

TEMPEST™

OWNER'S MANUAL

Power Blowers™

Laminar Air Flow (LAF) - Electric Driven
VS-1 / VS-1.2 Battery Powered Blower



111120_01A

1.800.561.8187

www.**itm**.com

information@itm.com

INTRODUCTION

Thank you for choosing Tempest Technology Corporation for your ventilation needs. With this manual we hope to help you operate your Tempest product safely and to its full potential. Maintained according to the specifications set in this manual, it is not uncommon to receive many years of use and operation out of your Tempest equipment.

This manual is produced solely for the use of purchasers and operators of Tempest Technology Corporation equipment. Any reproduction, retransmission, or other use of the contents of this manual without written consent of Tempest Technology Corporation is strictly prohibited.

It is the intent of this manual to provide the owner/operator of Tempest Technology Corporation products with both general and specific information regarding the safe and proper operation and maintenance of the equipment described within.

ABOUT TEMPEST

Tempest Technology Corporation is the leading manufacturer of products and accessories for environmental management in firefighting and industrial applications.

Tempest began as a manufacturer of gasoline and electric powered blowers for the fire service. Fire departments use the Tempest Power Blower™ to provide “Positive Pressure Ventilation / Attack” (PPV/PPA) to remove heat, gases and smoke from the interior of a burning structure.

Tempest has expanded into other industries and found new applications for its products. The Tempest Power Blower™ and PPV/PPA are used by industrial applications to control dust, fumes and unhealthy gases like carbon monoxide, greatly improving safety in confined spaces.

Tempest Technology Corporation has earned a reputation as a leader and innovator in the air movement industry and continues in that role today.

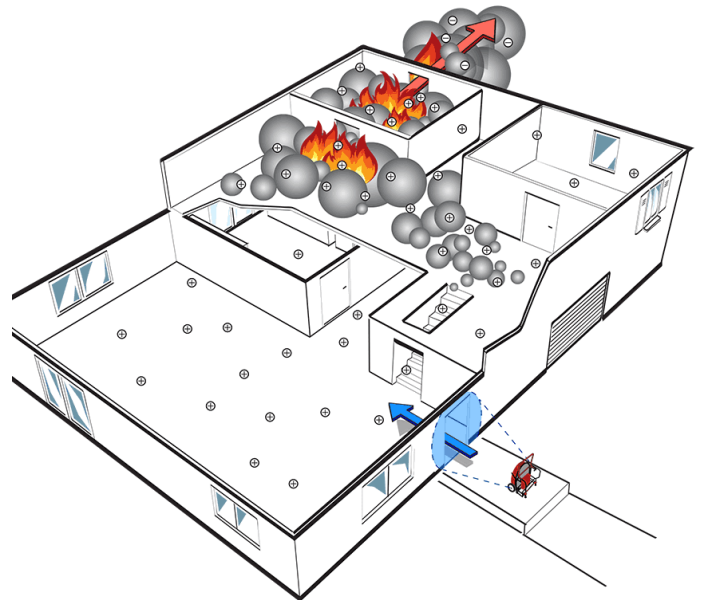


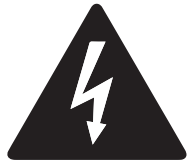
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SAFETY GUIDE

Failure to follow the operating, maintenance and lubrication requirements set forth in this manual may result in serious personal injury or death and/or damage to equipment or property.

The following WARNING statements indicate potentially hazardous conditions for operators and equipment. Make certain that anyone who works on or around the blower has read and fully understands the safety precautions listed.

1. Carefully read this owner's manual before attempting to operate, service or disassemble any part of your Tempest Power Blower™.
2. DO NOT operate the unit when mentally or physically fatigued or impaired.
3. Stay away from rotating parts; avoid wearing loose jackets, shirts, and ties. Keep hands and feet away from moving parts.
4. Keep all unauthorized personnel at a safe distance from the blower.
5. Keep all guards in place. DO NOT make repairs while the unit is running. DO NOT operate if any guard or grille is not in place.
6. Always wear eye protection. Loose debris can be picked up in the air stream and flown in the air.
7. Hearing protection is required. Fan blade and air noise may exceed safe dB levels.
8. Always ensure proper voltage and amperage is delivered to your Tempest Power Blower™.
9. Only a qualified technician should perform repairs or maintenance on electric components.
10. Never operate your Tempest Power Blower™ with electric components exposed.
11. Never operate your Tempest Power Blower™ with damaged, exposed or frayed wiring.
12. It is the sole responsibility of the owner/operator to develop procedures for proper use of the Tempest Power Blower™ in accordance with generally accepted ventilation techniques as well as the organization's own operating procedures, before placing the unit into service.



GENERAL INFORMATION

BLOWER IDENTIFICATION

Each Tempest Power Blower™ has a part number as well as a serial number. The part number identifies the type of unit (size, drive, etc.) while the serial number relates to information referencing the date of manufacture. This information is useful should it become necessary to contact the factory regarding your Power Blower™.

SERIAL NUMBER LOCATIONS

The serial number is typically located on the left side of the electrical box.

Please write the Serial Number of your Tempest Power Blower™ in the spaces below. This will aid us in identifying which model you have when assisting you.

Model (Part No.) _____

Date _____

Serial No. _____

WARRANTY

Warranty information on your unit can be found on the back page of this manual. For further information, please contact Tempest Technology Corp.

TECHNICAL SPECIFICATIONS

		PRODUCT FAMILY	POWER BLOWER™	
		PRODUCT LINE & TYPE	LAMINAR AIR FLOW ELECTRIC (LE) - VS1 BLDC	
		MODEL	VS1.2-18-FOLDING HANDLE BLDC	VS1-18-BLDC
		PART NO.	910-1825(110 vac) 910-1837(220 vac)	910-1820(110 vac) 910-1830(220 vac)
OUTPUT	AIR VOLUME	[cfm/m ³ h]	10,887 / 18,497	10,887 / 18,497
	AIR VELOCITY	[mph/kph]	41 / 66	41 / 66
	NOISE LEVEL @ 10 ft	[dB(A)]	83.7	83.7
FAN BLADE	TYPE		IMPELLER	IMPELLER
	MATERIAL		NYLON 6 W/ 30% GLASS-FIBER FILL	NYLON 6 W/ 30% GLASS-FIBER FILL
	DIAMETER	[in/mm]	18 / 457	18 / 457
	NO. OF BLADES		3 @ 25°	3 @ 25°
DIMENSIONS	WEIGHT (With Battery)	[lb/kg]	53 / 24	52 / 23.6
	WEIGHT (With Out Battery)	[lb/kg]	41 / 18.6	40 / 18
	WIDTH	[in/mm]	22.88 / 581	22.88 / 581
	DEPTH	[in/mm]	11 / 280	11 / 280
	HEIGHT	[in/mm]	HANDLE UP 29.3 / 745 HANDLE DOWN 24.4 / 620	26 / 660
MOTOR	MANUFACTURER		Private Label	Private Label
	MODEL		360-052	360-052
	TYPE		BLDC TOTALLY ENCLOSED, AIR OVER	BLDC TOTALLY ENCLOSED, AIR OVER
	VOLTAGE		48 VDC	48 VDC
	POWER OUTPUT	[HP/W]	.87 / 650	.87 / 650
	MAX AMPERAGE		20	20
	WATTS @ FULL RPM		744	744
DRIVE	MANUFACTURER		Private Label	Private Label
	MODEL		581-190	581-190
	TYPE		30 AMP BRUSH-LESS	30 AMP BRUSH-LESS
	INPUT OPERATING VOLTS		50 VOLTS DC	50 VOLTS DC
	OUTPUT VOLTS		0 TO 50 DC	0 TO 50 DC
AC POWER	AC VOLTAGE OPERATION	YES	AVAILABLE IN 110-115V AND 220-230V	AVAILABLE IN 110-115V AND 220-230V
	AMP DRAW		7.7 @ 115V / 3.9 @230V	7.7 @ 115V / 3.9 @230V
	WATTS @ FULL RPM		896	896
BATTERY 48VDC	OPERATING TEMPERATURE	°C / °F	-15° C / 5° F TO 45° C / 113 F	-15° C / 5° F TO 45° C / 113 F
	AMP HOUR / WATT HOUR		17.5 Ah / 841.75 Wh	17.5 Ah / 841.75 Wh
	RECHARGE TIME		4 HOURS FROM FULL DISCHARGE	4 HOURS FROM FULL DISCHARGE
FRAME	TYPE		ERGONOMIC WELDED ROLL CAGE	ERGONOMIC WELDED ROLL CAGE
	MATERIAL	[in]	0.75 ROUND ALUMINUM TUBE	0.75 ROUND ALUMINUM TUBE
	COATING		POWDER COAT	POWDER COAT
	DEFAULT COLOR		ANODIZED ALUMINUM	ANODIZED ALUMINUM
	FOLDING HANDLE		YES	NO
	TILT RANGE		-12.5° to +25°	-12.5° to +25°
	NO. OF TILT POINTS		4	4
	WHEEL TYPE		100 mm HIGH IMPACT	100 mm HIGH IMPACT
WHEEL SIZE	[in/mm]	3.9 / 100	3.9 / 100	
SHROUD	TYPE		TURBO 2000	TURBO 2000
	MATERIAL		STEEL W/ ROLLED EDGE	STEEL W/ ROLLED EDGE
	COATING		POWDER COAT	POWDER COAT
	DEFAULT COLOR		RED	RED
GRILLE	MATERIAL		SPIRAL WELDED STEEL WIRE	SPIRAL WELDED STEEL WIRE
	NO. OF TIE POINTS		8 FRONT, 8 REAR	8 FRONT, 8 REAR
	STANDARDS		MEETS CE SAFETY STANDARDS	MEETS CE SAFETY STANDARDS
	COATING		POWDER COAT	POWDER COAT
	DEFAULT COLOR		BLACK	BLACK

Periods Used to Designate Decimal Points

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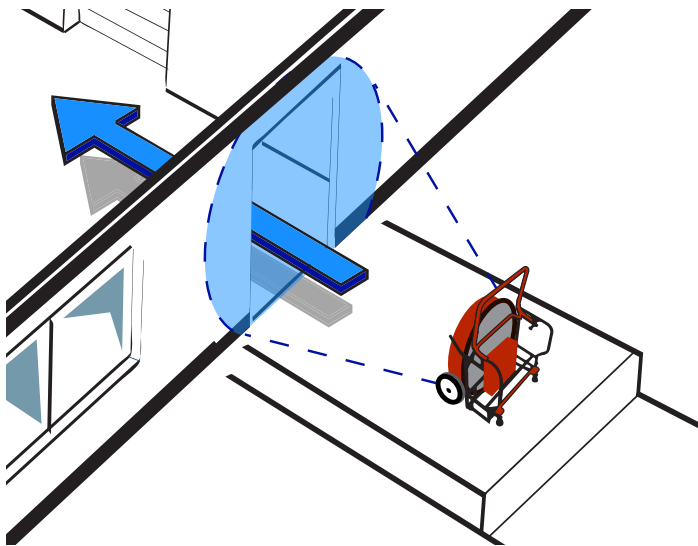
information@itm.com

POWER BLOWER™ INFORMATION

The Tempest Power Blower™ is a high powered, portable fan used for Positive Pressure Ventilation and Attack (PPV/PPA), ventilation techniques that quickly and efficiently replace hazardous interior environments with clean, cool air.

PPV and PPA were pioneered in the firefighting industry where firefighters use the Tempest Power Blower™ to ventilate smoke, heat, and harmful gases from buildings. This creates a safer environment for them to work in and makes it easier for them to find victims and extinguish the fire.

PPV and PPA rely on two principles, (1) an air pattern capable of creating an effective door seal, and (2) pressure. To accomplish Positive Pressure Ventilation or Attack, the blower is placed on the outside of the structure. It is positioned so that the air pattern created by the blower completely seals the entrance opening, or at least 2/3 of it. When this seal is achieved, the air pressure is increased equally at all points inside the structure. When an exhaust opening is created, all of the interior air moves in one mass towards it. The result is fast, efficient ventilation of the entire structure.



NOTE: The Tempest Power Blower™ is the most efficient tool for PPV and PPA for two reasons. First, the exclusive Tempest Turbo 2000 aluminum shroud design creates a broad, cone shaped air pattern. Second, the airflex impeller used on all Tempest blowers is designed to create high pressure. These two features working together make the Tempest Power Blower™ a highly effective and efficient ventilation tool.

OPERATING PROCEDURES

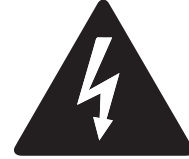
PRE-OPERATION

After receiving and unpacking your blower, be sure to carefully inspect it for any damage that might have occurred during shipping.

OPERATION

SET-UP, STARTING AND STOPPING

Assuming the previous Pre-Operation and safety instructions have been followed, the blower is now ready to run.



WHEN USING A GENERATOR, IT IS IMPERATIVE THAT THE GENERATOR BE RUNNING AT FULL CAPACITY BEFORE PLUGGING IN ANY ELECTRIC BLOWER. ALWAYS VERIFY SUFFICIENT GENERATOR OUTPUT BEFORE USE. IMPROPER VOLTAGE SUPPLY MAY DAMAGE UNIT AND VOID WARRANTY.

CAUTION: DO NOT MOVE THE BLOWER WHILE IT IS IN OPERATION. SEVERE PERSONAL INJURY IS POSSIBLE AS WELL AS DAMAGE TO THE BLOWER.

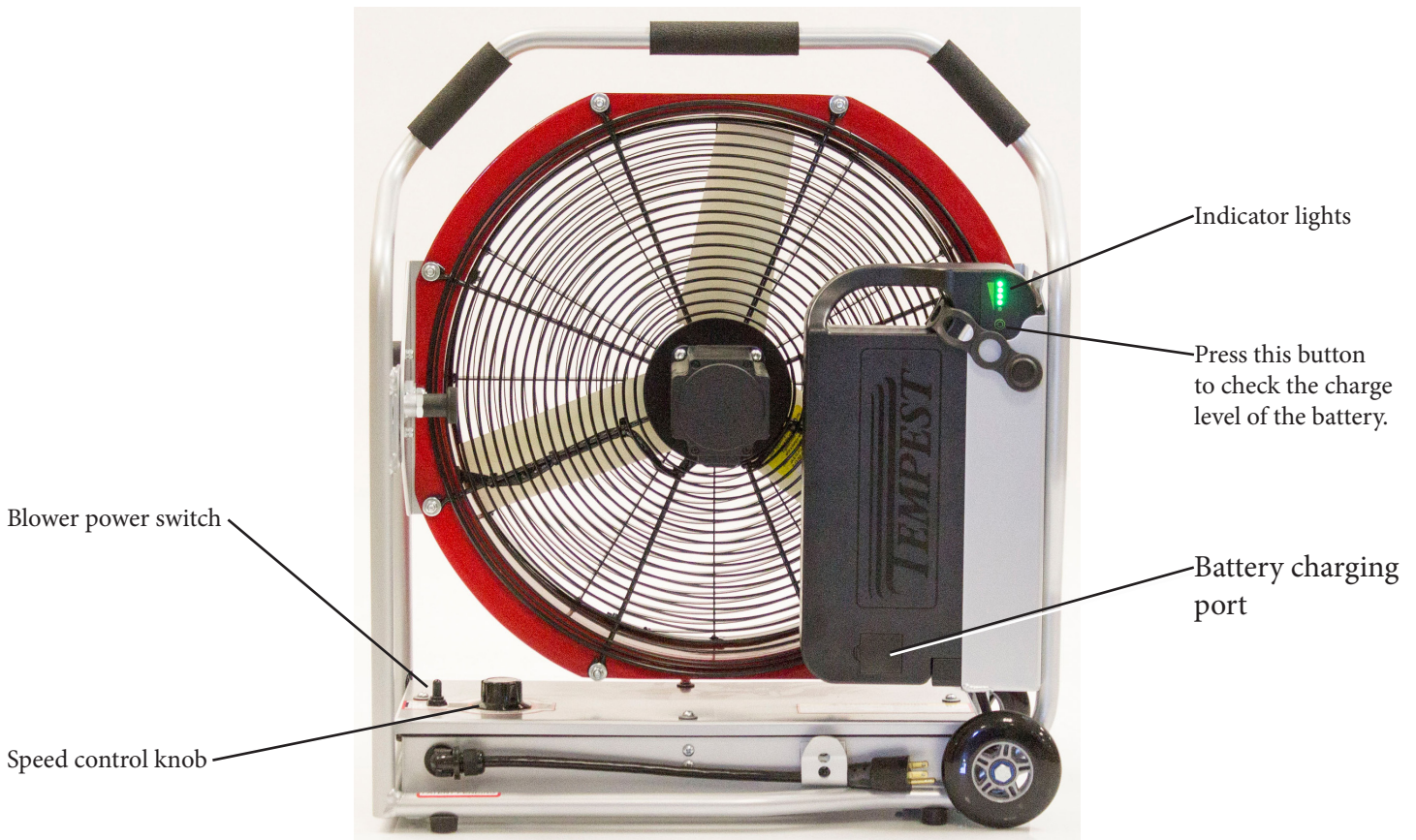
ALWAYS SHUT-DOWN THE BLOWER PRIOR TO MOVING.

SET-UP

Position the blower in the desired location, making sure it is placed on a flat, hard and debris free surface.

Operating procedures continued on the next page.

OPERATING PROCEDURES CONTINUED



BATTERY OPERATION INSTRUCTIONS

Before installing the battery, make sure that the on / off switch on the blower is in the off position and the speed control knob is set to 0.

Slide the battery onto the mounting rail in the battery tray and secure it with the rubber strap as shown in the picture above.

The blower is now ready for operation.

Set the on/ off power switch on the blower to battery. The LED lights on the front of the blower will come on.

Turn the speed control knob to the desired position, there will be a slight delay before the blower turns on and comes up to speed.

Set the on / off power switch to the off position to turn the blower off.

AC VOLTAGE OPERATION INSTRUCTIONS

Before connecting the blower to a power source, make sure that the on / off switch on the blower is in the off position and the speed control knob is set to 0.

Plug the AC power cord plug into an AC power source.

Set the on/ off power switch on the blower to 110 VAC. The LED lights on the front of the blower will come on.

Turn the speed control knob to the desired position, there will be a slight delay before the blower turns on and comes up to speed.

Set the on / off power switch to the off position to turn the blower off.

BATTERY OPERATION AND CHARGING

CHARGING THE BATTERY

This charger is designed for indoor use only.
Do not expose the charger to moisture, rain or snow.
Store the charger in a cool dry place when not in use.
Use only the supplied Tempest charger to charge Tempest batteries.

This charger has two cables, one is the power cable, the other is the battery charging cable.

There is not a power switch on this charger.
With the power cable connected to the charger plug the power cable into an AC power source. The charger will power up and the indicator light will be green. (Figure 1)

Lift back the cover of the charging port on the battery and plug the charging cable plug into the charging port. The indicator light on the charger will turn red. The red light indicates that the charger is connected to the battery and that the battery is charging. (Figure 2)

The indicator lights on the battery will flash during the charge cycle displaying the battery charge level. The red light on the charger will turn green once battery charging is complete, at this point, the charger will turn itself off. (Figure 3)

Two minutes after the charger turns itself off, the battery will go into sleep mode and the indicator lights on the battery will turn off.

Charge time for a fully discharged battery is approximately 5 hrs.



(Fig 1)



(Fig 2)



(Fig 3)

Battery indicator lights during charging.

Status	Remaining Capacity	LED5 (Green)	LED4 (Green)	LED3 (Green)	LED2 (Green)	LED1 (Red)
During Charging	<10%	OFF	OFF	OFF	OFF	Blinking
	<30%	OFF	OFF	OFF	Blinking	OFF
	<50%	OFF	OFF	Blinking	ON	OFF
	<75%	OFF	Blinking	ON	ON	OFF
	≥75%	Blinking	ON	ON	ON	OFF
	100%	ON	ON	ON	ON	OFF

Battery indicator lights during discharge

Status	Remaining Capacity	LED5 (Green)	LED4 (Green)	LED3 (Green)	LED2 (Green)	LED1 (Red)
Button pushed in Active mode or power off mode	<10%	OFF	OFF	OFF	OFF	ON
	<30%	OFF	OFF	OFF	ON	OFF
	<50%	OFF	OFF	ON	ON	OFF
	<75%	OFF	ON	ON	ON	OFF
	≥75%	ON	ON	ON	ON	OFF

Battery indicator lights error status display

Error Status	LED5 (Green)	LED4 (Green)	LED3 (Green)	LED2 (Green)	LED1 (Red)
Charger error			Blinking		
Long time not charging		Blinking			
Bad cell protection	Blinking				
Temperature protection in discharge		Blinking			
Unbalance protection	Blinking				
Overload protection			Blinking		
Battery under voltage protection			Blinking		

MAINTENANCE PROCEDURES

Although Tempest electric Power Blowers™ are designed to eliminate most maintenance issues, it is imperative that the blowers be inspected before startup on each use. Please review the following list before using this product.

MAINTENANCE SCHEDULE

EVERY USE

- INSPECT BLOWER FOR DAMAGE AND FIX IF ANY
- TIGHTEN/REPLACE ANY LOOSE OR MISSING PARTS

EVERY MONTH OR 10 HOURS

- INSPECT & CLEAN SHROUD & GRILLES

IMPORTANT: Always operate the blower in an area free of debris which may be pulled into the unit's blades. If you suspect the fan's blade may have contacted a hard object, thorough inspection of the blade assembly should be conducted immediately to ensure safety. You may contact Tempest Technology Corp. in order to find out how to properly inspect the blade assembly.

POWER BLOWER™ TROUBLESHOOTING

Various factors can contribute to or be the sole cause of problems for electric power blowers. This section will identify some of these problems and provide solutions to correct them.

BLOWER FAILS TO START

WHEN OPERATING ON THE BATTERY.

- Make sure that the battery is charged.
- Make sure that the battery is fully seated into the battery mounting rail.
- Make sure that the fuses are not burnt out and are in good working order.
- There may be damage to the internal wiring. Have a qualified technician or electronics specialist examine the blower circuitry and wiring and make any necessary repairs.

WHEN OPERATING ON AC POWER

- Make sure the unit is connected to the power source.
- Make sure that the fuses are not burnt out and are in good working order.
- Thoroughly check the power cord. If the cord shows any signs of serious wear, it may need to be replaced before running properly.
- There may be damage to the internal wiring. Have a qualified technician or electronics specialist examine the blower circuitry and wiring and make any necessary repairs.

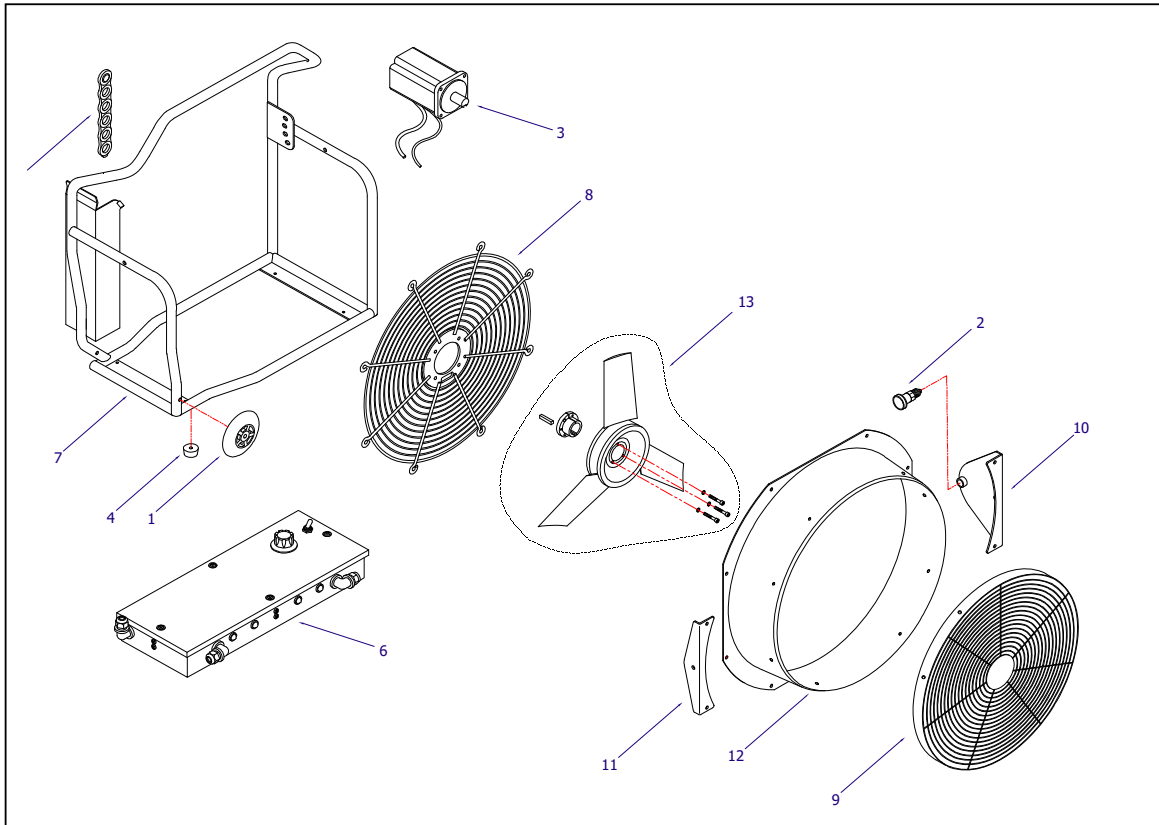
BLOWER SURGES WHEN RUNNING ON GENERATOR

- Check that the generator meets the proper voltage output to operate the blower.



LOCATION OF FUSE HOLDERS

- There is a 15 amp fuse for the 115 VAC power on the left side of the electrical enclosure.
- There is a 20 amp blade type fuse for the 48 VDC power located inside the electrical enclosure.



Item #	Part number	Description
1*	240-015K	WHEEL KIT
2	300-171	METERIC SPRING PLUNGER
3*	360-052K	MOTOR ELECTRIC BLDC
4	580-009	PAD FOOT EBS 16
5	581-200	5 HOLE BATTERY STRAP
NI	585-015	48V 17.5AH BATTERY
NI	585-030	CHARGER FOR 48V 17.5AH 110v
7*	610-1328K	FRAME VS-1
NI	610-1330K	FRAME VS-1.2 FOLDING HANDLE MODEL
8	610-1427	GRILL REAR
9*	610-1428K	GRILL FRONT A/S
10*	610-1521K	SHROUD MOUNT BRACKET LEFT
11*	610-1522K	SHROUD MOUNT BRACKET RIGHT
12*	705-122	SHROUD, RED
13*	705-295	BLADE ASSEMBLY
6*	600-840K	DRIVE ASSEMBLY COMPLETE
NI	581-015	BOOT TOGGLE SWITCH
NI	581-190	BLDC SPEED CONTROLLER
NI	581-191	48 VOLT DC POWER SUPPLY
NI	581-192K	VS1 POTENTIOMETER KIT
NI	581-197	FUSE HOLDER WATER PROOF IP66 115v
NI	581-196	SWITCH TOGGLE DPDT W/ SCREW TERMINALS
NI	581-206	SWITCH TOGGLE DPDT W/ FLAG TERMINALS
NI	581-210	FUSE, 15 AMPS VS1 115v
NI	581-284	FUSE, 20 AMPS 48 VDC BLADE TYPE
NI	585-016	RAIL MOUNT VS1 BATTERY

* denotes item includes hardware for installation

NI Not Illustrated

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AVAILABLE ACCESSORIES

**VS1 Mount Kit 12V Battery Rack
With Charger
#610-1814**



**Mount Kit 12V Inverter
w/Charger No Battery Rack
#610-1810**



**VS1 48V 17.5AH Battery 70 Minutes
#585-015**



**Flex Tube Ducting
18'x15'
#725-070**



**VS1 Charger 48V 17.5AH 110V/220V
#585-030**



**Rehab Misting System
#725-200**



**Door Bar Hanger
& Bracket Set
#300-141 & #300-142**



Please fill out and mail the warranty card that was supplied in the information packet.

WARRANTY REGISTRATION

Serial No.	Model No.
------------	-----------

(Serial and model numbers are located on the blower's frame near the motor/engine.)

PLEASE PRINT

Your Name _____
Department/Company Name _____
Address _____
City/St/Zip _____
Phone _____
Email _____

PURCHASE INFORMATION

Date of Purchase _____ Name of Dealer _____
Why did you purchase your Tempest product? (Check all that apply)
 Reputation Demonstration Quality Price
 Recommended by _____ Advertising
 Other _____
Is this your first Tempest? Yes No
What is the most important factor in purchasing this product?

In what applications will you use this Tempest product?

PPV INFORMATION (If Applicable)

Are you using any other PPV equipment?
 Yes (which) _____ No
How long have you used PPV? _____
Has your organization ever participated in a formal PPV training program?
 Yes No

ADDITIONAL INFORMATION

I would like information on Tempest PPV/Ventilation Training.
 I would like to receive information on product accessories.
 I would like to join your information network and receive regular Tempest product and ventilation updates.
E-mail _____

SUGGESTIONS AND COMMENTS _____

TEMPESTTM
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Fresno, CA 93722

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p/n 410-1038

WARRANTY INFORMATION

Except as otherwise set forth below, any claim by Customer with reference to the Goods sold shall be deemed waived by the Customer unless submitted in writing to Tempest within the earlier of (i) five (5) business days following the date Customer discovered, or by reasonable inspection should have discovered, any claimed breach of the foregoing warranty, or (ii) thirty (30) calendar days following the date of shipment. Any cause of action for breach of the foregoing warranty shall be brought within one (1) year from the date the alleged breach was discovered or should have been discovered, whichever occurs first.

Limited Power Blower Warranty

Tempest warrants to the original purchaser that all Tempest gasoline and electric powered blowers (except the engine or motor, drive, and power supply) will be free from original defects in workmanship and material, under normal-use conditions, and Tempest will replace any defective power blower part (except the engine or motor and drive) if returned during the applicable warranty period, for the time frame indicated below:

Firefighting Industry:

Five (5) years from date of shipment

Industrial/Rental Industry:

One (1) year from date of shipment

Blower Engine / Motor & Drive Warranty

The engines manufactured by Honda® and Briggs & Stratton® are covered by a separate manufacturer's warranty for a period of two (2) years. Electric motors manufactured by Magnetek, Marathon, Baldor, Franklin Electric and Multi-Fan are covered by a separate manufacturer's warranty for a period of one (1) year.

Lithium-ion Batteries

Lithium-ion batteries are covered by a separate manufacturer's warranty for a period of two (2) years or 300 charge cycles, whichever come first.

Warranty does not cover batteries that have been damaged due to being mis-handled, mis-used, or abused.

Note: Unauthorized repair or modification of the factory assembly or parts voids the warranty.

All information provided in this operations manual is subject to change without notice. Please refer to our website for the most recent sales terms and conditions.

TEMPEST™