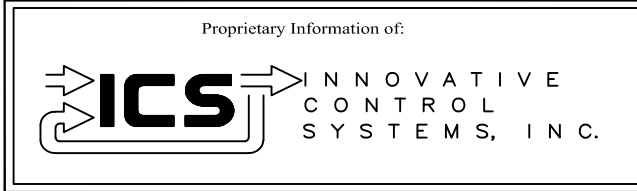
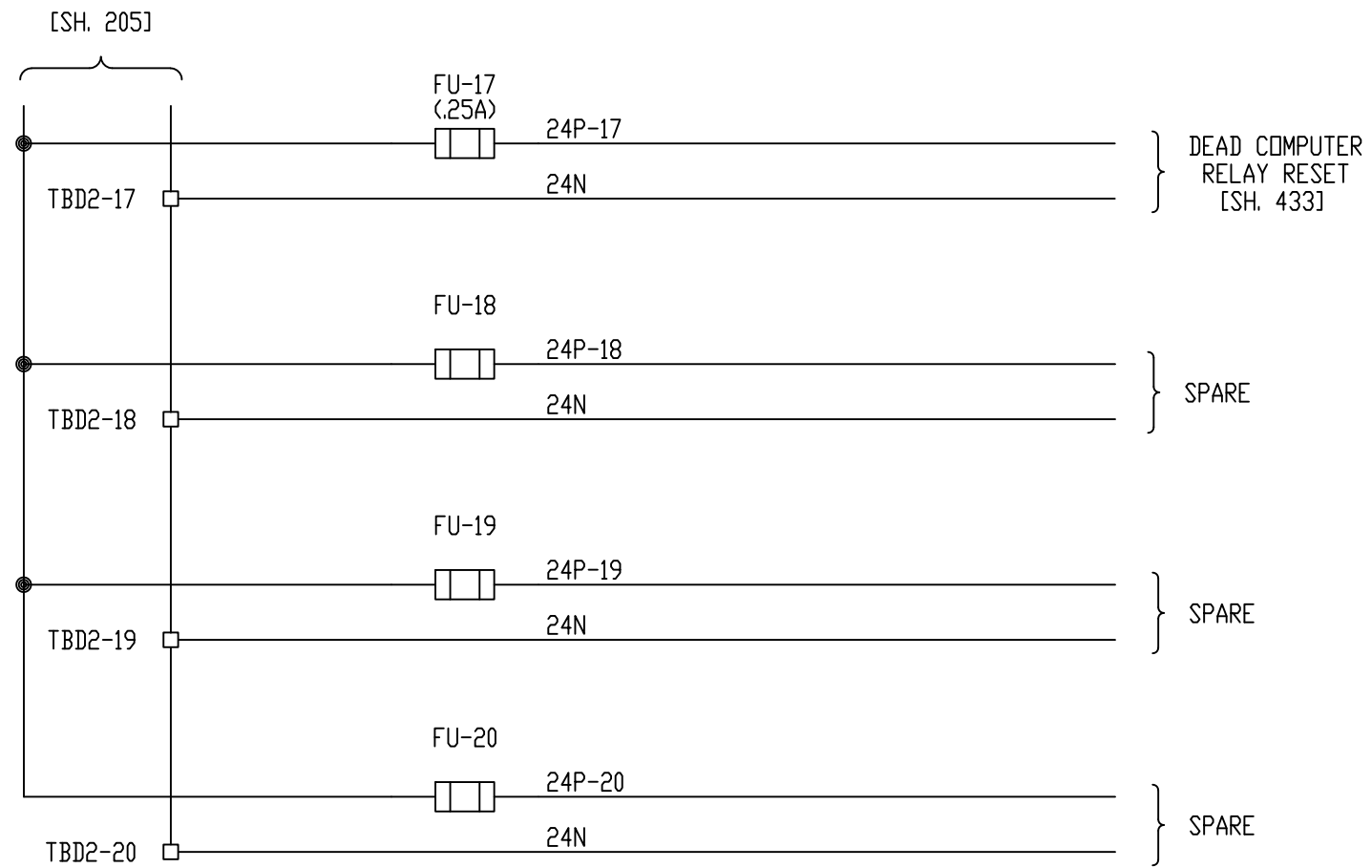
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-204-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 204 OF 9



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

24VDC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

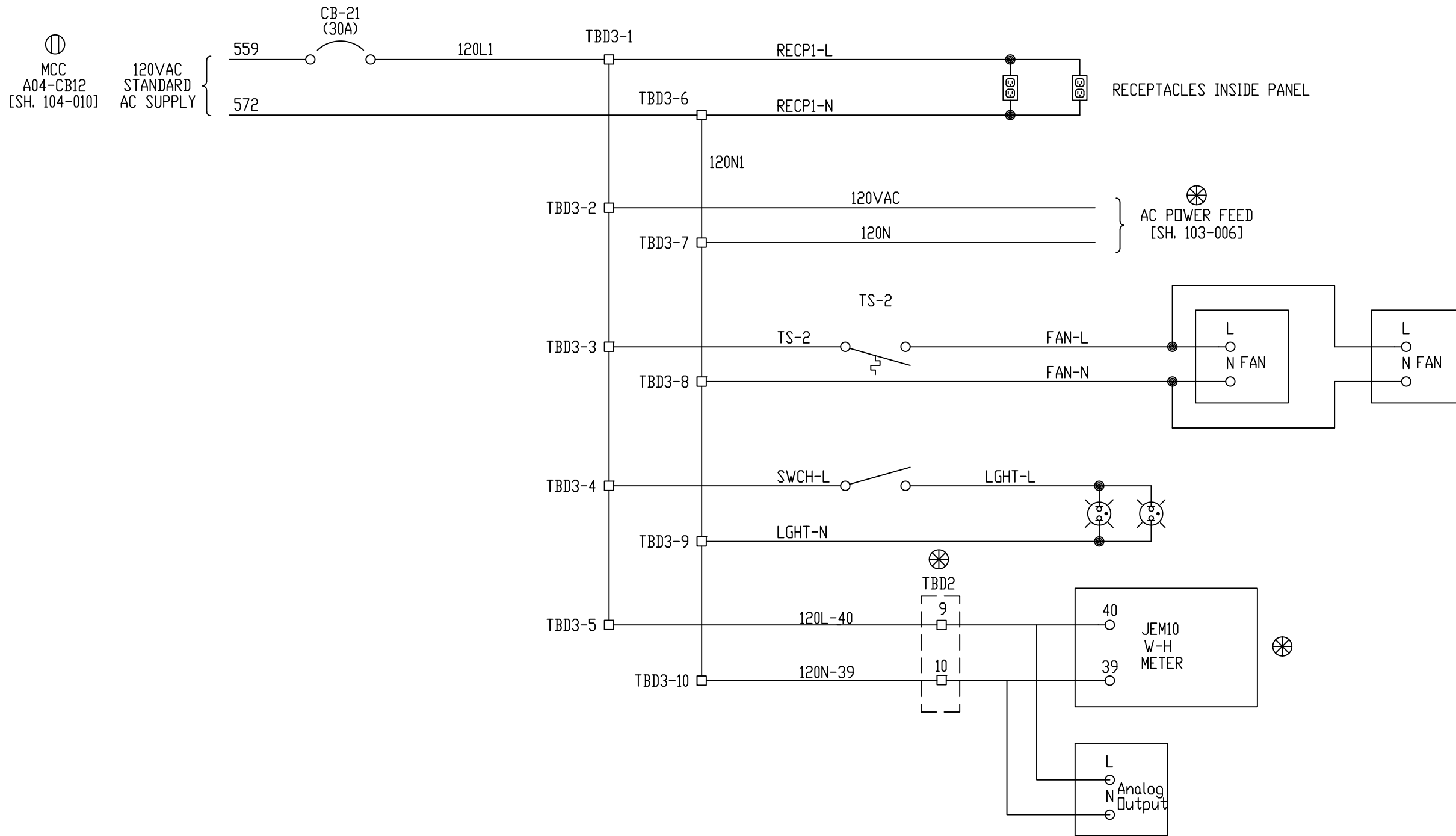
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-205-2	SHEET NO. 205 5 OF 9



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

24VDC PANEL POWER DISTRIBUTION
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-206-2	SHEET NO. 206 6 OF 9



MCC
A04-CB12
[SH. 104-010]

120VAC
STANDARD
AC SUPPLY

559
CB-21
(30A)
572

120L1

TBD3-1

RECP1-L

TBD3-6

RECP1-N

RECEPTACLES INSIDE PANEL

120N1

TBD3-2

120VAC

AC POWER FEED
[SH. 103-006]

TBD3-7

120N

TS-2

TBD3-3

TS-2

FAN-L

TBD3-8

FAN-N

L
N FAN

L
N FAN

TBD3-4

SWCH-L

LGHT-L

TBD3-9

LGHT-N

40
JEM10
W-H
METER
39

TBD3-5

120L-40

TBD2

9

TBD3-10

120N-39

10

L
N Analog
Output

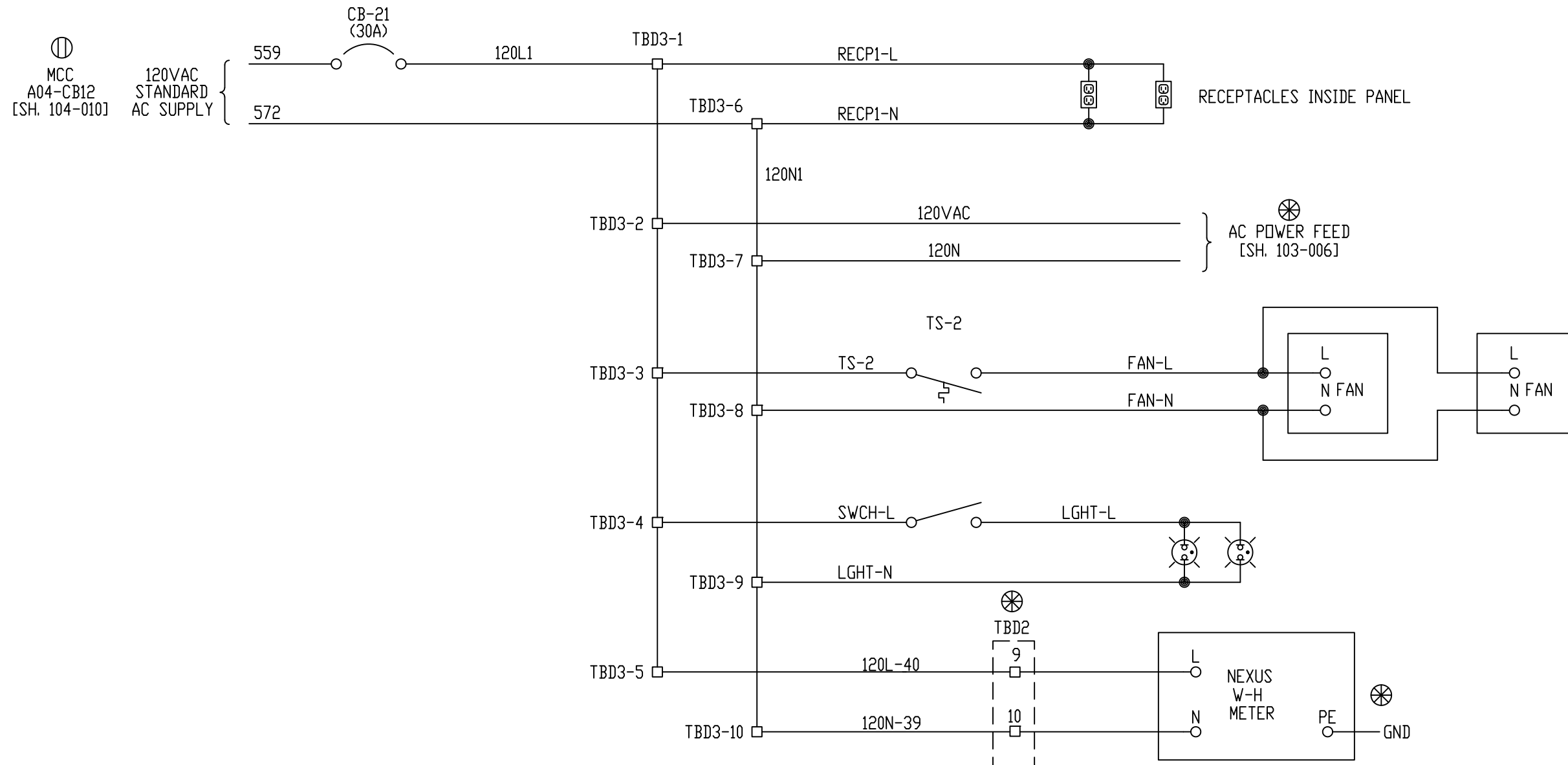
Proprietary Information of:

INNOVATIVE
CONTROL
SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

120VAC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-207-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 207 7 OF 9



MCC
A04-CB12
[SH. 104-010]

120VAC
STANDARD
AC SUPPLY

559
CB-21
(30A)
120L1

TBD3-1

RECP1-L

TBD3-6

RECP1-N

RECEPTACLES INSIDE PANEL

120N1

TBD3-2

120VAC

AC POWER FEED
[SH. 103-006]

TBD3-7

120N

TS-2

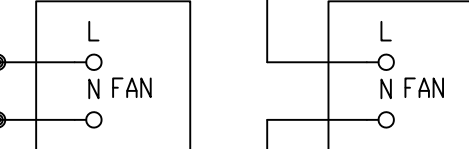
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TS-2

FAN-L

TBD3-8

FAN-N



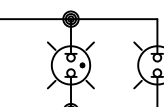
TBD3-4

SWCH-L

LGHT-L

TBD3-9

LGHT-N

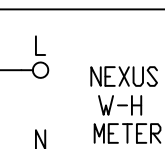


TBD3-5

120L-40

TBD2

9



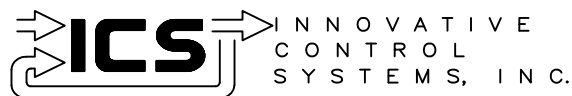
TBD3-10

120N-39

10

GND

Proprietary Information of:



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

120VAC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:

11/29/99

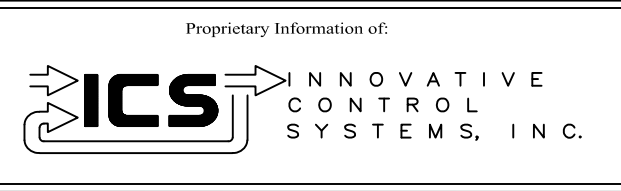
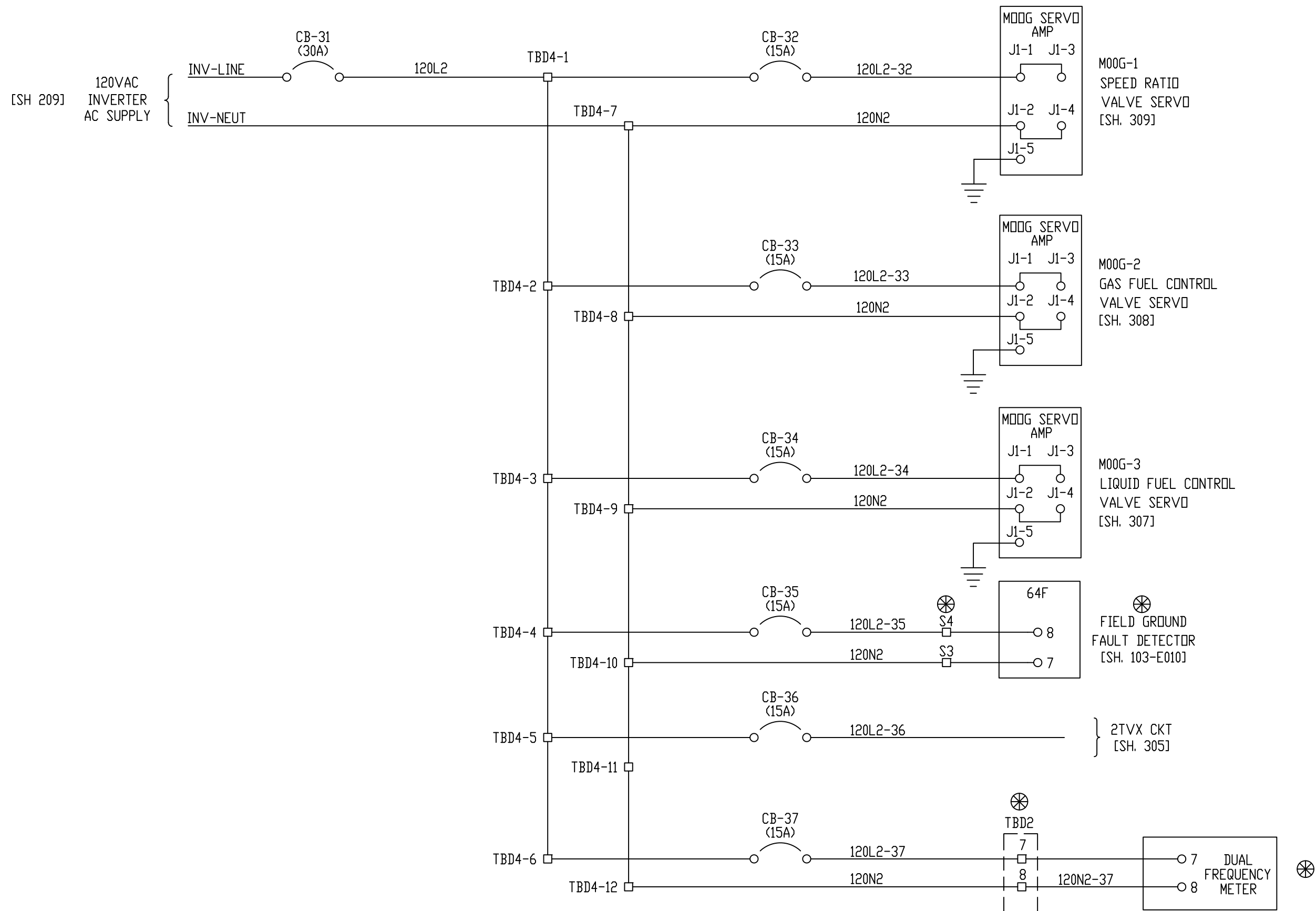
DRAWING NO.

99174-GTB-101-207-2

SCALE: NTS

SHEET NO. 207

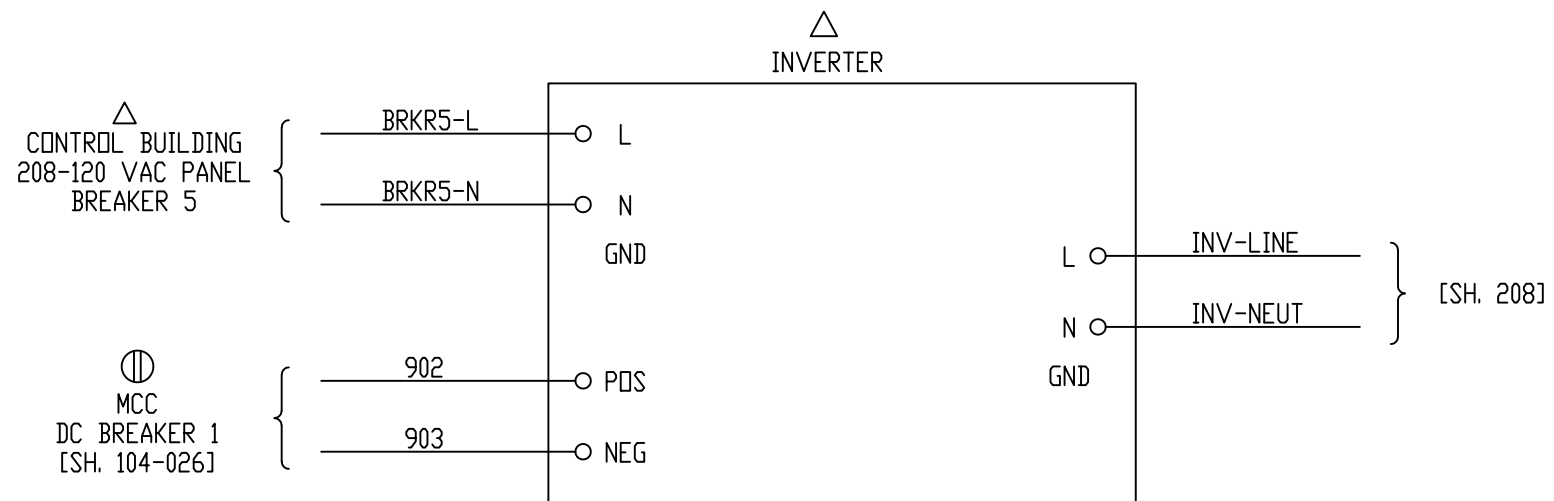
7 OF 9



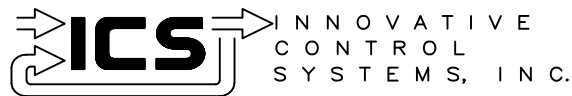
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REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

120VAC PANEL POWER DISTRIBUTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-208-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 208 OF 9	



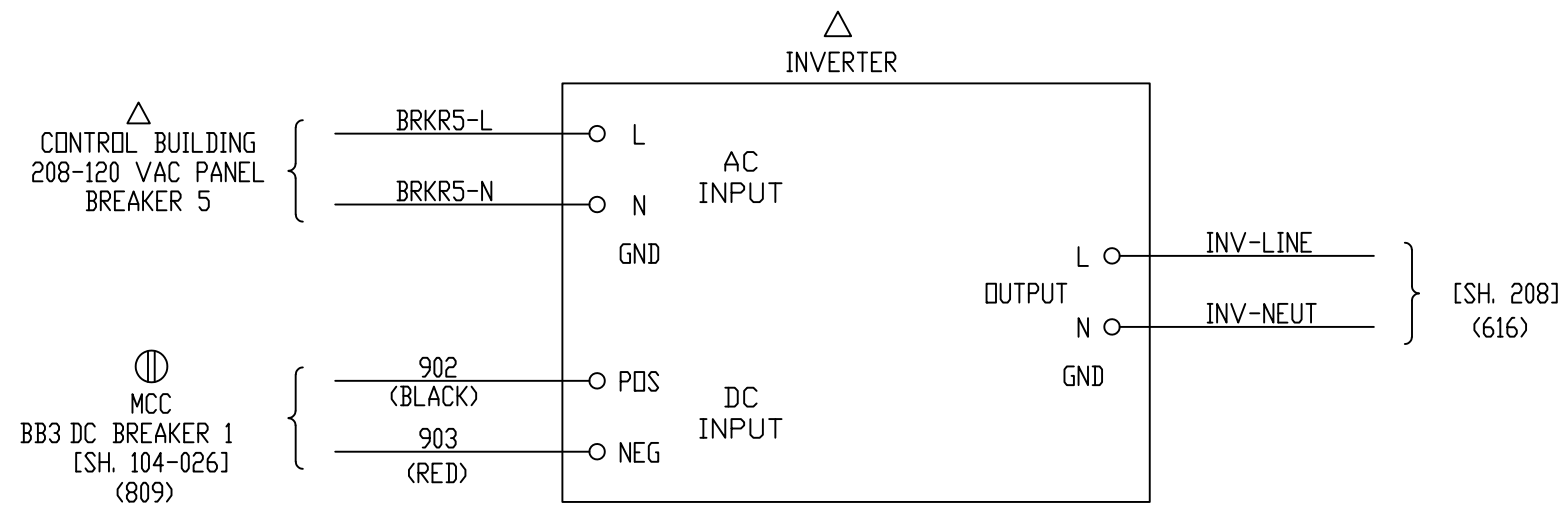
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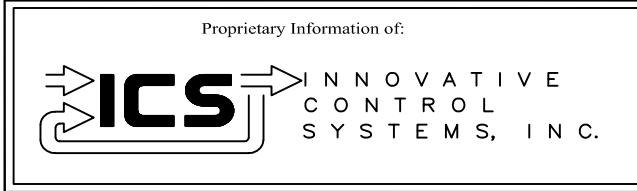
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

DC TO AC INVERTER
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-209-2	SHEET NO. 209 9 OF 9



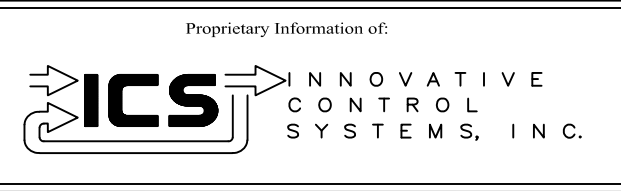
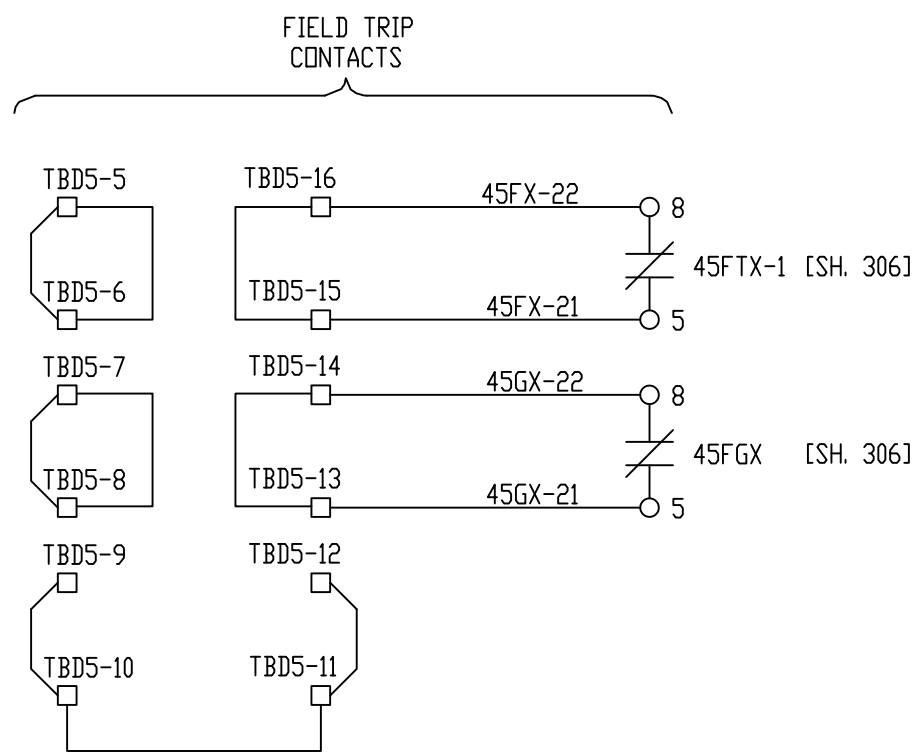
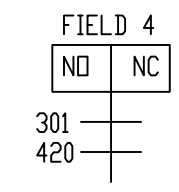
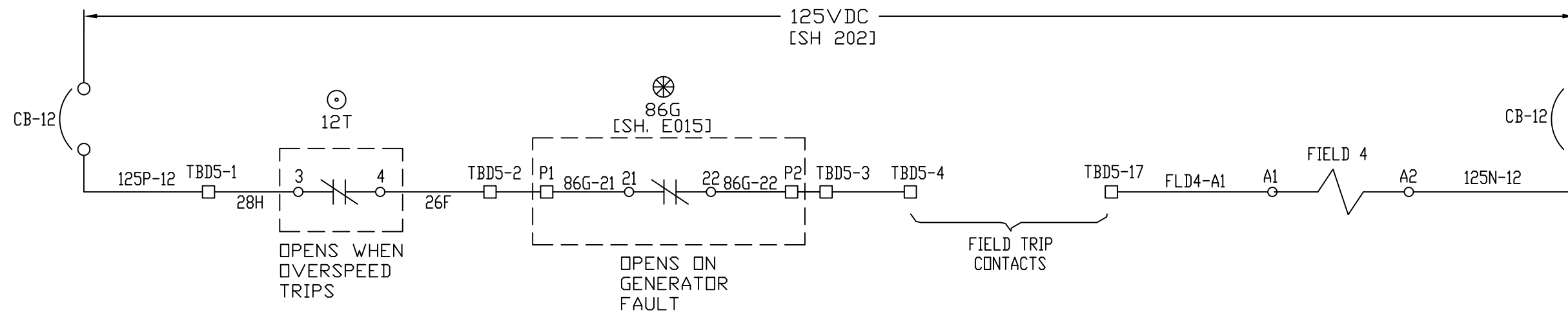
NOTE: RED WIRE IS NEGATIVE



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

DC TO AC INVERTER
TURBINE GENERATOR CONTROLLER
99174-GTB-101

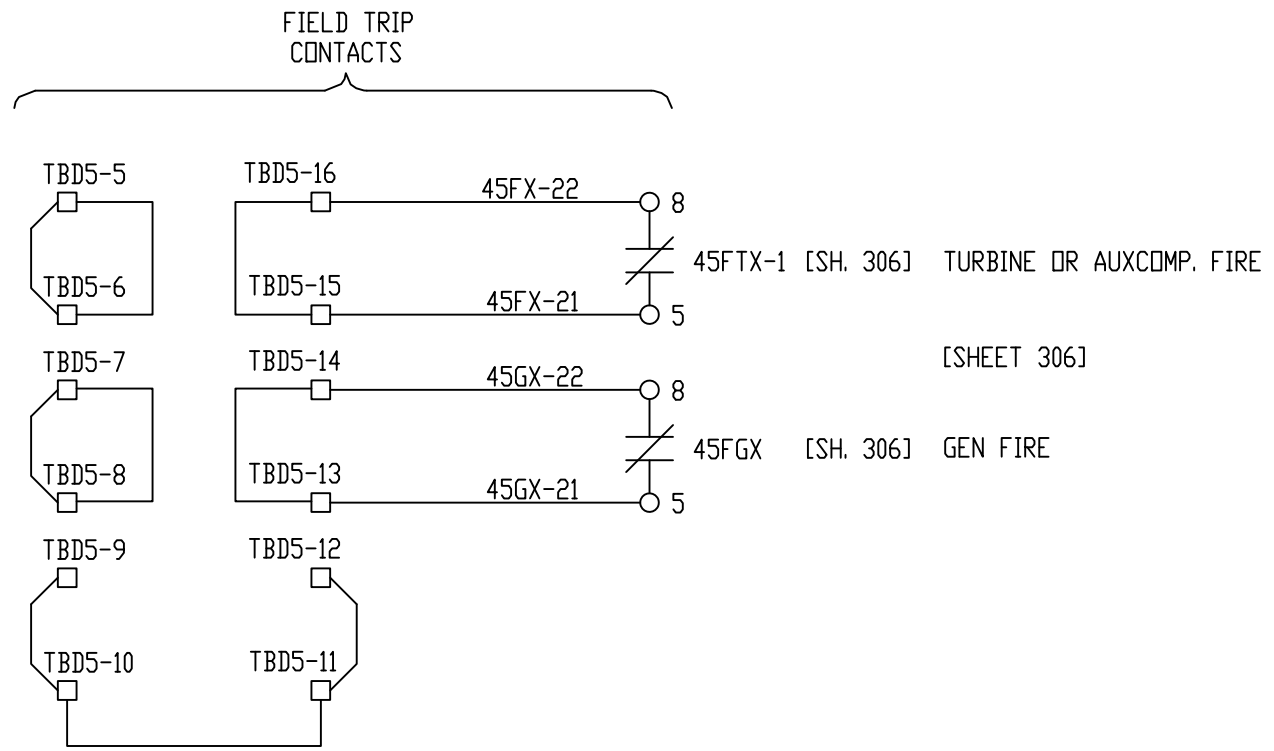
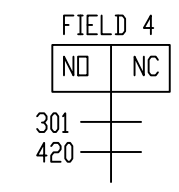
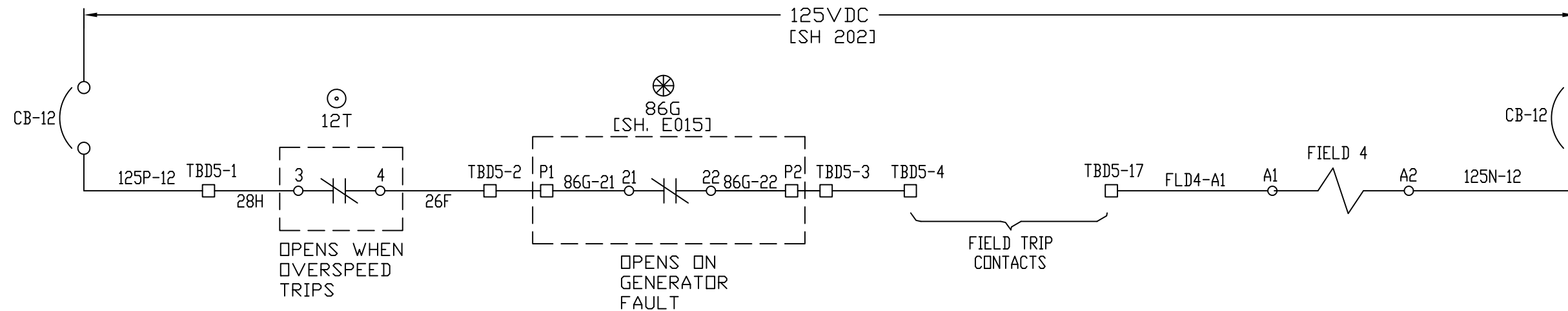
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SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-209-2	SHEET NO. 209 9 OF 9



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

MASTER PROTECTIVE CIRCUIT
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-300-2	SHEET NO. 300 1 OF 17

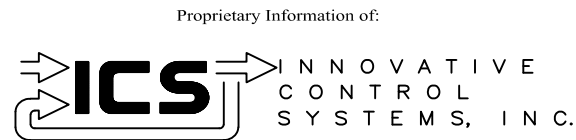
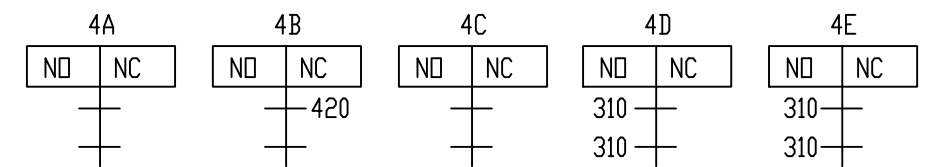
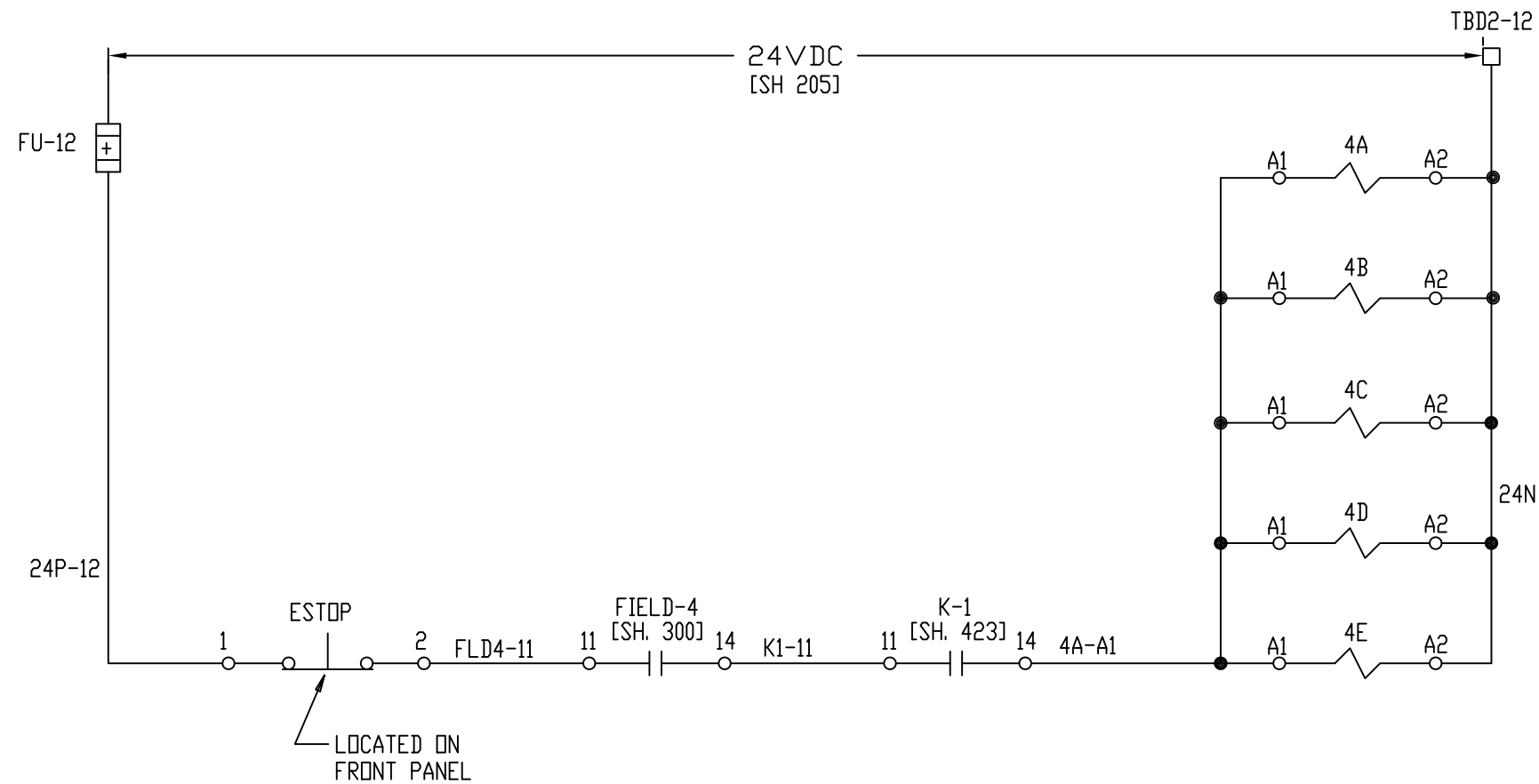


Proprietary Information of:

REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

MASTER PROTECTIVE CIRCUIT
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-300-2	SHEET NO. 300 1 OF 17



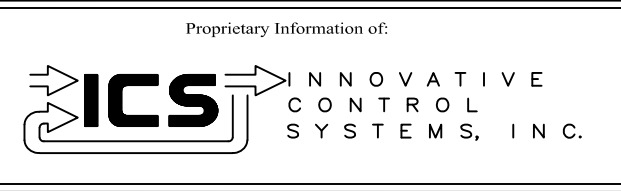
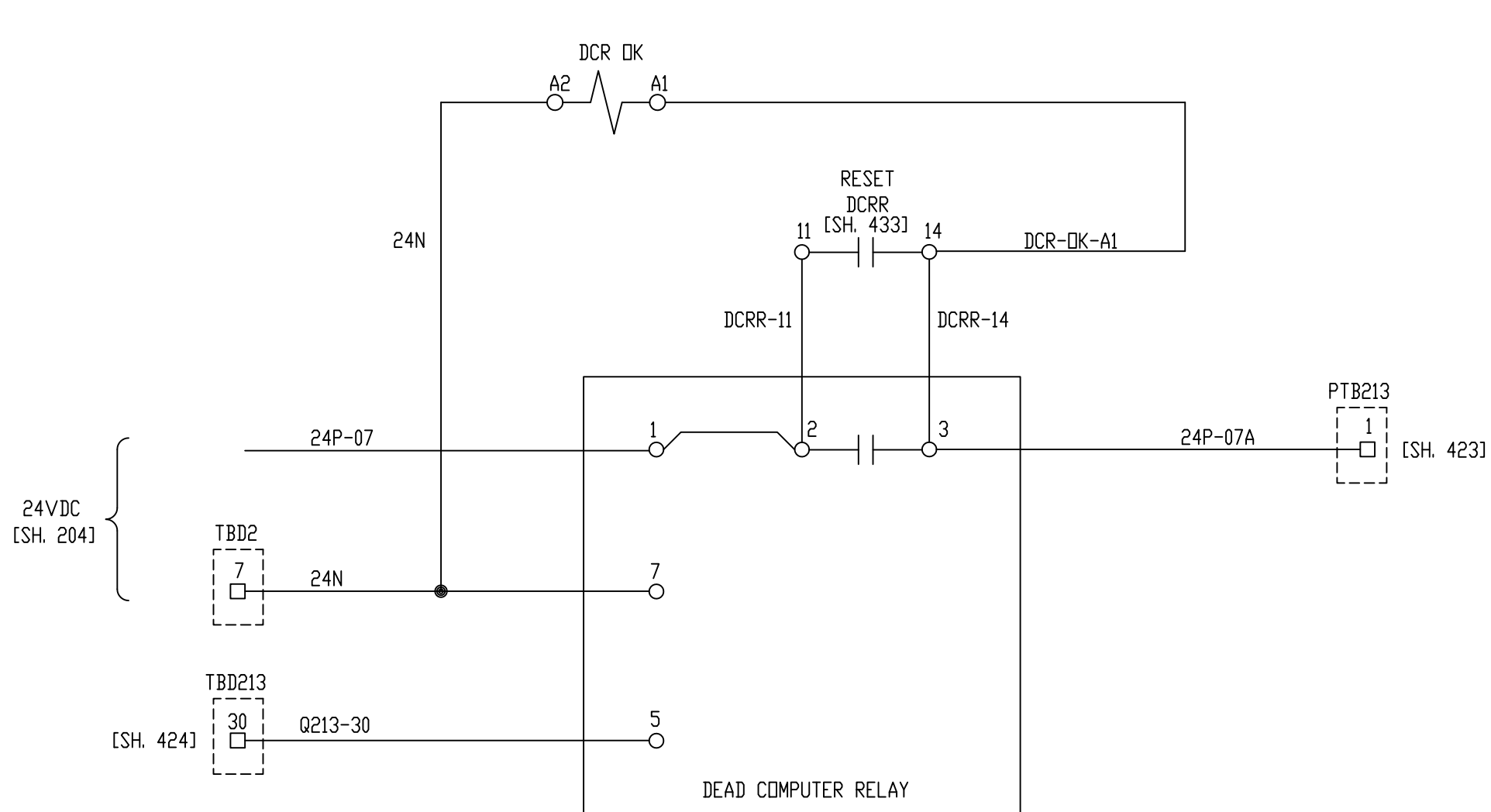
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

MASTER PROTECTIVE CIRCUIT
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

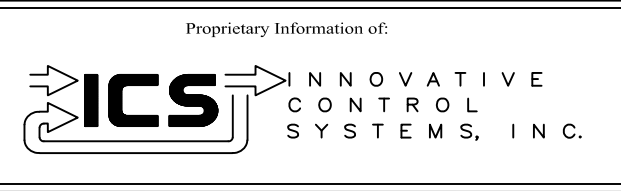
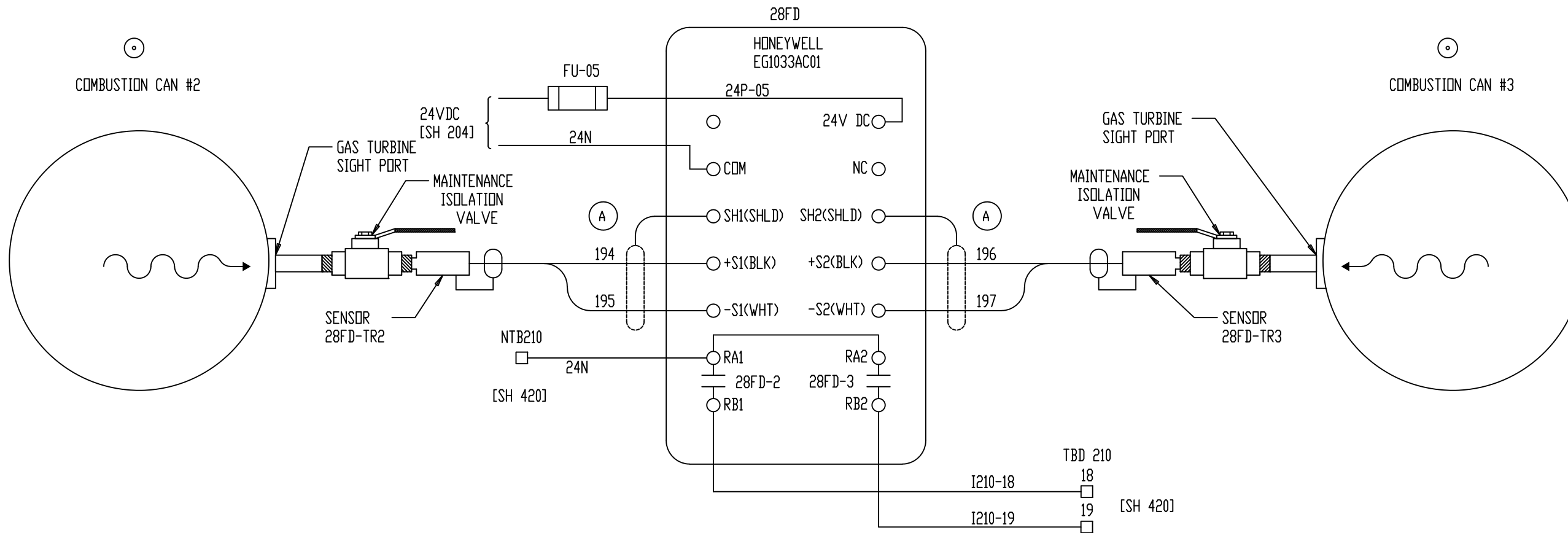
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-301-2	NTS
			SHEET NO. 301
			2 OF 17



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

DEAD COMPUTER RELAY
TURBINE GENERATOR CONTROLLER
99174-GTB-101

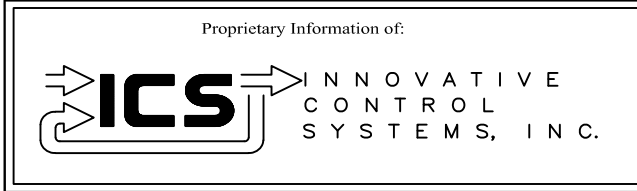
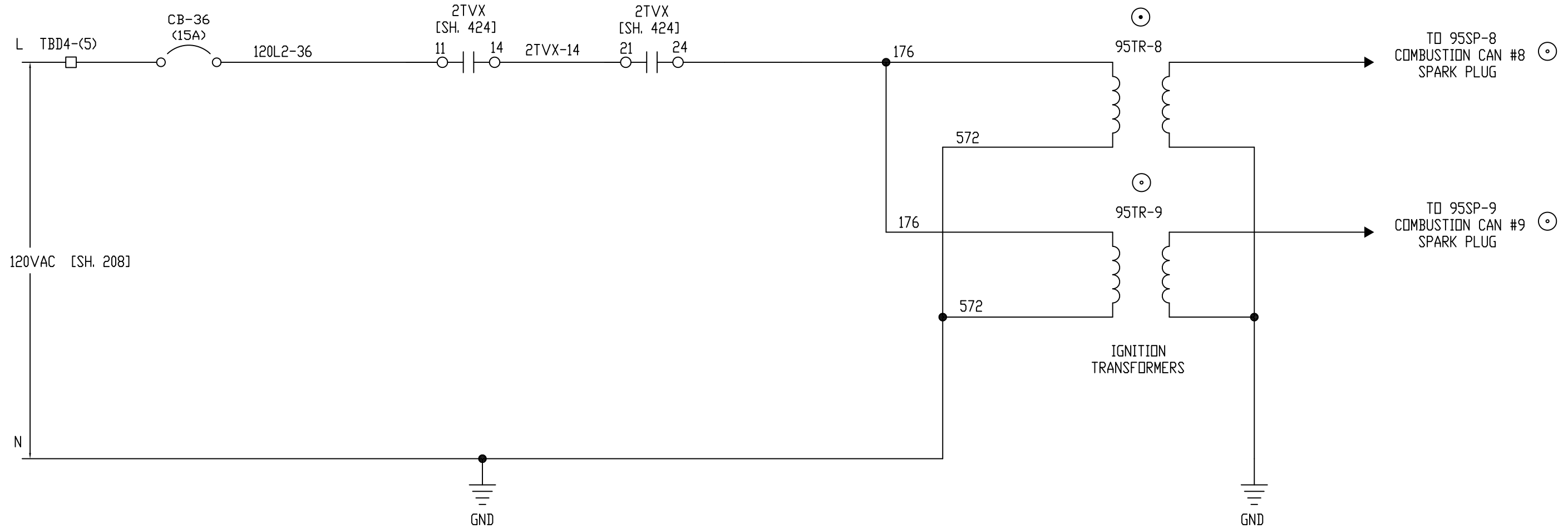
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-302-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 302 3 OF 17



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

FLAME DETECTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

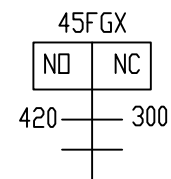
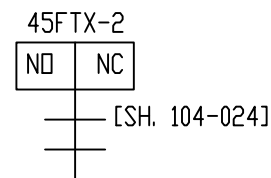
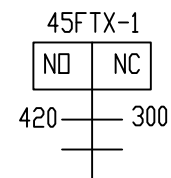
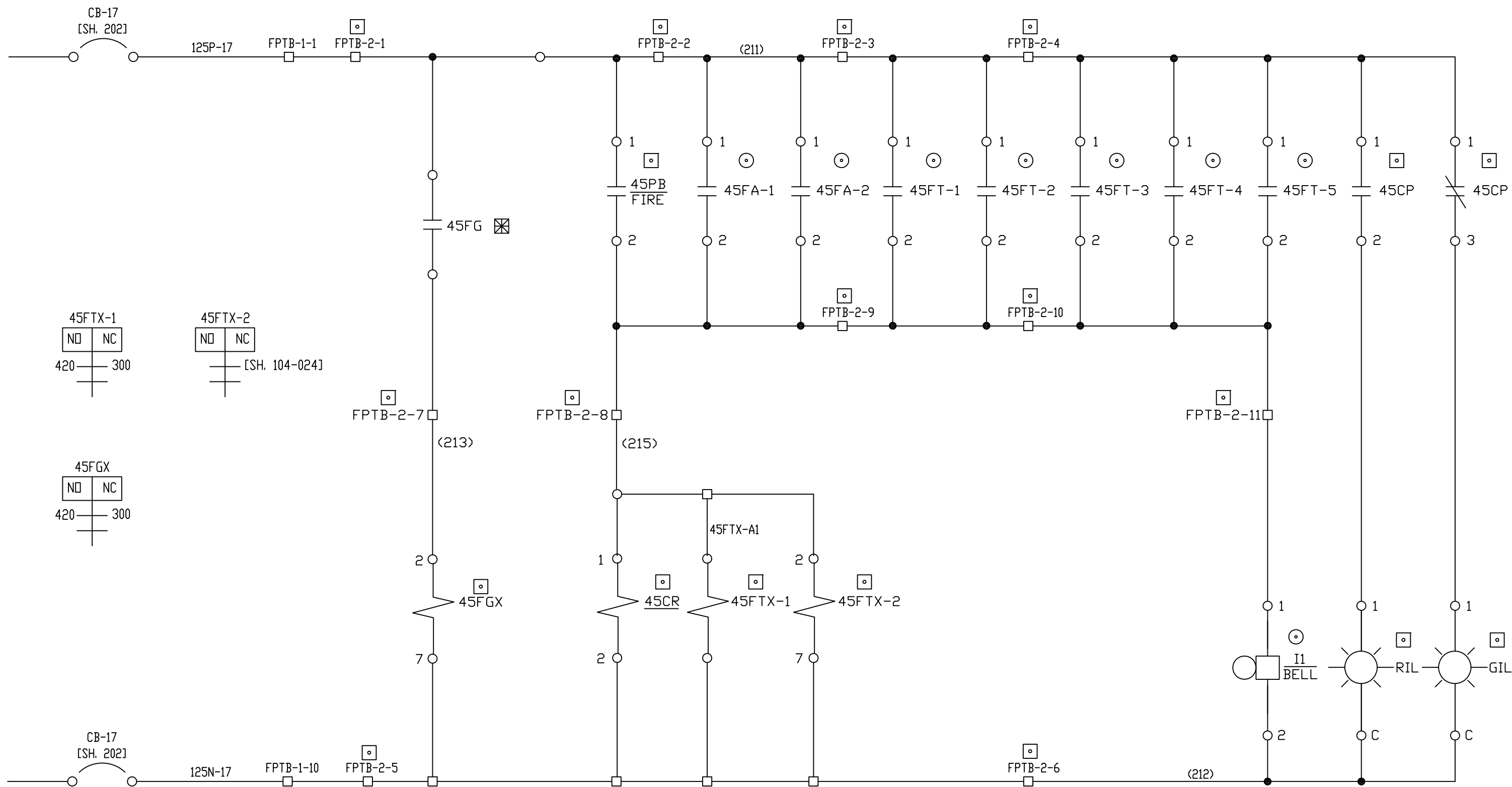
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-304-2	SHEET NO. 304 4 OF 17



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

IGNITION CIRCUIT
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-305-2	SHEET NO. 305 5 OF 17



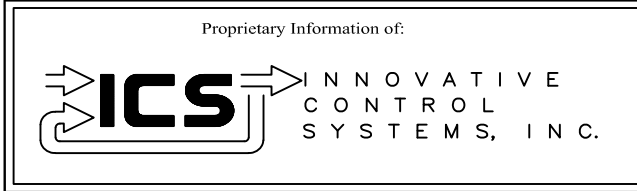
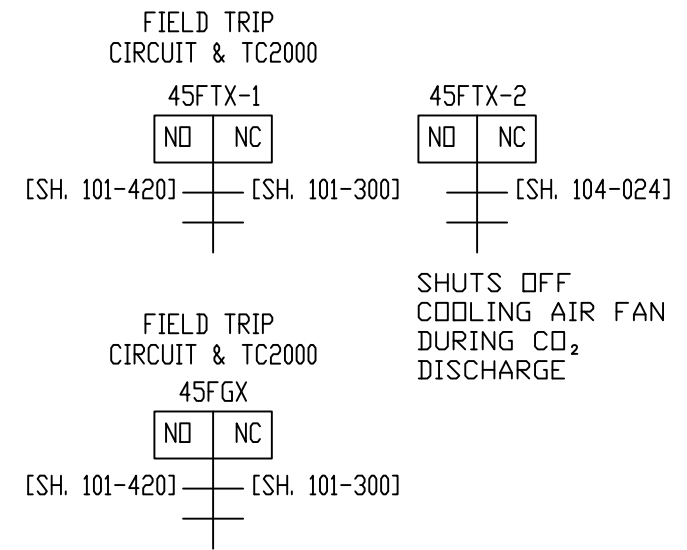
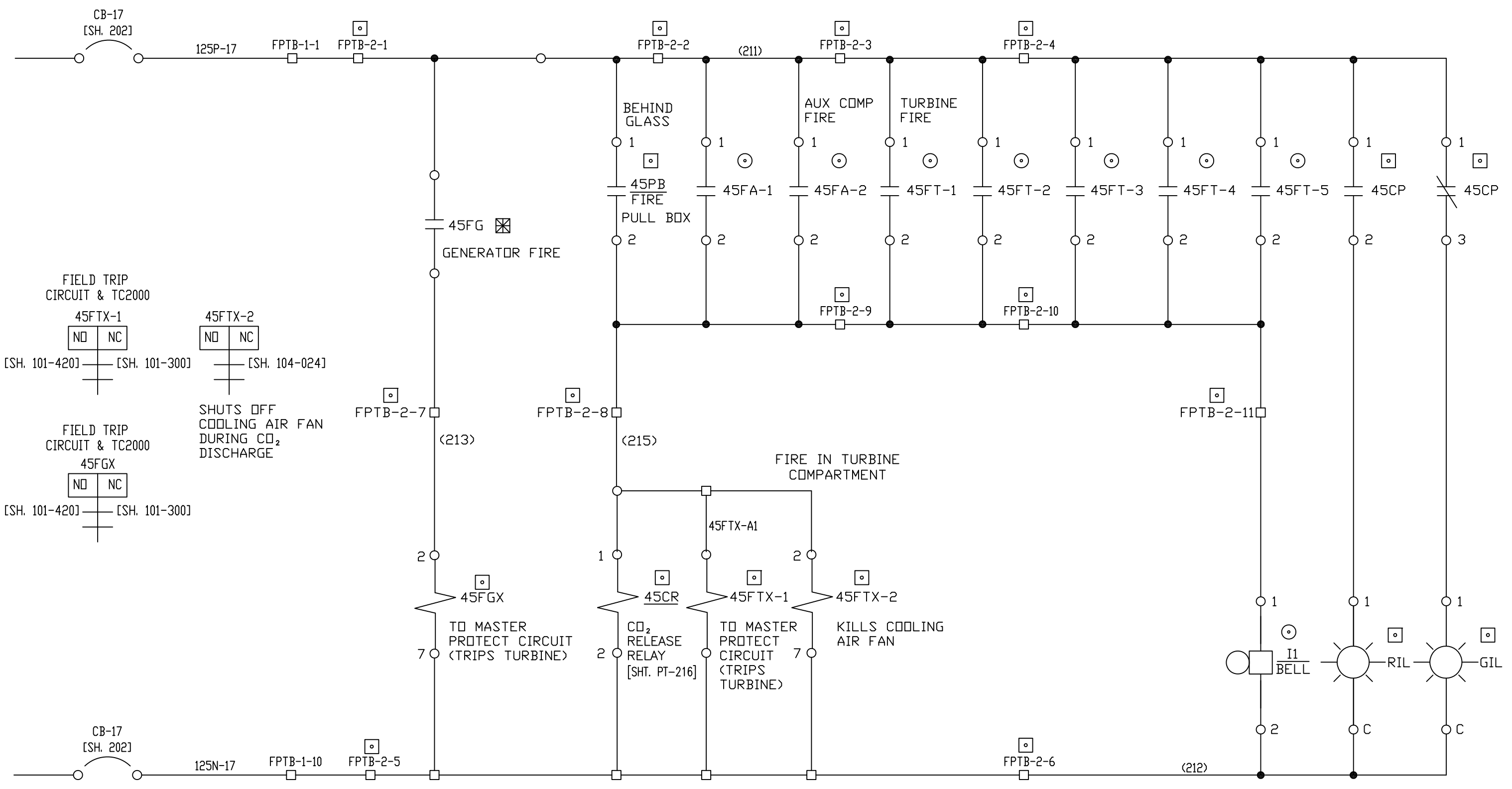
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

**FIRE PROTECTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101**

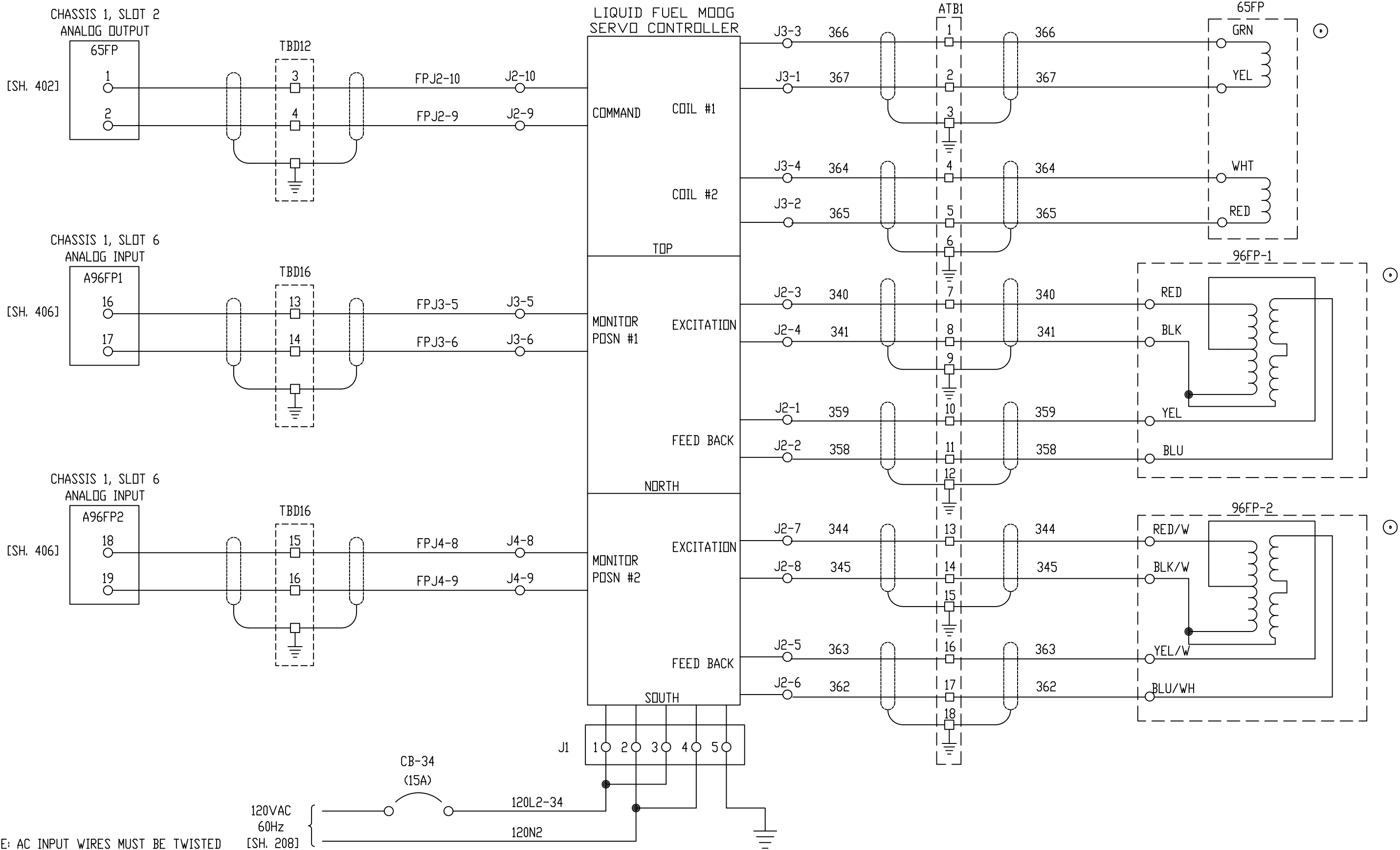
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-306-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 306 OF 17	



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	NOTES	DRB		06/06/14
REV 2	MODIFICATIONS:	CF	DRY	01/18/01
REV 1	AS BUILTS:	CF		04/14/00

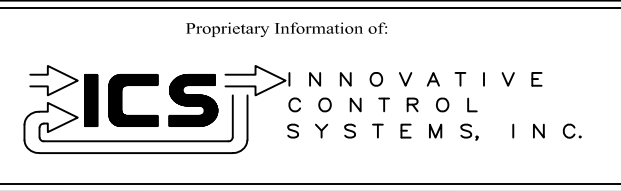
FIRE PROTECTION
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-306-2-REV3
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 306 OF 17



NOTE: AC INPUT WIRES MUST BE TWISTED

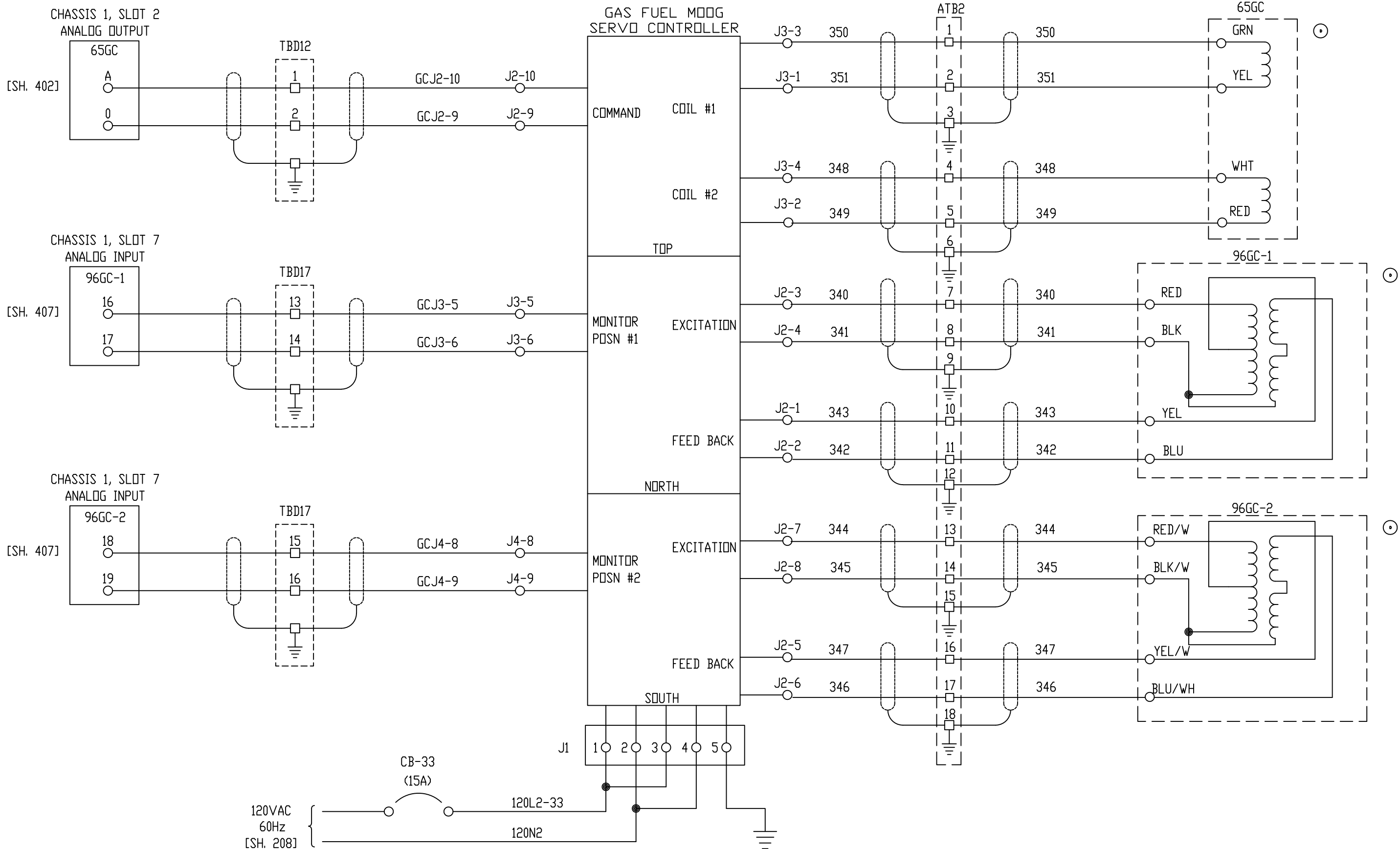
120VAC
60Hz
[SH. 208]



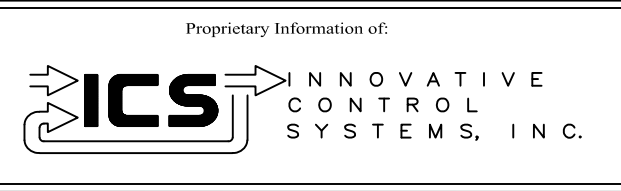
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

LIQUID FUEL CONTROL
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-307-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 307 7 OF 17	



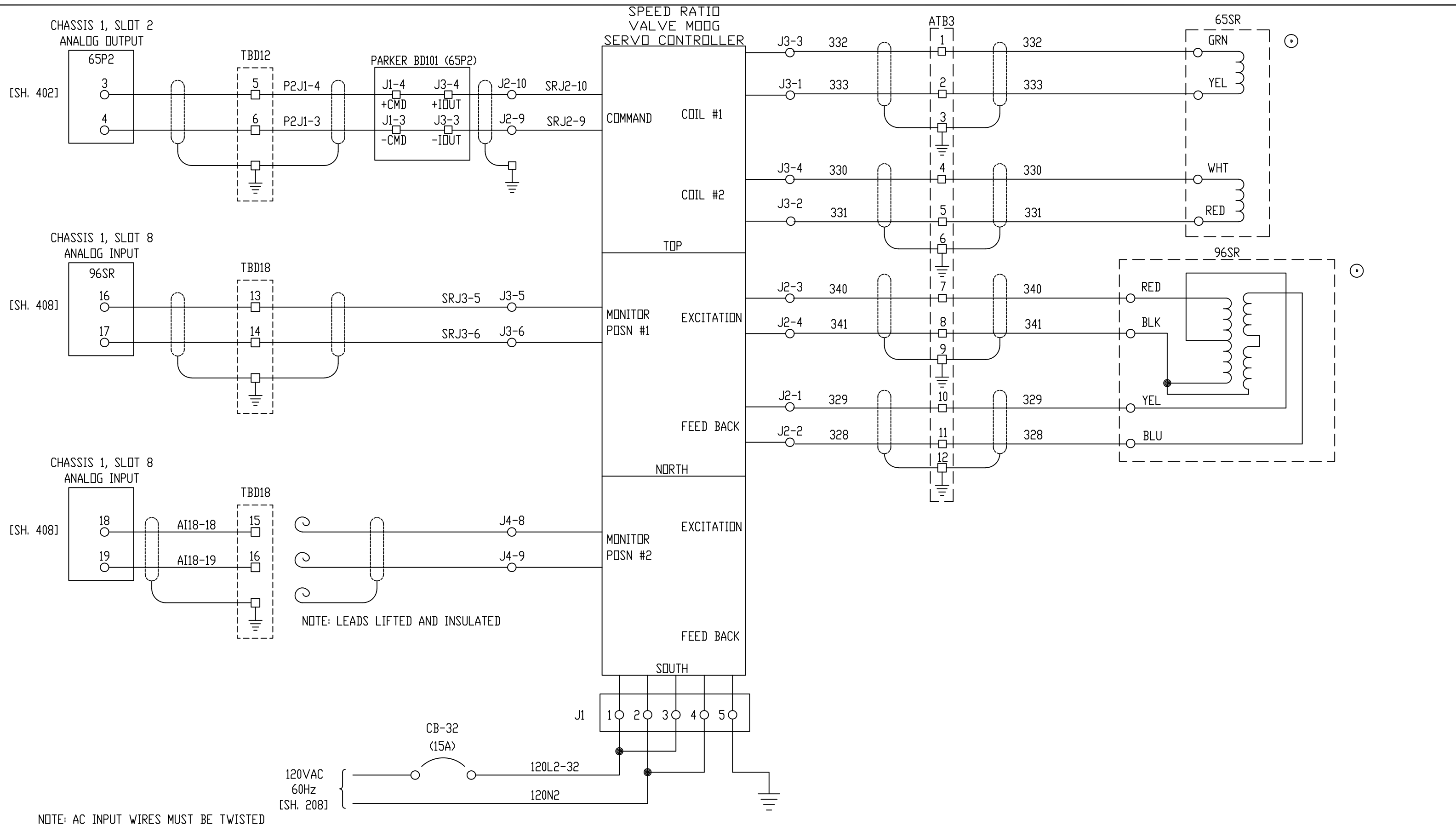
NOTE: AC INPUT WIRES MUST BE TWISTED



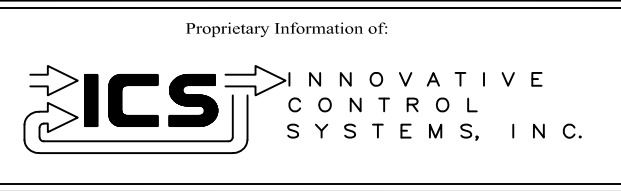
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

GAS FUEL CONTROL
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-308-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 308 OF 17	



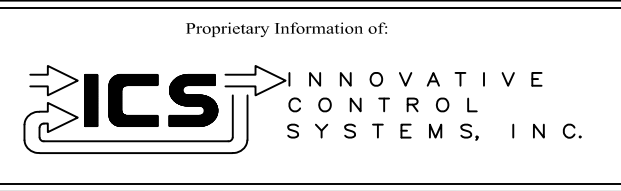
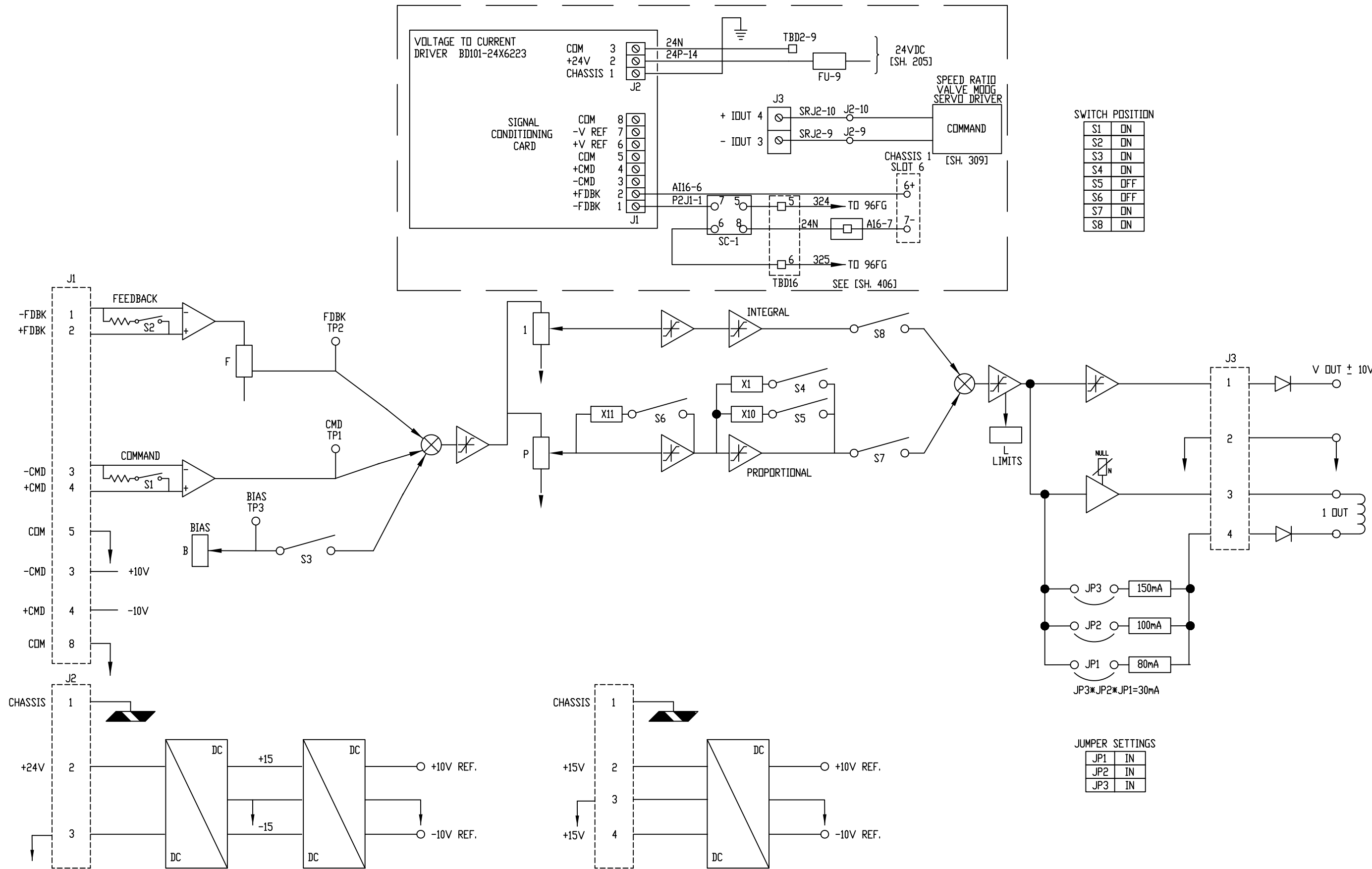
NOTE: AC INPUT WIRES MUST BE TWISTED



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

SPEED VALVE CONTROL
TURBINE GENERATOR CONTROLLER
99174-GTB-101

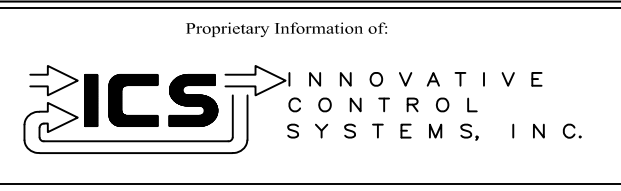
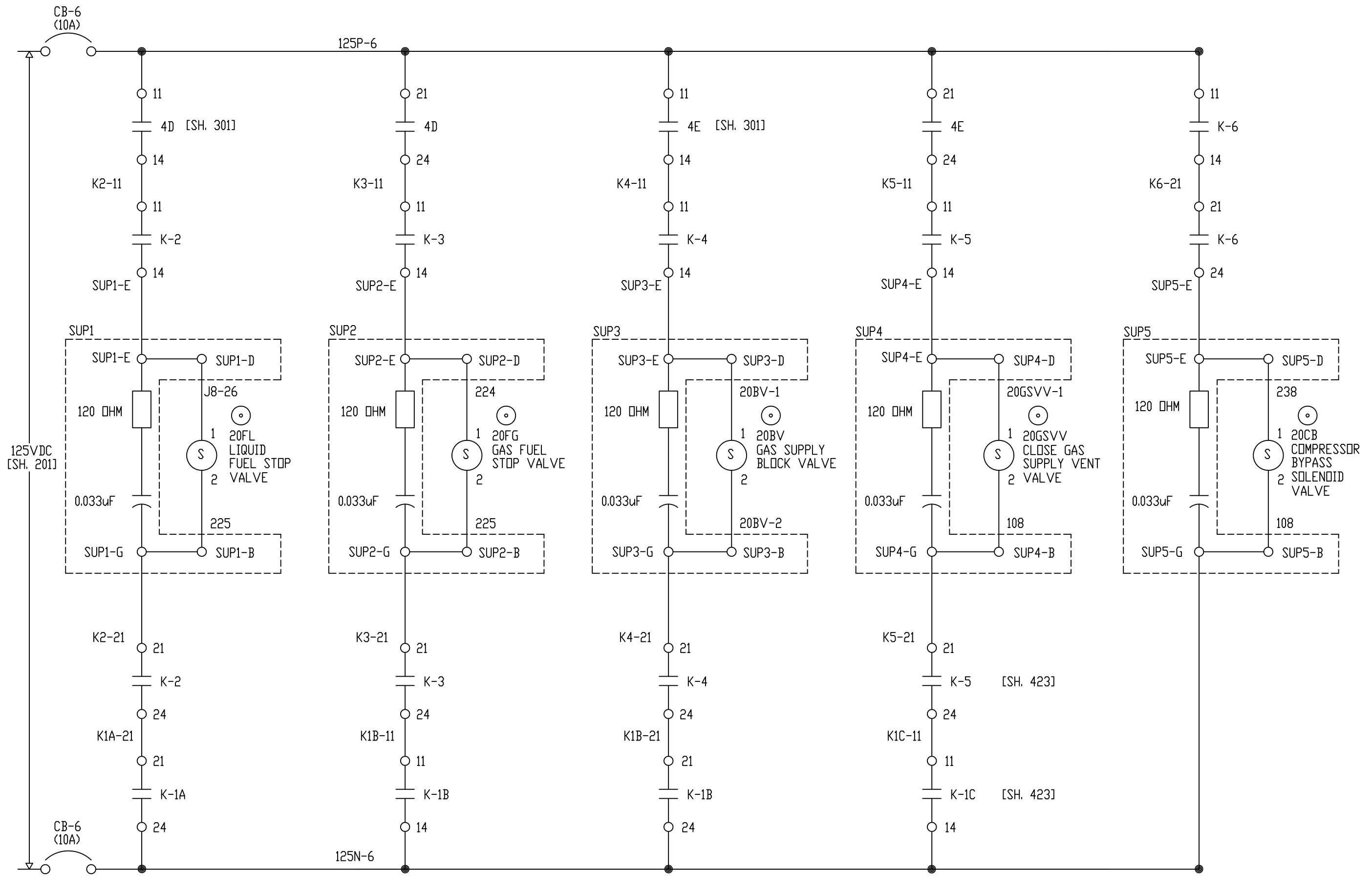
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-309-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 309 OF 17	



REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

PLC ANALOG OUTPUTS P2 PRESS. CONTROL
TURBINE GENERATOR CONTROLLER
99174-GTB-101

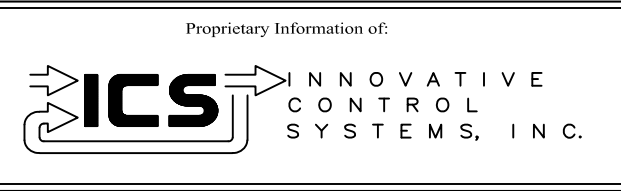
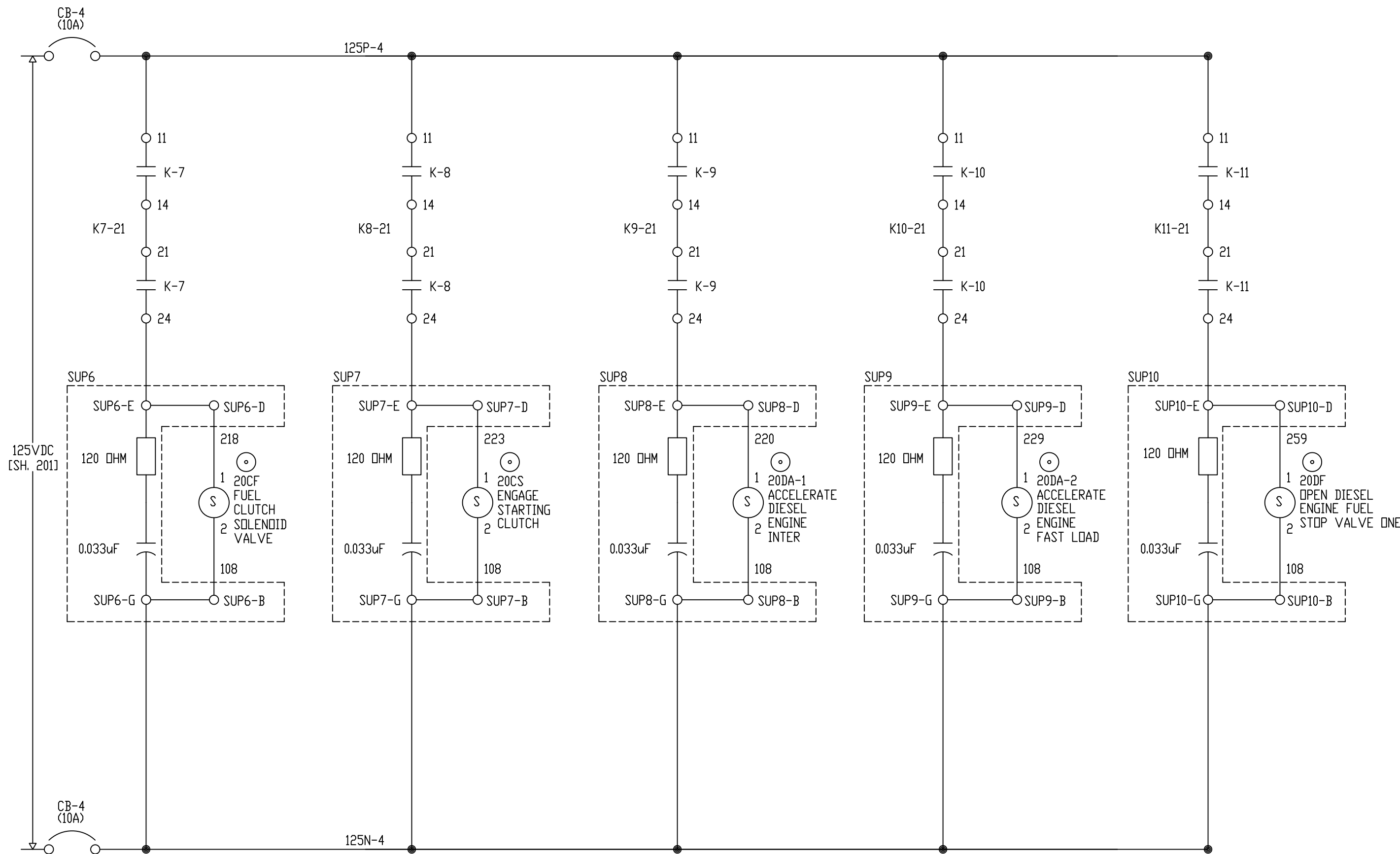
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-309a-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 309a 9 OF 17



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

SOLENOIDS
TURBINE GENERATOR CONTROLLER
99174-GTB-101

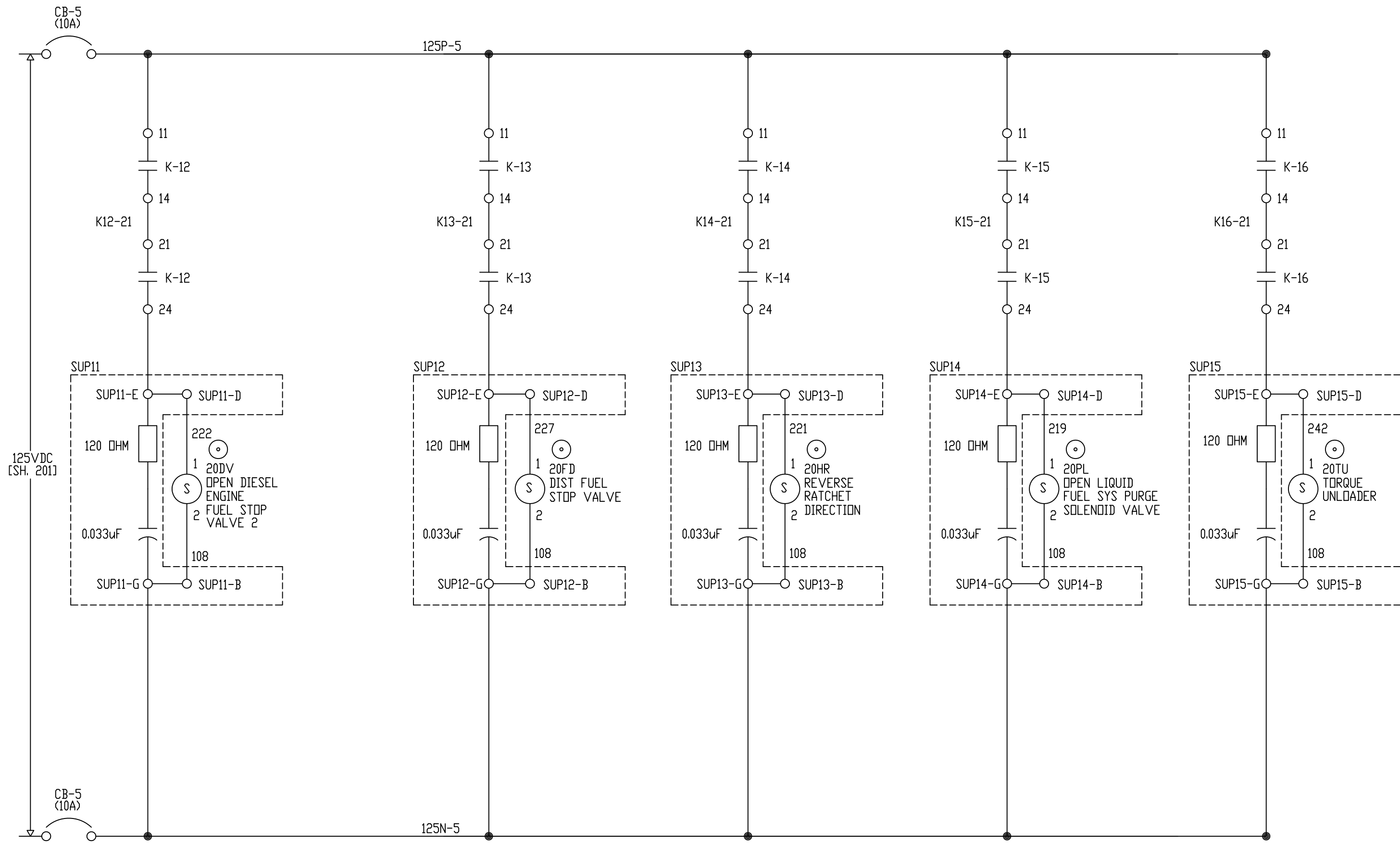
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-310-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 310 OF 17



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

SOLENOIDS
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-311-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 311 OF 17



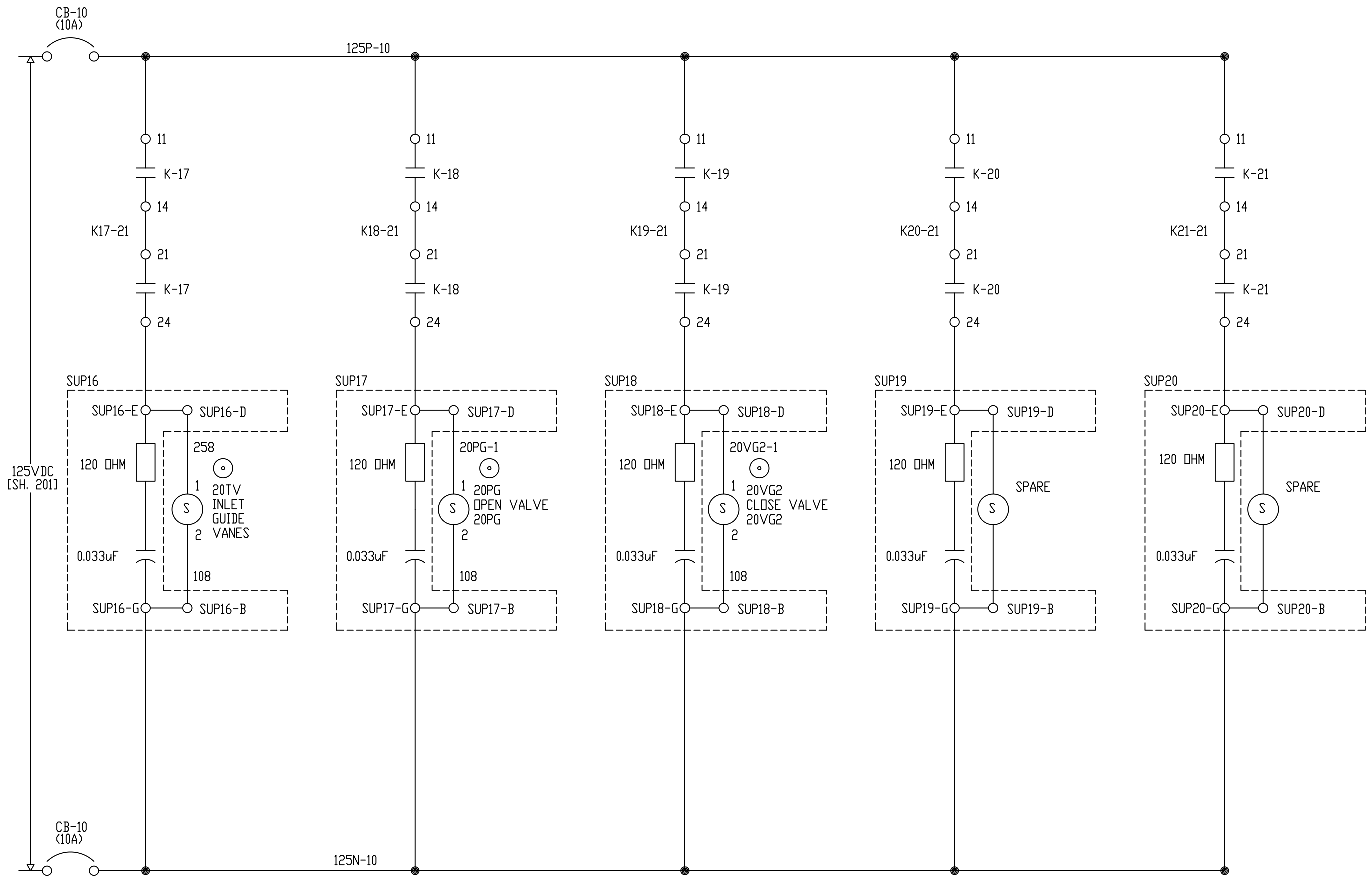
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

SOLENOIDS
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-312-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 312 OF 17	



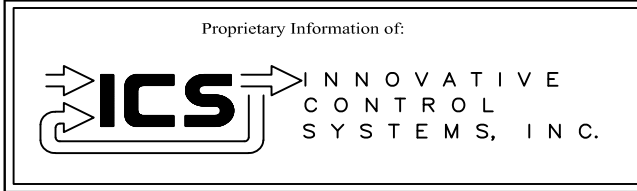
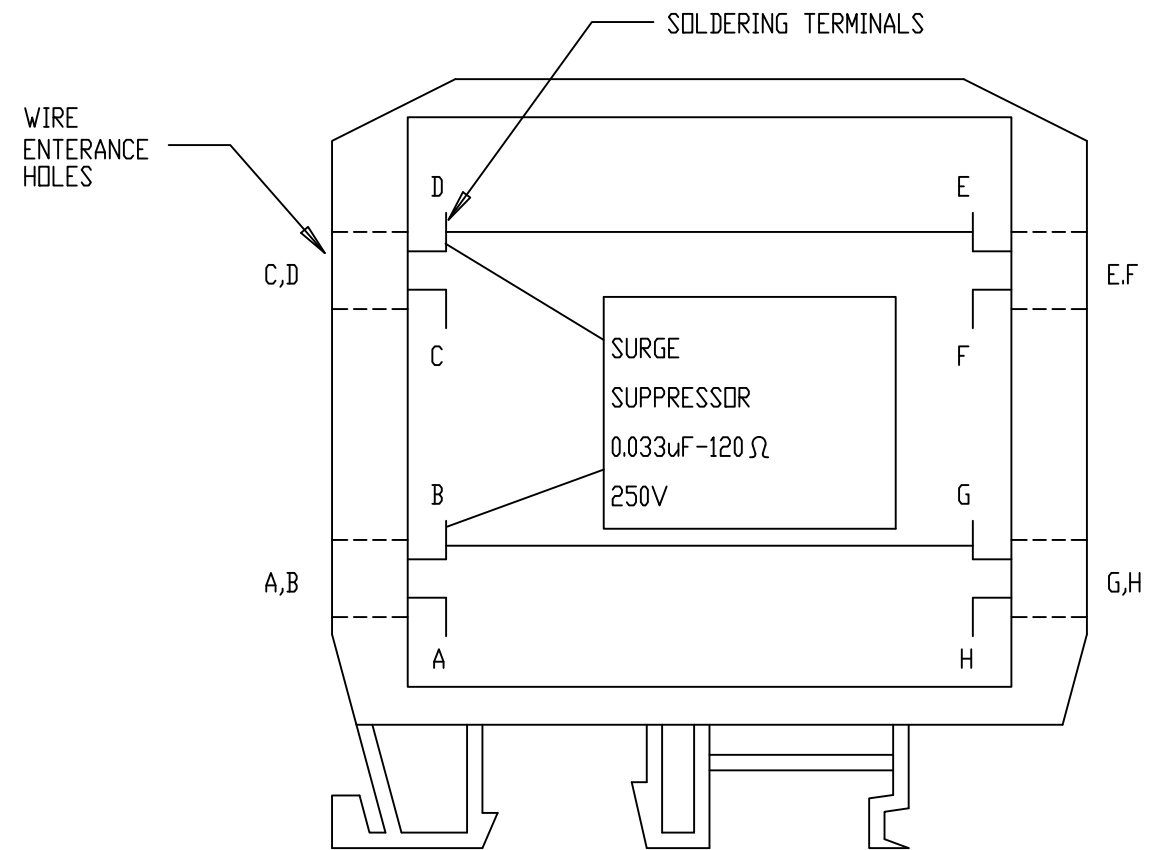
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

SOLENOIDS
TURBINE GENERATOR CONTROLLER
99174-GTB-101

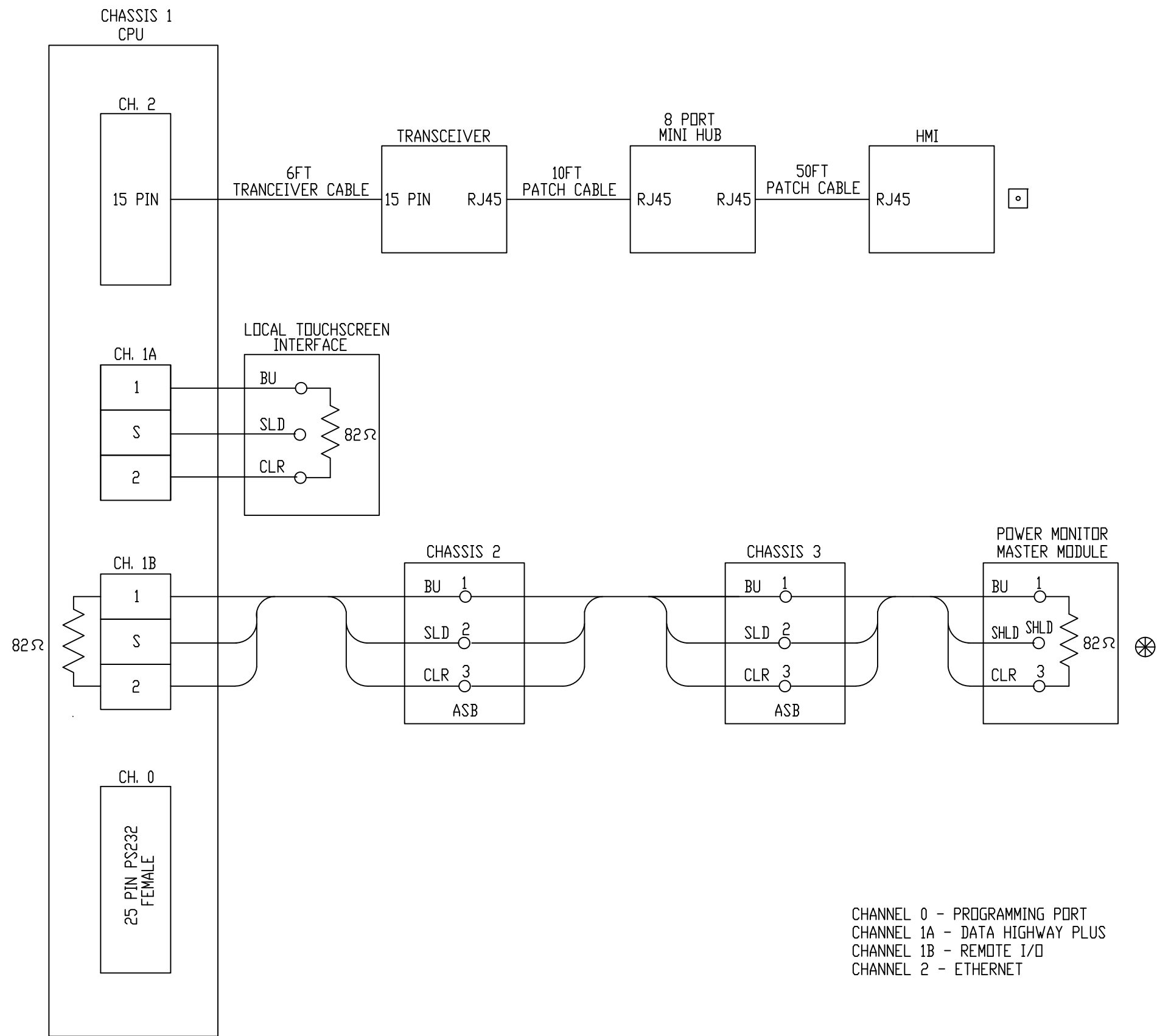
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-313-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 313 OF 17	



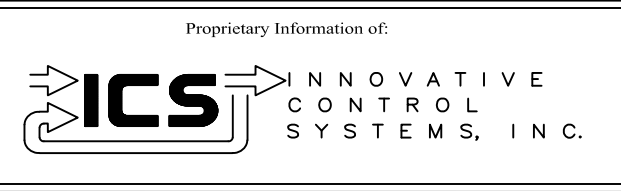
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

SURGE SUPPRESSOR SCHEMATIC
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-314-2	SHEET NO. 314 OF 17



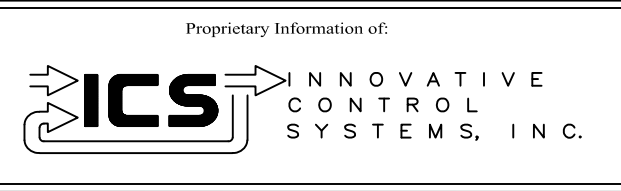
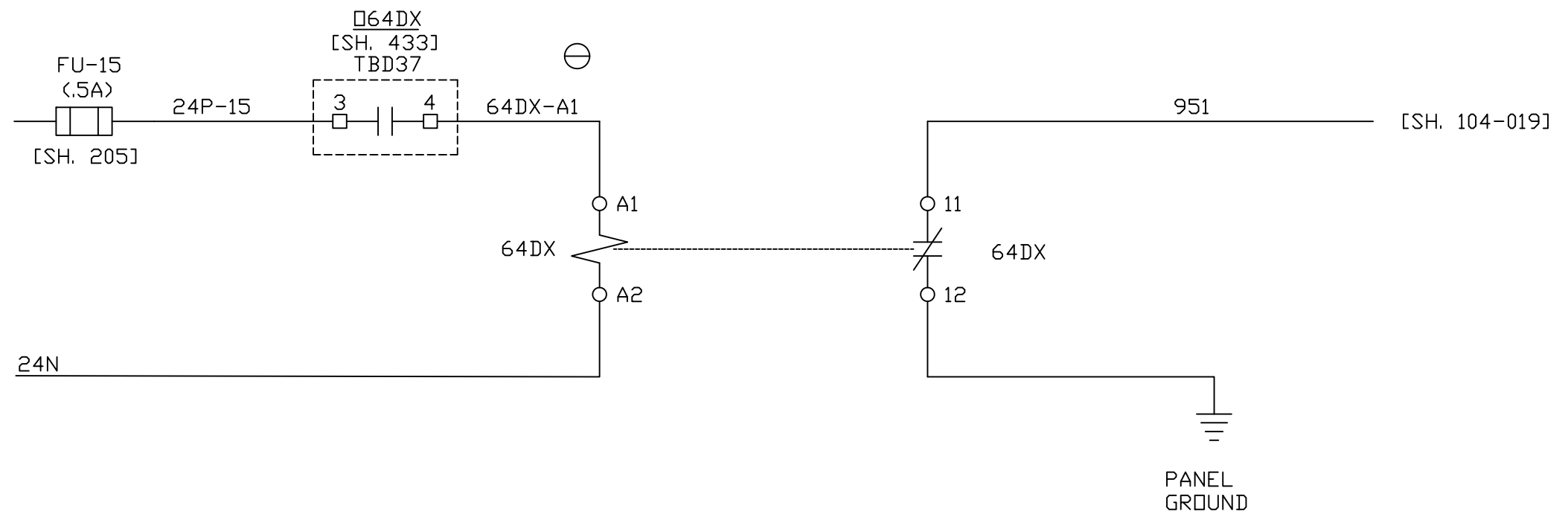
CHANNEL 0 - PROGRAMMING PORT
 CHANNEL 1A - DATA HIGHWAY PLUS
 CHANNEL 1B - REMOTE I/O
 CHANNEL 2 - ETHERNET



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

BUS CABLE LAYOUT
TURBINE GENERATOR CONTROLLER
99174-GTB-101

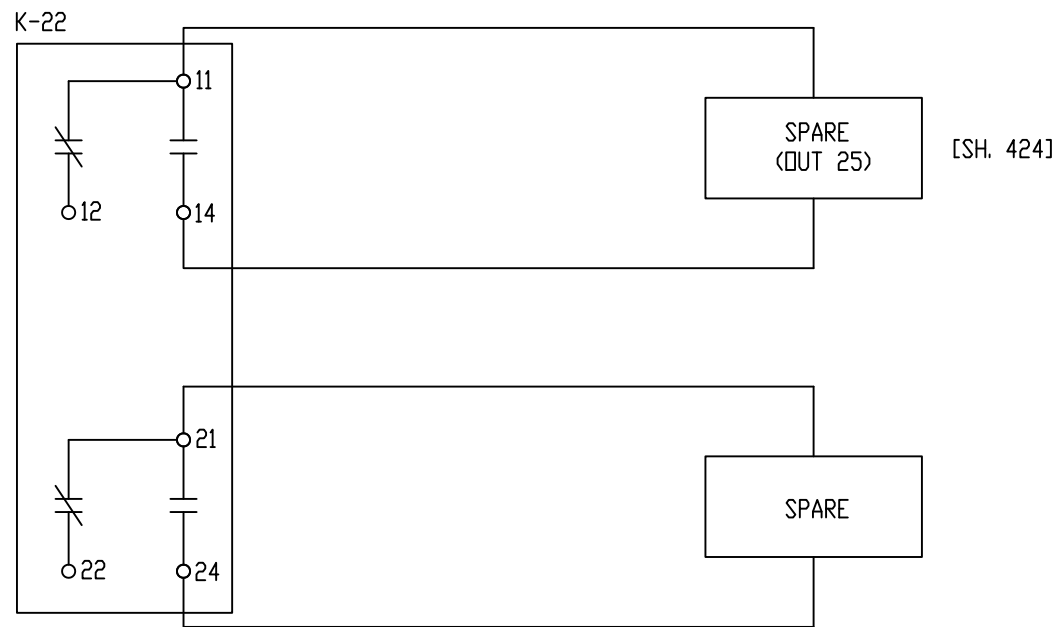
CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-318-2	SHEET NO. 318 15 OF 17



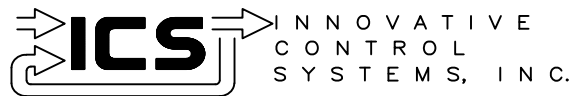
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

GROUND DETECTION CIRCUIT
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-319-2	SHEET NO. 319 OF 17



Proprietary Information of:



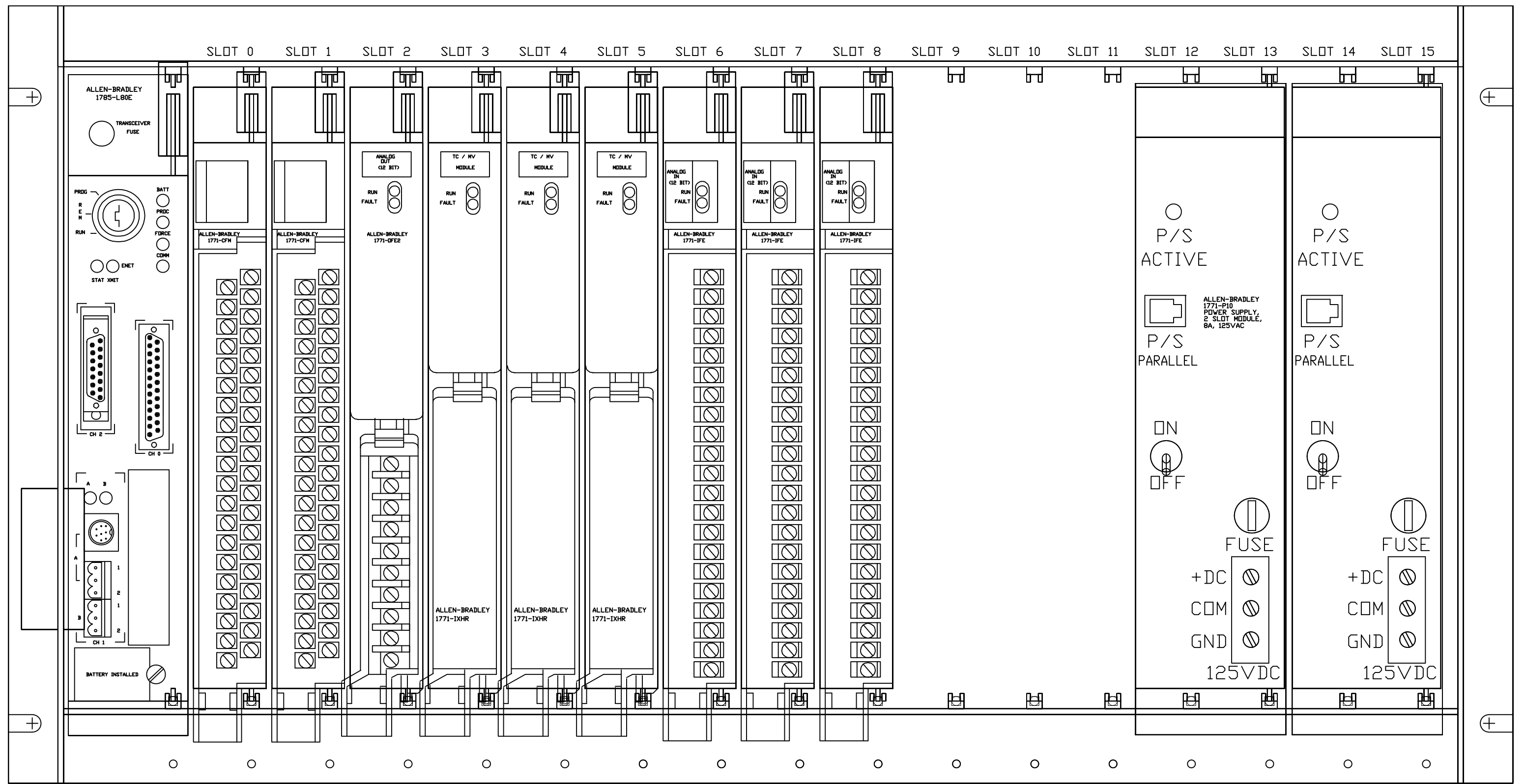
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS	CF		05/11/00

OUTPUT INTERPOSING RELAYS
TURBINE GENERATOR CONTROLLER
99174-GTB-101


CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	05/11/00	99174-GTB-101-320-2	NTS
			SHEET NO. 320
			17 OF 17



Proprietary Information of:

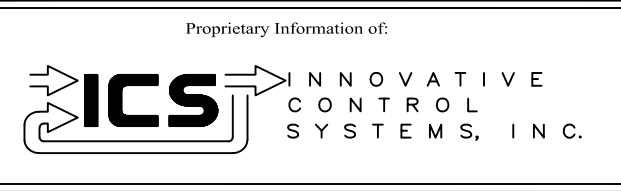
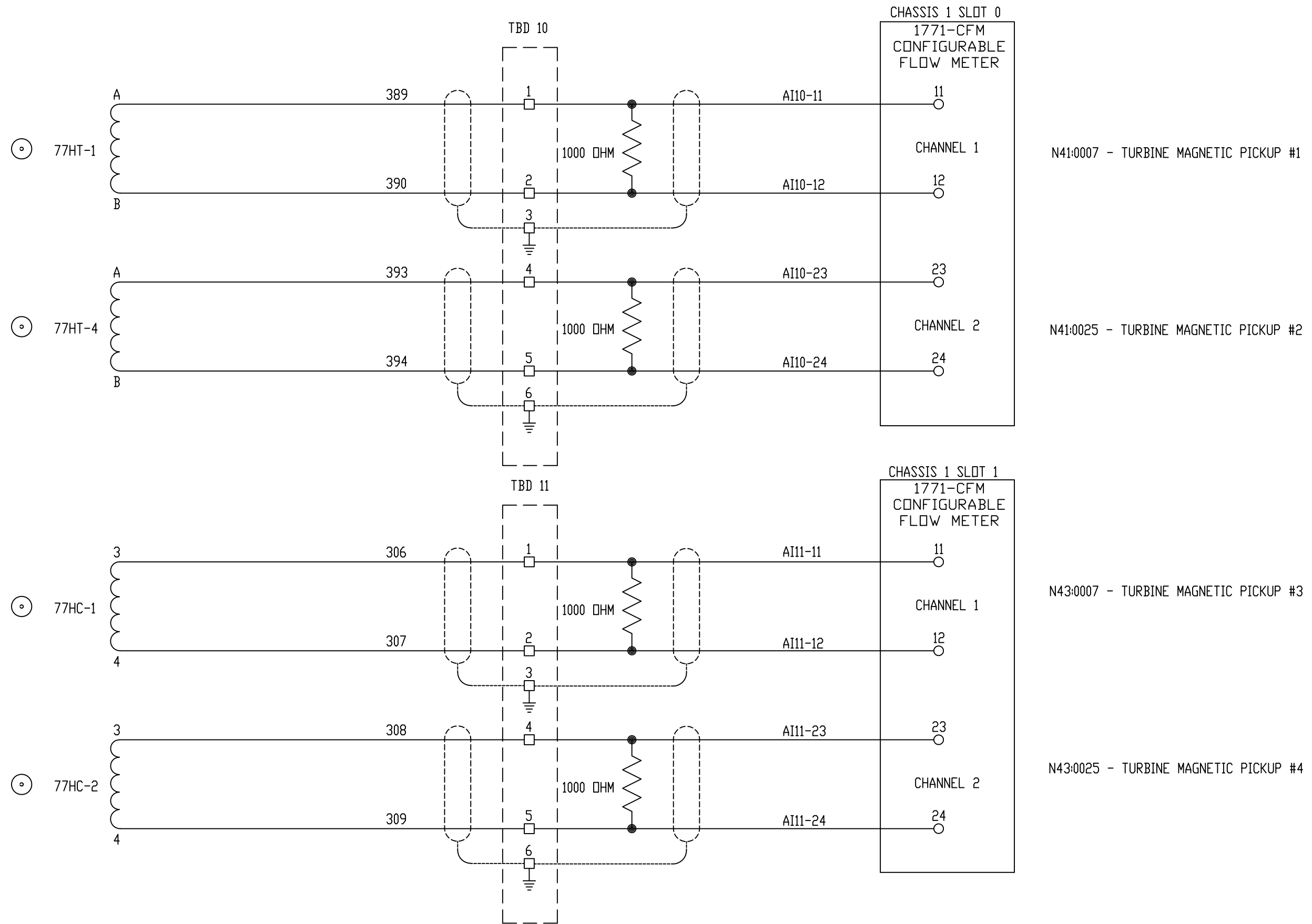


INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-400-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 400 OF 36	



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 0/1
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-401-2	SHEET NO. 401 2 OF 36

N13:0005 - TO GAS FUEL MOOG (65GC)

N13:0006 - TO LIQUID FUEL MOOG (65FP)

N13:0007 - TO SPEED RATIO MOOG (65P2)

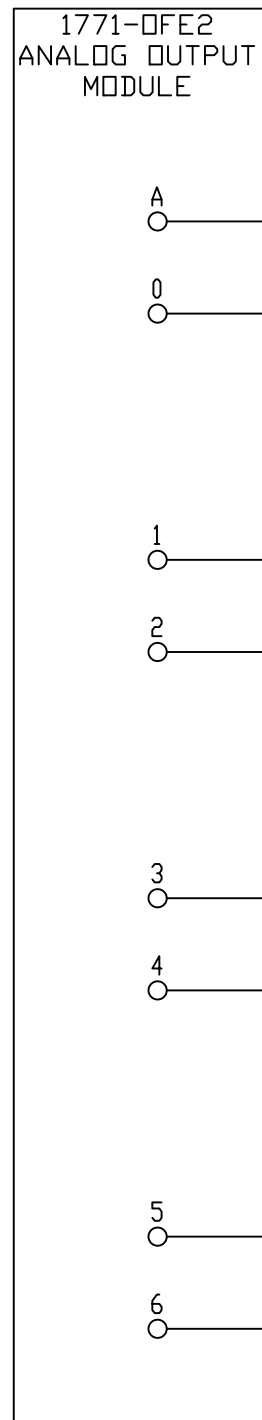
SPARE

CHANNEL 1

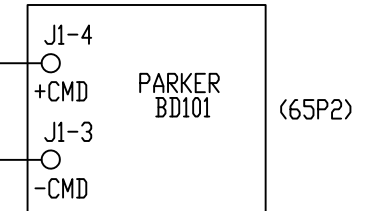
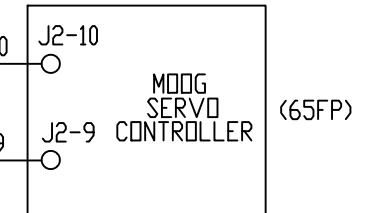
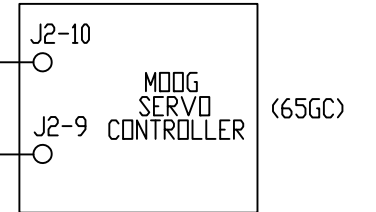
CHANNEL 2

CHANNEL 3

CHANNEL 4



TBD 12



GT-RPM
SCADA

Proprietary Information of:

INNOVATIVE
CONTROL
SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 2
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		SHEET NO. 402	
APPROVED BY:		DRAWING NO.	99174-GTB-101-402-2
DRAWN BY: C. FISHER	11/29/99		3 OF 36

N13:0005 - TO GAS FUEL MOOG (65GC)

N13:0006 - TO LIQUID FUEL MOOG (65FP)

N13:0007 - TO SPEED RATIO MOOG (65SR)
A65SR IN PLC

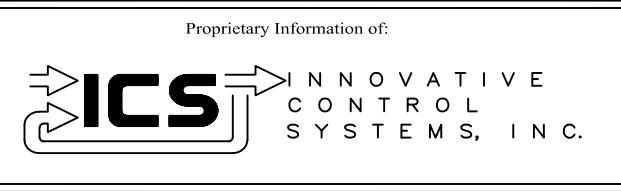
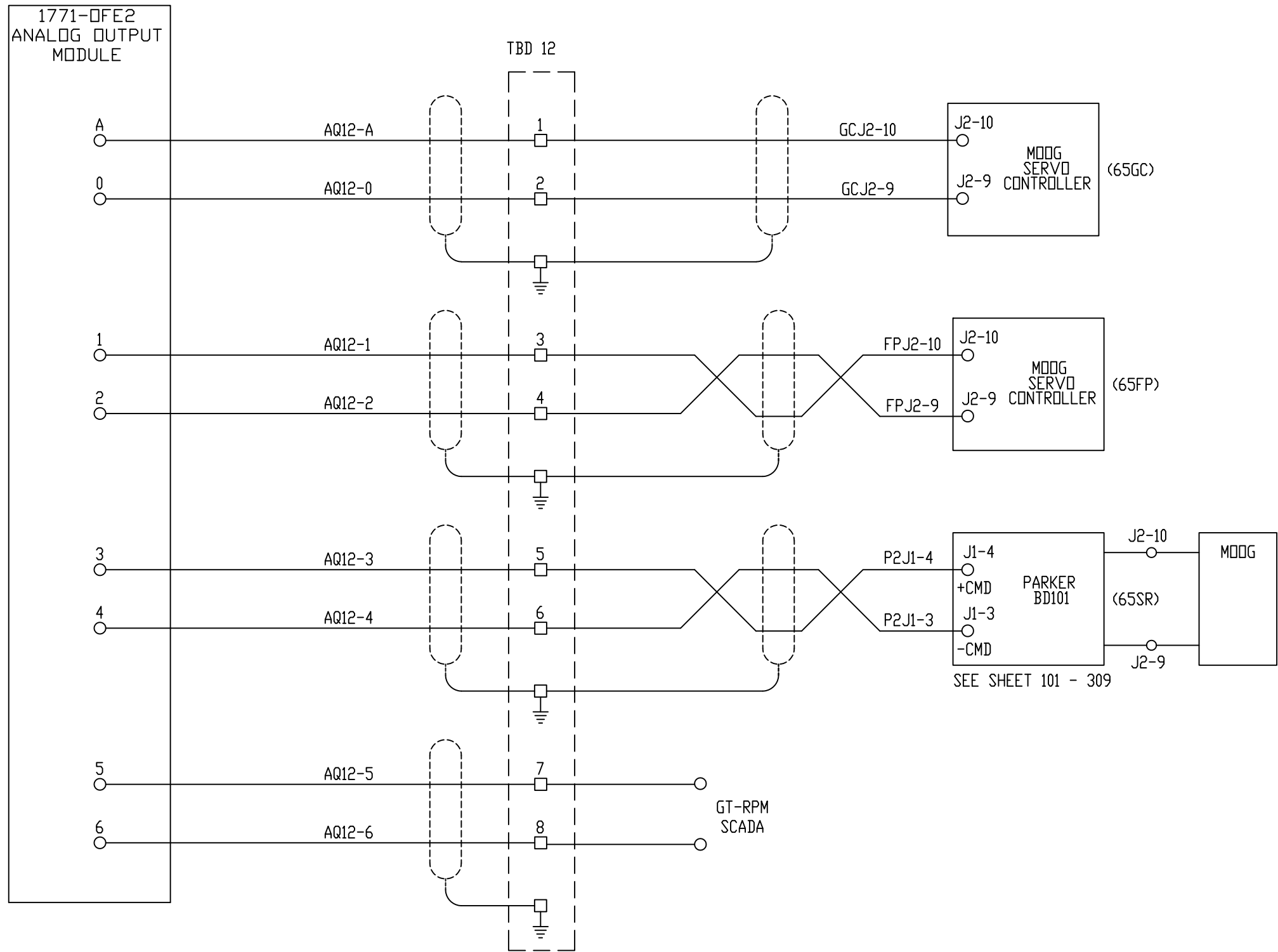
N13:0008 - TURBINE SPEED %

CHANNEL 1

CHANNEL 2

CHANNEL 3

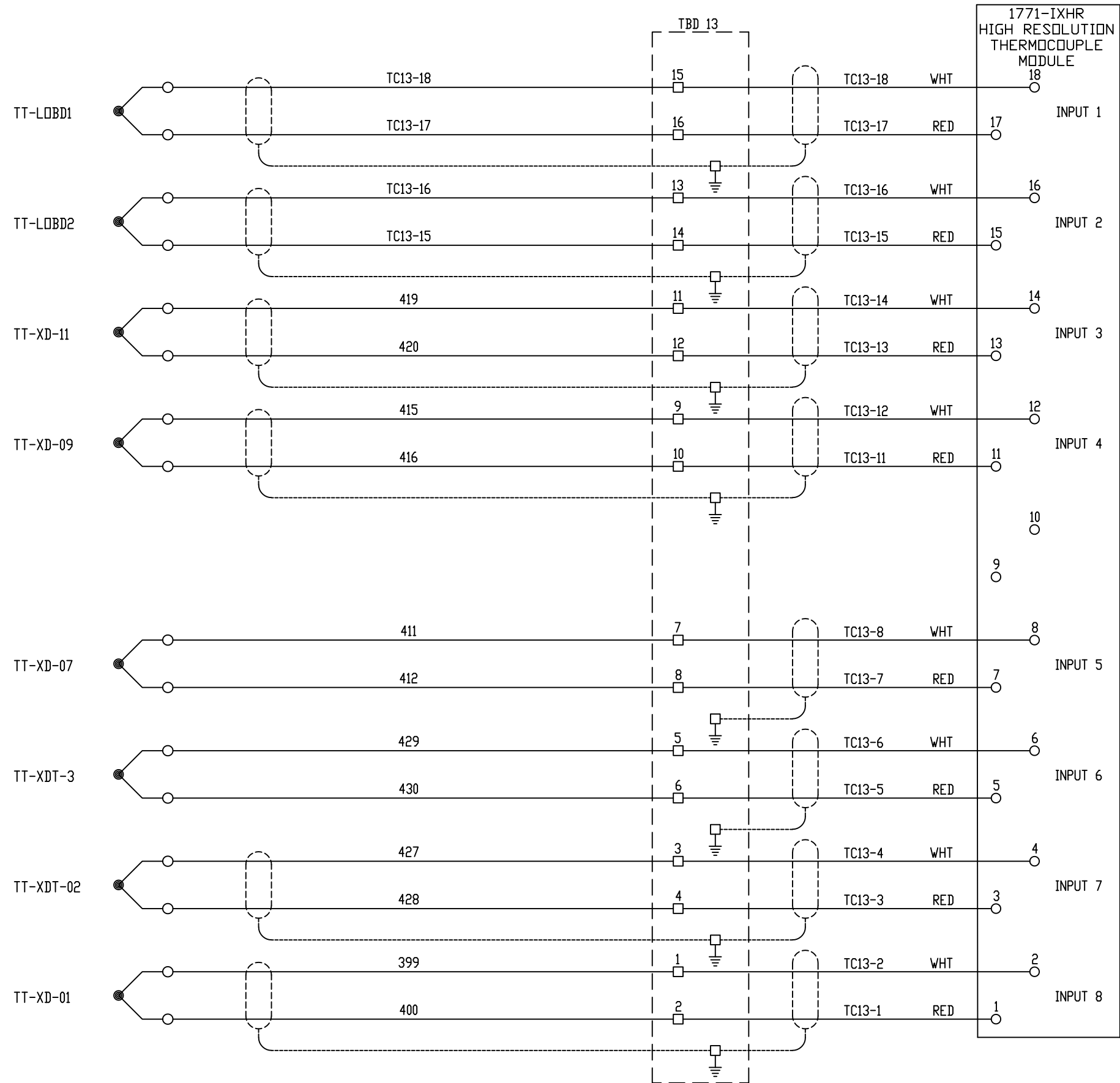
CHANNEL 4



REV 3	CONF TO FIELD NOTES	EK	TC	10/5/2018
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 2
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-402-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 402 3 OF 36



1771-IXHR
HIGH RESOLUTION
THERMOCOUPLE
MODULE

N13:0021 - #1 LUBE OIL BEARING DRAIN (TT-LOBD1)

N13:0022 - #2 LUBE OIL BEARING DRAIN (TT-LOBD2)

N13:0023 - TURBINE EXHAUST THERMOCOUPLE #11 (TT-XD-11)

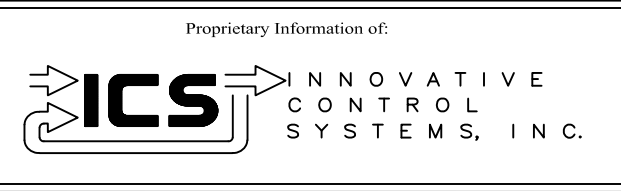
N13:0024 - TURBINE EXHAUST THERMOCOUPLE #9 (TT-XD-09)

N13:0025 - TURBINE EXHAUST THERMOCOUPLE #7 (TT-XD-07)

N13:0026 - TURBINE EXHAUST DUCT TRIP #3 (TT-XDT-3)

N13:0027 - TURBINE EXHAUST DUCT TRIP #2 (TT-XDT-2)

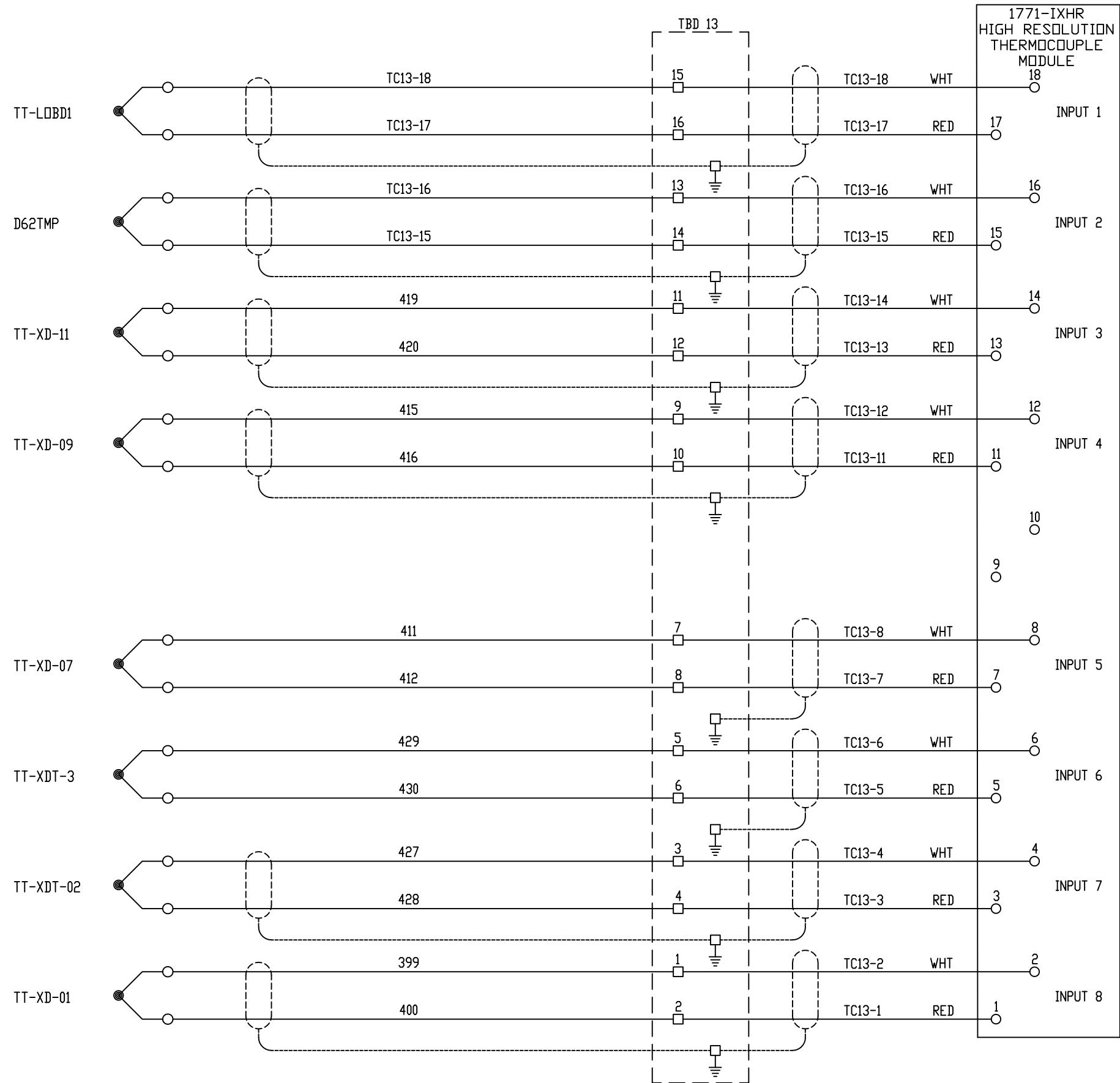
N13:0028 - TURBINE EXHAUST THERMOCOUPLE #1 (TT-XD-01)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 3
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-403-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 403 OF 36	



1771-IXHR
HIGH RESOLUTION
THERMOCOUPLE
MODULE

N13:0021 - #1 LUBE OIL BEARING DRAIN (TT-LOBD1)

N13:0022 - DIESEL BLOCK TEMP

NOTE:
THIS POINT IS BAD
MOVED TO CHASSIS 1
SLOT 5 INPUT 1
(D62TMP)

N13:0023 - TURBINE EXHAUST THERMOCOUPLE #11 (TT-XD-11)

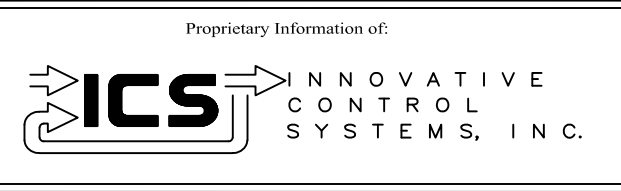
N13:0024 - TURBINE EXHAUST THERMOCOUPLE #9 (TT-XD-09)

N13:0025 - TURBINE EXHAUST THERMOCOUPLE #7 (TT-XD-07)

N13:0026 - TURBINE EXHAUST DUCT TRIP #3 (TT-XDT-3)

N13:0027 - TURBINE EXHAUST DUCT TRIP #2 (TT-XDT-2)

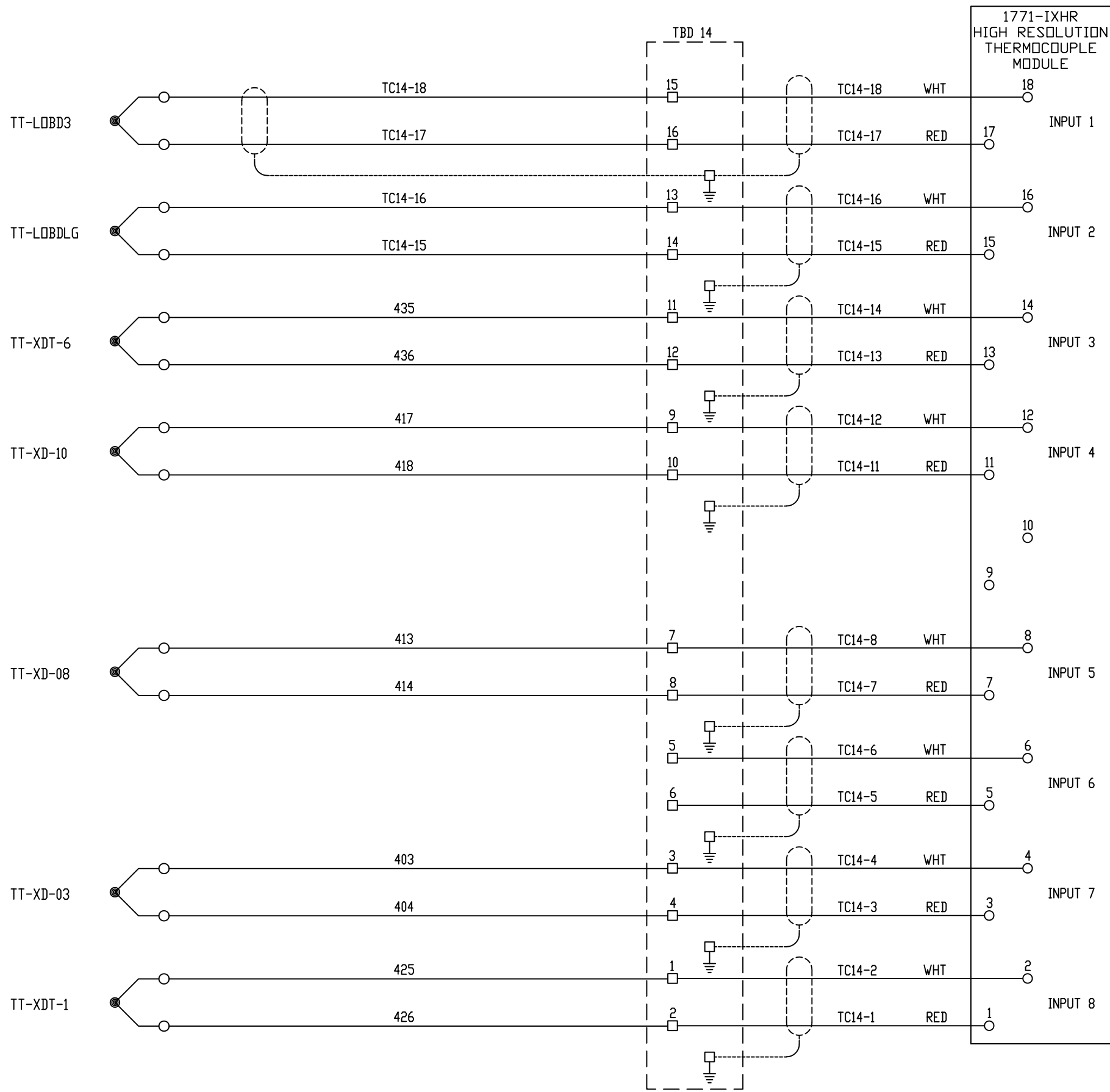
N13:0028 - TURBINE EXHAUST THERMOCOUPLE #1 (TT-XD-01)



REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 3
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-403-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 403 4 OF 36



N13:0062 - #3 LUBE OIL BEARING DRAIN (TT-LOBD3)

N13:0063 - LOAD GEAR LUBE OIL BEARING DRAIN (TT-LOBLG)

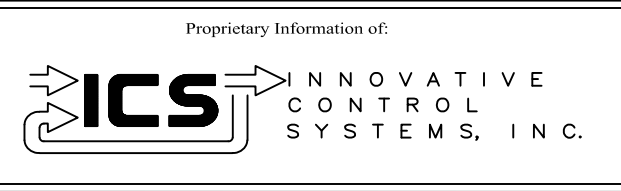
N13:0064 - TURBINE EXHAUST DUCT TRIP #6 (TT-XDT-6)

N13:0065 - TURBINE EXHAUST THERMOCOUPLE #10 (TT-XD-10)

N13:0066 - TURBINE EXHAUST THERMOCOUPLE #8 (TT-XD-08)

N13:0068 - TURBINE EXHAUST THERMOCOUPLE #3 (TT-XD-03)

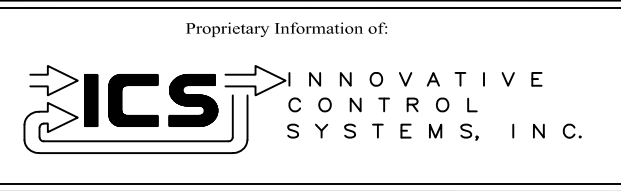
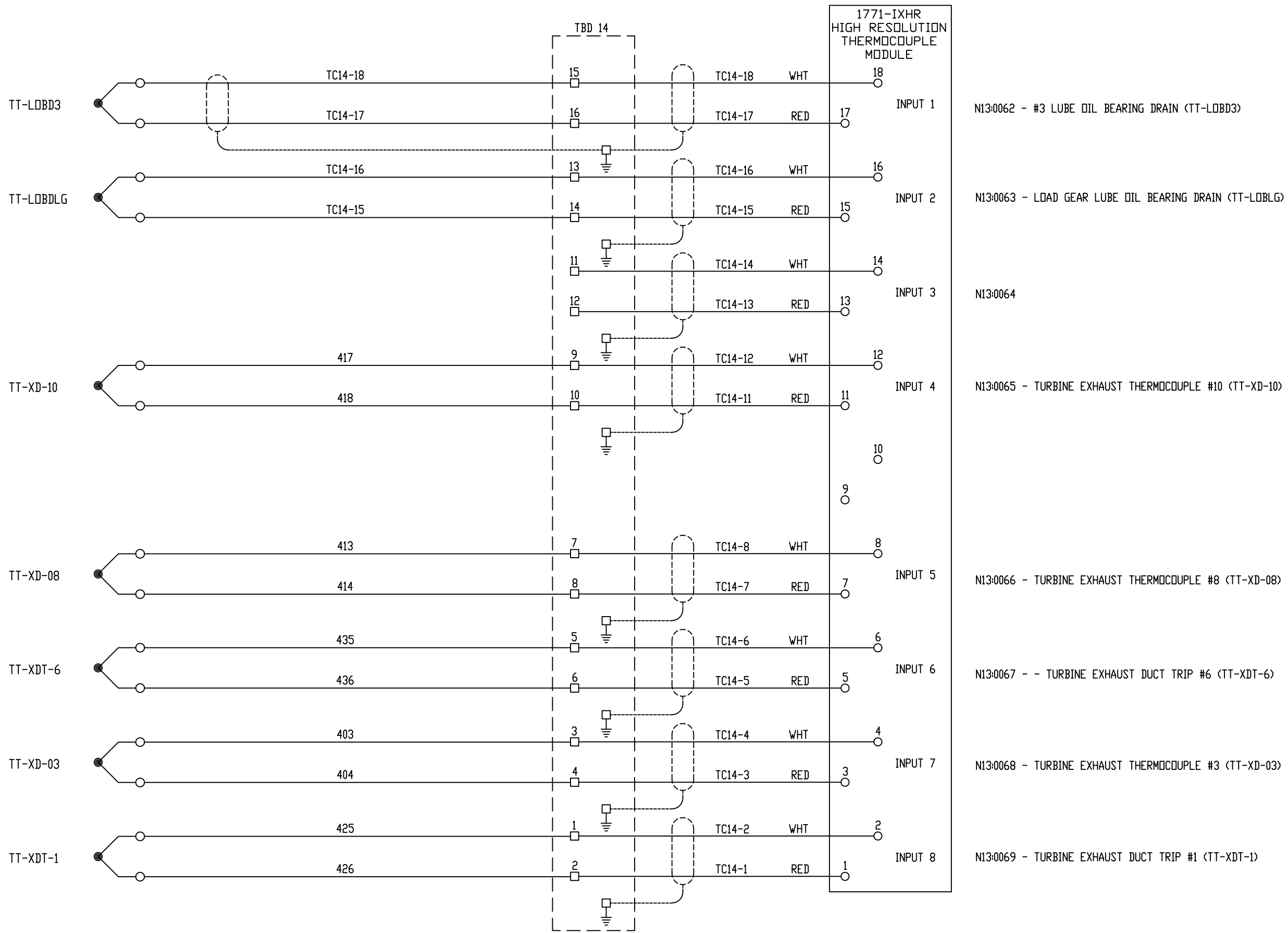
N13:0069 - TURBINE EXHAUST DUCT TRIP #1 (TT-XDT-1)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 4
TURBINE GENERATOR CONTROLLER
99174-GTB-101

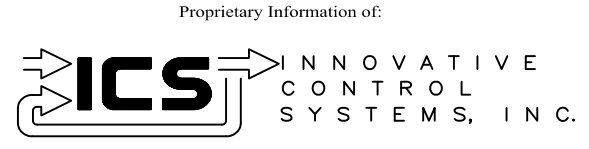
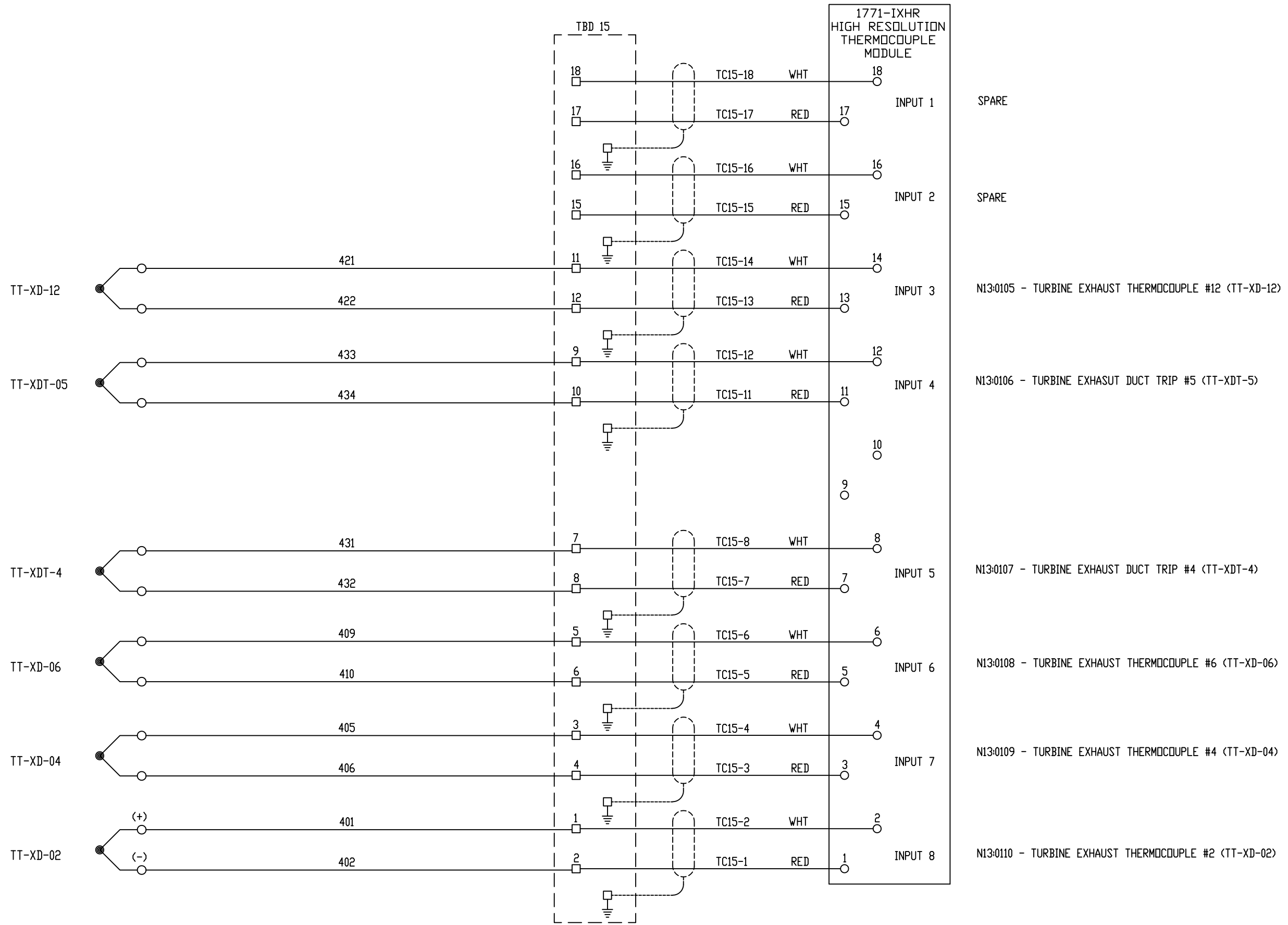
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-404-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 404 OF 36	



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	MODIFICATIONS:	EK	TC	12/21/16
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 4
TURBINE GENERATOR CONTROLLER
99174-GTB-101

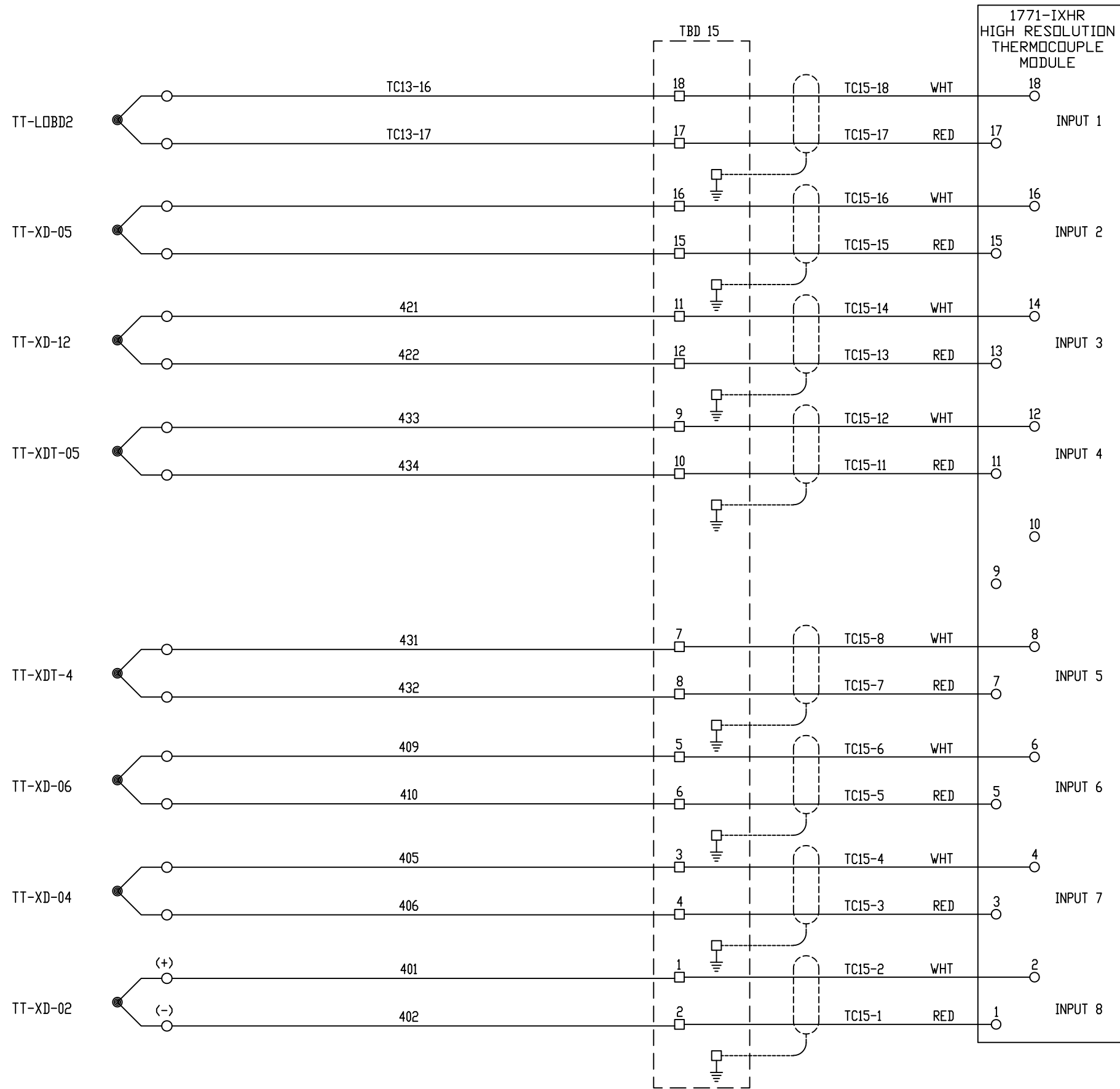
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-404-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 404 OF 36



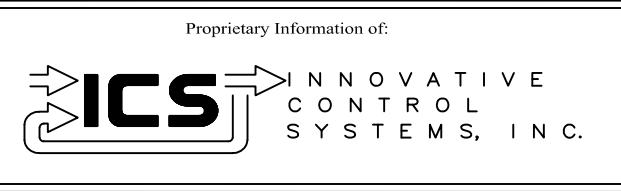
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 5
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-405-2	SHEET NO. 405 6 OF 36



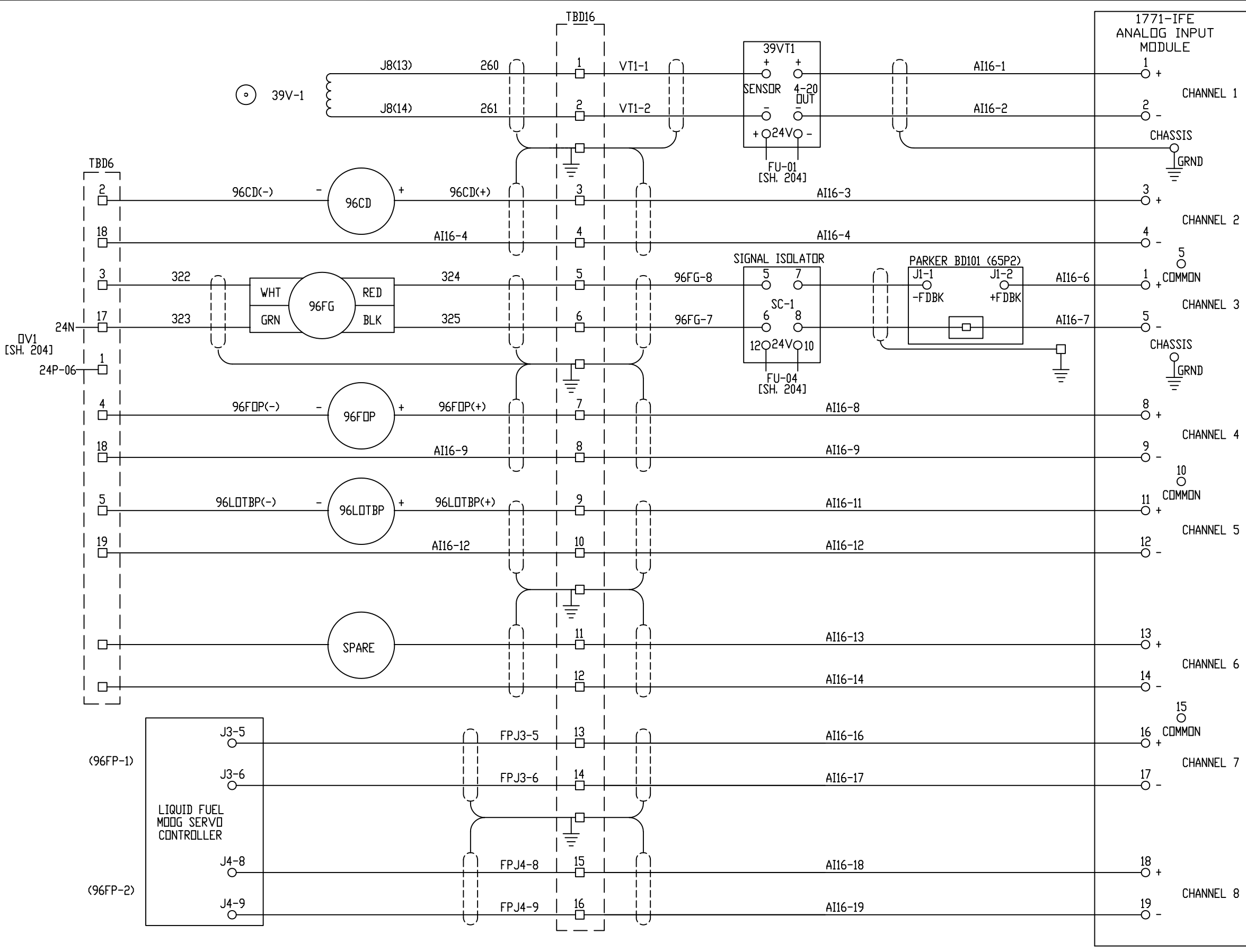
- N13:0103 - #2 LUBE OIL BEARING DRAIN (TT-LOBD20)
N13:101/0 UNDER RANGE
N13:101/8 OVER RANGE
- N13:0067 - TURBINE EXHAUST THERMOCOUPLE #5 (TT-XD-05)
MOVED FROM CHASSIS 1, SLOT 4, INPUT #6
- N13:0105 - TURBINE EXHAUST THERMOCOUPLE #12 (TT-XD-12)
- N13:0106 - TURBINE EXHAUST DUCT TRIP #5 (TT-XDT-5)
- N13:0107 - TURBINE EXHAUST DUCT TRIP #4 (TT-XDT-4)
- N13:0108 - TURBINE EXHAUST THERMOCOUPLE #6 (TT-XD-06)
- N13:0109 - TURBINE EXHAUST THERMOCOUPLE #4 (TT-XD-04)
- N13:0110 - TURBINE EXHAUST THERMOCOUPLE #2 (TT-XD-02)



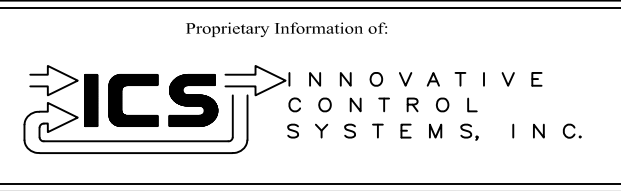
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 3	MODIFICATIONS:	EK	TC	12/21/16
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 1 SLOT 5
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-405-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 405 OF 36



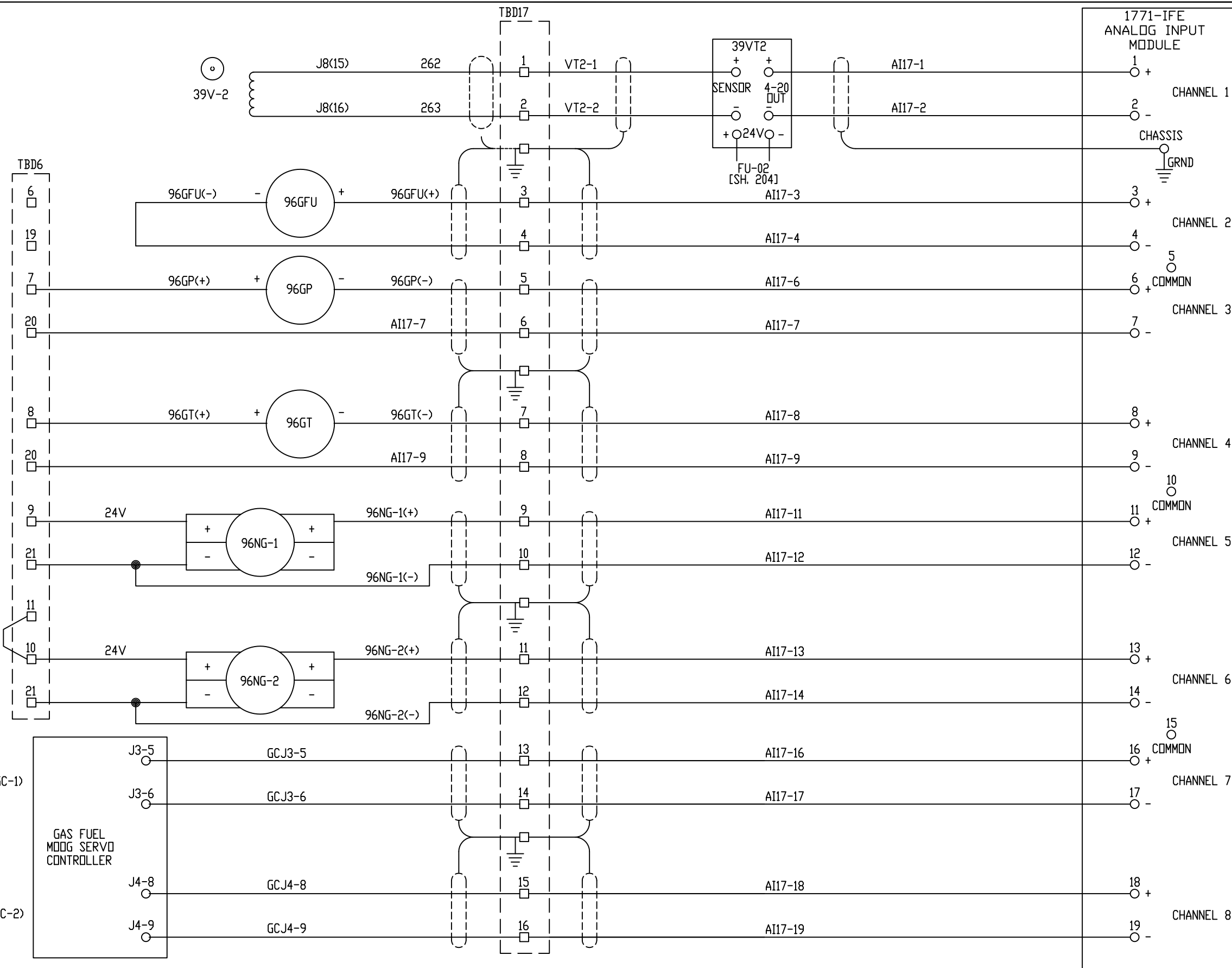
- N13:1014 - NO.1 BEARING VIBRATION PICKUP (39V1)
4mA = 0IPS
20mA = 2IPS
- N13:1015 - COMPRESSOR DISCHARGE PRESSURE (96CD)
4 mA = 0 PSI
20 mA = 250 PSI
- N13:1197 - FUEL GAS PRESSURE (96FG)
4 mA = 40 PSI
20 mA = 200 PSI
- N13:1017 - FUEL OIL PRESSURE AFTER MAIN FILTERS (96FDP)
4 mA = 0 PSIG
20 mA = 100 PSIG
- N13:1018 - LUBE OIL TURBINE BEARING PRESSURE (96LOTBP)
4 mA = 0 PSIG
20 mA = 50 PSIG
- N13:1019 - SPARE
4 mA =
20 mA =
- N13:1020 - LIQUID FUEL SYSTEM FUEL PUMP POSN 1 (96FP-1)
- N13:1021 - LIQUID FUEL SYSTEM FUEL PUMP POSN 2 (96FP-2)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 6
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-406-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 406 OF 36



- N13:1075 - TURBINE COMPRESSOR CASE VIBRATION (39VT-2)
4mA = 0IPS
20mA = 2IPS

- N13:1076 - NATURAL GAS UNCORRECTED FLOW FROM SCADA (96GFU)
4 mA = 0 CFH
20 mA = 30,000 CFH

- N13:1077 - NATURAL GAS PRESSURE FROM SCADA (96GP)
4 mA = 0 PSIG
20 mA = 300 PSIG

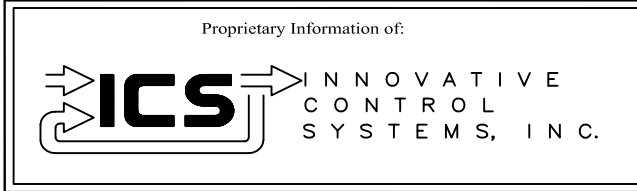
- N13:1078 - NATURAL GAS TEMPERATURE FROM SCADA (96GT)
4 mA = 0 F
20 mA = 90 F

- N13:1079 - NATURAL GAS DETECTOR-LEFT (96NG-1)
4 mA = 0% LEL
20 mA = 100% LEL

- N13:1080 - NATURAL GAS DETECTOR-RIGHT (96NG-2)
4 mA = 0% LEL
20 mA = 100% LEL

- N13:1081 - GAS CONTROL VALVE POSITION 1 (96GC-1)
4 mA = FULLY CLOSED
20 mA = FULLY OPENED

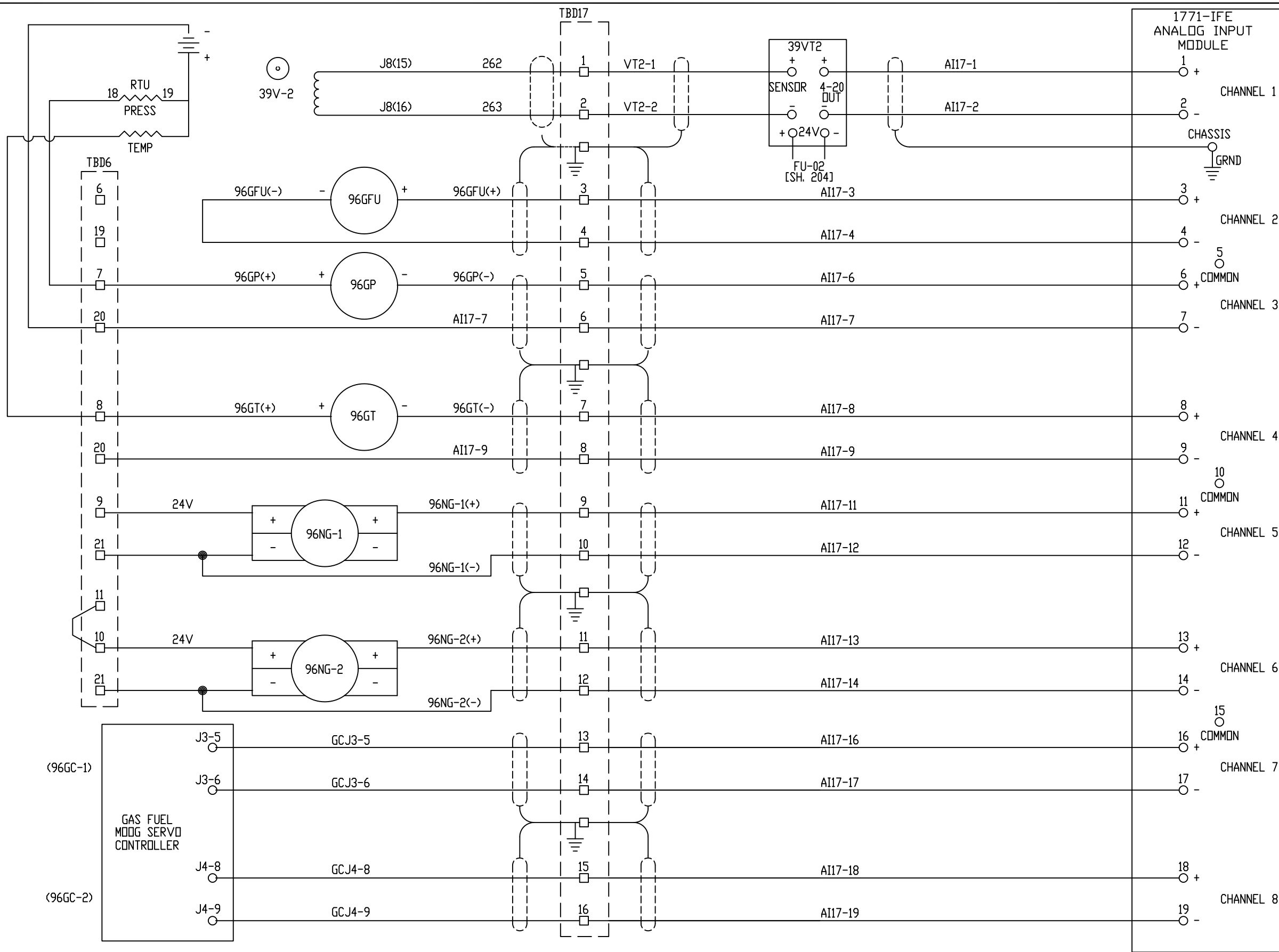
- N13:1082 - GAS CONTROL VALVE POSITION 2 (96GC-2)
4 mA = FULLY CLOSED
20 mA = FULLY OPENED



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 7
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-407-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 407 OF 36



- N13:1075 - TURBINE COMPRESSOR CASE VIBRATION (39VT-2)
4mA = 0IPS
20mA = 2IPS

- N13:1076 - NATURAL GAS UNCORRECTED FLOW FROM SCADA (96GFU)
4 mA = 0 CFH
20 mA = 30,000 CFH

- N13:1077 - NATURAL GAS PRESSURE FROM SCADA (96GP)
4 mA = 0 PSIG
20 mA = 300 PSIG

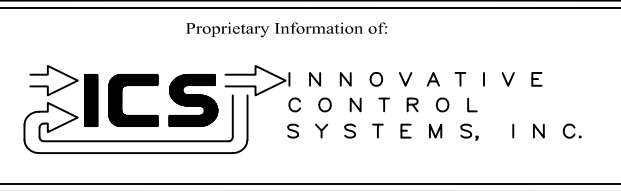
- N13:1078 - NATURAL GAS TEMPERATURE FROM SCADA (96GT)
4 mA = 0 F
20 mA = 90 F

- N13:1079 - NATURAL GAS DETECTOR-LEFT (96NG-1) WEST
4 mA = 0% LEL
20 mA = 100% LEL

- N13:1080 - NATURAL GAS DETECTOR-RIGHT (96NG-2) EAST
4 mA = 0% LEL
20 mA = 100% LEL

- N13:1081 - GAS CONTROL VALVE POSITION 1 (96GC-1)
4 mA = FULLY CLOSED
20 mA = FULLY OPENED

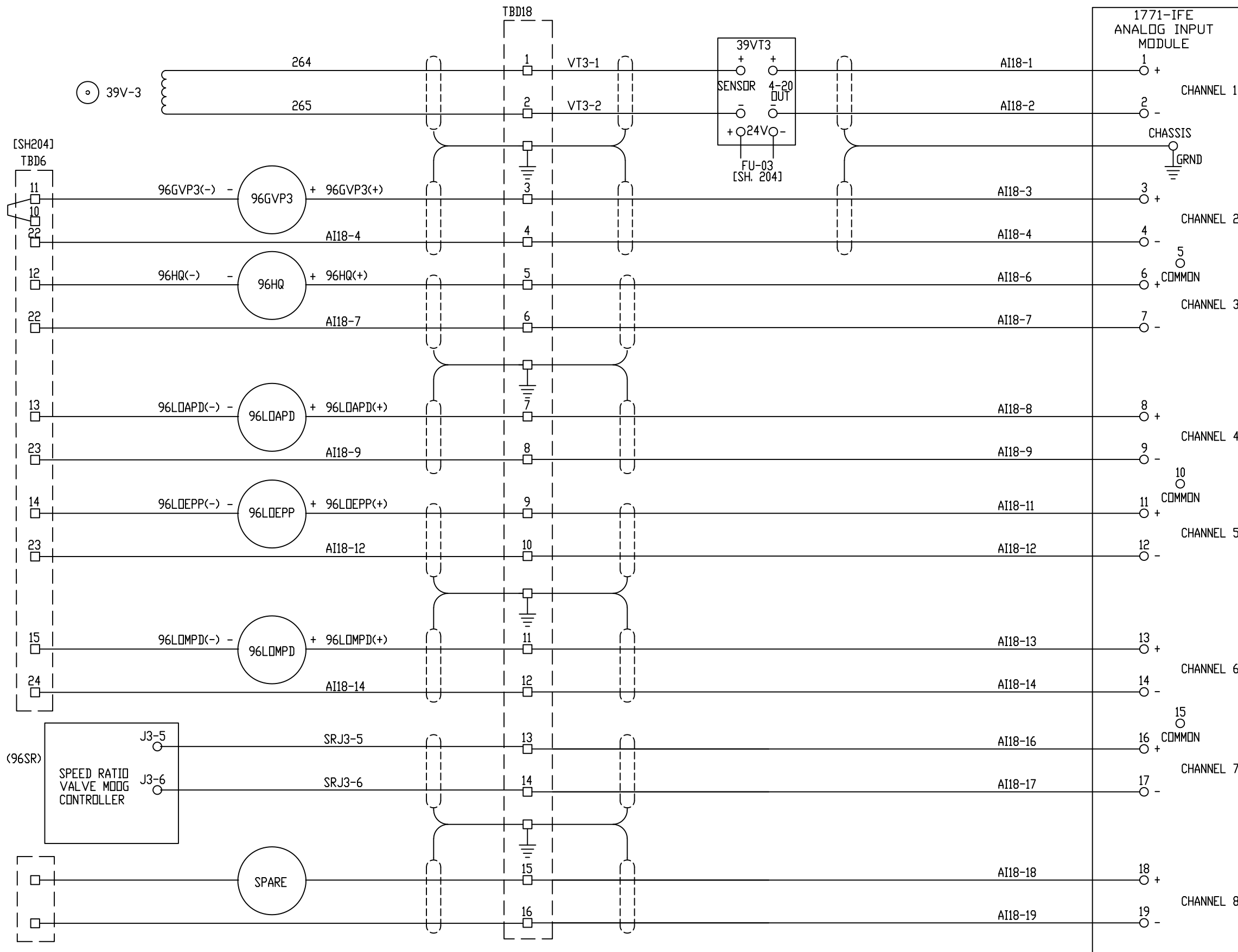
- N13:1082 - GAS CONTROL VALVE POSITION 2 (96GC-2)
4 mA = FULLY CLOSED
20 mA = FULLY OPENED



REV 3	CONF TO FIELD NOTES	EK	TC	10/8/18
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 7
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-407-2	SHEET NO. 407 8 OF 36



N13:1136 - GENERATOR BEARING VIBRATION (39VT-3)
 4mA = 0IPS
 20mA = 2IPS

N13:1137 - GAS VALVE P3 PRESSURE (96GVP3)
 4 mA = 0 CFH
 20 mA = 3000 CFH

N13:1138 - HYDRAULIC TRIP PRESSURE (96HQ)
 4 mA = 0 PSIG
 20 mA = 200 PSIG

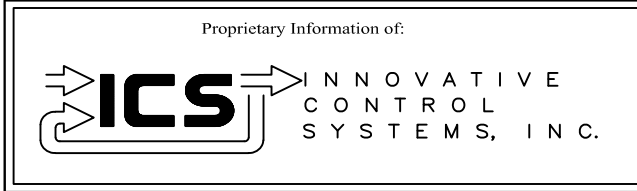
N13:1139 - LUBE OIL AUX PUMP DISCHARGE PRESSURE (96LDAPD)
 4 mA = 0 PSIG
 20 mA = 100 PSIG

N13:1140 - LUBE OIL EMERGENCY PUMP PRESSURE (96LDEPP)
 4 mA = 0 PSIG
 20 mA = 50 PSIG

N13:1141 - LUBE OIL MAIN PUMP DISCHARGE PRESSURE (96LMPD)
 4 mA = 0 PSIG
 20 mA = 100 PSIG

N13:1142 - SPEED RATIO VALVE POSITION (96SR)
 4 mA = FULLY CLOSED
 20 mA = FULLY OPENED

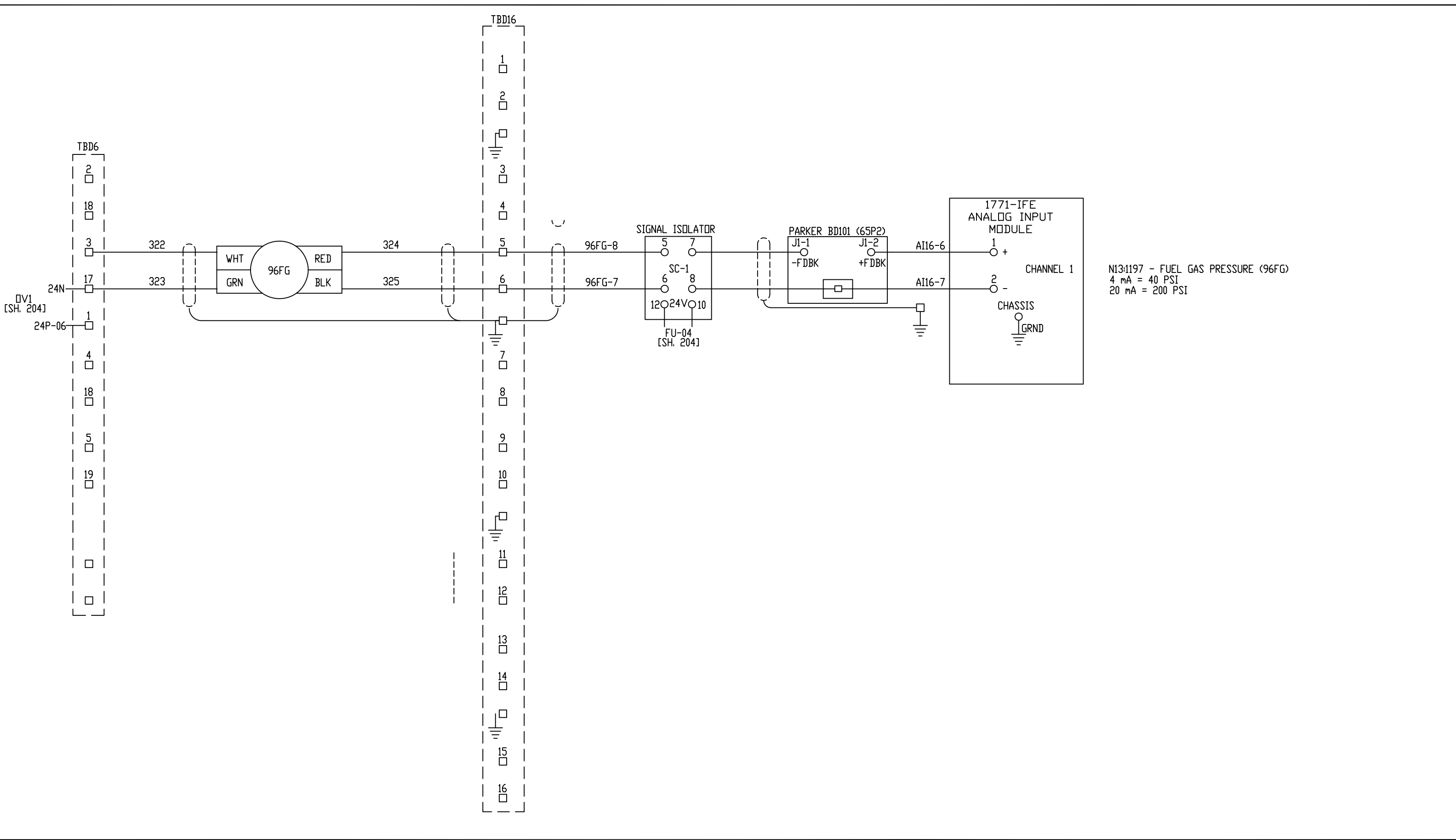
N13:1143 - SPARE
 4 mA =
 20 mA =



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS	CF		05/11/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 8
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-408-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 408 OF 36



N13:1197 - FUEL GAS PRESSURE (96FG)
 4 mA = 40 PSI
 20 mA = 200 PSI

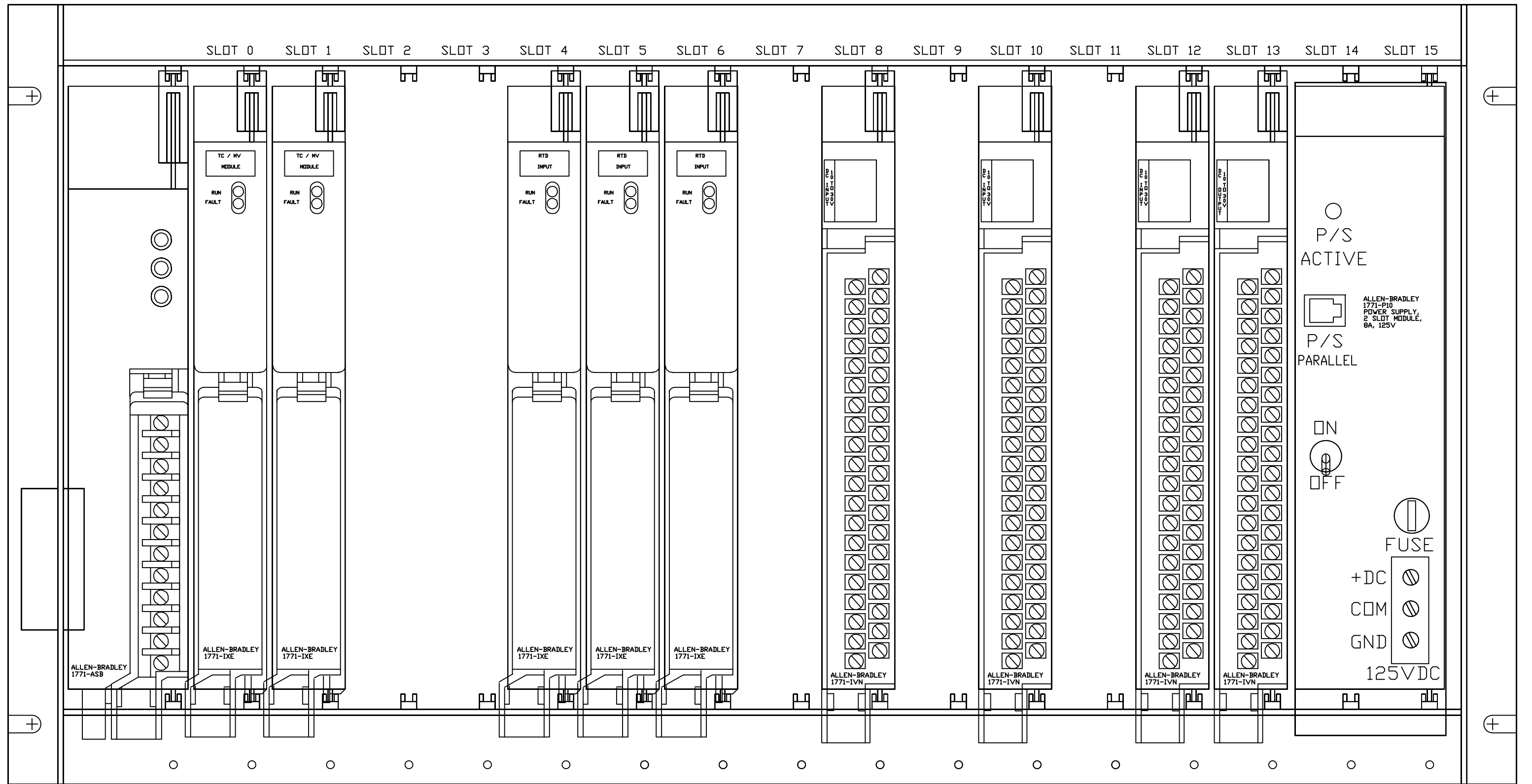
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV 1	AS BUILTS:	EK	TC	10/4/18
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 1 SLOT 9
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: EK	10/4/18	99174-GTB-101-408A-2	SHEET NO. 406 9A OF 36



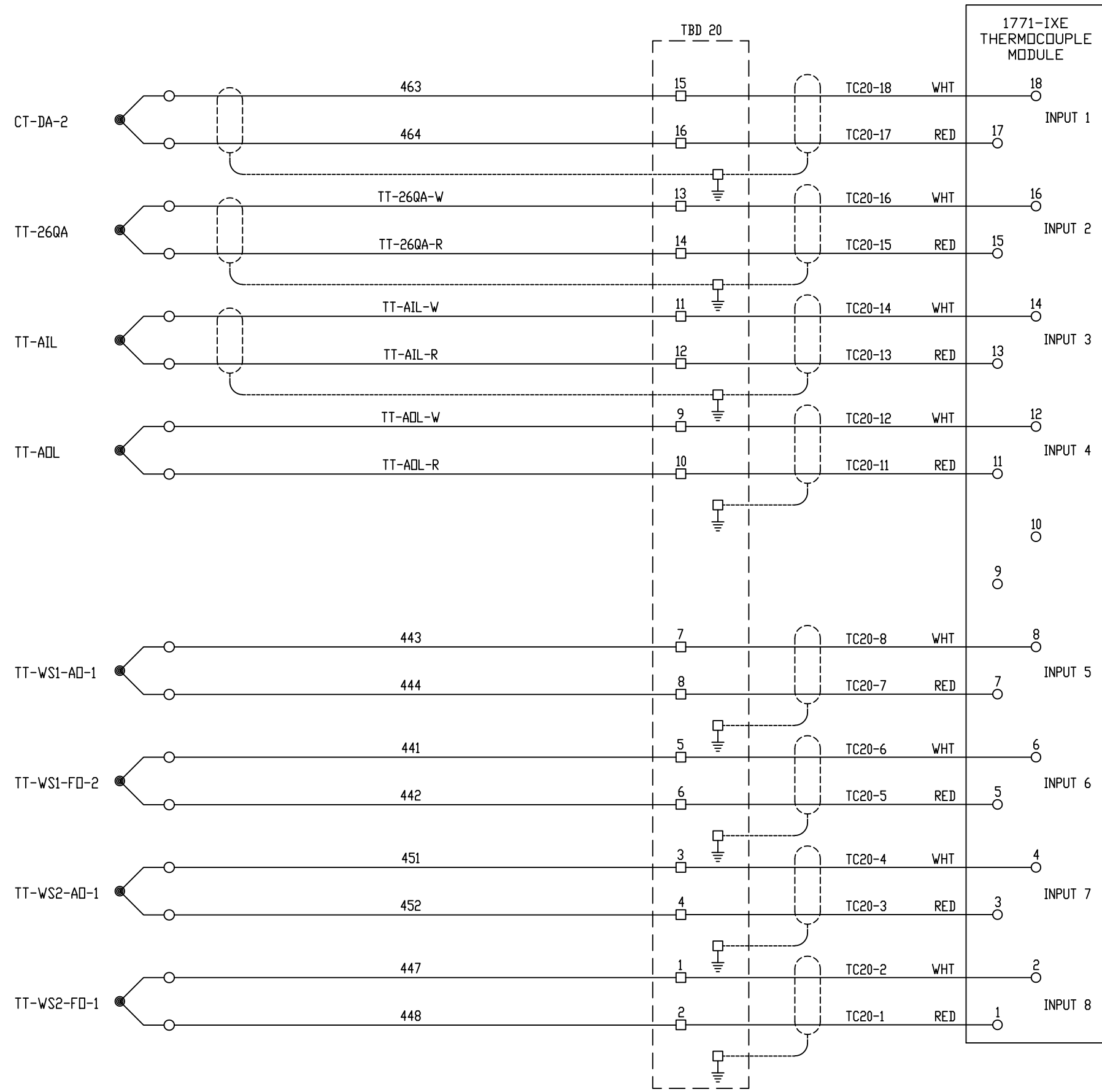
Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-409-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 409 OF 36	



N13:0315 - COMPRESSOR DISCHARGE TEMPERATURE LEFT (CT-DA-2)

N13:0316 - LUBE OIL TEMPERATURE 26QA (TT-26QA)

N13:0317 - AIR INLET TEMPERATURE LEFT SIDE (TT-AIL)

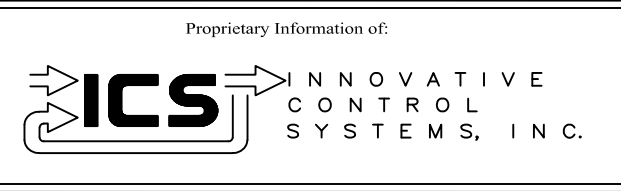
N13:0318 - AIR OUTLET TEMPERATURE LEFT SIDE (TT-AOL)

N13:0319 - WHEELSPACE TEMP 1ST STAGE AFT OUTER #1 (TT-WS1-AD-1)

N13:0320 - WHEELSPACE TEMP 1ST STAGE FWD OUTER #2 (TT-WS1-FD-2)

N13:0321 - WHEELSPACE TEMP 2ND STAGE AFT OUTER #1 (TT-WS2-AD-1)

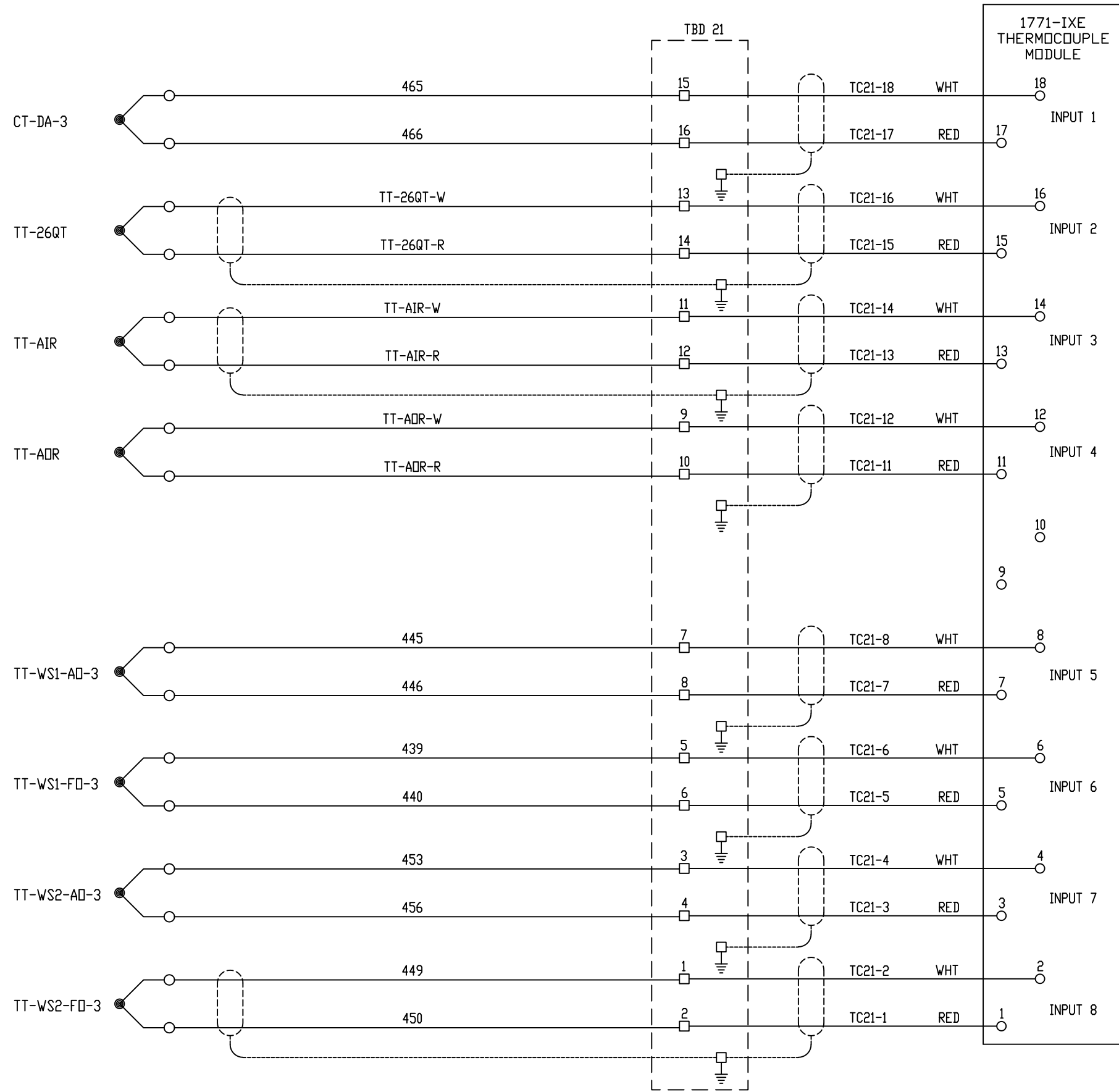
N13:0322 - WHEELSPACE TEMP 2ND STAGE FWD OUTER #1 (TT-WS2-FD-1)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 2 SLOT 0
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-410-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 410 OF 36



N130354 - COMPRESSOR DISCHARGE TEMPERATURE RIGHT (CT-DA-3)

N130355 - LUBE OIL TEMPERATURE 26QT (TT-26QT)

N130356 - AIR INLET TEMPERATURE RIGHT SIDE (TT-AIR)

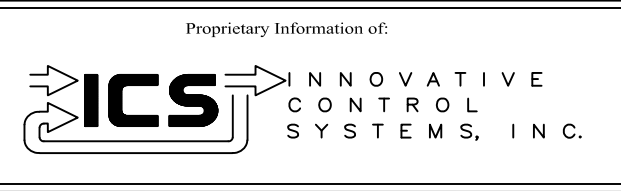
N130357 - AIR OUTLET TEMPERATURE RIGHT SIDE (TT-ADR)

N130358 - WHEELSPACE TEMP 1ST STAGE AFT OUTER #3 (TT-WS1-AD-3)

N130359 - WHEELSPACE TEMP 1ST STAGE FWD OUTER #3 (TT-WS1-FD-3)

N130360 - WHEELSPACE TEMP 2ND STAGE AFT OUTER #3 (TT-WS2-AD-3)

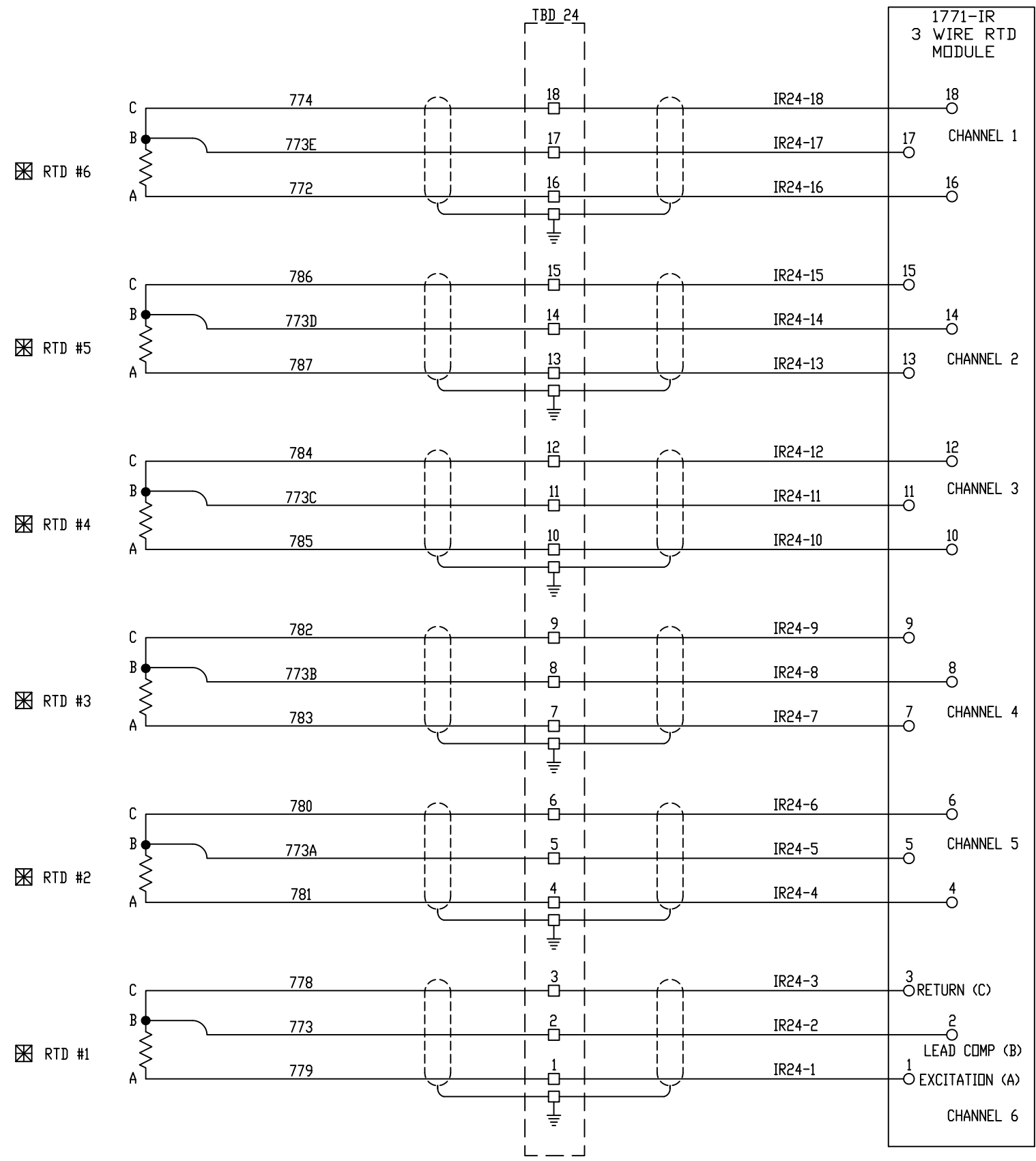
N130361 - WHEELSPACE TEMP 2ND STAGE FWD OUTER #3 (TT-WS2-FD-3)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2 SLOT 1
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-411-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 411 OF 36



N13-0470 - RTD #6 GENERATOR ARMATURE PHASE T4 (TGRTD6)

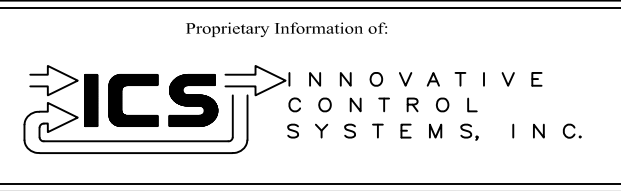
N13-0471 - RTD #5 GENERATOR ARMATURE PHASE T6 (TGRTD5)

N13-0472 - RTD #4 GENERATOR ARMATURE PHASE T5 (TGRTD4)

N13-0473 - RTD #3 GENERATOR ARMATURE PHASE T1 (TGRTD3)

N13-0474 - RTD #2 GENERATOR ARMATURE PHASE T3 (TGRTD2)

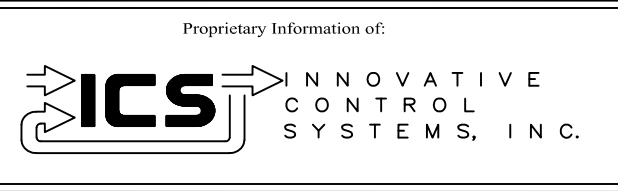
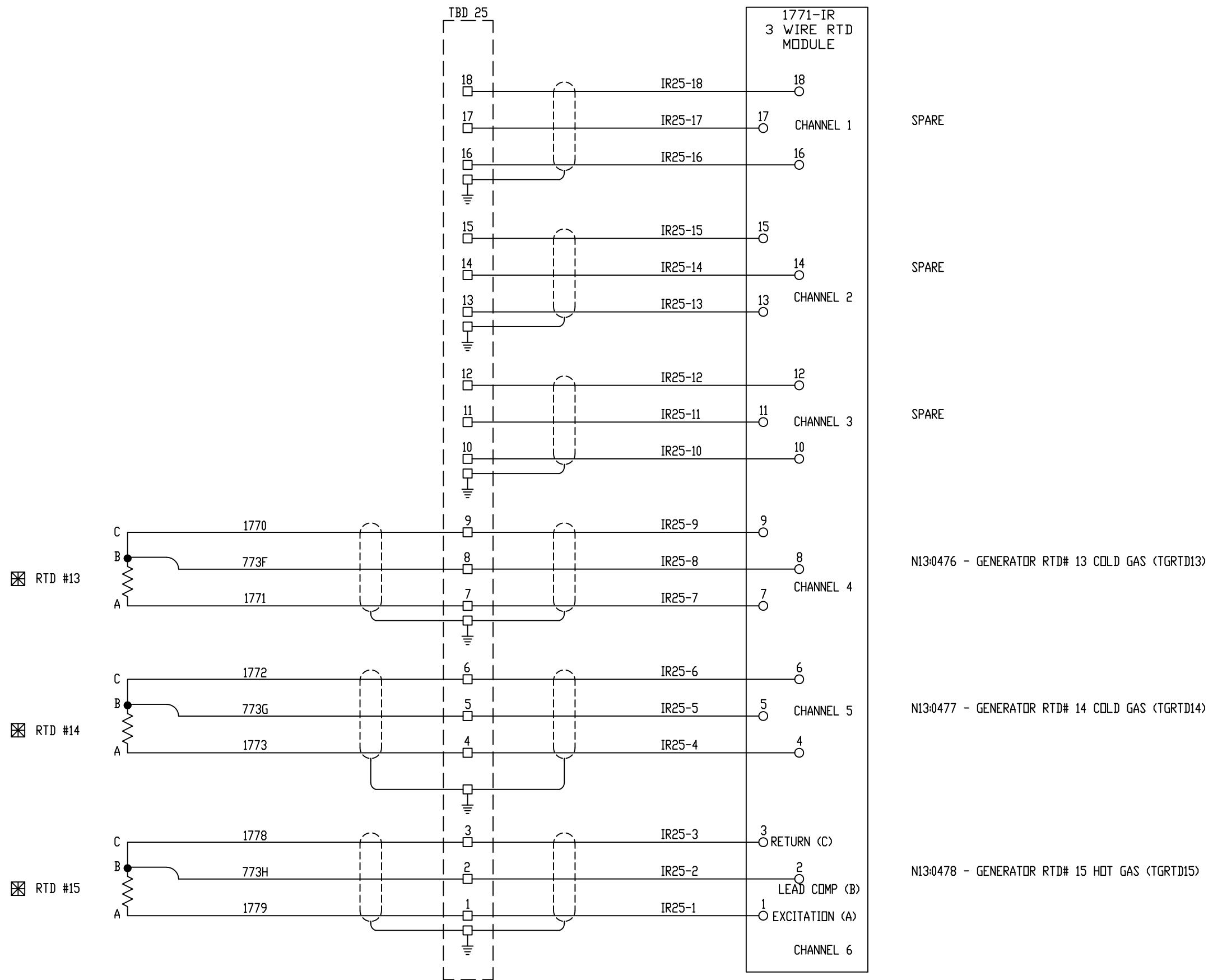
N13-0475 - RTD #1 GENERATOR ARMATURE PHASE T2 (TGRTD1)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 2 SLOT 4
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

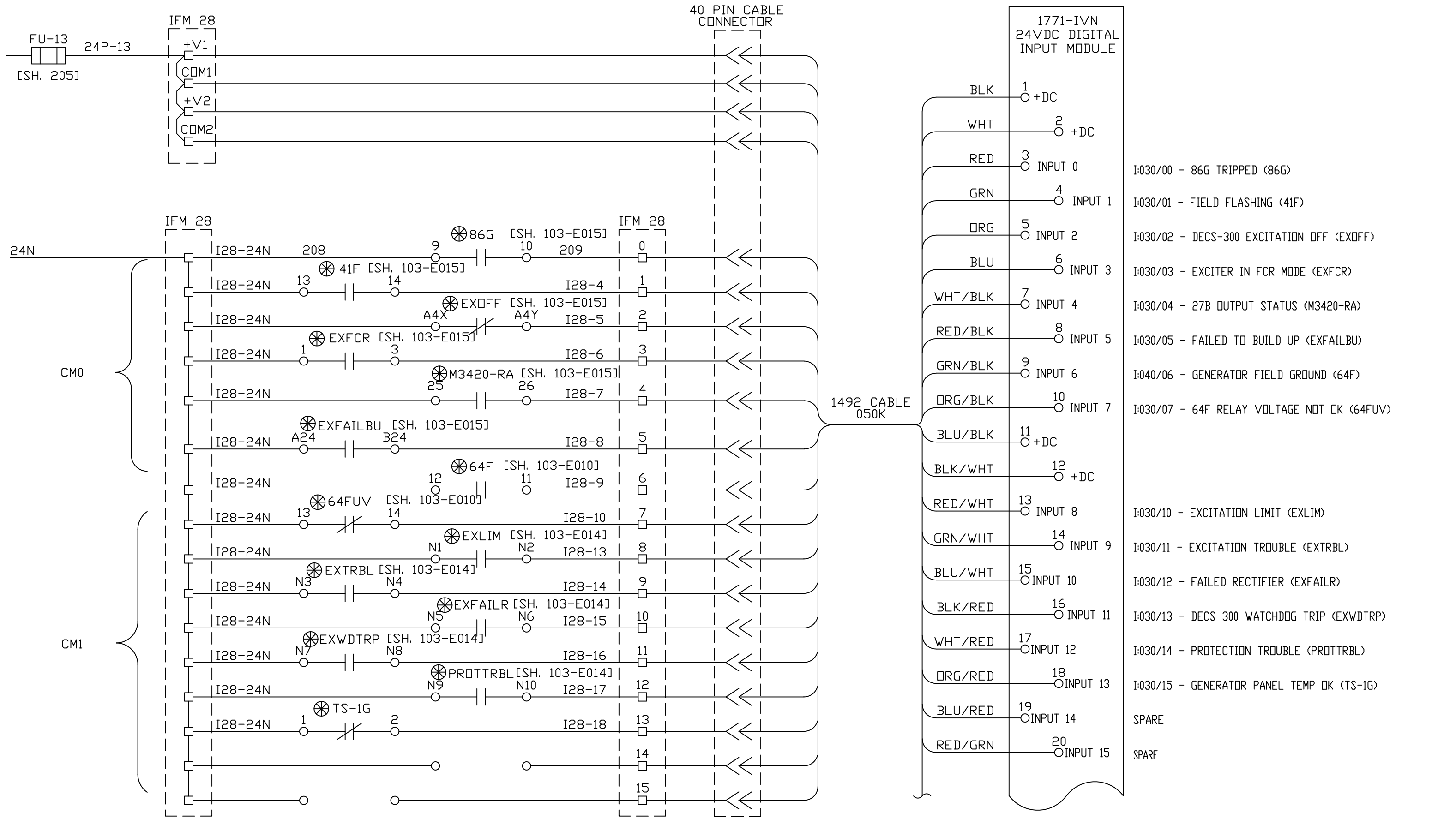
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-414-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 414 13 OF 36	



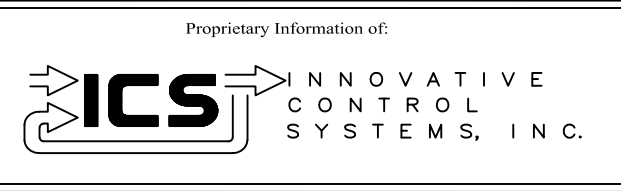
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2 SLOT 5
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-415-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 415 14 OF 36	



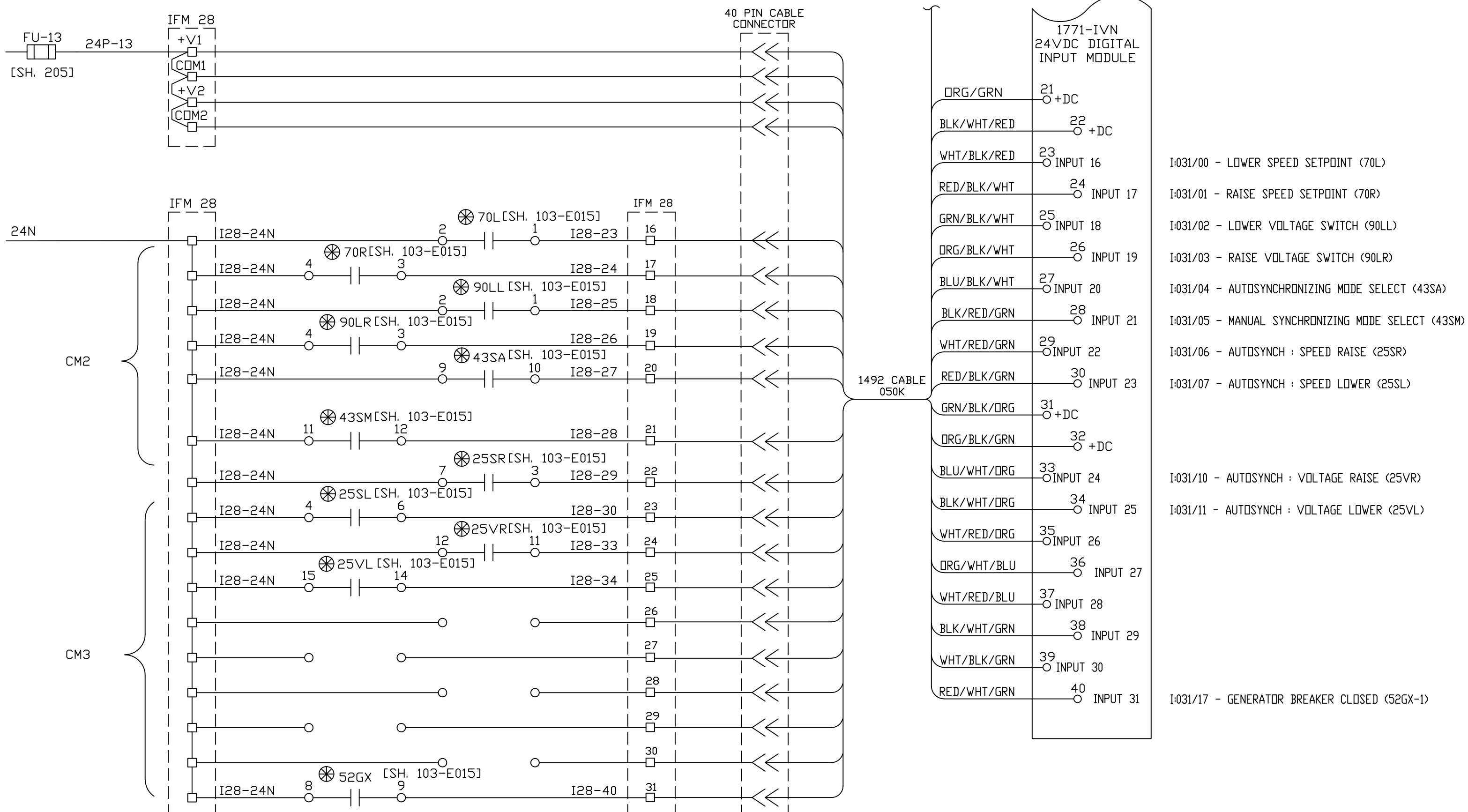
- I:030/00 - 86G TRIPPED (86G)
- I:030/01 - FIELD FLASHING (41F)
- I:030/02 - DECS-300 EXCITATION OFF (EXOFF)
- I:030/03 - EXCITER IN FCR MODE (EXFCR)
- I:030/04 - 27B OUTPUT STATUS (M3420-RA)
- I:030/05 - FAILED TO BUILD UP (EXFAILBU)
- I:040/06 - GENERATOR FIELD GROUND (64F)
- I:030/07 - 64F RELAY VOLTAGE NOT OK (64FUV)
- I:030/10 - EXCITATION LIMIT (EXLIM)
- I:030/11 - EXCITATION TROUBLE (EXTRBL)
- I:030/12 - FAILED RECTIFIER (EXFAILR)
- I:030/13 - DECS 300 WATCHDOG TRIP (EXWDTRP)
- I:030/14 - PROTECTION TROUBLE (PROTTRBL)
- I:030/15 - GENERATOR PANEL TEMP OK (TS-1G)



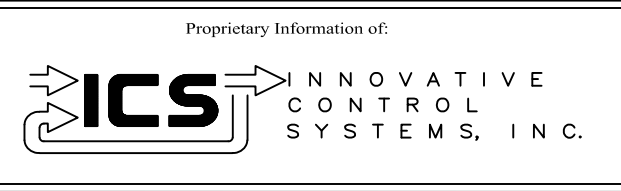
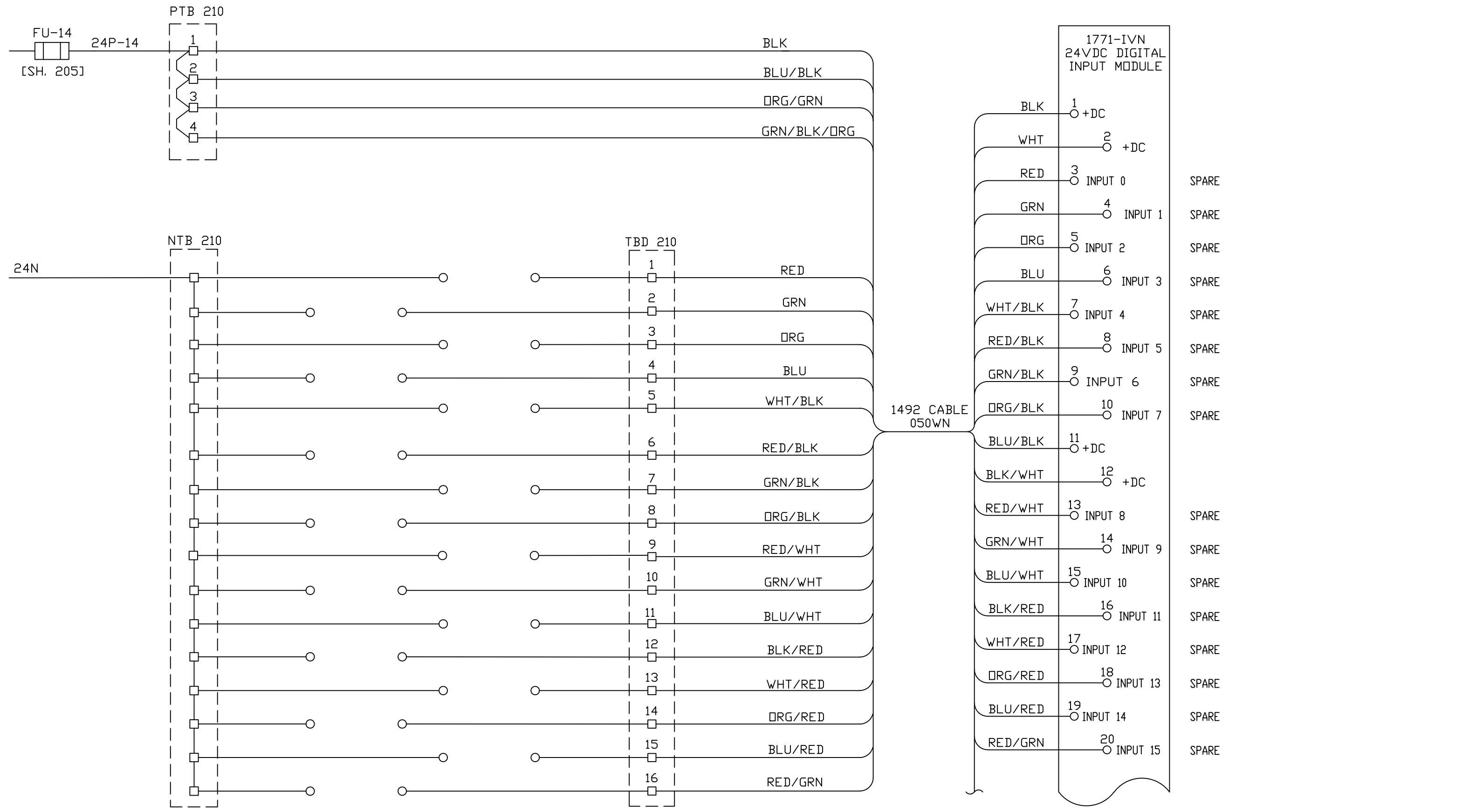
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REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2 SLOT 8
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-417-2	NTS
			SHEET NO. 417
			15 OF 36



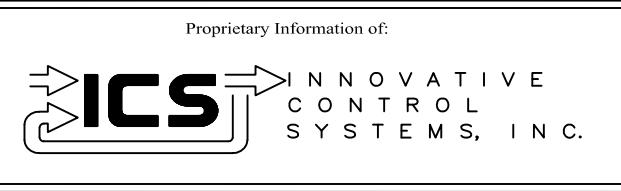
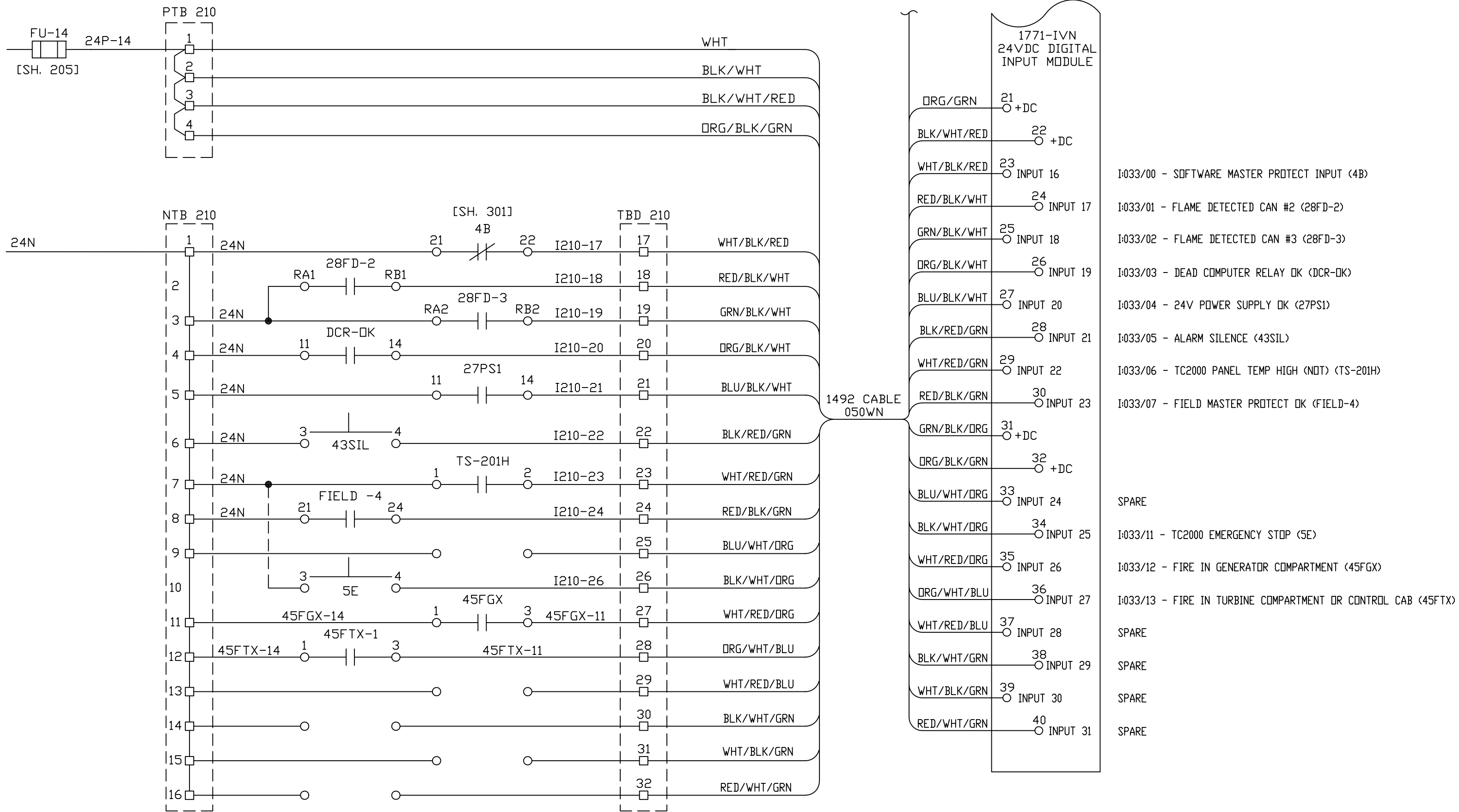
 <small>Proprietary Information of:</small> INNOVATIVE CONTROL SYSTEMS, INC.	REV 2	MODIFICATIONS:	CF		01/18/01	CHASSIS 2 SLOT 8 TURBINE GENERATOR CONTROLLER 99174-GTB-101	CUSTOMER: HASTINGS UTILITIES			
	REV 1	AS BUILTS	CF		05/11/00		SITE: DON HENRY POWER CENTER			
	REV	DESCRIPTION:	BY	APPROVED	DATE		APPROVED BY:		DRAWING NO.	SCALE:
							DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-418-2	NTS
						SHEET NO. 418 OF 36				



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 2 SLOT 10
TURBINE GENERATOR CONTROLLER
99174-GTB-101

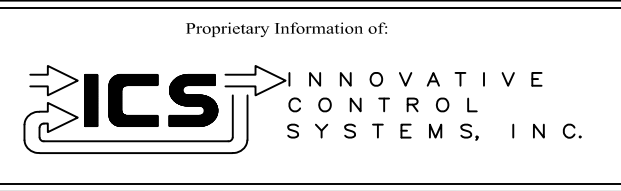
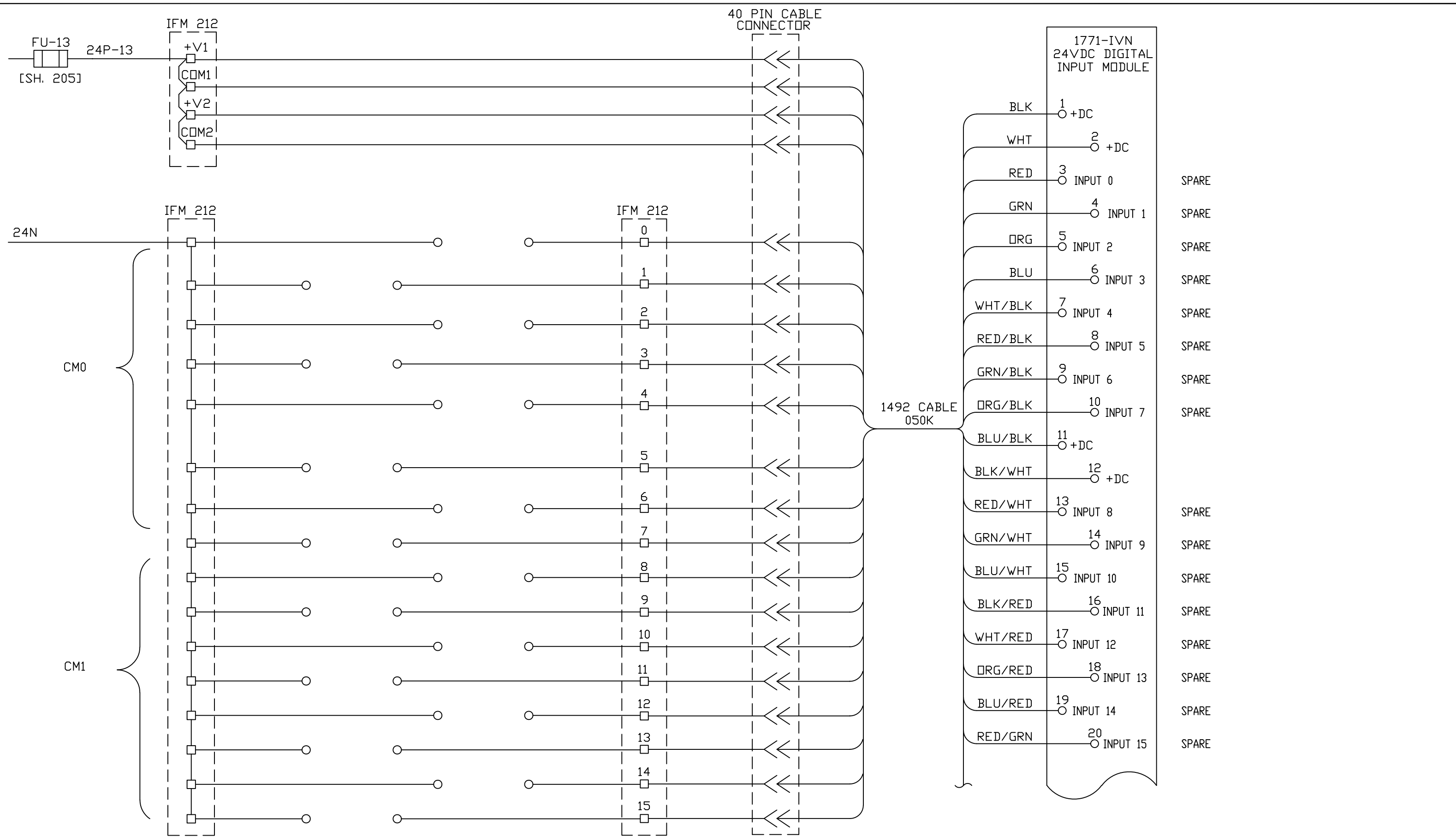
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-419-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 419 OF 36



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 2 SLOT 10
TURBINE GENERATOR CONTROLLER
99174-GTB-101

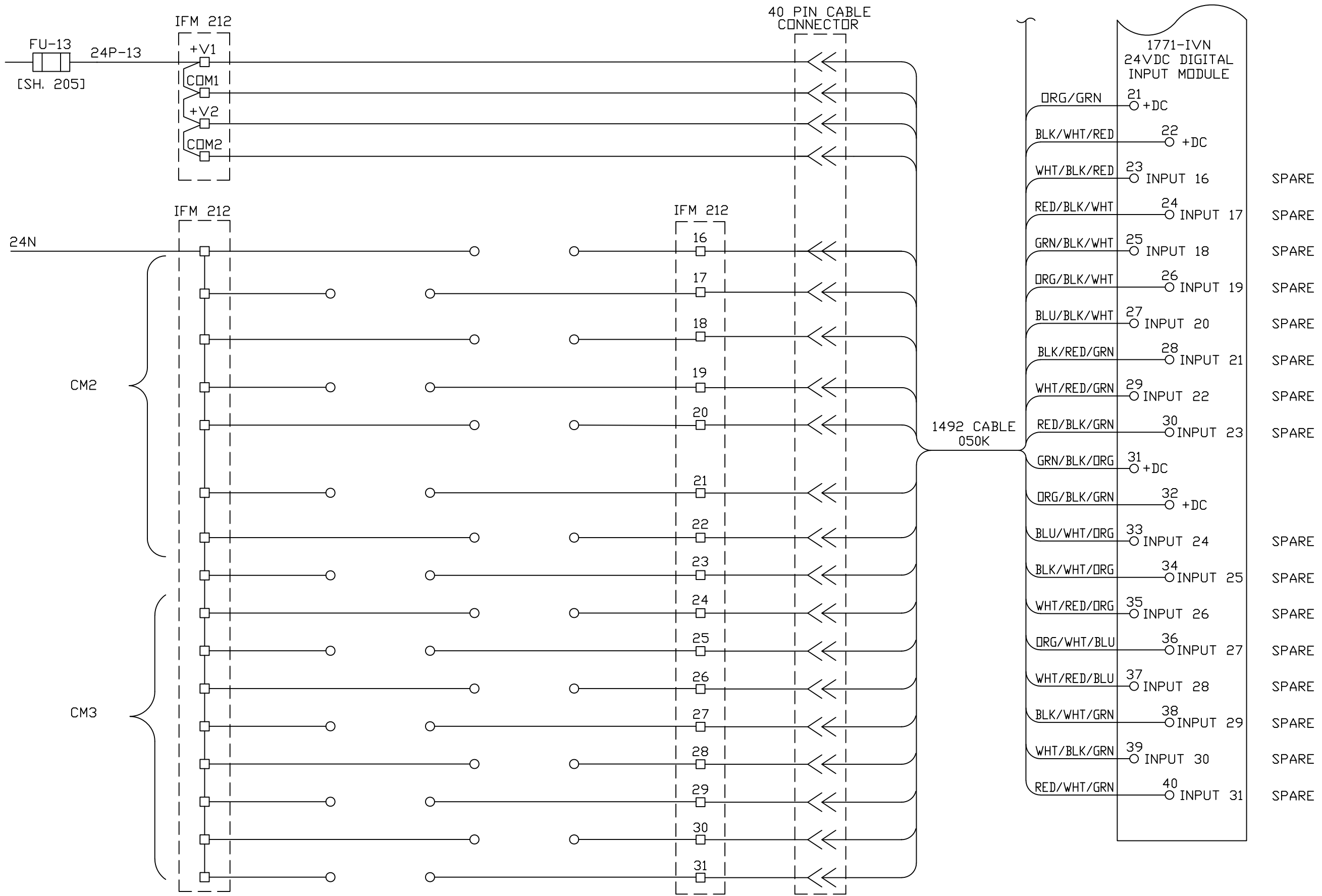
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SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-420-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 420 OF 36	



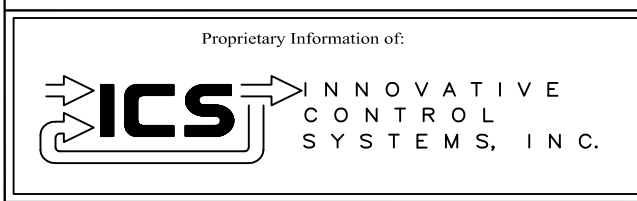
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REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 2 SLOT 12
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-421-2	SHEET NO. 421 OF 36



1771-IVN 24VDC DIGITAL INPUT MODULE		
ORG/GRN	21	○ +DC
BLK/WHT/RED	22	○ +DC
WHT/BLK/RED	23	○ INPUT 16
RED/BLK/WHT	24	○ INPUT 17
GRN/BLK/WHT	25	○ INPUT 18
ORG/BLK/WHT	26	○ INPUT 19
BLU/BLK/WHT	27	○ INPUT 20
BLK/RED/GRN	28	○ INPUT 21
WHT/RED/GRN	29	○ INPUT 22
RED/BLK/GRN	30	○ INPUT 23
GRN/BLK/ORG	31	○ +DC
ORG/BLK/GRN	32	○ +DC
BLU/WHT/ORG	33	○ INPUT 24
BLK/WHT/ORG	34	○ INPUT 25
WHT/RED/ORG	35	○ INPUT 26
ORG/WHT/BLU	36	○ INPUT 27
WHT/RED/BLU	37	○ INPUT 28
BLK/WHT/GRN	38	○ INPUT 29
WHT/BLK/GRN	39	○ INPUT 30
RED/WHT/GRN	40	○ INPUT 31



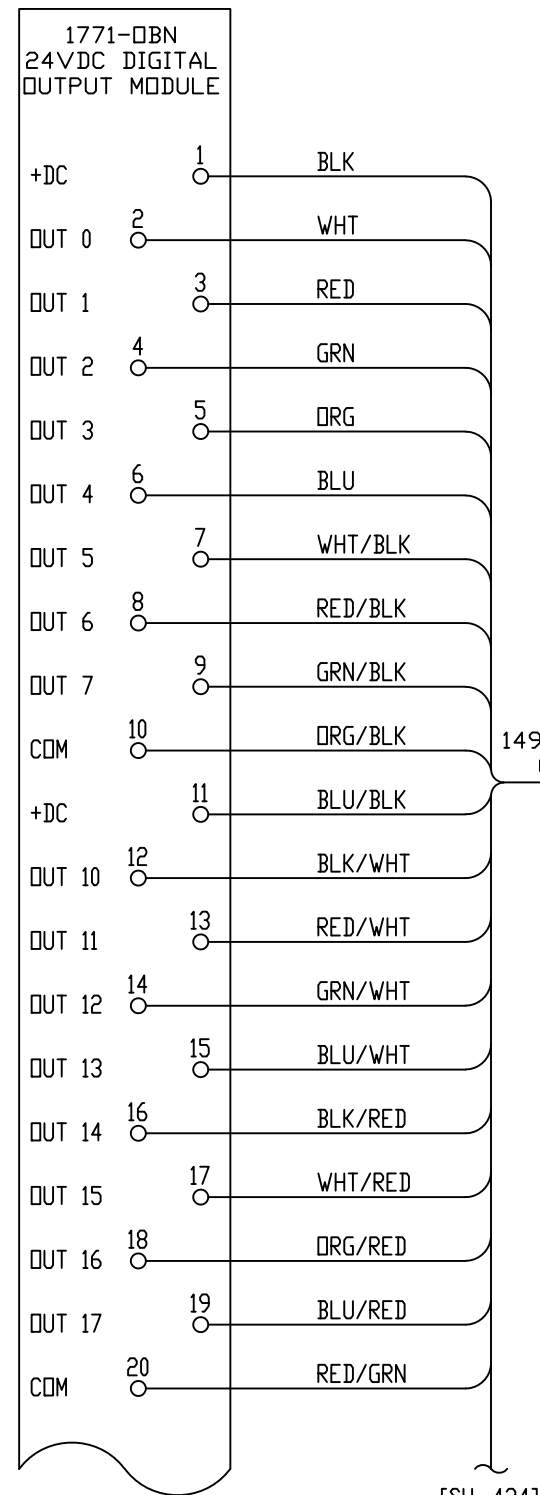
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REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2 SLOT 12
TURBINE GENERATOR CONTROLLER
99174-GTB-101

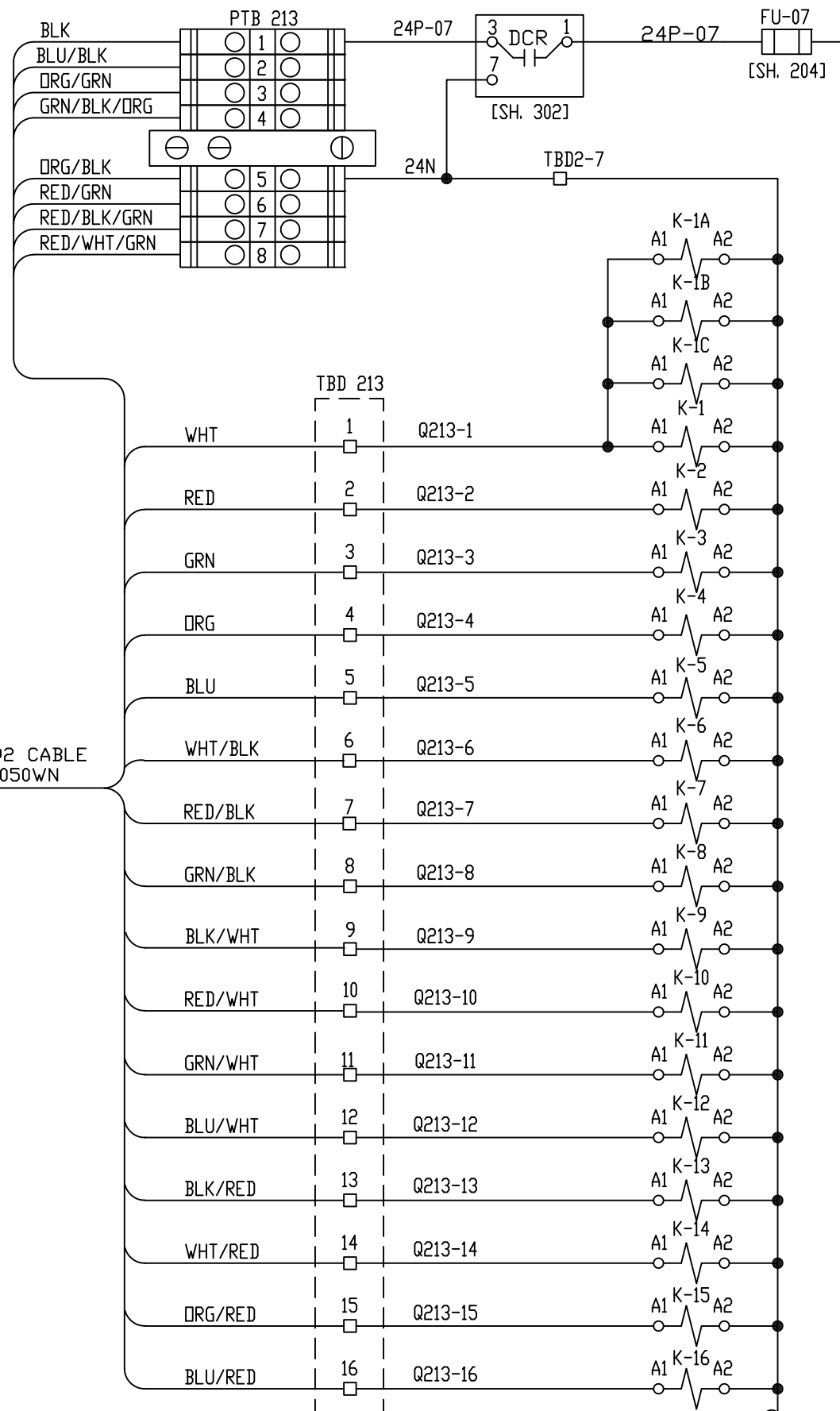
CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-422-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 422
	20 OF 36

- 034/00 - SOFTWARE MASTER PROTECT (QK1)
- 034/01 - OPEN LIQUID FUEL STOP VALVE (Q20FL)
- 034/02 - OPEN GAS FUEL STOP VALVE (Q20FG)
- 034/03 - OPEN BREAK VALVE (Q20BV)
- 034/04 - CLOSE GAS SUPPLY VENT VALVE (Q20GSVV)
- 034/05 - COMPRESSOR BYPASS SOLENOID VALVE (Q20CB)
- 034/06 - FUEL CLUTCH SOLENOID VALVE (Q20CF)
- 034/07 - ENGAGE STARTING CLUTCH (Q20CS)

- 034/10 - ACCELERATE DIESEL ENGINE INTERMEDIATE (Q20DA-1)
- 034/11 - ACCELERATE DIESEL ENGINE FAST LOAD (Q20DA-2)
- 034/12 - OPEN DIESEL ENGINE FUEL STOP VALVE 1 (Q20DF)
- 034/13 - OPEN DIESEL ENGINE FUEL STOP VALVE 2 (Q20DV)
- 034/14 - DISTILLATE FUEL STOP VALVE SOLENOID (Q20FD)
- 034/15 - REVERSE RATCHET DIRECTION (Q20HR)
- 034/16 - OPEN LIQUID FUEL SYSTEM PURGE SOLENOID VALVE (Q20PL)
- 034/17 - TORQUE UNLOADER SOLENOID (Q20TU)

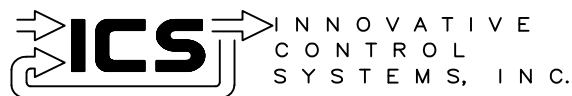


[SH. 424]



[SH. 424]

Proprietary Information of:



REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2 SLOT 13
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-423-2	NTS
		SHEET NO. 423	
		21 OF 36	

D:035/00 - INLET GUIDE VANES SOLENOID VALVE (Q20TV)

D:035/01 - ENERGIZE TO OPEN VALVE 20PG (Q20PG)

D:035/02 - ENERGIZE TO CLOSE VALVE 20VG2 (Q20VG2)

D:035/03 - DIESEL ENGINE FUEL SUPPLY VALVE (Q20DT)

D:035/04 - SPARE (OUT 24)

D:035/05 - SPARE (OUT 25)

D:035/06 - TOTAL STARTS COUNTER (TOT-CNT)

D:035/07 - FIRED LOAD STARTS (FIRE-CNT)

D:035/10 - FAST LOAD STARTS (FAST-CNT)

D:035/11 - PEAK HOURS (PEAKHR)

D:035/12 - MANUALLY INITIATED STARTS (MAN-CNTR)

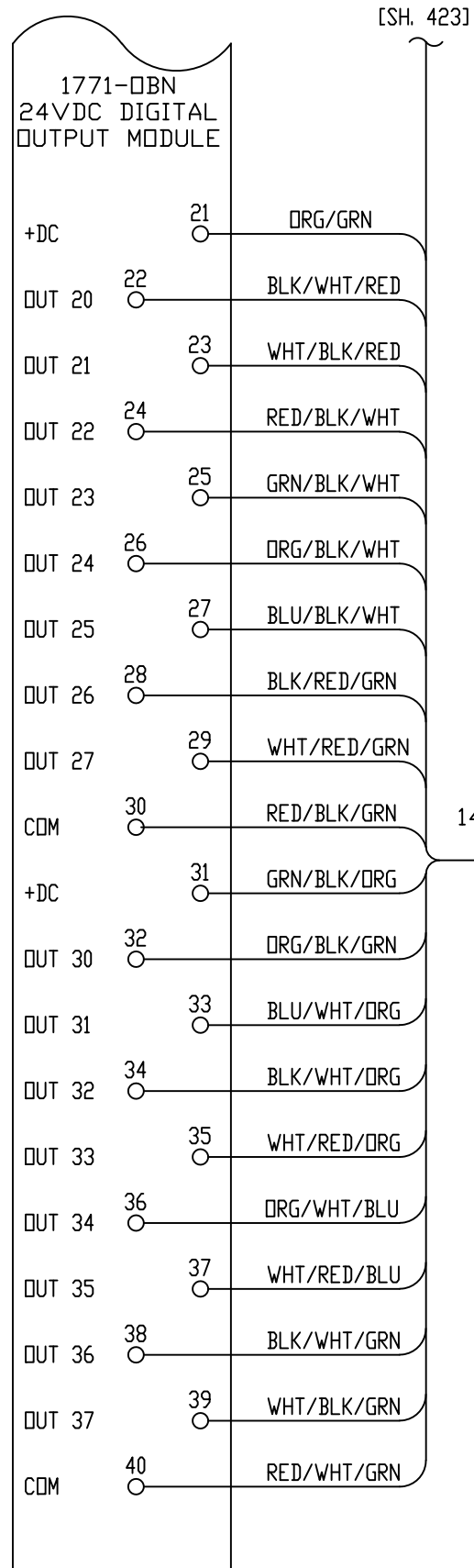
D:035/13 - FIRED HOURS (FHOURS)

D:035/14 - BASE HOURS (BASEHR)

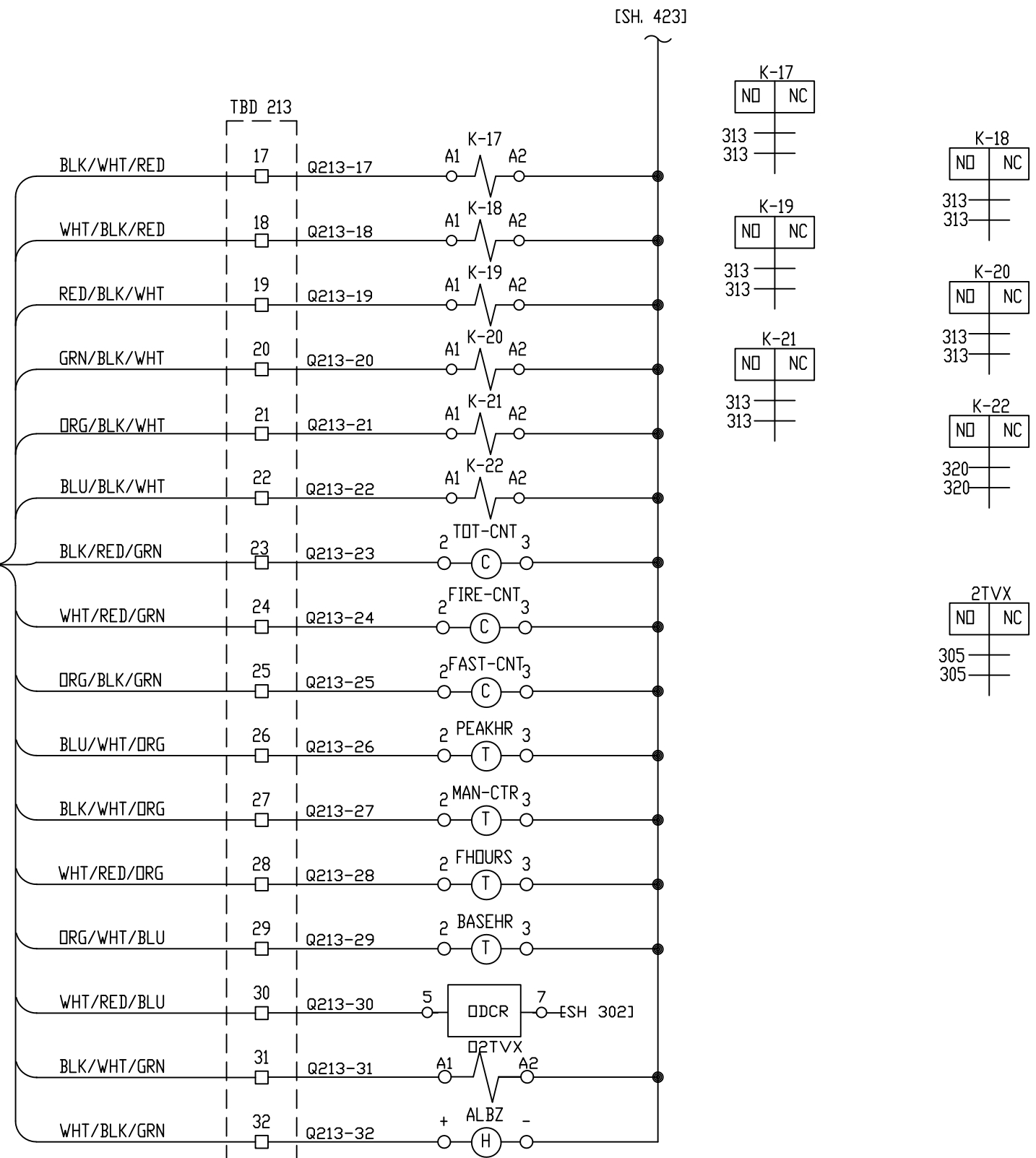
D:035/15 - DCR DEAD COMPUTER RELAY (QDCR)

D:035/16 - ENERGIZE SPARK (Q2TVX)

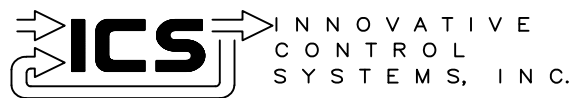
D:035/17 - RING ALARM BUZZER (ALBZ)



1492 CABLE
050WN



Proprietary Information of:



REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 2 SLOT 13
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES

SITE: DON HENRY POWER CENTER

APPROVED BY:

11/29/99

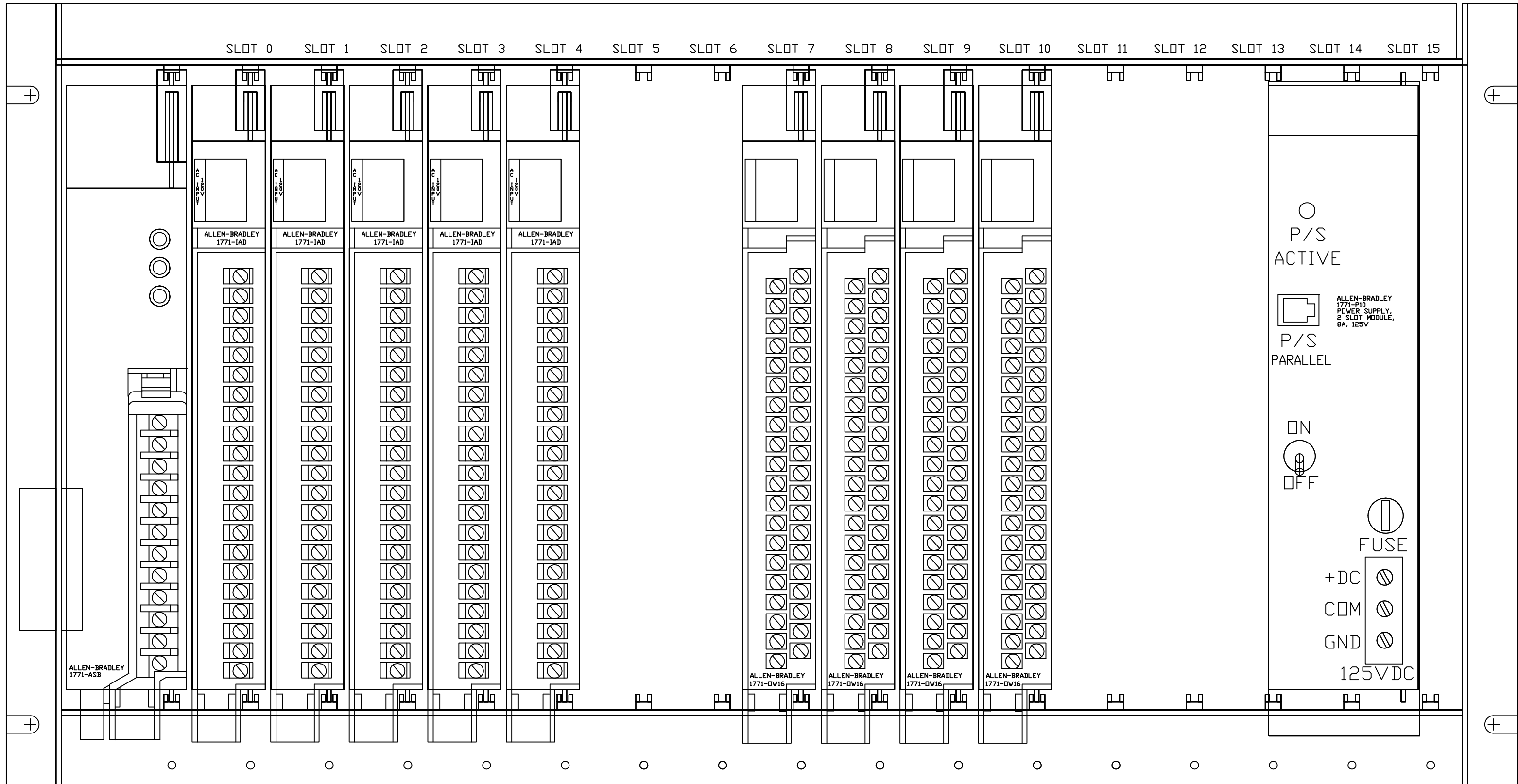
DRAWING NO.

SCALE: NTS


DRAWN BY: C. FISHER

99174-GTB-101-424-2

SHEET NO. 424
22 OF 36



Proprietary Information of:

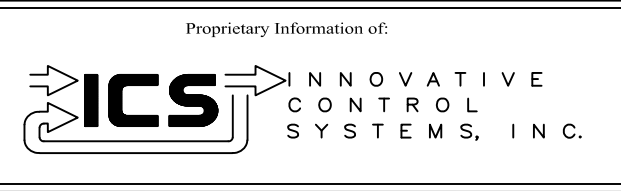
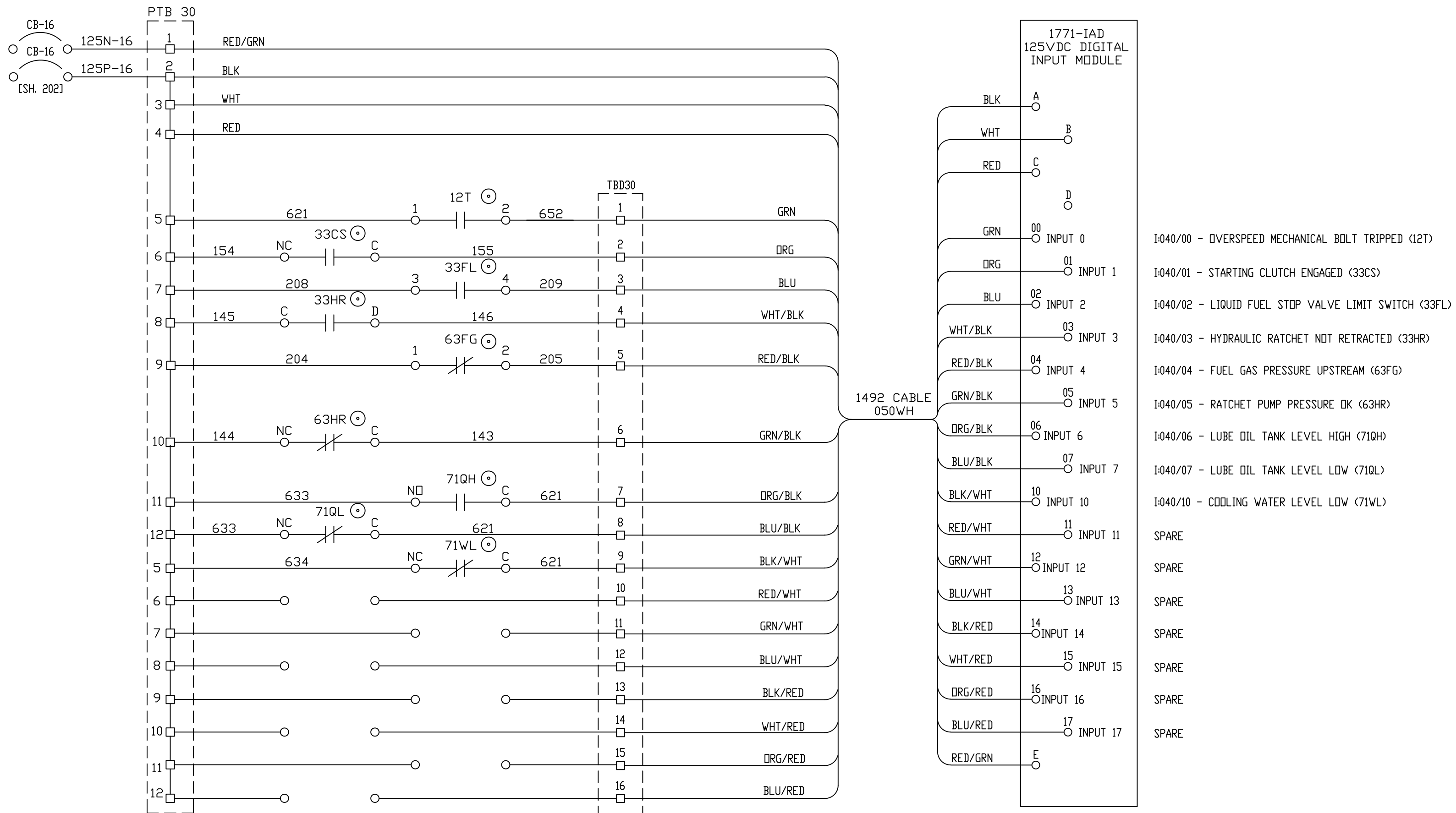


INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 3
TURBINE GENERATOR CONTROLLER
99174-GTB-101

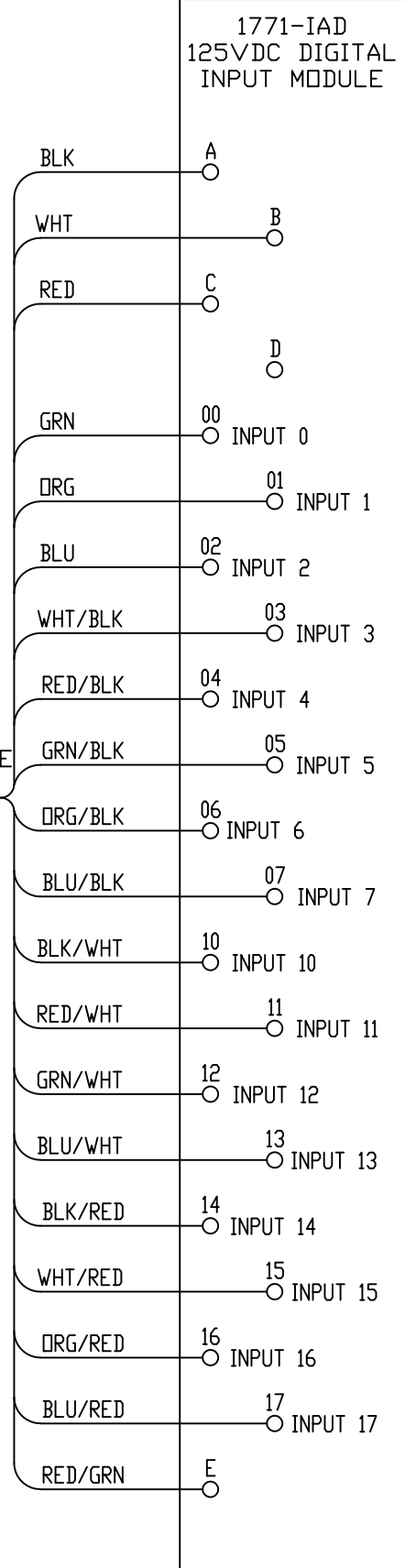
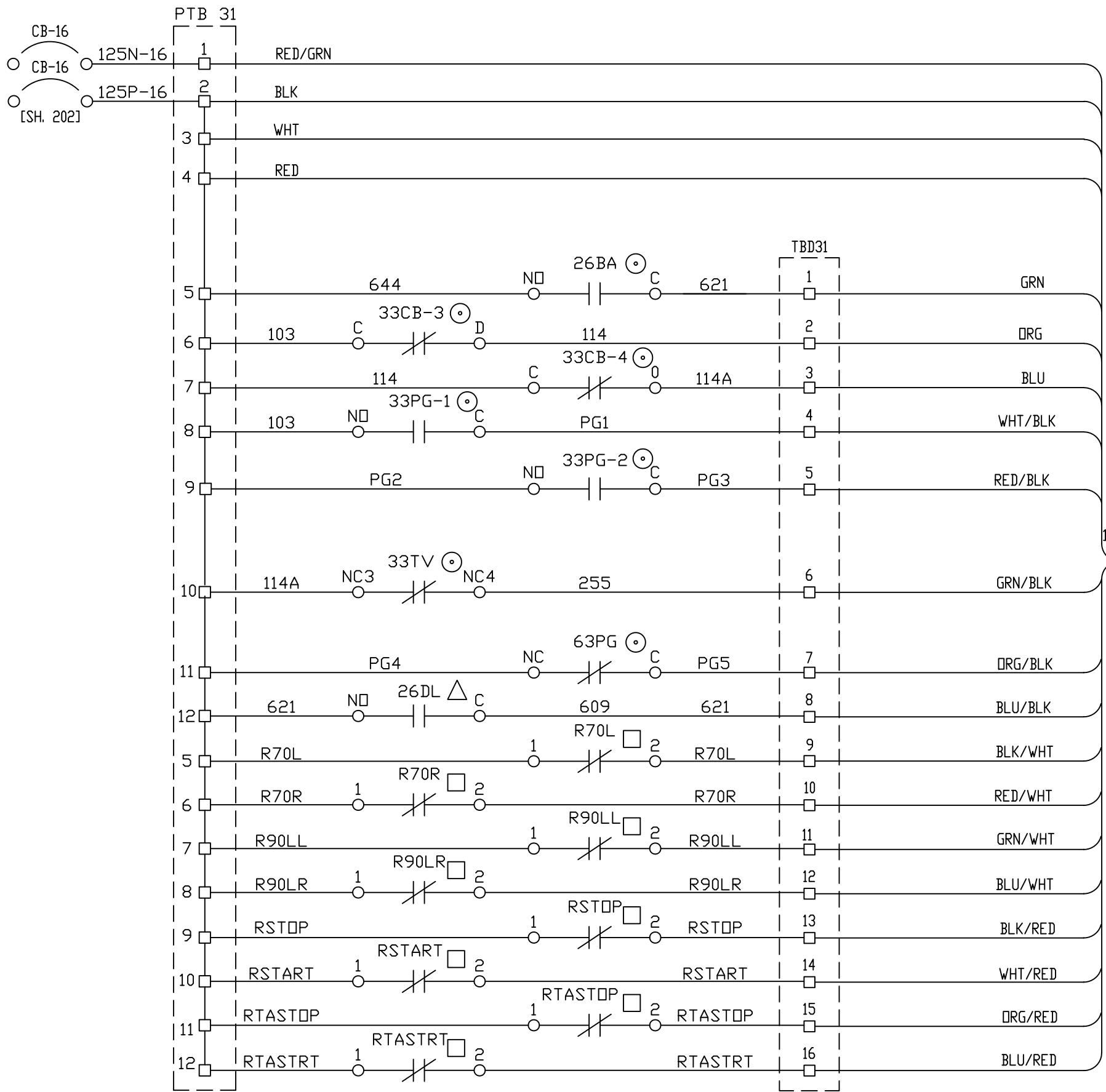
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-425-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 425 OF 36	



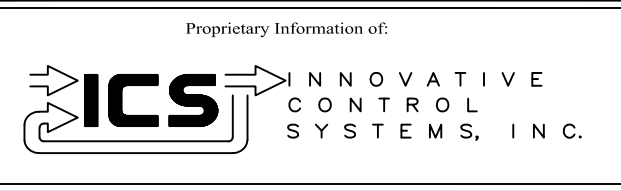
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REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 3 SLOT 0
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-426-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 426 OF 36	



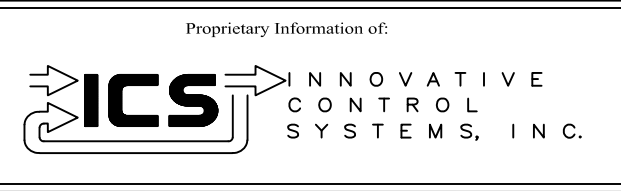
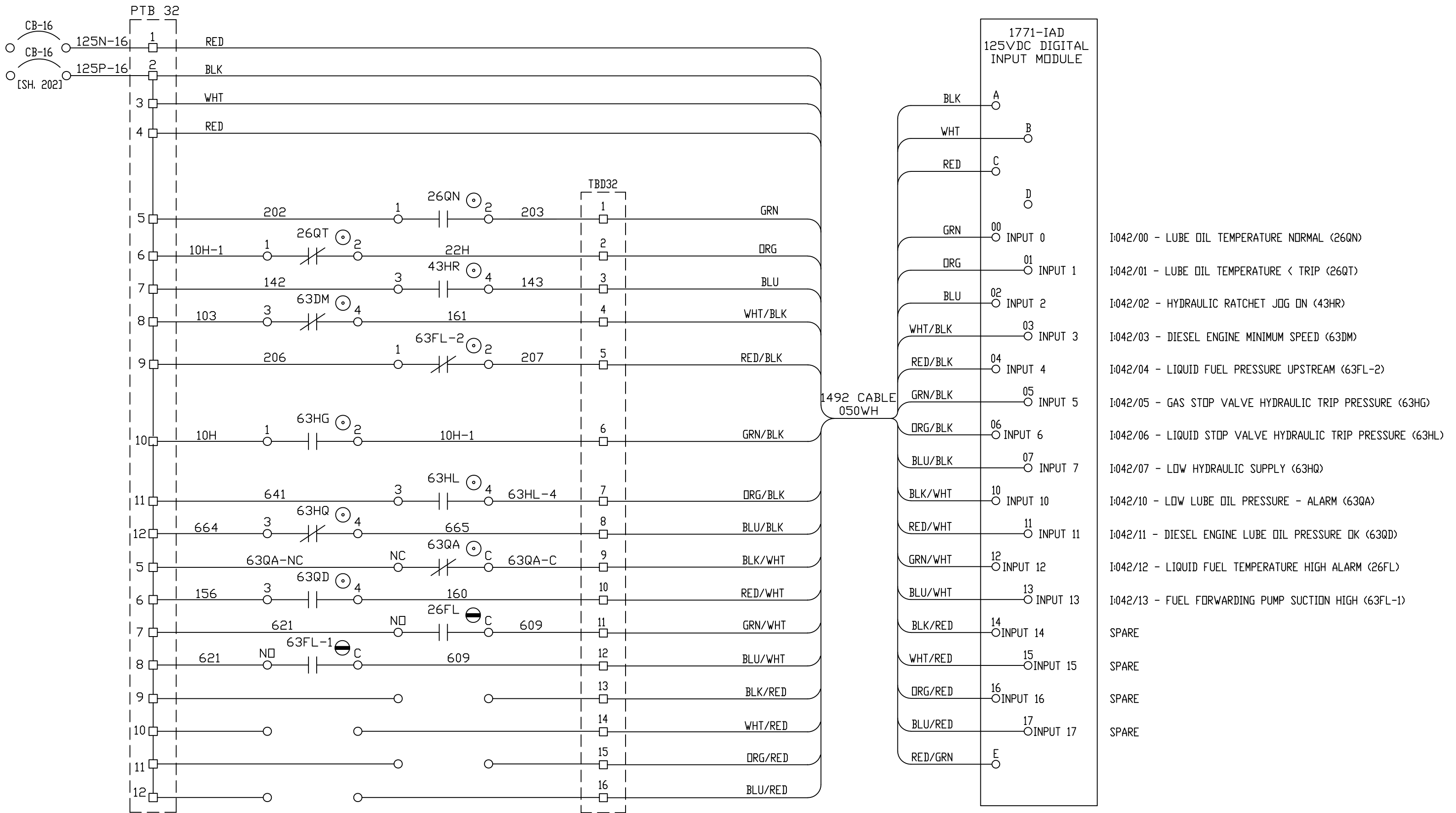
- I:040/00 - HIGH TURBINE COMPARTMENT TEMP - ALARM (26BA)
- I:040/01 - COMPRESSOR BYPASS LIMIT SWITCH (33CB-3)
- I:040/02 - COMPRESSOR BYPASS LIMIT SWITCH (33CB-4)
- I:040/03 - GAS PURGE VALVE #1 CLOSED (33PG-1)
- I:040/04 - GAS PURGE VALVE #2 CLOSED (33PG-2)
- I:040/05 - COMPRESSOR INLET GUIDE VANES LIMIT SWITCH (33TV)
- I:040/06 - NO GAS PRESSURE (63PG)
- I:040/07 - FUEL PIT FULL (26DL) [CABLE DIAG. 113]
- I:040/10 - REMOTE LOWER SPEED SETPOINT (R70L)
- I:040/11 - REMOTE RAISE SPEED SETPOINT (R70R)
- I:040/12 - REMOTE LOWER VOLTAGE (R90LL)
- I:040/13 - REMOTE RAISE VOLTAGE (R90LR)
- I:040/14 - REMOTE STOP SIGNAL (RSTOP)
- I:040/15 - REMOTE START SIGNAL (RSTART)
- I:040/16 - REMOTE AUX LUBE OIL PUMP STOP (RTASTOP)
- I:040/17 - REMOTE AUX LUBE OIL PUMP START (RTASTRT)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 3 SLOT 1
TURBINE GENERATOR CONTROLLER
99174-GTB-101

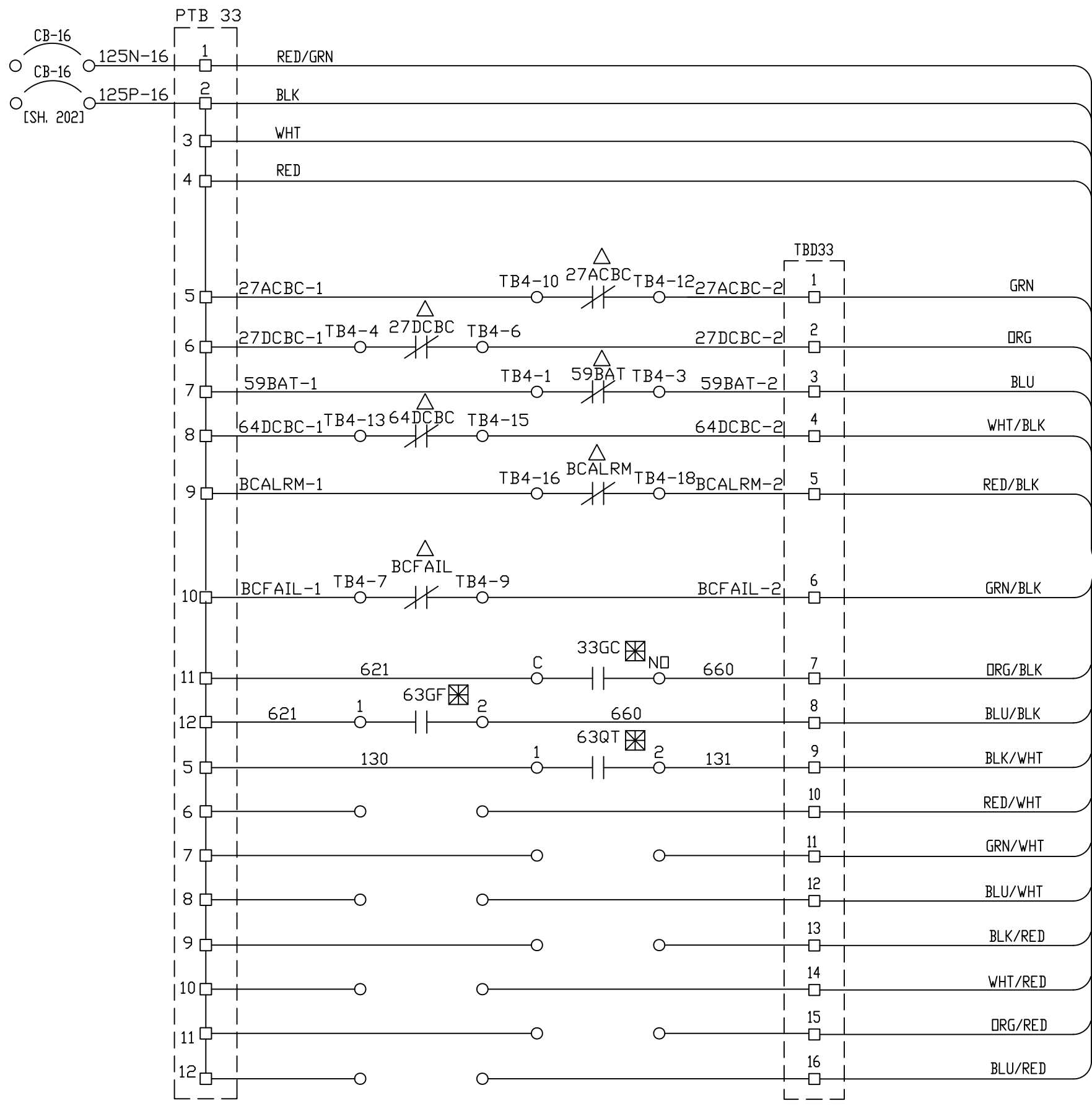
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-427-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 427 OF 36	



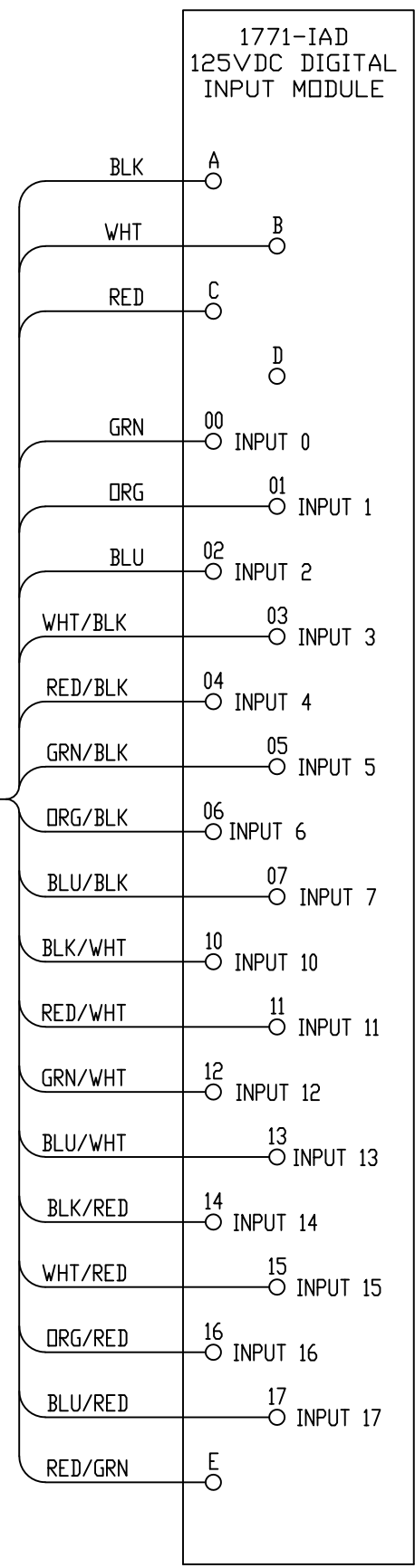
REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS	CF		05/11/00

CHASSIS 3 SLOT 2
TURBINE GENERATOR CONTROLLER
99174-GTB-101

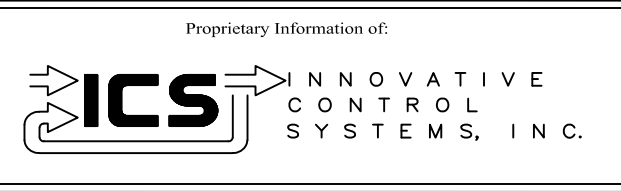
CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-428-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 428 OF 36	



1492 CABLE
050WH



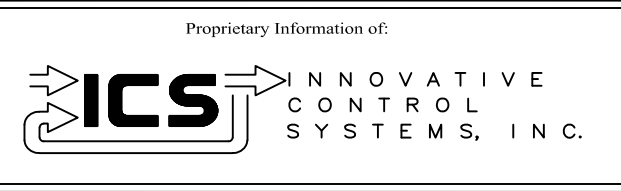
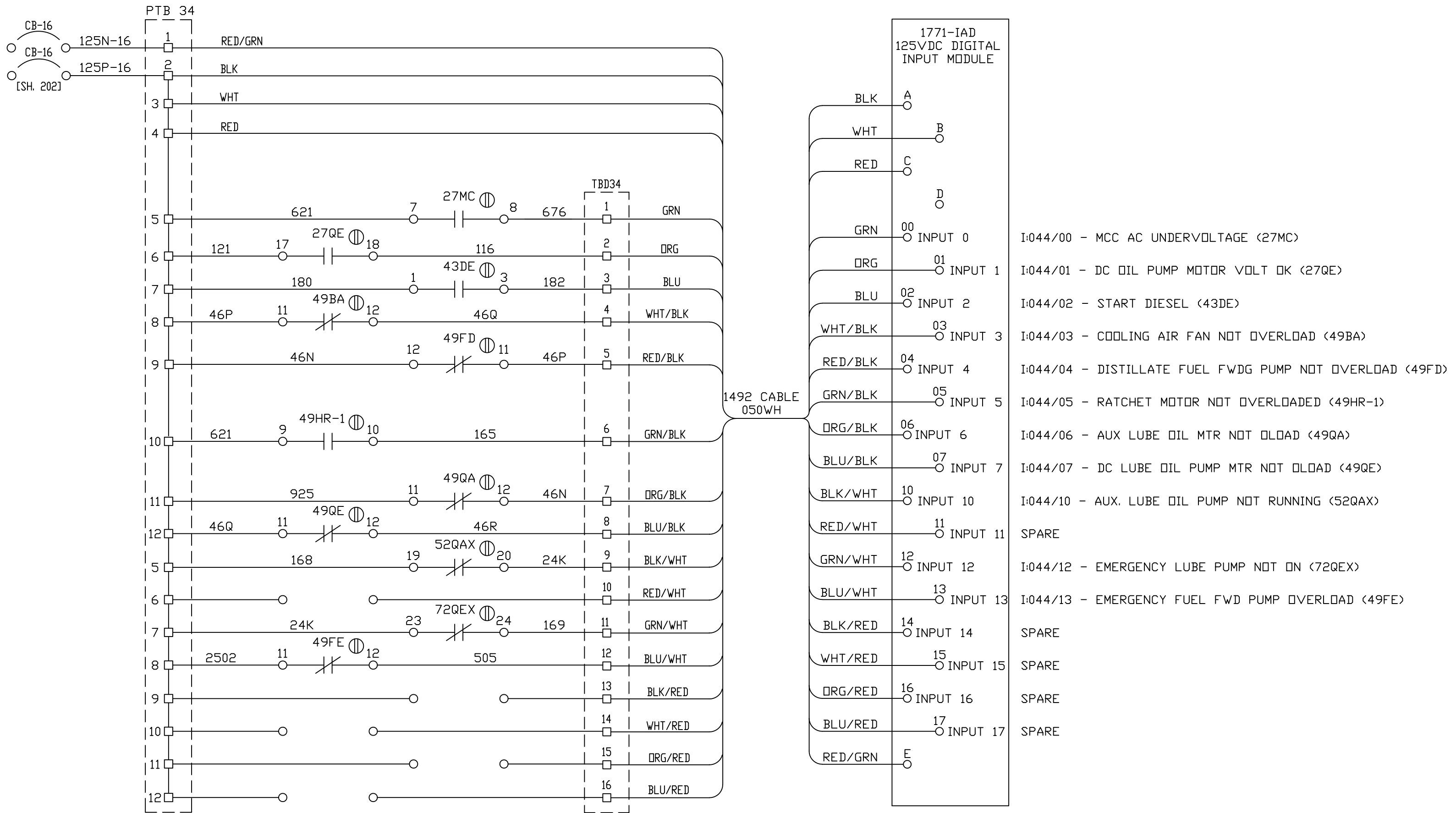
- I:043/00 - BATTERY CHARGER LOSS OF AC (27ACBC)
- I:043/01 - BATTERY CHARGER DC UNDERVOLTAGE (27DCBC)
- I:043/02 - BATTERY CHARGER OVERVOLTAGE (59BAT)
- I:043/03 - GROUND DETECTED AT BATTERY CHARGER (64DCBC)
- I:043/04 - BATTERY CHARGER COMMON ALARM (BCALRM)
- I:043/05 - BATTERY CHARGER TROUBLE (BCFAIL)
- I:043/06 - GENERATOR CO2 DOOR CLOSED (33GC)
- I:043/07 - GENERATOR AIR INLET FILTER EXCESSIVE DROP (63GF)
- I:043/10 - LUBE OIL PRESSURE NORMAL (63QT)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS	CF		05/11/00

CHASSIS 3 SLOT 3
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SITE: DON HENRY POWER CENTER	
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-429-2	SHEET NO. 429 27 OF 36



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 3 SLOT 4
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-430-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 430
	28 OF 36

D:047/00 - DEAD COMPUTER RELAY RESET (DCRR)

D:047/01 - REMOVE GROUND REFERENCE (064DX)

D:047/02 - START COOLING AIR FAN (088BA)

D:047/03 - START DIESEL HEATERS (Q23DH)

D:047/04 - DISTILLATE FUEL FORWARDING PUMP (088FD)

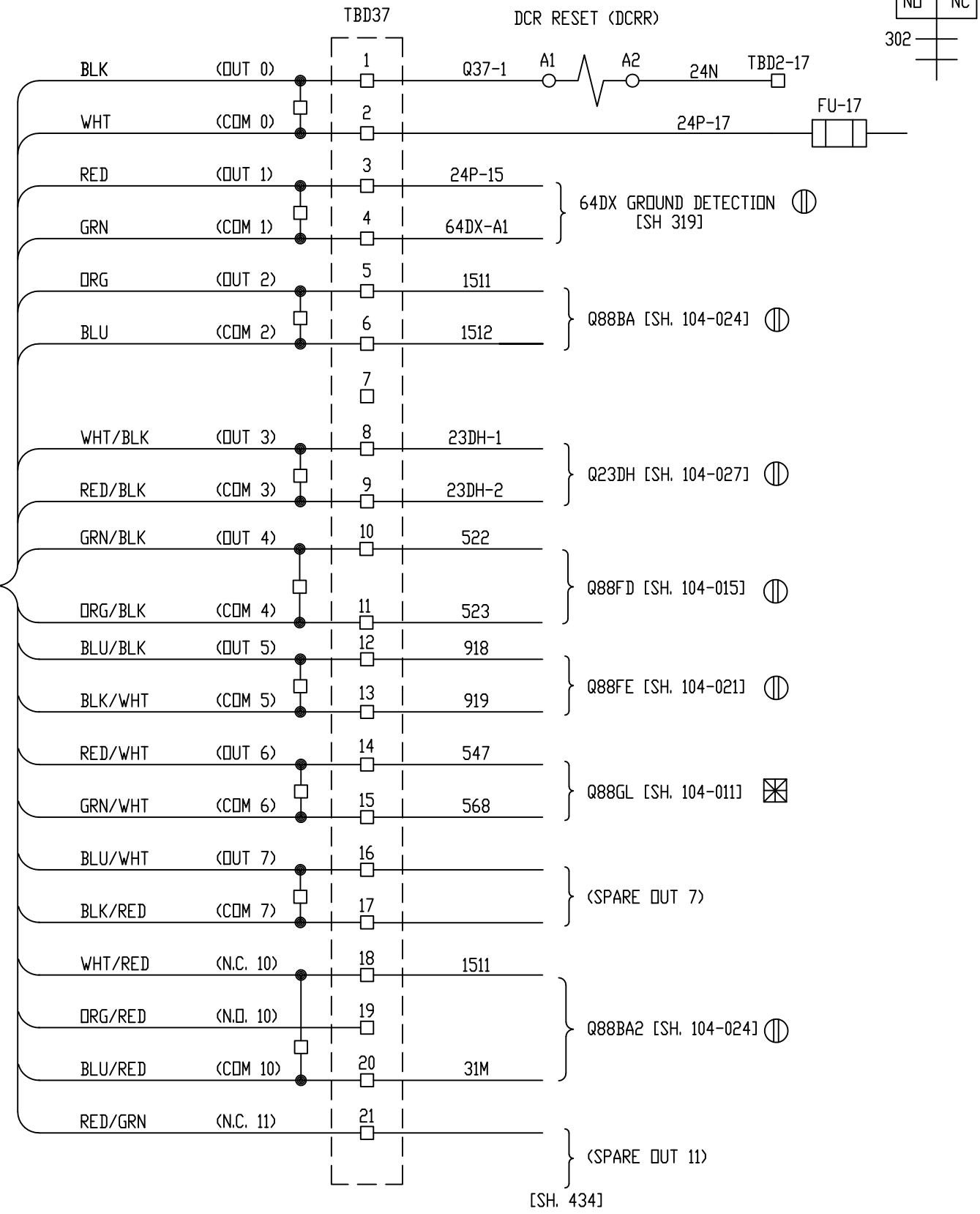
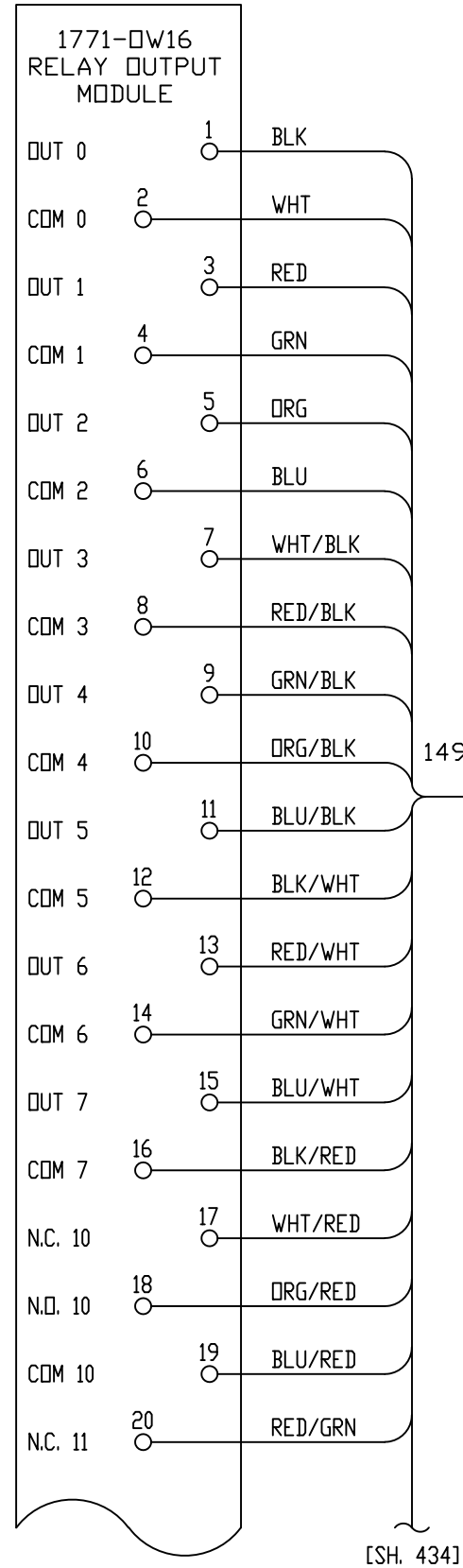
D:047/05 - EMERG. DC FUEL FORWARDING PUMP (088FE)

D:047/06 - OPEN GENERATOR LOUVERS (088GL)


SPARE (OUT 7)

D:047/10 - DEENERGIZE COOLING AIR FAN (088BA2)

SPARE (OUT 11)



Proprietary Information of:



INNOVATIVE CONTROL SYSTEMS, INC.

REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 3 SLOT 7
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-433-2	SHEET NO. 433 OF 36

SPARE (OUT 11) (CONTINUED)

Q:047/12 - AUXILLARY LUBE OIL PUMP CONTACT 1 (Q88QA-1)

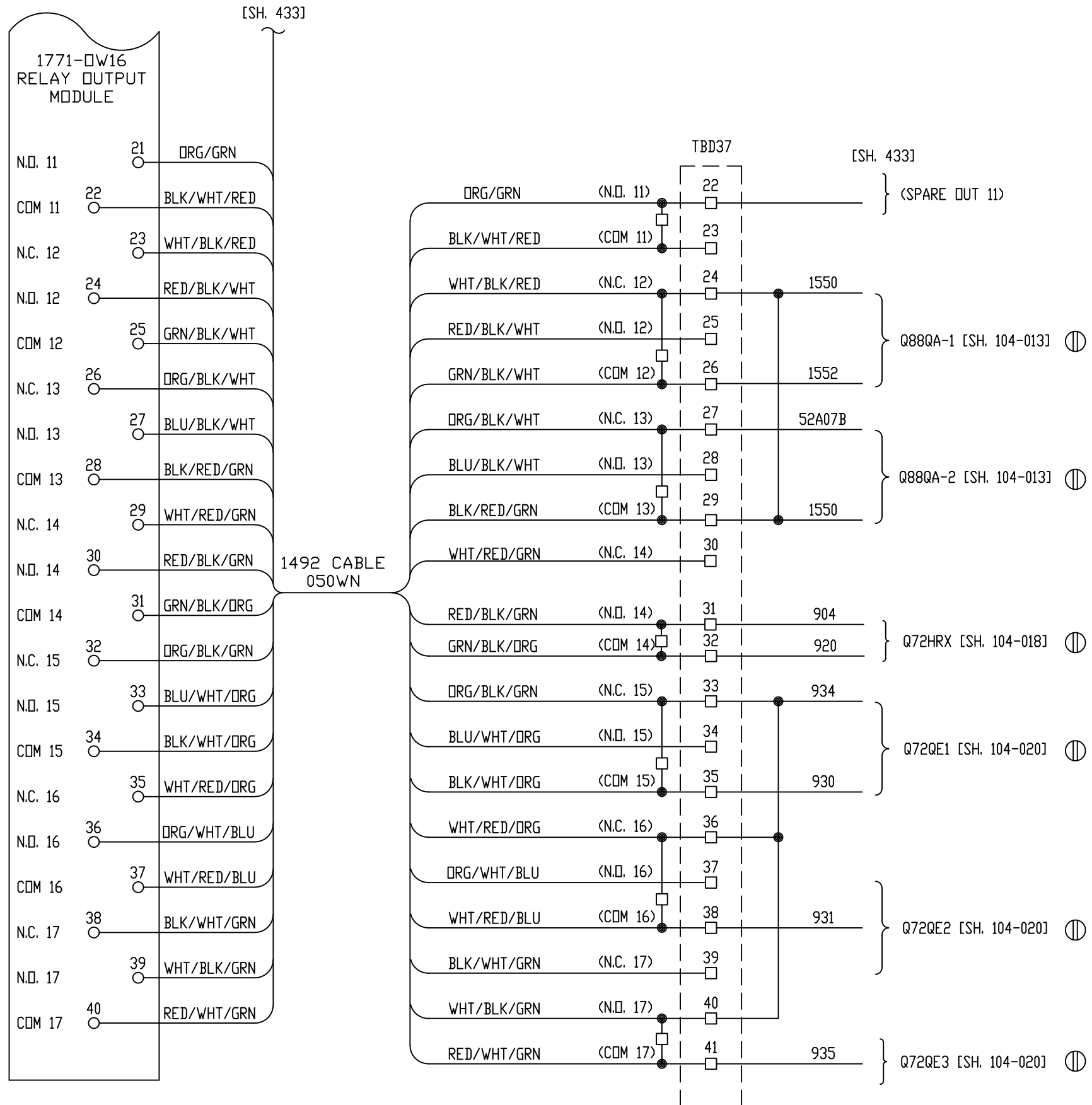
Q:047/13 - AUXILLARY LUBE OIL PUMP CONTACT 2 (Q88QA-2)

Q:047/14 - HYDRAULIC RATCHET PUMP (Q72HRX)

Q:047/15 - RUN 88QE EMERG LUBE OIL PUMP (Q72QE1)

Q:047/16 - RUN 88QE EMERG LUBE OIL PUMP (Q72QE2)

Q:047/17 - RUN 88QE EMERG LUBE OIL PUMP (Q72QE3)



Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 3 SLOT 7
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES
SITE: DON HENRY POWER CENTER

APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-434-2	NTS
			SHEET NO. 434
			30 OF 36

Q050/00 - DIESEL ENGINE STARTER MOTOR (Q72DSX)

SPARE (OUT 1)

SPARE (OUT 2)

SPARE (OUT 3)

SPARE (OUT 4)

SPARE (OUT 5)

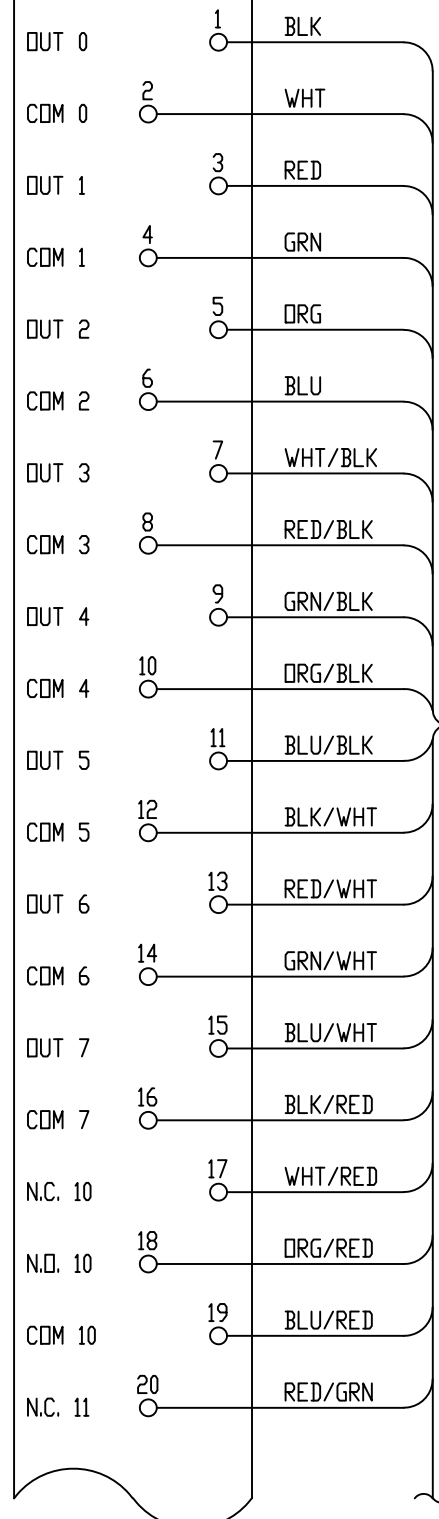
SPARE (OUT 6)

SPARE (OUT 7)

SPARE (OUT 10)

SPARE (OUT 11)

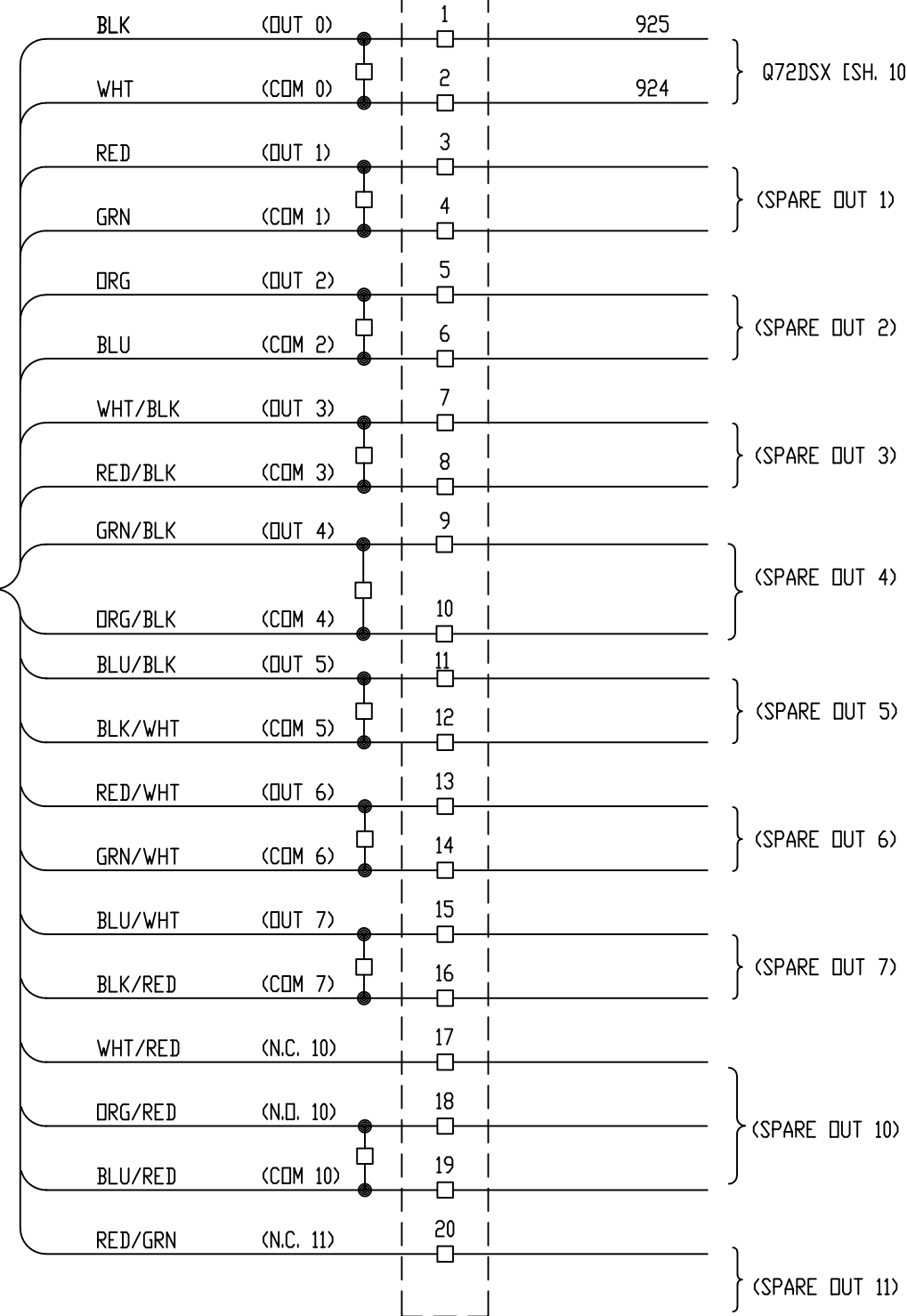
1771-DW16
RELAY OUTPUT
MODULE



1492 CABLE
050WN

[SH. 436]

TBD38



[SH. 436]

Q72DSX [SH. 104-019] Ⓢ

Proprietary Information of:

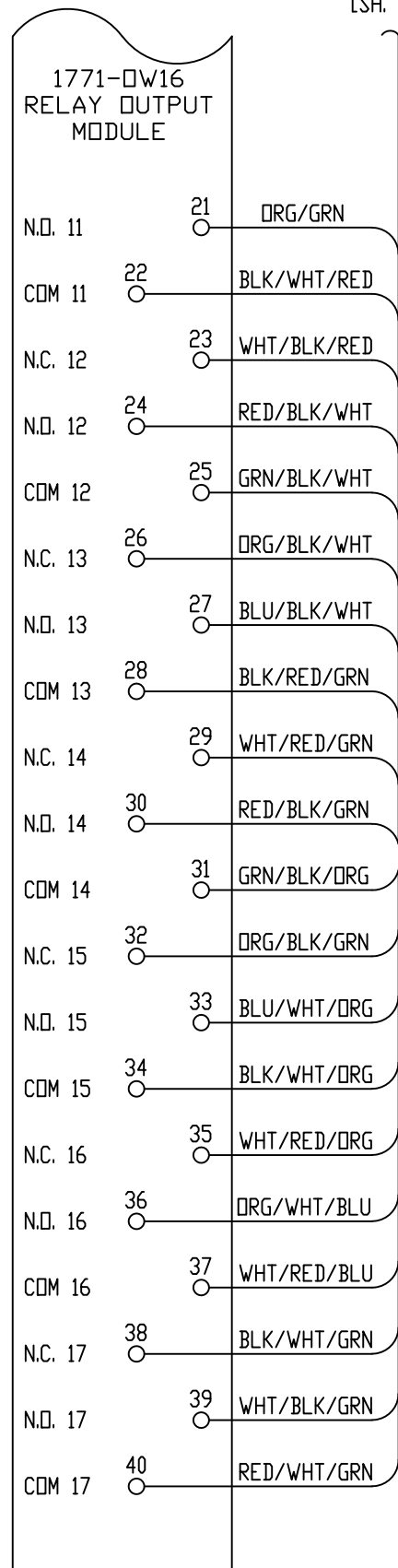
INNOVATIVE
CONTROL
SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

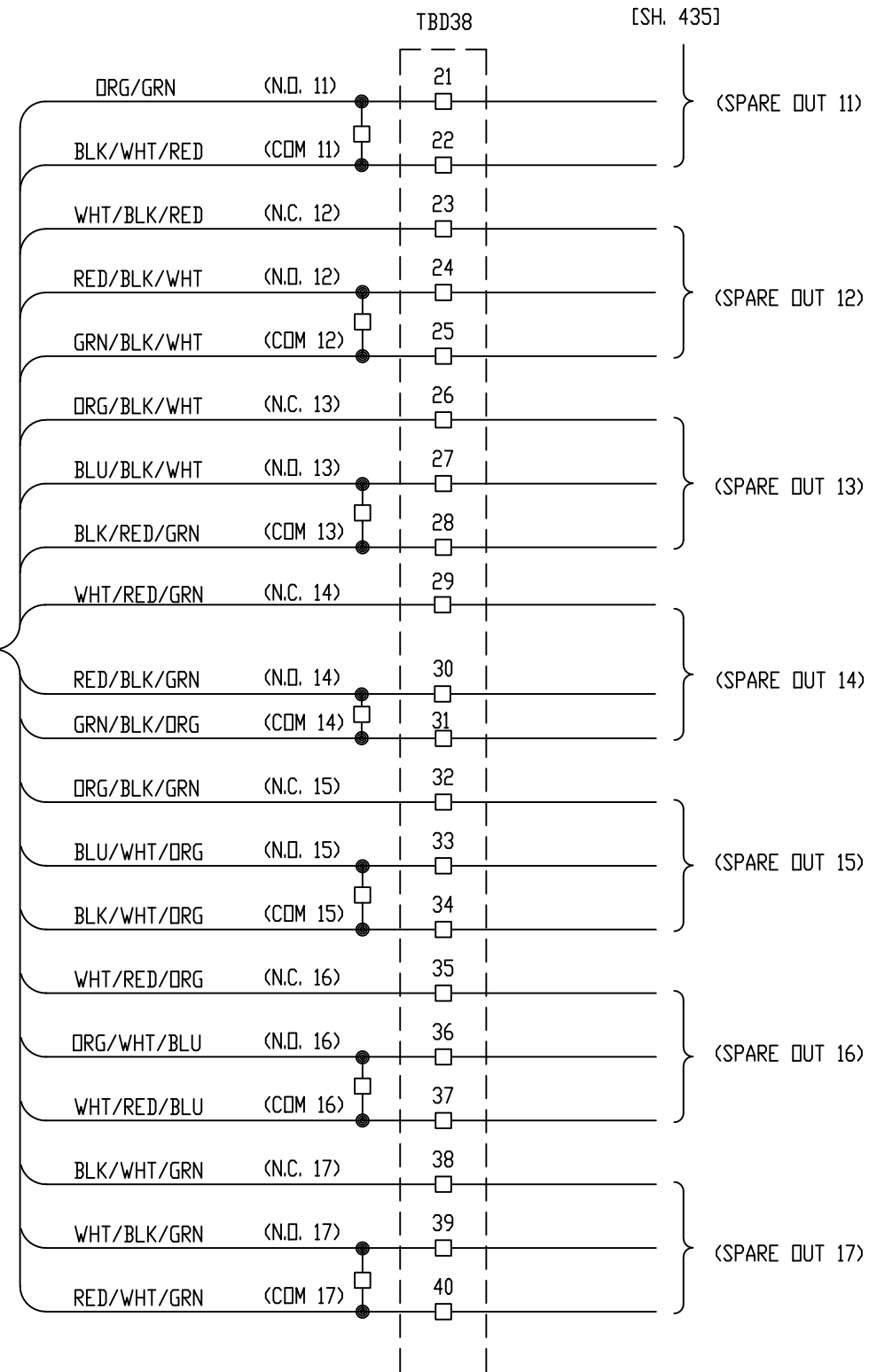
CHASSIS 3 SLOT 8
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-435-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 435 31 OF 36	

[SH. 435]



1492 CABLE
050WN



SPARE (OUT 11)

SPARE (OUT 12)

SPARE (OUT 13)

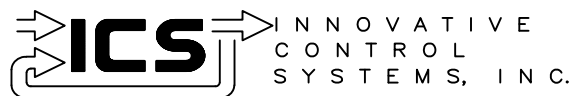
SPARE (OUT 14)

SPARE (OUT 15)

SPARE (OUT 16)

SPARE (OUT 17)

Proprietary Information of:



REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 3 SLOT 8
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE: NTS
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-436-2	SHEET NO. 436 32 OF 36

Q:051/00 - LUBE OIL TROUBLE REMOTE ALARM (R301424X)

Q:051/01 - EXHAUST TROUBLE REMOTE ALARM (R30-36X)

Q:051/02 - TURBINE TRIPPED REMOTE ALARM (R30T)

Q:051/03 - AUX LUBE OIL PUMP ON - REMOTE INDICATION (R88QA)

Q:051/04 - EMER. LUBE OIL PUMP ON - REMOTE INDICATION (R88QE)

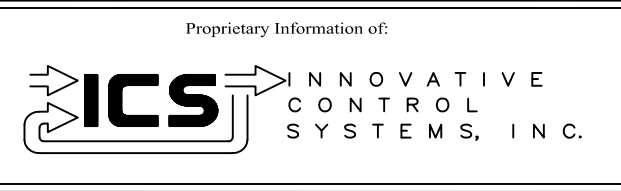
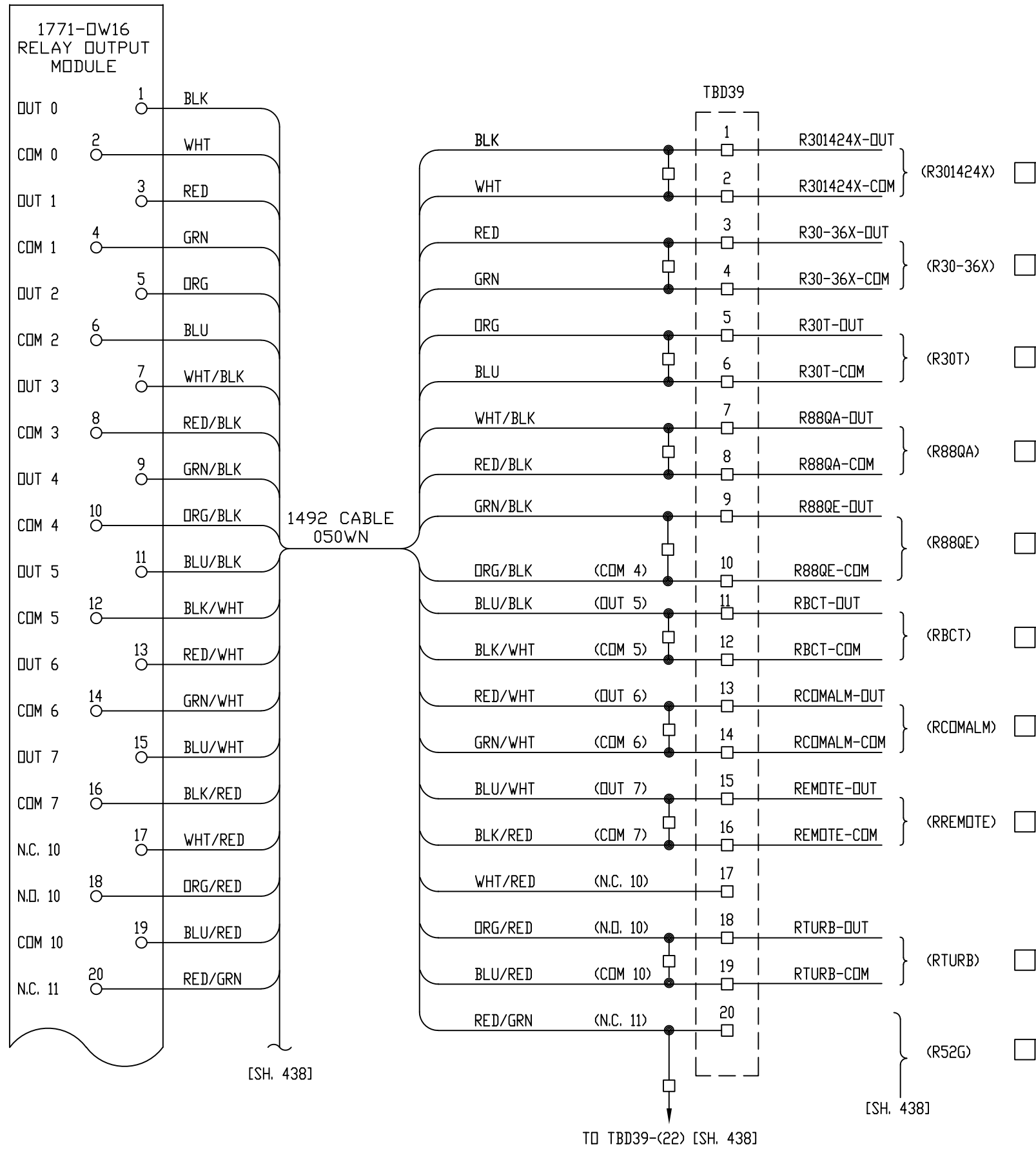
Q:051/05 - BATTERY CHARGER TROUBLE REMOTE ALARM (RBCT)

Q:051/06 - ALARM FUNCTION REMOTE ALARM (RCOMALM)

Q:051/07 - TURBINE CONTROL IN REMOTE (RREMOTE)

Q:051/10 - TURBINE OPERATING (RTURB)

Q:051/11 - GENERATOR BREAKER POSITION (R52G)



REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 3 SLOT 9
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-437-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 437 OF 36	

Q:051/00 - LUBE OIL TROUBLE REMOTE ALARM (R301424X)

Q:051/01 - EXHAUST TROUBLE REMOTE ALARM (R30-36X)

Q:051/02 - (START/STOP STATUS) FROM (R30T)
NOTE: 'D4RUN' TO R30T TO SCADA

Q:051/03 - AUX LUBE OIL PUMP ON - REMOTE INDICATION (R88QA)

Q:051/04 - EMER. LUBE OIL PUMP ON - REMOTE INDICATION (R88QE)

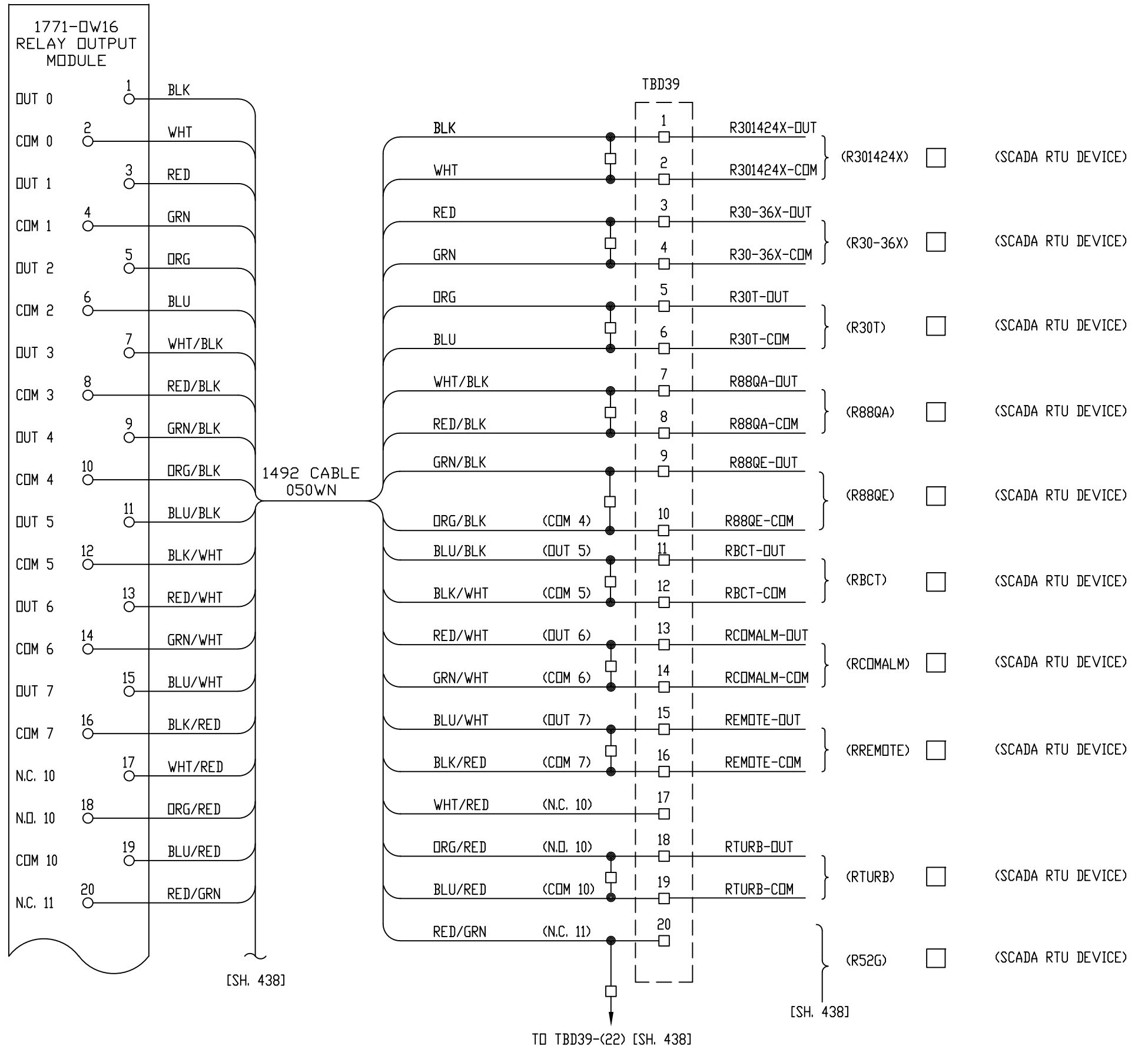
Q:051/05 - BATTERY CHARGER TROUBLE REMOTE ALARM (RBCT)

Q:051/06 - ALARM FUNCTION REMOTE ALARM (RCOMALM)

Q:051/07 - TURBINE CONTROL IN REMOTE (RREMOTE)

Q:051/10 - READY/NOT READY (RTURB)

Q:051/11 - GENERATOR BREAKER POSITION (R52G)



[SH. 438]

[SH. 438]

TO TBD39-(22) [SH. 438]

Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV 3	CONF TO FIELD NOTES	EK	TC	10/4/18
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 3 SLOT 9
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES	
SITE: DON HENRY POWER CENTER	
APPROVED BY:	DRAWING NO. 99174-GTB-101-437-2
DRAWN BY: C. FISHER	SCALE: NTS
11/29/99	SHEET NO. 437 33 OF 36

[SH. 437]

0:051/11 - GENERATOR BREAKER POSITION (R52G) (CONTINUED)

0:051/12 - ENABLE AVR (AVR)

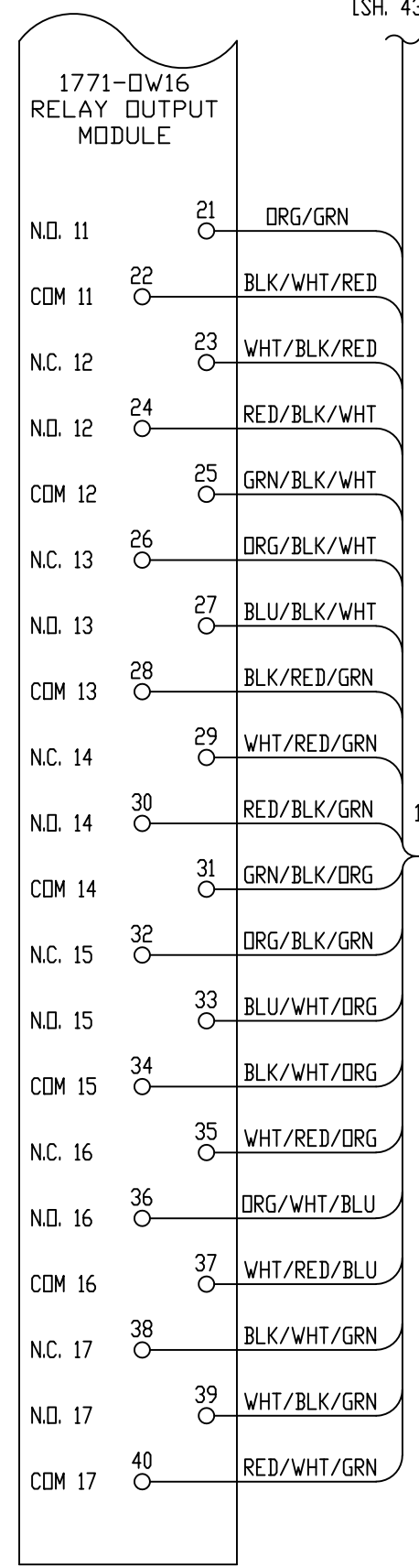
0:051/13 - TRIP 52G (52G-TRP)

SPARE (OUT 14)

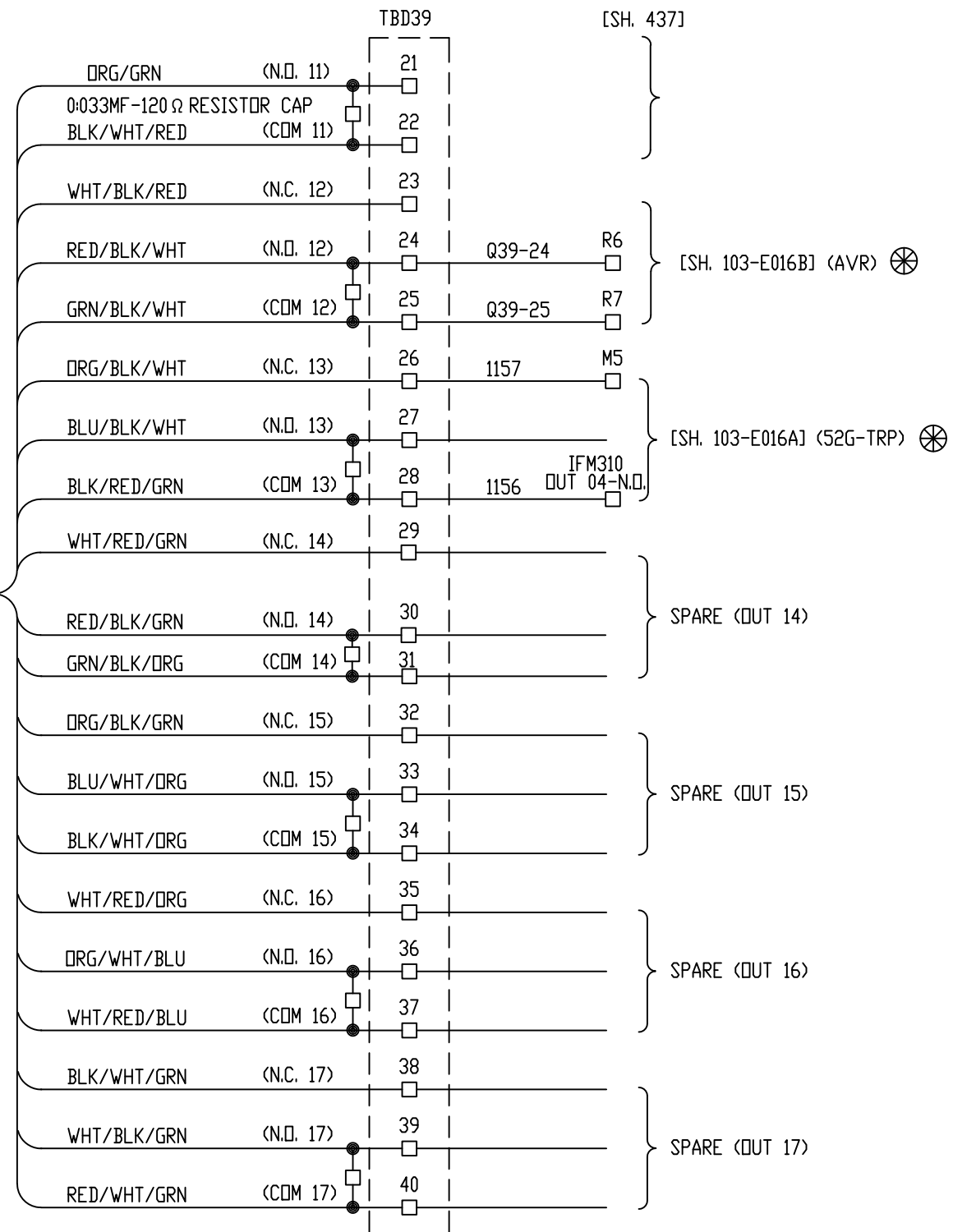
SPARE (OUT 15)

SPARE (OUT 16)

SPARE (OUT 17)



1492 CABLE
050WN



Proprietary Information of:

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 3 SLOT 9
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-438-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 438 OF 36	

D:052/00 - DEAD BUS CLOSE ENABLE (D-BUS)

D:052/01 - ENABLE AUTO CLOSE GEN BKR (25AS-C)

D:052/02 - ENABLE MANUAL CLOSE OF GEN BKR (25MS-C)

SPARE

D:052/04 - ENABLE MANUAL TRIP OF 52G (DCFA)

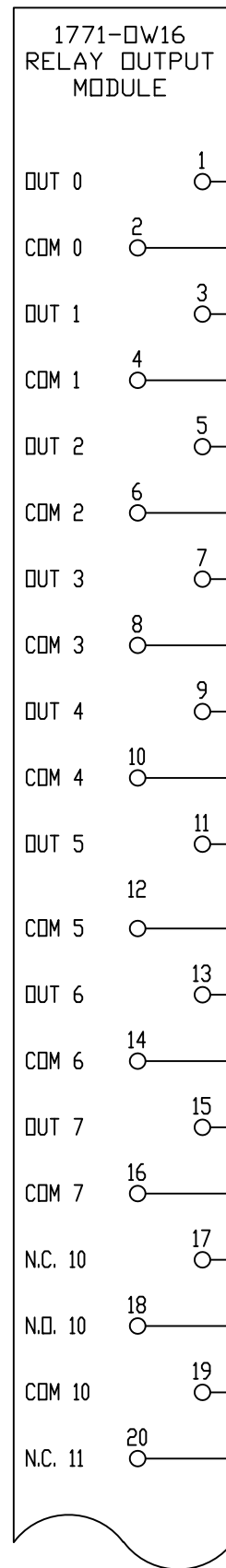
D:052/05 - TRIP 86G (86G-TRP)

D:052/06 - AUTOSYNC ENABLE (25AS1)

D:052/07 - AUTOSYNC ENABLE (25AS2)

D:052/10 - 41S FIELD SUPPRESSION (41S)

D:052/11 - EXCITATION START (DEXSTR)

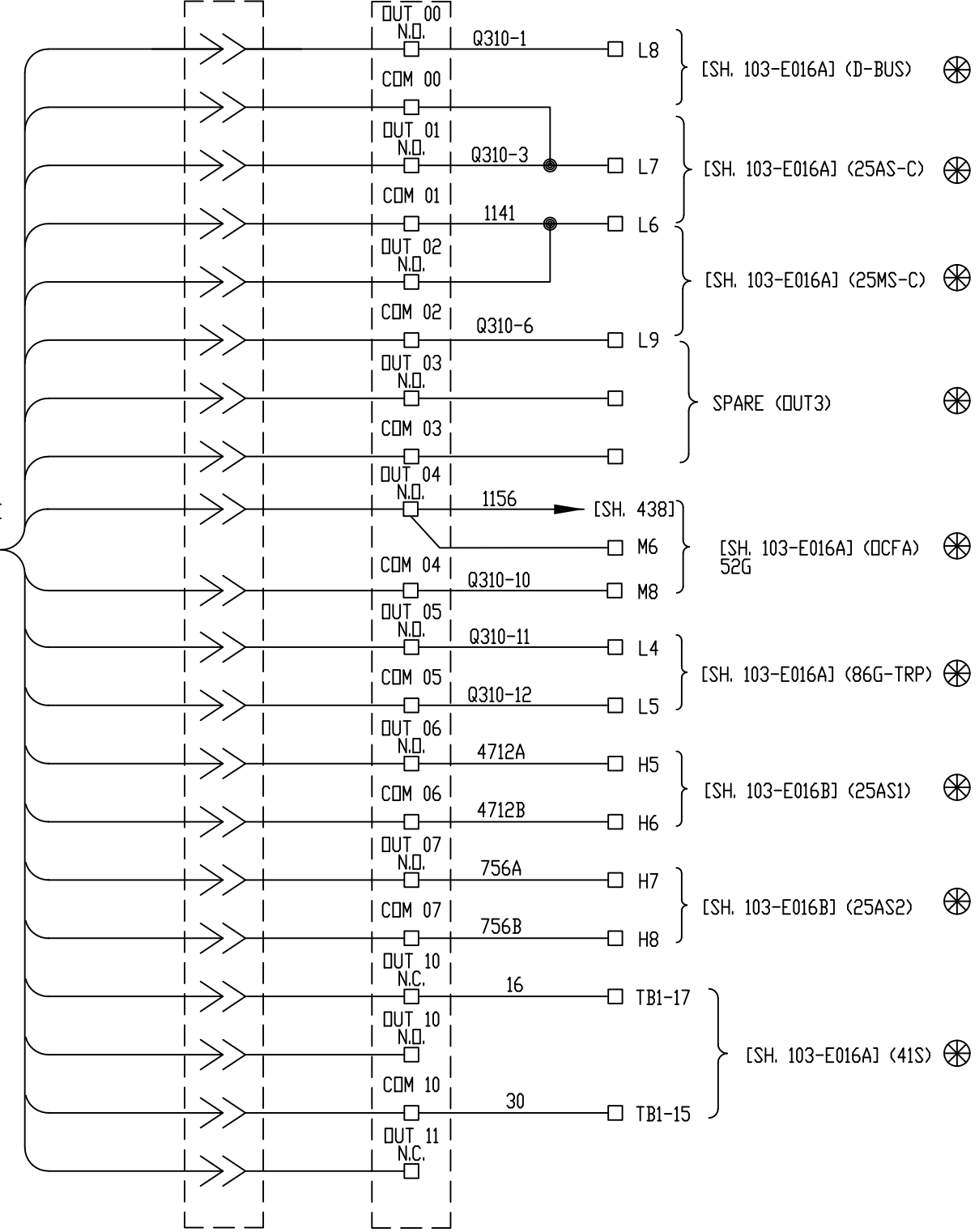


1492 CABLE
050K

[SH. 440]

40 PIN CABLE
CONNECTOR

IFM 310



[SH. 103-E016A] (D-BUS) ⊗

[SH. 103-E016A] (25AS-C) ⊗

[SH. 103-E016A] (25MS-C) ⊗

SPARE (OUT3) ⊗

[SH. 103-E016A] (DCFA) ⊗
52G

[SH. 103-E016A] (86G-TRP) ⊗

[SH. 103-E016B] (25AS1) ⊗

[SH. 103-E016B] (25AS2) ⊗

[SH. 103-E016A] (41S) ⊗

Proprietary Information of:

INNOVATIVE
CONTROL
SYSTEMS, INC.

REV 2	MODIFICATIONS:	CF		01/18/01
REV 1	AS BUILTS:	CF		04/14/00
REV	DESCRIPTION:	BY	APPROVED	DATE

CHASSIS 3 SLOT 10
TURBINE GENERATOR CONTROLLER
99174-GTB-101

CUSTOMER: HASTINGS UTILITIES			
SITE: DON HENRY POWER CENTER			
APPROVED BY:		DRAWING NO.	SCALE:
DRAWN BY: C. FISHER	11/29/99	99174-GTB-101-439-2	NTS
			SHEET NO. 439 35 OF 36

052/11 - EXCITATION START (DEXSTR) (CONTINUED)

052/12 - EXCITATION STOP (DEXSTOP)

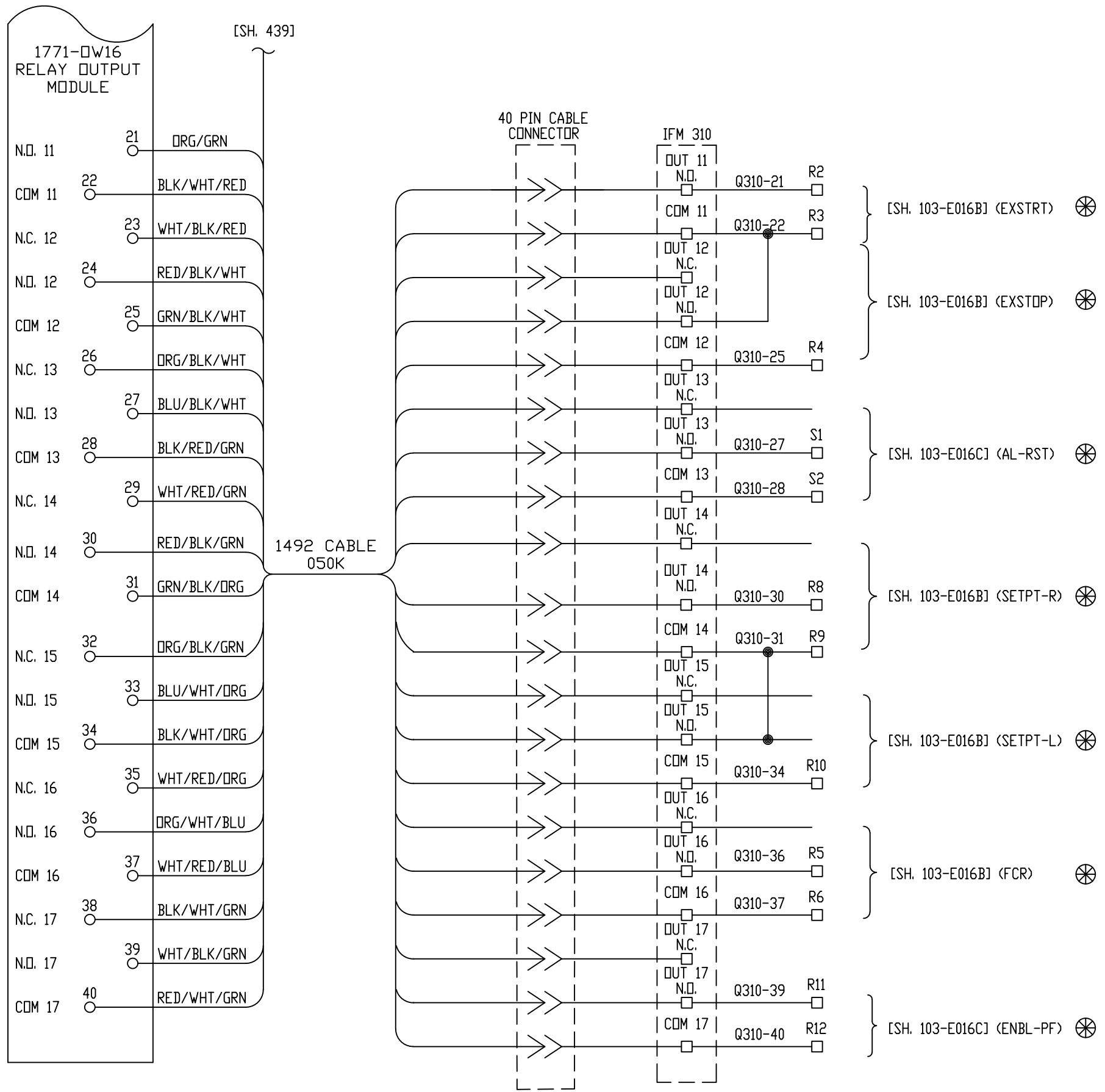
052/13 - RESET DECS-300 ALARMS (AL-RST)

052/14 - SETPOINT RAISE TO DECS-300 (SETPT-R)

052/15 - SETPOINT LOWER TO DECS-300 (SETPT-L)

052/16 - TRANSFER TO FCR (FCR)

052/17 - ENERGIZE TO ENABLE PF CONTROL (ENBL-PF)



Proprietary Information of:

INNOVATIVE CONTROL SYSTEMS, INC.

REV	DESCRIPTION:	BY	APPROVED	DATE
REV 2	MODIFICATIONS:	CF		09/10/01
REV 1	AS BUILTS:	CF		04/14/00

CHASSIS 3 SLOT 10
 TURBINE GENERATOR CONTROLLER
 99174-GTB-101

CUSTOMER: HASTINGS UTILITIES		SCALE: NTS	
SITE: DON HENRY POWER CENTER		DRAWING NO. 99174-GTB-101-440-2	
APPROVED BY:		DRAWN BY: C. FISHER	11/29/99
		SHEET NO. 440 OF 36	