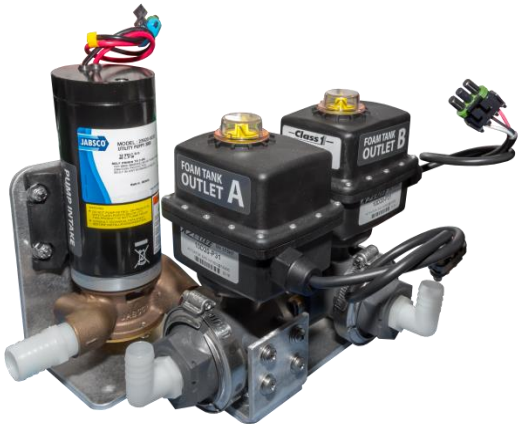
EZFill Foam Tank Refill System

Installer/User Guide





Class1 ◆ A Unit of IDEX Corporation
607 NW 27th Avenue ◆ Okala, FL 34475 U.S.A.
Telephone: 352-629-5020 ◆ FAX: 352-629-3569
Web: www.class1.com

Hale Products Inc. ◆ A Unit of IDEX Corporation
700 Spring Mill Avenue ◆ Conshohocken, PA 19428 U.S.A.
Telephone: 610-825-6300 ◆ FAX: 610-825-6440
Web: www.haleproducts.com

HALE PRODUCTS INC. ISO 9001 Certificate A4026

Manual p/n: 029-0020-82-0



NOTICE !

Class1 cannot assume responsibility for product failure resulting from improper maintenance or operation. Class1 is responsible only to the limits stated in the product warranty. Product specifications contained in this manual are subject to change without notice.

All Class1 products are quality components -- ruggedly designed, accurately machined, precision inspected, carefully assembled and thoroughly tested. In order to maintain the high quality of your unit, and to keep it in a ready condition, it is important to follow the instructions on care and operation. Proper use and good preventive maintenance will lengthen the life of your unit.

ALWAYS INCLUDE THE UNIT SERIAL NUMBER
IN YOUR CORRESPONDENCE.

Manual p/n: 029-0020-82-0, Rev. – B
Printed in U.S.A.

© Hale Products, Inc. 2005
All Rights Reserved

Contents

Page

1 Safety Precautions 5

1.1 Guidelines 5

2 Description 7

Figure 2-1:EZFill Refill System Overview, Single Tank 7

2.1 Smart-SWITCH Controller (SPC) 8

Figure 2-2:Smart-Switch Controller (SPC) 8

FILL Button 9

Press and Release 9
Press and Hold 10
Button Illuminations 10

FLUSH Button 10

Press and Release 10
Button Illuminations 10

“A” Button 11

Press and Release 11
Button Illuminations 11

“B” Button 11

Press and Release 11
Button Illuminations 11

3 Installation 12

3.1 PLUMBING 12

Figure 3-1:Three-Position Valve Plumbing, Single Tank 12
Figure 3-2:Mounting Bracket Layout 13
Figure 3-3:Sample, Tank FULL Sensor Mounting 14

3.2 Electrical 15

Smart-Switch Controller (SPC) 15

Figure 3-4:Smart-Switch Controller Panel Cutout 15

Interconnecting Wire Harness 16

Figure 3-5:Interconnecting Harness, Single Tank 16
Figure 3-6:Interconnecting Harness, Dual Tank 17

Motor Ground / Primary Power 18

Contents - continued

Page

4 Operation 19

4.1 Tank Full 19

4.2 Flush mode 20

4.3 Specifications 21

5 Illustrated Parts Breakdown 23

General 23

Abbreviations 23

EZFill Pump/Motor Assembly, Single Tank System 24

Figure 5-1: EZFill Parts Breakdown, Single Tank System 25

EZFill Pump/Motor Assembly, Dual Tank System 26

Wire Harness, Single and Dual Tank System 27

Figure 5-2: WIRE HARNESS, Single and Dual Tank System 27

Express Warranty 28

Drawings

Electrical / Wiring Schematic 30



Class1
A Unit of IDEX Corporation
607 NW 27th Avenue

1 Safety Precautions

IMPORTANT !



THE CLASS1 “EZFILL™” FOAM TANK REFILL SYSTEM IS DESIGNED FOR OPTIMUM SAFETY OF ITS OPERATORS. FOR ADDED PROTECTION AND BEFORE ATTEMPTING INSTALLATION OR OPERATION PLEASE FOLLOW THE SAFETY GUIDELINES LISTED IN THIS SECTION AND ADHERE TO ALL WARNING, DANGER, CAUTION AND IMPORTANT NOTES FOUND WITHIN THIS GUIDE.

THIS SECTION ON SAFETY MUST BE CAREFULLY READ, UNDERSTOOD AND ADHERED TO STRICTLY BY ALL INSTALLERS AND OPERATORS BEFORE ATTEMPTING TO INSTALL OR OPERATE THE EZFILL FOAM REFILL SYSTEM. WHEN DEVELOPING DEPARTMENTAL APPARATUS OPERATING PROCEDURES, INCORPORATE THE WARNINGS AND CAUTIONS AS WRITTEN.

EZFill is a trademark of Class1. All other brand and product names are the trademarks of their respective holders.

1.1 GUIDELINES



READ ALL INSTRUCTIONS THOROUGHLY BEFORE BEGINNING ANY INSTALLATION OR OPERATION PROCESS.

- Installation should be performed by a trained and qualified installer, or your authorized Class1 service representative. Be sure the installer has sufficient knowledge, experience and the proper tools before attempting any installation.
- The installer is responsible for observing all instructions and safety precautions in his or her daily routine as dictated by regional safety ordinances or departmental procedures.
- DO NOT permanently remove or alter any guarding or insulating devices, or attempt to operate the system with these guards removed.

  Make sure all access/service panels and covers are installed, closed and latched tight, where applicable.
- DO NOT remove or alter any hydraulic or pneumatic connections, electrical devices, etc. DO NOT tamper with or disconnect safety features or modify protective guards (such as covers, or doors). DO NOT add or remove structural parts.

WARNING!



NO MODIFICATIONS OR ADDITIONS MAY BE MADE TO the EZFILL FOAM REFILL SYSTEM WITHOUT PRIOR WRITTEN PERMISSION FROM:

CLASS 1
A Unit of IDEX Corporation
607 NW 27th Avenue
Ocala, FL 34475 U.S.A.
Telephone.....352-629-5020
FAX 352-629-3569
Web www.Class1.com

- Before connecting the wire harness, inspect the seal washers in the female connectors.

  If a seal washer is missing or damaged, water can enter the connector causing connector pin and terminal corrosion. This could result in possible system failure.

- To prevent electrical shock always disconnect the primary power source before attempting to service any part of the EZFill refill system.

- All electrical systems have the potential to cause sparks during service. Take the necessary precautions to eliminate explosive or hazardous environments during any installation/service.

- Relieve all system pressure, then drain all foam concentrate and water from the system before servicing any of its component parts. Lockout the system in accordance with the manufacturer's recommendations.

- Use only tubing/hose which is rated at or above the maximum pressure of the EZFill pump system, i.e., 50 PSI (3.5BAR) minimum. Use only tube/hose rated at 23 in.Hg (582.4 mmHg) vacuum.

- Fasteners used for the installation of the Class1 EZFill refill system are Grade 5, and some are stainless steel. NEVER substitute with a lesser grade fastener or quality. Failure to do so causes equipment malfunction or damage and/or personal injury.

- Use only approved sealants on the Class1 EZFill refill system. Class1 recommends using:

  Plastic Pipe -
  Permatex 80724 (or equal) thread sealing compound

  Metal Pipe -
  Loctite PST (or equal) thread sealing compound

2 Description

The **Hale EZFILL Foam Tank Refill System** is an electronically controlled, easy-to-operate, fixed mount 12 or 24 volt, 5 GPM (19 LPM) foam tank refill system. It features “Smart-Switch” technology (switch panel controller or **SPC**), interconnecting wire harness, motor/pump and valve assembly. The EZFill system is self-priming and automatically shuts OFF after sixty (60) seconds or when the foam concentrate reservoir is FULL.

See Figure 2-1: “EZFill Refill System Overview, Single Tank,” for an overview of the system components.

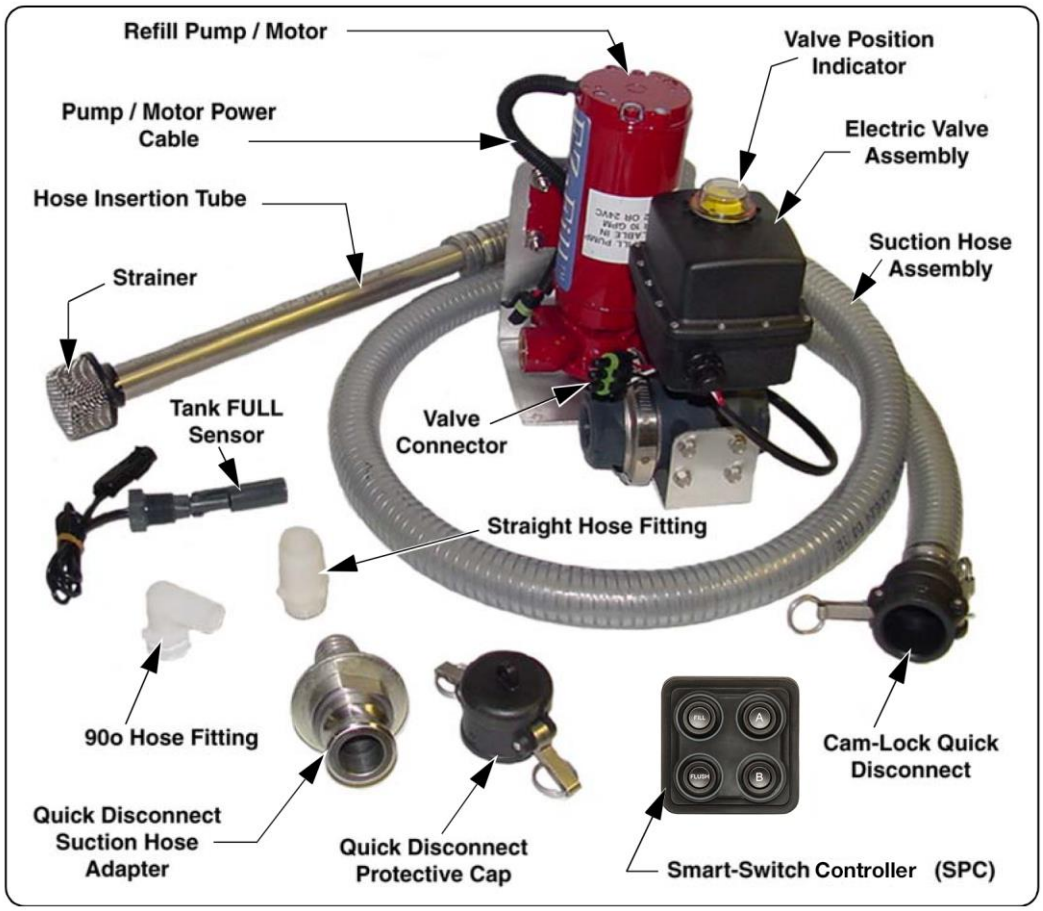


Figure 2-1: EZFill Refill System Overview, Single Tank

The EZFill is configured to handle either a:

- ❑ Single-tank foam concentrate reservoir system
- ❑ Dual-tank foam concentrate reservoir system

- Class “A” and/or
- Most Class “B” foams.

2.1 SMART-SWITCH CONTROLLER (SPC)

The “**S**mart-Switch” **P**anel **C**ontroller (**SPC**) is the primary component of the EZFill system that allows quick and easy refills of foam concentrate tanks. (See Figure 2-2: ‘Smart-Switch Controller (SPC).’)

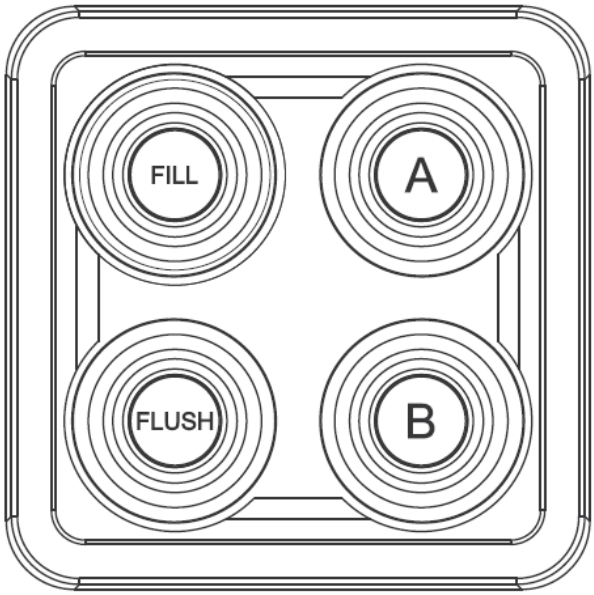


Figure 2-2: Smart-Switch Controller (SPC)

The SPC uses three push-buttons for Single Tank, and four for Dual Tank operation. The button borders are illuminated for status indication. See Figures 2-3 and 2-4.

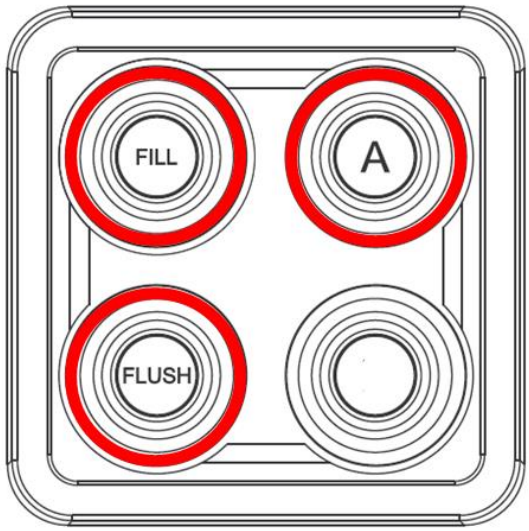


Figure 2-3: Single Tank Configuration

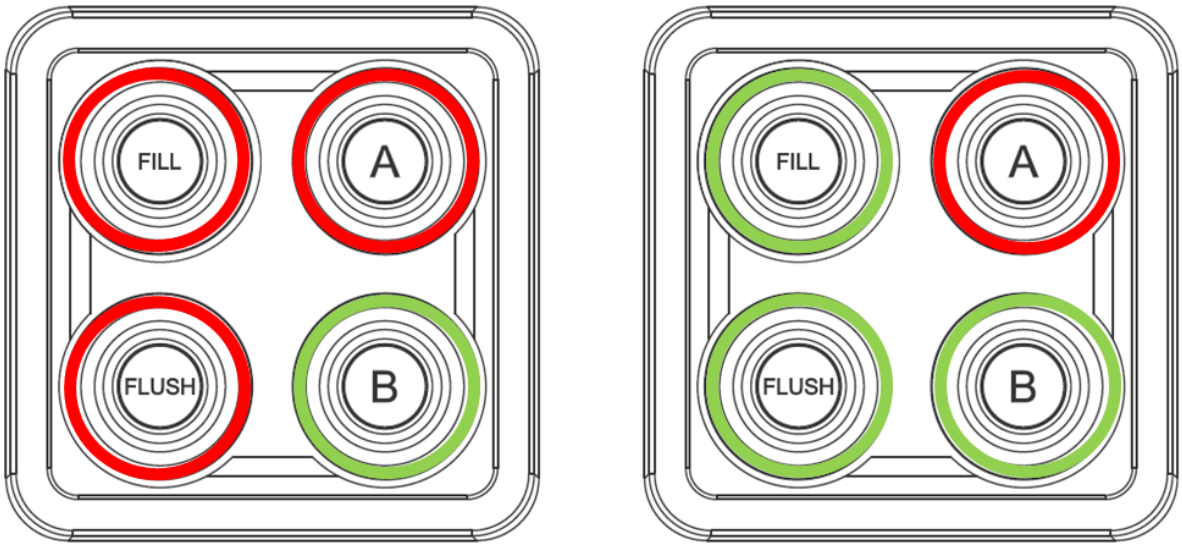


Figure 2-4: Dual Tank Configuration (Tank A selected left, Tank B selected right)

FILL Button

Press and Release

The FILL button sets the flush/fill valve to the FILL position. The foam fill pump/motor starts running for sixty (60) seconds or until the tank level FULL sensor is activated.

The foam fill pump/motor can be turned OFF at any time by pressing the FILL button again.

After the FILL cycle completes, either by activation of the FULL sensor or by pressing the FILL button a second time, the flush/fill valve returns to the FLUSH position.

Press and Hold

This sequence sets the flush/fill valve to the FILL position. After a few seconds the foam pump/motor runs for as long as the FILL button is held (*force fill*). (See Figure 2-2: 'Smart-Switch Controller (SPC)' on page 8.)

As soon as the button is released, the flush/fill valve returns to the FLUSH position (default position).

Button Illuminations

(See Figures 2-3 & 2-4.)

- The FILL button is ON FLASHING (red/green depending upon tank selection) while the pump/motor is running.
- The FILL button is ON STEADY (red/green depending upon tank selection) when FILL is not active.

FLUSH Button

Press and Release

This sequence begins by:

- Turning the foam fill pump/motor OFF
- Pressing the FLUSH button

The pump/motor runs for thirty (30) seconds to FLUSH the system of residual foam concentrate.

Notes: If additional flushing is needed, repeat this step. The flush/fill valve remains in the FLUSH position when the flush sequence is completed (default position).

Button illuminations

(See Figure 2-3, 2-4, 2-5)

- The FLUSH button is ON BLUE FLASHING and the FILL ON BLUE STEADY while the system is flushing.
- The button illuminations layout reverts to its Single OR Dual Tank configuration when FLUSH is not active.

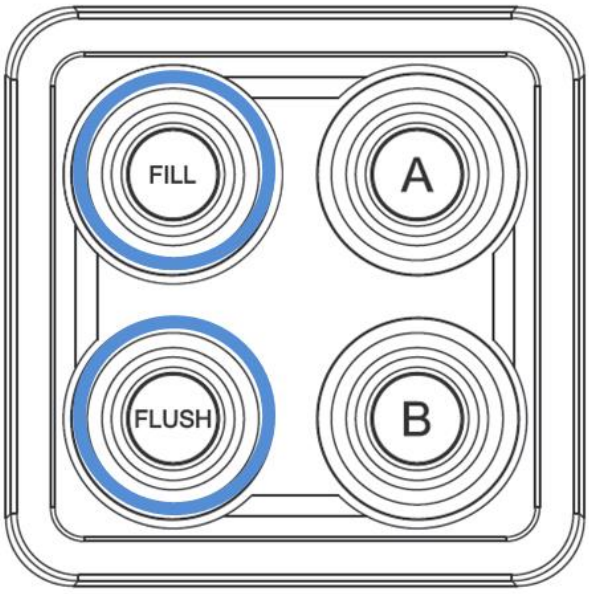


Figure 2-5: Flushing

"A" Button

Press and Release

Sets the electric valve to the TANK "A"' position.

Button Illuminations

- The "A" button configuration is ON STEADY when foam TANK "A" is selected (Figures 2-3 & 2-4).

"B" Button

Press and Release

Sets the electric valve to the TANK "B"' position.

Button Illuminations

- The "B" button configuration is ON STEADY when foam TANK "B" is selected (Figure 2-4).

3 Installation

3.1 PLUMBING

(See Figure 3-1: 'Three-Position Valve Plumbing, Single Tank.')

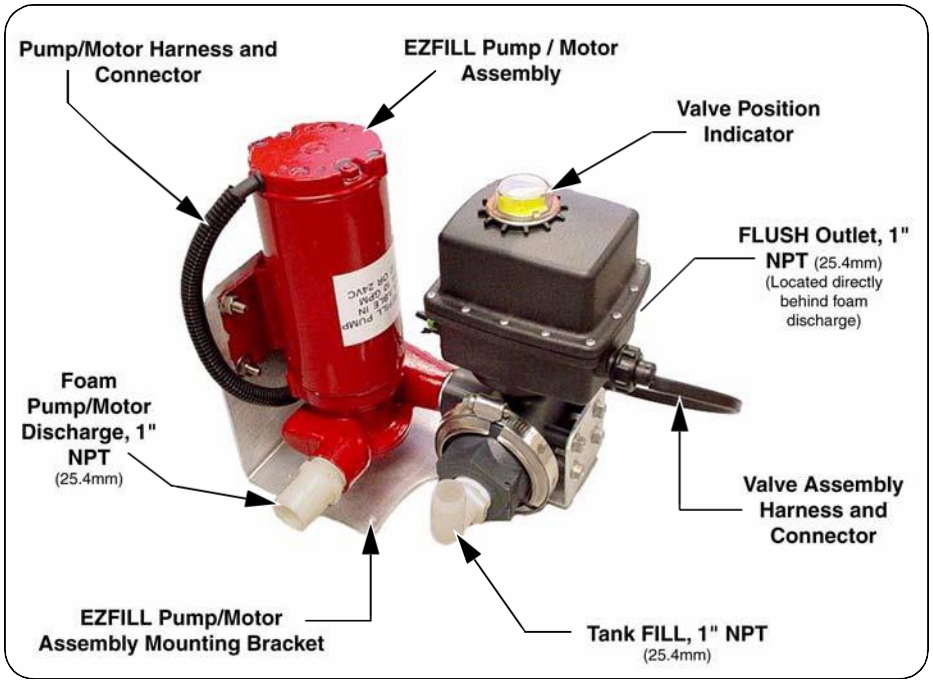
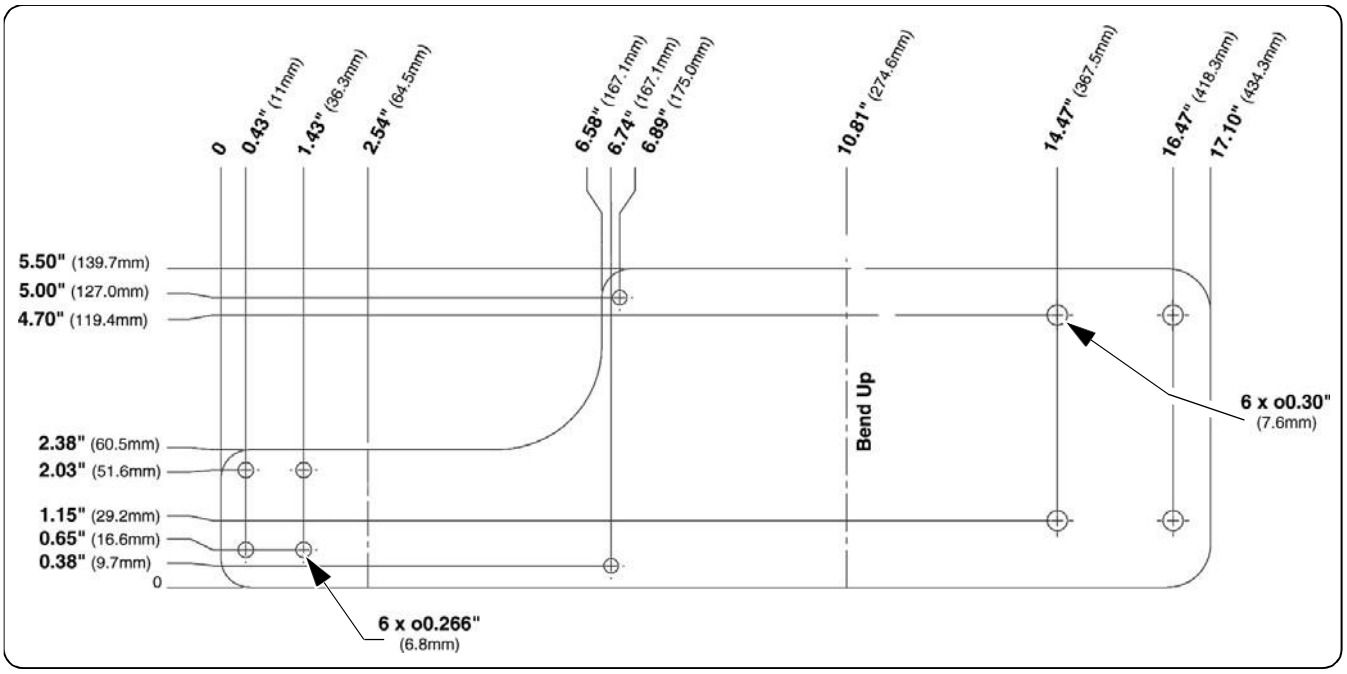


Figure 3-1: Three-Position Valve Plumbing, Single Tank

IMPORTANT!

WHEN DETERMINING THE LOCATION OF THE EZFILL SYSTEM COMPONENTS BEING INSTALLED KEEP IN MIND PIPING RUNS, CABLE ROUTING AND OTHER INTERFERENCES THAT COULD HINDER OR INTERFERE WITH PROPER SYSTEM PERFORMANCE.

Ideally, the EZFill pump/motor assembly should be located in an area that is protected from road debris and excessive heat buildup. The back of a compartment or a compartment shelf is often an ideal location. Access to the cam-lock, quick disconnect suction hose adapter must be provided on the operator panel. For bracket dimension layout, see Figure 3-2: "Mounting Bracket Layout" on page 12.



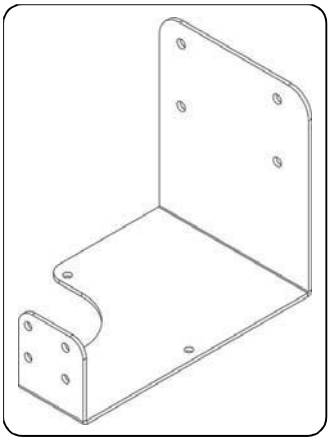


Figure 3-2: Mounting Bracket Layout

The EZFill may be located in the pump compartment as long as it is protected, preferably mounted “low” for easier pumping and better performance. The EZFill pump/motor assembly must be located where refilling can be easily accomplished with 5 gallon (19 liters) pails or other methods suitable to the end user.

The EZFill system is provided with 8.0’ (2.4 meters) of 1” (25.4 mm) ID reinforced PVC foam concentrate suction hose, a straight hose fitting and a 90° hose fitting. The system installer may need to supply additional fittings and hose from the foam tank to the inlet of the 3-position valve and from the operator panel quick disconnect adapter to the foam motor/pump.

All system plumbing transfers foam concentrate, therefore plumbing components must be compatible with the foam concentrates being used. Hoses for Class “A” or Class “B” foam concentrates should have minimum 1” (25.4mm) inside diameter.

Hoses for the foam concentrate suction must have a minimum rating of 23 in.Hg. (584.2mmHg) vacuum and 50 PSI (3.5 BAR) pressure or greater.

Make sure provisions are made for the following plumbing connections:

1. Use only approved sealants on the EZFill refill system. Class1 recommends using:

   - ❑ Plastic Pipe – Permatex #80724 (or equal) thread sealing compound
   - ❑ Metal Pipe – Loctite PST (or equal) thread sealing compound

2. Install the tank FULL level sensor near the top of the appropriate foam tank. (See Figure 3-3: 'Sample, Tank FULL Sensor Mounting.')

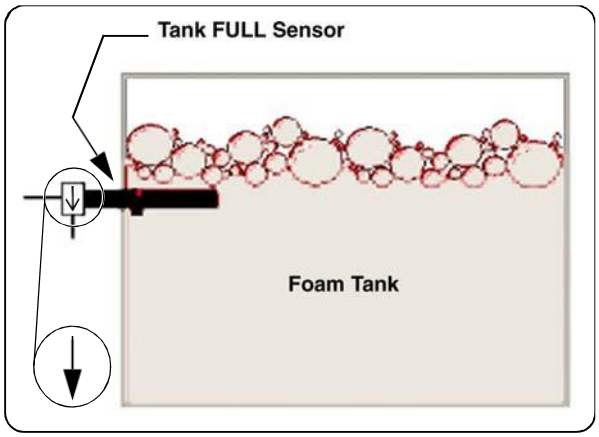


Figure 3-3: Sample, Tank FULL Sensor Mounting

3. Drill and tap a 1/2"-14 NPT hole and install the sensor. Apply pipe sealant to avoid leaks.

   Tighten the sensor having the "arrow" on the base of the hex pointing down.

   After installation, verify switch operation using a powered test light.

   Note: If a dual tank system is used, a second tank FULL level sensor must be installed in tank "B" as well.

4. Install the SUCTION/FILL quick disconnect adapter and hardware. The adapter should be located in a convenient location on the operator's panel. (See Figure 3-1: 'Three-Position Valve Plumbing, Single Tank' on page 11.)

5. Drill a 1-3/8" (35 mm) clearance hole and install the quick disconnect adapter and hardware.

6. Foam FILL suction hose connection, between quick disconnect adapter and the foam pump/motor SUCTION inlet port.

7. Foam FILL hose connection between 3-position valve port and the BOTTOM of the foam tank (Tank "A"). (See Figure 3-1: 'Three-Position Valve Plumbing, Single Tank' on page 11.) The foam tank fill hose must be plumbed to the bottom of the tank to prevent "foaming" of the concentrate.

Notes: The system installer must supply a service shut-off valve at the foam tank. If a dual tank system is used, a second hose line must be fed from the second 3-position valve to tank “B.”

8. Flush discharge hose between the 3-position valve FLUSH port and appropriate ground container (5 gallon/19 liter pail). (See Figure 3-1: ‘Three-Position Valve Plumbing, Single Tank’ on page 11.)

   The flushing hose must be a minimum of 1/2” (12 mm) inside diameter.

WARNING!

FLUSHING PROCEDURES MUST MEET EPA STANDARDS (AND/OR YOUR DEPARTMENTAL PROCEDURES) IN ACCORDANCE WITH TYPE OF FOAM BEING USED.

3.2 ELECTRICAL

Smart-Switch Controller (SPC)

Refer to Figure 3-4 for the suggested panel installation and cutout dimensions.

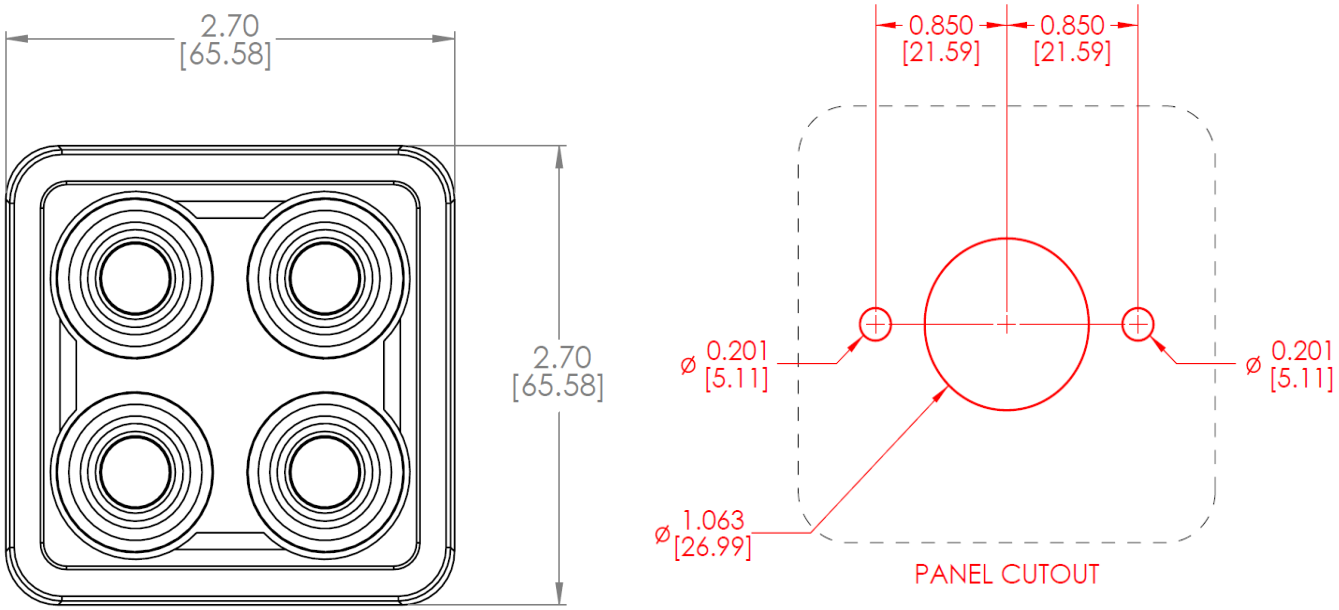


Figure 3-4: Smart-Switch Controller Panel Cutout

Determine a location on the operator panel of the apparatus for the smart-switch controller. Consideration must be given for routing the interconnecting cable from the controller to the EZFill pump/motor assembly and the apparatus tank FULL level sensor.

Interconnecting Wire Harness

Before connecting the cable harness, inspect the O-ring seals of the female connectors. If a seal washer is missing or damaged, water can enter the connector causing pin and terminal corrosion, resulting in possible system failure. (See Figure 3-5 & 3-6)

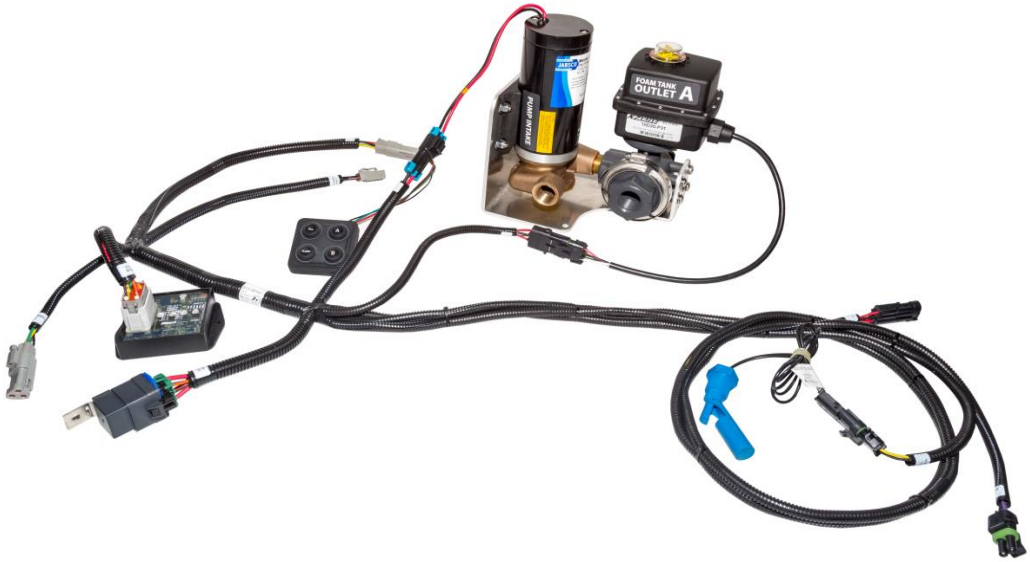


Figure 3-5: Interconnecting Harness, Single Tank



Figure 3-6: Interconnecting Harness, Dual Tank

If an additional harness extension is required, contact Class1 at **352-629-5020**.

The power must be fused for 12VDC (or optional 24VDC), minimum 20 amp. circuit to meet NFPA specifications.

IMPORTANT !

DO NOT CONNECT POWER SUPPLY HARNESS TO A “LOAD SHEDDING SYSTEM.”

Motor Ground / Primary Power

CAUTION !

PREVENT CORROSION OF POWER AND GROUND CONNECTIONS BY SEALING THESE CONNECTIONS WITH SILICONE SEALANT.

DO NOT CONNECT THE MAIN POWER LEAD TO SMALL LEADS THAT ARE SUPPLYING SOME OTHER DEVICE, SUCH AS A LIGHT BAR OR SIREN. THE CLASS1 EZFILL FOAM REFILL SYSTEM REQUIRES 40 AMP MINIMUM CURRENT.

USE MINIMUM 14 AWG TYPE SXL/GXL WIRE.

Primary electrical power must be supplied directly from the battery, the battery master disconnect switch or solenoids to the Hale EZFill refill system.

The primary power connection must be made so that power is supplied to the EZFill system when the main apparatus electrical system is energized.

Be sure the EZFill system is grounded to the chassis. (See Figure 3-5 & 3-6.)

When making the ground connections make sure lugs are soldered to the strap ends for trouble free connections. Seal all connection against corrosion.

4 Operation

The EZFill system should receive its power from the down side of the main disconnect of the apparatus and is always operable while power is supplied to the pump panel.

4.1 TANK FULL

1. When power is supplied to the operator's control panel, the area around the button borders on the smart-switch controller illuminate, per Figures 2-3 & 2-4, to indicate the system is operational.

2. Connect the suction hose to the quick disconnect adapter on the operator panel and assure a tight seal.

3. If not already installed, slide the strainer on the end of the suction tube until the tube bottoms within the strainer.

4. Fully insert the tube into the container of foam solution (usually a 5 gallon (19 liter) container).

5. Select the tank to be filled by pressing the appropriate button on the smart-switch controller (TANK "A" or TANK "B"). The appropriate tank button border illuminates.

6. Press and release the FILL button to begin the tank fill process. The pump/motor runs for approximately sixty (60) seconds or until the tank FULL sensor is activated, indicating a FULL tank.

7. As the foam container empties, replace the container and repeat Step 6 until the tank is FULL.

8. To "force fill" the tank, press and HOLD the FILL button. The foam pump/motor runs continuously until the button is released.



CAUTION!

IN THE "FORCE FILL" MODE, AN OPERATOR MUST ALWAYS BE AVAILABLE TO MONITOR THE CAPACITY OF THE TANK TO AVOID AN "OVERFILL" CONDITION.

4.2 FLUSH MODE

WARNING!



FLUSHING PROCEDURES MUST MEET EPA STANDARDS (AND/OR YOUR DEPARTMENTAL PROCEDURES) IN ACCORDANCE WITH TYPE OF FOAM BEING USED.

1. When power is supplied to the operator's control panel, the area around the button borders on the smart-switch controller illuminate, per Figures 2-3 & 2-4, to indicate the system is operational.

2. Connect the suction hose to the quick disconnect adapter on the operator panel and assure a tight seal.

3. Fully insert the suction tube into a container of clean, fresh water.

4. Place the FLUSH discharge hose into an empty container or discharge to the ground. See **WARNING!** note above.

5. Press and release the FLUSH button to begin flowing fresh water throughout the system (valve and pump/motor) for approximately thirty (30) seconds.

6. As the clean water container empties, replace the container and repeat Step 5 until all signs of foam residue are FLUSHED from the system.

7. To "force flush" the tank, press and HOLD the FLUSH button. The foam pump/motor runs continuously until the button is released.

CAUTION!



IN THE "FORCE FLUSH" MODE, AN OPERATOR MUST ALWAYS BE AVAILABLE TO MONITOR THE CAPACITY OF THE CONTAINER TO AVOID AN "OVERFILL" CONDITION.

4.3 SPECIFICATIONS

Voltage supply ..... +9…32VDC

Temperature range ..... -40°…+85°C

Maximum continuous current

Electric valve control output (Valve 1)..... 6A

Electric valve control output (Valve 2)..... 6A

Foam fill pump control output 500mA

Overlay (switch panel) ..... UV resistant

Environmental sealing IP67

Protection:

- ❑ Internal thermal fuse
- ❑ Reverse voltage protection on power input
- ❑ CAN bus communication lines protected for accidentally connecting with system voltage
- ❑ Electrical protection per SAE J1113 for heavy duty trucks (24V)
  - ♦ ESD protection on pins and enclosure
  - ♦ Transient protection on power input lines

NOTES

5 Illustrated Parts Breakdown

GENERAL

This section contains the parts breakdown for the serviceable assemblies, components and most commonly used options for the **EZFill** Foam Tank Refill System.

ABBREVIATIONS

The following abbreviations may be used in this IPB:

A/R .....As required

Cm .....Centimeters

Cont. .....Continued

Dia.....Diameter

EMI.....Electro-Magentic Interference

Ext.....Exrternal

FNPT.....Fine National Pipe Thread

Fwd .....Forward

Ga .....Gauge

Grd, Gr.....Grade – when hardware lists a grade rating, it is imperative to maintain that rating when replacing parts.

Hp, HP .....Horsepower

HS.....Hardened Steel

Hex.....Hexagonal

Id, ID .....Inner diameter

IPB .....Illustrated Parts Breakwown

JIC.....Joint Industry Conference – an industry standard used to describe a fitting.

Kw (kw) ....Killowatt

Lh, LH .....Left Hand

Max. .....Maximum

Min. .....Minimum

MM .....Millimeters

Mtg.....Mounting

n/s .....Not Shown – parts that are not shown but are servicable.

No .....Number

NFPA .....National Fire Protection Agency

NPT.....National Pipe thread

NPTF.....National Pipe Thread, Fine

OD.....Outer diameter

p/n.....Part number

Ref .....Reference

Rev.....Reverse

Rh, RH .....Right hand

RFI .....Radio Frequency Interference

Str .....Straight – usually to describe a hydraulic or pneumatic fitting (vs. elbow)

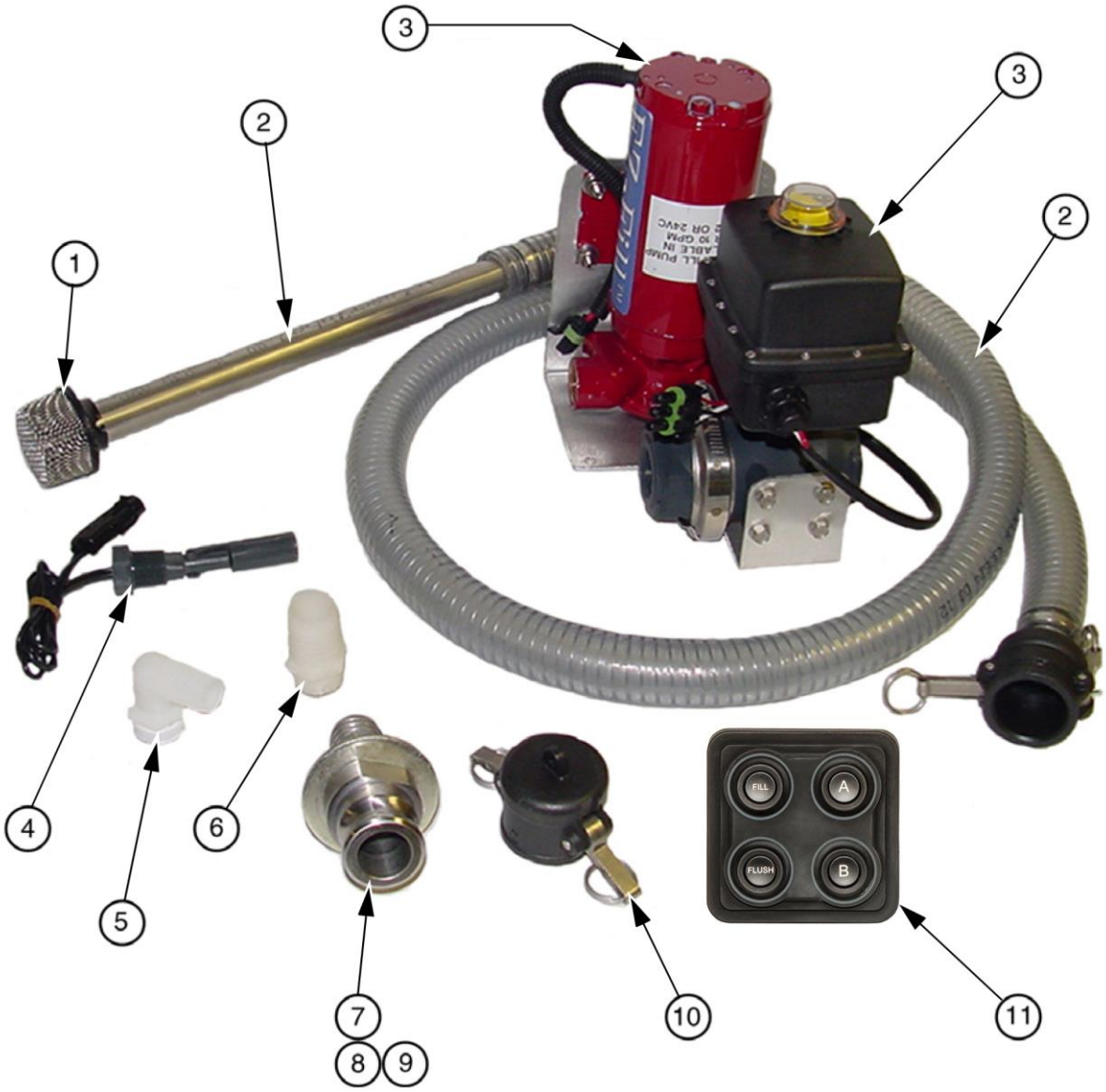
Thru.....Through

Typ.....Type

EZFill Pump/Motor Assembly, Single Tank System

Item	Part No.	Qty.	Description
1	010-0940-00-0	1	Strainer
2	340-2100-00-0	1	Suction Hose Assembly, with 3/4” Stainless Steel Wand
3	112096	1	Foam Pump/Motor and Valve Assembly
4	200-2110-02-0	1	Tank FULL Level Sensor Assembly
5	100266	2	90° Hose Fitting, 3/4”
6	112164	1	Straight Hose Fitting, 1”
7	082-3084-06-0	1	Cam-Lock Quick Disconnect Adapter
8	097-6100-00-0	1	Washer
9	110-3501-02-0	1	Nut
10	112097	1	Quick Disconnect Protective Cap
11	610-00062-000	1	Smart-Switch Controller (SPC)

Figure 5-1: EZFill Parts Breakdown, Single Tank System



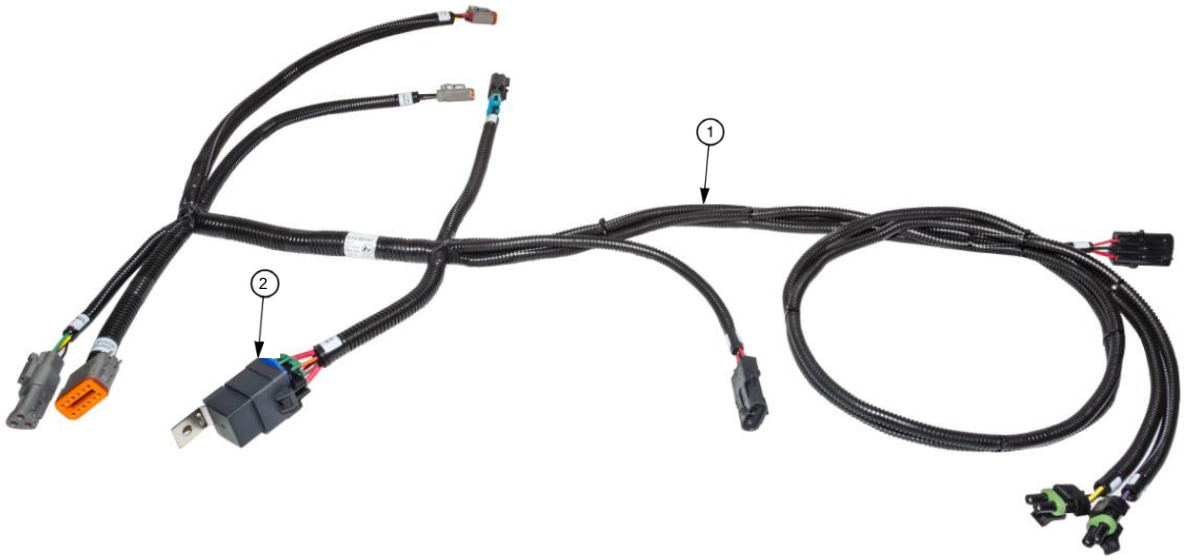
EZFill Pump/Motor Assembly, Dual Tank System

Item	Part No.	Qty.	Description
1	010-0940-00-0	1	Strainer
2	340-2100-00-0	1	Suction Hose Assembly, with 3/4” Stainless Steel Wand
3	112901	1	Foam Pump/Motor and Valve Assembly
4	200-2110-02-0	2	Tank FULL Level Sensor Assembly
5	100266	2	90° Hose Fitting, 3/4”
6	112164	1	Straight Hose Fitting, 1”
7	082-3084-06-0	1	Cam-Lock Quick Disconnect Adapter
8	097-6100-00-0	1	Washer
9	110-3501-02-0	1	Nut
10	112097	1	Quick Disconnect Protective Cap
11	610-00062-003	1	Smart-Switch Controller Panel (SPC) (Dual Configuration)

Wire Harness, Single and Dual Tank Systems

Item	Part No.	Qty.	Description
1	513-00141	1	Wire Harness
2	12193601	1	Motor Relay

Figure 5-2: WIRE HARNESS, Single and Dual Tank Systems



EXPRESS WARRANTY

EXPRESS WARRANTY: Hale Products, Inc (HALE) hereby warrants to the original Buyer that products manufactured by Hale are free of defects in material and workmanship for one (1) year. The "Warranty Period" commences on the date the original Buyer takes delivery of the product from the manufacturer.

LIMITATIONS: Hale's obligation is expressly conditioned on the Product being:

- Subjected to normal use and service.
- Properly maintained in accordance with Hale's Instruction Manual as to recommended services and procedures.
- Not damaged due to abuse, misuse, negligence, or accidental causes.
- Not altered, modified, serviced (non-routine) or repaired other than by an Authorized Service Facility.
- Manufactured per design and specifications submitted by the original Buyer.

THE ABOVE EXPRESS LIMITED WARRANTY IS EXCLUSIVE. NO OTHER EXPRESS WARRANTIES ARE MADE. SPECIFICALLY EXCLUDED ARE ANY IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATIONS, THE IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE OR USE; QUALITY; COURSE OF DEALING; USAGE OF TRADE; OR PATENT INFRINGEMENT FOR A PRODUCT MANUFACTURED TO ORIGINAL BUYER'S DESIGN AND SPECIFICATIONS.

EXCLUSIVE REMEDIES: If Buyer promptly notifies HALE upon discovery of any such defect (within the Warranty Period), the following terms shall apply:

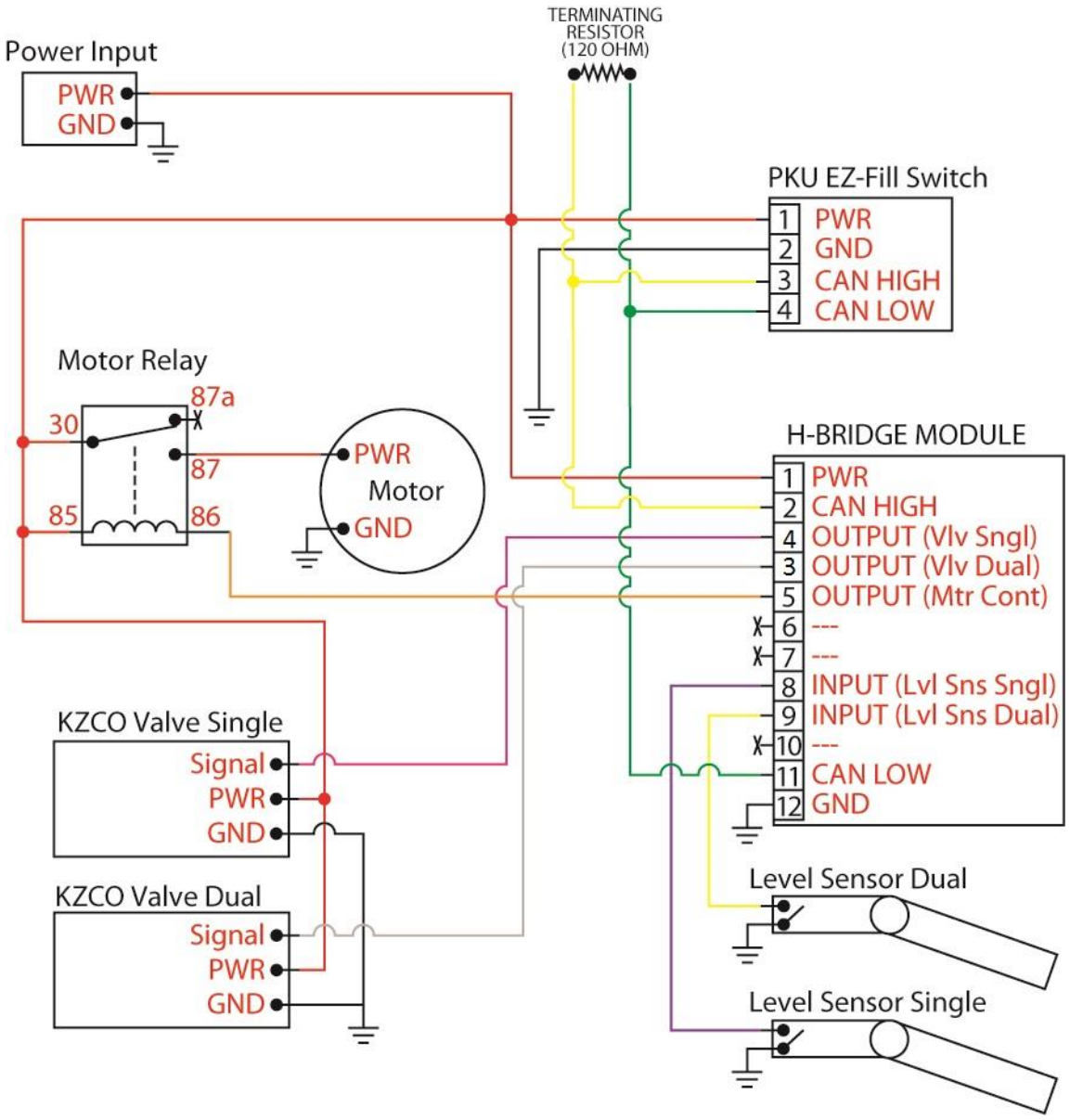
- Any notice to HALE must be in writing, identifying the Product (or component) claimed defected and circumstances surrounding its failure.
- HALE reserves the right to physically inspect the Product and require Buyer to return same to HALE's plant or other Authorized Service Facility.
- In such event, Buyer must notify HALE for a Returned Goods Authorization Number and Buyer must return the product F.O.B. within thirty (30) days thereof.
- If determined defective, HALE shall, at its option, repair or replace the Product, or refund the purchase price (less allowance for depreciation).
- Absent proper notice *within* the Warranty Period, HALE shall have no further liability or obligation to Buyer therefore.

THE REMEDIES PROVIDED ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE. IN NO EVENT SHALL HALE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGE INCLUDING, WITHOUT LIMITATION, LOSS OF LIFE; PERSONAL INJURY; DAMAGE TO REAL OR PERSONAL PROPERTY DUE TO WATER OR FIRE; TRADE OR OTHER COMMERCIAL LOSSES ARISING, DIRECTLY OR INDIRECTLY, OUT OF PRODUCT FAILURE.





Class1
A Unit of IDEX Corporation
607 NW 27th Avenue



Ocala, FL 34475
U.S.A.
Telephone..... 352-629-5020
Fax.. 352-629-3569
Web www.class1.com



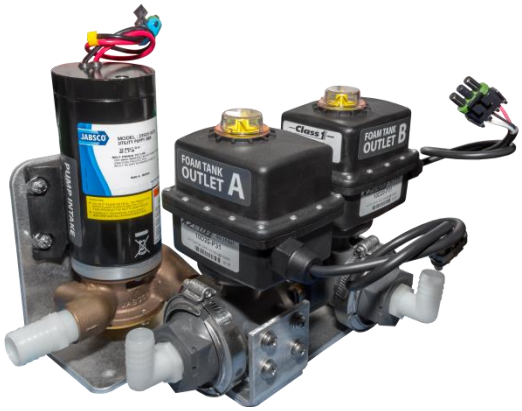


Class1
A Unit of IDEX Corporation
607 NW 27th Avenue

EZFill Foam Tank Refill System

Service Guide





Class1 ◆ A Unit of IDEX Corporation
607 NW 27th Avenue ◆ Okala, FL 34475 U.S.A.
Telephone: 352-629-5020 ◆ FAX: 352-629-3569
Web: www.class1.com

Hale Products Inc. ◆ A Unit of IDEX Corporation
700 Spring Mill Avenue ◆ Conshohocken, PA 19428 U.S.A.
Telephone: 610-825-6300 ◆ FAX: 610-825-6440
Web: www.haelproducts.com

Ocala, FL 34475
U.S.A.
Telephone..... 352-629-5020
Fax.....352-629-3569
\.....om

HALE PRODUCTS INC. ISO 9001 Certificate A4026

Manual p/n: 029-0020-82-0



NOTICE !

Class1 cannot assume responsibility for product failure resulting from improper maintenance or operation. Class1 is responsible only to the limits stated in the product warranty. Product specifications contained in this manual are subject to change without notice.

All Class1 products are quality components -- ruggedly designed, accurately machined, precision inspected, carefully assembled and thoroughly tested. In order to maintain the high quality of your unit, and to keep it in a ready condition, it is important to follow the instructions on care and operation. Proper use and good preventive maintenance will lengthen the life of your unit.

ALWAYS INCLUDE THE UNIT SERIAL NUMBER
IN YOUR CORRESPONDENCE.

Manual p/n: 029-0020-82-0, Rev. -A
Printed in U.S.A.

© Hale Products, Inc. 2005
All Rights Reserved

Contents

Page

6 Electrical 33

6.1 Single Tank 33

Figure 6-1: Typical Single Tank Electrical Schematic Overview 33

6.2 Dual Tank 34

Figure 6-2: Typical Dual Tank Electrical Schematic Overview - Optional 34

6.3 SPC Smart-Switch Controller & H-Bridge Module 35

Figure 6-3: SPC Connector Arrangement 35

Table 6-4: H-Bridge Module Connector Assignments 35

7 Routine Maintenance 36

7.1 Routine Maintenance 36

After each use 36

Monthly (or more often under severe duty) 36

8 Troubleshooting 37

Figure 8-1: Smart-Switch Troubleshooting Button Illuminations 37

Table 8-2: Button Illuminations 37

Button Borders 37

FILL Button 37

FLUSH Button 37

Tank “A” Button 37

Tank “B” Button 37

Table 8-3: Troubleshooting Table 38

EZFill System does not power ON 38

EZFill system is ON, but button borders fail to light up when FILL or FLUSH buttons are pressed 38

System attempts to FILL and/or FLUSH but no fluid is pumped. 40

Electric valve fails to operate. 40

Dual Tank System Option. 40

Express Warranty 42

Drawings

EZFill Electrical Diagram 44

Contents - continued

Page

NOTES:

6 Electrical

6.1 SINGLE TANK

(See Figure 6-1: 'Typical Single Tank Electrical Schematic Overview.')

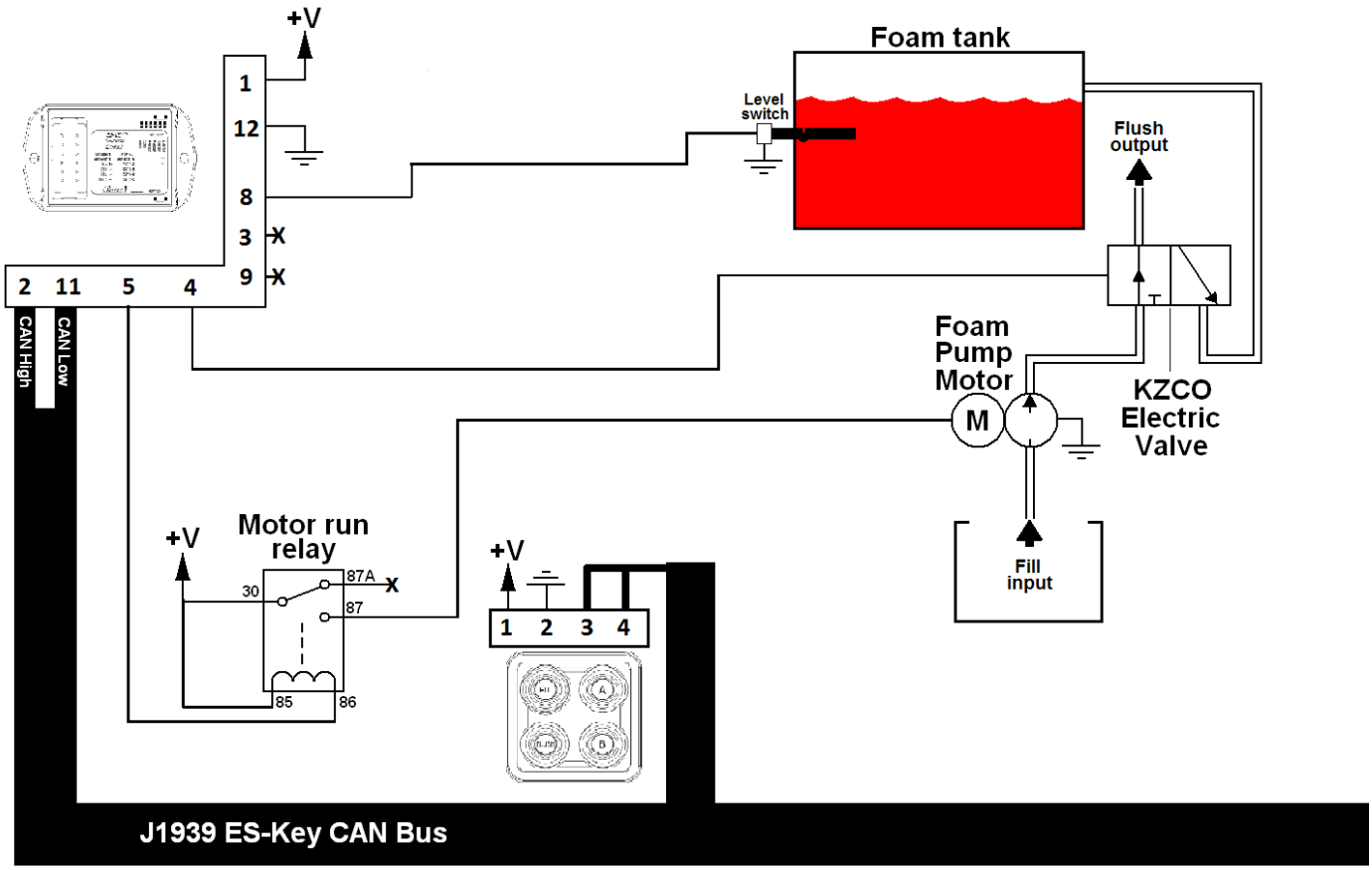


Figure 6-1: Typical Single Tank Electrical Schematic Overview

6.2 DUAL TANK

(See Figure 6-2: 'Typical Dual Tank Electrical Schematic Overview - Optional.')

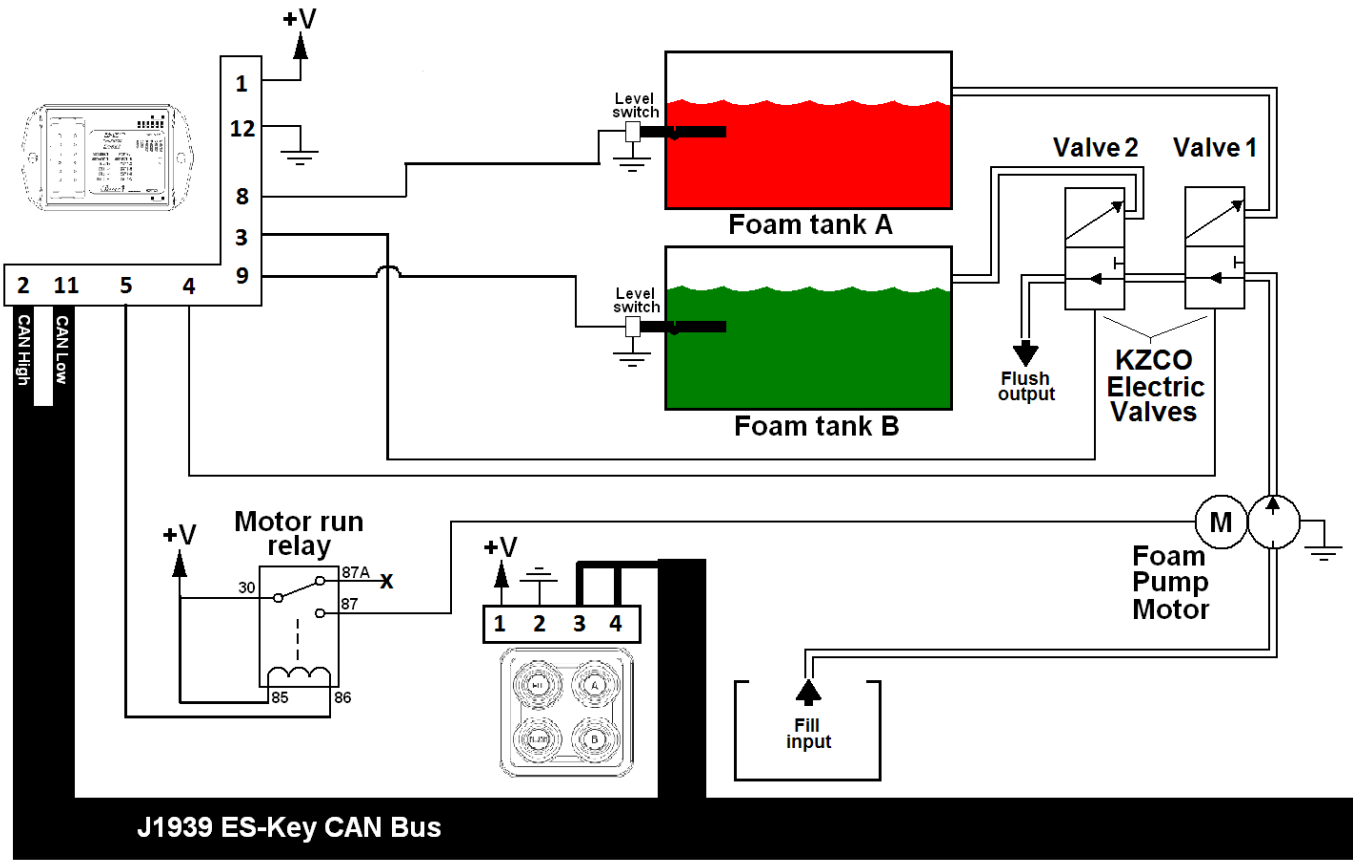


Figure 6-2: Typical Dual Tank Electrical Schematic Overview - Optional

6.3 SPC SMART-SWITCH CONTROLLER & H-Bridge Module

Pin No.	Circuit	Description
1	(S+) Supply +	Module Supply (+9VDC....+32VDC)
2	(S-) Ground	Module Ground
3	(CH) CAN High	Communications (J1939 CAN)
4	(CL) CAN Low	Communications (J1939 CAN)

Table 6-3: Panel Controller Connector Assignments

Pin No.	Circuit	Description
1	[S+] SUPPLY	Module supply
2	[CH] CAN High	Communications
3	[O+] OUTPUT	Valve B
4	[O+] OUTPUT	Valve A
5	[O-] OUTPUT	Motor Signal
6	---	---
7	---	---
8	[I] INPUT	Tank Level A
9	[I] INPUT	Tank Level B
10	---	---
11	[CH] CAN Low	Communications
12	[S-] GROUND	Module ground

Table 6-4: H-Bridge Connector Assignments

7 Routine Maintenance

WARNING!

BEFORE BEGINNING ANY INSPECTION OR MAINTENANCE OF THIS EQUIPMENT, VERIFY THAT THE PRESSURE HAS BEEN RELEASED FROM THE SYSTEM.

LOCK OUT THE EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND YOUR DEPARTMENTAL REGULATIONS / PROCEDURES.

OPEN THE DISCHARGE VALVES AND REMOVE THE SUCTION TUBE CAPS AND DISCHARGE VALVE CAPS TO RELEASE ANY RESIDUAL PRESSURE.

7.1 ROUTINE MAINTENANCE

The unique design of the Hale EZFill system makes it virtually maintenance free. However, as with any electromechanical system, periodic inspection and lubrication is required to ensure a long, trouble-free life (minimal down-time).

After each use:

1. Flush the EZFill system with fresh water in accordance with departmental procedures.
2. If accessible, visually inspect the 3-position valve to make sure there is no debris caught between the valve body or valve ball.
3. Cycle the 3-position valve to verify it operates smoothly. Apply an approved lubricant to the valve as necessary.

Monthly (or more often under severe duty)

1. Cycle the 3-position valve from the fully closed to the fully opened position, noting the torque required to operate the valve. If excessive resistance is noted, troubleshoot the valve. (See heading 'Troubleshooting' on page 37.)

8 Troubleshooting

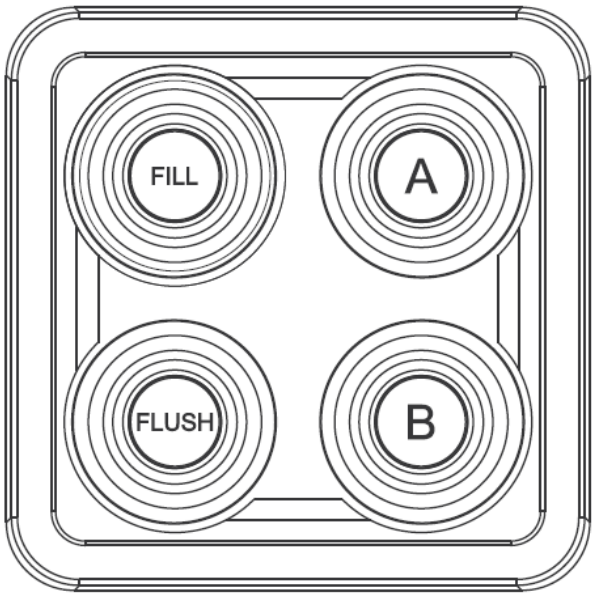


Figure 8-1: Smart-Switch Troubleshooting Button Borders

Button Illumination	Condition	Result
Button Borders (Button borders illuminate RED/GREEN depending upon Single/Dual Tank.)	On SOLID	Module is on-line and receiving main power.
	OFF	Module NOT receiving main power
FILL Button	On FLASHING	Foam FILL is active
FLUSH Button	On FLASHING	Foam FLUSH is active
Tank "A" Button	On SOLID Red & FILL, FLUSH BOTH Red	Foam Tank "A" is selected
Tank "B" Button	On SOLID Green & FILL, FLUSH BOTH Green	Foam Tank "B" is selected

Table 8-2: Button Illumination

#	Problem	Possible Cause	Remedy
1.	**EZFill System does not power ON.** (Button borders are not illuminated.)	Apparatus (operator's panel) not receiving power.	• Check apparatus operator's panel per manufacturer's recommendations. • See manufacturer's apparatus manual for troubleshooting procedures.
		Blown fuse / disconnect (between apparatus and EZFill system).	• Check and replace with same size fuse. If fuse / disconnect blows a second time, system requires further troubleshooting to determine cause. • NEVER insert a larger size fuse.
		Main power to EZFill system not available.	• Check for main power at pins #1 (+9VDC...+32VDC) and #2 (vehicle ground) on Smart-Switch. Check for main power at pins #1 (+9VDC...+32VDC) and #12 (vehicle ground) on H-Bridge Module. See Figures 6-3 and 6-4 on page 35. • If power is available, replace smart-switch and/or H-Bridge Module. • If power is not available, continuity test wire harness - repair and/or replace.
2.	**EZFill system is ON, but button borders fail to light when FILL or FLUSH buttons are pressed.**	Does pump/motor run when FILL or FLUSH buttons are pressed?	• If motor runs, possible defective button border LED - repair and/or replace smart-switch. • If motor does NOT run, see headings: * Defective motor run relay * Defective tank FILL sensor * Bad motor * Defective H-Bridge Module
		Defective motor relay.	• Check for main voltage (+9VDC...+32VDC) at pin #30 on relay. See Figure 6-1/6-2 on pages 33-34. No voltage - see preceding Step 1 to verify main power is provided, repair and/or replace accordingly. • If voltage is OK, check for voltage from smart-switch at pin #85 on relay. See Figure 6-1/6-2 on pages 33-34. No voltage - replace smart-switch. • Check for voltage at pin # 87 on relay. Low or odd voltage indicates possible motor stall leading to possible blown fuse / disconnect. No voltage indictaes defective relay - replace.
		Defective motor.	• Check for voltage across motor contacts. Low or odd voltage indicates possible motor stall leading to possible blown fuse / disconnect. • Repair and/or replace motor.
		Defective FULL tank level sensor. **Note:** A defective sensor can prevent pump motor operation by providing a constant tank FULL signal.	• Using an ohmmeter, check for current across sensor switch leads. • Low ohm reading is present when switch is activated Zero (0) reading when switch is released, indicating a FILL requirement.

		Defective H-Bridge Module.	• Check pin #5 when panel is put into FILL or FLUSH mode.

Table 8-3: Troubleshooting Table

#	Problem	Possible Cause	Remedy
3.	**System attempts to FILL and/or FLUSH but no fluid is pumped.**	KZCO 3-position electric valve not receiving power.	• **Power** Check for voltage across power leads to the valve. • **No voltage** See preceding Step 1 (on page 38) to verify main power is provided, repair and/or replace accordingly. • If voltage is present on valve power leads check for voltage on signal line to valve coming from pin 4 of H-Bridge Module when panel is put into FILL mode. **Note:** No voltage will be present in FLUSH mode. • If NO voltage is present when switch is in FILL mode, replace H-Bridge Module.
		KZCO 3-position electric valve is internally defective (binding). Valve does not shift between FILL and FLUSH positions.	• **Binding** Foam residue, left in the valve over time, can casue binding due to the sticky nature of the foam. If binding is suspected, the valve must be replaced, or dismantled and thoroughly cleaned. **Note:** It is imperative to thoroughly FLUSH the system after each use, especially when changing type of foam.
4.	**Electric valve fails to operate.**	Valve is obstructed or defective. **Note:** Should the valve become obstructed (unable to turn) an internal protection circuit disables the drive motor clutch and the valve is no longer operable via the smart-switch controller (SPC). Control of the valve is restored once power is reset - see next column.	• See separate valve manual and check valve for any obstruction or sluggish operation. Repair accordingly (disassemble and clean, lubricate, etc.). • Check that power is provided to the electric drive motor, pins #1 and #2 from smart-switch controller, and pins #1 and #12 from H-Bridge Module. Continuity test cable harness. Repair and/or replace accordingly. • **To reset**, either reset main power provided to the EZFill system, or temporarily disconnect the 3-position valve connector. • Once power is restored, check system for proper operation.
5.	**Dual Tank System Option.**	To control filling separate foam tanks (A or B), a dual tank system adds an additional: • Electric valve (Tank select 3-position) • Tank level switch sensor	• The tank select KZCO valve receives power from pin #3 at the smart-switch connector. • The tank level select sensor also receives power from the relay, pin #87 for Foam Tank "A" and pin # 87A for Foam Tank "B." **Note:** Troubleshooting is the same as the single tank system, as explained on the preceding pages.

Table 8-3: Troubleshooting Table

NOTES:

EXPRESS WARRANTY

EXPRESS WARRANTY: Hale Products, Inc (HALE) hereby warrants to the original Buyer that products manufactured by Hale are free of defects in material and workmanship for one (1) year. The "Warranty Period" commences on the date the original Buyer takes delivery of the product from the manufacturer.

LIMITATIONS: Hale's obligation is expressly conditioned on the Product being:

- Subjected to normal use and service.
- Properly maintained in accordance with Hale's Instruction Manual as to recommended services and procedures.
- Not damaged due to abuse, misuse, negligence, or accidental causes.
- Not altered, modified, serviced (non-routine) or repaired other than by an Authorized Service Facility.
- Manufactured per design and specifications submitted by the original Buyer.

THE ABOVE EXPRESS LIMITED WARRANTY IS EXCLUSIVE. NO OTHER EXPRESS WARRANTIES ARE MADE. SPECIFICALLY EXCLUDED ARE ANY IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATIONS, THE IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE OR USE; QUALITY; COURSE OF DEALING; USAGE OF TRADE; OR PATENT INFRINGEMENT FOR A PRODUCT MANUFACTURED TO ORIGINAL BUYER'S DESIGN AND SPECIFICATIONS.

EXCLUSIVE REMEDIES: If Buyer promptly notifies HALE upon discovery of any such defect (within the Warranty Period), the following terms shall apply:

- Any notice to HALE must be in writing, identifying the Product (or component) claimed defected and circumstances surrounding its failure.
- HALE reserves the right to physically inspect the Product and require Buyer to return same to HALE's plant or other Authorized Service Facility.
- In such event, Buyer must notify HALE for a Returned Goods Authorization Number and Buyer must return the product F.O.B. within thirty (30) days thereof.
- If determined defective, HALE shall, at its option, repair or replace the Product, or refund the purchase price (less allowance for depreciation).
- Absent proper notice *within* the Warranty Period, HALE shall have no further liability or obligation to Buyer therefore.

THE REMEDIES PROVIDED ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE. IN NO EVENT SHALL HALE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGE INCLUDING, WITHOUT LIMITATION, LOSS OF LIFE; PERSONAL INJURY; DAMAGE TO REAL OR PERSONAL PROPERTY DUE TO WATER OR FIRE; TRADE OR OTHER COMMERCIAL LOSSES ARISING, DIRECTLY OR INDIRECTLY, OUT OF PRODUCT FAILURE.





Class1
A Unit of IDEX Corporation
607 NW 27th Avenue
Ocala, FL 34475
U.S.A.
Telephone..... 352-629-5020
Fax.. 352-629-3569
Web www.class1.com



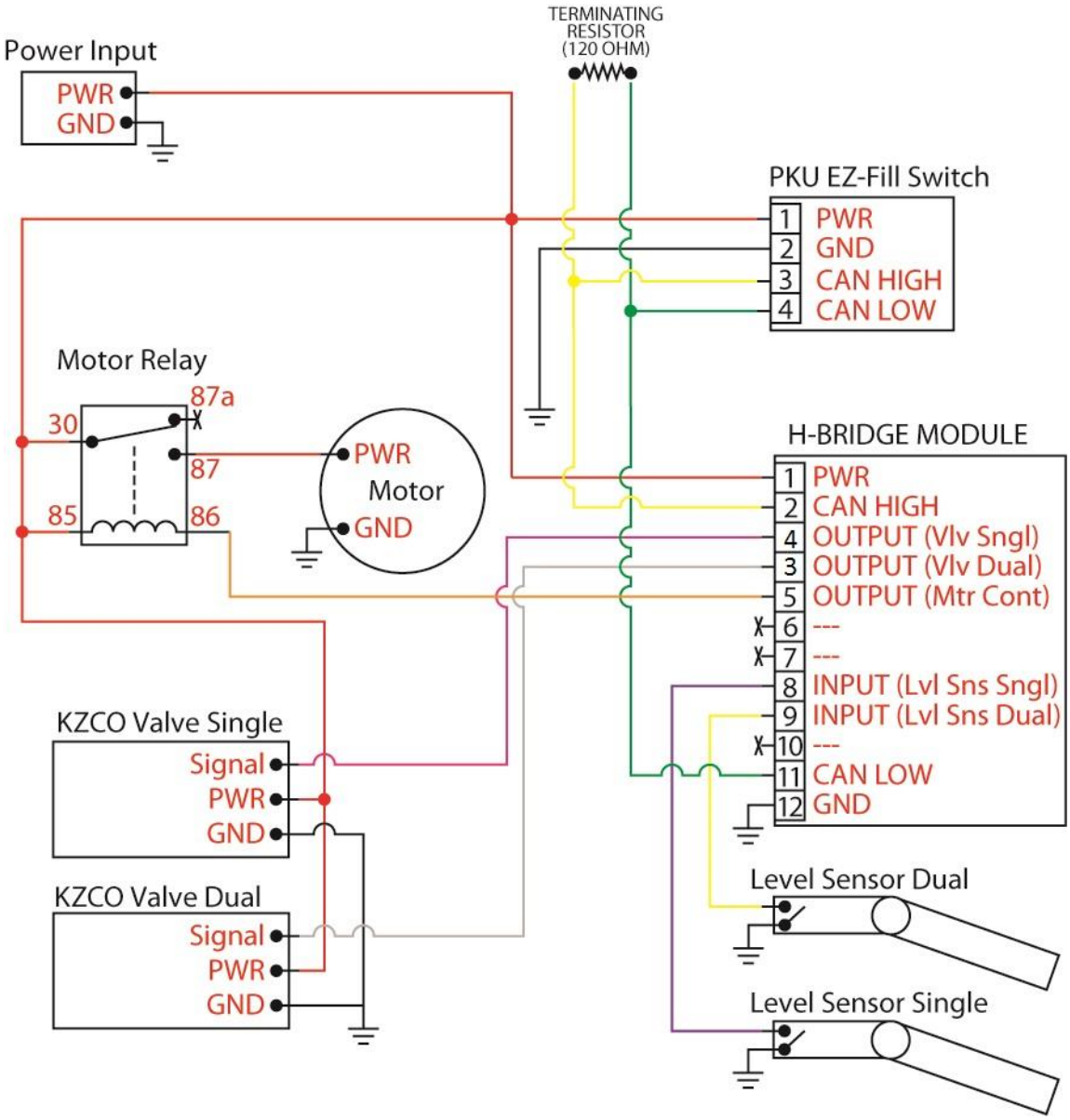











Power Input
PWR
GND
TERMINATING
RESISTOR
(120 OHM)
PKU EZ-Fill Switch
1 PWR
2 GND
3 CAN HIGH
4 CAN LOW
Motor Relay
87a
30
87
85
86
PWR
Motor
GND
H-BRIDGE MODULE
1 PWR
2 CAN HIGH
4 OUTPUT (Vlv Sngl)
3 OUTPUT (Vlv Dual)
5 OUTPUT (Mtr Cont)
6 ---
7 ---
8 INPUT (Lvl Sns Sngl)
9 INPUT (Lvl Sns Dual)
10 ---
11 CAN LOW
12 GND
KZCO Valve Single
Signal
PWR
GND
KZCO Valve Dual
Signal
PWR
GND
Level Sensor Dual
Level Sensor Single