



PosiGROUND[™] Grounding Controller

MODEL 672 OWNERS MANUAL

 **GARNET INSTRUMENTS LTD.**

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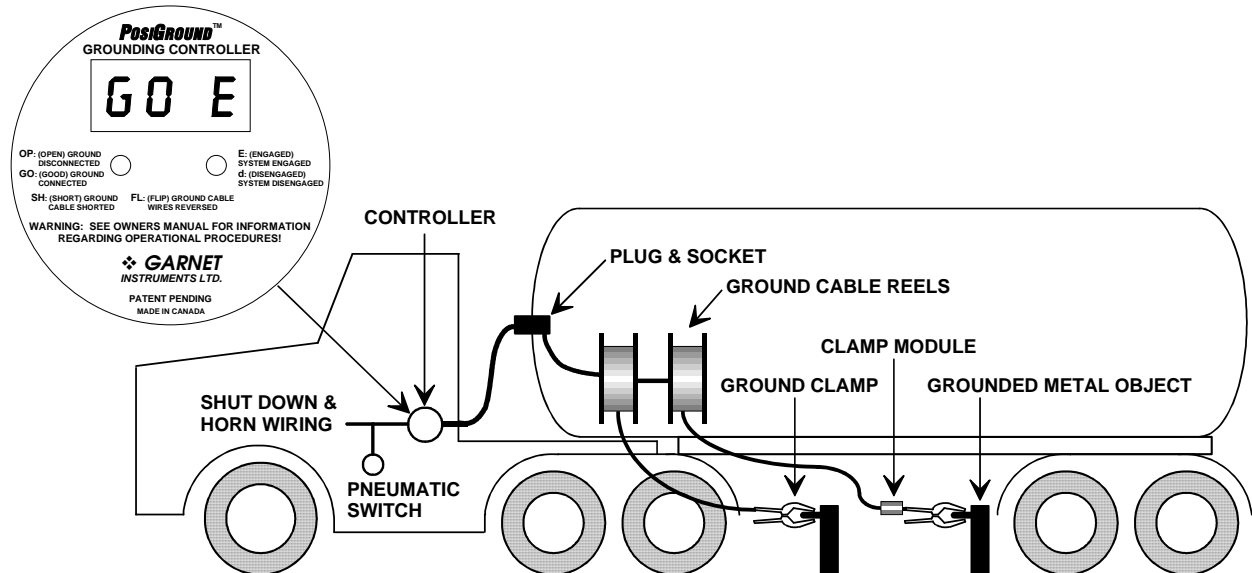
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A) 672 POSIGROUND GROUNDING CONTROLLER FEATURES & OPERATION

Congratulations on purchasing the Garnet Instruments Model 672 PosiGround Truck Grounding Control System. The 672 represents the state of the art in truck mounted grounding control systems, and will enhance safety in the handling of flammable products by providing a positive indication of proper grounding.

The PosiGround system consists of four main components: the controller mounted either inside or outside the cab of the truck, the pneumatic switch sensing loading/unloading engagement, the clamp module which connects between one of the ground cables and its clamp, and the dealer supplied pair of ground reels, cables, and clamps.



The controller is the “brains” of the system. It determines the operational status of the system and whether the ground clamps are properly connected, and controls the warning horn and the shutdown of the loading. The front panel of the controller has an LCD diagnostic display which allows the operator to determine whether the trailer is grounded, and also to assist in troubleshooting in the event of a system malfunction. The LCD has a light behind it to aid in night time viewing, this light operates from the 12 volt power on the truck. There are five wires coming from the controller: ground, ground sense, shutdown, warning horn, and optional 12 volt power for display illumination. The controller operates from a 3 volt Lithium coin cell which should give approximately 10 years of lifetime.

The controller continuously scans the ground and ground sense lines (the two ground cables with their clamps and the clamp module) to determine the ground status of the truck. There are six conditions that the controller scans for:

- 1) **Loading Disengaged:** If the PosiGround senses a short circuit between the **shutdown** and **ground** lines, (which would be caused by the pneumatic switch sensing no pressure) it displays **d** on the right side of the display, indicating that loading is disengaged. The warning horn will be off, and the closed circuit of the pneumatic switch will permit loading when it is engaged. The left side of the display will show the grounding connection, as described below.
- 2) **Loading Engaged:** If the PosiGround does not sense a short circuit between the **shutdown** and **ground** lines, it displays **E** on the right side of the display, indicating that loading

is engaged. It controls the horn and shutdown outputs in accordance with the grounding connection, as described below.

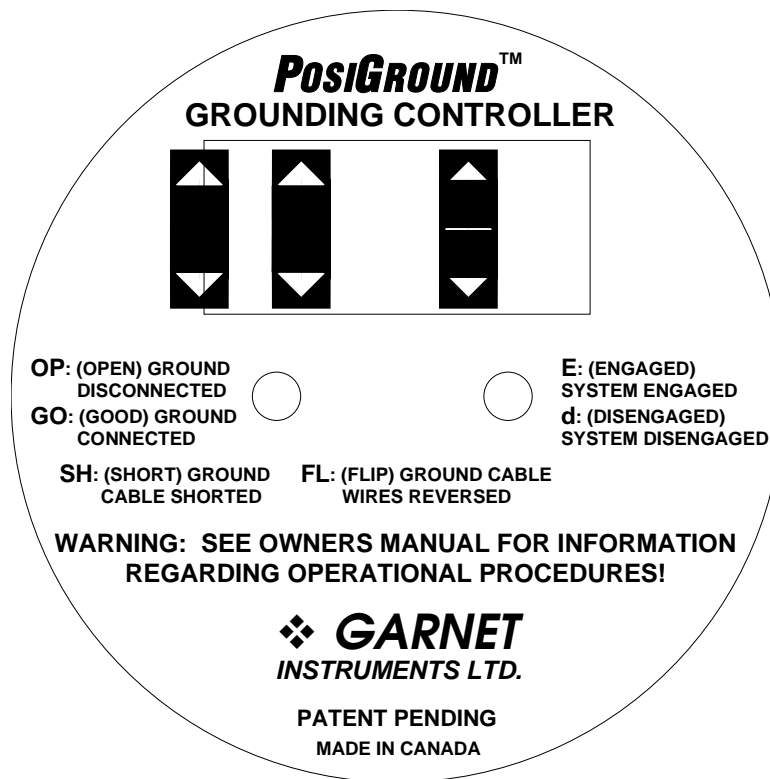
3) **Open Circuit:** If the controller determines that there is no electrical connection between the ground sense line and ground, indicating that the truck is not grounded, it displays **OP** (OPen) on the left side of the display. If loading is engaged, the horn will sound for 30 seconds, and then loading will be shut down.

4) **Short Circuit:** If the controller determines that there is an electrical connection between the ground sense line and ground that does not go through the clamp module, indicating a short circuit between the grounding cables, it displays **SH** (SHort) on the left side of the display. If loading is engaged, the horn will sound for 30 seconds, and then loading will be shut down.

5) **Reversed Clamp Module:** If the controller determines that there is an electrical connection between the ground sense line and ground, but that it is backwards, indicating that the clamp module is reversed or in the ground line, it displays **FL** (FLipped) on the left side of the display. If loading is engaged, the horn will sound for 30 seconds, and then loading will be shut down.

6) **Proper Ground Connection:** If the controller determines that there is an electrical connection between the ground sense line and ground, and that it is in the proper direction, indicating that the truck is properly grounded, it displays **GO** (GOod) on the left side of the display. The horn will be off, and loading will be allowed.

The following drawing shows the front panel of the controller:



The pneumatic switch closes when it senses low pressure. It is electrically connected between **the shut down** line and **ground**. If the truck is PTO loaded, then the pneumatic port of the

switch is plumbed into the PTO engagement air line, so that high pressure indicates PTO engagement. If the truck is vacuum loaded, then the switch is plumbed into the isolation valve pneumatic control line so that high pressure indicates that the isolation valve is open. If the truck is loaded with a hydraulically driven pump driven by a separate engine, then the switch is plumbed into the air line controlling pump engagement, so that high pressure indicates that the pump is running. If the loading pump is driven directly off a separate engine, then the switch is not used. An electrical switch which turns off the engine is used, and has extra contacts that close when the engine is off.

The clamp module is used to determine that the only electrical connection between the ground sense line and ground is through the sense line clamp. This ensures that a short circuit in the cabling prior to the clamps does not fool the system into thinking that the truck is grounded when in fact it may not be.

The dealer supplied cables, reels, and clamps are used to make the actual connections to ground. The proper procedure is to connect one clamp to a metal object which looks like it should be grounded, and to connect the other clamp to another metal object at least 20 feet away which also looks like it should be grounded. If they are both grounded, then there will be an electrical connection between them which the PosiGround will detect. If one or both of the objects is not grounded, then there should not be any connection between them, so the PosiGround will indicate that the truck is ungrounded. This ungrounded condition may result from connecting to pipes which have cathodic protection insulators at the flanges, or from paint or gaskets insulating the metal pieces from each other.

B) 672 POSIGROUND OPERATIONAL PROCEDURES

- 1) When the operator is ready to begin handling, loading, or unloading flammable material, the truck must be grounded.
- 2) Connect one clamp to a metal object which looks like it should be grounded, and connect the other clamp to another metal object at least 20 feet away which also looks like it should be grounded. Ideally, both objects should have a buried portion.
- 3) Check the display, it should show **GO d**, indicating that the ground is good but that loading or unloading has not been started.
- 4) Loading or unloading can now be started. If loading is attempted before the ground connection is made, the horn will sound for 30 seconds, and then loading will be shut down unless the ground connection is made within the 30 second period.
- 5) If the ground connection is lost during loading, the horn will sound for 30 seconds, and then loading will be shut down unless the ground connection is remade within the 30 second period.
- 6) When loading is complete, shut down the loading system and then disconnect the grounds.
- 7) If the ground has been lost and the horn is sounding, shutting down the loading system will silence the horn.
- 8) If the PosiGround shows **SH** or **FL** when the cables are connected, then there is a defect in the wiring of the ground cables which must be corrected before the PosiGround can be used.
- 9) Each time a proper grounding connection is established, or the loading system is shut down, the 30 second timer is reset.
- 10) The PosiGround system must be tested periodically to make sure that the horn sounds and that loading shuts down. The system must also be tested by any new operator to ensure that he is familiar with PosiGround operation for that particular vehicle.

WARNING: The PosiGround is intended as an emergency backup system only, and is not intended as a substitute for operator diligence during the loading or unloading process.

WARNING: It is the operators responsibility to properly connect the ground cables to ensure correct PosiGround operation. Simply hooking the ground clamps together and laying them on the ground does NOT constitute a proper ground connection.

WARNING: Do NOT travel with the ground clamps hooked together, or with the ground sense clamp connected to the truck frame. This may result in the operator forgetting to properly connect the ground

clamps since no warning will be given when loading or unloading is started.

WARNING: It is the installers responsibility to properly connect and test the horn and shut down features of the PosiGround. If these systems are not all connected, the truck operator **MUST** be made aware of exactly what the PosiGround does control, if anything.

IMPORTANT

In the unlikely event that the PosiGround system should fail and the truck is disabled due to engine shut down, the dash mounted PosiGround switch can be selected to **OVERRIDE** from the **NORMAL** position. This switch position completely disables the engine shutdown feature of the PosiGround system. All other features, such as the horn, may still be functional.

WARNING: When the PosiGround switch is in the **OVERRIDE** position, engine shutdown is disabled and grounding protection is eliminated.

C) TROUBLESHOOTING GUIDE

There are only 3 serviceable components in the PosiGround system: the controller, the clamp module, and the pneumatic switch. Each part can be tested independently.

To test the pneumatic switch, disconnect the terminals and connect a continuity tester across the terminals. When there is no pressure to the switch, there should be continuity. Applying more than about 4 PSI of air pressure should cause the switch to open.

To test the clamp module, connect the red wire to the yellow ground sense wire of a PosiGround controller (one that you know is good), and the black wire to the black ground wire of the controller. The controller should show **GO**, if not then the module is defective.

To test the controller, connect test lights between +12 volts and the horn and shutdown wires. Connect a known good clamp module (CM red to controller yellow, CM black to controller black). The display should read **GO E** and the shutdown light should be on and the horn light should be off. Note that it may take 1 to 2 seconds for the display to respond. Shorting the ground sense and ground wires together should show **SH E** and the shutdown light should stay on and the horn light should flash for 30 seconds, and then both lights should go out. Shorting the shutdown and ground wires together should turn on the shutdown light, and the display should show **SH d**. Removing this short should start the horn light flashing and the shutdown light should stay on for 30 seconds. Remove the short between the ground sense and ground wires, the display should read **GO E** again. Removing the clamp module should show **OP E** and the shutdown light should stay on and the horn light should flash for 30 seconds, and then both lights should go out.

If all components check out but problems are still encountered, check the wiring for faults by starting at the controller and working out from there.

D) SERVICE AND WARRANTY INFORMATION

The warranty will apply only if the warranty card shipped with the equipment has been returned to Garnet Instruments Ltd.

Garnet Instruments Ltd. warrants equipment manufactured by Garnet to be free from defects in material and workmanship under normal use and service for a period of one year from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation as indicated on the warranty card. Under these warranties, Garnet shall be responsible only for actual loss or damage suffered and then only to the extent of Garnet's invoiced price of the product. Garnet shall not be liable in any case for labor charges for indirect, special, or consequential damages. Garnet shall not be liable in any case for the removal and/or reinstallation of defective Garnet equipment. These warranties shall not apply to any defects or other damages to any Garnet equipment that has been altered or tampered with by anyone other than Garnet factory representatives. In all cases, Garnet will warrant only Garnet products which are being used for applications acceptable to Garnet and within the technical specifications of the particular product. In addition, Garnet will warrant only those products which have been installed and maintained according to Garnet factory specifications.

LIMITATION ON WARRANTIES

These warranties are the only warranties, expressed or implied, upon which products are sold by Garnet and Garnet makes no warranty of merchantability or fitness for any particular purpose in respect to the products sold. Garnet products or parts thereof assumed to be defective by the purchaser within the stipulated warranty period should be returned to the seller, local distributor, or directly to Garnet for evaluation and service. Whenever direct factory evaluation, service or replacement is necessary, the customer must first, by either letter or phone, obtain a Returned Material Authorization (RMA) from Garnet Instruments directly. No material may be returned to Garnet without an RMA number assigned to it or without proper factory authorization. Any returns must be returned freight prepaid to: Garnet Instruments Ltd., 284 Kaska Road, Sherwood Park, Alberta, T8A 4G7. Returned warranted items will be repaired or replaced at the discretion of Garnet Instruments. Any Garnet items under the Garnet Warranty Policy that are deemed irreparable by Garnet Instruments will be replaced at no charge or a credit will be issued for that item subject to the customer's request.

If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

Garnet Instruments Ltd.
288 Kaska Road
Sherwood Park, Alberta
Canada T8A 4G7
E-mail: tstalker@garnetinstruments.com

E) DEALER LISTS

American Dealer List

ADVANCED TANK SYSTEMS

301 Enterprise Lane
Colmar PA 18915 Ph (215) 822-1336

BEALL TRAILERS OF COLORADO INC.

4850 East 74th Avenue
Commerce City CO 80022 Ph (303) 289-3149

BEALL TRAILERS OF MONTANA INC.

1430 Highway 87 East
Billings MT 59103 Ph (406) 252-7163

BEALL TRAILERS OF NORTH DAKOTA INC.

537 – 27th Avenue East
Dickinson ND 58601 Ph (701) 225-4441

BEALL TRAILERS OF OREGON INC.

9200 N Ramsey Blvd
Portland OR 97203 Ph (503) 286-8823

BLUE STREAK WELDING

PO Box 275
Slanesville WV 25444 Ph (304) 822-8876

BRENNER TANK

PO Box 670
Fond Du Lac WI Ph (920) 922-4530

BULLZEYE TANK SERVICE

1041 Conrad Sauer
Houston TX 77043 Ph (713) 465-0447

C-CAM

9938 Chemical Road
Pasadena TX 77507 Ph (281) 474-1101

ENERGY FABRICATION INC.

3750 Kermit Hwy.
Odessa TX 79764 Ph (915) 362-0591

FLEETPRIDE POWER EQUIPMENT

7749 Interstate 37 1-888-884-9385
Corpus Christi TX 78409 Ph (361) 289-5151

HEIL TRAILER

1121 Cantrell Sansom Road 1-800-621-2563
Fort Worth TX 76131 Ph (817) 232-0900

HY-TEC INC.

51 Industrial Circle
Lancaster PA 17601 Ph (717) 656-4329

KERSTEN TRAILER SALES

8999 East 96 Avenue
Henderson CO Ph (303) 287-2891

MacCLASKEY OILFIELD SERVICES

5900 W Carlsbad Highway
Hobbs NM 88241 Ph (505) 393-1016

RAMPMASTER

140 Stewart Huston Drive 1-800-344-4018
Coatesville PA 19320 Ph (610) 857-1900

RUSH SALES COMPANY

2700 E. I-20 PO Box 2488
Odessa TX 79760 Ph (915) 337-2397

SEMI SERVICE INC.

1082 South 300 West
Salt Lake City UT 84115 Ph (801) 521-0360

SOONER GREAT DANE

5204 I-40 West
Oklahoma City OK 73128 Ph (405) 946-9907

STEPHANS PNEUMATIC INC.

147 County Road 4840
Haslet TX 76652 Ph (817) 636-9004

SUPERIOR TRUCK & TRAILER

4705 McGee Road
Greenwood LA 71033 Ph (318) 938-5492

TRANSTECH INDUSTRIES

42 Coffin Avenue
Brewer ME 04412 Ph (207) 244-9611

UTILITY TRUCK & EQUIPMENT

1432 Broad Street 1-800-256-8832
Lake Charles LA Ph (337) 433-5361

Distributors

ARMSTRONG EQUIPMENT SERVICE

1002 N. Parker Street 1-800-699-7557
Orange CA 92867 Ph (714) 289-7600

TANK TRAILER SPECIALTY EQUIP. CO. INC.

5733 Ransom Street
Houston TX 77087 Ph (713) 641-4255

Canadian Dealer/Distributor List

Dealers

ADVANCE ENGINEERED PRODUCTS LTD. 10498-17 Street Edmonton AB T6P 1V8	Ph (780) 467-8891	H & S MECHANICAL Box 156 Carlyle SK S0C 0R0	Ph (306) 453-2213
ADVANCE ENGINEERED PRODUCTS LTD. 5502-56 Avenue S.E. Calgary AB T2C 4M6	1-800-332-8385 Ph (403) 720-4888	INNOVATIVE HYDRAULICS 5202-62 Street Lloydminster AB T9V 2E4	Ph (780) 875-4385
ADVANCE ENGINEERED PRODUCTS LTD. 5218-62 Street Lloydminster AB T9V 2E4	Ph (780) 875-4952	JASPER TANK #200, 53016 Hwy 60 Spruce Grove AB T7X 3G7	Ph (780) 962-1333
ADVANCE ENGINEERED PRODUCTS LTD. 144 Henderson Dr. Regina SK S4N 5P7	Ph (306) 721-5678	PARTCO West Road Industrial Park SUNDRE AB T0M 1X0	Ph (403) 638-3414
ADVANCE ENGINEERED PRODUCTS LTD. 2335 Schuyler Street Saskatoon SK S7M 5V1	Ph (306) 933-2445	PROTANK LTD. 400-410 Pinebush Road Cambridge ON N1R 8E6	1-800-205-6871 Ph (519) 624-5150
AV BRAKE (formerly McCOY BRO'S SOUTH) 4005-9 TH Ave North Lethbridge AB T1H 6H6	1-800-265-4387 Ph (403) 327-2299	QUICKSILVER MANUFACTURING LTD. (Nocorode Tanks) 1 Main Street Strome AB T0B 2H0	Ph (780) 672-8180
BRADVIN TRAILER SALES LTD. 10939-96 Ave. Grande Prairie AB T8V 3J4	Ph (780) 539-6260	REMTEC 933 Boul Simard Chambly QC J3L 4B7	Ph (450) 658-6671
COLUMBIA REMTEC 12343A-104 Avenue Surrey BC V3V 3H2	Ph (604) 930-3551	ROCKY RAPIDS Box 61 Drayton Valley AB T0E 1Z0	Ph (780) 542-0787
EDMONTON TRAILER SALES 16830-111 Avenue Edmonton AB T5M 2S6	Ph (780) 413-6030	TRU-KARE TANK AND METER SERVICE LTD. RR1 Site 2 Box 2 Lacombe AB T0C 1S0	Ph (403) 782-1811
GBM TRAILER SERVICE LTD. 8516-40 Street S.E. Calgary AB T2P 2G6	Ph (403) 279-9717		
GOLDEC INT'L EQUIPMENT INC.(Hamm's Tanks) 6760-65 Avenue Red Deer AB T4P 1A5	1-800-661-1665 Ph (403) 343-6607		
HOTROD MACHINING INC. Box 253 High Level AB T0H 1Z0	Ph (780) 926-4944		

Distributors

FABMASTER
4313-76 Avenue
Edmonton AB T6B 2H7

Ph (780) 461-8111