

# Tempest<sup>®</sup> Hot Air Drying System

## Installation Instructions

Heidelberg GTO

**ACCEL**  <sup>®</sup>  
*Graphic Systems*

# GENERAL INFORMATION

## ATTENTION TEMPEST DRYER OWNER!

Accel Graphic Systems provides parts and service through its authorized distributors and dealers. Therefore, all requests for parts and service should be directed to your local dealer.

The philosophy of Accel Graphic Systems is to continually improve all of its products. Written notices of changes and improvements are sent to Accel Graphic System's Dealers.

If the operating characteristics or the appearance of your product differs from those described in this manual, please contact your local Accel Graphic System's Dealer for updated information and assistance.

Always update your equipment when improvements are made available, especially those related to safety.

### YOUR AUTHORIZED TEMPEST DEALER IS:

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### THE SERIAL NUMBER OF YOUR TEMPEST HOT AIR DRYING SYSTEM IS:

CONTROL BOX \_\_\_\_\_

FAN UNIT \_\_\_\_\_

## TECHNICAL ASSISTANCE

For technical assistance during the installation, please contact

**ACCEL GRAPHIC SYSTEMS**  
11103 Indian Trail  
Dallas, TX 75229  
PHONE (972) 484-6808  
FAX (800) 365-6510  
E-MAIL [accel@dallas.net](mailto:accel@dallas.net)  
WEB SITE [www.accelgraphicsystems.com](http://www.accelgraphicsystems.com)

## GENERAL INFORMATION

### ELECTRICAL REQUIREMENTS

220 V  
20 AMP  
DEDICATED LINE  
50/60HZ  
NEMA WALL PLUG SPEC L620R

### IMPORTANT INFORMATION

The use of heat to accelerate drying may require more frequent lubrication and/or use of a high temperature lubricant in the delivery of the press. Please consult your press manufacturer for specific recommendations.

### SAFETY INFORMATION

The Tempest Dryer contains high voltage and hot surfaces. Never attempt to service or work on the unit unless the power is shut off and the unit is cool.

Visually inspect the thermistors (triangular shaped objects arranged in a honeycombed pattern on the underside of the unit) weekly. If a thermistor is damaged or cracked, do not operate the dryer. Contact Accel immediately for a replacement part.

The fans should be turned on and set at the lowest speed ("0" on the dial when running just spray powder and no heat. This prevents spray powder from accumulating in the thermistors and housings.

### TERMINOLOGY

OPS = Operator's Side  
NOPS = Non Operator's Side

### TOOLS REQUIRED FOR INSTALLATION OF TEMPEST

1. 5/32" Allen Wrench
2. 7/16" Open End Wrench
3. Power Drill
4. 5/8 ", 5/16" dia. drill bits
5. Phillips screwdriver
6. 5mm Allen Wrench
7. 4mm Allen Wrench

## GENERAL INFORMATION

### HOT AIR VS INFRARED WHAT MAKES TEMPEST WORK

Although the technology behind the Tempest dryer was significant enough to be awarded the GATF Intertech Award it is by no means new. In fact, thermistors have been in use for many years. They were originally used in motors and other devices as a heat controller and later used in refrigeration to turn compressors on and off. It is only in the last 10 years or so that thermistors have been used as a heater.

Heat is generated by the thermistor because of the difficulty of electricity travelling through it when it is a conductor. The thermistor acts as a conductor until it reaches its set temperature and then it becomes a resistor. A thermistor is basically a coated semiconductor designed to switch from a conductor to a resistor at an established temperature.

When a current is applied to the thermistor it initially uses a large amount of electricity and heats up very quickly until it reaches its maximum set temperature. At this point it should not use any more electricity. However, air that is passed through the holes in the thermistor causes it to cool. This activates the thermistor to start using more power again so it can get back to its set temperature. The thermistor is constantly regenerating itself to stay at a constant temperature. This process is called autostabilization.

Thermistors are also the key element that makes the Tempest dryer safe. Because the set temperature of the thermistor is lower than the flash point of paper, you can place even the most easily burned substrate such as tissue paper, on top of the thermistor element without causing a fire. The tissue won't even char, let alone ignite. If you were to do the same with an IR element, a fire could be started in a matter of seconds. This is particularly important if a jam occurs in the delivery.

The objective of any drying system is to raise the pile temperature to accelerate the drying of the ink. However, heating the paper too much can aggravate problems such as blocking, setoff, mottle, loss of gloss, and loss of halftone definition. Too much heat can also cause the paper to shrink which can cause register problems in multiple pass work. The Tempest dryer can keep the pile at a lower temperature than IR and still effectively set the ink film.

## GENERAL INFORMATION

Because the thermistors used in the Tempest dryer use lower temperatures, the heated air has had time to cool by the time it reaches the wall of the press, reducing the chance of premature wear to press parts.

IR dryers use very high temperatures and a fixed amount of electricity. One of the drawbacks of using a very hot heat source is that heat wants to travel from a very high temperature to a very low temperature. In other words, the heat generated from an IR dryer will travel to the press wall and attempt to increase its temperature because it is cooler than the heat produced by the IR dryer.

### HOW DRYING IS ACCOMPLISHED WITH TEMPEST

Tempest "sets" the surface of the ink to prevent set-off from one sheet to another and to minimize the use of powder.

Tempest accelerates the final drying of oil based inks by raising the temperature of the delivery stack.

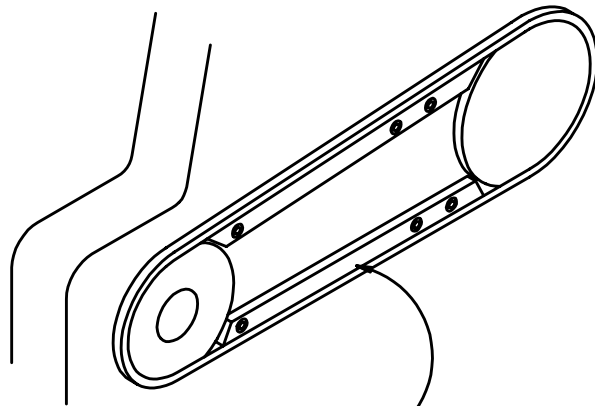
### KEY FACTORS TO REMEMBER ABOUT DRYERS FOR SMALL OFFSET PRESSES

Do not expect a dryer to "instantly" dry the ink. Only UV inks and coating dry instantly. The technology and hazards of such systems make them cost prohibitive on small offset presses.

Some jobs may require spray powder. Because dryers for small offset presses do not dry ink instantly, powder will be required from time to time. However, you should expect to see a significant decrease in the amount of powder needed on a regular basis.

Drying time is dependent upon the press speed, paper stock, ink coverage, type of ink etc.

Do not expect a dryer to accelerate the drying of rubber based inks. These inks dry by absorption into the stock and heat does not accelerate this process.



REMOVE LOWER CHAIN GUIDES

## INSTALLATION

1

Remove existing spray bar and light fixture from press. You may need to cut several wires to remove the light fixture. Be sure and tie these off correctly.

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2

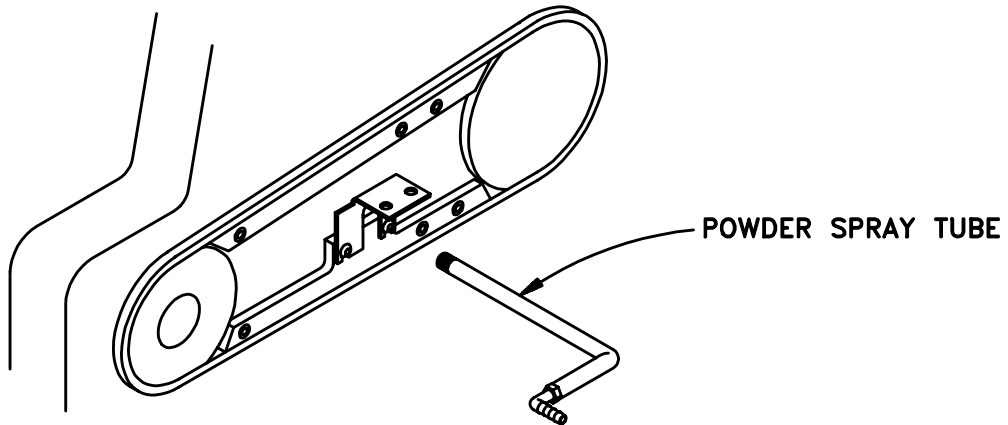
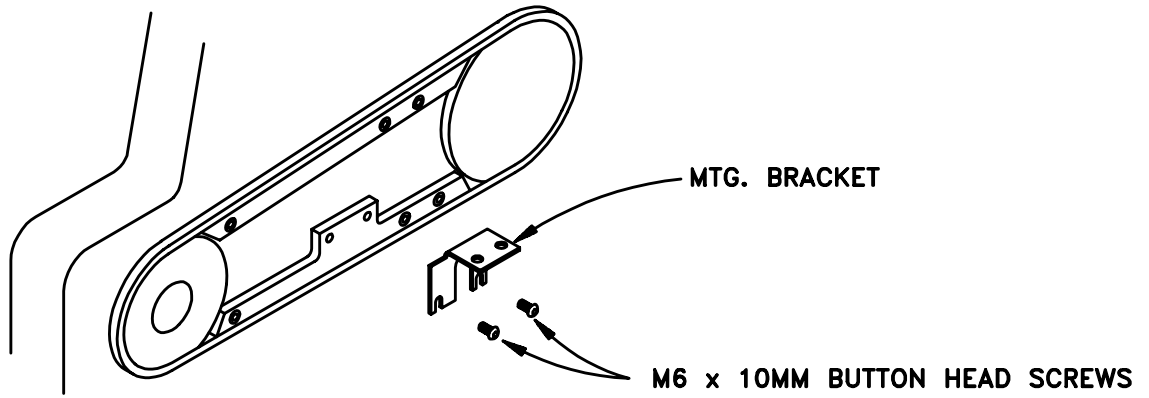
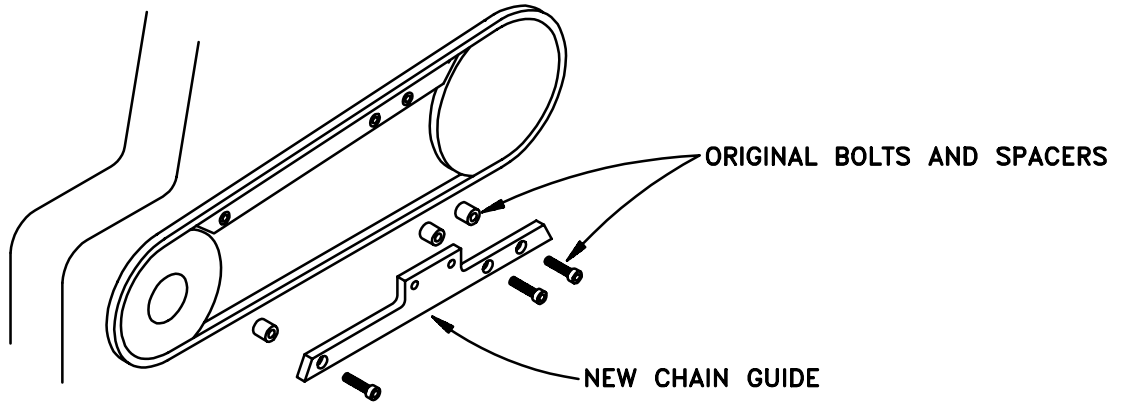
Enlarge the hole (right hand subject arrow) where the light fixture wires came through the press to 5/8" in diameter. The larger dryer wire will thread through this hole. Drill a second hole (left hand subject arrow) 5/16" in diameter for smaller dryer wire.

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3

Using a 5mm allen wrench, remove the chain guides at OPS & NOPS from the delivery (see diagram).

7



## INSTALLATION

**4**

Install the new chain guides (OPS & NOPS) in the press as shown. Use the existing bolts & spacers removed in step 3.

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**5**

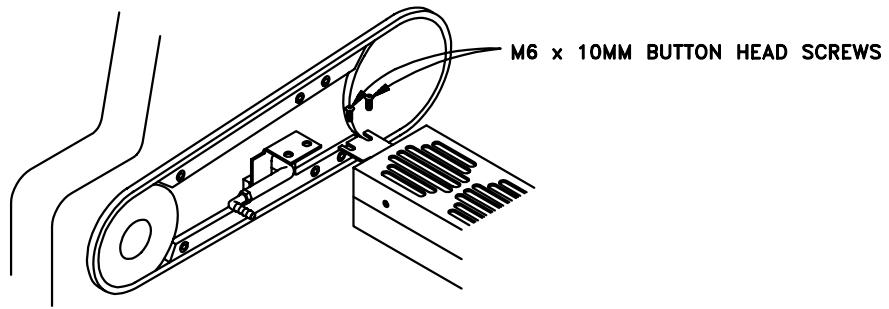
Partially thread M6 screws into chain guides. Install mounting brackets and tighten screws. Make sure the bracket with the deep slot is installed on the NOPS.

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**6**

Install new spray bar tube through the mounting bracket and press frame at the NOPS. Tighten set screw so that the tube is positioned above the pile crank transfer shaft.

**9**



## INSTALLATION

7

Set the dryer on the delivery of the press and feed the small cable through the mounting bracket and then the 5/16" hole drilled in step 2. Then feed the larger cable around the mounting bracket and through the 5/8" hole drilled in step 2.

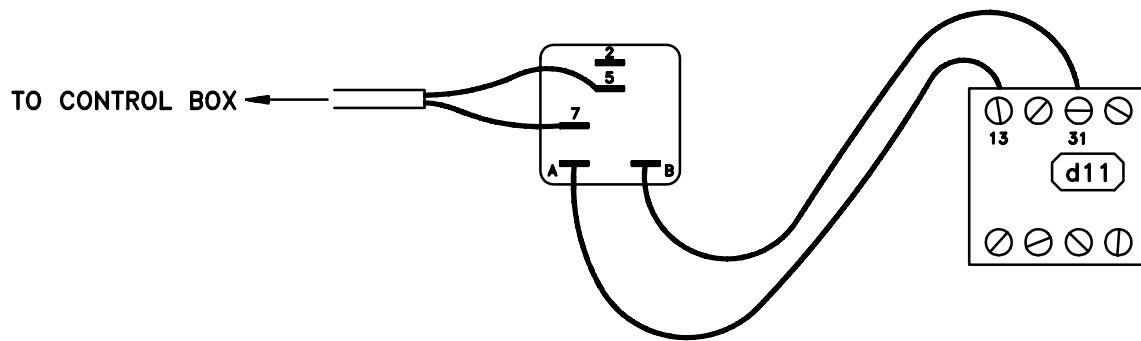
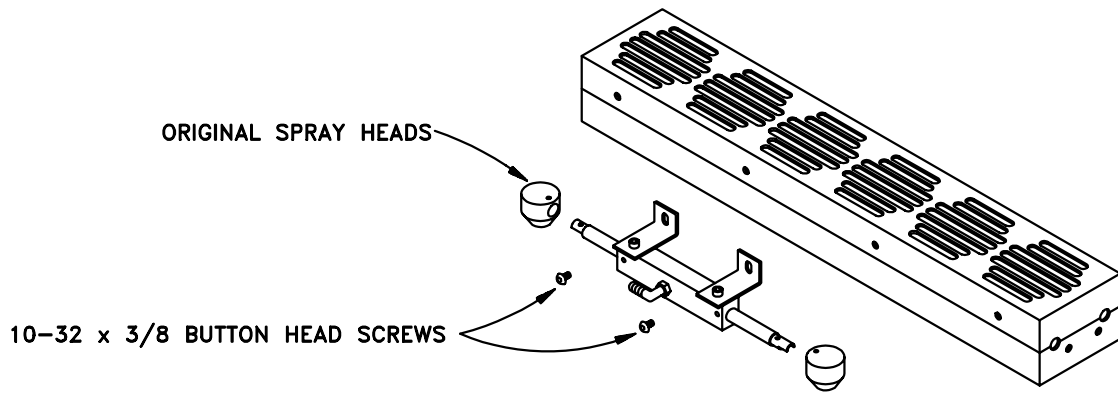
8

Place the dryer on the mounting brackets and secure using 4 M6 x 10mm bolts. Attach ground wire on NOPS to press using M8 X 20mm cap screw.

9

Jog the press by hand to make sure all grippers clear the top and bottom of the dryer.

11



## INSTALLATION

**10**

Attach the hose from the tube to the spray housing. Insert the original powder spray heads on the tubes and tighten the set screws. Mount the spray assembly to the dryer housing using the 10-32 screws.

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**11**

Remove the access panel from the press electrical box at the OPS and locate the "d11" relay. This is where the relay supplied with the Tempest is connected. Take the small cable supplied with the accessory pack and connect one wire to position 5 and one wire to position 7 (it doesn't matter which wire goes to which position). The other end of the cable is plugged into the Tempest control box.

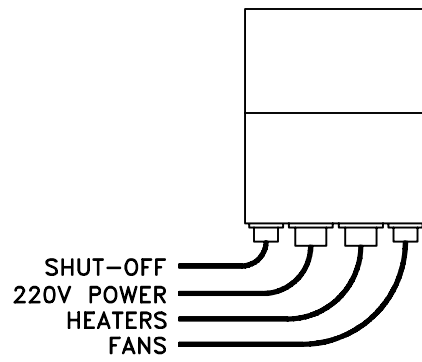
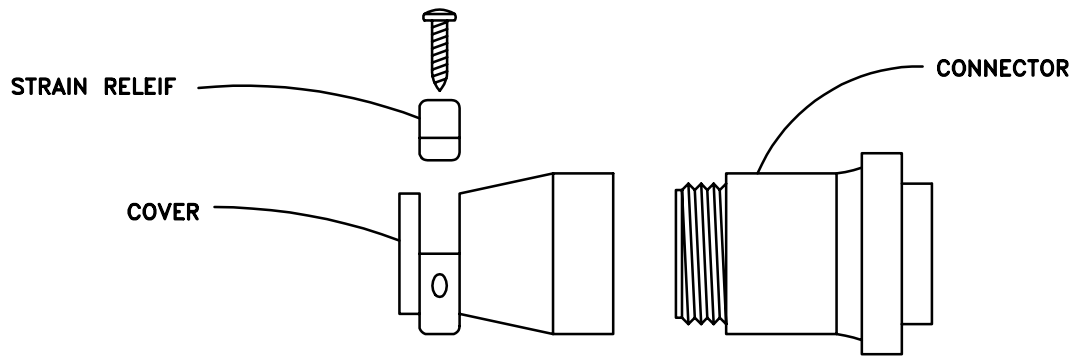
Take the two wire leads supplied and connect positions 13 & 31 of the press relay to positions A & B of the Tempest relay. (Again, it doesn't matter which wire.)

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**12**

Using the supplied template, drill two 5/16" diameter holes in the OPS cover. Mount control box to cover. Route cables through hole in cover indicated by subject arrow.

**13**



## INSTALLATION

**13**

Assemble connectors by first inserting the covers over cables. The white wire of the small cable (2 conductor) inserts into position 2 of the small connector. The black wire inserts into position 3.

On the larger cable (3 connector) the white wire goes in position 1, the black in 2 and the green in 3. Screw the cover up to the connectors and attach strain reliefs.

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**14**

Attach connectors to control box as shown.

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**15**

## OPERATION & MAINTENANCE

### HOW DRYING IS ACCELERATED WITH TEMPEST

Tempest creates a two step drying process when used with oil base inks. These steps are:

1. Skinning the surface of the ink with the initial blast of hot air to prevent set off .
2. Accelerating the final drying process of the ink by increasing the stack temperature. Heat accelerates the drying process, called oxidation and reduction, of oil based inks.

In general, dryers, including infrared, do not work well with rubber or acrylic based inks. These inks should be avoided when maximum results are desired.

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### HOW TEMPEST WORKS

1. When voltage is applied to the thermistors (triangular shaped objects arranged in a honeycomb pattern), the thermistors begin to heat. (Thermistors are coated semiconductors.)
2. Thermistors heat to a predetermined temperature, in this case about 375 degrees F, and remain at that temperature. This is known as autostabilization.
3. The fans blow air down towards and through the thermistors, creating a flow of hot air to the sheet.
4. Drying of the ink occurs in the two step process as described above.

No dryer totally eliminates the need for spray powder. There may be some jobs, for example a heavy solid on a high gloss sheet, where powder is required. Overall, Tempest should reduce your spray powder usage significantly, leaving you with a better printed product and cleaner working environment.

## OPERATION & MAINTENANCE

### TEMPEST POWER CONTROLS

The power control has three settings:

**OFF** No lights are on at this time.

Center position. Dryer does not work when switched to OFF.

**FAN** Green light is on.

Far left position. Only the fan blows when the switch is set to FAN. The fan position should be used for set up or when the press is running but the dryer isn't needed.

**HEAT** Red light is on.

Far right position. Applies current to the thermistors to create heat. Thermistors only heat up when the press is running and feeding paper.

### FAN CONTROL

The fan is controlled by a potentiometer on the top of the control box. "0" is the slowest speed and "10" is the fastest. In most cases, **the fan should be set between 4 and 6 on the dial.**

### AUTOMATIC SHUT OFF

Tempest contains an automatic shut off that prevents the thermistors from heating when the pump motor is off. If the press is off and the thermistors remain on (red light on) call Accel immediately.

### SPRAYER

Tempest comes with its own spray bar. The amount of spray is still controlled by the old spray mechanism. Use spray powder sparingly with Tempest.

## OPERATION & MAINTENANCE

### INITIAL SETTINGS

An initial fan speed setting of 4 to 6 should increase the stack temperature to reduce offset. If after 1" of paper is stacked in the delivery and offset is still occurring, reduce fan speed . Insert a thermometer into the center of the stack. Allow the thermometer to stabilize. You should see an increase of 10 to 15 degrees in pile temperature.

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### FACTORS THAT EFFECT DRYING

1. Speed of the press.
2. Amount of ink coverage and color.
3. Type of stock being printed.

In time and with practice you will learn which settings are best for your particular shop.

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### KEYS TO REMEMBER

- 1 The Tempest takes about 12 sheets to come up to full power. The dryer remains on as long as paper is being fed. It does not cycle like an infrared dryer.
2. The pile temperature should be between 95 - 105 degrees F for optimum drying.
3. Use of spray powder only when absolutely necessary. A little spray powder goes a long way. Use it sparingly.
4. Inspect the Tempest weekly.

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### MAINTENANCE

1. Inspect the dryer weekly. If the thermistors are cracked or have been damaged, do not operate the dryer. Call Accel immediately.
2. Never squirt cleaning solvents, water or any other liquids into the dryer. This may damage electrical components.
3. Any spray powder that accumulates in the dryer should be vacuumed out, not blown out.
4. Make sure all heat shields and guards are in place before operating the dryer of printing press.

# PARTS LISTING

ITEM NO.	ACCEL PART #	DESCRIPTION
1	25-01004	FAN HEATER ASSEMBLY
2	25-02018	CHAIN GUIDE/MTG. OPS
3	25-02019	CHAIN GUIDE/MTG. NOPS
4	25-02021	MTG. BRACKET NOPS
5	25-02022	MTG. BRACKET OPS
6	25-02023	MTG. BRACKET NOPS
7	25-02024	MTG. BRACKET OPS
8	25-99016	POWDER TRANSFER TUBE
9	25-99017	SPRAYER MTG. BRACKET
10	25-99020	POWDER SPRAY TUBE
11	25-99019	POWDER DISTRIBUTION BLOCK
12	99-30	HOSE FITTING
13	05-138M10	M6 X 10MM BUTTON HEAD SCREW
14	05-133038	10-32 X 3/8 BUTTON HEAD SCREW
15	05-127M10	M5 X 10MM CAP HEAD SCREW
16	05-157M06	M5 X 6MM SET SCREW
17	05-120M25	M8 X 25MM CAP HEAD BOLT
18	25-99026	GROUNDING WIRE ASSEMBLY

## PARTS NOT SHOWN ON SCHEMATIC

A	25-08001	CONTROL BOX
B	25-88008	POWER CORD
C	25-88009	SHUT-OFF CORD
D	25-88002	100V RELAY
E	25-88005	WIRE
F	25-88008	FEMALE CONNECTOR
G	25-88011	THERMOMETER
H	25-88029	HEATER CONNECTOR TOOL
I	25-88030	FAN CONNECTOR TOOL
J	05-134063	1/4-20 X 5/8 BUTTON HEAD SCREW
K	05-313329	FLAT WASHER

**ACCEL**  <sup>®</sup>  
*Graphic Systems*

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