

SEMI E186-1121

SPECIFICATION FOR LOCATION AND DIMENSIONS FOR POWER CONNECTORS AND ETHERCAT PORTS IN MASS FLOW CONTROLLERS AND MASS FLOW METERS

This Standard was technically approved by the Gases Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on August 12, 2021. Available at www.semiviews.org and www.semi.org in November 2021.

1 Purpose

1.1 This Standard establishes the location and physical dimensions of mass flow controllers (MFCs) and mass flow meters (MFMs) using EtherCAT^{®1} communication protocol.

2 Scope

2.1 This Standard describes location and physical dimension of EtherCAT power and communication connectors used in MFCs/MFMs.

2.2 This Standard applies to mass flow controllers and mass flow meters used in both conventional and surface mount gas delivery systems.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 This Standard only addresses location and dimensions of EtherCAT-specific hardware and does not specify the connectors, protocols or power requirements of communication. This is covered by separate EtherCAT Technology Group (ETG) specifications outlined in ETG.5003.2020 SDP.

4 Referenced Standards and Documents

4.1 *EtherCAT Specifications*¹

ETG.5003.2020 SDP — Specific Device Profile: Mass Flow Controller

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 *Abbreviations and Acronyms*

5.1.1 *MFC* — mass flow controller

5.1.2 *MFM* — mass flow meter

5.2 *Definitions*

5.2.1 *conventional gas delivery system* — a gas delivery system utilizing tubing and standard face-seal type weld fittings joined together with components (filters, valves, regulators, pressure transducers, MFCs etc.) using orbital tungsten inert gas (TIG) welding.

5.2.2 *mass flow controller (MFC)* — a self-contained device consisting of one or more pressure transducers/flow sensors, control valve and signal processing electronics commonly used in semiconductor processing equipment to measure and regulate mass flow of a gas.

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5.2.3 *mass flow meter (MFM)* — a self-contained device consisting of one or more pressure transducers/flow sensors and signal processing electronics commonly used in semiconductor processing equipment to measure mass flow of a gas.

5.2.4 *surface mount gas delivery system* — a gas delivery system utilizing components (filters, valves, regulators, pressure transducers, MFCs etc.) that are mounted onto a flat substrate which defines the flow path of the gas and with sealing systems located within the interface plane between components and substrate.

6 Requirements

6.1 Power Connector Location

6.1.1 Power connector shall be located in the top quarter of the upstream (flow inlet) side of the MFC/MFM as shown in Figure 1. Specific power connector location information for surface mount MFCs/MFMs is shown in Figure 2 and for Conventional MFCs/MFMs is shown in Figure 3.

6.1.2 The connector key shall be at a 45-degree angle from horizontal.

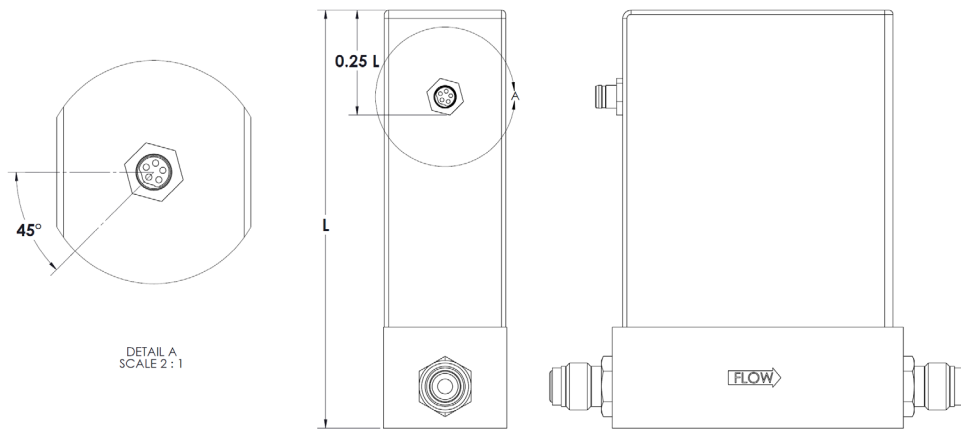


Figure 1
Power Connector Orientation

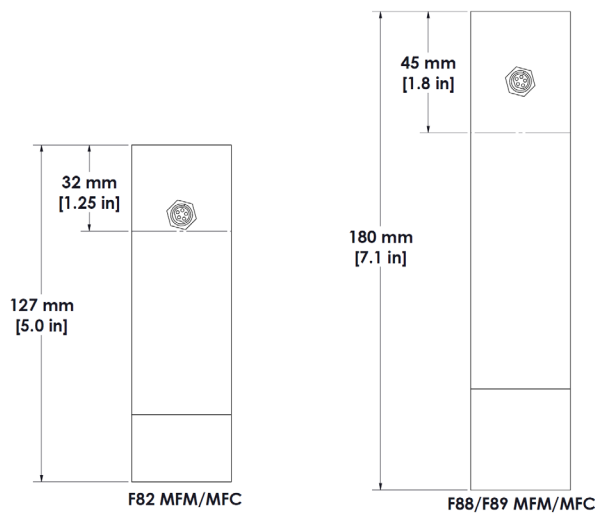


Figure 2
Power Connector Location on Upstream Side of Surface Mount MFCs