



INSTALLATION AND OPERATION MANUAL

6000 SERIES

PURGE/PRESSURIZATION SYSTEM



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.



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.



This symbol accompanies a list of tools you will need to install the unit.



Note

Grounding points internal and external will be identified with a ground symbol:



This symbol is used for AC power: ~

This symbol is used for DC power: ---

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68307 Mannheim
Germany

General Instructions regarding ATEX

1. The guidelines

The guideline 2014/34/EU 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 in 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 2014/34/EU.

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

3. Responsibilities of users and installers



This equipment shall only be used within its intended purpose. Refer to the manual for proper usage.

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.

4. General information about pressurized enclosures

The pressurized enclosure is one of the most multifunctional applicable types of protection. It is based on a first flush operation which removes potential, ignitable gas mixtures of the local environment from the enclosure. After the flush, the overpressure will be maintained by adding as much pressurized air as necessary to compensate for the leaks of the enclosure or components. This constant overpressure 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 applications with hazardous dust, the purge process is omitted because purging would raise explosive dust. Instead of pre-purging, the interior of the housing is inspected for dust and cleaned manually if dust is present.

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 of Ex p:

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



When using an inert gas like nitrogen, an asphyxiation hazard can exist.



EN 60079-2 and IEC 60079-2 do not cover both gas and dust hazard atmospheres. The 6000 system provides a solution for both at the same time but would have to be evaluated by the certification bodies for approval.

Certification Information

PEPPERL+FUCHS

68307 Mannheim, Germany www.pepperl-fuchs.com

Model 6000-DV-S2-UN-WH-AC

450 CF / 12.75 CM Max. Encl. Volume



Class I, Division 1, Grp's A, B, C, D
Class I, Zone 1, Grp IIC, T4
-20°C ≤ Ta ≤ 60°C
Class II, Division 1, Grp's E, F, G
Class II, Zone 21, Grp IIIC T60°C
-20°C ≤ Ta ≤ 50°C
[Ex i] Associated Equipment / Materiel associe
Ex db ib [ib Gb] [pxb Gb] IIC T4 Gb (-20°C ≤ Ta ≤ 60°C)
Ex ib tb [ib Db] [pxb Db] IIIC T60°C Db (-20°C ≤ Ta ≤ 50°C)
Refer to installation drawing 116-B027A

IP66 / Type 4X



II 2 G Ex db ib [ib Gb] [pxb Gb] IIC T4 Gb -20°C ≤ Ta ≤ 60°C
II 2 D Ex ib tb [ib Db] [pxb Db] IIIC T60°C Db -20°C ≤ Ta ≤ 50°C
DEMKO 07ATEX0705753X



Ex db ib [ib Gb] [pxb Gb] IIC T4 Gb -20°C ≤ Ta ≤ 60°C
Ex ib tb [ib Db] [pxb Db] IIIC T60°C Db -20°C ≤ Ta ≤ 50°C
IECEX UL 08.0003X

EPCU Power: 100-250V ~ 0.2A, 50-60Hz
UK CA 2503 UL21UKEX2015X

PURGE CONTROL FOR USE IN HAZARDOUS LOCATIONS IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD FOR PURGED AND PRESSURIZED ENCLOSURES FOR ELECTRICAL EQUIPMENT NFPA 496-2013.

Marking for the 6000 Control unit:

6000-__-S2-UN-WH-__ and 6000-__-S2-__-XD-__

PEPPERL+FUCHS

68307 Mannheim, Germany www.pepperl-fuchs.com

Model 6000-UIC-XX

Type X / Ex px
450 CF / 12.75 CM Max. Encl. Volume

UL 21UKEX2015X
II 2 G Ex ib [pxb Gb] IIC T4 Gb
II 2 D Ex ib [ib Db] [pxb Db] IIIC T135°C Db
-20°C ≤ Ta ≤ 60°C
Ex i intrinsically safe
Ex i [pxb Gb] IIC T4 Gb
Ex ib [pxb Db] IIIC T135°C Db
Refer to installation drawing 116-B027

CL I, Div 1, Grp A, B, C, D CL I, Zn 1, Grp IIC T4 -20°C ≤ Ta ≤ 60°C
Ex i intrinsically safe; refer to installation drawing 116-B027A
Part of DEMKO 07ATEX 0705753X Part of IECEx UL 08.0003X
Part of CML UL21UKEX2015X II 2 G Ex ib [pxb Gb] IIC T4 Gb
See main label on Model 6000 unit or 6000-CK kit. Ex ib [pxb Gb] IIC T4 Gb

Marking for the 6000 user interface controller, 6000-UIC-01

Model 6000-ISB-01

Class I, Div 1, Grp A,B,C,D

Class I, Zone 1, Grp IIC T4

Intrinsically safe when installed per 116-B027A

Ex i Intrinsically Safe

See main lbl on Model 6000 unit or 6000-CK kit

Part of DEMKO 07 ATEX 0705753X

Part of UL21UKEX2015X

Part of IECEx UL 08.0003X

CE 0539 Ex Ex ib [pxb Gb] IIC T4 Gb
II 2 G Ex ib [pxb Gb] IIC T4 Gb
II 2 D Ex ib [ib Db] [pxb Db] IIIC T4 Gb
-20°C ≤ Ta ≤ 60°C

Marking for the 6000-ISB-__ termination board,
DIN mounted

Class I, Division 1, groups A, B, C, D
Class II, Division 1, groups E, F, G, Class III
Class I, Zone 1, Group IIC T4 / Zone 21, Group IIIC
Intrinsically Safe if installed per 116-B027A Ex i
See main label on Model 6000 control unit
Part of DEMKO 07 ATEX 0705753X
II 2 G Ex ib IIC T4 Gb / II 2 D Ex ib IIIC T210°C Db
Part of IECEx UL 08.0003X
Ex ib IIC T4 Gb / Ex ib IIIC T210°C Db
Part of UL21UKEX2015X
Part of TÜV 22.1421 X

-20°C ≤ Ta ≤ 100°C

Marking for the 6000-TSEN-01

PEPPERL+FUCHS
68307 Mannheim, Germany www.pepperl-fuchs.com
6000-DV-S2-UN-CK-AC
450 CF / 12.75 CM Maximum Enclosure Volume IP66/Type 4X

Class I, Division 1, Grp's A, B, C, D
Class I, Zone 1, Grp IIC, T4
Class II, Division 1, Grp's E, F, G
Class II, Zone 21, Grp IIIC T60°C
-20°C ≤ Ta ≤ 60°C
[Ex i] Associated Equipment
Ex db [ib Gb] [pxb Gb] IIC T4 Gb (-20°C ≤ Ta ≤ 60°C)
Ex ib [ib Db] [pxb Db] IIIC T60°C Db (-20°C ≤ Ta ≤ 50°C)
Refer to installation drawing 116-B027A
Warning: Conduit seals must be within 18 in. of enclosure.
Disconnect power before servicing.
Attention: Joints de conduits doivent être dans 18 de l'enceinte. Débrancher l'alimentation avant l'entretien.

UK CA 2503 Ex CE 0539
UL21UKEX2015X
II 2 G Ex db [ib Gb] [pxb Gb] IIC T4 Gb
II 2 D Ex ib [ib Db] [pxb Db] IIIC T60°C Db
-20°C ≤ Ta ≤ 60°C DEMKO 07ATEX 0705753X
Ex db [ib Gb] [pxb Gb] IIC T4 Gb
Ex ib [ib Db] [pxb Db] IIIC T60°C Db
-20°C ≤ Ta ≤ 60°C IECEx UL 08.0003X
EPCU Power: 100-250V ~ 0.2A, 50-60Hz

PURGE CONTROL FOR USE IN HAZARDOUS LOCATIONS IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD FOR PURGED AND PRESSURIZED ENCLOSURES FOR ELECTRICAL EQUIPMENT NFPA 496-2013.

Marking for the 6000 control unit, 6000-__-S2-__-CK-__

PEPPERL+FUCHS

68307 Mannheim, Germany www.pepperl-fuchs.com

Model EPV-6000-SS-01

Type X / Ex px

450 CF/12.75 CM Max. Encl. Volume



Class I, Division 1, Grp's A, B, C, D
Class I, Zone 1, Grp IIC T4
Class II, Division 1, Grp's E, F, G
Class II, Zone 21, Grp IIIC T135°C
-20°C ≤ Ta ≤ 60°C
Ex i intrinsically safe

Ex ib [pxb Gb] IIC T4 Gb
Ex ib [pxb Db] IIIC T135°C Db
Refer to installation drawing 116-B027



DEMKO 15ATEX 1622X
II 2 G Ex ib [pxb Gb] IIC T4 Gb
II 2 D Ex ib [pxb Db] IIIC T135°C Db
-20°C ≤ Ta ≤ 60°C



IECEX UL 15.0147X
Ex ib [pxb Gb] IIC T4 Gb
Ex ib [pxb Db] IIIC T135°C Db
-20°C ≤ Ta ≤ 60°C



UL21UKEX2016X IP66/Type 4X

Marking for the 6000 vent, EPV-6000-__-__

Class I, Division 1, Groups A, B, C, D
Class I, Zone 1, Group IIC T4
Intrinsically Safe when installed
per 116-B027A Ex i
See main label on Model 6000
control unit
Part of DEMKO 07 ATEX 0705753X
II 2 G Ex ib [ib Gb] IIC T4 Gb
Part of IECEx UL 08.0003X
Ex ib [ib Gb] IIC T4 Gb
Part of UL21UKEX2015X
Part of TÜV 22.1421 X

-20°C ≤ Ta ≤ 60°C

Marking for the 6000-TEMP-01



6000 控制器
生产地: 美国

Ex db ib [ib Gb] [pxb Gb] IIC T4 Gb
Ex ib tb [ib Db] [pxb Db] IIIC T60°C Db



KOSHA 14-AV4BO-0083
Ex d [ib px] IIC T4

Marking for CCC approvals for the 6000 Control unit:

6000-__-S2-UN-WH-__

Warning Labels



WARNING - For US/Canadian applications, conduit seals or the 6000-CC-3/4NPT plug must be within 18" (457.2 mm) of the internal explosionproof/flameproof enclosure, or within 15.25" (387.3 mm) from the end of the conduit supplied with the 6000 unit. For ATEX/IECEx Zone applications, the conduit must be sealed directly at the wall of the explosionproof/flameproof enclosure or immediately at the end of the conduit supplied with the 6000 unit.



WARNING - FOR ENCLOSURES IN HAZARDOUS DUST ENVIRONMENTS

This enclosure shall not be opened unless the area is known to be free of flammable materials or unless all devices have been de-energized. Power must not be restored after the enclosure has been opened until combustible dusts have been removed and the enclosure repressurized.



WARNING - FOR ENCLOSURES IN HAZARDOUS GAS ENVIRONMENTS

This enclosure shall not be opened unless the area is known to be free of flammable materials or unless all devices have been de-energized. Power must not be restored after the enclosure has been opened until the enclosure is completely purged of all hazardous gas and the enclosure repressurized.



WARNING - FOR ENCLOSURES IN HAZARDOUS DUST AND GAS ENVIRONMENTS

This enclosure shall not be opened unless the area is known to be free of flammable materials or unless all devices have been de-energized. Power must not be restored after the enclosure has been opened until combustible dusts have been removed and completely purged of all hazardous gas and the enclosure repressurized.

Specific Conditions of Use

- Conduit seals shall be certified in type of explosion protection flameproof "db", or explosion-proof Class I/II Div 1 as required for the installation location and suitable for the conditions of use. They shall be correctly installed to the explosion-proof/flameproof enclosure or conduit extensions as required. All NPT threads are to be minimum 5 thread engagement, wrench tight.
- For US/Canadian applications, conduit seals or the 6000-CC-3/4NPT plug must be within 18" (457.2 mm) of the internal explosionproof/flameproof enclosure, or within 15.25" (387.3 mm) from the end of the conduit supplied with the 6000 unit. For ATEX/IECEx Zone applications, the conduit must be sealed directly at the wall of the explosionproof/flameproof enclosure or immediately at the end of the conduit supplied with the 6000 unit.
- When the purge control unit is mounted to an enclosure, the complete unit shall be evaluated to the current revision of IEC/EN 60079-2 or NFPA 496 as applicable. See certificates and/or Declaration of Conformity for reference to relevant editions of these standards.
- The purge control unit has an operating temperature class of 135 °C (T4 temperature class). This temperature shall be considered when mounted to an enclosure.
- The device must be installed in accordance with the manufacturer's installation drawing 116-B027A.
- Intrinsically safe cables extending from the explosion-proof/flameproof "db" enclosure must be provided with at least 0.25 mm insulation thickness per conductive core to maintain segregation between intrinsically safe circuits.
- The cable entries may be used only in places where they are protected against the influence of mechanical danger.
- The non-metallic membrane touchpad and display is a potential electrostatic discharge hazard. Use only water damp cloth and allow to air dry for cleaning device. Do not use or install in high charge areas. See IEC 60079-32-1 for further information.
- In hazardous dust environment, regularly remove dust from the control unit enclosure to prevent excessive temperature rise, including the solenoid valve.
- Only pressure relief vent model EPV-6000-xx-xx covered under the following certificates can be used with devices covered by this certificate: For ATEX applications: Certificate No. DEMKO 15 ATEX 1622X and DEMKO 07 ATEX 0705753X. For IECEx applications: Certificate No. IECEx UL 15.0147X and IECEx UL 08.0003X. For cULus applications: UL certification as part of file E184741.
- For all applications, the 6000-TEMP-XX I.S. temperature hub must be mounted in an enclosure that is a minimum IP54. In hazardous dust environment, the 6000-TEMP-xx temperature hub has to be mounted in an enclosure that is certified for the area classification. The pressurized enclosure does not account for this type of enclosure because power to this device is required before safe operation within the pressurized enclosure. Maintain separation of I.S. to non-I.S. wiring as required by local codes.
- Caution must be used when handling or cleaning products so there is no static charge buildup. Do not wipe off the 6000-TSEN-xx sensor with dry cloth or use in the presence of high charge generating processes such as ionizers or electrostatic equipment. See IEC 60079-32-1 for further information.
- The 6000 systems may also be provided with previously certified items (operators, gable glands, terminal box, etc.) as specified in the test reports.
- Enclosure 6000-DPE-xx is only for I.S. termination board 6000-ISB-xx and/or 6000-TEMP-xx.

**I.S. Termination Board, DIN Mounted:
6000-ISB-xx**

- In hazardous dust environments, the I.S. termination board, DIN mounted: 6000-ISB-xx must be mounted in an enclosure that is certified for the area classification. The pressurized enclosure does not account for this type of enclosure because power to this device is required before safe operation within the pressurized enclosure.
- Only connect to the 6000 EPCU I.S. termination connection.
- All wiring to and from this board is for intrinsically safe connections and must be properly routed and managed per international, NEC, local codes, and applicable standards.
- See the latest revision of installation drawing 116-B027A for important installation information.

- The 6000-CBLA-... is not certified to be used in a Zone 21 location. Use approved cable glands for this area classification.

Note:

- Peripheral devices such as optional SRM module and I.S. solenoid were not evaluated by UL as part of the intrinsically safe certification.
- When using third-party certification, ensure that you match the entity parameters for intrinsically safe devices as shown in control drawing 116-B027A.
- SRM module is a simple apparatus and does not require third-party certification.

EPV-6000 Vent

- The EPV vent has an operating temperature class of 135°C (T4 temperature class). This temperature shall be considered when mounted to an enclosure.
- When the purge control unit is mounted to an enclosure, the complete unit shall be evaluated to IEC/EN 60079-2: 2014 (Ed. 6)
- Cables used to connect to an EPV- vent must be provided with at least 0.25 mm insulation thickness per conductive core to maintain segregation between intrinsically safe circuits.
- In hazardous dust environments, regularly remove dust from the EPV vent to prevent excessive temperature rise. See certificate for full information.
- In hazardous dust environments, the connector end of the vent shall be protected from direct exposure of a UV light source. See certificate for full information.

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 explosionproof/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 and 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, Class II, Division 1 / Zone 1, Zone 21. 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 explosionproof 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 setup 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 horizontally or vertically 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.

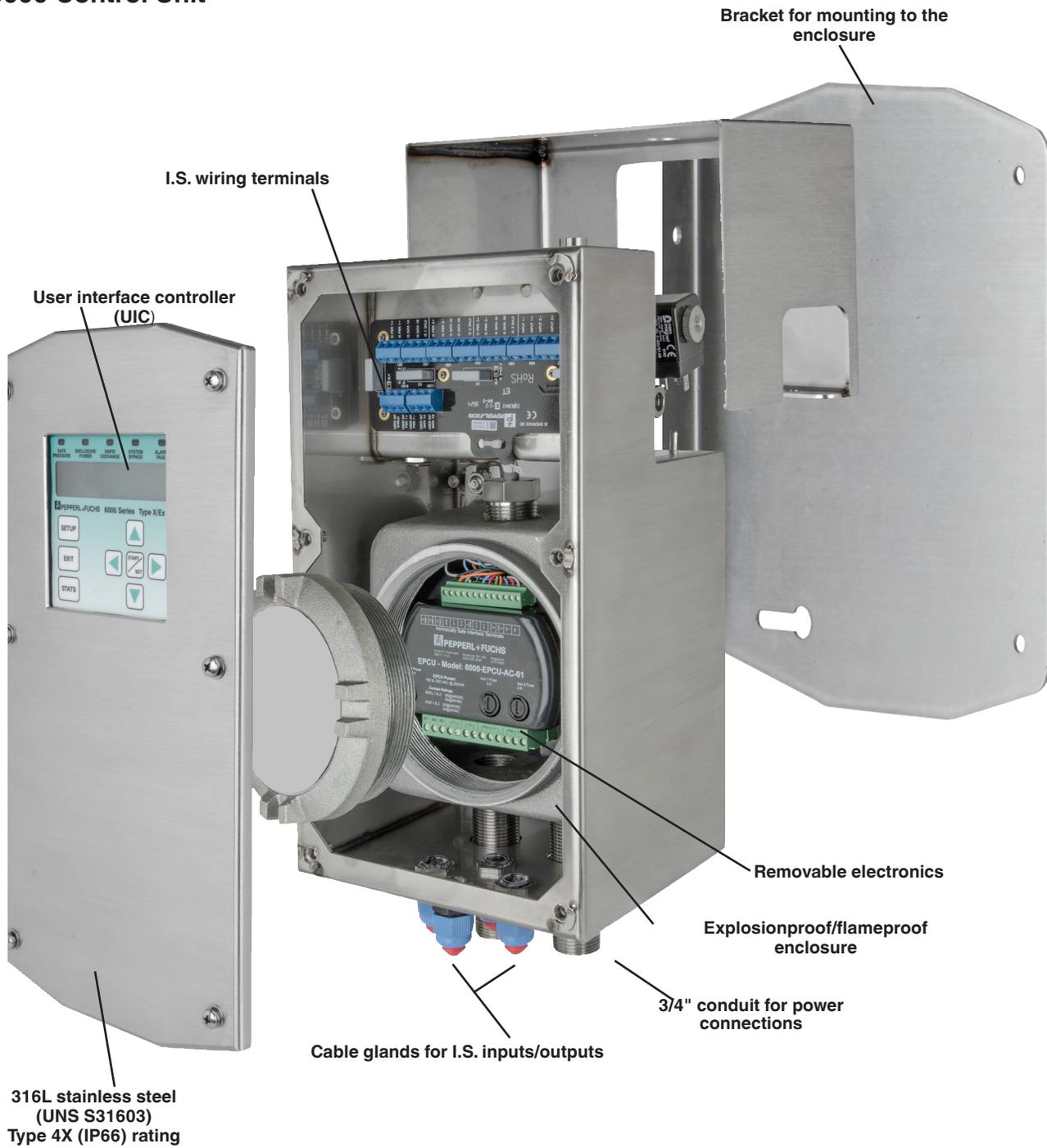


Note

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 startup.

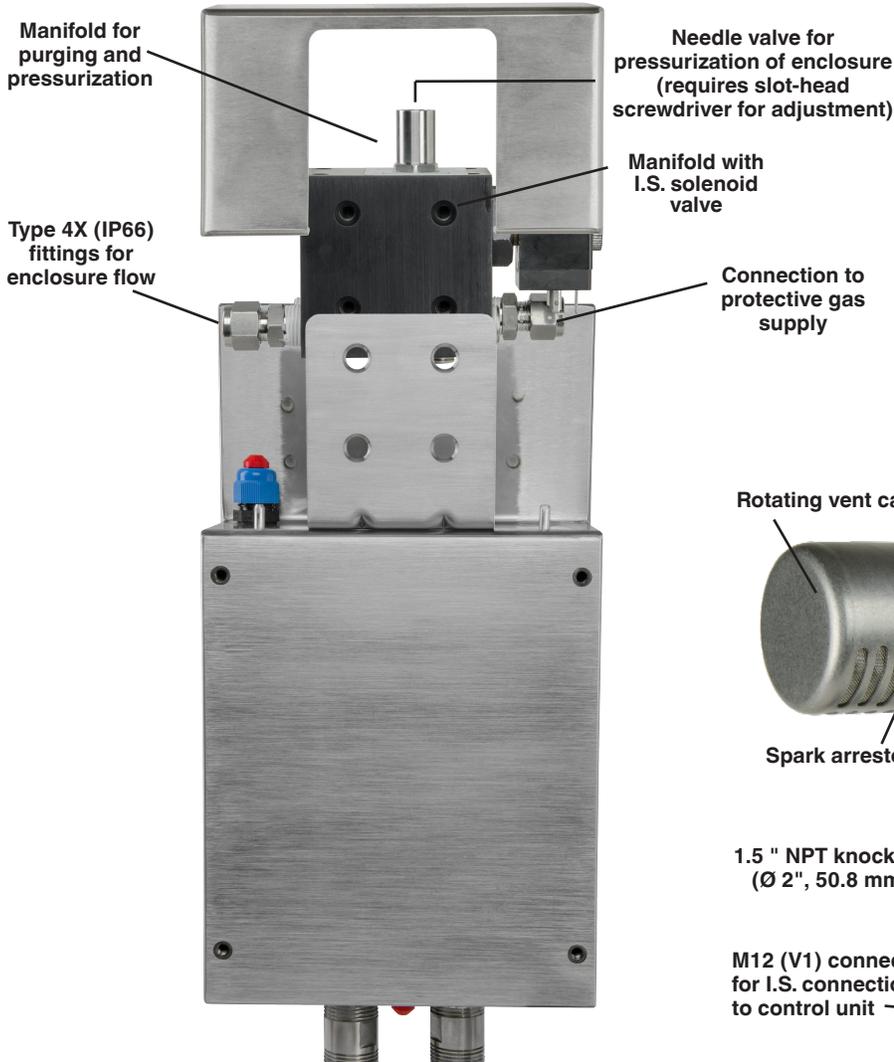
6000 Control Unit

Main Unit



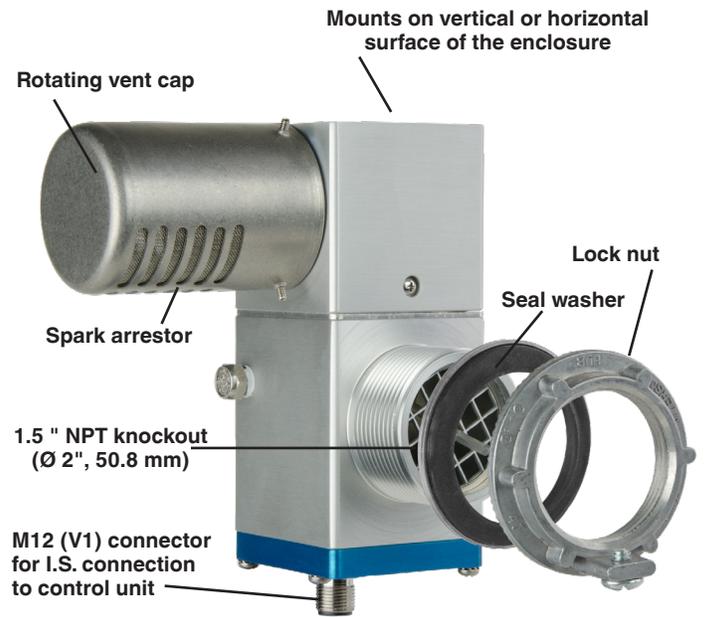
6000 Control Unit

Manifold



Vent

The EPV-6000 vent is required.



Temperature monitoring/control accessories



Conduit plug



Electrical and Pneumatic Diagrams

Complete 6000 full control unit power connections (-WH-) 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 .437" to .5" (11.1 mm to 12.7 mm). 
 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 0.2" to 0.27" (5 mm to 7 mm).
 7. Add extra wire length of 1.25" (31.75 mm) past top of opening in explosionproof/flameproof box to pluggable terminal block (allows connector to be moved out of the way when changing electronics. Prevents repouring seals).
 8. Wires are 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. For US/Canadian applications, conduit seals or the 6000-CC-3/4NPT plug must be within 18" (457.2 mm) of internal explosionproof/flameproof box, or within 15.25" (387.3 mm) from the end of the conduit supplied with the 6000 unit. For ATEX/IECEX Zone applications, the conduit must be sealed directly at the wall of the explosionproof/flameproof enclosure or immediately at the end of the conduit supplied with the 6000 series 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.
 13. Wire should be copper only, rated 90 °C minimum. Minimum of 0.25 mm wire insulation thickness required. 
 14. The minimum wire strand in a stranded wire should have a diameter of 0.1 mm or greater.
 15. The 6000-CC-3/4NPT plug is certified to be used only with the 6000 control unit's 3/4" nipples coming out of the housing. This plug is not certified to be used on any other hazardous location equipment. 
 16. Ensure that electrical, mechanical, and pneumatic connections and requirements are met to operate this system. Please refer to this manual and applicable standards/codes, including current edition of the EN/IEC 60079-14. Electrical supply to the purge system shall be supplied through a switch or circuit breaker and suitably located and easily reached and must be marked as the disconnect for the equipment.
 17. Power must be removed from the system when the Ex d enclosure cover is off, unless the area is known to be non-hazardous. 
- WARNING** – To prevent ignition of the flammable atmospheres, the wiring method must ensure that if any wire is disconnected and extended to the opposite terminal, a 2-inch separation must be maintained. 

I.S. wiring notes

For wires going to the explosionproof/flameproof box on the I.S. side:

1. The wire strip length is to be between 0.2" and 0.27" (5 mm and 7 mm). 
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 a 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), these wires must be either crimped to a single pin or grouped in an external junction box with one wire going into the terminal.



5. The wires must have a minimum insulation thickness of 0.01" (0.25 mm).
6. Add extra wire length of 1.25" (31.75 mm) past top of opening in explosion-proof/flameproof box to pluggable terminal block. (Allows connector to be moved out of the way when changing electronics. Prevents repouring seals.)



7. For US/Canadian applications, the conduit seal on I.S. wiring side must be within 18" (457.2 mm) of the explosionproof/flameproof enclosure. For ATEX/IECEX Zone applications, the conduit must be sealed directly at the wall of the explosionproof/flameproof enclosure.



8. Wire should be copper only, rated 90 °C minimum.
9. The minimum wire strand in a stranded wire should have a diameter of 0.1 mm or greater.

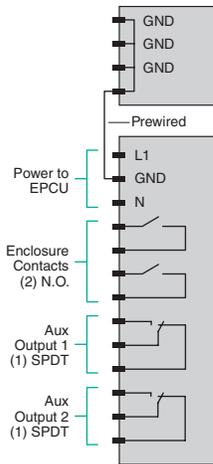
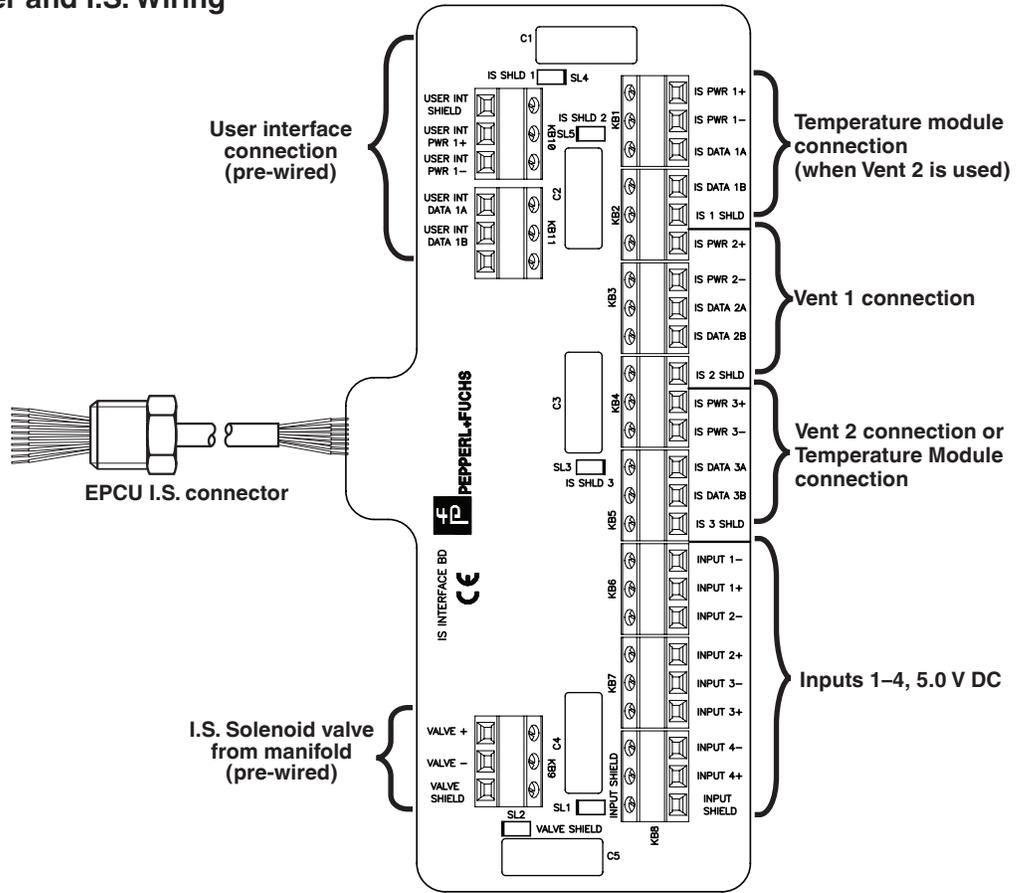
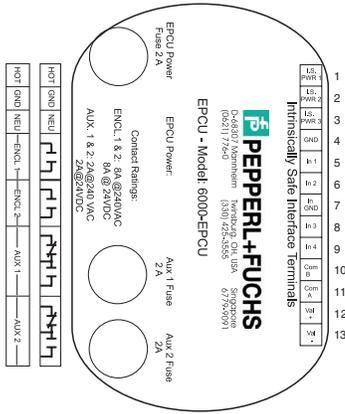
For wires going to the I.S. interface board in the main housing or to the DIN-rail-mount I.S. board:

1. The wire strip length is to be between 0.16" and 0.24" (4 mm and 6 mm).
2. The terminal blocks are rated for a wire size of 16 AWG (1.31 mm²) to 26 AWG (0.081 mm²).
3. The only terminals that might have multiple connections are the shield connections. These must be crimped to a single pin before connection to the board.
4. If cables are used (recommended for connections to the vents and UIC), it is recommended that the cables be shielded.
5. The wires must have a minimum insulation thickness of 0.01" (0.25 mm).



6. Wire should be copper only, rated 90 °C minimum.
7. The minimum wire strand in a stranded wire should have a diameter of 0.1 mm or greater.

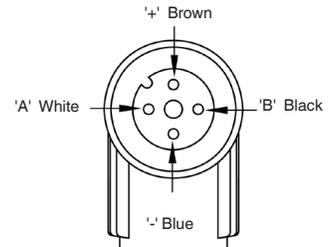
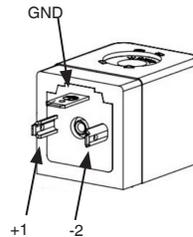
Electrical Installation: Power and I.S. Wiring



I.S. Solenoid valve from manifold (pre-wired)

Manifold connection

Vent connection



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)



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



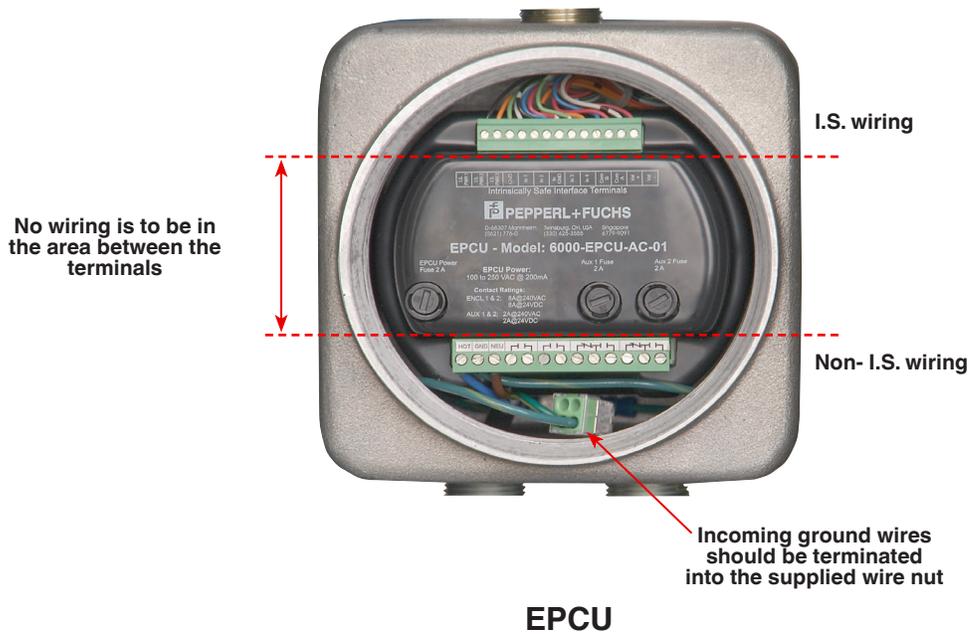
When removing the terminal block from the EPCU stack, place your hand on top of the plastic to support the stack when lifting the terminal block off the stack.



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



Both enclosure power contacts are switched at the same time.



WARNING: To prevent ignition of the flammable atmospheres, the wiring method must ensure that if any wire is disconnected and extended to the opposite terminal, a 2" (50.8 mm) separation must be maintained.



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

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.

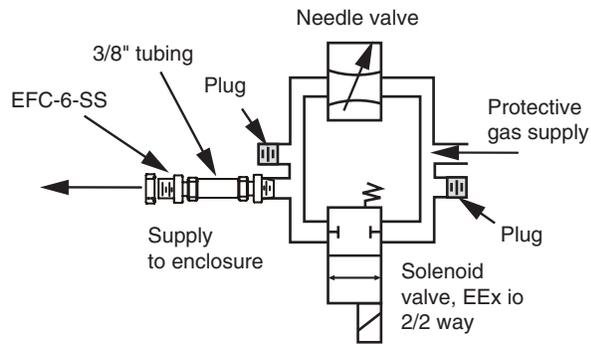
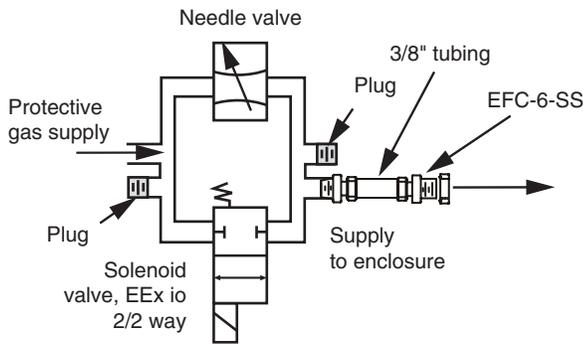
The protective gas supply provided must be able to handle the flow and pressure requirements for purging and pressurization. (See page 58, Establishing Connection Sizes, Lengths, and Bends.)

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 2" [50.8 mm]) 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 0.035" (0.9 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.



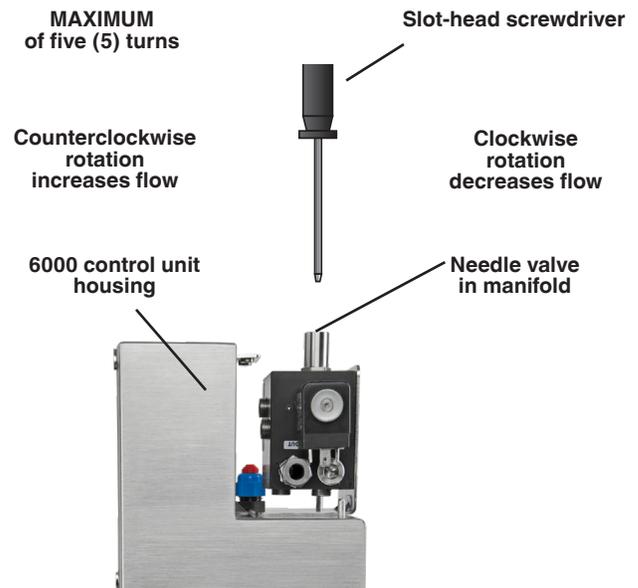
Pressurization adjustment

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

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

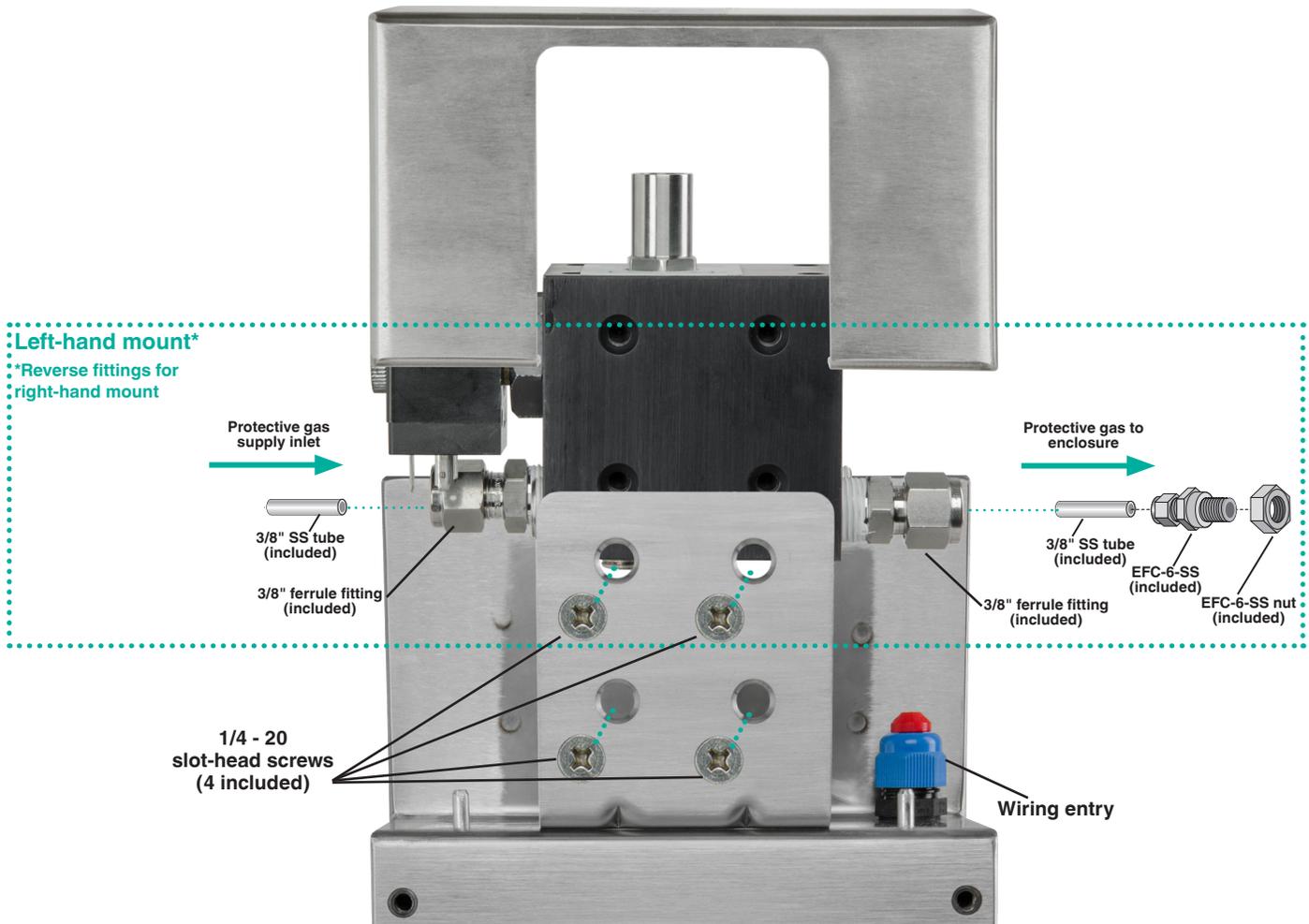
Note Unit must be powered to get a pressure reading.

Note 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 or Right-Hand Mount

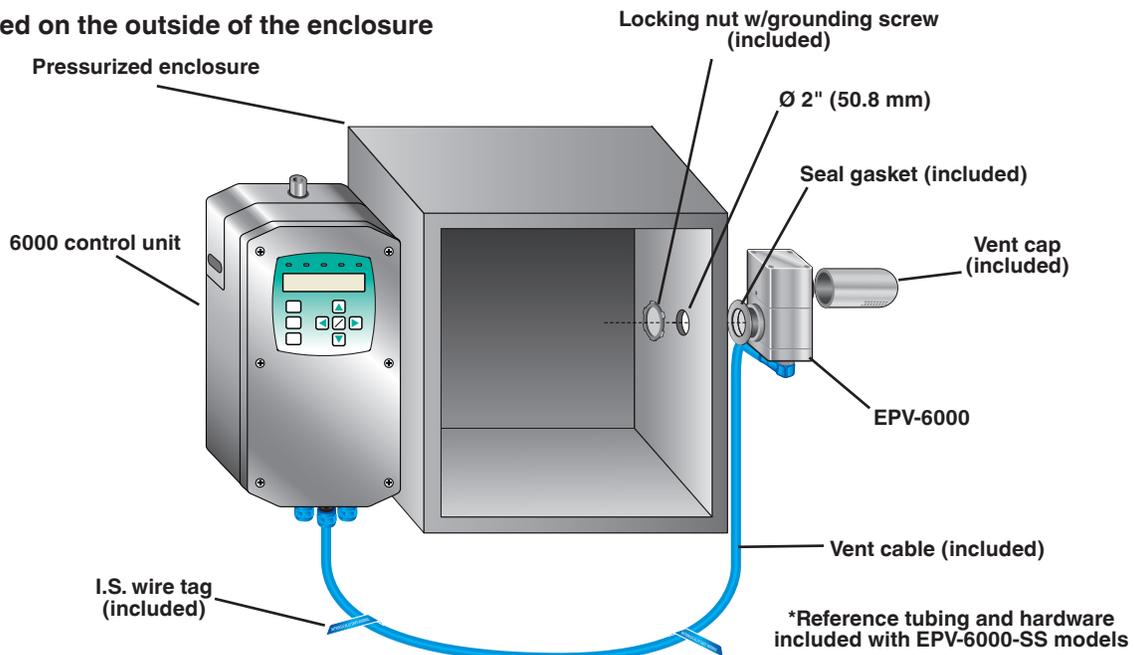


EPV-6000 Vent

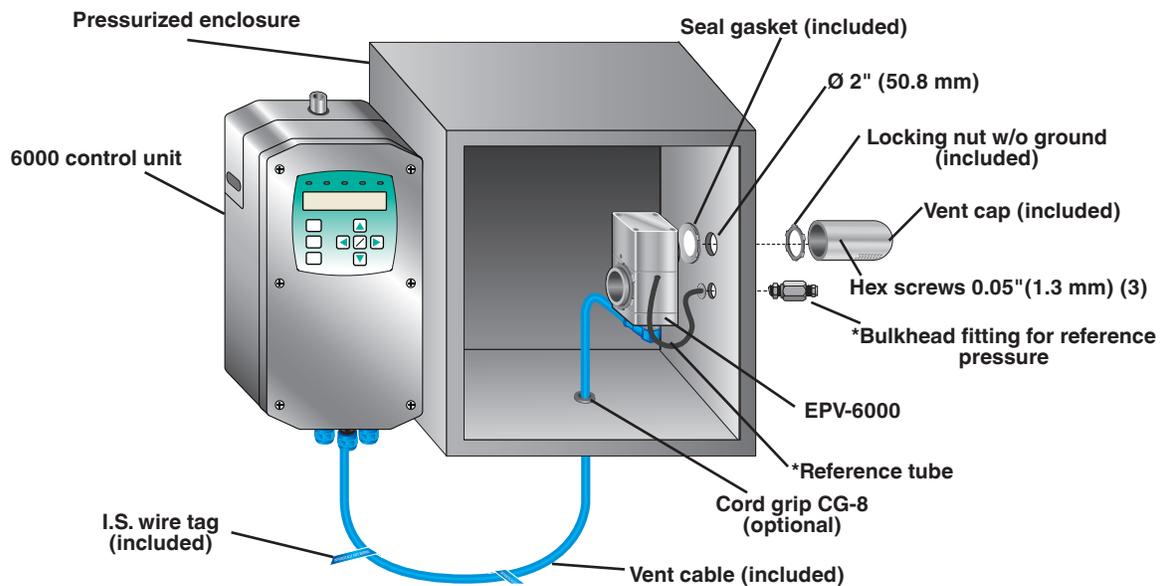
Tools:

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

Vent mounted on the outside of the enclosure



Vent mounted on the inside of the enclosure



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

 Warning Cable to the vent is I.S. and must be properly isolated from other wiring.

Torque Requirements (EPV-6000)

Hardware

Sealing Washer and Nut
Set Screws

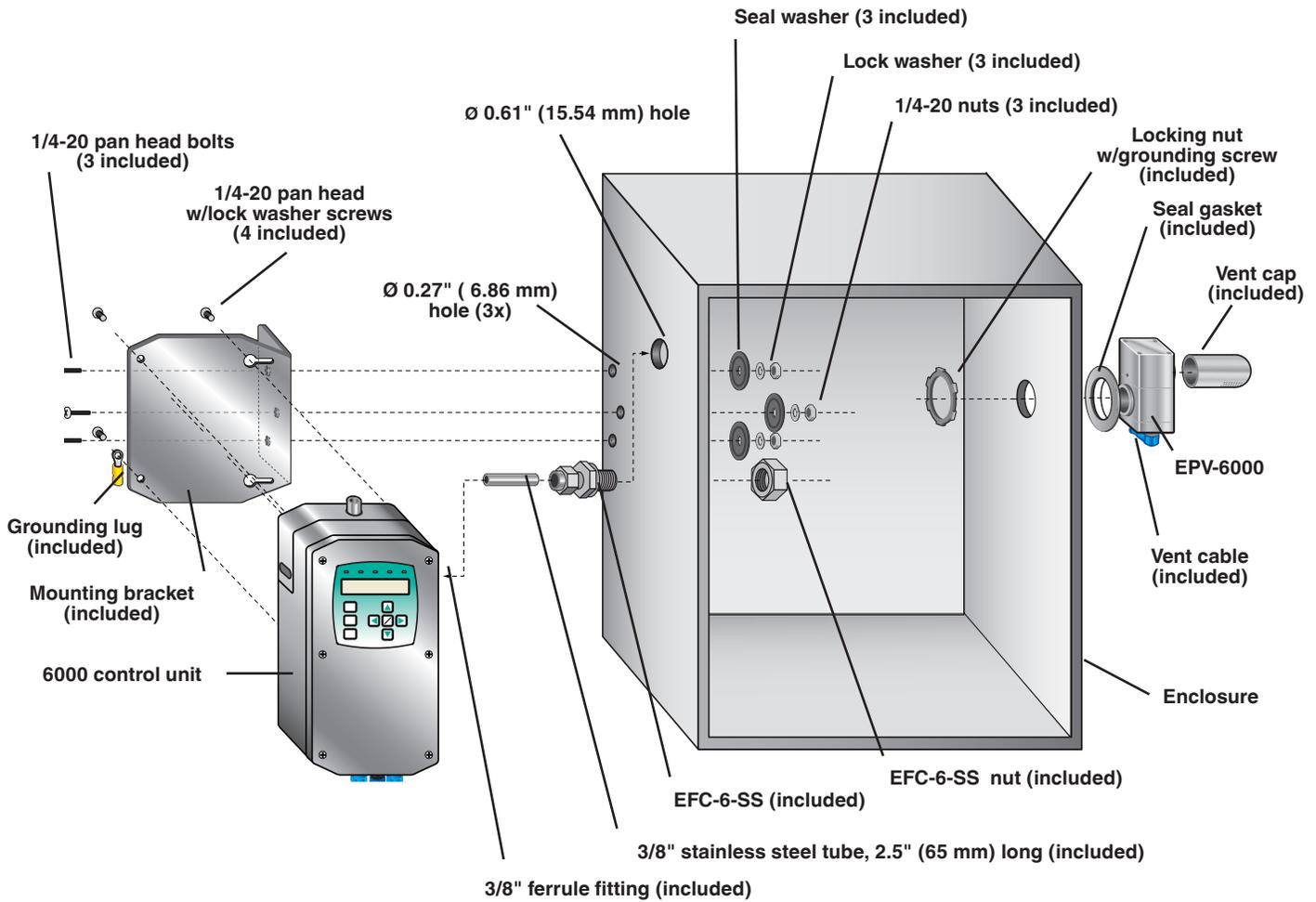
Torque

0.25–1 turns past finger tight. Do not over tighten.
Secure vent cap by evenly threading in set screws. Do not over tighten.

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 = 0.27" (6.86 mm) diameter
- EFC-6-SS (provided):
Hole clearance = 0.61" (15.54 mm) 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 60–80 in-lb (16.38–18.08 Nm).
4. Put two 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 toward the enclosure so that the EFC-6-SS fitting is in the proper location.
6. Tighten the two bolts. Put the other two mounting bolts in place and tighten.
7. Place the EFC-6-SS bolt in position and tighten.

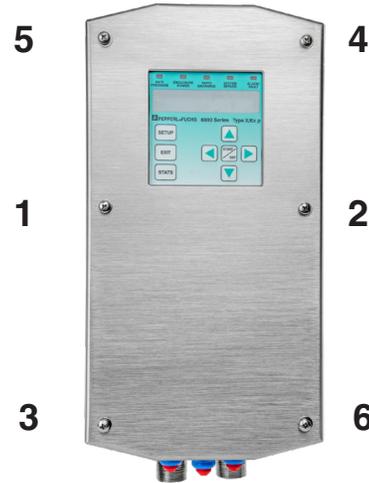
Tightening the Unit Cover Plate



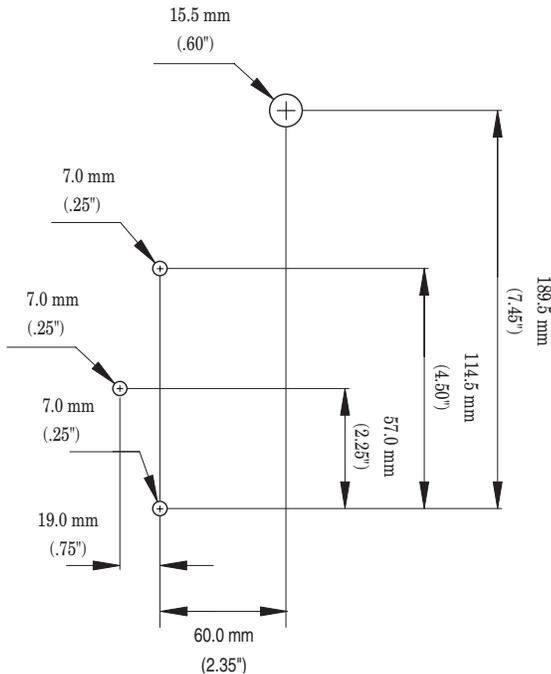
The screws on the unit cover plate must be tightened in the order shown on the diagram to the right. The cover plate to the main housing has positive stops so that the gasket is not over-tightened. Torque screws at 1.36 N-m (12 in-lb).



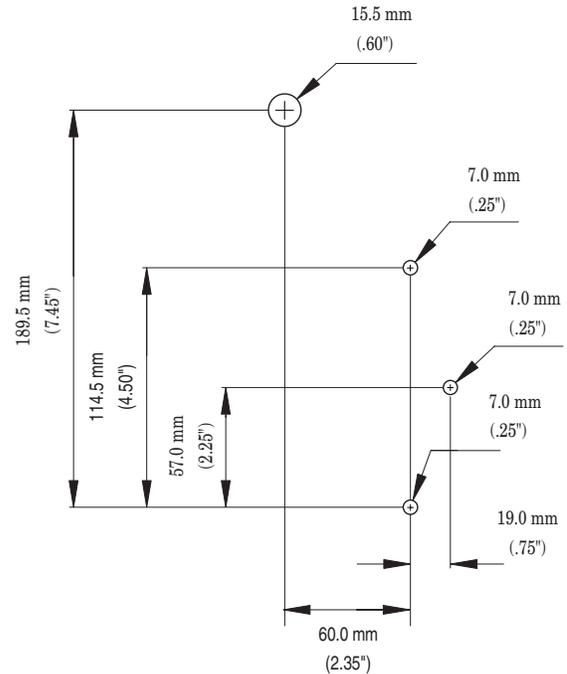
When rotating the UIC, torque down the 4 screws at 0.46 N-m (4 in-lb) using a crisscross pattern.



Left-hand mounting template



Right-hand mounting template





User interface (Included)

Cannot be mounted in a hazardous dust environment.



Optional pneumatic manifold with solenoid (Included)



Control unit and explosionproof/flameproof enclosure (Included)

EPV-6000 vent: required for 6000 control unit / component kit



EPV-6000



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



Attention



Attention

6000 series component kit accessories



6000-DPE-01-xxx (Not Included)
Dust-proof enclosure to house the 6000-TEMP-01 and 6000-TEMP-01 devices



6000-ISB-01 (Not Included)
DIN-mounted I.S. termination board. See datasheet for specifications.

the reference kit
ent but must be
PV-6000-AA ve



6000-CBLA-ISB-xxxx (Not Included)
Cable assembly for connection from the 6000 EPCU to the 6000-ISB-01. See datasheet for specific lengths.

Electrical Diagrams

General wiring notes for component kit design

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. Protective earth wire to be 14 AWG (2.08 mm²). Strip length of earth to mate with pigtail under wire nut .437" to .5" (11.1 mm to 12.7 mm).
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 0.2" to 0.27" (5 mm to 7 mm).
7. The torque at the power terminal block is 0.5–0.6 N-m.
8. Add extra wire length of 1.25" (31.75 mm) past top of opening in explosionproof/flameproof box to pluggable terminal block. (Allows connector to be moved out of the way when changing electronics. Prevents repouring seals.)
9. Wires are 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).
10. 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.)
11. For US/Canadian applications, conduit seals or the 6000-CC-3/4NPT plug must be within 18" (457.2 mm) of internal explosionproof/flameproof box, or within 15.25" (387.3 mm) from the end of the conduit supplied with the 6000 unit. For ATEX/IECEX Zone applications, the conduit must be sealed directly at the wall of the explosionproof/flameproof enclosure or immediately at the end of the conduit supplied with the 6000 control unit.
12. When wiring to the terminal plug, it is easier to remove the plug, terminate the wires, then reconnect the plug.
13. 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.
14. Wire should be copper only, rated 90 °C minimum.
15. The minimum wire strand in a stranded wire should have a diameter of 0.1 mm or greater.
16. The 6000-CC-3/4NPT plug is certified to be used only with the 6000 control unit's 3/4" nipples coming out of the housing. This plug is not certified to be used on any other hazardous location equipment.
17. Ensure that electrical, mechanical, and pneumatic connections and requirements are met to operate this system. Please refer to this manual and applicable standards/codes, including current edition of the EN/IEC 60079-14. Electrical supply to the purge system shall be supplied through a switch or circuit breaker and suitably located and easily reached and must be marked as the disconnect for the equipment.
18. Power must be removed from the system when the Ex d enclosure cover is off, unless the area is known to be non-hazardous.



Attention



Warning



Warning



Attention



Attention



Warning

I.S. wiring notes

For wires going to the explosionproof/flameproof box on the I.S. side:

1. The wire strip length is to be between 0.2" and 0.27" (5 mm and 7 mm).
2. The torque at the I.S. terminal block is 0.22–0.25 N-m.
3. 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.
4. The terminal blocks are rated for a wire size of 16 AWG (1.31 mm²) to 28 AWG (0.08 mm²).
5. If multiple wires need to lead to a single terminal (e.g., the RS-485 bus) 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.



6. The wires must have a minimum insulation thickness of 0.01" (0.25 mm).
7. Add extra wire length of 1.25" (31.75 mm) past top of opening in explosion-proof/flameproof box to pluggable terminal block. (Allows connector to be moved out of the way when changing electronics. Prevents repouring seals.)



8. For US/Canadian applications, the conduit seal on I.S. wiring side must be within 18" (457.2 mm) of the explosionproof/flameproof box. For ATEX/IECEx Zone applications, the conduit must be sealed directly at the wall of the explosionproof/flameproof enclosure.



9. Wire should be copper only, rated 90 °C minimum.
10. The minimum wire strand in a stranded wire should have a diameter of 0.1 mm or greater.

For wires going to the I.S. interface board in the main housing or to the DIN-rail-mount I.S. board:

1. The wire strip length is to be between 0.16" and 0.24" (4 mm and 6 mm).
2. The terminal blocks are rated for a wire size of 16 AWG (1.31 mm²) to 26 AWG (0.081 mm²)
3. The only terminals that might have multiple connections are the shield connections. These must be crimped to a single pin before connection to the board.
4. If cables are used (recommended for connections to the vents and UIC), it is recommended that the cables be shielded.
5. The wires must have a minimum insulation thickness of 0.01" (0.25 mm).

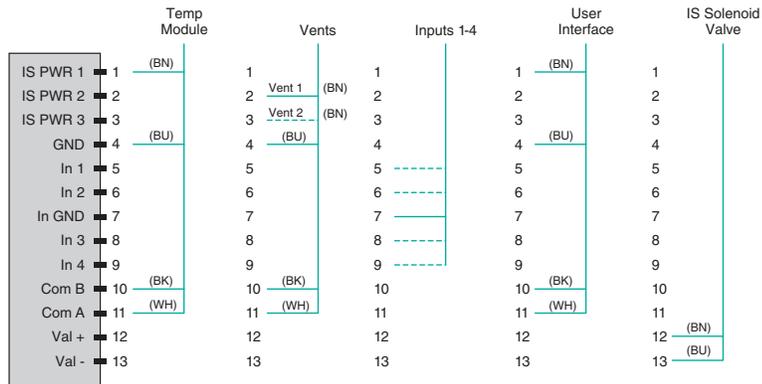
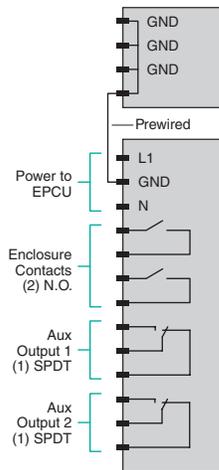
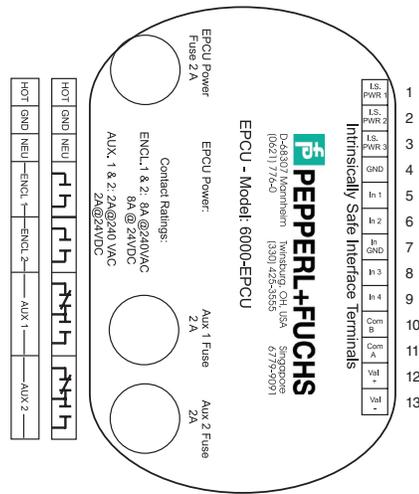


6. Wire should be copper only, rated 90 °C minimum.
7. The minimum wire strand in a stranded wire should have a diameter of 0.1 mm or greater.
8. The torque at the I.S. terminal block is 0.5–0.6 N-m.

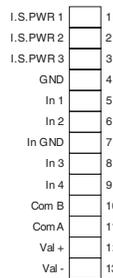


WARNING: The 6000-ISB I.S. termination board and 6000-TEMP are not certified to operate in dust-hazardous locations. The 6000-DPE is a dust-proof enclosure designed only to house either or both the I.S. termination board and 6000 temperature hub. No other devices are allowed in the enclosure. This does not apply to the 6000 control unit with housing, a complete unit.

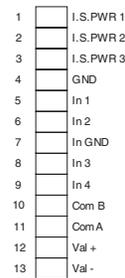
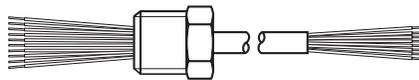
Electrical Installation: Power and I.S. Wiring



Connections from EPCU to field devices



EPCU I.S. connector



I.S. Termination board connector

Connection of the 6000 EPCU to the 6000-ISB-01 DIN-mounted I.S. termination board



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



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.



Corresponding wire numbers must be connected on the EPCU terminal and the I.S. termination board terminal.

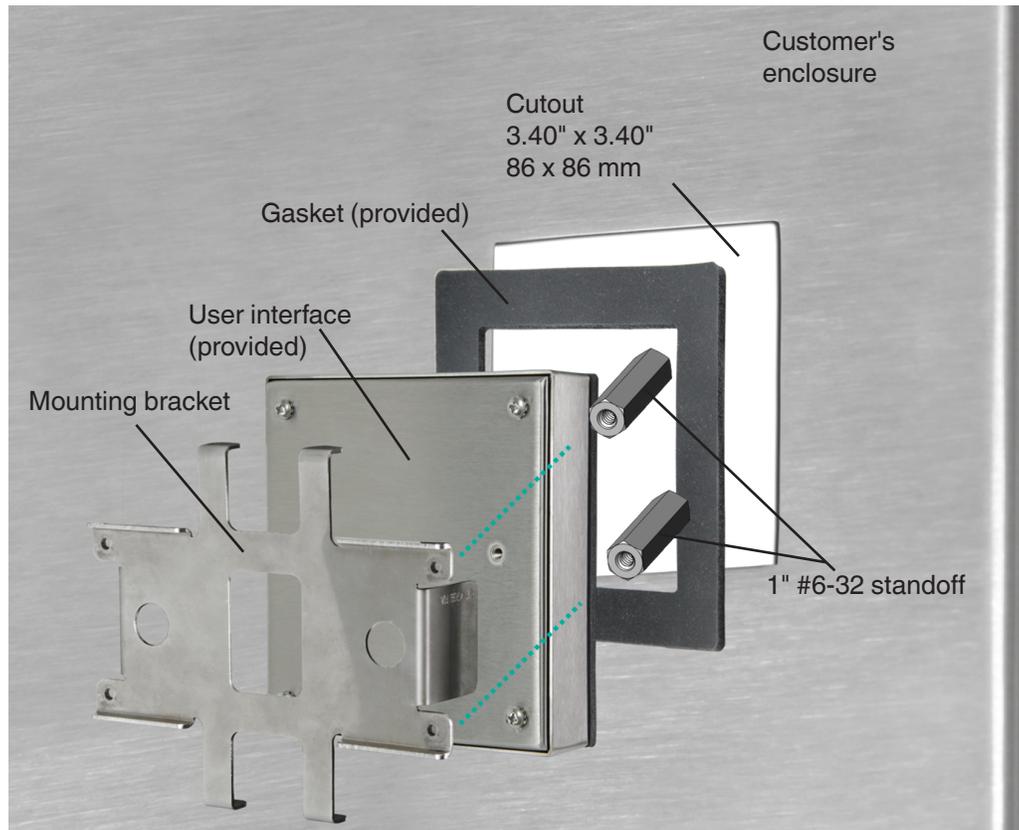


6000-ISB-... must be installed within an IP20 enclosure. See "Specific Conditions of Use" when mounting in a dust environment.

Component Kit Installation

User interface

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



Use a crisscross pattern to tighten the screws for the UIC bracket. Tighten bolts 0.4 N-m (3 to 4 in-lb). For a good seal, ensure that the bracket bottoms out on the enclosure.

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



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.

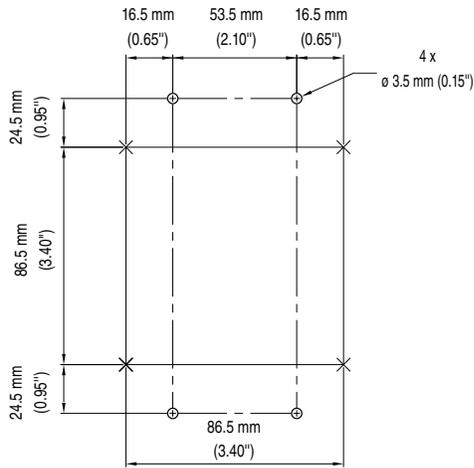


Cutout must be no larger than dimensions specified in above drawing.

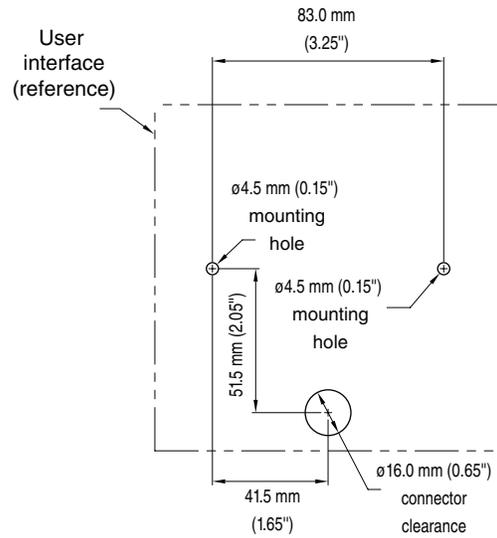


The user interface must be mounted inside the pressurized enclosure to maintain the environmental ratings.

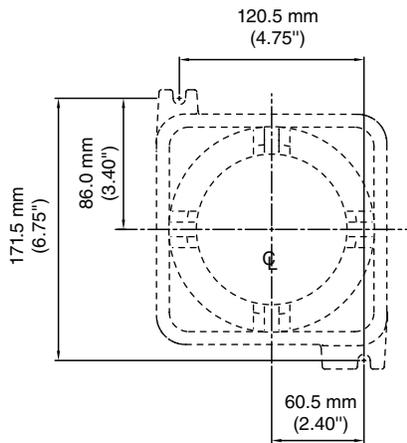
User Interface mounting template (panel mount)



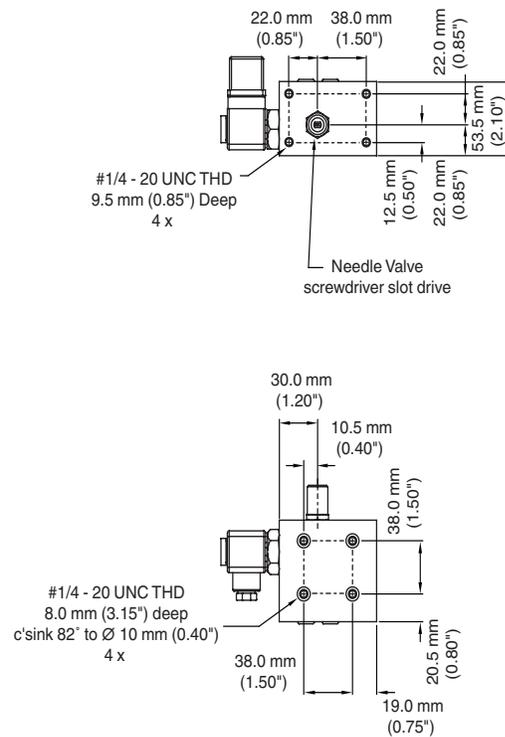
User interface mounting template (external mount)



EPCU mounting template

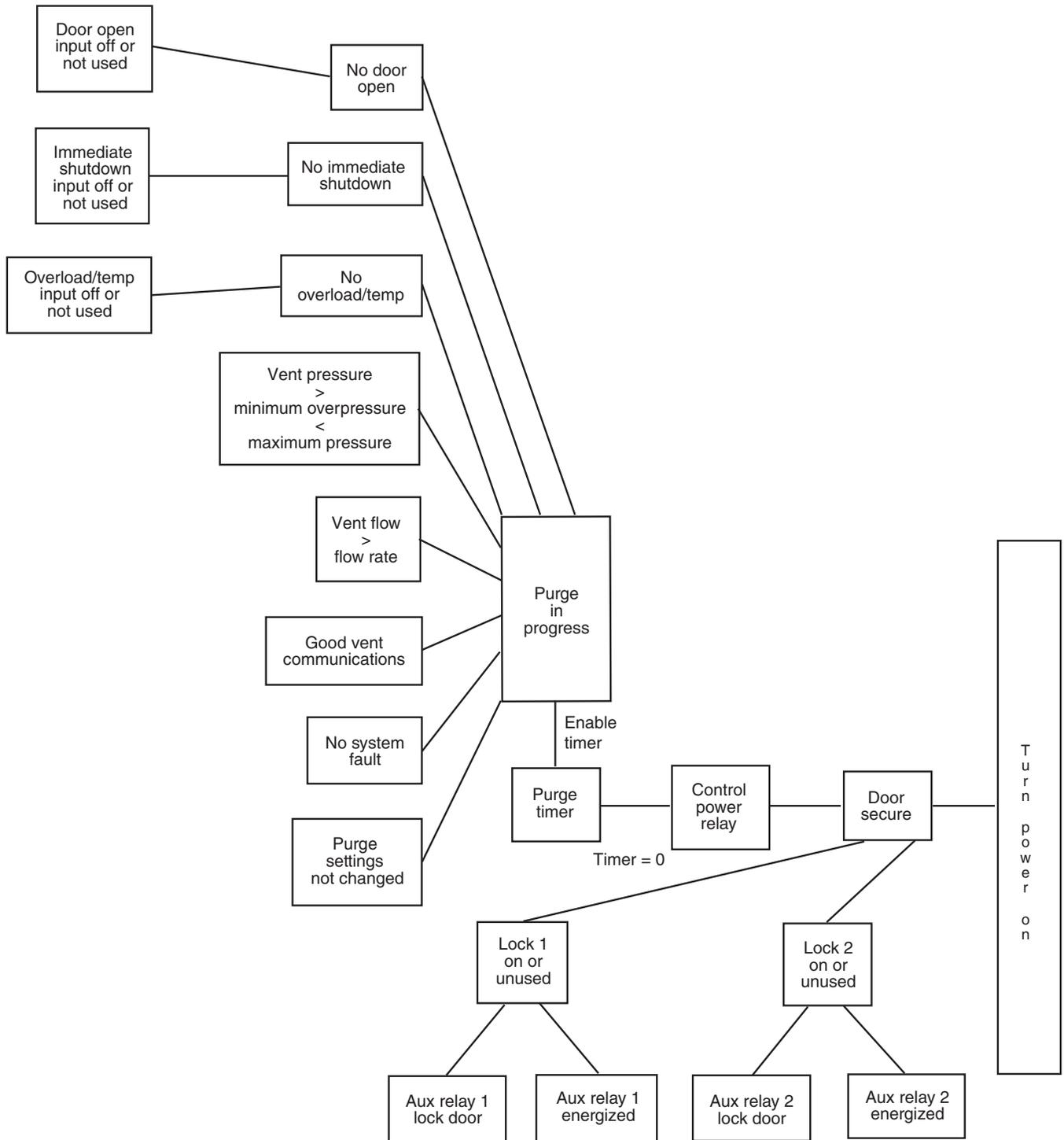


Solenoid mounting template

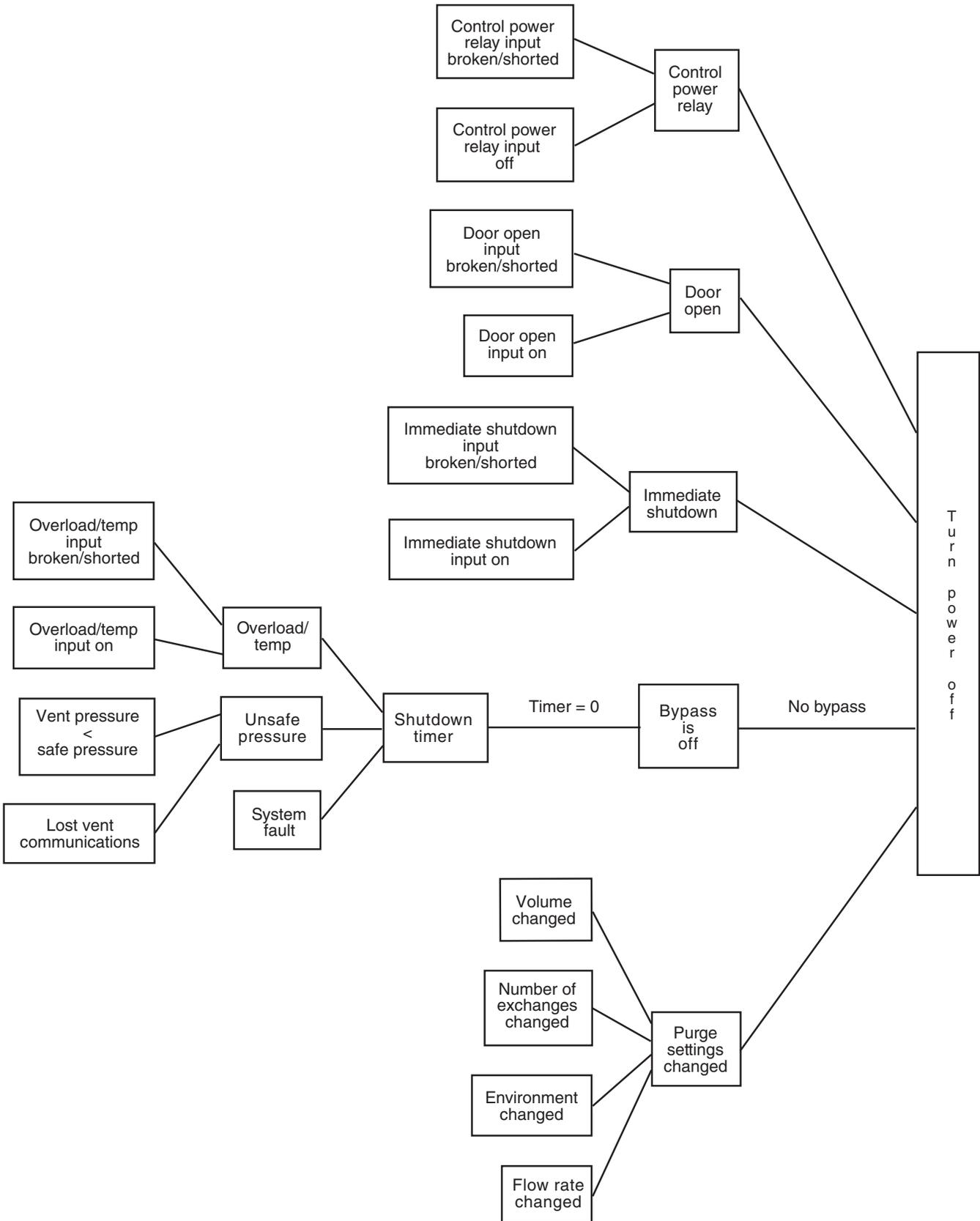


Sequence of Events

Turning on Power to the Enclosure



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, with '-WH-' housing, are listed below:

- EPCU mounted in an explosionproof/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 for internal mount.

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

- Control unit and explosionproof/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 450 ft³ (12.7 m³).

Optional accessories are available to make the component kit easier to install. The 6000-ISR-01 I.S. DIN-mounted termination board and 6000-CBLA-ISR-xxx cable harness allow easy connection to the EPCU of the control unit.

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 force-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.

Purge timing

When using the 6000 series in a gas or gas and dust location, the time for purging an enclosure can be based either on a known purge rate and time (fixed purge time), or based on the flow rate being measured from the vent (dynamic purge time). Both methods base the time on the flow measurement at the vent, and complete the process in steps. The EPCU will take the readings from the vent and use the appropriate reading (listed below) as the usable flow rate. For example, if the flow

rate measurement from the EPV-6000 vent is 7 SCFM (198 l/m), the EPCU will use 5 SCFM (141 l/m) as the flow rate for evaluation. The flow rate measurement steps and corresponding enclosure pressures are as follows:

EPV-6000-XX-01, 02

5 SCFM @ 1.5" wc, (141 l/min @ 3.7 mbar)
 12 SCFM @ 2.0" wc, (340 l/min @ 5.0 mbar)
 20 SCFM @ 2.7" wc, (565 l/min @ 6.7 mbar)
 30 SCFM @ 4.1" wc, (850 l/min @ 10.2 mbar)

EPV-6000-XX-03, 04

5 SCFM @ 2.1" wc, (141 l/min @ 5.2 mbar)
 12 SCFM @ 2.6" wc, (340 l/min @ 6.5 mbar)
 20 SCFM @ 4.1" wc, (565 l/min @ 10.2 mbar)
 30 SCFM @ 5.3" wc, (850 l/min @ 13.2 mbar)

EPV-6000-XX-05, 06

5 SCFM @ 1.5" wc, (141 l/min @ 4.5 mbar)
 12 SCFM @ 2.9" wc, (340 l/min @ 7.3 mbar)



The following parameters must be entered for the purge time:

- Enclosure volume
- Number of exchanges



Minimum purge time is 2 minutes.

Fixed purge time

If the purge time must be held to a specific time, then this 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 setup 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 three 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

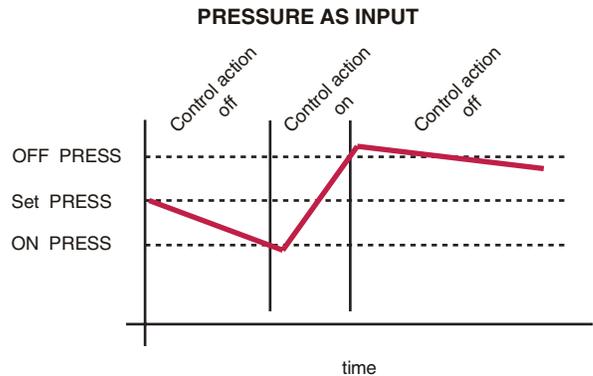
In the programming menu under "INPUT SETTINGS" for the optional pressure control. The pressure control is achieved within the enclosure by opening and closing a digital valve or manifold on the 6000 control unit. These two internal pressure set points can be controlled by the manifold or an outside source 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, nothing will happen.
- The "ON PRESSURE" function is active until the "OFF PRESSURE" is reached

This function only operates after the purging cycle is complete.

The "ON PRESSURE" always has to be lower

than the "OFF PRESSURE". This cannot be reversed.



I.S. Inputs 1-4

There are four (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 two (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.



This function only operates after the purging cycle is complete.

The "ON PRESSURE" always has to be lower



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 three 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".

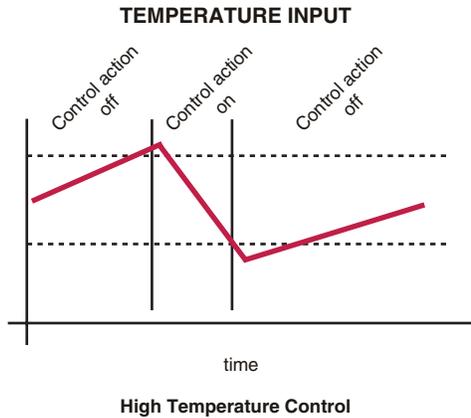


If using more than one (1) sensor, you may want the control action to occur during the peak or average temperature of the sensors.

"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."



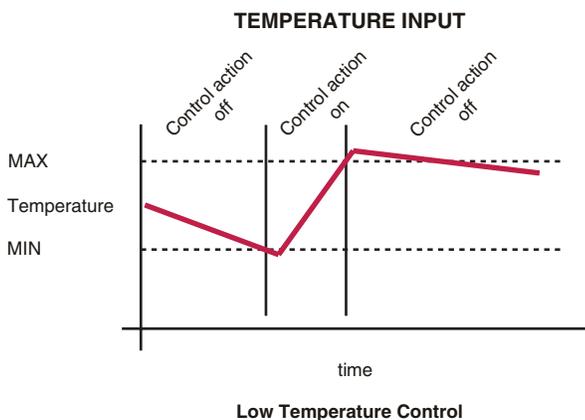
EPV-6000 I.S. relief vent

The EPV-6000 vent exhausts excess pressure from the enclosure when the enclosure pressure exceeds the breaking pressure of the vents relief mechanism. This pressure and flow is measured 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.

LEDs for the vent

LED indication for the vent is green for power and amber for second address vent which is used in two-vent / one-EPCU systems.



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 air is detectable 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.
- 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 of all combustible dust. Purging cannot be done to clean combustible dust out of enclosure.
- 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 considered 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.

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 considered safe, and power to the enclosure can be energized.

Dust and gas hazardous location

- Enclosure must be cleaned of all combustible dust.
- Enclosure is sealed.
- 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.
- Depending on how the purging mode is selected, purging the enclosure is required.
- After a successful purging, with the pressure in the enclosure above 0.65" wc [(16.5 mm wc), (1.6 mbar), (162 Pascal)], the enclosure is considered 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.

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, that hazard is dust.



Refer to "Specific Conditions of Use."



EN60079-2 and IEC 60079-2 do not cover both gas and dust hazardous atmospheres. The 6000 system provides a solution for both at the same time but would have to be evaluated by the certification bodies for approval.

Start-up Label Located on 6000 Series Control Unit

○ **Model 6000 Type X / Ex px** ○

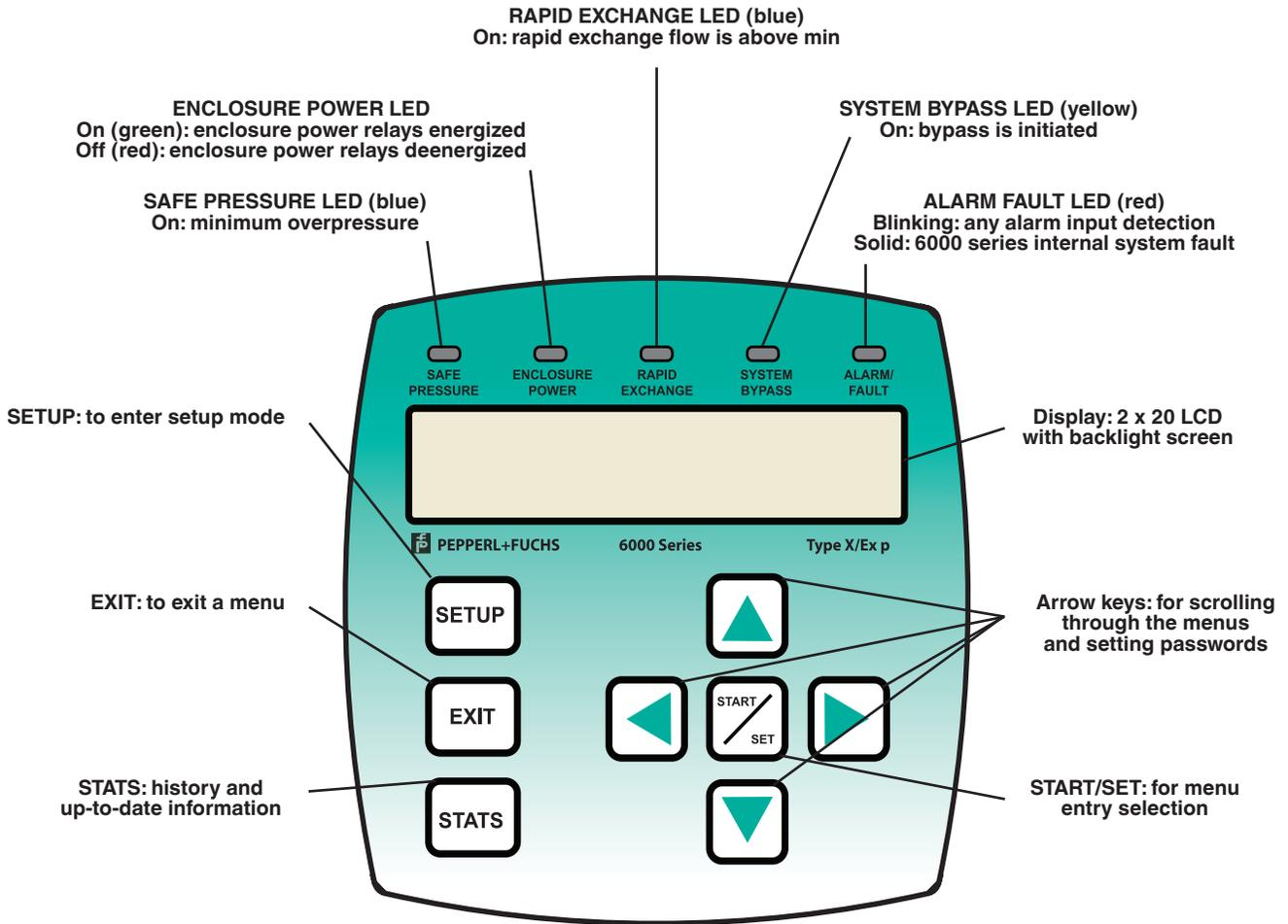
450 CF / 12.75 CM Maximum Enclosure Volume

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 cycle power to the unit, press the EXIT, Left Arrow, START/SET, and Right Arrow keys at the same time. This will cycle power to the EPCU without physically removing power. This re-cycle feature will de-energize the relays of the EPCU and reset the unit. This feature does not affect any of the settings in the menus of the EPCU.

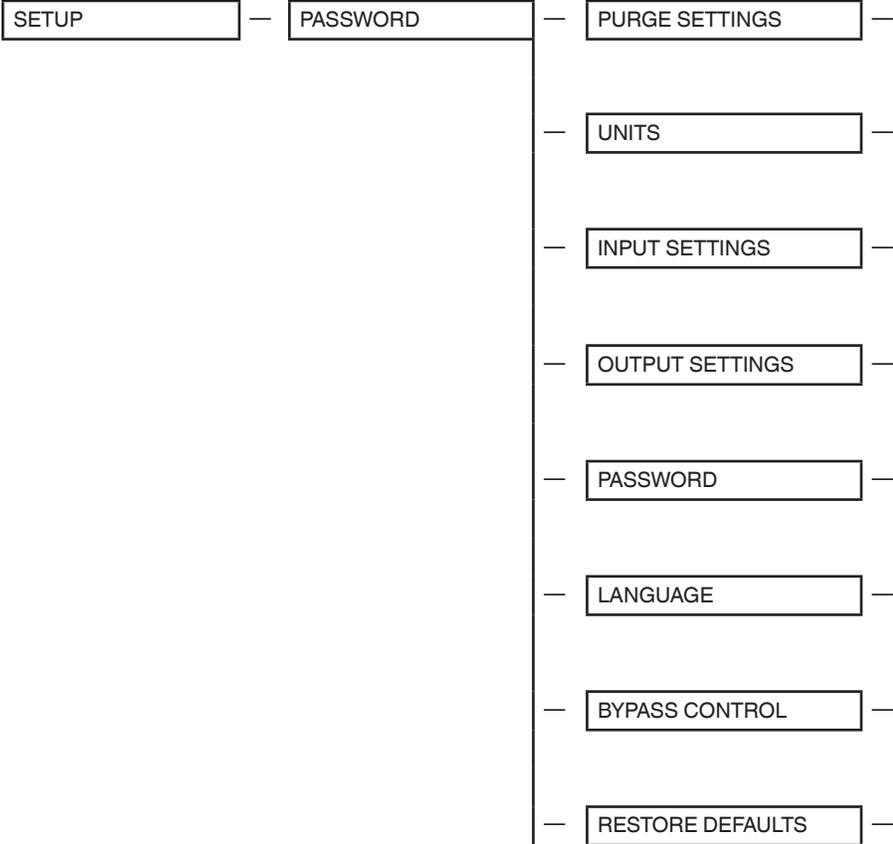


To turn LCD back light on and off, press the left and right arrow keys at the same time. The setting remains through the power cycles.



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



Purge Settings

PURGE SETTINGS	ENCLOSURE VOLUME	USER DEFINED	SETTING CORRECT Y/N	
	NUMB OF EXCHANGES.	4 - 19	SETTING CORRECT Y/N	
	PURGE FLOW	5	SETTING CORRECT Y/N	
		12	SETTING CORRECT Y/N	
		20	SETTING CORRECT Y/N	
		30	SETTING CORRECT Y/N	
		DYNAMIC	SETTING CORRECT Y/N	
		VENT FLOW CONTROL	ONE VENT	SETTING CORRECT Y/N
		2 VENTS ADD FLOWS	SETTING CORRECT Y/N	
		2 VENTS LEAST FLOW	SETTING CORRECT Y/N	
	ENVIRONMENT	GAS, DUST, BOTH	SETTING CORRECT Y/N	
	PRESSURES	MAX OVER PRESSURE	XX.XX	SETTING CORRECT Y/N
		LOW PRESSURE	XX.XX	SETTING CORRECT Y/N
		MIN OVER PRESSURE	XX.XX	SETTING CORRECT Y/N
	TIMERS	PURGE TIMER	READ ONLY - FIXED TIME.	SETTING CORRECT Y/N
		SHUTDOWN TIMER	0 - 300 SEC.	SETTING CORRECT Y/N
		UNLOCK DOOR TIMER	0 - 300 MIN.	SETTING CORRECT Y/N
		BYPASS OFF TIMER	0 - 300 SEC.	SETTING CORRECT Y/N
	OPERATION MODE	STD, SA, FA	SETTING CORRECT Y/N	

Units

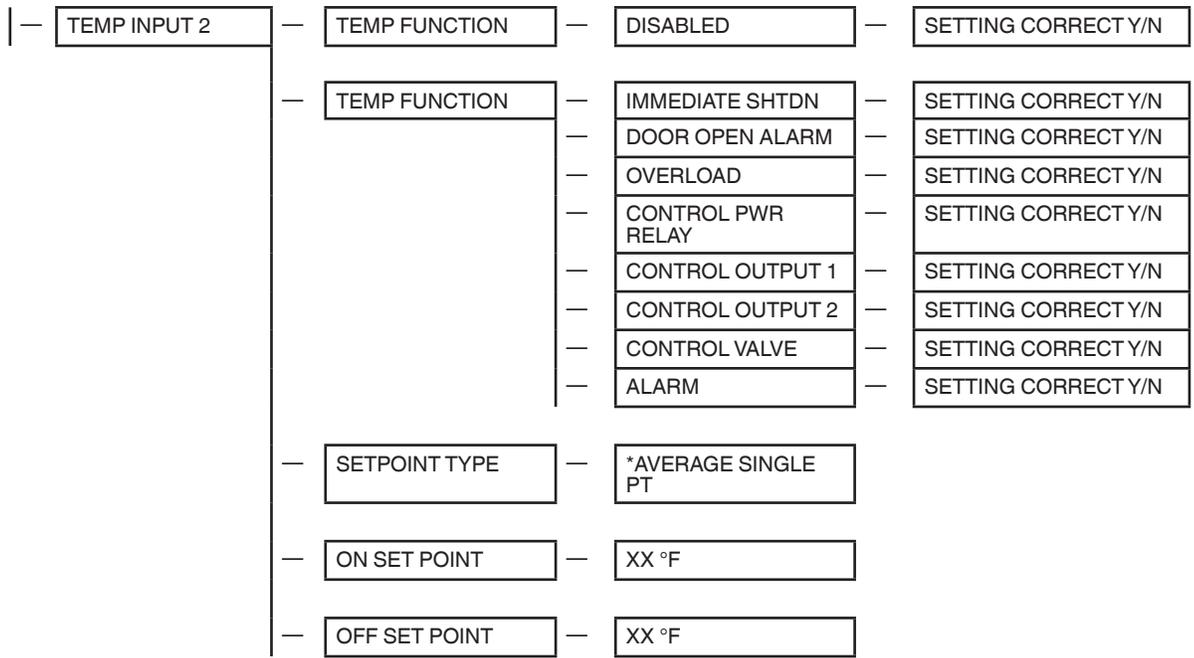
UNITS	ENGLISH OR METRIC	SETTING CORRECT Y/N
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Inputs

INPUT SETTINGS	INPUT 1	INPUT 1 FUNCTION	DISABLED	SETTING CORRECT Y/N
		INPUT 1 FUNCTION	IMMEDIATE SHTDN	SETTING CORRECT Y/N
			DOOR OPEN ALARM	SETTING CORRECT Y/N
			OVERLOAD	SETTING CORRECT Y/N
			CONTROL PWR RELAY	SETTING CORRECT Y/N
			CONTROL OUTPUT 1	SETTING CORRECT Y/N
			CONTROL OUTPUT 2	SETTING CORRECT Y/N
			CONTROL VALVE	SETTING CORRECT Y/N
		SYSTEM BYPASS	SETTING CORRECT Y/N	
		SRM	SRM YES,NO	SETTING CORRECT Y/N
	INVERT INPUT	INVERT YES, NO	SETTING CORRECT Y/N	
	INPUT 2	INPUT 2 FUNCTION	DISABLED	SETTING CORRECT Y/N
		INPUT 2 FUNCTION	IMMEDIATE SHTDN	SETTING CORRECT Y/N
			DOOR OPEN ALARM	SETTING CORRECT Y/N
			OVERLOAD	SETTING CORRECT Y/N
			CONTROL PWR RELAY	SETTING CORRECT Y/N
			CONTROL OUTPUT 1	SETTING CORRECT Y/N
			CONTROL OUTPUT 2	SETTING CORRECT Y/N
			CONTROL VALVE	SETTING CORRECT Y/N
		SRM	SRM YES,NO	SETTING CORRECT Y/N
INVERT INPUT		INVERT YES, NO	SETTING CORRECT Y/N	

INPUT 3	INPUT 3 FUNCTION	DISABLED	SETTING CORRECT Y/N
	INPUT 3 FUNCTION	IMMEDIATE SHTDN	SETTING CORRECT Y/N
		DOOR OPEN ALARM	SETTING CORRECT Y/N
		OVERLOAD	SETTING CORRECT Y/N
		CONTROL PWR RELAY	SETTING CORRECT Y/N
		CONTROL OUTPUT 1	SETTING CORRECT Y/N
		CONTROL OUTPUT 2	SETTING CORRECT Y/N
		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	INPUT 4 FUNCTION	DISABLED	SETTING CORRECT Y/N
	INPUT 4 FUNCTION	IMMEDIATE SHTDN	SETTING CORRECT Y/N
		DOOR OPEN ALARM	SETTING CORRECT Y/N
		OVERLOAD	SETTING CORRECT Y/N
		CONTROL PWR RELAY	SETTING CORRECT Y/N
		CONTROL OUTPUT 1	SETTING CORRECT Y/N
		CONTROL OUTPUT 2	SETTING CORRECT Y/N
		CONTROL VALVE	SETTING CORRECT Y/N
	SRM	SRM YES,NO	SETTING CORRECT Y/N
	INVERT INPUT	INVERT YES, NO	SETTING CORRECT Y/N

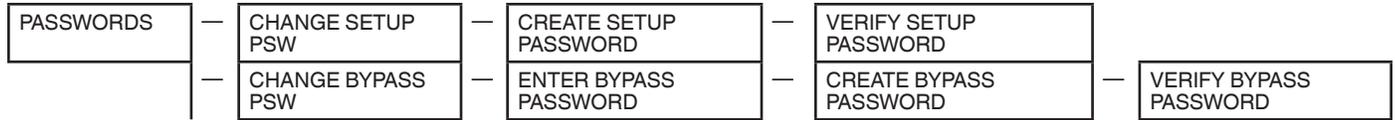
PRESS AS INPUT	PRESS FUNCTION	SETTING CORRECT Y/N			
	PRESS FUNCTION	DISABLED	SETTING CORRECT Y/N		
		CONTROL OUTPUT 1	SETTING CORRECT Y/N		
		CONTROL OUTPUT 2	SETTING CORRECT Y/N		
		CONTROL VALVE	SETTING CORRECT Y/N		
	ON PRESSURE	ON PRESSURE XX.X IN WC	SETTING CORRECT Y/N		
	OFF PRESSURE	OFF PRESSURE XX.X IN WC	SETTING CORRECT Y/N		
	TEMP INPUT	SENSOR SETUP	EXT SENSOR COUNT	XX	SETTING CORRECT Y/N
			USE HUB SENSOR	HUB YES, NO	SETTING CORRECT Y/N
		TEMP INPUT 1	TEMP FUNCTION	DISABLED	SETTING CORRECT Y/N
TEMP FUNCTION			IMMEDIATE SHTDN	SETTING CORRECT Y/N	
			DOOR OPEN ALARM	SETTING CORRECT Y/N	
			OVERLOAD	SETTING CORRECT Y/N	
			CONTROL PWR RELAY	SETTING CORRECT Y/N	
			CONTROL OUTPUT 1	SETTING CORRECT Y/N	
			CONTROL OUTPUT 2	SETTING CORRECT Y/N	
			CONTROL VALVE	SETTING CORRECT Y/N	
ALARM	SETTING CORRECT Y/N				
SETPOINT TYPE	*AVERAGE SINGLE PT				
ON SET POINT	XX °F				
OFF SET POINT	XX °F				



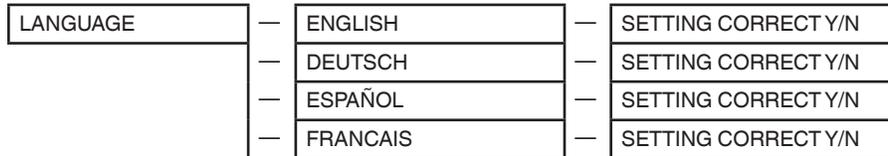
Outputs

OUTPUT SETTINGS	OUTPUT 1 FUNCTION	DISABLED	SETTING CORRECT Y/N
		IMMED SHUTDN ALARM	SETTING CORRECT Y/N
		DOOR OPEN ALARM	SETTING CORRECT Y/N
		OVERLOAD/TEMP ALARM	SETTING CORRECT Y/N
		MAX PRESSURE ALARM	SETTING CORRECT Y/N
		LOW PRESSURE ALARM	SETTING CORRECT Y/N
		LOST PRESSURE ALARM	SETTING CORRECT Y/N
		ANNOUNCE PURGE	SETTING CORRECT Y/N
		ANY ALARM	SETTING CORRECT Y/N
		ENCL DOOR LOCK	SETTING CORRECT Y/N
		SYS BYPASS ALARM	SETTING CORRECT Y/N
		TEMP INPUT 1 ALARM	SETTING CORRECT Y/N
	TEMP INPUT 2 ALARM	SETTING CORRECT Y/N	
	OUTPUT 2 FUNCTION	DISABLED	SETTING CORRECT Y/N
		IMMED SHUTDN ALARM	SETTING CORRECT Y/N
		DOOR OPEN ALARM	SETTING CORRECT Y/N
		OVERLOAD/TEMP ALARM	SETTING CORRECT Y/N
		MAX PRESSURE ALARM	SETTING CORRECT Y/N
		LOW PRESSURE ALARM	SETTING CORRECT Y/N
		LOST PRESSURE ALARM	SETTING CORRECT Y/N
		ANNOUNCE PURGE	SETTING CORRECT Y/N
		ANY ALARM	SETTING CORRECT Y/N
		ENCL DOOR LOCK	SETTING CORRECT Y/N
		TEMP INPUT 1 ALARM	SETTING CORRECT Y/N
TEMP INPUT 2 ALARM		SETTING CORRECT Y/N	

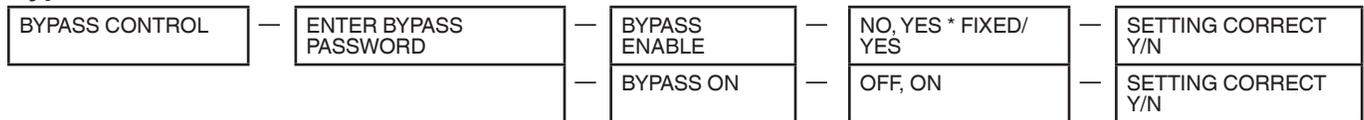
Password



Language



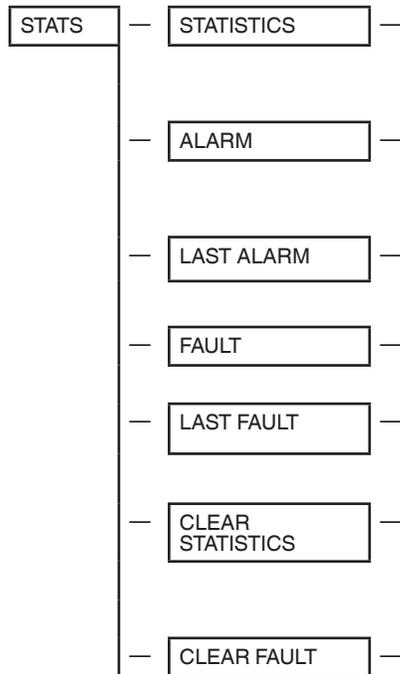
Bypass Control



Restore Defaults



Stats



Statistics

This provides system operating information. These fields are read only.

STATISTICS	TEMPERATURES	HUB SENSOR STATS	CURRENT HUB TEMP	CURRENT HUB TEMP XXX °F	
			MAX HUB TEMP	MAX HUB TEMP XXX °F	
			MIN HUB TEMP	MIN HUB TEMP XXX °F	
		SENSOR 1 STATS	SENSOR 1 TEMP	SENSOR 1 TEMP XXX °F	
			SENSOR 1 MAX TEMP	SENSOR 1 MAX TEMP XXX °F	
			SENSOR 1 MIN TEMP	SENSOR 1 TEMP MIN XXX °F	
			SENSOR 2 STATS	SENSOR 2 TEMP	SENSOR 2 TEMP XXX °F
				SENSOR 2 MAX TEMP	SENSOR 2 MAX TEMP XXX °F
				SENSOR 2 MIN TEMP	SENSOR 2 MIN TEMP XXX °F
		SENSOR 3 STATS	SENSOR 3 TEMP	SENSOR 3 TEM XXX °F	
			SENSOR 3 MAX TEMP	SENSOR 3 MAX TEMP XXX °F	
			SENSOR 3 MIN TEMP	SENSOR 3 MIN TEMP XXX °F	
	MIN OVER PRESSURE	MIN OVER PRESSURE X.XX IN WC			
	MAX OVER PRESSURE	MAX OVER PRESSURE X.XX IN WC			
	MIN PURGE PRESSURE	MIN PURGE PRESSURE X.XX IN WC			

MAX PURGE PRESSURE	MAX PURGE PRESSURE X.XX IN WC		
LAST PURGE TIME	LAST PURGE TIME XXXX MIN		
MIN PURGE FLOW	MIN PURGE FLOW XX CFM		
MAX PURGE FLOW	MAX PURGE FLOW XX CFM		
SYSTEM POWERED UP	SYSTEM POWERED UP XX CFM		
LAST SHUTDOWN	LAST SHUTDOWN XX CFM		
SHUTDOWN REASON	SHUTDOWN REASON XX CFM		
COM ERROR COUNT	COM ERROR COUN XX CFM		
P+F 6000 REVISION	MAIN UNIT	HARDWARE REVISION	XXXX
		SOFTWARE REVISION	XXXX
	USER INTERFACE	HARDWARE REVISION	XXXX
		SOFTWARE REVISION	XXXX
	VENT 1	HARDWARE REVISION	XXXX
		SOFTWARE REVISION	XXXX
	VENT 2	HARDWARE REVISION	XXXX
		SOFTWARE REVISION	XXXX
	TEMP HUB	HARDWARE REVISION	XXXX
		SOFTWARE REVISION	XXXX

Alarm

This provides the reason for the last system alarm.

ALARM	—	NONE
	—	NO SAFE PRESSURE
	—	MAX PRESSURE
	—	INPUT 1 BROKE/ SHORT
	—	INPUT 2 BROKE/ SHORT
	—	INPUT 3 BROKE/ SHORT
	—	INPUT 4 BROKE/ SHORT
	—	DOOR OPEN
	—	IMMEDIATE SHUTDOWN
	—	OVERLOAD SHUTDOWN
	—	LOST FLOW
	—	13 V
	—	9.5 V
	—	TEMP INPUT 1
	—	TEMP INPUT 2
	—	PRESSURE AS INPUT

Fault

This provides the reason for the system fault.

FAULT	—	NONE
	—	CONTROL OUTPUT 1
	—	CONTROL OUTPUT 2
	—	CONTROL VALVE
	—	ENCLOSURE POWER RELAY
	—	INPUT 1
	—	INPUT 2
	—	INPUT 3
	—	INPUT 4
	—	13 VOLT POWER
	—	9.5 VOLT POWER
	—	FLOW READING
	—	CONFIG STORAGE
	—	VENT 1 UPDATE
	—	CRC MISMATCH
	—	VENT 2 UPDATE
	—	VALVE
	—	VENT 1 FLOW UPDATE
	—	VENT 2 FLOW UPDATE
	—	TEMPERATURE UPDATE
—	INTERNAL RAM	

Clear Statistics

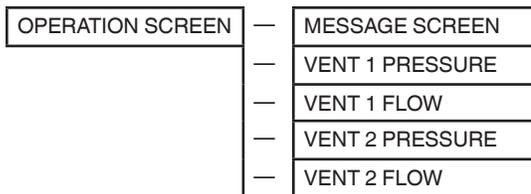


Clear Fault

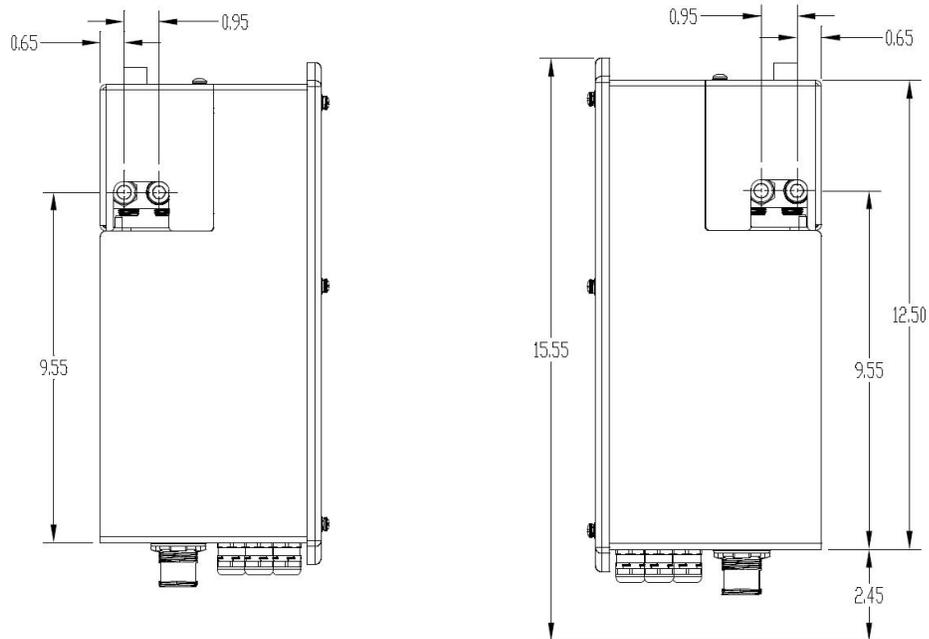
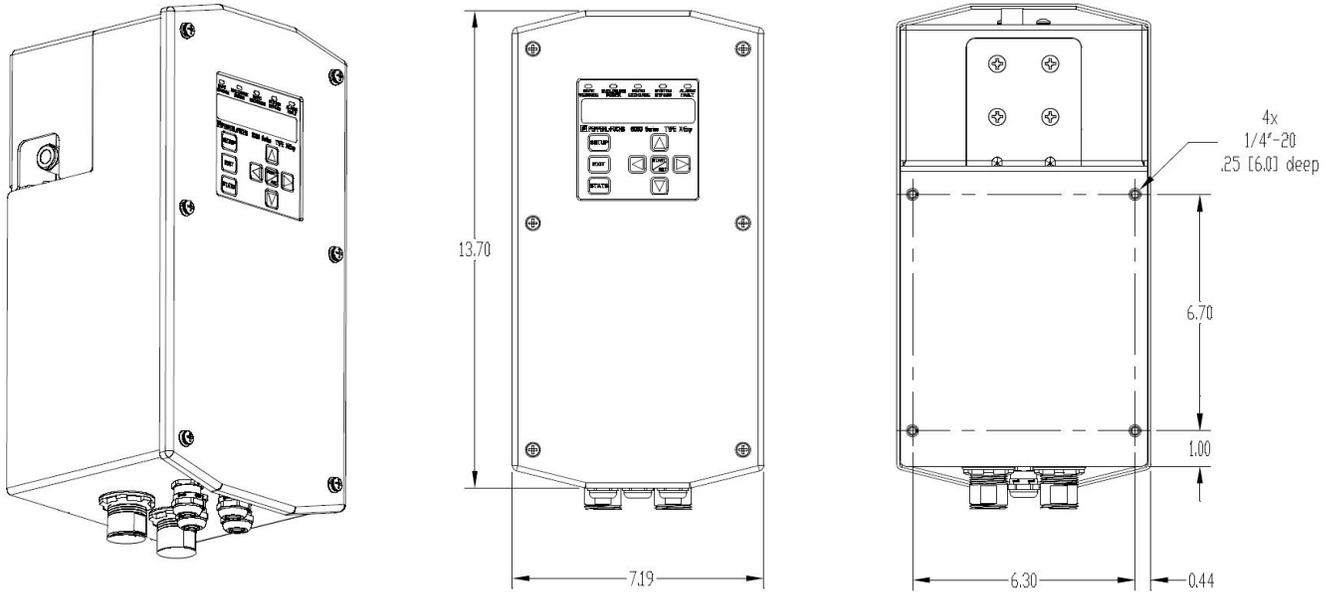


Operation Screen

This provides the system information.

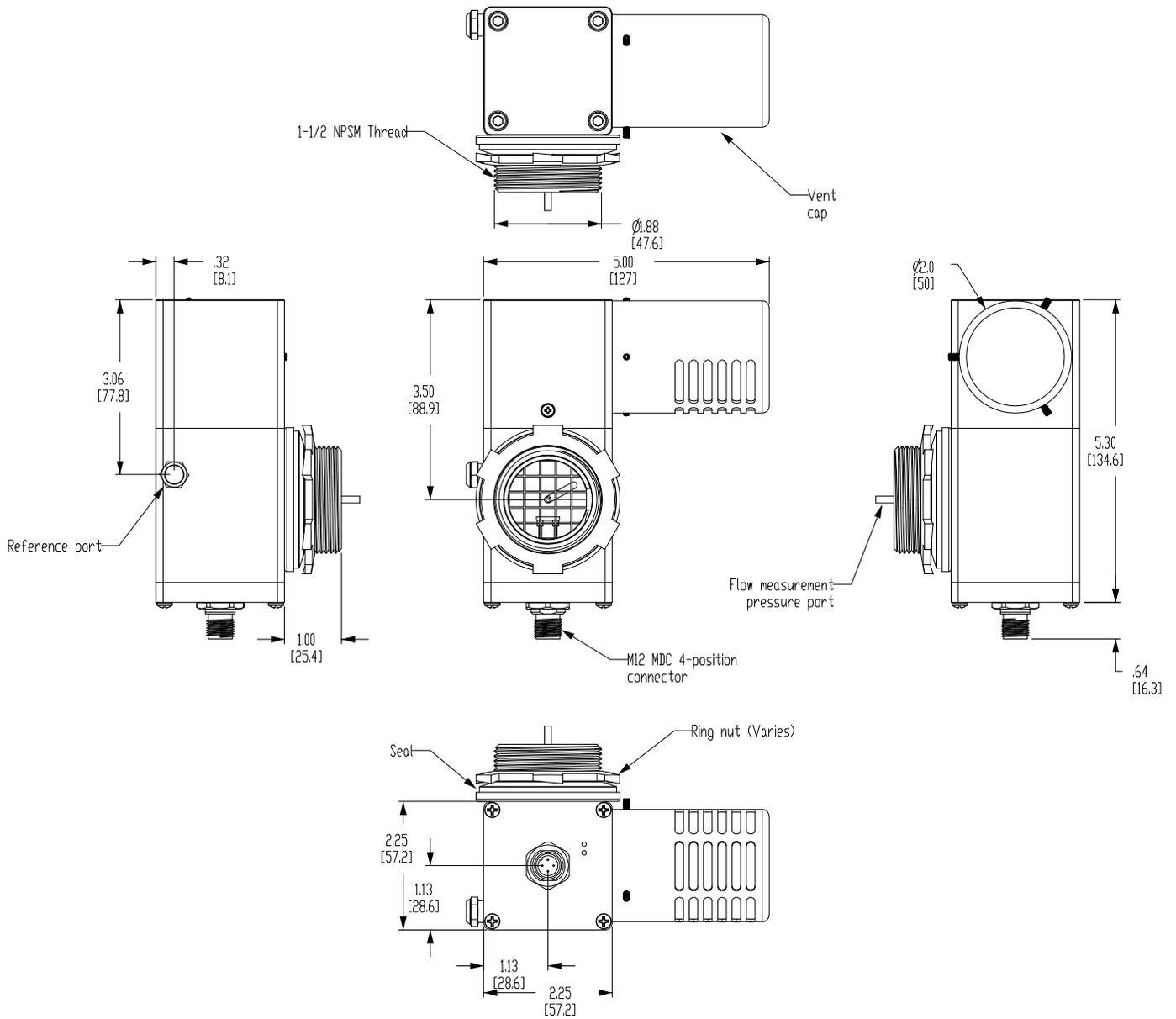
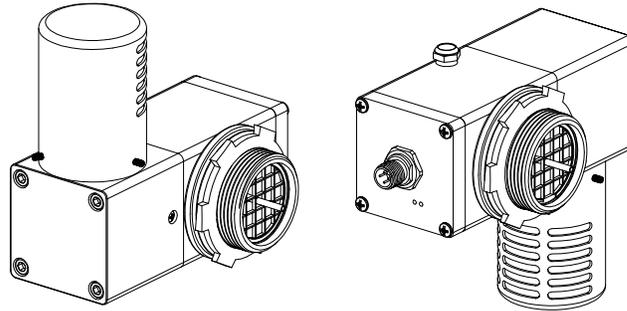


System Dimensions 6000 Series Control Unit

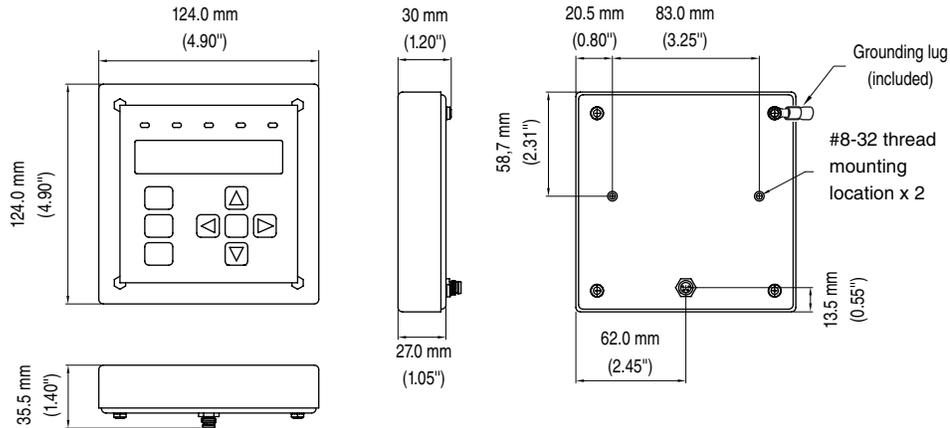


EPV-6000 Vent

Dimensions are in inches [millimeters] and are for reference only.



UIC for the Component Kit

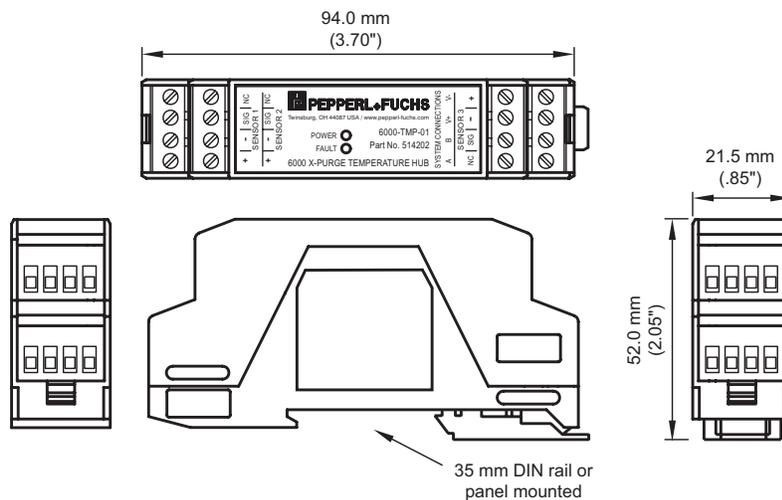


The user interface can be mounted either inside or outside the pressurized enclosure using the dimensions in the two previous drawings above.

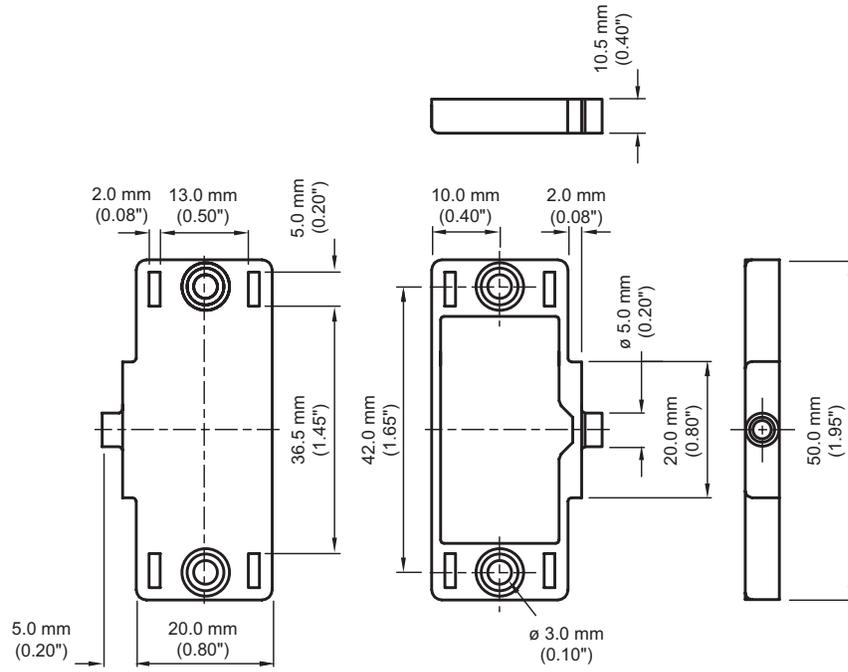


Do not make the opening any larger than indicated in the cutout. Install with the gasket provided (panel mount only).

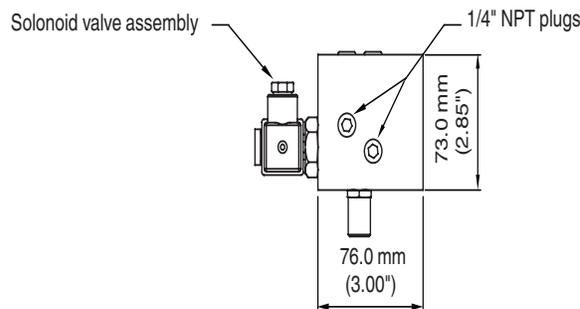
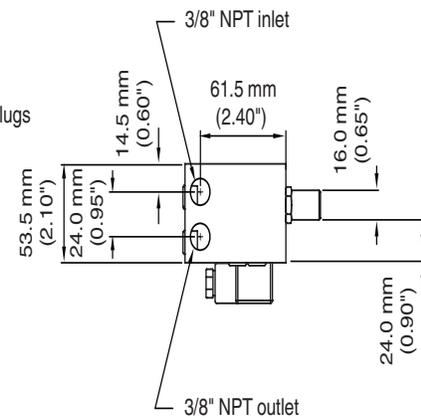
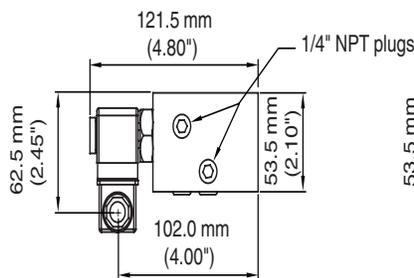
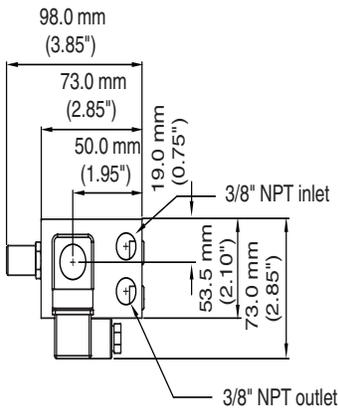
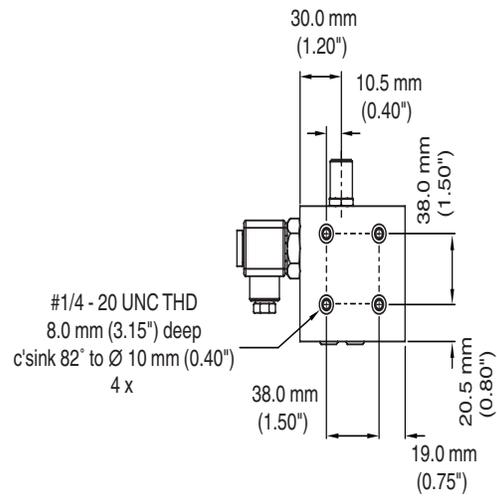
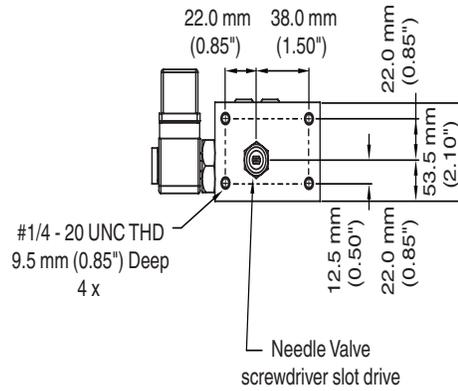
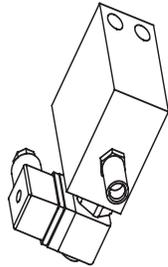
6000-TEMP-01, Temperature Hub



6000-TSEN-01, Temperature Sensor
 (Must be used with the 6000-TEMP-01 temperature hub.)



6000 Manifold



General Specifications

Enclosure volume:	450 ft ³ (12.7 m ³)
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 V AC \pm 10% / 50–60 Hz / 0.2 A
DC version:	20 to 30 V DC \pm 10% / 0.6 A
	Overvoltage category II

Fuse replacement - power:

AC version:	3.15 A Slo-Blo fuse, 5 x 20 mm size
DC version:	2.0 A Slo-Blo fuse, 5 x 20 mm size
Type of fuse:	UL recognized, JDYX2 / JDYX8 type

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

Fuse replacement - AUX contacts

AUX1, AUX 2:	2.0 A Slo-Blo fuse, 5 x 20 mm size
--------------	------------------------------------

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 RED – power off

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-B027A.

Operating conditions

Indoor/outdoor use	
Can be installed in environments up to pollution degree 4	
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)
Relative humidity:	Up to 85 % non-condensing
Altitude: max. 2000 m	

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:

EPV-6000-XX-01, 02	5 SCFM @ 1.5" wc, (141 l/min @ 3.7 mbar) 12 SCFM @ 2.0" wc, (340 l/min @ 5.0 mbar) 20 SCFM @ 2.7" wc, (565 l/min @ 6.7 mbar) 30 SCFM @ 4.1" wc, (850 l/min @ 10.2 mbar)
--------------------	--

EPV-6000-XX-03, 04

5 SCFM @ 2.1" wc, (141 l/min @ 5.2 mbar) 12 SCFM @ 2.6" wc, (340 l/min @ 6.5 mbar) 20 SCFM @ 4.1" wc, (565 l/min @ 10.2 mbar) 30 SCFM @ 5.3" wc, (850 l/min @ 13.2 mbar)

EPV-6000-XX-05, 06

5 SCFM @ 1.5" wc, (141 l/min @ 4.5 mbar) 12 SCFM @ 2.9" wc, (340 l/min @ 7.3 mbar)

Maximum flow rate measurement for enclosure size:

Enclosure volume	Flow rate
< 20 ft ³ (0.57 m ³)	5, 12 SCFM (141, 340 l/min)
20 to 30 ft ³ (0.57 to 0.85 m ³)	5, 12, 20 SCFM (141, 340, 565 l/min)
> 30 ft ³ (0.85 m ³)	5, 12, 20, 30 SCFM (141, 340, 565, 850 l/min)

Flow rate for leakage compensation: Depends on enclosure seal

EPV-6000-xx-01, 02
0.35 SCFM @0.25" wc (10.0 l/min @ 6.3 mbar)
1.0 SCFM @0.75" wc (28.0 l/min @ 1.9 mbar)

EPV-6000-xx-03, 04
0.22 SCFM @0.25" wc (6.2 l/min @ 6.3 mbar)
0.58 SCFM @0.75" wc (16.4 l/min @ 1.9 mbar)

EPV-6000-xx-05, 06
0.15 SCFM @0.25" wc (4.2 l/min @ 6.3 mbar)
0.35 SCFM @0.75" wc (10.0 l/min @ 1.9 mbar)

Inlet fitting to manifold: 3/8" ferrule fitting

Outlet fitting from manifold: 3/8" ferrule fitting

Inlet fitting to enclosure: 3/8" bulkhead fitting

Mechanical Specifications

Storage temp:

6000 control unit (all versions)	-30 °C to +80 °C (-22 °F to +176 °F)
EPV-6000 vents:	-30 °C to +80 °C (-22 °F to +176 °F)
6000-TEMP hub:	-20 °C to +70 °C (-4 °F to +158 °F)
6000-TSEN sensor:	-20 °C to +100 °C (-4 °F to +212 °F)
6000-ISB-01:	-20 °C to +60 °C (-4 °F to +140 °F)
6000-DPE-....:	-20 °C to +60 °C (-4 °F to +140 °F)

Operation temp:

6000 control unit	
6000-xx-S2-UN-WH-xx	-20 °C to +50 °C (-4 °F to +122 °F) For Dust application
	-20 °C to +60 °C (-4 °F to +140 °F) For Gas application
6000-xx-S2-UN-CK-xx	-20 °C to +60 °C (-4 °F to +140 °F)
6000-UIC-01	-20 °C to +60 °C (-4 °F to +140 °F)
EPV-6000 vent	-20 °C to +60 °C (-4 °F to +140 °F)
6000-TEMP hub:	-20 °C to +60 °C (-4 °F to +140 °F)
6000-TSEN sensor:	-20 °C to +100 °C (-4 °F to +212 °F)
6000-ISB-01:	-20 °C to +60 °C (-4 °F to +140 °F)

6000-DPE-....: -20 °C to +60 °C (-4 °F to +140 °F)

6000 control unit

Protection class (all electronics): Type 4X, IP66
(Device is protected against dust and strong jets of water.)

Weight: control unit: 25 lbs (11.4 kg)

Power connections: 3/4" NPT male pipe
(explosionproof 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)

Wire diameter: 5.5–7.0 mm (with both seals)
7.0–10.0 mm (with one seal)

Wire sealing nut torque:

1.0 N-m (with both seals)

1.0 N-m (with one seal) for wire dia. of 7.0 mm

1.4 N-m (with one seal) for wire dia. up to 10.0 mm

Enclosure seal torque: 3.3 N·m

Terminal blocks EPCU:

Power terminal block: Conductors 26–14 AWG
(0.13–2.08 mm²)
Torque 0.5–0.6 N-m

I.S. terminal block: Conductors 28–16 AWG
(0.08–1.31 mm²)
Torque 0.22–0.25 N-m

I.S. Board:

I.S. board terminal block: Conductors 26–16 AWG
(0.13–1.31 mm²)
0.5–0.6 N-m

EPV-6000 Relief Vent

Flow rate measurement (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
(Device is protected against dust and strong jets of water.)

EPV-6000-___-05,06: Ingress protection from vent to
pressurized enclosure, Type 4X

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)

LED indication GREEN – Power to EPV vent
AMBER – 2nd vent address for
two vent / one EPCU system

- 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.
- Mounting hole: 1 1/2" NPT knockout (Ø 2", 50.8 mm) hole, mounting with sealed nut
- Material:
- EPV-6000-AA-.....:
 Cap: Marine grade anodized 5053 aluminum
 Body: Marine grade anodized 6061 aluminum
- EPV-6000-SS-.....:
 Cap: 316L (UNS S31603) stainless steel
 Body: Marine grade anodized 6061 aluminum
- Spark arrestor assembly:
 Protected with 304 (UNS S30400) stainless steel spark arrestor screen. Cap is movable so that opening can be positioned downward.

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) 1/4-20 slot-head screws for mounting control unit to bracket
- (4) 1/4-20 round head
- (4) Type 4X seal washer
- (4) 1/4-20 bolts
- (1) EWN, enclosure warning nameplate
- (1) Installation/operation manual

EPV-6000 Vent

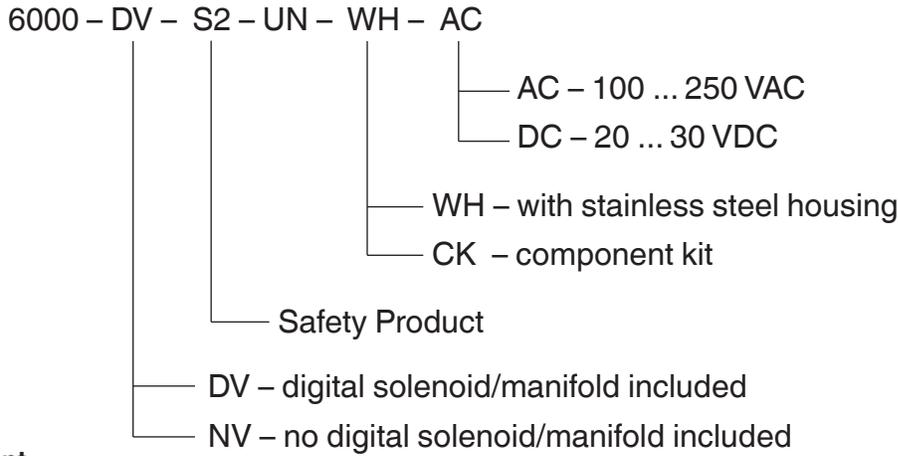
- (1) EPV-6000 vent
- (1) quick disconnect M12 (V1) cable
 22 AWG (0.33 mm²), 5 m (16.5 ft.)
- (1) reference fitting tubing kit
 (stainless steel version only)

Component kit

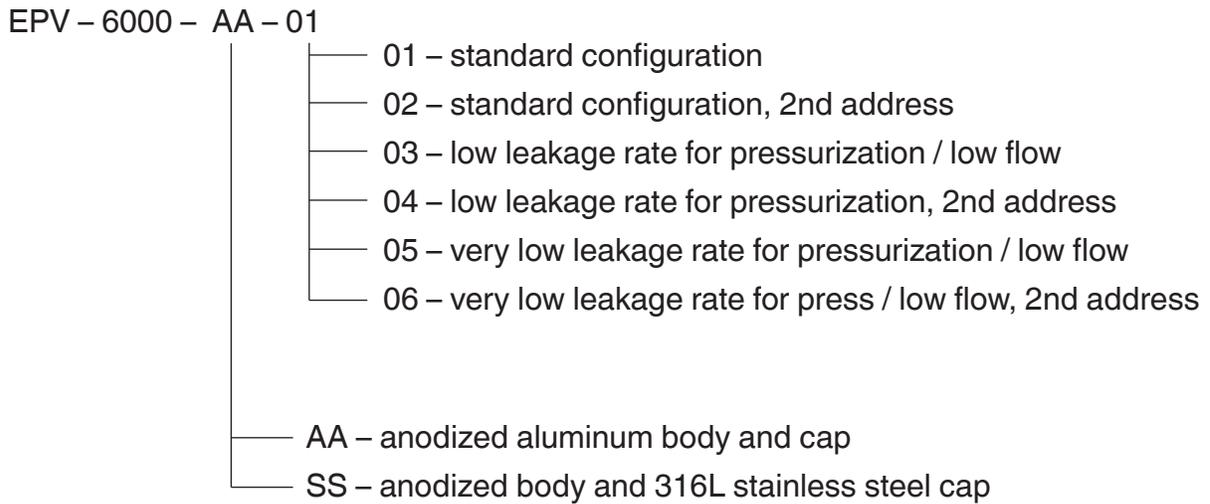
- (1) control unit
- (1) explosionproof/flameproof enclosure
- Bolts for mounting explosionproof/flameproof enclosure
- Washers/nuts for mounting explosionproof/flameproof enclosure
- (1) 6000-UIC-01 user interface
- (1) SMK-600-CK mounting hardware for 6000-UIC-01
- (1) quick disconnect M12 (V1) cable
 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

Model Number Designators

Control unit



Vent



Accessories:

The following accessories are available for the 6000 series purge system:

Model number	Description
EFC-6-SS	Flush mount connector (included with unit)
CG-8	1/2" cable gland
HR-SW00	Key switch (removable in one position)
SRM-6000	Short circuit, open circuit resistor module
6000-MAN-DV-01	I.S. manifold kit with solenoid valve
EWN-1	Warning metal tag
ETW-15	Temperature warning metal tag
(1) EWN tag comes with every system ordered	
6000-COUPLER-3/4-M20	3/4" NPT female to M20 female coupler for conduit, Ex de rated, nickel-plated brass
6000-COUPLER-3/4-M25	3/4" NPT female to M25 female coupler for conduit, Ex de rated, nickel-plated brass
6000-DCK-01	Explosion proof conduit seals for power EPCU and power to enclosure (1/2" NPT). Sealing material included
6000-JCK-01	Explosion proof conduit seals for power EPCU and power to enclosure with junction box (3/4" NPT). Sealing material included
6000-UIC-02	6000 user interface controller with bracket and cable
6000-ACC-514478	3/8" stainless steel tubing for manifold connection. 64 mm (2.5") long, 2 pcs
6000-ACC-514479	Mounting bracket with mounting screws for 6000 control unit
6000-ACC-514480	Mounting bolts for bracket to enclosure and control unit to bracket. 4 pcs.
6000-ACC-514481	3/8" filter and regulator with fitting for connection to 6000 series manifold
6000-ACC-514482	Atmospheric reference kit for mounting EPV-6000-AA vent inside enclosure
6000-ACC-514483	1 - 1/2" locknut with ground and gasket for EPV-6000 vent mounted outside enclosure
6000-ACC-514484	1 - 1/2" locknut without ground and gasket for EPV-6000 vent mounted inside enclosure
6000-ACC-514485	M12 vent cable for EPV-6000 with 4 I.S. tags
6000-TEMP-01	Temperature hub
6000-TSEN-01	Temperature sensor
6000-DPE-01-ISBC	Dust-proof enclosure for 6000-TEMP and/or 6000-ISB-01
6000-ISB-01	I.S. termination board, DIN mountable
6000-CBLA-ISB-xxxx	Cable harness for 6000-ISB-01 termination board

Maintenance and Repair

1. The 6000 purge and pressurization system does not require special maintenance except replacement of pneumatic filters, when used, and normal periodic functional checks, including pressure and flow readings within specifications contained in this manual. When checking whether the pressure and flow measurements of the EPV-6000 vent are within specifications, use calibrated equipment to determine measurements, or contact a Pepperl+Fuchs representative or the factory to send back the EPV-6000 vent for pressure and flow verification.
2. The purge and pressurization system, when operated in conjunction with a hazardous area, must not be modified. If there is a defect, the product may need to be replaced. Repairs must be performed only by a Pepperl+Fuchs specialist who is specifically trained and authorized to repair the defect.
3. Any replaceable fuses must be replaced with specific fuse ratings and type, as written in this manual under Specifications.
4. When servicing, installing, and commissioning, the area must be free of all combustible material and/or hazardous explosive gas. Only the terminal compartment of the control unit is accessible to the user. Not under any circumstances, shall the control unit, user-interface, or vent, be taken apart. The Ex d housing cover shall only be removed when power is removed from the device or the area is known to be safe.
5. Any cable glands that require replacement shall be replaced with the same model or another approved cable gland that meets the area classification.
6. When replacing the EPCU, the area must be free of hazardous gas and/or dust and power removed from the EPCU, enclosure contacts, and auxiliary contacts. Two screws on the bottom of the Ex d enclosure need to be loosened but not removed. Twist the EPCU clockwise and lift it out of the Ex d enclosure. Reverse to install new EPCU.

Contact customer service for an RMA (return merchandise authorization).

Alarm and Fault Conditions

The 6000 purge controller can indicate certain alarm and fault conditions when they happen. The alarm condition is indicated on the display under the Alarm/Fault LED and will blink for an alarm and remain solid for a fault. The alarm will not disengage enclosure contacts if they are on but can be directed to the AUX alarm contact. The fault will disengage enclosure contacts.

Below are the alarm descriptions:

Alarm	Description	Cause
NO SAFE PRESSURE	Enclosure pressure is below minimum safe pressure	-No purge supply -Enclosure leakage too great
MAX PRESSURE	Enclosure pressure is above the maximum pressure allowed	-Purge supply pressure too much -EPV-6000 vent is blocked or not installed
LOW PRESSURE	Enclosure pressure is below the alarm pressure but above the min. safe pressure	-Purge supply capacity is not keeping up -Enclosure is starting to leak more
INPUT 1-4 BROKE/SHORT	When SRM is selected, then a wire is broken or shorted going to the switch input	-SRM is selected and not installed on the switch input -Broken or shorted wire to switch/SRM
DOOR OPEN	Causes the purge system to reset and will not start again until clear	- Signal from switch input activated door open -Shorted wire going to switch input with no SRM selected
IMMEDIATE SHUTDOWN	Causes the purge system to reset and will not start again until clear	-Signal from switch input activated immediate shutdown -Shorted wire going to switch input with no SRM selected

OVERLOAD SHUTDOWN	Does not reset purge system but can sound an alarm	Signal from switch input activated immediate shutdown -Shorted wire going to switch input with no SRM selected
LOST FLOW	During purging, if EPV-6000 vent detects a flow lower than expected, alarm is activated	Signal from switch input activated immediate shutdown -Shorted wire going to switch input with no SRM selected
13V	Power to internal bus is too low for components to operate properly	-Defective EPCU
9.5V	Power to the I.S. comm bus for vent, UIC, Temp Hub is too low for proper operation	-Defective EPCU -I.S. barrier board fuse is blown
TEMP INPUT 1	Temperature Input 1 is active	-The temperature of the Temp Hub or Temp sensor is outside the limits
TEMP INPUT 2	Temperature Input 2 is active	-The temperature of the Temp Hub or Temp sensor is outside the limits
ENCLOSURE POWER RELAY	Monitor circuit detects relay malfunctioned	-One of the contacts are welded shut

Below are fault descriptions:

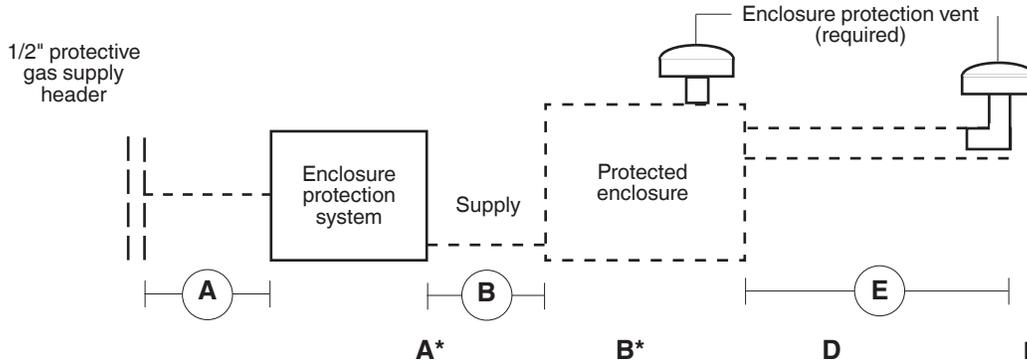
Fault	Description	Cause
CONTROL VALVE	The control valve circuit is not functioning properly	-I.S. barrier board fuse is blown -Power supply to control unit is too low
INPUT 1-4	Input 1 ,2,3, or 4 is not functioning properly	-I.S. barrier for inputs has blown fuse -EPCU defective
FLOW READING	Flow reading from EPV-6000 vent is corrupted or not available	-Flow readings are outside the range of the EPV-6000 vent being used
CONFIG STORAGE	Memory location corrupted	-EPCU defective
VENT 1-2 UPDATE	EPV-6000 vent is not communicating	-I.S. barrier for inputs has blown fuse -EPCU defective -No vent is connected, or vent is misconnected
CRC MISMATCH	Both of the EPCU processors instruction set are not in sync	-EPCU is defective
VENT 1-2 FLOW UPDATE	EPV-6000vent is getting power but communication is not correct	-One or more of the connections is not correct -EPV-6000 is defective
TEMPERATURE UPDATE	The Temp Hub/Temp sensor reading is out of specification or not reading	-Connections could be incorrect -Not set up properly in the menu structure of the EPCU
INTERNAL RAM	EPCU memory fault	-EPCU is defective

Dismantling and Decommissioning

Abide by all local and any other code requirements for disposing of electronic equipment. When disposing of any component of the 6000 system, certification labels or printing shall be marked VOID across each label or printing.

Establishing Connection Sizes, Lengths, and Bends

Typical single protected enclosure connections with vent

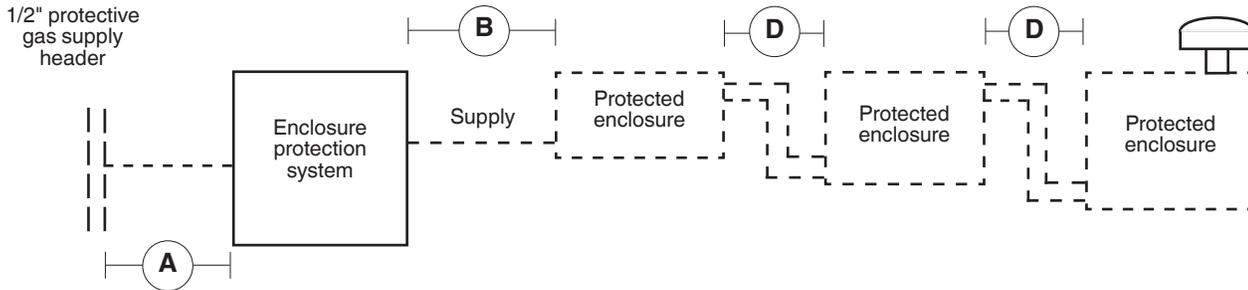


Model 6000	System supply tubing	Enclosure supply	Multi-enclosure connections	Optional remote venting
*Tubing or pipe diameter Tubing and pipe must be fully reamed	1/2" O.D. tubing or 1/2" I.D. piping	3/8" O.D. tubing	1-1/2" I.D. pipe fully reamed	1-1/2" I.D. pipe fully reamed
Maximum tubing / pipe length and maximum number of bends / elbows	6.1 m (20 feet) 10 bends	6.1 m (20 feet) 5 bends	3.1 m (10 feet) 5 elbows	3.1 m (10 feet) 5 elbows

*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



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.

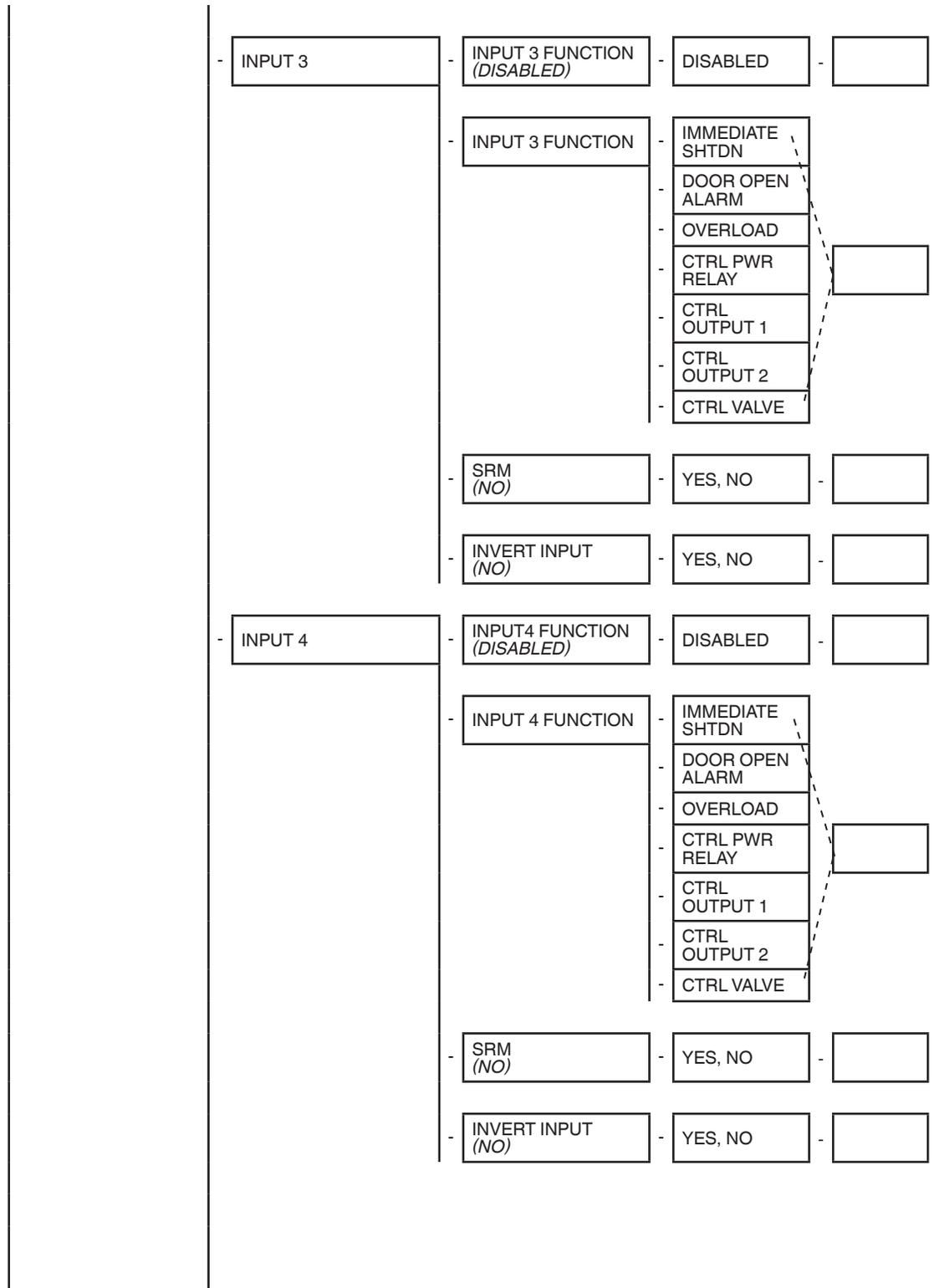


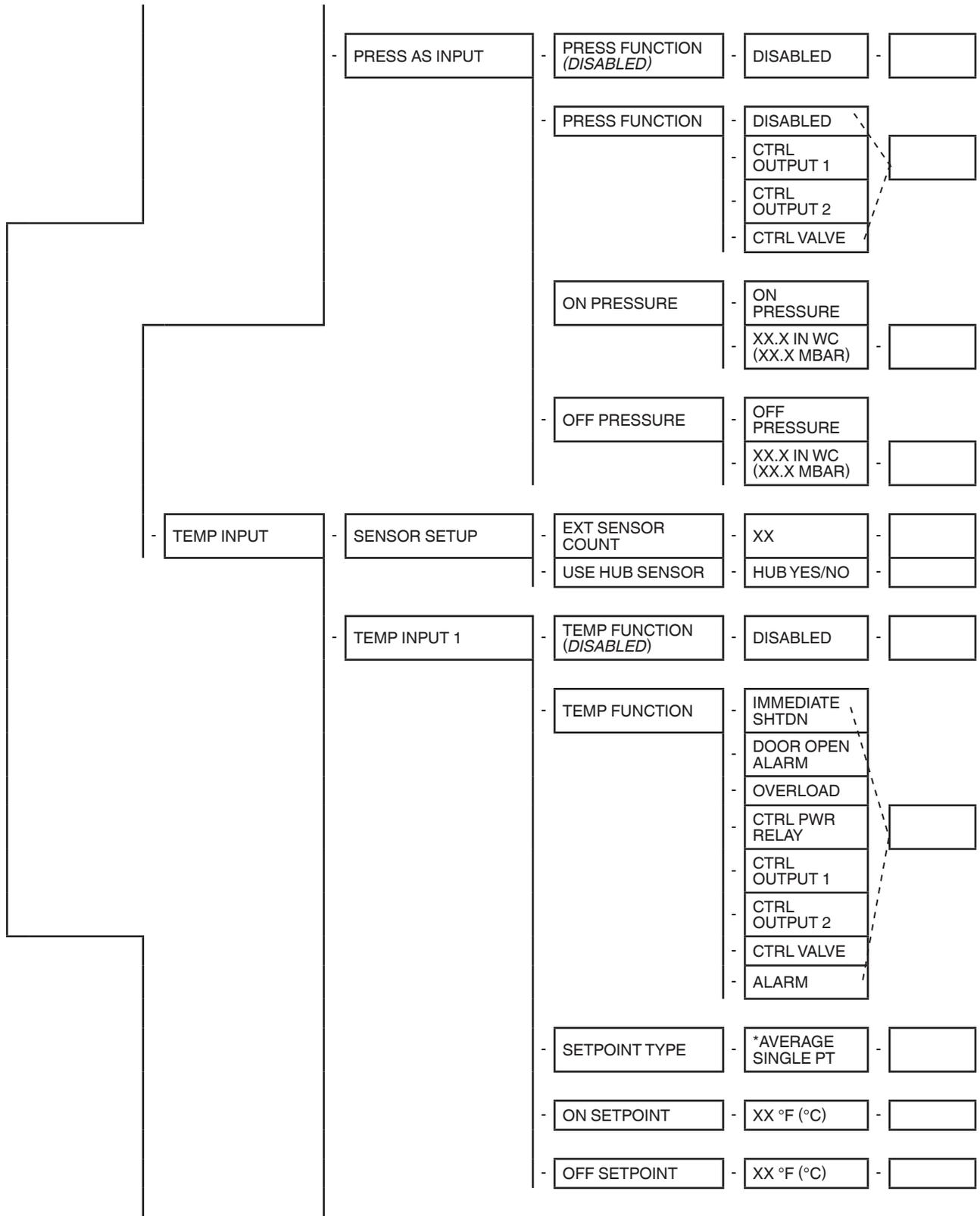
Flow rate will also be dependant on the regulated pressure source.

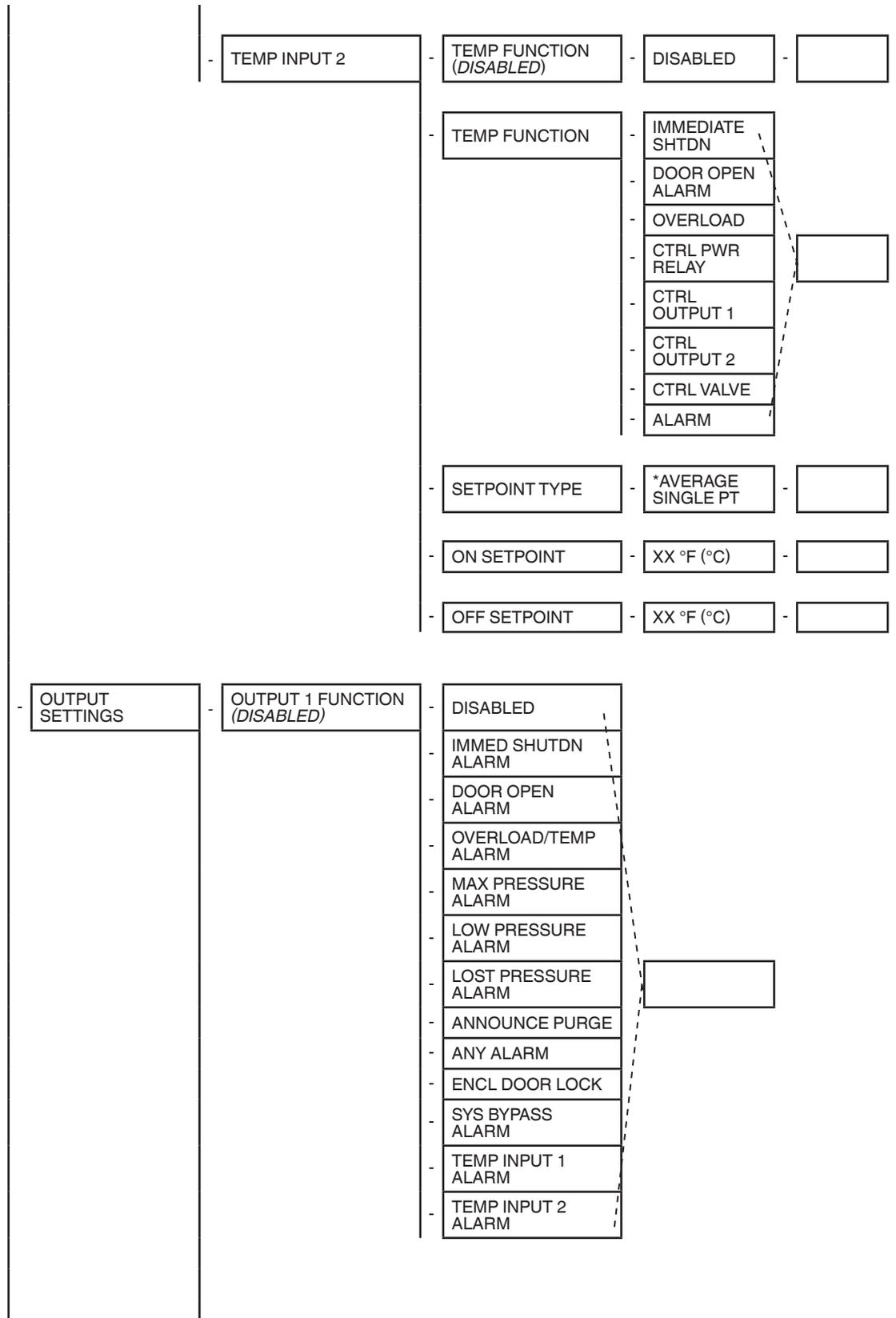
Programming Worksheet

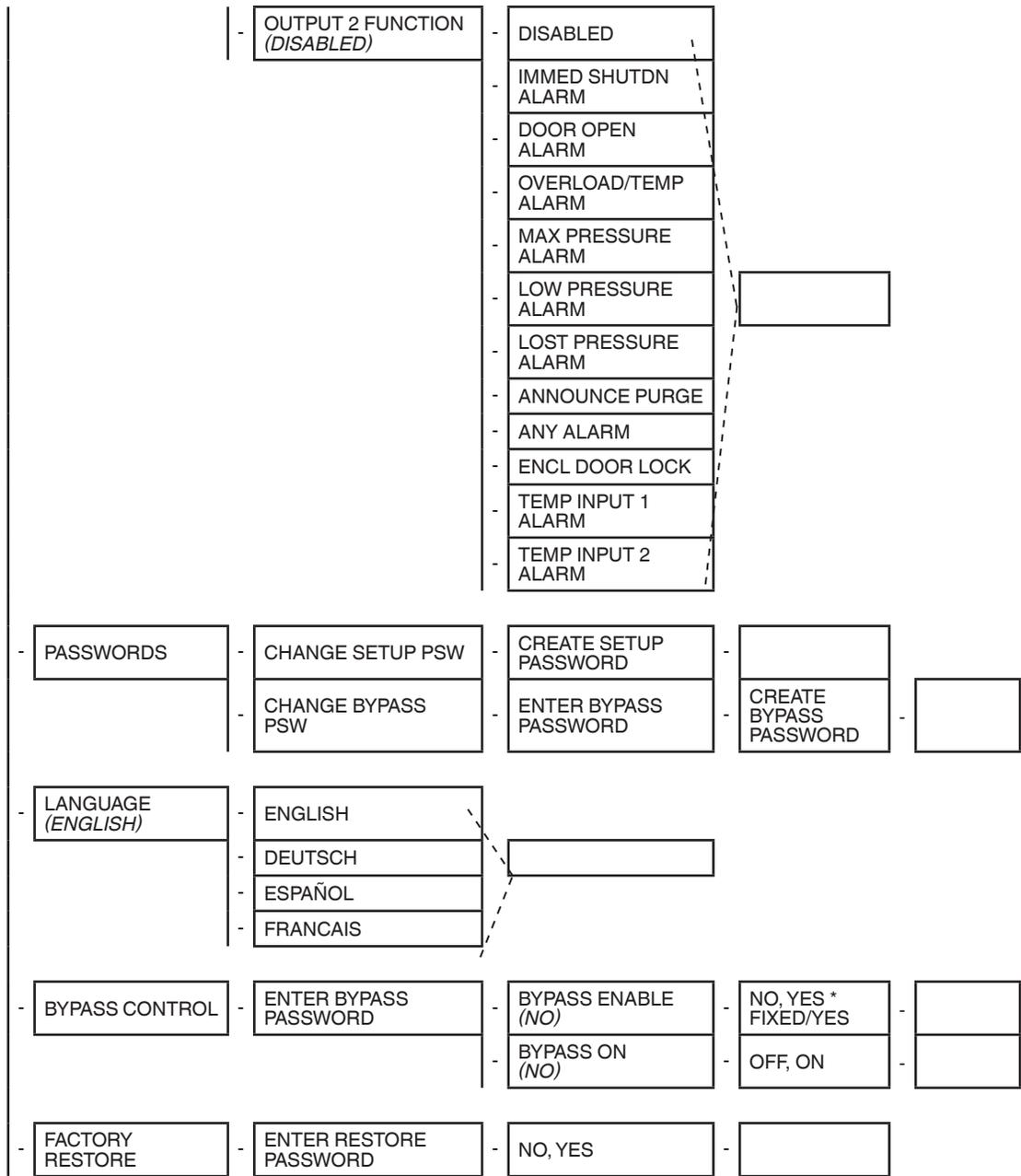
SETUP	PASSWORD	PURGE SETTINGS	ENCLOSURE VOLUME (XXXX FT3 [M3])	USER DEFINED	
			# OF EXCHANGES (5)	4 - 19	
			PURGE FLOW (12)	5 (141 L/M)	
				12 (340 L/M)	
				20 (565 L/M)	
				30 850 L/M)	
				DYNAMIC	
			VENT FLOW CONTROL (ONE VENT)	ONE VENT	
				2 VENTS ADD FLOWS	
				2 VENTS LEAST FLOW	
				2 VENTS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

INPUT SETTINGS	INPUT 1	INPUT 1 FUNCTION <i>(DISABLED)</i>	DISABLED	<input type="checkbox"/>
		INPUT 1 FUNCTION	IMMEDIATE SHTDN	<input type="checkbox"/>
			DOOR OPEN ALARM	
			OVERLOAD	
			CTRL PWR RELAY	
			CTRL OUTPUT 1	
			CTRL OUTPUT 2	
	CTRL VALVE			
	SYS BYPASS			
	SRM <i>(NO)</i>	YES, NO	<input type="checkbox"/>	
	INVERT INPUT <i>(NO)</i>	YES, NO	<input type="checkbox"/>	
	INPUT 2	INPUT 2 FUNCTION <i>(DISABLED)</i>	DISABLED	<input type="checkbox"/>
		INPUT 2 FUNCTION	IMMEDIATE SHTDN	<input type="checkbox"/>
			DOOR OPEN ALARM	
OVERLOAD				
CTRL PWR RELAY				
CTRL OUTPUT 1				
CTRL OUTPUT 2				
CTRL VALVE				
SRM <i>(NO)</i>	YES, NO	<input type="checkbox"/>		
INVERT INPUT <i>(NO)</i>	YES, NO	<input type="checkbox"/>		







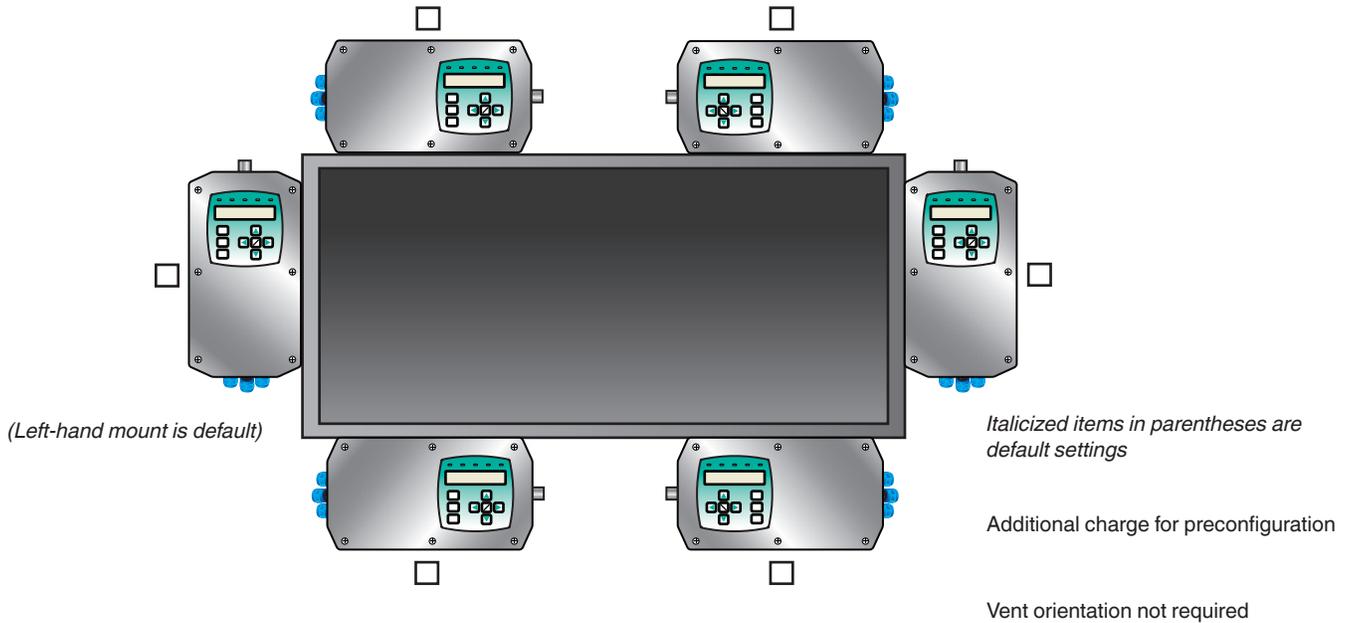


ARROW KEY SEQUENCE - 4 TO 8 STROKES EACH

SETUP PASSWORD								
BYPASS PASSWORD								

DATE:

NAME:



When rotating the UIC display in the housing, always torque adjacent screws at 0.46 N-m (4 in-lb).

Notes:

Notes:

Your automation, our passion.

Explosion Protection

- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity