Operating Manual – PowerXchanger®

Double Conversion AC Power Converter

EX Step-Down Series

12060EX-08
12060EX-12
12060EX-16
12060EX-21

Input Range: 180 Vac ~ 285 Vac
Input Frequency: 50Hz or 60Hz
Output Range: 100V-110V-115V-120V Selectable
Output Frequency: 50Hz/60 Hz Selectable



Read this manual before using PowerXchanger®. Failure to follow the instructions and safety precautions in this manual can result in serious injury or death.

Keep this manual in a safe location for future reference.

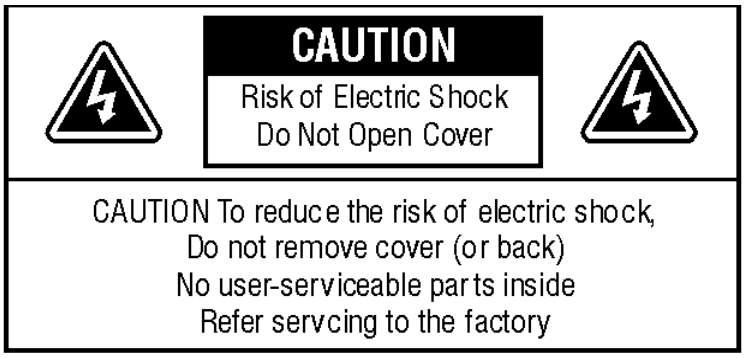
CAUTION:

- The Converter connection instructions and operation described in the manual must be followed in the indicated order.
- Converter must be connected to a nearby wall outlet that is easily accessible. The Converter can be disconnected from the AC-power source by removing the power cord.
- DO NOT install the Converter near liquids or in an excessively damp environment.
- DO NOT let a foreign body penetrate inside the Converter.
- DO NOT block the ventilation grates of the Converter.
- DO NOT expose the Converter to direct sunlight or source of heat.
- If the Converter must be stored prior to installation, storage must be in a dry place.
- The admissible storage temperature range is -15℃ to +55℃.

WARNING – YOUR APPLICATION(S) SHOULD NOT EXCEED MAXIMUM OUTPUT CURRENT

12060EX-08 = 8.4 AMPS MAX
12060EX-12 = 12.6 AMPS MAX
12060EX-16 = 16.8 AMPS MAX
12060EX-21 = 21.8 AMPS MAX

Special Symbols
The following are examples of symbols used on the Converter to alert you of important information.

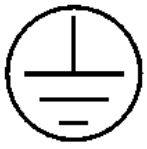




RISK OF ELECTRIC SHOCK -
Indicates that a risk of electric shock is present, and the associated warning should be observed



CAUTION; REFER TO OPERATOR'S MANUAL -
Refer to your operator's manual for additional information, such as important operating and maintenance



SAFETY EARTHING TERMINAL -
Indicates the primary safety ground.

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1. OVERVIEW AND FEATURES

This series is a double conversion Power Converter which produces stable pure sine wave voltage and frequency output (O/P). With the Converter, you can protect your equipment from most of the power problems, including power sags, power surges, brownouts, and line noise, etc. With the common neutral topology, the Converter provides internal connection from AC I/P neutral to AC O/P neutral; thus, it does not need to use an isolation transformer to provide 0 volt from AC I/P neutral to O/P neutral. This feature will reduce the interference to loads of communication or video system.

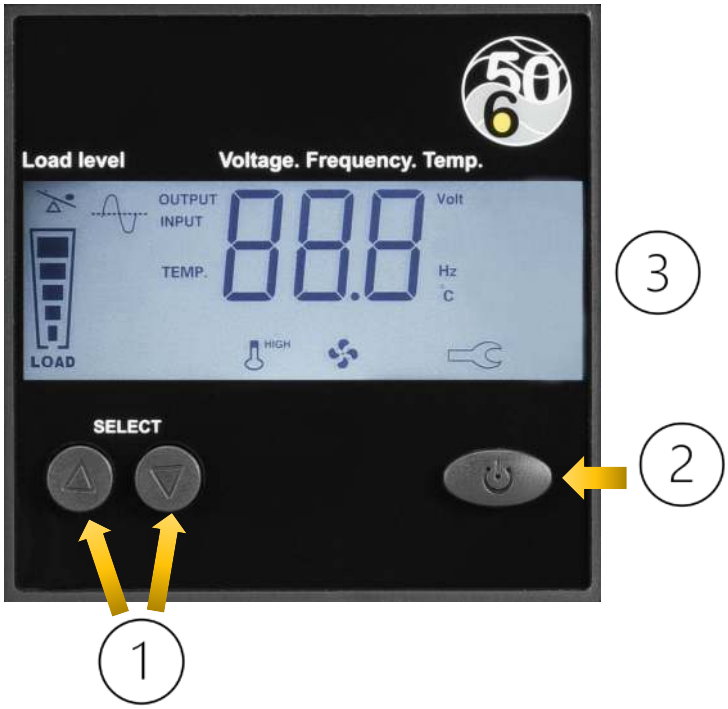
With outstanding performance & reliability, the unique benefits of the Converter include the following:

- Common Neutral, Double Conversion Topology
  (O/P Neutral to I/P Neutral is 0 volts normally)
- Wide Range Input Window and Input Power Factor correction
- Low Noise Smart Cooling Fan Design
- High Efficiency, New Full-bridge Inverter Design
- Full Function LCD Display
- Automatic Restart of Loads After Overload Shutdown
- AC Input Generator Compatible

2. PRESENTATION

2.1 Front Panel

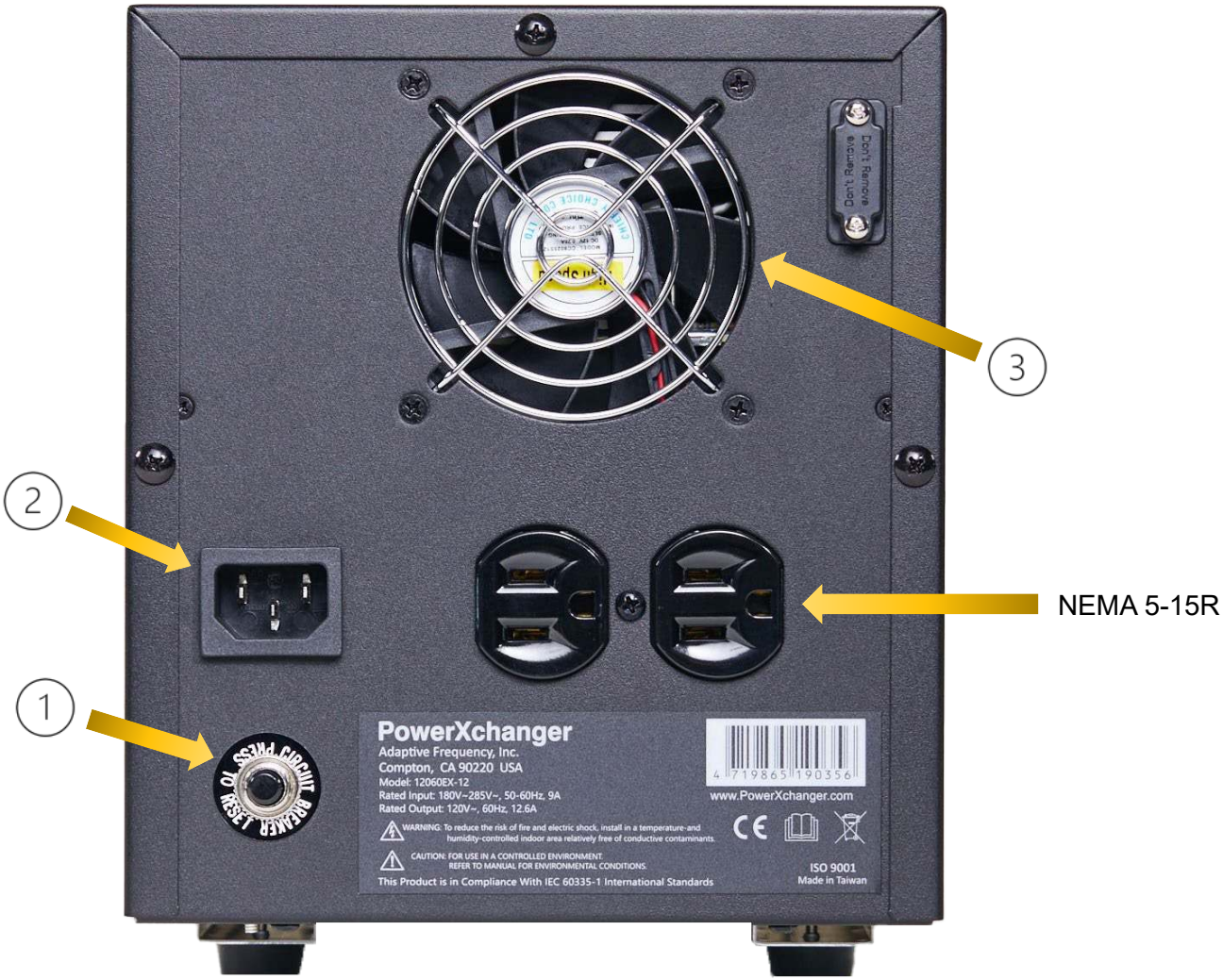
The following shows the LCD Display:



1. Data Select
2. Main Control Button
3. LCD Display

2.2 Rear Panels

EX-8 & EX-12



1. Circuit Breaker
2. Power Inlet
3. Cooling Fan

EX-16 & EX-21



1 Circuit Breaker

2 Power Inlet

3 Cooling Fan

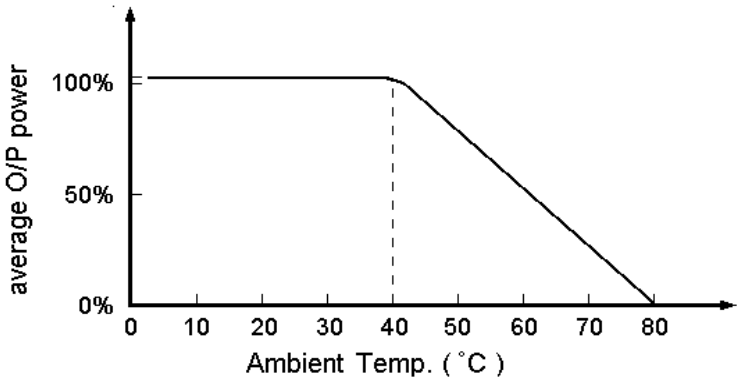
3. INSTALLATION

- **SAVE THESE INSTRUCTION**. Please follow these instructions for installation and maintenance of the Converter. Please read all instructions before operating the equipment and save this manual for future reference.

- Increased ambient temperature will shorten the life of the Converter, keep the Converter away from heating elements.

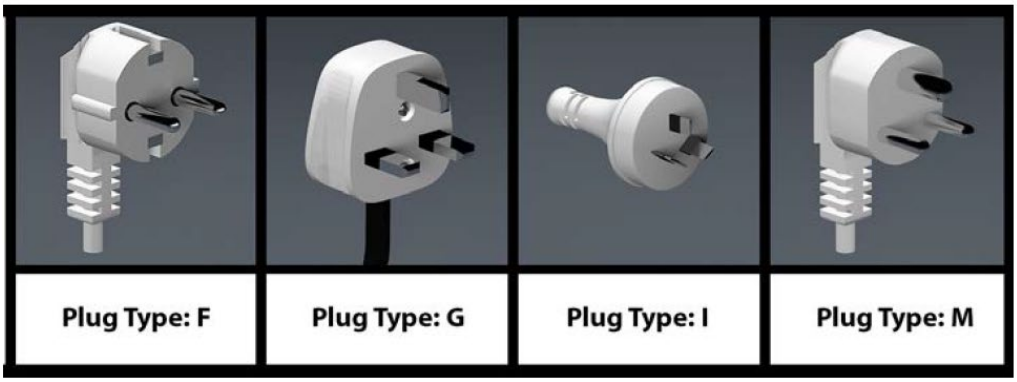
- If ambient temperature is over 40℃, the load level will be reduced.

- The ambient temperature should be between 0°C and 40°C to ensure optimal operation, over this range will reduce the average output power due to thermal de-rating.



3.1 INCLUDED ACCESSORIES

International Power Cord Set: 4 of the most commonly used plug type power cords



4. OPERATION

4.1 After installation with normal city power, the Converter will turn on automatically. Confirm the output voltage and frequency from LCD display by pressing the up/down select button.

4.2 Converter OFF: Pushing the main control button for 3 seconds, the Converter will turn off the output voltage. The CPU will run "OFF(idle) mode when LCD shows 'OFF'.

4.3 In idle mode, Converter will turn on again when the main control button is pushed for 1 second. Please pull out the power cord or disconnect the input power if you want to shut down the converter completely.

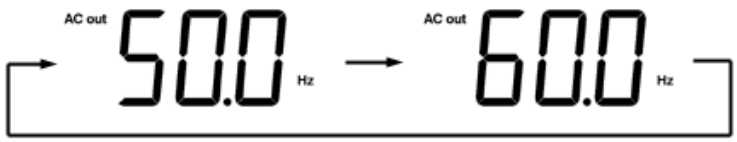


4.4 Change the Output Voltage and Frequency: To push the two selection buttons, △ and ▽, at the same time for 3 seconds until the LCD display begins to blink.



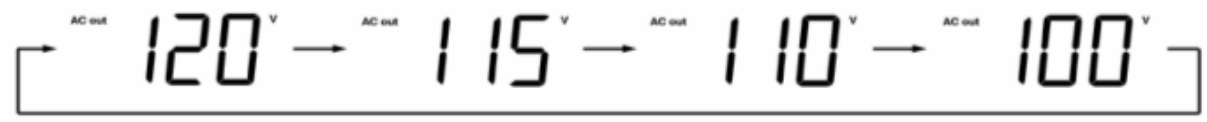
4.4.1 To Change the Converter O/P Frequency

When the frequency value is blinking, push any selection button, △ or ▽, for 1 second to change the frequency setting! The setting will keep changing every 2 seconds if you keep pushing the button. Push two selection buttons at the same time for next setting, or leave the LCD blinking without pushing any button for 30 seconds to end the setting.



4.4.2 To Change the Converter Rated Voltage

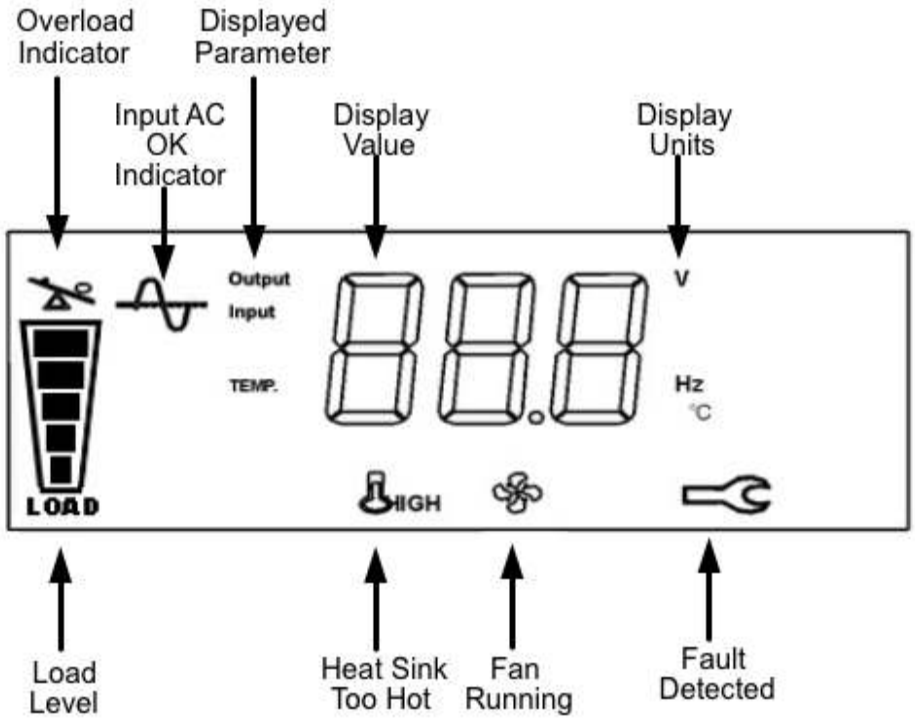
When the voltage value is blinking, push any selection button for 1 second to change the rated voltage. Keep pushing the button until the required voltage blinking. Then, push two select buttons at the same time for confirmation, or leave the LCD blinking for 30 seconds to end the setting.



5. INDICATION AND CONTROL

5.1 LCD Display

The Converter LCD display shows the input voltage, output voltage, output frequency, output load level, and temperature.



5.2 Thermal Protection

If the Converter detects that it is starting to overheat, it will sound a sequence of 32 beeps every two seconds. The LCD will show high temperature symbol when the inside is too hot. If the Converter continues to overheat, it will eventually turn itself off to protect itself from damage. Once the Converter has cooled off sufficiently, it will automatically restart.

5.3 Output Short Circuit Protection

If the Converter detects that the output voltage is too low for at least 250 ms, and the output is short circuited or extremely overloaded. The Converter will shut down and attempt to restart after 30 seconds.

The Converter will continue attempting to restart up to 30 times. If the overload is still present after 30 attempts, the Converter shuts down and latches off. To restore the Converter operation, remove the cause of the output short circuit or extreme overload, then push the main control button for 1 second, the Converter will turn on again.

5.4 Output Overload Alarm

The Converter can accept up to 129% of full load (See spec. for each model's rating) before continuous alarm sounds. If the output current drawn by the load exceeds the Converter's over current alarm threshold, the CPU timer will start to count. If the overload continues for more than one minute an audible alarm will sound as long as the overload is present. If the overload alarm continues for more than one minute, the Converter will turn off the output. After a 30 second delay, the Converter output will restart.

5.5 Output Overload Protection

If the output of the Converter is loaded to more than its output overload protection threshold for more than two seconds, it will turn off its output, sound an audible alarm, and LCD will display overload symbol. After a 30 second delay, the Converter will turn on the output again. If the overload is no longer present, the audible alarm will stop, and the output will operate normally. If the overload is still present, the Converter will once again turn off the output and wait 30 seconds before attempting to start again.

6. SPECIFICATIONS

STEP-DOWN VOLTAGE AND FREQUENCY CONVERTER (EX SERIES)
EX-8 / EX-12 / EX-16 / EX-21

⊟ Output

Capacity	1000VA/900W	1500VA/1350W	2000VA/1800W	2600VA/2340W
Output Voltage	100V/110V/115V/120V Selectable			
Voltage Waveform	Sine wave			
Crest Factor	3 : 1			
Output Frequency (Sync to Mains)	50/60Hz (selectable from LCD function button)			
Output Frequency (Not Sync to Mains)	50±0.01Hz or 60±0.01Hz			
Regulation	±2% of selected output voltage (adjustable by using the setting software)			
OUTPUT CURRENT 100 V ~ 120 V	8.4 Amp	12.6 Amp	16.8 Amp	21.8 Amp
OUTPUT PEAK CURRENT (<250mS)	26 Amp	40 Amp	52 Amp	67 Amp
Overload Protection	100%~129% for 60 seconds delay, then alarm; alarm for 60 seconds, then shutdown o/p; 130%, alarm for 2 seconds, then shutdown o/p;			
Harmonic Distortion	<3% (at full resistive load)			
Efficiency	Up to 90%			

⊟ Input

Voltage Range	180V~285Vac			
Frequency Range	45~70Hz			
Input Current	6 Amp	9 Amp	12 Amp	15A
Power Factor	≧0.98			
Surge Current	<100A, 3mS			

⊟ Communications & Management

Control Panel	LCD
Audible Alarm	Overload Alarm, Short-Circuit Alarm, Thermal Alarm

⊟ Environmental and Safety

Operating Temp.	Up to 1500 meters: 0℃ to 40℃ (32℉ to 104℉)
Transit / Storage Temp.	-15℃ to 55℃ (5℉ to 131℉)
Relative Humidity	5 - 95% non condensing
Operating Altitude	0 ~ 3000 meters
Audible Noise	≦45 dBA (at 1 meter from surface of unit)
Safety Markings	CE
Quality Control System	ISO9001

Physical

Dimension D x H x W	EX-8: 38×20×18cm/ 48 x 33 x 30cm (packing) EX-12: 45×20×18cm/ 54 x 33 x 30cm (packing) EX-16/Ex-21: 51×20×18cm/ 61 x 33 x 30cm (packing)	EX-8: 15×8×7in/ 19 x 13 x 12in (packing) EX-12: 18×8×7in/ 21 x 13 x 12in (packing) EX-16/Ex-21: 20×8×7in/ 24 x 13 x 12in (packing)
Weight (Net W. / Gross W.)	EX-8: 6.5kg / 8.5kg； EX-12: 7kg / 9kg； EX-16: 8kg / 10kg EX-21: 8.5kg / 10.5kg	EX-8: 14lbs / 19lbs EX-12: 15lbs / 20lbs EX-16: 18lbs / 22lbs EX-21: 19lbs / 23lbs

PS.“＊ ” Please refer to the input range for the condition of output rated capacity.

LIMITED WARRANTY

Adaptive Frequency Inc. warrants for two years from the date of shipment, the product is free of manufacturing defects and conforms to Adaptive's product specifications in force as of the date of manufacture of the product shipped.

This warranty does not apply to accidental damage, shipping damage, misuse, abnormal line or source voltage, abnormal conditions of operation beyond the parameters specified in this product manual;

- Products which have been opened, misused, tampered with internally and or deliberately modified will void the warranty;
- The failure to return a unit claimed to be defective in its original packaging will void the warranty;
- Upon receiving the properly returned defective unit, Adaptive will verify that the unit is defective and upon verification will ship a replacement unit at Adaptive's cost and reimburse purchaser's shipping charges for return of the defective unit.
- Prior to shipping the defective unit, purchaser shall contact Adaptive at www.PowerXchanger.com/Returns to complete a return authorization form and so that Adaptive can assist in making the shipping arrangements;
- Any claim under this warranty requires that purchaser send with the return shipment, a proof of purchase, the unit serial number and the completed return authorization form;
- If it is determined that this warranty has been voided for any of the above reasons, the unit will be returned to the sender;

Adaptive shall only be liable under this warranty if the product has been used in accordance with Adaptive's instructions, in force on the date of purchase.

The purchaser must examine the product when received and promptly notify Adaptive in writing of any non-conformity before the product is used and no later than 30 days after such non-conformity is first discovered. If Adaptive, in its sole discretion, determines that the product has breached the above warranty, it will, at its sole discretion: replace the non-conforming product; refund the purchase price; or issue a credit in the amount of the purchase price. This is the sole and exclusive remedy for breach of this warranty. Any modification of this Warranty shall be binding only if such modification is in writing, and signed by an Adaptive officer. This information supersedes all other sales information received by the purchaser during the sales process.

THE FOREGOING WARRANTY SHALL BE EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER WARRANTIES OTHERWISE ARISING BY OPERATION OF LAW, COURSE OF DEALING, CUSTOM, TRADE OR OTHERWISE.

LIMITED LIABILITY

Adaptive Frequency Inc. (“Adaptive”) shall not be liable in contract or in tort including, without limitation, negligence, strict liability or otherwise for loss of sales, revenues or profits; cost of capital or funds; business interruption or cost of downtime, loss of use, damage to or loss of use of other property (real or personal); failure to realize expected saving; frustration of economic or business expectations; claims by third parties (other than for bodily injury), or economic losses of any kind; or for any special; incidental, indirect, consequential, punitive or exemplary damages arising in any way out of the performance of, or failure to perform, its obligations under any contract for sale of product, even if Adaptive could foresee or has been advised of the possibility of such damages.

In addition, Adaptive’s liability shall be limited to the purchase price of the Adaptive product or products that is the source of the claim, and in no event more than the aggregate purchase price, for the last six months, of Adaptive’s products purchased by the purchasing party. The Parties expressly agree that these limitations on damages are allocations of risk constituting, in part, the consideration for this agreement, and also that such limitations shall survive the determination of any court of competent jurisdiction that any remedy provided in these terms or available at law fails of its essential purpose.

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