

# Technical Information

## RA33

### Batch Controller



### Batch Controller for the batching and dosing of mass and volume

#### Applications

Recording and control of slow batch processes with a duration of longer than 10 seconds. Typical applications include:

- Food industry
- Chemical industry
- Pharmaceutical industry
- Oil and gas industry

#### Your benefits

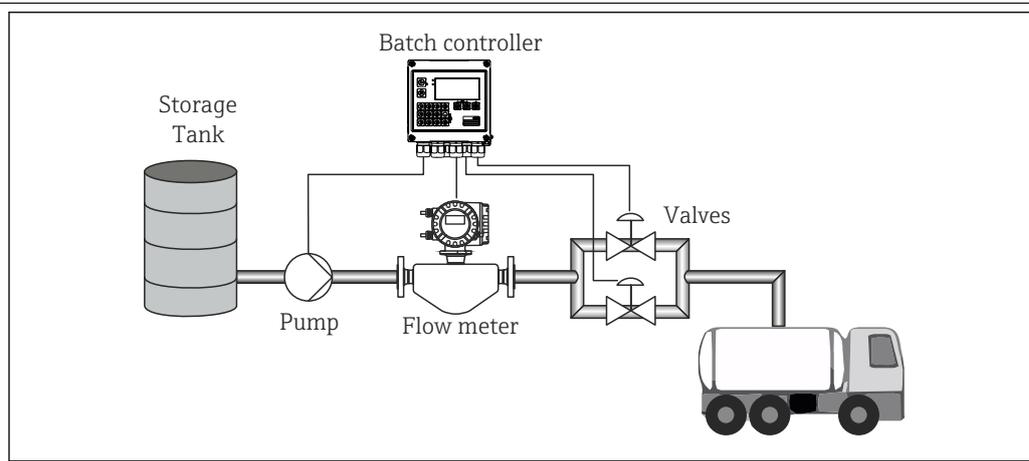
- Swift commissioning and easy operation with plain text in language of your choice
- Valve control for single-stage and two-stage batching
- Automatic after-run correction for constant, highly accurate results
- Temperature/density compensation as per ASTM D1250-04
- Standard models are suitable for connecting and supplying all common flow transmitters, temperature sensors and density sensors
- Detailed logging of batch reports as well as error messages, limit value violations and changes to operating parameters
- Advanced error diagnostics for leakage, fill deviation and "no flow"
- Industry-compliant compact housing for field or wall mounting, panel mounting or DIN rail mounting
- Remote control option to start and abort batch runs
- Daily, monthly and annual statistics on the batch run size and quantity
- Remote readout via Ethernet and fieldbuses

## Function and system design

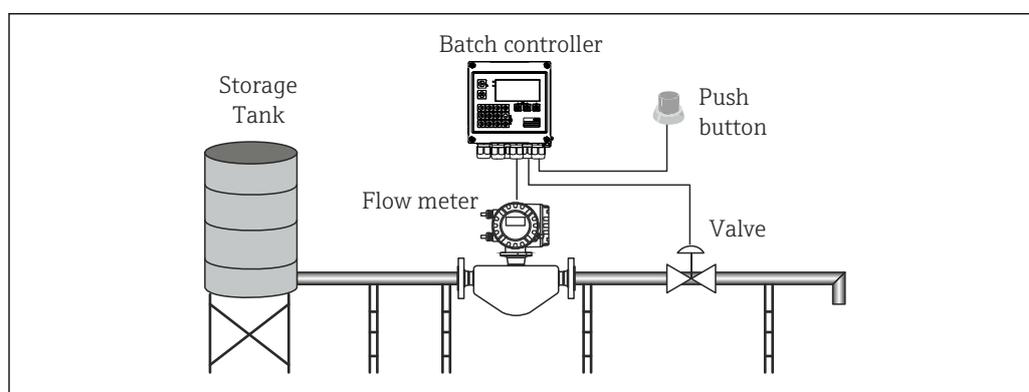
### Measuring principle

The Batch Controller RA33 is designed to record flow and control output signals for valves and pumps to ensure the exact dosing of predefined batch quantities. The calculation is based on measuring the current rate of flow and then totalizing or recording the quantity using pulses. The measured volume can be corrected with the temperature/density compensation function. Here, mineral oils can be corrected according to the ASTM D1250-04 standard. The volumes of other media can be corrected using expansion coefficients, or the volume can be converted to mass by measuring the density.

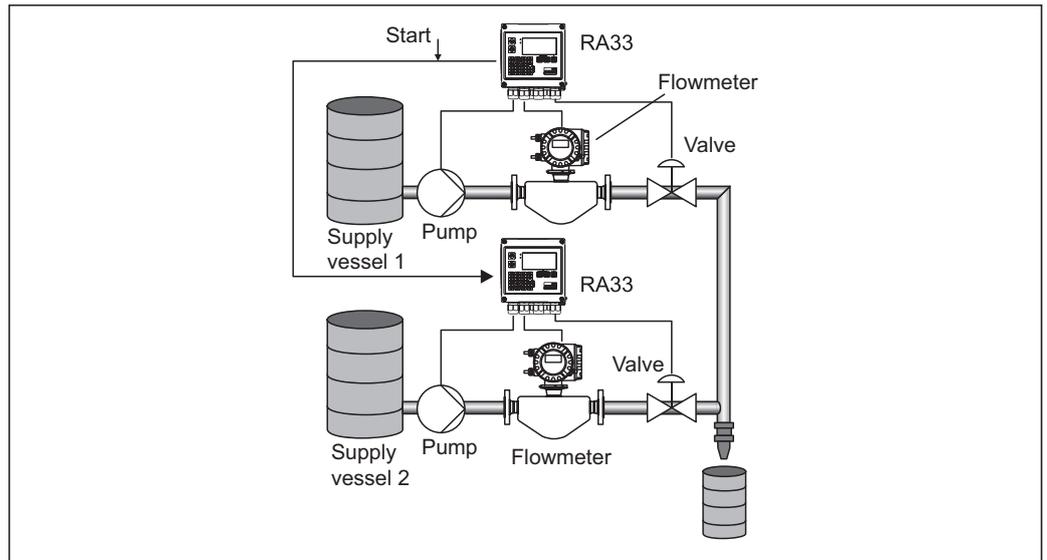
### Measuring system



1 Application: Batch Controller RA33 with two-stage batching to fill a tank truck



2 Application: manual batching without a pump with the Batch Controller RA33



A0014357-EN

3 Application: blending of two liquids when batching with the Batch Controller RA33

## Functions

### Batch control

The function of the Batch Controller RA33 is to control valves and pumps using the measured rate of flow and to fill a precise volume of the medium into a container.

Three different batch modes are available to perform this task:

- **Standard mode:** A value for the preset counter must be entered before batching commences. Batching can then be started by pressing the start button or via the digital input. The flow is measured, the counter calculates the volume and the pumps and valves are stopped as soon as the specified volume is reached. The value on the preset counter remains for the next run but can be changed manually.
- **Automatic restart:** In this scenario, the system repeatedly fills the selected fill quantity until the sequence ends. It is also possible to define an interval between the individual fill quantities. For added safety, a control input can also be assigned a blocking function which prevents the batching operation from restarting automatically.
- **Manual mode:** In the manual mode, it is possible to perform batching without a preset counter. The device registers the total flow between the start and end of a batch. The batch must be started and ended by pressing a button or via the control input.

**i** The device is suitable for the automatic control of slow batch processes with a duration of longer than 10 seconds..

### After-run correction

The after-run correction is a volume that is determined by the system response time. On the basis of this volume, the stop command from the batch control system is executed earlier in order to achieve maximum batching accuracy. Two correction capabilities, which build on one another, are implemented in the device.

- **Fixed after-run correction:** A fixed value can be specified if the system response time is known, or in order to keep the after-run quantity as low as possible when initially teaching the device and configuring it for the automatic correction function.
- **Automatic after-run correction:** It is advisable to enable automatic after-run correction. It complements manual correction and constantly optimizes the lead time before the valve is closed and the pump is switched off in order to permanently obtain precise batching results, and to compensate for possible system changes brought about by aging or external influencing factors.

### Outputs (optional)

The additional output package comprises two more digital outputs (open collector) and a pulse/analog output. These digital outputs are non-wearing and are thus suitable for a high number of switching cycles. Furthermore, a counter, a flow or a user-definable ramp function to indicate the progress of the batching can be output with the additional pulse/analog output.

### Temperature/density compensation (optional)

The temperature/density compensation enables compensation for various kinds of media. Compensation via temperature measurement, or temperature and density measurement, can be selected for mineral oils. The values measured are then converted to a compensated volume at 15 °C, 20 °C or 60 °F using the ASTM D1250-04 standard.

The compensation of user-defined media is a second possibility. A volume can be corrected by measuring the temperature and applying an expansion coefficient, or by measuring the density. Volume can also be converted to mass with a density measurement. The preset counter can also be set for this mass unit.

### Data logging/logbook

Data logging comprises three specific areas. Batching reports, daily, monthly and annual statistics, and a log of events are stored in the device.

- Batch report: A batch report is created for each batch run. This report contains any error messages that might have occurred. The preset counter value, the volume actually filled, the batch name and number, as well as the date and time are saved in every report.
- Statistics: Daily, monthly and annual statistics are generated internally. They contain information on the number of batches executed, the number of batches without errors, and the total amount.
- Event logbook: All the relevant device events are logged in the event logbook. These include setup changes, power outages, sensor errors and firmware updates.

### Real time clock (RTC)

The device has a real time clock that can be synchronized via a free digital input or using the Field Data Manager software MS20.

The real time clock continues running even in case of a power outage, the device documents power on and off; the clock switches either automatically or manually from daylight saving to standard time.

### Display

To display measured values, counters and calculated values, six groups are available. Each group can be assigned up to 3 values or meter readings as desired.

### Analyzing the stored data—Field Data Manager software MS20

The Field Data Manager software allows the saved measured values, alarms and events, as well as the device configuration to be read out from the device (automatically) and backed up securely in an SQL database in such a way that they are tamper-proof. The software offers centralized data management with a variety of visualization functions. Using an integrated system service, analyses and reports can be compiled, printed and saved fully automatically. Security is guaranteed by the FDA-compliant audit trail of the software and by the extensive user management functionality. Simultaneous access to and analysis of data from different workstations or different users is supported (client-server architecture).

## Communication interfaces

A USB interface (with CDI protocol), and optionally Ethernet, are used to configure the device and read out the values. ModBus is optionally available as a communication interface.

None of the interfaces has a modifying effect on the device in accordance with PTB Requirement PTBA 50.1.

#### USB device

|                    |                                 |
|--------------------|---------------------------------|
| Terminal:          | Type B socket                   |
| Specification:     | USB 2.0                         |
| Speed:             | "Full Speed" (max. 12 MBit/sec) |
| Max. cable length: | 3 m (9.8 ft)                    |

#### Ethernet TCP/IP

The Ethernet interface is optional and cannot be combined with other optional interfaces. It is galvanically isolated (testing voltage: 500 V). A standard patch cable (e.g. CAT5E) can be used for

the connection. A special cable gland is available for this purpose which allows users to guide pre-terminated cables through the housing. Via the Ethernet interface, the device can be connected to office equipment using a hub or a switch.

|                    |                               |
|--------------------|-------------------------------|
| standard:          | 10/100 Base-T/TX (IEEE 802.3) |
| Socket:            | RJ-45                         |
| Max. cable length: | 100 m (328 ft)                |

**RS232 printer interface**

The RS232 interface is optional and cannot be combined with other optional interfaces. A commercially available serial ASCII printer can be connected via the RS232 interface to print out batching reports directly from the device.

|                        |   |
|------------------------|---|
| Terminal:              | 3-pin plug-in terminal                          |
| Transmission protocol: | serial  |
| Transmission rate:     | 300/1200/2400/4800/9600/19200/38400/57600/76800 |

**RS485**

|                        |                             |
|------------------------|-----------------------------|
| Terminal:              | 3-pin plug-in terminal      |
| Transmission protocol: | RTU                         |
| Transmission rate:     | 2400/4800/9600/19200/38400  |
| Parity:                | choose from none, even, odd |

**Modbus TCP**

The Modbus TCP interface is optional and cannot be ordered with other optional interfaces. It is used to connect the device to higher-order systems to transmit all measured values and process values. Form a physical point of view, the Modbus TCP interface is identical to the Ethernet interface.

**Modbus RTU**

The Modbus RTU (RS-485) interface is optional, and cannot be ordered with other optional interfaces.

It is galvanically isolated (testing voltage: 500 V) and is used to connect to higher-order systems to transmit all measured values and process values. It is connected via a 3-pin plug-in terminal.

## Input

**Current/pulse input**

This input can be used either as a current input for 0/4 to 20 mA signals or as a pulse or frequency input. Sensors for volume or mass flow measurement can be connected to the Batch Controller.

The input is galvanically isolated (500 V testing voltage towards all other inputs and outputs).

**Cycle time**

The cycle time is 125 ms.

**Response time**

In the case of analog signals, the reaction time is the time between the change at the input and the time when the output signal is equivalent to 90 % of the full scale value.

| Input                             | Output                        | Reaction time [ms] |
|-----------------------------------|-------------------------------|--------------------|
| Current                           | Current                       | ≤ 440              |
| Current                           | Relay/digital output          | ≤ 250              |
| RTD                               | Current/ relay/digital output | ≤ 440              |
| Cable break detection             | Current/ relay/digital output | ≤ 440              |
| Cable open circuit detection, RTD | Current/ relay/digital output | ≤ 1100             |

| Input       | Output               | Reaction time [ms] |
|-------------|----------------------|--------------------|
| Pulse input | Pulse output         | ≤ 600              |
| Pulse input | Relay/digital output | ≤ 250              |

### Current input

|                           |  |
|---------------------------|--|
| Measuring range:          | 0/4 to 20 mA + 10 % over range             |
| Accuracy:                 | 0.1 % of full scale value                  |
| Temperature drift:        | 0.01 %/K (0.0056 %/°F) of full scale value |
| Loading capacity:         | Max. 50 mA, max. 2.5 V                     |
| Input impedance (load):   | 50 Ω                                       |
| HART® signals             | Not affected                               |
| A/D converter resolution: | 20 bit                                     |

### Pulse/frequency input

The pulse/frequency input can be configured for different frequency ranges:

- Pulses and frequencies 0.3 Hz to 12.5 kHz
- Pulses and frequencies 0.3 to 25 Hz (filters out bounce contacts, max. bounce time: 5 ms)

|   |  |
|---|--|
| <b>Minimum pulse width:</b>   |  |
| Range up to 12.5 kHz  | 40 μs  |
| Range up to 25 Hz   | 20 ms  |
| <b>Maximum permissible contact bounce time:</b>   |  |
| Range up to 25 Hz   | 5 ms   |
| <b>Pulse input for active voltage pulses and contact sensors as per EN 1434-2, Class IB and IC:</b> |  |
| Non-conductive state  | ≤ 1 V  |
| Conductive state  | ≥ 2 V  |
| No-load supply voltage:   | 3 to 6 V   |
| Current limiting resistance in the power supply (pull-up at input):                                 | 50 to 2 000 kΩ   |
| Maximum permissible input voltage:  | 30 V (for active voltage pulses)                       |
| <b>Pulse input for contact sensors as per EN 1434-2, Class ID and IE:</b>                           |  |
| Low-level   | ≤ 1.2 mA   |
| High-level  | ≥ 2.1 mA   |
| No-load supply voltage:   | 7 to 9 V   |
| Current limiting resistance in the power supply (pull-up at input):                                 | 562 to 1 000 Ω   |
| Not suitable for active input voltages  |  |
| <b>Current/pulse input:</b>   |  |
| Low-level   | ≤ 8 mA   |
| High-level  | ≥ 13 mA  |
| Loading capacity:   | Max. 50 mA, max. 2.5 V                                 |
| Input impedance (load):   | 50 Ω   |
| <b>Accuracy during frequency measurement:</b>   |  |
| Basic accuracy:   | 0.01 % of measured value                               |
| Temperature drift:  | 0.01 % of measured value over entire temperature range |

**Temperature input current/RTD**

These inputs can be used either as current inputs (0/4 to 20 mA) or as RTD inputs (RTD = Resistance Temperature Detector = resistance thermometer). It is also possible to configure one input as a current input and the other as an RTD input.

The two inputs are galvanically connected but galvanically isolated from the other inputs and outputs (testing voltage: 500 V).

*Cycle time*

The cycle time of the temperature measurement is 500 ms.

*Current input*

|                                 |  |
|---------------------------------|--|
| Measuring range:                | 0/4 to 20 mA + 10 % over range             |
| Accuracy:                       | 0.1 % of full scale value                  |
| Temperature drift:              | 0.01 %/K (0.0056 %/°F) of full scale value |
| Loading capacity:               | Max. 50 mA, max. 2.5 V                     |
| Input impedance (load):         | 50 Ω                                       |
| A/D converter resolution:       | 24 bit                                     |
| HART® signals are not affected. |  |

*RTD input*

Pt100, Pt500 and Pt1000 resistance temperature detectors can be connected to this input.

|                               |  |
|-------------------------------|--|
| Measuring ranges:             |  |
| Pt100_exact:                  | -200 to 300 °C (-328 to 572 °F)  |
| Pt100_wide:                   | -200 to 600 °C (-328 to 1 112 °F)  |
| Pt500:                        | -200 to 300 °C (-328 to 572 °F)  |
| Pt1000:                       | -200 to 300 °C (-328 to 572 °F)  |
| Connection method:            | 2-, 3- or 4-wire connection  |
| Accuracy:                     | 4-wire:<br>0.06 % of measuring range<br>3-wire:<br>0.06 % of measuring range + 0.8 K (1.44 °F) |
| Temperature drift:            | 0.01 %/K (0.0056 %/°F) of measuring range  |
| Characteristic curves:        | DIN EN 60751:2008 IPTS-90  |
| Max. cable resistance:        | 40 Ω   |
| Cable open circuit detection: | Outside the measuring range  |

**Density input**

*Cycle time*

The cycle time of the density measurement is 125 ms.

|                         |  |
|-------------------------|--|
| Measuring range:        | 0/4 to 20 mA + 10 % over range             |
| Accuracy:               | 0.1 % of full scale value                  |
| Temperature drift:      | 0.01 %/K (0.0056 %/°F) of full scale value |
| Loading capacity:       | Max. 50 mA, max. 2.5 V                     |
| Input impedance (load): | 50 Ω                                       |

|   |        |
|---|--------|
| A/D converter resolution:                   | 24 bit |
| HART <sup>®</sup> signals are not affected. |        |

### Digital inputs

The digital inputs can be used for external control. A batch run can be started or stopped via these inputs, or the inputs can prevent a new batch from starting. In addition, the time can be synchronized.

## Output

### Current/pulse output (option)

This output can be used either as a 0/4 to 20 current output or as a voltage pulse output.

The output is galvanically isolated (500 V testing voltage towards all other inputs and outputs).

#### Current output (active)

|                           |  |
|---------------------------|--|
| Output range:             | 0/4 to 20 mA + 10 % overrange                  |
| Load:                     | 0 to 600 Ω (as per IEC 61131-2)                |
| Accuracy:                 | 0.1 % of full scale value                      |
| Temperature drift:        | 0.01 %/K (0.0056 %/°F) of full scale value     |
| Inductive load:           | Max. 10 mH                                     |
| Capacitance load:         | Max. 10 μF                                     |
| Ripple:                   | Max. 12 mVpp on 600 Ω for frequencies < 50 kHz |
| D/A converter resolution: | 14 bit   |

#### Impulse output (active)

|                         |                                   |
|-------------------------|-----------------------------------|
| Frequency:              | Max. 12.5 kHz                     |
| Pulse width:            | min.40 μs                         |
| Voltage level:          | Low: 0 to 2 V<br>High: 15 to 20 V |
| Maximum output current: | 22 mA                             |
| Short-circuit proof     |                                   |

### 2 x relay output

The relays are designed as NO contacts. The output is galvanically isolated (1 500 V testing voltage towards all other inputs and outputs).

|                                |                                 |
|--------------------------------|---------------------------------|
| Max. relay switching capacity: | AC: 250 V, 3 A<br>DC: 30 V, 3 A |
| Minimum contact load:          | 10 V, 1 mA                      |
| Min. Switching cycles:         | >10 <sup>5</sup>                |

### 2 x digital output, open collector (option)

The two digital inputs are galvanically isolated from one another and from all the other inputs and outputs (testing voltage: 500 V). The digital outputs can be used as status or pulse outputs.

|              |             |
|--------------|-------------|
| Frequency:   | Max. 1 kHz  |
| Pulse width: | min.500 μs  |
| Current:     | Max. 120 mA |
| Voltage:     | Max. 30 V   |

|                          |  |
|--------------------------|--|
| Voltage drop:            | Max. 2 V in conductive state   |
| Maximum load resistance: | 10 kΩ<br> For higher values, the switching edges are flattened. |

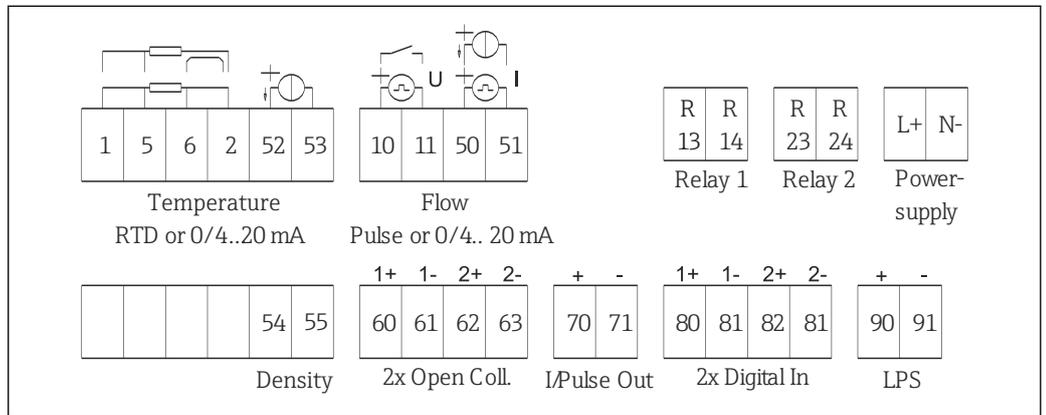
**Auxiliary voltage output (transmitter power supply)**

The auxiliary voltage output can be used to power the transmitter or control the digital inputs. The auxiliary voltage is short-circuit proof and galvanically isolated (500 V testing voltage towards all other inputs and outputs).

|                                 |                                |
|---------------------------------|--------------------------------|
| Output voltage:                 | 24 V DC ±15 % (not stabilized) |
| Output current:                 | Max. 70 mA                     |
| HART® signals are not affected. |                                |

## Power supply

**Terminal assignment**



4 Terminal assignment of RA33

A0014120

**Supply voltage**

- Low voltage power unit: 100 to 230 V AC (-15 % / +10 %) 50/60 Hz
- Extra-low voltage power unit:
  - 24 V DC (-50 % / +75 %)
  - 24 V AC (±50 %) 50/60 Hz

An overload protection unit (rated current ≤ 10 A) is required for the power cable.

**Power consumption**

15 VA

## Performance characteristics

|                                       |   |
|---------------------------------------|---|
| <b>Reference operating conditions</b> | <ul style="list-style-type: none"> <li>■ Power supply 230 V AC <math>\pm 10\%</math>; 50 Hz <math>\pm 0.5</math> Hz</li> <li>■ Warm-up time &gt; 2 h</li> <li>■ Ambient temperature 25 °C <math>\pm 5</math> K (77 °F <math>\pm 9</math> °F)</li> <li>■ Humidity 39 % <math>\pm 10</math> % RH</li> </ul> |
|---------------------------------------|---|

|                        |   |
|------------------------|---|
| <b>Arithmetic unit</b> | The system operates with a scan cycle of 125 ms. The flow at the specified response times is reliably recorded by the Batch Controller, but may deviate by this amount from the preset filling quantity. By using the after-run correction or reducing the flow rate in single-stage batching, the accuracy of the fill volume is increased. Using two filling stages enables both fast and highly accurate batching. |
|------------------------|---|

## Installation

|                          |  |
|--------------------------|--|
| <b>Mounting location</b> | Wall/pipe mounting, panel or DIN rail as per IEC 60715 |
|--------------------------|--|

|                              |   |
|------------------------------|---|
| <b>Installation position</b> | The only factor determining the orientation is the legibility of the display. |
|------------------------------|---|

## Environment

|                                  |                               |
|----------------------------------|-------------------------------|
| <b>Ambient temperature range</b> | -20 to +60 °C (-4 to +140 °F) |
|----------------------------------|-------------------------------|

|                            |                                |
|----------------------------|--------------------------------|
| <b>Storage temperature</b> | -30 to +70 °C (-22 to +158 °F) |
|----------------------------|--------------------------------|

|                      |  |
|----------------------|--|
| <b>Climate class</b> | as per IEC 60 654-1 Class B2, as per EN 1434 environmental class C |
|----------------------|--|

|                 |   |
|-----------------|---|
| <b>Humidity</b> | Maximum relative humidity 80 % for temperatures up to 31 °C (87.8 °F), decreasingly linearly to 50 % relative humidity at 40 °C (104 °F). |
|-----------------|---|

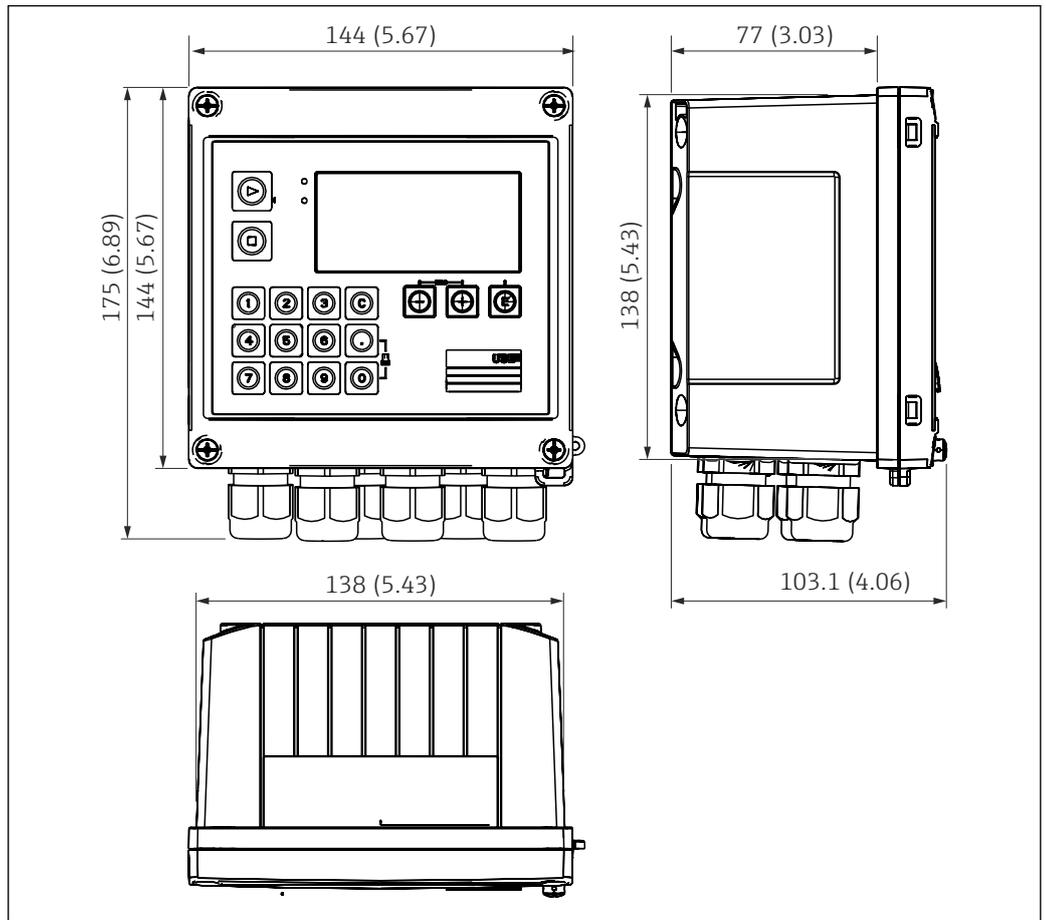
|                          |   |
|--------------------------|---|
| <b>Electrical safety</b> | <p>As per IEC 61010-1 and CAN C22.2 No 1010-1.</p> <ul style="list-style-type: none"> <li>■ Class II equipment</li> <li>■ Overvoltage category II</li> <li>■ Pollution level 2</li> <li>■ Overload protection <math>\leq 10</math> A</li> <li>■ Installation height: up to 2 000 m (6 560 ft.) above MSL</li> </ul> |
|--------------------------|---|

|                             |  |
|-----------------------------|--|
| <b>Degree of protection</b> | <ul style="list-style-type: none"> <li>■ Panel mounting: IP65 at front, IP20 at rear</li> <li>■ DIN rail: IP20</li> <li>■ Field housing: IP66, NEMA4x (for cable gland with double seal insert: IP65)</li> </ul> |
|-----------------------------|--|

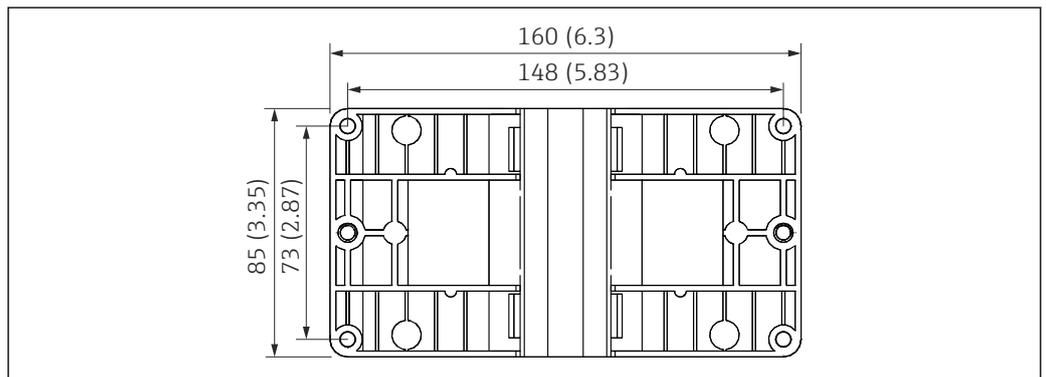
|                                      |   |
|--------------------------------------|---|
| <b>Electromagnetic compatibility</b> | as per EN 1434-4, EN 61326 and NAMUR NE21 |
|--------------------------------------|---|

## Mechanical construction

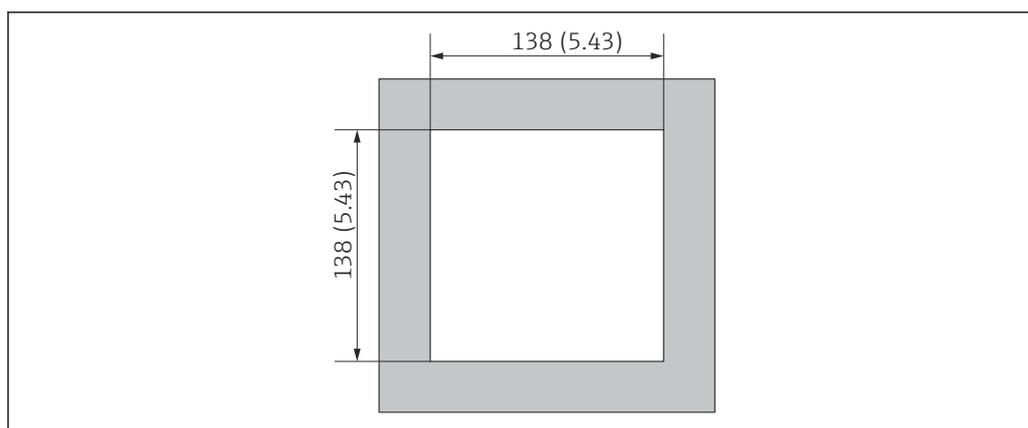
### Design, dimensions



5 Batch Controller housing; dimensions in mm (in)

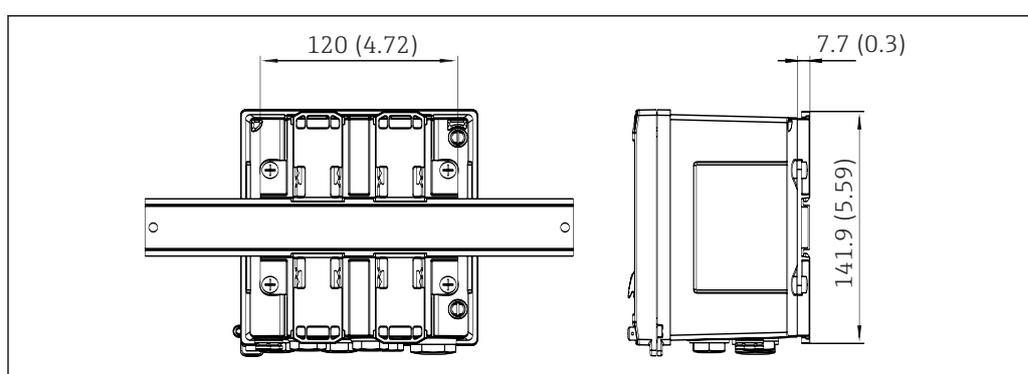


6 Mounting plate for wall, pipe and panel mounting; dimensions in mm (in)



A0014171

7 Panel cutout in mm (in)



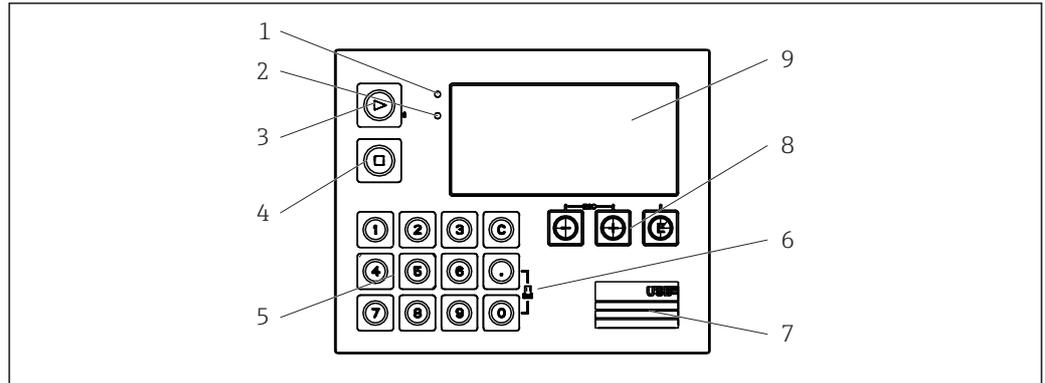
A0014610

8 Dimensions of DIN rail adapter in mm (in)

|                  |   |
|------------------|---|
| <b>Weight</b>    | Approx. 700 g (1.5 lbs)   |
| <b>Materials</b> | Housing: fiber-glass reinforced plastic, Valox 553  |
| <b>Terminals</b> | Spring terminals, 2.5 mm <sup>2</sup> (14 AWG); auxiliary voltage with plug-in screw terminal (30-12 AWG; torque 0.5 to 0.6 Nm) . |

## Operability

|                         |   |
|-------------------------|---|
| <b>Languages</b>        | You can choose from one of the following operating languages on the device: English, German, French, Spanish, Italian, Dutch, Portuguese, Polish, Russian, Czech  |
| <b>Display elements</b> | <ul style="list-style-type: none"> <li>■ Display:           <ul style="list-style-type: none"> <li>160 x 80 dot-matrix LCD with white backlighting, color changes to red in the event of an alarm, active display area 70 x 34 mm (2.76" x 1.34")</li> </ul> </li> <li>■ LED status display:           <ul style="list-style-type: none"> <li>Operation: 1 x green</li> <li>Fault message: 1 x red</li> </ul> </li> </ul> |



A0014276

#### 9 Display and operating elements

- 1 Green LED, "Operation"
- 2 Red LED, "Fault message"
- Function keys:
- 3 Start batch manually
- 4 Stop batch manually
- 5 Numeric keypad
- 6 Start printout
- 7 USB connection for configuration
- 8 Operating keys: -, +, E
- 9 Display: 160x80 dot-matrix display

#### Local operation

3 keys, "-", "+", "E".

##### 14 function keys:

- Start / stop function: Press the "Start" button to start a batch run. Press "Stop" to pause the batch that is currently running. Press "Stop" again to abort the batch; press "Start" to resume the batch run.
- Function C: Press "C" when a batch is stopped to reset the counters on the display to their initial values.
- Print function: Press "0" and "." simultaneously to trigger a printout of the last batch run. To avail of this functionality, the "RS232 printer interface" option must be purchased.

#### Configuration interface

USB interface at front, optional Ethernet: configuration via PC with FieldCare Device Setup configuration software.

#### Data logging

##### Real-time clock

- Deviation: 15 min per year
- Power reserve: 1 week

#### Software

- **Field Data Manager software MS20:** visualization software and database for analyzing and evaluating the measured data and calculated values as well as tamper-proof data logging.
- **FieldCare Device Setup:** The device can be configured with the FieldCare PC software. FieldCare Device Setup is included in the scope of delivery for RXU10-G1 (see "Accessories") or can be downloaded free of charge from [www.produkte.endress.com/fieldcare](http://www.produkte.endress.com/fieldcare).

## Certificates and approvals

#### CE mark

The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EC directives. The manufacturer confirms successful testing of the product by affixing to it the CE-mark.

## Other standards and guidelines

- IEC 60529:  
Degrees of protection provided by enclosures (IP code)
- IEC 61010-1: 2001 cor 2003  
Protection Measures for Electrical Equipment for Measurement, Control, Regulation and Laboratory Procedures
- IEC 61326 series:  
Electromagnetic compatibility (EMC requirements)
- NAMUR NE21, NE43:  
Association for Standards for Control and Regulation in the Chemical Industry
- ASTM D1250-04 / API MPMS 11.1  
Manual of Petroleum Measurement Standards Chapter 11–Physical Properties Data Section 1.

## CSA GP

CAN/CSA-C22.2 No. 61010-1, 2<sup>nd</sup> edition

## Ordering information

Detailed ordering information is available from the following sources:

- In the Product Configurator on the Endress+Hauser website: [www.endress.com](http://www.endress.com) -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator.
- From your Endress+Hauser Sales Center: [www.addresses.endress.com](http://www.addresses.endress.com)



### Product Configurator - the tool for individual product configuration

- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

## Scope of delivery

The scope of delivery comprises:

- Batch Controller in field housing
- Wall mounting plate
- Hard copy of Brief Operating Instructions
- Optional 3 pcs connecting terminal (each 5-pin)
- Optional interface cable and DVD set with FieldCare Device Setup configuration software
- Optional Field Data Manager software MS20
- Optional mounting hardware for DIN rail, panel mounting, pipe mounting
- Optional overvoltage protection

## Accessories

Various accessories, which can be ordered with the device or subsequently from Endress+Hauser, are available for the device. Detailed information on the order code in question is available from your local Endress+Hauser sales center or on the product page of the Endress+Hauser website: [www.endress.com](http://www.endress.com).

**Device-specific accessories For the transmitter**

| Accessories              | Description  |
|--------------------------|--|
| Weather protection cover | Is used to protect the measuring device from the effects of the weather: e.g. rainwater, excess heating from direct sunlight or extreme cold in winter.<br> For details, see Installation Instructions SD00333F |
| Pipe mounting set        | Mounting plate for pipe mounting   |
| DIN rail mounting set    | DIN rail adapter for DIN rail mounting   |
| Panel mounting set       | Mounting plate for panel mounting  |

**For the sensor**

| Accessories    | Description  |
|----------------|--|
| Heating jacket | Is used to stabilize the temperature of the fluids in the sensor.<br>Water, water vapor and other non-corrosive liquids are permitted for use as fluids. If using oil as a heating medium, please consult with Endress+Hauser. Heating jackets cannot be used with sensors fitted with a rupture disk.<br> For details, see Operating Instructions BA00099D |

**Communication-specific accessories**

|                             |  |
|-----------------------------|--|
| FDM software                | Visualization software and SQL-based database "Field Data Manager software (FDM)" MS20<br> For details, see "Technical Information" TI01022R  |
| RXU10-G1                    | USB cable and FieldCare Device Setup configuration software incl. DTM library  |
| Commubox FXA195 HART        | For intrinsically safe HART communication with FieldCare via the USB interface.<br> For details, see "Technical Information" TI00404F   |
| HART Loop Converter HMX50   | Is used to evaluate and convert dynamic HART process variables to analog current signals or limit values.<br> For details, see "Technical Information" TI00429F and Operating Instructions BA00371F   |
| Wireless HART adapter SWA70 | Is used for the wireless connection of field devices.<br>The WirelessHART adapter can be easily integrated into field devices and existing infrastructures, offers data protection and transmission safety and can be operated in parallel with other wireless networks with minimum cabling complexity.<br> For details, see Operating Instructions BA061S |
| Fieldgate FXA320            | Gateway for the remote monitoring of connected 4-20 mA measuring devices via a Web browser.<br> For details, see "Technical Information" TI00025S and Operating Instructions BA00053S   |
| Fieldgate FXA520            | Gateway for the remote diagnostics and remote configuration of connected HART measuring devices via a Web browser.<br> For details, see "Technical Information" TI00025S and Operating Instructions BA00051S  |
| Field Xpert SFX100          | Compact, flexible and robust industry handheld terminal for remote configuration and for obtaining measured values via the HART current output (4-20 mA).<br> For details, see Operating Instructions BA00060S  |

## Service-specific accessories

| Accessories | Description   |
|-------------|---|
| Applicator  | <p>Software for selecting and sizing Endress+Hauser measuring devices:</p> <ul style="list-style-type: none"> <li>■ Calculation of all the necessary data for identifying the optimum flowmeter: e.g. nominal diameter, pressure loss, accuracy or process connections.</li> <li>■ Graphic illustration of the calculation results</li> </ul> <p>Administration, documentation and access to all project-related data and parameters over the entire life cycle of a project.</p> <p>Applicator is available:</p> <ul style="list-style-type: none"> <li>■ Via the Internet: <a href="https://wapps.endress.com/applicator">https://wapps.endress.com/applicator</a></li> <li>■ On CD-ROM for local PC installation.</li> </ul>   |
| W@M         | <p>Life cycle management for your plant</p> <p>W@M supports you with a wide range of software applications over the entire process: from planning and procurement, to the installation, commissioning and operation of the measuring devices. All the relevant device information, such as the device status, spare parts and device-specific documentation, is available for every device over the entire life cycle.</p> <p>The application already contains the data of your Endress+Hauser device. Endress+Hauser also takes care of maintaining and updating the data records.</p> <p>W@M is available:</p> <ul style="list-style-type: none"> <li>■ Via the Internet: <a href="http://www.endress.com/lifecyclemanagement">www.endress.com/lifecyclemanagement</a></li> <li>■ On CD-ROM for local PC installation.</li> </ul> |
| FieldCare   | <p>FDT-based plant asset management tool from Endress+Hauser.</p> <p>It can configure all smart field units in your system and helps you manage them. By using the status information, it is also a simple but effective way of checking their status and condition.</p> <p> For details, see Operating Instructions BA00027S and BA00059S</p>   |

## System components

| Accessories                                 | Description  |
|---|--|
| Memograph M graphic data manager            | <p>The Memograph M graphic data manager provides information on all the relevant process variables. Measured values are recorded correctly, limit values are monitored and measuring points analyzed. The data are stored in the 256 MB internal memory and also on a SD card or USB stick.</p> <p> For details, see "Technical Information" TI00133R and Operating Instructions BA00247R</p> |
| Overvoltage protection HAW562 DIN rail      | <p>To protect against overvoltage in the power supply and signal/communication cables, Endress+Hauser provides a surge arrester HAW562 for DIN rail mounting.</p> <p> For details, see "Technical Information" TI01012K</p>   |
| Overvoltage protection HAW569 field housing | <p>To protect against overvoltage in the power supply and signal/communication cables, Endress+Hauser provides a surge arrester HAW562 for field mounting.</p> <p> For details, see "Technical Information" TI01013K</p>  |
| RN221N                                      | <p>Active barrier with power supply for safe separation of 4-20 mA standard signal circuits. Offers bidirectional HART transmission.</p> <p> For details, see "Technical Information" TI00073R and Operating Instructions BA00202R</p>  |
| RNS221                                      | <p>Supply unit for powering two 2-wire measuring devices solely in the non-Ex area. Bidirectional communication is possible via the HART communication jacks.</p> <p> For details, see "Technical Information" TI00081R and Brief Operating Instructions KA00110R</p>   |

## Supplementary documentation

- Operating Instructions "RA33 Batch Controller" (BA00300K)
- Brief Operating Instructions "RA33 Batch Controller" (KA00299K)
- Technical Information "Overvoltage protection HAW562" (TI01012K)
- Technical Information "Overvoltage protection HAW569" (TI01013K)
- Brief Operating Instructions "Field Data Manager software" (KA00466C)
- "System Products and Data Managers: Solutions for the loop" brochure (FA00016K)



---

[www.addresses.endress.com](http://www.addresses.endress.com)

---