Instructions - Parts List

4-Zone Heat Control

311513 rev.B

4-Zone Heat Control for Therm-O-Flow® Hot Melt Drum Unloaders

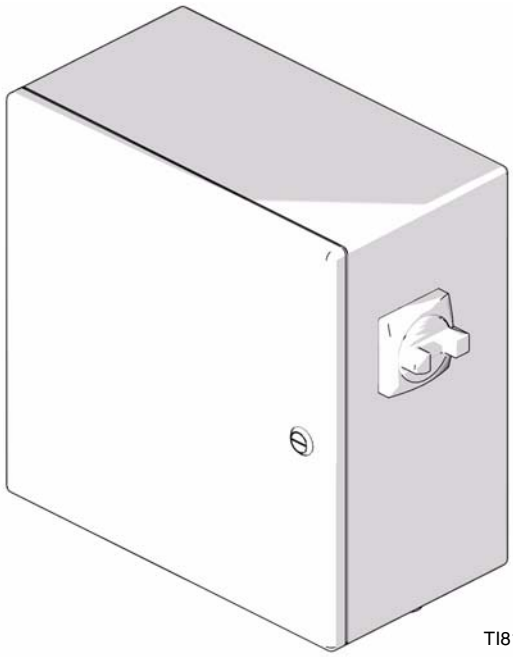
Part No. 255372, Series A

400°F (204°C) Maximum Control Temperature

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.

For complete system installation and operation instructions, see the following manuals:

Therm-O-Flow 200	**311208**
Therm-O-Flow 20 (6-Zone)	**311976**
Therm-O-Flow 20 (4-Zone)	**312094**



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PROVEN QUALITY. LEADING TECHNOLOGY.

Graco Inc. P.O. Box 1441 Minneapolis, MN 55440-1441

Contents

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

ELECTRIC SHOCK HAZARD

Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

Installation

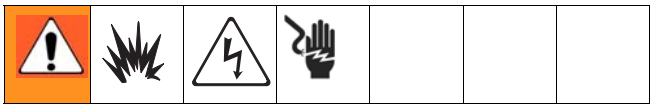
Overview

Therm-O-Flow Expansion Zone Controls are typically used to add more heat zones to an existing Therm-O-Flow system. As an example, a user may have a Therm-O-Flow system with six heat zones (pump, plate, two hose zones, and two gun/access zones). There is a need to add more hoses to the system because of a long fluid run from the unloader to the dispense point. An expansion 4-zone control can be added to the system to heat additional zones beyond the six of the system unloader. When properly connected with appropriate communication cables, the Therm-O-Flow system can recognize the main system unloader as well as the expansion zones.

For operation and startup of a Therm-O-Flow unloader system, refer to your Therm-O-Flow manual (see front cover).

The Therm-O-Flow Expansion Controls are intended to heat combinations of hot melt hoses and guns or accessory devices. Accessory devices include guns, compensators, regulators, manifolds, and headers. See FIG. 1 for a typical installation.

Fluid Hoses



Only use hoses that have a maximum wattage less than or equal to 1250 watts. Using hoses with higher maximum wattage could create a failure in the electrical circuit.

The Therm-O-Flow Expansion Zone Controls were designed for use with Graco single-circuit material hoses that are rated at a maximum of 1250 watts, and single circuit devices rated at a maximum of 500 watts.

The 255372 4-zone control can operate a maximum of two hoses and two gun/auxiliary zones, or four gun/auxiliary zones when no hose zones are used.

See **Accessories**, page 15, for zone connection instructions.

When installing a system, make sure:

- all air and fluid hoses are properly sized for your system.
- to use only electrically conductive air and fluid hoses.

Key:FIG. 1

A Bleed Type Master Air Valve (required)
B Pump Air Supply Hose
C Fluid Compensator (Zone 4)
D Heated Hose (Zones 5 and 6)
E Hose Hanger
F Manual Dispense Valve
G Extra Heated Hose (Zone Acc. 1)
H Extra Dispense Valve (Zone Acc. 2)
J 4-Zone Expansion Control
K Electrical Control Panel (6 Zone)
L Heated Ram Plate Assembly
M Pump Assembly (Zone 2)

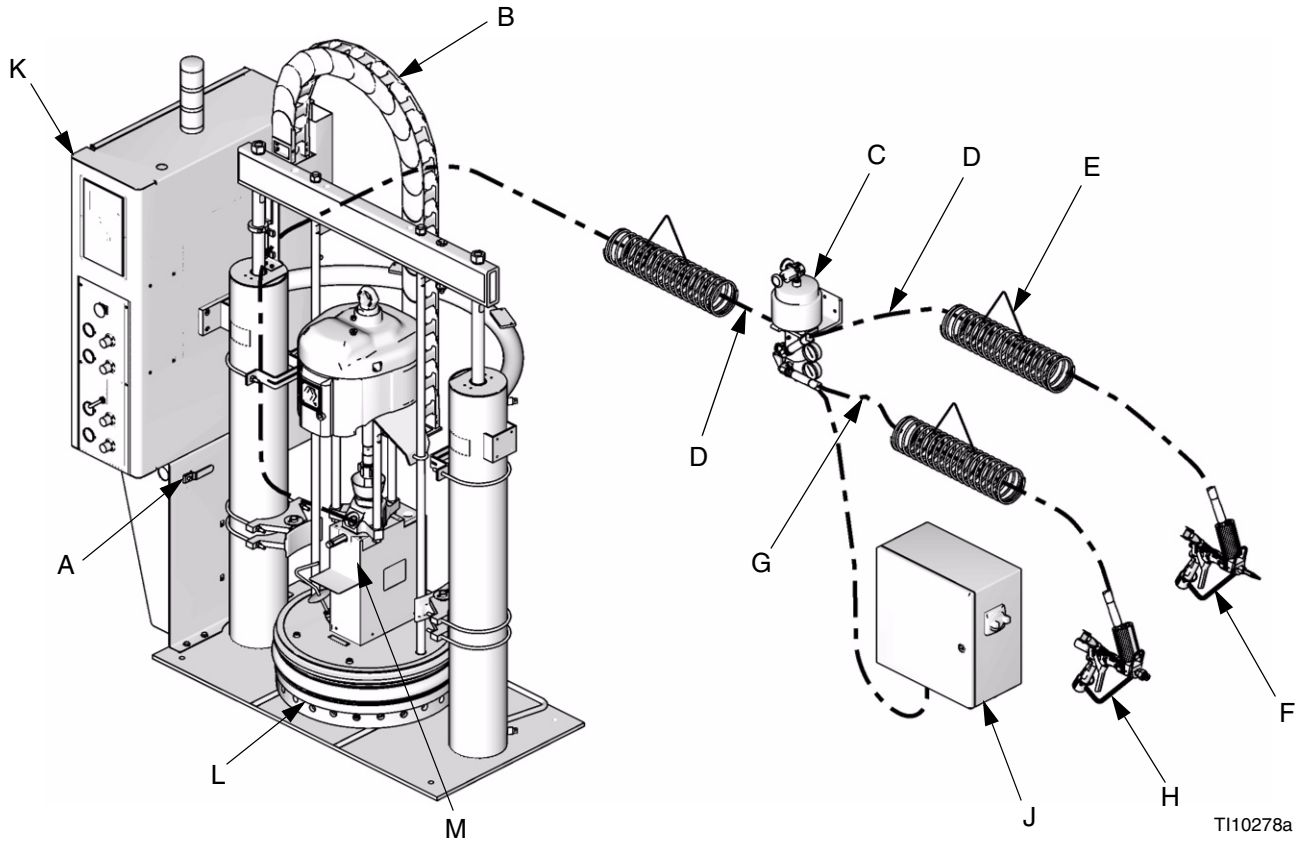
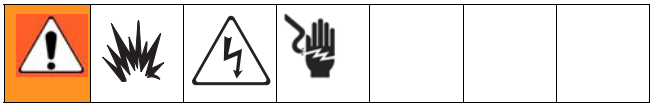


FIG. 1. Typical Installation (Therm-O-Flow 200 Shown)

Electrically Connect Hoses to the Electrical Control Panel



Only use hoses that have a maximum wattage less than or equal to 1250 watts. Using hoses with higher maximum wattage could create a runaway temperature condition.

Assemble the hose and gun components as needed. For information on connecting the hose and gun components, follow the gun's instructions.

Electrically connect the hoses to the electrical control panel. The connectors are located on the bottom of the expansion zone control panel (FIG. 2).

1. Connect the plug from hose 1 to the DH1 (1) hose 1250W/gun 500W receptacle.
2. Connect the plug from hose 2 to the DH2 (2) hose 1250W/gun 500W receptacle.

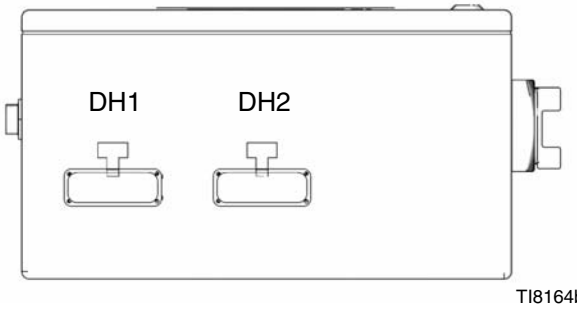


FIG. 2. Bottom View of Electrical Control Box

Ground the System

The power source conduit is not an adequate ground for the system. The unit must be bonded to either the building ground or a true earth ground.

A qualified electrician must complete all grounding and wiring connections and check the resistance as instructed on page 8.

Refer to your local code for the requirements for a true earth ground in your area.

Ground the supply unit as instructed here and in the individual component manuals.

To reduce the risk of static sparking, ground the pump, object being dispensed to, and all other spraying/dispensing equipment used or located in the spraying/dispensing area. Check your local electrical code for detailed grounding instructions for your area and type of equipment.

Fluid Hoses

Use only Therm-O-Flow heated hoses and accessories.

Dispensing/Spray Gun

Follow the dispensing/spray gun grounding instructions.

Object Material is Applied To

Ground the object according to your local code.

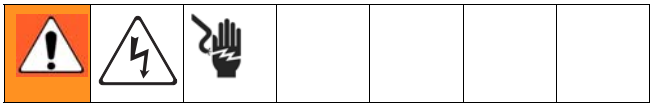
Material Drums

Ground the material drums according to your local code. Use only metal drums placed on a grounded surface. Do not place the drum on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.

Maintain Grounding Continuity When Purging Or Relieving Pressure

Follow the instructions in your separate gun manual for safely grounding your gun while purging.

Connecting the Electrical Control Panel to a Power Source



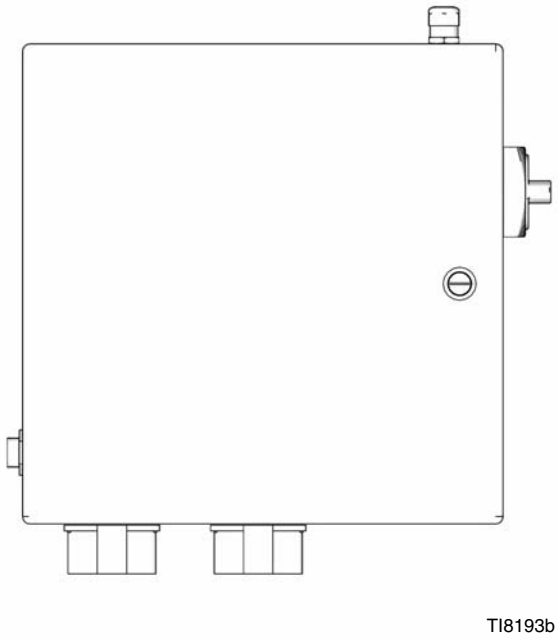


FIG. 3. Electrical Control Panel

Have a trained electrician connect the electrical control panel (FIG. 3) to a grounded electrical source that has the required service ratings. See Table 1.

CAUTION
If power and grounding connections are not done properly, the equipment will be damaged and the warranty will be voided. Check the label on the control box for the proper voltage.

Table 1: Electrical Specifications

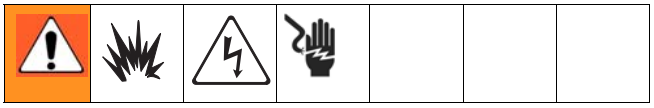
Panel Voltage, Vac	Hz	Phase	Full Load Amps
220/240	50/60	1	15.5

For information about specific terminal locations and connections, see the schematic drawing on page 17.

To connect the control panel to the electrical source:

1. Locate the opening in the control panel`s top housing for the conduit that will enclose the wire from the facility's power source. The hole diameter is 0.804" (20 mm) and includes a cord strain relief for cable diameters from 0.236" (6 mm) to 0.472" (12 mm).
2. Thread the wire from the power source into the control panel housing, and then connect the power source wires to the appropriate terminals on the panel.

Check the Resistance Between the Supply Unit and the True Earth Ground

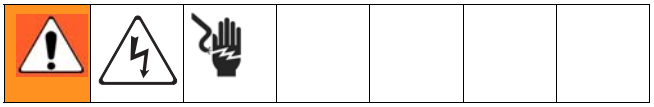


The resistance between the supply unit components and true earth ground must be less than 0.25 ohms.

Have a qualified electrician check the resistance between each supply unit component and the true earth ground. The resistance must be less than 0.25 ohms. If the resistance is greater than 0.25 ohms, a different ground site may be required. Do not operate the system until the problem is corrected.

Use a meter that is capable of measuring resistance at this level.

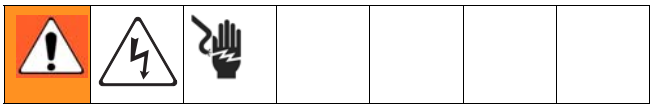
Checking Resistance



Do not open the electrical control panel unless you are a trained professional. Before opening the control panel, make sure that all power has been removed from the control panel.

You can check the resistance of the supply unit's heat sensors and heaters.

Sensor Resistance Checks



To verify the RTD sensors to be used with the 4-zone heat control, refer to the table below.

Table 2: RTD Sensors, 4-Zone Control

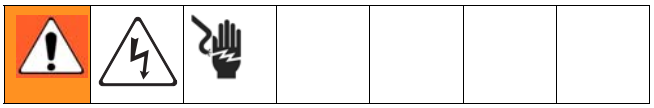
Zone	Component	Terminals	Value Range, ohms
1	Dispense Hose 1	2011 & 2021	108 +/- 2%
2	Dispense Gun 1	2041 & 2051	108 +/- 2%
3	Dispense Hose 2	2081 & 2091	108 +/- 2%
4	Dispense Gun 2	2110 & 2111	108 +/- 2%

An ohm meter can be used to check the resistance between the terminals indicated. To check the sensor resistance:

1. Make sure the power is off and that the disconnect switch is in the OFF position.
2. Make electrical resistance checks for the components.
3. Replace any parts whose resistance readings do not comply with the ranges listed in the chart below.

Check resistance at 63-77°F (17-25°C).

Heater Resistance Checks



To check heater resistance:

1. Make sure the power is off and that the disconnect switch is in the OFF position.
2. Make electrical resistance checks for the components. Refer to your Therm-O-Flow manual for wiring diagram information.
3. Replace any parts whose resistance readings do not comply with the ranges listed in Tables 3 and 4.

Use the following tables for the appropriate zone control. Resistance values of the heating elements for the various devices vary by length and/or type. If the resistance values are not within the indicated range, reference the appropriate device manual for further information.

Check resistance at 63-77°F (17-25°C).

Table 3: Check Heater Resistance, 4-Zone Control

Zone	Component	Between Terminals	Resistance Values, ohms
1	DH Hose/ Auxiliary	1134 & 1142	See Table 4 and Table 5 for resistance values for the device connected.
2	DH Gun/ Auxiliary	1162 & 1142	
3	DH Hose/ Auxiliary	1192 & 1142	
4	DH Gun/ Auxiliary	1222 & 1142	

Table 4: Gun/Auxiliary Heater Resistance Values

Device	Watts	Resistance Values, ohms at 240 Vac
Gun, automatic or manual	200	288, +30/- 40
Compensator	400	144, +14/- 20
Manifold	400	144, +14/- 20
Heater	500	115, +12/- 16

Table 5: Hose Heater Resistance Values (50 Watts/ft)

Length, ft (m)	Resistance Values, ohms at 240 Vac
6 (1.83)	288, +30/- 40
10 (3.05)	144, +14/- 20
15 (4.57)	144, +14/- 20
20 (6.10)	115, +12/- 16
25 (7.62)	115, +12/- 16

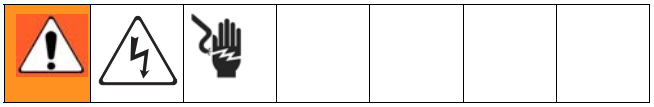
Overview of Temperature Controller Settings

Temperature controls are set in the zone configuration setup screens. See **Run Screens** in your Therm-O-Flow manual for information about setting temperature controls.

P, I, and d settings are preset for device types and will not need to be changed. Refer to the **Zone Setup Screens** in your Therm-O-Flow manual for a list of device types and how to set them for each zone.

Resetting the Ground Fault Interrupt

This control panel is equipped with a ground fault interrupt (GFPE) circuit breaker (FIG. 4). If the disconnect switch is ON, but all lights on the electrical control panel are off, have a qualified electrician check the ground fault interrupt.



To reset the ground fault interrupt, have a qualified electrician:

1. Turn OFF the electrical disconnect on the electrical control panel.
2. Open the electrical control box and locate the Ground Fault Interrupt switch (GFPE). The ground fault interrupt will be in a neutral position, between the ON and OFF positions.
3. Move the GFPE switch to the OFF position, then move it to the ON position.
4. Close the door and turn ON the disconnect switch.

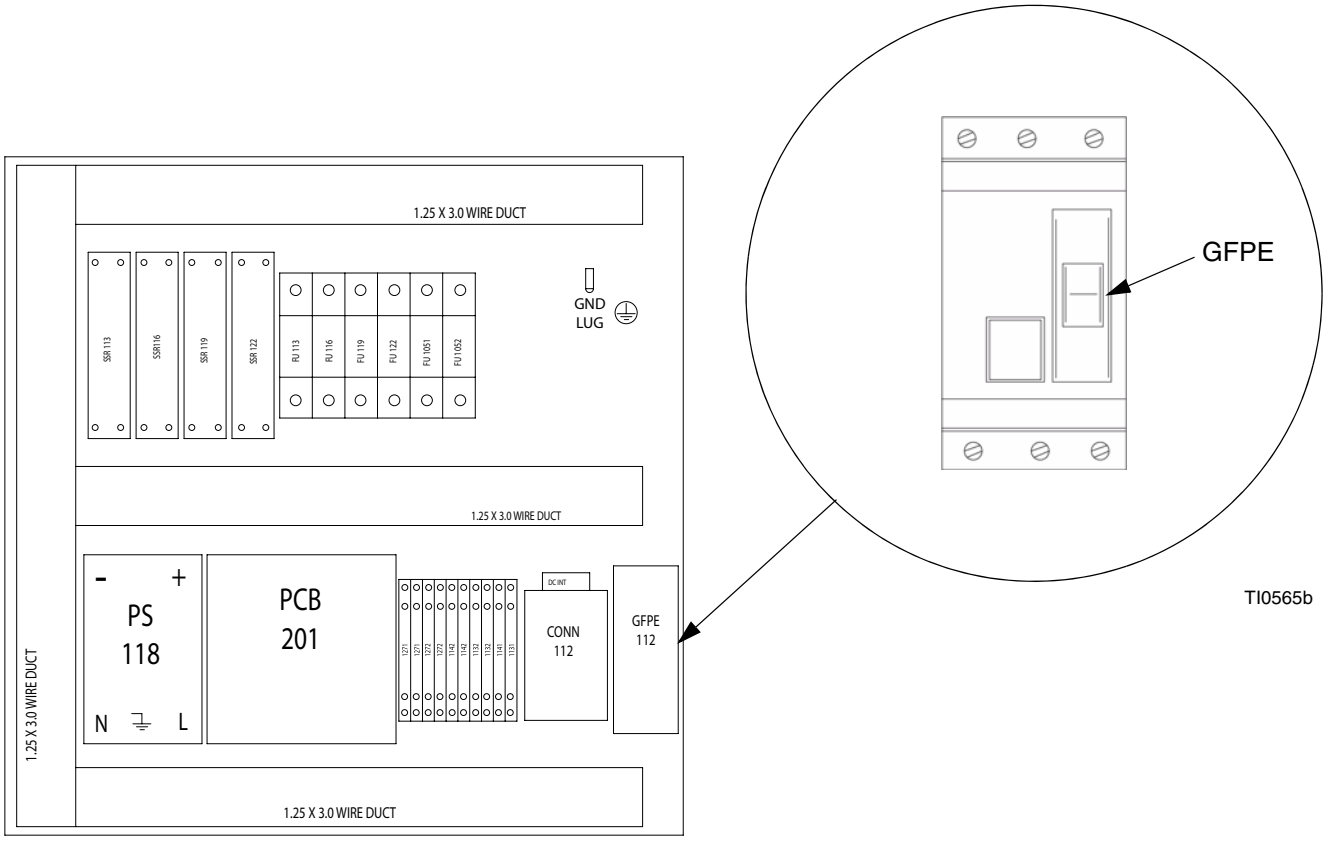


FIG. 4. Reset Ground Fault Interrupt

Electrical Control Panel Troubleshooting

Problem	Cause	Solution
Disconnect is ON, but EasyKey on Therm-O-Flow has communication error.	The ground fault interrupt activated.	Reset ground fault interrupt, page 10.
	One or more fuses is blown.	Replace the blown fuse(s).
	Communication cable disconnected.	Connect cable.

Warnings
Cause
With optional light tower, the yellow light illuminates and green light remains on if in Run mode.
Temperature Warning - occurs when a zone temperature is above/below the setpoint +/- warning deviation specified in the Zone tab of the Setup screen.
Alarms
Cause
W*ith optional light tower, the red light illuminates.*
High Temperature - occurs when the zone temperature is above the setpoint plus alarm deviation specified in the Zone tab of the Setup screen.
Low Temperature - occurs when the zone temperature is below the setpoint minus alarm deviation specified in the Zone tab of the Setup screen while the unloader is in the Run state.
Sensor Error occurs in the following conditions: • When an enabled zone does not increase in temperature within 7 minutes while the system is in the Heat On state. This is the short circuit state of an RTD sensor. • When a zone temperature exceeds 500°F (260°C). This is the open circuit state of an RTD sensor.
Heater Error - occurs if the contactor relay on a temperature board is not closed when a zone of the temperature board is enabled and in a heat state for the active unloader**.**
Communication Error - there are two possibilities: • Start up - Occurs if the EasyKey display board cannot communicate with any board in the system. • Normal Operation - occurs if any board in the system, including expansion enclosure, cannot communicate with the EasyKey Display board.
Events
Cause
Maintenance - occurs in advanced unit if user presses maintenance call button. See **Maintenance Call Kit** in Therm-O-Flow manual for additional information. *With optional light tower the yellow light turns on.* *See **Electrical Schematics** in Therm-O-Flow manual for additional information.*

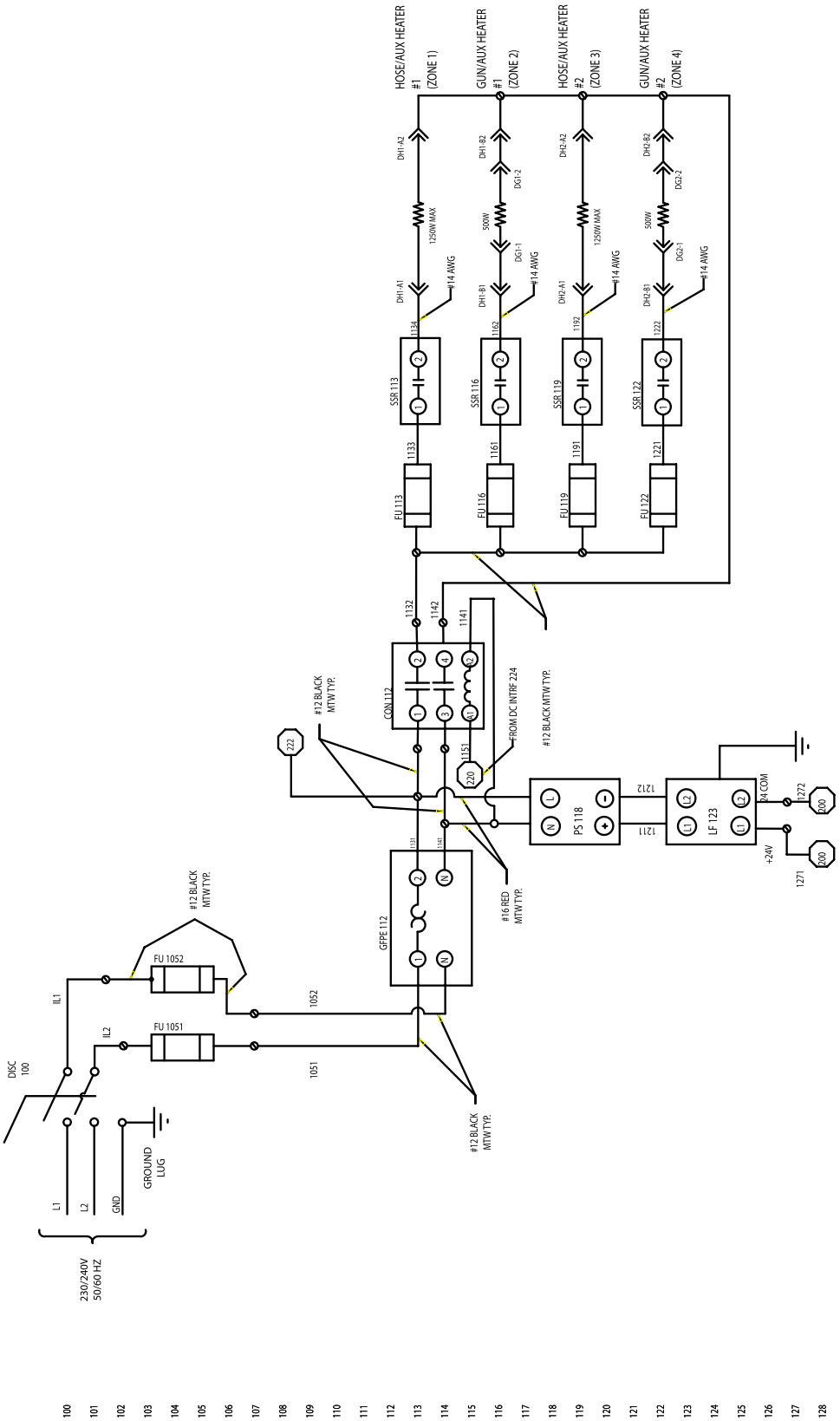


FIG. 5. Electrical Schematic (continued on page 13)

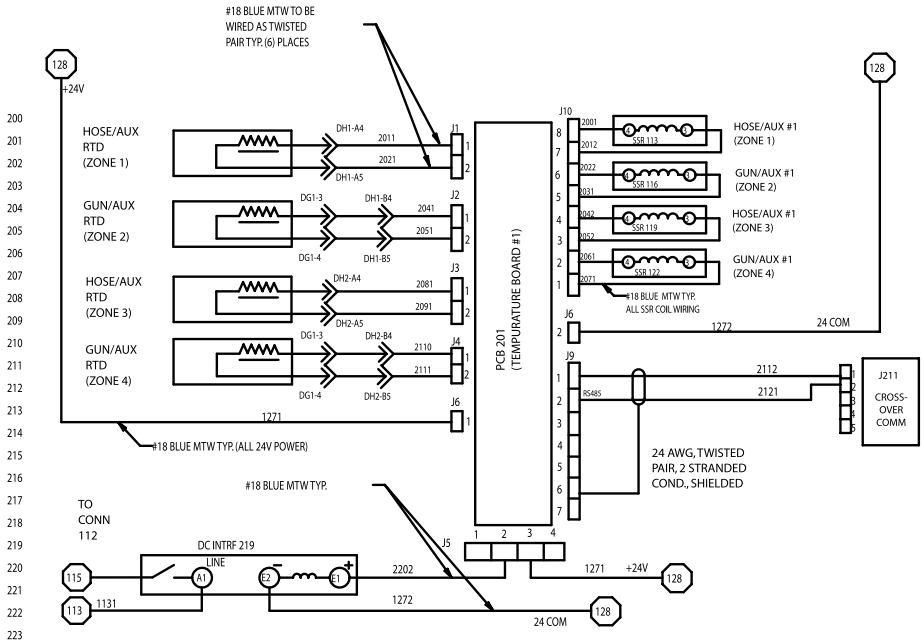
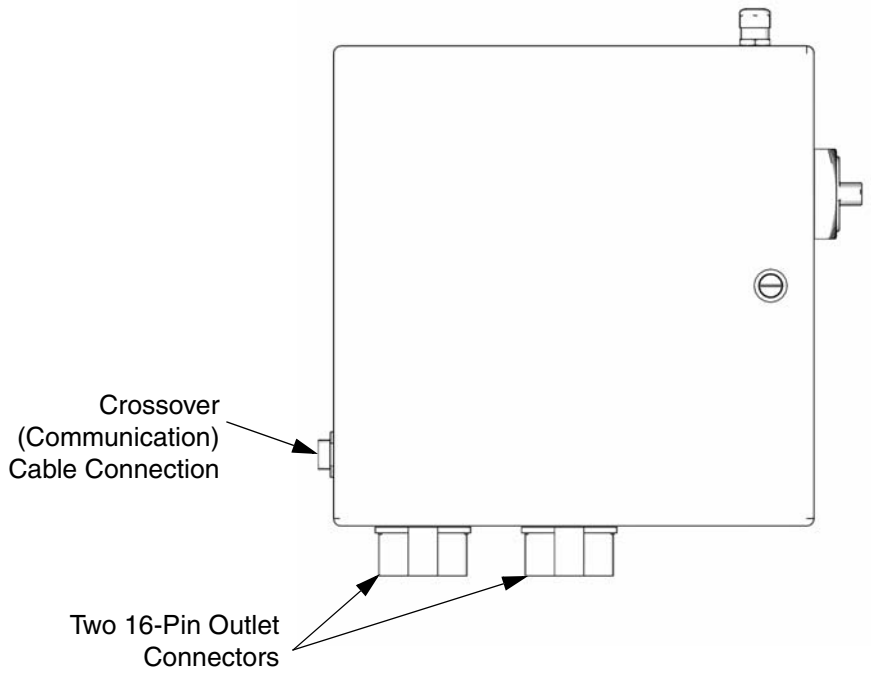


FIG. 6. Electrical Schematic (continued)

Parts

Part No. 255372, 4-Zone Electrical Control, 230/240 Vac



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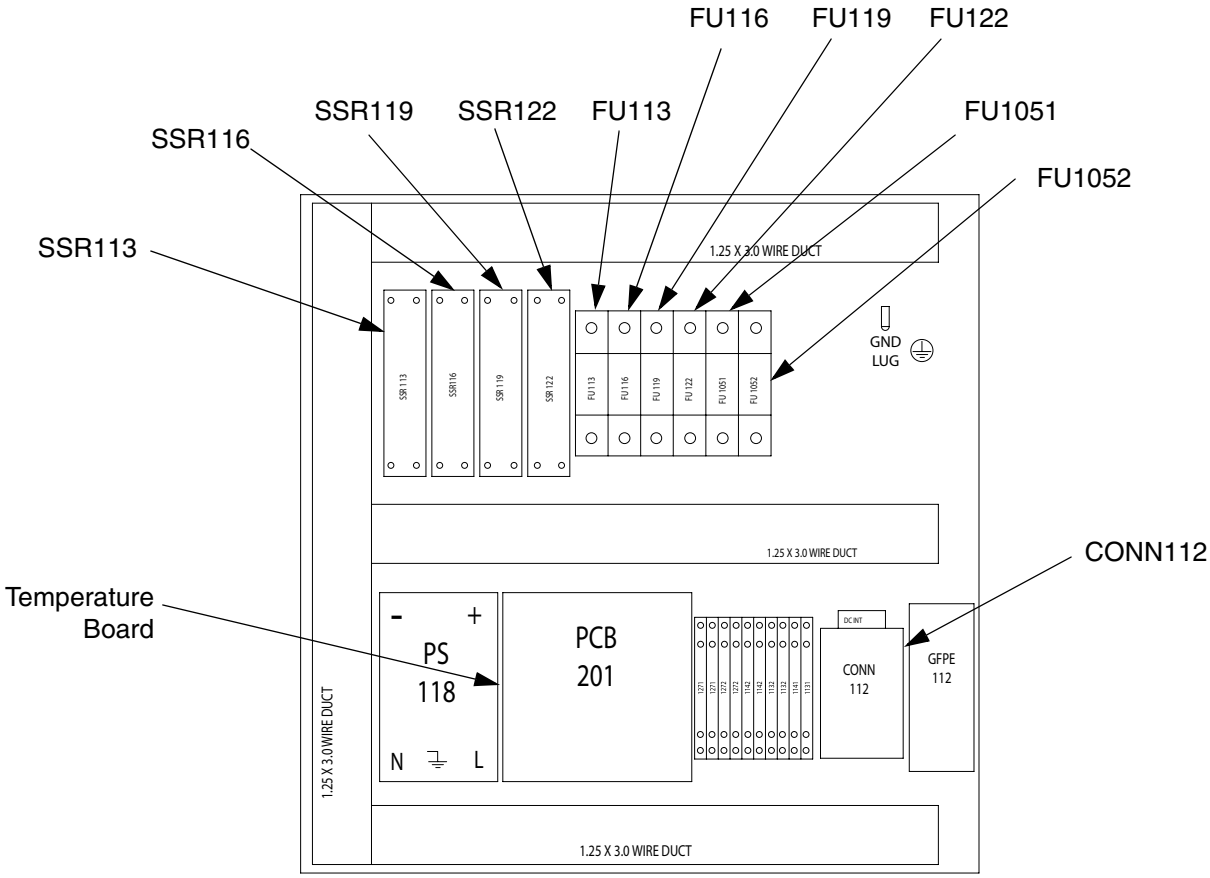


Part No. 255372, 4-Zone Electrical Control, 230/240 Vac

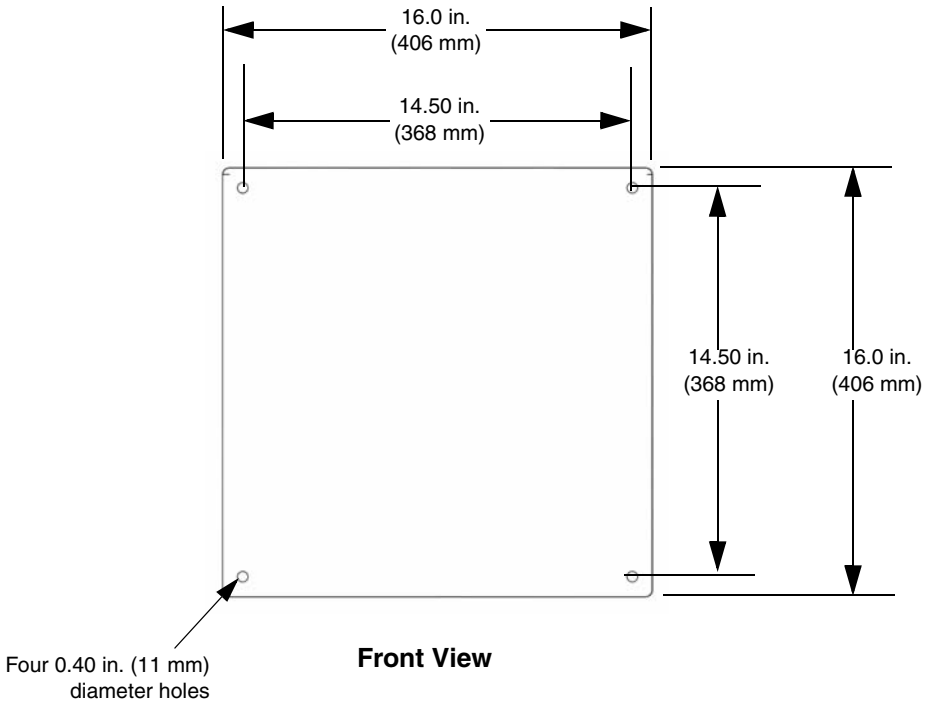
Device	Manufacturer	Manufacturer's Part No.	Graco Part No.	Qty. in Panel
SSR113, 116, 119, 122	Watlow	CZ18-A60V-DC10	120398	4
FU1061, 1062	Bussmann	FNQ-R-20 Class CC	116215	2
FU116, 122	Bussmann	FNQ-R-2-1/4 Class CC	116209	2
FU113, 119	Bussmann	FNQ-R-6 Class CC	116208	2
Temperature Board	Graco	249405	249405	1
CONN112	Allen Bradley	100-C23VA10		

Accessories

Always use genuine Graco parts and accessories. For a full selection of Graco heated hoses and accessories, see your Graco distributor.

Part No.	Description
196313	16 pin to 16 pin Extension Cable, 15 ft (4.57 m) long. Runs between controller and heated hose.
196314	16 pin to 16 pin Extension Cable, 25 ft (7.62 m) long. Runs between controller and heated hose.
196315	16 pin to 8 pin Extension Cable, 15 ft (4.57 m) long. Runs between controller and heated accessory.
196316	16 pin to 8 pin Extension Cable, 25 ft (7.62 m) long. Runs between controller and heated accessory.
196317	16 pin to (2) 8 pin Extension Cable, 15 ft (4.57 m) long. Runs between controller and heated devices.
196318	16 pin to (2) 8 pin Extension Cable, 25 ft (7.62 m) long. Runs between controller and heated devices.
15H385	Cable, 25 ft (7.62 m) long, for communication to Therm-O-Flow System Unloader. Connects PN connector of 4-zone control to PN connector of system control.

Dimensions



Front View

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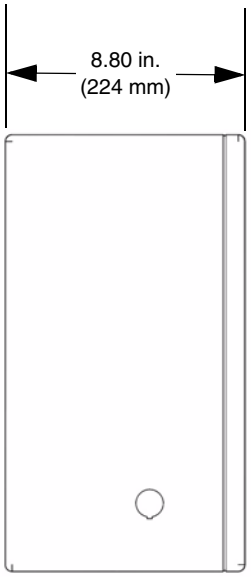

Side View

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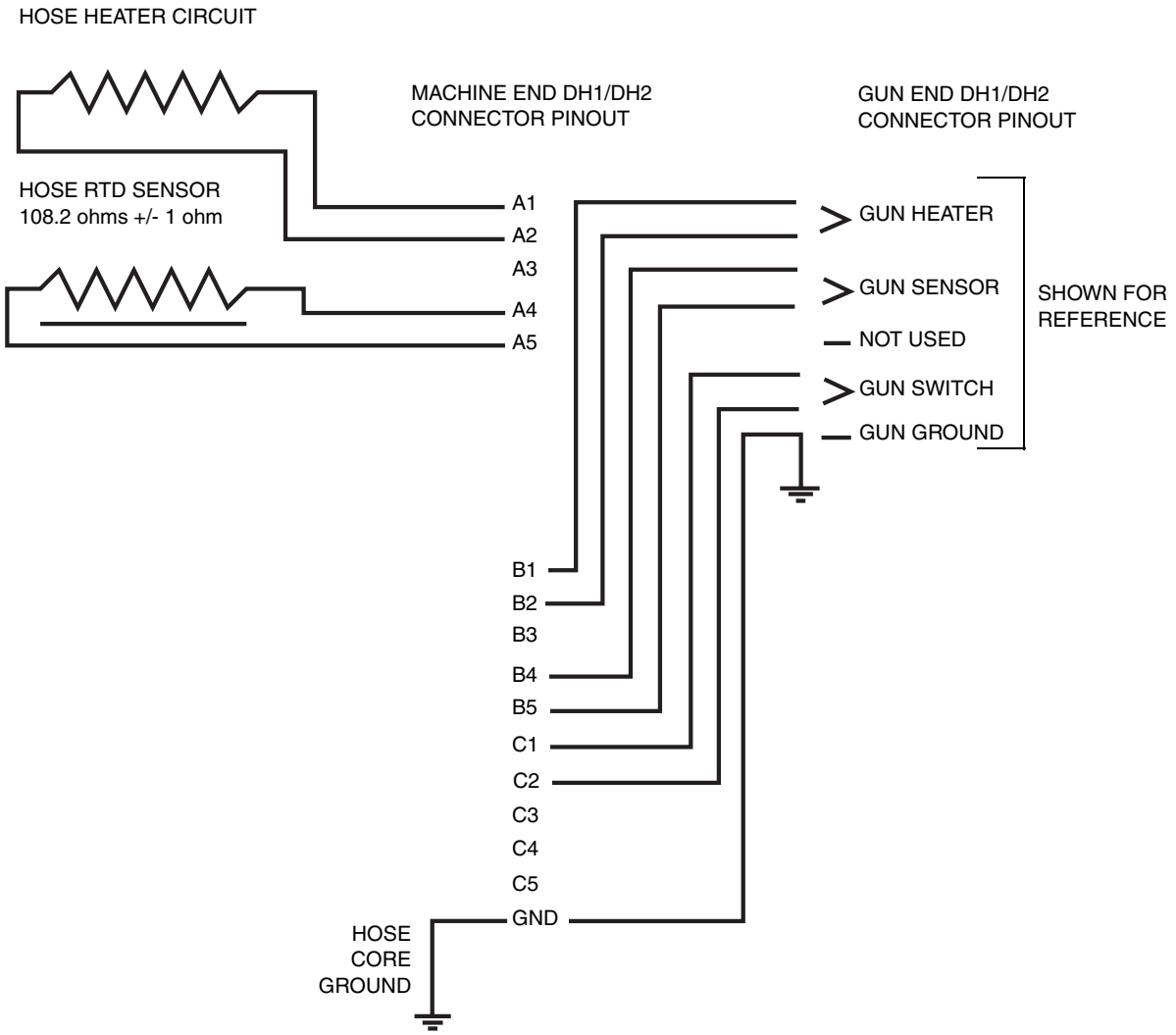
Technical Data

Voltage	220/240 Vac
Frequency	50/60 Hz
Full Load Amps	15.5 A



16-Pin Output Connector Pinout Designations

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Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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Graco Information

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.
Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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