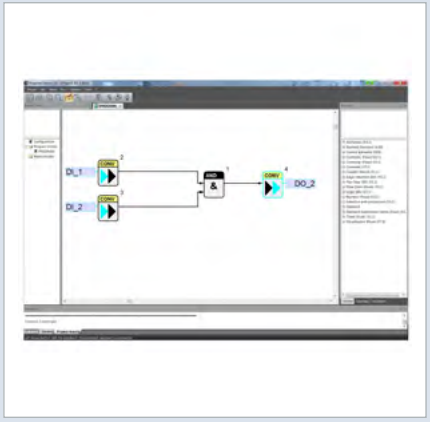

Activation of software functions

- “Batch controller” for precise dosing of liquids
- Simple configuration via a wizard. Intuitive visualisation and operation via a 7" touch display (Type ME61)
- Creation of simple control tasks with the aid of graphic programming
- For test mode: 60 minutes’ run time without licence
- Activation of licence for software functions possible via Bürkert Communicator

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type ME43
Fieldbus gateway

Type ME63
Industrial Ethernet gateway, IP65/ IP67/ IP69k

Type ME44
I/O module, IP20

Type 8098
FLOWave SAW flowmeter

Type ME61
EDIP Process Control Display 7" (17.8 cm)

Type description

With the aid of the “Bürkert Communicator” tool, you can activate licenced software functions, such as the “Batch Controller” or graphic programming (also known as f(x)) on the intended Bürkert products. Filling or control applications can be performed this way.

“Batch Controller” for Type ME43 and Type ME63 - The “Batch Controller” is arranged for the exact dosing of pre-defined quantities in combination with a flowmeter and a corresponding valve. The batch functionality runs on the Type ME43 and Type ME63 gateways. An intuitive step-by-step wizard helps you with the configuration of the “Batch Controller” and optimises your filling process.

The graphic programming - also known as f(x) - offers you a programme editor that represents a data flow-oriented programming environment. With an extensive library, you can either create your control logic as a function block diagram or a flow diagram. The user interface is easy to understand and intuitive to operate. The Type ME43 and Type ME63 gateways support graphic programming - decentralised control therefore becomes a reality.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

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Table of contents

1. General technical data **3**

2. Performance specifications **3**

2.1. Scenarios ... 3
Overview of scenarios ... 3
Brief description of scenarios ... 4
2.2. Batch logging ... 6
2.3. Dosing examples ... 6
Dosing system 1 ... 6
Dosing system 2 ... 7

3. Product operation **7**

3.1. Functional overview ... 7
3.2. Function modes ... 8
Automatic mode ... 8
Batch ... 9
Teach-in mode ... 10
Manual control mode ... 11
3.3. Operating instructions – best practice for precise dosing ... 12
3.4. Licensing ... 12

4. Product accessories **13**

4.1. Type ME61 - EDIP process control display ... 13
4.2. EDIP – Efficient Device Integration Platform ... 13
4.3. Bürkert Communicator software ... 13

5. Networking and combination with other Bürkert products **14**

5.1. With fieldbus gateway Type ME43 or Type ME63 without I/O module ... 14
5.2. With fieldbus gateway Type ME43 or Type ME63 with I/O module ... 15

6. Ordering information **16**

6.1. BürkertBürkert eShop ... 16
6.2. Recommendation regarding product selection ... 16
6.3. Bürkert product filter ... 16
6.4. Ordering chart ... 16
6.5. Ordering chart accessories ... 16

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

1. General technical data

Note:
The dosing function software extension on the devices Type ME43, Type ME63 is described below as “Batch Controller”.

Product properties	
Compatibility	“Batch Controller” can be installed with fieldbus gateways Type ME43 and Type ME63. See **data sheet Type ME43** ▸ and **data sheet Type ME63** ▸ for more information.
Scenario	Detailed information on the presentation of the valve-flowmeter arrangement can be found in chapter **“2.1. Scenarios” on page 3**.
Performance data	
Dosing range	0.001 l…10 000 000 000 l [1.)]
Dosing time	0.5 s…50 days
Totalizer sampling time	10 ms
System accuracy	The accuracy of the batch system is the result of the accuracy of individual system components: • Sensor measuring accuracy and sampling rate, the dosing valve used and its control unit, the communication delay (e.g. CAN, fieldbus). Detailed information and best practice for precise dosing can be found in chapter **“3.3. Operating instructions – best practice for precise dosing” on page 12**. • The longer the dosing time is, the lower the influence of the totalizer sampling time on the relative accuracy. Dosing examples for batch systems can be found in chapter **“2.3. Dosing examples” on page 6**.

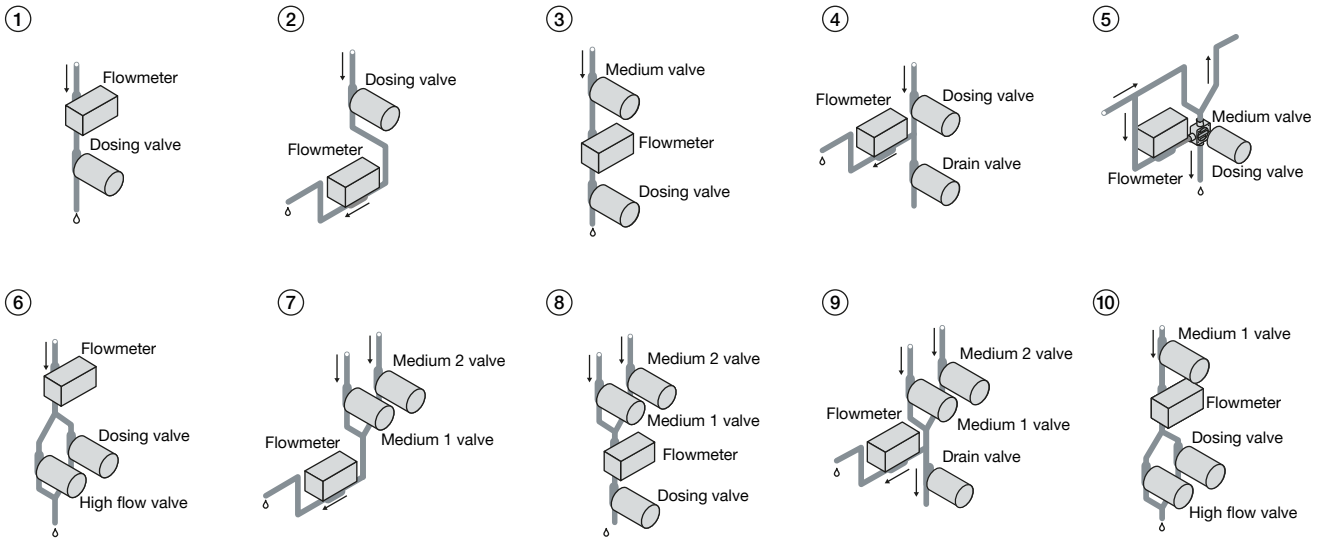
1.) 7 positions can be displayed in combination with the dashboard on Type ME61 “ProcessControlDisplay”.

2. Performance specifications

2.1. Scenarios

The “Batch Controller” can be combined with different valve-flowmeter arrangements. The following image and the table give an overview of the possible assembly scenarios supported.

Overview of scenarios



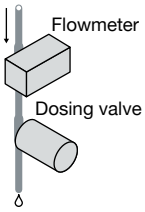
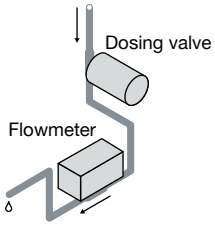
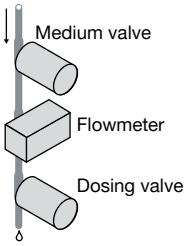
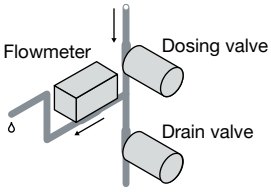
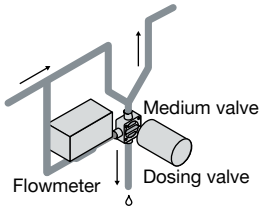
DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

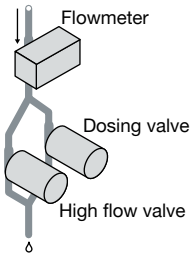
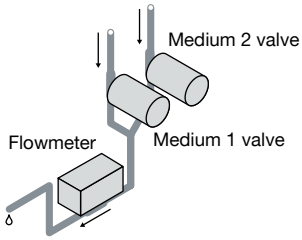
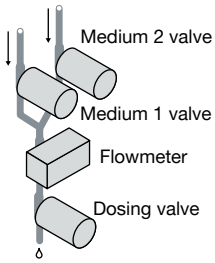
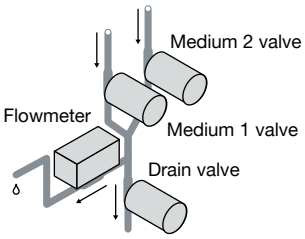
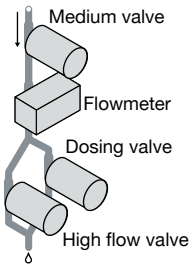
DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

Brief description of scenarios

Note:

- The following illustrations show a highly simplified representation of the structure: inlet sections etc. are not represented here.
- The description of the scenarios concerns principle representations of the state of technology. Depending on the scenario, dead spaces that may not be wanted may occur. In this case, another scenario must be chosen.
- Explanation of illustration:
  - Medium 1 valve = medium valve for medium 1
  - Medium 2 valve = medium valve for medium 2
  - Drain valve = drain/bleed valve
  - High flow valve = valve with larger orifice

Scenario of valve-flowmeter arrangement	Function / Diagram	Description
1		The dosing valve is installed after the flowmeter. The flowmeter is permanently filled with the medium.
2		The dosing valve is installed before the flowmeter.
3		The pipe with the flowmeter is filled via the medium valve. The dosing valve is installed after the flowmeter.
4		The dosing valve is installed before the flowmeter. The flowmeter is permanently filled with the medium until the drain/ bleed valve is opened.
5		This scenario is tailored to suit Robolux valves [1.)], see **data sheet Type 2035** ▶ or **data sheet Type 2036** ▶ for more information. If no dosing occurs, the medium valve is opened so that the flowmeter permanently has medium flowing through. During dosing, the medium valve is closed and the dosing valve opened.

Scenario of valve-flowmeter arrangement	Function / Diagram	Description
6		This scenario supports a dosing valve with low flow in combination with a dosing valve with high flow (coarse and fine dosing). Both are installed after the flowmeter. This scenario can also be performed with a single proportional valve.
7		Medium valve 1 and medium valve 2 are the dosing and selection valves. Both are installed before the flowmeter. An in-house recipe/dosing quantity is required for each medium.
8		Medium valve 1 and medium valve 2 are selection valves. Both are installed before the flow sensor. The dosing valve is installed after the flowmeter.
9		Medium valve 1 and medium valve 2 are the dosing and selection valves. Both are installed before the flowmeter. An in-house recipe/dosing quantity is required for each medium. The flow sensor is permanently filled with the medium until the drain/bleed valve is opened.
10		This scenario supports a dosing valve with low flow with a small orifice, in combination with a dosing valve with high flow with a large orifice. By closing medium valve 1 and opening the dosing valve with low flow, or the dosing valve with high flow, the line can be drained via the dosing valve, including the flowmeter. Both are installed after the flowmeter. This scenario can also be performed with a single proportional valve.

1.) The valve programme is based on the patented Robolux technology, wherein the diaphragm actuates two crossbars. With this concept, dead spaces are avoided and the flow volume is reduced.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

2.2. Batch logging

The batch logging saves important data of individual batch processes such as:

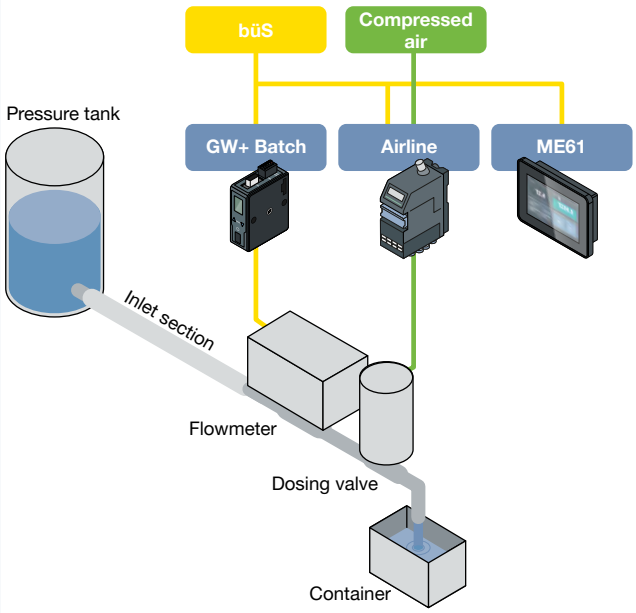
- Dosing time
- Dosing quantity
- Number of batch processes
- Batch status

The protocols can be written to the micro SD card (must be ordered separately, see chapter “6.5. Bestelltabelle Zubehör” on page 16) and read out as required. Up to 30 logs are possible without a memory card.

2.3. Dosing examples

Dosing system 1

Assembly



System properties

Parameters	Value
Flowmeter	FLOWave S Type 8098 Article no.: 20045101 Nominal diameter: DN 08
Dosing valve	Type 2080 Article no.: 20045680 Nominal diameter: DN 08
Inlet and outlet sections as per specification	Nominal diameter: DN 08
Fieldbus gateway	Type ME43 Article no.: 307390
"Batch Controller" licence	Type 8922 Article no.: 572948
Valve island AirLINE Field	Type 8653 Article no.: 20048647
Communication	büS (based on CANopen)
Batch operation/display	Type ME61 Article no.: 368545
Scenario	1
Dosing medium	Water

Results

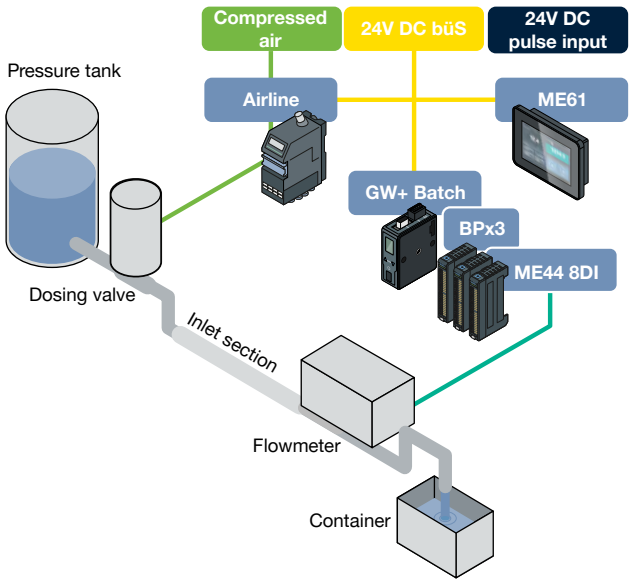
Parameters	Value [1.)]								
Mass flow	15 000 g/min			30 000 g/min			45 000 g/min		
Quantity [g]	1000	5000	10 000	1000	5000	10 000	1000	5000	10 000
Dosing time [s]	4	20	40	2	10	20	1.34	6.67	13.34
Average dosed quantity [g]	1001	5001	10 001	1002	5002	10 002	1004	5003	10 003
Standard deviation [g]	±7	±4	±2	±11	±11	±8	±19	±27	±26
Max. error [g]	±25	±11	±7	±27	±25	±19	±57	±75	±81
System accuracy [%]	±2.5	±0.22	±0.07	±2.70	±0.50	±0.19	±5.70	±1.50	±0.81

1.) Under laboratory conditions with calibrated sensor

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

Dosing system 2

Assembly



System properties

Parameters	Value
Flowmeter	Inline flowmeter Type 8030/SE30 Transmitter Type SE30 Article no.: 423913 Inline sensor-fitting Type S030 Article no.: 443302
Dosing valve	Type 2103 Article no.: 317767
Fieldbus gateway	Type ME43 Article no.: 307390
"Batch Controller" licence	Type 8922 Article no.: 572948
Backplane System Connect	Type BPX3 Article no.: 307510
I/O module	Type ME44 Article no.: 354316
Valve island AirLINE Field	Type 8653 Article no.: 20048647
Scenario	2
Average flow	40 l/min
Dosing volumes	10 l
Dosing time	Approx. 15 s
Dosing medium	Water

Results

Parameters	Value
Dosing result [1.)]	10 l ± 0.15 l
System accuracy	± 1.5 %

1.) Under laboratory conditions with calibrated sensor

3. Product operation

3.1. Functional overview

The “Batch Controller” is for dosing liquids. Dosing can be performed using the process value transmitted by the sensor as a volume or mass. The supported scenarios (combination of medium/dosing valves) are set out in chapter “2.1. Scenarios” on page 3 .

The configuration of the “Batch Controller” takes place via the Communicator, see software instructions for “Batch Controller**” Type 8922** ▸ for Type ME43 and Type ME63.

The parameters of a dosage are set via a recipe (target quantity, timeout, medium valve etc.). A total of up to 7 different recipes can be saved. The configured target quantities can be selected using the optional process control display, a free target quantity can be entered here (see chapter “4.1. Type ME61 - EDIP process control display” on page 13).
The “Batch Controller” can also be controlled via a PLC with the configured target quantities (recipes), and a target quantity can also be entered freely.

The “Batch Controller” offers three different function modes for dosing, see chapter “3.2. Function modes” on page 8.

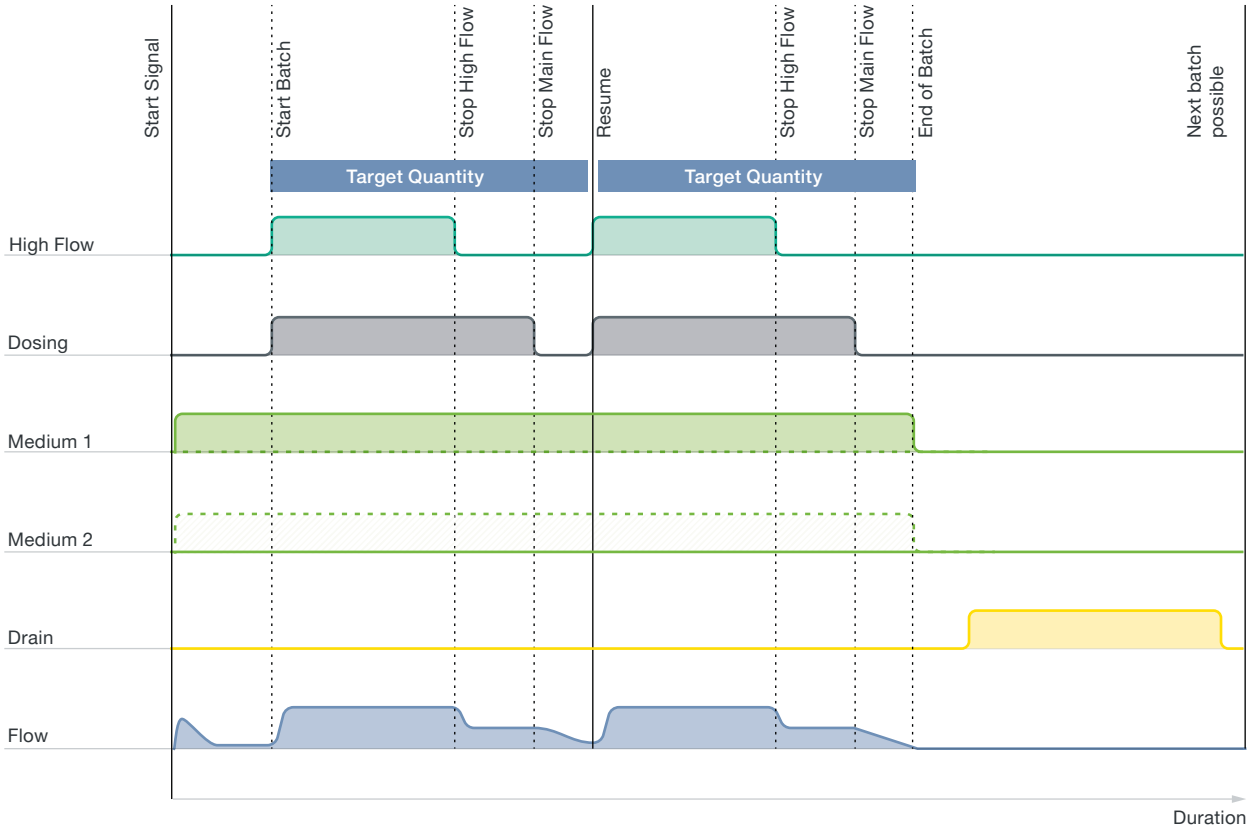
DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

3.2. Function modes

The “Batch Controller” can be operated in three different operating modes. The function modes are selected via the communicator.

Automatic mode

“First Batch”
There is an option to perform a “First Batch” in automatic mode.



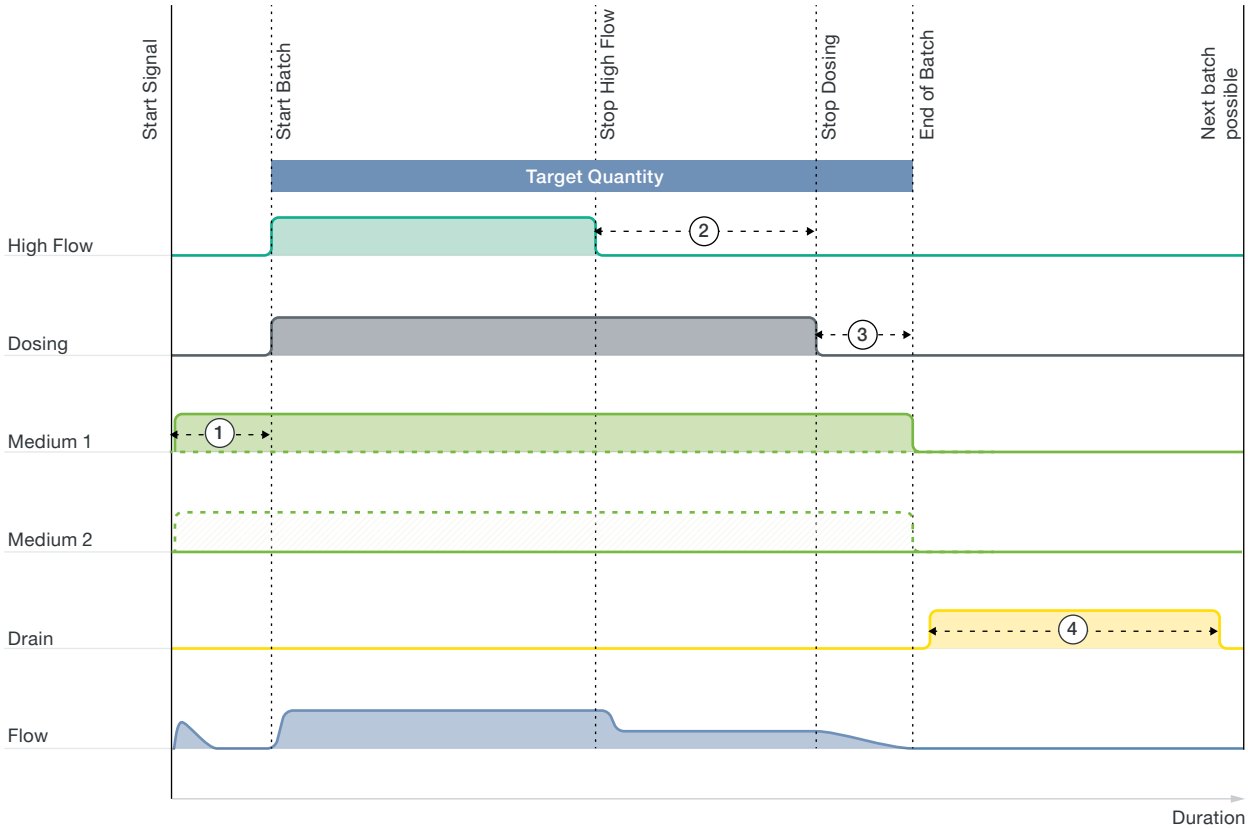
- This is performed when the automatic correction volume has a value of 0 (when the system starts for the first time, or can be reset via communicator).
- Essentially, this functions like a normal automatic batch mode.
- The difference is that the “First Batch” temporarily closes the dosing valve or valves at half of the target volume, depending on the scenario.
- The high flow valve is closed before the main valve in this case.
- The automatic correction volume can be calculated by closing.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

Batch

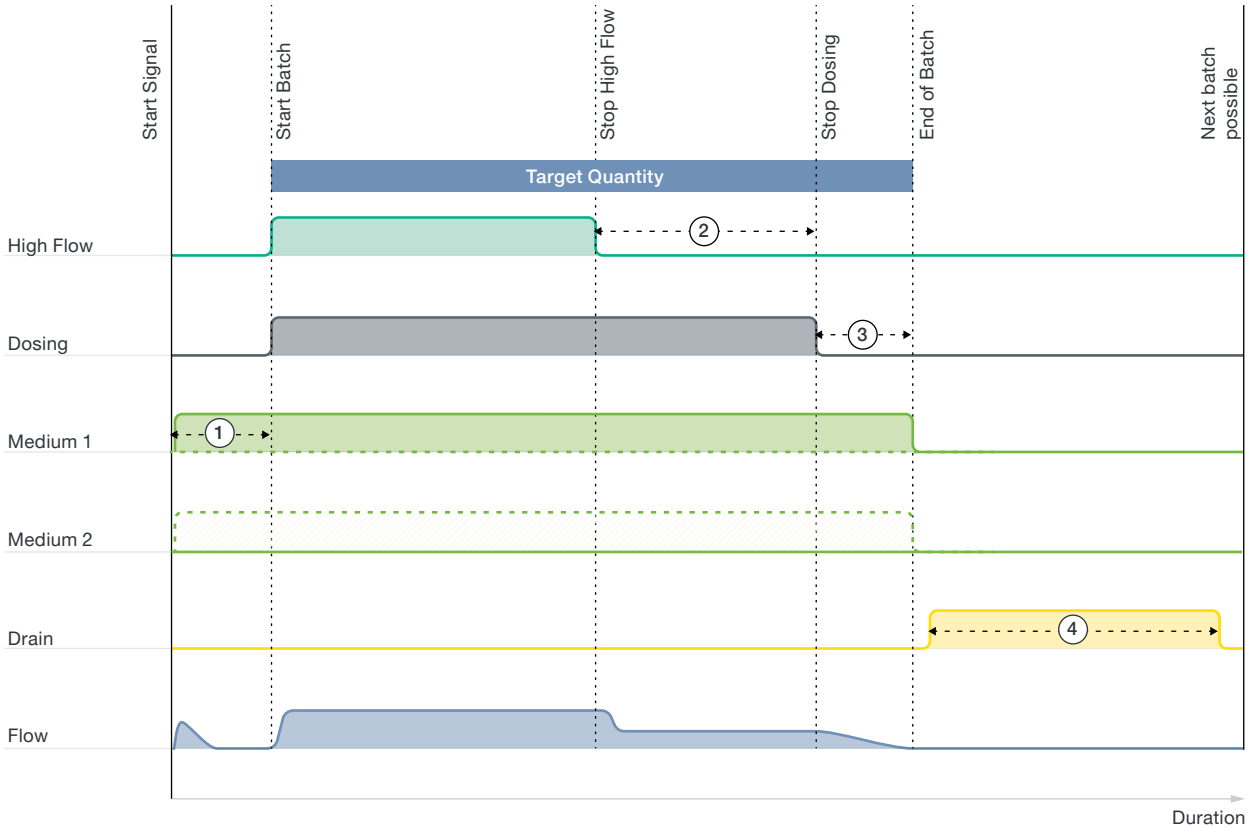
The “Batch Controller” automatically corrects the dosed volume from the first dosage in automatic batch mode. Dosing is briefly interrupted during calibration (first batch) in this case. It is also possible in this mode to configure a manual correction volume. This means that deviations can consistently be eliminated.



- Start signal - batch is started.
- If medium valve available:
  - selected medium valve opens (medium 1 or medium 2).
  - the dosing valves are opened after “medium selection delay” ①.
- The dosing valves will be directly opened as long as “medium selection delay” has not been selected, or there is no medium valve in the scenario.
- Flow rises to maximum value.
- If high flow valve available (depending on scenario):
  - Customer defines volume or weight, which should only be dosed to the main valve at the end.
  - If the quantity from which only the main valve should be used is reached in the totalizer, the high flow valve is closed (target quantity – residual volume or weight for main valve) ②.
- If the target quantity, excluding the automatically determined correction volume or weight, is achieved in automatic batch mode, the main valve is closed ③.
- If a manual correction volume or weight is configured in automatic batch mode, this is also taken into consideration here. This is what makes it different from the Teach-in mode. In that case, only the manual correction volume is used, automatic correction does not take place.
- After no more flow is available, the medium valve is closed.
- If drain valve available:
  - The drain valve can be opened for a certain time after the batch has been completed (Drain parameter in recipe) ④.
  - If the drain valve is closed, the batch is finished.
- A new batch procedure can then be started.

Teach-in mode

Automatic correction of the dosed volume does not take place in teach-in mode. Only a reaction to the manually pre-set correction volume occurs. This mode is particularly advised for consistent system conditions and known excess volumes, and/or when the dosing time is too short, meaning that automatic corrections cannot be made.

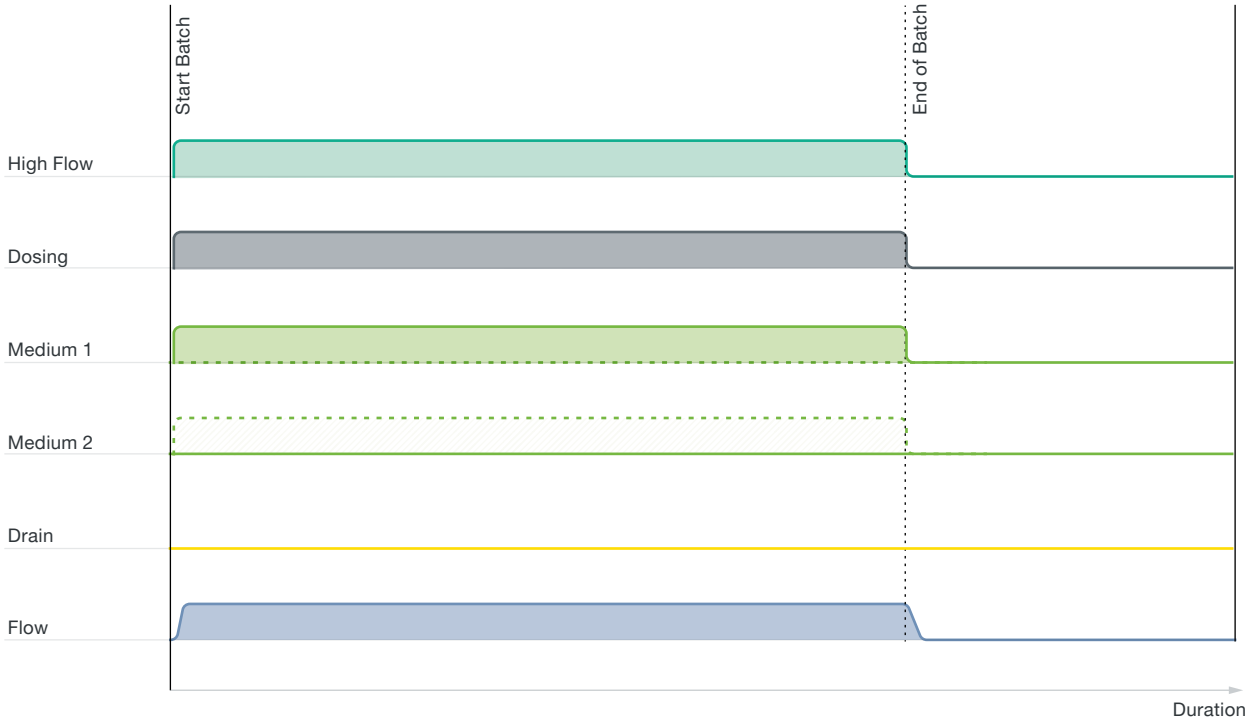


- Start signal - batch is started
- If medium valve available (depending on scenario):
  - selected medium valve opens (medium 1 or medium 2).
  - the dosing valves are opened after “medium selection delay” ①.
- The dosing valves will be directly opened as long as “medium selection delay” has not been selected, or there is no medium valve in the scenario.
- Flow rises to maximum value
- If high flow valve available (depending on scenario):
  - Customer defines volume or weight, which should only be dosed to the main valve at the end.
  - If the quantity from which only the main valve should be used is reached in the totalizer, the high flow valve is closed (target quantity – residual volume or weight for main valve) ②.
- If the target quantity, excluding the automatically determined correction volume or weight, is achieved, the main valve is closed ③.
- After no more flow is available, the medium valve is closed.
- If drain valve available:
  - The drain valve can be opened for a certain time after the batch has been completed (Drain parameter in recipe) ④.
  - If the drain valve is closed, the batch is finished.
- A new batch procedure can then be started.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

Manual control mode

The manual control mode is, for manually opening the valves, depending on the scenario selected. All valves are opened as soon as the start command is received (e.g. “Start” key pressed on the display). The valves are closed again when the cancel command is sent (e.g. via the display). The system can be flushed and tested using this mode, or a dosage made “by hand”.



- The medium valve (medium 1 or medium 2) is selected via the current recipe.
- When the batch starts, all valves (medium + high flow + main flow) are directly opened.
- The totalizer adds up the flow.
- All valves are closed with the next control signal and the batch is finished.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

3.3. Operating instructions – best practice for precise dosing

The following list offers “best practices”/information for hardware, as well as software settings, in order to perform precise dosing.

Hardware:

- Inlet section maintenance
  - FLOWave flowmeter (see **data sheet Type 8098** ▶ for more information)
  - Paddle wheel flowmeter (see **data sheet Type 8020** ▶, **data sheet Type 8025** ▶, **data sheet Type 8026** ▶, **data sheet Type 8030** ▶, **data sheet Type 8031** ▶, **data sheet Type 8032** ▶,**data sheet Type 8035** ▶, **data sheet Type 8036** ▶ for more information)
  - Magnetic induction (MID) flowmeter (see **data sheet Type 8041** ▶, **data sheet Type 8045** ▶ for more information)
  - Oval gears flowmeter (see **data sheet Type 8077** ▶, **data sheet Type S077** ▶ for more information)
  - Ultrasonic flowmeter (see **data sheet Type 8081** ▶ for more information)
  - Any sensor with a pulse or analog output, as stated in **“5.2. With fieldbus gateway Type ME43 or Type ME63 with I/O module” on page 15**
- Correct seal size
- Follow the flow speed specifications for each flow sensor
- The sensor must be filled
- No air bubbles in medium
- Ensure that the sensor is suitable for the medium and for measuring it
- No pressure and/or flow fluctuations
- büS load according to specifications (see cabling guideline operating instructions for büS/EDIP under **Type 8920** ▶ for more information).

Software:

- Correct FLOWave flowmeter settings:
  - K-factor
  - Damping mode: none
  - Refresh time: very short
- Corrective paddle wheel flowmeter settings
  - K-factor
  - Filter response time: 0 s
- Correct third party provider settings
  - Follow operating instructions
  - Sensor calibrated to medium
  - Perform “First Batch”
  - Correct “Batch Controller” settings
  - Flow value must be received within a flow of 10 ms

3.4. Licensing

The “Batch Controller” can be operated for an hour after starting the device without a licence. The function is then locked and the device needs to be rebooted.
A licence can be acquired for the gateways Type ME43 and Type ME63 (see chapter **“6.4. Ordering chart” on page 16**). There is no time limit if a licence has been purchased.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

4. Product accessories

4.1. Type ME61 - EDIP process control display

The process control display Type ME61 extends the EDIP (Efficient Device Integration Platform) with an easily attachable display for process parameters. The device provides a Bürkert system bus interface (büS) with the aid of an M12 connection, and can therefore be quickly integrated into existing büS and CANopen environments. The ME61 can easily and conveniently be configured to display the desired information, via the EDIP platform configuration tool (Bürkert Communicator). See **data sheet Type ME61** ▶ for more information.

4.2. EDIP – Efficient Device Integration Platform

EDIP is a Bürkert device platform that standardises the operation, communication and interfaces of many process devices (e.g. sensors, mass flow controllers).
EDIP is the Bürkert device and communication platform that combines interfaces for several process devices (e.g. sensors, mass flow controllers). Thanks to EDIP, devices can be intelligently networked and operated with the uniform software, the Bürkert Communicator. The backbone and connecting link of EDIP is a digital interface that meets the CANopen standard and can also be used in a downward compatible manner with it. EDIP offers the user the following advantages:

- Interoperability – guaranteed by the uniform interface
- Comfortable operation and display concept
- Faster and simplified commissioning
- Modularity - allows the devices to be adapted to individual customer requirements
- Easy transfer and fusion of device settings

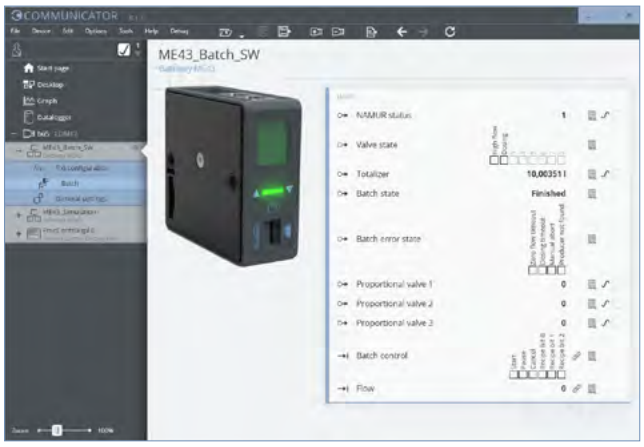
4.3. Bürkert Communicator software

Note:
To install the software, click **here** ▶.

The Bürkert Communicator is the most important software component of the ‚Efficient Device Integration Platform‘ (EDIP). Various features of this universal tool simplify the configuration and parameterization of devices equipped with a digital CANopen based interface. With this tool the user has a complete overview of cyclic process values as well as acyclic diagnosis data. The integrated graphical programming environment enables the creation of decentralized sub-system control functions. The connection to the PC is established with a USB-CAN adapter. This is available as an accessory (see **“6.5. Ordering chart accessories” on page 16**).

The Communicator enables:

- Configuration, parameterisation and diagnosis of EDIP devices / networks
- Easy and comfortable mapping of cyclic values
- Graphical display of process values
- Firmware update for the connected EDIP devices
- Backup and restoring of device configurations



The configuration of the “Batch Controller” is integrated from the communicator version 6.2 onwards.

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

5. Networking and combination with other Bürkert products

The “Batch Controller” can be integrated into the fieldbus gateways Type ME43 or Type ME63.

Type 8922

Integration possibilities

Type ME43 ▸
Gateway

Type ME63 ▸
Gateway

5.1. With fieldbus gateway Type ME43 or Type ME63 without I/O module

If the “Batch Controller” is integrated into a **fieldbus gateway** Type ME43 or Type ME63 without an I/O module, this can be combined with various mass flow/volume flow measuring devices which send their value via büS. The “Batch Controller” itself sends the switch signals via büS. This means that all devices/valves that receive the switch signal via the büS fieldbus can be used as dosing valves.

Type ME43 ▸
Gateway without I/O module

Type ME63 ▸
Gateway without I/O module

büS input	büS output
Type 8098 ▸ FLOWave flowmeter	**Type 8652** ▸ **or Type 8653** ▸ **with valve Type 2103** ▸**, Type 8605** ▸ AirLINE, büS cable plug

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

5.2. With fieldbus gateway Type ME43 or Type ME63 with I/O module

If the “Batch Controller” is integrated into a **fieldbus gateway**s Type ME43 or Type ME63 with I/O module, the connectivity is extended, compared to the options described above. Valves such as the **plunger valve Type 6027** can also be switched directly from the gateway via the digital outputs of a DO module. A DI module offers the option to integrate sensors with a pulse outlet, such as the **paddle wheel sensor Type 8012** or the **magnetic inductive sensor Type 8045**.

Type ME43 ▸ Gateway with backplane **Type BPx3** ▸ and I/O module **Type ME44** ▸	**Type ME63** ▸ Gateway with I/O modules **Type ME64** ▸

Digital output	büS output	Digital input		büS input
Type 6027 ▸ Plunger valve	**Type 8652** ▸/ **Type 8653** ▸ **with valve Type 2103** ▸, **Type 8605** ▸ AirLINE, büS cable plug	**Type 8012** ▸ Flowmeter with paddle wheel	**Type 8045** ▸ Magnetic inductive flowmeter	**Type 8098** ▸ FLOWave flowmeter

DTS 1000546235 EN Version: H Status: RL (released | freigegeben | validé) printed: 18.12.2024

6. Ordering information

6.1. BürkertBürkert eShop

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

6.2. Recommendation regarding product selection

Different items are required when selecting a complete batch system with the Type 8922.
A complete batch system consists of multiple products, such as the examples listed in chapter “2.3. Dosing examples” on page 6 .

6.3. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

6.4. Ordering chart

Description	Article no.
“Batch Controller” licence for Type ME43 and Type ME63 gateways	572948

6.5. Ordering chart accessories

Description	Article no.
Micro SD card	774087
Software Bürkert Communicator	Download **Type 8920**

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