

GENERATOR SELF-TEST VERIFIER (GSV200) INSTALLATION INSTRUCTIONS



INTRODUCTION

The GSV (Generator Self test Verifier) device verifies that the connected emergency power generator successfully performs its periodic auto-start self test. If a fault is detected (generator fails to start in the prescribed number of days) the GSV sounds an audible alarm and closes the contacts on an internal alarm relay. External alarms may include but are not limited to self-dialers, tones, lights, etc. The load on this internal relay is limited to 0.1Amps (AC or DC). If current exceeds 0.1 Amps, a relay package may be purchased from Transtar Products Inc.

The GSV works with a wide variety of generator types. Jumpers are used to select the generator voltage and number of connected phases. In addition to detecting the mere presence of voltages on the generator phases, the GSV also determines whether the generator voltage outputs are in the correct range. Thus, the GSV also serves as an undervoltage/overvoltage detector.

INSTALLATION & WIRING

- 1) Choose a convenient location to mount GSV unit (usually on the generator control panel). The GSV includes hardware for convenient mounting to a standard 1/2" knockout.
- 2) Wire the white and black leads from the GSV to an uninterrupted 120 VAC source. The utility grid power to the transfer switch is the ideal connection point but the transfer switch output may also be used.
 - a. BLACK = HOT
 - b. WHITE = NEUTRAL
 - Limit the power input to the GSV to 25A maximum
- 3) Wire the red, orange and yellow leads from the GSV to the appropriate outputs on the emergency power generator.
 - a. RED = PHASE A
 - b. ORANGE = PHASE B
 - c. YELLOW = PHASE C
 - For three phase Y (Wye) installations (Figure 2) all three wires (red, orange, yellow) are to be connected.
 - For three phase Δ (Delta) installations (Figure 3) or single phase 120/240 installations (Figure 1) only the red and orange wires are to be connected. Tape off the yellow wire.
 - If the generator output is a Δ configuration, one leg of the Δ output from the generator must be connected to neutral (see Figure 3). If this is not possible because the Δ installation requires three ungrounded hot wires then an auxiliary transformer is required (see Figure 4). Contact Transtar Products Inc for auxiliary transformer.
 - Limit the input phases to the GSV to 25A maximum
- 4) Optionally connect the alarm relay (two blue wires) to the remote device or monitoring equipment. See Figures 5 and 6 for sample wiring diagrams.

TABLE 1 WIRING CONNECTIONS	
COLOR	FUNCTION
BLACK	120V Hot
WHITE	120V Neutral
RED	Generator Phase A
ORANGE	Generator Phase B
YELLOW	Generator Phase C
BLUE	Alarm Relay Contact
BLUE	Alarm Relay Contact

Y = Wye Δ = Delta

JUMPER SETTINGS

- 5) With the POWER TURNED OFF, remove the four screws on the rear of the GSV to gain access to the internal jumpers.
- 6) Set the Voltage Select Jumpers according to the Generator Output per the following table.
 - a. Example 1: If the installation is 277/480 three phase Y, set JMP5=Removed, JMP4=Installed, JMP3=Removed. Make sure that the three active phases are connected to the Red, Orange, and Yellow sensing wires.
 - b. Example 2: If the installation is 480 three phase Δ, set JMP5=Installed JMP4=Removed, JMP3=Installed. Make sure that the two active phases are connected to the Red and Orange wires. Do not connect the yellow wire and tape off the yellow wire.

TABLE 2 VOLTAGE SELECT JUMPERS					
JMP5	JMP4	JMP3	GENERATOR OUTPUT	VALID RANGE Ø-N VAC	CONNECTIONS (NEUT of 120VAC serves as reference)
Out	Out	Out	1Ø 120/240	90 to 135	2 hot leads to RED, ORG wires (see Figure 1 and Note 1 below)
Out	Out	In	3ØY 120/208 (208 Ø-Ø)	90 to 135	3 hot leads to RED,ORG,YEL wires (see Figure 2 and Note 2 below)
Out	In	Out	3ØY 277/480 (440/460/480 Ø-Ø)	235 to 305	3 hot leads to RED,ORG,YEL wires (see Figure 2 and Note 2 below)
Out	In	In	3ØY 220/380 (380 Ø-Ø)	185 to 245	3 hot leads to RED,ORG,YEL wires (see Figure 2 and Note 2 below) 220/380 is typical of European Generators
In	Out	Out	3ØΔ 240 (220/230/240 Ø-Ø)	185 to 265	2 hot leads to RED, ORG wires (see Figure 3 or 4, and Note 3 below)
In	Out	In	3ØΔ 480 (440/460/480 Ø-Ø)	375 to 530	2 hot leads to RED,ORG wires (see Figure 3 or 4, and Note 3 below)
In	In	Out	<<reserved>>	<<reserved>>	<<reserved>>
In	In	In	N/A	N/A	5 MINUTE TIMER TEST MODE (see Steps 14 and 15)

NOTE 1: For 1Ø 120/240 connect the red and orange wires to the two hot phases. Tape off the yellow wire.

NOTE 2: Center of Wye must be connected to neutral.

NOTE 3: For 3ØΔ, one lead of the Δ secondary must be connected to earth ground (neutral) or the device will not work without an auxiliary transformer. For these configurations do not connect yellow wire. If connection of one Δ phase to ground is not possible (Δ installation requires three hot phases) then an auxiliary transformer must be used. Contact Transtar Products Inc for auxiliary transformer.

- 7) Set the Timeout Select Jumpers according to the following table. Make sure that the selected timeout is LONGER than the generator auto-start exercise cycle.
 - a. Example: If the generator is programmed to exercise every week, set the jumpers to either 8 days or 15 days.

TABLE 3 TIMEOUT SELECT JUMPERS		
JMP2	JMP1	TIMEOUT
Out	Out	8 Days
Out	In	15 Days

In	Out	22 Days
In	In	32 Days

- 8) When finished power up the GSV (apply 120VAC) and test the GSV as described below. When the GSV is powered up or the RESET button is pressed, the GSV will sound a quick double beep and the LED will flash briefly every 2 seconds.

TESTING GENERATOR OUTPUT

- 9) To verify that the Voltage Select Jumpers are properly configured, SIMULTANEOUSLY press the TEST and RESET button. Release the RESET button first and then the TEST button. The LED on the GSV will blink five times to indicate that the GSV is in "Voltage Test Mode". The LED will then go off and the GSV will be looking for a valid output from the generator.
- 10) Manually start the emergency power generator. Within a few seconds the LED should turn on solid indicating that the generator has started and that the Voltage Select Jumpers are in the proper position.

If the LED fails to come on verify that the wiring installation is correct and that the generator output voltage on each phase lies within the range shown in Table 2 above. Note that prior to turning on the generator the LED should be off continuously and should not flash every 2 seconds. If it is flashing then repeat step 9.

- 11) When finished press the RESET button. The GSV will sound a quick double beep and the LED will flash briefly every 2 seconds.

Note that "Voltage Test Mode" is active for only 5 minutes and the GSV will automatically reset after 5 minutes has elapsed.

TESTING ALARM OUTPUT

- 12) If an external monitoring device is connected to the relay output (blue wires) then you can test the monitoring device by pressing the TEST button. The GSV will sound an alarm tone and the relay contacts will close. Follow the instructions from the manufacturer of the monitoring device to ensure that it is operating correctly.
- 13) When finished press the RESET button.

YOU MUST RESET THE GSV AFTER ALARM TESTING BY PRESSING THE RESET BUTTON. FAILURE TO DO SO WILL RESULT IN A PERSISTENT ALARM CONDITION

TESTING TIMER (OPTIONAL)

- 14) Install JMP5, JMP4, and JMP3. Then press the RESET button. This places the GSV into a special 5 minute timer mode which can be used to verify that the GSV outputs an alarm after 5 minutes has elapsed. After pressing the RESET button do not start the generator and verify that the GSV enters alarm mode (speaker is sounding the alarm tone and the relay closes) after 5 minutes has elapsed.
- 15) When finished reconfigure JMP5, JMP4, and JMP3 as previously desired in Step 6.

DO NOT LEAVE THE THREE JUMPERS IN THIS TEST SETTING. FAILURE TO RECONFIGURE THE JUMPERS FOR THE DESIRED GENERATOR VOLTAGE WILL RENDER THE GSV INOPERATIVE

SPECIFICATIONS

Model	GSV200 Rev A, September 2004	Microprocessor Controlled
Generator Input	1Ø 120/240 3ØY 120/208 3ØY 277/480 3ØY 220/380 3ØΔ 240 3ØΔ 480	Input Voltage is Jumper Selectable via JMP5,JMP4,JMP3 Overvoltage/Undervoltage Detection provided for selected input voltage (Note 1)
Undervoltage / Overvoltage Detection Accuracy	+/- 15% of nominal generator output	Typical
Generator Auto-Start Self-test Interval	8 / 15 / 22 / 32 days	Duration is Jumper Selectable via JMP2, JMP1
Power Input	120VAC	0.1A Maximum (Note 2)
Alarm Relay Output	Contact Closure Up to 24V (DC or AC) 0.1A maximum current	Semiconductor Relay
Environment	Indoor use only	
Listings	Approved by the Underwriters Laboratory for use as Industrial Control Equipment in the U.S. or Canada	CCN: 20BC E238900

NOTE 1: Limit input current to GSV200 (Generator Input on RED/ORG/YEL wires) to 25A maximum

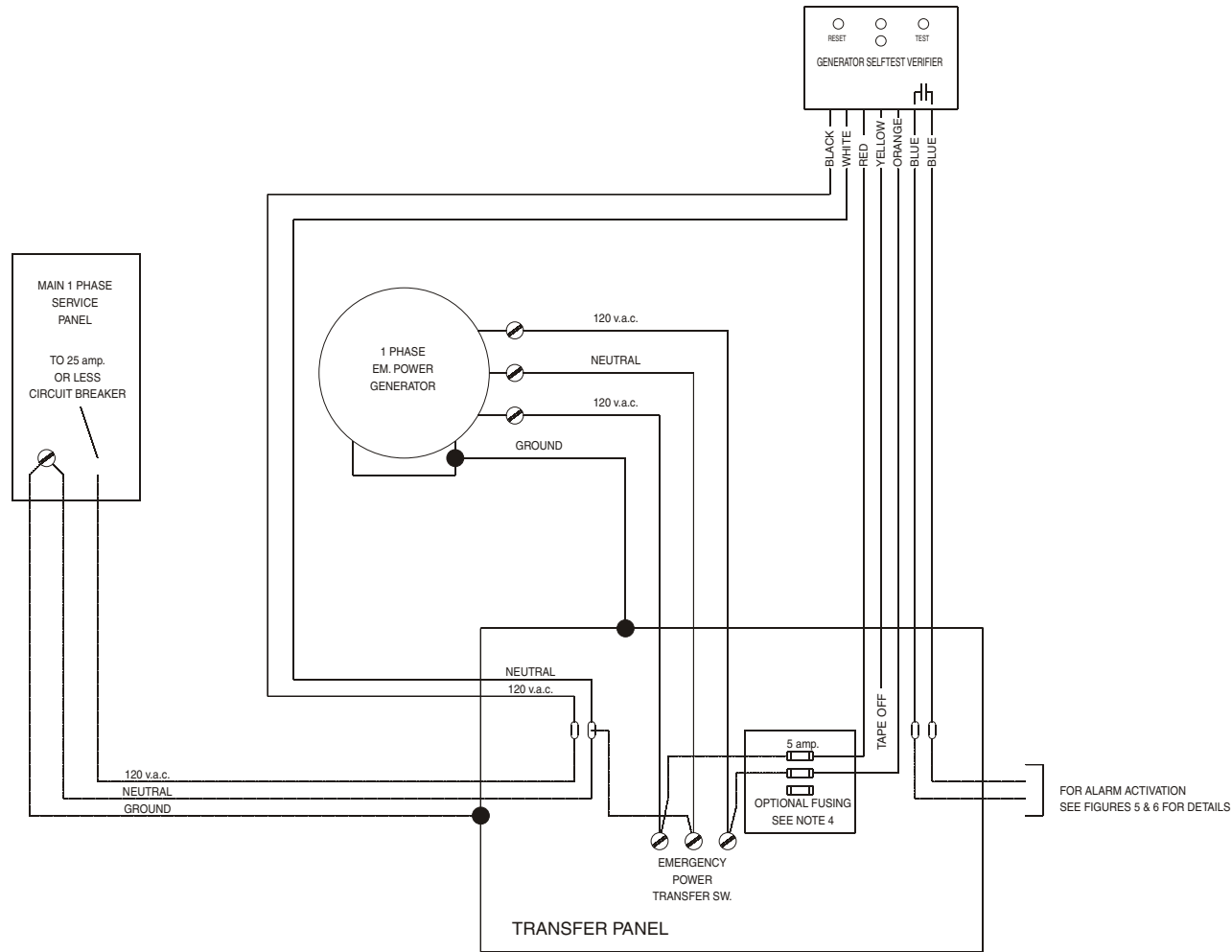
NOTE 2: Limit input current to GSV200 (120VAC power on BLACK/WHITE wires) to 25A maximum

For more information or troubleshooting help contact Transtar Products Inc

Transtar Products, Inc.
www.GeneratorVerifier.com
767 Warehouse Road
Toledo, OH 43615 USA
Toll Free: 1-866-660-3900
Tel: 419-385-7573
Fax: 419-385-0747

The GSV200 is manufactured by Hicks Electronic Design, Fort Collins, CO.
The GSV200 is a UL Listed Device; UL# E248900; CCN# 20BC

FIGURE 1 OF 6
 SINGLE PHASE WIRING DIAGRAM
 240 VOLTS (LINE TO LINE)
 120 VOLTS (LINE TO NEUTRAL)

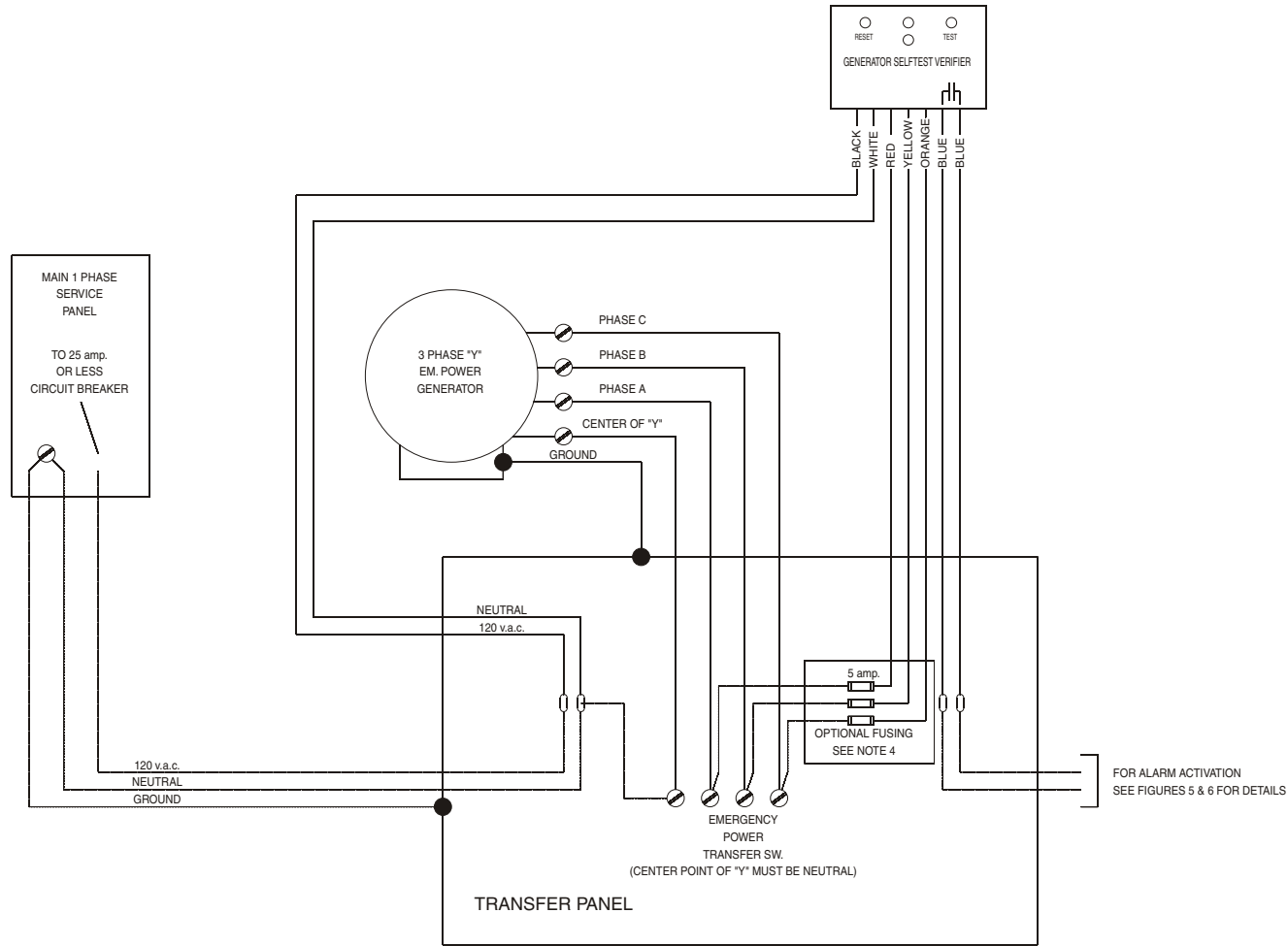


NOTES:

- 1) ALARM CIRCUIT MAY BE MODIFIED AS LONG AS CURRENT DOES NOT EXCEED .1amp. (1 tenth amp.)
- 2)
- 3)
- 4) REQUIRED IF GEN. OUTPUT EXCEEDS 25 amps. PER LINE. TRANSTAR #TS2A588 (120-250volts), FUSES FURNISHED BY INSTALLER.
- 5)
- 6)
- 7)

REV. NO.	BY	DATE	REV. NO.	BY	DATE	Generator Selftest Verifier BY TRANSTAR PRODUCTS		
1			5					
2			6					
3			7			DR. DLB	DATE 08/08/04	FIGURE 1
4			8			APR. DLB	REVISED 09/27/04	OF 6
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FIGURE 2 OF 6
THREE PHASE "Y" WIRING DIAGRAM
 208/440/460/480/380 VOLTS (PHASE TO PHASE)
 120/254/265/277/220 VOLTS (PHASE TO NEUTRAL)

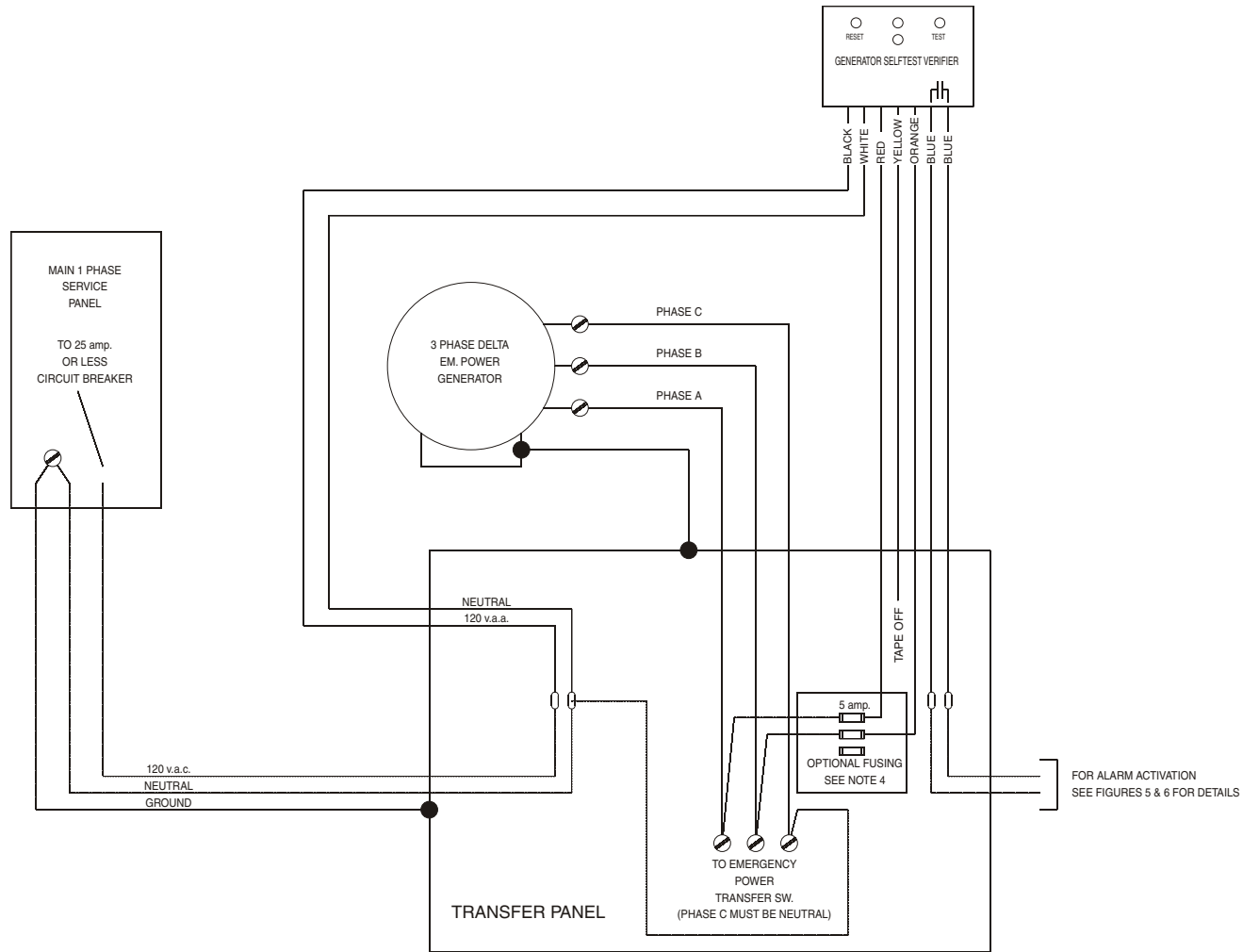


NOTES:

- 1) ALARM CIRCUIT MAY BE MODIFIED AS LONG AS CURRENT DOES NOT EXCEED .1amp. (1 tenth amp.)
- 2)
- 3)
- 4) REQUIRED IF GEN. OUTPUT EXCEEDS 25amps. PER PHASE. TRANSTAR #TS2A588 (120-250volts) #TS2A598 (380-600volts). FUSES FURNISHED BY INSTALLER.
- 5)
- 6)
- 7)

REV. NO.			BY			DATE			Generator Selftest Verifier BY TRANSTAR PRODUCTS		
1			5								
2			6								
3			7						DR. DLB	DATE 08/08/04	FIGURE 2
4			8						APR. DLB	REVISED 09/27/04	OF 6
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FIGURE 3 OF 6
THREE PHASE DELTA WIRING DIAGRAM (PHASE C CONNECTED TO NEUTRAL)
220/230/240/440/460/480 VOLTS (PHASE TO PHASE)

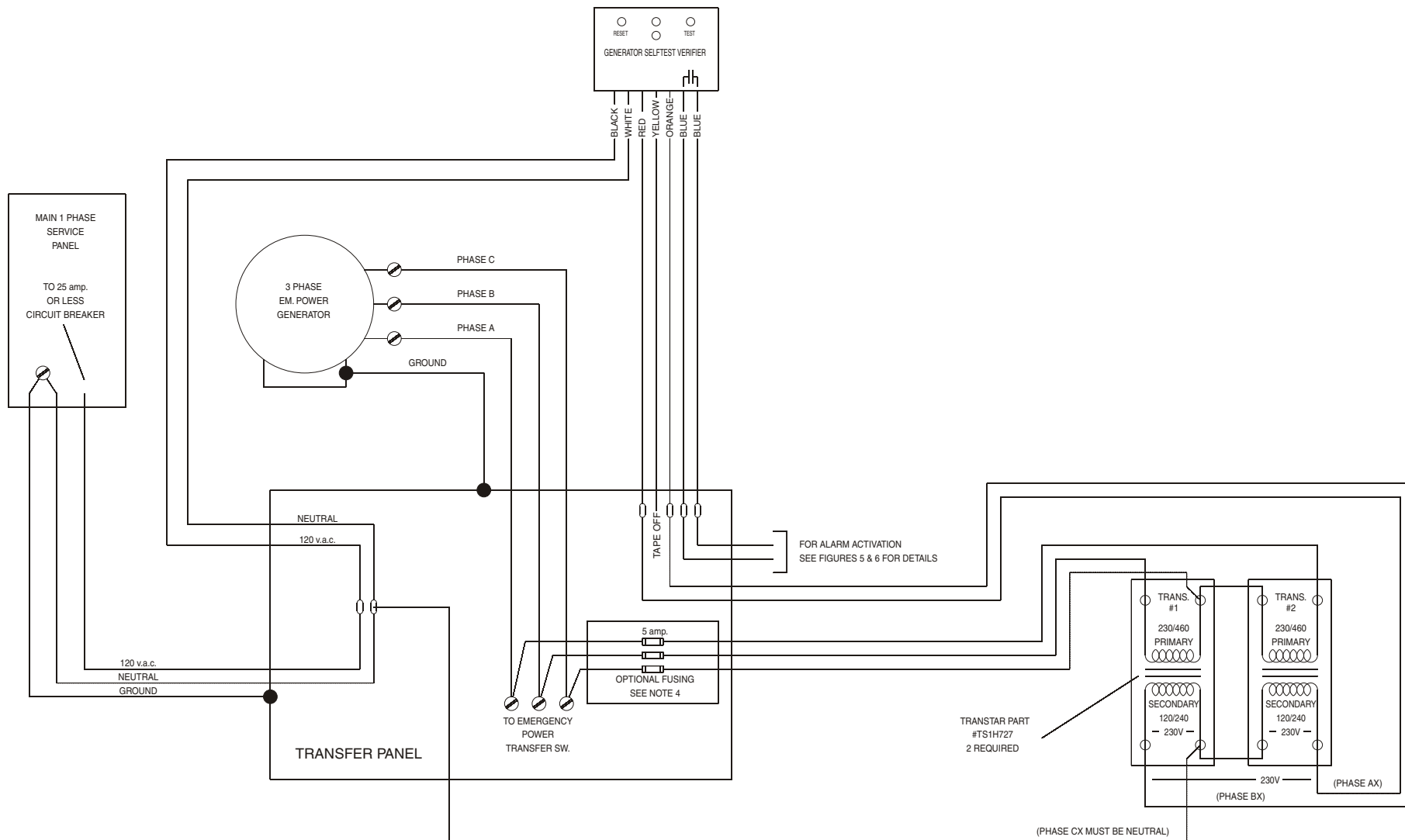


NOTES:

- 1) ALARM CIRCUIT MAY BE MODIFIED AS LONG AS CURRENT DOES NOT EXCEED .1amp. (1 tenth amp.)
- 2)
- 3)
- 4) REQUIRED IF GEN. OUTPUT EXCEEDS 25amps. PER PHASE. TRANSTAR #TS2A588 (120-250volts) #TS2A598 (380-600volts). FUSES FURNISHED BY INSTALLER.
- 5)
- 6)
- 7)

REV. NO.	BY	DATE	REV. NO.	BY	DATE	Generator Selftest Verifier BY TRANSTAR PRODUCTS		
1			5					
2			6					
3			7			DR. DLB	DATE 08/08/04	FIGURE 3
4			8			APR. DLB	REVISED 09/27/04	OF 6
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FIGURE 4 OF 6
 THREE PHASE DELTA (ALL PHASES FLOATING)
 220/230/240/440/460/480 VOLTS (PHASE TO PHASE)

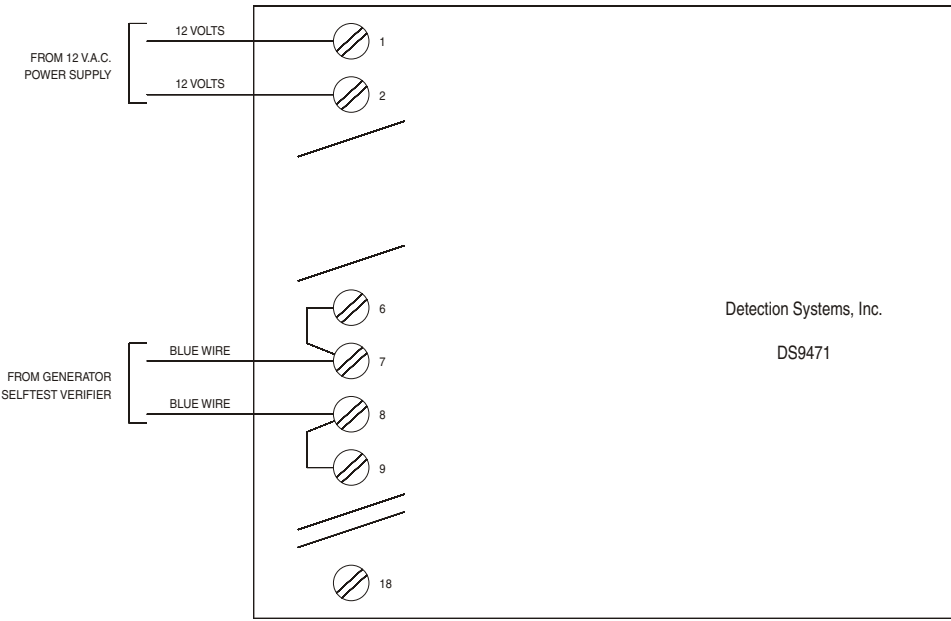
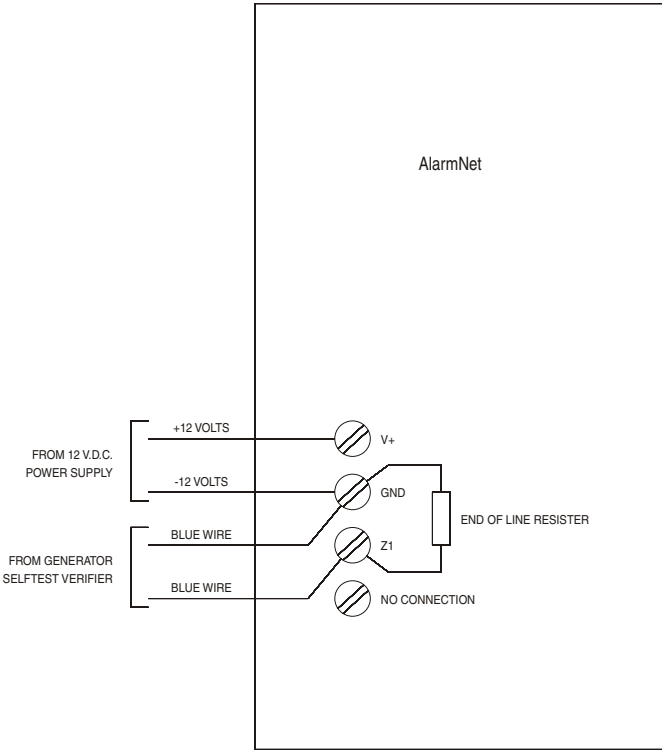


NOTES:

- 1) ALARM CIRCUIT MAY BE MODIFIED AS LONG AS CURRENT DOES NOT EXCEED .1amp. (1 tenth amp.)
- 2) 230 VOLTS MUST BE READ BETWEEN PHASES AX & BX and BX & CX and CX & AX
- 3) REVERSE INDIVIDUAL TRANSFORMER SECONDARY LEADS UNTIL NOTE #2 VOLTAGES ARE OBTAINED
- 4) REQUIRED IF GEN. OUTPUT EXCEEDS 25amps. PER PHASE. TRANSTAR #TS2A588 (120-250volts) #TS2A598 (380-600volts). FUSES FURNISHED BY INSTALLER.
- 5) TRANSFORMER PRIMARY VOLTAGE CONNECTION MUST BE THE SAME AS GENERATOR OUTPUT VOLTAGE
- 6) EACH INDIVIDUAL TRANSFORMER MUST BE 10va OR MORE.
- 7) JUMPERS IN GSV MUST BE SET FOR 3PH DELTA 240 (JMP5 in, JMP4 out, JMP3 out)

REV. NO.	BY	DATE	REV. NO.	BY	DATE	Generator Selftest Verifier BY TRANSTAR PRODUCTS		
1			5					
2			6					
3			7			DR. DLB	DATE 08/08/04	FIGURE 4
4			8			APR. DLB	REVISED 09/27/04	OF 6
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FIGURE 5 OF 6
 WIRING DIAGRAMS FOR AUTODIALERS



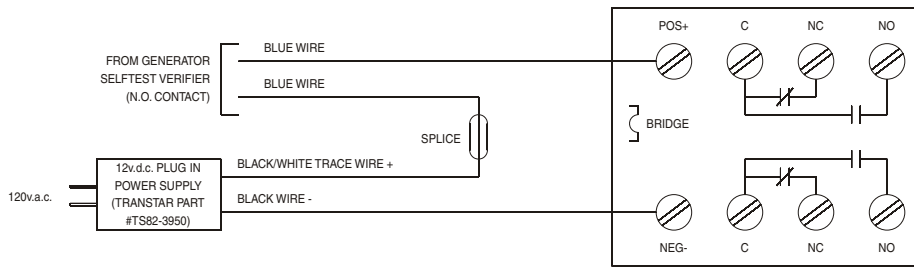
REV. NO.	BY	DATE	REV. NO.	BY	DATE	Generator Selftest Verifier BY TRANSTAR PRODUCTS		
1			5					
2			6					
3			7			DR.	DLB	DATE 08/08/04
4			8			APR	DLB	REVISED 09/23/04
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								FIGURE 5 OF 6

14-0000-00-0001

FIGURE 6 OF 6
 WIRING DIAGRAMS FOR REMOTE ALARMS UNDER .1amp. (1 tenth amp.)



FIGURE 6 OF 6
 WIRING DIAGRAMS FOR REMOTE ALARMS OVER .1amp. (1 tenth amp.)



12/24v.d.c. RELAY
 CLOSE BRIDGE FOR 12v.d.c.
 CONTACT RATED 5amps. 115v.a.c./28v.d.c.
 (TRANSTAR PART #TSRB1224)

NOTES:

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)

Generator Selftest Verifier						BY TRANSTAR PRODUCTS	
REV. NO.	BY	DATE	REV. NO.	BY	DATE	DR.	DLB
1			5				
2			6				
3			7				
4			8				
						DATE	08/08/04
						REVISD	09/27/04
						JOB NO.	EE- GSV
						FIGURE	6
						OF	6

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