

# Flow Conductor

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## About This Document

This document describes the site requirements for the Flow Conductor™ system. For detailed instructions on system and software operation, see the Flow Conductor User Guide (FLDM-00140).

**IMPORTANT** Read and understand the detailed instructions and safety guidelines in this document. Failure to follow these guidelines may result in improper system performance, injury to personnel, and/or damage to the instrument or to property. For complete safety information, see [Appendix B](#).

## Safety Alert Conventions

Fluidigm documentation uses specific conventions for presenting information that may require your attention. Refer to the following safety alert conventions.

### Safety Alerts for Chemicals

For hazards associated with chemicals, this document follows the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and uses indicators that include a pictogram and a signal word that indicates the severity level:

Indicator	Description
	Pictogram (see example) consisting of a symbol on a white background within a red diamond-shaped frame. Refer to the individual safety data sheet (SDS) for the applicable pictograms and hazards pertaining to the chemicals being used.
<b>DANGER</b>	Signal word that indicates more severe hazards.
<b>WARNING</b>	Signal word that indicates less severe hazards.

### Safety Alerts for Instruments

For hazards associated with instruments, this document uses indicators that include a pictogram and signal words that indicate the severity level:

Indicator	Description
	Pictogram (see example) consisting of a symbol on a white background within a black triangle-shaped frame. Refer to the system user guide for the applicable pictograms and hazards pertaining to system usage.
<b>DANGER</b>	Signal word that indicates an imminent hazard that will result in severe injury or death if not avoided.
<b>WARNING</b>	Signal word that indicates a potentially hazardous situation that could result in serious injury or death if not avoided.
<b>CAUTION</b>	Signal word that indicates a potentially hazardous situation that could result in minor or moderate personal injury if not avoided.
<b>IMPORTANT</b>	Signal word that indicates information necessary for proper use of products or successful outcome of experiments.

## Safety Data Sheets

Read and understand the SDSs before handling chemicals. To obtain SDSs for chemicals ordered from Fluidigm, either alone or as part of this system, go to [fluidigm.com/sds](https://fluidigm.com/sds) and search for the SDS using either the product name or the part number.

Some chemicals referred to in this user guide may not have been provided with your system. Obtain the SDSs for chemicals provided by other manufacturers from those manufacturers.

## Introduction

Fluidigm technical support will schedule a time to install the Flow Conductor system at your site and train your staff to use the instrument. Before a Fluidigm service representative arrives to install the system, choose and prepare your site according to the instructions in this document.

Notify your Fluidigm representative if special shipping arrangements are necessary at your site or if you need assistance in placing the Flow Conductor system.

## Installation Time Estimate

Installation of the Flow Conductor is estimated to take 3–4 hours. Site issues and other factors may delay or extend the installation time.

## Site Preparation Workflow

To choose and prepare an installation site for the Flow Conductor system:

- 1 Review this guide.
- 2 Select a site for the Flow Conductor instrument.
- 3 Receive the system.
- 4 Place the crated and boxed components at the site.

## Step 1: Review This Guide

Read and understand this guide for information on all Flow Conductor system site requirements, including safety, environmental, electrical, and space requirements.

For a complete list of reagents and consumables used with the Flow Conductor system, see the Flow Conductor User Guide (FLDM-00140).

## Step 2: Select a Site for the Flow Conductor

To install and operate the Flow Conductor system, consider the following at your site:

- Harmonized standards
- Environmental conditions
- System dimensions and laboratory bench requirements
- Electrical requirements



**WARNING** The installation location cannot be done at a site designated BioSafety Level 3 (BSL-3) or BioSafety Level 4 (BSL-4). Fluidigm does not install, service, or repair the Flow Conductor system in areas designated BSL-3 or BSL-4.

### Environmental Conditions

Flow Conductor is for indoor use only and should be used in an environment that meets these conditions:

Conditions	Requirements
Temperature	Ambient 18–26 °C (64–79 °F) <b>IMPORTANT</b> Do not locate the system next to heat sources or cooling ducts, or in direct sunlight or extreme ambient lighting. Temperature extremes can cause system instability.
Humidity	25–60%, non-condensing
Pollution	Degree 2 rating, whereby only nonconductive pollution occurs for electrical and laboratory equipment. Flow Conductor conforms to standard laboratory environments. Do not install the system where conductive pollutants are present.
Electrical installation	Category II
Altitude	Flow Conductor is for use in altitudes not exceeding 2,000 m (6,562 ft) above sea level. If your facility is located above this elevation, call technical support.
Ventilation	Ensure that your lab space is ventilated using non-recirculating air exchanges. Maintain at least 10.2 cm (4 in) of clearance at the exhaust grill exits. Flow Conductor produces only hot air exhaust (no fumes or vapors). It has an exhaust grill exit at the back of the instrument and on the left side of the instrument. The air intake is on the right side of the instrument underneath the bottle holders.

## System Dimensions and Laboratory Bench Requirements

**IMPORTANT** The Flow Conductor system is a benchtop instrument. Provide a work surface that can accommodate the system. The instrument stands on 4 standard machine mounts that can be leveled in order to securely install the instrument.

**IMPORTANT** Provide appropriate seismic anchors, such as straps or other devices to secure the instrument to a seismically secure surface such as a bench or a wall.

**IMPORTANT** Prior to unpacking the instrument, ensure that the placement area is a level surface such as a laboratory bench.

- Your laboratory bench must support at least 99 kg (219 lb).
- Ensure that the instrument is on a sturdy, immobilized lab bench that is not affected by vibration-generating lab equipment (such as shakers, vortexers, centrifuges, or instruments with heavy fans) and doors that might generate vibrations when used.
- Position the system so the power cord can be easily disconnected.

**IMPORTANT** Do not place the instrument on a heated surface or near a source of heat.

To accommodate the instrument, consider the following dimensions:

	Height	Width	Depth
Instrument dimensions	73 cm (28.7 in)	106 cm (41.7 in)	68 cm (26.8 in)
Instrument minimum footprint	63 cm (24.8 in)	90 cm (35.4 in)	66 cm (25.9 in)
Additional headroom from the lab bench	120 cm	–	–
Lab bench recommended dimensions	155 cm (61 in)*	130 cm (51.2 in)	76 cm (29.9 in)

\* Additional headroom is required to accommodate the upward-opening of the safety door.

It is recommended to allow 91.5 cm (3 ft) clearance on either side of the Flow Conductor instrument so it can be rotated 360 degrees for service.

The clearance need not be maintained at all times. However, any equipment occupying that space should be easily movable.

Recommended instrument clearance for adequate air circulation and maintenance:

	Sides (each side)	Back
Minimum clearance	10–15 cm (3.9–5.9 in)	10 cm (3.9 in)

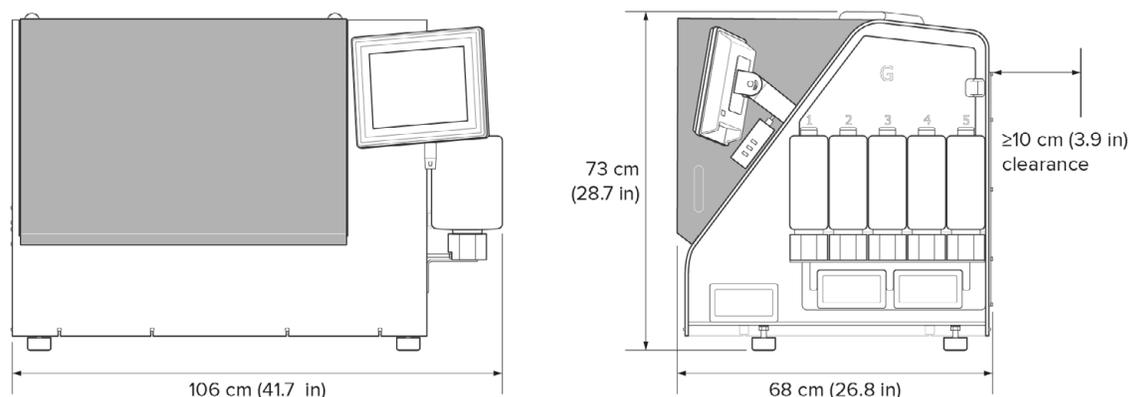


Figure 1. Instrument dimensions

## Connecting the Waste Tank

The Flow Conductor system is equipped with a 25 L waste tank that connects with a waste line to the back of the instrument. It is recommended that the waste tank be placed on the floor below the instrument, typically under the lab bench. This may require drilling an opening through the bench to accommodate the waste line prior to installation by the Fluidigm field service representative.

Waste line opening

Location	Distance cm (in)
Back wall	7–10 (2.8–3.9)
Back right corner of instrument	18.5 (7.3)
Diameter of opening	6–8 (2.4–3.1)

The suggested location of the opening for the waste line:

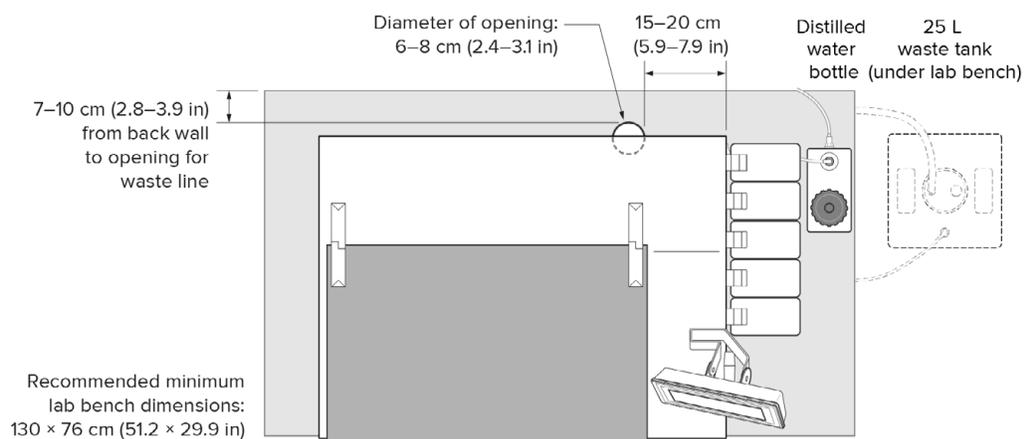


Figure 2. Waste line opening dimensions and location. Top-down view.

Alternatively, the waste tank may be placed on the floor to the side of the instrument, either immediately to the left or right of the instrument. If this option is chosen, ensure that the waste tank is safely fastened in place. Accidental or rough shifting of the waste tank may cause improper system operation or harm the instrument.

## Electrical Requirements

### Instrument Electrical Requirements

The Flow Conductor system requires 1 grounded electrical power outlet. The system operates through 100–240 V AC power at 50–60 Hz, (6.3 A). Power consumption is variable due to ambient conditions, such as temperature and humidity, operating frequency, and mode of operation.

Voltage (V AC)	Frequency (Hz)	Maximum Current (A)
100–120 and 210–240	50–60 $\pm$ 1%	(At 220 V) 3.15 A (At 110 V) 6.3 A

Fuse Type	Fuse Rating
Transformer	T2.5 A
Cooling Chamber	T4.0 A

**IMPORTANT** Supply voltage fluctuation must not exceed  $\pm$  10% of the normal value. If the voltage fluctuation exceeds normal value, see [Uninterruptible Power Supply](#).

### Power Cord Requirements

Fluidigm provides a country-specific power cord.

Customer Location	Minimum Wire Gauge (AWG)	Maximum Length	Instrument End Plug	Receptacle End Plug
US, Canada, Japan, Europe, Australia	16	2m (6 ft)	IEC C13	Country-specific

### IMPORTANT



- The instrument has a connection to protective earth (grounding) through the power cord provided by Fluidigm. Ensure that the electrical receptacle provides an earth ground before connecting the power cord.
- Use only power cords provided by Fluidigm.
- Do not use extension cords.

### Receptacle Requirements

When connecting this instrument to a receptacle, check with your facilities manager to make sure the circuit will not be overloaded. If you are connecting multiple instruments to the same electrical receptacle or circuit, be sure that the total maximum current draw for all instruments is within the circuit current limit. Receptacles must be grounded. The Flow Conductor requires only 1 grounded electrical connection.

### Disconnecting Power

In case of emergency, you must be able to immediately disconnect the main power supply to the instrument.

## Uninterruptible Power Supply

Fluidigm strongly recommends that you protect your Flow Conductor system with an uninterruptible power supply (UPS) with voltage regulating capability, such as an APC Smart-UPS™ (APC, SRT3000XLW-IEC or equivalent for 208 to 230 V) with battery power (APC, SRT96BP or equivalent), or SRT3000XLA for 120 V in North America, to prevent any damage to the equipment due to power fluctuations. For customers who will connect the instrument to backup power in the event of power loss, Fluidigm recommends purchasing sufficient UPS battery power to support the transition from UPS to backup power at your site. We recommend checking with the facilities department at your site for guidelines on how much transition time might be required.

The minimum requirements for 1 UPS to maintain power for 1 system are:

Conditions	Requirements
UPS type	Double conversion online (AC to DC to AC)
Output power capacity	2.7 kW/3.0 kVA
Power factor	0.9
Power transition time	Site-specific, depending on the time required to switch to backup power.
Power draw (when charging)	375 W

## External Ventilation Requirements

One 80 x 80 mm (3.2 in x 3.2 in) fan at the back of the instrument.

One 60 x 60 mm (2.4 in x 2.4 in) vent on the left side of the instrument.

## Site Safety

**IMPORTANT** Safety personnel at your company must ensure that:

- Safety policies to protect laboratory personnel from potential harm are established and are followed by personnel.
- All necessary safety devices and equipment are in the laboratory or in close proximity.

Fluidigm expects your laboratory to have safety policies in place to protect laboratory personnel from potential harm. We expect that appropriate safety practices are followed at all times.

## Step 3: Receive the System

For new Flow Conductor system installations, you can anticipate receiving:

- Flow Conductor system, crated
- Instrument accessories, boxed
- Optional: Bar code reader, boxed

Because the crated Flow Conductor system weighs approximately 196 kg (432 lb), consider the space and weight-bearing for the intended delivery site and the path to that site. Also consider using a forklift such as pallet truck (pallet jack) for on-site transportation.

### Flow Conductor Crated System Size and Weight Specifications



**WARNING** PHYSICAL INJURY HAZARD. Do not attempt to lift or move any boxed or crated items unless you use proper lifting techniques. The crated Flow Conductor weighs ~196 kg (~432 lb).

The measurements for Flow Conductor as shipped are:

	Length	Width	Height	Weight
Crated Flow Conductor	120 cm (47.2 in)	80 cm (31.5 in)	100 cm (39.4 in)	~196 kg (~432 lb)
Uncrated Flow Conductor	73 cm (28.7 in)	106 cm (41.7 in)*	68 cm (26.8 in)	~99 kg (~218 lb)

\* Including a bottle rack on the right side of the instrument and a touchscreen computer.

### Delivery and System Inspection

Use this checklist to perform a check of all delivered components:

- Check the packing list against the original order.
- Check the crates for damage.
- Note any damage and report it to the Fluidigm service representative.
- Store each component at the appropriate temperature according to the instructions.

## Step 4: Place the System at the Site

**NOTE** Notify your Fluidigm representative if you need assistance in placing the Flow Conductor system.

Remove all unnecessary materials from the installation site prior to the arrival of the Fluidigm field service engineer.

Have the crated Flow Conductor system at its permanent location prior to the arrival of a field service engineer. Wait for the engineer to arrive before unpacking the crate.

**IMPORTANT** If you choose to drill an opening in the laboratory bench for the waste line, do so before placing the instrument on the bench. See [Connecting the Waste Tank](#).



**WARNING** PHYSICAL INJURY HAZARD. The instrument is to be moved and positioned only by the Fluidigm service representative. The crated Flow Conductor weighs approximately 196 kg (432 lb).



**WARNING** PHYSICAL INJURY HAZARD. Do not attempt to lift or move any boxed or crated items unless you use proper lifting techniques. The crated Flow Conductor weighs approximately 196 kg (432 lb).

If you choose to lift or move the Flow Conductor after it has been installed, do not attempt to do so without the assistance of others. Use appropriate moving equipment and proper lifting techniques to minimize the chance of physical injury.



**WARNING** Do not tip the Flow Conductor instrument on end. Tipping damages the instrument hardware and electronics.

### Path Clearances

**IMPORTANT** A clear path from the loading dock to the laboratory bench must be established. The path must accommodate the dimensions of the crate.

Ensure that the path to the installation site has the following minimum clearances:

	Width	Height
Minimum path clearance	110 cm (43.3 in)	240 cm (94.5 in)

### Installation

Before the installation date, be certain that you have done the following:

- Remove all unnecessary materials from the final installation site.
- Receive the Flow Conductor system and performed a visual check of the crate and containers.
- Move the crated and boxed equipment from the receiving location to the installation area.
- Optional: Drill an opening in the bench for the waste line.
- Place the crated and boxed components at their final and permanent location.

Contact your Fluidigm representative if you require assistance with any of these steps.

# Appendix A: Related Documentation

Document Title	Part Number
Flow Conductor User Guide	FLDM-00140

## Appendix B: Safety

### Instrument Safety

The instrument should be serviced by authorized personnel only.



**WARNING** Do not modify this instrument. Unauthorized modifications may create a safety hazard.



**WARNING** BIOHAZARD. If you are putting biohazardous material on the instrument, use appropriate personal protective equipment and adhere to Biosafety in Microbiological and Biomedical Laboratories (BMBL), a publication from the Centers for Disease Control and Prevention, and to your lab's safety protocol to limit biohazard risks. If biohazardous materials are used, properly label the equipment as a biohazard. For more information, see the BMBL guidelines online at [cdc.gov/biosafety/publications/index.htm](https://www.cdc.gov/biosafety/publications/index.htm).



**WARNING** PHYSICAL INJURY HAZARD. Do not attempt to lift or move any boxed or crated items unless you use proper lifting techniques. The weight of the boxed or crated instrument is 196 kg (432 lb). Remove boxed or crated as appropriate. If you choose to lift or move the instrument after it has been installed, do not attempt to do so without the assistance of others. Use appropriate moving equipment and proper lifting techniques to minimize the chance of physical injury.

### Electrical Safety

**NOTE** The main power disconnect is on the rear panel of the instrument.



**WARNING** ELECTRICAL HAZARD. DO NOT REMOVE THE COVERS. Electrical shock can result if the instrument is operated without its protective covers. No internal components are serviceable by the user.



**WARNING** ELECTRICAL HAZARD. Plug the instrument into a properly grounded receptacle with adequate current capacity.

### Chemical Safety

The responsible individuals must take the necessary precautions to ensure that the surrounding workplace is safe and that instrument operators are not exposed to hazardous levels of toxic substances. When working with any chemicals, refer to the applicable safety data sheets (SDSs) provided by the manufacturer or supplier.

#### For technical support visit [techsupport.fluidigm.com](https://techsupport.fluidigm.com).

North America +1 650 266 6100 | Toll-free (US/CAN): 866 358 4354 | [support.northamerica@fluidigm.com](mailto:support.northamerica@fluidigm.com) Latin America +1 650 266 6100 | [techsupportlatam@fluidigm.com](mailto:techsupportlatam@fluidigm.com)  
Europe/Middle East/Africa/Russia +33 1 60 92 42 40 | [eu.support@fluidigm.com](mailto:eu.support@fluidigm.com) China (excluding Hong Kong) +86 21 3255 8368 | [techsupportchina@fluidigm.com](mailto:techsupportchina@fluidigm.com)  
Japan +81 3 3662 2150 | [techsupportjapan@fluidigm.com](mailto:techsupportjapan@fluidigm.com) All other Asian countries/India/Australia +1 650 266 6100 | [techsupportasia@fluidigm.com](mailto:techsupportasia@fluidigm.com)

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