

**TECHNICAL
AND
INSTALLATION INFORMATION
FOR ALL
K62 SERIES DISPENSERS
AND
K322 SERIES DISPENSERS**

Tulsa Gas Technoloiges' dispensers are manufactured with service and ease of installation. Before you service or install the dispenser, open both lower doors and familiarize yourself with the contents of the dispenser.

Locate the main junction box. As you are facing the lid, hose "A" is on the left and hose "B" is on the right. The display eletronics is an aluminum box just above the main junction box. There is one per hose. As you are facing the display electronics box, the hose that it works is the hose on your right. Weights and measures dispensers will have a NEMA 4 junction box on the outside of the dispenser that will have the terminals that are required by Handbook 44. Weights and measures dispensers will also have a switch that will switch the display from GGE to Mass Weight. It is located behind the display face that has the infrared LEDs on them. Open the face and it will be located behind the dollar sign (\$) on the back of the display board.

On a twin hose dispenser, the Micro Motion transmitter (blue round box) is behind the display face plate and the transmitter that controls the hose on your right will be facing you. (See face plate removal instructions.) On a single hose dispenser, the Micro Motion transmitter is located just behind the display box. The solenoid valve is located on the right of the lower junction box for the respective hose that it controls. On a single, it is located on the back of the junction box.

The Micro Motion Sensor is on the right as you are facing the display electronics box. You can follow the tubing and find the solenoid valve and the manual shut off valve. (See P&ID drawing in manual for flow diagram).

Warning: This dispenser can have high pressure gas inside at any time. Extreme care must be taken to discharge this gas, as automatic and manual valves may trap gas inside tubing. Make sure that any automatic function of the complete fill station is disabled to prevent accidental discharge of gas. Multiple voltage sources can be present at any time. Take extreme car to turn off any and all power to dispenser. Be aware that you are working with a flammable gas and that you are working in a Class 1, Div.1, Group D area inside the dispenser, and a Class 1, Div. 2, Group D area outside the dispenser, within five (5) feet of the dispenser body. Any tool or device that is used in a hazardous area must be rated for the area that it is in.

TECHNICAL SPECIFICATIONS

1. Maximum Allowable Working Pressure (MAWP) is 5000psig (DH38) and 4000psig (DH25).
 2. Operating temperature range is -40 C (-40 F) to 66 C (150 F).
 3. Electrical rating is 120V AC, 3 AMPS maximum; 60HZ, Class I, Division I, Group D;
 4. Micro Motion DH25 meter is rated for 4000psi and 25 lbs./minute fill rate or approximately 500 CFM. The DH38 meter is rated for 5000psi and 60 lbs./minute fill rate or approximately 1000 CFM. The DH38 meter is required in weights and measures version of dispensers.
 5. This dispenser shall only be installed with a listed or approved overfill protection system.
 6. The permissible fill pressures for a P24 system is 2400 psi, a P30 system is 3000 psi, and a P36 system is 3600 psi.
 7. This dispenser is "For Use With Natural Gas Only".
 8. TGT dispensers are manufactured under the following guidelines:
 - NFPA 52
 - ANSI B31.3
 - AGA 4.1/CGA 12.5 STANDARD (Proposed to be in effect 01-01-97)
 - NEC.
 - NIST Hand book 44
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INSTALLATION

1. The TGT concrete island box will need to be poured into the concrete flush with the concrete. The dispenser will mount to this island box with 1/2" bolts through pre-punched holes in the island box and the dispenser. The island box needs to be self-supporting and not dependent on the electrical conduits or piping going to the dispenser.
2. The TGT foot print on a twin is not directional. You can use the center of the island box for your rough-in of conduits and gas lines. (See twin foot print drawings.)
3. The TGT foot print on a single is directional, so look at foot print diagram before rough-in begins. (See single footprint drawing.)
4. Note the rough in heights of the conduits on the electrical drawing. The junction box is low in the cabinet, so make sure to leave plenty of room for the sealoffs and unions.
5. It is recommended that an isolation valve be installed upstream of the dispenser so that the dispenser can be removed or serviced without having to undo any pipe fittings. When the dispenser is removed, the isolation valve will stay with the piping, not the dispenser.
6. The vent line is located inside the dispenser cabinet and is a 1/4" tube fitting. You will need to connect this to the vent location that is on your site.
7. The TGT dispenser can be configured so that the solenoid valve inside the dispenser serves as the temperature compensation valve. If this is done, there MUST be a pressure relief valve (as specified in NFPA 52, AGA NGV 4.1/CGA 12.5 Standard for NGV Dispensing Systems, Article 1.11.3, Item A) down stream of this valve.
8. The user, installation, service, and technical manuals, as applicable, shall be left with the appropriate person.

9. The installation shall be in accordance with the following:

The requirements of the authorities having jurisdiction, in accordance with the provisions of either the CAN/CGA-B108-M95 NGV Refueling Stations installation Code, or the NFPA 52 Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems, and;

the CAN/CSA-C22.1-1990 Canadian Electrical Code, Part 1, and NFPA 70 National Electrical Code, and;

the dispenser system is intended for use with gas composition specified by SAE J1616 Recommended Practice for Compressed Natural Gas Vehicle Fuel Composition, unless additional precautions are taken, and;

the dispensing device shall be installed as recommended by the manufacturer, and;

the maximum allowable working pressure (MAWP) of the dispenser is 5000psig.

10. Select NGV1 nozzle for the delivery pressure of the vehicle and shall be in accordance with AGA NGV 4.1/CGA 12.5 Standard for NGV Dispensing Systems, Article 1.9.3.

READING TOTALIZERS

1. Ensure the pump handle is in the off position.
2. Aim the communicator's transmitters (located on the top of the unit) at the optical sensor located to the right of the price display. Depress and hold the "SEL" key on the communicator. The red indicator to the left of the price display will flash as the electronic head receives the communicator's signal.
3. Hold the "SEL" key until the dollar sales total is displayed. Dollars sale total uses ten digits of the dollars and volume displays preceded by the letters "DOL".
4. To display volume total, depress and hold the "SEL" key until the display shows "V" followed by the ten digit volume total. Pressing the "SEL" key repeatedly or holding it down will cause the display to switch back and forth between volume and dollars totals.

PRICE SETTING

1. Place the pump handle in the on position.
2. Switch off the head power to the electronic head. The electronic head displays should now be flashing.
3. Aim the communicator at the optical sensor as described above and hold the "SEL" key until only the desired digit is being displayed. (If communication is properly established, only one digit of the price display will be shown at time.)
4. Depress and hold the "SET" key until the display increments to the desired number.
5. When the correct price per unit has been entered return the handle switch to the off position and restore head power.

**ELECTRICAL CONNECTIONS
AND
GENERAL INFORMATION**

All wiring must be installed in accordance with National and local electrical codes.

-WARNING-

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

The customer leads are located in the bottom of the dispenser under the round screw cover. All unused wires must be capped or taped off.

WIRE COLOR	WIRE NUMBER	DESCRIPTION
120 VAC Lines		
Black 18 AWG	1	120 VAC head power hot line. If power is interrupted on this line, the head will go into standby and power-fail modes. If an ESD system is used, removing voltage from this line will disable all dispenser functions.
White 18 AWG	2	Neutral for head power and main board authorize/authorize request circuit.
Green 14 AWG	3	Earth. This line is connected internally to the casting and must be connected to the service ground.
Brown 18 AWG	14	Authorize input. Application of 120 VAC will authorize the electronic head to dispense product. If 120 VAC is not present when the handle switch is turned on, the electronic head applies a 2.7 K ohm resistor between this line and wire #2.
Gray 18 AWG	15	Authorize output. When 120 VAC is applied to wire #14 and the handle switch is on, 120 VAC will be present on this line. This line is also used for an IN USE signal. The IN USE signal will appear on this line before the reset.

WIRE COLOR	WIRE NUMBER	DESCRIPTION
Orange 14 AWG	8	Solenoid valve output. When the electronic head is ready to dispense product, the power applied to wire #7 is switched to this line to operate the solenoid valve This wire is also used as an IN USE signal, after the reset has completed. This voltage will go away if the handle is shut off.(120vac). This is used in most common card readers and consoles.
Orange 18 AWG	80	Solenoid valve wire. Normal installations should be looped to wire #8. Card readers that control the valve will connect between #80 and #8 in place of the jumper.
Black 14 AWG	7	Solenoid valve input. This line is connected to wire #8 when the electronic head is authorized and the handle switch is on. This is pre wired in the dispenser.
Orange 18 AWG	6	Solenoid power out. This line is used to supply power to a slow-flow or cut-if solenoid under electronic head control. Not used on standard models.
Purple 18 AWG	20	Solenoid power in. This line is switched to wire #6 by the electronic head to activate the solenoid valve. Not used on standard models.

WIRE COLOR WIRE NUMBER DESCRIPTION

LOW VOLTAGE LINES

Yellow 18 AWG 4 Pulsar common. This line is normally connected to the pulsar power supply positive line (+30 volts maximum, DC only) and provides power to the penny and volume pulsar lines.

Red 18 AWG 5 Penny pulsar output. The electronic head will source a maximum of 100 ma from the pulsar common (#4) to this line to form a pulse once for each penny of product dispensed.

Blue 18 AWG 18 Volume pulsar output provides a pulse (as described above for penny pulsar) for each specified fraction of a unit of volume. (Used for card or key systems.).

Dry Contact Relays Mounted on back of terminal strip plate. Double pole, double throw relay with coil triggered on wire #8 after reset.

LOW VOLTAGE WIRE DATA SIGNAL

Green 18 AWG 16 Date Channel Common. This line is connected to the "DCC" terminal block of a Concept 5000 control box or to the diode board of a Micro 2RP system.

Tan 18 AWG 10 Talk-to-Console. This line is connected to the "TTC" terminal block of a Concept 5000 control box and carries messages from the pump to the console.

Pink 18 AWG 9 Talk-To-Pump. This line is connected to the appropriate terminal on the "TTP" terminal block of a Concept 5000 control box or to the diode board of a Micro 2RP system and carries messages from the console to the pump.

TESTING THE UNIT

1. Insure that all the wires are properly connected and that the unit is properly grounded.
2. Apply power to the unit. The LCD displays should come on.
3. Turn the handle on. The unit should go through lamp test. (NOTE: Lamp test is when the displays go to all 8's and then to 0's.) The price display will show a price that is set in at the factory.
4. Check valve for proper operation.
5. Check dispenser for leaks.

In the event of a drive off and the hose breaks away from the dispenser:

1. Make sure power is off.
2. Check for leaks and damage that may have resulted from the drive off.
3. De-pressurize hose.
4. De-pressurize dispenser through bleeder under dispenser. NOTE: Gauge on dispenser can be used to check for pressure.
5. Inspect hose for damage, retest according to hose manufacturer's suggested procedures, and reinstall.
6. Check nozzle for operation and seal.

REMOVING COMPONENTS

MODEL K62

MAIN BOARD

1. If possible, read totals and record before starting to save any information that may be lost in the replacement of the board.
2. Disconnect all power to dispenser.
3. Close manual shut off valve.
4. Remove bolts on cover; or break seal on a weights and measures version. (If seal is broken, weights and measures shall be notified and a qualified weights and measures technician must reseal this enclosure.) This will expose the back of the main board.
5. Remove the two (2) screws at the bottom of the board.
6. Pull plugs and remove board.

Observe the plugs and their position on the board, as they must be replaced in the same location. You will have to re-program the price back into the head. (See price change instructions.)

SOLENOID VALVE

1. Disconnect all power.
2. Close the manual shut off valve upstream of the dispenser.
3. Remove the pressure on the dispenser by opening the bleeder valve on the tubing that you are on.
4. Disconnect wires from the coil by cutting the wires.
5. Loosen the union that connects the coil to the junction box.
6. Loosen the tube fittings and remove the valve.

MICRO MOTION SENSOR

1. Disconnect all power.
2. Close the manual shut off valve upstream of the dispenser.
3. Remove the pressure on the dispenser by opening the bleeder valve on the tubing that you are on.
4. Remove the brace in front the sensor.

5. Disconnect the wires from the terminals.
6. Remove the conduit fitting from the junction box.

7. Remove the tube fittings at the base of the sensor making sure to use a backup wrench on the fittings.

Reverse this process for reinstallation. The sensor and transmitter are a matched set and reprogramming of the sensor will be required if a different sensor is installed in the same place. (Call TGT for help with reprogramming.)

MICRO MOTION TRANSMITTER

Call TGT for help. Major reprogramming is required for this step. (If seal is broken, weights and measures shall be notified and a qualified weights and measures technician must reseal this enclosure.)

DISPLAY FACE

Model K62

1. Remove the two (2) screws at the bottom of the display face frame.
2. Pull out bottom.

The face frame fits in the slot at the top, so you will need to pull down after you clear the frame from the body. At this time, the frame will come loose from the body and no attachment but the wire is left on the frame.

3. Holding firmly to the frame, remove it from the body.
4. Unplug the wires and completely remove the face plate.

Model K322

1. Remove the wing nut inside, under the door of the dispenser. This will let you remove the large panel on the left side of the front middle panel.
2. After removing the panel, you will find two wing nuts on each side of the top box just under the top box. Loosen the nuts until the internal clamp releases the face plate. If the face plate does not become loose, the nuts are not all the way down. There is a finger hole in the middle of the lower top box allowing you to push out the face plate if the face plate is stuck. Make sure you hold on to the face because there is no other attachment, other than the clamp, holding the face.

1. Disconnect all power.
2. Close the manual shut off valve upstream of the dispenser.
3. Remove the pressure on the dispenser by opening the bleeder valve on the tubing that you are on.
4. Disconnect fill hose by uncoupling the breakaway connector at breakaway base on side of dispenser.
5. Disconnect vent hose by uncoupling the breakaway connector at breakaway base on side of dispenser.
6. Disconnect retractor ball.

To re-install, re-attach hose at breakaway coupling and make sure hose is positioned so vent hose can attach to the vent hose breakaway. Close bleed valve and re-apply pressure. Check for leaks.

FILTER

1. A filter is optional. If a filter is installed, a tag shall be provided stating **"WARNING - Disconnect electrical power and vent gas before servicing filter."**

NOZZLE

1. De pressurize the hose, vent any pressure that may be in nozzle and valve, unthread nozzle using a back up wrench on the nipple or hose that the nozzle is attached to.

MAINTENANCE

1. Visual inspection of the hose and breakaway assembly weekly.
2. Breakaway coupling must be kept clean. A light oil or white grease will help breakaway in the event of a pull-away. The breakaway needs to be completely disconnected, and cleaned and greased yearly.
3. Filter element needs to be replaced on the demand of the station.
4. Keeping the dispenser clean will prolong appearance of stainless steel and all moving parts. A compressor that makes oil will build up at the dispenser hose. This should be kept clean to keep the breakaway working properly.
5. A filter is optional. If a filter is installed, a tag shall be provided stating **"WARNING - Disconnect electrical power and vent gas before servicing filter."**

TROUBLESHOOTING

Three- way valve leaking from fill to vent: Replace packing in three way valve with Packing Kit #SS-9KL83XX

Gas leak inside the dispenser: Use a non-ammonia soap or SNOOP to locate the leak. Replace the part, or tighten the filling that is loose. De pressurize dispenser before attempting to re tighten any tube fitting or pipe fitting.

Dispenser has no display, or flashing display: This is a sign of no AC to the dispenser. First, check the AC voltage to terminal 1 & 2 on the terminal board inside the junction box. If you have 120v at 1 & 2, take off the large junction box cover to the head electronics and check the fuse. If the fuse is blown, you will need to isolate the short and replace the fuse. **On a weights and measures dispenser you will be breaking a seal and you MUST notify the proper weights and measures office at this time. A certified technician will have to reseal the box.**

Dispenser has display but will not reset: Wire #14 is the reset signal to the dispenser. If you are using a POS controller, it MUST send 120v to #14 to reset the dispenser. If you have 120v at #14, check the handle switch for correct operation. If the handle switch is working properly, then the main board needs replaced.

Dispenser has display and flows gas, but display does not move: You will first need to locate the Micro Motion transmitter. (On some models it will be behind the display face plate. See instructions on face plate removal.) Open this by unscrewing the cover.

NOTE: If seal is broken, weights and measures shall be notified and a qualified weights and measures technician must reseal this enclosure.

There will be a red LED. This is the "heartbeat" of the dispenser. This LED MUST BE BLINKING ONE TIME PER SECOND. Any other rhythm other than a steady one beat per second is a fault condition. Call TGT for further directions, as this is a major failure. We will send you some hardware and walk you through, or a service call can be arranged.

Dispenser will reset, but no gas will flow: First, check to see if the manual shut off valves under the dispenser and on the side of the dispenser are on. You should here the solenoid valve "click" after reset. (Some card readers control the solenoid valve. The card reader must be in the bypass mode for this test.) If you here a click, make sure the sequence valve panel is sending you gas. If you are sure of gas pressure, remove valve and see if any debris is in the valve.

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NOTE: You do not have to remove the valve coil to inspect for debris; but DO NOT energize the solenoid valve coil without the valve in place. This will permanently damage the coil.

On a unit with a pneumatic operated ball valve, visually see if the valve pointer is moving when the valve is energized. If the pointer is not moving, check air supply. If it is established that the valve is bad, you may send it to TGT for repair, or order a valve repair kit from TGT.

Hose leaking oil through the jacket: The CNG hoses are made of a thermoplastic and oil will permeate the hose in low quantities. The outer jacket is pin pricked to let the oil escape along with any pressure that may leak between the jacket. This is not a failure of the hose, but you will need to replace the hose if the oil becomes too much to handle the hose safely.

Dispenser is locked up, ie; no response from anything: Sometimes, in an electrical storm, the dispenser will not respond favorably to the sudden off/on electrical surge. If this happens, cycle the power off for 30 seconds, then restart. If no response, call TGT for assistance.

Dispenser resets and flows gas but no pulsar signal to a POS device. Check polarity on pulsar, the pulsar is a opto coupler and requires the common to have the positive voltage and the pulsar out will send the return pulses, use a pulse counter on the pulse output to see if you are getting the pulses out or s analog volt meter can be used by watching the deflection of the needle for a pulse indication.

No pulse can cause the dispenser to not deliver fuel after thirty (30) seconds the missing pulse detector will cut off the flow, also a low flow rate of less than the rated low flow cutoff flow rate will cause no pulse out of the dispenser.

If there is no response from any test call TGT for a new main board in the display electronics.

**TULSA GAS TECHNOLOGIES, INC.
TULSA, OK**

WARRANTY

TULSA GAS TECHNOLOGIES, INC. WARRANTS ALL PARTS OF ITS EQUIPMENT FOR 12 MONTHS AND 90 DAYS LABOR FROM THE DATE OF INVOICE AGAINST DEFECTIVE MATERIAL OR WORKMANSHIP WHEN INSTALLED IN ACCORDANCE WITH OUR SPECIFICATIONS. TULSA GAS TECHNOLOGIES WILL REPAIR OR REPLACE DEFECTIVE PARTS PRE-AUTHORIZED FOR RETURN TO ITS FACTORY, TRANSPORTATION CHARGES PREPAID. THIS WARRANTY DOES NOT APPLY WHERE EQUIPMENT IS DAMAGED BY ACCIDENT, ABUSE, FAULTY INSTALLATION OR ACT OF GOD. THIS WARRANTY DOES NOT COVER ANY COSTS OF DIRECT OR INDIRECT DAMAGE TO OR LOSS OF PROPERTY OF VALUE; INJURY TO PERSONNEL REGARDLESS OF THE SEVERITY AND INCLUSIVE OF LOSS OF LIFE, DIRECTLY OR INDIRECTLY RESULTING FROM ANY OF ITS PRODUCTS WHICH HAVE BEEN SUBJECTED TO ONE OR MORE OF THE FOLLOWING:

1. Improper installation or installation by unqualified personnel;
2. Misapplication, misuse or neglect;
3. Maintenance, repair, modification or adjustment by other than Tulsa Gas Technologies authorized personnel or their authorized agents;
4. Improper environment, excessive or inadequate heating or air conditioning;
5. Electrical power failures, surges or other irregularities of the electrical power line including interference generated by related or non-related electrical devices elsewhere on the power line system;
6. Interference from radio-frequency or microwave transmitting devices;
7. Lightning, flooding, or any other uncontrollable acts of nature; and/or
8. Operation by unauthorized personnel.

PARTS NOT MANUFACTURED BY TULSA GAS TECHNOLOGIES, INC. INCLUDING BUT NOT LIMITED TO HOSES, NOZZLES, RETRIEVER CABLES, AND FILTERS ARE NOT COVERED BY THIS WARRANTY.

WARRANTY DOES NOT COVER ANY COSTS OF CONSEQUENTIAL DAMAGES, LOSS OR DELAY ASSOCIATED WITH WARRANTY DEFECTS. TULSA GAS TECHNOLOGIES' LIABILITY THEREUNDER SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PART OR PARTS, AND SUCH CORRECTION SHALL CONSTITUTE A FULFILLMENT OF ALL OF SELLER'S OBLIGATIONS THEREUNDER. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, INCLUDING ANY OTHER WARRANTY OF QUALITY, EXPRESSED OR IMPLIED AND INCLUDING ANY WARRANTY, MERCHANT ABILITY, OR ANY WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE.