MPS 3000
MULTIPROBE TEST
GAS SEQUENCER

**(with World Class 3000
Digital Electronics or Model 218A
Electronics Package)**

Instruction Bulletin IB-106-300MS Rev. 3.3

ROSEMOUNT® ANALYTICAL

FISHER-ROSEMOUNT™ Managing The Process Better.™

HOW TO USE THIS MANUAL

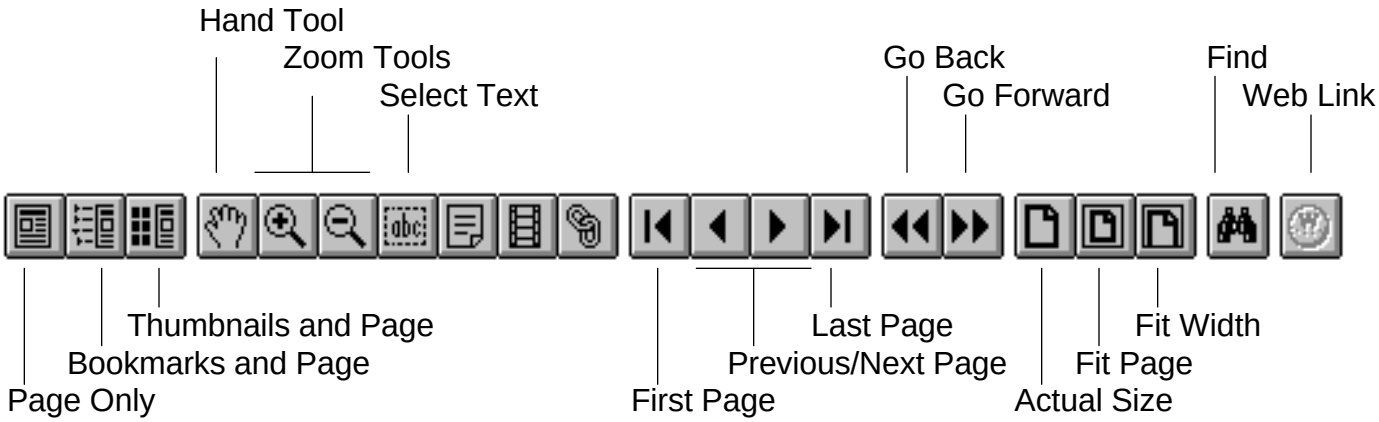
This electronic manual is a complete version of the paper manual. The tools provided as part of Acrobat Reader make it easy for you to move through and read the document, move to referenced items through links, find text, and copy text and graphics to the clipboard for use in another application.

For more detailed information on using Acrobat Reader features, see Acrobat Reader Help.

Links

References throughout the manual are linked and identified with blue text. To move to a referenced area, move the mouse pointer to the red text until it turns into a pointing finger, then click.

Links are located in the Table of Contents as well as throughout the manual.



Viewing

You may find it easier to work with the overview area of the window open. Click either the Bookmarks and Page button or the Thumbnails and Page button. This will allow you to view document book-marks or thumbnails. Click on a bookmark name to go to the location identified by the bookmark. Thumbnails will help you to locate your placement on the page.

The Zoom tools allow you to increase or decrease magnification of the page. The Actual Size, Fit Page, and Fit Width buttons are presets for specific magnification.

Browsing

Use the First Page, Last Page, Previous Page and Next Page buttons to easily move through the document. Go Back and Go Forward allow you to retrace your steps in order through the document.

The Hand tool lets you move the view of the page on your screen, similar to using your hand to move a piece of paper on the top of your desk.

HIGHLIGHTS OF CHANGES

Effective June, 1994 Rev. 3

PAGE	SUMMARY
1-1	Replace old MPS outline drawing with new MPS drawing.
1-1	Figure 1-2: Replace old MPS interior view with new MPS.
1-3	Figure 1-3: Delete "OPTIONAL" for check valve.
1-4	Add Figure 1-4, MPS with Z-Purge.
2-1	Replace old MPS views with new MPS.
2-2	Specify test gas pressure in paragraphs 2-2.b.2. and b.3. Figure 2-2: replace old MPS gas connections diagram with new MPS.
2-3	Figure 2-3: Replace old power supply with new power supply and correct table.
2-4	Figure 2-4: replace old termination board with new board.
2-5	Figure 2-5: replace old termination board with new board.
5-1	Change paragraph 5-2, Fuse Replacement, the fuses are no longer on the power supply. Replace paragraph 5-3, Power Supply Replacement with updated procedures for new MPS.
5-1	Replace paragraph 5-4, Solenoid Valve Replacement, with updated procedures for new MPS.
5-2	Figure 5-1: Replace exploded view of MPS with new MPS.
6-1	Table 6-1: correct part numbers for power supply assembly, solenoid valve, and test gas flowmeter assembly. Add part number for reference gas flowmeter assembly.

Effective February, 1995 Rev. 3.1

PAGE	SUMMARY
1-3	Figure 1-3: Add check valve note to figure.
2-2	Insert caution concerning low (zero) gas.
3-1	Added gas caution. Added check valve requirement. Deleted nominal values note (now covered by caution).
3-2	Added gas caution for paragraphs 3-3 and 3-4.

HIGHLIGHTS OF CHANGES (Continued)

Effective January, 1997 Rev. 3.2

PAGE	SUMMARY
Front matter	Added “Safety instructions for the wiring and installation of this apparatus”.
2-1	Added warning to read new safety instructions and protective covers and grounds warning.
2-2	Added NOTE regarding reference to Figure 2-4 for MPS unit fuse locations and specifications.
2-4	Added NOTE regarding MPS fuse specifications to Figure 2-4.
4-1	Added protective covers and grounds warning.
5-1	Added protective covers and grounds warning and reference to Table 6-1 for replacement fuse specifications.
6-1	Updated fuse specifications.
Index	Added fuses to index listing.

Effective May, 1997 Rev. 3.3

PAGE	SUMMARY
iii-xv	Added foreign language safety sheets.

ROSEMOUNT WARRANTY

Rosemount warrants that the equipment manufactured and sold by it will, upon shipment, be free of defects in workmanship or material. Should any failure to conform to this warranty become apparent during a period of one year after the date of shipment, Rosemount shall, upon prompt written notice from the purchaser, correct such nonconformity by repair or replacement, F.O.B. factory of the defective part or parts. Correction in the manner provided above shall constitute a fulfillment of all liabilities of Rosemount with respect to the quality of the equipment.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY WHETHER WRITTEN, ORAL, OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OF FITNESS FOR PURPOSE).

The remedy(ies) provided above shall be purchaser's sole remedy(ies) for any failure of Rosemount to comply with the warranty provisions, whether claims by the purchaser are based in contract or in tort (including negligence).

Rosemount does not warrant equipment against normal deterioration due to environment. Factors such as corrosive gases and solid particulates can be detrimental and can create the need for repair or replacement as part of normal wear and tear during the warranty period.

Equipment supplied by Rosemount Analytical Inc. but not manufactured by it will be subject to the same warranty as is extended to Rosemount by the original manufacturer.

At the time of installation it is important that the required services are supplied to the system and that the electronic controller is set up at least to the point where it is controlling the sensor heater. This will ensure, that should there be a delay between installation and full commissioning that the sensor being supplied with ac power and reference air will not be subjected to component deterioration.

NOTE

Only one probe can be calibrated with digital electronics. A separate MPS 3000 is required for each probe being used.

DEFINITIONS

The following definitions apply to WARNINGS, CAUTIONS, and NOTES found throughout this publication.

WARNING

Highlights an operation or maintenance procedure, practice, condition, statement, etc., that if not strictly observed, could result in injury, death, or long-term health hazards of personnel.

CAUTION

Highlights an operation or maintenance procedure, practice, condition, statement, etc., that if not strictly observed, could result in damage to or destruction of equipment, or loss of effectiveness.

NOTE

Highlights an essential operating procedure, condition, or statement.

IMPORTANT

SAFETY INSTRUCTIONS FOR THE WIRING AND INSTALLATION OF THIS APPARATUS

The following safety instructions apply specifically to all EU member states. They should be strictly adhered to in order to assure compliance with the Low Voltage Directive. Non-EU states should also comply with the following unless superseded by local or National Standards.

1. Adequate earth connections should be made to all earthing points, internal and external, where provided.

2. After installation or troubleshooting, all safety covers and safety grounds must be replaced. The integrity of all earth terminals must be maintained at all times.

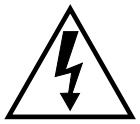
3. Mains supply cords should comply with the requirements of IEC227 or IEC245.

4. All wiring shall be suitable for use in an ambient temperature of greater than 75°C.

5. All cable glands used should be of such internal dimensions as to provide adequate cable anchorage.

6. To ensure safe operation of this equipment, connection to the mains supply should only be made through a circuit breaker which will disconnect all circuits carrying conductors during a fault situation. The circuit breaker may also include a mechanically operated isolating switch. If not, then another means of disconnecting the equipment from the supply must be provided and clearly marked as such. Circuit breakers or switches must comply with a recognized standard such as IEC947. All wiring must conform with any local standards.

7. Where equipment or covers are marked with the symbol to the right, hazardous voltages are likely to be present beneath. These covers should only be removed when power is removed from the equipment — and then only by trained service personnel.



8. Where equipment or covers are marked with the symbol to the right, there is a danger from hot surfaces beneath. These covers should only be removed by trained service personnel when power is removed from the equipment. Certain surfaces may remain hot to the touch.

9. Where equipment or covers are marked with the symbol to the right, refer to the Operator Manual for instructions.

10. All graphical symbols used in this product are from one or more of the following standards: EN61010-1, IEC417, and ISO3864.

BELANGRIJK

Veiligheidsvoorschriften voor de aansluiting en installatie van dit toestel.

De hierna volgende veiligheidsvoorschriften zijn vooral bedoeld voor de EU lidstaten. Hier moet aan gehouden worden om de onderworpenheid aan de Laag Spannings Richtlijn (Low Voltage Directive) te verzekeren. Niet EU staten zouden deze richtlijnen moeten volgen tenzij zij reeds achterhaald zouden zijn door plaatselijke of nationale voorschriften.

1. Degelijke aardingsaansluitingen moeten gemaakt worden naar alle voorziene aardpunten, intern en extern.

2. Na installatie of controle moeten alle veiligheidsdeksels en -aardingen terug geplaatst worden. Ten alle tijde moet de betrouwbaarheid van de aarding behouden blijven.

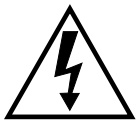
3. Voedingskabels moeten onderworpen zijn aan de IEC227 of de IEC245 voorschriften.

4. Alle bekabeling moet geschikt zijn voor het gebruik in omgevingstemperaturen, hoger dan 75°C.

5. Alle wartels moeten zo gedimensioneerd zijn dat een degelijke kabel bevestiging verzekerd is.

6. Om de veilige werking van dit toestel te verzekeren, moet de voeding door een stroomonderbreker gevoerd worden (min 10A) welke alle draden van de voeding moet onderbreken. De stroomonderbreker mag een mechanische schakelaar bevatten. Zoniet moet een andere mogelijkheid bestaan om de voedingsspanning van het toestel te halen en ook duidelijk zo zijn aangegeven. Stroomonderbrekers of schakelaars moeten onderworpen zijn aan een erkende standaard zoals IEC947.

7. Waar toestellen of deksels aangegeven staan met het symbool is er meestal hoogspanning aanwezig. Deze deksels mogen enkel verwijderd worden nadat de voedingsspanning werd afgelegd en enkel door getraind onderhoudspersoneel.



8. Waar toestellen of deksels aangegeven staan met het symbool is er gevaar voor hete oppervlakken. Deze deksels mogen enkel verwijderd worden door getraind onderhoudspersoneel nadat de voedingsspanning verwijderd werd. Sommige oppper-vlakken kunnen 45 minuten later nog steeds heet aanvoelen.

9. Waar toestellen of deksels aangegeven staan met het symbool gelieve het handboek te raadplegen.

10. Alle grafische symbolen gebruikt in dit produkt, zijn afkomstig uit een of meer van devolgende standaards; EN61010-1, IEC417 en ISO3864.

VIGTIGT

Sikkerhedsinstruktion for tilslutning og installering af dette udstyr.

Følgende sikkerhedsinstruktioner gælder specifikt i alle EU-medlemslande. Instruktionerne skal nøje følges for overholdelse af Lavsspændingsdirektivet og bør også følges i ikke EU-lande medmindre andet er specificeret af lokale eller nationale standarder.

1. Passende jordforbindelser skal tilsluttes alle jordklemmer, interne og eksterne, hvor disse forefindes.

2. Efter installation eller fejlfinding skal alle sikkerhedsdæksler og jordforbindelser reetableres.

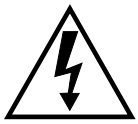
3. Forsyningskabler skal opfylde krav specificeret i IEC227 eller IEC245.

4. Alle ledningstilslutninger skal være konstrueret til omgivelsestemperatur højere end 75° C.

5. Alle benyttede kabelforskruninger skal have en intern dimension, så passende kabelaflastning kan etableres.

6. For opnåelse af sikker drift og betjening skal der skabes beskyttelse mod indirekte berøring gennem afbryder (min. 10A), som vil afbryde alle kredsløb med elektriske ledere i fejlsitua-tion. Afbryderen skal indholde en mekanisk betjent kontakt. Hvis ikke skal anden form for afbryder mellem forsyning og udstyr benyttes og mærkes som sådan. Afbrydere eller kontakter skal overholde en kendt standard som IEC947.

7. Hvor udstyr eller dæksler er mærket med dette symbol, er farlige spændinger normalt forekom-mende bagved. Disse dæksler bør kun afmonteres, når forsyningsspændingen er frakoblet - og da kun af instrueret servicepersonale.



8. Hvor udstyr eller dæksler er mærket med dette symbol, forefindes meget varme overflader bagved. Disse dæksler bør kun afmonteres af instrueret servicepersonale, når forsyningsspænding er frakoblet. Visse overflader vil stadig være for varme at berøre i op til 45 minutter efter frakobling.

9. Hvor udstyr eller dæksler er mærket med dette symbol, se da i betjeningsmanual for instruktion.

10. Alle benyttede grafiske symboler i dette udstyr findes i én eller flere af følgende standarder:- EN61010-1, IEC417 & ISO3864.

BELANGRIJK

Veiligheidsinstructies voor de bedrading en installatie van dit apparaat.

Voor alle EU lidstaten zijn de volgende veiligheidsinstructies van toepassing. Om aan de geldende richtlijnen voor laagspanning te voldoen dient men zich hieraan strikt te houden. Ook niet EU lidstaten dienen zich aan het volgende te houden, tenzij de lokale wetgeving anders voorschrijft.

1. Alle voorziene interne- en externe aardaansluitingen dienen op adequate wijze aangesloten te worden.

2. Na installatie,onderhouds- of reparatie werkzaamheden dienen alle beschermdeksels /kappen en aardingen om reden van veiligheid weer aangebracht te worden.

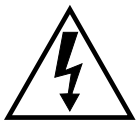
3. Voedingskabels dienen te voldoen aan de vereisten van de normen IEC 227 of IEC 245.

4. Alle bedrading dient geschikt te zijn voor gebruik bij een omgevings temperatuur boven 75°C.

5. Alle gebruikte kabelwartels dienen dusdanige inwendige afmetingen te hebben dat een adequate verankering van de kabel wordt verkregen.

6. Om een veilige werking van de apparatuur te waarborgen dient de voeding uitsluitend plaats te vinden via een meerpolige automatische zekering (min.10A) die **alle** spanningvoerende geleiders verbreekt indien een foutconditie optreedt. Deze automatische zekering mag ook voorzien zijn van een mechanisch bediende schakelaar. Bij het ontbreken van deze voorziening dient een andere als zodanig duidelijk aangegeven mogelijkheid aanwezig te zijn om de spanning van de apparatuur af te schakelen. Zekeringen en schakelaars dienen te voldoen aan een erkende standaard zoals IEC 947.

7. Waar de apparatuur of de beschermdeksels/kappen gemarkeerd zijn met het volgende symbool, kunnen zich hieronder spanning voerende delen bevinden die gevaar op kunnen leveren. Deze beschermdeksels/kappen mogen uitsluitend verwijderd worden door getraind personeel als de spanning is afgeschakeld.



8. Waar de apparatuur of de beschermdeksels/kappen gemarkeerd zijn met het volgende symbool, kunnen zich hieronder hete oppervlakken of onderdelen bevinden. Bepaalde delen kunnen mogelijk na 45 min. nog te heet zijn om aan te raken.

9. Waar de apparatuur of de beschermdeksels/kappen gemarkeerd zijn met het volgende symbool, dient men de bedieningshandleiding te raadplegen.

10. Alle grafische symbolen gebruikt bij dit produkt zijn volgens een of meer van de volgende standaarden: EN 61010-1, IEC 417 & ISO 3864.

TÄRKEÄÄ

Turvallisuusohje, jota on noudatettava tämän laitteen asentamisessa ja kaapeloinnissa.

Seuraavat ohjeet pätevät erityisesti EU:n jäsenvaltioissa. Niitä täytyy ehdottomasti noudattaa jotta täytettäisiin EU:n matalajännitedirektiivin (Low Voltage Directive) yhteensopivuus. Myös EU:hun kuulumattomien valtioiden tulee nou-dattaa tätä ohjetta, elleivät kansalliset standardit estä sitä.

1. Riittävät maadoituskytkennät on tehtävä kaikkiin maadoituspisteisiin, sisäisiin ja ulkoisiin.

2. Asennuksen ja vianetsinnän jälkeen on kaikki suojat ja suojamaat asennettava takaisin pai-koilleen. Maadoitusliittimen kunnollinen toiminta täytyy aina ylläpitää.

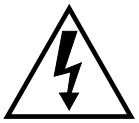
3. Jännitesyöttöjohtimien täytyy täyttää IEC227 ja IEC245 vaatimukset.

4. Kaikkien johdotuksien tulee toimia >75°C lämpötiloissa.

5. Kaikkien läpivientiholkkien sisähalkaisijan täytyy olla sellainen että kaapeli lukkiutuu kun-nolla kiinni.

6. Turvallisen toiminnan varmistamiseksi täytyy jännitesyöttö varustaa turvakytkimellä (min 10A), joka kytkee irti kaikki jännitesyöttöjohtimet vikatilanteessa. Suojaan täytyy myös sisältyä mekaaninen erotuskytkin. Jos ei, niin jännitesyöttö on pystyttävä katkaisemaan muilla keinoilla ja merkittävä siten että se tunnistetaan sellaiseksi. Turvakytkimien tai kat-kaisimien täytyy täyttää IEC947 standardin vaatimukset näkyvyydestä.

7. Mikäli laite tai kosketussuoja on merkitty tällä merkillä on merkinnän takana tai alla hengenvaarallisen suuruinen jännite. Suojaa ei saa poistaa jänniteen ollessa kytkettynä laitteeseen ja poistamisen saa suorittaa vain alan asian-tuntija.



8. Mikäli laite tai kosketussuoja on merkitty tällä merkillä on merkinnän takana tai alla kuuma pinta. Suojan saa poistaa vain alan asiantuntija kun jännite-syöttö on katkaistu. Tällainen pinta voi säilyä kosketuskuumana jopa 45 mi-nuuttia.

9. Mikäli laite tai kosketussuoja on merkitty tällä merkillä katso lisäohjeita käyt-töohjekirjasta

10. Kaikki tässä tuotteessa käytetyt graafiset symbolit ovat yhdestä tai useammasta seuraavis-ta standardeista: EN61010-1, IEC417 & ISO3864.

IMPORTANT

Consignes de sécurité concernant le raccordement et l'installation de cet appareil.

Les consignes de sécurité ci-dessous s'adressent particulièrement à tous les états membres de la communauté européenne. Elles doivent être strictement appliquées afin de satisfaire aux directives concernant la basse tension. Les états non membres de la communauté européenne doivent également appliquer ces consignes sauf si elles sont en contradiction avec les standards locaux ou nationaux.

1. Un raccordement adéquate à la terre doit être effectuée à chaque borne de mise à la terre, interne et externe.

2. Après installation ou dépannage, tous les capots de protection et toutes les prises de terre doivent être remis en place, toutes les prises de terre doivent être respectées en permanence.

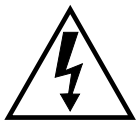
3. Les câbles d'alimentation électrique doivent être conformes aux normes IEC227 ou IEC245

4. Tous les raccordements doivent pouvoir supporter une température ambiante supérieure à 75°C.

5. Tous les presse-étoupes utilisés doivent avoir un diamètre interne en rapport avec les câbles afin d'assurer un serrage correct sur ces derniers.

6. Afin de garantir la sécurité du fonctionnement de cet appareil, le raccordement à l'alimentation électrique doit être réalisé exclusivement au travers d'un disjoncteur (minimum 10A.) isolant tous les conducteurs en cas d'anomalie. Ce disjoncteur doit également pouvoir être actionné manuellement, de façon mécanique. Dans le cas contraire, un autre système doit être mis en place afin de pouvoir isoler l'appareil et doit être signalisé comme tel. Disjoncteurs et interrupteurs doivent être conformes à une norme reconnue telle IEC947.

7. Lorsque les équipements ou les capots affichent le symbole suivant, cela signifie que des tensions dangereuses sont présentes. Ces capots ne doivent être démontés que lorsque l'alimentation est coupée, et uniquement par un personnel compétent.



8. Lorsque les équipements ou les capots affichent le symbole suivant, cela signifie que des surfaces dangereusement chaudes sont présentes. Ces capots ne doivent être démontés que lorsque l'alimentation est coupée, et uniquement par un personnel compétent. Certaines surfaces peuvent rester chaudes jusqu'à 45 mn.

9. Lorsque les équipements ou les capots affichent le symbole suivant, se reporter au manuel d'instructions.

10. Tous les symboles graphiques utilisés dans ce produit sont conformes à un ou plusieurs des standards suivants: EN61010-1, IEC417 & ISO3864.

Wichtig

Sicherheitshinweise für den Anschluß und die Installation dieser Geräte.

Die folgenden Sicherheitshinweise sind in allen Mitgliederstaaten der europäischen Gemeinschaft gültig. Sie müssen strickt eingehalten werden, um der Niederspannungsrichtlinie zu genügen. Nichtmitgliedsstaaten der europäischen Gemeinschaft sollten die national gültigen Normen und Richtlinien einhalten.

1. Alle intern und extern vorgesehenen Erdungen der Geräte müssen ausgeführt werden.

2. Nach Installation, Reparatur oder sonstigen Eingriffen in das Gerät müssen alle Sicherheitsabdeckungen und Erdungen wieder installiert werden. Die Funktion aller Erdverbindungen darf zu keinem Zeitpunkt gestört sein.

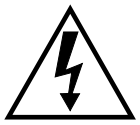
3. Die Netzspannungsversorgung muß den Anforderungen der IEC227 oder IEC245 genügen.

4. Alle Verdrahtungen sollten mindestens bis 75 °C ihre Funktion dauerhaft erfüllen.

5. Alle Kabeldurchführungen und Kabelverschraubungen sollten in Ihrer Dimensionierung so gewählt werden, daß diese eine sichere Verkabelung des Gerätes ermöglichen.

6. Um eine sichere Funktion des Gerätes zu gewährleisten, muß die Spannungsversorgung über mindestens 10 A abgesichert sein. Im Fehlerfall muß dadurch gewährleistet sein, daß die Spannungsversorgung zum Gerät bzw. zu den Geräten unterbrochen wird. Ein mechanischer Schutzschalter kann in dieses System integriert werden. Falls eine derartige Vorrichtung nicht vorhanden ist, muß eine andere Möglichkeit zur Unterbrechung der Spannungszufuhr gewährleistet werden mit Hinweisen deutlich gekennzeichnet werden. Ein solcher Mechanismus zur Spannungsunterbrechung muß mit den Normen und Richtlinien für die allgemeine Installation von Elektrogeräten, wie zum Beispiel der IEC947, übereinstimmen.

7. Mit dem Symbol sind Geräte oder Abdeckungen gekennzeichnet, die eine gefährliche (Netzspannung) Spannung führen. Die Abdeckungen dürfen nur entfernt werden, wenn die Versorgungsspannung unterbrochen wurde. Nur geschultes Personal darf an diesen Geräten Arbeiten ausführen.



8. Mit dem Symbol sind Geräte oder Abdeckungen gekennzeichnet, in bzw. unter denen heiße Teile vorhanden sind. Die Abdeckungen dürfen nur entfernt werden, wenn die Versorgungsspannung unterbrochen wurde. Nur geschultes Personal darf an diesen Geräten Arbeiten ausführen. Bis 45 Minuten nach dem Unterbrechen der Netzzufuhr können derartig Teile noch über eine erhöhte Temperatur verfügen.

9. Mit dem Symbol sind Geräte oder Abdeckungen gekennzeichnet, bei denen vor dem Eingriff die entsprechenden Kapitel im Handbuch sorgfältig durchgelesen werden müssen.

10. Alle in diesem Gerät verwendeten graphischen Symbole entspringen einem oder mehreren der nachfolgend aufgeführten Standards: EN61010-1, IEC417 & ISO3864.

IMPORTANTE

Norme di sicurezza per il cablaggio e l'installazione dello strumento.

Le seguenti norme di sicurezza si applicano specificatamente agli stati membri dell'Unione Europea, la cui stretta osservanza è richiesta per garantire conformità alla Direttiva del Basso Voltaggio. Esse si applicano anche agli stati non appartenenti all'Unione Europea, salvo quanto disposto dalle vigenti normative locali o nazionali.

1. Collegamenti di terra idonei devono essere eseguiti per tutti i punti di messa a terra interni ed esterni, dove previsti.

2. Dopo l'installazione o la localizzazione dei guasti, assicurarsi che tutti i coperchi di protezione siano stati collocati e le messa a terra siano collegate. L'integrità di ciscun morsetto di terra deve essere costantemente garantita.

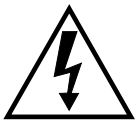
3. I cavi di alimentazione della rete devono essere secondo disposizioni IEC227 o IEC245.

4. L'intero impianto elettrico deve essere adatto per uso in ambiente con temperature superiore a 75°C.

5. Le dimensioni di tutti i connettori dei cavi utilizzati devono essere tali da consentire un adeguato ancoraggio al cavo.

6. Per garantire un sicuro funzionamento dello strumento il collegamento alla rete di alimentazione principale dovrà essere eseguita tramite interruttore automatico (min.10A), in grado di disattivare tutti i conduttori di circuito in caso di guasto. Tale interruttore dovrà inoltre prevedere un sezionatore manuale o altro dispositivo di interruzione dell'alimentazione, chiaramente identificabile. Gli interruttori dovranno essere conformi agli standard riconosciuti, quali IEC947.

7. Il simbolo riportato sullo strumento o sui coperchi di protezione indica probabile presenza di elevati voltaggi. Tali coperchi di protezione devono essere rimossi esclusivamente da personale qualificato, dopo aver tolto alimentazione allo strumento.



8. Il simbolo riportato sullo strumento o sui coperchi di protezione indica rischio di contatto con superfici ad alta temperatura. Tali coperchi di protezione devono essere rimossi esclusivamente da personale qualificato, dopo aver tolto alimentazione allo strumento. Alcune superfici possono mantenere temperature elevate per oltre 45 minuti.

9. Se lo strumento o il coperchio di protezione riportano il simbolo, fare riferimento alle istruzioni del manuale Operatore.

10. Tutti i simboli grafici utilizzati in questo prodotto sono previsti da uno o più dei seguenti standard: EN61010-1, IEC417 e ISO3864.

VIKTIG

Sikkerhetsinstruks for tilkobling og installasjon av dette utstyret.

Følgende sikkerhetsinstruksjoner gjelder spesifikt alle EU medlemsland og land med i EØS-avtalen. Instruksjonene skal følges nøye slik at installasjonen blir i henhold til lavspenningsdirektivet. Den bør også følges i andre land, med mindre annet er spesifisert av lokale- eller nasjonale standarder.

1. Passende jordforbindelser må tilkobles alle jordingspunkter, interne og eksterne hvor disse forefinnes.

2. Etter installasjon eller feilsøking skal alle sikkerhetsdeksler og jordforbindelser reetableres. Jordingsforbindelsene må alltid holdes i god stand.

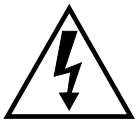
3. Kabler fra spenningsforsyning skal oppfylle kravene spesifisert i IEC227 eller IEC245.

4. Alle ledningsforbindelser skal være konstruert for en omgivelsestemperatur høyere en 750C.

5. Alle kabelforskruvninger som benyttes skal ha en indre dimensjon slik at tilstrekkelig avlastning oppnåes.

6. For å oppnå sikker drift og betjening skal forbindelsen til spenningsforsyningen bare skje gjennom en strømbryter (minimum 10A) som vil bryte spenningsforsyningen til alle elektriske kretser ved en feilsituasjon. Strømbryteren kan også inneholde en mekanisk operert bryter for å isolere instrumentet fra spenningsforsyningen. Dersom det ikke er en mekanisk operert bryter installert, må det være en annen måte å isolere utstyret fra spenningsforsyningen, og denne måten må være tydelig merket. Kretsbrytere eller kontakter skal oppfylle kravene i en annerkjent standard av typen IEC947 eller tilsvarende.

7. Der hvor utstyr eller deksler er merket med symbol for farlig spenning, er det sannsynlig at disse er tilstede bak dekslet. Disse dekslene må bare fjærnes når spenningsforsyning er frakoblet utstyret, og da bare av trenet servicepersonell.



8. Der hvor utstyr eller deksler er merket med symbol for meget varm overflate, er det sannsynlig at disse er tilstede bak dekslet. Disse dekslene må bare fjærnes når spenningsforsyning er frakoblet utstyret, og da bare av trenet servicepersonell. Noen overflater kan være for varme til å berøres i opp til 45 minutter etter spenningsforsyning frakoblet.

9. Der hvor utstyret eller deksler er merket med symbol, vennligst referer til instruksjonsmanualen for instrukser.

10. Alle grafiske symboler brukt i dette produktet er fra en eller flere av følgende standarder: EN61010-1, IEC417 & ISO3864.

IMPORTANTE

Instruções de segurança para ligação e instalação deste aparelho.

As seguintes instruções de segurança aplicam-se especificamente a todos os estados membros da UE. Devem ser observadas rigidamente por forma a garantir o cumprimento da Directiva sobre Baixa Tensão. Relativamente aos estados que não pertençam à UE, deverão cumprir igualmente a referida directiva, exceptuando os casos em que a legislação local a tiver substituído.

1. Devem ser feitas ligações de terra apropriadas a todos os pontos de terra, internos ou externos.

2. Após a instalação ou eventual reparação, devem ser recolocadas todas as tampas de segurança e terras de protecção. Deve manter-se sempre a integridade de todos os terminais de terra.

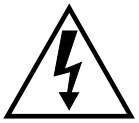
3. Os cabos de alimentação eléctrica devem obedecer às exigências das normas IEC227 ou IEC245.

4. Os cabos e fios utilizados nas ligações eléctricas devem ser adequados para utilização a uma temperatura ambiente até 75º C.

5. As dimensões internas dos bucins dos cabos devem ser adequadas a uma boa fixação dos cabos.

6. Para assegurar um funcionamento seguro deste equipamento, a ligação ao cabo de alimentação eléctrica deve ser feita através de um disjuntor (min. 10A) que desligará todos os condutores de circuitos durante uma avaria. O disjuntor poderá também conter um interruptor de isolamento accionado manualmente. Caso contrário, deverá ser instalado qualquer outro meio para desligar o equipamento da energia eléctrica, devendo ser assinalado convenientemente. Os disjuntores ou interruptores devem obedecer a uma norma reconhecida, tipo IEC947.

7. Sempre que o equipamento ou as tampas contiverem o símbolo, é provável a existência de tensões perigosas. Estas tampas só devem ser retiradas quando a energia eléctrica tiver sido desligada e por Pessoal da Assistência devidamente treinado.



8. Sempre que o equipamento ou as tampas contiverem o símbolo, há perigo de existência de superfícies quentes. Estas tampas só devem ser retiradas por Pessoal da Assistência devidamente treinado e depois de a energia eléctrica ter sido desligada. Algumas superfícies permanecem quentes até 45 minutos depois.

9. Sempre que o equipamento ou as tampas contiverem o símbolo, o Manual de Funcionamento deve ser consultado para obtenção das necessárias instruções.

10. Todos os símbolos gráficos utilizados neste produto baseiam-se em uma ou mais das seguintes normas: EN61010-1, IEC417 e ISO3864.

IMPORTANTE

Instrucciones de seguridad para el montaje y cableado de este aparato.

Las siguientes instrucciones de seguridad , son de aplicacion especifica a todos los miembros de la UE y se adjuntaran para cumplir la normativa europea de baja tension.

1. Se deben preveer conexiones a tierra del equipo, tanto externa como internamente, en aquellos terminales previstos al efecto.

2. Una vez finalizada las operaciones de mantenimiento del equipo, se deben volver a colocar las cubiertas de seguridad aasi como los terminales de tierra. Se debe comprobar la integridad de cada terminal.

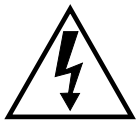
3. Los cables de alimentacion electrica cumpliran con las normas IEC 227 o IEC 245.

4. Todo el cableado sera adecuado para una temperatura ambiental de 75ºC.

5. Todos los prensaestopas seran adecuados para una fijacion adecuada de los cables.

6. Para un manejo seguro del equipo, la alimentacion electrica se realizara a traves de un interruptor magnetotermico (min 10 A), el cual desconectara la alimentacion electrica al equipo en todas sus fases durante un fallo. Los interruptores estaran de acuerdo a la norma IEC 947 u otra de reconocido prestigio.

7. Cuando las tapas o el equipo lleve impreso el simbolo de tension electrica peligrosa, dicho alojamiento solamente se abrira una vez que se haya interrumpido la alimentacion electrica al equipo asimismo la intervencion sera llevada a cabo por personal entrenado para estas labores.



8. Cuando las tapas o el equipo lleve impreso el simbolo, hay superficies con alta temperatura, por tanto se abrira una vez que se haya interrumpido la alimentacion electrica al equipo por personal entrenado para estas labores, y al menos se esperara unos 45 minutos para enfriar las superficies calientes.

9. Cuando el equipo o la tapa lleve impreso el simbolo, se consultara el manual de instrucciones.

10. Todos los simbolos graficos usados en esta hoja, estan de acuerdo a las siguientes normas EN61010-1, IEC417 & ISO 3864.

VIKTIGT

Säkerhetsföreskrifter för kablage och installation av denna apparat.

Följande säkerhetsföreskrifter är tillämpliga för samtliga EU-medlemsländer. De skall följas i varje avseende för att överensstämma med Lågspännings direktivet. Icke EU medlemsländer skall också följa nedanstående punkter, såvida de inte övergrips av lokala eller nationella föreskrifter.

1. Tillämplig jordkontakt skall utföras till alla jordade punkter, såväl internt som externt där så erfordras.

2. Efter installation eller felsökning skall samtliga säkerhetshöljen och säkerhetsjord återplaceras. Samtliga jordterminaler måste hållas obrutna hela tiden.

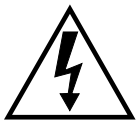
3. Matningsspänningens kabel måste överensstämma med föreskrifterna i IEC227 eller IEC245.

4. Allt kablage skall vara lämpligt för användning i en omgivningstemperatur högre än 75ºC.

5. Alla kabelförskruvningar som används skall ha inre dimensioner som motsvarar adekvat kabelförankring.

6. För att säkerställa säker drift av denna utrustning skall anslutning till huvudströmmen endast göras genom en säkring (min 10A) som skall frånkoppla alla strömförande kretsar när något fel uppstår. Säkringen kan även ha en mekanisk frånskiljare. Om så inte är fallet, måste ett annat förfarande för att frånskilja utrustningen från strömförsörjning tillhandahållas och klart framgå genom markering. Säkring eller omkopplare måste överensstämma med en gällande standard såsom t ex IEC947.

7. Där utrustning eller hölje är markerad med vidstående symbol föreliggerisk för livsfarlig spänning i närheten. Dessa höljen får endast avlägsnas när strömmen ej är ansluten till utrustningen - och då endast av utbildad servicepersonal.



8. När utrustning eller hölje är markerad med vidstående symbol föreligger risk för brännskada vid kontakt med uppvärmd yta. Dessa höljen får endast avlägsnas av utbildad servicepersonal, när strömmen kopplats från utrustningen. Vissa ytor kan vara mycket varma att vidröra även upp till 45 minuter efter avstängning av strömmen.

9. När utrustning eller hölje markerats med vidstående symbol bör instruktionsmanualen studeras för information.

10. Samtliga grafiska symboler som förekommer i denna produkt finns angivna i en eller flera av följande föreskrifter:- EN61010-1, IEC417 & ISO3864.

ΠΡΟΣΟΧΗ

Οδηγίες ασφαλείας για την καλωδίωση και εγκατάσταση της συσκευής.

Οι ακόλουθες οδηγίες ασφαλείας εφαρμόζονται ειδικά σε όλες τις χώρες μέλη της Ευρωπαϊκής Κοινότητας. Θα πρέπει να ακολουθούνται αυστηρά ώστε να εξασφαλιστεί η συμβατότητα με τις οδηγίες για τη Χαμηλή Τάση. Χώρες που δεν είναι μέλη της Ευρωπαϊκής Κοινότητας θα πρέπει επίσης να ακολουθούν τις οδηγίες εκτός εάν αντικαθίστανται από τα Τοπικά ή Εθνικά Πρότυπα.

1. Επαρκείς συνδέσεις γείωσης θα πρέπει να γίνονται σε όλα τα σημεία γείωσης, εσωτερικά και εξωτερικά όπου υπάρχουν.

2. Μετά την εγκατάσταση ή την εκσφαλμάτωση όλα τα καλύματα ασφαλείας και οι γειώσεις ασφαλείας πρέπει να επανεγκαθίστανται. Η καλή κατάσταση όλων των ακροδεκτών γείωσης πρέπει να ελέγχεται και να συντηρείται διαρκώς.

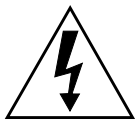
3. Τα καλώδια τροφοδοσίας πρέπει να πληρούν τις απαιτήσεις των IEC227 ή IEC245.

4. Ολες οι καλωδιώσεις θα πρέπει είναι κατάλληλες για χρήση σε ατμοσφαιρική θερμοκρασία χώρου υψηλότερη από 75°C.

5. Ολοι οι στυπιοθλίπτες θα πρέπει να είναι τέτοιων εσωτερικών διαστάσεων ώστε να παρέχουν επαρκή στερέωση των καλωδίων.

6. Για τη διασφάλιση ασφαλούς λειτουργίας της σύνδεσης τροφοδοσίας αυτής της συσκευής θα πρέπει να γίνεται μόνο μέσω ασφαλειοδιακόπτη (ελάχιστο 10A) ο οποίος θα αποσυνδέει όλους του ηλεκτροφόρους αγωγούς στη διάρκεια κατάστασης σφάλματος.
   Ο ασφαλειοδιακόπτης μπορεί επίσης να περιλαμβάνει μηχανικό διακόπτη απομόνωσης. Εάν δεν περιλαμβάνει, τότε άλλα μέσα αποσύνδεσης της συσκευής από την τροφοδοσία πρέπει να παροχηθούν και σαφώς να σημανθούν σαν τέτοια. Οι ασφαλειοδιακόπτες ή διακόπτες πρέπει να συμφωνούν με αναγνωρισμένα πρότυπα όπως το IEC947.

7. Οπου συσκευές ή καλύματα είναι σημασμένα με το σύμβολο επικίνδυνες τάσεις ενυπάρχουν κάτω από αυτά.
   Αυτά τα καλύματα θα πρέπει να αφαιρούνται μόνο όταν έχει αφαιρεθεί η τροφοδοσία από τη συσκευή και τότε μόνο από ειδικευμένο τεχνικό προσωπικό.



8. Οπου συσκευές ή καλύματα είναι σημασμένα με το σύμβολο υπάρχει κίνδυνος από καυτές επιφάνειες κάτω από αυτά.
   Αυτά τα καλύματα θα πρέπει να αφαιρούνται μόνο από ειδικευμένο τεχνικό προσωπικό, όταν η τροφοδοσία έχει αφαιρεθεί από από τη συσκευή. Τέτοιες επιφάνειες μπορούν να παραμείνουν ζεστές στην αφή έως και 45 λεπτά αργότερα.

9. Οπου συσκευές ή καλύματα είναι σημασμένα με το σύμβολο αναφερθείται στις οδηγίες χρήσης της συσκευής.

10. Ολα τα γραφικά σύμβολα που χρησιμοποιούνται σε αυτό το προϊόν είναι από ένα ή

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SECTION I. DESCRIPTION

1-1. <u>DESCRIPTION</u>. The Rosemount MPS 3000 Multiprobe Test Gas Sequencer provides automatic test gas sequencing for a single probe and electronic package. The MPS can be configured to operate with the Model 218A electronics package or the World Class 3000 Digital electronics package. The MPS routes test gas to the selected probe under control of the electronic package. The electronic package can be preprogrammed by the user for automatic periodic recalibration, or can be used to manually initiate calibration through the keypad on the front of the electronic package. The calibration parameters held in the electronic package can be selected to automatically update after each calibration.

The MPS is housed in a NEMA 4X (IP56) non-hazardous enclosure, Figure 1-1.

The MPS, Figure 1-2, consists of: an air pressure regulator, a terminal board, a flowmeter assembly, HI GAS solenoid, LO GAS solenoid, a manifold, and a power supply. The flowmeter assembly contains a probe solenoid.

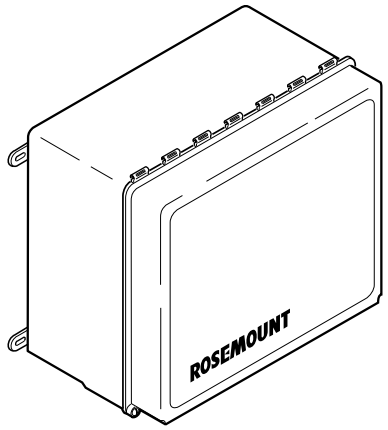


Figure 1-1. MPS 3000 Multiprobe Test Gas Sequencer

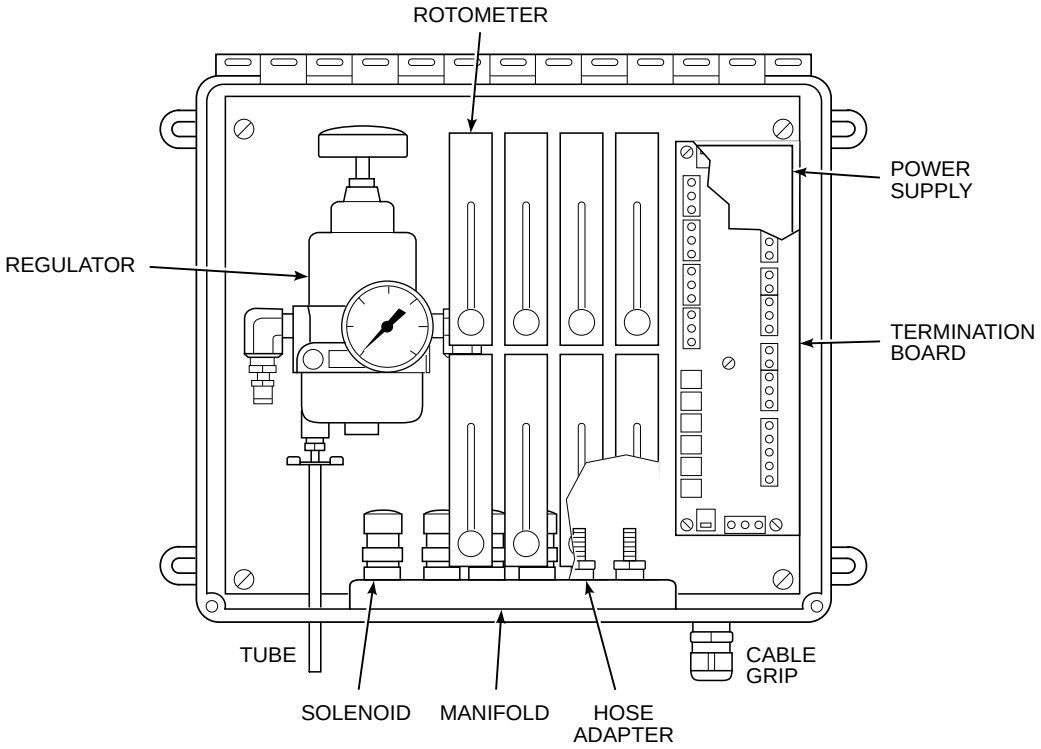


Figure 1-2. Multiprobe Test Gas Sequencer, Interior

Table 1-1. Specifications for Multiprobe Test Gas Sequencer.

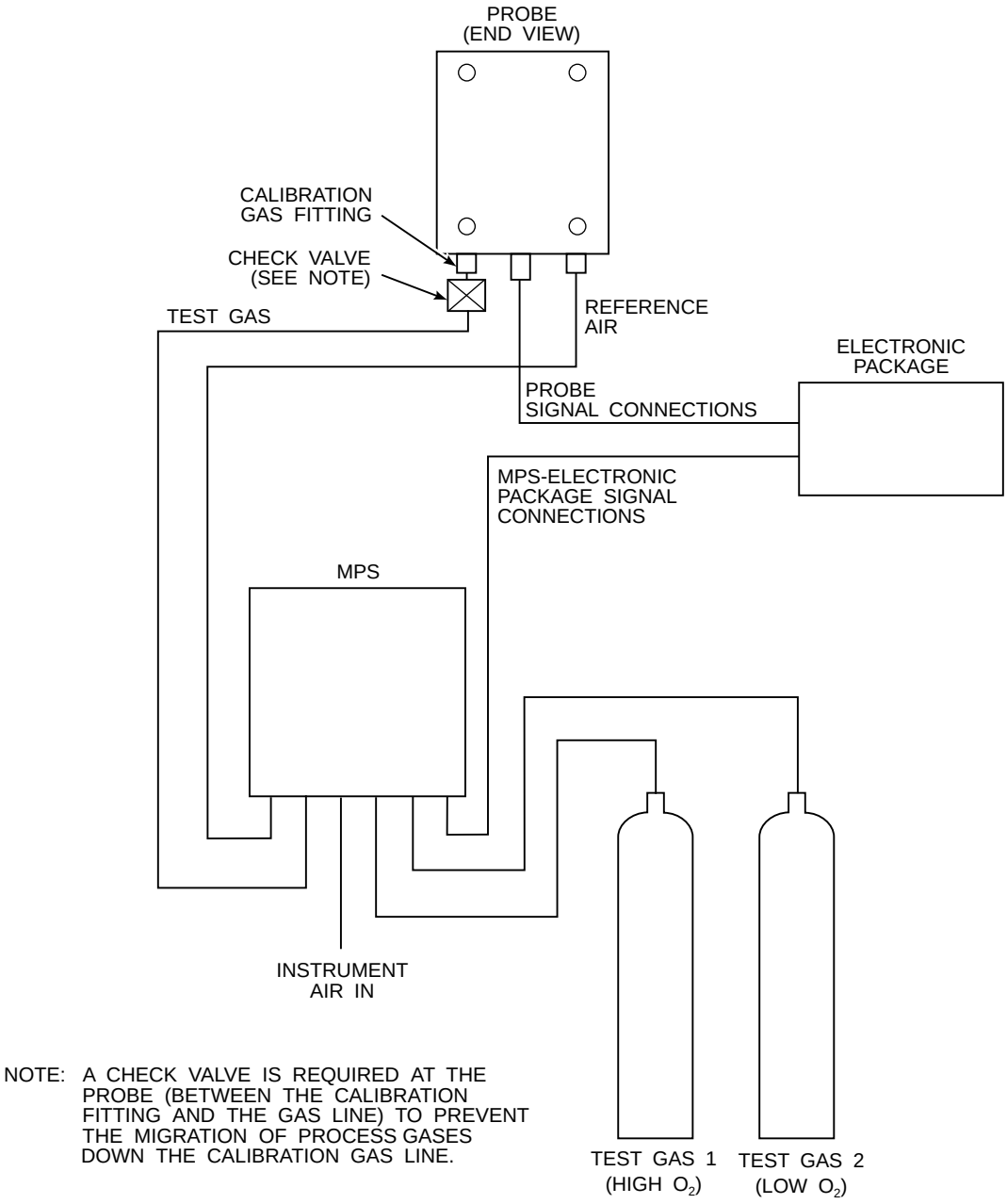
Electrical Classification	NEMA 4X (IP65)
Humidity Range	95% Relative Humidity
Ambient Temperature Range	-20° to 160°F (-30° to 71°C)
Vibration	5 m/sec^2, 10 to 500 xyz plane
External Electrical Noise	Minimum Interference
Piping Distance Between MPS 3000 and Probe	Maximum 300 feet (91 m)
Cabling Distance Between MPS 3000 and Electronics Package	Maximum 1000 feet (303 m)
In Calibration Status Relay	48 V max, 100 mA max
Cabling Distance Between MPS 3000 and Status Relay Indicator	Maximum 1000 feet (303 m)
Approximate Shipping Weight	35 lbs (16 kg)

1-2. THEORY OF OPERATION. A typical automatic calibration setup is shown in Figure 1-3. The MPS 3000 Multiprobe Test Gas Sequencer operates under the control of the electronic package. When the electronic package initializes automatic calibration, the probe solenoid is energized. Next, the solenoid controlling test gas 1 (high O_2) energizes, which allows test gas 1 to flow to the probe. After the probe measures the oxygen concentration of test gas 1, the gas solenoid is deenergized. An operator selected time delay allows the gas to clear the system. Then, the solenoid controlling test gas 2 (low O_2) energizes, and allows test gas 2 to flow to the probe. After the probe measures the oxygen concentration of test gas 2, the gas and probe solenoids deenergize. The automatic calibration is now complete.

NOTE

With digital electronics, only one probe can be hooked up to an MPS. A separate MPS is required for each probe being used.

1-3. Z-Purge Option. Some applications of the MPS 3000 have area safety requirements (Class 1 Division 1 and Division 2). These requirements may be satisified with the installation of an optional Z-Purge. Z-Purge provides positive pressure within the MPS enclosure. This will keep out dust and other foreign matter. Figure 1-4 shows the Z-Purge unit and how it connects to the MPS.

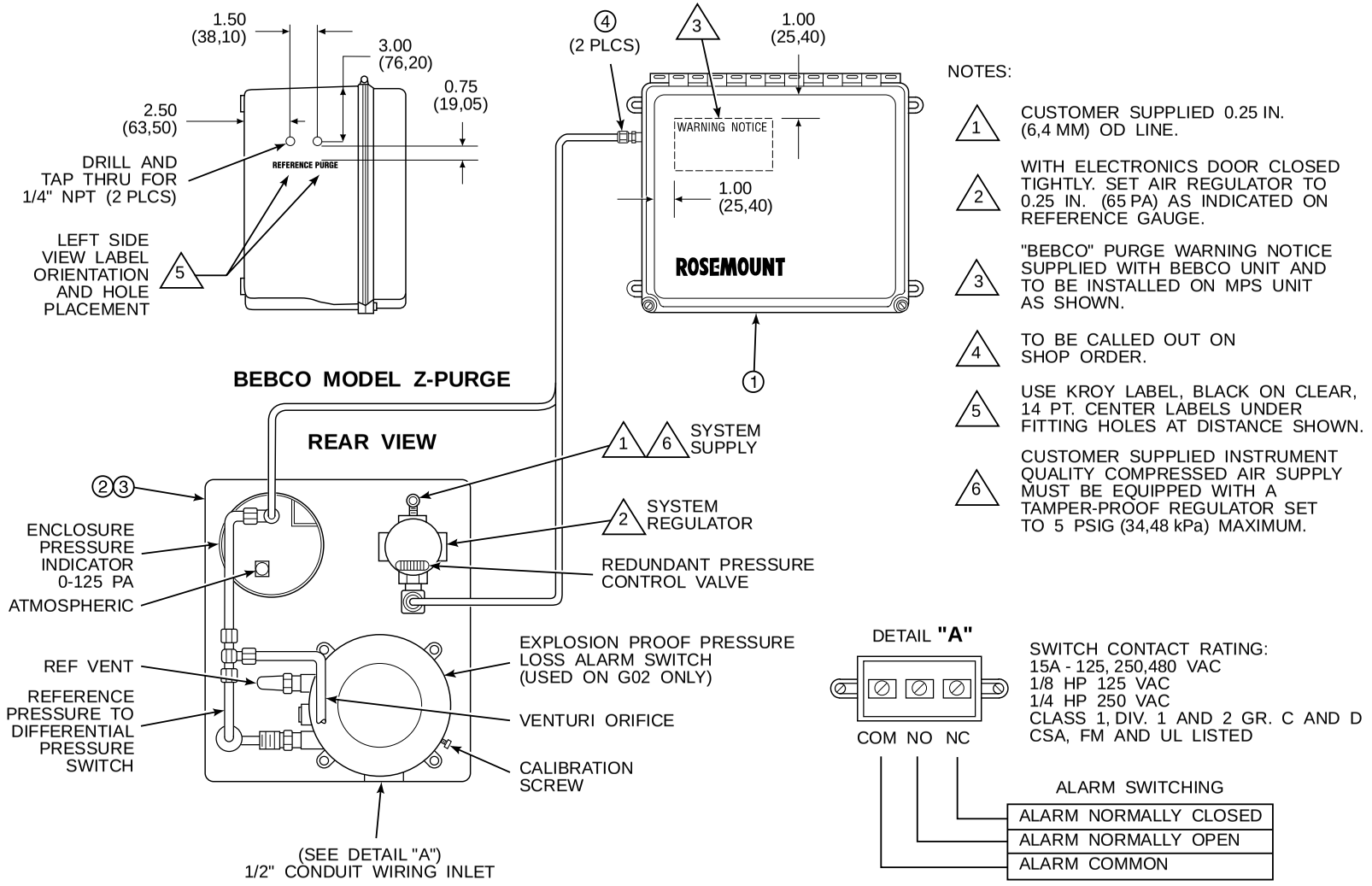


NOTE: A CHECK VALVE IS REQUIRED AT THE PROBE (BETWEEN THE CALIBRATION FITTING AND THE GAS LINE) TO PREVENT THE MIGRATION OF PROCESS GASES DOWN THE CALIBRATION GAS LINE.

Figure 1-3. Typical Automatic Calibration System

PARTS LIST			PARTS LIST UNITS: INCHES		GROUP NOTE →		
NOTE →			DEFINER →		MAT'L CODE PART NUMBER OR REF DWG	GROUP	
ITEM		PART NAME		SIZE - REFERENCE INFORMATION		G01	G02
01	4	MPS ASSEMBLY	DWG	)	3D39425GXX	A/R	A/R
02		Z-PURGE UNIT	AML	) W/O PRESSURE LOSS SWITCH	1A98474H01	1	
03		Z-PURGE UNIT	AML	) W/ PRESSURE LOSS SWITCH	1A98474H02		1
04		TUBE FITTING	DWG	) 1/4" TUBE TO 1/4", S.S.	771B870H05	2	2

NOTE: DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN PARENTHESES.



NOTES:

1. CUSTOMER SUPPLIED 0.25 IN. (6,4 MM) OD LINE.
2. WITH ELECTRONICS DOOR CLOSED TIGHTLY. SET AIR REGULATOR TO 0.25 IN. (65 PA) AS INDICATED ON REFERENCE GAUGE.
3. "BEBCO" PURGE WARNING NOTICE SUPPLIED WITH BEBCO UNIT AND TO BE INSTALLED ON MPS UNIT AS SHOWN.
4. TO BE CALLED OUT ON SHOP ORDER.
5. USE KROY LABEL, BLACK ON CLEAR, 14 PT. CENTER LABELS UNDER FITTING HOLES AT DISTANCE SHOWN.
6. CUSTOMER SUPPLIED INSTRUMENT QUALITY COMPRESSED AIR SUPPLY MUST BE EQUIPPED WITH A TAMPER-PROOF REGULATOR SET TO 5 PSIG (34,48 kPa) MAXIMUM.

SWITCH CONTACT RATING:
15A - 125, 250,480 VAC
1/8 HP 125 VAC
1/4 HP 250 VAC
CLASS 1, DIV. 1 AND 2 GR. C AND D
CSA, FM AND UL LISTED

ALARM SWITCHING
ALARM NORMALLY CLOSED
ALARM NORMALLY OPEN
ALARM COMMON

Figure 1-4. MPS 3000 with Z-Purge

SECTION II. INSTALLATION

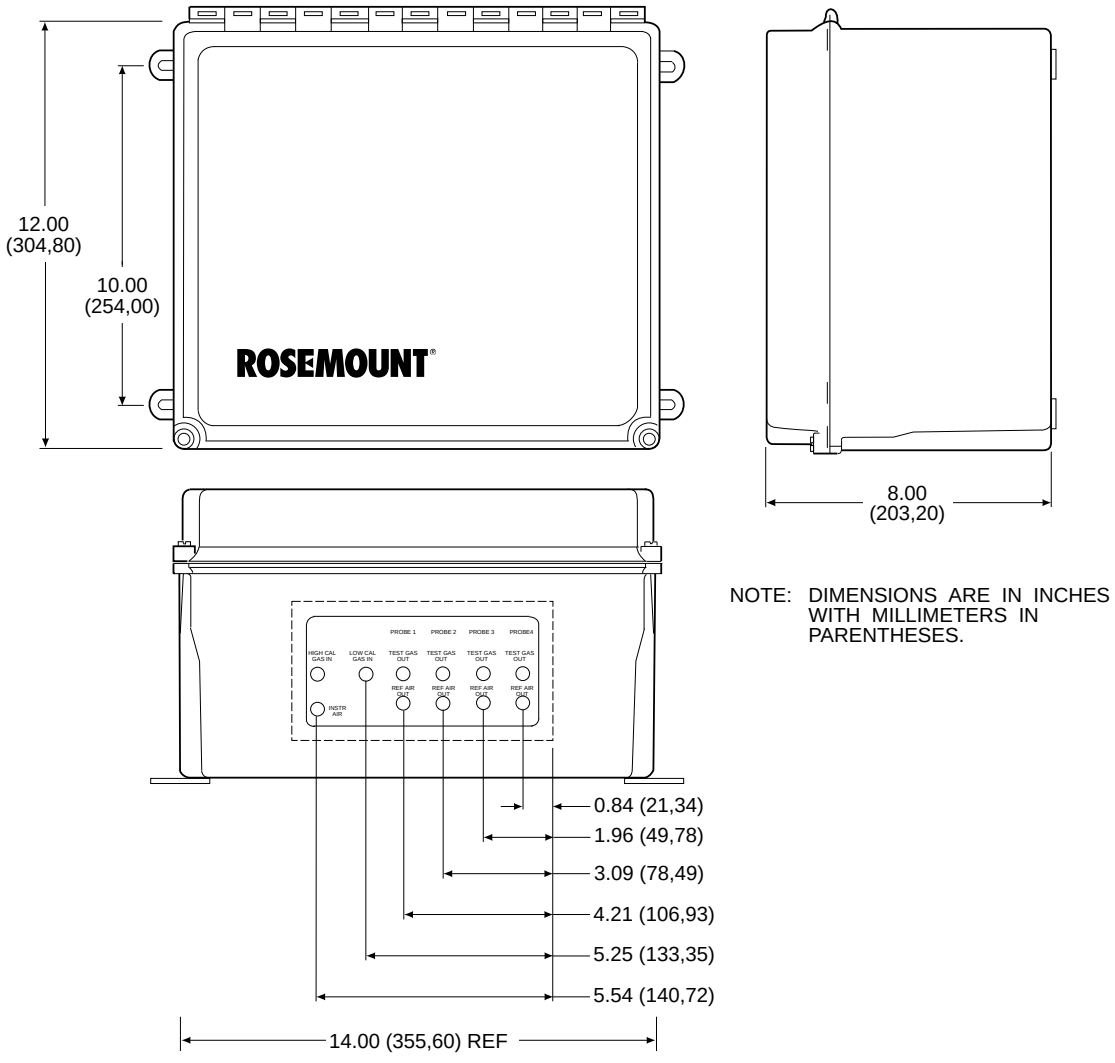
2-1. OVERVIEW. This section describes the installation of the MPS 3000 Multiprobe Test Gas Sequencer with the Model 218A electronic package or the World Class 3000 Digital electronic package.

WARNING

Before starting to install this equipment read the "Safety instructions for the wiring and installation of this apparatus" at the front of this Instruction Bulletin. Failure to follow the safety instructions could result in serious injury or death.

WARNING

Install all protective equipment covers and safety ground leads after installation. Failure to install covers and ground leads could result in serious injury or death.



NOTE: DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN PARENTHESES.

Figure 2-1. MPS Module

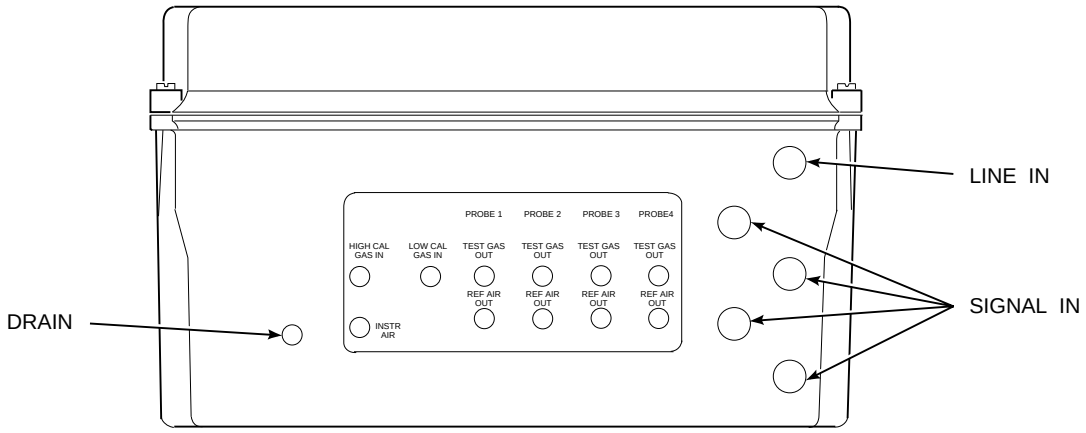


Figure 2-2. MPS Gas Connections

2-2. MULTIPROBE TEST GAS SEQUENCER INSTALLATION.

a. Mechanical Installation. The outline drawing of the MPS module in Figure 2-1 shows mounting centers and clearances. The box is designed to be mounted on a wall or bulkhead. The MPS module should be installed no further than 300 ft (91 m) piping distance from the probe, and no more than 1000 feet (303 m) cabling distance from the electronic package. Install the MPS module in a location where the ambient temperature is between -20° and 160°F (-30° and 71°C).

b. Gas Connections. Gas connections are located on the bottom of the MPS (Figure 2-2). 1/4 inch threaded fittings are used.

1. Connect the reference air supply to INSTR. AIR IN. The air pressure regulator valve is set at the factory to 20 psi (138 kPa). If the reference air pressure must be readjusted, turn the knob on the top of the valve until the desired pressure is obtained.

2. Connect the high O_2 test gas to HIGH GAS. The test gas pressure should be set at 20 psi (138 kPa).

CAUTION

Do not use 100% nitrogen as a low gas (zero gas). It is suggested that gas for the low (zero) be between 0.4% and 2.0% O_2. Do not use gases with hydrocarbon concentrations of more than 40 parts per million. Failure to use proper gases will result in erroneous readings.

3. Connect the low O_2 test gas to LOW GAS. The test gas pressure should be set at 20 psi (138 kPa).

4. Connect the REF AIR OUT to the reference gas fitting on the probe head.

5. Connect the TEST GAS OUT to the calibration gas fitting on the probe head.

c. Electrical Connections. Electrical connections should be made as described in the electrical installation diagrams, Figures 2-4 and 2-5. All wiring must conform to local and national codes. The electrical connections will exist only between the electronics package and the MPS to enable automatic and semiautomatic calibration.

NOTE

Refer to Figure 2-4 for MPS unit fuse locations and specifications.

1. Run the line voltage through the bulkhead fitting on the bottom of the MPS marked LINE IN, Figure 2-2. Connect the line voltage to J9 LINE IN terminal for the Model 218A electronic package as shown in Figure 2-4, or to J9 LINE IN terminal for the World Class 3000 Digital electronic package as shown in Figure 2-5. The wiring on the power supply can be changed to accommodate different line voltages. See Figure 2-3 for configuration information. Tighten the cord grips to provide strain relief.

Line Voltage	Attach Jumper Between	Attach Line Out Voltage from J10 Terminals to	Fuse	White Wire	Black Wire
100	1-3, 2-4	F1, F2	1.0A	5	1
117	1-3, 2-4	F1, F2	1.0A	4	1
220	2-3	F1, F2	0.5A	5	1
230/240	2-3	F1, F2	0.5A	4	1

NOTE: DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN PARENTHESES.

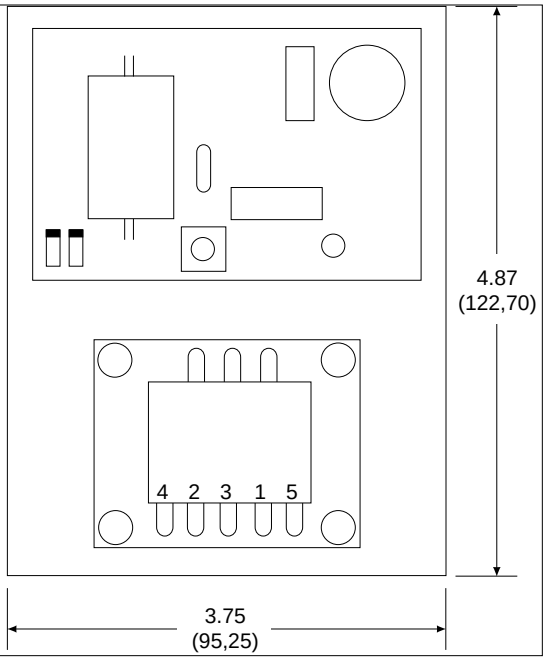


Figure 2-3. Power Supply Connections

2. The terminal strips on the MPS termination board are marked PROBE 1 (J1-J2), PROBE 2 (J3-J4), PROBE 3 (J5-J6), and PROBE 4 (J7-J8). All connections are made to PROBE 1 (J1-J2).

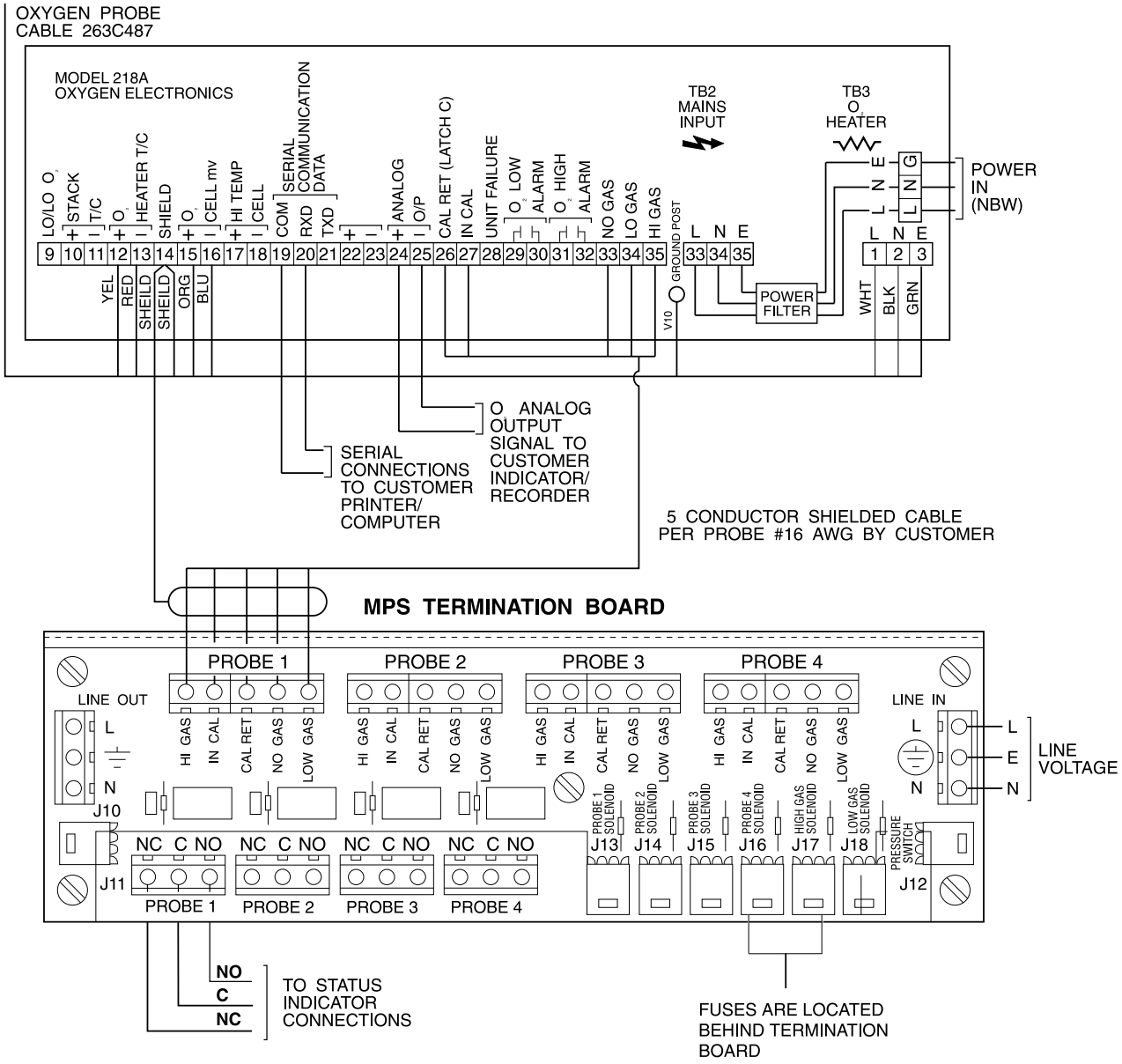
3. Make the connection from the MPS to the Model 218A electronic package as shown in Figure 2-4, or to the World Class 3000 Digital electronic package as shown in Figure 2-5. Run wires from the MPS Termination Board inside the unit through the bulkhead fitting on the bottom of the unit marked SIGNAL IN, Figure 2-2. After the connections are made, tighten the cord grips to provide strain relief.

d. **Status Relay Switch Connections.** Status relay connections are available on the MPS termination board to signal when a probe is in/out of calibration, Figure 2-4. Terminal block J19 can be wired to provide calibration status. Status relays can be connected to either indicator lights or a computer interface to indicate when probe is in calibration mode. Relay contacts are capable of handling up to a 48 V max, 100 mA max power source. Cabling requirement is 1000 ft (303 m) maximum.

1. Connect one wire, from a pair of wires, to the C terminal on status relay switch J19, Figure 2-4.

2. Connect second wire to either the NO terminal or the NC terminal on status relay switch J19, depending on the desired switch action. If the second wire is connected to the NO terminal, the status signal turns on when the probe is in calibration. If it is connected to the NC terminal, the status signal turns off when the probe is in calibration.

3. Run the pair of wires from J19 through the bulkhead fitting on the bottom of the unit marked SIGNAL IN (Figure 2-2), to the status indicator connections (Figure 2-4). After the connections are made, tighten cord grips to provide strain relief.



NOTES:
1. **NO-C** STATUS SIGNAL CONNECTION TURNS ON WHEN PROBE IS IN CALIBRATION.
2. **NC-C** STATUS SIGNAL CONNECTION TURNS OFF WHEN PROBE IS IN CALIBRATION.
3. FUSES ARE:
   a. FAST ACTING, 1A @ 250 VAC, SIZE: 1/4" DIA. X 1-1/4" LG., GLASS BODY, NON TIME DELAY, BUSSMAN PART NUMBER BK/AGC -1
   b. FAST ACTING, 0.5A @ 250 VAC, SIZE: 1/4" DIA. X 1-1/4" LG., GLASS BODY, NON TIME DELAY, BUSSMAN PART NUMBER BK/AGC-1/2

Figure 2-4. MPS Electrical Connection with Model 218A Electronic Package

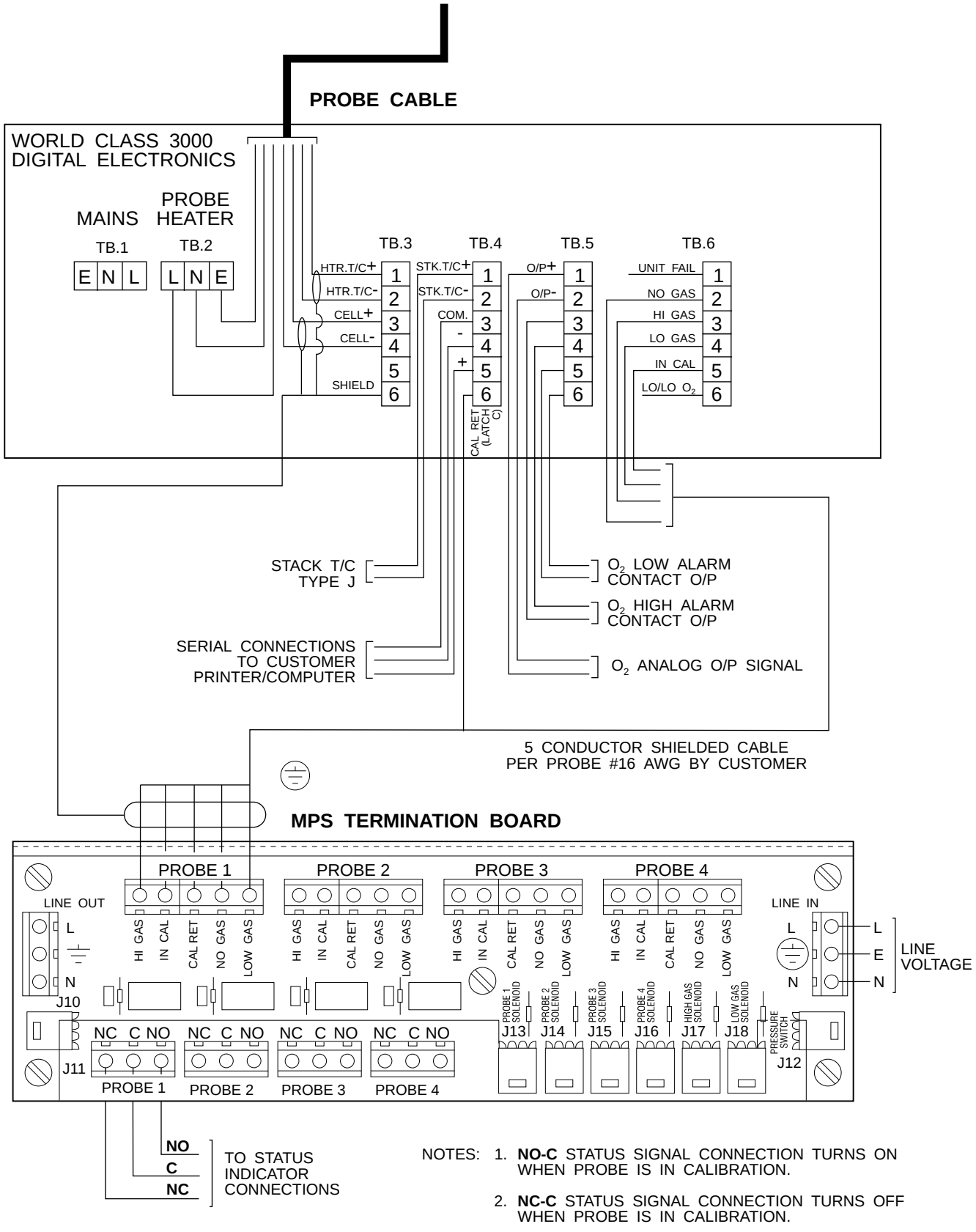


Figure 2-5. MPS Electrical Connection with World Class 3000 Digital Electronic Package

SECTION III. OPERATION

3-1. OVERVIEW. This section describes the semi-automatic and automatic calibration modes for the MPS with either the Model 218A electronic package or the World Class 3000 Digital electronic package.

3-2. CALIBRATION REQUIREMENTS.

a. Two tanks of precision calibration gas mixtures are required. Recommended calibration gases are nominally 0.4% and 8.0% oxygen in nitrogen.

CAUTION

Do not use 100% nitrogen as a low gas (zero gas). It is suggested that gas for the low (zero) be between 0.4% and 2.0% O_2. Do not use gases with hydrocarbon concentrations of more than 40 parts per million. Failure to use proper gases will result in erroneous readings.

Two sources of calibrated gas mixtures are:

LIQUID CARBONIC GAS CORP.
SPECIALTY GAS LABORATORIES

700 South Alameda Street
Los Angeles, California 90058
213/585-2154

767 Industrial Road
San Carlos, California 94070
415/592-7303

9950 Chemical Road
Pasadena, Texas 77507
713/474-4141

12054 S.W. Doty Avenue
Chicago, Illinois 60628
312/568-8840

603 Bergen Street
Harrison, New Jersey 07029
201/485-1995

255 Brimley Road
Scarborough, Ontario, Canada
416/266-3161

SCOTT ENVIRONMENTAL TECHNOLOGY, INC.
SCOTT SPECIALTY GASES

2600 Cajon Blvd.
San Bernardino, California 92411
714/887-2571
TWX: 910-390-1159

1290 Combermere Street
Troy, Michigan 48084
314/589-2950

Route 611
Plumsteadville, Pennsylvania 18949
215/766-8861
TWX: 510-665-9344

2616 South Loop West
Suite 100
Houston, Texas 77054
713/669-0469

b. A check valve is required at the probe (between the calibration fitting and the gas line) to prevent the migration of process gases down the calibration gas line.

A typical automatic calibration system is shown in Figure 1-3.

3-3. SEMIAUTOMATIC CALIBRATION. The following procedure relates to an operator initiated calibration selected at the electronic package using an MPS 3000 Multiprobe Gas sequencer.

a. Precalibration.

1. Set the value of parameter 25 to 1. Information on changing parameters may be found in Instruction Bulletins 106-101A, Model 218A or 106-300, World Class 3000 Digital electronic packages.

2. Check that reference air flow is set at 2 scfh (56,6 L/hr).

3. Set the value of parameter 1 to the value of the high test gas. Information on changing parameters may be found in Instruction Bulletins 106-101A, Model 218A or 106-300, World Class 3000 Digital electronic packages.

CAUTION

Do not use 100% nitrogen as a low gas (zero gas). It is suggested that gas for the low (zero) be between 0.4% and 2.0% O_2. Do not use gases with hydrocarbon concentrations of more than 40 parts per million. Failure to use proper gases will result in erroneous readings.

4. Set the value of parameter 2 to the value of the low test gas. Information on changing parameters may be found in Instruction Bulletins 106-101A, Model 218A or 106-300, World Class 3000 Digital electronic packages.

b. **Calibration.** In the European model, the output is locked at the value it held prior to entering the calibration mode. It is held at this level until calibration is over. During calibration, both high and low oxygen alarms are disabled. The American model continues to vary during calibration.

If an alarm condition arises during calibration (simple high, low alarms are disabled), the calibration should be aborted deliberately to avoid corrupting the slope or cell constant, and then restarted.

If the slope and constant held in memory are different from those of the probe, then the indicated value may be different to that of the test gas. This condition is corrected by recalibration.

The slope and constant are only updated into the non-volatile memory if the calibration passes.

1. Depress ALT/FUNCT and hold. Now press ACK/LOCK. Release both keys together.

2. Press [7] [ENTER]. The display now reads "O_2 CAL" which indicates that the analyzer is in the calibration mode.

NOTE

From this point on the only key used is [ENTER]. If any other key is pressed, the calibration will be aborted.

3. Press [ENTER], the display reads "TG1 on ?". Press [ENTER] at this prompt. The display now shows the calculated value of oxygen.

4. When the oxygen reading has settled (allow approximately two to five minutes depending on the length of the test gas tubing) press [ENTER]. The display will momentarily show "WAIT" as it stores the cell readings. It will then show "TG2 on ?". Press [ENTER] at this prompt.

5. The display will show the oxygen value. When the oxygen value has settled, press [ENTER].

6. Press [ENTER], the display shows the result of the calibration, either "PASSED" or "FAILED".

7. Press [ENTER], the display shows "REM TG". Press [ENTER].

8. The display now shows "PURGE" for one minute, after which the unit exits calibration mode and displays oxygen value. As the test gas may be slow to purge from the probe chamber, one minute is allowed before releasing the isolated control signal from its locked position. (European units only.)

3-4. **AUTOMATIC CALIBRATION.** The automatic calibration allows automatic calibration without operator intervention. For fully automatic calibration, Parameter 25 must be set to 0.

CAUTION

Do not use 100% nitrogen as a low gas (zero gas). It is suggested that gas for the low (zero) be between 0.4% and 2.0% O_2. Do not use gases with hydrocarbon concentrations of more than 40 parts per million. Failure to use proper gases will result in erroneous readings.

The operator must set the interval time between calibration cycles. The interval time can range from one to 256 hours. To manually ask for information, the operator can interrupt the automatic calibration cycles with semiautomatic calibration commands.

Once the parameters have been set for automatic calibration, the system will initiate calibration without operator intervention.

a. Set parameters 31 and 33 (Model 218A electronic package) or parameters 31 and 32 (World Class 3000 Digital electronic package) to the required calibration interval time (1-256 hours). For example, if parameter 31 is set at 24, automatic calibration will occur every 24 hours. Information on changing parameters may be found in Instruction Bulletins 106-101A, Model 218A or 106-300, World Class 3000 Digital electronic packages.

b. Interrupt automatic calibration. Refer to paragraph 3-3 for information on semiautomatic calibration.

SECTION IV. TROUBLESHOOTING

4-1. OVERVIEW. This section describes troubleshooting for the MPS 3000 Multiprobe Test Gas Sequencer. Additional troubleshooting information can be found in the Instruction Bulletin for the electronic package.

WARNING

Install all protective equipment covers and safety ground leads after troubleshooting. Failure to replace covers and ground leads could result in serious injury or death.

4-2. TROUBLESHOOTING. Table 4-1 provides a guide to fault finding failures within the MPS. The flowchart in Figure 4-1 provides an alternate approach to fault finding MPS related problems.

Table 4-1. Fault Finding.

SYMPTOM	CHECK	FAULT	REMEDY
1. Power to solenoid, test gas not released to probe	Test gas	Insufficient test gas	Install new test gas tanks.
	Solenoid	Solenoid failure	Replace solenoid.
2. No power to solenoid	Power supply output	Power supply failure	Replace power supply.
	Fuses in power supply	Fuse blown	Replace fuse.
	Main power source	Main power off	Repair power outage.

SYMPTOM

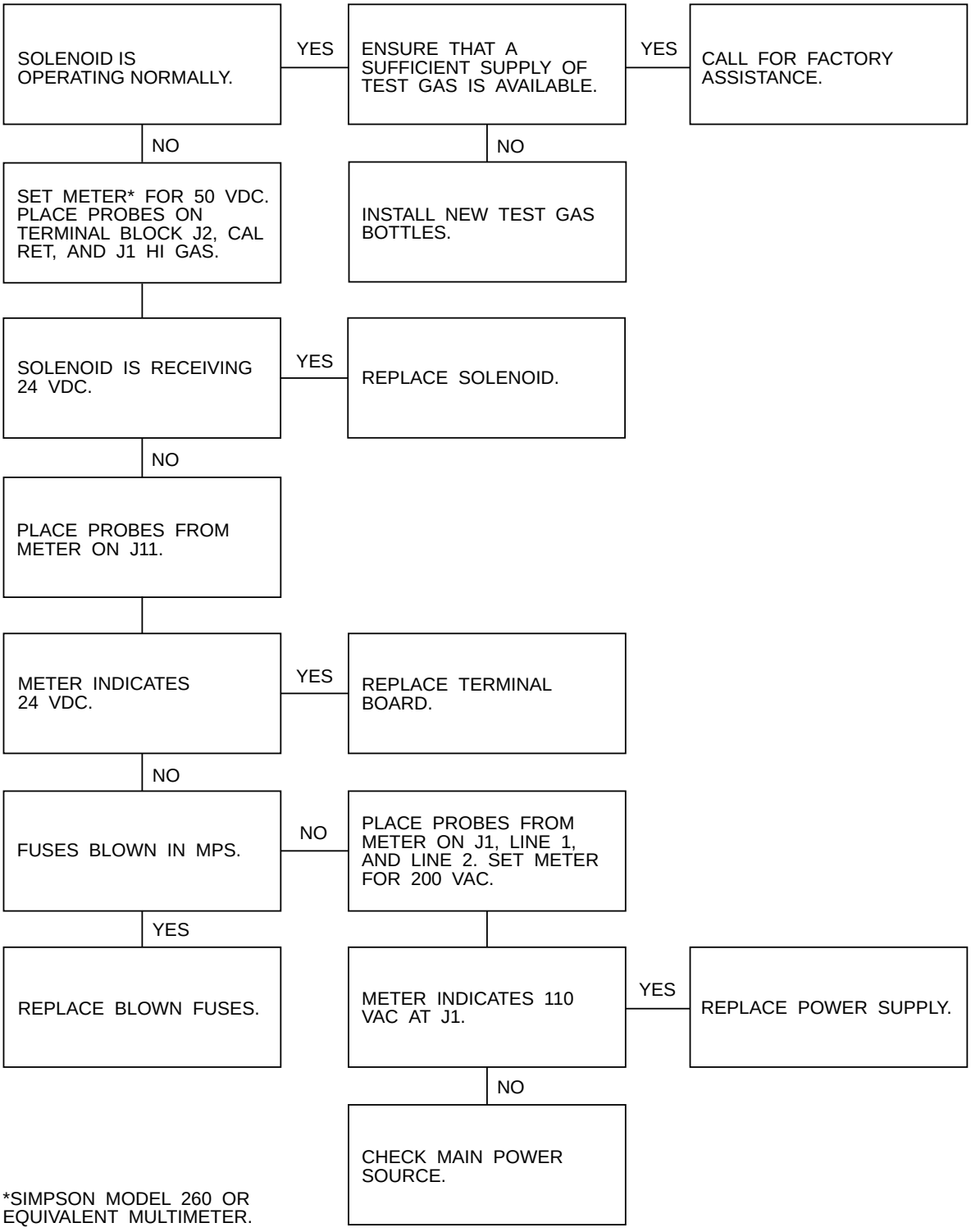


Figure 4-1. MPS Troubleshooting Flowchart

SECTION V. SERVICE AND NORMAL MAINTENANCE

5-1. OVERVIEW. This section describes service and routine maintenance of the MPS 3000 Multiprobe Test Gas Sequencer. Replacement parts referred to are available from Rosemount. Refer to Section VI for part numbers and ordering information.

> **WARNING**
>
> **Install all protective equipment covers and safety ground leads after equipment repair or service. Failure to install covers and ground leads could result in serious injury or death.**

5-2. FUSE REPLACEMENT. The MPS 3000 has two identical fuses. Refer to Table 6-1 for replacement fuse specifications. Perform the following procedure to check or replace a fuse.

> **WARNING**
>
> **Disconnect and lock out power before working on any electrical components.**

a. Turn off power to the system.

b. To remove fuseholder top, push in top and turn 1/4 turn counterclockwise. Remove the fuse.

c. After checking or replacing a fuse, reinstall fuseholder top by pushing in top and turning 1/4 turn clockwise.

5-3. POWER SUPPLY REPLACEMENT.

> **WARNING**
>
> **Disconnect and lock out power before working on any electrical components.**

a. Turn off power to the system.

b. Loosen two captive screws holding the MPS cover (15, Figure 3-1). Open the MPS cover.

c. Loosen two captive screws holding the inner cover (16). Lower the inner cover.

d. Disconnect the 24V connector (1) from J11 on the termination board (34).

e. Remove two screws (39) and washers (38) holding the terminal cover (37). Remove the terminal cover.

f. Tag and remove wires from terminals 1 and 4 or 5 of the transformer in the power supply (58).

g. Remove two nuts (60) and washers (59) from the screws holding the power supply (58). Remove the power supply.

h. Mount the new power supply onto the screws with two nuts (60) and washers (59). Make sure the ground wires are connected to the upper mounting screw.

i. Reconnect the wires removed in step f.

j. Install the terminal cover (37) with two screws (38) and washers (39).

k. Connect the 24V connector to J11 on the termination board (34).

l. Close and secure the inner cover (16) with two captive screws. Close and secure the outer cover (15) with two captive screws.

5-4. SOLENOID VALVE REPLACEMENT. An MPS 3000 will always have a HI GAS solenoid (63, Figure 5-1) and a LOW GAS solenoid (64) mounted to the manifold (11). Each probe will also have a solenoid valve (9) mounted on the manifold.

> **WARNING**
>
> **Disconnect and lock out power before working on any electrical components.**

a. Turn off power to the system.

b. Loosen two captive screws holding the MPS cover (15). Open the MPS cover.

c. Loosen two captive screws holding the inner cover (16). Lower the inner cover.

d. Disconnect the HI GAS (J17), LOW GAS (J18), or Probe (J13-J16) plug from its receptacle on the termination board (34).

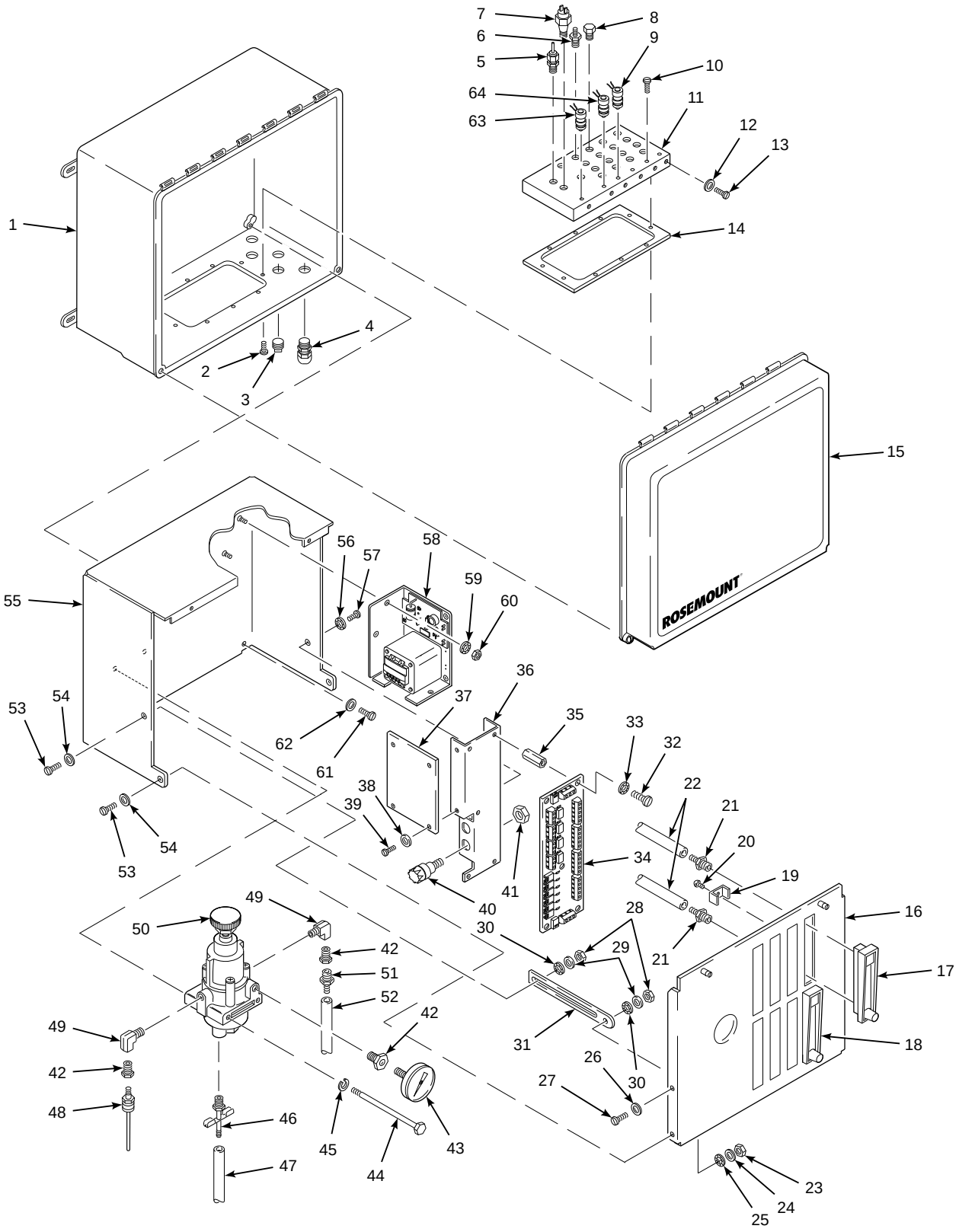


Figure 5-1. Multiprobe Test Gas Sequencer, Exploded View

LEGEND FOR FIGURE 5-1

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Enclosure	23	Nut	45	Washer
2	Screw	24	Lockwasher	46	Drain Valve
3	Plug	25	Washer	47	1/8 in. Impolene Tubing
4	Cable Grip	26	Washer	48	Connector
5	Fitting	27	Screw	49	Elbow
6	Hose Adapter	28	Nut	50	Pressure Regulator
7	Pressure Switch	29	Washer	51	Hose Adapter
8	Plug	30	Washer	52	1/4 in. Tube
9	Solenoid Valve	31	Cover Stop Slide	53	Screw
10	Screw	32	Screw	54	Washer
11	Manifold	33	Washer	55	Inner Enclosure
12	Washer	34	Termination Board	56	Washer
13	Screw	35	Standoff	57	Screw
14	Gasket	36	Mounting Bracket	58	Power Supply
15	Outer Cover	37	Cover Plate	59	Washer
16	Inner Cover	38	Washer	60	Nut
17	Rotometer, 10 SCFH	39	Screw	61	Screw
18	Rotometer, 2.0 SCFH	40	Fuseholder	62	Washer
19	Bracket	41	Plastic Nut	63	Solenoid
20	Screw	42	Bushing	64	Solenoid
21	Hose Adapter	43	Pressure Gauge		
22	1/8 in. Hose	44	Bolt		

e. Loosen the retaining ring in the middle of the solenoid and remove the top part.

f. With a spanner wrench or padded pliers, remove the remaining part of the solenoid from the manifold (11).

g. Separate the new solenoid, and screw the smaller part into the manifold.

h. Place the top part of the solenoid into position and tighten the retaining ring.

i. Connect the plug to the proper receptacle on the termination board (34).

j. Close and secure the inner cover (16) with two captive screws. Close and secure the outer cover (15) with two captive screws.

5-5. PRESSURE REGULATOR MAINTENANCE.

a. Pressure Adjustments. Pressure regulator (50, Figure 5-1) is factory set to 20 psi (138 kPa). Adjust the pressure with the knob on top of the pressure regulator if necessary.

b. Condensation Drain. To drain excess moisture from the internal gas circuit of the MPS, periodically loosen drain valve (46) on the bottom of pressure regulator (50). The moisture will flow through vinyl tubing drain (47) on the bottom of pressure regulator (50), and exit the bottom of MPS enclosure (1).

5-6. FLOWMETER ADJUSTMENTS. There are two flowmeters per flowmeter assembly. The top flowmeter must be set to 5 scfh. The bottom flowmeter must be set to 2 scfh. Adjust the flow with knob on the bottom of the respective flowmeter if necessary.

SECTION VI. REPLACEMENT PARTS

Table 6-1. Replacement Parts for the MPS 3000 Multiprobe Test Gas Sequencer.

FIGURE and INDEX No.	PART NUMBER	DESCRIPTION
5-1, 58	1A97909H01*	Power Supply
5-1, 9	3D39435G01	Solenoid Valve
5-1	138799-004	Fuse, fast acting, 1A @ 250 Vac, size: 1/4” Dia. x 1-1/4” Lg., glass body, non time delay, Bussman part no. BK/AGC-1
5-1	138799-014	Fuse, fast acting, 0.5A @ 250 Vac, size: 1/4” Dia. x 1-1/4” Lg., glass body, non time delay, Bussman part no. BK/AGC-1/2
5-1, 17	771B635H01	Rotometer - Test Gas
5-1, 18	771B635H02	Rotometer - Reference Gas
3-1	7307A56G02	Check Valve

* Specify line voltage and probe type when ordering.

SECTION VII. RETURNING EQUIPMENT TO THE FACTORY

7-1. If factory repair of defective equipment is required, proceed as follows:

a. Secure a return authorization from a Rosemount Analytical Sales Office or Representative before returning the equipment. Equipment must be returned with complete identification in accordance with Rosemount instructions or it will not be accepted.

In no event will Rosemount be responsible for equipment returned without proper authorization and identification.

b. Carefully pack defective unit in a sturdy box with sufficient shock absorbing material to insure that no additional damage will occur during shipping.

c. In a cover letter, describe completely:

1. The symptoms from which it was determined that the equipment is faulty.
2. The environment in which the equipment has been operating (housing, weather, vibration, dust, etc.).
3. Site from which equipment was removed.
4. Whether warranty or nonwarranty service is requested.
5. Complete shipping instructions for return of equipment.

d. Enclose a cover letter and purchase order and ship the defective equipment according to instructions provided in Rosemount Return Authorization, prepaid, to:

American

Rosemount Analytical Inc.
RMR Department
1201 N. Main Street
Orrville, Ohio 44667

European

Rosemount Ireland
Equipment Return Repair Dept.
Site 7 Shannon Industrial Estate
Co. Clare
Ireland

If warranty service is requested, the defective unit will be carefully inspected and tested at the factory. If failure was due to conditions listed in the standard Rosemount warranty, the defective unit will be repaired or replaced at Rosemount's option, and an operating unit will be returned to the customer in accordance with shipping instructions furnished in the cover letter.

For equipment no longer under warranty, the equipment will be repaired at the factory and returned as directed by the purchase order and shipping instructions.

INDEX

This index is an alphabetized listing of parts, terms, and procedures having to do with the MPS 3000 Multiprobe Test Gas Sequencer. Every item listed in the index refers to a location in the manual by page number or numbers.