



GASBOY

ELECTRIC KEYTROL INSTALLATION/PARTS MANUAL

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GASBOY INTERNATIONAL LLC LANSDALE, PA

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INTRODUCTION

PURPOSE

The *Gasboy Electric Keytrol Installation/Operation Manual* is provided to assist the installer and user in installing and operating the unit. This manual should be supplied to the electrician prior to the installation of conduit and wiring, to ensure the unit is properly installed. The unit **must** be installed and operated as described in this manual to ensure reliability and satisfactory operation. In addition, this manual contains warnings, safeguards, and procedures on the use and care of the unit. This manual should reside with the owner of the unit after the installation is complete.

GENERAL DESCRIPTION

The Electrical Keytrol is a Fuel Management System designed to provide 24-hour, unattended control of the dispensing of motor fuel. The basic system consists of a control cabinet containing up to 50 modular keyswitch/electro-mechanical totalizers (counters) in strips of 5 or 10, up to a maximum of 50 counters per unit. Each user has his own key to actuate the pump, and have the quantity of fuel dispensed totalized on his own counter. Auxiliary (slave) units can be added to increase the number of counters required.

The unit may be factory-mounted to the top of a GASBOY pump or dispenser, or mounted remotely. The factory mounted version is available on a single hose pump or dispenser as a Master cabinet for up to 50 counters, or a Master/Auxiliary cabinet (back to back) for up to 100 counters. On twin hose pumps or dispensers, a Master/Master arrangement may be used for up to 50 counters per hose, or a Split Dual Control cabinet may be used. In this case, the counters in a single cabinet are divided to control both hoses, with a combined maximum of 50 counters for the two hoses.

Standard Features on the GASBOY Electric Keytrol include;

- Six-digit, non-resettable counters in 0.1 gallon or whole liter increments. Quantity of counters are available in 5-counter increments.
- A working voltage of 115 VAC, 60 Hz. (Optional 230 VAC, 50 or 60 Hz. available).
- The standard cabinet finish is painted the color of the dispenser, or white for remote-mounted units. Other colors available upon request. (Cabinet dimensions: 18-1/8" high x 17-1/8" wide x 6-3/8" deep)
- Anti-Multi Key Count Feature ensures the accumulation of counts on only one counter in the event that a second (or more) key is inserted while the pump is being operated.
- Manual - Automatic By-Pass Switch allows the user to bypass the Electric Keytrol and operate the dispenser without using a key to activate the system.
- Anti-False Count on Start-Up feature prevents a false count from recording upon start-up.

- Missing Pulse Detector (MPD) feature alerts the user of a situation where the counter is not receiving pulses from the pump pulser. After the key is inserted and turned on, an alarm will sound if no pulses are received within a preset length of time. This feature also serves as a key reminder alarm. After fueling is complete and the pulser stops, the alarm will sound after the preset time if the key is not turned off. The MPD feature is not available on Split Dual Pump Control Units.
- Time Delay on Turn-On (Start Delay:SD) feature prevents pulse counts from being missed if the key is turned off and on while dispensing fuel. The SD feature is not available on Split Dual Pump Control Units.
- Lockout feature allows individual keyswitches to be locked-out from use.
- Anti-surge diodes minimize pulser and time delay relay contact erosion.

Optional features include;

- Stainless steel cabinet
- 230V operation
- Resettable Accumulative Totalizer
- Liter measurement (counters measure in one liter increments)
- Universal Electric Keytrol (for remote mounting)

SYSTEM FEATURES

POWER SUPPLY

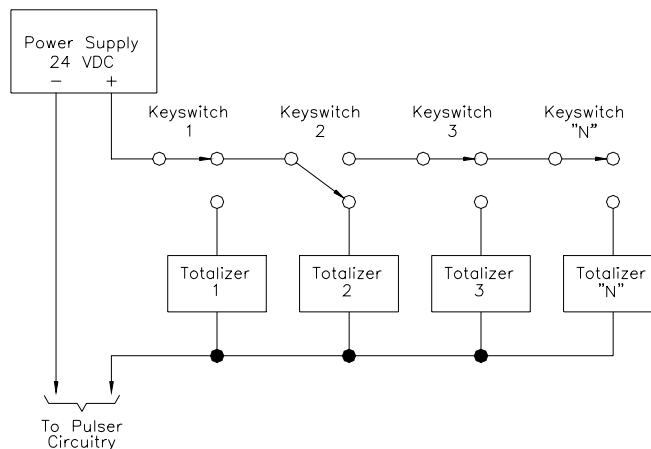
24 volts DC is supplied via a 115/24 volt transformer (230/24 volt transformer for 230 VAC EK's) and bridge rectifier made up of diodes D1-D4. Any multimeter or DC voltmeter may be used to check the power supply voltage, which should be 24 ± 5 VDC. for 115 or 230 VAC, 50-60HZ.

POWER RELAY

The power relay is rated at 3/4 HP at 115 or 230 VAC. It is permanently wired in to break the hot side of the 115 VAC line or L1 of the 230 VAC line. One side of a 115 VAC motor is connected to neutral by the customer, and the other side of the motor is fed from the output of the power relay or motor switch terminal on the Electrical Keytrol terminal block. In case of the 230 VAC motor, one side of the motor is connected to L2 while the other is connected to the Electrical Keytrol motor (switch) terminal.

ANTI-MULTI KEY COUNT FEATURE

The keyswitches are wired in series, which ensures the accumulation of counts on only one counter in the event that a second (or more) key is inserted while the pump is being operated. See diagram below. For example, if keyswitch 2 is turned on, all keyswitches after this position will not function. If, however, while user 2 is pumping fuel and user 1 inserts his key, the pulses will accumulate on totalizer 1, but not on totalizer 2. Any user will immediately realize his error, since the totalizer will start counting while the user still has his hand on the key.



CIRCUIT CONCEPT TO AVOID COUNTING ON MORE THAN ONE TOTALIZER

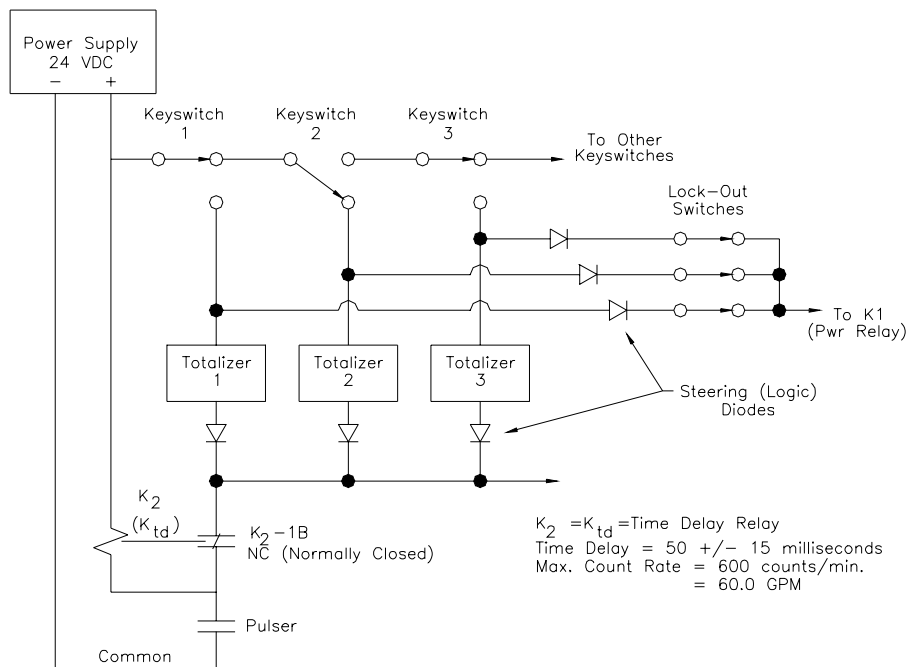
MANUAL/AUTOMATIC BYPASS SWITCH (AUTO/MAN)

The function of the Electric Keytrol may be bypassed by setting the **Auto/Man** switch to the **Manual** position. This setting allows fueling without using a key and/or without totalizing the fuel on any counter. It is also used in the event of a failure of any electrical portion of the Keytrol.

ANTI-FALSE COUNT ON STARTUP

A time delay relay is used to prevent a false count during startup (See figure below). If the pulser is open, no count occurs upon start-up since the circuit is open. When the pulser is in a closed position, Relay K2 (the time delay relay) is energized and its contact (K2-1B, which is normally closed) is open, again preventing a count.

Upon receiving pulses from the pulser, the relay will drop out in 50 milliseconds. The next pulser closure causes current flow through the normally closed (NC) contact, and actuates the totalizer. Fifty milliseconds later, while the pulser is still closed, K2 (or Ktd) energizes, its contact opens, dropping power to the totalizer, thereby reading the fuel in 0.1 gallon increments and not one-half counts as other devices are prone to do. The 50 millisecond delay of the relay permits a maximum pumping rate of 60 gpm (227 liters) dispensing and totalizing in 0.1 gallon (or whole liter) increments.



CIRCUITRY FOR ANTI-FALSE COUNT ON START UP IF PULSER IS CLOSED

MISSING PULSE DETECTOR (MPD)

Not available on Split Dual Pump Control Units The Missing Pulse Detector (MPD) circuitry senses pulses from the pump pulser. If no pulses are received after the key is inserted and turned in the Electric Keytrol within a preset time, the main power relay will open and an alarm will sound. The alarm will continue to sound until the key is turned off, whereby the MPD circuitry is reset.

This circuit is primarily designed to prevent dispensing of fuel if the pulser is not functioning properly. This could be due to a broken cable or shaft linking the pulser to the computer, or a broken wire from the pulser to the Electric Keytrol.

The MPD delay is set by applying a slotted screwdriver to the adjuster, K4, located on the relay at the extreme left of the bottom bracket. It is factory-set to 30 seconds, but can be adjusted to between 2 to 180 seconds. This same timer also detects the time between pulses, so that a pulser that malfunctions after fueling has started will also actuate the MPD circuitry. Every pulse resets the timer to zero.

The MPD option also serves as a key reminder alarm. After fueling is complete, and the pulser stops, the alarm will sound (and power relay open) within the pre-set time (nominally 30 seconds).

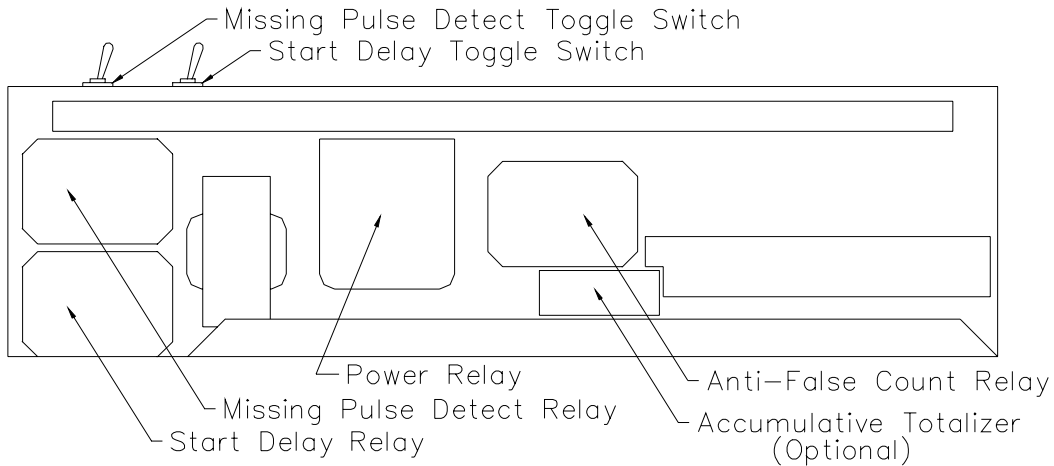
This relay may be bypassed by a toggle switch located on the upper left portion of the bottom bracket.

START DELAY (SD)

Not available on Split Dual Pump Control Units. The GASBOY Electric Keytrol is supplied with an additional time delay relay that provides a delay on initial turn-on. The delay is adjustable from 3 to 180 seconds. It has been factory set for 3 seconds. Just like the missing Pulse Detector (MPD) relay, it can be set by the owner to the time desired. See figure below for the location of the different relays.

Upon actuation of a key, there will be a three second delay before power is applied to the Electric Reset in the pump or dispenser. Consequently, the register will reset to zero after this delay time and the fuel can then be dispensed. However, rapid switching of the key will not turn the pump on and off. It is suggested that the time be set for three seconds to minimize customer inconvenience. However, to prevent excessive product losses, set the time to ten seconds or greater.

This relay may be bypassed by a toggle switch located on the upper left portion of the bottom bracket.



LOCKOUT

Individual lockout is provided by means of a 10PST switch mounted at the bottom of each module. (5PST on 5 counter versions). Access to this portion is accomplished by removing the locked bezel. The switch can be actuated with the tip of a ball-point pen or any other pointed object. To reinstate, push the top of the switch lever in firmly. The switch is numbered 1-10 from left to right on 10 counter modules and 1-5 on 5 counter modules.

ANTI-SURGE DIODES

Diodes D5 and D6 are placed across the time delay relay (K2) and selected totalizer in the reverse direction. Upon opening of the inductive circuit, the current surges through the diode, minimizing pulser and K2 relay contact erosion.

HEATER

A heating element controlled by a thermostat set at 40°F protects electrical components when temperatures fall below the recommended operating temperature. The heater/thermostat circuitry is continuously connected to the 115 VAC (or 230 VAC) line, but will operate only when the temperature drops below 40°F.

When an auxiliary unit is used, the 115 VAC or 230 VAC line must be connected from the master unit for powering the heater, along with the other interconnections.

INSTALLATION

INSTALLATION PRECAUTIONS

All installations must conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.

Plan your installation carefully. Dispensing troubles, which seem to be related to the pump or Electric Keytrol, are frequently traced to the installation. Review the following list of installation **DO's** and **DON'T's** to avoid potential problems:

1. **DO** read the **WARNINGS** page at the front of this manual, preceding the Table of Contents. It contains important information regarding the safe use of your dispensing equipment.
2. **DO** install an emergency power cutoff. In addition to circuit breaker requirements of NFPA 70 and NFPA 30A, a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes.

In order to provide the highest level of safety to you, your employees, and customers, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system.

3. **DO** have the Electric Keytrol installed by a competent installer/electrician.
4. **DO NOT** experiment with a pump or Electric Keytrol if you are not sure that the installation is correct.
5. **DO NOT** overload sub or main breaker panels.
6. **DO NOT** use power line wiring of inadequate capacity. (Use gauge specified by the wiring diagram or wire chart provided in the **Wiring** section of this manual.)
7. **DO NOT** use circuit breaker of improper size (See **Wiring** section of this manual).
8. **DO NOT** use knock-out boxes or flexible conduit for installing this unit. All wires should be run in threaded, rigid metal conduit. All threaded connections must be drawn up tight with five (5) threads minimum engagement. At completion of the installation, it is the installer's responsibility to ensure that any unused openings are plugged.

GENERAL INSTRUCTIONS

Upon receiving, perform the following:

1. Unpack carefully and report any damage immediately.
2. Using the door key, unlock and open door. (Door opens only 90°, so do not force it beyond this point.)
3. Using the bezel key, remove the bezel by pulling gently outward and down after clearing the bottom, front of the cabinet. (*NOTE: Do not overtighten bezel locks. Tighten lock with key making 3 to 4 complete turns.*)
4. Ensure that all screws holding the modules are in place and tight.
5. Ensure that all terminal block screws are tight.
6. Ensure that no damage has occurred during shipment. Report any damage immediately.
7. Ensure that the time delay relay is properly installed in the upper octal socket (not available on Split Dual Pump Control units).

CAUTION! Relay and socket are “keyed”, so be careful to align these properly when reinstalling.

8. Ensure that the missing pulse detector is set for 15 seconds (not available on Split Dual Pump Control units).

Factory-Mounted Units on a Pump or Dispenser

Follow installation instructions supplied with pump or dispenser.

Field-Mounted Master or Auxiliary Electric Keytrol

IMPORTANT: Do not install in Class 1, Division 1 or Division 2 hazardous location.

1. When mounting on a wall or post, the use of a shelf is recommended; order GASBOY P/N 014632.
2. Auxiliary Keytrol units must be of the appropriate power rating. Units are available for 115 VAC or 230 VAC applications.
3. Install wires in accordance with the National Electrical Code (NFPA 70). Also, all wiring must conform with local electrical codes. Units must be properly grounded.
4. Seal conduit as per NEC requirements.

WIRING



Customers and installers having any questions pertaining to the installation should contact their GASBOY distributor.

WIRING PRECAUTIONS

The quality of the electrical installation is a major factor in maintaining proper safety levels and providing trouble-free operation of your GASBOY Electric Keytrol and your pump/remote dispenser. To assure a quality installation, follow these rules:

1. All wiring must be installed to conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.
2. Use only threaded, rigid, metal conduit.
3. Use only UL-labeled, insulated, gasoline and oil-resistant, stranded copper wiring of the proper size.
4. Wire connections should be tightly spliced and secured with a wire nut; close off the open end of the wire nut with electrical tape.
5. The line to the motor should be on a separate circuit and installed on a breaker sufficiently sized for the motor size and/or the voltage setting.
6. Install an emergency power cutoff. In addition to circuit breaker requirements of NFPA 70 and NFPA 30A, a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes.

In order to provide the highest level of safety to you, your employees, and customers, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system.

WARNING:

To reduce the risk of electrical shock when servicing, turn off all power to the pump/remote dispenser. In submersible pump applications, turn off power to the submersible pump and any other remote dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when dispensers share a common submersible pump or starter relay.

7. Have the Electric Keytrol and the pump/remote dispenser installed by a competent installer/electrician.

GROUNDING

To ensure proper operation of the equipment and provide the necessary safety factors, this unit must be grounded. A ground wire (preferably green) must be connected between the ground terminal position of a remotely-mounted Electric Keytrol, and the main electrical service panel. When the Keytrol is factory-mounted to a pump or dispenser, the pump or dispenser must be properly grounded. One (1) earth ground connection is required per unit. The ground rod is to be a solid, corrosion-resistant conductor and must be installed at the main electrical panel in accordance with the National Electrical Code. It should be properly tied into the ground bus strip of the panel. We recommend the neutral and ground bus strips be bonded together (unless prohibited by local codes).

CIRCUIT BREAKERS

Power to the unit should be supplied from a dedicated breaker. No other equipment should be powered from this breaker. Units directly driving pumps (suction or submersible) should be supplied power from a separate breaker. A tag on the motor identifies the maximum current draw of the motor. If two (2) pumps are supplied from one breaker, that breaker must be capable of handling the load of both motors. In cases where multiple remote dispensers supply power to a single submersible pump, all breakers controlling the remote dispenser must be on the same phase of power. Failure to do this will damage the equipment. Provisions must be made to break both legs of any AC circuit.

VOLTAGE REQUIREMENTS

This unit must be supplied with at least 105VAC (210VAC for 230VAC units) to ensure proper operation. Power should be checked between positions 7 and 8 (**H** and **N** or **L1** and **L2**) of the main terminal block in the Keytrol housing while the pump is idle and running in bypass. If the power drops below the minimum allowable levels during either of these operation modes, the Keytrol controls may not function properly.

WIRE SIZE

Electric Keytrol - Factory Mounted to Top of Pump or Dispenser

When installing a GASBOY Electric Keytrol, wiring of sufficient size is required. When the Keytrol is mounted directly to the top of a GASBOY pump or dispenser, the Keytrol is pre-wired to the dispenser at the factory. Field wiring for this configuration may be referenced by the wiring diagram for your model pump or dispenser.

Electric Keytrol - Remotely Mounted from Pump or Dispenser

When the Electric Keytrol is mounted remotely from the dispenser, use the following **Wire Size** table as a guide to determine the required sizes for the AC wiring to the master Electric Keytrol unit. As shown in the table, the wire size is dependent on the HP rating of the pump motor, the distance from the circuit breaker to the pump/remote dispenser, and the operating voltage (115 or 230 VAC) of the circuit.

If multiple units are powered from the same breaker through the same wires, you must increase the gauge of the wires to handle the added load according to the distance from the breaker panel and the HP rating (if applicable).

AC wiring from a Master Electric Keytrol unit to an Auxiliary Keytrol unit (**Hot**, **Neutral**, and **Ground** for 115 VAC, or **L1**, **L2**, and **Ground** for 230 VAC) must be 14 AWG minimum, and sized according to the breaker feeding the Keytrol. Positions 4 through 7 on an Auxiliary Keytrol unit (marked **A**, **B**, **C**, and **D** on the terminal block) handle DC current and should be connected to the Master Keytrol, or other Auxiliary Keytrol Units, with 18 AWG wiring.

The DC wire size for the **Pulser** lines must be 18 AWG minimum.

Wire Size

115 VOLT WIRE GAUGE SIZES PER FEET/METERS OF RUN								
FEET METERS	25' 7.6m	50' 15.2m	100' 30.5m	150' 45.7m	200' 61m	250' 76.2m	300' 91.4m	OVER 300' (91.4m) USE RELAY AT MOTOR LOCATION
MOTOR HP								
1/2	14	12	10	8	8	8	8	
3/4	14	12	10	8	6	6	4	
230 VOLT								
1/2	14	12	12	12	10	10	10	
3/4	14	12	12	10	10	10	8	
1-1/2	12	12	10	10	8	8	6	

CONDUIT

All wiring to the GASBOY Electric Keytrol must be installed in threaded, rigid, metal conduit. **PVC is not acceptable.**

All wiring and conduit runs must also conform with the National Electrical Code (NFPA 70) and the Automotive and Marine Service Station Code (NFPA 30A). All wiring and conduit runs must conform to local codes. Canadian users must also comply with the Canadian Electrical Code.

Use the charts below as a guideline to determine the proper conduit sizes for a remotely mounted GASBOY Electric Keytrol. When planning the orientation of the wiring runs, follow the applicable wiring diagram and consider the layout of the components at the site. Long runs or a large number of bends may require you to increase conduit size over what is listed.

THHN/THWN Wire Areas				
Gauge	Diameter		Area (Sq units)	
	in	mm	in	mm
18	.090	2.29	.007	4.1
16	.104	2.64	.009	5.5
14	.118	2.95	.011	6.8
12	.135	3.43	.014	9.2
10	.169	4.29	.022	14.5
8	.216	5.49	.037	23.7
6	.259	6.60	.053	34.2
4	.331	8.41	.086	55.5
3	.359	9.14	.102	65.6
2	.394	10.01	.122	78.7
1063A	.417	10.59	.137	88.4

Areas of Trade Size Conduit						
Trade Size	Int. Diameter		Area (Sq units)		Fill Area (sq units) 25% Fill	
	in	mm	in	mm	in	mm
1/2	.629	16	.303	196	.076	49
3/4	.826	21	.532	343	.133	86
1	1.063	27	.862	556	.215	139
1-1/4	1.378	35	1.50	968	.375	242
1-1/2	1.614	41	2.04	1314	.509	329
2	2.087	53	3.36	2165	.839	541

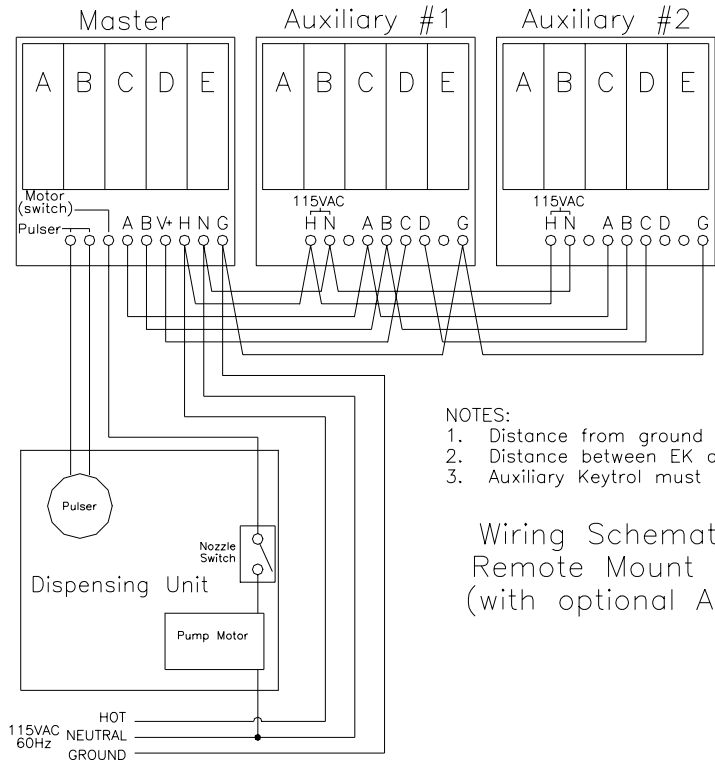
To determine conduit size needed, use the THHN/THWN Wire Areas table (left) to find the area for each wire gauge. Add up all wire areas. Use the Areas of Trade Size Conduit Table (right) to select the smallest number in the 25% fill area (based on NEC 501-1) that comes closest without exceeding the total wire area.

WIRING DIAGRAMS

The following schematics show the standard wiring configuration for a GASBOY Electric Keytrol to a typical dispenser. When connected to a GASBOY Series 9100A pump or dispenser, consult the appropriate numbered wiring diagram immediately following these standard diagrams. If connecting to a GASBOY Series 9800A, call GASBOY's Quick Facts hotline for the appropriate wiring diagram for your model pump or dispenser. If connecting to an older 9100, 115VAC, order packet 024207 for the appropriate wiring diagram; for 230VAC applications contact Gasboy Technical Service.

1. All wiring must be installed to conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.
2. Refer to the **Wire Size** section of this manual to determine the required line sizes.
3. Submersible starter relays are always recommended when a submersible pump is used; however, the control circuit is capable of directly driving a submersible pump up to 3/4 HP at 115/230VAC. Any pump over 3/4 HP requires a submersible starter relay.

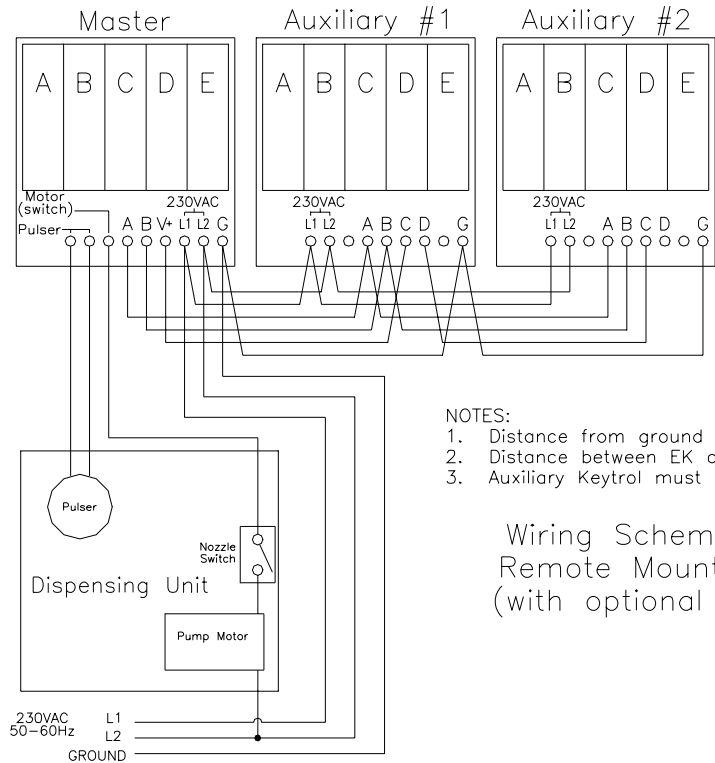
STANDARD WIRING DIAGRAMS - REMOTE MOUNT



NOTES:

1. Distance from ground to EK base must be 18" minimum.
2. Distance between EK and dispenser must be 18" minimum.
3. Auxiliary Keytrol must be rated 115 VAC.

Wiring Schematic – 115 VAC
Remote Mount Electric Keytrol
(with optional Auxiliary Keytrol)

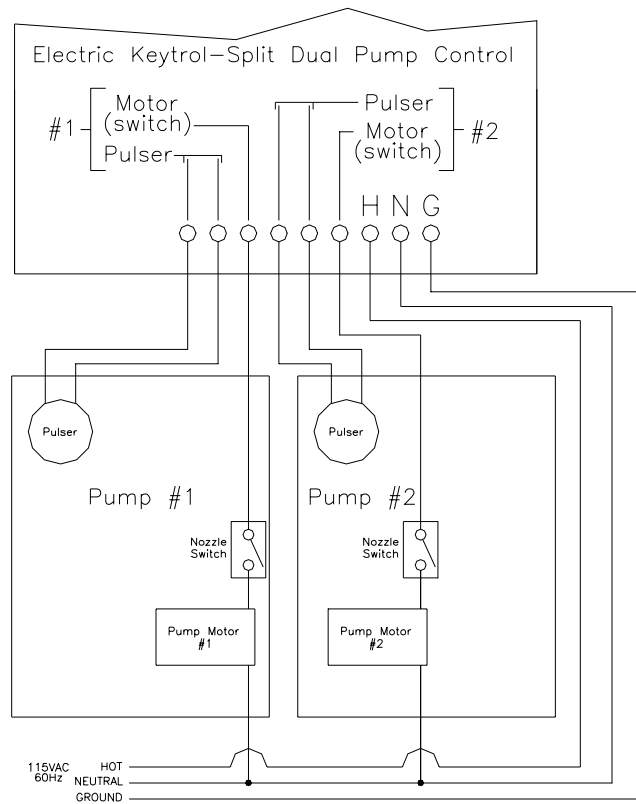


NOTES:

1. Distance from ground to EK base must be 18" minimum.
2. Distance between EK and dispenser must be 18" minimum.
3. Auxiliary Keytrol must be rated 230 VAC.

Wiring Schematic – 230 VAC
Remote Mount Electric Keytrol
(with optional Auxiliary Keytrol)

STANDARD WIRING DIAGRAMS - SPLIT



NOTES:

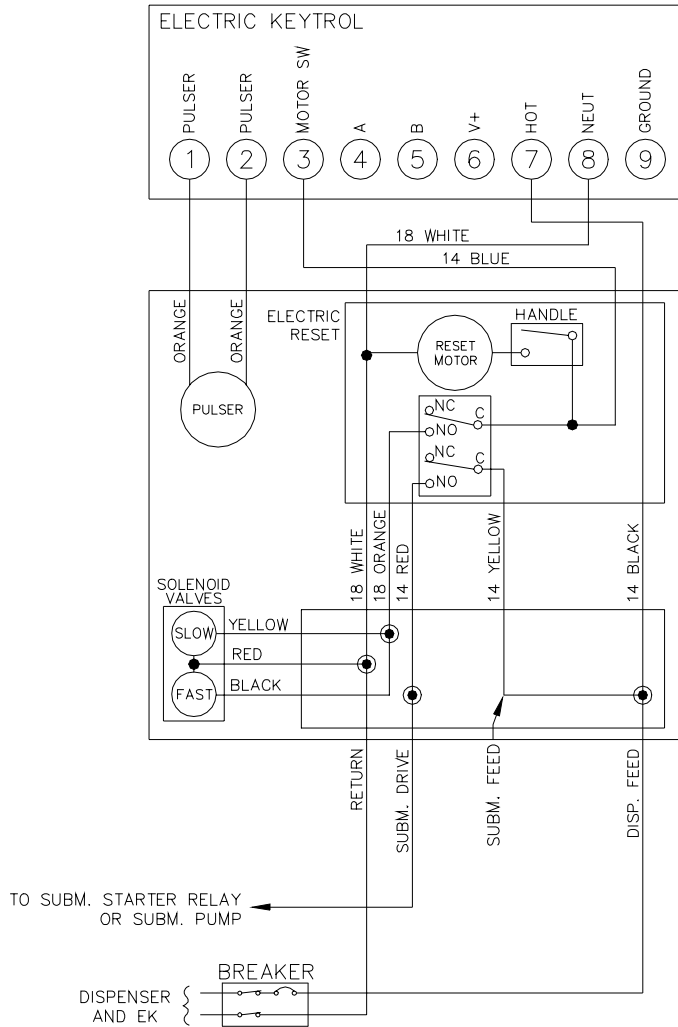
1. Distance from ground to EK base must be 18" minimum.
2. Distance between EK and dispenser must be 18" minimum.

Wiring Schematic – 115 VAC
 Split Dual Pump Control
 Remote Mount Electric Keytrol

WIRING DIAGRAM 024267

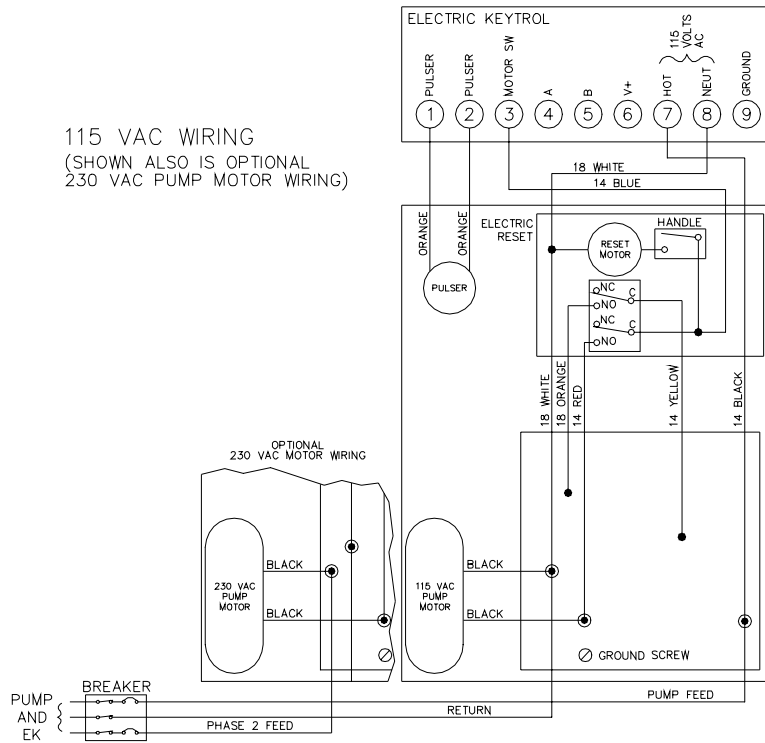
Models: 9152AX EK, 9153AX EK, 9140AX EK, 7552AX EK, 7553AX EK, 7540AX EK

115/230 VAC WIRING

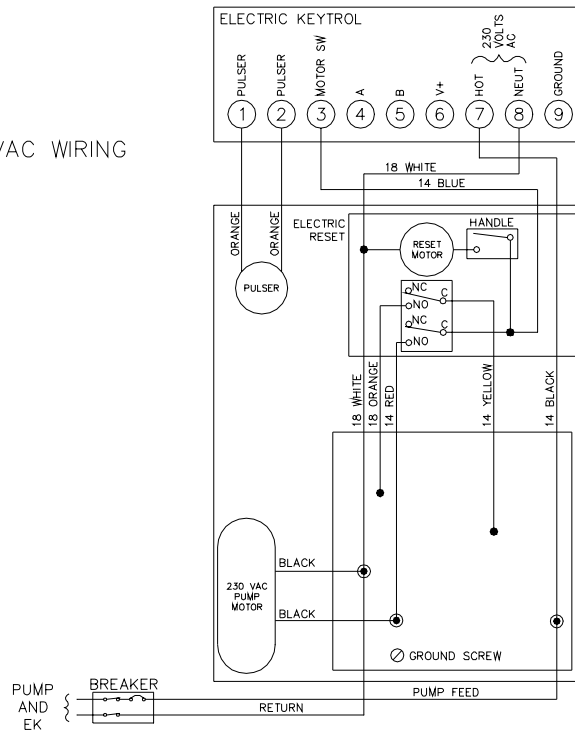


WIRING DIAGRAM 024268

Models: 9152A EK, 9153A EK, 7552A EK, 7553A EK

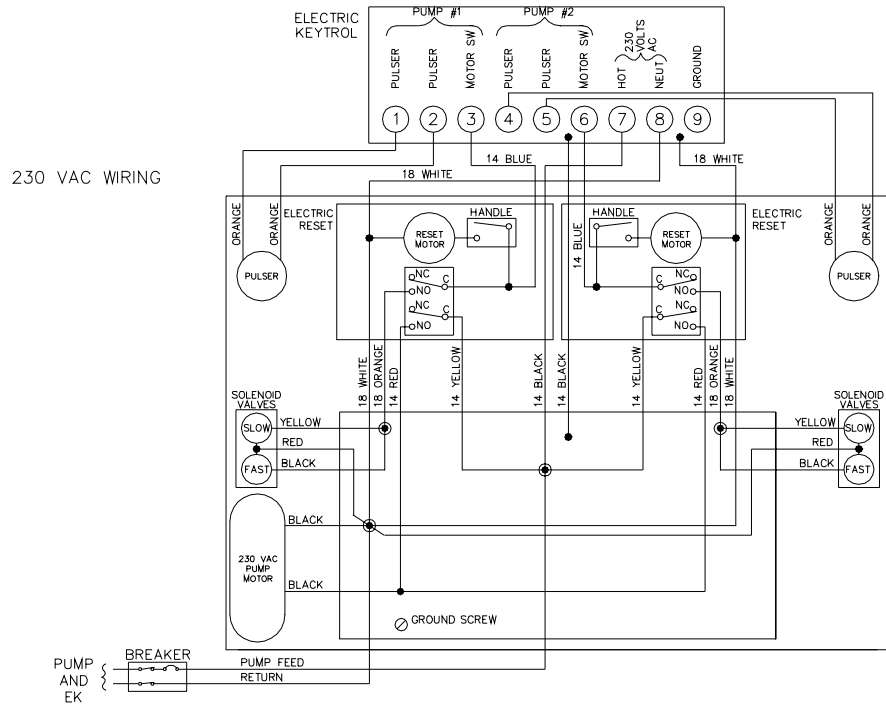
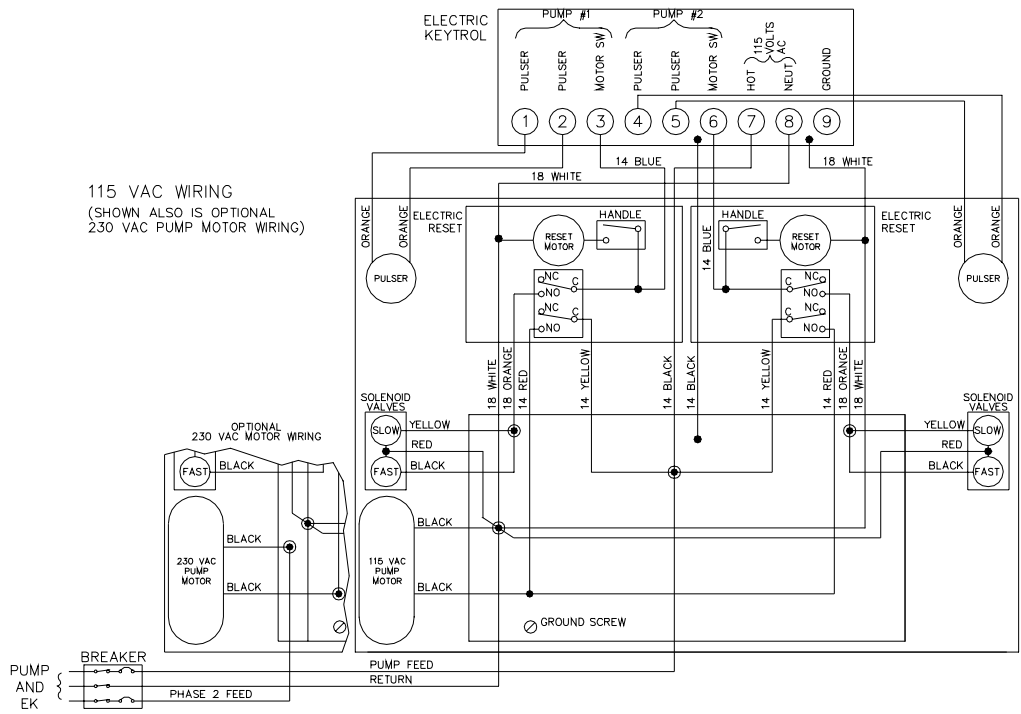


230 VAC WIRING



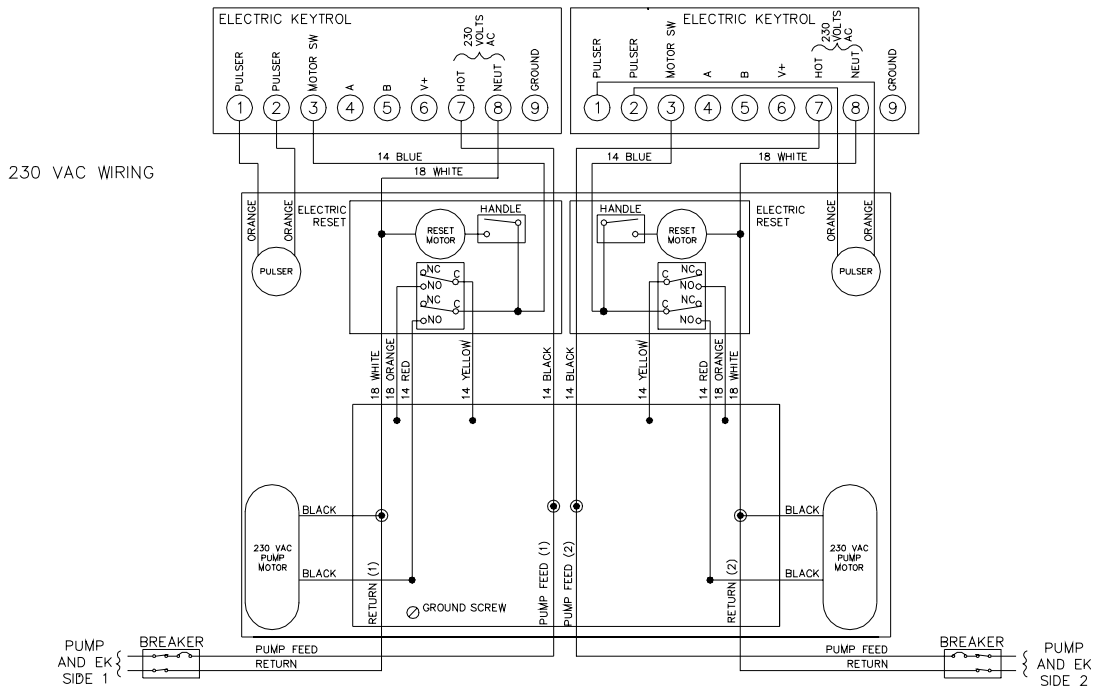
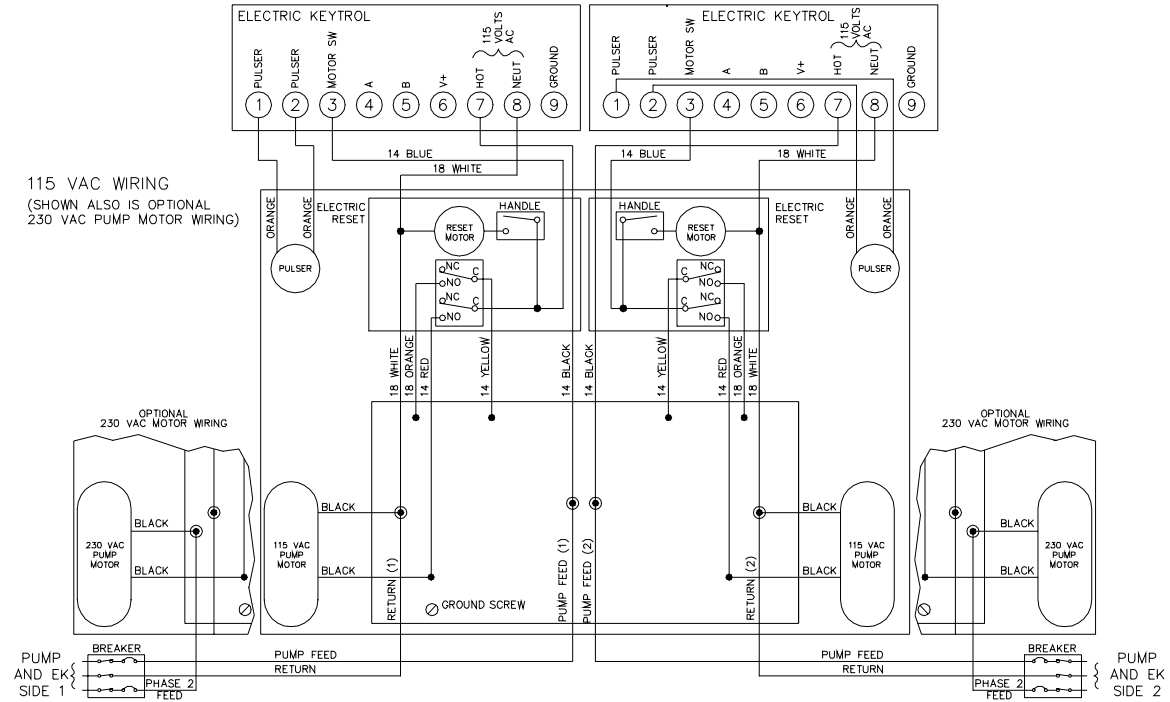
WIRING DIAGRAM 024271

Models: 9152ATW1 EK SPLIT, 7552ATW1 EK SPLIT



WIRING DIAGRAM 024272

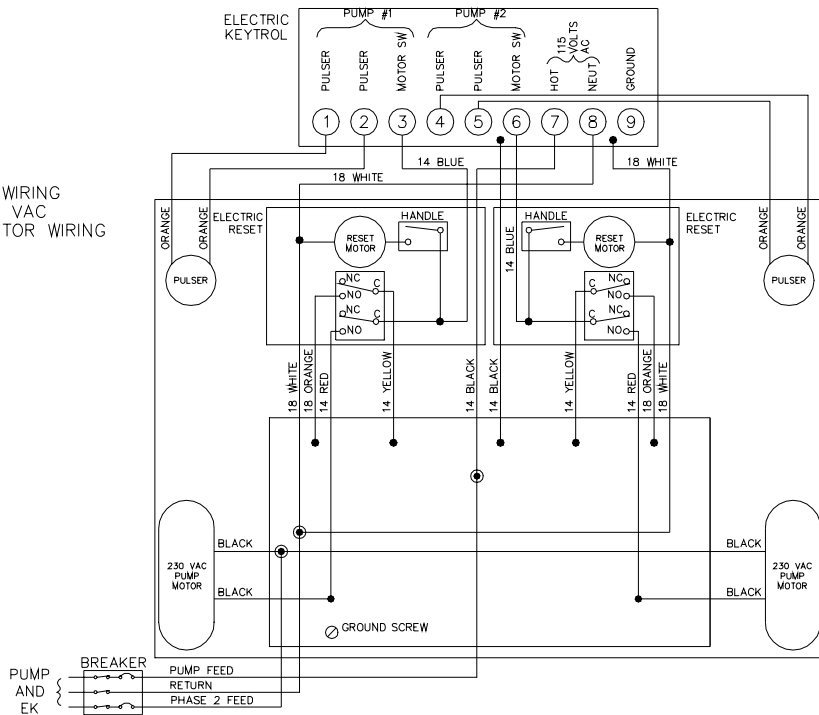
Models: 9152ATW2 EK M/M, 9153ATW2 EK M/M, 9153ATW1M EK M/M
7552ATW2 EK M/M, 7553ATW2 EK M/M, 7553ATW1M EK M/M



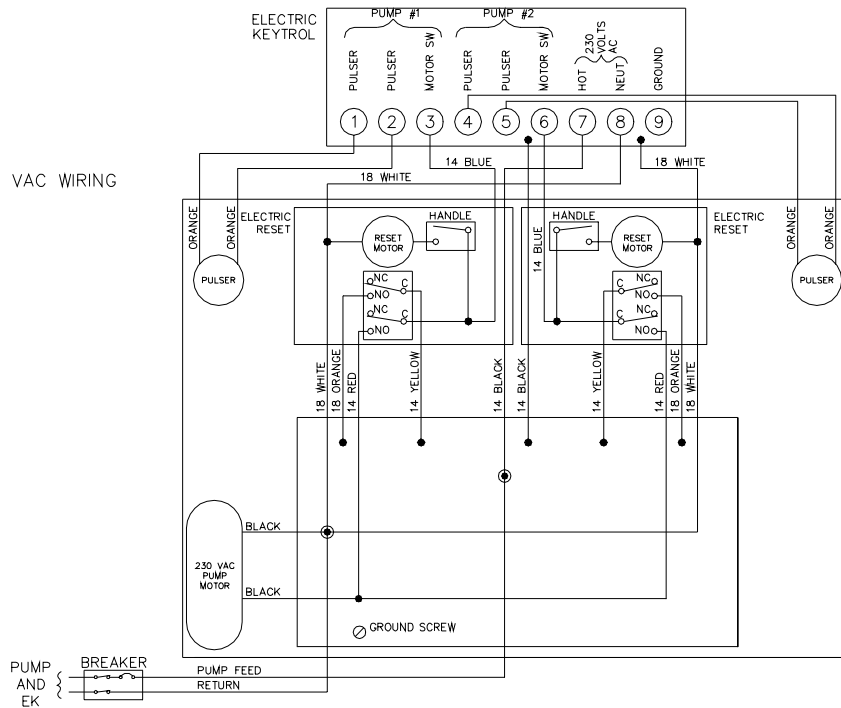
WIRING DIAGRAM 024273

Models: 9152ATW2 EK SPLIT, 9153ATW2 EK SPLIT, 9153ATW1M EK SPLIT
 7552ATW2 EK SPLIT, 7553ATW2 EK SPLIT, 7553ATW1M EK SPLIT

115 VAC WIRING
 WITH 230 VAC
 PUMP MOTOR WIRING



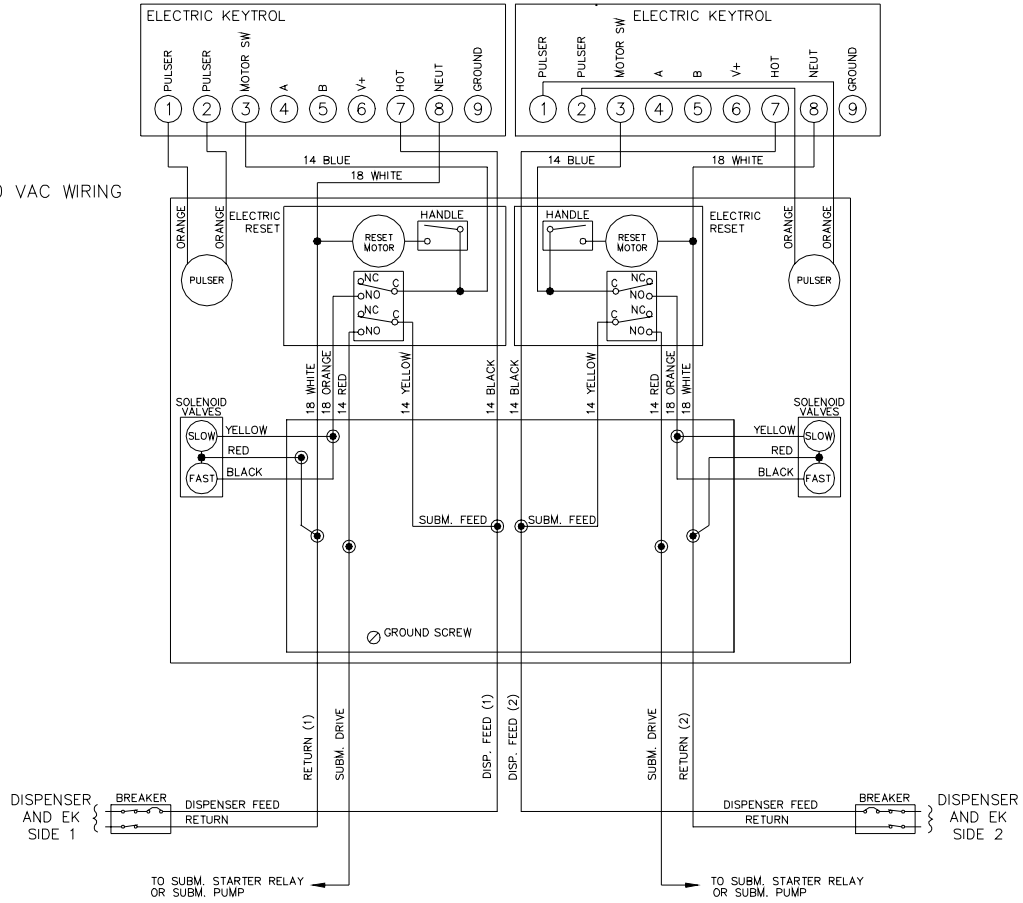
230 VAC WIRING



WIRING DIAGRAM 024274

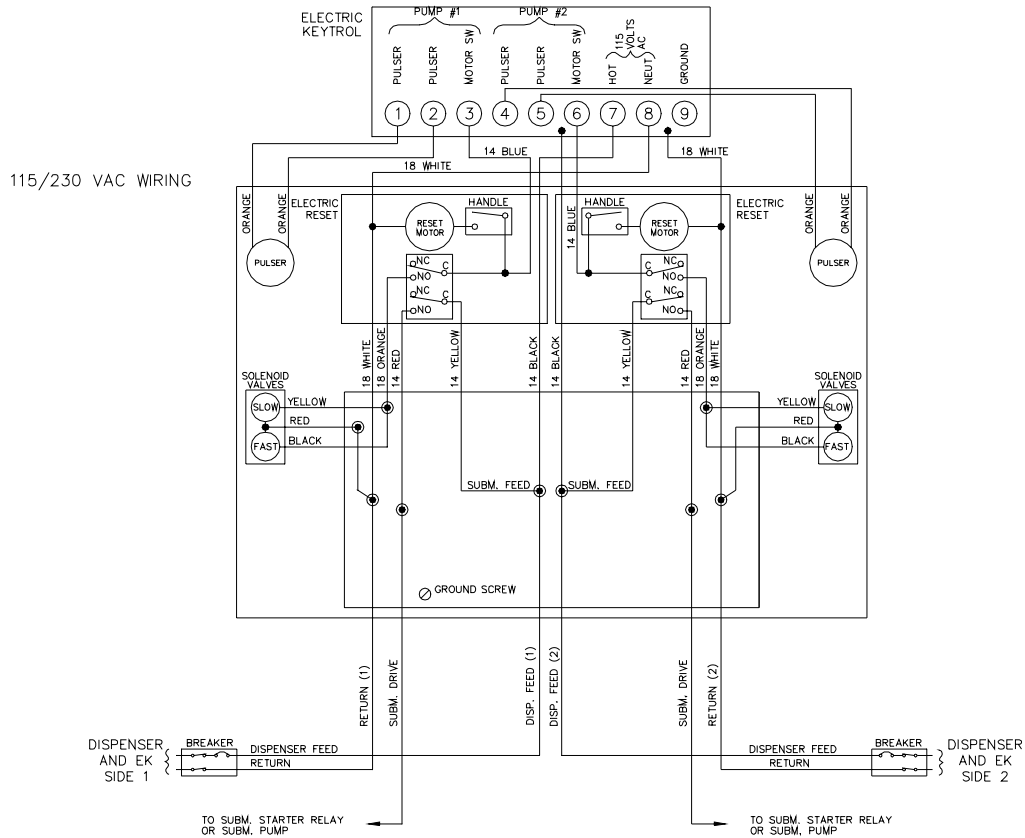
Models: 9152AXTW1 EK M/M, 9152AXTW2EK M/M, 9153AXTW1 EK M/M, 9153AXTW2 EK M/M, 7552AXTW1 EK M/M, 7552AXTW2EK M/M, 7553AXTW1 EK M/M, 7553AXTW2 EK M/M

115/230 VAC WIRING



WIRING DIAGRAM 024275

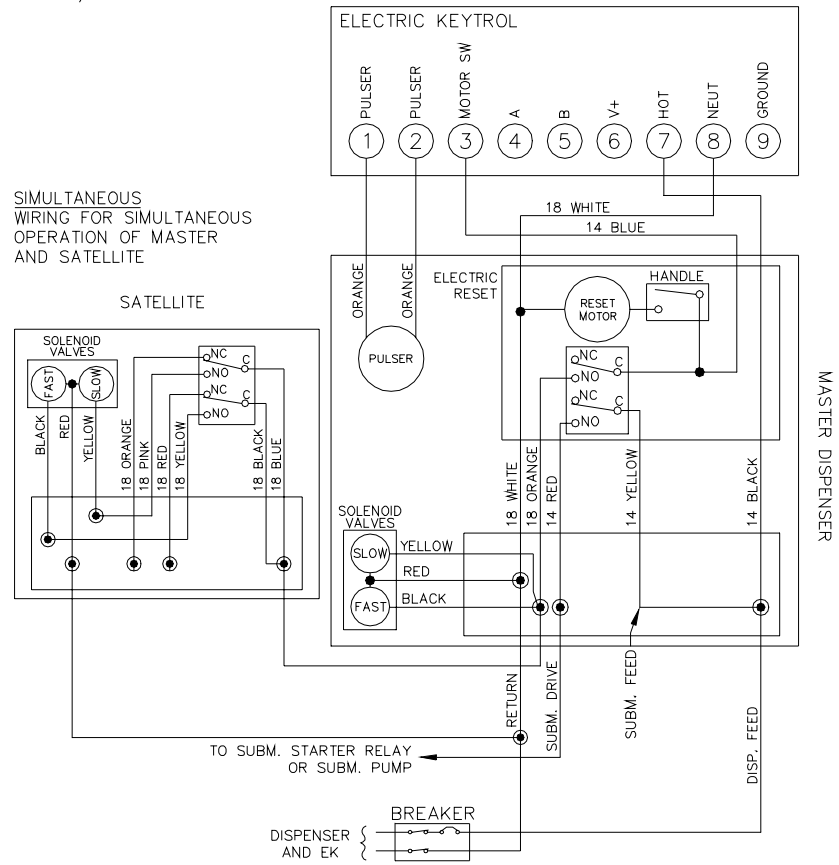
Models: 9152AXTW1 EK SPLIT, 9152AXTW2EK SPLIT, 9153AXTW1 EK SPLIT, 9153AXTW2 EK SPLIT, 7552AXTW1 EK SPLIT, 7552AXTW2EK SPLIT, 7553AXTW1 EK SPLIT, 7553AXTW2 EK SPLIT



WIRING DIAGRAM 024276 (1 OF 2)

Models: 215A/9152AX EK, 215A/9153AX EK, 216A/9140AX EK, 7215A/7552AX EK, 7215A/7553AX EK, 7216A/7540AX EK

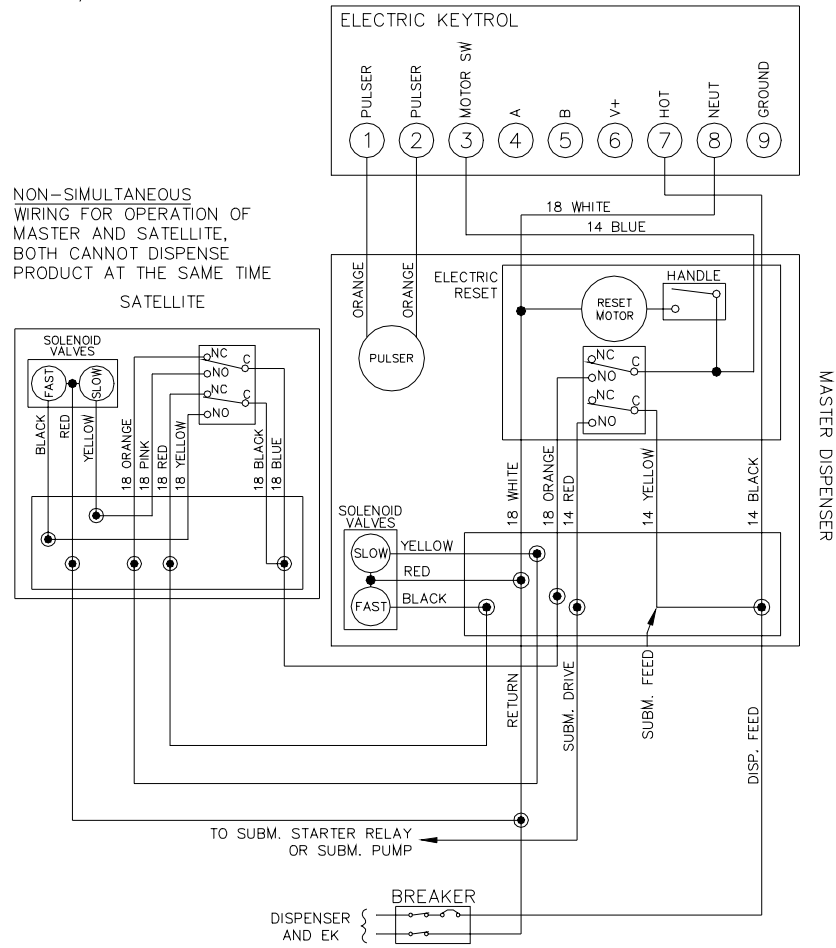
115/230 VAC WIRING



WIRING DIAGRAM 024276 (2 OF 2)

Models: 215A/9152AX EK, 215A/9153AX EK, 216A/9140AX EK

115/230 VAC WIRING



OPERATING SEQUENCE

OPERATING INSTRUCTIONS

1. Insert key in assigned lock, turn 180°.
2. Remove nozzle from holder.
3. Move start lever down over nozzle holder to reset register to zero and start pump. If your system is equipped with the Start Delay feature, there may be a delay of several seconds until delivery begins. Dispense product.
4. After delivery, return start lever to original upright OFF position.
5. Replace nozzle in holder.
6. Turn key off and remove. Close door.

Please notify your fuel or equipment distributor of any malfunction.

MANAGER INSTRUCTIONS FOR BYPASSING ELECTRIC KEYTROL

In case of difficulties, Electric Keytrol may be bypassed as follows:

1. After removing power, open door, insert bezel key and turn clockwise 1/2 turn.
2. Lift up and outward until the bezel clears the bottom of the enclosure. Then, pull downwards until the bezel is clear. Set the bezel aside on a clean, level surface.
3. Move AUTO/MAN switch down to the **MAN** or manual position.
4. Replace bezel, being careful not to damage the relay, and turn bezel key 1/2 turn counterclockwise to remove.
5. Restore power and operate pump manually until the Electrical Keytrol can be serviced.
6. If the pump still will not operate, either the dispenser is at fault or power is off.

MAINTENANCE AND TROUBLESHOOTING

MAINTENANCE OF YOUR ELECTRIC KEYTROL

Procedures requiring disassembly of portions of the Electric Keytrol, pump, or remote dispenser must be performed by qualified service personnel.

WARNING:

To reduce the risk of electrical shock when servicing, turn off all power to the Electric Keytrol, pump/remote dispenser. In submersible pump applications turn off power to the submersible pump and any other remote dispensers which use that submersible pump. AC power can feed back into a shut-off remote dispenser when dispensers share a common submersible pump or starter relay. Always turn off all power to the remote dispenser and submerged pumps at the master panel and close any impact valve before performing any maintenance or service to the remote dispenser, including the changing of any fuel filters or strainers. Also block islands so no vehicles can pull up to the remote dispenser when the dispenser is being worked on.

Demand Competent Service

If your Electric Keytrol should stop or fail to operate properly, don't depend upon the repair service of a general mechanic unless he is thoroughly familiar with the mechanism. Experience shows that the repair results will be much more satisfactory if you demand the service of a competent representative of the pump manufacturer. GASBOY has a distributor network which services fuel dispensing and management systems in every section of the country.

Use Authorized Parts

Should excessive wear, rust, or corrosion of parts cause inefficient operation, it is always best to replace them immediately; but if you want the best results and continuity of the Underwriters' Label on your pump, be sure they are new authorized service parts supplied by GASBOY. Every part of a pump or remote dispenser is carefully designed for a particular purpose. If it is replaced by an incorrect or substandard substitute, operation will be unsatisfactory.

Operate with Reasonable Care

Like any machine, an Electric Keytrol that is operated with reasonable care will last longer and give better service. Abuse should be avoided. The time and care given to your Electric Keytrol will be returned to you in the form of dependable service.

Preserve the Electric Keytrol Cabinet

Nearly all Electric Keytrol's are installed outdoors where their surfaces are subjected to the action of the weather. As a result, it is necessary to give the finish a reasonable amount of care if an attractive appearance is to be maintained.

The finish on GASBOY Electric Keytrol is a high-heat baked synthetic enamel, similar to that used on automobiles. The life of this finish can be lengthened several years if, at regular intervals, the painted surfaces are thoroughly cleaned with a high grade automobile polish and then protected with a coat of paste wax. Do not use abrasive cleaners or polish. Do not use high pressure spraying equipment.

In order to retain the unmarked finish on stainless steel, occasional cleaning is required. In corrosive atmospheres, such as coastal areas, a more frequent cleaning schedule is necessary. Under ordinary conditions, washing with detergent or soap and water, followed by a clean water rinse, is sufficient. If hard water is used, the surface should be wiped dry with a soft clean cloth to prevent the formation of water spots. Marks or spots, such as grease, oily fingerprints and smudges which resist soap and detergents, will have to be removed with a stronger cleaner. (**DO NOT** use ordinary steel wool as iron particles may adhere to the surface and cause corrosion.) Care should be taken in choosing a cleaner because any cleaning compounds or powders which contain abrasives can scratch a mill-rolled finish. Care must be exercised in their use to run in the direction of the polishing lines in the steel, never across them. After cleaning, an application of paste wax is recommended to protect the surface and prolong the interval between cleaning.

TROUBLESHOOTING

The paragraphs that follow detail troubleshooting procedures for major components in your Electric Keytrol.

ANTI-FALSE COUNT RELAY, P/N 0M0017

1. To check for faulty relay, remove relay and short pin 6 to 7. Operate dispenser. If counter operates, the time delay relay is faulty. Replace with a new unit.
2. The dispenser and Electric Keytrol can be operated indefinitely this way, only the unit may pick up a count (0.1 gallon) on start-up if the pulser has stopped in a closed position.

POWER RELAY, P/N 0M0015

1. Check power relay for movement of the armature when a key is inserted and turned.
2. If the armature moves in, but the pump will not run, move bypass switch to **MANUAL**. If the pump starts, the trouble is in the power relay contacts. Replace power relay or clean contacts.
3. If the armature does not move in, check for voltage across the coil when a key is inserted and turned. Proper voltage should be 24 VDC \pm 5 VDC. If this voltage is present, then the relay coil is burned out. Replace power relay.
4. If voltage is not present across the coil when a key is inserted and turned, the trouble lies elsewhere. Check power supply and counter module.
5. To replace power relay, remove counter modules and bottom bracket. Carefully remove both through bolts ensuring that no parts (spacers, nuts, washers) are lost. Replace relay, ensuring that the spacers are properly installed, otherwise the bottom of the printed circuit board (PCB) will short to the chassis. Reinstall wires to proper terminals, one at a time to prevent mix-ups.
6. Replace bottom bracket and counter modules and check for proper operation.

POWER SUPPLY TRANSFORMER

For 115 VAC Units, P/N 0M0008

1. The output of the power transformer should be 24 VAC (50-60 Hz) \pm 5 VAC for 115 VAC line. If no voltage is present, check on primary side for 115 VAC. If 115 VAC is present at the primary, but no voltage appears at the secondary, the transformer is defective. Replace transformer.
2. To replace transformer, remove all counter modules and bottom bracket. Remove bolts and cut wires after marking or identifying leads.
3. Strip and splice leads with solder and tape properly.
4. Remount with the two bolts.
5. Reinstall bottom bracket and counter modules.
6. Check for proper operation.

For 230 VAC Units, P/N 0M0055

1. The output of the power transformer should be 24 VAC (50-60 Hz) \pm 5 VAC for 230 VAC line. If no voltage is present, check on primary side for 230 VAC. If 230 VAC is present at the primary, but no voltage appears at the secondary, the transformer is defective. Replace transformer.
2. To replace transformer, remove all counter modules and bottom bracket. Remove bolts and cut wires after marking or identifying leads.
3. Strip and splice leads with solder and tape properly.
4. Remount with the two bolts.
5. Reinstall bottom bracket and counter modules.
6. Check for proper operation.

COUNTER OR TOTALIZER, P/N 0M0010

1. If any one counter does not function properly, when all other counters on that same module strip do, then the trouble is in the counter or keyswitch. To eliminate the keyswitch as the source of error, jumper from the top turret terminal (with a red lead C 24 VDC) to the proper turret terminal of the counter under question (white lead) and operate pulser. If the counter functions, replace keyswitch. If keyswitch is not defective, replace counter.
2. Counter removal. (Record reading for inventory).
 - Remove 4 bolts holding printed circuit board (PCB) to frame.
 - Remove two bolts holding the counter to the PCB and carefully swing PCB with counters away from frame. **CAUTION! The two counter bolts are metric threads. Do not lose or replace with standard screws.**
 - Unsolder the two leads from the turret terminals.

- Mount new counter with the same two bolts or bolts provided with the new counter. Counters are 24 VDC (Record reading).
 - Solder leads to same turret terminals from which the old counter was removed.
 - Re-bolt PCB with four bolts.
3. If all the counters on one module strip do not function, while those on another adjacent module do, check all four spade terminal connections for breakage or loose terminal block screws.
 4. If none of the counters are functioning, the problem may be with the pulser, 24 VDC power supply or interwiring.

KEYSWITCH (Microswitch: P/N 0M0011, includes tumbler)

1. Keyswitches can be isolated as the source of error as described in section **Counter or Totalizer**.
2. If the keyswitch turns (physically) but does not actuate the rear-mounted microswitch, as determined above, it is not necessary to remove the tumbler mechanism from the frame. Also, it may be desirable to leave the same tumbler mechanism to avoid having to issue new keys.
3. To remove the rear-mounted microswitch, remove PCB as described in **Counter or Totalizer**, Step 2. Unscrew 2 bolts holding the microswitch to the rear of the key mechanism. **CAUTION! DO NOT LOSE THESE SCREWS!**
4. Mark lead orientation and unsolder, or pull off.
5. Solder new leads in same configuration as removed, or push on.
6. Rebolt microswitch.
7. Rebolt PCB.

KEYSWITCH (Tumbler: P/N 0M0011, includes microswitch)

1. To change lock mechanism it is not necessary to remove or unsolder the microswitch.
2. Remove 2 bolts holding microswitch to rear of key mechanism.
3. Remove nut holding switch tumbler to frame. Remove tumbler mechanism.
4. Install new key lock tumbler and tighten nut.
5. Rebolt microswitch.
6. Rebolt PCB.
7. Issue new key(s) to proper personnel.

ADDING MODULES IN THE FIELD

Modular construction allows ease in adding strips of counters in units of 5 or 10. To install, first turn off all power to the Electric Keytrol and pump. Then remove the locked bezel. Remove a blank panel (held with two screws). Loosen the four appropriate terminal block screws, removing the jumper between terminals **C** and **D**. Carefully install the counter module with its spade terminals behind the lower support bar and into the terminal block. Make certain all 4 terminals on the module are behind the screw heads of the terminal block. Reinstall and tighten the two screws holding the module first. Then, tighten the four terminal block screws. Check the position of the lockout switches to ensure that the desired units are on. Check each counter for operation. Record the starting number. Reinstall bezel.

PULSER INSTALLATION ON EXISTING REGISTERS

Electric Keytrol's may be retrofitted to an existing dispensing system, which requires installation of a pulser. The pulser must be installed so that an active keyswitch will not record pulses during a reset cycle. To accommodate this restriction, the pulser should drive off the center extended shaft, which does not turn during the reset cycle. Another method is to wire one leg of the pulser through an isolated, normally open switch in the electric reset or control handle switch housing which will then close when the motor or solenoid valve is activated after reset is complete. This method allows the pulser to be driven by the gallon wheel which turns during the reset cycle.

PARTS

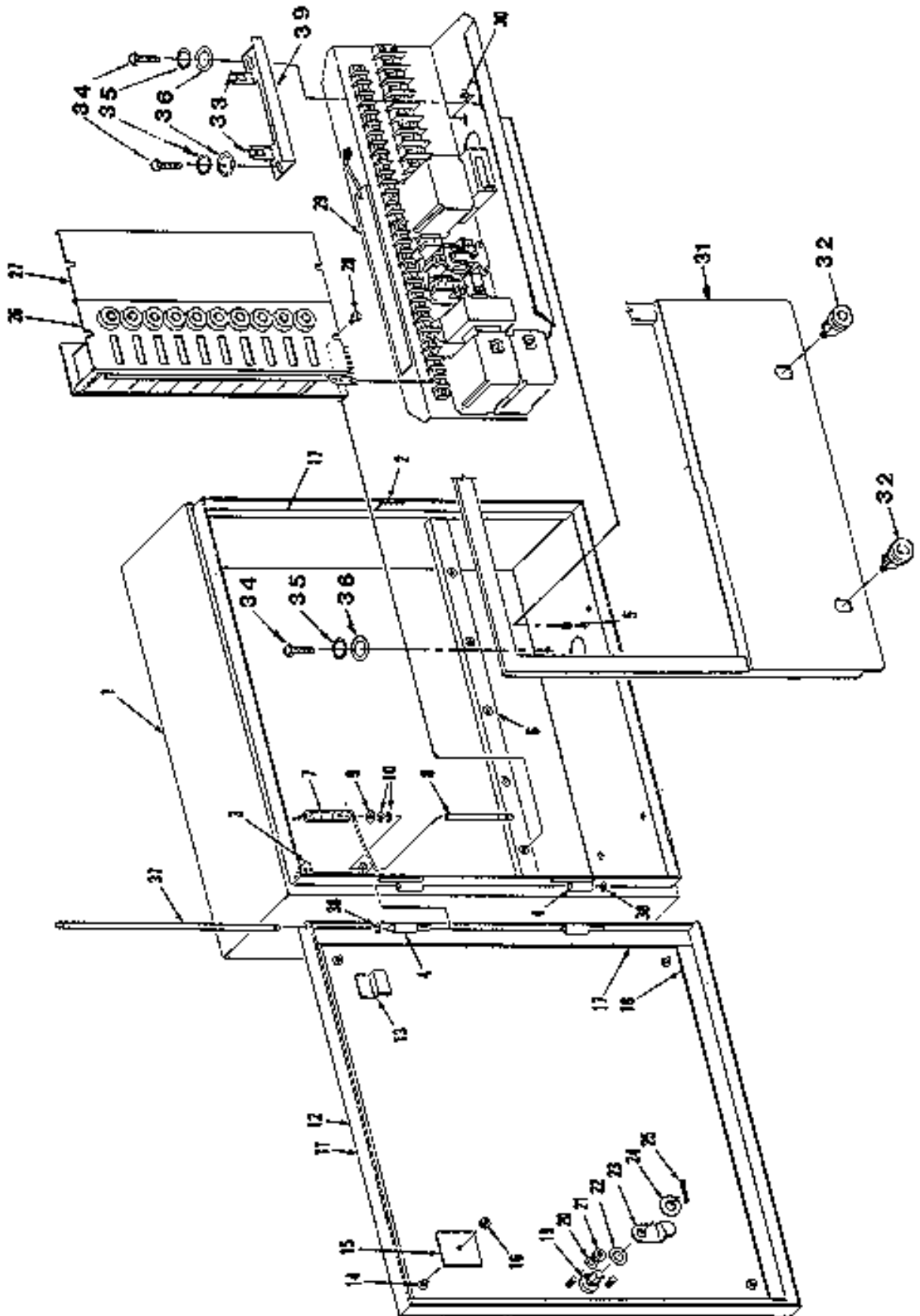
USING THIS PARTS LIST

This section lists parts information for the Electrical Keytrol Unit for pumps and dispensers. Using part numbers when ordering will expedite your order and reduce the possibility of the wrong parts being shipped. When ordering replacement parts, be sure to give the complete name and part number as shown in the appropriate parts list. It is also helpful to supply the serial number of the equipment.

Procedures requiring disassembly of portions of the unit should be performed by competent service personnel. Do not depend upon the repair service of a general mechanic unless he is thoroughly familiar with the mechanism. GASBOY has a distributor network which services fuel dispensing equipment and management systems in every section of the country.

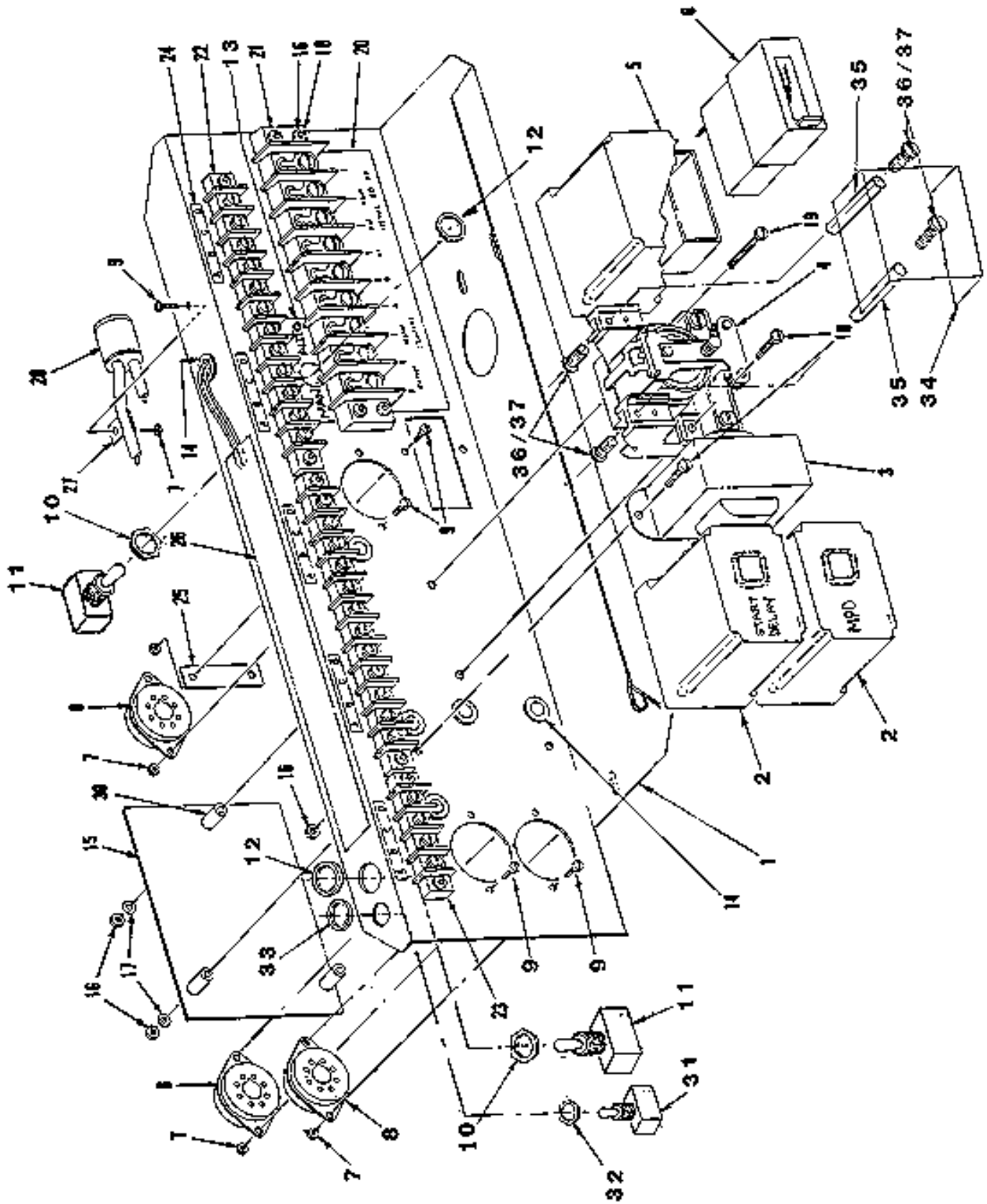
WARNING:

To reduce the risk of electrical shock when servicing, turn off and lock out all power to the pump/dispenser. In submersible pump applications, turn off and lock out power to the submersible pump and any other pumps/dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when dispensers share a common submersible pump or starter relay. Always turn off and lock out all power to the dispenser and the submersible pump at the master panel and close any impact valve before performing maintenance or service to the dispenser, including the changing of any fuel filters or strainers. Also block islands so no vehicles can pull up to the dispenser when the dispenser is being worked on.



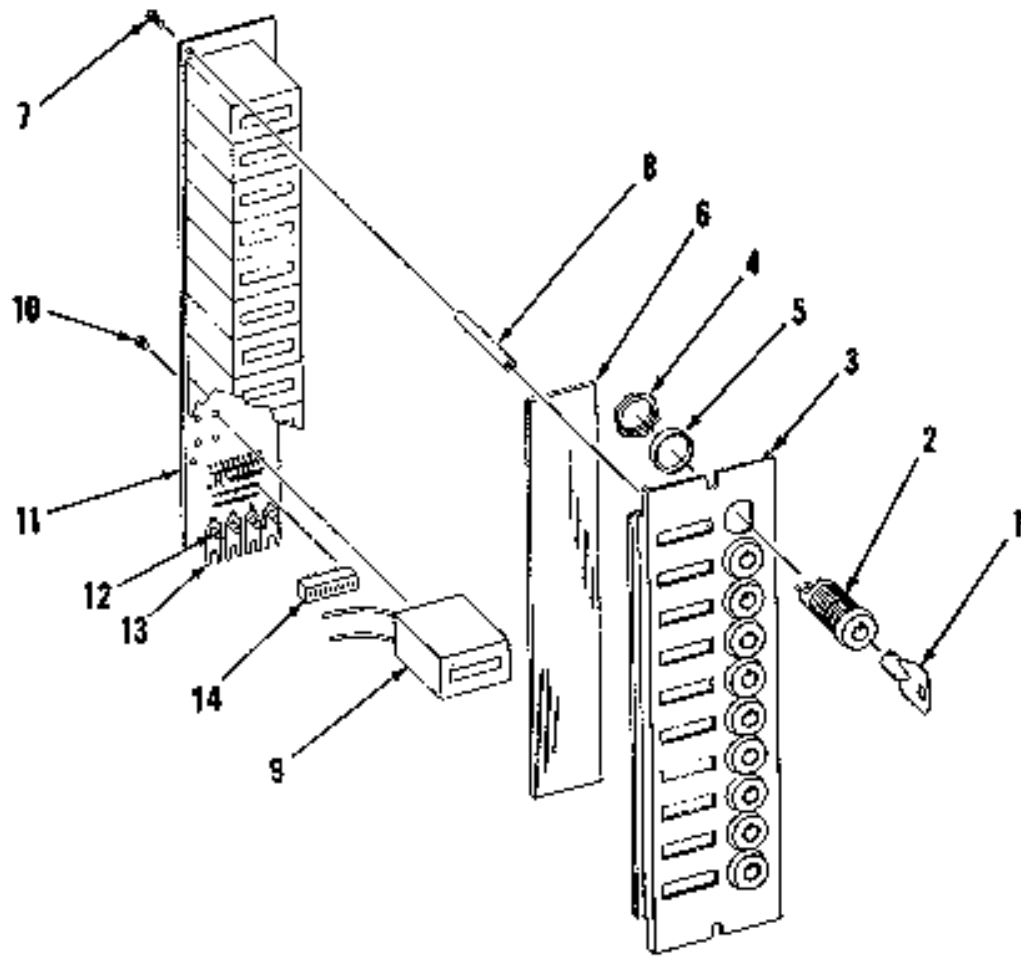
ELECTRICAL KEYTROL ASSEMBLY

Item	Part No.	Description	Qty.
1	017318	Cabinet, EK50, CRS - Must replace Assembly (Specify color)	1
	017302	Cabinet, EK50, SS - Must replace Assembly	1
	017321	Cabinet, EK50, CRS w/ Auxiliary (Specify color)	1
	017349	Cabinet, EK50, SS w/ Auxiliary (Includes Items 2-6, not sold separately)	1
2		Latch Catch	1
3		Spring Bracket	1
4		Hinge, Righthand Female	4
5		Bottom Bracket Locating Stud	2
6		Bottom Support Bar	1
		Top Support Bar (Not Shown)	1
7	057445	Door Spring	1
8	054475	Shaft	1
9	067270	Washer	1
10	049391	Retaining Ring	2
11	017341	Cabinet Cover Assembly, CRS (Specify color)	1
	017342	Cabinet Cover Assembly, SS Must replace Assembly (Includes Items 4, 12-18, not sold separately)	1
12		Cabinet Cover	1
13		Door Spring Guide Bracket	1
14		Weld Bolt	4
15		Gasket Clamp	4
16		Keps Nut, 6-32	4
17		Gasket, 3/8 x 3/4 x 17-1/2	2
18		Gasket, 3/8 x 3/4 x 15-1/2	2
19	029415	Lock Handle (Not Shown)	1
20		Lockwasher (Part of Item 19)	2
21		Hex Nut, 1/4" (Part of Item 19)	2
22	068281	Spring Washer	1
23	017607	Cam	1
24	068710	Washer	1
25	042310	Cotter Pin	1
26	0M0020	Counter Module, 10 Key, White	1-5
	0M0033	Counter Module, 5 Key, White	1-5
	0M0622	Counter Module, 10 Key, whole liter, White	1-5
27	026503	Panel, Blank	As Req'd
28	053019	Screw, 10-32 x 1/2	10
29	0M0377	Bottom Bracket Assembly	1
	0M0376	Bottom Bracket Assembly, A/T	
	0M0111	Bottom Bracket Assembly, Dual Control	
	0M0448	Bottom Bracket Assembly, 230 VAC	
	0M0447	Bottom Bracket Assembly, 230 VAC A/T	
	0M0635	Bottom Bracket Assembly, 230 VAC, Dual Control	
30	039069	Keps Nut, 6-32	1
31	012365	Bezel, (A-E), White	1
	012366	Bezel, (F-J), White	1
32	035026	Bezel Lock (master/aux; must purchase 2 locks)	2
	035027	Bezel Lock (master/aux, master/master, must purchase 4 locks) <i>NOTE: Individual locks not available.</i>	4
33	039460	Speed Nut	2
34	051805	Screw, 1/4-20 x 5/8 HHC	4
35	068281	Lockwasher	4
36	068005	Washer	4
37	029983	Hinge Pin	1
38	049390	Retaining Ring	2
39	012268	Bezel Locking Bar	1
Mounting Hardware (Not Shown)			
	003101	Base Casting, Flat, 9100 Series	1
	003073	Base Casting, Curved, 50 Series	1
	062102	Standoff	4
	014632	Shelf, for wall or post mount	1
	013631	U-Bolt	2



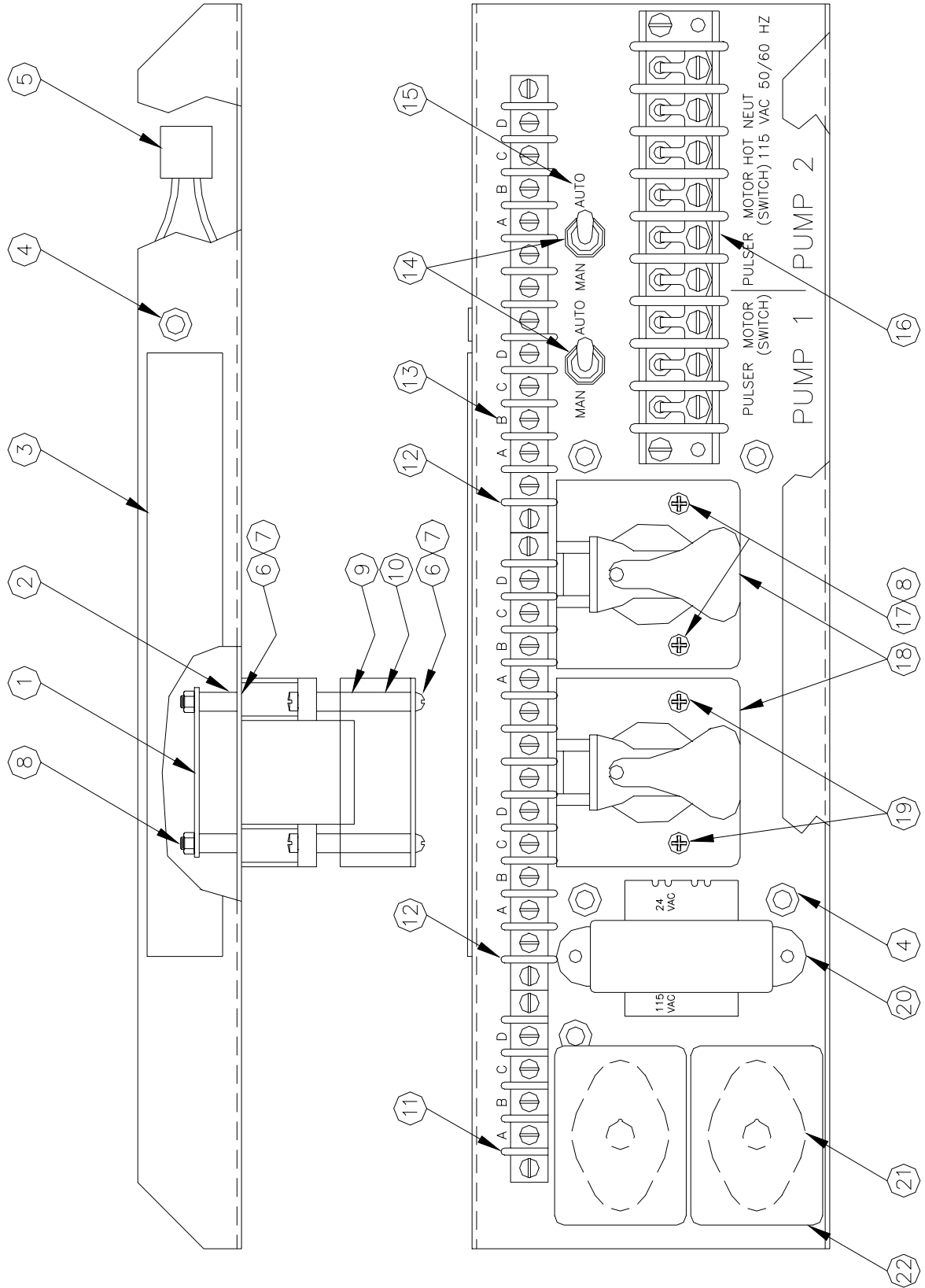
BOTTOM BRACKET ASSEMBLY

Item	Part No.	Description	Qty.
1	014897	Bottom Bracket (0M0377 & 0M0448)	1
	014899	Bottom Bracket (0M0376 & 0M0447)	1
	014901	Bottom Bracket (0M0108)	1
2	0M0065	Relay, MPD-TD	2
3	0M0008	Transformer, 115/24V	1
	0M0055	Transformer, 230/24V	1
4	0M0015	Power Relay	1
5	0M0017	Relay, Anti-False Count	1
6	0M0067	Accumulative Totalizer	1
7	039069	Keps Nut, 6-32)	13
8	0M0006	Octal Socket	2
9	052689	Screw, 6-32 x 3/8	9
10		Locknut, (Part of 11)	2
11	064455	Toggle Switch - Start Delay	2
12		Bushing (Part of 11)	2
13	0M0045	Auto-Manual Label	1
14	0M0068	Nylon Bushing	5
15	0M0124	Printed Circuit, MPD Assembly (Must Replace Assembly)	1
16	039070	Keps Nut, 8-32	14
17	067126	Washer, #8	3
18	052706	Screw, 8-32 x 7/8 Pan Hd Phi	13
19	052751	Screw, 8-32 x 1-1/4	1
20	0M0022	Marker Label (115 V)	1
	0M0201	Marker Label (230 V)	1
21	0M0016	Terminal Block	1
22	0M0007	Terminal Block	2
23	0M0041	Terminal Block	1
24	0M0044	A, B, C, D Label	5
25	011303	Totalizer Mounting Bar	1
26	025010	Heater, 115 VAC	1
	025018	Heater, 230 VAC	1
27	Z09835	Cable Clip	1
28	Z10187	Thermostat, 115 VAC	1
	C01449	Thermostat, 230 VAC	1
30	062101	Spacer	7
31	0M0370	Switch, DPDT Toggle, MPD	1
32		Lock Nut (Part of Item 31)	1
33		Bushing (Part of Item 31)	1
34	0M0275	Relay Shield	1
35	062104	Standoff, 1/4 dia. x 1-3/8 lg.	2
36	052870	Screw, 8-32 x 1/2	4
37	068152	Lockwasher	4
38	0M0502	Terminal Block Cover (Not Shown)	1
	0M0047	Jumper (Not Shown)	As req'd



COUNTER MODULE ASSEMBLY

Item	Part No.	Description	Qty.
	0M0020	Counter Module Assembly (10 Key)	1-5
	0M0033	Counter Module (5 Key)	1-5
	0M0622	Counter Module (10 Key, Whole Liter)	1-5
	0M0071	Counter Module (5 Key, Whole Liter)	1-5
1	099400	All Assemblies include Items 1 through 15 Key, Reg #, each keyswitch Specify letter number location, (i.e., A1) or number of key or lock (i.e., WMExxxx)	2
2	0M0011	Keyswitch	5-10
	0M0293	Switch only (subpart of 0M0011)	1
3	026502	Counter Module Frame	1
4		Hex Nut (Part of Item 2)	5-10
5	057055	Bushing	5-10
6	028767	Cover Glass	1
7	052689	Screw, 6-32 x 3/8	4
8	062100	Standoff	4
9	0M0010	Counter	5-10
	0M0105	Counter, Whole Liter	5-10
10		Screw (Part of Item 9)	10-20
11	0M0024	Printed Circuit Board	1
12	049616	Rivet	4
13	0M0013	Spade Terminal	4
14	0M0014	Rocker Switch Assembly, 10 pole, single throw	1



BOTTOM BRACKET ASSEMBLY FOR DUAL PUMP CONTROL

Item	Part No.	Description	Qty.
	014909	Bottom Bracket (0M0111 & 0M0635)	1
1	0M0018	Diode PCB Assembly	1
2	062101	Spacer, Aluminum #8 x 1/2" Lg.	2
3	025010	Heater, 60W, 115 VAC	1
	025018	Heater Strip, 60W, 230 VAC	1
4	0M0068	Bushing, Snap-in, 1/4" ID	6
5	Z10187	Thermostat, 15A, 55F-0/40F, 115 VAC	1
	C01449	Thermostat, Close 50F/Open 65F-22, 230 VAC	1
6	068152	Lockwasher, #8 Int Tooth	4
7	052854	Screw, 8-32 x .375 RH	2
8	039070	Nut, Hex Keps, 8-32	16
9	062104	Standoff, 1/4" x 1.375 Lg.	4
10	0M0275	Relay Shield, EK	2
11	0M0367	Terminal Block, Machined	1
12	0M0007	Terminal Block, 12-position, .437 ctrs, 1 row, 20 A	2
13	0M0044	A, B, C, D Label, EK	5
14	064455	Toggle Switch, 12 V	2
15	0M0045	Auto-Man Label	2
16	0M0016	Terminal Block, 9-pos, .562 ctrs, 2 row, 30A	1
17	052706	Screw, 8-32 x 7/8 Pan Hd, Phl	14
18	0M0015	Power Relay, SPST-N.O., 24 VDC	2
19	052751	Screw, 8-32 x 1-1/4 Fillstr Hd	2
20	0M0008	Transformer, 115V/24V	1
	0M0055	Transformer, 230V/24V	1
21	0M0006	Octal Socket	2
22	0M0017	Relay, T/D Octal, 24 VDC	2
23	0M0502	Terminal Block Cover, Silkscreened (Not Shown)	1

WARRANTY

General Statements:

Gasboy International LLC. warrants all new equipment manufactured by Gasboy against defective material and/or workmanship, for the warranty period specified below, when the equipment is installed in accordance with specifications prepared by Gasboy.

This warranty does not cover damage caused by accident, abuse, Acts of God, lack of surveillance of automatic recording systems, negligence, mis-application, faulty installation, improper or unauthorized maintenance, installation or use in violation of product manuals, instructions, or warnings. Under no circumstance shall Gasboy be liable for any indirect, special, or consequential damages, losses, or expenses to include, but not limited to, loss of product, loss of profits, litigation fees, or the use, or inability to use, our product for any for any purpose whatsoever.

Parts Only - During the warranty period, Gasboy will, at its option, repair or replace defective parts returned transportation prepaid to its factory.

On-Site Labor Included - Gasboy will also provide, within the Continental United States and during the warranty period, the services of an Authorized Service Representative (ASR) for on-site repair or replacement of defective parts.

Replacement Parts - Any system components that are not part of the original system order, including Island Card Readers, Pump Control Units, etc., are considered replacement parts.

Equipment	Term	Coverage
Commercial Pumps and Dispensers Full-Cabinet Consumer Pumps	One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.	Parts and Labor.
Small Transfer Pumps, Meters, Pressure Regulators	One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.- Excepting the Model 2020 Hand Pump, which has a 90-day warranty from date of GASBOY International's invoice.	Parts Only.
Keytrol	One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.	Parts and Labor.
Fuel Management Systems: - CFN/ Profit Point - Series 1000/Fleetkey - TopKAT - Fuel Point Readers (sold with new systems)	One year from date of start-up or 15 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.- The basic warranty only applies to systems which have been started up by a Gasboy Authorized Service Representative (ASR).	Parts and Labor.
Additional Fuel Point Items: - Fuel Point Readers sold for retrofitting existing systems. - Fuel Point vehicle and dispenser components.	One year from date of start-up or 15 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.	Parts Only.
Encoders, Embossers, Modems, CRTs, and Logger Printers	Purchased with Fuel Management System (Encoders, Embossers only): 90 days from the date of start-up by a Gasboy ASR, or 180 days from date of Gasboy International's invoice, whichever occurs first. Purchased with Fuel Management System (Modems, CRTs, and Logger Printers only): Matches system warranty. Purchased Separately: 90 days from date of Gasboy International's invoice to the purchaser.	Purchased with System (Encoders, Embossers only): Parts only. Purchased with System (Modems, CRTs, Logger Printers only): Matches system warranty. Purchased Separately: Parts Only.
Air Diaphragm Pumps	Three years from date of purchase (for full warranty description, see Price List).	Parts Only.
Items not manufactured by Gasboy (ex. automatic nozzles, hoses, swivels, etc.)	Not warranted by Gasboy International (consult original manufacturer's warranty).	Not Applicable.
Replacement Parts	One year from date of Gasboy International's invoice to the purchaser.	Parts Only.

To the extent permitted by law, this warranty is made in lieu of all other warranties, expressed or implied, including warranties of freedom from patent infringement, or merchantability, or fitness for a particular purpose, or arising from a course of dealing or usage of trade. No one is authorized to vary the terms of the warranty nor may anyone make any warranty of representation, or assume any liability other than that herein stated, in connection with the sale described herein. The acceptance of any order by Gasboy International is expressly made subject to the purchaser's agreement to these conditions.



GASBOY INTERNATIONAL LLC

P.O. Box 309, Lansdale, PA 19446 ● (800) 444-5579 ● FAX: (800) 444-5569 ● www.gasboy.com