

# Technical Datasheet



## Control Unit

### Universal HART control unit

Model: DMCU900 series

#### Key Features

- Controller for use with DMSP400/500 and DMSP900 series level transmitters
- Supports any 4-20mA or HART transmitter
- Display measured values, control pumps, actuators and alarms
- Configure transmitters, access diagnostics
- Single or dual transmitter inputs
- 4-20mA and four relay outputs
- Data logging with RS485 comms
- DC or AC power supply
- Galvanically isolated supplies to power intrinsically safe transmitters

#### Series Overview

The DMCU900 Series Universal Controller provides an interface between HART devices, operators or control systems.

Designed for use with Delta Mobrey ultrasonic transmitters, but will also work with any pressure, temperature or level HART transmitter.

Large LCD display with push button menu driven programming. Intrinsically safe power supply for transmitters Data logging, with download facility.

#### Other products

Other HART capable products we can offer:

- Ultrasonic level transmitters
- Pressure transmitters



#### Product applications

- When used with Delta Mobrey ultrasonic transmitters;
- Display of tank level and volume, of linear or non-linear tanks
- Pump control for tanks, well wells, and sumps
- High or low alarms in storage tanks
- Open channel flow measurements of many weir and flume designs
- Differential measurement for blocked filter detection
- HART master for any HART device, to provide power, to configure, to display values, or to operate relays

#### How can we help you?

Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our web site at [www.delta-mobrey.com](http://www.delta-mobrey.com) to find your local support centre or call us on:

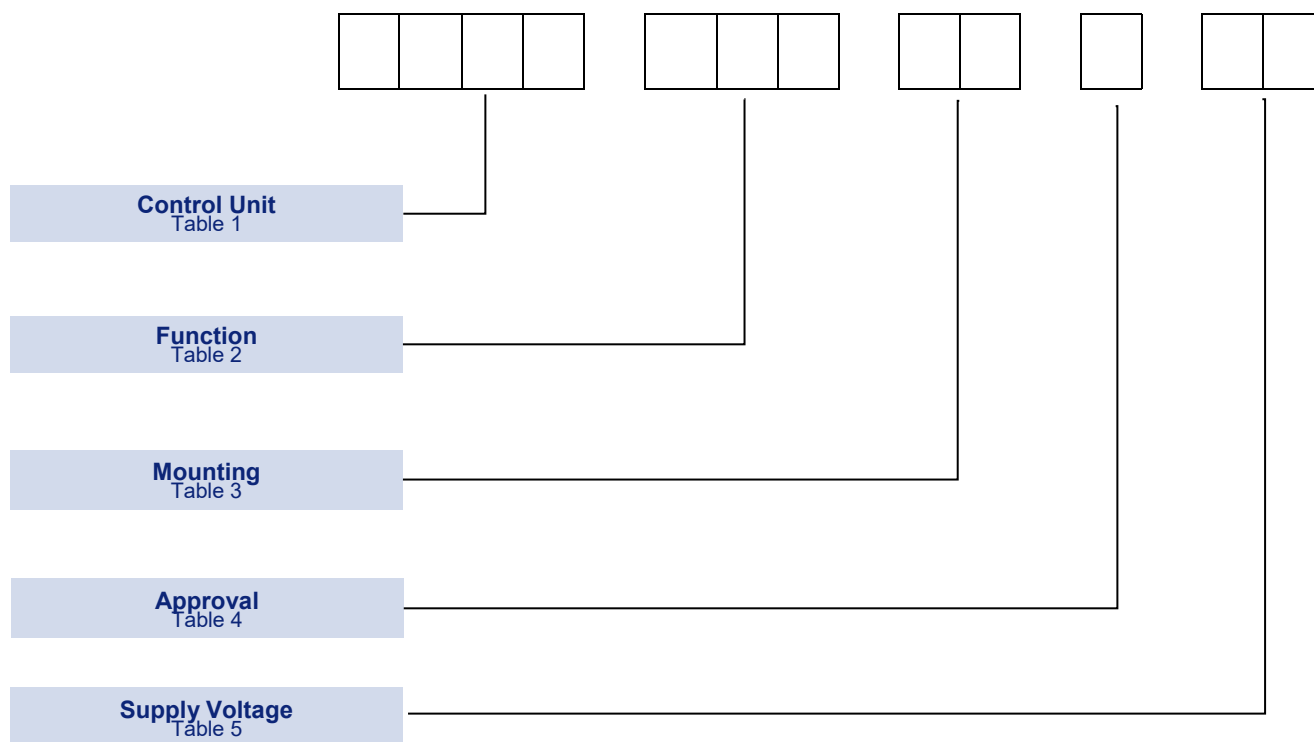
**+44 (0)1252 729140**

Liquid Level & Flow Measurement

Model: DMCU900

## How to order

DMCU900 controllers can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



## Models

TABLE 1	
Description	Code
Control unit. HART transmitter input(s)	<b>DMCU</b>

## Function

Standard unit

Differential measurement

Ideal for Open Channel Flow

TABLE 2	
Description	Code
Single transmitter input, 4-20mA and 4 relay outputs	<b>901</b>
Dual transmitter input, 4-20mA and 4 relay outputs	<b>902</b>
Single transmitter input, logging and data download, 2 relay outputs	<b>90F</b>

## Mounting

TABLE 3	
Description	Code
Wall mount	<b>WX</b>
Panel mount	<b>PX</b>

## Approval

TABLE 4	
Description	Code
Safe area use only	<b>-N</b>
ATEX hazardous area approval (available soon) Ex II 91) G [Ex ia Ga] IIB, Ex II (1) D [Ex ia Da] IIIC	<b>-A</b>

## Supply

TABLE 5	
Description	Code
85 to 255V AC 50-60Hz 12VA	<b>no code</b>
11.4-40 V DC or 11.4-28 V AC 50-60Hz 12VA or 11W	<b>24</b>

## Technical Specification

DMCU900 series: all models		DMCU901**.*	
Mounting	Wall mount (Panel mount on request)	Transmitter input	One transmitter input 4-20mA & HART
Display	128 x 64 LED dot matrix	Output	4-20mA
Housing material	Polycarbonate	Relays	4 SPDT 250V AC, 5A
Ambient Temperature	-20°C to +50°C		
Ingress protection	IP65		
DMCU90*WX-A (mains supply)		DMCU902**.*	
Supply voltage	85 to 255V AC 50-60Hz	Transmitter inputs	Two transmitters (differential) 4-20mA & HART
Power requirements	12VA	Output	4-20mA
		Relays	4 SPDT 250V AC, 5A
DMCU90*WX-A24 (low voltage supply)		DMCU90F**.*	
Supply voltage	11.4-40 V DC or 11.4-28 V AC 50-60Hz	Transmitter input	One transmitter 4-20mA & HART
Power requirements	12VA or 11W	Output	4-20mA
		Relays	2 SPDT 250V AC, 5A
		Additional function	Data logging
		Additional output	RS485

## Approvals

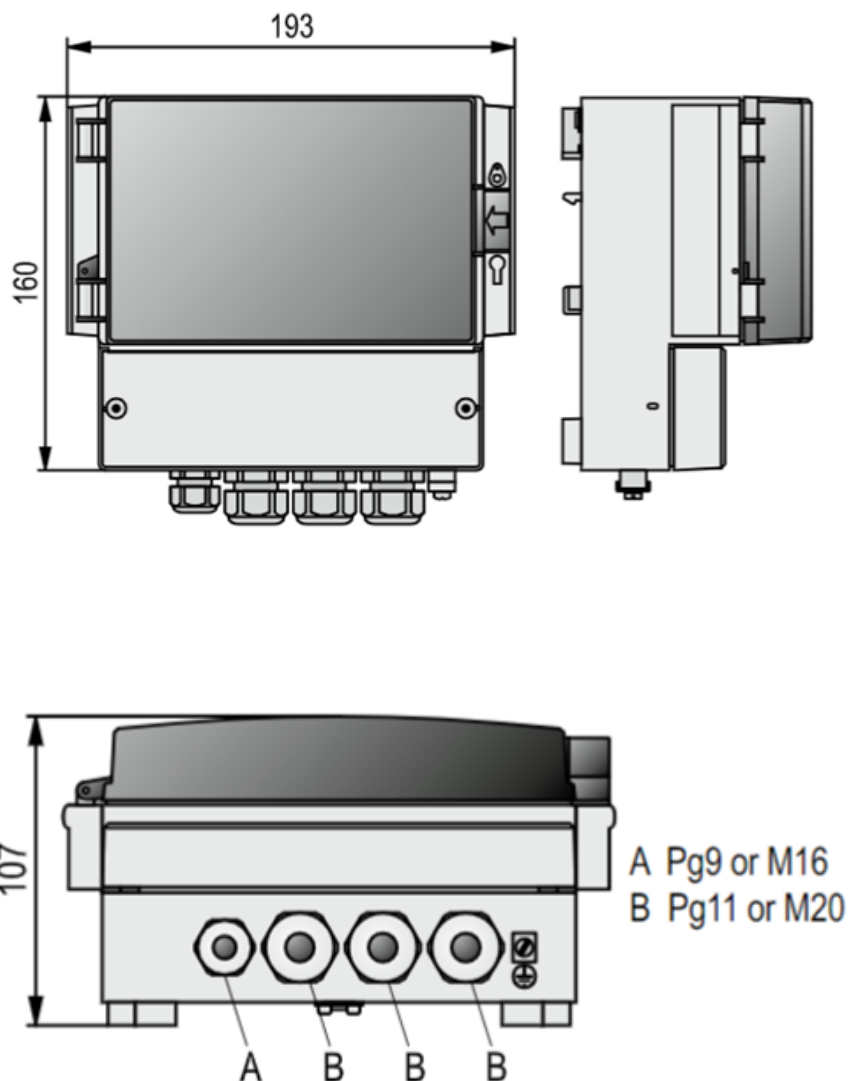
### EUROPEAN DIRECTIVES



**Low voltage Directive (LVD) 2014/35/EU.**  
Compliant to LVD

## Dimensions

DMCU*** ** -A	
<b>ATEX Ex marking</b>	Ex II 91) G [Ex ia Ga] IIB, Ex II (1) D [Ex ia Da] IIIC
<b>Intrinsically safe data</b>	Uo=30V; Io=140mA; Po=1W; Lo=4mH; Co=200nF; Um=253V



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FM00720

# Technical Datasheet



## Ultrasonic Transmitters

### Liquid Level & Flow Measurement

Series: DMSP900

#### Key Features

- Non-contacting measurement with no moving parts
- Continuous measurement of Level, Contents, or Open Channel Flow
- Simple to install and configure via Delta Mobrey's DMCU900 HART® controller or other HART master
- Loop powered 4-20mA and HART® output
- Configure to ignore disturbing object false echo
- Factory sealed IP68
- Rugged PVDF construction ideal for applications on exposed sites

#### Series Overview

The DMSP900SH for level, contents and open channel flow) uses ultrasonic technology.

Ultrasonic pulses are transmitted to and reflected from the liquid surface. The transmitter measures the 'time-of-flight' and determines the distance to the surface. By configuring the distance to the bottom of a vessel, the transmitter can then calculate the liquid level and contents (volume) for linear or non-linear vessels (domed, spherical, etc). For open channel flow, the transmitter can calculate the flow rate from the level for a wide variety of flumes and weirs.

An internal temperature sensor compensates for temperature affects. The level, contents or flow measurement is transmitted through the 4–20 mA and HART output. If used with the DMCU900 HART® controller, this simplifies configuration and has local display

#### Other products

Other products we can offer :

- Ultrasonic level transmitters with display
- Control unit for configuration, display and pump control
- Submersible type level transmitters



#### Product applications

- Liquid level or contents measurement in storage tanks
- Level measurement and pump control for wet wells and pumping stations
- Pump control for feeder tanks
- High or low level alarms in storage tanks
- Small or thin wall tanks
- Bund level measurement
- Open channel flow
- Chemical or Hydrocarbon storage tanks
- Differential measurement by two transmitters for blocked filter detection

#### How can we help you?

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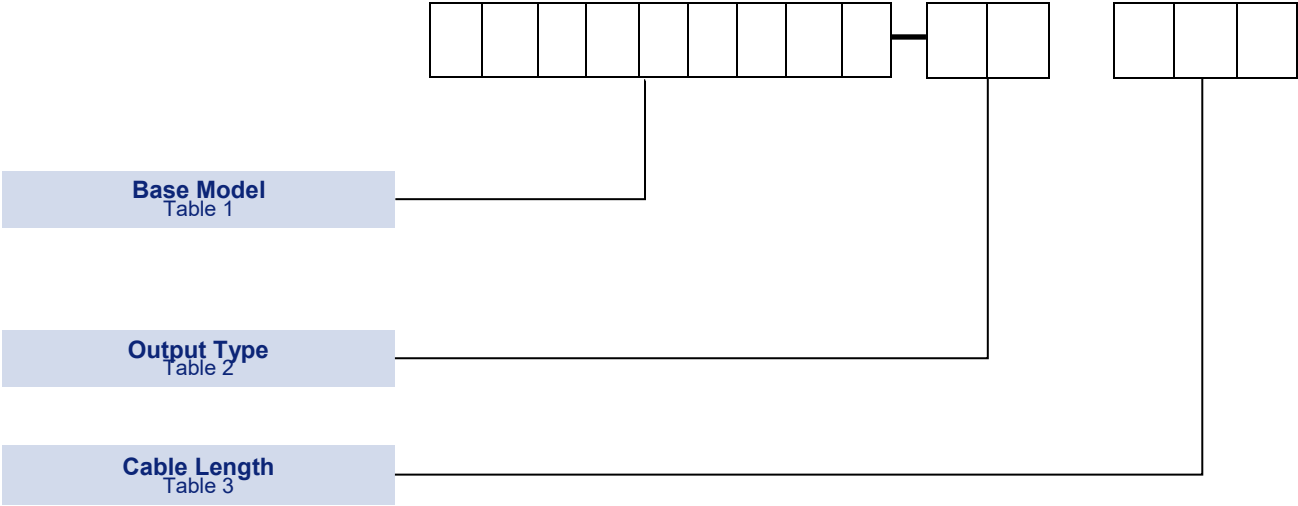
Liquid Level & Flow Measurement

Model: DMSP900

How to order

Transmitters can be configured by selecting codes representing the desired features from the tables that follow.

The chart below, describes how the model code is built up. For assistance in configuring a transmitter that best suits your needs, please contact your local sales office.





## Models

Standard sensor.

Range up to 6m

Standard sensor.

Range up to 6m

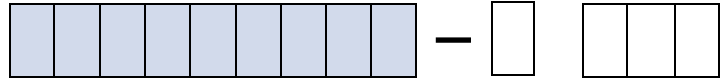
Large sensor.

Range up to 10m

Large sensor.

Range up to 15m

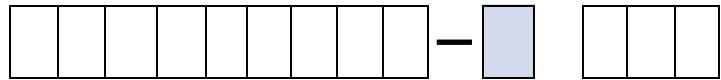
TABLE 1



All models are capable of giving Level, Contents and Open Channel Flow	Code
<b>Range 0.25m to 6m. Process connections 1" BSP upper, 2" BSP lower.</b> PVDF, with weather protection IP68, cable length as required (see table 3).	<b>DMSP900SH</b>
<b>Range 0.25m to 6m. Process connections 1" BSP upper, 2" NPT lower.</b> PVDF, with weather protection IP68, cable length as required (see table 3).	<b>DMSP901SH</b>
<b>Range 0.35m to 10m. Process connections 1" BSP upper.</b> PVDF body with weather protection IP68, cable length as required (see table 3).	<b>DMSP902SH</b>
<b>Range 0.45m to 15m. Process connections 1" BSP upper.</b> PVDF body with weather protection IP68, cable length as required (see table 3).	<b>DMSP903SH</b>

## Certification

TABLE 2



Description	Code
No Ex approval.	<b>N</b>
ATEX Intrinsically Safe certification: Ex II 1 G Ex ia IIB T6...T5 Ga	<b>A</b>
FM/CSA Intrinsically Safe certification (for future use):	<b>U</b>

## Cable Length

TABLE 3



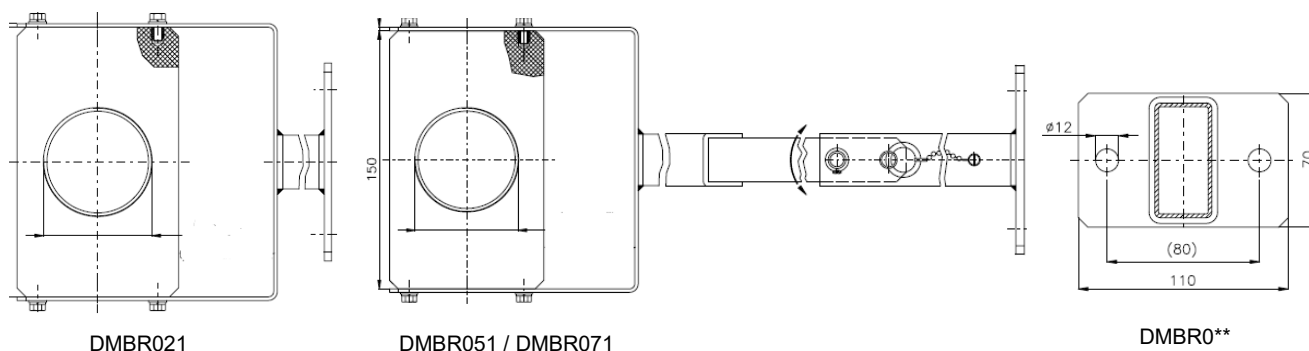
Description	Code
2 x 0.5 mm <sup>2</sup> shielded cable, Ø7.5 mm: standard length 5m	<b>/5</b>
2 x 0.5 mm <sup>2</sup> shielded cable, Ø7.5 mm: 10m	<b>/10</b>
2 x 0.5 mm <sup>2</sup> shielded cable, Ø7.5 mm: 20m	<b>/20</b>
2 x 0.5 mm <sup>2</sup> shielded cable, Ø7.5 mm: 30m	<b>/30</b>

Liquid Level & Flow Measurement  
Model: DMSP900

## Installation

Installation Brackets: 1" BSP thread to fit all DMSP900 transmitters, for horizontal mounting off a supporting structure

Length: fixing point to transmitter	Model
200mm	DMBR021
500mm	DMBR051
700mm	DMBR071



A range of flange adaptors are also available on request

## Technical Specification

DMSP90xSH			
ULTRASONIC LEVEL TRANSMITTERS	<b>Materials</b>	PVDF transducer and housing	<b>Power Supply</b> <b>For Ex models</b>
	<b>Ambient temperature</b> <b>For Ex models</b>	-30 to 80°C (-22 to 176°F) -20 to 70°C (-4 to 158°F)	13.4 to 36 V DC – 48 to 720 mW 12V to 30V DC
	<b>Process temperature</b> <b>For Ex models</b>	-30 to 90°C (-22 to 194°F) -20 to 80°C (-4 to 176°F)	<b>LED indication</b>
	<b>Operating Pressure</b> <b>(absolute)</b>	0.5 to 3 Bar (7.3 to 43.5 psia)	Red/Green on connector
	<b>RANGES</b>	DMSP900SH = 0.25 to 6m (80kHz) DMSP901SH = 0.25 to 6m (80kHz) DMSP902SH = 0.35 to 10m (60kHz) DMSP903SH = 0.45 to 15m (40kHz) Total beam angle: 5°	<b>IP rating</b>
	<b>Accuracy</b>	+/- (0.2% of distance + 0.05% of range)	IP68
	<b>Resolution (acc. to range)</b>	<2 m: 1 mm, 2 to 5 m: 2 mm 5 to 10 m: 5 mm, >10m: 10mm	<b>Electric protection</b>
	<b>Ex marking</b> <b>DMSP9****-A only)</b> <b>Intrinsically Safe Data</b>	Ex II 1 G Ex ia IIB T6...T5 Ga U <sub>i</sub> ≤ 30V; I <sub>i</sub> ≤ 140mA; P <sub>i</sub> ≤ 1W; C <sub>i</sub> ≤ 28nF; L <sub>i</sub> ≤ 200µH	Class III
			<b>Cable</b>
			2 -core
			<b>Process connections</b> (refer dimensional drawings on page 6)
			Range 6m: Upper: 1" BSP Lower: 2" BSP or NPT
			Range 10m: Upper 1" BSP
			Range 15m: Upper 1" BSP
			<b>Programming</b>
			HART protocol
			<b>Weight (with 3m of Cable)</b>
			1.2 Kgs (with 3m cable)

## Approvals

### EUROPEAN DIRECTIVES



#### **Electromagnetic Compatibility Directive (EMC) 2014/30/EU**

Compliant to EMC directive

#### **Pressure Equipment Directive (PED) 2014/68/EU:**

This product is outside the scope of the PED directive



#### **ATEX Directive 2014/34/EU**

Intrinsically Safe

Certificate No. BKI20ATEX0019 X

EN 60079-0, EN 60079-11

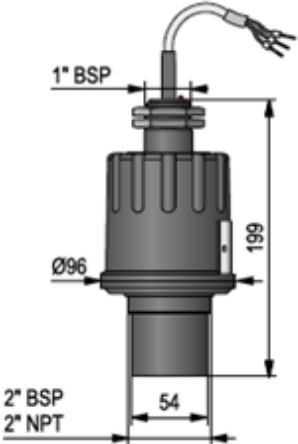
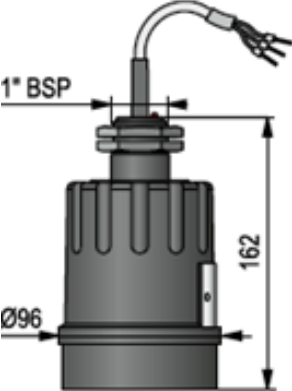
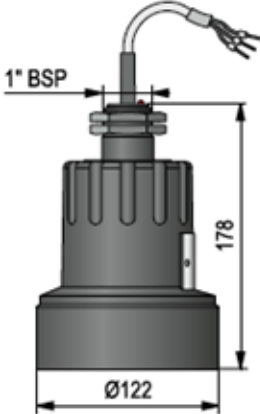
For Zone 0 models (Code A, see Table 2)



II 1 G

Ex ia IIB T6...T5 Ga (-20°C ≤ Ta ≤ +70°C)

Dimensions

GENERAL DIMENSIONS		
DSMP900SH & DMSP901SH Range up to 6m	DMSP902SH Range up to 10m	DMSP903SH Range up to 15m
		

Special Engineering

For these instruments, we have many other options already designed and configured, for example:

- PP body
- Alternative cables, including low smoke or halogen free.

Other options can also be designed to meet specific requirements of an application. Please contact us for further information.