Electrical Requirements

- Prepare sites according to NFPA 30A, NFPA 70, and applicable national, state and local
- Use licensed electricians to make all electrical connections.
- Use a dedicated circuit/phase system. Wire all electronic units to the same power leg.
- Use an earth ground for circuits. Mount all circuit breaker panels and relay boxes securely to the wall.
- Use UL recognized/approved components and/or systems.
- Recommended voltages for pumping units are 220VAC- single phase or 380VAC- 3
- Route product wiring to protect from damage, using conduit as required. Note: Pumping units operating at higher load levels than dispensers. See FE-363 and FE-364

Emergency Power Cutoff Switch

△ WARNING

injury or death.

codes/regulations.

Spills and collisions expose highly flammable and explosive fuels. Failure to install and use an Emergency Power Cutoff could result in severe

Observe all safety precautions in this and other manuals

- NFPA 30A and Gilbarco require that you install one or more emergency power
- An emergency power cutoff switch is a single control that removes AC power to all island
- equipment (pumps/dispensers, STPs, canopies, lights, and so on.). • Make the emergency power cutoff switch accessible, label it clearly and install it away from any hazard that may occur at the pumps/dispensers. Do not install cutoff switches
- more than 100-feet away from the pumps/dispensers. • Show all employees where the emergency power cutoff switch is located and how to use
- it. Remind them often. Note: Do not use E-STOP, ALL-STOP, or PUMP STOP keys on Gilbarco console/cash

registers to shut off pump/dispenser power. These keys do not remove AC power and do not always stop product flow.

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Circuit Breakers

be permitted. Ref. NEC 514

and clearly marked.

STP Control Relay Boxes for Dispensers

(self-contained models).

STP Isolation Relays for Electronic Dispensers

single circuit breaker.

powering down of pump/dispenser for service.

Install a separate control relay for each STP.

Do not use the dispenser relay to power the STP.

• Use only UL/CUL listed circuit breaker panel as appropriate for that area.

Combined STP Control Relay/Isolation Relay boxes are recommended.

Combined STP Control Relay/Isolation Relay boxes are recommended.

Install circuit breakers away from the pumps/dispensers. They must be readily accessible

• Install a separate circuit breaker for each STP (dispenser models) or each pump motor

STP isolation relays provide electrical isolation between dispensers and prevent damage from

cross phasing. Refer to MDE-2755 Gilbarco STP Control and Dispenser Isolation Relay Box,

PA0287 Installation and FE-321 Gilbarco STP Isolation Relay Box PA0287 Field Wiring

• Gilbarco requires installation of STP isolation relays in addition to STP control relays.

• Use isolation relays for each STP control line at each dispenser or dispenser grouping on a

• Route neutral wire to the control relays from the dispenser circuit breaker (see field wiring

Note: For 3 phase STP, use isolation relay at the input of the 3 phase STP control box.

Install one circuit breaker for each pump/dispenser or small island group to allow

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Electrical Requirement

Conduit

- Gilbarco recommends that a spare conduit be run for future high speed communications. See High Speed Communication Wiring on page 13 for details.
- Use 1-inch trade size rigid aluminum conduit with the Encore and Eclipse pumps/
- dispensers to connect wires to the pump/dispenser. InfoScreen® and two-wire data wires can share power wiring conduit (See model-specific wiring diagrams).
- Use separate 1-inch conduit for CRIND® Twisted Pair, intercom and call button wiring. • Use threaded, rigid metal conduit or a rigid non-metallic conduit for applications below the pump dispenser to carry electrical wires. Conduit must conform to national and local electrical codes. If you use nonmetallic conduit, it must be at least 2-feet underground. The
- last 2-feet of the underground run to the junction box must be rigid metal conduit or threaded steel intermediate metal conduit. Tighten all threaded conduits.
- Use of galvanized pipe is acceptable as an alternative to black iron pipe, when black iron pipe is specified. • Never share conduit with other manufacturers' equipment (for example, speaker wires,
- canopy lights). Note: You can use the same conduit for routing power to the pump/dispenser and the two-wire data loop (Class 1 circuit). The two-wire data loop is a Class 1 circuit.
- Never rely on metal conduit to provide an equipment ground. Run a separate ground wire. Separate and isolate dispenser/pump wiring from other equipment wiring in wiring
- Never use knock-out boxes or flexible conduit for installation. Note: Extra junction boxes added to the pump/dispenser must be listed Class 1, Div. 1, Group C and D explosion-proof.
- Use electrical fittings that are listed for Class 1, Group C and D hazardous locations as required by NFPA 30A and NFPA 70.
- A seal-off 'Y' fitting (example: Killark® Type EY) must be installed on all units as a first connection where conduit leaves the ground.

Wiring

For high speed communications information, go to High Speed Communication Wiring on

- Wire all pumps/dispensers according to NFPA 30A, NFPA 70 and applicable national, state, and local codes/ regulations.
- Wire all circuits N.E.C. Class 1 except speaker (intercom) circuit which must be N.E.C. Class 2. Install speaker (intercom) circuit in separate 1-inch conduit.
- Use stranded gas and oil resistant copper wire rated for 300 volts (up to 240VAC source)
- In the main conduit, for two-wire communications use only twisted-pair wiring per the
- Unshielded twisted pair wire is required for two wire communication wiring for new installations. Previously wired stations may continue to use tested existing non-twisted
- pair wiring, that has been short and continuity tested and passed. Twisted pair is recommended for existing wired stations for all geographic regions experiencing higher
- than national average lightening strikes. • Leave 6 to 8-feet of wire out of conduit for connection to dispenser.

diagram. Do not use shielded twisted pair.

- Place dispensers on the same phase. Note: If Gilbarco isolation relay box is installed, dispensers are not required to be on the same phase. (Also note that Red Jacket also has an isolation relay box that can be

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Electrical Requirement

- Use listed wire nuts for all connections. Do not use tape.
- Pull spare wires for future use. Protect conduit ends and wire from water or damage.
- Seal-off 'Y' fitting(s) must be potted after all wires are run to termination points.
- For additional wiring notes and requirements consult the following documents: • FE-341 Field Wiring Diagrams - The Eclipse Series Dispensers 120/240 VAC
- FE-363 Field Wiring Diagrams Encore 500/550 Series Units
- FE-364 Field Wiring Diagrams Encore 300 Units

Data Wire Lengths

Use the following table to determine maximum data wire lengths.

For This Distribution Box	The Distance Between the Distribution Box and Dispenser	The Distance Between the Distribution Box and Console/Controller
PA0133, PA0187 G-SITE®	"Total" data wire system run no more	e than 2600 ft. with 14 AWG.
PA0242 Transac® System 1000™	No more than 2600 ft. with 14AWG.	No more than 2600 ft. with 14AWG.
PA0261 Universal D-Box	No more than 2600 ft. with 14AWG.	No more than 2600 ft. with 14AWG.
PA0306 Distribution Box	No more than 2600 ft. with 14AWG.	No more than 2600 ft. with 14AWG.

Note: When installing new 2-Wire Communication wiring, use unshielded twisted pair data wires. Shielded wire must not be used. Wiring spec: 2-wire twisted pair (UTP) with 10 to 12 twists per foot, stranded annealed copper tinned with 18 AWG minimum required for runs up to 1000 feet or 14 AWG minimum for runs up to 2600 feet. Do not daisy chain communications wiring. Insulation spec: PVC insulation of type TFFN or MTW, UL approved gasoline and oil resistant. Reference C&M Corporation Part #27525 (18 AWG) or equivalent. Gilbarco part number for wire is: Q13221-2.

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Electrical Requirements Receptacles Output Terminals opens on bypass • Install a dedicated UL/CUL listed switched-neutral breaker (except for Canada) to each Cable circuit leading to a pump/dispenser or dispenser and STPs. It must be able to disconnect hot and neutral conductors simultaneously. Single-pole breakers with handle ties shall not Wired Plug/Receptacle Loads

"Mac Victor® Power Network" - Operation Schematic

Description of Operation

- Dashed lines indicate field wiring. The integral isolation transformer in the POWERVAR *UPM is critical to the proper
- operation of the MVPN and is therefore specified as "No substitutions". • Each dedicated branch circuit breaker requires its own Mac Victor *Power Network.
- Multiple MVPN units in the same facility should be wired to the same electrical phase of power
- The Power Transfer Switch bypasses the POWERVAR *UPM and Optional UPM Power Off contacts in the event of UPM maintenance or UPM failure
- Mac Victor[®] and Expand Your Power[®] are registered U.S. Trademarks of Mac Victor Power POWERVAR[®] is a registered U.S. Trademark of Powervar, Inc.

- 120 VAC, 1 Ø input power supplied to "Mac Victor® Power Network" (hereinafter MVPN) enclosure
- Input power status pilot light is illuminated Power routed within the MVPN enclosure to Normal/Bypass transfer switch
- Power routed from Normal/Bypass switch to the POWERVAR® UPM POWERVAR® UPM conditions power and provides battery backup

 120 VAC, 1 ø, POWERVAR® UPM conditioned & battery power routed back
- MVPN enclosure. Output power status pilot light is illuminated
- MVPN provides power conditioned/battery backup source to dedicated receptacles and/or equipment
- Power is routed from Normal/Bypass switch directly to dedicated receptacles and/or equipment, bypassing the POWERVAR® UPM and remote UPM power off terminals.
- Output power status pilot light remains illuminated and does not flicker during the transfe
- JPM Power Off (UPO) Switch 15 amp minimum disconnect switch wired When UPO switch is engaged, the output power from the POWERVAR® UPM

 • MVPN overall dimensions 19.25"H x 26"W x 10"D
- is disconnected from the dedicated receptacles and/or equipment When UPO switch is disengaged, the output power from the POWERVAR $^{\bullet}$ UP is reconnected to the dedicated receptacles and/or equipment
- MVPN provides "make before break" switching technology between normal and bypass modes going in both directions which eliminates the flicker associated with standard switches.

Wiring indicated dashed is field wiring.

heory of Operation Isolated Ground (IG) Receptacles (identified by orange color and/or orange

triangle) are used with Critical Electronic Systems to provide a separate round reference point (primarily for internal/external data communication & ogic) from the safety or chassis ground required to protect personnel from short circuit voltages in the conduit/raceway system.

Typically, this isolated ground conductor must be run back to the electrical Service Entrance grounding terminal of the facility which can expose this critical ground reference to electrical contamination by induced voltages from other parallel current carrying conductors that are run in the same conduits,

Theory of Operation (Continued) e National Electrical Code (NEC) allows for alternate wiring of the isolated

ground conductor to terminate at a "separately derived system". The POWERVAR® Uninterruptible Power Manager (UPM) constitutes a "separately derived system" otherwise described as a "newly derived system" based on

Security Panels

Telephone Systems

Tank Gauge

Critical Electronics Receipt Printers

Point of Sale

Office Computer

Video Monitors

Victor Power Strips are

the Electrical Contractor

the integral, low impedance isolation transformer that allows for the re-establishment of the Neutral – Ground bond. The "Mac Victor® Power Network" provides the necessary power interface device between the plug and receptacle POWERVAR® UPM and the remote, hard wired Isolated Ground (IG) receptacles along with many practical operational and maintenance features described in the Benefits section

"Mac Victor * Power Network " System Specifications Power Conditioning and Battery Backup unit: POWERVAR® ABCE1440—11 (no substitutions) U.L. 1778 Listed Power Supply & Accessory

ittery Backup Time: 6 minutes at full load/20 minutes at half load One (1) 120VAC, 1 phase input 120VAC, 1 phase, power conditioned, isolated, and battery backup output Maximum load capacity of 12 amps at 120 VAC (1440 VA) Pilot light status indicators for input and output power
Transfer Switch with "make before break" technology to bypass UPM for

[⊄] "Mac Victor® Power Network" Benefits The "Mac Victor® Power Network" (MVPN) is designed to allow

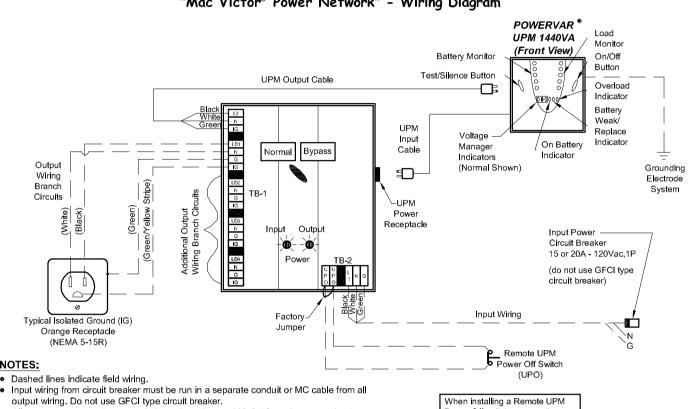
maintenance or emergency

ion of dedicated, power conditioned and battery backup receptacles and/or hardwired loads, located remotely from each other and the MVPN, to the POWERVAR® UPM Benefits of the (MVPN) are:

- Provides cleans & continuous (battery back up) electrical power for all selected Critical Electronic System power network components such as f terminals, printers, office computers, telephone, security, automation Wall mounted design saves valuable floor and under counter space
- Reduces installation cost by providing the innovative "Newly Derived Isolo Ground" (NDIG) technology and by eliminating unnecessary circuit breaker electrical panels, conduit wiring runs, and the associated installation labo
- Eliminates data communications problems associated with the electrical "multiple—phasing" of network system power Reduces both operating & maintenance expenses from downtime due to
- software lockups and hardware failures

 Increases revenues with continuous system operation during short durati power failures (6-30 minutes) and other power quality disturbances Reduces auxiliary equipment cost and space by eliminating all remote plu in battery backups, filters, and surge strips

which is dedicated for the UPM power receptacle 23" Center to center mounting hole width Number of pre-punched 1/2" EMT knockouts → 26" Enclosure & mounting flanges width Input power conduit Output power conduits UPM power off conduit circuit breaker (Option #1) Optional remote mounted UPM All conduits entering or exiting the top of the enclosure are routed behind the POWERVAR *UPM which is offset from the wall by 1.5" by the shelf. power off switch Product & Purchasing Information Mac Victor Power Network and Mac Mac Victor® and Expand Your Power® are registered U.S. Trademarks of Mac Victor Power. Local IG Receptacles POWERVAR® is a registered U.S. Trademark of furnished by Circle K and installed by "Mac Victor® Power Network" - Wiring Diagram POWERVAR UPM 1440VA Monitor (Front View) / Battery Monitor Test/Silence Butto **UPM Output Cable** Indicator Voltage -Input / On Battery Indicator Manager Indicator (Normal Shown) Circuits



"Mac Victor® Power Network" - Typical Elevation

POWERVAR®UPM

ver Conditioner & Batter

Input O O O Output

Input power condult from

circuit breaker (Option #2)

Mounting hole diameter = 7/16"

20" Enclosure only width

height

(Typical of 6)

POWERVAR *UPM

• Input wiring from circuit breaker must be run in a separate conduit or MC cable from all

 All output wiring must be run in dedicated conduits or MC Cable and not routed with any other wiring. Maximum recommended branch circuit length = 50 ft. Conduit entry is not allowed on the right hand side of the enclosure.

receptacle screws on the back of the UPM

MAC VICTOR WIRING DIAGRAM

Remote IG Receptacles

UPM Strapping Slots for Selsmic Zones or

for factory mounting with Integrated -

(2 on front flange and 2 on back flange)

Electrical Panels

Hard-wired

Remote System

Input wiring from circuit breaker must be run in a

Conduit entry is not allowed on the right hand side

separate conduit or MC cable from all output wiring.

NOTES:

Power Off switch, remove the actory jumper between terminals UPO and "UPO" and connect to the N/C contacts of a 15A/120Vac Connect the UPM NIG bond to the Grounding Electrode System via one of the bonded minimum rated remote switch.

PROJECT MANAGER CHRIS CERBO

PROFESSIONAL SEAL

REFERENCE

ONLY

PROFESSIONAL IN CHARGE

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PROJECT NAME **CIRCLE K** STORES, INC.

> **PFLUGERVILLE TEXAS**

SEC WEST PECAN ST. & SARAH'S CREEK DR. PFLUGERVILLE, TX



SHEET TITLE

20140041.5

PROJECT NUMBER

FUEL SYSTEM DIAGRAMS

SHEET NUMBER

Radiant LightHouse 5.1 / 3.44 Red - Serial or analog patch chords with RJ+5 al patch panel end and RJ+2 at the desice end. (Made from 6-Vitre Flat cable) Patching & Labeling ■ Blue - Efferne i 108aseT paich chords . (Cal-5 UTP) Equipment Rack and BO PC Area ■ Black - Analog with RJ 12 aldevice end and other end leminating to 24-port patch panel. (64-Mre Flat) BACKOFFICE PC BackOffice EED •• ② Access Point POSA Switch-2x 1-Orange Bite Cat-5 POSB Switch-3x 2-Orange Bite Cart-5 POSC Swiftch-4x 3-Gray Bite Cart-5
 Omni
 JBM-Porti
 4-White
 Bite
 Cat-5

 Brible
 6-Red
 8-Bite
 White
 6-Flat

 TM
 TM
 7-Gray
 White
 6-Flat
 Fuel D-Box-1 9-Green White 6-Flat
 Critical
 D=8xx-2
 10-hxxxy
 White
 6-Flat

 Credit
 Credit Jack
 11-Yellow
 White
 6-Rud

 BOPC1
 Switch-AX
 13-Orange
 Bite
 Cat-5

 BOPC2
 Switch-6x
 14-Orange
 Bite
 Cat-5
 BOPC3 Swiftsh-7x 15-Orange Bite Cat-5 BOPC4 Swiftsh-8x 16-Orange Bite Cart-5 Phone Store Phone 21 White 6-Rad Aralog 1 Phote Jack 22 White 6-Rid Analog2 Modern Jack 23 White 6-Rnd Switch Switch-1x Router-Ether Blue Cart-5 JBM Switch-Sx JBM-PortQ Blue Cart-5 Swiftch Console Console JBM-PortS White 6-Raid والأرف الله الله الله الله Telephone Router-FXS1 21-White White 6-Raid Analog-LEC Router-FXO5 22-White White 6-Rind Frame Router-T1/E1 Frame Jack White 6-Red Modem Router-AUX Modem-COM Black 8-Flat Analog-Modern Modern 23-White White 6-Raid 000000 • 😎 Computer Computer 13-Orange Blue Cart-5 Adapter i JBM-Porti Ma Ma Adapter 2 JBM-Port5 Ma Ma Adapter 3 Modern-COM n/a n/a Add to Matrix: "Server "Actapter for TM

FRAME RELAY RACK ELEVATIONS