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Instruction Sheet
PN 51A-54epH/rev.H
November 2007

Model 54e pH/ORP

pH/ORP HART® Analyzer/Controller

For additional information, please refer to the Instruction Manuals CD shipped with this product, or visit our website at *www.emersonprocess.com/raihome/liquid/*.

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 this Instruction Manual is not the correct manual, telephone 1-949-757-8500 and the requested manual will be provided. Save this Instruction Manual for future reference.
- If you do not understand any of the instructions, contact your Rosemount 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 and place the safe operation of your process at risk. 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.



WARNINGS

RISK OF ELECTRICAL SHOCK

Making cable connections to and servicing this instrument require access to shock hazard level voltages which can cause death or serious injury, therefore, disconnect all hazardous voltage before accessing the electronics.

Relay contacts made to separate power sources must be disconnected before servicing.

Electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70) and/or any other applicable national or local codes.

Unused cable conduit entries must be securely sealed by non-flammable closures to provide enclosure integrity in compliance with personal safety and environmental protection requirements. Use NEMA 4X or IP65 conduit plugs supplied with the instrument to maintain the ingress protection rating (IP65).

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

Proper relay use and configuration is the responsibility of the user. No external connection to the instrument of more than 60VDC or 43V peak allowed with the exception of power and relay terminals. Any violation will impair the safety protection provided.

Do not operate this instrument without front cover secured. Refer installation, operation and servicing to qualified personnel.

WARNING

This product is not intended for use in the residential, commercial or light industrial environment per CE certification to EN50081-2.

ROSEMOUNT® Analytical

EMERSON™ Process Management

CAUTION

Ground conduit to metal stiffener or to metal enclosure. Use non-flammable watertight conduit fittings/plugs to preserve enclosure rating.

DANGER



LIVE VOLTAGES MAY BE PRESENT
When fuse or this cover is removed will cause severe injury or death.

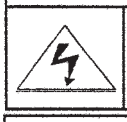
CAUTION

For continued protection against fire, replace only with fuses of specificed voltage and current ratings. Fuses are located under this cover.

VAROVANI

Zemnici vodic musi byt vodive spojen s kostrou pristroje. Pouzivejte nehorlave vodotesne pruchodky, abyste zachovali stupen kryti pristroje.

NEBEZPECI



ZARIZENI POD NAPETIM
Odstraneni pojistky nebo tohoto krytu muze zpusobit vazne zraneni nebo smrt.

VAROVANI

Poskozene pojistky nahrazujte pouze pojistkami se stejnym jmenovitym napetim a proudem. Pojistky jsou umisteny pod timto krytem.

FORSIGTIG

Brug uantændelig vandtæt forskruning som sikkerhed for bevaring af kapslings klasse.

Jordforbindelse til metal kapsel.

FARE



UBESKYTTET SPÆNDING
Hvis sikringen eller denne påskrift fjernes kan dette medføre alvorlige kvæstelser eller død.

FORSIGTIG

Brug kun sikringer med nærmere angivet spænding og strømstyrke som sikkerhed for vedvarende beskyttelse mod brandfare.
Sikringerne er placeret under denne påskrift.

ATENCION

La toma a tierra debe hacerse a un contrafuerte de metal o a la caja metálica.Utilice accesorios/enchufes no inflamables y estancos al agua para preservar las especificaciones de la caja.

PELIGRO



VOLTAJE PUEDE ESTAR PRESENTE
Cuando los fusibles o esta cubierta son removidos causará severas lesiones o muerte.

ATENCION

Para una proteccion continua contra el fuego,reemplace solamente con fusibles de voltaje y corriente especificados.Los fusibles se encuentran debajo de esta cubierta.

VOORZICHTIG

Aardleiding naar metalen profiel of naar metalen behuizing. Gebruik onbrandbare, waterdichte wartels en pluggen om de beschermingsklasse te handhaven.

GEVAAR



KAN ONDER SPANNING STAAN
Verwijderen van zekering of dit deksel kan dit leiden tot ernstig of dodelijk letsel.

VOORZICHTIG

Voor duurzame bescherming tegen brand, uitsluitend zekeringen gebruiken met aangegeven nominale spannings - en stroomwaarden. De zekeringen bevinden zich onder dit deksel.

ATTENTION

Raccorder le tube à la masse métallique d'une entretoise ou du coffret. Utiliser des raccords et des bouchons étanches ininflammables afin de preserver la classification du boîtier.

DANGER



POSSIBILITE DE HAUTE TENSION
En cas de démontage de ce capot ou des fusibles. Risques de Blessures graves ou de mort

ATTENTION

Afin d'assurer une protection permanente contre le feu, ne remplacer les fusibles que par des modèles équivalents en tension et en courant. Les fusibles se trouvent derriere cette plaquette.

ADVARSEL

Kabelinnføring må jordes til metallavstiver eller til metallkapslingen. Bruk flammesikre og vanntette nipler\plugger slik at kapslingens tetthetsgrad opprettholdes.

FARE



SPENNING KAN VÆRE TIL STEDE
når sikringen eller dette dekslet fjærnes, og kan føre til alvorlige skader eller dødsulykker.

ADVARSEL

For at beskyttelse mot antennelse skal opprettholdes, må sikringer bare erstattes med tilsvarende som har spesifisert spenning- og strømstyrke.
Sikringer er plassert under dette dekslet.

ACHTUNG

Der Analysator ist vorschriftsmaessig zu erden.

Um die Schutzart des Geraetes sicherzustellen ist es mit den entsprechenden Kabelverschraubungen und Blindkappen auszuruesten.

ACHTUNG



GEFAEHRLICHE ELEK-TRISCHE SPANNUNG
Ist die Schutzabdeckung oder die Sicherung entfernt, so koennen am Geraet ernsthafte oder toedliche Verletzungen entstehen.

ATTENTION

Um die Gefahr von Kurzschluß und Funkenbildung zu verhindern dürfen die Sicherungen nur durch solche gleicher Spannung und Stromwerte ausgetauscht werden. Die Sicherungen befinden sich unter dieser Abdeckung.

Attenzione

Tubo di protezione per messa a terra con elemento di ingresso in metallo o con custodia in metallo.

Utilizzare accessori/connettori del tubo di protezione a tenuta stagna, non infiammabili, per assicurare i limiti di resistenza della custodia

Pericolo



POSSIBILE PRESENZA DI ALTA TENSIONE
La rimozione del fusibile o del coperchio può causare gravi lesioni o morte.

ATTENZIONE

Per garantire una continua protezione contro gli incendi, sostituire solo con fusibili del voltaggio indicato e dell'attuale potenza. I fusibili sono alloggiati sotto il coperchio.

UWAGA

Uziemij przewod do metalowego plaskownika lub obudowy. Aby zachowac stopien szczelnosci obudowy stosuj niepalne, wodoszczelne dlawiki,.

NIEBEZPIECZENSTWO



URZADZENIE MOZE BYC POD NAPIECIEM
Gdy bezpieczniki lub ta pokrywa sa usuniete istnieje mozliwosc uszkodzenia ciala lub smierci.

UWAGA

W celu utrzymania zabezpieczenia przed zapaleniem, nalezy stosowac bezpieczniki o identycznym z oryginalnym napieciu i amperazu.

Bezpieczniki sa umieszczone pod ta pokrywa.

ATENÇÃO

Ligar a conducta de cabos à terra através de suporte ou invólucro metálicos. Utilize bucins e acessórios ignífugos e estanques para preservação da estanquecidade.

PERIGO



POSSIBILIDADE DE TENSÃO PERIGOSA
A remoção do fusível ou desta tampa pode causar lesões graves ou a morte.

ATENÇÃO

Para manter sempre uma boa proteção contra incêndio, substituir somente por fusíveis com a tensão e corrente especificadas. Os fusíveis encontram-se sob esta tampa.

IAKTTAG FÖRSIKTIGHET

Anslutningspunkt är jordad till chassi. Använd brandsäker, vattentät kabelanslutning för att bevara klassificering av apparatskåp.

FARA



HÖGSPÄNNING KAN FÖREKOMMA
Avlägsnande av säkring eller skyddskåpa kan förorsaka allvarlig skada eller dödsfall

IAKTTAG FÖRSIKTIGHET

För kontinuerligt skydd mot brandfara, ersätt endast med specificerad säkringsstorlek och spänning.

PHYSICAL SPECIFICATIONS – GENERAL

Enclosure: Epoxy-painted aluminum
NEMA 4X (IP65)
144 X 144 X 131 mm, DIN size (5.7 X 5.7 X 5.2 in.)

Front Panel: Membrane keyboard with tactile feedback and user selectable security. Light gray, blue and white overlay
Light gray enclosure, dark gray bezel

Display: Back-lit dot matrix LCD (7.0 x 3.5 cm), blue on gray-green
The display contrast is compensated for ambient temperature.

Process Variable Character Height: 16mm (0.6 in.)

Electrical Classification:
Class I, Division 2, Groups A, B, C, & D. T5 Ta=50°C. Dust ignition proof: Class II, Division 1, Groups E, F, & G; Class III.

CSA-LR34186:
Max. relay contact rating: 28 Vdc; 110 Vac; 230 Vac; 6 amps resistive

FM: Max. relay contact rating: 28 Vdc resistive
150 mA - Groups A & B;
400 mA - Group C;
540 mA - Group D

Power:
Code -01: 100 - 127 VAC, 50/60 Hz ± 6%, 6.0 W
200 - 253 VAC, 50/60 Hz ± 6%, 6.0 W

Code -02: 20 - 30 VDC, 6.0 W

Current Outputs: Output 1: pH, ORP, temperature, glass impedance, or reference impedance.

Output 2: pH, ORP, temperature, glass impedance, or reference impedance.

Each output is galvanically isolated, 0-20 mA or 4-20 mA into 500 ohms maximum load at 24 Vdc or 115/230 Vac or 500 ohms maximum load at 100/200 Vac. Output 1 includes digital signal 4-20 mA superimposed HART (Code -09 only).

RFI/EMI: EN-61326 CE

LVD (Code -01 only): EN-61010-1 mCERTS Sira MC070111/00

Ambient Temperature: 0 to 50°C (32 to 122°F)
NOTE: The analyzer is operable from -20 to 60°C (-4 to 140°F) performance.

Relative Humidity: 95%, non condensing

Alarms:

Relay 1 - Process, Interval, or Time Proportional Control (TPC requires code -20)

Relay 2 - Process, Interval, or Time Proportional Control (TPC requires code -20)

Relay 3 - Process, Interval, or Time Proportional Control (TPC requires code -20)

Relay 4 - Sensor/analyzer and process fault alarm

Each relay has a dedicated LED on the front panel.

Relay Contacts: Relays 1-3: Epoxy sealed form A contacts, SPST, normally open

Relay 4: Epoxy sealed form C, SPDT

	Resistive	Inductive
28 Vdc	5.0 Amps	3.0 Amps
115 Vac	5.0 Amps	3.0 Amps
230 Vac	5.0 Amps	1.5 Amps

Weight/Shipping Weight: 1.8 kg/2.3 kg (4 lb/5 lb)

INSTRUMENT SPECIFICATIONS @ 25°C — pH

Measurement Range: 0 to 14 pH

Output Scale Expansion: Zero suppression: up to 13 pH units
Span: Any pH from 1 to 14

Accuracy: ± 0.01 pH

Repeatability: ± 0.01 pH

Stability: ± 0.01 pH/month, non-cumulative

Temperature Coefficient: Input: ± 0.003 pH/°C
Output: ± 0.006 pH/°C

Temperature Compensation: Pt 100 or Pt 1000 RTD, Automatic or Manual; –15 to 120°C (5 to 248°F)

INSTRUMENT SPECIFICATIONS @ 25°C — ORP

Measurement Range: –1400 to +1400 mV

Output Scale Expansion: Zero suppression: up to ±1300 mV
Span: Any ORP range from 100 to 2800 mV

Accuracy: ± 1.0 mV

Repeatability: ± 1.0 mV

Stability: ± 1.0 mV/month, non-cumulative

Temperature Coefficient: Input: ± 0.2 mV/°C
Output: ± 0.4 mV/°C

Temperature Measurement: –15 to 120°C (5 to 248°F)
Pt 100 or Pt 1000 RTD

WARNING

All electrical installation must conform to the National Electrical Code, all state and local codes, and all plant codes and standards for electrical equipment. All electrical installations must be supervised by a qualified and responsible plant electrician.

LOCATING THE CONTROLLER

Position the Model 54e pH/ORP controller to minimize the effects of temperature extremes and to avoid vibration and shock. Locate the controller away from your chemical process to protect it from moisture and fumes.

Select an installation site that is more than 2 ft from high voltage conduit, has easy access for operating personnel, and is not exposed to direct sunlight.

UNPACKING AND INSPECTION

Inspect the exterior of the shipping container for any damage. Open the container and inspect the controller and related hardware for missing or damaged parts.

If there is evidence of damage, notify the carrier immediately. If parts are missing, contact Rosemount Analytical customer support.

MECHANICAL INSTALLATION

Mounting the Controller

The Model 54e pH/ORP controller may be supplied with a mounting bracket accessory. If you use the mounting bracket on wall or pipe installations, avoid mounting on pipes which vibrate or are close to the process. The bracket may be modified to mount the controller on I-beams or other rigid members. You can also fabricate your own bracket or panel mount the controller using the bracket as an example.

Wall or Surface Mounting:

1. Mount the bracket to the controller using the supplied four screws.
2. Mount controller mounting bracket to wall using any appropriate fastener such as screws, bolts, etc

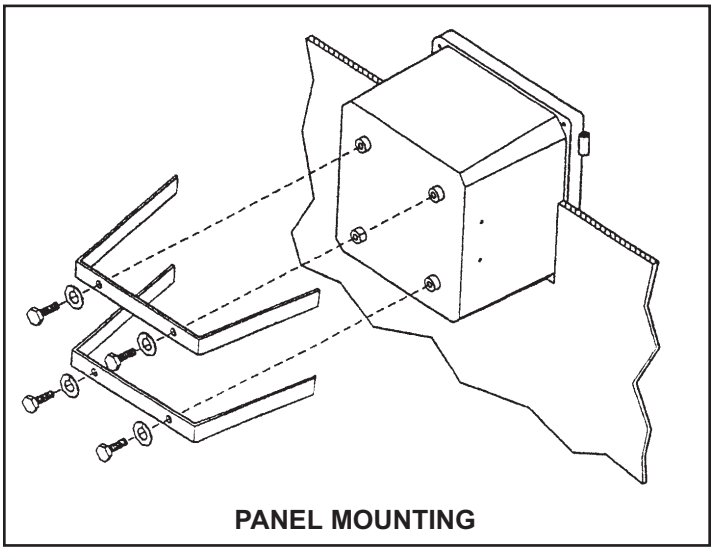
Pipe Mounting:

1. Attach the mounting bracket to the rear of the controller and tighten the four screws.
2. Place supplied U bolts around the mounting pipe and through the pipe mounting bracket and mounting bracket. Tighten the U bolt nuts until the controller is securely mounted to the pipe.

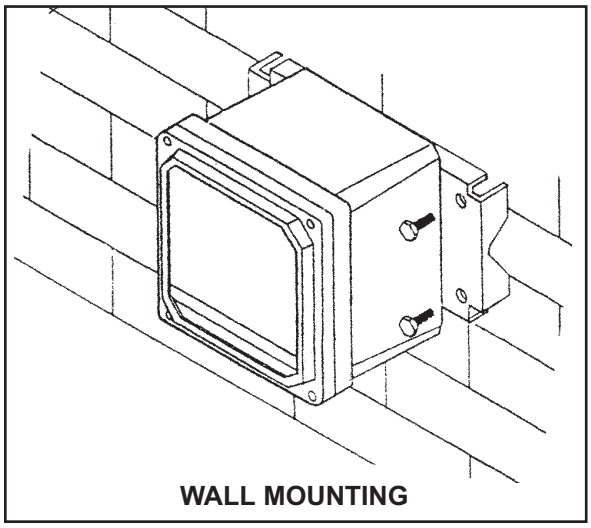
Panel Mounting:

The controller is designed to fit into a 5.43 x 5.43 inch (DIN standard 144x144 mm) panel cutout (shown below). Installation requires both front and rear access.

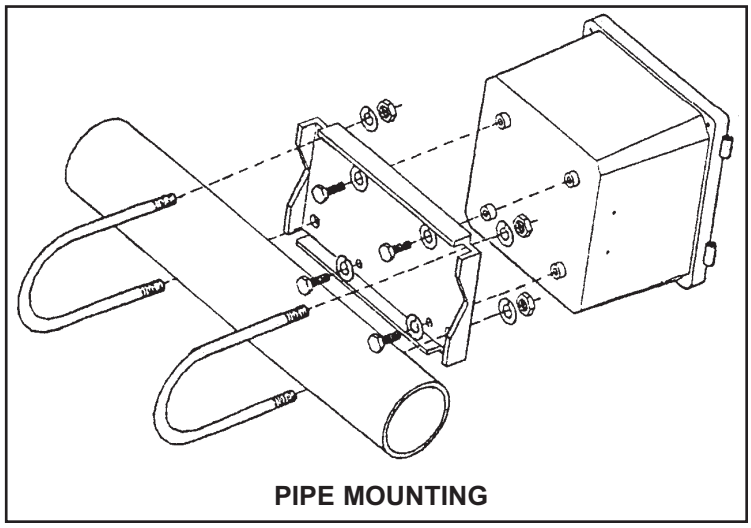
1. Install the controller as shown below. Insert the instrument enclosure through the front of the panel cutout and align the panel mounting brackets as shown.
2. Insert two mounting bracket screws through each of the two mounting brackets and into the tapped holes in the rear of the controller enclosure and tighten each screw.
3. Insert four panel mounting screws through each hole in the mounting brackets. Tighten each screw until the mounting bracket holds controller firmly in place. To avoid damaging the controller mounting brackets, do not use excessive force.



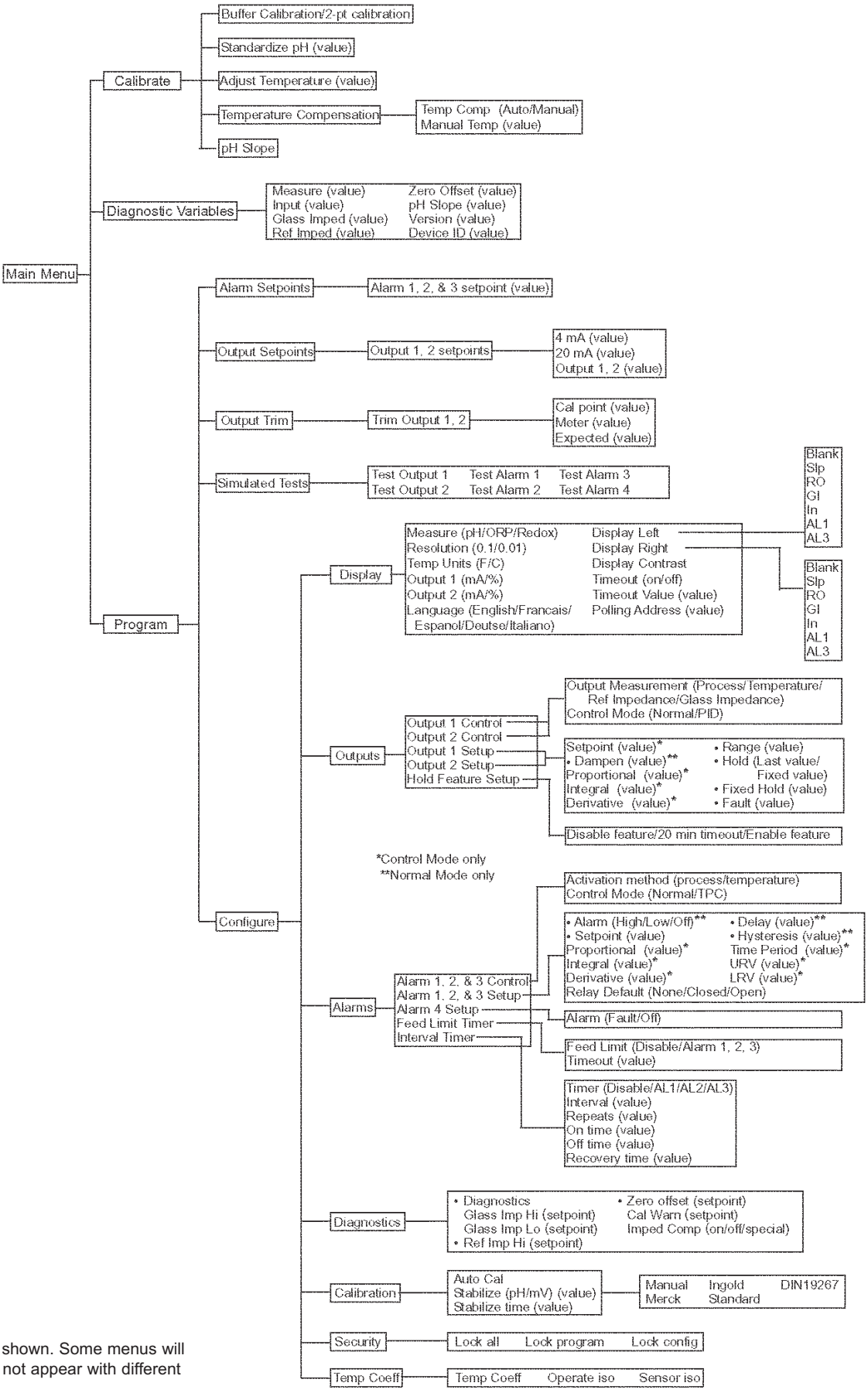
PANEL MOUNTING



WALL MOUNTING



PIPE MOUNTING



All menus shown. Some menus will change or not appear with different settings.

MODEL 54e pH/ORP QUICK START

Use the ↓ or key to move the cursor down or up and the → or ← to move the cursor right or left.

Press ENTER (F4) to move to the next menu, SAVE (F4) to store a setting, EDIT (F4) to change a setting, and EXIT (F1) to exit without saving changes.

STEP 1 - MEASUREMENT TYPE

Note: The analyzer is factory configured for a pH sensor. Skip to step 2 if you will be measuring pH.

Press any button. he main menu will appear with CALIBRATE highlighted.

Use the arrow buttons to select Program. Press ENTER.

Use the arrow buttons to select Configure. Press ENTER.

DISPLAY will be highlighted. Press ENTER.

MEASURE will be highlighted. Press ENTER.

Use the arrow buttons to select REDOX or ORP. Press SAVE.

Press EXIT until the main display appears.

STEP 2 - OUTPUT SETPOINTS

Press any button. The main menu will appear with CALIBRATE highlighted.

Use the arrow buttons to select Program. Press ENTER.

Use the arrow buttons to select OUTPUT SETPOINTS. Press ENTER.

OUTPUT 1 SETPOINTS will be highlighted. Press ENTER. Press CONT.

4 mA will be highlighted. Press EDIT. Use the arrow buttons to enter the desired value. Press SAVE.

Use the arrow buttons to select 20 MA. Press EDIT. Use the arrow buttons to enter the desired value. Press SAVE. Press EXIT.

Use the arrow buttons to select OUTPUT 2 SETPOINTS. Press ENTER. Press CONT.

Enter the 4 mA and 20 mA values as above.

Press EXIT until the main display appears.

STEP 3 - AUTOCAL

Note: Obtain two pH buffer solutions with values at least 2 pH units apart. (Factory set buffers are 4.01, 7.00, and 10.01 pH.)

Press any button. The main menu will appear with CALIBRATE highlighted. Press ENTER.

BUFFER CALIBRATION will be highlighted. Press ENTER.

Place the sensor in the first buffer and press CONT. Wait until the screen reads "Buf 1 done."

Use the arrow buttons to select the correct buffer. Press CONT.

Rinse and dry the sensor.

Place the sensor in the second buffer and press CONT. Wait until the screen reads "Buf 2 done."

Use the arrow buttons to select the correct buffer. Press CONT.

Press EXIT until the main display appears.

STEP 4 - SINGLE-POINT STANDARDIZATION

After the sensor is installed, take a grab sample as close to the sensor as possible.

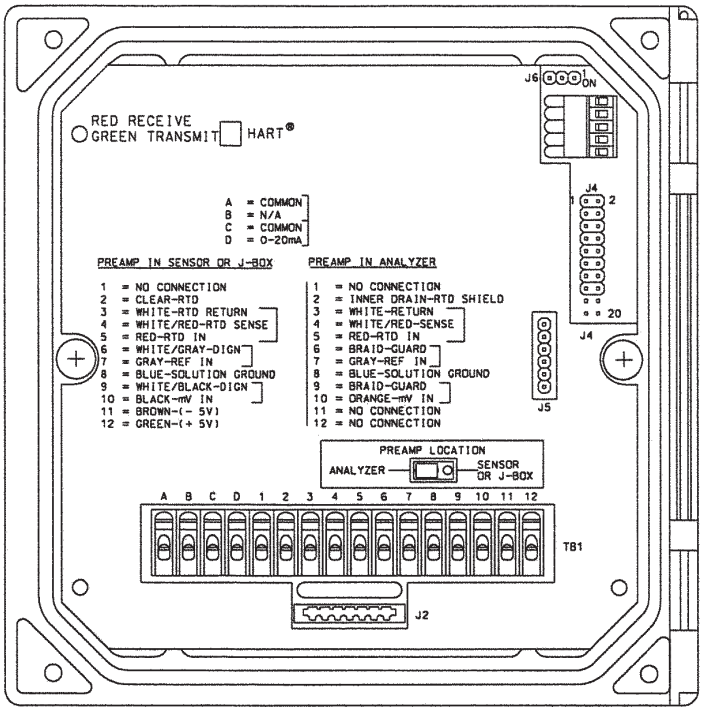
Use a calibrated pH instrument with automatic temperature compensation to determine the pH of the grab sample.

Press any button. The main menu will appear with CALIBRATE highlighted. Press ENTER.

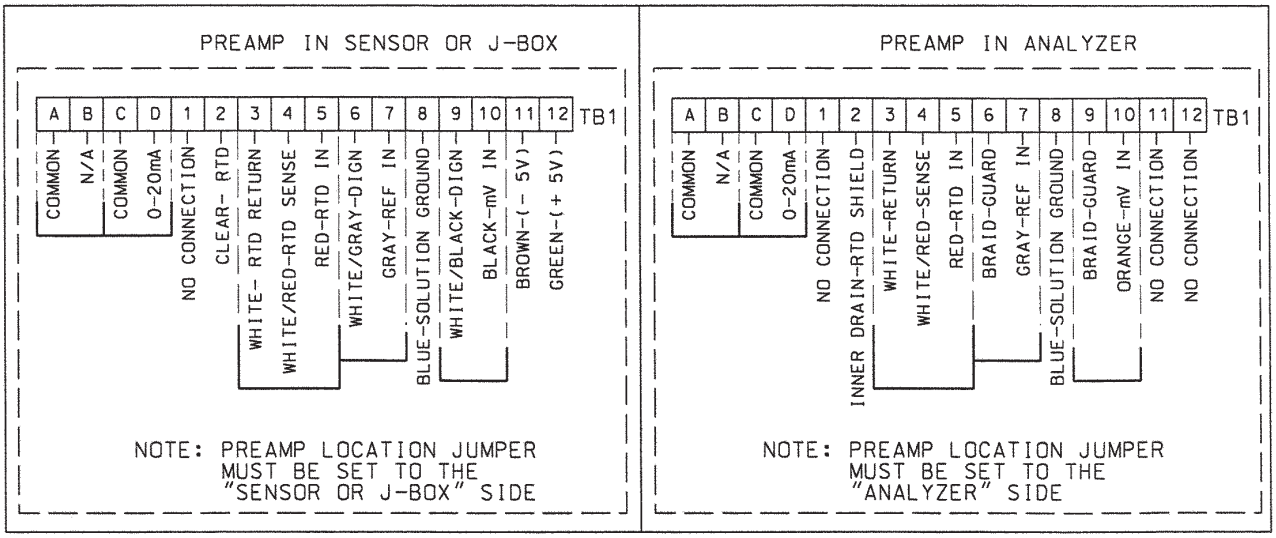
Use the arrow buttons to select STANDARDIZE. Press ENTER.

Press EDIT. Use the arrow buttons to enter the pH value of the sample. Press SAVE.

Press EXIT until the main display appears.

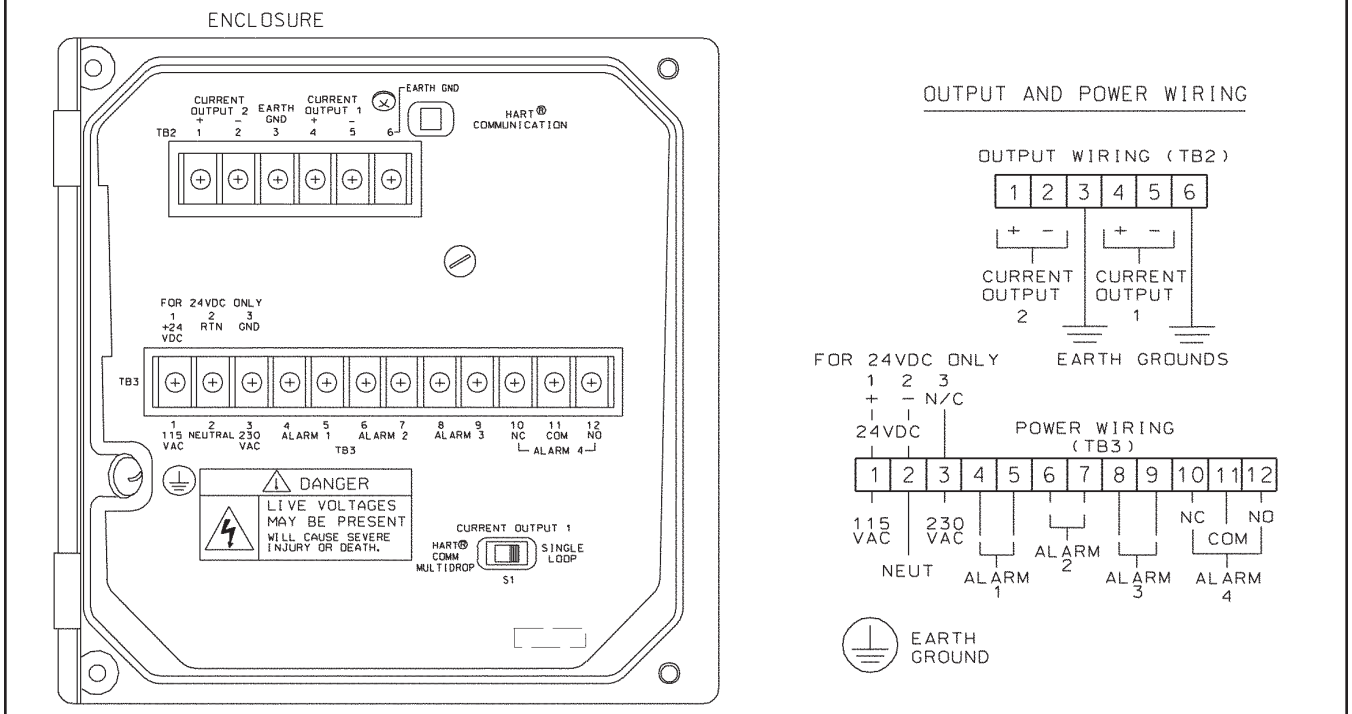


FRONT PANEL



TB1 SENSOR WIRING

Sensor Wiring Diagram



Power Input and Relay Output Wiring for Model 54e pH/ORP

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