

# Masoneilan\* SVI\* FF Digital Positioner

## Quick Start Guide

(Rev. C)



## About this Guide

This instruction manual applies to the following instruments and approved software:

SVI FF

- with Firmware version 1.0.0.1 or higher
- with ValVue\* version 3.0
- with handheld communicator with DD published for SVI FF

All information contained herein is believed to be accurate at the time of publication and is subject to change without notice.

The information contained in this manual, in whole or part, shall not be transcribed or copied without GE Oil & Gas' written permission.

In no case does this manual guarantee the merchantability of the positioner or the software or its adaptability to a specific client needs.

Please report any errors or questions about the information in this manual to your local supplier or visit [www.geoilandgas.com/valves](http://www.geoilandgas.com/valves).

## DISCLAIMER

THESE INSTRUCTIONS PROVIDE THE CUSTOMER/OPERATOR WITH IMPORTANT PROJECT-SPECIFIC REFERENCE INFORMATION IN ADDITION TO THE CUSTOMER/OPERATOR'S NORMAL OPERATION AND MAINTENANCE PROCEDURES. SINCE OPERATION AND MAINTENANCE PHILOSOPHIES VARY, GE (GENERAL ELECTRIC COMPANY AND ITS SUBSIDIARIES AND AFFILIATES) DOES NOT ATTEMPT TO DICTATE SPECIFIC PROCEDURES, BUT TO PROVIDE BASIC LIMITATIONS AND REQUIREMENTS CREATED BY THE TYPE OF EQUIPMENT PROVIDED.

THESE INSTRUCTIONS ASSUME THAT OPERATORS ALREADY HAVE A GENERAL UNDERSTANDING OF THE REQUIREMENTS FOR SAFE OPERATION OF MECHANICAL AND ELECTRICAL EQUIPMENT IN POTENTIALLY HAZARDOUS ENVIRONMENTS. THEREFORE, THESE INSTRUCTIONS SHOULD BE INTERPRETED AND APPLIED IN CONJUNCTION WITH THE SAFETY RULES AND REGULATIONS APPLICABLE AT THE SITE AND THE PARTICULAR REQUIREMENTS FOR OPERATION OF OTHER EQUIPMENT AT THE SITE.

THESE INSTRUCTIONS DO NOT PURPORT TO COVER ALL DETAILS OR VARIATIONS IN EQUIPMENT NOR TO PROVIDE FOR EVERY POSSIBLE CONTINGENCY TO BE MET IN CONNECTION WITH INSTALLATION, OPERATION OR MAINTENANCE. SHOULD FURTHER INFORMATION BE DESIRED OR SHOULD PARTICULAR PROBLEMS ARISE WHICH ARE NOT COVERED SUFFICIENTLY FOR THE CUSTOMER/OPERATOR'S PURPOSES THE MATTER SHOULD BE REFERRED TO GE.

THE RIGHTS, OBLIGATIONS AND LIABILITIES OF GE AND THE CUSTOMER/OPERATOR ARE STRICTLY LIMITED TO THOSE EXPRESSLY PROVIDED IN THE CONTRACT RELATING TO THE SUPPLY OF THE EQUIPMENT. NO ADDITIONAL REPRESENTATIONS OR WARRANTIES BY GE REGARDING THE EQUIPMENT OR ITS USE ARE GIVEN OR IMPLIED BY THE ISSUE OF THESE INSTRUCTIONS.

THESE INSTRUCTIONS CONTAIN PROPRIETARY INFORMATION OF GE, AND ARE FURNISHED TO THE CUSTOMER/OPERATOR SOLELY TO ASSIST IN THE INSTALLATION, TESTING, OPERATION, AND/OR MAINTENANCE OF THE EQUIPMENT DESCRIBED. THIS DOCUMENT SHALL NOT BE REPRODUCED IN WHOLE OR IN PART NOR SHALL ITS CONTENTS BE DISCLOSED TO ANY THIRD PARTY WITHOUT THE WRITTEN APPROVAL OF GE.

## Copyright

Copyright 2015 by GE Oil & Gas. All rights reserved. PN 720023977-888-0000 Rev. C.

## Document Changes

<b>Version/Date</b>	<b>Changes</b>
B/12-14	Updated headers and footers. Made a few changes to Quick Start section Changed ES-766 to Rev J.
C/2-15	Changed ES-766 to Rev. K

*This page intentionally left blank.*

# 1. SVI FF Quick Start

## Safety Information

### Safety Symbols

**WARNING**



*Indicates a potentially hazardous situation, which if not avoided could result in serious injury or death.*

**CAUTION**



*Indicates a potentially hazardous situation, which if not avoided could result in instrument or property damage, or data loss.*

**NOTE**



*Indicates important facts and conditions.*

## SVI FF Product Safety

The SVI FF digital valve positioner is intended for use with industrial compressed air or, natural gas systems only.

### NOTE



*Installations using natural gas are Zone 0 or Div 1 installations.*

Ensure that an adequate pressure relief provision is installed when the application of system supply pressure could cause peripheral equipment to malfunction. Installation must be in accordance with local and national compressed air and instrumentation codes.

#### *General installation, maintenance or replacement*

- Products must be installed in compliance with all local and national codes and standards by qualified personnel using safe site work practices. Personal Protective Equipment (PPE) must be used per safe site work practices.
- Ensure proper use of fall protection when working at heights, per safe site work practices. Use appropriate safety equipment and practices to prevent the dropping of tools or equipment during installation.
- Under normal operation, compressed supply gas is vented from the SVI FF to the surrounding area, and may require additional precautions or specialized installations.

#### *Intrinsically Safe Installation*

Products certified as explosion proof or flame proof equipment or for use in intrinsically safe installations **MUST BE**:

- Installed, put into service, used and maintained in compliance with national and local regulations and in accordance with the recommendations contained in the relevant standards concerning potentially explosive atmospheres.
- Used only in situations that comply with the certification conditions shown in this document and after verification of their compatibility with the zone of intended use and the permitted maximum ambient temperature.
- Installed, put into service and maintained by qualified and competent professionals who have undergone suitable training for instrumentation used in areas with potentially explosive atmospheres.

**WARNING**



*Before using these products with fluids/compressed gases other than air or for non-industrial applications, consult the factory. This product is not intended for use in life support systems.*

**WARNING**



*Under certain operating conditions, the use of damaged instruments could cause a degradation of the performance of the system which may lead to personal injury or death.*

*Installation in poorly ventilated confined areas, with any potential of gases other than oxygen being present, can lead to a risk of personnel asphyxiation.*

Use only genuine replacement parts which are provided by the manufacturer, to guarantee that the products comply with the essential safety requirements of the European Directives.

Changes to specifications, structure, and components used may not lead to the revision of this manual unless such changes affect the function and performance of the product.

# Product Numbering

## Series Identification SVI FF-abcdefgh

### a Style 1,2

2. SD Version - Standard Diagnostics
3. AD Version - Advanced Diagnostics

### b Pneumatic Train 1, 2

1. Single Acting
2. Double Acting

### c Pneumatics

1. Standard flow
2. High Flow

### d Display 1,2,3,4

1. No Display and Pushbuttons
2. With Display and Pushbuttons
3. No Display and Pushbuttons, Marine
4. With Display and Pushbuttons, Marine

### e Communications

F, FF

### f Options

1. None

### g Agency Approvals

3. Unilabeled (ATEX, IEC, FMc, FM)

### h Other Agencies

1. North American Zones
2. GOST\*
3. KOSHA\*
4. NEPSI\*
5. INMETRO\*
6. JIS\*
7. CCOE\*

\* Pending at time of publication

### Approved Configuration Codes

SVI FF-	2	1	1	1	F	1	3	1	
	3	2	2	2				2	
			3	3				3	
			4	4				4	
								5	
								6	
								7	



# Installation and Set Up

The steps necessary to complete the SVI FF installation and software setup are outlined in Table 1.

**Table 1: SVI FF Installation Steps**

Step No.	Procedure
1	Attach mounting bracket to the actuator.
2	Install the SVI FF magnetic assembly (rotary valves only).
3	Assemble the SVI FF on the bracket that is mounted to the valve actuator.
4	Connect the pneumatic tubing to the SVI FF.
5	Connect the air supply to the SVI FF.
6	Connect the positioner to the H1 segment by installing the SVI FF wiring.
7	Configure/calibrate using ValVue, the SVI FF DTM or a handheld using the DD. See "Example Configuration" on page 14 for a general example.

## WARNING



*Failure to adhere to the requirements listed may cause loss of life and property.*

*Before installing, using, or carrying out any maintenance tasks associated with this instrument, READ ALL THE INSTRUCTIONS CAREFULLY.*

# Pushbuttons and Local Display

## Pushbuttons

The local pushbuttons are located behind a hinged cover, directly below the display window. To open the cover loosen the screw and swing the cover down. Always re-fasten the cover after use to protect the pushbuttons from environmental contamination.

The three pushbuttons perform the following functions:

- Left Button* - Marked with **\***, permits you to *select* or *accept* the value or parameter option currently displayed.
- Middle Button* - Marked **−**, permits you to move back through the menu structure to the previous item in the menu or decrement the value currently shown in the digital display. When used to decrease a displayed value, holding the button down causes the value to decrease at a faster rate.
- Right Button* - Marked **+**, permits you to move forward through the menu structure to the next item in the menu, or to increment the value currently shown in the digital display. When used to increase a displayed value, holding this button down causes the value to increase at a faster rate.

### NOTE



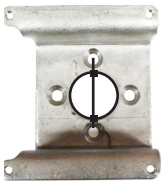
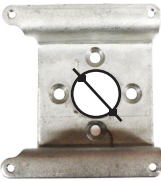

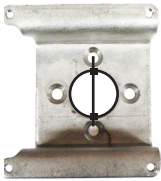
*When an exclamation point (!) appears in the SVI FF display window, it indicates that there is instrument status available.*

# Mounting the SVI FF on Rotary Valves

## Travel Sensor Alignment

Table 2 shows the general guidelines for travel sensor alignment. Review the table prior to installing the SVI FF on a rotary valve actuator for proper alignment of the magnet. Alignment is required for proper Hall sensor operation.

**Table 2: Travel Sensor Alignment**

Rotary Mounting System	Stroke Direction	Magnet Orientation	Valve Position	Sensor Counts (TB: RAW_POSITION)
Rotary	<60° Rotation Clockwise or counter-clockwise rotation	 (0°)	Closed (0%)	0 +/- 1000
	>60° Rotation Clockwise with increasing setpoint	 (-45°)	Full Open or Full Closed	-8000 +/- 1500 or +8000 +/- 1500
	>60° Rotation Counter Clockwise rotation with increasing setpoint	 (+45°)	Full Open or Full Closed	-8000 +/- 1500 or +8000 +/- 1500
General Rule for other configurations	Any amount of rotation Clockwise or counter-clockwise	 (0°)	50% Travel (Mid-Stroke)	0 +/- 1000

# Mounting the SVI FF on Reciprocating Valves

**Table 3: Reciprocating Valve Mounting Hole and Turnbuckle Length**

Actuator Size Masoneilan	Stroke	Mounting Hole	Lever Hole	Turnbuckle Length
6 and 10	0.5 - 0.8" (12.7 - 20.32 mm)	A	A	1.25" (31.75 mm)
10	0.5 - 0.8" (12.7 - 20.32 mm)	A	A	1.25" (31.75 mm)
10	>0.8 - 1.5" (20.32 - 41.5 mm)	B	B	1.25" (31.75 mm)
16	0.5 - 0.8" (12.7 - 20.32 mm)	B	A	2.90" (73.66 mm)
16	>0.8 - 1.5" (20.32 - 41.5 mm)	C	B	2.90" (73.66 mm)
16	>1.5 - 2.5" (41.5 - 63.5 mm)	D	C	2.90" (73.66 mm)
23	0.5 - 0.8" (12.7 - 20.32 mm)	B	A	5.25" (133.35 mm)
23	>0.8 - 1.5" (20.32 - 41.5 mm)	C	B	5.25" (133.35 mm)
23	>1.5 - 2.5" (41.5 - 63.5 mm)	D	C	5.25" (133.35 mm)

# Wiring the SVI FF

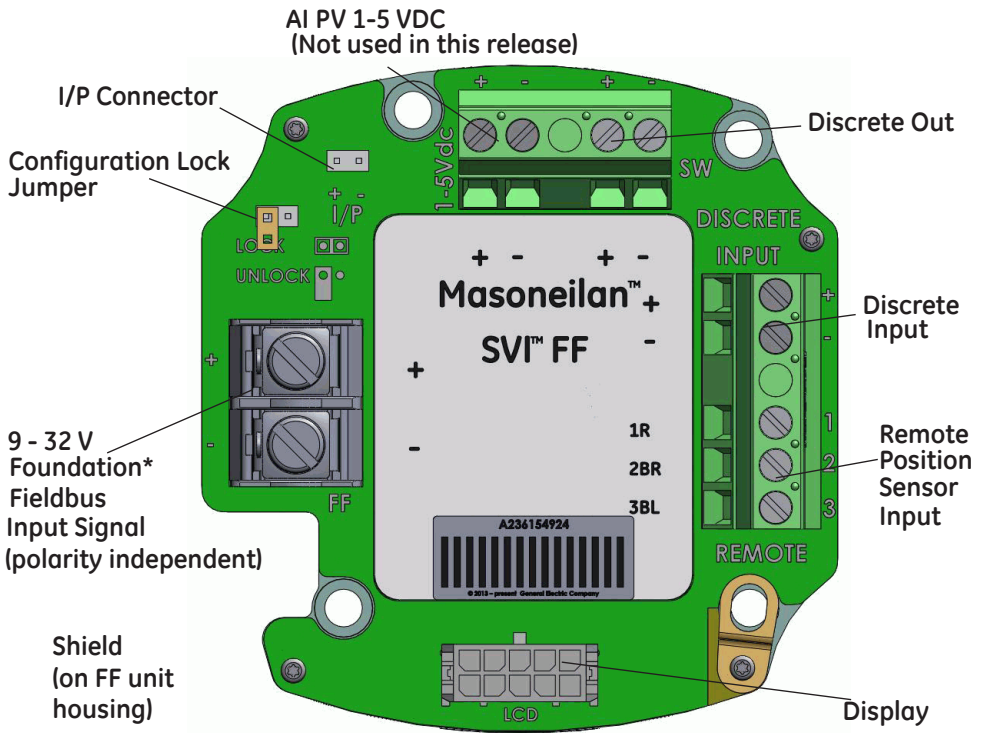


Figure 1 Connections to Electronics Module (via Terminal Board)

# FF Environment Minimum Settings

The general steps necessary to complete the SVI FF configuration and software setup are outlined in Figure 2.

**Quick Start Configuration**

**Air Action**  
 Air To Open     Air To Close    *Step 1: Set Air Action.*

**Control Tuning**  
 Single Acting     Double Acting    *Step 2: Set Control Tuning by choosing Single or Double Acting and setting tuning type. Autotune is recommended, Custom requires entering your values.*  
 Fastest (Smallest)     Fast (Small)     Medium     Slow (Big)     Slowest (Bigest)     Autotune     Custom

**Characterization Type**    *Step 3: Set Characterization Type. Custom requires entering your values.*  
 Linear     EQ% 30     EQ% 50     Quick Open     Camflex %     Custom

**Network Settings**  
Device Address:     *Step 4: Enter a Device Address and Device Tag.*  
Device Tag:

*Step 5: Run Find Stops and then run Autotune.*

Figure 2 Quick Start Configuration

## Example Configuration

### Step 1: Install the Positioner on the Valve

See "Installation and Set Up" on page 9.

## Step 2: Set Tag and Address

Using NI Configurator:

1. Import DD/CFF files.

### CAUTION



*Do not navigate to the NI DD folder and copy the DD file onto itself.*

2. Right-click on the device, select **Set Tag**, follow the prompts to enter a *Tag*.
3. Click **Set**.

### CAUTION



*Do not deactivate the Set to OOS mode checkbox. The block must be in OOS to change the Tag.*

4. Right-click on the device, select **Set Address**, follow the prompts to enter an *Address*.

### CAUTION



*If the device is at the temporary address range (248 (0xF8)- 251 (0xFB)), you must set the address outside of that range.*

5. Click **Set**.

### CAUTION



*Do not deactivate the Set to OOS mode checkbox. The block must be in OOS to change the Address.*

## Step 3: Basic Configuration

This section serves as an example where the AO block and TB block are configured. However, there are a number of combinations that can be configured. This discussion is valid if the positioner is controlled by the AO block.

1. For the Transducer block set:

- ACTUATOR\_3.ACT\_FAIL\_ACTION\_1 = either 1. *Valve Closed* (most common) or 2. *Valve Open*
- ACCESSORY.REMOTE\_SENSOR = 0, if remote sensor is not in use (internal Hall sensor is used)**
- ACTIVATE\_CONTROL\_SET to one of:
  - 0: Activate Custom Control Set (required for Auto-tune as well - most common)**
  - 1: Activate Control Set 1 (Slowest)
  - 2: Activate Control Set 2
  - 3: Activate Control Set 3
  - 4: Activate Control Set 4
  - 5: Activate Control Set 5 (Fastest)
  - 6: Activate Control Set 6 (Double Acting - Slow)
  - 7: Activate Control Set 7 (Double Acting - Fast)
- CHAR\_SELECTION.TYPE to one of:
  - 0. Linear
  - 1. Equal Percentage (30:1)
  - 2. Equal Percentage (50:1)
  - 3. Quick Open (reversal from Equal Percentage (50:1))
  - 4. Custom
  - 5. Camflex Percentage

See *Transducer Block Parameters* in the SVI FF instruction manual for further settings.

2. For the AO block set as below:

- PV\_SCALE.UNIT INDEX = %
- XD\_SCALE.UNIT INDEX = %
- CHANNEL = *Position*
- SHED\_OPT = *NORMAL SHED  
NORMAL RETURN*



## Step 4: Run Find Stops METHOD

Use a configuration tool (DD, SVI FF local pushbuttons or software) to run METHOD.

## Step 5: Run Auto Tune METHOD

Use a configuration tool (DD, SVI FF local pushbuttons or software) to run METHOD.

## Downloads

To download the complete user manual, DD, SVI FF Advanced DTM and the ValVue Suite trial program, visit: <http://www.ge-mcs.com/en/download.html>.

*This page intentionally left blank.*

# 2. ES-776 and Declaration of Conformity

GE Oil & Gas

## ES-776

### SPECIAL INSTRUCTIONS FOR INSTALLING Masoneilan SVI FF POSITIONER IN AREAS WHERE THERE IS A POTENTIAL FOR EXPLOSIVE GAS ATMOSPHERE OR FLAMMABLE DUST

Rev	Description	Date
A	Initial Release ECO-14740	Jun. 10, 2013
B	ECO-15557	Aug. 23, 2013
C	ADR-003891	Sept. 24, 2013
D	ADR-003896	Oct. 1, 2013
E	ADR-003908	Nov 6, 2013
F	ADR-003913	Jan 8, 2014
G	ADR-003926	Feb 24, 2014
H	ADR-003933	May 6, 2014
J	ADR-003987	Dec 16, 2014
K	ADR-004000	Jan 16, 2015

Written by	L. Lu	Jun. 10, 2013
Approved by	R. Belmarsh	Jun. 10, 2013

ES-776	Rev K
--------	-------

## Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
<b>2</b>	<b>GENERAL REQUIREMENTS .....</b>	<b>4</b>
<b>3</b>	<b>MODEL NUMBER DESCRIPTION OF SVI FF POSITIONER .....</b>	<b>5</b>
<b>4</b>	<b>FLAMEPROOF AND DUST IGNITION PROOF REQUIREMENTS .....</b>	<b>6</b>
4.1	General .....	6
4.2	Cable Glands .....	6
4.3	Natural gas.....	6
4.4	Bolting.....	6
4.5	Carbon Disulphide Exclusion .....	6
4.6	Label Cleaning .....	6
4.7	Dust Environment.....	6
<b>5</b>	<b>INTRINSICALLY SAFE REQUIREMENTS .....</b>	<b>7</b>
5.1	Div 2.....	7
5.2	Category II 1 (Zone 0).....	7
5.3	Category II 1 (Zone 0).....	7
5.4	Internal pollution degree 2 and overvoltage category III.....	7
<b>6</b>	<b>DESCRIPTION OF FLAMEPROOF AND INTRINSICALLY SAFE MARKINGS .....</b>	<b>8</b>
<b>7</b>	<b>INTRINSICALLY SAFE INSTALLATION WIRING REQUIREMENTS .....</b>	<b>10</b>
<b>8</b>	<b>NOTES FOR INTRINSICALLY SAFE INSTALLATION .....</b>	<b>11</b>
8.1	HAZARDOUS LOCATION .....	11
8.2	FIELD WIRING.....	11
8.3	Foundation Fieldbus IN (+) and (-) Terminals .....	11
8.4	PV 1-5VDC (+) and (-) Terminals.....	12
8.5	SW (+) and (-) Terminals.....	12
8.6	REMOTE (1) and (2) and (3) Terminals.....	12
8.7	Digital In Terminals .....	12
8.8	Entity Requirement.....	13
8.9	Use in dust atmosphere .....	13
<b>9</b>	<b>REPAIR.....</b>	<b>13</b>
9.1	Main Cover.....	14
9.2	I/P.....	14
9.3	Relay.....	14
9.4	Electronics.....	14
9.5	Pneumatic Cover.....	14

## 1 INTRODUCTION

This manual covers the requirements for safe installation, repair, and operation of the SVI FF positioner as it relates to operation in areas where there is a potential for explosive atmosphere or flammable dust. Adherence to these requirements assures that the SVI FF positioner will not cause ignition of the surrounding atmosphere. Hazards related to control of the process are beyond the scope of this manual.

For mounting instructions on specific valves refer to the mounting instructions supplied with the mounting kit. Mounting does not affect the suitability of the SVI FF positioner for use in a potentially hazardous environment.

For language translation assistance contact your local representative or email [svisupport@ge.com](mailto:svisupport@ge.com).

Pour la langue de traduction aide, contactez votre représentant local ou envoyez un e-mail [svisupport@ge.com](mailto:svisupport@ge.com).

The SVI FF positioner is manufactured by:

Dresser Inc.  
GE  
85 Bodwell Street  
Avon MA – 02322 – USA

## 2 GENERAL REQUIREMENTS

**!WARNING!**  
**Failure to adhere to the requirements  
 listed in this manual may cause loss  
 of life and property.**

Installation and maintenance must be performed only by qualified personnel. Area Classification, Protection Type, Temperature Class, Gas Group, and Ingress protection must conform to the data indicated on the label.

Wiring and conduit must conform to all local and national codes governing the installation. Wiring must be rated for at least 10°C above the highest expected ambient temperature.

Approved wire seals against ingress of water and dust are required and the NPT fittings must be sealed with tape or thread sealant in order to meet the highest level of ingress protection.

Where the protection type depends on wiring glands, the glands must be certified for the type of protection required.

The metal housing is a die-casting alloy which is predominately aluminum. "X" Marking is on label.

Before powering the SVI FF positioner:

Verify that the pneumatic and electronic cover screws are tightened. This is important to maintain the ingress protection level and the integrity of the flameproof enclosure.

If the Installation is Intrinsically safe, then check that the proper barriers are installed and the field wiring meets local and national codes for an IS installation. Never install a device, which was previously installed without an intrinsically safe barrier, in an intrinsically safe system.

If the pneumatic system is powered by a combustible gas then the installation must be treated as Zone 0 or DIV I.

In non-incendive installation, check to ensure all electrical connections are made to approved circuits which meet local and jurisdictional installation codes.

Verify that the markings on the label are consistent with the application.

Verify that the air supply pressure can not exceed the marking on the respective label.

### 3 Model Number Description of SVI FF positioner

SVI-abcdefgh Not all combinations are available.

SVI-	A Style (2,3,4)	B Pneumatic Train (1,2)	C Pneumatics (1,2)	D Display / housing Material (1,2,3,4)	E Communications (F,P)	F Options (1)	G Agency Approvals (2)	H Other Agency Approvals (1,2,3,4,5,6)
1		Single Acting	Standard Flow	No Display No Buttons Aluminum	F= Foundation Fieldbus	None		North American Zone (FM, FMc)
2	Standard Diagnostics	Double Acting	High Capacity	Display Buttons Aluminum	P=Profibus		Unilabeled (ATEX, IEC,FMc, FM)	GOST
3	Advanced Diagnostics			No Display No Buttons Stainless Steel				KOSHA
4				Display Buttons Stainless Steel				NEPSI
5								INMETRO
6								JIS
7								CCOE

#### MODEL CODES COVERED BY THIS DOCUMENT:

SVI-abcdefgh, where "a" thru "h" can take on the following values:

- a= 1..X. Indicates internal firmware style.  
(NOT RELEVANT TO PROTECTION TYPES)
- b= 1, 2. Indicates pneumatic train type.  
(1 = SINGLE ACTING, 2 = DOUBLE ACTING)
- c= 1, 2. Indicates pneumatic flow.  
(1 = STANDARD FLOW, 2 = HIGH FLOW)
- d= 1, 2, 3, 4. Indicates display type and housing material.  
(1 = NO DISPLAY; NO BUTTONS; ALUMINUM)  
(2 = DISPLAY; BUTTONS; ALUMINUM)  
(3 = NO DISPLAY; NO BUTTONS; STAINLESS STEEL)  
(4 = DISPLAY; BUTTONS; STAINLESS STEEL)
- e= F, P. Indicates communication protocol.  
(F = FOUNDATION FIELDBUS. P = PROFIBUS)
- f= 1..X. Indicates options turned on by firmware.  
(NOT RELEVANT TO PROTECTION TYPES)
- g= 2. Indicates agency approvals.  
(UNI-LABEL; ATEX, IEC, FM, FMc)
- h= 1. Indicates North American Zone Approvals  
2...X. Indicates additional region specific approvals.  
(NOT RELEVANT TO PROTECTION TYPES)

## 4 FLAMEPROOF and DUST IGNITION PROOF REQUIREMENTS

### 4.1 General

The 1/2 inch NPT fittings must enter the housing at least five full turns. The cover flange must be clean and free of corrosion products.

### 4.2 Cable Glands

Certified cable glands are required based on the hazardous area the device is installed in. That is, the particular cable gland used must have the same certification as the tick-box checked off on the label.

### 4.3 Natural gas

Use of a pressurized gas which is ignitable in the presence of air (for example natural gas) is not allowed as the SVI FF positioner supply pressure in a flameproof (protection type "d") installation.

### 4.4 Bolting

"X" Marking on label- M8 X 1.25-6g cover screws must be supplied by GE. No substitution allowed. Minimum yield stress to be 296 N/mm<sup>2</sup> (43,000 psi).

### 4.5 Carbon Disulphide Exclusion

Carbon Disulphide is excluded.  
(IEC 60079-1, Clause 15.4.3.2.2., carbon disulphide is excluded for enclosures with a volume greater than 100cm<sup>3</sup>)

### 4.6 Label Cleaning

"X" marking on label-Potential Electrostatic Charge Hazard – Use only damp cloth when cleaning or wiping. Do not use solvent.

### 4.7 Dust Environment

"X" marking on label-Instruments Installed in dusty hazardous areas. Must be cleaned regularly to prevent the buildup of dust layers on any surface.

To avoid the risk from electrostatic discharge follow the guidance as detailed in EN TR50404.

For safe operation, use only wet cloth when cleaning or wiping the device. Cleaning must only be done when local conditions around the device are free of potentially explosive atmospheres. Do not use dry cloth or any solvents.



## 5 INTRINSICALLY SAFE REQUIREMENTS

### 5.1 Div 2

WARNING: EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

### 5.2 Category II 1 (Zone 0)

For operation in hazardous area category II 1, over-voltage protection of the electrical connections need to be installed according to EN 60079-14.

For operation in hazardous area category II 1 the ambient temperature needs to be lowered according to the requirements of EN 1127-1 (reduction factor of 80%). The max. allowed ambient temperature for category 1 inclusive the requirement of EN1127-1 is:

T6 : Ta = -40°C to +60°C

T5 : Ta = -40°C to +75°C

T4 : Ta = -40°C to +85°C

### 5.3 Category II 1 (Zone 0)

“X” Marking on label - Since the SVI-abcdefgh (“SVI FF positioner”) contain greater than 10% aluminum, care must be taken during installation to avoid impacts or friction that could create an ignition source.

### 5.4 Internal pollution degree 2 and overvoltage category III

Ensure all covers and seals are correctly installed before putting device into service.

## 6 Description of Flameproof and Intrinsically Safe Markings

Applicable models numbers can be found in Section 3.

IN GROUP A INSTALLATIONS CONDUIT SEAL REQUIRED WITHIN 18 INCHES OF ENCLOSURE

### Summary of Agency Markings

#### Factory Mutual Approvals



##### Intrinsically Safe & FISCO

Class I Division 1 Groups A,B,C,D T6...T4  
 Class II,III Division 1 Groups E,F,G T6...T4  
 Class I, Zone 0, AEx ia IIC T6...T4 Ga  
 Class I, Zone 2, AEx ic IIC T6...T4 Gc  
 Zone 20, AEx ia IIIC T96°C Da

##### Explosion Proof

Class I, Division 1, Groups A,B,C,D T6...T4  
 Class I, Zone 1, AEx d mb IIC T6...T4  
 Class I, Zone 1, IIC T6...T4

##### Temperature Classification

T4 Ta = -40°C to 85°C  
 T5 Ta = -40°C to 75°C  
 T6 Ta = -40°C to 60°C

##### Type n Protection

Class I Division 2 Groups A,B,C,D T6...T4  
 Class II Division 2 Groups F,G T6...T4  
 Class III Division 1,2 T6...T4  
 Class I, Zone 2, IIC T6...T4

##### Dust Ignition Proof

Class II,III Division 1 Groups E,F,G T6...T4  
 Zone 21, AEx tb IIIC T96°C Db  
 Zone 22, AEx tc IIIC T96°C Dc

##### Ingress Protection

IP66; NEMA Type 4X

#### Canada Approvals (FM Canada Approved)



##### Intrinsically Safe & FISCO

Class I, Division 1, Groups A,B,C,D T6...T4  
 Class II,III Division 1 Groups E,F,G  
 Class I, Zone 0, Ex ia IIC T6...T4 Ga  
 Class I, Zone 2, Ex n IIC T6...T4 Gc  
 Zone 20, Ex ia IIIC T96°C Da

##### Explosion Proof

Class I Division 1 Groups B,C,D T6...T4  
 Class I, Zone 1, Ex d m IIB+H2 T6...T4  
 Class I, Zone 1, IIB+H2 T6...T4

##### Temperature Classification

T4 Ta = -40°C to 85°C  
 T5 Ta = -40°C to 75°C  
 T6 Ta = -40°C to 60°C

##### Type n Protection

Class I Division 2 Groups A,B,C,D T6...T4  
 Class II Division 2 Groups F,G  
 Class III Division 1,2

##### Dust Ignition Proof

Class II, Division 1 Groups E,F,G  
 Class III, Division 1,2

##### Ingress Protection

IP66, Type 4X

**ATEX Approvals**  
**FM14ATEX0014X**  
**FM14ATEX0015X**



**Intrinsically Safe**

II 1G Ex ia IIC T6...T4 Ga  
 II 1D Ex ia IIIC T96°C Da  
 II 3G Ex ic IIC T6...T4 Gc

**Dust Ignitionproof**

II 2D Ex tb IIIC T96°C Db  
 II 3D Ex tc IIIC T96°C Dc

**IECEx Approvals**

**IECEx FMG 14.0007X**

**Intrinsically Safe**

Ex ia IIC T6...T4 Ga  
 Ex ia IIIC T96°C Da  
 Ex ic IIC T6...T4 Gc

**Dust Ignitionproof**

Ex tb IIIC T96°C Db  
 Ex tc IIIC T96°C Dc

**Operating Ranges**

Temp:  $-40^{\circ}\text{C} \leq T_a \leq 85^{\circ}\text{C}$   
 Voltage: 9 to 32V DC  
 Pressure: 150 psig (1.03MPa)  
 Current: 18.3 mA (Max)

**Notes Related to Explosionproof Rating**

- 1) "DO NOT OPEN EVEN WHEN ISOLATED WHEN EXPLOSIVE ATMOSPHERES ARE PRESENT"

**Notes Related to Intrinsic Safety**

- 1) "INSTALL Per ES-776"
- 2) "Supply Connection Wiring Rated for 10°C Above Max Ambient"
- 3) "PERMANENTLY MARK THE PROTECTION TYPE CHOSEN. ONCE THE TYPE HAS BEEN MARKED, IT CAN NOT BE CHANGED"

**Model Code:**

"SVI-abcdefgh" (see section 3 above for explanation)

**Serial Number:**

"SN-nnyywwnnnn"

**Temperature Classification**

T4 Ta =  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$   
 T5 Ta =  $-40^{\circ}\text{C}$  to  $75^{\circ}\text{C}$   
 T6 Ta =  $-40^{\circ}\text{C}$  to  $60^{\circ}\text{C}$

**Ingress Protection**

IP66

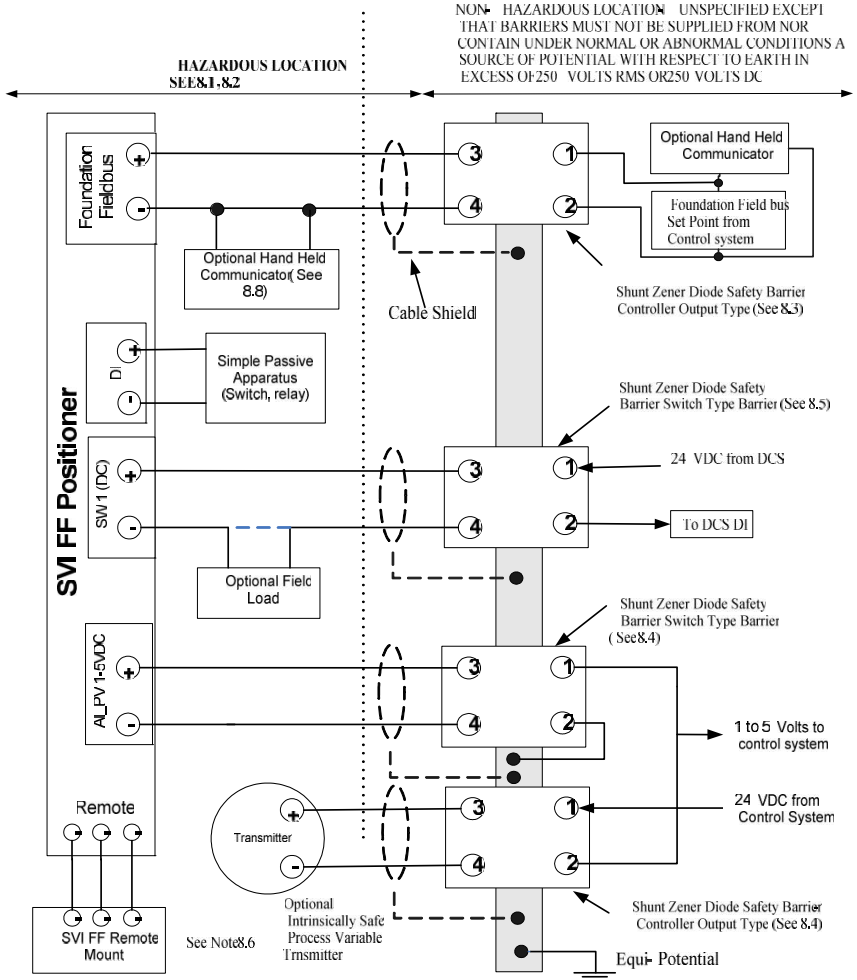
**Temperature Classification**

T4 Ta =  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$   
 T5 Ta =  $-40^{\circ}\text{C}$  to  $75^{\circ}\text{C}$   
 T6 Ta =  $-40^{\circ}\text{C}$  to  $60^{\circ}\text{C}$

**Ingress Protection**

IP66

7 Intrinsically Safe Installation Wiring Requirements



Each intrinsically safe cable must include a grounded shield or be run in a separate metal conduit.

## 8 Notes for Intrinsically Safe Installation

### 8.1 HAZARDOUS LOCATION

Refer to the device label for the description of the environment in which the device may be installed.

### 8.2 FIELD WIRING

Intrinsically Safe wiring must be made with grounded shielded cable or installed in grounded metal conduit. The electrical circuit in the hazardous area must be capable of withstanding an A.C. test voltage of 500 volts R.M.S. to earth or frame of the apparatus for 1 minute. Installation must be in accordance with GE guidelines. The installation including the barrier earthing requirements must comply with the installation requirements of the country of use. For Division 1/Zone 0 installations, the configuration of associated apparatus shall be FM Approved under Entity/FISCO Concept.

FM Approvals requirements (USA): ANSI/ISA RP12.6 (Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations) and the National Electrical Code, ANSI/NFPA 70. Division 2 installations must be installed per the National Electrical Code, ANSI/NFPA 70.

FMC requirements (Canada): Canadian Electrical Code Part 1. Division 2 installations must be installed per the Canadian Electrical Code Division 2 Wiring Methods.

ATEX requirements (EU): Intrinsically safe installations must be installed per EN60079-10 and EN60079-14 as they apply to the specific category.

### 8.3 Foundation Fieldbus IN (+) and (-) Terminals

These terminals power the SVI FF positioner, and are not polarity sensitive. The FF interface shall conform to the physical layer requirements of IEC60079-11, IEC61158-2, and FF-816.

		FISCO I.S. Model Parameters	Entity Model Parameters
Max. Input Voltage	U <sub>i</sub>	17.5V	24V
Max. Input Current	i <sub>i</sub>	380mA	250mA
Max. Input Power	P <sub>i</sub>	5.32W	1.2W
Max. Internal Capacitance	C <sub>i</sub>	1nF	1nF
Max. Internal Inductivity	L <sub>i</sub>	1μH	1μH

#### 8.4 PV 1-5VDC (+) and (-) Terminals

The Process Transmitter and the SVI FF positioner's PV Input are both barrier protected. The transmitter 4 to 20 mA signal is converted to 1 to 5 Volts at the Transmitter barrier. The 1 to 5 volt signal is monitored by the DCS and used by the SVI FF positioner for the embedded process controller. The sense resistor may be in the barrier or in the Digital Control System.

The Process Transmitter must be approved for use with the Process Transmitter Barrier. An example of a suitable barrier is MTL 788 or 788R. An example of the PV INPUT barrier is MTL 728.

Entity Parameters of the PV terminals:

$V_{max} = 30 \text{ Vdc}$ ;  $I_{max} = 125 \text{ mA}$ ;  $C_i = 1 \text{ nF}$ ;  $L_i = 0 \text{ uH}$ ;  $P_{max} = 900 \text{ mW}$

#### 8.5 SW (+) and (-) Terminals

There is one solid state switch contact output on the SVI FF positioner. It is labeled SW. The switch is polarity sensitive – that is, conventional current flows INTO the plus terminal.

Entity parameters are:

$V_{max} = 30 \text{ Vdc}$   $I_{max} = 125 \text{ mA}$   $C_i = 4 \text{ nF}$   $L_i = 10 \text{ uH}$

$P_{max} = 500 \text{ mW}$

#### 8.6 REMOTE (1) and (2) and (3) Terminals

The REMOTE terminals deliver reference Voltage to an optional remote position sensing potentiometer. Current, Voltage, and Power are limited by the SVI FF positioner.

The REMOTE terminals entity parameters are the parameters of the 4 to 20 mA INPUT barrier.

The SVI-II REMOTE MOUNT is approved for use as a remote position sensing device with the SVI FF positioner.

Entity parameters of the Remote Terminals are:

$U_o/V_{oc} = 6.5 \text{ Volts}$   $I_o/I_{sc} = 9.6 \text{ mA}$   $C_a = 22 \text{ uF}$   $L_a = 300 \text{ mH}$

Connect only to suitable potentiometer.

#### 8.7 Digital In Terminals

The Digital In terminal is suitable for direct connection to a passive switch.

Entity Parameters are:

$U_o/V_{oc} = 5.35 \text{ Volts}$   $I_o/I_{sc} = 50.6 \text{ mA}$   $C_a = 1.25 \text{ uF}$   $L_a = 2 \text{ mH}$

Connect only to passive dry contact simple apparatus.

## 8.8 Entity Requirement

Cable capacitance and inductance plus the I.S. apparatus unprotected capacitance (Ci) and inductance (Li) must not exceed the allowed capacitance (Ca) and inductance (La) indicated on the associated apparatus. If the optional Hand Held Communicator is used on the Hazardous Area side of the barrier, then the capacity and inductance of the communicator must be added and the communicator must be agency approved for use in the hazardous area. Also, the current output of the Hand Held Communicator must be included in the current output of the associated equipment.

For North American installations, the barriers may be active or passive and from any FM Approved manufacturer as long as the barriers comply with the listed entity parameters.

For European installations, the barriers may be active or passive and from any certified manufacturer as long as the barriers comply with the listed entity parameters and are installed per the guidelines of EN60079-14.

For other international installations, the barriers may be active or passive and from any certified manufacturer as long as the barriers comply with the listed entity parameters and are installed per the guidelines of IEC60079-14.

If the electrical parameters of the cable used are unknown, the following values may be used: Capacitance – 197pF/m (60 pF/ft), Inductance – 0.66  $\mu$ H/m (0.20  $\mu$ H/ft).

## 8.9 Use in dust atmosphere

Dust-tight conduit seal must be used when installed in dust hazard environments.

## 9 REPAIR

**WARNING: EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN A HAZARDOUS LOCATION.**

Only qualified service personnel are permitted to make repairs on the SVI FF positioner. Replace **ONLY** with genuine GE parts.

Use only cover bolts of Autentic Grade A2 Class 70 or Grade A4 Class 70, supplied by the manufacturer.

Consult the manufacturer for dimensional information on the flameproof joints for repair.

Only parts supplied by GE are permitted. This includes not only the major assemblies but also mounting screws and “O” rings. No substitutions with non-GE parts are permitted.

Detailed replacement procedures are described in the SVI FF Quick Start Guide. The following summary assures the safe operation of the SVI FF positioner.

For assistance, contact the nearest sales office, your local representative or email [svisupport@ge.com](mailto:svisupport@ge.com). Visit our web page at [www.ge-energy.com/valves](http://www.ge-energy.com/valves)

#### 9.1 Main Cover

Make sure that:

- The gasket is seated in the groove in the housing flange.
  - No wires or retaining cable can be trapped under the cover flange.
  - The flange area is not corroded and the surface is not scarred.
  - The four cover bolts are securely tightened.
- Secure the four cover bolts by applying a torque of  $55\pm 5$  in-lbs.

#### 9.2 I/P

Make sure that:

- The wire is not damaged when feeding it through the housing.
  - A single "O" ring is in place on the wire-sleeve and is not damaged.
  - The four retaining screws are snug.
- Inserting the wire sleeve through the housing does not require force.

#### 9.3 Relay

Make sure that:

- The five "O" rings are seated in the base of the relay and are not damaged. Note that the five "O" rings may be 5 individual parts, or 5 "O" rings ganged together as 1 part.
- The mounting screws are snug.

#### 9.4 Electronics

Make sure that:

- The 4 "O" rings are seated on the base of the electronics assembly and are not damaged.
- The four retaining screws are snug.

#### 9.5 Pneumatic Cover

Make sure that:

- The gasket is seated in the groove.
- The retaining screws are snug.





<b>EC DECLARATION OF CONFORMITY</b> in accordance with ATEX 94/9/CE and EMC 2004/108/EC directives			
<b>Manufacturer:</b> GE Dresser Inc. 85 Bodwell Street Avon Massachusetts, 02322 - USA			
<b>Declares that the:</b> <b>Product Name:</b> SVI FF Positioner <b>Model:</b> SVI xxxxFx3x			
<b>Conforms with :</b> The essential requirements of the European directive 94/9/EC for the reconciliation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres: <b>EC type examination notified body :</b> FM Approvals (1725) FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK <b>EC type examination certificate:</b> FM14ATEX0014X <div style="text-align: center;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Ex</span> II 1G Ex ia IIB T6...T4 Ga  <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Ex</span> II 1 D Ex ia IIIC T96°C Da  <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Ex</span> II 2 G Ex d mb IIC T6...T4 Gb  <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Ex</span> II 2 D Ex tb IIIC T96°C Db  <b>Type examination certificate:</b> FM14ATEX0015X  <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Ex</span> II 3G Ex ic IIC T6...T4 Gc  <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Ex</span> II 3D Ex tc IIIC T96°C Dc         </div>			
<b>Temperature Classifications:</b> T6: -40°C to 60°C      T5: -40°C to 75°C      T4: -40°C to 85°C			
<b>Applicable standards:</b>			
EN 60079-0:2012	EN 60079-1:2007	EN 60079-11:2012	EN 60079-18:2009
EN 60079-26:2007	EN 60079-31:2009	EN60529:2013	
<b>Production quality assessment notification: SIRA (Nr 0518)</b> Sira Certification Service, Rake Lane, Ecclestone, Chester, CH4 9JN England			
<b>Conforms with :</b> The essential requirements of the European directive 2004/108/EC for the reconciliation of the laws of the Member States concerning electromagnetic compatibility: <b>Applicable standards:</b> <b>EMC PERFORMANCE:</b> IEC 61514-2 <b>IMMUNITY: following generic standard EN 61326</b>			
EN 61000-4-2	EN 61000-4-4	EN 61000-4-6	
EN 61000-4-3	EN 61000-4-5	EN 61000-4-8	
<b>EMISSION: following generic standard IEC 61326-1</b> CISPR 11			
<b>Name</b>	Kevin Mackie	<b>Signature</b>	
<b>Function</b>	Engineering Manager	<b>Date</b>	22 DEC 2014

*This page intentionally left blank.*



# DIRECT SALES OFFICE LOCATIONS

## AUSTRALIA

Brisbane  
Phone: +61-7-3001-4319  
Fax: +61-7-3001-4399

## Perth

Phone: +61-8-6595-7018  
Fax: +61-8-6595-7299

## Melbourne

Phone: +61-3-8807-6002  
Fax: +61-3-8807-6577

## BELGIUM

Phone: +32-2-344-0970  
Fax: +32-2-344-1123

## BRAZIL

Phone: +55-11-2146-3600  
Fax: +55-11-2146-3610

## CHINA

Phone: +86-10-5689-3600  
Fax: +86-10-5689-3800

## FRANCE

Courbevoie  
Phone: +33-1-4904-9000  
Fax: +33-1-4904-9010

## GERMANY Ratingen

Phone: +49-2102-108-0  
Fax: +49-2102-108-111

## INDIA

Mumbai  
Phone: +91-22-8354790  
Fax: +91-22-8354791

## New Delhi

Phone: +91-11-2-6164175  
Fax: +91-11-5-1659635

## ITALY

Phone: +39-081-7892-111  
Fax: +39-081-7892-208

## JAPAN

Chiba  
Phone: +81-43-297-9222  
Fax: +81-43-299-1115

## KOREA

Phone: +82-2-2274-0748  
Fax: +82-2-2274-0794

## MALAYSIA

Phone: +60-3-2161-0322  
Fax: +60-3-2163-6312

## MEXICO

Phone: +52-55-3640-5060

## THE NETHERLANDS

Phone: +31-15-3808666  
Fax: +31-18-1641438

## RUSSIA

Veliky Novgorod  
Phone: +7-8162-55-7898  
Fax: +7-8162-55-7921

## Moscow

Phone: +7 495-585-1276  
Fax: +7 495-585-1279

## SAUDI ARABIA

Phone: +966-3-341-0278  
Fax: +966-3-341-7624

## SINGAPORE

Phone: +65-6861-6100  
Fax: +65-6861-7172

## SOUTH AFRICA

Phone: +27-11-452-1550  
Fax: +27-11-452-6542

## SOUTH & CENTRAL AMERICA AND THE CARIBBEAN

Phone: +55-12-2134-1201  
Fax: +55-12-2134-1238

## SPAIN

Phone: +34-93-652-6430  
Fax: +34-93-652-6444

## UNITED ARAB EMIRATES

Phone: +971-4-8991-777  
Fax: +971-4-8991-778

## UNITED KINGDOM

Bracknell  
Phone: +44-1344-460-500  
Fax: +44-1344-460-537

## Skelmersdale

Phone: +44-1695-526-00  
Fax: +44-1695-526-01

## UNITED STATES

Massachusetts  
Phone: +1-508-586-4600  
Fax: +1-508-427-8971

## Corpus Christi, Texas

Phone: +1-361-881-8182  
Fax: +1-361-881-8246

## Deer Park, Texas

Phone: +1-281-884-1000  
Fax: +1-281-884-1010

## Houston, Texas

Phone: +1-281-671-1640  
Fax: +1-281-671-1735

Visit us online at: [www.geoilandgas.com/valves](http://www.geoilandgas.com/valves)

\* Masoneilan, SVI, and ValVue are registered trademarks of the General Electric Company. FOUNDATION Fieldbus is a trademark of the FOUNDATION Fieldbus organization. Other company names and product names used in this document are the registered trademarks or trademarks of their respective owners.



© 2015 General Electric Company. All rights reserved.

GEA31030C 02/2015