

# Mobrey MCU900 Series

## 4–20 mA + HART Compatible Controller



- Intrinsically Safe power supply to transmitter
- 4–20mA HART input
- Isolated 4–20mA output
- Five control relays
- Multi-function back lit display
- Wall or panel mount
- Pre-programmed linearization: contents volume and open channel flow
- Configurable by using the integral keypad

# Overview of the Mobrey MCU900 Series



Wall mount, IP65 model of the Mobrey MCU900 Series Controller Unit



Panel mount model of the Mobrey MCU900 Series Controller Unit

The MCU900 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 any 4–20 mA or HART compatible input. (HART revisions 5, 6, and 7 are supported)
- 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
- Pre-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 time-stamped data logging

## Intrinsically safe power supply to transmitter

The MCU900 Series is mounted in a non-hazardous area, and provides a protected (intrinsically safe) 24 volts direct current supply to a transmitter in a hazardous area.

## Ideal for programming and control of HART transmitters

It is ideal for programming and control of Mobrey MSP Series level and flow transmitters.

Other HART transmitters can be connected. The MCU900 Series recognizes the transmitters as an “unknown instruments” but allows access to programming of Universal and Common Practice HART commands. HART revisions 5, 6, and 7 are supported.

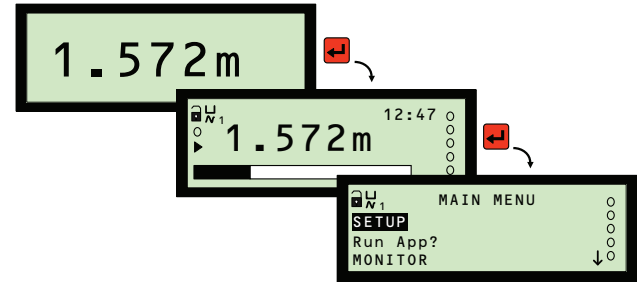
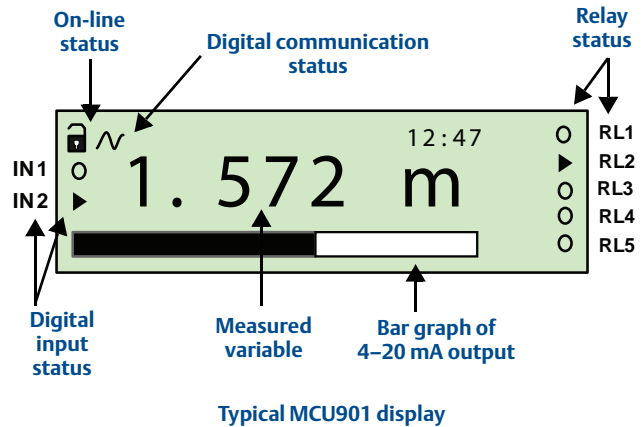
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## Special features

- 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, contents 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



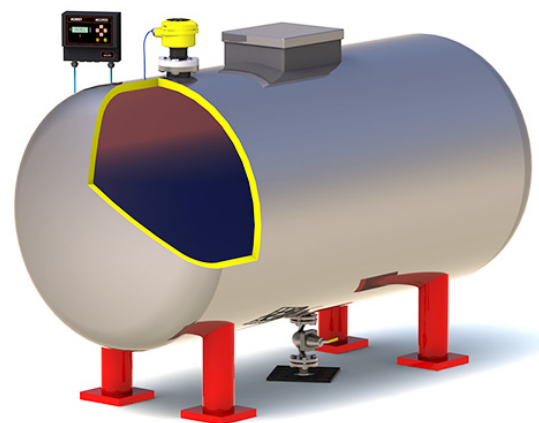
## Choosing the right control unit

Each model of the MCU900 Series has been designed for a specific purpose, as shown below:

**Table 1. Choosing the right control unit**

Controller Unit Purpose	Model	Ordering Information
Pump control, contents volume, or flow	MCU901	Page 4
Differential level or summated flow	MCU902	Page 4
Open channel flow data logging	MCU90F	Page 4

- The standard MCU901 and MCU90F Control Units accept input from one transmitter
- The Mobrey MCU902 Differential Measurement Control Unit accepts input from two transmitters and performs sum or differential calculations, providing a single current output proportional to the answer
- The MCU90F Flow logging control unit provides on-board logging of flow rate and flow total up to 7000 events



**Level or Contents Volume measurement with a Mobrey MSP400RH Transmitter and a Mobrey MCU900 Series Control Unit**

## Ordering Information for Mobrey MCU900 Series

**Table 2. MCU900 Series control units ordering information**

Model	Product Description
MCU901	Standard Control Unit, 110 to 230 Vac (50/60 Hz)
MCU902	Differential Control Unit, 110 to 230 Vac (50/60 Hz)
MCU90F <sup>(1)</sup>	Open Channel Flow Logging Control Unit, 110 to 230 Vac (50/60 Hz)
Enclosure / Mounting	
WX-	Wall mounting, IP65
PX-	Panel mounting, IP40 <sup>(2)</sup>
Product Certificates	
A	ATEX Intrinsically Safe
<b>Typical Model Numbers: MCU901WX-A, MCU902WX-A, and MCU90FWX-A</b>	

**Option (include with the selected model number)**

Power Supply	
24	24 Vdc
<b>Examples of option included with the model number: MCU901WX-A24, MCU902WX-A24, and MCU90FWX-A24</b>	

(1) The MCU90F Control Unit includes a LOGVIEW software installation CD (32-bit) and an RS232 data communications cable.

(2) Ingress Protection (IP) rating of front panel improves to IP65 when the hood mounting kit accessory is used (see [Table 3](#) for the part number to order)

## Ordering Information for Mobrey Accessories

**Table 3. MCU900 Series accessory ordering information**

Part Number	Accessory Description
MSP-HDK1	Hood mounting kit for MCU90*PX-A, IP65 front panel protection

# Specification

## General

### Product

- Mobrey MCU900 Series Universal Control Unit:
  - MCU901 Standard Control Unit
  - MCU902 Differential Control Unit
  - MCU90F Flow Logging Control Unit

### Mounting styles

- Wall mount or panel mount

## Display

### Type

- Dot matrix LCD, 32 x 122 pixels, back lit

### Location

- Integrated into enclosure

### Indicators

- Red LED for health status

## Electrical

### Power options

- AC mains powered control units
- DC powered control units

### AC mains power supply input

- 115 or 230 Vac  $\pm 10\%$  (switch selectable)
- Power consumption: 10 VA nominal, 18 VA maximum
- Fuse: 200 mA(T), 5 x 20 mm, 250 V

### DC power supply input

- 15 to 30 Vdc
- Power consumption: 9 W maximum

### Current input

- 4–20mA (Earth referenced in control unit) or HART digital communications (revisions 5, 6, and 7)
- Supplies 23 volts from 400 Ohm source resistance

### Trigger inputs

- 2 voltage-free contact closures

### Relays

- 5 x SPDT, 5 A at 240 Vac

### Current output

- Signal range (nominal): 4–20 mA
- Output range (linear): 3.8 to 20.5 mA (Alarm current of 3.6 mA, 21 mA, or 22.5 mA user-selectable)
- Load: Rmax is 1 K Ohm
- 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): 5 times per second

### Cable entry

- IP-rated wall mount enclosure: 5 positions pre-drilled, 2 glands and 3 blanking plugs 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: 2-part cage clamp terminal blocks at rear

## Mechanical

### Materials of construction (wall mount)

- Polycarbonate enclosure and cover
- IP-rated wall mount: 304SST cover fixing screws
- 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 7 to 8

### Weight

- IP-rated wall mount: 1.4 kg (mains unit) or 1.0 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](#) for approval temperatures ranges

### Relative humidity

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

### Electrical safety

- EN61010-1

### Ingress Protection (IP) rating

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

### Vibration

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

### Installation category

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

### Pollution degree

- 2 (IEC60664)

### Maximum altitude

- 2000 m

### Electromagnetic Compatibility

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

## Product Certifications

### Note

The MCU900 Series is mounted in a non-hazardous area, and provides a protected (intrinsically safe) 24 volts direct current supply to a transmitter in a hazardous area.

## European Union directive information

- The EC declaration of conformity for all applicable European directives for this product may be obtained by contacting your local sales office.

### ATEX directive (94/9/EC)

- Complies with the ATEX directive

### Low voltage directive (LVD)(2006/95/EC)

- EN61010 Part 1

### Pressure equipment directive (PED) (97/23/EC)

- The MCU900 Series is outside the scope of the PED directive

### Electro magnetic compatibility (EMC) directive

- EN61326-1

### CE-mark

- The Mobrey MCU900 Series complies with EMC, ATEX, and LVD directives

### Restriction of Hazardous Substances (ROHS)

- The Mobrey MCU900 Series is exempt

## Hazardous locations certifications

### ATEX intrinsically safe approval

Certificate numbers:

BAS00ATEX7064 (Wall Mount),  
BAS01ATEX7225X (Panel Mount)

Intrinsically safe for II(1) G D,  
[Ex ia Ga] IIC, [Ex ia Da] IIIC

Ambient temperature: -40 °C to +55 °C

Uo = 27,3 V, Io = 96,9 mA, Po = 0,66 W, Li = 0,22 mH, Ci = 0,6 nF

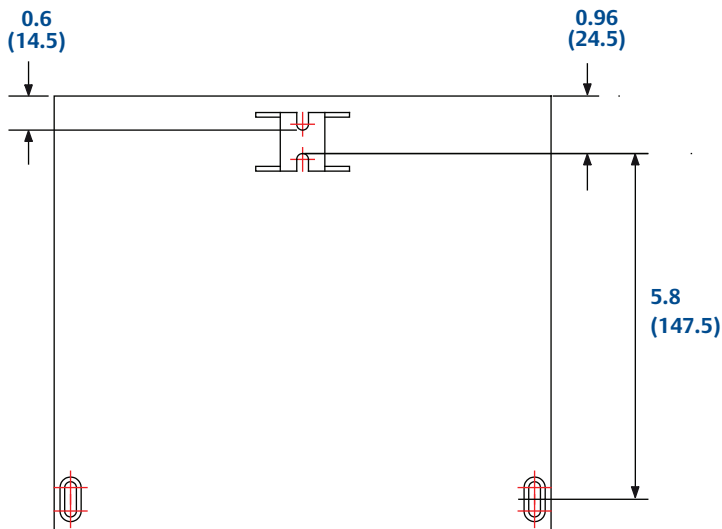
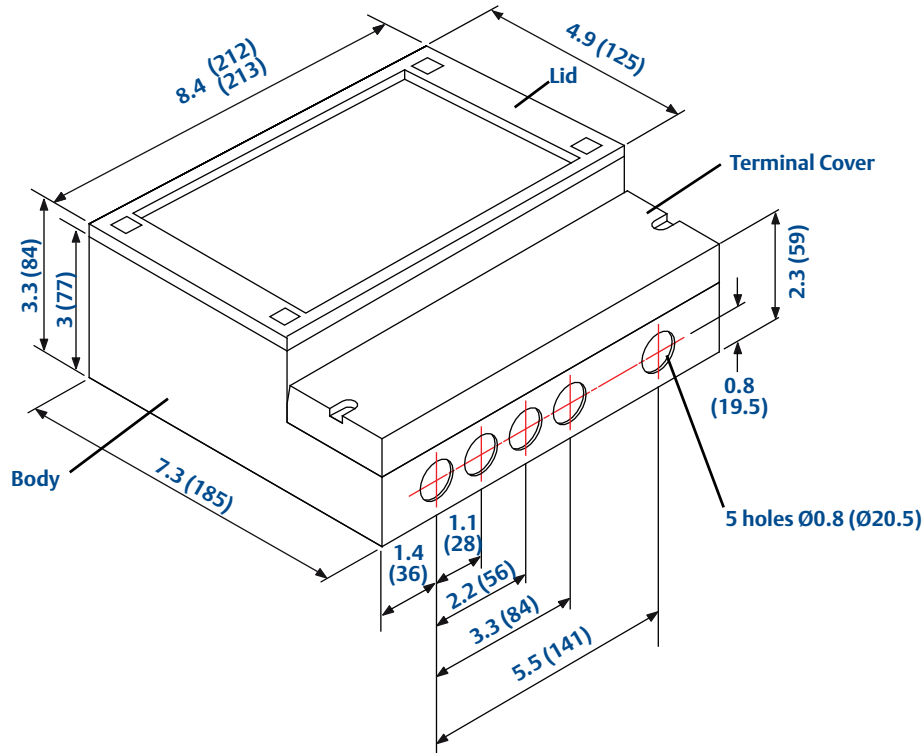
### Special conditions for safe use (Certificate BAS01ATEX7225X):

1. Terminal 30 must be earthed in the safe area to a high integrity earth.

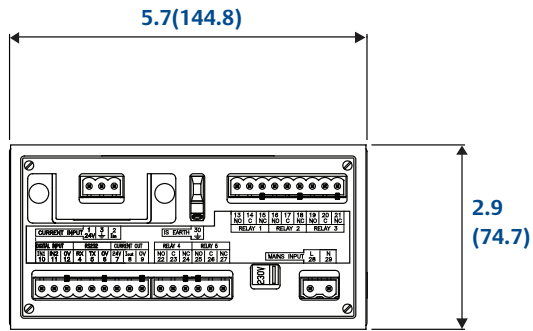
# Dimensional Drawings

## Dimensions for the wall-mounted unit

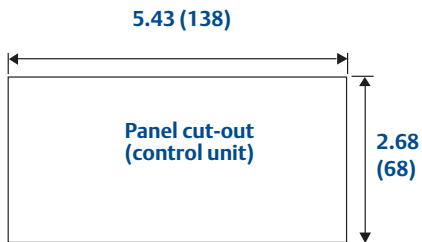
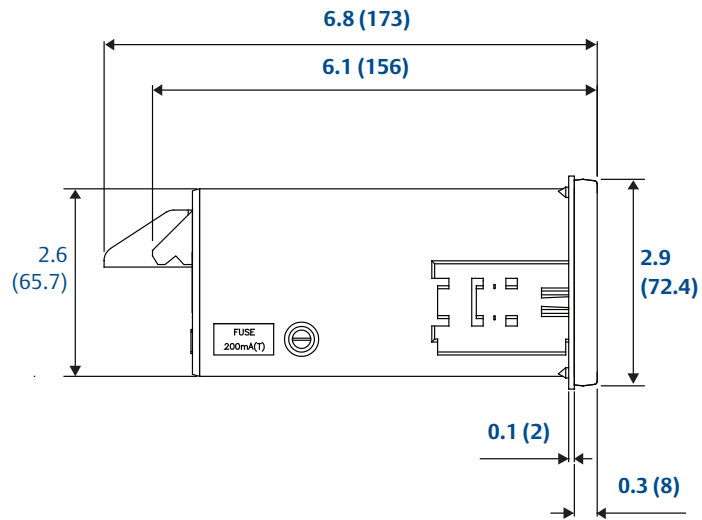
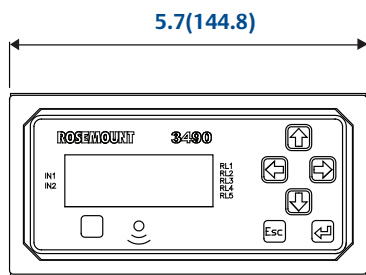
Note: Dimensions are in inches (mm).



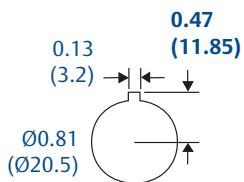
Dimensions for panel mount



Note: Dimensions are in inches (mm).



For safety, the panel should be strong enough to support the 1.2 kg (mains power) or 0.8 kg (DC power) mass of the unit.



Panel cut-out (RS232 data download socket on MCU90F only)







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