

Instruction Manual

748468-E

August 2003

Model MicroCEM SHS

Sample Handling System



ROSEMOUNT
Analytical

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EMERSON
Process Management

ESSENTIAL INSTRUCTIONS

READ THIS PAGE BEFORE PROCEEDING!

Rosemount Analytical designs, manufactures and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you **MUST properly install, use, and maintain them** to ensure they continue to operate within their normal specifications. The following instructions **MUST be adhered to** and integrated into your safety program when installing, using, and maintaining Rosemount Analytical products. Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.

- **Read all instructions** prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, **contact your Rosemount Analytical representative** for clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, **use qualified personnel** to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Rosemount. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, **and VOID YOUR WARRANTY**. Look-alike substitutions may result in fire, electrical hazards, or improper operation.
- **Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.**

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DRAWINGS (Located In Rear of Manual)

662011	Sample Probe 5'
662012	Sample Probe 4'
662320	Wiring Diagram, MicroCEM SHS
662321	Flow Diagram, MicroCEM SHS
662349	Installation Drawing, MicroCEM SHS
662350	Installation Drawing, MicroCEM SHS Hi Temp

PREFACE

The purpose of this manual is to provide information concerning the components, functions, installation and maintenance of the MicroCEM SHS.

Some sections may describe equipment not used in your configuration. The user should become thoroughly familiar with the operation of this module before operating it. Read this instruction manual completely.

DEFINITIONS

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

DANGER

Highlights the presence of a hazard which will cause severe personal injury, death, or substantial property damage if the warning is ignored.

WARNING

Highlights an operation or maintenance procedure, practice, condition, statement, etc. 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. 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.

INTENDED USE STATEMENT

The MicroCEM Sample Handling System is intended for use as an industrial process measurement device only. It is not intended for use in medical, diagnostic, or life support applications, and no independent agency certifications or approvals are to be implied as covering such applications.

SAFETY SUMMARY

If this equipment is used in a manner not specified in these instructions, protective systems may be impaired.

AUTHORIZED PERSONNEL

To avoid explosion, loss of life, personal injury and damage to this equipment and on-site property, do not operate or service this instrument before reading and understanding this instruction manual and receiving appropriate training. Save these instructions.

DANGER

ELECTRICAL SHOCK HAZARD

Do not open while energized. Installation requires access to live parts which can cause death or serious injury.

For safety and proper performance this instrument must be connected to a properly grounded three-wire source of power.

DANGER

POSSIBLE EXPLOSION HAZARD

Do not operate without covers secure. Ensure that all gas connections are made as labeled and are leak free. Improper gas connections could result in explosion and death.

WARNING

DEVICE HAZARDOUS AREA CERTIFICATION(S)

Any addition, substitution, or replacement of components installed on or in this device, must be certified to meet the hazardous area classification that the device was certified to prior to any such component addition, substitution, or replacement. In addition, the installation of such device or devices must meet the requirements specified and defined by the hazardous area classification of the unmodified device. Any modifications to the device not meeting these requirements, will void the product certification(s).

WARNING

PARTS INTEGRITY AND UPGRADES

Tampering with or unauthorized substitution of components may adversely affect the safety of this instrument. Use only factory approved components for repair.

Because of the danger of introducing additional hazards, do not perform any unauthorized modification to this instrument.

Return the instrument to Rosemount Analytical Customer Service Center. See Section 7.

CAUTION

PRESSURIZED GAS

This unit requires periodic calibration with a known standard gas. It also may utilize a pressurized carrier gas, such as helium, hydrogen, or nitrogen. See General Precautions for Handling and Storing High Pressure Gas Cylinders, page P-4.

CAUTION

HEAVY WEIGHT

Use two persons or a suitable lifting device to move or carry the instrument.

GENERAL PRECAUTIONS FOR HANDLING AND STORING HIGH PRESSURE GAS CYLINDERS

Edited from selected paragraphs of the Compressed Gas Association's "Handbook of Compressed Gases" published in 1981

**Compressed Gas Association
1235 Jefferson Davis Highway
Arlington, Virginia 22202
Used by Permission**

1. Never drop cylinders or permit them to strike each other violently.
2. Cylinders may be stored in the open, but in such cases, should be protected against extremes of weather and, to prevent rusting, from the dampness of the ground. Cylinders should be stored in the shade when located in areas where extreme temperatures are prevalent.
3. The valve protection cap should be left on each cylinder until it has been secured against a wall or bench, or placed in a cylinder stand, and is ready to be used.
4. Avoid dragging, rolling, or sliding cylinders, even for a short distance; they should be moved by using a suitable hand-truck.
5. Never tamper with safety devices in valves or cylinders.
6. Do not store full and empty cylinders together. Serious suckback can occur when an empty cylinder is attached to a pressurized system.
7. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). A flame should never be permitted to come in contact with any part of a compressed gas cylinder.
8. Do not place cylinders where they may become part of an electric circuit. When electric arc welding, precautions must be taken to prevent striking an arc against the cylinder.

DOCUMENTATION

The following MicroCEM SHS instruction materials are available. Contact Customer Service Center or the local representative to order (See Section 7).

748467 Instruction Manual, MicroCEM Continuous Emission Monitor

748468 Instruction Manual, MicroCEM Sample Handling System (this document)

COMPLIANCES

This product may carry approvals from several certifying agencies. The certification marks appear on the product name-rating plate.

CSA (Pending)

SECTION 1 DESCRIPTION AND SPECIFICATIONS

1-1 OVERVIEW

The MicroCEM Sample Handling System (SHS) (Figure 1-1) is designed for use with the MicroCEM Continuous Emission Monitor (Figure 1-2) to continuously determine the concentration of O₂, CO, and NO_x in a flowing gaseous mixture.

The sampled gas is collected from the stack and prepared by the Probe/Sample Handling System for analysis and processing by the Analysis Enclosure.

The MicroCEM SHS is enclosed in a rugged NEMA 4X, IP65 type enclosure, for harsh environment.



Figure 1-1. MicroCEM Sample Handling System



Figure 1-2. MicroCEM Continuous Emissions Monitor

1-2 MicroCEM SHS SPECIFICATIONS

Power	Universal Power Supply 85 – 264 VAC, 50 – 60 Hz, \pm 10% 500 Watts Maximum at Start Up. 250 Watts Nominal
Mounting.....	Wall Mount
Area Classification.....	General Purpose / NEMA 4X (IP65) Fiberglass Enclosure
Ambient Range	
Temperature	-30° to 50° Celsius
Relative Humidity.....	5 to 99%
Instrument Weight	75 lbs. Typical
Dimensions.....	24" x 24" x 12" (HxWxD)
Stack Sample Moisture	Up to 25%
Sample Cooler.....	Thermo Electric dual pass Chiller. Permeation Tube (-30° C) dewpoint. Customer instrument air required @ 5 L/M, -40° C dewpoint
Max. Stack Temperature	500° F (Higher temperatures available by utilizing elongated spools)
Stack Pressure	-5 to 15 inches H ₂ O
Sample Flow Rate	1 L/min from sample handling enclosure to Analysis enclosure
Response Time (Max distance between Analysis Enclosure and Sample Conditioning/Probe)	Enclosure is 300'. (Response time is 20 seconds/100' w/1/4" tubing).
Probe Length.....	48" length 316 SS Probe with .5 micron sintered filter. (Customer to cut to length in field.)
Mounting Flange.....	Optional 4" 150#
Sample Pump.....	316 SS diaphragm type
Instrument Air Requirements.....	Instrument grade air required. 15 SCFM @ 60 -100 PSIG (30 seconds 2 times per day). (Pressure Regulation by Customer.)

SECTION 2 INSTALLATION

WARNING

**ELECTRICAL SHOCK HAZARD
POSSIBLE EXPLOSION HAZARD**

Do not open while energized. Do not operate without doors and covers secure. Installation requires access to live parts which can cause death or serious injury.

DANGER

ELECTRICAL SHOCK HAZARD

Installation and servicing of this device requires access to components that may present electrical shock and/or mechanical hazards. Refer installation and servicing to qualified service personnel.

CAUTION

CODE COMPLIANCE

Installation of this device must be made in accordance with all applicable national and/or local codes. See specific references on the installation drawing located in the rear of this manual.

CAUTION

PRESSURIZED GAS

This unit requires periodic calibration with a known standard gas. It also may utilize a pressurized carrier gas, such as helium, hydrogen, or nitrogen. See General Precautions for Handling and Storing High Pressure Gas Cylinders, page P-4.

2-1 INSTALLATION

Refer to drawings located in the rear of this manual.

1. Move packaged System Enclosure to installation location. Unpack system and inspect for shipping damage. Install system in permanent location as required as shown on Outline and Mounting Dimensions Drawing. Install
2. Leak check interconnecting sample line(s) with 15 psig (103 kPa) nitrogen (or clean, dry, oil-free air) from sample tap to enclosure at ambient temperature and at normal operating temperature. Eliminate all leaks. System must be leak tight or incorrect analyzer reading will result. A temporary pressure gauge may be installed on sample line. Pressure loss should be less than 1 psig (6.89 kPa) per 16 hours.
3. Connect vent and drain line per Outline and Mounting Dimensions Drawing. Insure that connection is made to a pipe or tubing size equal to or larger than the fitting size supplied and is vented and drained to a pressure source at atmospheric pressure ± 4 inches water column.
4. Verify the tightness of every tube fitting and pipe fitting in the system as they may have loosened in transit. The entire panel system should be leak checked at 15 psig (103 kPa). The system must be leak tight prior to attempting a system start-up. At this time, also verify that no foreign material is in any of the tubing or piping. You may want to blow out the lines with nitrogen or clean, dry, oil-free instrument air. Never use plant air for pressure checking or purging of sample lines as plant air may contain unacceptable amounts of oil and/or water.

5. Connect analog output signal as required per Electrical Interconnect and Outline and Mounting Dimensions Drawings. Connect Status ID contacts and System Alarm contacts as required.
6. Connect 115 VAC 60 Hz single phase power (utility). Observe polarity when installing power - hot to black and neutral to white. Incorrect connections may cause damage to system. Provide grounding for power as required by local codes for fiberglass enclosures. Verify all wiring is per the Electrical Interconnect diagram.
7. Connect customer supplied zero and span calibration gas cylinders and Rosemount supplied dual stage regulators as required. Connect Instrument Air (per ISA Standard S7.3).

NOTE

Refer to all NOTES on drawings located in the rear of this for additional installation information.

System should now be ready for start-up by authorized personnel. **Prior to start-up, the operating instructions should be read and thoroughly understood.**

SECTION 3 OPERATION

CAUTION

Do not operate or service this instrument before reading and understanding this instruction manual and receiving appropriate training.

Refer to installation drawing supplied with the application data package.

3-1 SIMPLIFIED STARTUP AND OPERATION PROCEDURE

1. Install System Enclosure(s), interconnecting sample line, user supplied zero and span gas cylinders with Rosemount supplied dual stage regulators, conduit, and electrical cables per installation instructions.
2. Connect 115 VAC 60 Hz single phase power to appropriate terminals as required. Turn on user supplied main disconnect and circuit breaker.
3. Apply power to temperature control system for probe box. Apply power to Thermoelectric Cooler. Allow box to stabilize at operating temperature prior to introducing sample.
4. Verify that analyzer ranges and analog outputs are configured as desired. Apply power to analyzer (if not all ready powered).
5. Introduce zero gas locally to analyzer as it is warming to operating temperature. Calibrate analyzer as recommended using valves integral to analyzer. Allow 12-24 hours for analyzer reading to stabilize.
6. Verify that Thermoelectric cooler is operating properly prior to starting sample pump. Verify that all remote/local switches are in Remote mode. Adjust perma pure purge air flow for 3-4 liter/minute on FI₁. Allow sample to flow by applying power to sample pump (if not all ready powered.) Sample system will provide 1-2 liter/minute sample flow at 8-12 psig. If more sample is used, then dewpoint of sample will not be low enough to prevent condensation in minimum ambient conditions.
7. System should now be analyzing sample. Table 3-1 lists typical settings for various components.

ITEM	DESCRIPTION	NORMAL SETTING/INDICATION
FI ₁	Perma Pure Purge Air Flow	3-4 Liters/minute
PR ₁ /PI ₁	Perma Pure/Blowback Air Pressure	20-30 psig
Enclosure Air Conditioner	35 ^o C Set	
PRS ₁ Zero Gas	8-12 psig	
PRS ₂	90 PPM Nitric Oxide in N ₂ Span Gas	8-12 psig

Table 3-1. Typical Component Settings

8. Verify output from analyzer. Adjust as required. Refer to analyzer instruction manual. When switching ranges, it is the user's responsibility to insure that analyzer output is coordinated with range change.
9. Verify operation of Thermoelectric cooler high temperature and moisture carryover contact closure and indicator lights. Contacts will close on alarm. Clear any alarms by correcting problem.

3-2 CALIBRATION

Analyzer may be manually or automatically calibrated locally or through sample system by analyzer controls.

Normally a calibration will be recommended once every 24 hours or as determined by user based on application requirements.

System has capability to manually introduce zero and span gas near sample point, through sample line, and through sample system. The user should periodically com-

pare this value with zero and span gas admitted directly to analyzer to determine if the system is contributing a bias.

The sample system should contribute less than a 5% change. The cause of any larger deviation should be determined and corrected.

3-3 ROUTINE OPERATION

The system should operate continuously unattended. Periodic visual inspection of system should be made to insure that operating parameters of system are correct. Manual zero/span gas calibration recommended once per 24 hour period or as desired depending on application. This may be adjusted based on actual operating experience. Refer to Analyzer Instruction Manual for details.

For short term shutdown of system, introduce nitrogen or zero gas to analyzer(s) for 10-15 minutes. For long term shutdown of system, close sample inlet valve. Remove power from system. Shut off all zero and span gases and air to system.

SECTION 4 MAINTENANCE AND SERVICE

The Sample Conditioning system is designed for minimum maintenance based on anticipated sample composition and conditions. A routine maintenance program will minimize system downtime.

Maintenance will consist of two types: preventive and corrective. Preventive consists of monitoring certain operating parameters at selected intervals and determining if corrective maintenance is required. Following are tables which define the expected preventive maintenance. Corrective maintenance will be performed on as needed basis due to an unexpected system failure.

4-1 PREVENTIVE MAINTENANCE

Preventive maintenance activities have been developed to maximize system availability. These activities are extremely important to the overall quality of the monitoring system. All preventive maintenance activities shall be performed by maintenance personnel.

The performance of the monitoring system should be reviewed on a weekly basis for the initial six months of operation to determine if the preventive maintenance activities and schedule are effective. After six months, maintenance activities shall be added or deleted and the frequency adjusted, if neces-

sary, to maintain a high level of data availability and accuracy.

4-2 CORRECTIVE MAINTENANCE

Corrective maintenance shall be initiated to remedy any problems that may occur with the system. In order to determine the cause of a problem, maintenance personnel should refer to the trouble shooting sections of the Operation and Service Manual.

4-3 MAINTENANCE LOGS

All maintenance activities performed on the monitoring equipment shall be recorded on maintenance log sheets and stored with the monitoring system files.

4-4 MAINTENANCE FREQUENCY

Table 4-1 through Table 4-7 lists expected service and maintenance intervals for the various system components - they should be inspected at this interval. Actual life may vary depending on operating conditions. If any component requires repair or replacement more frequently than listed, then consideration should be given to providing a more reliable or more corrosion resistant component. Those components not identified are not applicable to this system.

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
SP ₁	Primary sintered metal sample filters	Filter Element	B				I,C or R		
	Sintered Metal Sample Guard Filters	Filter Element					I,C or R		
		Seal Kit					I,R		
	Y-Strainers	Filter Element		B				I,R	
		Seal Kit						I,R	
	Disposable End-of-Line Filters	Element				I,R			
F ₂	Sample Filters with Non-Metallic Elements	Filter Element			R				
		Seal Kit					I,R		
	Sample Coalescing Filters with Non-Metallic Elements	Filter Element			R				
		Seal Kit					I,R		
	Instrument Air Filters with Non-Metallic Elements	Filter Element				I,R			
		Seal Kit					I,R		

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-1. Component Maintenance Schedule - Filters

Model MicroCEM SHS

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
F ₂	Regulating/Needle Valves/Toggle Valves	Packing Adjust-ment				I,T			
		Seat and Seals							I,R
	Flow Regulators	Flexible Orifice						I,R	
RV ₁	Check/Relief Valves	O-Ring Seal, Spring							I,R
	Manual or Remote-Operated Ball Valves - 2, 3, 4, or 5- Way	Seals						I,R	
		Packing Adjust-ment				I,A			
EOV ₁	Plug Valves - 2,3,4, or 5-Way, Manual or Remote-Operated	Plug Assembly							I,R
	Packless Valve (Dia-phragm or Bellows Sealed), Manual or Re-mote- Operated	Seat and Seals							I,R
	Quick Connect Fittings	O-Rings							I,R
SV ₁	Solenoid Valves	Coils							
		Valve Internals (check for cross leakage)						I,R	
		Valve Seats and Springs						I,R	
EOV ₁	Valve Operators	Air Operators						I,R	
		Motorized Op-erators				I,R			

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-2. Component Maintenance Schedule - Valves

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
FI ₁	Flowmeters	Indication	V						
		O-Rings and Seals							I,R
PI ₁	Pressure Gauges	Indication	V						
		Snubbers							I,R

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-3. Component Maintenance Schedule – Indicators

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
P ₁	Diaphragm Pumps	Diaphragm				I,R			
	Piston Pumps	Valve/Valve Gasket							
	Rotary or Centrifugal Pump	Seals					I,R		
	Bellows Pump	Valves and Valve Seat				I,C			
		Bellows ¹				I			
P _{2A,B}	Peristaltic Pump	Tubing			I,R				
	Sample Back-, Differential-, and Pressure Regulators	Valve Seat and Diaphragm							I,R
PR ₁	Air Service Pressure Regulators	Regulator							R

1, Factory replacement of bellows as required by pump manufacturer only.

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-4. Component Maintenance Schedule – Pressure Adjustment

Model MicroCEM SHS

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
PR ₁	Refrigerated Condenser	Coolant and/or Sample Temperature	V						
RC _{1A,B}	Thermo-Electric Cooler	Sample Temperature	V						
	Water Cooler/Water-Cooled Separator	Coolant and/or Sample Temperature	V						
	Ball Float Traps	Seats and Seals							I,C or R
PPD ₁	Perma-Pure Dryer	Check for Leaks			I				
	Regenerative Dryer	Solenoid Coils/Internals						I,R	
		Columns/Refill with Mole Sieve							I,R
	Ammonia Scrubber				I	I,R	I,R	I,R	I,R

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-5. Component Maintenance Schedule – Dryers

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
	Heated/Vaporizing Pressure Regulating Stations	Heating Element		I					
	Heated Sample Line			I					
T ₁	Temperature Sensing Element, Bi-metal			I					
	Temperature Controllers, Self Operated	Valve and Seat							I,R
	Enclosure Heaters			I					
	Enclosure Air Conditioners			I					
	Enclosure Vent Fans			I					
EC ₁	Enclosure Heat Exchangers			I					
	Exhaust Blowers			I					

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-6. Component Maintenance Schedule – Temperature Control

Model MicroCEM SHS

WHERE USED	COMPONENT	MAINTENANCE ITEM	DAILY	WEEKLY	MONTHLY	EVERY 3 MO.	EVERY 6 MO.	EVERY 9 MO.	EVERY 12 MO.
	Purge Pressure Switches				T				
	Sample Pressure Switches						T		
	Loss of Pump Diaphragm Flow Switch				T				
	Sample Flow Switches						T		
	Temperature Switches						T		
MS ₁	Level Sensor Switches						T		
	Timers							I,T	
K ₁₋₄	Relays - Electromechanical							I,T	
	Relays - Solid State								I,T
	Transducers - E to I						I,T		
	Dual Alarm Modules						I,T		
	Sample Hold Modules						I,T		
24VPS1	DC Power Supply	Verify Voltage Out						I	

Legend:

- A – Tighten as required
- B – Blowback/Blowdown
- C – Clean
- I – Inspect (some disassembly may be required)
- R – Replace as required.
- T – Test for proper function by stimulating operating/alarm condition
- V – Visual check.

Table 4-7. Component Maintenance Schedule – Electrical

SECTION 5 TROUBLESHOOTING

DANGER

ELECTRICAL SHOCK HAZARD

Disconnect power to the module(s) prior to replacing components.

WARNING

QUALIFIED PERSONNEL

This equipment should not be adjusted or repaired by anyone except properly qualified service personnel.

WARNING

PARTS INTEGRITY

Tampering with or unauthorized substitution of components may adversely affect safety of this product. Use only factory-approved components for repair.

Troubleshooting should be referred to qualified service technicians. Basic troubleshooting involves first isolating the fault to the failed component. Refer to the following symptom chart.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No flow or low sample flow to analyzer(s)	a. Sample Flow valves not adjusted properly	a. Adjust correct flow for analyzer(s)
	b. No sample pressure to analyzer(s)	b. Verify RV ₁ is set for 8-12 psig
	c. System in other than sample mode	c. Place system in sample mode
	d. Sample or guard filters plugged	d. Inspect and replace as required
	e. Pump diaphragm or valves have failed	e. Replace pump diaphragm and check valve operation
2. Water carryover to analyzer(s)	a. Trap drain full	a. Verify that Peristaltic pump is operating properly.
	b. High thermoelectric cooler temperature (above 45°F/7.2°C)	b. Verify that Peristaltic pump is operating properly.
	c. Temperature setting is incorrect	c. Correct setting
	d. High ambient temperature	d. Ambient should be less than 90°F (32°C)
	e. Failed thermoelectric elements	e. Inspect and replace as required
	f. Cooling fan not operating or heat exchanger blocked	f. 4. Verify operation of fan and adequate ventilation around heat exchanger
3. Greater than 5% difference when introducing calibration gas in local mode and Remote mode (Sample System Bias)	a. Filter Element of F ₁ contaminated	a. Remove element from system and retest. If reading is within tolerance now, then replace element with a new one.
	b. Sample line or Thermocooler contaminated.	b. Check operating temperature of all heated zones. Purge/backflush system with HC-free air for 5-10 minutes. Retest. If still high, then sections of the system will have to be individually isolated and checked.
	c. Leak in system (prior to pump) which is diluting sample	c. Check sample line, pump diaphragm, Peristaltic Pump tubing.
	d. Insufficient flow of calibration gas to sample probe	d. Set flow of calibration gas so that sample inlet pressure is above 0 or analyzer reading is maximized.

SECTION 6 REPLACEMENT PARTS

6-1 INTERNAL SAMPLE PANEL

662210 Relay Board Assembly
897861 Fuse 5A, Time Delay
902127 Flowmeter
902222 Pressure Gauge
902238 Pressure Regulator
902262 Relief Valve (set for 10-12 psig)
904772 Fuse 10A, Slow Blow
905781 Scrubber, Ammonia
905782 4-Way Valve
905783 Electric Actuator
905784 Mount Kit
905785 Solenoid Valve 24V DC
905786 Sample Pump
905787 Dryer
905788 Thermocooler
905789 Moisture Sensor
905790 Mounting Bracket, Pressure Gauge
905792 Filter Element
905793 Motor
905794 Pump Head
905795 Dual Head Kit
905796 Power Supply
906080 Air Conditioner 1400/1600 BTU
905842 Flange Gasket
905866 Rebuild Kit, Solenoid Valve
905869 Rebuild Kit, Sample Pump
905870 Coil 24 DCFT, Solenoid Valve
906016 Hose Clamp
906028 Filter Housing, Stainless Steel

6-2 SAMPLE PROBES

662011 Probe Assembly 5 foot
662012 Probe Assembly 4 foot
905839 Filter 0.5 micron

6-3 HI TEMP COMPONENTS

662091 Filter Baffle, Probe
662127 Probe Assembly, Hi Temp
662170 Heated Sample Line, 10 foot
662195 Heated Sample Line, 15 foot
662196 Heated Sample Line, 25 foot
662197 Heated Sample Line, 50 foot
905873 Filter 0.5 micron, Hi Temp

SECTION 7 RETURN OF MATERIAL

7-1 RETURN OF MATERIAL

If factory repair of defective equipment is required, proceed as follows:

1. Secure a return authorization from a Rosemount Analytical Inc. 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.
2. In no event will Rosemount be responsible for equipment returned without proper authorization and identification.
3. Carefully pack the defective unit in a sturdy box with sufficient shock absorbing material to ensure no additional damage occurs during shipping.
4. In a cover letter, describe completely:
 - a. The symptoms that determined the equipment is faulty.
 - b. The environment in which the equipment was operating (housing, weather, vibration, dust, etc.).
 - c. Site from where the equipment was removed.
 - d. Whether warranty or non-warranty service is expected.
 - e. Complete shipping instructions for the return of the equipment.
5. Enclose a cover letter and purchase order and ship the defective equipment according to instructions provided in the Rosemount Return Authorization, prepaid, to:

Rosemount Analytical Inc.
Process Analytic Division
Customer Service Center
1-800-433-6076

If warranty service is expected, the defective unit will be carefully inspected and tested at the factory. If the failure was due to the 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 the 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.

7-2 CUSTOMER SERVICE

For order administration, replacement parts, application assistance, on-site or factory repair, service or maintenance contract information, contact:

Rosemount Analytical Inc.
Process Analytic Division
Customer Service Center
1-800-433-6076

7-3 TRAINING

A comprehensive Factory Training Program of operator and service classes is available. For a copy of the Current Operator and Service Training Schedule, contact:

Rosemount Analytical Inc.
Process Analytic Division
Customer Service Center
1-800-433-6076

WARRANTY

Goods and part(s) (excluding consumables) manufactured by Seller are warranted to be free from defects in workmanship and material under normal use and service for a period of twelve (12) months from the date of shipment by Seller. Consumables, glass electrodes, membranes, liquid junctions, electrolyte, o-rings, etc., are warranted to be free from defects in workmanship and material under normal use and service for a period of ninety (90) days from date of shipment by Seller. Goods, part(s) and consumables proven by Seller to be defective in workmanship and/or material shall be replaced or repaired, free of charge, F.O.B. Seller's factory provided that the goods, part(s) or consumables are returned to Seller's designated factory, transportation charges prepaid, within the twelve (12) month period of warranty in the case of goods and part(s), and in the case of consumables, within the ninety (90) day period of warranty. This warranty shall be in effect for replacement or repaired goods, part(s) and the remaining portion of the ninety (90) day warranty in the case of consumables. A defect in goods, part(s) and consumables of the commercial unit shall not operate to condemn such commercial unit when such goods, part(s) and consumables are capable of being renewed, repaired or replaced.

The Seller shall not be liable to the Buyer, or to any other person, for the loss or damage directly or indirectly, arising from the use of the equipment or goods, from breach of any warranty, or from any other cause. All other warranties, expressed or implied are hereby excluded.

IN CONSIDERATION OF THE HEREIN STATED PURCHASE PRICE OF THE GOODS, SELLER GRANTS ONLY THE ABOVE STATED EXPRESS WARRANTY. NO OTHER WARRANTIES ARE GRANTED INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Limitations of Remedy. SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE. THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT UNDER THE STANDARD WARRANTY CLAUSE. IN NO CASE, REGARDLESS OF THE FORM OF THE CAUSE OF ACTION, SHALL SELLER'S LIABILITY EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS MANUFACTURED BY SELLER GIVING RISE TO THE CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY EXTEND TO INCLUDE INCIDENTAL OR CONSEQUENTIAL DAMAGES. CONSEQUENTIAL DAMAGES SHALL INCLUDE, BUT ARE NOT LIMITED TO, LOSS OF ANTICIPATED PROFITS, LOSS OF USE, LOSS OF REVENUE, COST OF CAPITAL AND DAMAGE OR LOSS OF OTHER PROPERTY OR EQUIPMENT. IN NO EVENT SHALL SELLER BE OBLIGATED TO INDEMNIFY BUYER IN ANY MANNER NOR SHALL SELLER BE LIABLE FOR PROPERTY DAMAGE AND/OR THIRD PARTY CLAIMS COVERED BY UMBRELLA INSURANCE AND/OR INDEMNITY COVERAGE PROVIDED TO BUYER, ITS ASSIGNS, AND EACH SUCCESSOR INTEREST TO THE GOODS PROVIDED HEREUNDER.

Force Majeure. Seller shall not be liable for failure to perform due to labor strikes or acts beyond Seller's direct control.

Instruction Manual

748468-E
August 2003

Model MicroCEM SHS

EMERSON PROCESS MANAGEMENT

Rosemount Analytical Inc.

Process Analytic Division

6565P David Industrial Parkway

Solo, OH 44139

T (440) 914-1261

F (440) 914-1271

E-mail: gas.csc@emersonprocess.com

EUROPEAN TECHNOLOGY CENTER

Fisher-Rosemount GmbH & Co.

Industriestrasse 1

63594 Hasselroth

Germany

Phone: 49-6055-884 0

Fax: 49-6055-884209

ASIA - PACIFIC

Fisher-Rosemount

Singapore Private Ltd.

1 Pandan Crescent

Singapore 128461

Republic of Singapore

Phone: 65-777-8211

Fax: 65-777-0947

<http://www.raihome.com>

EUROPE, MIDDLE EAST, AND AFRICA

Fisher-Rosemount Ltd.

Heath Place

Bognor Regis

West Sussex PO22 9SH

England

Phone: 44-1243-863121

Fax: 44-1243-845354

LATIN AMERICA

Fisher - Rosemount

Av. das Americas

3333 sala 1004

Rio de Janeiro, RJ

Brazil 22631-003

Phone: 55-21-431-1882



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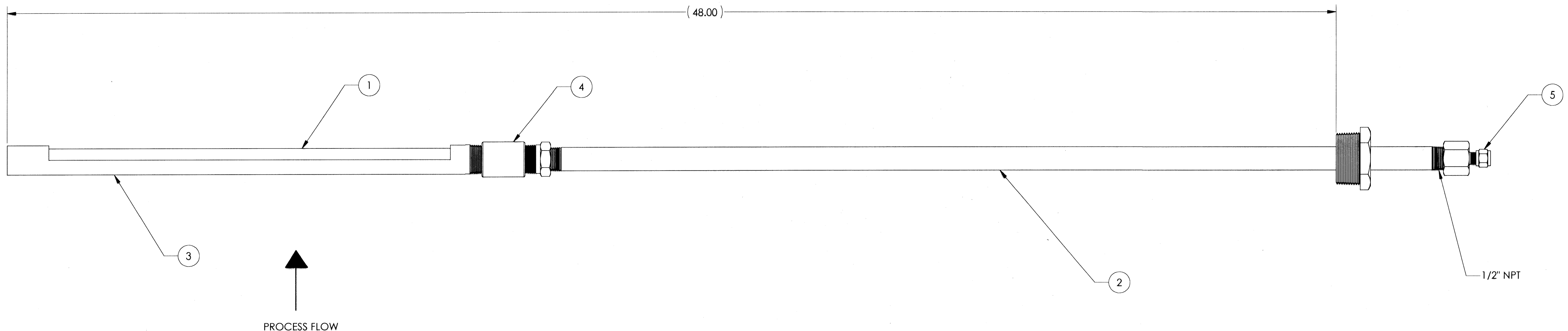
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1

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF ROSEMOUNT ANALYTICAL INC. AND IS TENDERED SUBJECT TO THE CONDITIONS THAT THE INFORMATION (A) BE RETAINED IN CONFIDENCE, (B) NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART AND (C) NOT BE USED OR INCORPORATED IN ANY PRODUCT, EXCEPT UNDER AN EXPRESS WRITTEN AGREEMENT WITH ROSEMOUNT ANALYTICAL INC.

CHG	E.O. NO.	DATE	BY	CHK	ENGR
C	19718	7/02	TJ	JB	



- NOTES:
1. INSTALL PROBE WITH EXPOSED PORTION OF FILTER ELEMENT AWAY FROM DIRECTION OF FLOW.
 2. USE JET LUB NIKAL HIGH TEMPERATURE THREAD LUBRICANT ON PIPE THREADS (2600F) (1427C) OR EQUIVALENT.
 3. FILTER INTAKE AREA LOCATED WITHIN CENTRAL 10% OF STACH AREA.
 4. PUT SCRIBE MARK ON FACE OF BUSHING (ITEM 2) INDICATING LOCATION OF FILTER BAFFEL.

QTY	ITEM	PART NO.	DESCRIPTION
1	5	905826	CONNECTOR
1	4	905841	COUPLING, PIPE 3/4"
1	3	662091	FILTER BAFFEL
1	2	662072	PROBE BODY, SAMPLE, 33" SS
1	1	905839	FILTER, 0.5 MICRON

MATERIAL:
NOTED

FINISH:
NONE

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES/MILLIMETERS
TOLERANCES

INCH	mm
.X ±.050	X ± 1.27
.XX ±.020	X ± 0.51
.XXX ±.005	XX ± 0.13

ANGULAR: 90°/30' MACH. SURF. 125/μIN/3.2 μM
UN STD THREADS: CLASS 2A OR 2B
REMOVE BURRS & SHARP EDGES .020/0.5
MACH FILLET RADIUS .020/0.5
MACH SURF FLAT WITHIN .001 in/in (.025 mm/mm)
OTHER SURF FLAT WITHIN .005 in/in (.127 mm/mm)
CONCENTRICITY MACH. SURF.
TIR WITHIN 1/2 SUM OF DIA TOL .001/.025 MIN
DO NOT SCALE DRAWING.

BY	DATE
DR: L.ANDERSON	2/5/02
CHK: BRIGHT	3/02
DSGN:	
ENGR: G.HEYMAN	3/8/02
APPD: <i>J.Riley</i>	7/26/02

Rosemount Analytical Inc.

TITLE
SAMPLE PROBE, 4 FOOT

D SIZE DWG NO. 662011

SCALE: 1/2 INITIAL USE: SHEET 1 OF 1

L:\SOLIDWORKS\PARTS\

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DWG NO. 662011

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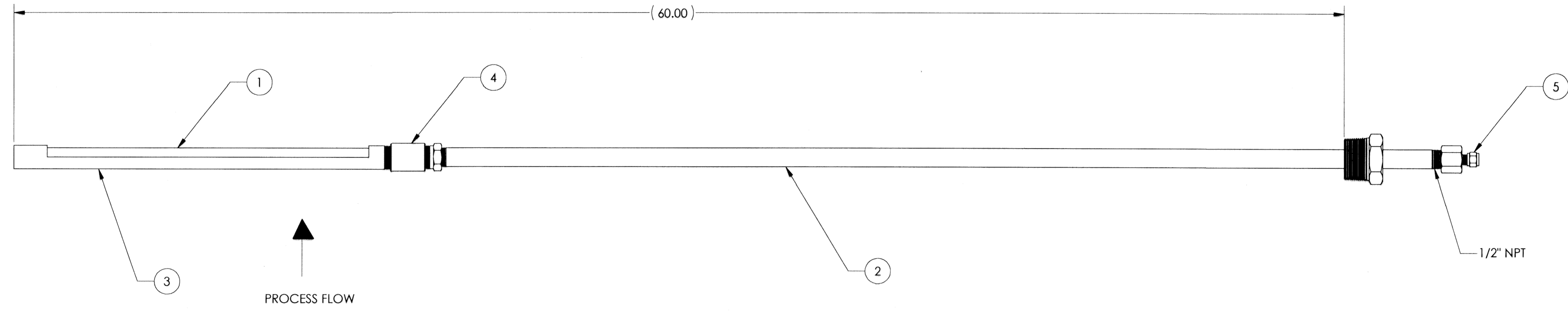
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1

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF ROSEMOUNT ANALYTICAL, INC. AND IS TENDERED SUBJECT TO THE CONDITIONS THAT THE INFORMATION (A) IS BE RETAINED IN CONFIDENCE, (B) NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART AND (C) NOT BE USED OR INCORPORATED IN ANY PRODUCT, EXCEPT UNDER AN EXPRESS WRITTEN AGREEMENT WITH ROSEMOUNT ANALYTICAL, INC.

CHG	E.O. NO.	DATE	BY	CHK	ENGR
C	19718	7/02	TJ	JS	



- NOTES:
1. INSTALL PROBE WITH EXPOSED PORTION OF FILTER ELEMENT AWAY FROM DIRECTION OF FLOW.
 2. USE JET LUB NIKAL HIGH TEMPRATURE THREAD LUBRICANT ON PIPE THREADS (2600F) (1400C) OR EQUIVALENT.
 3. FILTER INTAKE AREA LOCATED WITHIN CENTRAL 10% OF STACK AREA.
 4. PUT SCRIBE MARK ON FACE OF BUSHING (ITEM 2) INDICATING LOCATION OF FILTER BAFFEL.

QTY	ITEM	PART NO.	DESCRIPTION
1	5	905826	CONNECTOR
1	4	605841	COUPLING, PIPE 3/4"
1	3	662061	FILTER BAFFEL
1	2	662073	PROBE BODY, SAMPLE, 45" SS
1	1	905839	FILTER, 0.5 MICRON

MATERIAL:	NOTED
FINISH:	NONE

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES/MILLIMETERS

TOLERANCES	INCH	mm
	.X ± 0.050	X ± 1.27
	.XX ± 0.020	X ± 0.51
	.XXX ± 0.015	XX ± 0.13

ANGULAR: 90° MACH. SURF. 126 UIN/3.2 UM
UN STD THREADS: CLASS 2A OR 2B
REMOVE BURRS & SHARP EDGES .020/0.5
MACH FILLET RADIUS .020/0.5
MACH SURF FLAT WITHIN .001 in/in (.025 mm/mm)
OTHER SURF FLAT WITHIN .005 in/in (.127 mm/mm)
CONCENTRICITY MACH. SURF.
TIR WITHIN 1/2 SUM OF DIA TOL. .001/.025 MIN
D02 NOT SCALE DRAWING

BY	DATE
DR: L.ANDERSON	2/5/02
CHK: BRIGHT	3/02
DSGN:	
ENGR: G.HEYMAN	3/8/02
APPD: <i>J. Riley</i>	7/26/02

Rosemount Analytical Inc.

TITLE: **SAMPLE PROBE, 5 FOOT**

DWG NO. **662012**

SCALE: NONE INITIAL USE: SHEET 1 OF 1

L:\SOLIDWORKS\PARTS\

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D DWG NO. 662012

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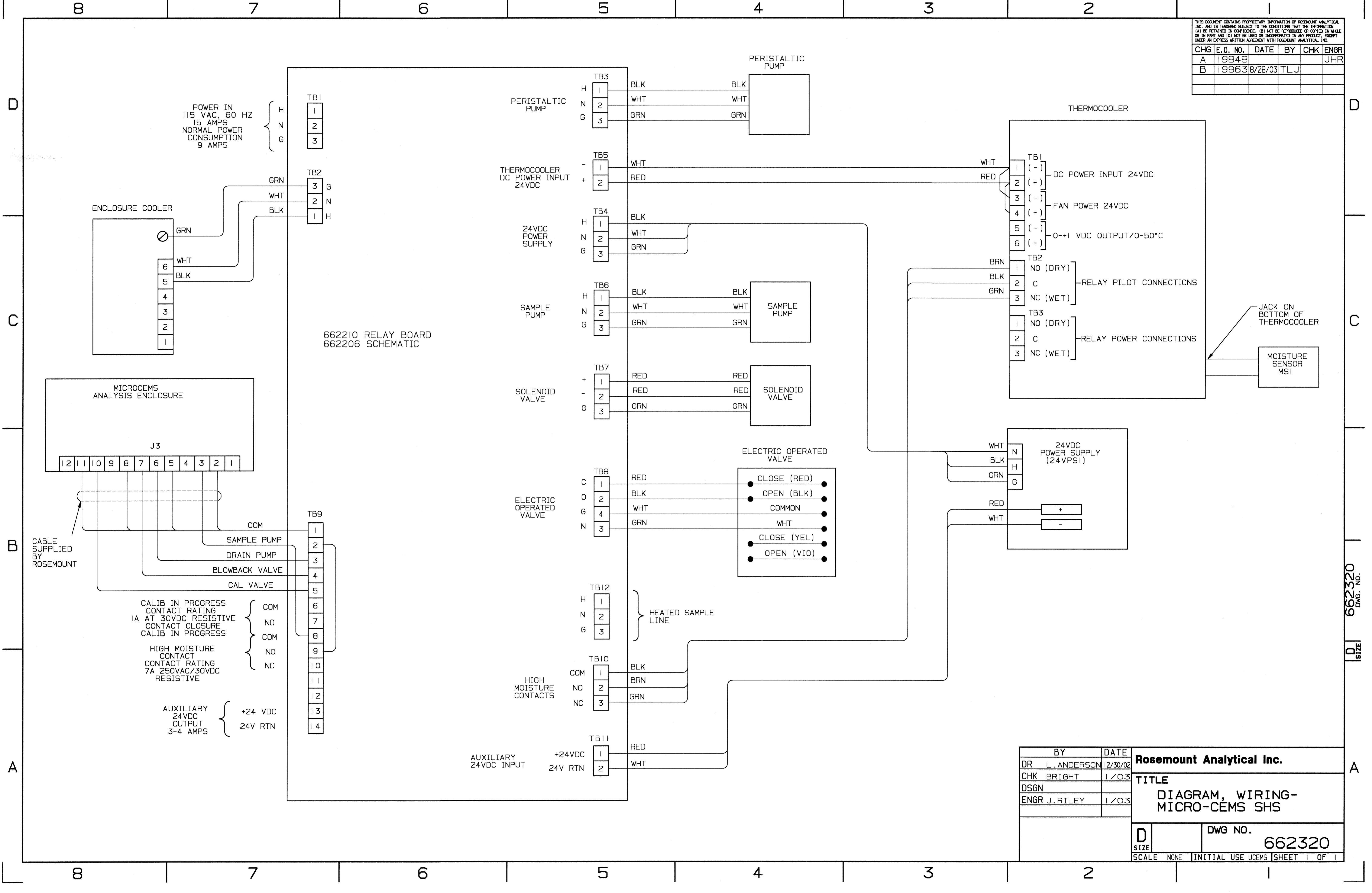
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CHG	E.O. NO.	DATE	BY	CHK	ENGR
A	19848				JHR
B	19963	8/28/03	TLJ		



BY	DATE	Rosemount Analytical Inc.
DR L. ANDERSON	12/30/02	
CHK BRIGHT	1/03	
ENGR J. RILEY	1/03	

TITLE
DIAGRAM, WIRING-MICRO-CEMS SHS

D SIZE	DWG NO. 662320
SCALE NONE	INITIAL USE UCEMS SHEET 1 OF 1

D SIZE 662320 DWG. NO.

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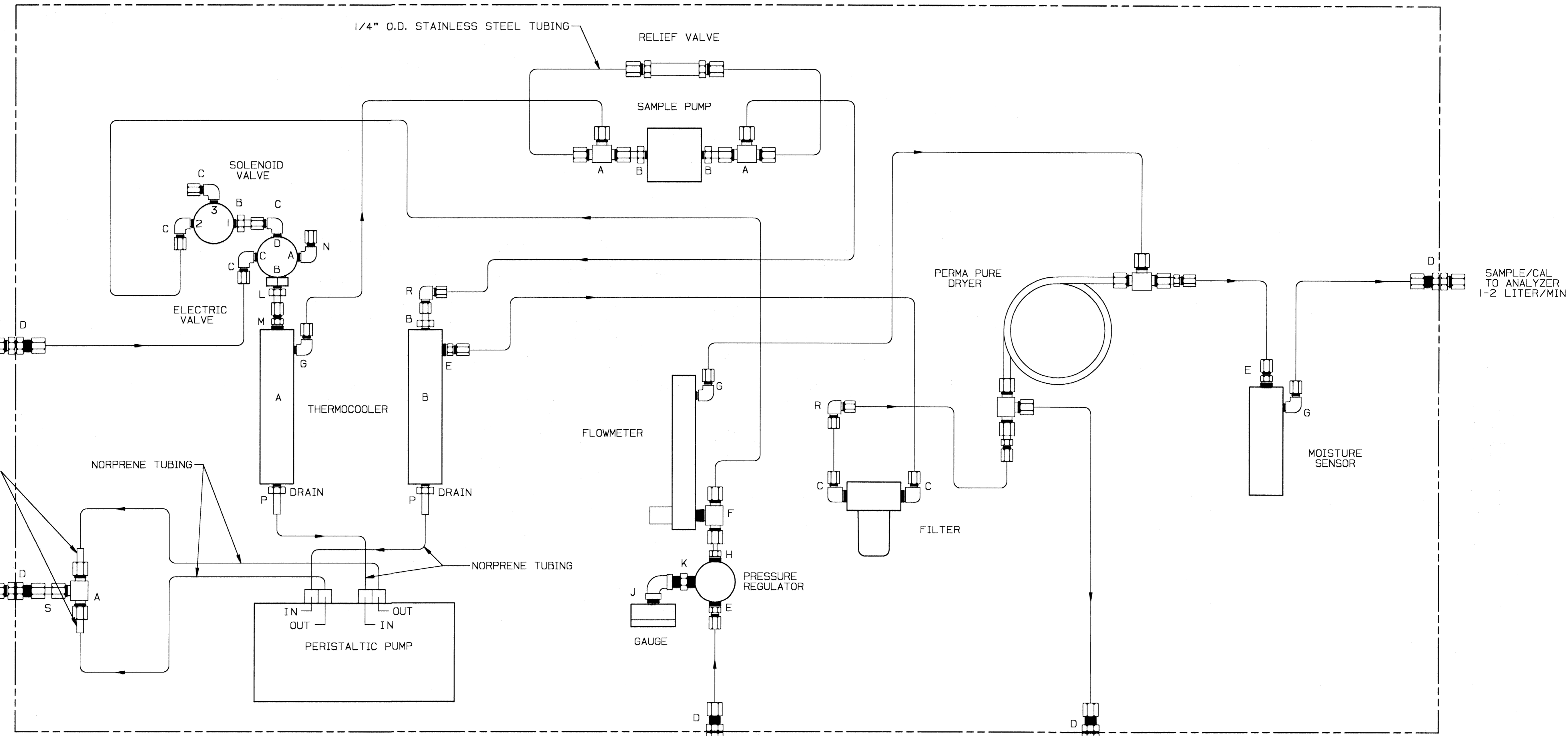
CHG	E.O. NO.	DATE	BY	CHK	ENGR
A	19848				
B	19922	5/6/03	LA	JB	JHR
C	19952	7/25/03	TLJ		

D

C

B

A



- A. 016433 TEE, 1/4T (SS)
- B. 099070 ADAPTER, MALE 1/4T X 1/4NPT (SS)
- C. 016429 ELBOW, MALE 1/4T X 1/4NPT (SS)
- D. 016432 BULKHEAD UNION 1/4T (SS)
- E. 008435 FITTING, 1/4T X 1/8NPT (SS)
- F. 023978 TEE, MALE 1/4T X 1/8NPT (SS)
- G. 023977 ELBOW, MALE 1/4T X 1/8NPT (SS)
- H. 099492 ADAPTER, MALE 1/4T X 1/8NPT (SS)
- J. 906011 ELBOW, FEMALE 1/8NPT (SS)
- K. 815988 NIPPLE, 1/8NPT (SS)
- L. 823851 ADAPTER, MALE 3/8T X 1/4NPT (SS)
- M. 099514 FITTING, 3/8T X 1/4NPT (SS)
- N. 099512 ELBOW, MALE 3/8T X 1/4NPT (SS)
- P. 905825 ADAPTER, MALE 1/4T X 3/8NPT (SS)
- R. 079378 ELBOW, 1/4T (SS)
- S. 903686 CONNECTOR, PORT 1/4T (SS)

I. ALL TUBING TO BE 1/4" O.D. X .062 WALL TEFLON (FEP) TUBING EXCEPT AS NOTED.

BY	DATE	Rosemount Analytical Inc.
DR L. ANDERSON	1/3/03	
CHK J. BRIGHT	1/3/03	
ENGR <i>J. Riley</i>	7/25/03	
TITLE		DIAGRAM, FLOW MICROCEMS SHS
DWG NO.		
D		662321
SCALE NONE		
INITIAL USE UCEMS SHEET		OF 1

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D SIZE
 DWG. NO. 662321

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CHG	E.O. NO.	DATE	BY	CHK	ENGR
A	19952				

LABELS
1/16" WHITE GRAVOPLI WITH BLACK 1/8"
LETTERS NORMAL TAG SIZE IS 1" X 2"

MISCELLANEOUS

TI-1
ENCLOSURE
TEMPERATURE

3/4" NPT FEMALE

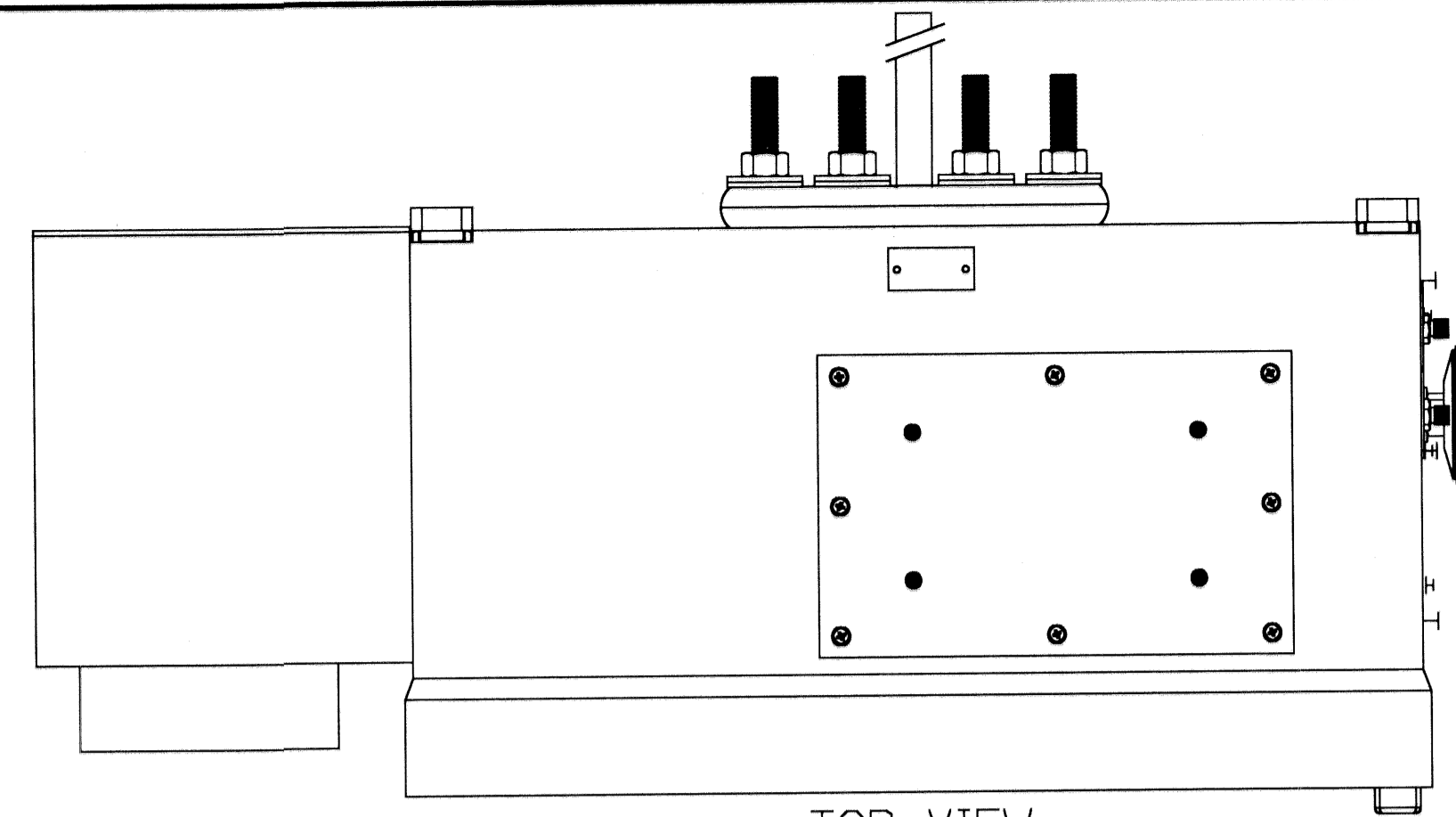
A. POWER IN
115 VAC 60 HZ
15 AMPS

NORMAL POWER
CONSUMPTION
9 AMPS

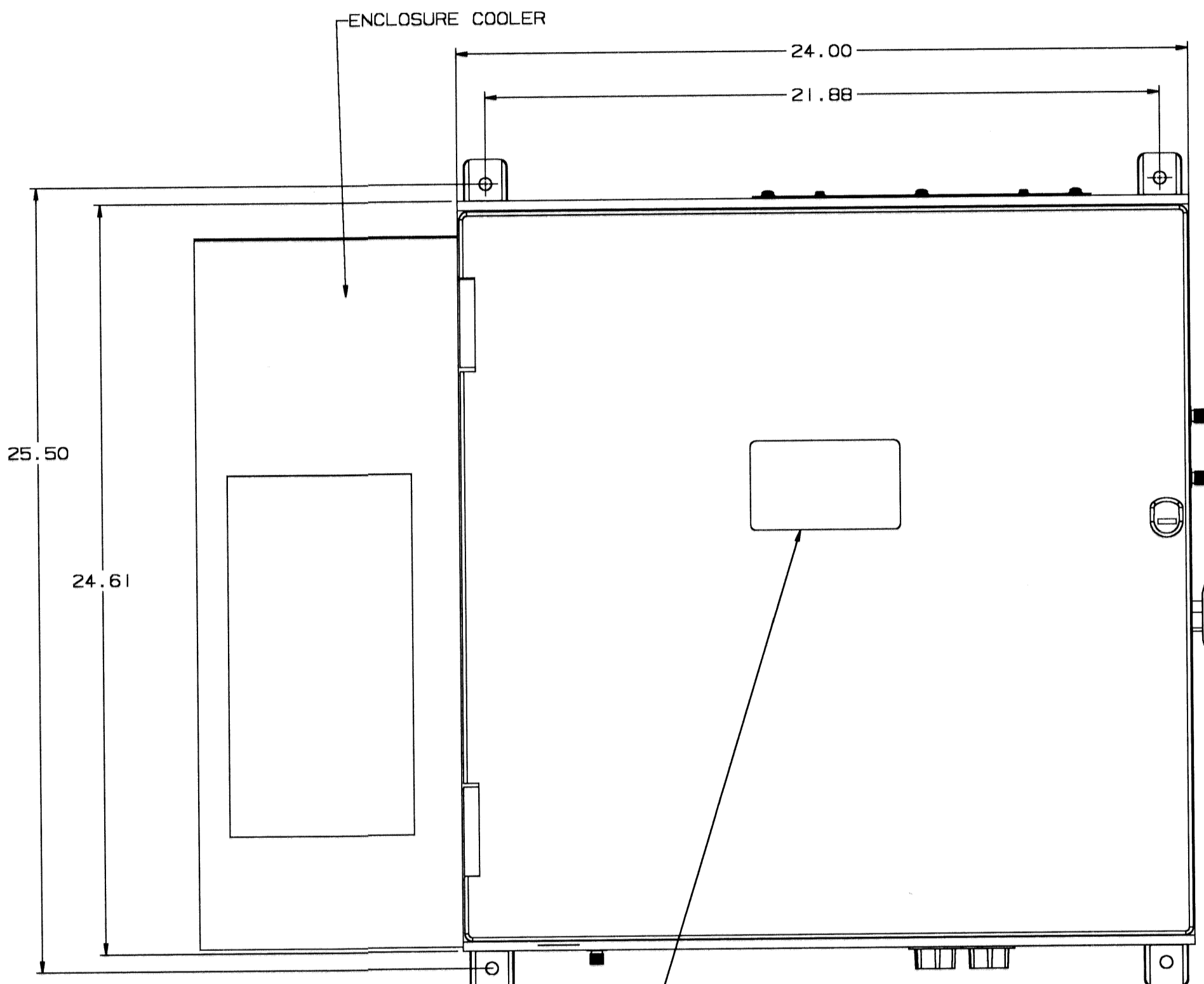
B. ALARM/STATUS
CONTACTS

1/4" BULKHEAD UNIONS

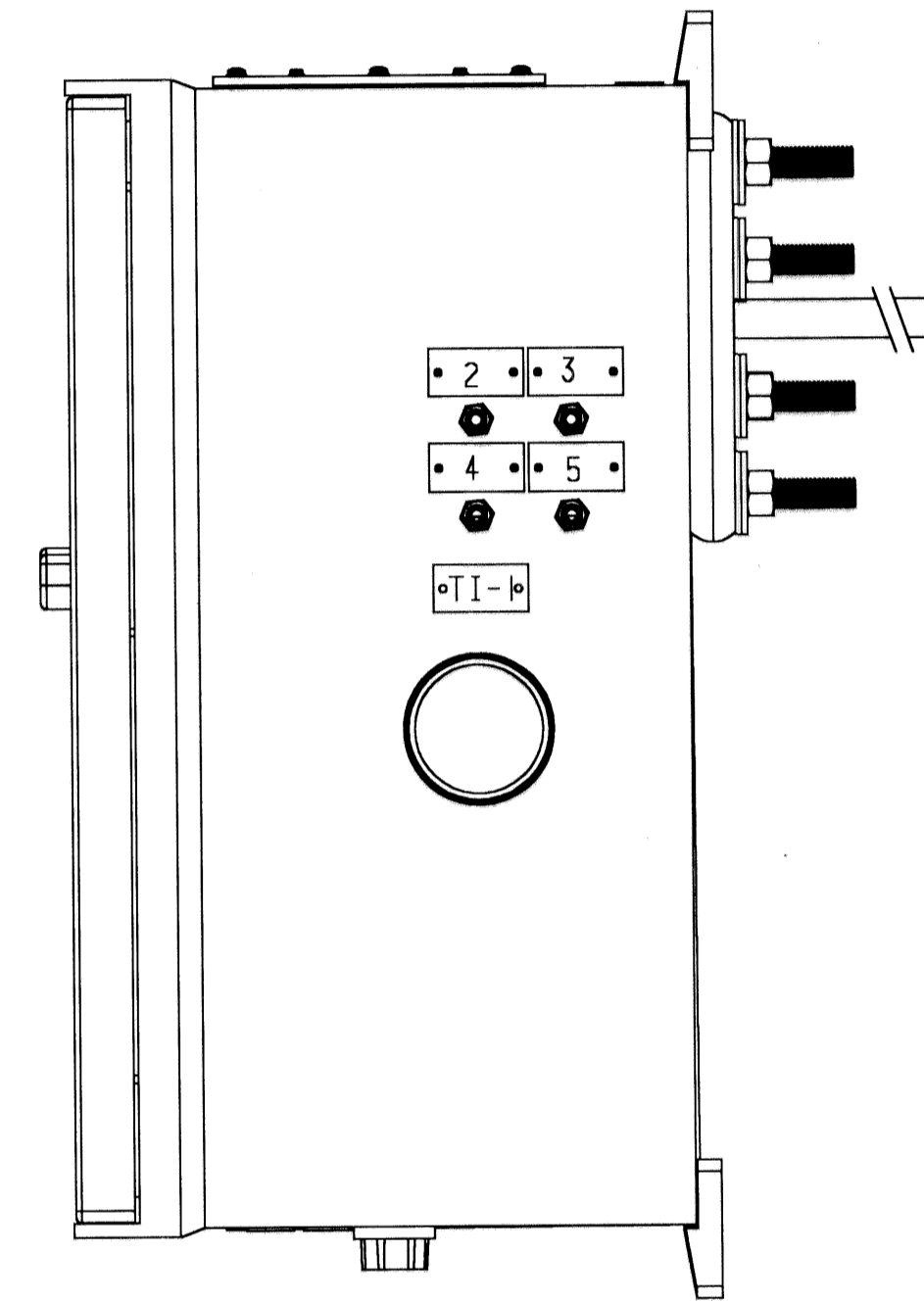
- 2. SAMPLE/CAL
OUTLET
1-2 LITER/MIN
- 3. CAL GAS
INLET
1-2 LITER/MIN
- 4. INSTRUMENT AIR
60-125 PSIG
1-5 SCFM
- 5. ATMOS PRESSURE
DRAIN TO SAFE
LOCATION
- 6. ATMOS PRESSURE
DRAIN TO SAFE
LOCATION



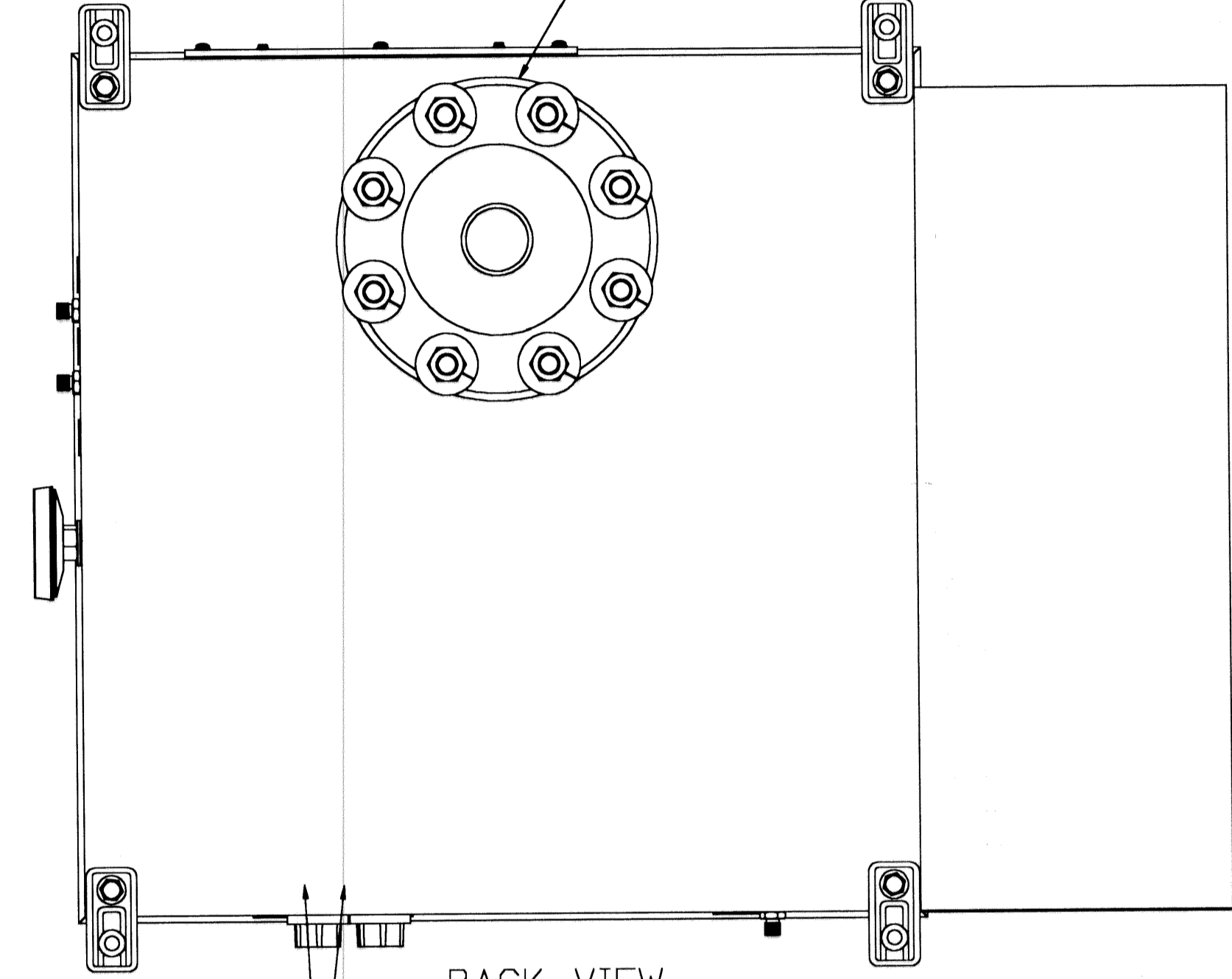
TOP VIEW



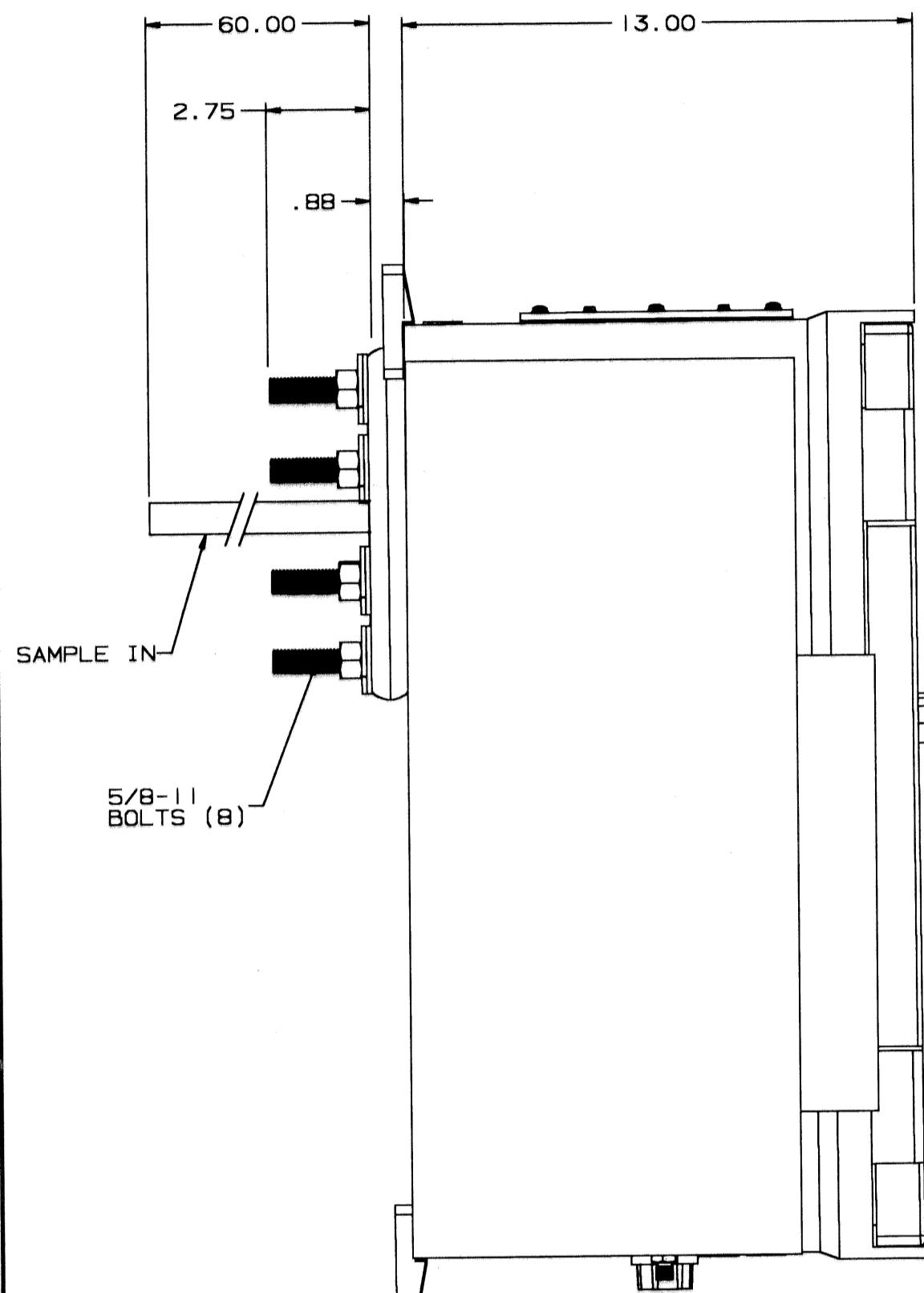
FRONT VIEW



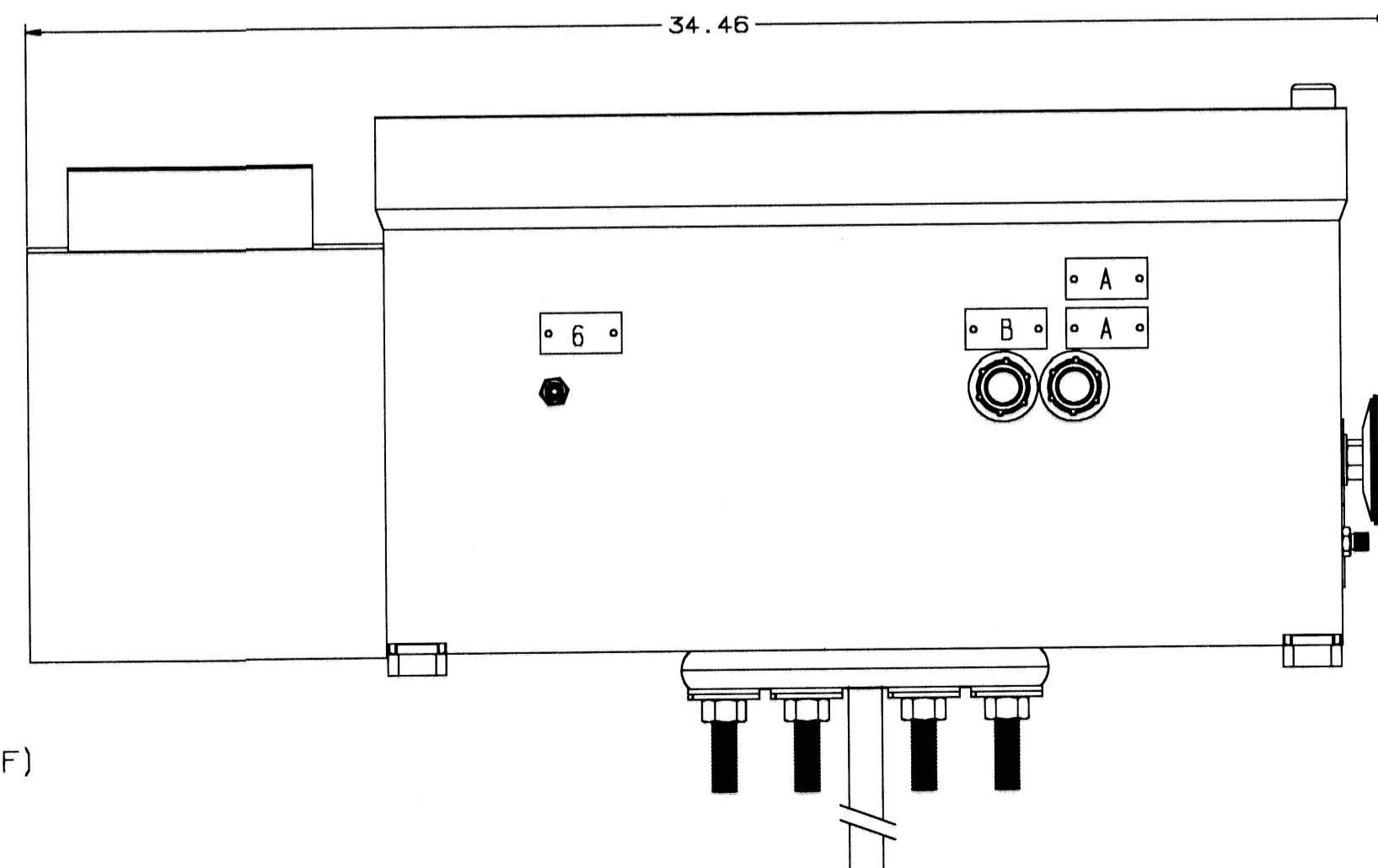
RIGHT SIDE VIEW



BACK VIEW



LEFT SIDE VIEW



BOTTOM VIEW

NOTES:

1. NEC AREA CLASSIFICATION:
 NON-HAZARDOUS
 CLASS I, DIVISION 2, GROUPS B, C & D
 CLASS I, DIVISION 1, GROUPS B, C & D
2. A GROUND STRAP IS TO BE CONNECTED BETWEEN MAIN FRAME ASSEMBLY/ENCLOSURE AND ALL DOORS/REMOVABLE TOPS, BASES, AND SIDE PANELS.
3. LOCATION: INDOORS OUTDOORS
4. ENCLOSURE: NEMA 4X (IEP 65), INSULATED UNINSULATED
5. RECOMMENDED AMBIENT TEMPERATURE LOCATION: -23 TO 40°C (-10 TO 104°F)
6. ESTIMATED ENCLOSURE INTERIOR TEMPERATURE: 20-40°C (68-104°F)
8. ESTIMATED WEIGHT: 125 LBS. (56.8 Kg)

4" BLIND FLANGE
DIA. OF BOLT CIRCLE 7.5"
DIA. OF STUD BOLTS .62"

TB3 AND TB4
LOCATED INSIDE
ENCLOSURE

ROSEMOUNT
WARNING TAG
P/N 659508

MATERIAL	UNLESS OTHERWISE SPECIFIED		BY	DATE	Rosemount Analytical Inc.								
	DIMENSIONS ARE IN INCHES/MILLIMETERS TOLERANCES		DR	T.L. JOHNSON 7/24/03									
FINISH	<table border="1"> <thead> <tr> <th>INCH</th> <th>MILLIMETERS</th> </tr> </thead> <tbody> <tr> <td>.X ± .050</td> <td>X ± 1.27</td> </tr> <tr> <td>.XX ± .020</td> <td>.X ± 0.51</td> </tr> <tr> <td>.XXX ± .005</td> <td>.XX ± 0.13</td> </tr> </tbody> </table>		INCH	MILLIMETERS	.X ± .050	X ± 1.27	.XX ± .020	.X ± 0.51	.XXX ± .005	.XX ± 0.13	CHK	Bright 7/03	TITLE
	INCH	MILLIMETERS											
.X ± .050	X ± 1.27												
.XX ± .020	.X ± 0.51												
.XXX ± .005	.XX ± 0.13												
ANGULAR 30° MACH. SURF. 1/25 UIN/3.2 UM UN STD THREADS: CLASS 2A OR 2B REMOVE BURRS & SHARP EDGES .020/0.5 MACH FILLET RADIUS .020/0.5 MACH SURF FLAT WITHIN .001 1/16 (.025 mm/mm) OTHER SURF FLAT WITHIN .005 1/16 (.127 mm/mm) CONCENTRICITY MACH. SURF. TIR WITHIN 1/2 SQ OF DIA TOL .001/.025 MIN DO NOT SCALE DRAWING.		DSGN		ENGR	APPD	ENGR	7/25/03	INSTALATION DRAWING MICROCEMS SHS					
				SCALE	1/4	INITIAL USE UCEMS	SHEET 1 OF 1						

DWG. NO. 662349

SIZE

DWG NO. 662349

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1

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CHG	E.O. NO.	DATE	BY	CHK	ENGR
A	19952				

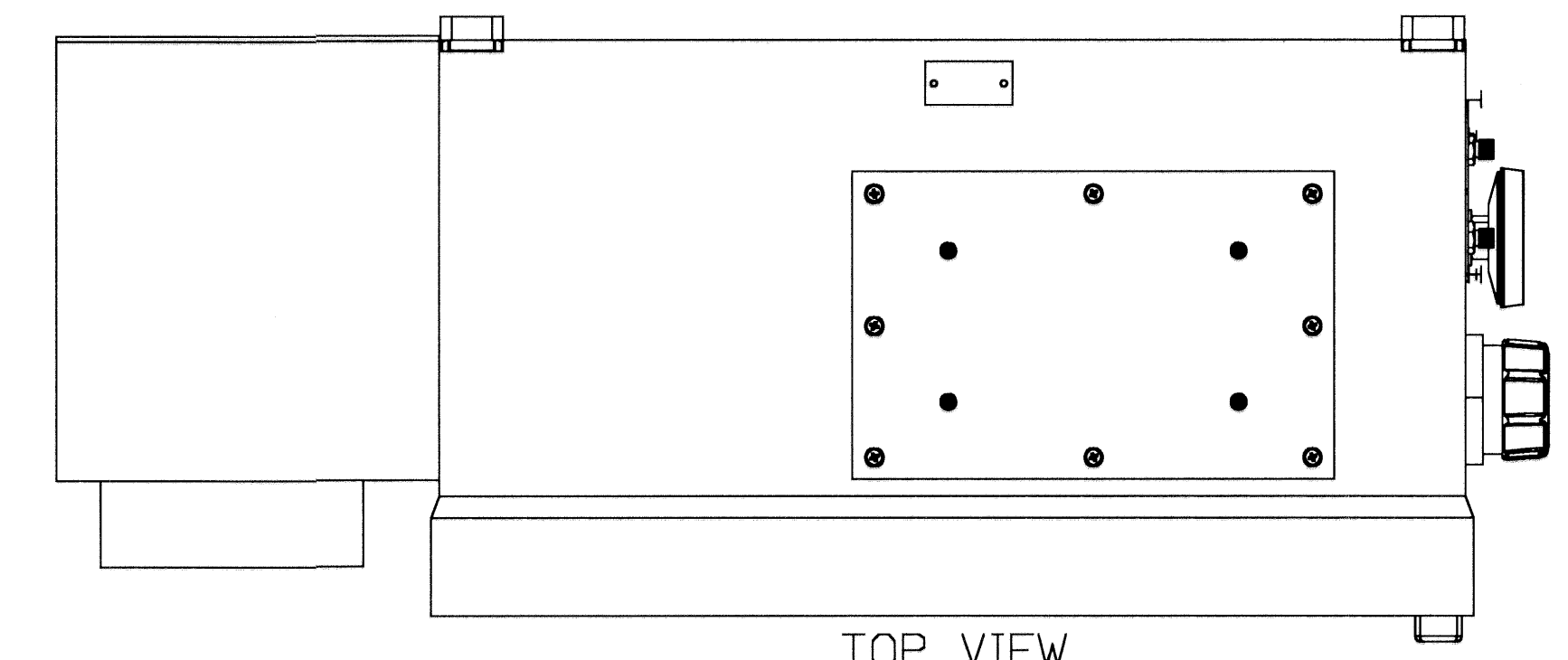
LABELS
1/16" WHITE GRAVOPLIY WITH BLACK 1/8"
LETTERS NORMAL TAG SIZE IS 1" X 2"

MISCELLANEOUS
TI-1
ENCLOSURE
TEMPERATURE

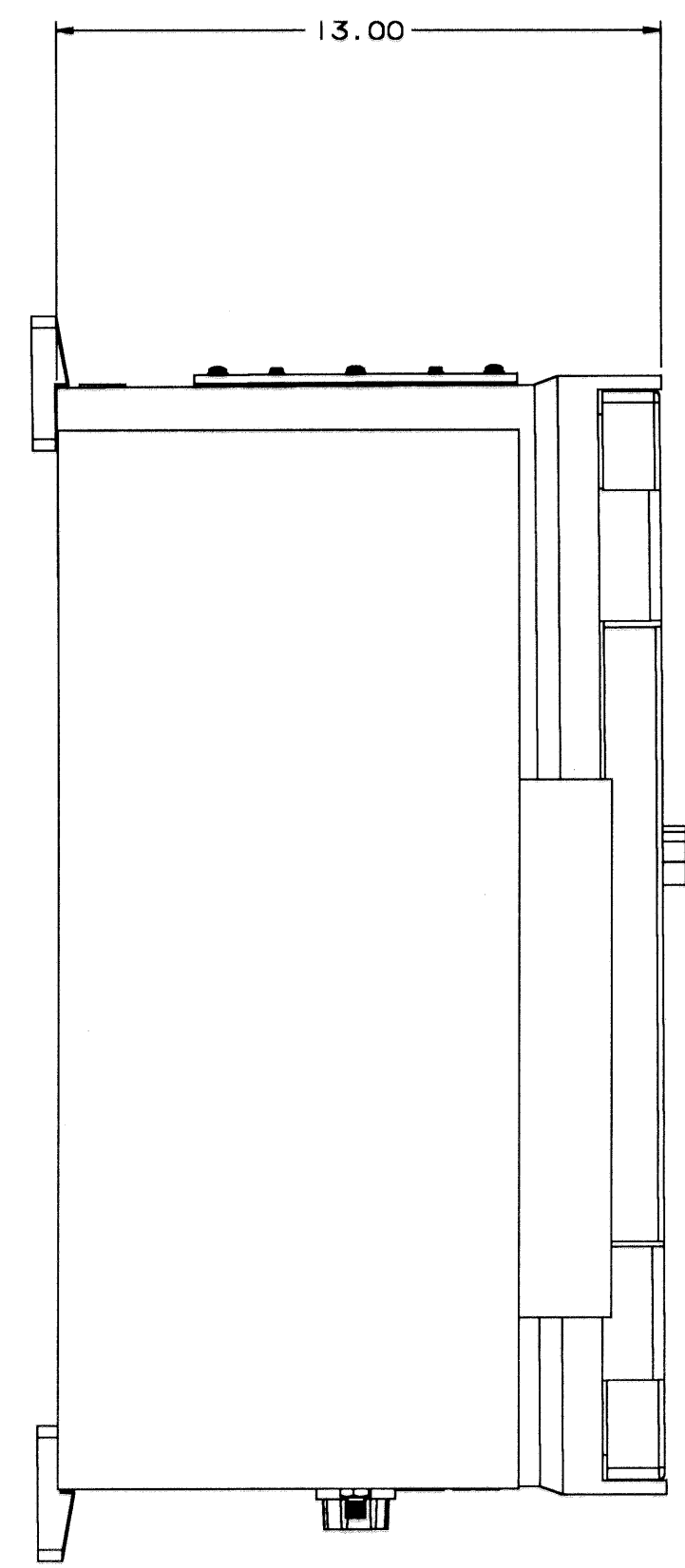
3/4" NPT FEMALE
A. POWER IN
115 VAC 60 HZ
15 AMPS
NORMAL POWER
CONSUMPTION
9 AMPS
B. ALARM/STATUS
CONTACTS

1/4" BULKHEAD UNIONS

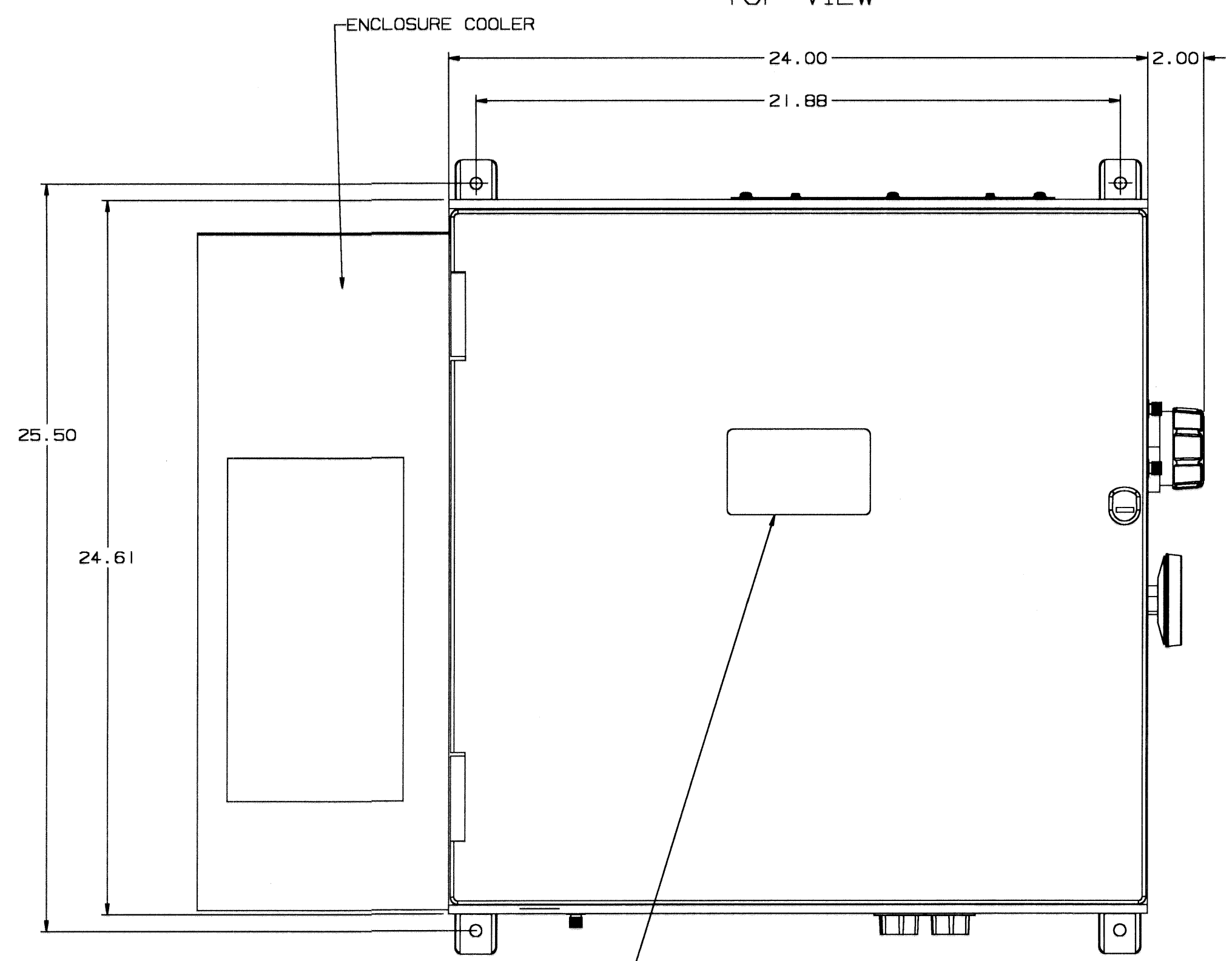
- 2. SAMPLE/CAL
OUTLET
1-2 LITER/MIN
- 3. CAL GAS
INLET
1-2 LITER/MIN
- 4. INSTRUMENT AIR
60-125 PSIG
1-5 SCFM
- 5. ATMOS PRESSURE
DRAIN TO SAFE
LOCATION
- 6. ATMOS PRESSURE
DRAIN TO SAFE
LOCATION



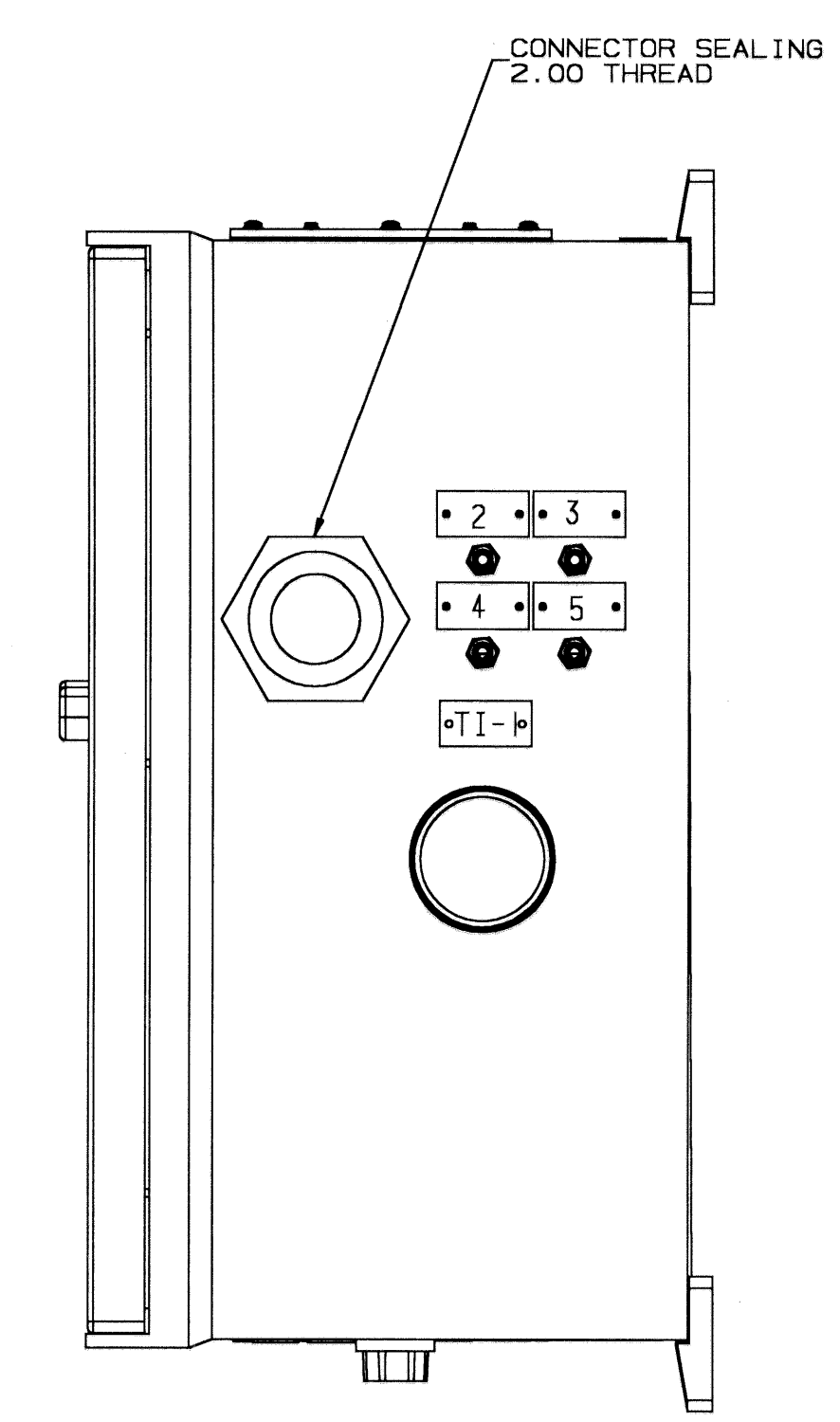
TOP VIEW



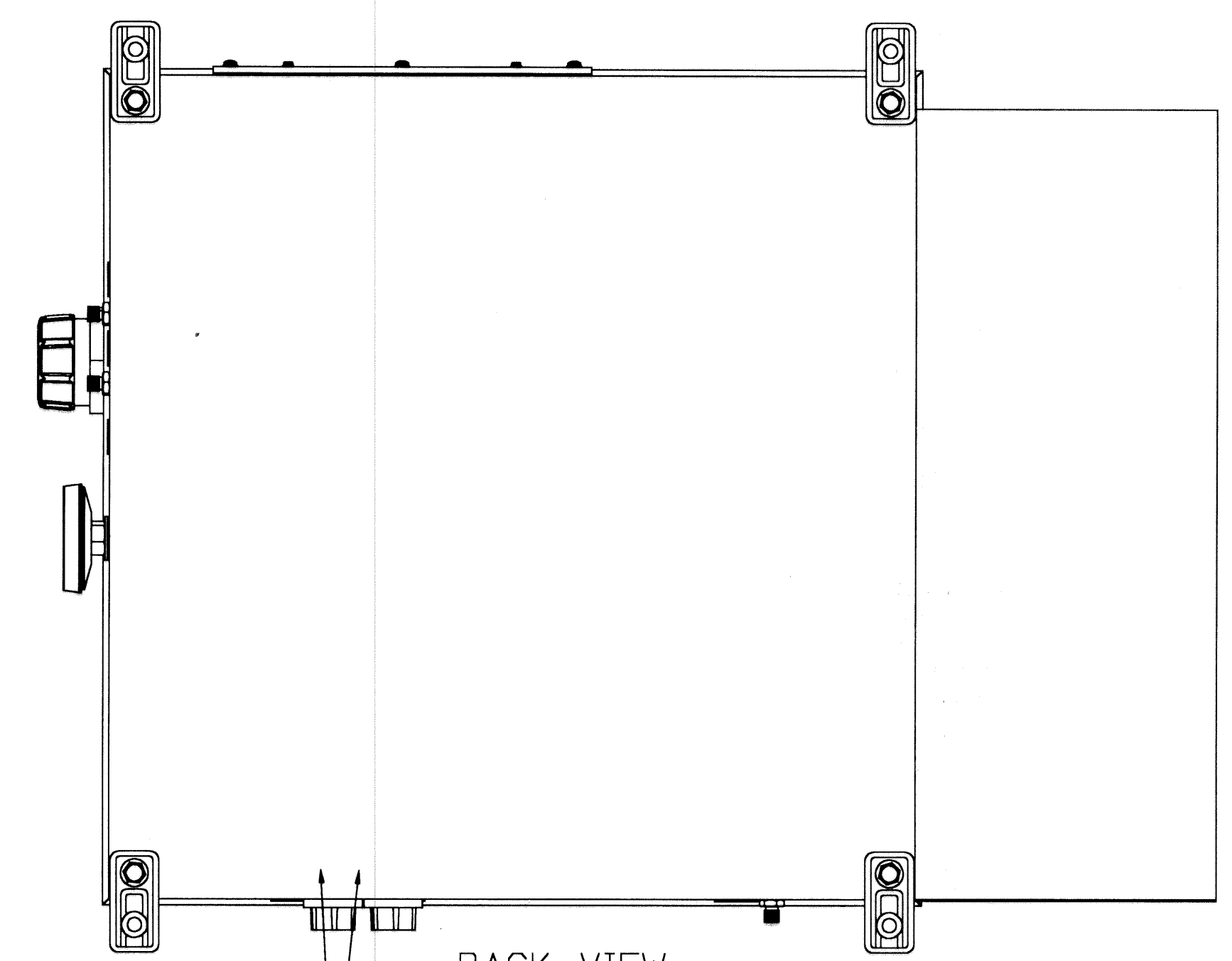
LEFT SIDE VIEW



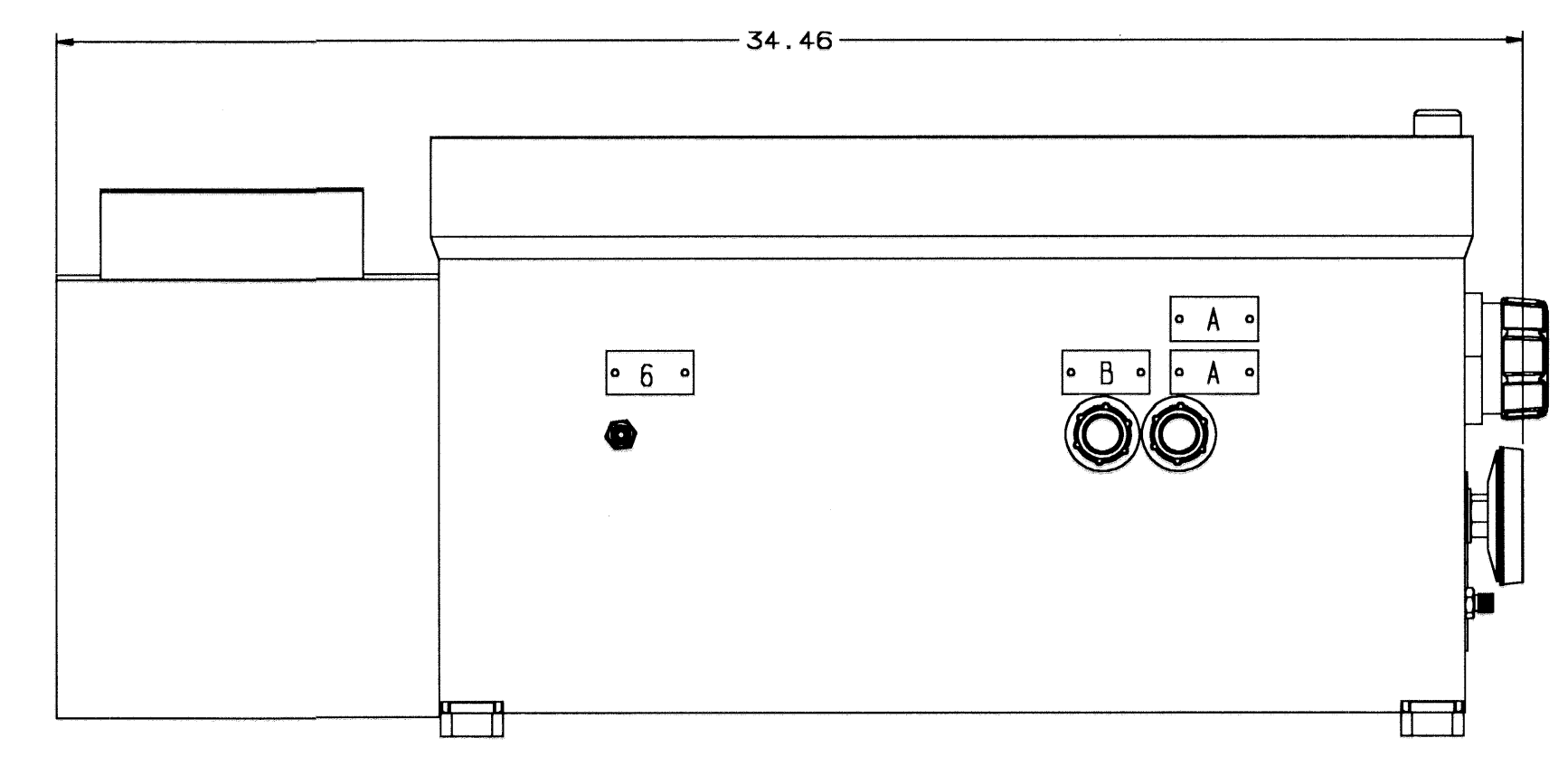
FRONT VIEW



RIGHT SIDE VIEW



BACK VIEW



BOTTOM VIEW

- NOTES:
- NEC AREA CLASSIFICATION:
 - NON-HAZARDOUS
 - CLASS I, DIVISION 2, GROUPS B, C & D
 - CLASS I, DIVISION 1, GROUPS B, C & D
 - A GROUND STRAP IS TO BE CONNECTED BETWEEN MAIN FRAME ASSEMBLY/ENCLOSURE AND ALL DOORS/REMOVABLE TOPS, BASES, AND SIDE PANELS.
 - LOCATION: INDOORS OUTDOORS
 - ENCLOSURE: NEMA 4X (IEP 65), INSULATED UNINSULATED
 - RECOMMENDED AMBIENT TEMPERATURE LOCATION: -23 TO 40°C (-10 TO 104°F)
 - ESTIMATED ENCLOSURE INTERIOR TEMPERATURE: 20-40°C (68-104°F)
 - ESTIMATED WEIGHT: 125 LBS. (56.8 Kg)

MATERIAL	UNLESS OTHERWISE SPECIFIED		BY	DATE	Rosemount Analytical Inc.								
	DIMENSIONS ARE IN INCHES/MILLIMETERS TOLERANCES		DR T.L. JOHNSON	7/24/03		TITLE							
FINISH	<table border="1"> <thead> <tr> <th>INCH</th> <th>mm</th> </tr> </thead> <tbody> <tr> <td>.X ± .050</td> <td>X ± 1.27</td> </tr> <tr> <td>.XX ± .020</td> <td>X ± 0.51</td> </tr> <tr> <td>.XXX ± .005</td> <td>.XX ± 0.13</td> </tr> </tbody> </table>		INCH	mm	.X ± .050	X ± 1.27	.XX ± .020	X ± 0.51	.XXX ± .005	.XX ± 0.13	CHK <i>Bjkt</i>	7/03	INSTALLATION DRAWING MICROCEMS SHS
	INCH	mm											
.X ± .050	X ± 1.27												
.XX ± .020	X ± 0.51												
.XXX ± .005	.XX ± 0.13												
ANGULAR 30° MACH. SURF. 1/25 / UN/3.2 UN UN STD. THREADS; CLASS 2A DR Z8 REMOVE BURRS & SHARP EDGES .020/0.5 MACH FILLET RADIUS .020/0.5 MACH SURF FLAT WITHIN .001 in/in (.025 mm/mm) OTHER SURF FLAT WITHIN .005 in/in (.127 mm/mm) CONCENTRICITY MACH. SURF. TIR WITHIN 1/2 SUM OF DIA TOL. .001/.025 MIN DD NOT SCALE DRAWING		DSGN <i>AKley</i>	7/2/03	DWG NO. 662350									
SCALE 1/4					INITIAL USE UCEMS	SHEET 1 OF 1							

662350 DWG. NO.

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