Model 9016 X-Purge

Interfaces:

User’s Manual

October 2009
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1 Introduction

Thank you for selecting a D3 solution for your hazardous area operator interface requirements!

This manual describes the general procedures for installing and operating D3 Model 9016 X-Purge interface systems. The text portion of the manual also includes an overview of the theory behind the methods used to make electronic systems safe for hazardous areas. Section 9, Specifications, also contains an overview of system specifications, and Section 10, Drawings, includes mechanical drawings of each unit.

We are always working to improve our documentation. If you have any suggestions or requests, please forward them to our sales department at sales@d3inc.net, or to Daisy Data Displays, Inc., 2850 Lewisberry Road, York Haven, PA 17370, Attn: User Manual Coordinator.
2 Hazardous Area Safety Methods: Theory of Operation

2.1 Division 1: X-Purge Protection

X-purge systems are another option available for Division 1 hazardous areas. The installation of an X-purge system on an enclosure in a Division 1 area renders the area within the enclosure to an essentially non-rated environment. Thus, normally rated equipment may be installed within the enclosure (within reasonable limits, such as complying with temperature and power restrictions).

An X-purge system is fully automated. The system not only provides the protective purge and maintains positive pressure, but it also automatically controls the connection and disconnection of power supplies and signal paths. A well-designed X-purge system also automatically controls flow rates, internal pressure regulation, purge timing, and switching of states between purge flow and normal operation. D3 X-purge controls provide all of these features.

X-purge controls must also satisfy the FM 3620: 4.2 specifications. D3 X-purged equipment has also been validated by Factory Mutual as meeting these requirements.
3 **Pre-Installation Testing**

Before installing your system in its final location, you may wish to test it to verify that the purge system is functioning correctly.

3.1 **Division 1 X-Purge Test**

**IMPORTANT NOTE:** Pre-installation testing should *always* be conducted in a safe area.

**Equipment Required**

- Clean, dry purge air or inert gas supply equipped with local water/oil separator or filter capable of supplying 40 to 300 SCFH at 30 to 60 PSI.
- Fittings and tubing for purge air or inert gas supply (0.25” NPT Male to connect to the inlet of the purge system).
- Local air pressure shutoff valve.
- AC power line (with ground) to pigtails (tinned bare wire, stripped 0.25”), 120V, 8A or 240V, 4A

**Procedure**

1. Place the unit in a safe area near a source of the purge gas to be used (compressed air line or other inert gas source).
2. Temporarily install a pressure regulator, water/oil separator or filter, shutoff valve, pressure relief valve, and pressure gauge in the purge air or inert gas line (see drawing P007).
3. **Bleed the purge air or inert gas line to insure that dirt, moisture, and other contaminants are cleared from the line prior to connecting the line to the unit!**
4. Connect the purge gas line to the inlet of the regulator on the Purge Unit.
5. Remove the cover of the explosion-proof I/O casting (see drawing P007 at the end of this manual).
6. Connect an AC power line (*not plugged into AC power outlet!* to the power interface board (see drawing P008). For connection, location and wiring, see drawing E017 (NOTE1).
7. Close all access doors and covers.
8. Apply purge gas to the system by opening the shutoff valve (if installed). Adjust the pressure regulator on the air-in box (see drawing P008) so that the pressure gauge indicates 40 PSI.
9. Apply AC power to the unit.
10. Once the pressure inside the unit reaches 1.0” Water Column and at least 40 SCFH, the Purge Status LED will illuminate yellow, indicating that it is purging. If the purge status indicator does not turn yellow, inspect the unit for leakage. The gasketed panels can be checked with a soap solution. If leaks are not obvious, verify that the purge air of inert gas is clean and dry and that the pressure at the inlet is 40 PSI.
11. **DO NOT ATTEMPT TO OPEN THE ENCLOSURE WHILE IT IS PRESSURIZED!**
12. Note the reading on the Pressure Gauge while slowly turning the Air Input Regulator up until the purging process stops and the Purge Status LED flashes red with an error code of 2 – 2 (over pressure) or 3 – 2 (over flow).

13. Remove AC power from the enclosure for a minimum of 30 seconds. Decrease the pressure reading on the pressure gauge by 5 PSI.

This change may vary slightly on some unit; if in later testing the unit fails with an over flow error (3-2 blink code), decrease the inlet pressure by another 2 PSI. **Note this pressure for use during start-up.**

14. Re-apply AC power. The Purge Status LED will illuminate yellow. The system should purge for a minimum of 8 minutes. The time will vary according to the flow rate of the air into the enclosure; lower flow rates will result in a longer purge time.

15. After the purge is complete, the Purge Status indicator will illuminate green. AC power is now applied to the internal electronics so you should be able to power on the display or PC.

16. If the purge status light blinks red, one of several possible errors has been detected. Please refer to Table 6.1 on page 14 for an explanation of the possible error codes.
4 Installation

4.1 PAC-Seal Connection Instructions

A conduit seal is necessary for most equipment enclosures in hazardous areas. Please consult your local code for other instances and full details.

ALWAYS follow all NEC, NFPA, and local codes when installing conduit and PAC-seals in hazardous areas! It is very important that knowledgeable personnel, familiar with national and local codes, supervise hazardous area equipment installations.

The sealing compound generally used for PAC-seals is an inorganic, chemically setting, magnesium oxide base material, which develops a slight expansion while hardening into a porcelain-like body. Sealing Compound is supplied as a powder and need only be mixed with water to apply. Approximately one ounce of sealing compound is needed per cubic inch of space to be filled.

The sealing compound powder has a shelf life of six months when stored in unopened, tightly sealed containers in a dry location at 70°F.

Any equipment accidentally splashed with sealing compound should be cleaned with soap and water before the sealing compound cures.

Equipment Required

- Four PAC-Seal fittings, 1” NPT or 0.75” NPT for the X-Purge (2 for conduit connection at the enclosure or I/O casting, 2 for connection in the safe area), or sealing conduits. The PAC Seal and conduit size selected will depend on the size and number of conductors, which must be run to the unit. Check the NEC tables (Chapter 9, Table 4) to determine the conduit size necessary
- Conduit for electrical signals and for electrical power (separate runs), NEC and NFPA approved for use in hazardous areas
- NEC and NFPA approved flexible conduit if needed for difficult installations
- Fittings as required for permanent conduit installation NEC and NFPA approved for use in hazardous areas
- Signal cables, power cables, and connectors as required to mate with the equipment within the enclosure or cast aluminum box
- AC power switch for use in the safe area
Procedure

1. Threaded surfaces and pour locations should be cleaned with soap and water and thoroughly dried before proceeding.

2. Install two conduit runs (one signal, one power) between the enclosure I/O casting and AC power source (located in a safe area or in an explosion-proof box). See drawing P011 at the end of this manual.

3. Shake the sealing compound powder well before mixing with water. The recommended mix ratio is 5 parts powder to 1 part clean water, by weight. Place 70°F water into a clean mixing container and gradually add powder to water while mixing. Continue mixing until a uniform consistency is obtained. Mixing may be done with a slow-speed mixer or by hand with a spatula. The minimum amount of water (as specified above) should be used as excess water reduces mechanical strength, increases shrinkage, and delays set time. Failure of the cement to adhere indicates setting has begun – discard cement, do not attempt to re-temper by adding more water.

4. The compound may be applied by pouring, casting, or mechanical dispenser. The sealing compound hardens with an internal chemical-setting action in 18 to 24 hours at ambient temperature. Working time of the sealing compound when the powder is mixed with water is approximately 30 minutes at 70°F. If accelerated curing is desired, low temperature oven drying at 180°F can be used. Do not expose the sealing compound to higher temperatures, constant water immersion, or steam environments while curing. If high humidity resistance is required in the cured product, a moisture-resistant lacquer or silicone coating should be applied to the exposed surfaces.

5. The packing fiber is made from an environmentally safe, non-asbestos material. It is easy to use and forms a positive dam to hold the compound. The fiber is placed around each individual wire or cable at both ends of the cavity for horizontal pouring in the PAC Seal so that the Sealing Compound can encapsulate each completely. For vertical pouring, the packing fiber need only be placed at one end. See drawing P002 at the end of this manual.

6. We recommend a special blend of lubricants, LUBT-2, for use with threaded joints. This lubricant is to be used to prevent galling of the pipe threads when threaded into a coupling, junction box, etc. It insures a quick release and undamaged male and female threads when parts are disassembled. The thread lubricant is high quality lubricant to be used in temperatures ranging from -40° to +50° F. It is recommended for use in a hazardous location. The PAC Seal Compound, packing fiber and LUBT-2 are available from Killark at http://www.killark.com/.

7. For enhanced reliability of the unit, install an AC line conditioner. AC power lines should be no smaller than 14 gauge and have a TRUE EARTH GROUND.
4.2 **Purge Air Line Connection Instructions**

4.2.1 **For Division 1 X-Purge Systems Model 9016**

After the unit has been mounted in its final location in the hazardous area, it must be permanently connected to a purge air or inert gas line and checked for leaks and proper operation of the purge/pressurization system. Only when its pressure integrity has been established should electrical signals and power be brought “live” to the unit.

**ALWAYS follow all NEC, NFPA, and local codes when installing purge systems in hazardous areas!** It is *very important* that knowledgeable personnel, familiar with national and local codes, supervise hazardous area equipment installations.

**Equipment Required**

- Clean, dry purge air or inert gas supply equipped with local water/oil separator or filter capable of supplying 40 to 300 SCFH at 30 to 60 PSI.
- Fittings and tubing for purge air or inert gas supply (0.25” NPT Male to connect to the inlet of the purge system).
- Local air pressure shutoff valve.

**Procedure**

1. Mount the enclosure in the location in which it will be installed. This must be near the source of air or inert gas to be used for the purge system.
2. Install the pressure regulator, water/oil separator or filter, shutoff valve, pressure relief valve, and pressure gauge in the purge air or inert gas line (see drawing P011 at the end of this manual).
3. **Bleed the purge air or inert gas line to insure that dirt, moisture, and other contaminants are cleared from the line prior to connecting the line to the unit!**
4. Connect the purge gas line to the inlet of the regulator on the Purge Unit.
5. The PAC-Seals bringing the power and signals to the explosion-proof I/O casting should already be installed. Connect the signal lines to the interlock system (see drawings E018, E019, E022, and E025).
6. Ensure that the power to the AC supply lines is disconnected. Connect the power line(s) to the X-purge system (see drawing E017).
7. If the area can be made safe, you may want to test your connections before closing the explosion-proof I/O casting. **If you test the system in place, it is VITAL that you ENSURE THAT THE AREA IS SAFE during the test and FOLLOW ALL APPLICABLE SAFETY PROCEDURES for “hot work” in a hazardous area!** You can test connections without purging by holding down the “Bypass Purge” button (see drawing E020) while applying power; you must release the button within 30 seconds of power application to prevent a diagnostic error. When the button is released, power and signals are immediately “live” to the system; you can test operation to make sure that the connections have been made correctly. **Disconnect power IMMEDIATELY upon completion of this test** to ensure that the unit is not erroneously operated in bypass mode!
8. When the signal and power connections are complete, replace the cover on the I/O casting and secure with the supplied 14 hex-head bolts. Torque these bolts to 7.5 ft. lbs.
5 Start-Up Operation

5.1 Division 1 X-Purge Start-Up Operation

1. Set DIP switches (see page 20 drawing P008, note 8 and page 38 drawing E029 note 3 to set the DIP switches for the size enclosure you are going to purge.

2. When the air, signal, and power connections are complete, replace and close all access doors and covers.

3. Apply AC power. The Purge Status LED will illuminate red. Power is now applied though the Intrinsic Safety Barriers to the purge/pressurization control circuits only.

4. Apply purge gas to the system by opening the shutoff valve (if installed). If the pre-installation test has been performed, the air-in pressure regulator will be preset – you should begin the start-up process at the pressure noted during testing. Otherwise, adjust the pressure regulator on the air-in box (see drawing P008) so that the pressure gauge indicates 40 PSI.

5. Once the pressure inside the unit reaches 1.0” Water Column and at least 40 SCFH, the Purge Status LED will illuminate yellow, indicating that it is purging. If the purge status indicator does not turn yellow, inspect the unit for leakage. The gasketed panels can be checked with a soap solution. If leaks are not obvious, verify that the purge air of inert gas is clean and dry and that the pressure at the inlet is 40 PSI (or, if a pre-installation test was completed, at the pressure noted during that test).

6. **DO NOT ATTEMPT TO OPEN THE ENCLOSURE WHILE IT IS PRESSURIZED!**

7. If the pre-installation test was completed and the unit appears to be functioning correctly within the same parameters as during the test, you may skip the remaining steps of this procedure.

8. Note the reading on the Pressure Gauge while slowly turning the Air Input Regulator until the Purge Status LED flashes red with an error code of 2 – 2 (over pressure) or 3 –2 (over flow).

9. Remove AC power from the enclosure for a minimum of 30 seconds. Decrease the pressure reading on the pressure gauge by 5 PSI. This change may vary slightly on some unit; if the unit fails during purging with an over flow error (3-2 blink code), decrease the inlet pressure by another 2 PSI.

10. Re-apply AC power. The Purge Status LED will illuminate yellow. The purge time is set for a minimum of 8 minutes. The time will vary according to the flow rate of the air into the enclosure.

11. After the purge is complete, the Purge Status indicator will illuminate green. AC power is now applied to the internal electronics and the signal relays are closed.

12. **If the purge status light blinks red**, one of several possible errors has been detected. Please refer to Table 6.1 on page 14 for an explanation of the possible error codes.
6 Operation Notes

6.1 Division 1 X-Purge

X-purge systems are fully automatic; the system safely disconnects power and signal paths in the event of a purge failure. The D3 purge control also performs automatic self-diagnostics and can report other errors. Table 6.1 details both the normal conditions and the errors (fatal and non-fatal) that are reported by the purge status LED (see drawing P008, indicated by note 9). Please note that blink codes can be read in forward or reverse; that is, code 2-3 is the same as code 3-2. A “0” in the code column indicates steady (non-blinking) light. The status column indicates the nature of the information being given: “informative” is simply a status indication and no action needs to be taken, “non-fatal” is a condition that can be corrected and operation will then proceed normally, and “fatal” are errors that require that the purge system be shut down before correcting the problem and restarting the purge cycle.

<table>
<thead>
<tr>
<th>Color</th>
<th>Code</th>
<th>Meaning</th>
<th>Status</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>0</td>
<td>Operate, purge complete</td>
<td>Informative</td>
<td>n/a</td>
</tr>
<tr>
<td>Yellow</td>
<td>0</td>
<td>Purge in progress</td>
<td>Informative</td>
<td>n/a</td>
</tr>
<tr>
<td>Yellow</td>
<td>1-1</td>
<td>Minor over flow</td>
<td>Non-fatal</td>
<td>Turn the air in regulator down a few PSI.</td>
</tr>
<tr>
<td>Red</td>
<td>0</td>
<td>Waiting to begin purge</td>
<td>Non-fatal</td>
<td>Turn the purge gas supply on. If it is on, the enclosure may not be developing enough internal pressure – make sure all doors and access panels are closed. Also, the air inlet pressure may not be high enough – try turning the regulator up.</td>
</tr>
<tr>
<td>Red</td>
<td>1-1</td>
<td>System Error</td>
<td>Fatal</td>
<td>Contact D3 customer service (see section 7, Customer Service on page 15 in this manual).</td>
</tr>
<tr>
<td>Red</td>
<td>2-1</td>
<td>Under pressure</td>
<td>Fatal</td>
<td>Loss of pressure is usually due to a door being opened or failure of the purge gas supply. Check both.</td>
</tr>
<tr>
<td>Red</td>
<td>2-2</td>
<td>Over pressure</td>
<td>Fatal</td>
<td>Turn the air inlet regulator down at least 5 PSI. Repeat until purge will complete without error. If problems continue, or occur during operation, contact D3 customer service (see section 7, Customer Service on page 15 in this manual).</td>
</tr>
<tr>
<td>Red</td>
<td>3-2</td>
<td>Major over flow</td>
<td>Fatal</td>
<td>Turn the air inlet regulator down at least 5 PSI.</td>
</tr>
</tbody>
</table>
Red 3-3  Water detected  Fatal  This should only occur if a water sensor option is installed. If it is installed, the unit must be opened and dried completely out. Ensure that no water remains in the unit and that there is no damage to the internal components resulting from the water. In case of serious water incursion, DO NOT ATTEMPT TO REAPPLY POWER TO THE EQUIPMENT; the equipment should be returned to D3 for evaluation.

Red 4-1  Faulty pressure sensor  Fatal  A purge system component has failed. Please contact D3 customer service (see section 7, Customer Service on page 15 in this manual).

Red 4-2  Faulty flow sensor  Fatal  A purge system component has failed. Please contact D3 customer service (see section 7, Customer Service on page 15 in this manual).

Red 4-3  Short purge switch is stuck  Fatal  The “Short Purge” switch on the DIP switch mounting board (see drawing E020) is either shorted or stuck, or the operator has held it down too long while beginning a test. Ensure that there is nothing holding the switch closed or shorting the circuit. If you continue to experience problems, contact D3 customer service (see section 7, Customer Service on page 15 in this manual).

Red 4-4  Bypass purge switch is stuck  Fatal  The “Bypass Purge” switch on the DIP switch mounting board (see drawing E020) is either shorted or stuck, or the operator has held it down too long while beginning a test. Ensure that there is nothing holding the switch closed or shorting the circuit. If you continue to experience problems, consult D3 customer service (see section 7, Customer Service on page 15 in this manual).

Table 6.1 X-Purge Status Light Key
7 **Customer Service**

You can contact D3’s customer service department via three methods:
Phone, FAX, E-mail

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**Equipment returned to D3 for service must be accompanied by a valid return merchandise authorization (RMA) number. Anything shipped to D3 without a valid RMA number will be refused. Please contact customer service for an RMA number, be prepared to provide model AND serial numbers to help identify your equipment. Typical I.D label shown below with Serial and Model numbers highlighted.**

You may be able to trouble shoot problems yourself. To save time and money, please consult the trouble-shooting guide in this manual.
# Trouble-Shooting Guide

## Division 1 X-Purge Trouble-Shooting

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTED SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>When power is applied, the purge status indicator light does not come on</td>
<td>Power is not connected to the unit</td>
<td>Connect AC power to the power connection on the purge system. Ensure that the power switch is on. Ensure that AC power is on.</td>
</tr>
<tr>
<td></td>
<td>Improper line voltage selection</td>
<td>Ensure that the 120/240 VAC switch on the purge control is set appropriately for your power source.</td>
</tr>
<tr>
<td>After power is applied, the purge status indicator stays solid red; it does not switch to yellow or blink</td>
<td>No air supply to unit</td>
<td>Ensure that a purge gas line is connected to the unit and that the supply line is “on.” The pressure gauge on the air-in box should indicate a higher pressure than 20 PSI</td>
</tr>
<tr>
<td></td>
<td>Restrictions in air line</td>
<td>Ensure that supply line and inlet connect have no restrictions and that the supply line is not kinked</td>
</tr>
<tr>
<td></td>
<td>Restrictions in main purge line inside enclosure</td>
<td>Ensure that the main purge line (terminating in a brass tee fitting) is not kinked or disconnected</td>
</tr>
<tr>
<td></td>
<td>Leaks in the enclosure</td>
<td>Ensure that all access doors are closed and latched. Ensure that all access panels are closed and sealed. There should be no holes or openings in the enclosure.</td>
</tr>
<tr>
<td>The purge status indicator is yellow, but the enclosure takes an excessively long time to complete the purge (when the status indicator turns green)</td>
<td>Low purge gas supply pressure</td>
<td>Increase purge gas inlet pressure at the air-in regulator or on the main supply line</td>
</tr>
<tr>
<td></td>
<td>Restriction in the main purge line</td>
<td>Ensure that the main purge line within the enclosure (ending in a brass tee fitting) is not kinked or obstructed</td>
</tr>
<tr>
<td>Purge status indicator flashes yellow and purge takes an excessively long time to complete.</td>
<td>Low purge gas supply pressure</td>
<td>Increase purge gas inlet pressure at the air-in regulator or on the main supply line</td>
</tr>
<tr>
<td>Purge or operation stops and purge status indicator flashes red code</td>
<td>Fatal purge error</td>
<td>See Table 6.1 on page 13&amp;14</td>
</tr>
</tbody>
</table>
9 Specifications

MATERIAL
Purge Control main panel, Interface Box, and all mounting screws ........................................ 304 Stainless Steel
I/O Casting and lid ........................................ Cast Aluminum
I/O Casting bolts .......................................... Iridited Steel

PHYSICAL
Purge Controller ........................................ 17.5 Height (H)
11.5" Width (W)
10.81" Depth (D)
4.0" D-Inside
5.63" D-Outside
25 lbs.

Interface Box ........................................ 17.5" Height (H)
11.5" Width (W)
5.0" Depth (D)
5 lbs.

ENVIRONMENTAL
Operating Temperature ................................... 32-122° F
Storage Temperature ..................................... 32-158° F
Relative Humidity ....................................... 10-95% Non-condensing

ELECTRICAL
Power Usage ........................................ 5 watts maximum
Switching Capacity (power) ............................ 120V/8A or 240V/4A maximum
Switched contacts (signal) ................................ 36
Contact ratings ........................................ 24VDC @ 1A
FCC Class A computing device
Alarm Contacts .......................................... SPDT
120V/8A or 240V4A Maximum

PRESSURE AND AIR REQUIREMENTS
Incoming Air Pressure (Customer Air Input) ........... 20-60 psi
Operating Pressure ...................................... 1" - 4" of water column
Air Flow During Purge .................................. 40-300 SCFH

CONTROLS MONITORING
Microprocessor based

For current options and for special requirements, consult factory.
## 10 Drawings

The following is a list of drawings in the order in which they appear:

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<th>Drawing No.</th>
<th>Description</th>
<th>Page</th>
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</thead>
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<td>Cable and conduit entry 9016 15&quot; &amp; 18&quot; enclosures</td>
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<td>X-Purge front panel item location</td>
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<td>Cable and conduit entry 9016 mounted to enclosure</td>
<td>21</td>
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<td>E030</td>
<td>Electrical input connections</td>
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<td>M015</td>
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</table>
**NOTES:**

1. **REFER TO ALL LOCAL CODES FOR CONDUIT ENTRY INFORMATION!**
   The user assumes total responsibility for compliance with all applicable codes & procedures in the final installation.

2. **THE PAC SEAL FITTINGS CAN BE A MAXIMUM OF 18" FROM THE ENCLOSURE.**
   PAC SEAL FITTINGS MAY BE ATTACHED DIRECTLY TO THE ENCLOSURE & THE RIGID CONDUIT EXTENDED IN ANY CONVENIENT DIRECTION. THE PACKING FIBER & THE SEALING COMPOUND MUST COMPLETELY SURROUND EACH CONDUCTOR OR CABLE.

3. **THE AIR INLET FITTING IS A 1/4" NPT FEMALE. THE AIR SOURCE MUST BE CLEAN DRY INSTRUMENT GRADE AIR CAPABLE OF SUPPLYING 40 TO 300 SCFH AT 30 – 80 PSI.**

---

**DIMENSIONS ARE IN INCHES**

**CABLE AND CONDUIT ENTRY**

**9016 MOUNTED TO ENCLOSURE**
NOTES:

1. All input connections are located on two ports in the explosion proof aluminum box on the top of the unit. The 120 vac power input connection is on the XPI board (1051-000000). The alarm relay connection is also on the XPI board. A three conductor cable is required.

2. The data signal input connections are on the XPI board (1051-000000). The CATs network data cable can plug into cable 1100-001347-01 which is supplied with the unit.

3. See Table 1 for the Daisy data CATs input cable model number & length.

4. For cable & conduit entry into the enclosure, refer to drawings "input".

5. The air input fitting is a 1/4" NPT female. The air source must be clean dry instrument grade air capable of supplying 40 to 300 SCFM at 30 to 60 PSI.

Table 1

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<td>0072</td>
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Customer supplied alarm cable - 3 conductor

ENCLOSURE WALL

Daisy Data Displays Inc.
2830 Evergreen Road, York, PA 17404

We thrive in the harshest environments
Voice: (717) 932-9999 Fax: (717) 932-8000 or visit us at www.daisyydata.com

Sheet 1 of 1

Dimensions are in inches

The design and specifications are the property of Daisy Data Displays Inc., and are subject to change without notice.
PATTERN A: FOR FLUSH OR EXTENDED MOUNTING

PATTERN B: FOR SIDE MOUNTING

MOUNTING NOTES: (SEE DRAWING MO16)

1. *A* HOLES: MOUNTING HOLES FOR #10 HOLES.
2. "B" HOLES:
   4.0" DIA.; CLEARANCE HOLE FOR CONDUIT AND AIR EXHAUST.
3. "C" HOLES:
   2.5" DIA.; CLEARANCE HOLE FOR CONDUIT AND AIR EXHAUST.
4. CENTER LINE SYMBOL:
5. CUT OUT DIMENSIONS:
   USE RECTANGULAR CUT OUT IF PREFERRED TO THE "B" HOLES.
NOTES:

1. **Purge Air Inlet:**
   - This is the point the purge air will enter the enclosure. The 1/4" tube should be free of dirt & ions.

2. **Exhaust Valve Assembly Kit:**
   - The valve dumps during purge to exhaust the purge air. Once the purge is complete, the valve closes & will not reopen unless the internal pressure rises above 8" WC or the purge is lost.

3. **Atmosphere Sensor:**
   - Allows the pressure sensor on the purge control board to measure the differential pressure between the enclosure & the surrounding environment.

4. **Internal Signal Interface Board:**
   - See drawing #A for detail information.

5. **Purge Valve Board:**
   - Located under the RF shield box. See drawing "#A" for additional information.

6. **Purge Switch Mounting Board:**
   - See drawing "#A" for detail information.

7. **RF Shield Box:**
   - Protects the purge control board from RF radiation that would reset the purge system.

8. **Power I/O Pac Seal:**
   - This PAC SEAL contains the AC power Cable for the internal equipment, 24V Cable for the solenoid & 3 data cables with 6 pairs in each cable. The PAC SEAL has the sealing compound though its length & can not be re-Positioned.

9. **I.S. Pac Seal:**
   - This PAC SEAL contains the intrinsically safe power cable & the enclosure redundant ground wires. The PAC SEAL has the sealing compound through its length & can not be re-Positioned.

10. **Pilot Air Feed:**
    - This air line provides the pilot pressure for the exhaust solenoid.

Dimensions are in inches.
NOTES:

1. THE AIR INPUT FITTING IS A 1/4" NPT FEMALE. THE AIR SOURCE MUST BE CLEAN, DRY INSTRUMENT GRADE AIR CAPABLE OF SUPPLYING 40 TO 300 SCFH AT 30 TO 60 PSI.

2. THE SHORT & BYPASS PURGE SWITCHES ARE LOCATED UNDER THE 4.5" x 2" COVER ON THE LEFT OF THE PURGE PANEL.

3. FOR CABLE & CONDUIT ENTRY INTO THE ENCLOSURE, REFER TO DRAWING "PD11".

4. USE CARE WHEN INSTALLING THE "FLOW TUBE" FITTING. THE HOSE AND TUBE LENGTH SENT FROM THE FACTORY CANNOT BE CHANGED. MOUNT THE "FLOW TUBE" INSIDE THE ENCLOSURE, SO THE HOSE AND TUBE ARE NOT BLOCKED OR BENT. THE AIR OUTPUT INTO THE ENCLOSURE NEEDS 6" TO 8" OF CLEAR SPACE TO WORK PROPERLY. USE A #8 SCREW THAT IS 1.5" LONG TO MOUNT.

0.17" MOUNTING HOLE

FLOW READING TO SAPC
1/8" RED HOSE

AIR INTO MAIN ENCLOSURE

AIR FROM MAIN ENCLOSURE INPUT
NOTES:

1. FOR CABLE & CONDUIT ENTRY INTO THE ENCLOSURE, REFER TO DRAWING "PD11".

2. REFER TO INDIVIDUAL CIRCUIT BOARD PAGES FOR DETAILED INFORMATION.
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Grey shaded connections are terminated by D.D.
Green shaded wires are the regular twisted pairs
Blue shaded wires are CAT5 cables
Red shaded wires are hook-up wire
NOTES:

1. JA: JA IS CONNECTED TO J13 ONE TO ONE. SEE THE SSB–SIB CONNECTION TABLE FOR A MORE DETAILED PIN–OUT. J13 IS CONNECTED TO JA ON THE INTERNAL SIGNAL INTERFACE BOARD THOUGH THE PAC–SEAL.

2. JB: JB IS CONNECTED TO J12 ONE TO ONE. SEE THE SSB–SIB CONNECTION TABLE FOR A MORE DETAILED PIN–OUT. J12 IS CONNECTED TO JB ON THE INTERNAL SIGNAL INTERFACE BOARD THOUGH THE PAC–SEAL.

3. JC: JC IS CONNECTED TO J13 ONE TO ONE. SEE THE SSB–SIB CONNECTION TABLE FOR A MORE DETAILED PIN–OUT. J3 IS CONNECTED TO JC ON THE INTERNAL SIGNAL INTERFACE BOARD THOUGH THE PAC–SEAL.

4. TO INSERT WIRES INTO THE CONNECTORS SUPPLIED AT JA, JB & JC, STRIP THE WIRE INSULATION OFF 1/4" & TIN, UNSCREW THE TERMINAL UNTIL THE WIRE WILL FIT IN & SCREW TILL THE WIRE IS SECURE.

5. J7: SHORT WHEN NET3 (J5) IS USED FOR ARCNET.

6. J15 & J16: SHORT BOTH WHEN NET1 (J6) & NET2 (J4) ARE USED FOR THINNET.

7. J1 & J2: FOR ARCNET NETWORK LOOPBACK. CONSULT FACTORY FOR MORE INFORMATION.

IO53–000000
SIGNAL SWITCHING BOARD
NOTES:

1. **JA:** JA IS CONNECTED TO J13 ONE TO ONE. SEE THE SSB–SIB CONNECTION TABLE FOR A MORE DETAILED PIN–OUT. J13 IS CONNECTED TO JA ON THE SIGNAL SWITCHING BOARD THOUGH THE PAC–SEAL.

2. **JB:** JB IS CONNECTED TO J12 ONE TO ONE. SEE THE SSB–SIB CONNECTION TABLE FOR A MORE DETAILED PIN–OUT. J12 IS CONNECTED TO JB ON THE SIGNAL SWITCHING BOARD THOUGH THE PAC–SEAL.

3. **JC:** JC IS CONNECTED TO J13 ONE TO ONE. SEE THE SSB–SIB CONNECTION TABLE FOR A MORE DETAILED PIN–OUT. J3 IS CONNECTED TO JC ON THE SIGNAL SWITCHING BOARD THOUGH THE PAC–SEAL.

4. TO INSERT WIRE INTO THE CONNECTORS SUPPLIED AT JA, JB & JC, STRIP THE WIRE INSULATION OFF 1/4" & TIN. UNSCREW THE TERMINAL UNTIL THE WIRE WILL FIT IN & SCREW TILL THE WIRE IS SECURE.
NOTES:

1. **BYPASS PURGE:**
   
   **THIS TEST MUST BE DONE IN A SAFE ENVIRONMENT!** BYPASS PURGE IS FOR TEST ONLY!
   
   The purge control system is completely bypassed & the isolation relays close immediately, applying power & signals to any connected internal electronics. The purge status LED on the front panel will be illuminated flashing green. No purge air is required. Remove main AC power. Press & hold the bypass purge switch & apply main power in to the XPI board (see notes 1 & 4 on drawing "E017"). Then release the switch within 30 seconds. Now the unit is in bypass purge. The unit’s internal environment will not be safe unless a normal purge cycle is done.

2. **SHORT PURGE SWITCH:**
   
   **THIS TEST MUST BE DONE IN A SAFE ENVIRONMENT!** SHORT PURGE IS FOR TEST ONLY!
   
   The purge control system will set the purge time to 30 seconds regardless of the setting on the enclosure size select dip switches. The purge will then continue as normal. The purge status LED will be illuminated green. Purge air is required. Remove main AC power in. Press & hold the short purge switch & apply main power in to the XPI board (see notes 1 & 4 on drawing "E017"). Then release the switch within 30 second. Close the switch cover & the enclosure door. Apply air to the purge system. The unit is now operating normally. The unit’s internal environment will not be safe unless a normal purge cycle is done.

3. **ENCLOSURE SIZE DIP SWITCHES:**
   
   The dip switches control the timing of the normal purge cycle. For both the 15” & 18” display models the purge time will be 8 minutes. The follow are the correct settings of the switches.
   1: OFF
   2: OFF
   3: ON
   4: OFF
   5: ON
   6: ON
   7: ON
   8: ON
NOTES:

1. **BYPASS PURGE:**
   - THIS TEST MUST BE DONE IN A SAFE ENVIRONMENT! BYPASS PURGE IS FOR TEST ONLY!
   - THE PURGE CONTROL SYSTEM IS COMPLETELY BYPASSED & THE ISOLATION RELAYS CLOSE IMMEDIATELY, APPLYING POWER & SIGNALS TO ANY CONNECTED INTERNAL ELECTRONICS.
   - THE PURGE STATUS LED ON THE FRONT PANEL WILL BE ILLUMINATED FLASHING GREEN: NO PURGE AIR IS REQUIRED. REMOVE MAIN AC POWER. PRESS & HOLD THE BYPASS PURGE SWITCH & APPLY MAIN POWER IN TO THE XPI BOARD (SEE NOTES 1 & 4 ON DRAWING "E017"). THEN RELEASE THE SWITCH WITHIN 30 SECONDS. NOW THE UNIT IS IN BYPASS PURGE.
   - THE UNIT’S INTERNAL ENVIRONMENT WILL NOT BE SAFE UNLESS A NORMAL PURGE CYCLE IS DONE.

2. **SHORT PURGE SWITCH:**
   - THIS TEST MUST BE DONE IN A SAFE ENVIRONMENT! SHORT PURGE IS FOR TEST ONLY!
   - THE PURGE CONTROL SYSTEM WILL SET THE PURGE TIME TO 30 SECONDS REGARDLESS OF THE SETTING ON THE ENCLOSURE SIZE SELECT DIP SWITCHES. THE PURGE WILL THEN CONTINUE AS NORMAL. THE PURGE STATUS LED WILL BE ILLUMINATED GREEN: PURGE AIR IS REQUIRED. REMOVE MAIN AC POWER IN. PRESS & HOLD THE SHORT PURGE SWITCH & APPLY MAIN POWER IN TO THE XPI BOARD (SEE NOTES 1 & 4 ON DRAWING "E017"). THEN RELEASE THE SWITCH WITHIN 30 SECOND. CLOSE THE SWITCH COVER & THE ENCLOSURE DOOR. APPLY AIR TO THE PURGE SYSTEM. THE UNIT IS NOW OPERATING NORMALLY.
   - THE UNIT’S INTERNAL ENVIRONMENT WILL NOT BE SAFE UNLESS A NORMAL PURGE CYCLE IS DONE.

3. **ENCLOSURE SIZE DIP SWITCHES:**
   - THE DIP SWITCHES CONTROL THE TIMING OF THE NORMAL PURGE CYCLE. DETERMINE THE INTERNAL CUBIC FOOT AREA OF THE ENCLOSURE THAT THE 9016 IS ATTACHED TO. USE TABLE 1 FOR THE CORRECT SETTING OF THE SWITCHES. SWITCHES 5, 6, 7 & 8 ARE ALWAYS ON. ROUND THE CUBIC UP TO THE NEAREST NUMBER LISTED IN THE TABLE.

### TABLE 1

<table>
<thead>
<tr>
<th>SIZE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ft³</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>2ft³</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3ft³</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>4ft³</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>5ft³</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>6ft³</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>7ft³</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>8ft³</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>9ft³</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>10ft³</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>15ft³</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>20ft³</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>25ft³</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>30ft³</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>
NOTES:

1. **BYPASS PURGE:**
   - This test must be done in a safe environment! Bypass Purge is for test only!
   - The purge control system is completely bypassed & the isolation relays close immediately, applying power & signals to any connected internal electronics.
   - The purge status LED on the front panel will be illuminated flashing green. No purge air is required. Remove main AC power, press & hold the bypass purge switch & apply main power in to the XPI board (see notes 1 & 4 on drawing "E017"). Then release the switch within 30 seconds. Now the unit is in bypass purge.
   - The unit’s internal environment will not be safe unless a normal purge cycle is done.

2. **SHORT PURGE SWITCH:**
   - This test must be done in a safe environment! Short purge is for test only!
   - The purge control system will set the purge time to 30 seconds regardless of the setting on the enclosure size select dip switches. The purge will then continue as normal. The purge status LED will be illuminated green. Purge air is required. Remove main AC power in. Press & hold the short purge switch & apply main power in to the XPI board (see notes 1 & 4 on drawing "E017"). Then release the switch within 30 second. Close the switch cover & the enclosure door. Apply air to the purge system. The unit is now operating normally.
   - The unit’s internal environment will not be safe unless a normal purge cycle is done.

3. **ENCLOSURE SIZE DIP SWITCHES:**
   - The dip switches control the timing of the normal purge cycle. Determine the internal cubic foot area of the enclosure that the 9016 is attached to. Use table 1 for the correct setting of the switches. switches 5, 6, 7 & 8 are always on. Round the cubic up to the nearest number listed in the table.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>SWITCH NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>1</td>
</tr>
<tr>
<td>5 ft²</td>
<td>ON</td>
</tr>
<tr>
<td>10 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>20 ft²</td>
<td>ON</td>
</tr>
<tr>
<td>30 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>40 ft²</td>
<td>ON</td>
</tr>
<tr>
<td>50 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>60 ft²</td>
<td>ON</td>
</tr>
<tr>
<td>70 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>80 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>90 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>100 ft²</td>
<td>ON</td>
</tr>
<tr>
<td>110 ft²</td>
<td>OFF</td>
</tr>
<tr>
<td>120 ft²</td>
<td>ON</td>
</tr>
<tr>
<td>130 ft²</td>
<td>OFF</td>
</tr>
</tbody>
</table>

FOR SOFTWARE VERSION S300–012032
USED FOR ENCLOSURES UP TO 130 CUBIC FEET

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**Daisy Data Displays Inc.**
2850 Lewisberry Road, York Haven, PA 17370

**DIP SWITCH MOUNTING (DMB)**
**ITEM LOCATION (130 C.F.)**

**ITEM LOCATION DIAGRAM DRAWING**

**DRAWING NUMBER**
E032

**REV.**
A

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NOTES:

1. **EPROM:**
   This is the factory supplied EPROM with the software for the purge system.

2. **JUMPER SETTINGS:**
   All jumpers are set at the factory. Do not change!

3. **FLOW & PRESSURE ADJUSTMENTS:**
   All potentiometers are set at the factory. Do not change!

4. **FLOW SENSOR:**
   This is the sensor that measures the air flow into the enclosure. The red hose is connected to port "A".

5. **PRESSURE SENSOR:**
   This is the sensor that measures the air pressure inside of the enclosure. The blue hose is connected to port "A".

1068-000001-01
PURGE CONTROL BOARD