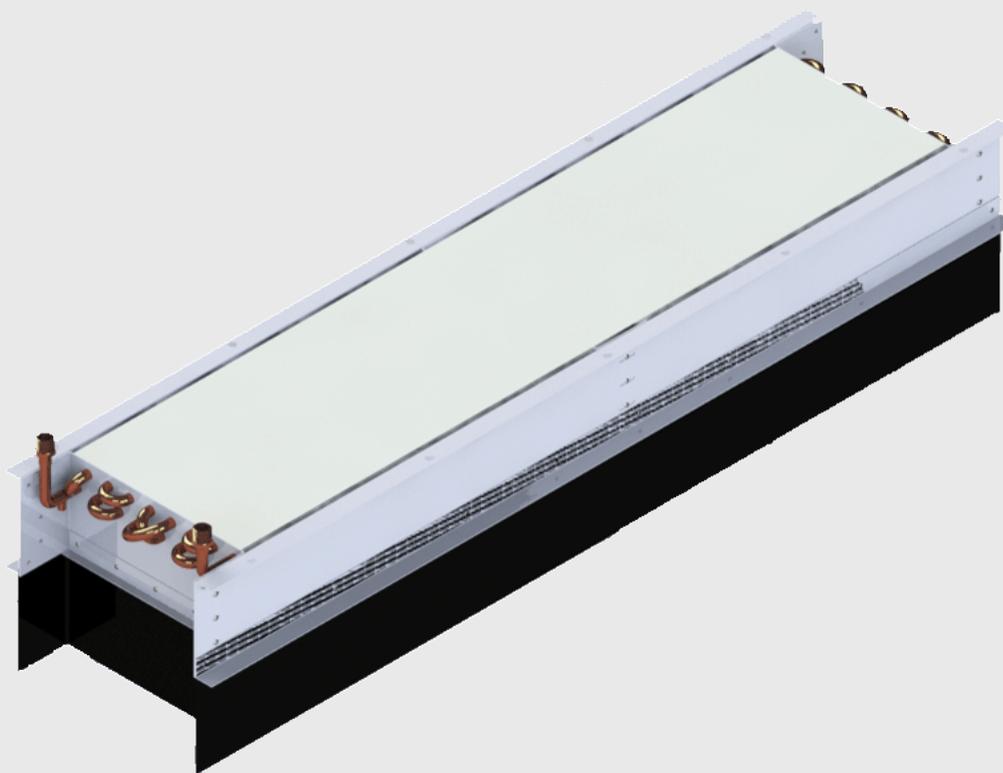


Installation, Operation and  
Maintenance Manual

Passive Chilled Beam  
Type TPB



# Contents

## General Information

1.1	Introduction	3
1.2	Safety	3
1.3	Symbols used in this manual	3
1.4	Receiving, Inspection and Storage	3
1.4	Damage reporting	3

## Product Description and Installation Preparation

2.1	Product overview	4
2.2	Construction description	4
2.3	Application precautions	4
2.4	Preparation for installation	4
2.4	Items provided by installer	4
2.4	Precautions	4

## Installation

3.1	General procedure	5
3.2	Installation considerations	5
3.3	Hanging the chilled beam	5
3.4	Water connections	6
3.5	Flushing the water piping system	6
3.6	Filling and venting the water system	6

## Commissioning

4.1	Waterside commissioning	6
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## Maintenance

5.1	Cleaning instructions	7
5.2	Replacement parts	7

## Troubleshooting

6.1	Symptoms & Solutions	7
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## Warranties

7.1	Representations and Warranties	8
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# General Information

## 1.1 Introduction

This installation, operation and maintenance manual is intended for passive chilled beam Type TPB-RB and TPB-EB.

**You must read all instructions prior to the installation, operation or maintenance of this product. Take special note of the information that is accompanied by the symbols described in section 1.3 below.**

Passive chilled beams are a very simple yet effective cooling device, use for dissipation of high internal heat loads. They offer low investment costs ideal for refurbishment or new construction projects.

## 1.2 Safety

The customer must use qualified personnel and follow all applicable building codes and safety regulations when installing, commissioning and performing maintenance of this product. Eye protection, gloves and hard hat should be worn at all times when handling the product.

Consult all local building, occupational safety and other codes applicable to the installation.

Please pay particular attention to the symbols used throughout the manual that indicate safety related issues, warnings and important notices or information; read the complete manual before installation and be familiar with the meaning of the safety symbols in the next section 1.3.

## 1.3 Symbols used in this manual

When reading this manual, particular attention must be given to the parts marked with the following symbols:



### Warning!

Indicates a potentially dangerous situation for the product and the environment



### Important!

Designation of a danger that can cause personal injury or damage to property



### Note

Indicates important notices or information



### Fragile

Handle with care. The chilled beam should not be handled using the water pipes or damage to the coil assembly will result.

## 1.4 Receiving, Inspection and Storage

All TROX products are inspected and tested prior to shipment to ensure the highest quality. Chilled beams are packed individually in cardboard cartons.

Upon receipt of the chilled beam shipment, conduct a thorough inspection of the outer packaging and pallets for possible damage. If damage has occurred during shipping, indicate the damaged items on the delivery papers immediately and inspect the chilled beams contained in those containers for damage.

If damage has occurred during shipping, immediately file a claim with the carrier.

Refer to the Manufacturer's Representations and Warranties (included in each carton and on page 11 of this manual) for detailed handling instructions and damage reporting procedures.



### Note

Chilled beam should not be removed from its individual carton for storage. Beams should not be unpacked until they have been moved to the installation location and just before installation is to begin (see details on pages 4-5).

Beams should be stored in a clean and dry location. If beams remain packaged as delivered (strapped and wrapped on pallet), they can be stored as delivered (do not stack pallets). If packaged beams are removed from pallet, they should not be stacked more than four high. Packaging is not suitable for outside storage.

# Product Description / Installation Preparation

## 2.1 Product Overview

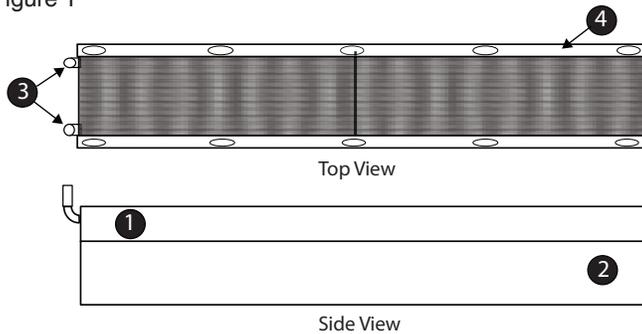
TROX passive beams Type TPB are suitable for mounting above the ceiling grid (TPB-RB) or suspended freely in the space (TPB-EB). By using water as a cooling medium, TROX passive chilled beams provide energy benefits over traditional cooling systems. See figure 2 below for detailed image of the TPB-RB and TPB-EB passive beams.

## 2.2 Construction Description

The assembly (figure 1) of the TPB consists of:

1. Casing
2. Separation skirt (TPB-RB only)
3. Coil return and supply water connections
4. Support flange

Figure 1



## 2.3 Application precautions



### Note

TPB passive chilled beams provide sensible cooling only and cannot be used to do latent cooling. Condensate trays or the option to retrofit one is not available.

## 2.4 Preparation for installation



### Important!

Designation of a danger that can cause personal injury or damage to property

### Installer to provide:

1. A suspension system (including all hardware) for mounting the chilled beam.
2. Flexible hoses (recommended) for water connections from assembly to the supply and return water circuits (unless factory furnished flexible hoses are include with product order) or hard connections.

### Precautions



### Important!

Wear eye protection and gloves during installation. Product includes sharp edges and burrs.

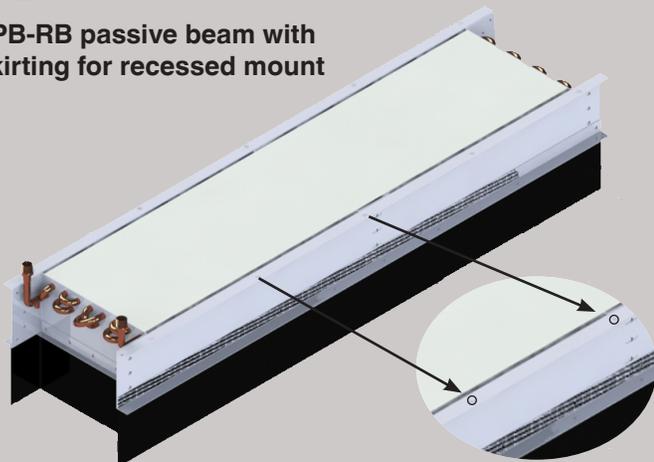


### Product is heavy!

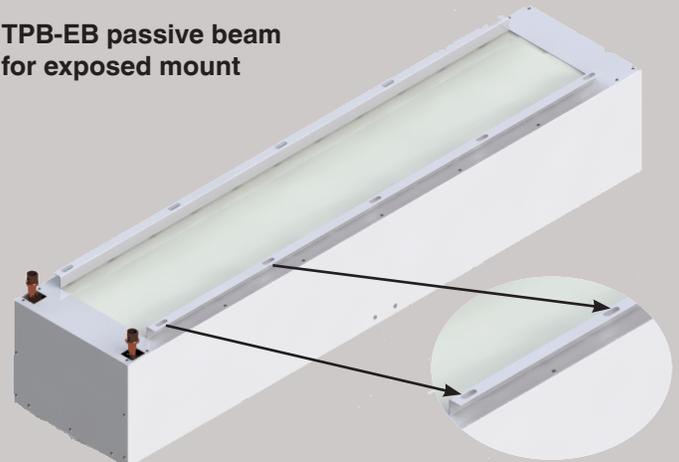
Machinery recommended for movement and installation of beams. Passive beams can weigh as much as 150+ lbs. Use caution when removing from packaging and hanging beam.

Figure 2

### TPB-RB passive beam with skirting for recessed mount



### TPB-EB passive beam for exposed mount



# Installation

## 3.1 General procedure

Chilled beams should be mounted and connected prior to installing the suspended ceiling or drywall. The unit should be installed in the location shown on the design drawings. Deviation from the designed mounting position should be avoided as the chilled beam location in relation to the room walls and other chilled beams is critical to the comfort of the conditioned space.

Exposed passive beams with grille leave the factory with low-tack film applied to the face to protect the painted surface. If film is present on beam face, it should remain on beam during installation. Beams installed above the ceiling tile will not have a blue film.



### Warning!

Care should be taken to avoid any water or condensation buildup between the blue film and the beam face during handling and waterside commissioning.

## 3.2 Installation considerations

### Note

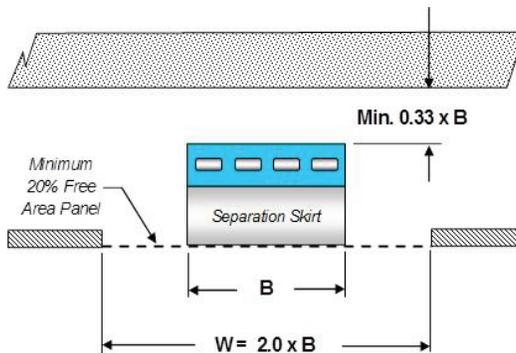
It is recommended that chilled beams be installed using flexible hoses.

**If hard connections are used, the connections should be made AFTER the chilled beam is lowered into its final decision.**

## 3.3 Hanging the chilled beam (by Mechanical Contractor)

1. Determine beam locations according to design drawings. If applicable, refer to figure 3 below for interior space installations and figure 4 for perimeter installations above the ceiling.
2. Fix anchors (type dependent on building design and determined by others) into the structure above the chilled beam mounting location.

**Figure 3:**  
Beam location example for interior installations



3. The beam should be suspended using building code approved threaded rods or wires (both provided by others). The rod or wire allow the beam's vertical height to be adjusted so that the beam can be lowered into its final position.
4. The unit is provided with mounting brackets located on the top of the beam and running along its length on both sides (see figure 2, page 4).

### Guidelines when using rods:

1. Install unistrut with appropriate support to carry the beam
2. Fasten studs to Unistrut with Unistrut nut in proper location above the beams mounting brackets
3. Adjust beam as needed to final hanging location

### Guidelines when using wire:

1. Wire/cable should be looped through each of the provided hanging locations along the mounting brackets on the top of the beam (see images bottom of page 4) and fastened above securely to the anchors above the chilled beam.

### Suspension device requirements

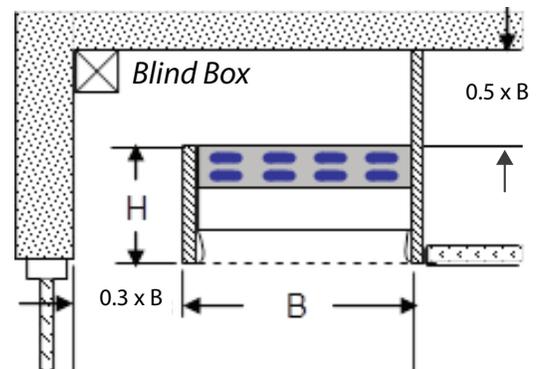
Chilled beams up to 6ft in length should be supported by a minimum of four (4) suspension devices. Chilled beams above 6ft in length should be supported by a minimum of six (6) suspension devices.



### Warning!

Each unit should be supported independently from the suspended ceiling. The fixing points should only carry the weight of the chilled beam. Separate supports should be provided for adjacent systems and components.

**Figure 4:**  
Beam location example for perimeter installations



# Installation & Commissioning

Once the chilled beam has been lowered into its final position, the water connections can be made.

## 3.4 Water Connections

The chilled beam is fitted with two water pipes (see figure 5 below for pipe configuration) which terminate in either NPT threaded male connections or straight pipe ends for field soldering. Each coil is factory tested for leakage and provided clean and capped.

1. Identify the chilled water supply connections on the beam.
2. Remove the plastic cap before making the final water connections.
3. Make water connections.



### Warning!

If NPT connections apply, do NOT overtighten! Applying excessive force on the water pipes may damage the heat exchange coil.

## 3.5 Flushing the water piping system

Before flushing the water system, close all valves that isolate the beams and flush the main piping system first.

## 3.6 Filling and venting the water system

To ensure the easy venting, the main pipes should be installed at a higher level than the beams. The horizontal pipes should be installed rising slightly towards the venting points.



### Note

There should be no high points to create "air pockets" within the system!



### Warning!

The hanging wire should NEVER angle across the beam as it will put undue stress on the support flange.

Before filling, all shut-off and control valves must be in the fully open position. The pumps should not be running as the system is being filled (static filling). Continuous venting is necessary. The installation of both manual and automatic venting systems is recommended. The pump should only be started when filling is complete.

To remove all air from the system, the majority (>75%) of the system should be closed so that the water can circulate fast enough. When each section is full, it should be closed and the procedure repeated throughout the system.



### Note

Use non-chilled water when filling up the system! Cold water can cause immediate condensation on the pipes. Warm water contains less oxygen which can limit venting to some extent.

## 4.1 Waterside Commissioning



### Important!

Wear eye protection and gloves. Product includes sharp edges and burrs.



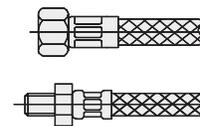
### Important!

Commissioning is to be performed by properly trained and authorized personnel only!

1. Fully purge the complete hydronic system of air prior to commissioning.
2. Carefully inspect the system for leaks, paying particular attention to the connections.
3. Carefully inspect flexible hose, if applicable, for leaks. Factory-provided flexible hose shown here (not provided on all orders)

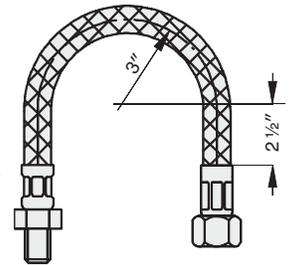
### Flexible hose

For water connections 1/2" NPT



Female swivel thread for connection to beam

Male fixed thread for connection to pipe header



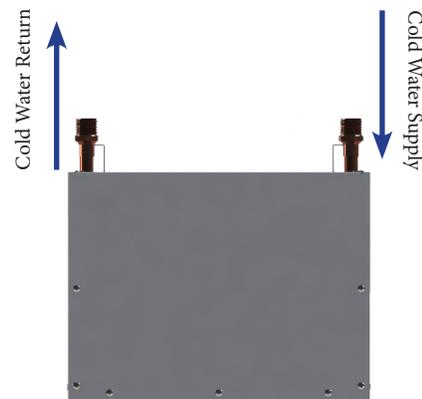
Min. bending radius



### Note

The chilled beam is not provided with any water flow control or measuring devices, therefore the pipe work system should be fitted with sufficient balancing aids to enable adjustment of the flow rate.

**Figure 5:**  
**Passive chilled beam pipe configuration**



# Maintenance & Troubleshooting

## 5.1 Maintenance/Cleaning Instructions

The chilled beam unit contains no moving or consumable parts, therefore the maintenance requirements are limited to periodic inspection for leakage and occasional cleaning of the heat exchanger.

The accumulation of dust on the heat exchanger coil could eventually restrict the airflow through the coil, reducing cooling performance.

The inspection frequency is subject to environmental conditions and occupancy levels. Environments where bed linen is in use, for example, would require more frequent cleaning than office environments.

It is recommended that the beams be inspected on an annual basis until a pattern is established.

To clean the heat exchanger coil:

1. Access the coil located on the top of the beam.



### Note

Beams can be recessed into the ceiling or exposed. Accessing the coil will be dependent on application type.

2. Using a soft nozzle brush attached to vacuum cleaner, gently vacuum back and forth in the direction of the coil to remove any accumulated dust.

## 5.2 Replacement Parts

Passive chilled beams contain no serviceable or consumable parts.

## 6.0 Troubleshooting

Symptom	Probable Cause	Solution
Reduced Cooling	Obstruction of airflow on heat exchanger coil	Inspect and clean heat exchanger as necessary
	Loss of water circulation through heat exchanger coil	Inspect control valves and check flow using system check points
Condensation on pipe-work or heat exchanger	Chilled water temperature too low	Measure chilled water temperature and reset to design values
	Incorrect primary air temperature or condition	Measure room humidity level. If humidity is higher than design condition, the primary air is failing to control room humidity. The air handling unit must be set so the primary air is dry enough to offset the latent gains.

# Representations and Warranties

## 7 Representations and Warranties



### MANUFACTURER'S REPRESENTATIONS AND WARRANTIES

**TROX USA, INC.**  
4305 Settingdown Circle  
Cumming, GA 30028

Phone: +1 (770) 569 1433  
Fax: +1(770) 569 1435

These Representations and Warranties are applicable to all customers (the "Customers" and each, individually, a "Customer") purchasing products (the "Products") manufactured by TROX USA, Inc. (the "Company").

#### 1. Warranty and Limitations:

1.1. Company warrants solely to the original purchaser of the Products that for the Warranty Period (as defined below), the Products will be free from defects in materials and workmanship under normal use, and will conform to Company's published specifications of the Products. Notwithstanding the foregoing, Company retains its right to deviate from its published specifications due to the latest innovations and improvements in function and design of the Products. The foregoing warranty is subject to the proper storage, transportation, installation, use and maintenance of the Products and does not include defects due to normal wear and tear or deterioration, improper modifications of the Products, improper construction of the surrounding facilities and unsuitable static, chemical, electrochemical or electrical conditions.

1.2. In the event of any shipping and freight damages of the Product, Customer shall refer any claims to the shipping company.

1.3. Upon delivery, Customer shall immediately and within seven (7) working days inspect the Products for conformity and visible defects (other than the shipping and freight damages described above in Section 1.2). Customer shall give Company immediate written notice of any non-conformities or visible defects regarding the Products, including photographs of the same, and contact Company in writing concerning return or repair, as the case may be. In order to make a determination regarding the existence of the alleged defect or non-conformity and the proper remedy thereof, the Company shall have the right to inspect the Products at Customer's premises. In the event that the Customer refuses to give Company access to its premises in order to inspect the Products, Customer shall lose all warranty claims related to the Products to be inspected.

1.4. Any defect or non-conforming Product discovered upon delivery should immediately be stored in a safe place and not be installed. If the defective or non-conforming Product is installed, TROX USA shall not be liable for any labor or charges associated with installation or labor costs, unless specific prior authorization is issued in writing by an officer of the Company.

1.5. Customer shall notify Company in writing of any defects of the Products immediately upon discovery. Any defect or non-compliant Product or part thereof should be put aside for inspection by the Company and should not be installed. Company's sole obligation under the foregoing warranty is, at Company's option, to repair or correct any such covered defect or to replace or exchange the Product. Customer shall bear all shipping and handling expenses related to the return of the Products. Any repaired, corrected, replaced or exchanged Products shall be subject to the warranty set forth in 1.1., following their repair, correction, replacement or exchange. If Company has received notification from Customer, and no defects of the Product could be discovered, Customer shall bear the costs that Company incurred as a result of the notice.

1.6. With respect to orders made to custom, any defects of the Products caused by Customer's specifications are excluded from the warranty set forth in 1.1.

1.7. Company also makes no warranty that the Products manufactured under an order made to custom do not infringe the intellectual property or other proprietary rights of any third party and Customer is solely responsible for assuring that such Products do not so infringe.

1.8. The "Warranty Period" begins on the invoice date, and continues to be in effect for twelve (12) months.

1.9. Company does not authorize any person or party to assume or create for it any other obligation or liability in connection with the Products except as set forth herein.

1.10. All requests and notices under this Warranty shall be directed to:

TROX USA, Inc.  
Attn. Thomas J. Bosko, Production Manager  
4305 Settingdown Circle  
Cumming, GA 30028

Fax: +1(770) 569 1435  
E-Mail: [tjb@troxusa.com](mailto:tjb@troxusa.com)

1.11. THE WARRANTY SET FORTH IN SECTION 1.1 IS MADE IN LIEU OF ALL OTHER WARRANTIES (WHETHER EXPRESS OR IMPLIED), RIGHTS OR CONDITIONS, AND CUSTOMER ACKNOWLEDGES THAT EXCEPT FOR SUCH LIMITED WARRANTY, THE PRODUCTS ARE PROVIDED "AS IS." COMPANY SPECIFICALLY DISCLAIMS, WITHOUT LIMITATION, ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF ANY KIND, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, AND THOSE WARRANTIES ARISING FROM A COURSE OF PERFORMANCE, A COURSE OF DEALING OR TRADE USAGE.

#### 2. Limitation of Liability:

2.1. IN NO EVENT SHALL COMPANY BE LIABLE FOR ANY INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS, REVENUE, GOODWILL OR USE, INCURRED BY CUSTOMER OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT, TORT, STRICT LIABILITY, OR IMPOSED BY STATUTE, OR OTHERWISE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. COMPANY'S LIABILITY FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCTS. IT IS AGREED AND ACKNOWLEDGED THAT THE PROVISIONS OF THIS AGREEMENT ALLOCATE THE RISKS BETWEEN COMPANY AND CUSTOMER, THAT COMPANY'S PRICING REFLECTS THIS ALLOCATION OF RISK, AND BUT FOR THIS ALLOCATION AND LIMITATION OF LIABILITY, COMPANY WOULD NOT HAVE ENTERED INTO THIS AGREEMENT.

2.2. IN JURISDICTIONS THAT LIMIT THE SCOPE OF OR PRECLUDE LIMITATIONS OR EXCLUSION OF REMEDIES OR DAMAGES, OR OF LIABILITY, SUCH AS LIABILITY FOR GROSS NEGLIGENCE OR WILLFUL MISCONDUCT OR DO NOT ALLOW IMPLIED WARRANTIES TO BE EXCLUDED, THE LIMITATION OR EXCLUSION OF WARRANTIES, REMEDIES, DAMAGES OR LIABILITY SET FORTH ABOVE ARE INTENDED TO APPLY TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW. CUSTOMER MAY ALSO HAVE OTHER RIGHTS THAT VARY BY STATE, COUNTRY OR OTHER JURISDICTION.

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