Trace™ SW Series

Addendum to the Installation and Operator's Manual
for SW4024, SW4048, SW5548 Models Only

XANTREX
Smart Choice For Power

The items listed in this addendum have changed to reflect product compliance with UL1741 First Edition requirements. The changes only affect 120 VAC/60 Hz units using the SELL mode function of the inverter/charger. The software revision has changed from 4.01 to 4.10.

Model Numbers Affected:
SW4024, SW4048 and SW5548 (120 VAC/60 Hz models only)

General Information:
The inverter software has been redesigned to meet UL1741 First Edition requirements which incorporates IEEE929 recommended practices. These requirements have altered voltage and frequency operating windows and have added a 5 minute grid connect timer delay before selling power. In addition to user utility interactive changes, the inverter has been approved to meet the rigorous non-islanding and harmonics analyses initiated by UL1741.

The SELL voltage window is now nonadjustable and locked at 106–132 VAC range, indicated by the inverter's LINE TIE LED ON. Any voltage limits programmed in *SET INPUT LOWER/UPPER LIMIT VAC* menu item (located under *MENU HEADING 11*) for input AC1, are displayed, but ignored when the SELL mode is selected.

The SELL frequency window is nonadjustable and locked at 59.3–60.5 Hz anytime the inverter is in SELL mode. This is indicated by the LINE TIE LED ON. For any voltage or frequency condition outside these specified operating windows, the inverter will disconnect and attempt to reconnect to the grid when proper voltage and frequency conditions are detected (after a 5 minute wait period elapses). The inverter will reset the 5 minute timer each time an out-of-bounds condition is detected, during periods when the AC1 light is blinking or ON.

	SOFTWARE REV 4.10		
	SW4024	**SW4048**	**SW5548**
AC Voltage Window	Fixed 106–132 VAC when SELL mode is engaged (AC1 input only). Adjustable for all other modes.		
Frequency Window	59.3–60.5 Hz in SELL mode (AC1 input only), 54–66 Hz for all other modes.		
SET MAX SELL AMPS	1–35	1–35	1–50
	Default 33 A	Default 33 A	Default 46 A
SET MAX CHARGE AMPS	1–35	1–35	1–40
	Default 30 A	Default 30 A	Default 35 A
TRACE ENGINEERING 3 Menu	REV 4.10		

976-0013-D-001

ADDENDUM

Changes in Manual:

Page-1, 5, 34, 39 and 119–All references to software version 4.01 should now read **4.10**.

Page 1 and 17–**The SW4024, SW4048 and SW5548 inverter models are UL listed to UL1741-First Edition which incorporates IEEE929 recommended practices.**

Labeling

Page 7 and 12–The product rating labels have changed as shown below to reflect the UL listing:

Label 1 (270-0033-01-01):

UL LISTED 55CL
UL LISTED 39FL

POWER INVERTER/CHARGER
STANDARD UL1741-1999
1st EDITION

NON-ISLANDING
UTILITY INTERACTIVE INVERTER
WITH INTEGRAL TRANSFORMER ISOLATION

POWER INVERTER/CHARGER
LISTED FOR CANADA
CAN/CSA-C22.2 No. 107.1-95

MODEL: ☐ SW4024   ☐ SW4024____

------ INVERTER SYSTEM ------
MAX CONTINUOUS AC OUTPUT POWER: 4000 VA
NOMINAL BATTERY BANK VOLTAGE: 24 VDC
NOMINAL DC OPERATING VOLTAGE: 25.2 VDC
RANGE OF OPERATING DC VOLTAGE: 22-32 VDC
MAX OPERATING DC CURRENT: 200 AMPS DC
MAX SHORT CIRCUIT DC CURRENT: 800 AMPS DC
NOMINAL AC OUTPUT VOLTAGE: 120 VAC 1∅
NOMINAL AC OUTPUT FREQUENCY: 60 HZ
MAX CONTINUOUS AC OUTPUT CURRENT: 33.3 AMPS AC
MAX AC OUTPUT OVERCURRENT PROTECTION: 35 AMPS AC
MAX OUTPUT FAULT AC CURRENT: 78 AMPS AC RMS

------ BATTERY CHARGER SYSTEM ------
NOMINAL AC INPUT VOLTAGE: 120 VAC 1∅
OPERATING FREQUENCY RANGE: 54-66 HZ
MAX CONTINUOUS BATTERY CHARGER AC CURRENT: 30 AMPS AC
MAX CONTINUOUS BATTERY CHARGER DC CURRENT: 110 AMPS DC
MAX CONTINUOUS BATTERY CHARGER INPUT VA: 3600 VA
TYPICAL BATTERY CHARGER POWER FACTOR: 0.9 TO 1.0
MAX AC TRANSFER SWITCH INPUT CURRENT: 60 AMPS AC

---- UTILITY INTERACTIVE SYSTEM ----
OPERATING AC INPUT VOLTAGE RANGE: 106-132 VAC 1∅
OPERATING FREQUENCY RANGE (AC1): 59.3-60.5 HZ
MAX UTILITY AC BACKFEED CURRENT: 0 AMPS AC
MAX CONTINUOUS AC OUTPUT POWER: 4000 VA
OPERATING POWER FACTOR: 0.9 TO 1.0

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Label 2 (270-0032-01-01):

UL LISTED 55CL
UL LISTED 39FL

POWER INVERTER/CHARGER
STANDARD UL1741-1999
1st EDITION

NON-ISLANDING
UTILITY INTERACTIVE INVERTER
WITH INTEGRAL TRANSFORMER ISOLATION

POWER INVERTER/CHARGER
LISTED FOR CANADA
CAN/CSA-C22.2 No. 107.1-95

MODEL: ☐ SW4048   ☐ SW4048____

------ INVERTER SYSTEM ------
MAX CONTINUOUS AC OUTPUT POWER: 4000 VA
NOMINAL BATTERY BANK VOLTAGE: 48 VDC
NOMINAL DC OPERATING VOLTAGE: 50.4 VDC
RANGE OF OPERATING DC VOLTAGE: 44-66 VDC
MAX OPERATING DC CURRENT: 100 AMPS DC
MAX SHORT CIRCUIT DC CURRENT: 400 AMPS DC
NOMINAL AC OUTPUT VOLTAGE: 120 VAC 1∅
NOMINAL AC OUTPUT FREQUENCY: 60 HZ
MAX CONTINUOUS AC OUTPUT CURRENT: 33.3 AMPS AC
MAX AC OUTPUT OVERCURRENT PROTECTION: 35 AMPS AC
MAX OUTPUT FAULT AC CURRENT: 78 AMPS AC RMS

------ BATTERY CHARGER SYSTEM ------
NOMINAL AC INPUT VOLTAGE: 120 VAC 1∅
OPERATING FREQUENCY RANGE: 54-66 HZ
MAX CONTINUOUS BATTERY CHARGER AC CURRENT: 30 AMPS AC
MAX CONTINUOUS BATTERY CHARGER DC CURRENT: 60 AMPS DC
MAX CONTINUOUS BATTERY CHARGER INPUT VA: 3600 VA
TYPICAL BATTERY CHARGER POWER FACTOR: 0.9 TO 1.0
MAX AC TRANSFER SWITCH INPUT CURRENT: 60 AMPS AC

---- UTILITY INTERACTIVE SYSTEM ----
OPERATING AC INPUT VOLTAGE RANGE: 106-132 VAC 1∅
OPERATING FREQUENCY RANGE (AC1): 59.3-60.5 HZ
MAX UTILITY AC BACKFEED CURRENT: 0 AMPS AC
MAX CONTINUOUS AC OUTPUT POWER: 4000 VA
OPERATING POWER FACTOR: 0.9 TO 1.0

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Label 3 (270-0031-01-01):

UL LISTED 55CL
UL LISTED 39FL

POWER INVERTER/CHARGER
STANDARD UL1741-1999
1st EDITION

NON-ISLANDING
UTILITY INTERACTIVE INVERTER
WITH INTEGRAL TRANSFORMER ISOLATION

POWER INVERTER/CHARGER
LISTED FOR CANADA
CAN/CSA-C22.2 No. 107.1-95

MODEL: ☐ SW5548   ☐ SW5548____

------ INVERTER SYSTEM ------
MAX CONTINUOUS AC OUTPUT POWER: 5500 VA
NOMINAL BATTERY BANK VOLTAGE: 48 VDC
NOMINAL DC OPERATING VOLTAGE: 50.4 VDC
RANGE OF OPERATING DC VOLTAGE: 44-66 VDC
MAX OPERATING DC CURRENT: 140 AMPS DC
MAX SHORT CIRCUIT DC CURRENT: 400 AMPS DC
NOMINAL AC OUTPUT VOLTAGE: 120 VAC 1∅
NOMINAL AC OUTPUT FREQUENCY: 60 HZ
MAX CONTINUOUS AC OUTPUT CURRENT: 45.8 AMPS AC
MAX AC OUTPUT OVERCURRENT PROTECTION: 50 AMPS AC
MAX OUTPUT FAULT AC CURRENT: 78 AMPS AC RMS

------ BATTERY CHARGER SYSTEM ------
NOMINAL AC INPUT VOLTAGE: 120 VAC 1∅
OPERATING FREQUENCY RANGE: 54-66 HZ
MAX CONTINUOUS BATTERY CHARGER AC CURRENT: 35 AMPS AC
MAX CONTINUOUS BATTERY CHARGER DC CURRENT: 70 AMPS DC
MAX CONTINUOUS BATTERY CHARGER INPUT VA: 4200 VA
TYPICAL BATTERY CHARGER POWER FACTOR: 0.9 TO 1.0
MAX AC TRANSFER SWITCH INPUT CURRENT: 60 AMPS AC

---- UTILITY INTERACTIVE SYSTEM ----
OPERATING AC INPUT VOLTAGE RANGE: 106-132 VAC 1∅
OPERATING FREQUENCY RANGE (AC1): 59.3-60.5 HZ
MAX UTILITY AC BACKFEED CURRENT: 0 AMPS AC
MAX CONTINUOUS AC OUTPUT POWER: 5500 VA
OPERATING POWER FACTOR: 0.9 TO 1.0

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Mounting

The second paragraph under "MOUNTING" should read as follows:

"Use 1/4" minimum bolts for mounting. The mounting must capable of supporting **four times** the weight of the inverter..."

Add the following to the second paragraph:

When mounting to a vertical surface, such as a wall, ensure the inverter (or backing material) is securely mounted to the wall studs for proper support.

Vertical wall mounting with proper access panels in place is the only UL approved mounting method for fire prevention.

Menu Maps

The USER and SETUP menu have been updated to reflect the new software revision as follows:

Page 34–USER MENU. The software revision shown under menu heading *"TRACE ENGINEERING 3"*, menu item *"REVISION 4.01"* is changed to *"**REVISION 4.10**."*

An information file has been added to menu heading 11 and reads: "***IN SELL MODE AC1 INPUT VAC LIMITS FIXED AT 88% AND 110% OF NOMINAL***."

Menu System

Page 39–*"TRACE ENGINEERING (3)"* menu heading. The software revision has been updated from *"4.01"* to *"**4.10**."*

Page 48–The *"SET MAX CHARGE AMPS AC"* menu item, the range has been changed from *"01 to 35 amps"* to *"**01 to 40 amps**"* for the SW5548 model.

Page 54–*"BATTERY SELLING (17)"* menu heading. The *"SET MAX SELL AMPS AC"* range has been changed from *"01 to 35 amps"* to *"**01 to 50 amps**"* for SW5548 model.

Operation

Page 61– The following paragraph should be added to the UTILITY INTER-ACTIVE MODE bulleted item: "**To meet agency approvals, SELL mode will sell power only between the locked 106–132 volts AC range and 59.3–60.5 Hz range windows (120 VAC/60 Hz models only).**"

Page 83–When in SELL mode, the *SET INPUT LOWER LIMIT VAC* is locked at 106 VAC and sells power only when the AC output of the inverter is between 88 to 110% of nominal AC line voltage.

Display Deletions

The following menu display items have been deleted for various reasons unrelated to UL requirements.

Under the *"ERROR CAUSES 5"* menu heading, menu item *"**INVERTER BREAKER TRIPPED**"* has been deleted.

Under the *"GENERATOR MODE 2"* menu heading, menu item *"**GEN MAX RUN TIME ERROR**"* has been deleted.

Under the *"GENERATOR MODE 2"* menu heading, all references to the *GEN MAX RUN TIMER* have been deleted (i.e., "***IF GEN RUNS FOR MORE THAN MAX RUN TIME THEN ERROR***").

Under *"GEN AUTO START SETUP 12"* menu heading, all references to the *GEN MAX RUN TIMER* have been deleted (i.e., "***SET MAXIMUM RUN TIME H:M 08:00***" and "***SET MAX RUN TIME TO 0 TO DEFEAT***").

Utility Interactive Mode Islanding Protection Compliance

Trace™ SW inverters are capable of utility interactive operation, which includes utility protection features to prevent injury and damage from occurring when power is sold to the utility grid. These protective systems utilize high-speed microprocessor hardware and software to detect the abnormal conditions and disconnect the inverter from the utility grid.

The UL1741 standard requires specific responses by the inverter to abnormal voltage and frequency conditions. The following summarizes the voltage and frequency levels and the response time period required, plus other features required by the UL1741 standard.

ADDENDUM

Over/Under Voltage Fluctuations

VOLTAGE	MAXIMUM TRIP TIME*
Voltage < 60 V (< 50%)	6 cycles
Voltages between 60–106 V (50–88%)	120 cycles
Voltages between 106–132 V (88–110%)	Normal operation
Voltages between 132–165 V (110–137%)	120 cycles
Voltage >165 V (137%)	2 cycles
FREQUENCY	MAXIMUM TRIP TIME*
Frequency < 59.3 Hz	6 cycles
Frequency > 60.5 Hz	6 cycles

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"Trip time" refers to the time between the abnormal conditions being applied and the inverter ceasing to energize the utility line.

Over/Under Frequency Disturbances

Small renewable energy systems are allowed to sell within a fixed frequency range of -0.7 Hz/ +0.5 Hz of the nominal frequency in which they will operate. When the utility frequency is outside the range of the nominal frequency window, the inverter must cease to energize the utility line within 6 cycles.

Reconnect Delay After a Utility Disturbance

An unacceptable utility event causes the renewable energy system to disconnect from the utility line. It will remain disabled until acceptable voltage and frequency have been maintained for a minimum of five minutes. After the 5 minute timer is complete, the inverter is allowed to automatically reconnect the renewable energy system to the utility.

Islanding Protection

The non-islanding inverter protection features required by UL1741 ensures that the inverter ceases to energize the utility line when the inverter is subjected to island conditions. As a result, active control techniques have been incorporated into the SW inverter for detecting potential dispersed-generation islands.

A utility wishing to ensure against renewable-energy supported dispersed-generation islanding may require the use of a non-islanding inverter. Trace™ has designed the new software protection system to comply with the requirements of the non-islanding inverter section of UL1741.

Over-current Protection

The Trace™ SW Series inverters also include over-current protection for the inverter system. This protective system is used if the inverter attempts to power too large of a load or if the inverter loses synchronization with the utility grid. This protective system is implemented with redundant systems in analog hardware, microprocessor software and with a mechanical device (circuit breaker). This insures the inverter is protected from damage and can not create an unsafe fault condition to the utility or residence.

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