

Racing Driver Cooling System Basic Model

Model: COMP-RDCS-12200-BS

Rev. A

Operation Manual



Designed for Racing Drivers to Combat Heat in Extreme Hot Conditions!
Keeping body ready cool, extend endurance, reduce lap times.

Compcooler, keep your body cool and comfortable in harsh conditions.

COMPCOOLER Introduction:

Compcooler Technology specializes in working for personal cooling & heating systems for harsh conditions. Compcooler has established its resume as a manufacturer for Military, Electronic, Medical cooling equipment. The employees at Compcooler's state of the art manufacturing facility have been producing liquid heating & cooling systems over 15 years. Quality system: ISO9001 and AS9100 registered facility. Certifications for major items: CE, FCC, UL, PSE, CB, FDA.

Product Categories

1. ICE Water Circulation Systems
2. Micro Refrigeration Chiller Units
3. Liquid Heating Systems
4. Liquid Cooling & Heating Garment and Pad
5. Customized Cooling Systems
6. Industrial Chiller or Cooling Module

Certifications for major items



Quality System for facility



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Racing Driver Cooling Unit

Model: COMP-RDCS-12200-BS

Description:

Compcooler Racing Driver Cooling System (RDCS) is a rugged vehicle-based refrigeration cooling unit and specially designed for Racing drivers body cooling in the extreme hot ambient. Maintain energy, extend endurance, ensure focus, to reduce lap times for driver ultimately.

Compact Micro Refrigeration Chiller unit pumps the cold liquid to cooling vest and continuously flow around the body, it will keep user's body temperature at a conformable range to against heat stress. Chiller unit delivers up to 300W cooling capacity, user can set up temperature from -5 °C to 30 °C (23 °F to 86 °F), once circulation liquid reaches to set point temperature, system intellectually control the cooling capacity to that temperature. User may pre-cool the unit and get the coldest liquid as he needs, 3" air intake device with fresh air flow to increase the cooling performance in the hot condition. Iceless cooling unit, maintain free, this model was operated by 12V vehicle power or 12V rechargeable battery.

Components List:



Item	Part number	Description	Quantity
1	COMP-CRCU-12200	Micro Refrigeration Chiller Unit	1
		Remote Controller	1
		Power Cord	1
		Quick Release Base	1
2	COMP-LCG-TX	Liquid Cooling T-shirt	1
3	COMP-ET2M	Extension Tubing	1
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Optional Components

Item	Part Number	Description	Note
1	COMP-LCG-FB	Full body cooling garment	
2	COMP-LCG-FBFR	Full body cooling garment (Fire Resistant)	
3	COMP-LCG-TXFR	Cooling T-shirt (Fire Resistant)	
4	COMP-ET2M-1T2	1 to 2 Extension Tubing	
5	COMP-RB-1220	Rechargeable Battery 12V 20A	
6	COMP-FIT-2M	Fresh Air Inlet Tubing 2Meters	

KEY FEATURES

Compact Chiller Unit

Micro refrigeration chiller, Small size, Light weight, 1/3 of same powerful unit.

Rugged Unit Design

Aluminum base and structure parts, Absorber base, Racing vehicle installation for 8G shock acceleration testing.

Hot Ambient Operation

High cooling performance in the extreme hot ambient 60°C(140°F), better than standard cooling system only work below 50°C(122°F)

Enhance Cooling Capacity

Unit top panel reserves 3" fresh air intake tubing assembly to enhance cooling capacity in the extreme hot ambient.

Remote Controller Panel

User may fix the remote controller anywhere he want, control unit start, compressor speed and liquid temperature

Pre-cool for circulation liquid

User may turn on system only without pump circulation to pre-cool the liquid to the lowest temperature as he needs, anti-freeze liquid is need for setting below 0°C (32°F).

Confined Space Installation

Unit only need one side ventilated for installation, could be installed at corner or confined space,

Vehicle Power Operation

Chiller unit operated by Vehicle power 12V DC, or Compcooler 12V 20A rechargeable battery.

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Chiller Unit Technical Datasheet

Cooling Capacity (Ambient Temp. 40°C)		W	200
Cooling Capacity (Ambient Temp. 104°F)		Btu	682
Max Cooling Capacity		W	300
Power Supply		V DC	11-16
Operation Current		A	6-17
Max Current		A	20
Max Power Consumption		W	250
Refrigerant	Type		R134a
Compressor Speed Setting	Auto	RPM	2000-6000
Temp Control		°C	-5 to 30
		°F	23-86
Coolant	Anti-freeze liquid		Yes
Circulation Tubing	ID	inch	1/4
Miniature Rotary Compressor	Qty	PC	1
	Voltage	V DC	12
	Discharge	CC	2.0
	Weight	G	900
Fan	Qty	PC	2
	Voltage	V DC	12
	Air Flow	CFM	110
Pump	Voltage	V DC	12
	Water flow	L/Min	5
	Lift	M	5
Power Connector	3 pins Aero connector		yes
Controller Connector	5 pins Aero connector		yes
Operation Ambient	Max	°C	65
		°F	150
Storage Temp		°C	-20 to 70
Noise	Max	dba	65
Color	Black and silver		yes
Dimension	L x W x H	MM	356x200x217
		INCH	14x7.9x8.5
Weight		KGS	8.2
		LBS	18

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Rechargeable Battery Specifications

Model: COMP-RB1220
 Rechargeable Battery: Li-Ion
 Voltage: 12V DC
 Operation Voltage: 11V to 16.8V
 Capacity: 20A
 Max Output: 40A @12V
 Charging: 16.8V 5525 plug charging by 110/220V AC adaptor
 Capacity Checking: 3 lights checking for capacity remaining
 Battery Case: Aluminum
 Color: Black
 Operation Time: 60-150 minutes

Liquid Cooling T-shirt **COMP-LCG-TX**

Fabric: Stretch Cotton/Poly/Lycra Fabric
 Stretch Rate: 10%
 Color: Dark Blue
 Cooling channel: Silicon 3x5mm
 Cooling Zones: Four zones
 Manifold fitting: Aluminum one 1/4" to four 1/8"
 Connector: 1/4" quick fitting
 Dry weight: 0.5kg
 Size: XS/S, M/L, XL/2XL, 3XL/4XL



Optional:

Fire Resistant Liquid Cooling T-shirt

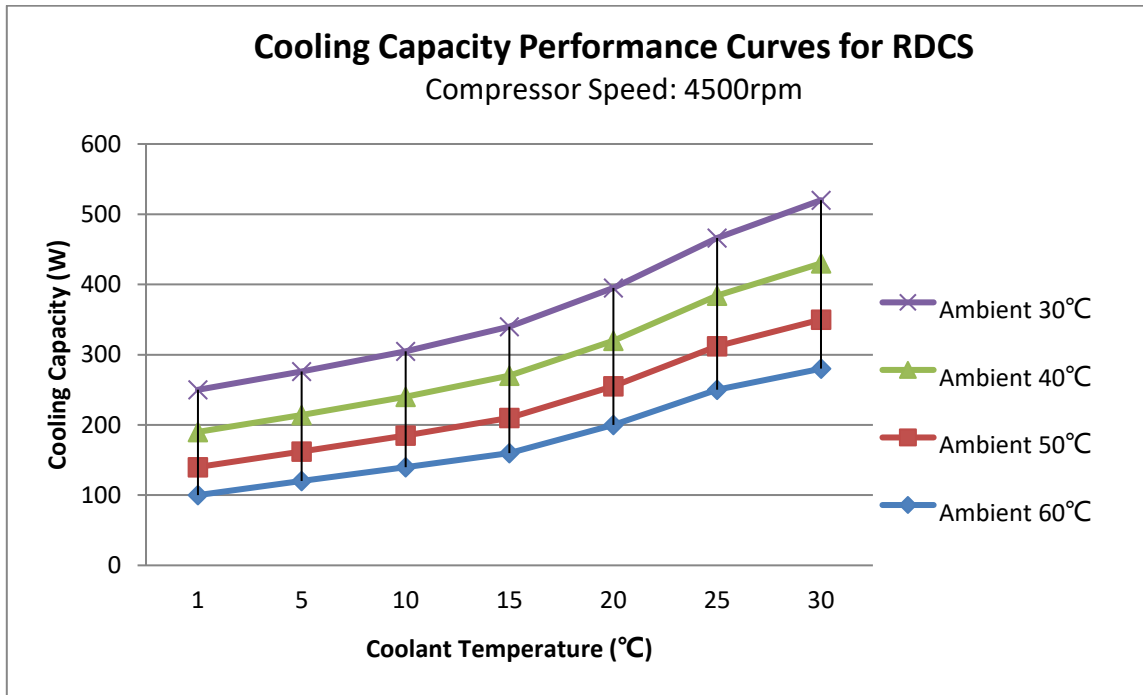
COMP-LCG-TXFR
 Fabric: Nomex/Lycra
 Color: Cream
 Stretch rate: 10%
 Cooling channel: Silicon 3x5mm
 Cooling Zones: Four zones
 Manifold fitting: Aluminum one 1/4" to four 1/8"
 Connector: 1/4" quick fitting
 Dry weight: 0.5kg
 Size: XS/S, M/L, XL/2XL, 3XL/4XL



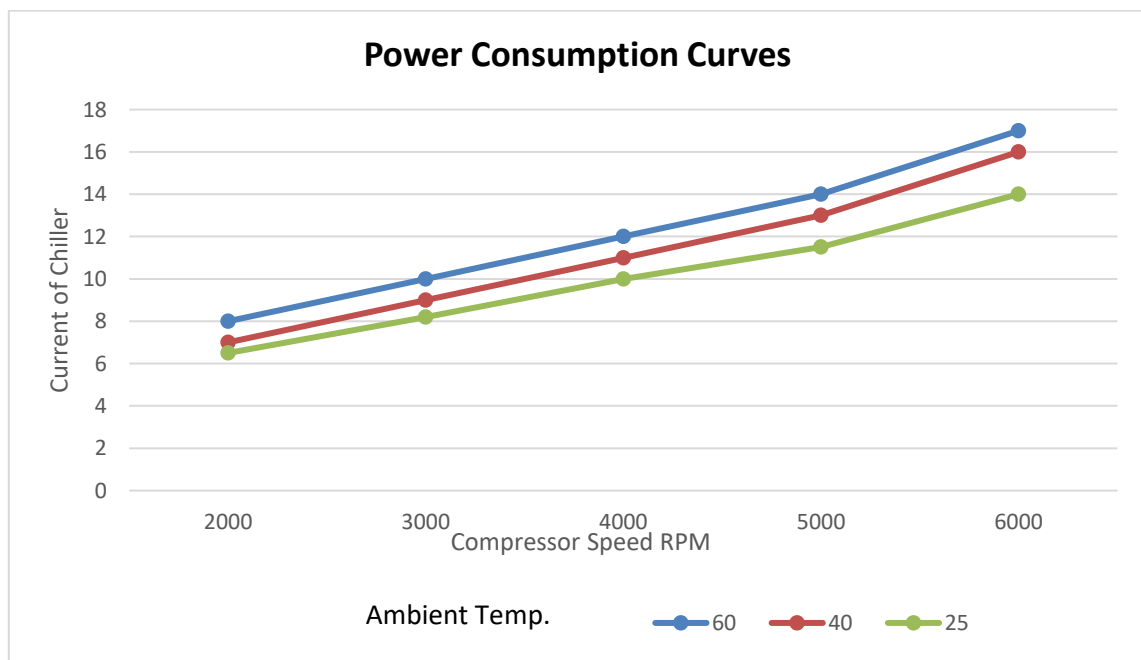
Garment Size				
Item	XS/S	M/L	XL/XXL	3XL/4XL
Chest	84cm/33.1"	100cm/39.4"	108cm/42.5"	123cm/49.6"
Length	64cm/25.2"	68cm/26.8"	70cm/27.6"	73cm/28.8"

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Cooling Capacity Performance Curves



Power Consumption Curves (Compressor Speed)



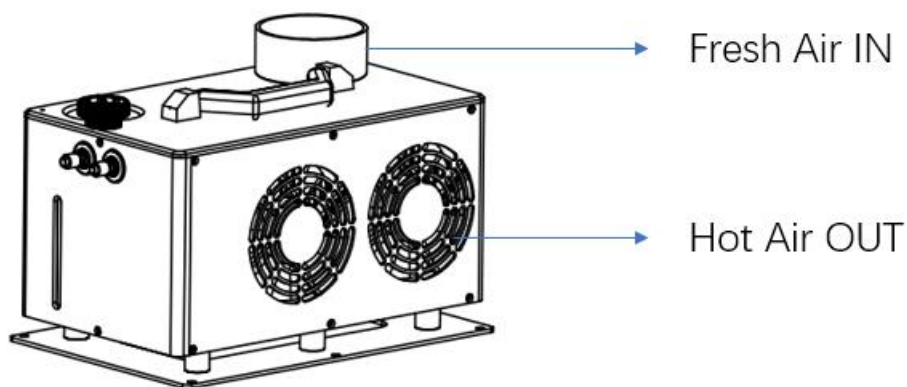
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Operation processes

Preparation

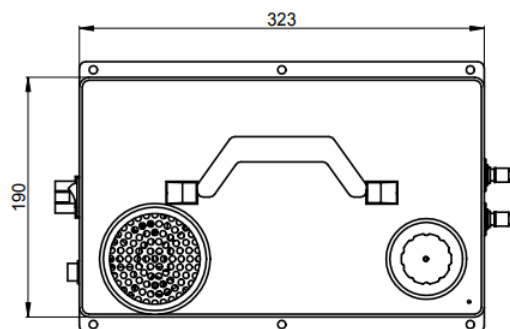
Chiller Unit Installation:

Unit could be installed on the flat surface at corner or confined spaces, make sure it is a well-ventilated area, no blocks for fresh air inlet portal on the top panel and hot air outlet port on the side panel.



Quick Release Base Installation:

User may fix the chiller on the flat surface by screw and nut.



Power Connection

One power cord was provided with chiller, it is for 12V DC ONLY, voltage range 11V to 16V. User may connect it with 12V vehicle power.

DO NOT plug the chiller with AC input!

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Remote controller connection

User may remove or replace the controller from chiller unit by disconnect or connect 5 pins aero connector.

Cooling Garment Connection

User may connect the chiller with Compcooler Cooling Vest by quick release fitting.
Or user may remove the quick fitting from extension hose and replace the new fittings to compatible with other cooling garment.

Circulation Liquid

User needs to fill circulation liquid by twice.

The first time, remove the filler cap from top side, add liquid to full by funnel, connect the cooling garment, turn on the pump and circulates the liquid from reservoir to cooling garment.

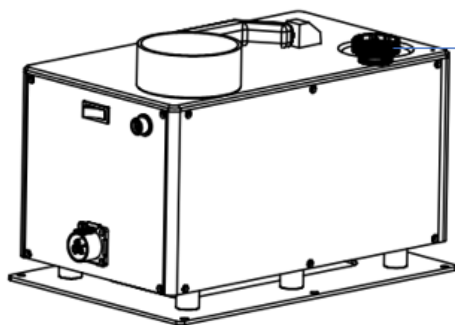
The second time, keep running and allow the liquid cooling garment fill with water for 30-60 seconds (without cooling), refill again to full (maybe couple times, be patient), then tight the filler cap.

Clean or distilled water is fine if ambient more than 1°C

Deionized water for isolation request.

Anti-freeze liquid for ambient below 0°C.

DO NOT use salt water, caustic, corrosive or flammable fluids!



Fill Cap of
reservoir

Fill circulation liquid by twice
after connected the cooling
garment.

Refrigeration or Pre-cool Testing

User may turn on the system and start refrigeration, no pump circulation, temperature will down in minutes. Cooling unit will be in standby mode once liquid temperature reaches to setting point.

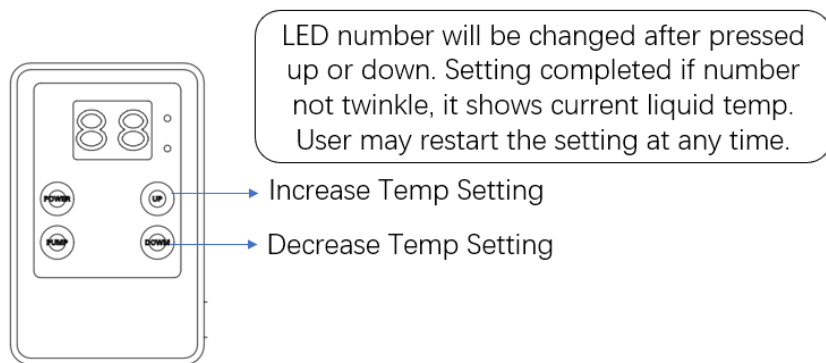
Fresh Air Tubing Assembly

User may assemble 3" fresh air inlet tubing from top panel of chiller.

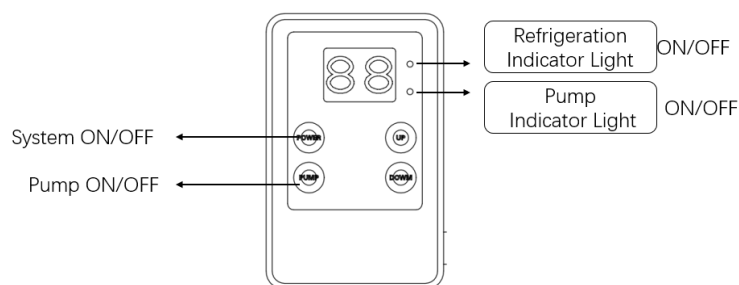
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Operation Processes

1. Garment or Pad connection: Connect the extension tubing with liquid heating unit and liquid cooling garment.
Once you hear a click, it's in position.
2. Power Connection: connect the chiller with vehicle power, light the controller.
The cooling unit will be in standby mode.
3. Start cooling: user may press ON/OFF to start chiller, liquid temperature will go down to set point in minutes.
pump is not working at this time.
4. Temp setting: user may press up and down to set up the temp for circulation liquid as need.



5. Start circulation:
User may press the pump to start or stop circulation. Please make sure the tubing is connected (no kinks) before circulation.



Chiller Auto Control:

Chiller Stop: Liquid temperature 3°C (6°F) lower than setting

Chiller Restart: Liquid temperature 1°C (2°F) higher than setting

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Clean and Maintenance

Chiller Unit:

Unplugged the power, use a clean damp cloth to clean the outside of chiller unit.
Use compressed air to remove dust and debris.

Reservoir cleaning

Please disconnect the extension tubing from chiller unit.
Empty the remain water or liquid from drain cap on the bottom, and open for dry.

Condenser clean

To keep the system at optimum cooling capacity, the condenser should be kept free of dust and dirt, user may check and clean it if necessary.

Open the side panel and remove the fans, use 50-100psi compressed air to clean the contamination.

Charging Refrigerant

(not recommend for uncertified operator)

If cooling capacity was decreased because of lack of refrigerant, user may vacuum the unit and recharge 150g R134a refrigerant.

Liquid Cooling Garment:

Machine wash liquid heating and cooling garment using a front-loading wash machine with cold water on a gentle/delicate cycle.

Note: DO NOT BLEACH, NO IRON, NO DRYER, TUMBLE DRY ON LOW

Chiller Unit Storage:

1. Turn off chiller unit, disconnect the power cord.
2. Disconnect the extension tubing.
3. Empty the circulation water from chiller unit by open bottom drain cap, then clean and disinfect the reservoir, then tight the cap after open dry.
4. Pack the unit for storage.

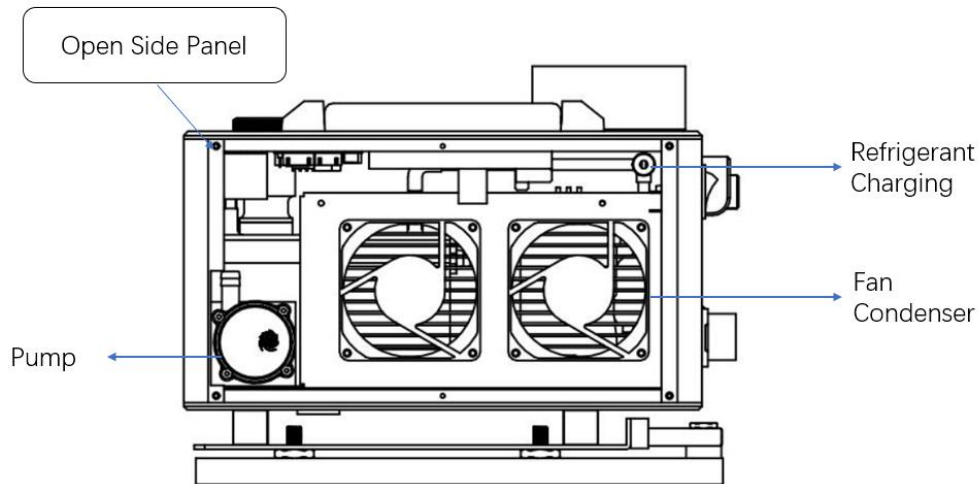
Restart: after long term storage, please fill in clean water with less degerming agent, run system over 10 minutes with cooling vest connection. Then empty the system and re-fill in the liquid as need.

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Components Renewal:

User may open side panel to replace the fans and pump if damaged.

User may disconnect the remote controller and replace the new one if damaged.



Battery Storage:

1. Shall be in the clean and dry ventilation room at temperature 0-35°C
2. Shall be keep out of fire or heat and avoid touching corrosion elements.
3. Shall be charged every 6 months during storage
4. Keep the battery out of children's reach

Cautions:

1. Please confirm vehicle voltage is 12V DC before connect chiller unit.
2. Please confirm vehicle power 250W or 20A before operation.
3. Please do not turn ON/OFF to run to stops system frequently within a short period, it may affect the refrigeration system, and significant enhance power consumption, reduce cooling time.
4. Please do not block air inlet and outlet, it may cause the problem of compressor overheat or less cooling capacity.
5. Please make sure cooling garments or vest be connected before start pump circulation, it may cause unit leak because of pump pressure.
6. Please use anti-freeze liquid if temperature setting lower than 0°C
7. Please use Compcooler battery only to run the chiller unit.
8. Please do not run the system close to fire or under water.

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Fault Code

Item	Code	Description
1	E1	Wrong Polarity or reverse connection from power input
2	E2	Low voltage protection, less than 11V
3	E3	High voltage protection, more than 18V
4	P1	No liquid temp signal from sensor

Trouble shoot

Item	Problem Description	Root Cause	Trouble Shoot
1	No Cooling Performance	Compressor locked, Overheat protection, Low Voltage	Check the compressor drive, yellow light means normal, red light means abnormal.
		No liquid circulation	Check if cooling garment be connected, check if pump be turned on
		Power connection	Check if power connection loose or not.
2	Less cooling capacity	Less heat exchange rate for evaporator	Check if circulation water inside reservoir is enough or not?
		Lack of refrigerant	Check if hot air out from condenser air outlet
		Low compressor speed	Check compressor speed setting
		Low voltage	Check unit input voltage
3	No pumping	Pump ON/OFF	Check if pump be turned on
		Quick fitting connection	Check quick fitting connection loose or not
		Pump blocked	Check if pump be blocked
4	Remote controller can't operate	Connection loose	Check if the connection loose or not
		Controller LED vague or twinkle	Check the unit input voltage
5	Temp sensor	No feedback, P1 on the panel	Check if the connection loose or not

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Safety:

It is important to become thoroughly familiar with the manual and operating characteristics of the unit. It is the owner's responsibility to assure proper operator training, installation, operation and maintenance of the unit. Observe all warning can result in injury to the operator and severe mechanical damage to the unit.

Warranty:

Compcooler Warrants to the original Purchaser that products sold shall be free from defects material and workmanship for warranty period not exceed one year from the date of shipment. Compcooler agrees to correct for the original user of this product, either by repair, or at the manufacturer's election by replacement. This warranty shall not apply if the defect or malfunction was caused by accident, neglect, unreasonable use, improper service, or other causes not arising out of defects in material or workmanship. The manufacturer's sole obligation under this warranty is limited to the repair or replacement of a defective product and shall not in any event be liable for any incidental or consequential damages of any kind resulting from use or possession of this product.

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