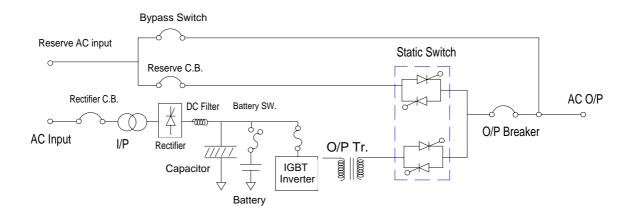
1. System Description

1.1 System Configuration



The UPS system consists of a rectifier, battery bank, inverter, static switch, circuit breaker, monitoring, and indicators.

Normal Operation:

In normal operational conditions, the UPS receives AC power and consequently transforms to DC power through rectifier for charging battery and supplying inverter. The inverter transforms DC power to stable and clean AC power for the various loads.

When the utility AC power is absent, the battery will instantly provide DC power to inverter for continuous operation. Hence, the UPS output will not be interrupted for insuring normal operation of the load.

Reserve AC Supply Mode:

When the inverter in abnormal situations, such as over temperature, short circuit, abnormal output voltage, the inverter will shutdown due to self-protection function. If the utility power is normal, the static switch shall transfer the load to the reserve source without interruption of power supply.

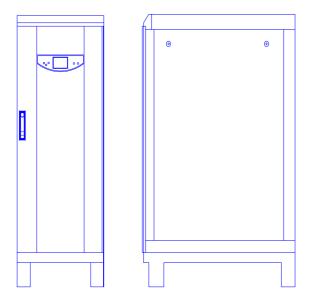
Maintenance Bypass mode:

During maintenance, turning off the inverter and all circuit breakers except the maintenance bypass switch keeps continuously power supply to the load. Risk will not exist in UPS for making sure safety of service personnel.

Note!

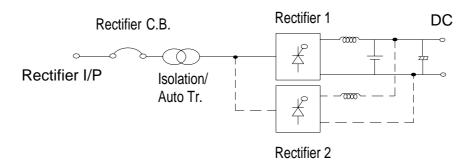
If only single mains power is available, please utilize the same power source for reserve AC input and rectifier input.

1.2 Profile Construction



The above diagrams are the foresight drawing and side-view drawing of the UPS profile frame-work. Regarding dimensions and weights information is detail listed in Section 1.8.

1.3 Rectifier

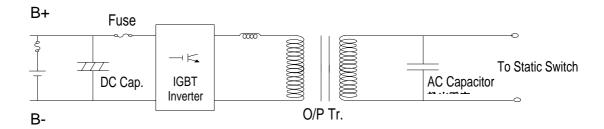


The rectifier transforms AC power to DC power and supplies to inverter, battery charger. Its input is protected by circuit breaker and current sensor that can protect input from over current. It also has the function of steady current charging (current limit is adjustable). The large capacity models can have option for 2 sets of rectifier (12 pulse rectifier) to reduce the harmonics of input current.

Another function of the rectifier is to charge the battery and the charge voltage can set in floating mode or boost mode. If the battery is discharged under 2 volts per cell and AC utility restores, the rectifier automatically goes into the boost mode and supplies sufficient current to charge the battery for the purpose of extending battery life and insuring the battery in a full charged condition. (The time of boost charge is adjustable).

To prevent the disturbance surges and inrush current of the input AC power source, the rectifier is soft started and DC bus voltage is set up over a time period of 20 seconds.

1.4 Inverter

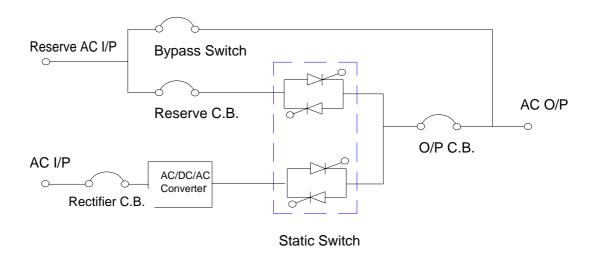


The purpose of the inverter is to convert the DC output of the rectifier or battery into AC power for accommodating different loads under all conditions. The inverter consists of IGBT transistors with full bridge circuit which is under control by sinusoidal pulse-width modulation (SPWM).

The frequency of the inverter is maintained in a phase locked condition with the reserve input frequency as long as the reserve input frequency is with in a predetermined tolerance of nominal. If the frequency of utility power is beyond the predetermined tolerance, logical control circuit will lock phase using the crystal oscillating frequency.

The inverter has the protection of short circuit, over load and over temperature. The acceptable DC input range is between 300 and 400 Vdc, and the inverter output is connected to static switch.

1.5 Static Switch and Maintenance Bypass Switch

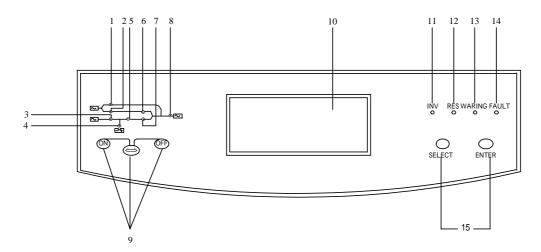


The static switch consists of SCR, and its function is to transmit the inverter AC output to external load.

When following conditions occur: 1.UPS shutdown due to DC low voltage, 2.Over temperature or fuse failure, 3.Inverter output over the permitted tolerance, 4.Inverter malfunction, 5.Inverter serious overload, the load will automatically transfer to the reserved AC source. When the over load condition is disappear, the static switch will again turn back the load to inverter. When reserved AC source voltage or frequency is over the permitted tolerance, the static switch will not transfer the load to reserved AC source.

When the UPS needs to be maintained, service personnel can consequently operate the UPS in bypass mode. The internal circuit is completely isolated from AC supply, and protects service personnel from electric shock.

1.6 Control panel



Front Panel

Explanation:

- 1. Bypass LED (red)--When LED lighted, the bypass switch is turn on.
- 2. Reserved AC source LED (green)--When LED lighted, UPS is supplied by the reserved AC source.
- 3. Rectifier LED (green)--When LED lighted, the rectifier is in operation •
- 4. Battery LED (red)--When LED lighted, the main power is failure, and output power is sustained by the battery bank.
- 5. Inverter LED (green)--When LED lighted, the inverter is in operation.
- 6. Reserved AC power LED (Yellow)--When LED lighted, the load is supplied power by reserved AC source through the static switch.
- 7. Inverter AC power LED (green)--When LED lighted, the load is supplied power by inverter through the static switch.
- 8. AC output LED (green)--When UPS is in normal output status, LED will be lighted.
- 9. Inverter control button--Press "ON" and "⇔"in synchronization for turning on the inverter. Press "OFF" and "⇔"in synchronization for turning off the inverter.
- 10. LCD display--Its used for message display.
- 11. Inverter LED (green)--When LED lighted, the load is supplied power by inverter.
- 12. Reserve AC LED (yellow)--When LED lighted, the load is supplied power by

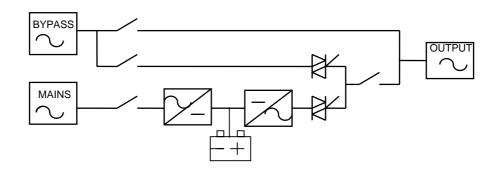
reverse AC source.

- 13. Warning LED (yellow)--When LED lighted, one of the following condition is happen. The inverter will still operate, and the load is supplied power by inverter.
 - Rectifier I/P abnormal
- Battery low
- Battery ground fault
- Inverter overload
- Reserve power failure
- Utility frequency abnormal
- 14. Emergency conditions (red)-- When LED lighted, one of the following conditions is happen, the load will switch to reserve AC source instantly.
 - Rectifier high DC voltage
- Over temperature / Fuse fail
- Battery low stop
- Inverter abnormal
- 15. "SELECT" key and "ENTER" key--Used to select and set LCD display function.
- 16. Warning LED inside front panel:

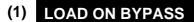
RES FREQ ABNORNAL	RES MAINS FAIL	LOAD ON RES	INV FAULT	INV OVERLOAD	NO VNI	BATT GND FAULT	LOAD LEVEL	BATT LOW / STOP	OVERTEMP / FUSE FAIL	RECT HI DC STOP	RECT MAINS FAIL
•	•	•	•	•	•	•	•	•	•	•	•

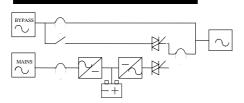
1.7 LCD Display

1. Initial display as follow:

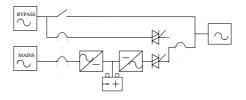


2. UPS status display as follows:

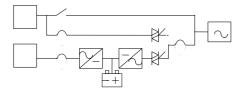




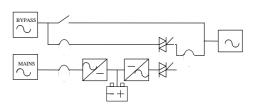
(3) LOAD ON INV.



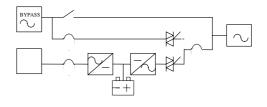
(5) BATTERY LOW



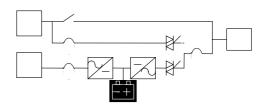
(2) LOAD ON RESERVE



(4) LOAD ON BATTERY



(6) LOW SHUTDOWN



3. Measurement Display

(1) I/P,O/P Voltage & I/P Frequency

(2) O/P Load, O/P Current & Battery Voltage

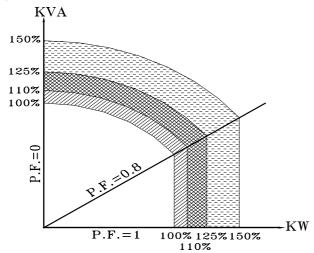
AC: INPUT OUTPUT
R: 220V, 220V
S: 220V, 220V
T: 220V, 220V
: 50Hz

R: 110%, 60A S: 110%, 60A T: 110%, 60A -+: 400V

(3) I/P,O/P Voltage, & O/P Frequency

AC:INPUT OUTPUT RS: 380V, 380V ST: 380V, 380V RT: 380V, 380V : 50Hz

***The load percentage is the ratio of load to UPS rated power output (power factor P.F.=0.8). If output P.F.≥0.8, the load percentage will be judged by rated KVA value. If output P.F.<0.8, the load percentage will be judged by rated KVA value. Please see the following chart.



Therefore, according to the load percentage on LCD display, users can determine the moderate load.

4. LCD display when UPS in abnormal condition

(1) Inverter overload

UPS INVERTER OVERLOAD!

Output current is in excess of 110% loading. Please reduce output load!

(3) Rectifier abnormal

RECTIFIER HIGH DC SHUTDOWN!

DC bus voltage too high!
Please consult the maintenance personnel.

(5) Battery ground fault

BATTERY GROUND FAULT!

Please check battery wiring & any battery fluid leakage. (2) Inverter over current shutdown

INVERTER OVER - CURRENT STOP!

Output current is in excess of 200% loading. Reduce load or short circuit!

(4) Over temperature or fuse failure

OVERTEMPERATURE FUSE FAILURE!

Warning signal! Check Inv. fuse & cooling fan before restart the inverter. 5. Auxiliary Screen—Using "SELECT" & "ENTER" key to chose the following function.

VIEW DATA Log
MEASURE Screen
DEMO UPS Screen
START UP Step
SHUTDOWN Step
INVERTER: (OFF)
INVERTER: (ON)
ALARM IS: (OFF)
UPS I. D.: (31)
LANGUAGE: (ENG)

6. Function Setting

- (1) Function key:
 - a. Press SEL key: Used for selecting [Auxiliary Display].
 - b. Press ENT key: To enter [Auxiliary Display] function. Press SEL key for setting the detail, and press again ENT key to complete the setting.
 - c. Press ENT key twice: To change [Auxiliary Display] selecting direction.
- (2) View data log: UPS historical records are displayed as follows:

INTELLIGENT U.P.S. DATA LOG

BACKUP No.: xxxx
OVERLOAD No.: xxx
INV. Operating
x Years, xxx Days
xx Hours, xx Mins

- (3) Measure screen: Press SEL key to display measurement data.
- (4) Demo-UPS screen: Automatically demo the UPS status, measurement and abnormal status display.

(5) Start-up step: According to UPS status automatically indicates the start-up procedure step by step. The LCD display as follows:

SYSTEM START UP PROCEDURE

- 1. Close BYPASS MCB
- 2. Close RECTIFIER MCB
- 3. Close RESERVE MCB
- 4. Close OUTPUT MCB
- 5. Open BYPASS MCB
- 6. Close BATTERY FUSE ISOLATOR
- 7. Press INV. ON & (CTRL) button simultaneously
- 8. Load on INV. Automatically
- (6) Shutdown step: According to UPS status automatically indicates the shutdown procedure step by step. The LCD display are as follows:

SYSTEM SHUTDOWN PROCEDURE

- 1. Press INV. OFF & (CTRL) button simultaneous
- 2. Close BYPASS MCB
- 3. Open BATTERY FUSE ISOLATOR
- 4. Open RECTIFIER MCB
- 5. Open RESERVE MCB
- 6. Open OUTPUT MCB
- 7. Wait 5 mins DC discharge
- 8. Open BYPASS MCB
- (7) INVERTER ON: When ON is flashing, it indicates the inverter is ON.
- (8) INVERTER OFF: When OFF is flashing, it indicates the inverter is OFF.
- (9) UPS I.D.: Setting UPS Identification number (ID range: $1 \le ID \le 31$).

1.8 Technical Specification

DELTA 3Ø GES T-series UPS Technical data

	DELIAGE	<u> </u>	301100	, 0, 0	10011	moai	autu			
	Power rating KVA (P.F.=0.8)		10	15	20	30	40	50	60	80
	Nominal voltage	V				220/	380 (*)			
<u>+</u>	Voltage range	%				±2				
2	Nominal frequency	Hz					/ 60			
Input	Frequency range	%				±5				
_	Nominal current	A	20	29	39	58	77	96	116	154
	Maximum input current	A	28	41	55	82	109	136	163	218
	Nominal voltage	V					380 (*)			
	Phase						W+G			
	Nominal voltage adjustment range	%				±1	-			
Output	Waveform	0./					usoid			
ᅙ	T.H.D. (with linear load) Voltage regulation	%				≦	3			
₹	—static	%				±1				
0	—dynamic	%				±5				
	Nominal frequency	Hz					,) / 60			
	Frequency regulation					0.	,, 00			
	—with internal oscillator	%				±0.	01			
	—with mains synchronize	%				±1				
	Buzzer Load on battery					Disc	ontinuo	us alarm		
ĭ						2.00		alaiiii		
Alarm	UPS abnormal					Cant	inuous	alarm		
	LED status indication	LIPS	etatue i	ndication	· AC ma				a norm	al, rectifier
_	LLD status indication	01 0	status II							indication.
.ō	LCD display	UPS	abnorm							r overload
ä								ge stop,		
<u>:3</u>								e fail, and		
Indication					fault.	•				
<u>_</u>										frequency
		batt	ery volta	ge and c	urrent, a	nd load l	evel se	lf-diagno:	sis wise	ly.
Φ	Monitor	Mult	i-unit mo	nitor, gra	phic dis	play, and	history	data sta	tistics.	
ð							•			
Ē										
Remote	Control	Inve	rter/horn	s remot	e cont	rol, pas	sword	setting,	fault	information
ш		read	ding, and	l auto-dia	ıler.					
	Overload current capacity		-							
Static switch	—30 minutes	%					120			
ŧ	—30 milliseconds	%				1	000			
×	Maximum transfer time :									
()	From inverter to reserve									
÷	a. inverter failure	msec				<	<1			
ā	b. inverter overload or manual	maaa					0			
S	operation —From reserve to inverter	msec msec					0 0			
	Overall efficiency (at nominal load)	%	86	88	89	90	91	92	92	92
system	Inverter efficiency	%	88	90	91	92	93	94	94	94
ste	Inverter emoiority	/0)% : 15 m					0% : 60	
Š	Maximum power dissipated	KW	1.30	1.63	1.98	2.67	3.16	3.48	4.17	
(I)	Audible noise (at a distance of 1.5m)	dBA					60	5.10	,	3.01
	Ambient temperature	°C					·40			
te	Relative humidity (no condensate)	%					0			
<u>ē</u>	Dimensions: —width	≫ mm	600	600	600	600	600	800	800	1200
٥	— depth		800	800	800	800	800	800	800	
Complete	—аерті —height	mm mm	1700	1700	1700	1700	1700	1700	1700	
X	—neigni Weight	mm kg	480	380	420	490	550	670	750	

^(*) The different voltage specification is available.

DELTA 3Ø GES T-series UPS Technical data

		DEL://(OZ					
	Power rating	KVA (P.F.=0.8)		100	120	150	160
	Nominal voltag	е	V		220/3	380 (*)	
.	Voltage range		%			20	
Input	Nominal freque	ency	Hz		50	/ 60	
늗	Frequency range		%			±5	
=	Nominal currer		Ã	193	231	289	308
	Maximum inpu		A	272	326	408	435
	Nominal voltag		V	212	220/38		+00
	Phase	Е	V		220/36 3Ø4W		
		a adiciatina ant ranga	0/			-	
		e adjustment range	%			10	
Output	Waveform		0.7			usoid	
요	T.H.D. (with lin		%		≦	≦3	
בֿ	Voltage regulat	tion:					
0	—static		%			±1	
	—dynamic		%			±5	
	Nominal freque	ency	Hz		50	/ 60	
	Frequency reg	ulation:					
		rnal oscillator	%		±0	0.01	
		ins synchronize	%			±1	
_	Buzzer	Load on Battery	, ,		Discontinu	oue alarm	
Ξ	Duzzei	Load on Battery			Discontinu	ous alaitti	
<u>a</u>							
⋖		UPS abnormal			Continuous		
	LED status ind	ication	UPS s	tatus indication: A			
_				inv	erter, static swit	ch, and battery	status indication.
on							
tion	LCD display		UPS a	bnormal display: i	nverter over-cur	rent shutdown,	inverter overload
cation	LCD display		UPS a	bnormal display: i	nverter over-cur ctifier high DC vo	rent shutdown, oltage stop, low	inverter overload battery stop,
lication	LCD display		UPS a	ıbnormal display: i re	ctifier high DC vo	oltage stop, low	battery stop,
ndication	LCD display			ıbnormal display: i re	ctifier high DC vo er-temperature,	oltage stop, low fuse fail, and ba	battery stop, attery ground faul
Indication Alarm	LCD display		Input	ibnormal display: i re ov	ctifier high DC vo er-temperature, uency, output v	oltage stop, low fuse fail, and ba voltage, currer	battery stop, attery ground faul nt, and frequenc
	LCD display Monitor		Input batter	bnormal display: i re ov voltage and freq	ctifier high DC vo er-temperature, juency, output v ent, and load lev	oltage stop, low fuse fail, and ba voltage, curren vel self-diagnos	battery stop, attery ground faul nt, and frequenc sis wisely.
			Input batter	bnormal display: i re ov voltage and freq y voltage and curi	ctifier high DC vo er-temperature, juency, output v ent, and load lev	oltage stop, low fuse fail, and ba voltage, curren vel self-diagnos	battery stop, attery ground faul nt, and frequenc sis wisely.
			Input batter Multi-u	bnormal display: i re ov voltage and freq y voltage and curi	ctifier high DC vo er-temperature, uency, output v ent, and load lev ic display, and h	oltage stop, low fuse fail, and ba voltage, currer vel self-diagnos history data stat	battery stop, attery ground faul nt, and frequency sis wisely. istics.
	Monitor		Input batter Multi-u Inverte	bnormal display: i rei ov voltage and freq y voltage and curi unit monitor, graph	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and ba voltage, currer vel self-diagnos history data stat	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote Indication	Monitor		Input batter Multi-u Inverte	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and ba voltage, currer vel self-diagnos history data stat	battery stop, attery ground faul nt, and frequency sis wisely. istics.
	Monitor Control		Input batter Multi-u Inverte	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and ba voltage, currer vel self-diagnos history data stat	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre		Input batter Multi-u Inverte readir	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and be voltage, currer vel self-diagnos history data stat word setting,	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu	tes	Input batter Multi-u Inverte readir	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and be voltage, current vel self-diagnost history data stat word setting,	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu —30 millis	tes econds	Input batter Multi-u Inverte readir	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and be voltage, currer vel self-diagnos history data stat word setting,	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans	tes econds sfer time :	Input batter Multi-u Inverte readir	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and be voltage, current vel self-diagnost history data stat word setting,	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From inv	tes econds sfer time : verter to reserve	Input batter Multi-u Inverte readir	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and by voltage, currenvel self-diagnoshistory data statword setting, 120 1000	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From inva. inverte	tes econds sfer time: verter to reserve ir failure	Input batter Multi-u Inverte readir	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and be voltage, current vel self-diagnost history data stat word setting,	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From inva. inverte	tes econds sfer time : verter to reserve	Input batter Multi-u Inverte readir %	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and by voltage, currenvel self-diagnoshistory data statword setting, 120 1000	battery stop, attery ground faul nt, and frequency sis wisely. istics.
Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From inva. inverte	tes econds sfer time: verter to reserve r failure r overload or manual	Input batter Multi-u Inverte readir %	bnormal display: i rec ov voltage and frec y voltage and curi unit monitor, graph er/horns remote	ctifier high DC vo er-temperature, uency, output vent, and load levalic display, and hooting control, passy	oltage stop, low fuse fail, and by voltage, currenvel self-diagnoshistory data statword setting, 120 1000	battery stop, attery ground faul nt, and frequency sis wisely. istics.
	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operat —From re	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter	Input batter Multi-u Inverte readir % % msec msec msec msec	abnormal display: i recovery voltage and frequency voltage and currection of the cur	ctifier high DC vo er-temperature, uency, output vent, and load leviic display, and h control, passv	oltage stop, low fuse fail, and by voltage, curren vel self-diagnos history data stat word setting, 120 1000	battery stop, attery ground faul nt, and frequence is wisely. istics. fault information
Static switch Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operat —From re	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter cy (at nominal load)	Input batter Multi-u Inverte readir % msec msec msec msec %	ubnormal display: i recover over over over over over over over	ctifier high DC voer-temperature, uency, output vent, and load levic display, and honoror, passvor.	oltage stop, low fuse fail, and by voltage, currenvel self-diagnoshistory data stat word setting, 120 1000 <1 0 0 92	battery stop, attery ground faul nt, and frequence is wisely. istics. fault information
Static switch Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operat —From re	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter cy (at nominal load)	Input batter Multi-u Inverte readir % % msec msec	abnormal display: i recovery voltage and frequency voltage and currection of the cur	ctifier high DC voer-temperature, uency, output vent, and load levic display, and honoror, passvor.	oltage stop, low fuse fail, and by voltage, currer vel self-diagnos history data stat word setting, 120 1000 <1 0 0 92 94	battery stop, attery ground faul nt, and frequence is wisely. istics. fault information
Static switch Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operat —From re	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter cy (at nominal load) iciency	Input batter Multi-u Inverte readir % msec msec msec msec %	ubnormal display: i recover over over over over over over over	ctifier high DC voer-temperature, uency, output vent, and load levic display, and honoror, passvor.	oltage stop, low fuse fail, and by voltage, currer vel self-diagnos history data stat word setting, 120 1000 <1 0 0 92 94	battery stop, attery ground faul nt, and frequence is wisely. istics. fault information
Static switch Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operat —From re Overall efficien INVERTER eff	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter cy (at nominal load) iciency erload	Input batter Multi-u Inverte readir % % msec msec msec msec % %	ubnormal display: i recovered for a construction over the construction of the construc	ertifier high DC voer-temperature, uency, output vent, and load levic display, and hocontrol, passvor.	oltage stop, low fuse fail, and by voltage, currer vel self-diagnos history data stat word setting, 120 1000 <1 0 0 92 94	p battery stop, attery ground fault, and frequence is wisely. istics. fault information 92 94
Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operat —From re Overall efficien INVERTER eff INVERTER over	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter oy (at nominal load) iciency erload er dissipated	Input batter Multi-u Inverte readir % % msec msec msec msec % % KW	ubnormal display: i recovoltage and frequency voltage and currounit monitor, grapher/horns remoteng, and auto-dialer	ctifier high DC voer-temperature, uency, output vent, and load levic display, and honoror, passvor.	oltage stop, low fuse fail, and by voltage, currenvel self-diagnoshistory data stat word setting, 120 1000 <1 0 0 92 94 10 min ≤1 10.4	p battery stop, attery ground faulnt, and frequencial sistics. fault information 92 94 150%: 60 sec
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Static switch Remote	Monitor Control Overload curre —30 minu —30 millis Maximum trans —From in a. inverte b. inverte operal —From re Overall efficien INVERTER eff INVERTER ov Maximum pow Audible noise (Ambient tempe Relative humid	tes seconds sfer time: verter to reserve or failure or overload or manual tion serve to inverter cy (at nominal load) iciency erload er dissipated at a distance of 1.5m) erature lity (no condensate) —width	Input batter Multi-u Inverte readir % % msec msec msec msec McBA C % mm	subnormal display: i recover over over over over over over over	ctifier high DC voer-temperature, uency, output vent, and load levic display, and hocontrol, passvo. 92 94 min ≤125%: 8.35	oltage stop, low fuse fail, and by voltage, current vel self-diagnostistory data state word setting, 120 1000 <1 0 0 92 94 $<10 \text{ min}$ $=10.4$ ≤ 60 $=0.0$ 0 0 1200	p battery stop, attery ground faulnt, and frequency is wisely. istics. fault information 92 94 150%: 60 sec 11.13

^(*) The different voltage specification is available.

DELTA 3Ø GES T-series UPS Technical data

	DELIA 3® C							
	Power rating KVA (P.F.=0.8)		10	15	20	30	40	50
	Nominal voltage	V				380 (*)		
•	Voltage range	%			±20)		
Input	Nominal frequency	Hz			50	/ 60		
₽	Frequency range	%			±5			
=	Nominal current	Ã	20	29	39	58	77	96
	Maximum input current	A	28	41	55	82	109	136
	Nominal voltage	V	20	71		20 (*)	100	100
	Phase	V				2W+G		
	Nominal voltage adjustment range	%			±1			
¥	Waveform				_	usoid		
<u>d</u>	T.H.D. (with linear load)	%			≦;	3		
Output	Voltage regulation:							
ನ	-static	%			±1			
_	—dynamic	%			±5			
	Nominal frequency	Hz			50	/ 60		
	Frequency regulation:							
	—with internal oscillator	%			±0.0)1		
	—with mains synchronize	%			±1			
	Buzzer Load on battery	70				ntinuous a	larm	
Alarm	Edd on ballery				21300	aous a		
<u>8</u>	UPS abnormal				Conti	nuous aları	m	
₹	Of 3 abhornar				Conti	iuous aiaii	11	
	LED status indication	LIDS	ctatus ind	ication: AC n	naine narm	al recerve	cource no	rmal
	LLD status indication	OF C	status iriu					
\subseteq						, static swit	ich, and ba	ttery status
<u>.0</u>	LOD diamin	LIDO	· - I I	indica			dame tare	
at .	LCD display	UPS	abnormai	display: inve				
ၓ							voltage sto	
Indication							ure, fuse fa	ail, and
č				hattar	v around f	aril+		
					y ground fa			
_		Inpu	t voltage a	and frequence	cy, output	voltage, c	urrent, and	frequency,
_		batt	ery voltage	and frequent and current	cy, output, and load	voltage, c level self-d	iagnosis wi	sely.
	Monitor	batt	ery voltage	and frequence	cy, output, and load	voltage, c level self-d	iagnosis wi	sely.
	Monitor	batt	ery voltage	and frequent and current	cy, output, and load	voltage, c level self-d	iagnosis wi	sely.
	Monitor Control	batt Mult	ery voltage i-unit monit	and frequent and current for, graphic of	cy, output , and load lisplay, and	voltage, c level self-d d history da	iagnosis wi	sely. S.
		batt Mult Inve	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output , and load lisplay, and	voltage, c level self-d d history da	iagnosis wi	sely. S.
Remote	Control	batt Mult Inve	ery voltage i-unit monit	and frequence and current for, graphic corremote cor	cy, output , and load lisplay, and	voltage, c level self-d d history da	iagnosis wi	sely. S.
Remote		batt Mult Inve	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output , and load lisplay, and	voltage, c level self-d d history da	iagnosis wi	sely. S.
Remote	Control	batt Mult Inve read	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output , and load lisplay, and htrol, pass	voltage, c level self-d d history da	iagnosis wi	sely. S.
Remote	Control Overload current capacity	batt Mult Inve read	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi	sely. S.
Remote	Control Overload current capacity —30 minutes	batt Mult Inve read	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi	sely. S.
Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time:	batt Mult Inve read	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi	sely. S.
Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve	batt Mult Inve read % %	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi	sely. S.
Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure	batt Mult Inve read	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi	sely. S.
Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure b. inverter overload or manual	batt Mult Inve read % % msec	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett 120 000	iagnosis wi	sely. S.
	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure b. inverter overload or manual operation	Mult Inve read % % msec msec	ery voltage i-unit monit rter/horns	and frequence and current for, graphic corremote cor	cy, output, and load lisplay, and ntrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi	sely. S.
Static switch Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure b. inverter overload or manual operation -From reserve to inverter	Multi- Inversease % % msec msec msec	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic cor remote cor uto-dialer.	cy, output, and load lisplay, and and load lisplay, and antrol, pass	voltage, c level self-d d history da sword sett	iagnosis wi ata statistica ing, fault	information
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Static switch Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure b. inverter overload or manual operation -From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency	Multi- Inversease % % msec msec msec	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote.	and load lisplay, and hitrol, pass	voltage, c level self-d d history da sword sett 20 000 1 0 90 92	iagnosis wita statistics ing, fault 91 93	sely. s. information 91 94
Static switch Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure b. inverter overload or manual operation From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload	Multi- Inversease // // // // // // // // // /	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote. 88 90 9%: 15 min	and load lisplay, and hitrol, pass 10 89 91 ≤125%	voltage, c level self-d d history da sword sett 20 000 1 0 90 92 6: 10 min	iagnosis wi ita statistics ing, fault 91 93 ≤150%	91 94 : 60 sec
Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated	Multi- Inversease // // // // // // // // // /	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote.	89 91 ≤ 125%	voltage, c level self-d d history da sword sett 120 000 1 0 90 92 6: 10 min 2.67	iagnosis wita statistics ing, fault 91 93	sely. s. information 91 94
Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m)	msec msec msec skW dBA	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote. 88 90 9%: 15 min	89 91 \$1.98	voltage, c level self-d d history da sword sett 120 000 1 0 90 92 6: 10 min 2.67	iagnosis wi ita statistics ing, fault 91 93 ≤150%	91 94 : 60 sec
system Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature	msec msec msec sec sec sec sec sec sec sec sec sec	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote. 88 90 9%: 15 min	89 91 \$1.98	voltage, c level self-d d history da sword sett 20 000 1 0 90 92 6: 10 min 2.67	iagnosis wi ita statistics ing, fault 91 93 ≤150%	91 94 : 60 sec
system Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature Relative humidity (no condensate)	msec msec msec skW dBA	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote. 88 90 9%: 15 min	89 91 \$1.98	voltage, c level self-d d history da sword sett 20 000 1 0 90 92 6: 10 min 2.67	iagnosis wi ita statistics ing, fault 91 93 ≤150%	91 94 : 60 sec
system Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature Relative humidity (no condensate) Dimensions:	msec msec msec sec sec sec sec sec sec sec sec sec	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote. 88 90 9%: 15 min	89 91 \$1.98	voltage, c level self-d d history da sword sett 20 000 1 0 90 92 6: 10 min 2.67	iagnosis wi ita statistics ing, fault 91 93 ≤150%	91 94 : 60 sec
system Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature Relative humidity (no condensate)	msec msec msec sec sec sec sec sec sec sec sec sec	ery voltage i-unit monit rter/horns ding, and a	and frequence and current for, graphic corremote corremote corremote. 88 90 9%: 15 min	89 91 \$1.98	voltage, c level self-d d history da sword sett 20 000 1 0 90 92 6: 10 min 2.67	iagnosis wi ita statistics ing, fault 91 93 ≤150%	91 94 : 60 sec
system Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature Relative humidity (no condensate) Dimensions:	msec msec msec sec sec sec sec sec sec sec sec sec	ery voltage i-unit monit rter/horns ding, and a 86 88 ≦ 110 1.30	and frequence and current for, graphic corremote corremote corremote. 88 90 90: 15 min 1.63	89 91 \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	voltage, c level self-d d history da sword sett 20 000 1 0 90 92 6: 10 min 2.67 60	iagnosis wi ata statistics ing, fault 91 93 ≤150% 3.16	91 94 : 60 sec 3.96
system Static switch Remote	Overload current capacity -30 minutes -30 milliseconds Maximum transfer time: -From inverter to reserve a. inverter failure b. inverter overload or manual operation -From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature Relative humidity (no condensate) Dimensions: -width -depth	msec msec msec sw dBA c mm mm	ery voltage i-unit monit rter/horns ding, and a 86 88 ≦ 110 1.30	and frequence and current for, graphic corremote correctoruto-dialer. 88 90 90: 15 min 1.63	89 91 \$1.98 \$600 800	voltage, c level self-d d history da sword sett 120 000 1 1 0 0 90 92 6: 10 min 2.67 00 40 0	91 93 ≤ 150% 3.16	91 94 : 60 sec 3.96
Static switch Remote	Overload current capacity —30 minutes —30 milliseconds Maximum transfer time: —From inverter to reserve a. inverter failure b. inverter overload or manual operation —From reserve to inverter Overall efficiency (at nominal load) INVERTER efficiency INVERTER overload Maximum power dissipated Audible noise (at a distance of 1.5m) Ambient temperature Relative humidity (no condensate) Dimensions: —width	msec msec msec msec sc	ery voltage i-unit monit rter/horns ding, and a 86 88 ≦ 110 1.30	and frequence and current for, graphic corremote correctoruto-dialer. 88 90 90: 15 min 1.63	89 91 \$1.98 \$600	voltage, c level self-d d history da sword sett 120 000 1 1 0 90 92 6: 10 min 2.67 040	iagnosis wi ita statistics ing, fault 91 93 ≤150% 3.16	91 94 : 60 sec 3.96

^(*) The different voltage specification is available.

2. Instructions for Installation

2.1 Location Environment and Safety Precaution

For ensuring UPS normal operation, prolonging UPS lifetime, and protecting UPS from disorder and malfunction, user should select optimal installing location and environment according to the following instructions, and observe the noticed items of safety.

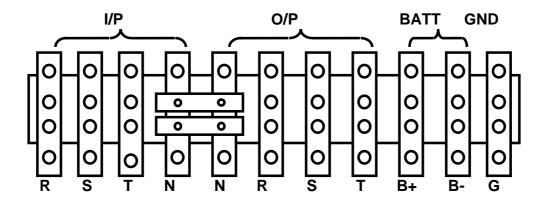
- 1. The weight of the UPS system (see paragraph 1.8) is concentrated on a relatively small floor area due to the cabinet design. The installing location must therefore have a sufficient floor loading capacity adequate to bear the load.
- 2. The UPS should be located on place with good ventilation. Its rear panel should be kept away from wall at least 50 cm. A space of about 1m should be kept clear in front of the UPS to provide room for both operation and maintenance.
- 3. The UPS is capable of continuous normal operation with in a temperature range of 0°C to 40°C (32°F to 104°F). For optimum performance and reliability to prolong UPS lifetime, the temperature should be kept below 25°C environment, and humidity must be maintained within a range of 0 to 95% (non-condensing).

For decreasing the dangerous due to accident, following rules should be observed.

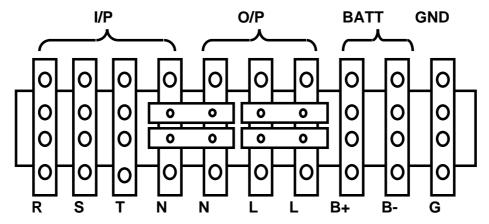
- 1. Walls, ceiling, floors as well as everything surrounding or near the UPS should be preferably constructed of noncombustible materials. The room should be equipped with a portable fire extinguisher.
- 2. Litter or trash of any sort should not be allowed to accumulate in or around the UPS system. The floor area surrounding the UPS should be kept clean so that metallic powder and filings are not sucked into the unit thus causing a short circuit and damage to the system.
- 3. Access to the UPS room should be limited to a minimum number of operation and maintenance personnel only. The doors should be kept locked and the keys should be controlled to authorized personnel only.
- 4. All personnel who operate or maintain the UPS system should be proficient in normal and emergency operational procedures. New personnel should be trained and tested prior to operating the equipment.

2.2 Electrical Connections

1. Terminals of 3 phase input Y connection / 3 phase output Y connection



2. Terminals of 3 phase input Y connection / single phase output



** Connection of extra reserve AC power source:

Please take off wires on AC input terminals that connect to reserve input circuit breaker, and connect the reserve AC power source to reserve input circuit breaker.

- 3. UPS systematic circuit breakers are aligned from left to right by the following order:
 - (1) AC input circuit breaker
 - (2) Rectifier input circuit breaker
 - (3) Reserve input circuit breaker
 - (4) UPS output circuit breaker
 - (5) Manual bypass circuit breaker

Note: In some UPS unit, the AC input circuit breaker is not installed depending on the input voltage type.

4. Following is the table correlating UPS rating capacity to input power requirements, output cables and battery cables. If the wire length is too long and cause the voltage drop too large, please according to the allowable voltage drop to chose adequate wire cables.

	I/P	O/P	I/P	I/P	RES	RES	O/P	O/P	BAT.	BAT.
RATED	VOLTAGE	VOLTAGE	C.B.	CABLE	C.B.	CABLE	C.B.	CABLE	CABLE	FUSE
VA	(V)	(V)	(A)	(mm²)	(A)	(mm²)	(A)	(mm²)	(mm²)	(A)
	120/208	120/208	50							
	127/220	127/220	40		40	14	40	14		
10K	220/380	220/380		14					14	30
	230/400	230/400	40		20	8	20	8		
	240/415	240/415								
	120/208	120/208	75	20	50	4.4	50	4.4		
	127/220	127/220	75	22	50	14	50	14		
15K	220/380	220/380							22	50
	230/400	230/400	40	14	30	8	30	8		
	240/415	240/415								
	120/208	120/208	100	22	75	22	75	22		
	127/220	127/220	75	22	75	22	75	22		
20K	220/380	220/380	50						22	60
	230/400	230/400	40	14	40	14	40	14		
	240/415	240/415								
	120/208	120/208	125	30	100	30	100	30		
	127/220	127/220	123	30	100	30	100	30		
30K	220/380	220/380								
	230/400	230/400	75	22	75	22	75	22	30	100
	240/415	240/415								
	120/208	120/208	175	50	150	50	150	50		
	127/220	127/220	150	38	130	30	130	30		
40K	220/380	220/380							38	120
	230/400	230/400	100	22	75	22	75	22		
	240/415	240/415						<u> </u>		
	120/208	120/208	225	80	475	60	475	60		
50K	127/220	127/220	200	60	175	60	175	60		
	220/380	220/380	125	30					50	160
	230/400	230/400	123	30	100	30	100	30		
	240/415	240/415	100	22						

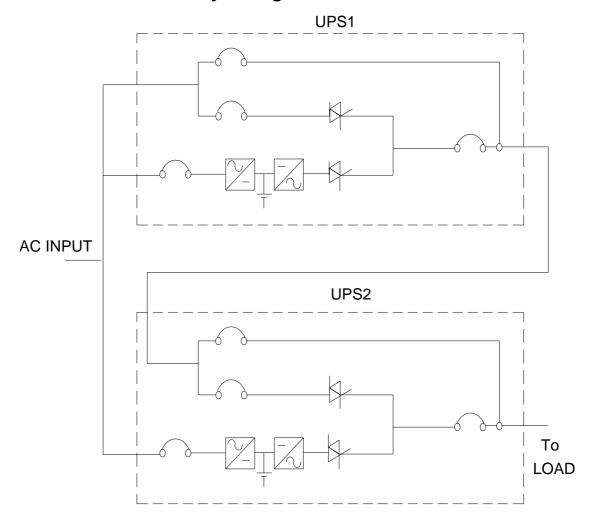
		0/0	L/D	I/D	DEC	DEC	0/5		D.4-	DAT
RATED	I/P VOLTAGE	O/P VOLTAGE	I/P C.B.	I/P CABLE	RES C.B.	RES CABLE	O/P C.B.	O/P CABLE	BAT.	BAT. FUSE
VA	(V)	(V)	(A)	(mm²)	(A)	(mm²)	(A)	(mm²)	CABLE (mm²)	(A)
	120/208	120/208	250	100	(٢)		(٢)		()	(//)
	127/220	127/220	225	80	200	60	200	60		
60K	220/380	220/380	150	38					60	200
	230/400	230/400	125	30	125	38	125	38		
	240/415	240/415								
	120/208	120/208	350	150	222	405	200	405		
	127/220	127/220	300	125	300	125	300	125		
80K	220/380	220/380							80	250
	230/400	230/400	175	50	150	60	150	60		
	240/415	240/415								
	120/208	120/208	500	250	350	150	350	150		
	127/220	127/220	400	200						
100K	220/380	220/380	225	80					100	300
	230/400	230/400		- 00	200	80	200	80		
	240/415	240/415	200	60						
	120/208	120/208	500	250	400	200	400	200		
	127/220	127/220								
120K	220/380	220/380	300	125					125	350
	230/400	230/400	250	80	225	100	225	100		
	240/415	240/415								
	120/208	120/208	700	400	500	250	500	250		
	127/220	127/220	600	325		200		200		
150K	220/380	220/380							200	450
	230/400	230/400	350	150	300	125	300	125		
			200	405						
	240/415	240/415	300	125						
	120/208	120/208	700	400	600	250	600	250		
1601/	127/220	127/220	600	325						
160K	220/380	220/380						00 125	200	500
	230/400	230/400	350	150	300	125	300			
	240/415	240/415								
	470/41J	470/41J								

Note: Output neutral cable should double the size of phase cable for non-linear load.

2.3 Check UPS and Battery Cabinet

The UPS system had been carefully checked both electrical and mechanical characteristics in detail prior to shipment from the factory. The system should be in proper conditions upon receipt. A thorough visual/mechanical inspection of the system should be performed to determine if any physical damage was caused during transit. Confirm all plug-connectors are properly.

2.4 Isolated Redundancy Wiring



The advantages of isolated redundancy wiring:

- 1. Higher reliability than single module.
- 2. Higher fault clearance capability than single module when main power failure.
- 3. 100% UPS cover during maintenance intervals.
- 4. Life time of both UPS is increased.

3. Operation

3.1 Parameter Settings

Boost charge time: Use dip switch SWA1-5 & SWA1-6 on A PCB behind the UPS front door to adjust boost charge time. The preset values of boost time is 1 hour. Following is the time table.

SW1-5	SW1-6	BOOST TIME
OFF	OFF	1 HOUR
OFF	ON	2 HOURS
ON	OFF	4 HOURS
ON	ON	8 HOURS

Boost charge reset: Press SWA4 on A PCB behind the UPS front door to clear boost charge function.

3.2 System Start-up procedure

Please check the following noticed items before UPS start-up:

- 1. All circuit breakers and isolators are in off position and battery fuse is out.
- 2. Ensure that neutral line and grounding are the same voltage level.
- 3. Apply power to the AC input cables and check that input voltage, frequency and phase order are with in the machine specifications.

When UPS comply with the above mentioned conditions, start-up UPS according to the following procedure:

- Close "MANUAL BYPASS" breaker, at the same time LCD display "LOAD ON BYPASS".
- 2. Close " AC INPUT " and " RECTIFIER INPUT " breaker $\,^{,}$ wait 15 \sim 20 seconds until " BATT LOW " LED behind the door is off.
- Close "RESERVED INPUT" breaker, at the same time LCD display "LOAD ON RESERVE".
- 4. Close "UPS OUTPUT" breaker.
- 5. OPEN "MANUAL BYPASS" breaker.
- 6. Close "BATTERY FUSE ISOLATOR" in battery cabinet.
- 7. Press the inverter "ON" & "⇔" button simultaneously, the load will be transferred from reserve to inverter automatically, at the same time LCD display "LOAD ON INVERTER".

Note: It must nerver turn on "manual bypass" circuit breaker when the inverter is turned on. It will damage the UPS owing to utility power parallel with inverter output.

3.3 Maintenance Manual Bypass Procedure

This procedure leaves the critical load undisturbed and the UPS batteries still being charged.

- Check "MAIN FREQ ABNORMAL" "RES MAIN FAIL" LEDS behind the door are all off.
- 2. Press inverter " OFF " & " ⇔ "button simultaneously. Check that " INV ON " LED behind the door is off.
- 3. Close "MANUAL BYPASS" breaker.
- 4. OPEN "UPS OUTPUT" breaker.
- 5. OPEN "RESERVE INPUT" breaker.

3.4 Return from Bypass to Normal Mode

This operating procedure will transfer load from bypass to normal mode as follows:

- 1. Check that "INV ON" LED behind the door is off.
- 2. Close "RESERVE INPUT" breaker.
- 3. Close "UPS OUTPUT" breaker.
- 4. Open "MANUAL BYPASS" breaker.
- 5. Press the inverter "ON" & "⇔" button simultaneously.
- 6. The load will be transferred from reserve to inverter automatically.

3.5 System Shutdown Procedure

This operating procedure can turn off power supply to UPS, please first confirm the load has been shutdown, the procedures as follows:

- 1. Press inverter "OFF" & "⇔" button simultaneously, Check that "INV ON "LED behind the door is off.
- 2. Close "MANUAL BYPASS" breaker.
- 3. Open "BATTERY FUSE ISOLATOR" in battery cabinet.
- 4. Open "RECTIFIER INPUT" breaker.
- 5. Open "RESERVE INPUT" breaker.
- 6. Open "UPS OUTPUT" breaker.
- 7. Wait 5 mins for DC CAP to discharge.
- 8. Open "AC INPUT" & "MANUAL BYPASS" breaker.

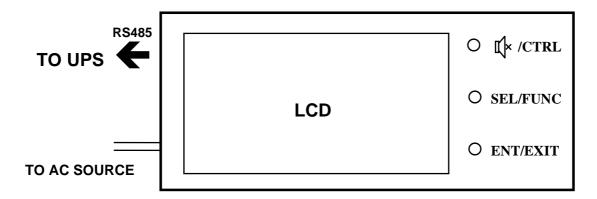
4. Maintenance

To increase system reliability, please according to the following notice do the cyclical maintenance:

- 1. Blowers or fans, mounted in the top of the system, should be checked for proper operation at monthly intervals. Improper blower operation can cause a rise in system operating temperature resulting in an over temperature shutdown.
- 2. Cable connections to circuit breakers and other terminals should be checked for discoloration produced by overheating also at monthly intervals.
- 3. Every 6 Months a qualified service engineer should check the machines electronic settings and take any appropriate action to ensure the long term reliability of the UPS.

5. Options

5.1 Remote Monitoring



When the remote monitor communicates with the UPS, you can see not only more than one UPS test data and status, but also can set inverter and alarm ON / OFF. LCD display is the same as UPS synchronously, but with more three keys.

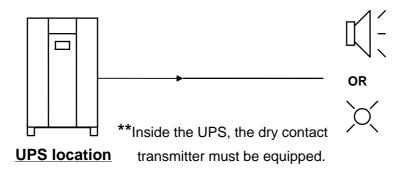
Silence/Control (X/CTRL) key: When UPS status is abnormal, pressing this key will turn off alarm.

Select/Function (SEL/FUNC) key: Press for selecting control item.

Enter/Exit (ENT/EXIT) key: Press for entering or setting on communication.

You can monitor and control three sets of UPS by using only one remote monitor.

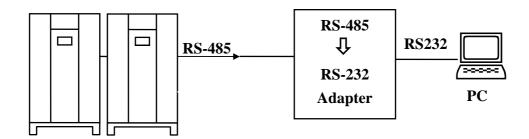
5.2 Dry Contact



The user can use four sets dry contact for indicating status or driving the alarm device, which are synchronized with four LEDs located on the left side of the front panel. Their statuses are described as follows:

- 1. **INV (load on inverter):** The inverter is in operating condition.
- 2. RES (load on reserve AC source): The load is supplied by reserve AC source.
- 3. **WARNING:** Indicate the rectifier input voltage abnormal, battery low stop, reserve AC source abnormal, battery low, battery ground fault, or inverter overload.
- 4. **FAULT:** Indicate the rectifier high dc voltage, over temperature / fuse failure, or inverter short circuit.

5.3 Monitoring software



If the exclusive software---UPSentry for GES T-series is installed, you can monitor 31 sets UPS status at the same time on one PC with inverter/horns remote control, password setting, automatic detection and warning, malfunction data statistics, real time monitoring (input / output voltage, current and frequency etc.), and file transmission.

5.4 Custom- Mode Accommodation

According to the customer's wiring system, we can design the different input / output voltage specifications to meet the customer's demand.