With regard to the supply of products, the current issue of the following document is applicable:

The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: “Expanded reservation of proprietorship”.
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Safety note and symbols used
It is strongly urged that you follow all instructions and recommendations in this manual, in addition to all applicable codes, standards, and local requirements. Failure to do so voids all warranties, both implicit and explicit, and relieves the manufacturer of all liability.

Symbols used

⚠️ Attention
This symbol calls your attention to instructions or requirements that must be followed. Failure to observe the instructions and information that this symbol calls attention to may result in the failure of the device and any devices or systems connected to it.

🔍 Note
This symbol draws your attention to important information.

STOP Warning
This symbol warns the user of potential danger. Failure to observe this warning may lead to personal injury or death and/or property damage.

🛠️ Tool
This symbol accompanies a list of tools you will need to install the unit.
General instructions regarding ATEX

1. The guidelines

The guideline 94/9/EG determines the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II of the directive.

The guideline 1999/92/EG is addressed to the operator/user of facilities in explosive areas and governs the safety regulations of persons during installation, handling and maintenance.

Furthermore local laws and rules for electrical installations and accident prevention have to be observed.

2. General information for this manual

Preconditions for handling and operating the series 6000 controller safely are basic knowledge of safety regulations and additional training and experience explosion protection.

This user manual contains important information and instructions to handle the series 6000 controller in explosive areas safely and to operate it according to guideline 94/9/EG.

This user manual in particular the safety instructions have to be observed by everybody who works with the components.

3. Responsibilities of users and installers

The user and/or the installer is obligated to let only competent, trained persons work at the 6000 Control Unit who

- are familiar with the regulations about safety and accident prevention and briefed in handling of the component
- are trained to work on explosion protection equipment.
- know the appropriate instructions and rules for the installation, handling and maintenance of explosion protected equipment.
- read the safety chapter and danger warnings in this manual

4. General information about pressurized enclosures

The pressurized enclosure is one of most multifunctional applicable type of protection. It is based on a first flush operation which removes a potential, ignitable gas mixtures of the local environment from the enclosure. After the flush, the over-pressure will be maintained by adding as much pressurized air as necessary to compensate for the leaks of the enclosure or components. This constant over-pressure status protects against the diffusion of potentially explosive atmospheres.

During the flush the internal pressure will be up to 10-12 mbar, in the operation phase it is reduced to 2-3 mbar. Hot spots at single components inside the enclosure are monitored by temperature sensors (optional) and if required turned off. This assures that no unacceptable surface temperature will occur.

For this reason, the pressurized enclosure is especially suited for the use of non-Ex certified equipment in Ex-areas.

The enclosure has to be prepared specially for the use Ex p:

- all walls had to be additionally armed
- the doors had to be specially constructed
- tested for mechanical stability
- tested for overpressure resistance

5. Flush gas and pressurized air grades

The grade of flush gas has to relate to the pressurized air grades according to DIN ISO 8573-1 Class 1 to ensure a trouble free operation of the 6000 Series.
<table>
<thead>
<tr>
<th>Class</th>
<th>Particle</th>
<th>Water</th>
<th>Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Size max in µm</td>
<td>Density max in mg/m³</td>
<td>Pressure dew point in °C</td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
Certification information

Certification markings

---

**6000 Series main unit**

---

**6000 Series vent**
(1 vent or 1st vent when more than 1 vent in use)

---

**6000 Series vent**
(2nd vent when more than 1 vent in use)
Warning labels

WARNING - Conduit seal must be installed within 18 inches of the enclosure. To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

WARNING - PRESSURIZED ENCLOSURE
This enclosure must not be opened unless the area atmosphere is known to be below the ignitable concentration of combustible materials or unless all devices within have been de-energized.

WARNING - To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
WARNING - Power must not be restored after the enclosure has been opened until combustible dusts have been removed and the enclosure re-pressurized.

Certifications
Applied harmonized standards:
- EN 60079-0 : 2006
- EN 60079-1 : 2004 with Corrigendum April 2006
- EN 60079-11 : 2007
- EN 60079-2 : 2004 with Corrigendum April 2006
- EN 61241-0: 2004
- EN 61241-1: 2004

Conditions of Safe use
1. Conduit seals shall be certified in type of explosion protection flameproof "d", suitable for the conditions of use and correctly installed to the flameproof "d" enclosure.

2. Conduit seals shall be installed within 18 in. (450 mm) of the flameproof "d" enclosure.

3. When the purge control unit is mounted to an enclosure, the complete unit shall be evaluated to EN 60079-2: 2004 with Corrigendum April 2006.

4. The purge control unit has an operating temperature of 135 °C (T4 temperature class). This temperature shall be considered when mounted to an enclosure.

5. The device must be installed in accordance with the manufacturer’s installation drawing number 116-013UL-12.

6. Intrinsically safe cables extending from the flameproof "d" enclosure must be provided with at least 0.25 mm insulation thickness to maintain segregation between intrinsically safe circuits.

7. The cable entries may be used only in places where they are protected against the influence of mechanical danger.

8. In hazardous dust environments, regularly remove dust from the control unit enclosure to prevent excessive temperature rise.
Purpose
The purpose of the Pepperl+Fuchs 6000 series Type X & Ex px, Zone 1 enclosure protection system is to allow the use of general purpose or non-rated electrical or electronic devices located in general purpose enclosures instead of explosion proof/ flameproof, Type 7 or 9 / Ex d enclosures or other means of protection for the rated area. Other purposes include heat, moisture, and dust contamination prevention.

Description
The 6000 series Type X & Ex px purge pressurization system protects general purpose equipment mounted in a standard enclosure. This allows the enclosure to be located and the equipment operated in a hazardous area. The hazardous area classification can be Class I, Division 1 / Zone 1. The 6000 series operates by controlling and monitoring compressed instrument air or inert gas through the protected enclosure(s) so as to remove and prevent the accumulation of flammable gas, vapors, or dust.

The 6000 series system features these main parts:

- Electronic processor (EPCU) housed in an explosion proof enclosure
- I.S. electrical/pneumatic manifold assembly
- I.S. user interface for programming and monitoring the system
- 316L stainless steel (UNS S31603) type 4X IP66 enclosure for EPCU and connections
- Pressure relief vent with flow and pressure monitoring at the exhaust.

The user interface allows programming of up to 4 switch inputs, temperature modules, enclosure power contacts, 2 auxiliary outputs, and various operational functions. Through the user interface menus, configuration of the standard information for set-up and operation of a system (purge time, flow rates, pressures, enclosure size, etc.) are easily programmed. Additional features allow inputs for system bypass, enclosure power on/off, temperature overload and activation of rapid exchange flow for cooling or auxiliary relay for separate cooling source, delay power shutdown, and more. The two auxiliary contact outputs can be configured to activate on most of the input switches or any of the configured alarm states for pressure, flows, and temperature.

The power for the solenoid valve on the manifold unit, inputs, the user interface controller (UIC), and EPV-6000 vent are provided by the EPCU through the internal galvanically isolated intrinsic safety barrier. No additional I.S. barrier is required.

The adjustable mounting bracket and the universally mountable vent make the 6000 system easy to install horizontal or vertical onto the enclosure. A component kit is available for custom installations that fit specific customer needs.

The 6000 control unit can monitor multiple enclosures and control and accept inputs from two (2) EPV-6000 vents.

The 6000 series provides a complete system for purging and pressurizing enclosures for hazardous location operation.

The 6000 series system can be set up for Class I & II/ Division 1 and Zone 1 & 21 applications in accordance with the NEC-NFPA 70, NFPA496, UL913, CSA C22.2 No.157, IEC60079-11, and EN60079-2. This system is suitable for SIL 2 in accordance with IEC61508.

One (1) operations copy of this manual must be studied and retained by the system operator in addition to one (1) permanent file copy. User's agents are responsible for transferring this manual to the user/operator prior to start-up.

The final certification of IEC61508 is pending.

Component kit dust certifications pending.
6000 Series Purge/Pressurization System

The EPV-6000 vent is required.

- Manifold for purging and pressurization
- Needle valve for pressurization of enclosure (requires flathead screwdriver for adjustment)
- Manifold with I.S. solenoid valve
- Connection to protective gas supply
- Type 4X (IP66) fittings for enclosure flow
- I.S. wiring terminals
- Bracket for mounting to the enclosure
- Explosion proof / flameproof enclosure
- 3/4" conduit for power connections
- Cable glands for I.S. inputs/outputs
- Main unit
- Rotating vent cap
- Spark arrestor
- 1.5 " NPT knockout (Ø 2", 50.8 mm)
- M12 (V1) connector for I.S. connection to control unit
- Seal washer
- Lock nut
- User interface controller (UIC)
- 316L stainless steel (UNS S31603) Type 4X (IP66) rating
- Vent Temperature monitoring/control accessories
- I.S. temperature hub
- I.S. temperature sensor

Attention

Subject to modifications without notice
**Electrical & pneumatic diagrams**

**6000 control unit power connections**

**General wiring notes**

For power connections to the 6000 control unit and relay contacts:

1. All applicable local and national wiring codes **MUST** be followed when wiring to the unit.

2. Ground wire to be 14 AWG (2.08 mm²). Strip length of ground to mate with pigtail under wire nut 11.1 mm to 12.7 mm (.437” to .5”).

3. If a single wire is used, the maximum wire gauge to the pluggable terminal block is 14 AWG (2.08 mm²).

4. If jumpering from one terminal to another at pluggable terminal block, the maximum wire gauge is 16 AWG (1.31 mm²) for both wires.

5. Minimum wire gauge to the pluggable terminal block is 24 AWG (0.20 mm²) (Based on connector, not code. Follow all applicable codes.).

6. Strip length of wires terminating into the screw terminals on the pluggable terminal block to be 5 mm to 7 mm (0.2” to 0.27”).

7. Extra wire length of 31.75 mm (1.25”) past top of opening in explosion proof / flame proof box to pluggable terminal block (Allows connector to be moved out of the way when changing electronics. Prevents repouring seals).

8. Wires to be neatly tucked back down past the lid threads before lid is placed on unit. The wires must not loop past the high point of the plastic cover. The wire nut should be tucked in last (If not, it may be difficult to access when changing electronics).

9. If using a single conduit seal, the other conduit on the 6000 control unit will need a cap for the end of the conduit with appropriate hazloc certifications (A standard 3/4” conduit cap will not work).

10. Conduit seals must be within 4572 mm (18”) of internal explosion proof / flame proof box, or within 3873 mm (15.25”) from the end of the conduit supplied with the 6000 unit.

11. When wiring to the terminal plug, it is easier to remove the plug, terminate the wires, then reconnect the plug.

12. When removing the pluggable terminal block, it is recommended that the electronics module be supported by pressing down on top of the EPCU to counteract the lifting force required to remove the connector.

**I.S. wiring notes**

For wires going to the I.S. interface board:

1. The wire strip length is to be between 4 mm and 6 mm (0.16” and 0.24”)

2. The terminal blocks are rated for wire size of 16 AWG (1.31 mm²) to 26 AWG (0.13 mm²).

3. The only terminals that might have multiple connections are the shield connections. These must be crimped to a single pin before connecting to the board.

4. If cables are used (recommended for connections to the vents and UIC):
   - It is recommended that the cables be shielded. They must have a minimum internal conductor insulation of 0.25 mm (0.01”) to be intrinsically safe.
   - The shield can be left open or connected to the I.S. interface board. If connected to the I.S. interface board, the shield must be connected to earth ground through the capacitor on the I.S. interface board.
Electrical installation - power and I.S. wiring

Requires standard explosion proof seals to explosion proof/flameproof enclosure at a maximum distance of 457.2 mm (18").

When removing the terminal block from the EPCU stack, place your hand on top of the plastic to support the stack when lifting the terminal block off the stack.

The EPCU is prewired to the I.S. terminal board.

Both enclosure power contacts are switched at the same time.
Connector color code for the user interface, temperature module, and vent:

- **PWR +**: BN (brown)
- **PWR -**: BU (blue)
- **DATA_A**: WH (white)
- **DATA_B**: BK (black)
**WARNING:** To prevent ignition of the flammable atmospheres, the wiring method must insure that if any wire is disconnected and extended to the opposite terminal, a 50.8 mm (2") separation must be maintained.

Maintain a minimum space of 50.8 mm (2") between the I.S. wiring and the non-I.S. wiring. Make sure that the wiring is neatly tucked in to the explosion proof housing. Use wire ties if necessary. As a rule, no wires are to be in the area between the two terminals, as shown above.

**WARNING:** No wiring is to be in the area between the terminals.
**Pneumatic requirements**

**Protective gas supply**
The protective gas supply to the enclosure system must be a clean, instrument quality compressed air or inert gas filtered to a minimum of 40 microns. It must contain no more than trace amounts of flammable gas, vapor, or dust.

The protective gas supply compressor intake must originate in a nonhazardous location. The suction duct passing through a hazardous location and the protective tubing and piping must be fabricated from noncombustible materials suitable for the prevailing hazardous and environmental conditions.

The protective gas supply provided must be able to handle the flow and pressure requirements for purging and pressurization (see page 66, Establishing connection sizes, lengths & bends).

**Pneumatic connections**
The 6000 series system requires only two pneumatic connections to the protective enclosure, one for the exhaust for the vent mounting and the other for the protective gas supply for purging and pressurization. The vent requires a single 1 1/2" conduit knockout (Ø 50.8 mm [2"] hole) in the enclosure. A lock ring with gasket for sealing are provided. The control unit for the 6000 series provides a compression fitting with a lock ring and washer connected to a 3/8" tube. All tubing and fittings are 316L (UNS S31603) Stainless steel. A single hole into the enclosure as noted on the mounting template will provide the installation for this fitting.

For replacement of this tubing use only 3/8" tubing with wall thickness of 0.35" (.889 mm).

The 6000 series control unit with the manifold can be top, bottom, right, or left hand mounted on the enclosure. However, the manifold connections may have to be reversed as shown below.

---

**Pressurization adjustment**

To adjust, use a flat head screw driver inserted into the needle valve of the manifold as shown. Turn clockwise to decrease the flow, counter-clockwise to increase the flow. The maximum number of complete rotations allowed is five (5).

Diagram shown is without plumbing. See the diagrams on the following page for plumbing installation.

Unit must be powered to get a pressure reading.

When delivered, the system is in its default mode (fully automatic [FA]). It may be easier to adjust safe pressure in standard (STD) or semiautomatic (SA) mode so that the system does not automatically begin purging when energized.
Mounting Instructions
Manifold assembly
Left hand mount

1/4 - 20 flathead screws (4 included)

3/8" stainless steel tube (included)

EFC-6-SS (included)

EFC-6-SS nut (included)

Plug (included)

Manifold (included)

Protective gas supply inlet

Protective gas to enclosure

Right hand mount

1/4 - 20 flathead screws (4 included)

3/8" stainless steel tube (included)

EFC-6-SS (included)

EFC-6-SS nut (included)

Plug (included)

Manifold (included)

Protective gas supply inlet

Protective gas to enclosure
EPV-6000 vent

Tools:

- 1 1/2" NPT knockout (Ø 50.8 mm [2"] hole) for vent

Vent mounted on the outside of the enclosure

- Pressurized enclosure
- 6000 control unit
- Locking nut w/grounding screw (included)
- Seal gasket (included)
- Ø 2" (50.8 mm)
- Vent cap (included)
- EPV-6000
- Vent cable (included)

Vent mounted on the inside of the enclosure

- Pressurized enclosure
- 6000 control unit
- Locking nut w/o ground (included)
- Seal gasket (included)
- Ø 2" (50.8 mm)
- Vent cap (included)
- Hex screws 0.05" (1.3 mm) (3)
- EPV-6000
- *Reference tube
- Cord grip CG-8 (optional)

*Reference tubing and hardware included with EPV-6000-SS models

Vent is not gravity sensitive and can be installed in any orientation.

Cable to the vent is I.S. wiring and must be properly isolated from other wiring.
6000 Control unit with housing "WH"

Tools:
- Appropriate sized drill bits or knockout holes
- 1 1/16" open end box wrench
- Bolts: 1/4-20 (provided), hole clearance = 6.86 mm (0.27") diameter
- EFC-6-SS (provided): hole clearance = 15.54 mm (0.61") diameter

1. Drill holes using template. Check the scale if printing an electronic version.
2. Assemble tubing and fitting to control unit. Install on the "Out" port of the correct side.
3. Bolt mounting plate to the enclosure. Type 4X washers must be mounted inside the enclosure. Tighten to 16.38 - 18.08 Nm (145 – 160 in-lb).
4. Put 2 of the mounting screws in the back of the control unit to align with the key holes in the mounting plate.
5. Hang the control unit onto the plate. Slide the unit towards the enclosure so that the EFC-6-SS fitting is in the proper location.
6. Tighten the 2 bolts. Put the other two mounting bolts in place and tighten.
7. Place the EFC-6-SS bolt in position and tighten.
Tightening unit cover plate

The screws on the unit cover plate must be tightened in the order shown on the diagram to the right. The torque specification on this is 0.113 Nm (1 in-lb).

Failure to do so can leave the unit improperly sealed.

---

Left hand mounting template

Right hand mounting template

---
6000 Series Component kit
Identification of components

User interface

Control unit and explosion proof / flameproof enclosure

Optional pneumatic manifold with solenoid

Component kit

EPV-6000

The EPV-6000 vent is required.

Atmospheric reference kit (6000-ACC-514482) for mounting vent inside the enclosure

The reference kit comes with the EPV-6000-SS vent but must be ordered when mounting the EPV-6000-AA vent inside the enclosure.
Electrical diagrams

General wiring notes

For power connections to the control unit and relay contacts:

1. All applicable local and national wiring codes MUST be followed when wiring to the unit.

2. Ground wire to be 14 AWG (2.08 mm²). Strip length of ground to mate with pigtail under wire nut 11.1 mm to 12.7 mm (.437” to .5”).

3. If a single wire is used, the maximum wire gauge to the pluggable terminal block is 14 AWG (2.08 mm²).

4. If jumpering from one terminal to another at pluggable terminal block, the maximum wire gauge is 16 AWG (1.31 mm²) for both wires.

5. Minimum wire gauge to the pluggable terminal block is 24 AWG (0.20 mm²)(Based on connector, not code. Follow all applicable codes.).

6. Strip length of wires terminating into the screw terminals on the pluggable terminal block to be 5 mm to 7 mm (0.2” to 0.27”).

7. Extra wire length of 31.75 mm (1.25”) past top of opening in explosion proof / flame proof box to pluggable terminal block (Allows connector to be moved out of the way when changing electronics. Prevents repouring seals).

8. Wires to be neatly tucked back down past the lid threads before lid is placed on unit. The wires must not loop past the high point of the plastic cover. The wire nut should be tucked in last (If not, it may be difficult to access when changing electronics).

9. If using a single conduit seal, the other conduit on the 6000 control unit will need a cap for the end of the conduit with appropriate hazloc certifications (A standard 3/4” conduit cap will not work).

10. Conduit seals must be within 457.2 mm (18”) of internal explosion proof / flame proof box, or within 387.3 mm (15.25”) from the end of the conduit supplied with the 6000 unit.

11. When wiring to the terminal plug, it is easier to remove the plug, terminate the wires, then reconnect the plug.

12. When removing the pluggable terminal block, it is recommended that the electronics module be supported by pressing down on top of the EPCU to counteract the lifting force required to remove the connector.

I.S. wiring notes

For wires going into the explosion proof / flame proof box on the I.S. side:

1. The wire strip length is to be between 5 mm and 7 mm (0.2” and 0.27”).

2. The wire’s gauge depends on the number of connections. Fewer wires allow for heavier gauge and will still meet the conduit seal fill requirement. See the applicable standards for fill requirement.

3. The terminal blocks are rated for wire size of 16 AWG (1.31 mm²) to 28 AWG (0.08 mm²).

4. If multiple wires need to land to a single terminal (e.g., the RS-485 bus) then these wires must be either crimped to a single pin, or grouped in an external junction box with one wire going in to the terminal.

5. The wires must have a minimum insulation thickness of 0.25 mm (0.01”).

6. Extra wire length of 31.75 mm (1.25”) past top of opening in explosion proof / flame proof box to pluggable terminal block (Allows connector to be moved out of the way when changing electronics. Prevents repouring seals).

7. Conduit seal on I.S. wiring side must be within 457.2 mm (18”) of the explosion proof/flameproof box.
Electrical installation - power and I.S. wiring

Warning

Requires standard explosion proof seals to explosion proof/flame proof enclosure at a maximum distance of 457.2 mm (18").

When removing the terminal block from the EPCU stack, place your hand on top of the plastic to support the stack when lifting the terminal block.

The maximum distance between the control unit and the termination board is 3 meters.
Component kit installation

User interface

Panel mount (internal mount, for hazardous area installation, NOT to be used in Dust, Class II/Zone 21 areas)

Mount the explosion proof enclosure and valve as desired. Follow all applicable electrical codes when required.

Note: When installing panel mount configuration, the installation must be evaluated for Type 4x rating by a third party NRTL authorized certification agency.

Enclosure must be made of metal and grounded.

Cut out must be no larger than dimensions specified in above drawing.

The user interface must be mounted inside the pressurized enclosure to maintain the environmental ratings.
External mount (non-hazardous locations only)

Environmental ratings are NOT maintained when mounted in this manner.

Mounting in this manner is not approved for hazardous area locations.
User Interface mounting template (panel mount)

User interface mounting template (external mount)

EPCU mounting template

Solonoid mounting template
Sequence of events
Turning on power to the enclosure

- Door open input off or not used
  - No door open
- Immediate shutdown input off or not used
  - No immediate shutdown
- Overload/temp input off or not used
  - No overload/temp
- Vent pressure
  - > minimum overpressure
  - < maximum pressure
- Vent flow
  - > flow rate
- Good vent communications
- No system fault
- Purge settings not changed
- Enable timer
  - Purge timer
  - Control power relay
  - Door secure
  - Timer = 0
- Lock 1
  - on or unused
  - Lock 1 on or unused
  - Aux relay 1 lock door
  - Aux relay 1 energized
- Lock 2
  - on or unused
  - Lock 2 on or unused
  - Aux relay 2 lock door
  - Aux relay 2 energized
  - Immediate shut down input off or not used
  - Overload/temp input off or not used
  - No immediate shutdown
  - No system fault
  - Purge settings not changed
  - Enable timer
  - Purge timer
  - Control power relay
  - Door secure
  - Timer = 0
  - Lock 1
    - on or unused
    - Lock 1 on or unused
    - Aux relay 1 lock door
    - Aux relay 1 energized
  - Lock 2
    - on or unused
    - Lock 2 on or unused
    - Aux relay 2 lock door
    - Aux relay 2 energized
- No system fault
- Purge settings not changed
- Enable timer
  - Purge timer
  - Control power relay
  - Door secure
  - Timer = 0
  - Lock 1
    - on or unused
    - Lock 1 on or unused
    - Aux relay 1 lock door
    - Aux relay 1 energized
  - Lock 2
    - on or unused
    - Lock 2 on or unused
    - Aux relay 2 lock door
    - Aux relay 2 energized
Turning off power to the enclosure

- Control power relay input broken/shorted
- Control power relay input off
- Door open input broken/shorted
- Door open input on
- Immediate shutdown input broken/shorted
- Immediate shutdown input on
- Immediate shutdown
- Overload/temp input broken/shorted
- Overload/temp input on
- Unsafe pressure
- System fault
- Timer = 0
- Immediate shut down input
- Bypass is off
- No bypass
- Volume changed
- Number of exchanges changed
- Purge settings changed
- Environment changed
- Flow rate changed
- Turning off power to the enclosure

- Overload/temp input broken/shorted
- Overload/temp input on
- Vent pressure < safe pressure
- Lost vent communications
- Unsafe pressure
- Shutdown timer
- Timer = 0
- Bypass is off
- No bypass
- Volume changed
- Number of exchanges changed
- Purge settings changed
- Environment changed
- Flow rate changed
- Turning off power to the enclosure
Operation of the 6000 series and component kit

**Operation**
The 6000 series consists of the control unit and user interface mounted in a 316L (UNS S31603) stainless steel Type 4X (IP66) enclosure with the pneumatic solenoid valve mounted on the unit. The EPV-6000 series relief vent is separate and is mounted to the enclosure. The 6000 series control unit is also available as a kit. The kit consists of the key components of the system, the control unit, and the user interface. It does not include the enclosure. The manifold is an optional item. The user interface includes a panel-mount bracket so that it can be panel mounted to the customer's enclosure. The pneumatic valve for the protective gas can be supplied by the customer. The EPV-6000 relief vent is still required.

The components of the 6000 series control unit are listed below:

- EPCU mounted in an explosion proof / flameproof enclosure
- I.S. user interface with display and cable
- I.S. termination board (not included with "CK" kit version)
- Manifold with I.S. solenoid valve (not included with "CK" kit version)
- Flush mount Type 4X IP66 fitting for protective gas supply to enclosure with tube attached
- Type 4X cable glands for I.S. wiring to I.S. inputs, vents, and temperature modules
- 3/4" pipe nipples for power wires
- 316L (UNS S31603) stainless steel Type 4X enclosure for the 6000 series controller. (Not included with the Component Kit.)

The components of the EPV-6000 vent:

- EPV-6000 vent with stainless steel spark arrestor screen
- 1½" lock nut with grounding lug and gasket for attachment of vent to customer's enclosure
- One 5 m (16.4 ft.), quick disconnect cable; for connection to I.S. termination board inside 6000 series control unit.

If ordering a stainless steel vent, an atmospheric reference kit is included.

The components of the 6000 series component kit are listed below:

- Control unit and explosion proof / flameproof enclosure
- 6000-UIC-01 user interface
- SMK-600-CK mounting hardware for 6000-UIC-01
- One 5 m (16.5 ft.), quick disconnect cable for 6000-UIC-01
- 6000-MAN-DV-01 pneumatic manifold w/solenoid (optional)
- EFC-6-SS flush mount connector

The 6000 series control unit and vent can be universally mounted to the customer's enclosure. Top, bottom, right-, or left-side mounting can be completed with only one control unit and vent. Mounting configuration does not need to be designated when ordering. One unit is used for enclosure sizes up to 7.2 m³ (250 ft³).

**Electronic power control unit – EPCU**
The EPCU houses the redundant microprocessors, enclosure power contacts, (2) auxiliary contacts, power supply module, galvanically isolated barriers for the inputs, vent(s), and temperature modules. The EPCU is easy to remove and install into the explosion proof enclosure that houses it.

The EPCU is available in 20 - 30 VDC or 100 - 250 VAC units. The enclosure power contacts are forced-guided safety relays. The auxiliary contacts can be user configured for different functions, depending on user requirements.

**User interface controller - UIC**
The 6000 series is user programmable for many of the configurable options available. This is done with the intrinsically safe user interface on the face of the unit, which can also be remote mounted. The user interface contains a 2 x 20 LCD that allows programming through a set of buttons on the menu driven unit. All configuration and options are programmed through this unit. There are also (5) LEDs for easy visual indication of operation:

- Safe pressure – This turns on (blue) when safe pressure is achieved inside the enclosure.
- Enclosure power – This is (red) when the enclosure power is off, and (green) when enclosure power is on. The enclosure power can be on only after a successful purge and a safe pressure is achieved. The bypass option allows power to remain on if safe pressure is lost.
• Rapid Exchange® – The rapid exchange or purging flow rate turns on (blue) when the flow rate is measuring proper flow.

• System bypass – This turns on (yellow) when the system bypass is active. This should be used only when the area around the enclosure is known to be safe.

• Alarm fault – The (red) LED blinks when any alarm input is detected and is solid when there is an internal system fault.

**Pneumatic manifold with I.S. solenoid**

• Manifold with I.S. solenoid valve: The manifold system is mounted on the 6000 control unit providing a needle valve to set enclosure pressure and an I.S. solenoid valve that is used for purging (Rapid Exchange). Power for the I.S. solenoid valve is provided by the EPCU and is galvanically isolated. Regulated instrument-grade air or nitrogen is required.

The 6000 series unit can be ordered without the manifold so that customers can use their own method or valves for purging and pressurization. If a third-party electronic valve is used, the valve must be certified and installed in accordance with the hazardous location where the unit is operating. The use of the 6000 series manifold unit allows easy and correct installation of the system.

**Requirements for purging/pressurization**

Certifications allow the 6000 series to be used on enclosures in gas, dust, or both gas and dust hazardous atmospheres. Gas atmospheres require the purging of the enclosure. Dust atmospheres require the physical removal of all the dust that collects inside. Both gas and dust atmospheres require the following: 1) removing the dust, 2) sealing the enclosure, and then 3) purging the enclosure.

After these sequences, the pressure within the enclosure is above the minimum level. The equipment within the enclosure can then be energized.

**Purging modes**

Purging start-up can be set in 3 different modes:

• STD – Standard mode requires the operator to enter enclosure volume and number of exchanges. Minimum purge time is 2 min of purging.

If the purge time must be held to a specific time, then the time is based on the known enclosure volume, number of volume exchanges, and flow rate through the vent. If the flow rate is below the required minimum, then the purging cycle will reset and will not start until the flow rate is above the selected rate. This set up does not allow purge flow to go below the value required and will not recalculate the time for purging if it goes above the required purge rate. This measurement method is the same type as was used in our previous system, the 4000 series. The actual time is calculated by the EPCU.

**Dynamic purge time**

Dynamic purge time allows the purge time to be updated based on the purge flow through the vent. This method is not dependent on a constant flow from the protective gas source. It bases the purge time on the measured flow and not a set flow. This is very useful when the protective gas supply pressure varies throughout the purging cycle or when it may vary from one installation to another.

The purge time will be based on the measurement of the vent and evaluation of this measurement from the EPCU. This allows recalculation of the time based on this measurement. During the dynamic purge time, the user-interface will display the purge time in a percentage starting with 0% and ending with 100% (purge time complete).

**Purging modes**

Purging start-up can be set in 3 different modes:

• STD – Standard mode requires the operator to enter enclosure volume and number of exchanges. Minimum purge time is 2 min of purging.

If the purge time must be held to a specific time, then the time is based on the known enclosure volume, number of volume exchanges, and flow rate through the vent. If the flow rate is below the required minimum, then the purging cycle will reset and will not start until the flow rate is above the selected rate. This set up does not allow purge flow to go below the value required and will not recalculate the time for purging if it goes above the required purge rate. This measurement method is the same type as was used in our previous system, the 4000 series. The actual time is calculated by the EPCU.

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Dynamic purge time allows the purge time to be updated based on the purge flow through the vent. This method is not dependent on a constant flow from the protective gas source. It bases the purge time on the measured flow and not a set flow. This is very useful when the protective gas supply pressure varies throughout the purging cycle or when it may vary from one installation to another.

The purge time will be based on the measurement of the vent and evaluation of this measurement from the EPCU. This allows recalculation of the time based on this measurement. During the dynamic purge time, the user-interface will display the purge time in a percentage starting with 0% and ending with 100% (purge time complete).

**Purging modes**

Purging start-up can be set in 3 different modes:

• STD – Standard mode requires the operator to
engage the manifold solenoid valve manually when purging and manually disengage when a successful purging is complete.

- **SA** – Semi-automatic mode requires the operator to engage the manifold solenoid valve manually when purging. The EPCU will automatically disengage when a successful purging is complete.

- **FA** – Fully-automatic mode will automatically engage the manifold solenoid valve when safe pressure is detected and will automatically disengage when a successful purging is complete. This is the factory default setting.

The minimum purge time is 1 minute.

During the purging cycle, when the enclosure pressure reaches 0.25” wc ([6.4 mm wc], (0.625 mbar), (62 pa)) or higher, there will be a 5 second delay before the rapid exchange solenoid valve is activated. If the flow is enough through the vent to satisfy the required flow rate setting, then the timer will begin after 1 min. The update of the timer is in increments of 1 min in the Fixed Purge Time and % completed in the Dynamic Purge Time.

### Pressure as Input

In the programming menu under "INPUT SETTINGS" for the optional pressure control. The pressure control is achieved within the enclosure by opening and closing a digital valve or manifold on the 6000 control unit. These two internal pressure set points can be controlled by the manifold or an outside source for pressure. The pressure function can manage the control outputs 1 or 2, or the control valve (manifold valve).

- The "ON PRESSURE" is the lowest pressure you want in the enclosure and will start the control action on when pressure goes below this value
- The "OFF PRESSURE" is when the valve shuts off. When the pressure is between these two values then nothing will happen
- The "ON PRESSURE" function is active until the "OFF PRESSURE" is reached

This function does not operate during purging cycle and only operates after purging and pressurization.

The "ON PRESSURE" always has to be lower than the "OFF PRESSURE". This cannot be reversed.

### I.S. Inputs 1 - 4

There are (4) intrinsically safe inputs for activation of various outputs and actions by the EPCU. These inputs only accept a dry contact for activation and are supplied by the EPCU's galvanically isolated barrier. The configurations of the inputs for various actions are done through the user-interface controller. Only one function can operate per input. The intrinsically safe inputs can be configured through the UIC to activate the auxiliary relays, energize the rapid exchange valve, de-energize the enclosure contacts, and shut the system down, as well as other actions and outputs. To monitor wiring, the SRM-6000 (Sensor Resistor Module, not required, ordered separately) can be added to detect shorts or breaks in the inputs' wiring to the contacts.

### Outputs

#### Enclosure 1 and Enclosure 2

There are (2) normally open dry contacts for the enclosure power that can be energized only after a successful purging and a minimum enclosure pressure is maintained. Loss of pressure will cause the contacts to de-energize unless the shutdown timer is activated or bypass mode is implemented. These contacts operate simultaneously.

#### Auxiliary 1 and Auxiliary 2

Also available are the Auxiliary 1 and Auxiliary 2 SPDT dry contact outputs. The auxiliary outputs are user configurable using the user-interface controller and can control various inputs or various conditions such as low pressure, loss of pressure, bypass implemented, Rapid Exchange valve on, enclosure above maximum pressure setting, etc. Both enclosure contacts and auxiliary contacts are forced-guided safety relays for functional safety.

Do not use auxiliary contact for power to enclosure(s).
If powering auxiliary equipment with auxiliary 1 or auxiliary 2 outputs, the wiring methods used must be suitable for the hazardous area.

**Temperature Inputs**

The 6000-TEMP-01 temperature hub and 6000-TSEN-01 external temperature sensor(s) are designed to work only with the 6000 Purge and Pressurization system.

An averaging or maximum temperature input reading from the sensor(s) is used to control a solenoid valve or activate the auxiliary relay to cool or heat the enclosure, or warn of temperature problems.

In the programming menu, under "SENSOR SETUP", "EXT SENSOR COUNT", you can configure up to 3 sensors per temperature hub. Each temperature hub has one embedded temperature sensor. In the programming menu under "INPUT SETTINGS" you will select the "HUB", this must be selected if you want to include the hub as a sensor input.

You may not want to include the temperature as an input if the sensor is not located near the device or process you are tracking the temperature of.

Once a "CONTROL ACTION" is selected, then select "SETPOINT TYPE" for the "AVERAGE" or "SINGLE PT".

If using more than one (1) sensor, you may want the control action to occur during the peak or average temperature of the sensors.

"ON SET POINT" and "OFF SET POINT" are the temperatures for the control action.

The "ON SET POINT" can be greater than the "OFF SET POINT"

**EPV-6000 I.S. relief vent**

The EPV-6000 vent exhausts excess pressure from the enclosure if the pressure within the enclosure is above 1.0" (25.4 mm) wc and measures flow and pressure during operation. The 6000 series vent has a pressure transducer and thermal flow sensor that is connected to the 6000 EPCU and is intrinsically safe through the galvanic isolation barrier within the EPCU. The measurement of the flow is always at the exhaust of the pressurized enclosure; therefore, the vent is located on the enclosure(s) such that it is venting to the atmosphere.

When using the complete 6000 series system, the vent is connected to the I.S. termination board using the M12 (V1) connector and cable that come with the vent. If using the 6000 series component kit, the vent is connected to the EPCU as shown in the diagram on page 19 (brown wire to terminal 2, blue wire to terminal 4, black wire to terminal 10, white wire to terminal 11). The EPV-6000 vent can be mounted vertically or horizontally and is not gravity dependent. For corrosive environments, the EPV-6000 vent can be ordered with a stainless steel cap so that the body of the vent can be mounted in the enclosure with only the stainless steel cap exposed to the outside environment.
Set-up procedures of 6000 series system

1. Ensure that electrical, mechanical, and pneumatic connections and requirements are met to operate this system. Please refer to this manual and standards for explanation of requirements.

2. Apply power to the 6000 series system.

3. (Step 3 is for initial set-up of the system.) The factory default of the 6000 control unit is SA. To adjust the programming of the system, please see page 31 (“Programming menu”) for instructions.

4. Verify that the "enclosure pressure control valve" stem is closed before applying pressure to the manifold.

5. Turn on the protective gas supply to the 6000 series system inlet on the manifold. Inlet pressure should be below 120 psig, (8.2 bar).

6. Larger cabinets may take longer to pressurize. Put the system in SA or STD mode for this procedure. Select the user interface display so that the enclosure pressure is showing. This should be reading less than 0.1 " wc [(2.54 mm wc), (.25 mbar), (24.9 Pa)]. Slowly open the needle valve until you can feel air venting at the exhaust. Do not exceed 1.5 " wc [(38.10 mm wc), (3.75 mbar), (374 Pa)].

7. If air is not exhausting at the vent, check for any obstructions or improper installation.

8. The system is ready to operate.

Operation of the 6000 series system

Gas hazardous location

• Follow “Set-up procedures of 6000 series system"
• Enclosure is sealed.
• Pressure is set to a value above a minimum of 0.25 " wc [(6.4 mm wc), (.625 mbar), (62 Pa)], or the set value from the user input.
• Depending on how the purging mode is selected, purging the enclosure is required.
• After a successful purging, with the pressure in the enclosure above 0.25 " wc [(6.4 mm wc), (.625 mbar), (62 Pa)], the enclosure is consider safe and power to the enclosure can be energized.
• If the safe pressure drops below 0.25 " wc [(6.4 mm wc), (.625 mbar), (62 Pa)], power to the enclosure will be disconnected unless a time delay for shutting off power is implemented (see the requirements for time delay of power shut off).

• To energize the enclosure again, repeat the procedure.

Dust hazardous location

• Enclosure must be cleaned out of all combustible dust. Purging can not be done to clean out enclosure of combustible dust.
• Enclosure is immediately sealed upon removal of combustible dust.
• Pressure is set to a value above a minimum of 0.65 " wc [(16.5 mm wc), (1.6 mbar), (162 Pa)], or the set value from the user input.
• With the pressure in the enclosure above 0.65 " wc [(16.5 mm wc), (1.6 mbar), (162 Pa)], the enclosure is consider safe and power to the enclosure can be energized.
• If the safe pressure drops below 0.65 " wc [(16.5 mm wc), (1.6 mbar), (162 Pa)], the power to the enclosure will be disconnected unless a time delay for shutting off power is implemented (see the requirements for time delay of power shut off).

• To energize the enclosure again, repeat the procedure.

Dust and gas hazardous location

• Enclosure must be cleaned out of all combustible dust.
• Enclosure is sealed.
• Pressure is set to a value above a minimum of 0.25 " wc [(6.4 mm wc), (.625 mbar), (62 Pa)], or the set value from the user input.
• Depending on how the purging mode is selected, purging the enclosure is required.
• After a successful purging, with the pressure in the enclosure above 0.25 " wc [(6.4 mm wc), (.625 mbar), (62 Pa)], the enclosure is consider safe and power to the enclosure can be energized.
• If the safe pressure drops below 0.25 " wc [(6.4 mm wc), (.625 mbar), (62 Pa)], power to the enclosure will be disconnected unless a time delay for shutting off power is implemented (see the requirements for time delay of power shut off).
• To energize the enclosure again, repeat the procedure.

The combination of dust and gas requires the cleaning and sealing of the enclosure to clear out the dust hazard(s) and purging the enclosure to clear out the gas hazard(s). After these sequences, the enclosure can be energized. However, the pressure during operation must be sufficient to keep out the worst case hazard in the atmosphere/environment. In this application, dust.

Refer to "Conditions of Safe Use"

Start up label located on 6000 series control unit

Model 6000 Type X / Ex px
250 CF / 7.2 CM Maximum Enclosure Volume

System Operation Instructions
1. With Pepperl+Fuchs Purging system air supply on
2. Apply power to the 6000 series control unit.
3. Follow set-up configuration in manual.
   For GAS only areas proceed to step 5
   For DUST only areas proceed to step 4, Omit step 7
   For both GAS and DUST areas proceed to step 4
4. Clean all dust inside of enclosure.
5. With enclosure sealed,
6. Set safe pressure (pressurization) with the control valve.
7. Start the purging by:
   a. FA - Fully automatic will start purging after a safe pressure is set, will automatically stop.
   b. SA - Semi-automatic purging initiated by activating keypad, will automatically stop.
   c. STD - Standard mode, purging starts and stops by activating Keypad.
      After flow rate is met, purging timer will count down until complete.
8. Power to the enclosure can be initiated.
9. Loss of pressure will automatically start the deenergizing of the enclosure power.
The user interface

To turn LCD back light on and off, press the left and right arrow keys at the same time. The setting remains through the power cycles.

To change the LCD contrast, press the up and down arrow keys at the same time. This will take you to the contrast screen. Then use the up and down arrow keys to adjust the contrast. Once the contrast level is selected, press the START/SET key to save setting. This setting remains through power cycles.
Programming menu

- SETUP
- PASSWORD
- PURGE SETTINGS
- UNITS
- INPUT SETTINGS
- OUTPUT SETTINGS
- PASSWORD
- LANGUAGE
- BYPASS CONTROL
- RESTORE DEFAULTS
Purge settings

<table>
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<th>Enclosure Volume</th>
<th>User Defined</th>
<th>Setting Correct Y/N</th>
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<tr>
<td></td>
<td>Numb of Exchanges</td>
<td>4 - 19</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
<td>Purge Flow</td>
<td>5</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
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<td>20</td>
<td>Setting Correct Y/N</td>
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<td></td>
<td>30</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dynamic</td>
<td>Setting Correct Y/N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ventr Flow Control</th>
<th>One Ventr</th>
<th>Setting Correct Y/N</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2 Vents Add Flows</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
<td>2 Vents Least Flow</td>
<td>Setting Correct Y/N</td>
</tr>
</tbody>
</table>

| Environment       | Gas, Dust, Both | Setting Correct Y/N |

<table>
<thead>
<tr>
<th>Pressures</th>
<th>Max Over Pressure</th>
<th>XX.XX</th>
<th>Setting Correct Y/N</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Low Pressure</td>
<td>XX.XX</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
<td>Min Over Pressure</td>
<td>XX.XX</td>
<td>Setting Correct Y/N</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Timers</th>
<th>Purge Timer</th>
<th>Read Only - Fixed Time.</th>
<th>Setting Correct Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shutdown Timer</td>
<td>0 - 300 Sec.</td>
<td>Setting Correct Y/N</td>
</tr>
<tr>
<td></td>
<td>Unlock Door Timer</td>
<td>0 - 300 Min.</td>
<td>Setting Correct Y/N</td>
</tr>
</tbody>
</table>

| Operation Mode    | Std, Sa, Fa       | Setting Correct Y/N |

| Units             | English or Metric | Setting Correct Y/N |

### Inputs

<table>
<thead>
<tr>
<th>INPUT SETTINGS</th>
<th>INPUT 1</th>
<th>INPUT 1 FUNCTION</th>
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<th>SETTING CORRECT Y/N</th>
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<tr>
<td></td>
<td></td>
<td>INPUT 1 FUNCTION</td>
<td>IMEDIATE SHTDN</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DOOR OPEN ALARM</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OVERLOAD</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CONTROL PWR RELAY</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CONTROL OUTPUT 1</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CONTROL OUTPUT 2</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CONTROL VALVE</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SYSTEM BYPASS</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SRM</td>
<td>SRM YES,NO</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INVERT INPUT</td>
<td>INVERT YES, NO</td>
<td>SETTING CORRECT Y/N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INPUT 2</th>
<th>INPUT 2 FUNCTION</th>
<th>DISABLED</th>
<th>SETTING CORRECT Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INPUT 2 FUNCTION</td>
<td>IMEDIATE SHTDN</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DOOR OPEN ALARM</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OVERLOAD</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CONTROL PWR RELAY</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CONTROL OUTPUT 1</td>
<td>SETTING CORRECT Y/N</td>
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<tr>
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<td></td>
<td>CONTROL OUTPUT 2</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CONTROL VALVE</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td>SRM</td>
<td>SRM YES,NO</td>
<td>SETTING CORRECT Y/N</td>
</tr>
<tr>
<td></td>
<td>INVERT INPUT</td>
<td>INVERT YES, NO</td>
<td>SETTING CORRECT Y/N</td>
</tr>
</tbody>
</table>
### INPUT 3
- **FUNCTION**: Disabled
- **SETTING CORRECT**: Y/N

- **FUNCTION**: Immediate SHTDN
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Door Open Alarm
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Overload
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control PWR
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control Output 1
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control Output 2
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control Valve
- **SETTING CORRECT**: Y/N

- **SRM**: SRM Yes, No
- **SETTING CORRECT**: Y/N

- **INVERT INPUT**: Invert Yes, No
- **SETTING CORRECT**: Y/N

### INPUT 4
- **FUNCTION**: Disabled
- **SETTING CORRECT**: Y/N

- **FUNCTION**: Immediate SHTDN
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Door Open Alarm
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Overload
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control PWR
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control Output 1
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control Output 2
- **SETTING CORRECT**: Y/N
- **FUNCTION**: Control Valve
- **SETTING CORRECT**: Y/N

- **SRM**: SRM Yes, No
- **SETTING CORRECT**: Y/N

- **INVERT INPUT**: Invert Yes, No
- **SETTING CORRECT**: Y/N
<table>
<thead>
<tr>
<th>Function</th>
<th>Setting</th>
<th>Y/N</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press as input</td>
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<tr>
<td>Press function</td>
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<td>OFF SET POINT</td>
<td>XX °F</td>
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<td>OUTPUT 1 FUNCTION</td>
<td>OUTPUT 2 FUNCTION</td>
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<td>DOOR OPEN ALARM</td>
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<td>OVERLOAD/TEMP ALARM</td>
<td>OVERLOAD/TEMP ALARM</td>
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<td>MAX PRESSURE ALARM</td>
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<td>ANNOUNCE PURGE</td>
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<td>ANY ALARM</td>
<td>ANY ALARM</td>
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<td>ENCL DOOR LOCK</td>
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<td>SYS BYPASS ALARM</td>
<td>SYS BYPASS ALARM</td>
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<td>TEMP INPUT 1 ALARM</td>
<td>TEMP INPUT 1 ALARM</td>
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<td>TEMP INPUT 2 ALARM</td>
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<th>SETTING CORRECT Y/N</th>
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Stats

- STATS
- STATISTICS
- ALARM
- FAULT
- CLEAR STATISTICS
- CLEAR FAULT
Statistics
This provides system operating information. These fields are read only.

- **STATISTICS**
- **TEMPERATURES**
- **HUB SENSOR STATS**
- **SENSOR 1 STATS**
- **SENSOR 2 STATS**
- **SENSOR 3 STATS**
- **MIN OVER PRESSURE**
- **MAX OVER PRESSURE**
- **MIN PURGE PRESSURE**

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>TEMPERATURES</th>
<th>HUB SENSOR STATS</th>
<th>CURRENT HUB TEMP</th>
<th>CURRENT HUB TEMP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>XXX °F</strong></td>
<td><strong>MAX HUB TEMP</strong></td>
<td><strong>MIN HUB TEMP</strong></td>
<td><strong>MAX HUB TEMP</strong></td>
<td><strong>MIN HUB TEMP</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SENSOR 1 Stats</th>
<th>SENSOR 1 TEMP</th>
<th>SENSOR 1 MAX TEMP</th>
<th>SENSOR 1 MIN TEMP</th>
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</thead>
<tbody>
<tr>
<td><strong>XXX °F</strong></td>
<td><strong>MAX TEMP</strong></td>
<td><strong>MIN TEMP</strong></td>
<td><strong>MAX TEMP</strong></td>
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<table>
<thead>
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<th>SENSOR 2 Stats</th>
<th>SENSOR 2 TEMP</th>
<th>SENSOR 2 MAX TEMP</th>
<th>SENSOR 2 MIN TEMP</th>
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<tbody>
<tr>
<td><strong>XXX °F</strong></td>
<td><strong>MAX TEMP</strong></td>
<td><strong>MIN TEMP</strong></td>
<td><strong>MAX TEMP</strong></td>
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<tr>
<th>SENSOR 3 Stats</th>
<th>SENSOR 3 TEMP</th>
<th>SENSOR 3 MAX TEMP</th>
<th>SENSOR 3 MIN TEMP</th>
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</thead>
<tbody>
<tr>
<td><strong>XXX °F</strong></td>
<td><strong>MAX TEMP</strong></td>
<td><strong>MIN TEMP</strong></td>
<td><strong>MAX TEMP</strong></td>
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</table>

- **MIN OVER PRESSURE**
- **MAX OVER PRESSURE**
- **MIN PURGE PRESSURE**

- **MIN OVER PRESSURE**
- **MAX OVER PRESSURE**
- **MIN PURGE PRESSURE**

X.XX IN WC
### Alarm
This provides the reason for the last system alarm.

<table>
<thead>
<tr>
<th>ALARM</th>
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<tbody>
<tr>
<td>NONE</td>
</tr>
<tr>
<td>NO SAFE PRESSURE</td>
</tr>
<tr>
<td>MAX PRESSURE</td>
</tr>
<tr>
<td>INPUT 1 BROKE/SHORT</td>
</tr>
<tr>
<td>INPUT 2 BROKE/SHORT</td>
</tr>
<tr>
<td>INPUT 3 BROKE/SHORT</td>
</tr>
<tr>
<td>INPUT 4 BROKE/SHORT</td>
</tr>
<tr>
<td>DOOR OPEN</td>
</tr>
<tr>
<td>IMMEDIATE SHUTDWN</td>
</tr>
<tr>
<td>OVERLOAD SHUTDWN</td>
</tr>
<tr>
<td>LOST FLOW</td>
</tr>
<tr>
<td>13 V</td>
</tr>
<tr>
<td>9.5 V</td>
</tr>
<tr>
<td>TEMP INPUT 1</td>
</tr>
<tr>
<td>TEMP INPUT 2</td>
</tr>
<tr>
<td>PRESSURE AS INPUT</td>
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### Fault
This provides the reason for the system fault.

<table>
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<tr>
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<tbody>
<tr>
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<td>CONTROL OUTPUT 1</td>
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<tr>
<td>CONTROL OUTPUT 2</td>
</tr>
<tr>
<td>CONTROL VALVE</td>
</tr>
<tr>
<td>ENCLOSURE POWER RELAY</td>
</tr>
<tr>
<td>INPUT 1</td>
</tr>
<tr>
<td>INPUT 2</td>
</tr>
<tr>
<td>INPUT 3</td>
</tr>
<tr>
<td>INPUT 4</td>
</tr>
<tr>
<td>13 VOLT POWER</td>
</tr>
<tr>
<td>9.5 VOLT POWER</td>
</tr>
<tr>
<td>FLOW READING</td>
</tr>
<tr>
<td>CONFIG STORAGE</td>
</tr>
<tr>
<td>VENT 1 UPDATE</td>
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<tr>
<td>CRC MISMATCH</td>
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<tr>
<td>VENT 2 UPDATE</td>
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<tr>
<td>VALVE</td>
</tr>
<tr>
<td>VENT 1 FLOW UPDATE</td>
</tr>
<tr>
<td>VENT 2 FLOW UPDATE</td>
</tr>
<tr>
<td>TEMPERATURE UPDATE</td>
</tr>
<tr>
<td>INTERNAL RAM</td>
</tr>
</tbody>
</table>
Clear statistics

CLEAR STATISTICS — CLEAR STATS Y OR N — SETTING CORRECT Y/N

Clear fault

CLEAR FAULT — CLEAR FAULT Y OR N — SETTING CORRECT Y/N

Operation screen

This provides the system information.

OPERATION SCREEN — MESSAGE SCREEN
— VENT 1 PRESSURE
— VENT 1 FLOW
— VENT 2 PRESSURE
— VENT 2 FLOW
System dimensions
6000 series control unit

EPV-6000 vent
6000 series component kit

EPCU with Ex enclosure

User interface with mounting bracket (panel mount)
User-interface without mounting bracket (external mount)

The user-interface can be mounted either inside or outside the pressurized enclosure using the dimensions in the two previous drawings above.

Do not make the opening any larger than indicated in the cutout. Install with the gasket provided (panel mount only).

Temperature hub

35 mm DIN rail or panel mounted
Temperature sensor
Solenoid

#1/4 - 20 UNC THD
9.5 mm (0.85") Deep
4 x

Needle Valve
screwdriver slot drive

30.0 mm
(1.20")

10.5 mm
(0.40")

38.0 mm
(1.50")

19.0 mm
(0.75")

1/4" NPT plugs

3/8" NPT outlet

3/8" NPT inlet

1/4" NPT plugs

121.5 mm
(4.80")

53.5 mm
(2.10")

21.0 mm
(0.85")

3/8" NPT inlet

3/8" NPT inlet

25.0 mm
(0.98")

38.0 mm
(1.50")

1/4" NPT plugs

53.5 mm
(2.10")

71.0 mm
(2.80")

76.0 mm
(3.00")

16.0 mm
(0.60")

24.0 mm
(0.90")

61.5 mm
(2.40")

14.5 mm
(0.57")

22.0 mm
(0.85")

10.5 mm
(0.40")

53.5 mm
(2.10")

20.5 mm
(0.80")

38.0 mm
(1.50")

19.0 mm
(0.75")

53.5 mm
(2.10")

22.0 mm
(0.85")

53.5 mm
(2.10")

24.0 mm
(0.95")

38.0 mm
(1.50")

19.0 mm
(0.75")

73.0 mm
(2.85")

3/8" NPT inlet

#1/4 - 20 UNC THD
8.0 mm (0.315") deep
c"sink 82° to Ø 10 mm (0.40")
4 x

98.0 mm
(3.85")

73.0 mm
(2.85")

50.0 mm
(1.95")

3/8" NPT outlet

3/8" NPT inlet

53.5 mm
(2.10")

12.5 mm
(0.49")

22.0 mm
(0.85")

22.0 mm
(0.85")

38.0 mm
(1.50")

22.0 mm
(0.85")

12.5 mm
(0.49")
General specifications

Enclosure volume: 7.2 m³ (250 ft³)

Number of volume exchange: 4 to 19

Hazardous environment: Gas, dust, or both

Operation mode for purging (rapid exchange valve)

STD: Manually ON and OFF
SA: Manually ON, automatically OFF
FA: Automatically ON and OFF

Electrical parameters

6000 series control unit

Power requirement:
AC version: 100 to 250 VAC/ 50-60 Hz / 0.2 A
DC version: 20 to 30 VDC / 0.6 A

Outputs:
ENC_1, ENC_2
Protected enclosure contacts: 8 A @ 240 VAC, resistive load
(Dry contacts (2) SPST N.O.) 8 A @ 24 VDC
AUX1 (output 1)
Auxiliary 1 contact output: 2 A @ 240 VAC, resistive load
(Dry contacts, SPDT) 2 A @ 24 VDC
AUX2 (output 2)
Auxiliary 2 contact outputs: 2 A @ 240 VAC, resistive load
(Dry contacts, SPDT) 2 A @ 24 VDC

Inputs:
Inputs 1,2,3,4: Contact input
5 VDC @ 2 mA, intrinsically safe

Temperature inputs:
6000-TEMP, intrinsically safe

Vent(s) EPV-6000:
Intrinsically safe connection via connector
Up to 2 vents can be connected

User Interface module:
Intrinsically safe connection via M8 (V31) connector
2x20 LCD backlight screen for menu driven set-up and operation

LED indication
Safe pressure: BLUE – Safe pressure is achieved
Enclosure power: GREEN – power on
Rapid exchange: BLUE – when purging is running
System bypass: YELLOW – when bypass is activated

Alarm fault:
RED blinking - any alarm input detected
RED solid – 6000 series system fault

I.S. solenoid valve output
Refer to drawing 116-013UL-112.
This can be found on our website, www.pepperl-fuchs.com

Operating conditions

Storage temp: -30 °C to +80 °C (-22 °F to +176 °F)
Operating temp:
6000 control unit: -20 °C to +60 °C (-4 °F to +140 °F)
EPV-6000 vent: -20 °C to +60 °C (-4 °F to +140 °F)

Pneumatic parameters

Protective gas requirement: Instrument grade air or inert gas
Pressure requirement:
20 to 120 psig (1.4 bar to 8.3 bar)
(138 kPa to 827 kPa)
(Filter + regulator not provided)

Safe pressure minimum:
Gas: 0.25" wc (6.4 mm wc)
(0.625 mbar) (62 Pa)
Dust: 0.65" wc (16.5 mm wc)
(1.6 mbar) (162 Pa)
Gas+dust: 0.65" wc (16.5 mm wc)
(1.6 mbar) (162 Pa)

Purging flow rate increment and minimum enclosure pressures at flow rate. Minimum purge time is 2 min:
5 SCFM @ 1.3" wc, (141 l/min @ 33 mm wc)
(3.3 mbar), (324 Pa)
12 SCFM @ 2.5" wc, (340 l/min @ 64 mm wc)
(6.3 mbar), (623 Pa)
20 SCFM @ 3.1" wc, (565 l/min @ 77 mm wc)
(7.1 mbar), (772 Pa)
30 SCFM @ 3.4" wc, (850 l/min @ 86 mm wc)
(8.5 mbar), (847 Pa)

Maximum flow rate measurement for enclosure size:

<table>
<thead>
<tr>
<th>Enclosure volume</th>
<th>Flow rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 ft³ (0.57 m³)</td>
<td>5, 12 SCFM</td>
</tr>
<tr>
<td>(141, 340 l/min)</td>
<td></td>
</tr>
<tr>
<td>20 to 30 ft³</td>
<td>5, 12, 20 SCFM (0.57 to 0.85 m³)</td>
</tr>
<tr>
<td>(141, 340, 565 l/min)</td>
<td></td>
</tr>
<tr>
<td>&gt; 30 ft³</td>
<td>5, 12, 20, 30 SCFM (0.85 m³)</td>
</tr>
<tr>
<td>(141, 340, 565, 850 l/min)</td>
<td></td>
</tr>
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</table>

Flow rate (pressurization):

<table>
<thead>
<tr>
<th>Enclosure volume</th>
<th>Flow rate (pressurization)</th>
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</thead>
<tbody>
<tr>
<td>0.01 SCFM (0.30 l/min)</td>
<td></td>
</tr>
<tr>
<td>@ 0.25*(5.6 l/mm) @ 0.75*</td>
<td></td>
</tr>
</tbody>
</table>

Inlet fitting to manifold:
3/8" tubing (included)
Outlet fitting from manifold: 3/8" bulkhead fitting (included)

**Mechanical specifications**

**6000 control unit**
- Protection class (all electronics): Type 4X, IP66 pending
- Weight: control unit: 25 lbs (11.4 kg)
- Power connections: 3/4" NPT male pipe (explosion proof seals required)
- I.S. input connections: Terminal connection inside 6000 series unit

**Material:**
- Enclosure: 316L (UNS S31603) stainless steel
- Manifold valve: Anodized 6082 aluminum
- Fittings: 316L (UNS S31603) stainless steel
- I.S. cable glands: M16 x 1.5 (5.5 - 10 mm) (4)

**Terminal blocks EPCU:**
- Power terminal block: Conductors 26-14 AWG (0.13 - 2.08 mm²), torque 5-7 in-lbs (0.6 to 0.8 Nm)
- I.S. terminal block: Conductors 28 - 16 AWG (0.08 - 1.31 mm²), torque 4 in-lbs (0.5 Nm)

**EPV-6000 relief vent**

**Flow rate measurement**
- Flow rate is measured in increments, 5, 12, 20, 30 SCFM & Dynamic,
  (141 l/min, 340 l/min, 565 l/min, 850 l/min, & Dynamic)
- Protection class: Mounting fitting Type 4X, IP66
- Weight: 3 lb (1.4 kg)
- Power connections: M12 (V1) pin connector, intrinsically safe
  (mating connector with cable comes with vent for connection to the control unit)
- Max cable length: 22 AWG (0.33 mm²) wire = 5 m (16.5 ft)
  Maximum run length 18.3 m (60 ft)
- Mounting: Mounting can be any orientation to the enclosure. Not dependent on gravity.
  1 ½" NPT knockout (0.2", 50.8 mm) hole, mounting with sealed nut

**Material:**
- EPV-6000-AA-__: Marine grade anodized 6061T6 aluminum
- EPV-6000-SS-__: Marine grade anodized 6061T6 aluminum

**Spark arrestor assembly:**
- Protected with 304 (UNS S30400) stainless steel spark arrestor screen. Cap is movable so that opening can be positioned downwards.

**User interface controller**
- Max cable length: 24 AWG (0.20 mm²) wire = 12.2 m (40 ft)

**Parts List**
- Control unit with housing
  - (1) 6000 control unit
  - (1) bracket for mounting control unit
  - (1) EFC-6-SS
  - (2) 3/8" stainless steel tube
  - (1) 3/8" male ferrule fitting
  - (4) ¼-20 flathead screws for mounting control unit to bracket
  - (4) ¼-20 round head
  - (4) Type 4X seal washer
  - (4) ¼-20 bolts
  - (1) EWN, enclosure warning nameplate
  - (1) Installation/operation manual
- EPV-6000 Vent
  - (1) EPV-6000 vent
    - (1) quick disconnect M12 (V1) cable 22 AWG (0.33 mm²), 5 m (16.5 ft.)
    - (1) reference fitting tubing kit (stainless steel version only)
- Component kit
  - (1) control unit
  - (1) explosion proof / flameproof enclosure
  - Bolts for mounting explosion proof / flameproof enclosure
  - Washers/nuts for mounting explosion proof / flameproof enclosure
  - (1) 6000-UIC-01 user interface
    - (1) SMK-600-CK mounting hardware for 6000-UIC-01
    - (1) quick disconnect M12 (V1) cable 24 AWG (0.20 mm²), 5 m (16.5 ft.) for 6000-UIC-01
    - (1) 6000-MAN-DV-01 pneumatic manifold w/solenoid
    - Mounting screws for 6000-MAN-DV-01
    - (1) EFC-6-SS flush mount connector

**User interface controller**
- Max cable length: 24 AWG (0.20 mm²) wire = 12.2 m (40 ft)
Certifications

**Complete Unit**

Class I, Division 1, Groups A, B, C, D T4
Class I, Zone 1, Groups IICT4
Intrinsically Safe when installed per 116-013UL-12

[Ex i] Associated Equipment
Class II, Groups E, F, G, Class III
Ex tD 21 T60 °C

-20 °C ≤ Ta ≤ 50 °C

Class I, Division 1, Groups A, B, C, D
Class I, Zone 1, Groups IICT4
Intrinsically Safe when installed per 116-013UL-12

[Ex i] Associated Equipment
Ex d [ib px] IIC T4

-20 °C ≤ Ta ≤ 60 °C

Il 2 GD Ex d [ib px] IIC T4 tD A21 IP6X T60 °C
Sira 09ATEX9337X

Ex d [ib px] IIC T4 tD A21 IP6X T60 °C
IECEx CSA09.0007X

**Component Kit**

Class I, Division 1, Groups A, B, C, D T4
Class I, Zone 1, Groups IICT4
Intrinsically Safe when installed per 116-013UL-12

[Ex i] Associated Equipment
Class I, Division 1, Groups A, B, C, D
Class I, Zone 1, Groups IICT 4
Intrinsically Safe when installed per 116-013UL-12

[Ex i] Associated Equipment
Ex d [ib px] IIC T4

-20°C ≤ Ta ≤ 60 °C

DEMKO 07ATEX 0705753X
Il 2 G Ex d [ib px] IIC T4
IECEx UL08.0003X
Model number designators

Control unit

6000 - DV - S2 - UN - WH - AC

AC - 100 - 250 V AC
DC - 20 - 30 V DC
WH - with stainless steel housing
XE - with increased safety terminal box
CK - component kit
XD - with Ex de couplings
S2 - Sil 2, IEC61508, standard
DV - digital solenoid valve
NV - no valve - digital valve

Vent

EPV - 6000 - AA - 01

01 - standard vent
02 - 2nd vent configuration
AA - anodized aluminum
SS - stainless steel
## Accessories

The following accessories are available for the 6000 series purge system

<table>
<thead>
<tr>
<th>Model number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFC-6-SS</td>
<td>Flush mount connector (included with unit)</td>
</tr>
<tr>
<td>CG-8</td>
<td>1/2&quot; cable gland</td>
</tr>
<tr>
<td>HR-SW00</td>
<td>Key switch (removable in one position)</td>
</tr>
<tr>
<td>SRM-6000</td>
<td>Short circuit, open circuit resistor module</td>
</tr>
<tr>
<td>6000-MAN-DV-01</td>
<td>I.S. manifold kit with solenoid valve</td>
</tr>
<tr>
<td>EWN-1</td>
<td>Warning metal tag</td>
</tr>
<tr>
<td>ETW-15</td>
<td>Temperature warning metal tag</td>
</tr>
<tr>
<td>6000-COUPLE-3/4-M20</td>
<td>3/4&quot; NPT female to M20 female coupler for conduit, Ex de rated, nickel-plated brass</td>
</tr>
<tr>
<td>6000-COUPLE-3/4-M25</td>
<td>3/4&quot; NPT female to M25 female coupler for conduit, Ex de rated, nickel-plated brass</td>
</tr>
<tr>
<td>6000-DCK-01</td>
<td>Explosion proof conduit seals for power EPCU and power to enclosure (1/2&quot; NPT). Sealing material included</td>
</tr>
<tr>
<td>6000-JCK-01</td>
<td>Explosion proof conduit seals for power EPCU and power to enclosure with junction box (3/4&quot; NPT). Sealing material included</td>
</tr>
<tr>
<td>6000-UIC-02</td>
<td>6000 user interface controller with bracket and cable</td>
</tr>
<tr>
<td>6000-ACC-514478</td>
<td>3/8&quot; stainless steel tubing for manifold connection. 64 mm (2.5&quot;) long, 2 pcs</td>
</tr>
<tr>
<td>6000-ACC-514479</td>
<td>Mounting bracket with mounting screws for 6000 control unit</td>
</tr>
<tr>
<td>6000-ACC-514480</td>
<td>Mounting bolts for bracket to enclosure and control unit to bracket. 4 pcs.</td>
</tr>
<tr>
<td>6000-ACC-514481</td>
<td>3/8&quot; filter and regulator with fitting for connection to 6000 series manifold</td>
</tr>
<tr>
<td>6000-ACC-514482</td>
<td>Atmospheric reference kit for mounting EPV-6000-AA vent inside enclosure</td>
</tr>
<tr>
<td>6000-ACC-514483</td>
<td>1 - 1/2&quot; locknut with ground and gasket for EPV-6000 vent mounted outside enclosure</td>
</tr>
<tr>
<td>6000-ACC-514484</td>
<td>1 - 1/2&quot; locknut without ground and gasket for EPV-6000 vent mounted inside enclosure</td>
</tr>
<tr>
<td>6000-ACC-514485</td>
<td>M12 vent cable for EPV-6000 with 4 I.S. tags</td>
</tr>
<tr>
<td>6000-TEMP-01</td>
<td>Temperature hub</td>
</tr>
<tr>
<td>6000-TSEN-01</td>
<td>Temperature sensor</td>
</tr>
</tbody>
</table>
Appendix
Supplement: NFPA 496 information

Enclosure & device design

Enclosure design requirements

1. All windows must be shatterproof and sized as small as possible.

2. All required markings must be placed on or near all enclosure doors and covers.

3. The enclosure must withstand an internal pressure of ten (10) inches (254 mm) of water without sustaining permanent deformation and resist all corrosive elements in the surrounding atmosphere.

4. All lightweight objects in the enclosure, such as paper or insulation, must be firmly secured.

5. The enclosure should be constructed from materials such as metal or anti-static polycarbonate to meet or exceed Type 4 or 12 performance requirements, but does not require third party approval.

6. The installation of obstructions or other barriers which block or impede the flow of protective gas must be avoided.

7. The creation of air pockets or other areas which trap flammable gases within the enclosure or devices must be avoided.

8. The enclosure should be located in an area where impact hazards are minimal.

9. If the enclosure is nonmetallic and contains equipment which utilizes or switches power loads greater than 2500 A, it must be constructed from substantially noncombustible materials, such as materials designed to meet or exceed ANSI/UL94 ratings of 94 V-0 or 94 5 V.

Adjacent enclosures

1. Adjacent enclosures must be protected by one of the following means:
   a. purged or pressurized in series with the protected enclosure;
   b. purged or pressurized separately; or
   c. protected by other means; e.g., explosion proof enclosures, hermetically sealed devices, or intrinsically safe circuits.

2. Adjacent purged or pressurized enclosures must be designed to meet all construction requirements above.

Total Volume Calculation

1. The total volume of all pressurized enclosures, devices and wireways must be considered.

2. All enclosure, device, and wireway volumes must be calculated without consideration of internally consumed space.

NFPA 496 defines the enclosure volume for generators, motors, and other rotating electric machinery to be the volume within the enclosure minus the volume of the internal components, e.g., rotors, stators, and field coils.

Device ventilation

1. Enclosed devices within the protected enclosure which do not exceed 20 cm³ (1.22 in³) of free volume do not require ventilation to the protected enclosure.

2. If the free volume of an internal device exceeds 20 cm³ (1.22 in³), it must be protected by one of the following means:
   a. ventilated on the top and bottom sides with 6.45 cm³ (one [1] square inch) of opening for each 6555 cm³ (four hundred [400] in³) of volume within the internal protected enclosure, at a minimum diameter of 6.4 mm (one [1] quarter in. [1/4”]);
   b. purged in series with the protected enclosure or be purged separately; or
   c. protected by other means; e.g., explosion proof enclosures, hermetically sealed devices, or intrinsically safe circuits.

Temperature limitations

1. The enclosure must have no surface area which exceeds 80 percent of the flammable or ignitable substance’s auto-ignition temperature.

2. Internal devices which exceed this temperature must be protected by one of the following manners:
   a. the device is enclosed in a chamber which is cUL or FM listed as a hermetically sealed device which prohibits the entrance of flammable or ignitable substance, and maintains a surface temperature below temperature limits;
   b. it can be proven by testing that the devices will not ignite the substance involved;
   c. the device is purged in a separate enclosure that bears an ETW (Enclosure Temperature Warning Note)
nameplate). Devices may only be accessed after power has been removed and the device has been allowed to cool to a safe temperature, or the area is positively known to be nonhazardous.
Establishing connection sizes, lengths & bends

Typical single protected enclosure connections with vent

![Diagram of a single protected enclosure connection with vent](image)

<table>
<thead>
<tr>
<th>Model 6000</th>
<th>System supply tubing</th>
<th>Enclosure supply</th>
<th>Multi - enclosure connections</th>
<th>Optional remote venting</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Tubing or pipe diameter</em></td>
<td>1/2&quot; O.D. tubing or 1/2&quot; I.D. piping</td>
<td>3/8&quot; O.D. tubing</td>
<td>1-1/2&quot; I.D. pipe fully reamed</td>
<td>1-1/2&quot; I.D. pipe fully reamed</td>
</tr>
<tr>
<td>Tubing and pipe must be fully reamed</td>
<td>Maximum tubing / pipe length and maximum number of bends / elbows</td>
<td>6.1 m (20 feet) 10 bends</td>
<td>6.1 m (20 feet) 5 bends</td>
<td>3.1 m (10 feet) 5 elbows</td>
</tr>
</tbody>
</table>

*Smaller tubing and longer lengths allowed but flow will be decreased

**NOTE:** Tube and pipe sizes are trade sizes and are NOT equal in inside diameter. **DO NOT** substitute tube for pipe with the same trade size.

Typical multiple protected enclosure connections

![Diagram of multiple protected enclosure connections](image)

Helpful hints

To ensure adequate protective gas flow to the protected enclosure(s), all piping and tubing must be fully reamed. Precautions must be taken to prevent crimping and other damage to protective gas piping and tubing.

When protecting multiple enclosures with a single enclosure protection system, the enclosures should be connected in series from the smallest to the largest to ensure adequate protective gas flow.

Flow rate will also be dependant on the regulated pressure source.
Programming worksheet

<table>
<thead>
<tr>
<th>SETUP</th>
<th>PASSWORD</th>
<th>PURGE SETTINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCLOSE VOLUME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(XXX FT³ [M³])</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUMB OF EXCHANGES</td>
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<td></td>
</tr>
<tr>
<td>(5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PURGE FLOW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(12)</td>
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<td></td>
</tr>
<tr>
<td>USER DEFINED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 (141 L/M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (340 L/M)</td>
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<td></td>
</tr>
<tr>
<td>20 (565 L/M)</td>
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<tr>
<td>30 850 L/M)</td>
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<tr>
<td>DYNAMIC</td>
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<tr>
<td>VENT FLOW CONTROL</td>
<td></td>
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<tr>
<td>(ONE VENT)</td>
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<td></td>
</tr>
<tr>
<td>ONE VENT</td>
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<td></td>
</tr>
<tr>
<td>2 VENTS ADD FLOWS</td>
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<td></td>
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<tr>
<td>2 VENTS LEAST FLOW</td>
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<tr>
<td>2 VENTS SIL</td>
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</tr>
<tr>
<td>ENVIRONMENT</td>
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<tr>
<td>(GAS)</td>
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<td>GAS, DUST, BOTH</td>
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<td>PRESSURES</td>
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<tr>
<td>MAX OVER PRESSURE</td>
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<tr>
<td>(4.0 IN WC [10 MBAR])</td>
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<tr>
<td>LOW PRESSURE</td>
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<tr>
<td>(4.0 IN WC [10 MBAR])</td>
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<tr>
<td>MIN OVER PRESSURE</td>
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<tr>
<td>(0.25 IN WC [0.63 MBAR])</td>
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<tr>
<td>TIMERS</td>
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<td>PURGE TIMER</td>
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<td>READ ONLY - FIXED TIME</td>
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<td>SHUTDOWN TIMER</td>
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<td>(0 SEC.)</td>
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<tr>
<td>UNLOCK DOOR TIMER</td>
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<tr>
<td>(0 MIN)</td>
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<tr>
<td>UNLOCK DOOR TIMER</td>
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<tr>
<td>0 - 300 SEC.</td>
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<tr>
<td>0 - 300 MIN.</td>
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<td>OPERATION MODE</td>
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<tr>
<td>STD, SA, FA</td>
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<td>UNITS</td>
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<td>(ENGLISH)</td>
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<tr>
<td>ENGLISH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>METRIC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
--- INPUT 3 --- INPUT 3 FUNCTION (DISABLED) --- DISABLED ---

--- INPUT 3 FUNCTION --- IMMEDIATE SHTDN

--- SRM (NO) --- YES, NO

--- INVERT INPUT (NO) --- YES, NO

--- INPUT 4 --- INPUT4 FUNCTION (DISABLED) --- DISABLED ---

--- INPUT 4 FUNCTION --- IMMEDIATE SHTDN

--- SRM (NO) --- YES, NO

--- INVERT INPUT (NO) --- YES, NO
ARROW KEY SEQUENCE - 4 TO 8 STROKES EACH

<table>
<thead>
<tr>
<th>SETUP PASSWORD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYPASS PASSWORD</td>
</tr>
</tbody>
</table>

DATE: ________________________________

NAME: ________________________________

Italicized items in parentheses are default settings

Additional charge for preconfiguration

(Vent orientation not required)

(Left hand mount is default)
Notes:
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