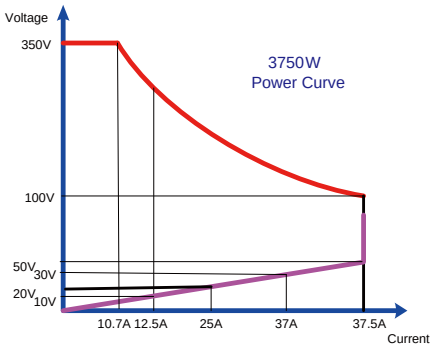
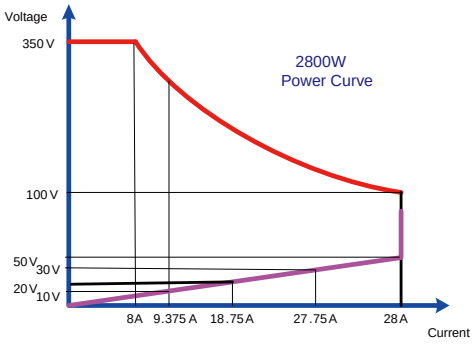
3270 Series AC & DC Electronic Load

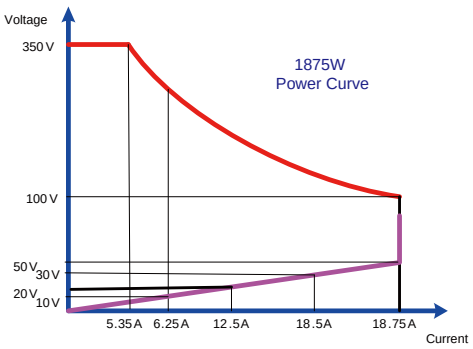
MODEL		3270	3271	3272
Power (W)	Turbo OFF	3750 W	2800W	1875 W
	Turbo ON	7500W (x2)*	5600W (x2)*	3750W (x2)*
Current(Ampere)	Turbo OFF	37.5 Arms / 112.5Apeak	28 Arms / 84Apeak	18.75 Arms / 56.25Apeak
	Turbo ON	75.0Arms/112.5Apeak (x2)*	56Arms/84Apeak (x2)*	37.5Arms/56.25Apeak (x2)*
Voltage(Volt)		50~350Vrms / 500Vdc		

* Turbo ON can double the power and Current ratings

Power Curve







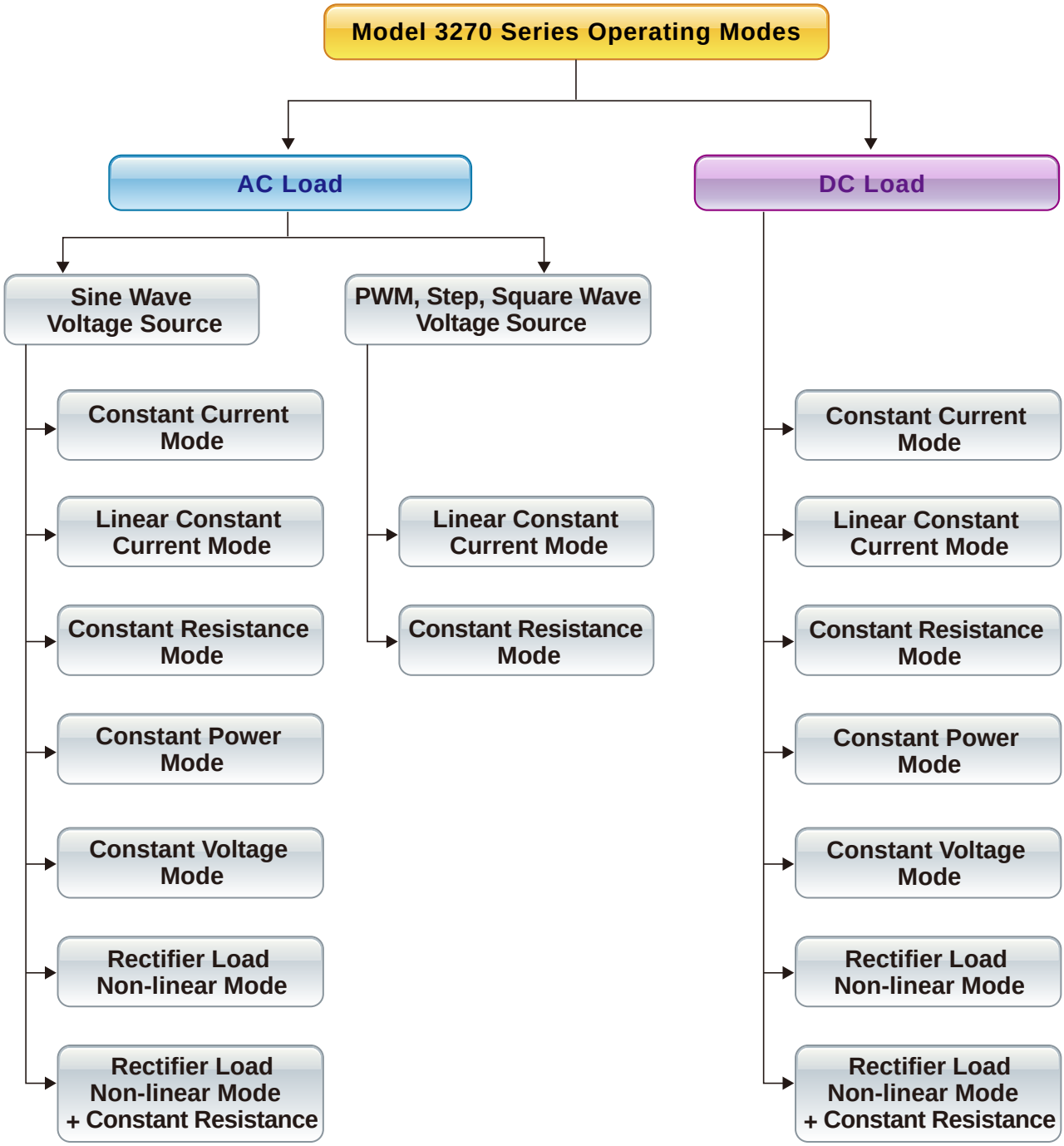
Features

- 4 digit V / A/W Meter，display the Voltage（Vrms, Vpeak, Vmax., Vmin）、Current （Irms, Ipeak, Imax., Imin.）、Watt, Voltampere （VA）、Frequency、Crest Factor、Power Factor、Total Harmonic Distortion of Voltage（VTHD）, Voltage Harmonic（VH）、Total Harmonic Distortion of Current（ITHD）, Current Harmonic（IH）
- CC, Linear CC, CR, CV, CP and AC Rectifier Load mode
- Crest factor range : 1.414~5.0
- Power factor（PF) range : 0~1 lead or（-1~0）lag
- Built-in function test modes include UPS Efficiency, PV Inverter Efficiency, UPS Back-up time, Battery Discharge time, UPS transfer time, Fuse/Breaker Trip/Non-Trip, Short circuit , OCP, OPP test modes
- Turbo mode is able to increase to 2 times the current (75A) and power (7.5KW) of electronic load in a short period which is the most suitable for Fuse / Breaker test and short circuit, OCP, OPP test of AC power supply.
- Time measurement can be applied to batteries, UPS, fuses and circuit breakers and other tests
- Three units parallel up to 11250W and three-phase △ or Y load connection can be synchronized control by one master unit
- Frequency Range : DC, 40~440Hz
- Voltage and current monitoring
- Can be controlled by external voltage for CC, Linear CC, CR, CV, CP operating modes
- Protection against V, I, W, and℃
- Optional interface：GPIB、RS232、USB、LAN
- The most complete measurement capabilities

  3270 Series AC & DC electronic load built-in 16-bit A/D and DSP precision measurement circuit, provides accurate measurements, measurement items have Vrms, Arms, Watt, VA, CF, PF, THD, VTHD, ITHD, Ipeak, Amax, Amin, Vmax, and Vmin

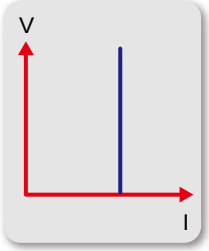
  In addition to these measurement functions, it also provides time measurement，products such as UPS, fuses and circuit breakers etc. trip or blow time and transfer time for Off-line UPS

Complete AC and DC load modes

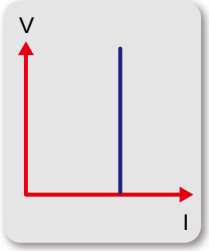


- AC Load Mode

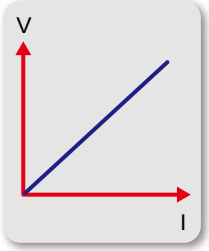
Constant Current Mode



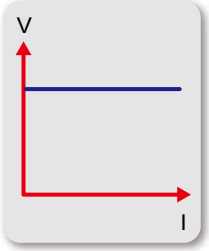
Linear Constant Current Mode



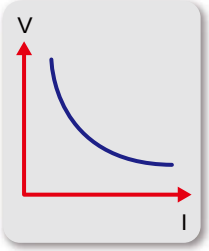
Constant Resistance Mode



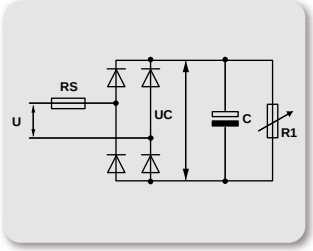
Constant Voltage Mode



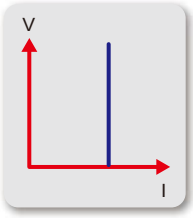
Constant Power Mode



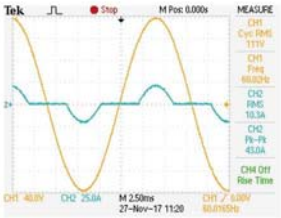
Rectifier Load Mode



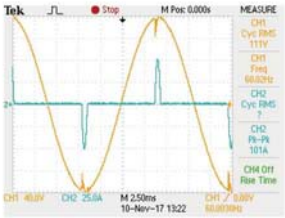
- CC Mode : In the constant current mode of AC Load, can be applied to sine wave voltage source, providing CF, PF test of linear load.



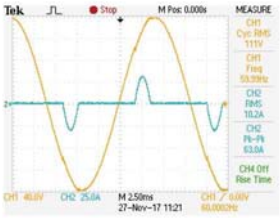
CC mode



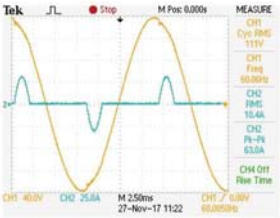
CC mode, CF=2



CC mode, CF=5

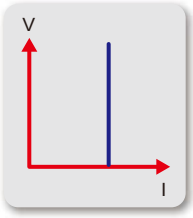


CC mode, PF= +0.5

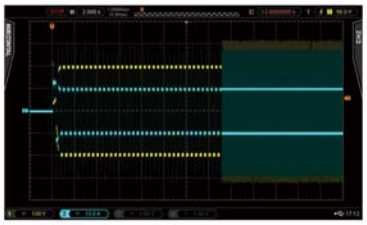


CC mode, PF= -0.5

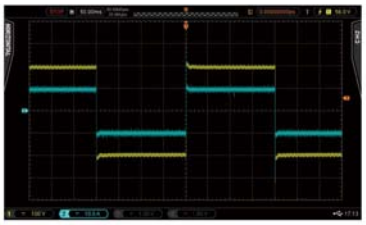
- Linear Constant Current Mode : Can be applied to sine wave and non-sine wave voltage source, as shown in the PWM inverter driver, step voltage source, and off-line UPS sine wave switch to square wave, square wave switch to sine wave.



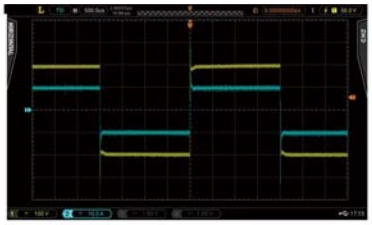
Linear CC Mode



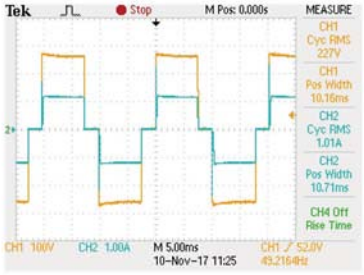
Linear CC mode, PWM 10A 2.5Hz to 250Hz



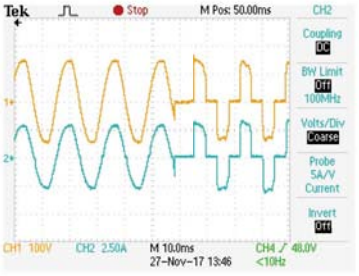
Linear CC mode, PWM 10A 2.5Hz



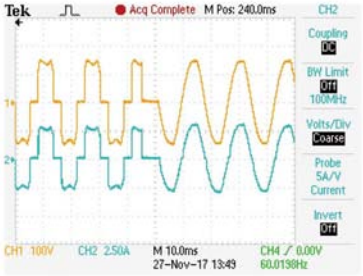
Linear CC mode, PWM 10A 250Hz



Linear CC mode, Step 10A



Linear CC mode, UPS Sine to Square waveform

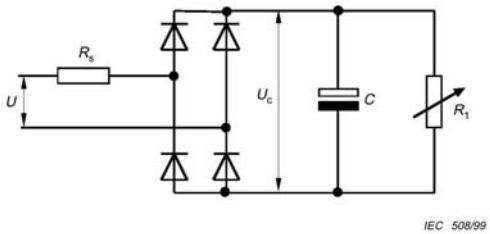


Linear CC mode, UPS Square to Sine waveform

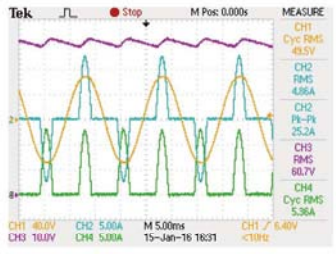
AC rectified load simulation meet the IEC62040-3 and IEC61683 test specifications

(IEC62040-3 UPS Efficiency Measurement non-Linear and IEC61683 Resistive Plus Non-Linear) 3270 AC & DC electronic load AC rectified load mode is fully compliance with the IEC test specification requirements for the UPS, IEC 62040-3 UPS Efficiency Measurement Non-Linear and IEC 61683 Resistive Plus Non-Linear, respectively, 3270 AC rectifier load mode uses CC + CR load mode and maintain current THD at 80%, to simulate the actual PV Inverter connected to the electronic device.

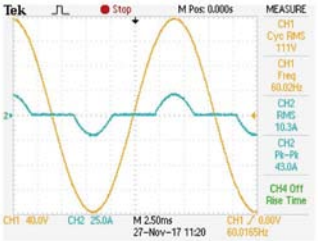
Rectifier Load Mode

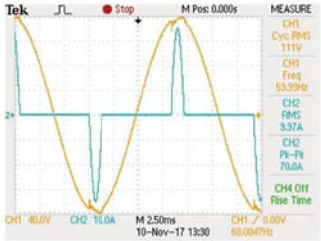


IEC 508/99

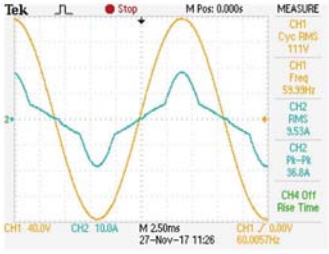


The actual V / A waveform

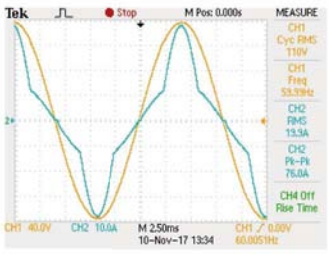




Non-Linear CC mode for UPS test



110V, 5A + 22ohm Test Waveform

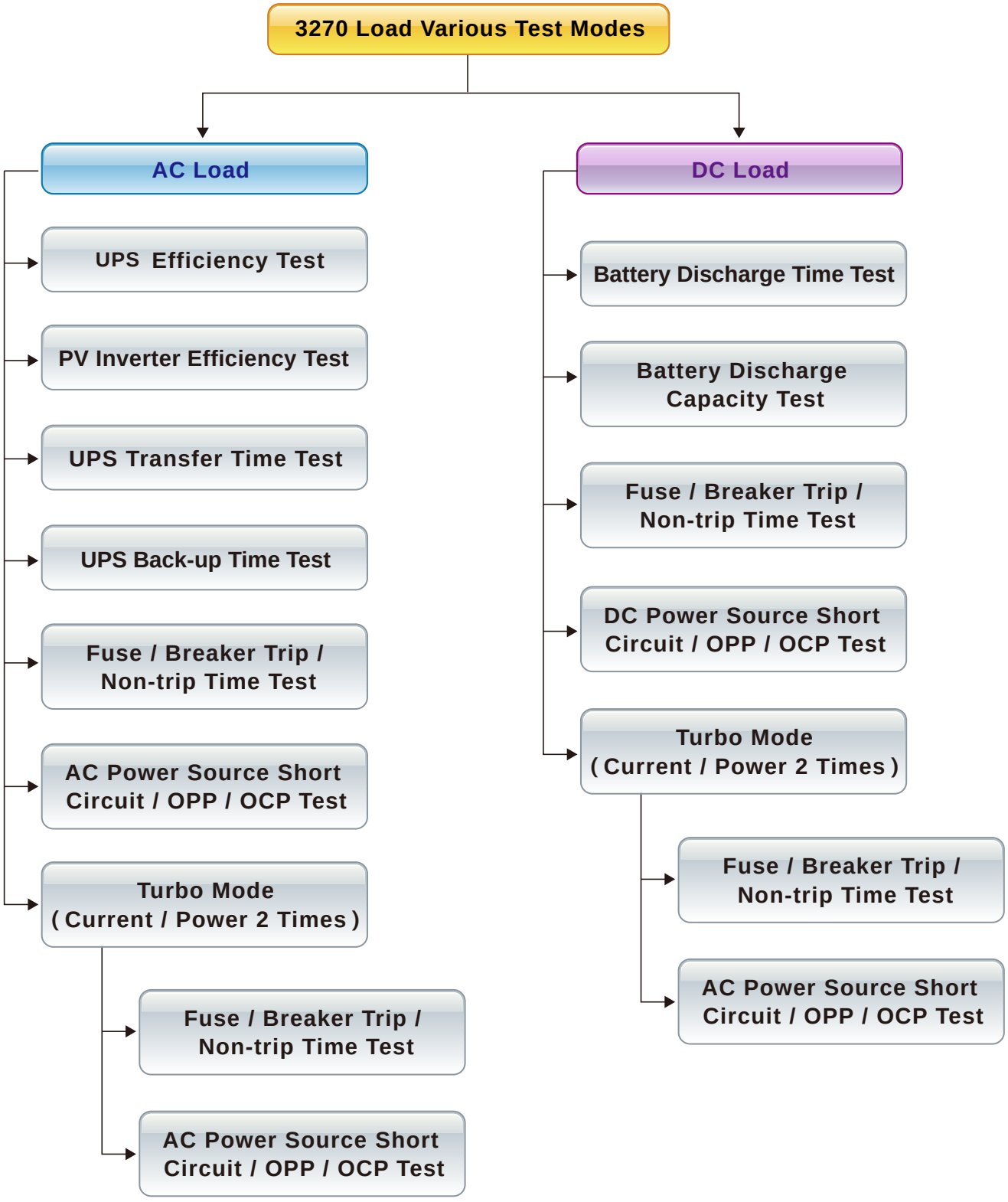


110V, 10A + 11ohm Test Waveform

PV Inverter test Non-Linear CC + Resistive mode (CC+CR)

3270 Load Various Test Modes

The 3270 Series AC & DC electronic load features built-in test modes for a variety of products. Including AC Load of UPS, Inverter, Fuse/Breaker, AC Power Source，and DC Load of Battery, Fuse/Breaker, DC Power Source etc..，as shown below.



Current protection component test

Current protection component includes Fuse, Circuit breakers and a new PTC Resettable fuse etc.., its function is when the circuit current exceeds the design of the rated value, that is, if the load exceeds the design of the current capacity, the circuit will be disconnected, in order to avoid overheating, even fire. Fuse is a one-time use of the protection components, Breaker and PTC can be reused.

The current protection components of the protection current value and the protection reaction time has usually a product of the relationship that is, the greater the current through the current protection component, the shorter the reaction time to protect the circuit. This is similar to energy protection components.

Due to this feature, the 3270 series AC & DC electronic load, in particular for the verification of current protection components, has developed a Fuse Test function to test and verify such protection element with an electronic load of rated current and power. When Turbo mode is set to ON, the test current can be up to double the maximum current within 1 second of test period. Take 3270 as an example, the maximum test current can be doubled to 75A. That is, when the Turbo mode of the 3270 series is ON, the test current value can reach to 2 units 3270 series (normal mode) within 1 second test period.

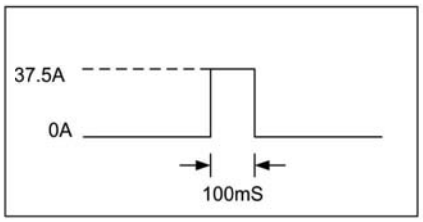
Fuse

Breaker

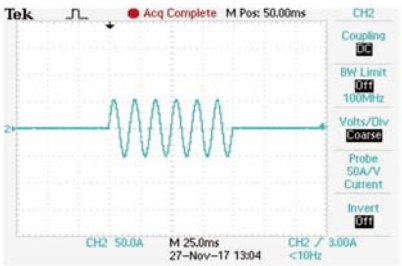
PTC

MODEL		3270	3271	3272
Power (W)		3750 W	2800W	1875 W
Current(Ampere)		37.5 Arms / 112.5Apeak	28 Arms / 84Apeak	18.75 Arms / 56.25Apeak
Voltage(Volt)		50~350Vrms / 500Vdc		
Fuse Test mode				
Max. Current	Turbo OFF	37.5Arms	28.0Arms	18.75Arms
	Turbo ON	75.0Arms (x2) *3	56.0Arms	37.5Arms
Trip & Non-Trip Time	Turbo OFF	0.1~9999.9sec.		
	Turbo ON	0.1~1.0sec.		
Meas. Accuracy		±0.003 Sec.		
Repeat Cycle		0~255		
Short/OPP/OCP Test Function				
Short Time	Turbo OFF	0.1S ~ 10Sec. Or Cont.		
	Turbo ON	0.1S ~ 1Sec		
OPP/OCP Step Time	Turbo OFF	100ms		
	Turbo ON	100ms, up to 10 Steps		
OCP Istop	Turbo OFF	37.5Arms	28.0Arms	18.75Arms
	Turbo ON	75.0Arms	56.0Arms	37.5Arms
OPP Pstop	Turbo OFF	3750W	2800W	1875W
	Turbo ON	7500W	5600W	3750W

Turbo OFF, Short 100ms 37.5A
Test result screen

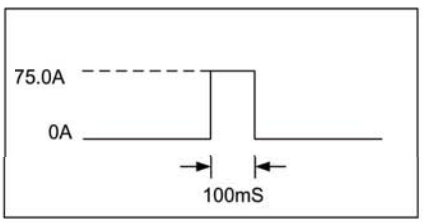


Turbo OFF, Short 100ms 37.5A Setting

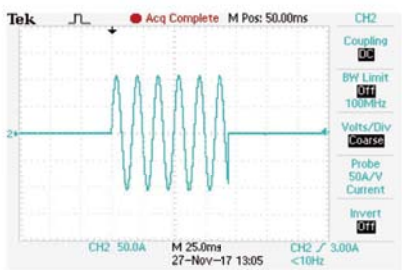


Turbo OFF, Short 100ms 37.5A
The actual test waveform

Turbo ON, Short 100ms 75.0A
Test result screen

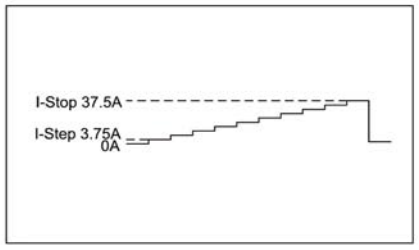


Turbo ON, Short 100ms 75.0A Setting

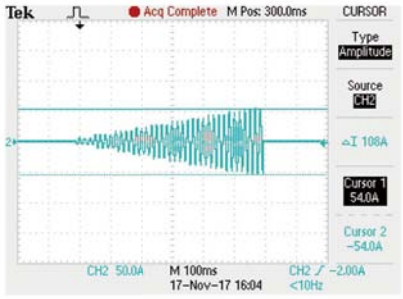


Turbo ON, Short 100ms 75.0A
The actual test waveform

Turbo OFF, OCP Istep 3.75 A Istop 37.5A
Test result screen

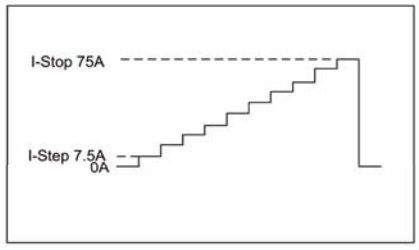


Turbo OFF, OCP Istep 3.75 A Istop 37.5A
Setting

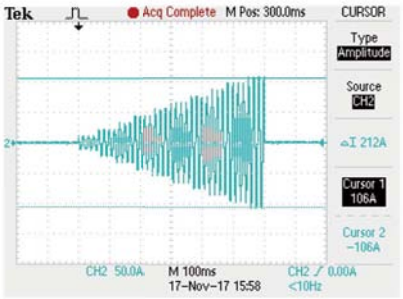


Turbo OFF, OCP Istep 3.75 A Istop 37.5A
The actual test waveform

Turbo ON, OCP Istep 7.5 A Istop 75A
Test result screen



Turbo ON, OCP Istep 7.5 A Istop 75.0A
Setting



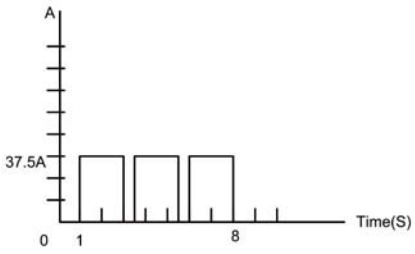
Turbo ON, OCP Istep 7.5 A Istop 75.0A
The actual test waveform

Basically, Fuse test has Trip (Blown) and Non-Trip (no Blown) 2 types.
Fuse Test setting parameters include test current (Istart), test time (Time), test REPEAT Cycle etc..
In the Trip fuse test, it is used to test when there is too large abnormal current the Fuse or Bleaker must be able to provide the protection of the circuit break, that means current protection components need the fuse action, therefore the test current needs to be larger than the fuse current rating.

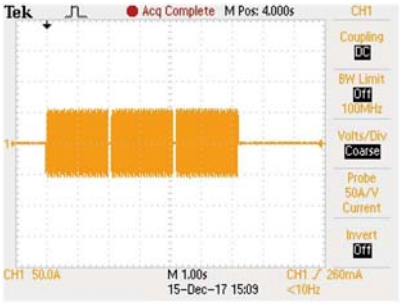
When the 3270 Series AC & DC electronic load detects a voltage lower than 1.0V, the LCD displays the number of Repeat Cycle and Current Protection Fusing Time XXXX.X sec.

In the Non-Trip (no Blown) test, the current protection component is required to achieve non-blow action, so the test current needs to be lower than the fuse current rating that is used to verify the fuse must not blow during normal current range. When the 3270 series AC & DC electronic load is not blown after the test time (Pulse Time) and the number of repeat cycles, the LCD displays the information of the number of repeat cycles.

Turbo：OFF, Fuse mode
Test result screen

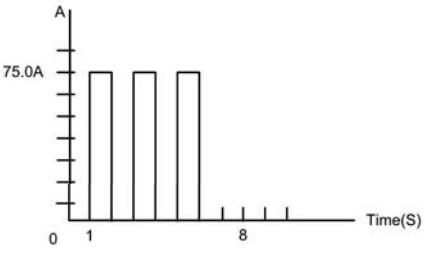


Setting：Turbo：OFF, Fuse ON
CC pulse 37.5A, 2S, Test 3 cycles

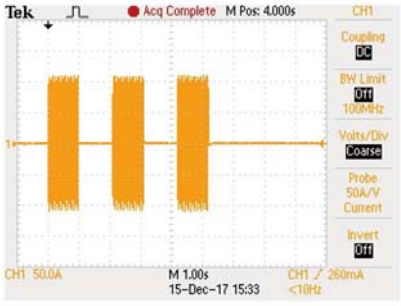


Turbo : OFF, Fuse ON, CC pulse 37.5A, 2S,
Test 3 cycles the actual test waveform

Turbo ON, Fuse mode
Test result screen



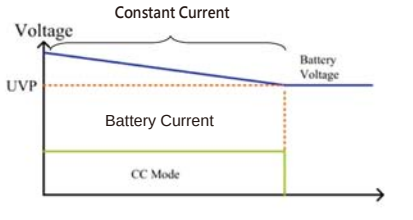
Setting：Turbo：ON, Fuse ON
CC pulse 75.0A, 1S, Test 3 cycles



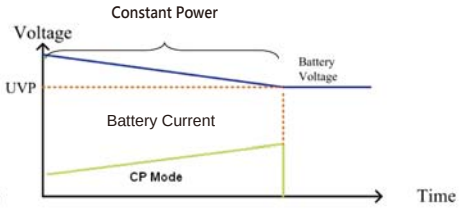
Turbo : ON, Fuse ON, CC pulse 75A, 1S,
Test 3 cycles the actual test waveform

Battery test function

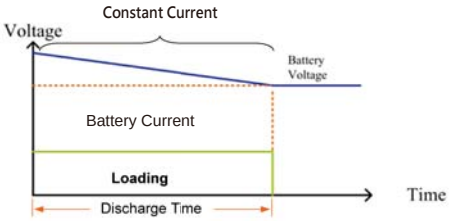
3270 series AC & DC electronic load has built-in new TYPE1 ~ TYPE3 battery discharge test, you can select the desired battery test mode, the test results can be directly displayed on the LCD display for battery AH capacity, the voltage value after discharge and the cumulative discharge time.



CC + UVP Battery discharge mode
Type 1



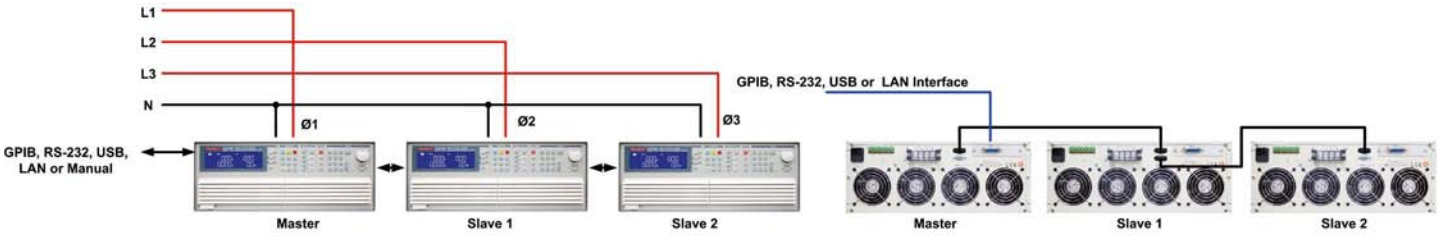
CP + UVP Battery discharge mode
Type 2



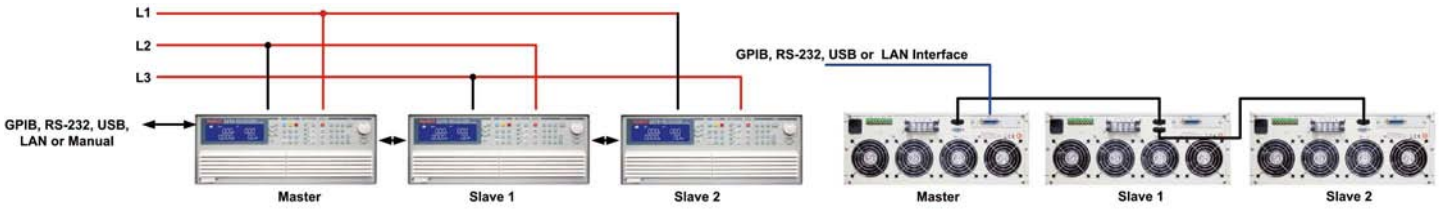
Programmed Battery Discharge Time
Type 3

Parallel and three-phase control

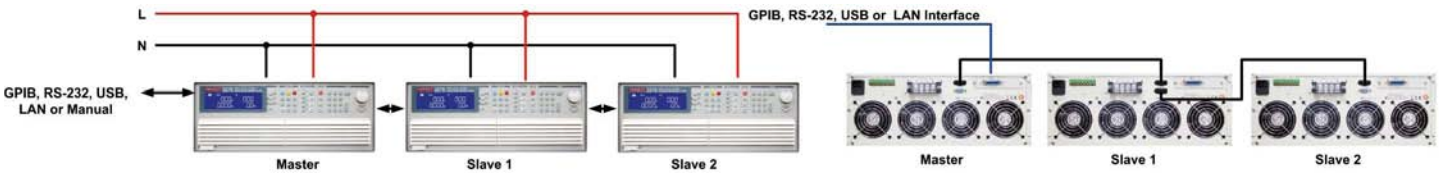
The 3270 Series AC & DC load provides multiple units in parallel, three-phase applications that allows users to test applications with greater power or three-phase AC power, this is more flexibility to use the 3270 Series AC & DC Electronic Load for control. In parallel / three-phase operation, the user operates the unit as the operation of a single machine, as long as the Master can be operated, Slave1 and Slave2 will automatically sink the load and measurement. Parallel and three-phase connection as shown below.



3 phase Y connection



3 phase △ connection



3 units in parallel

Panel instructions

1	**LCD Multi-function display** Four meters can display the voltage value at the same time the Voltage（Vrms, Vpeak, Vmax., Vmin）、Current（Irms, Ipeak, Imax., Imin.）、Watt, Voltampere（VA）、Frequency、Crest Factor、Power Factor、Total Harmonic Distortion of Voltage（VTHD）、Voltage Harmonic（VH）、Total Harmonic Distortion of Current（ITHD）、Current Harmonic（IH）	3	**Operate function keys** Mode、Preset ON / OFF、Load ON / OFF、Sense ON / OFF、Level A / B、Config、Limit、Recall、Store、SEQ、Local、System operate function keys
		4	**Waveform library keys** Can be quickly set CF √2 / 2 / 2.5 / 3 / 3.5，+/- PF0.6 / 0.7 / 0.8 / 0.9 / 1.0， FREQ Auto / 50Hz/ 60Hz / 400Hz。
		5	**Test function keys** Can select Short / OPP / OCP /Non-L / NL-CR /Fuse / Batt (Battery Discharge) / Trans (UPS transfer time) test functions.
2	**Meter switch button** V / A / W keys can set the display Rms / Peak / Max / Min，Meter key can select PF / CF / FREQ，switchable display WATT / VA / VAR keys，THD key choose to display THD	6	Numeric keypad
		7	Knob setting
		8	Switch
		9	Cursor and button setting

10	AC power input connector	13	**Master-slave control connector** Master : Connect the top or bottom to the next unit Slave : The top connects to the previous unit and the bottom connects to the next unit
11	Vmonitor、Imonitor、Analog input、SYNC input Input terminal		
12	Vload, Vsense Input terminal	14	Communication interface (GPIB、RS-232、USB、LAN)

Order Information

- **3270** 350V, 37.5A, 3750W
- **3271** 350V, 28A, 2800W
- **3272** 350V, 18.75A, 1875W

Optional Interface：

1 GPIB Card　3 USB Card
2 RS232 Card　4 LAN Card

Specifications

MODEL		3270	3271	3272
Power (W)		3750 W	2800W	1875 W
Current(Ampere)		37.5 Arms / 112.5Apeak	28 Arms / 84Apeak	18.75 Arms / 56.25Apeak
Voltage(Volt)		50~350Vrms / 500Vdc		
FREQUENCY Range		DC,40~440Hz (CC,CP Mode) , DC~440Hz (LIN,CR,CV Mode)		
PROTECTIONS				
Over Power Protection		≒ 3937.5Wrms or Programmable	≒2940Wrms or Programmable	≒ 1968.75Wrms or Programmable
Over Current Protection		≒ 39.375 Arms, or Programmable	≒ 29.4 Arms or Programmable	≒ 19.687 Arms or Programmable
Over Vlotage Protection		≒ 367.5 Vrms / 525Vdc		
Over Temp. Protection		Yes		
OPERATION MODE				
Constant Current Mode for Sine-Wave				
Range		0 ~ 37.5A	0 ~ 28A	0 ~ 18.75A
Resolution		0.625mA / 16bits	0.467mA / 16bits	0.3125mA / 16bits
Accuracy		± (0.1% of setting + 0.2% of range) @ 50/60Hz , ± 0.5% of (setting + range)		
Linear Constant Current Mode for Sine-Wave, Square-Wave or Quasi-Square Wave, PWM Wave				
Range		0~37.5A	0 ~ 28A	0 ~ 18.75A
Resolution		0.625mA/16bits	0.467mA/16bits	0.3125mA/16bits
Accuracy		± (0.1% of setting + 0.2% of range) @ 50/60Hz , ± 0.5% of (setting + range)		
Constant Resistance Mode				
Range		1.6 ohm ~ 32K ohm	2.133 ohm ~ 42.66K ohm	3.2 ohm ~ 64K ohm
Resolution*1		0.010416mS / 16bits	0.0078137mS / 16bits	0.0052083mS / 16bits
Accuracy		±0.2% of (setting + range) @ 50/60Hz , ± (0.5% of setting + 2% of range)		
Constant Voltage Mode				
Range		50 ~ 350Vrms / 500Vdc		
Resolution		0.1V		
Accuracy		±(0.1% of reading + 0.1% of range)		
Constant Power Mode				
Range		3750W	2800W	1875W
Resolution		0.1W	0.1W	0.1W
Accuracy		±(0.1% of reading + 0.1% of range)		
CREST FACTOR (CC & CP MODE ONLY)				
Range		√2~5		
Resolution		0.1		
Accuracy		(0.5% / Irms) + 1%F.S.		
POWER FACTOR (CC & CP MODE ONLY)				
Range		0~1 Lag or Lead		
Resolution		0.01		
Accuracy		1%F.S.		
TEST MODE				
UPS Efficient Measurement		Non-Linear Mode		
Operating Frequency		Auto ; 40 ~ 440Hz		
Current Range		0~37.5A	0~28A	0~18.75A
PF Range		0~1		
MEASURING EFFICIENCY FOR PV SYSTEMS, POWER CONDITIONERS for THD 80%		Resistive + Non-Linear Mode		
Operating Frequency		Auto ; 40 ~ 440Hz		
Current Range		0~37.5A	0 ~ 28A	0~18.75A
Resistive Range		1.6 ohm~32K ohm	2.133 ohm ~ 42.66K ohm	3.2 ohm~64K ohm
UPS Back-Up function(CC,LIN,CR,CP)				
UVP(V_{TH})		50 ~ 350Vrms / 500Vdc		
UPS Back-Up Time		1 ~ 99999 Sec. (>27H)		
Battery Discharge function(CC,LIN,CR,CP)				
UVP (V_{TH})		50 ~ 350Vrms / 500Vdc		
Battery Discharge Time		1 ~ 99999 Sec. (>27H)		
UPS Transfer Time				
Current Range		0 ~ 37.5A	0 ~ 28A	0 ~ 18.75A
UVP (V_{TH})		2.5V		
Time range		0.15mS ~ 999.99mS		
Fuse Test mode				
Max. Current	Turbo OFF	37.5Arms	28.0Arms	18.75Arms
	Turbo ON	75.0Arms (x2) *3	56.0Arms	37.5Arms
Trip & Non-Trip Time	Turbo OFF	0.1 ~ 9999.9sec.		
	Turbo ON	0.1 ~ 1.0sec.		
Meas. Accuracy		±0.003 Sec.		
Repeat Cycle		0 ~ 255		
Short/OPP/OCP Test Function				
Short Time	Turbo OFF	0.1S ~ 10Sec. Or Cont.		
	Turbo ON	0.1S ~ 1Sec		
OPP/OCP Step Time	Turbo OFF	100ms		
	Turbo ON	100ms, up to 10 Steps		
OCP Istop	Turbo OFF	37.5Arms	28.0Arms	18.75Arms
	Turbo ON	75.0Arms (x2) *3	56.0Arms	37.5Arms
OPP Pstop	Turbo OFF	3750W	2800W	1875W
	Turbo ON	7500W	5600W	3750W
MEASUREMENTS				
VOLTAGE READBACK A METER				
Range		500V		
Resolution		0.01V		
Accuracy		±0.05% of (reading +range)		
Parameter			Vrms,V Max/Min,+/-Vpk	
CURRENT READBACK A METER				
Range		18.75Arms / 37.5Arms	14Arms / 28Arms	9.375Arms / 18.75Arms
Resolution		0.4mA / 0.8mA	0.3mA / 0.6mA	0.2mA / 0.4mA
Accuracy		±0.05% of (reading + range) @ 50/60Hz , ±0.2% of (reading + range)		
Parameter		Irms,I Max/Min,+/-Ipk		
WATT READBACK W METER				
Range		3750W	2800W	1875W
Resolution		0.0625W	0.0467W	0.03125W
Accuracy		±0.1% of (reading + range)		
VA METER		Vrms×Arms Correspond To Vrms and Arms		
Power Factor METER				
Range		+/- 0.000~1.000		
Accuracy		±(0.002±(0.001/PF)*F)		
Frequency METER(V)				
Range		DC,40~440Hz		
Accuracy		0.1%		
Other Parameter METER				
		VA, VAR, CF_I, Ipeak, Imax., Imin. Vmax., Vmin., I_{HD}, V_{HD}, I_{THD}, V_{THD}		
OTHERS				
Master/Slave (3 Phase Application)		Yes		
External programming input		F.S / 10Vdc, Resulotion 0.1V		
External SYNC input		TTL		
Vmonitor (Isolated)		±500V / ±10V		
Imonitor (Isolated)		±112.5Apk / ±10Vpk	±84Apk / ±10Vpk	±56.25Apk / ±10Vpk
Interface (OPTION)		GPIB ; RS-232 ; LAN ; USB		
Operation Temperature *2		0 ~ 40 ℃		
Dimension (H x W x D)		177 x 440 x 513 mm		
Weight		33.5Kg	27.5Kg	21.5Kg

*1 ms (millisiemens) is the unit of conductance(G), one siemens equal to 1/kΩ
*2 Operating temperature range is 0~40℃, all specification apply for 25℃±5℃, Except as noted
*3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCP/OPP test function