

Rosemount™ 3490 Series

4–20 mA + HART® Compatible Controller



- Field mounted controller with integral multi-function LCD display and keypad
- Tough weatherproof wall mount enclosure for internal or external mounting
- Accepts 4–20 mA and HART inputs
- Compatible with HART 7 transmitters
- Intrinsically safe power supply to a transmitter
- Isolated 4–20 mA output
- Five field adjustable alarm and control relays
- Pre-programmed with tank shapes, flow algorithms, and pump control routines to simplify configuration

Overview of the Rosemount 3490 Series



Wall mount, IP65 version of the Rosemount 3490 Series Control Unit



Wall mount, NEMA® 4X version of the Rosemount 3490 Series Control Unit



Panel mount version of the Rosemount 3490 Series Control Unit

The Rosemount 3490 Series of wall and panel mounting control units provide comprehensive control functionality for any 4–20 mA or HART compatible transmitter. A back-lit display gives clear visual indication of the measured value and status of all inputs and outputs.

Features and benefits

- Tough weatherproof wall mount enclosure for internal and external mounting
- Accepts 4–20 mA or HART inputs
- Compatible with HART 5, 6, and 7 transmitters
- Five voltage-free SPDT relays for alarm and control duties
- Supports two voltage-free contact closure inputs
- 4–20 mA 12-bit isolated current output proportional to calculated value
- Bright local display of measured value and input/output status
- Programmed tank shapes, flow algorithms, and control routines simplify configuration. A 20-point strapping table facility is provided for non-standard applications.
- Real-time clock for energy saving routines, pump efficiency calculations, and date/time stamping of data logging.
- The Rosemount 3490 Series is mounted in a non-hazardous area, and provides a protected (intrinsically safe) direct current supply to a transmitter mounted in a hazardous area.

Ideal for programming and control of Rosemount level and flow transmitters

It is ideal for programming and control of Rosemount 3100 Series Level and Flow Transmitters, and Rosemount 3300 Guided Wave Radar Level and Interface Transmitters (non-explosion-proof only).

Other HART transmitters can be connected. The Rosemount 3490 Series recognizes transmitters as “unknown instruments” but allows access to programming of Universal and Common Practice HART command.

Contents

| | | | |
|---|--------|----------------------------|--------|
| Overview of the Rosemount 3490 Series | page 2 | Dimensional Drawings | page 9 |
| Product Certifications | page 8 | Specifications | page 5 |
| Ordering Information | page 4 | | |

Special features

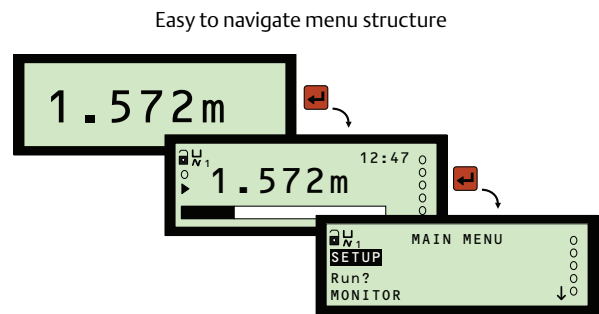
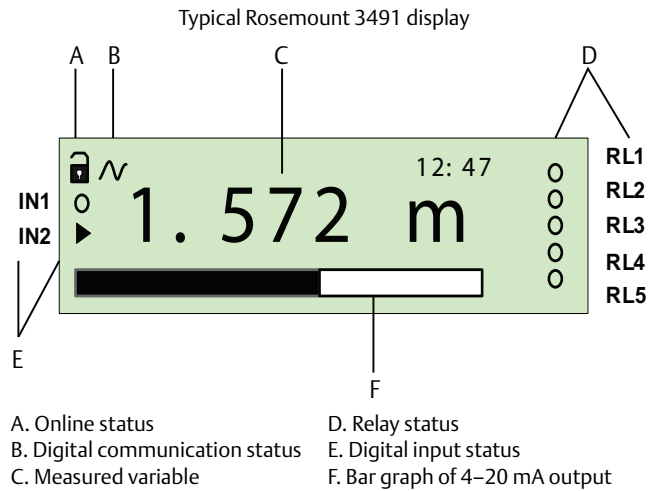
- Configured and interrogated using an integral six-button keypad.
- Easy to navigate menu structure.
- Wizard assisted programming, with password protection to prevent unauthorized access.
Many popular configurations are “Wizard assisted”, enabling fast and accurate programming. Typical applications include level, volume, distance measurement, and open channel flow measurement.
- The HART digital or 4–20 mA analog signal from the transmitter may be offset, dampened, scaled, and linearized. A range of pre-programmed linearization algorithms are user-selectable.
- The 4–20 mA output signal may be scaled to re-transmit all or just part of the transmitter’s input signal or calculated value.
- Five relays are fully field programmable to perform a variety of control, fault indication, and alarm duties.

Two digital inputs can be individually set-up to perform various control actions (e.g. raise an alarm) whenever activated.

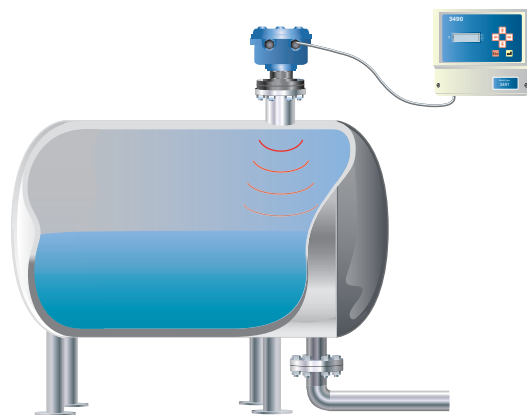
Choosing a control unit

Each Rosemount 3490 Series Control Unit has been designed for a specific purpose:

- The Rosemount 3491 Standard Control Unit accepts input from one transmitter.
- The Rosemount 3492 Differential Measurement Control Unit accepts input from two HART transmitters and performs sum or differential calculations, providing a single current output proportional to the answer.
- The Rosemount 3493 Logging Measurement Control Unit provides on-board logging of the process/primary value (PV), and totalized open channel flow.



Level or volume measurement with a Rosemount 3490 Series Control Unit and Rosemount 3100 Series Level Transmitter



Ordering Information

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 6](#) for more information on Material Selection.

Table 1. Rosemount 3491, 3492, and 3492 Ordering Information

The starred options (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

| Model | Product description | |
|---|---|---|
| 3491 | Standard control unit | |
| 3492 | Differential control unit | |
| 3493 | Logging control unit | |
| Signal output | | |
| L | 4–20 mA | ★ |
| Power supply | | |
| 1 | 115/230 Vac | ★ |
| 2 | 24 Vdc | ★ |
| Enclosure / mounting | | |
| P6 | Wall mounting, IP65 | ★ |
| P7 | Panel mounting, IP40 | ★ |
| P4 | Wall mounting, NEMA 4X | ★ |
| Product certificates | | |
| I1 | ATEX Intrinsically Safe | ★ |
| I3 | NEPSI Intrinsically Safe | ★ |
| I5 ⁽¹⁾ | USA Intrinsically Safe | ★ |
| I6 ⁽¹⁾ | CSA Intrinsically Safe | ★ |
| I7 | IECEx Intrinsically Safe | ★ |
| IM | Technical Regulation Customs Union (EAC) Intrinsically Safe | ★ |
| Typical model number: 3491 L 1 P4 I5 | | |

1. Enclosure/mounting codes P4 or P7 are required for this option.

Accessory

Table 2. Accessory Ordering Information

The starred options (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

| Accessory | | |
|------------------|--|---|
| 03490-7001-0001 | IP65 hood kit for panel-mountable control unit (P7 option in Table 1) | ★ |

Specifications

General

Products

Rosemount 3491 Standard Control Unit,
Rosemount 3492 Differential Control Unit, and
Rosemount 3493 Logging Control Unit

Mounting styles

Wall or panel mount

Power options

AC mains or DC

Display

Type

Dot matrix LCD, 32 × 122 pixels, back lit

Location

Integrated into the housing

Indicators

Red LED for health status

Electrical

AC mains power supply input

115 or 230 Vac ± 10% (switch selectable)

Power consumption: 10 VA nominal, 18 VA maximum

Fuse: 200 mA(T), 5 × 20 mm, 250 V

DC power supply input

15 to 30 Vdc, 30 Vdc maximum

Power consumption: 9 W maximum

Current input

4–20 mA (Earth referenced in control unit) or
HART digital communications (Rev. 5, 6, and 7)

One HART transmitter on the Rosemount 3491 and 3493,
and two HART transmitters on the Rosemount 3492.

The Rosemount 3490 Series provides an intrinsically safe power supply to an intrinsically safe approved transmitter mounted in a hazardous area. The control unit provides a nominal 24 Vdc supply, but this output varies at the terminals depending on electrical load conditions (see [Table 3](#)).

Table 3. Minimum Terminal Output Voltages

| Load current mA | Rosemount 3490 Series terminal voltage Vdc | Maximum loop resistance ohms |
|----------------------|--|------------------------------|
| 3.75 ⁽¹⁾ | 20.9 | 2370 |
| 4.0 | 20.8 | 2195 |
| 20.0 | 13.9 | 95 |
| 21.75 ⁽²⁾ | 13.5 | 50 |
| 22.5 ⁽³⁾ | 12.8 | 35 |

1. Minimum fault current.
2. Maximum output (Rosemount standard fault level).
3. Maximum output (NAMUR NE43 fault level).

Trigger inputs

Two voltage-free contact closures

Relays

5 × SPDT, 5 A at 240 Vac

Current output

Signal range (nominal): 4–20 mA

Output range (linear):

- 3.8 to 20.5 mA (user-selectable alarm current of 3.6, 21, or 22.5 mA) or
- 3.9 to 20.8 mA (user-selectable alarm current of 3.75 or 21.75 mA)

Load

R_{max} is 2370 Ohms (see [Table 3](#))

Resolution

12-bit

Regulation

< 0.1% over load change from 0 to 600 Ohms

Isolation

Isolated from other terminals to 500 Vdc

Update rate (software)

Five times per second

Cable entry

- IP-rated wall mount enclosure:
 - Five positions pre-drilled, two glands and three blanking plugs supplied
- NEMA-4X-rated wall mount enclosure:
 - Positions require drilling by user, glands/conduits and blanking plugs are not supplied
- Panel enclosure:
 - Direct wiring to terminal blocks at rear

Cable connection

- Wall mount enclosure:
 - Cage clamp terminal blocks in separate terminal compartment
- Panel mount enclosure:
 - Two-part cage clamp terminal blocks at rear

Mechanical

Material selection

Emerson™ Process Management provides a variety of Rosemount product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson Process Management is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

Materials of construction (wall mount)

Polycarbonate enclosure and cover

IP-rated wall mount: 304SST cover fixing screws

NEMA-4X-rated wall mount: Polyester and Alloy 400 fastening

UV resistant Polycarbonate membrane keypad

Nylon cable glands and blanking plugs
(IP-rated wall mount version only)

Materials of construction (panel mount)

Noryl PPO enclosure and cover

Carbon Steel/Zinc plated fascia fixing screws

UV resistant Noryl PPO membrane keypad

Nylon + PBT terminal blocks with plated fittings

Dimensions

See [Dimensional Drawings](#) on pages 9 to 11.

Weight

- IP-rated wall mount:
 - 1.4 kg (mains unit) or 1.0 kg (DC unit)
- NEMA-4X-rated wall mount:
 - 3.5 kg (mains unit) or 3.1 kg (DC unit)
- Panel mount:
 - 1.2 kg (mains unit) or 0.8 kg (DC unit)

Environment

Ambient temperature

–40 to 55 °C (–40 to 131 °F)

See “[Product Certifications](#)” on page 8 for approval temperatures ranges.

Relative humidity

- Wall mount: 100%
- Panel mount: 90% non-condensing

Electrical safety

EN61010-1

Ingress protection

- IP-rated wall mount: IP65 indoor/outdoor
- NEMA-4X-rated wall mount: NEMA 4X indoor/outdoor
- Panel mount:
IP40 indoor mount (or IP65 if with optional hood)

Maximum vibration

Control Room: 0.1 to 9 Hz 1.5 mm displacement peak amplitude/9 to 200 Hz 0.5 g.

Installation category

- Category III: Supply voltage < 127 Vac (IEC60664)
- Category II: Supply voltage < 254 Vac (IEC60664)

Pollution degree

2 (IEC60664)

Maximum altitude

2000 m

Electromagnetic compatibility

Emissions and immunity
(for IP-rated wall mount and panel mount): EN61326-1

Certifications

Intrinsically Safe associated apparatus.

See [“Product Certifications” on page 8.](#)

Product Certifications

European directive information

The EC declaration of conformity for all applicable European directives for this product can be found in the Rosemount 3490 Series [Product Certifications and Safety Manual](#) and on EmersonProcess.com/Rosemount.

Hazardous locations certifications

The Rosemount 3490 Series is mounted in a non-hazardous area, and provides a protected (intrinsically safe) 24 Vdc nominal supply to a transmitter in a hazardous area. See [Table 3 on page 5](#) for further information.

North American and Canadian approvals

Canadian Standards Association (CSA)

intrinsically safe approvals – certified to US standard

- I5** Project ID: 1830310
 Intrinsically safe for: Class I, Division 1, Groups A, B, C, D
 Intrinsically safe for: Class 1, Zone 0, Group IIC [Ex ia]
 Ambient temperature: -40 °C to +55 °C
 Control drawing: 71097/1201
 $U_o = 27.3 \text{ V}$, $I_o = 96.9 \text{ mA}$, $P_o = 0.66 \text{ W}$,
 $L_a = 2.26 \text{ mH}$, $C_a = 70 \text{ nF}$

Canadian Standards Association (CSA)

intrinsically safe approvals

- I6** Project ID: 1830310
 Intrinsically safe for: Class I, Division 1, Groups A, B, C, D
 Intrinsically safe for: Class 1, Zone 0, Group IIC [Ex ia]
 Ambient temperature: -40 °C to +55 °C
 Control drawing: 71097/1201
 $U_o = 27.3 \text{ V}$, $I_o = 96.9 \text{ mA}$, $P_o = 0.66 \text{ W}$,
 $L_a = 2.26 \text{ mH}$, $C_a = 70 \text{ nF}$

European approvals

ATEX intrinsically safe approvals

- I1** Certificate numbers:
 SIRA 06ATEX7128 (Wall Mount),
 SIRA 06ATEX7129X (Panel Mount)
 Intrinsically safe for II(1) G D,
 [Ex ia] IIC, [Ex ia Da] IIIC
 Ambient temperature: -40 °C to +55 °C
 $U_o = +27.3 \text{ V}$, $I_o = 96.9 \text{ mA}$, $P_o = 0.66 \text{ W}$,
 $L_i = 0.22 \text{ mH}$, $C_i = 0.6 \text{ nF}$

Special conditions for safe use (SIRA 06ATEX7129X):

- Terminal 30 must be connected to a high integrity ground point in a non-hazardous area.

International approvals

National Supervision and Inspection Centre for Explosion Protection and Safety Instrumentation (NEPSI) intrinsically safe approval

- I3** Certificate number: GYJ11.1710X
 Intrinsic safety: [Ex ia Ga] IIC

International Electrotechnical Commission (IEC) intrinsically safe approvals

- I7** Certificate number: IECEx SIR 06.0104X
 Intrinsically safe for:
 [Ex ia] IIC, [Ex ia Da] IIIC
 Ambient temperature: -40 °C to +55 °C
 $U_o = 27.3 \text{ V}$, $I_o = 96.9 \text{ mA}$, $P_o = 0.66 \text{ W}$,
 $L_i = 0.22 \text{ mH}$, $C_i = 0.6 \text{ nF}$

Conditions of IEC certification (panel mount):

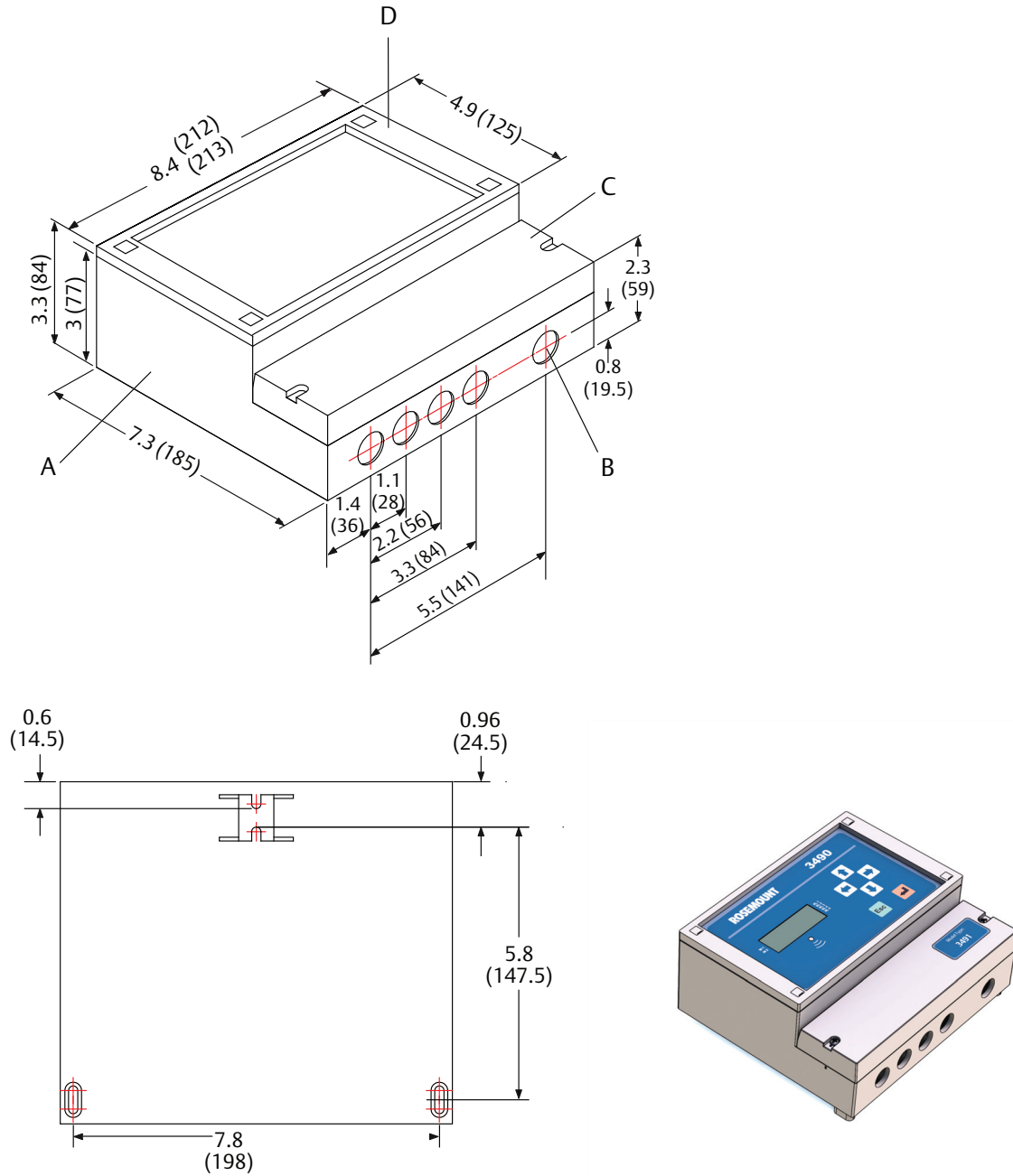
- Terminal 30 must be connected to a high integrity ground point in a non-hazardous area.

Technical Regulation Customs Union (EAC)

- IM** Certificate number: TC RU C-GB.AA87.B.00117
 Intrinsically safe for:
 [Ex ia] IIC
 Ambient temperature: -40 °C to +55 °C
 $U_o = +27.3 \text{ V}$, $I_o = 96.9 \text{ mA}$, $P_o = 0.66 \text{ W}$,
 $L_i = 0.22 \text{ mH}$, $C_i = 0.6 \text{ nF}$

Dimensional Drawings

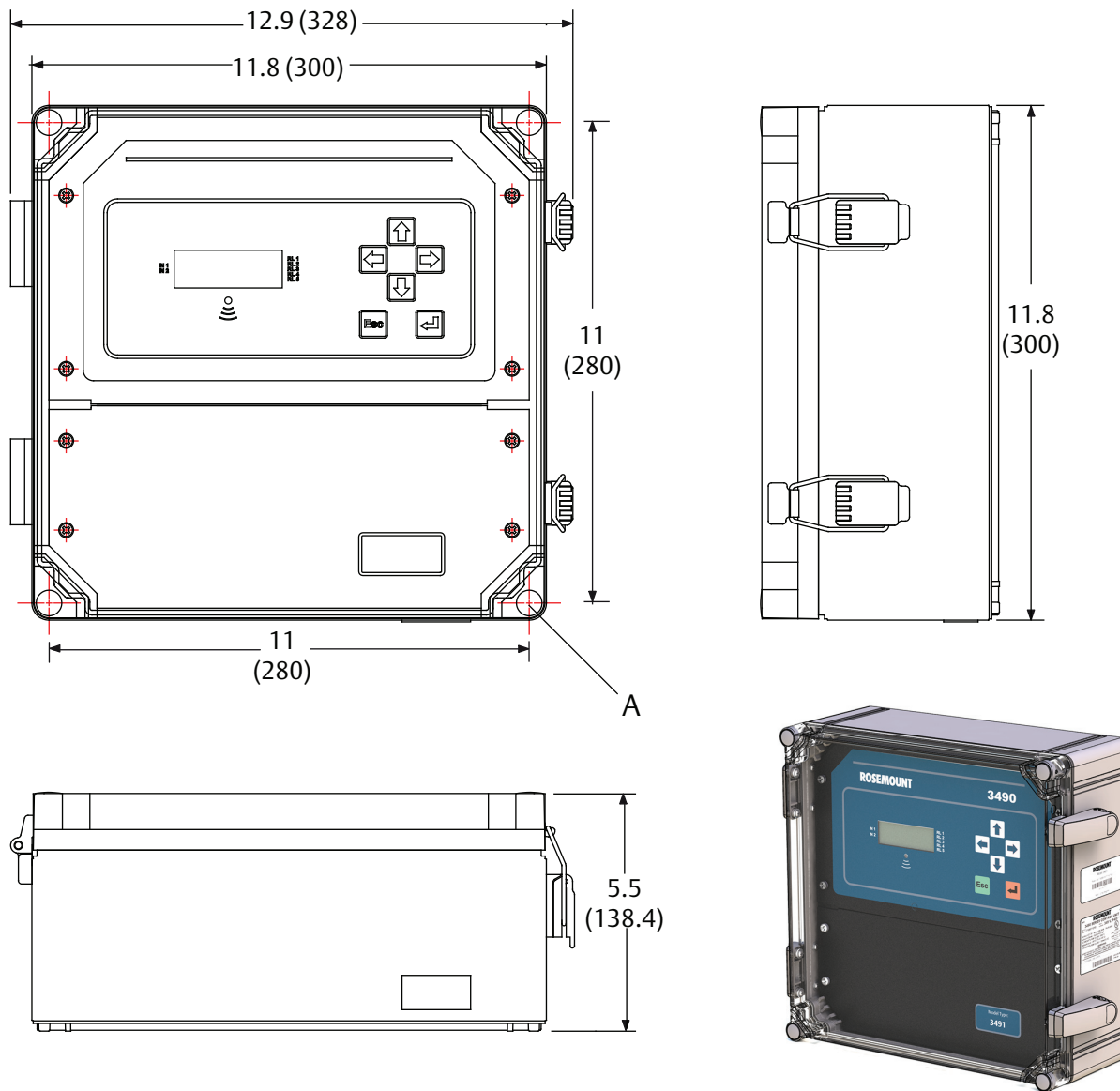
Figure 1. IP-Rated Wall Mount Control Unit



A. Body
 B. Five holes 0.8 (20.5)
 Dimensions are in inches (millimeters).

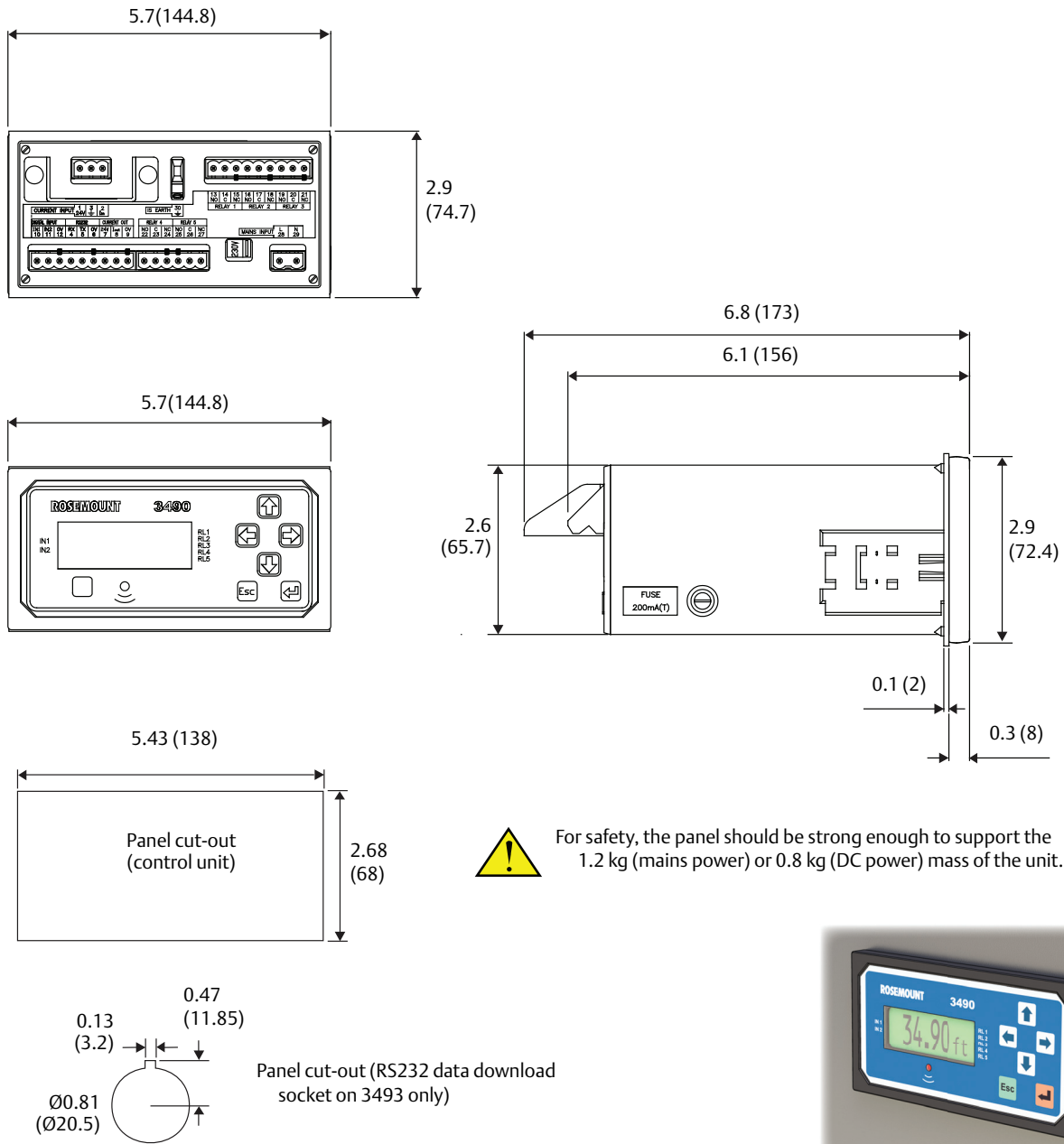
C. Terminal cover
 D. Lid

Figure 2. NEMA-4X-Rated Wall Mount Control Unit



A. Four mounting holes 0.3 (8)
 Dimensions are in inches (millimeters).

Figure 3. Panel Mount Unit






Dimensions are in inches (millimeters).

Global Headquarters

Emerson Process Management

6021 Innovation Blvd.

Shakopee, MN 55379, USA




 +1 800 999 9307 or +1 952 906 8888 +1 952 949 7001 RFQ.RMD-RCC@EmersonProcess.com

North America Regional Office

Emerson Process Management

8200 Market Blvd.

Chanhassen, MN 55317, USA




 +1 800 999 9307 or +1 952 906 8888 +1 952 949 7001 RMT-NA.RCCRFQ@Emerson.com

Latin America Regional Office

Emerson Process Management

1300 Concord Terrace, Suite 400

Sunrise, FL 33323, USA

 +1 954 846 5030 +1 954 846 5121 RFQ.RMD-RCC@EmersonProcess.com



Europe Regional Office

Emerson Process Management Europe GmbH

Neuhofstrasse 19a P.O. Box 1046

CH 6340 Baar

Switzerland



 +41 (0) 41 768 6111 +41 (0) 41 768 6300 RFQ.RMD-RCC@EmersonProcess.com

Asia Pacific Regional Office

Emerson Process Management Asia Pacific Pte Ltd

1 Pandan Crescent

Singapore 128461

 +65 6777 8211 +65 6777 0947 Enquiries@AP.EmersonProcess.com



Middle East and Africa Regional Office

Emerson Process Management

Emerson FZE P.O. Box 17033,

Jebel Ali Free Zone - South 2

Dubai, United Arab Emirates

 +971 4 8118100 +971 4 8865465 RFQ.RMTMEA@Emerson.com[Linkedin.com/company/Emerson-Process-Management](https://www.linkedin.com/company/Emerson-Process-Management)[Twitter.com/Rosemount_News](https://twitter.com/Rosemount_News)[Facebook.com/Rosemount](https://www.facebook.com/Rosemount)[Youtube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)[Google.com/+RosemountMeasurement](https://plus.google.com/+RosemountMeasurement)

Standard Terms and Conditions of Sale can be found at:

[Emerson.com/en-us/pages/Terms-of-Use.aspx](https://www.emerson.com/en-us/pages/Terms-of-Use.aspx)

The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount and Rosemount logotype are trademarks of Emerson Process Management.

HART is a registered trademark of FieldComm Group.

NEMA is a registered trademark and service mark of the National Electrical Manufacturers Association.

All other marks are the property of their respective owners.

© 2016 Emerson Process Management. All rights reserved.