



**ROCHESTER
GAUGES, LLC**

The Measure of Excellence

e-Dial™ P/N: 6317-00001

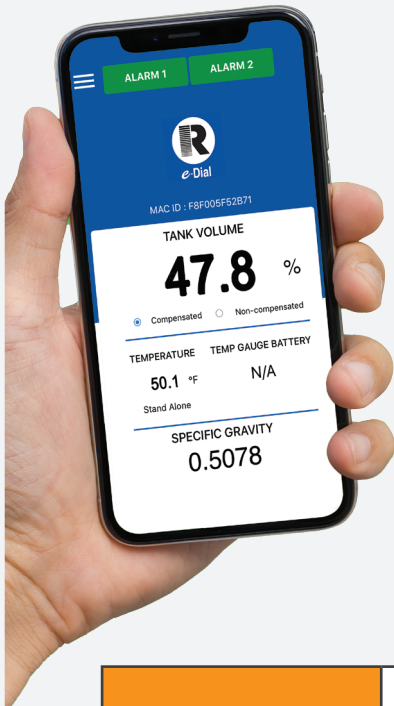
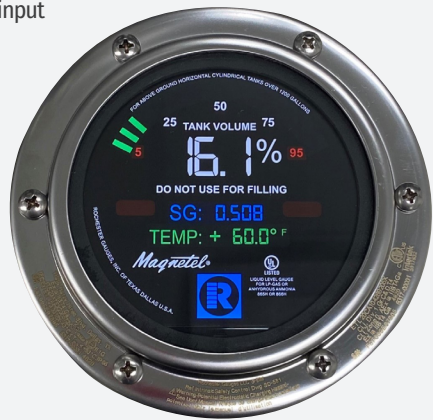


e-Dial™: General Information & Features

- 24ft (7.3m) of cable provided (user cuts to length) with flying leads for Power/ Ground
- Temp Range: -40°F to +176°F (-40°C to +80°C)
- Ingress Protection: IP66 Rated
- High Visibility 4" LCD Digital Gauge Indicator
- Resolution: 0.1%
- Retrofittable on existing Rochester Magnetel and Taylor RoadMaster Gauges

Safety Barrier: General Information & Features

- Pre-installed 5ft (1.5m) cable for battery/power input
- Intrinsically Safe Electrical design
- Supply Voltage: 12-24 VDC
- Max Input Current: 120mA
- Output Voltage Typical: 9.45V
- Fused output



Download the Free Rochester Gauges e-Dial™ App Today!



DS-1857, Related Drawing
Revision A, 11/30/2020

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ISO 9001:2015 CERTIFIED

e-Dial™ Installation Manual

These instructions are made to assist tradesmen and others generally familiar with liquid storage tank equipment. Most consumers are not qualified to perform the installation described herein. If you have any question concerning installation or operation of e-Dial™ gauges, contact Rochester Gauges International or one of our authorized distributors for assistance. Specifications are subject to change without notice. Pressure ratings subject to change due to temperature and other environmental considerations.

e-Dial™ gauges are designed for center line mounting on bulk storage tanks, or angle mounting on bobbails or transports. Materials of construction are carefully selected for compatibility with liquid to be gauged, so the unit you are about to install can be expected to give long and trouble-free services.

Attachment to Tank

Various adapters are commonly welded or screwed to tanks, and e-Dial™ gauges are bolted to them. All adapters used must conform to [Rochester Machining Standard MS 508](#).

Inspection of e-Dial™

Before attempting installation of the digital gauge indicator, verify if the gauge is adequate for your application. The gauges are supplied packed in a cardboard box with a sticker indicating the model, the main dimensions of the gauge, the mounting position and tank dimensions for which the gauge has been manufactured and the product intended to be gauge.

Removal of Existing Gauge – Precautions

Should it appear necessary for any reason to remove the gauge from the tank, it is, of course, presumed that such operations will only be attempted under competent supervision, with due precautions, against hazard of escaping liquid or gas, with pressure entirely down and no chance of wind carrying any fumes where they might accumulate or drift near open flames. A hazard of fire or explosion could exist if proper methods are not used when vessels contain pressurized liquid or gas, flammable liquids, oxidizers, NH₃, or LP-Gas.

Warning

Improper installation or use of digital gauge indicator or barrier may cause serious injury or property damage. The use of cable other than provided by Rochester Gauges is not allowed and will void the safety of the device.

- Do not operate e-Dial™ without its protective barrier.
- Do not add or splice cable between the e-Dial™ and its Barrier.
- Do not remove gauge bezel screws or bolts.
- Tank contains high pressure and flammable gas.
- A hazard of fire or explosion may exist if gauge mounting nuts, bolts or heads are loosened or removed.

- CAUTION- NEVER RE-USE AN OLD GASKET, ALWAYS REPLACE WITH A NEW ONE

Installation Instructions for e-Dial™

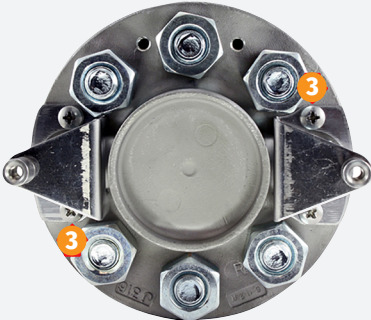
1. Record the reading on existing dial.
2. Remove the 2 side screws on the left and right side of the 4" dial. You can now remove the old dial from its retainer.

Note: For 8" Dials, remove the three screws on the three brackets attached to the existing dial, then remove old dial.

3. With the old (4") dial removed, keep the two mounting brackets on the Left and Right side attached to gauge head shown below on existing 4" dial gauge.



Note: For 8" dials remove all three existing brackets attached to the head and install two 4" dial brackets (0093s00001; sold separately) with 2 screws (0040-00413) each bracket. You may use 4 of the 6 screws from removal of existing dial brackets for 8" dial.



4. Provided with the e-Dial™ are two metal standoffs. Screw the standoffs on the existing mounting bracket holes where the 4" dial was mounted on.
5. Once the new standoffs are installed the e-Dial™ may be fitted in place over the standoffs. Torque the e-Dial™ screws to 22 lbf-ft (29.8 N·m) shown to complete installation.
6. Once the e-Dial™ is powered on after properly connecting to safety barrier (Refer to safety barrier installation guide) and power source, compare the new Digital Gauge Indicator reading to recorded readings or estimated tank contents. If the new DGI is not correct (+5%), the DGI may need adjustment.

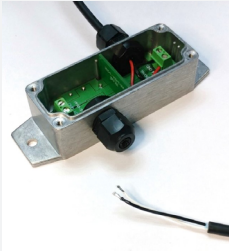


Safety Barrier Installation Instructions

Included with each e-Dial™ is a remote safety barrier module to be installed in a nonhazardous location per SD-581. The safety barrier comes with 5ft (1.5m) of cable preinstalled. This is the power input for the device. e-Dial™ comes with a minimum 24ft (7.3m) cable that can be cut to length. Use only a current limited source of ≤ 4.5 Amp to the e-Dial™ Barrier. Utilisez uniquement une source de courant limitée de ≤ 4.5 Amp à la barrière e-Dial™.

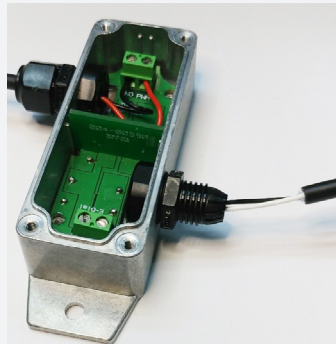
Connect e-Dial™ to barrier instructions

1. Open Safety Barrier box by removing the 4 screws on the cover. Note box divider separating PCB is not attached and may fall out.

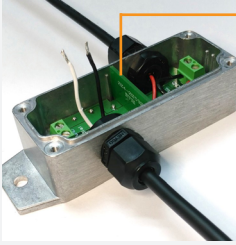


2. Loosen the gland cover on the unpopulated cable fitting.

3. Remove the gland cover on the unpopulated cable fitting. Slide cover onto e-Dial™ cable and push wires through fitting. Be careful that the waterproof rubber jacket stays in place.



- Pull cable through the water-proof fitting, once the cable's jacket is past the rubber gasket. Tighten the glands cover to close the seal to 22 lbf·in (2.5 N·m). Attach the wires to the terminal block, pay close attention to polarity.



- Re-install box divider

- Check alignment of gasket before reinstalling cover

- Torque 4 screws to 12 lbf·in (1.4 N·m), now the case assembly is complete.



Mount Safety Barrier to Vehicle or Bulk Storage Tank.

Warning: Avoid mounting in direct sunlight or next to sources of heat.

Ideal mounting locations: truck cab, service, or electrical box

Connect Safety Barrier to Power Source

The equipment references neutral as earth. The end user shall ensure that there is no potential difference between the neutral connections between the e-Dial™ and e-Dial™'s Barrier.

L'équipement fait référence au neutre comme à la terre. L'utilisateur final doit s'assurer qu'il n'y a pas de différence de potentiel entre les connexions neutres entre le e-Dial™ et la barrière d'e-Dial™.

Ensure proper termination of the power leads to power source. All leads should be crimped or soldered and covered in heat shrink.

Assurez-vous que les fils d'alimentation sont correctement raccordés à la source d'alimentation. Tous les fils doivent être sertis ou soudés et recouverts de thermorétractable.



Safety Specifications

- **WARNING** - POTENTIAL ELECTROSTATIC CHARGING HAZARD
Caution must be used when handling or cleaning products so there is no static charge buildup. Do not wipe off the e-Dial™ sensor with dry cloth. Use only water damp cloth and allow to air dry for cleaning device. Do not use or install in high charge areas. See IEC60079-32-1 for further information.
- **AVERTISSEMENT** - RISQUE DE CHARGE ÉLECTROSTATIQUE POTENTIEL
Il faut être prudent lors de la manipulation ou du nettoyage des produits afin qu'il n'y ait pas d'accumulation de charge statique. N'essayez pas le capteur e-Dial™ avec un chiffon sec. Utilisez uniquement un chiffon humide et laissez sécher à l'air pour nettoyer l'appareil. Ne pas utiliser ou installer dans des zones de charge élevée. Voir IEC 60079-32-1 pour plus d'informations.

List of safety Related info which is critical for safe operation.

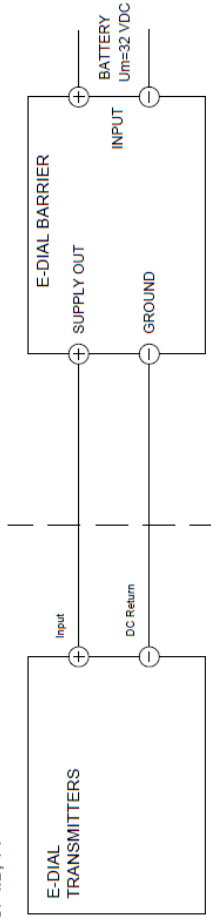
Ordinary Locations Safety Standards	
Conforms to UL STD 61010-1 Ed. 3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements
*Note: For USA ordinary locations listing certification	
Certified to CSA STD C22.2 #61010-1-12 Ed.3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements
*Note: For Canada ordinary locations listing certification	
Hazardous Locations Safety Standards	
IEC 60079-0: 2017	Explosive atmospheres - Part 0: Equipment - General requirements
*Note: For IECEx Certification	
IEC 60079-11: 2011 + C1: 2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
*Note: For IECEx Certification	
IEC 60079-25: 2010 Ed 2.	Explosive atmosphere – Part 25: Intrinsically safe electrical systems
*Note: For IECEx Certification	
EN 60079-0: 2018	Explosive atmospheres - Part 0: Equipment - General requirements
*Note: For ATEX Certification	
EN 60079-11:2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
*Note: For ATEX Certification	
EN 60079-25: 2010	Explosive atmosphere – Part 25: Intrinsically safe electrical system
*Note: For ATEX Certification	
Conforms to UL STD 60079-0 Ed.7	Explosive atmospheres - Part 0: Equipment - General requirements
*Note: For USA listing certification	
Conforms to UL STD 60079-11 Ed.6	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
*Note: For USA listing certification	
Certified to CSA STD C22.2 #60079-0 Ed.4	Explosive atmospheres - Part 0: Equipment - General requirements
*Note: For Canada listing certification	
Certified to CSA STD C22.2 #60079-11 Ed.2	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
*Note: For Canada listing certification	

Hazardous (Classified) Location

Class I, Division 1, Groups C and D, T4
Class I, Zone 0, GROUP IIB, T4

SCHEDULED DRAWING

Safe (Nonhazardous) Location



NOTES: INTRINSIC SAFETY ENTITY PARAMETERS - E-DIAL

1. E-DIAL BARRIER
 $U_i = 32\text{VDC}$
 $U_o = 9.45\text{VDC}$
 $I_i = 444\text{mA}$
 $P_i = 1.05\text{W}$
 $C_i = 27\mu\text{F}$
 $L_i = 4.7\mu\text{H}$
 $U_i = 9.45\text{V}$
 $I_i = 444\text{mA}$
 $P_i = 1.05\text{W}$
 $C_i = 27\mu\text{F}$
 $L_i = 4.7\mu\text{H}$

2. THE ELECTRICAL PARAMETERS OF THE ORDINARY CABLE ARE ASSUMED:

CAPACITANCE: 60 pF/ft
 INDUCTANCE: 0.20 $\mu\text{H}/\text{ft}$

MAXIMUM CABLE LENGTH OF 50 FEET

$C_{\text{CABLE-MAX}} = 0.003\mu\text{F}$
 $L_{\text{CABLE-MAX}} = 10\mu\text{H}$

3. THE INSTALLATION MUST BE IN ACCORDANCE WITH THE APPLICABLE LOCAL CODES (NATIONAL ELECTRICAL CODE, NFPA 70, ANSI/ISA RP-12.06.01, OR IEC/EN 60079-14)

INTRINSIC SAFETY SYSTEM VERIFICATION			
STEP	ITEM	E-DIAL BARRIER	E-DIAL SYSTEM
A	EQUIPMENT GROUP	GROUPS C & D (GROUP IIB)	GROUPS C & D (GROUP IIB)
B	LEVEL OF PROTECTION	Ex ia	Ex ia
C	TEMPERATURE CLASSIFICATION	N/A	T4
D	AMBIENT TEMPERATURE	-40°C TO +60°C	-40°C TO +60°C - BARRIER -40°C TO +60°C - E-DIAL
E	VOLTAGE	$U_o: 9.45\text{V}$	$U_i: 9.45\text{V}$
	CURRENT	$I_o: 444\text{mA}$	$I_i: 444\text{mA}$
	POWER	$P_o: 1.05\text{W}$	$P_i: 1.05\text{W}$
F	CAPACITANCE	$C_o: 27\mu\text{F}$	$C_i: 15.12\mu\text{F}$
	INDUCTANCE	$L_o: 721.44\mu\text{H}$	$L_i: 4.7\mu\text{H}$
	L/R RATIO	N/A	N/A
G	EARTHING	GROUNDING	GROUNDING

REV	DESCRIPTION	ER#	DATE	REV	ECO #	DESCRIPTION	ECO #	DATE
A	UPDATED	34331	4/2/20	B	35430	9/28/20		

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NOT SHOWN	$\pm 010^\circ$	$\pm 005^\circ$	$\pm 1/64^\circ$	NEW	34331	1/30/20	USED ON

TITLE	PART NUMBER	REV	SIZE	SHEET
INTRINSIC SAFETY SCHEDULE DRAWING FOR E-DIAL SAFETY BARRIER BOX	SD-581	B	A	1 OF 1



ROCHESTER GAUGES, LLC

SCALE 1:1



Rochester Gauges, LLC e-Dial™ sensor device is intrinsically safe apparatus intended to be powered through a designated e-Dial™ Barrier with matching intrinsic safety entity parameters. e-Dial™ and e-Dial™ Barrier are certified as complete intrinsic safety system (Reference Intrinsic Safety Control Drawing SD-581) and the maximum supply voltage to the barrier should not exceed $U_m=32VDC$. e-Dial™ Barrier device is intended to be installed in safe (non-hazardous) location and e-Dial™ sensor device is intended for use in Class I, Division 1, Groups C and D, T4 or Zone 0, Group IIB, T4 Hazardous Locations under the certification schemes and ratings noted below:

IECEx (Global Certification):

e-Dial™ Barrier

[Ex ia Ga] IIB
 $-40^{\circ}C \leq T_{AMB} \leq +60^{\circ}C$


e-Dial™

Ex ia IIB T4 Ga
 $-40^{\circ}C \leq T_{AMB} \leq +80^{\circ}C$


IECEx ETL 20.0019X

ATEX (EU Certification):

e-Dial™ Barrier

CE 0359  II (1) G [Ex ia Ga] IIB
 $-40^{\circ}C \leq T_{AMB} \leq +60^{\circ}C$

e-Dial™

CE 0359  II 1 G Ex ia IIB T4 Ga
 $-40^{\circ}C \leq T_{AMB} \leq +80^{\circ}C$

ITS20ATEX205570X

North America (USA & Canada):

e-Dial™ Barrier

To be installed in safe areas and provides intrinsic safety outputs to:

[Ex ia] Class 1, Division 1, Groups C & D
USA: [AEx ia Ga] IIB
Canada: [Ex ia Ga] IIB
 $-40^{\circ}C \leq T_{AMB} \leq +60^{\circ}C$

e-Dial™

Class 1, Division 1, Groups C & D, T4
USA: Class 1, Zone 0, AEx ia IIB T4 Ga
Canada: Ex ia IIB T4 Ga
 $-40^{\circ}C \leq T_{AMB} \leq +80^{\circ}C$

ETL20CA104269205X

Step	Item	e-Dial Barrier	e-Dial	System
a)	Equipment group	Groups C&D (Group IIB)	Groups C&D (Group IIB)	Groups C&D (Group IIB)
b)	Level of protection	Ex ia	Ex ia	Ex ia
c)	Temperature classification	N/A	T4	T4
d)	Ambient temperature	-40°C to +60°C	-40°C to +80°C	-40°C to +60°C – Barrier -40°C to +80°C – e-Dial
e)	Parameter comparison			
	Voltage	U ₀ : 9.45 V	U _j : 9.45 V	✓
	Current	I ₀ : 444 mA	I _j : 444 mA	✓
	Power	P ₀ : 1.05 W	P _j : 1.05 W	✓
f)	Cable parameters			
	Capacitance	C ₀ : 27 µF	C _j : 15.12 µF	C _c < 11.4 µF
	Inductance	L ₀ : 721.44 µH	L _j : 4.7 µH	L _c < 716.3 µH
	L/R ratio	N/A	N/A	N/A
g)	Earthing	Grounded	Grounded	Grounded

CE Compliance section:

A.-Electromagnetic Compatibility

1. EN 61000-6-2:2005 - Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments IEC 61000-6-2:2005
2. EN 61000-6-4:2007 - Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments IEC 61000-6-4:2006

B. -Restriction of hazardous substances in electrical and electron equipment

1. EN 50581:2012 - Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances



ROCHESTER GAUGES, LLC

**DS-1857, Related Drawing
Revision A, 11/30/2020**

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