

Part Number D301452X012

Document No. S1400CW

April 2017

Site Considerations for Equipment Installation, Grounding, and Wiring



FB1100/1200 Flow Computer



FB2100/2200 Flow Computer



ControlWave Family of Flow Computers and RTUs

Remote Automation Solutions



Device Safety Considerations

- **Reading these Instructions**

Before operating the device, read these instructions carefully and understand their safety implications. In some situations, improperly using this device may result in damage or injury. Keep this manual in a convenient location for future reference. Note that these instructions may not cover all details or variations in equipment or cover every possible situation regarding installation, operation, or maintenance. Should problems arise that are not covered sufficiently in the text, immediately contact Customer Support for further information.

- **Protecting Operating Processes**

A failure of this device – for whatever reason -- may leave an operating process without appropriate protection and could result in possible damage to property or injury to persons. To protect against this, you should review the need for additional backup equipment or provide alternate means of protection (such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc.). Contact Remote Automation Solutions for additional information.

- **Returning Equipment**

If you need to return any equipment to Remote Automation Solutions, it is your responsibility to ensure that the equipment has been cleaned to safe levels, as defined and/or determined by applicable federal, state and/or local law regulations or codes. You also agree to indemnify Remote Automation Solutions and hold Remote Automation Solutions harmless from any liability or damage which Remote Automation Solutions may incur or suffer due to your failure to ensure device cleanliness.

- **Grounding Equipment**

Ground metal enclosures and exposed metal parts of electrical instruments in accordance with OSHA rules and regulations as specified in *Design Safety Standards for Electrical Systems*, 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code). You must also ground mechanical or pneumatic instruments that include electrically operated devices such as lights, switches, relays, alarms, or chart drives.

- **Protecting from Electrostatic Discharge (ESD)**

This device contains sensitive electronic components which be damaged by exposure to an ESD voltage. Depending on the magnitude and duration of the ESD, it can result in erratic operation or complete failure of the equipment. Ensure that you correctly care for and handle ESD-sensitive components.

Contents

Chapter 1 – Overview	1
1.1 Introduction.....	1
1.2 Major Topics.....	1
Chapter 2 – Protection	3
2.1 Protecting Instrumentation Systems	3
2.1.1 Quality is Conformance to Requirements	3
2.2 Protecting Equipment and Personnel.....	4
2.2.1 Considerations for the Protection of Personnel	4
2.2.2 Considerations for the Protection of Equipment	5
2.3 Other Site Safety Considerations.....	6
Chapter 3 – Grounding and Isolation	7
3.1 Power and Ground Systems	7
3.2 Importance of Good Grounds.....	7
3.3 Earth Ground Connections.....	8
3.3.1 Establishing a Good Earth Ground	8
3.3.2 Ground Wire Considerations.....	13
3.3.3 Other Grounding Considerations	14
3.4 Isolating Equipment from the Pipeline.....	15
3.4.1 Meter Runs Without Cathodic Protection.....	15
3.4.2 Meter Runs With Cathodic Protection.....	17
Chapter 4 – Lightning Arresters and Surge Protectors	21
4.1 Strokes and Strikes	21
4.1.1 Chance of Being Struck by Lightning.....	21
4.1.2 Antenna Caution	24
4.1.3 Ground Propagation.....	27
4.1.4 Tying it all Together	27
4.1.5 Impulse Protection Summary.....	28
4.2 Use of Lightning Arresters and Surge Protectors	28
4.2.1 Installation of Lightning Arresters and Surge Protectors	29
Chapter 5 – Wiring Techniques	31
5.1 Overview	31
5.2 Instrument Wiring	31
5.2.1 Common Returns.....	32
5.2.2 Use of Twisted Shielded Pair Wiring (with Overall Insulation).....	33
5.2.3 Grounding of Cable Shields.....	33
5.2.4 Use of Known Good Earth Grounds	33
5.2.5 Earth Ground Wires	34
5.2.6 Working Neatly and Professionally	34
5.2.7 High Power Conductors and Signal Warning	34
5.2.8 Use of Proper Wire Size	34
5.2.9 Lightning Arresters & Surge Protectors	35
5.2.10 Secure Wiring Connections	36

[This page is intentionally left blank.]