
ABLE Instruments & Controls Limited

Introduction to Coriolis Mass Flow Meters

Course CM001B: One day; Instructor-Led

ABLE Training - Education and Certification

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Introduction

Elements of this syllabus are subject to change.

At the end of this one-day course, students will learn about the history and development of Coriolis flow meters and where this technology can be applied. Students will learn the operating theory of Coriolis flow meters and how to specify a meter for a given application. This includes installation recommendations and requirements. They will also learn the fundamentals to install and commission a Coriolis flow meter and troubleshoot / diagnose operating problems. Other topics on this course include:- Outputs and protocols, documentation and calibration guidelines, communication programs, product datasheet review, available options and accessories and benefits and drawbacks of Coriolis flowmeters compared to other metering technologies

Audience

Instruments Engineers, Design Engineers, and Engineering Buyers who want to learn about Coriolis mass flow meters are the audience for this course. Instruments Engineers, Design Engineers, and Engineering Buyers should have at least a basic understanding of flow metering - typically in the areas of process control and automation, oil & gas, and chemical industry. No experience with Coriolis flow meters is necessary.

At Course Completion

After completing this course, students will be able to:

- Describe how Coriolis flow meters operate.
- Generate a specification for a Coriolis meter
- Understand fundamentals to install and commission a Coriolis flow meter.
- Apply Coriolis technology correctly.
- Troubleshoot and Diagnose operating problems.
- Understand the outputs and protocols available.
- Specify appropriate meter options and accessories.

Prerequisites

This course requires that students meet the following prerequisites:

- Have a basic understanding of flow metering
- An awareness of typical flow meter technologies – such as Ultrasonic clamp on meters, orifice plates, turbine meters.

Course Materials

The student kit includes a comprehensive workbook for this class and a rig manual for hands-on training.

Course Outline

Module 1: History, Development and theory of operation of Coriolis Flow Meters

After completing this module, students will have knowledge of the history of the Coriolis effect, named after the French scientist Gaspard-Gustave Coriolis, and how it has been applied to flow metering. This module also includes development of coriolis flow meters and theory of operation.

Lessons

- Introduction to the Coriolis effect and how it is applied to flow metering
- Development of Coriolis mass flow meters.

Skills

After completing this module, students will be able to:

- Describe the Coriolis effect and how it is applied to flow metering.
- Describe the developments made to Coriolis flow meters to meet application requirements.

Module 2: Advantages and Disadvantages of Coriolis mass flow meters including selection and installation

After completing this module, students will understand when to use a Coriolis mass flow meter over alternative technologies and how to specify a meter for a given application. This module also includes installation requirements and recommendations.

Lessons

- Introduction to applying Coriolis flow meters including advantages and disadvantages
- Installation requirements and recommendations
- Available meter sizes, configurations and materials including typical datasheet review
- How Coriolis flow meters compare with other metering technologies



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Skills

After completing this module, students will be able to:

- Describe the installation requirements and recommendations when considering a Coriolis flow meter
- Understand when to use a Coriolis flow meters over alternative technologies

Module 3: Fundamentals of Installing and Commissioning a Coriolis Flow Meter

After completing this module, students will understand the fundamentals of how to install and commission a Coriolis flow meter.

Lessons

- Overview of Installing a Coriolis Flow Meter including area classification considerations
- Mechanical and Electrical requirements including outputs and protocols
- Typical options and accessories available for Coriolis flow meters
- Documentation and calibration guidelines

Rig Lab: Installing a Coriolis flow meter.

- Overview of Installing of a Coriolis Flow Meter
- Mechanical and Electrical Overview
- Configuring a Coriolis flow meter
- Communication programs

Skills

After completing this module, students will be able to:

- Describe the fundamentals of installing and commissioning a Coriolis flow meter.
- Understand the Mechanical and Electrical requirements to install a Coriolis flow meter
- Configure a Coriolis flow meter using local display and communication software

Module 4: Troubleshooting and Diagnosis

After completing this module, students will be able to competently troubleshoot Coriolis flow meter operating problems.

Lessons

- How to troubleshoot and diagnose operating problems on a Coriolis flow meter installation

Rig Lab: Troubleshoot and diagnose a failed Coriolis flow meter.

- Hands-on troubleshooting of a failed Coriolis flow meter

Skills

After completing this module, students will be able to:

- Competently troubleshoot and diagnose potential problems with a Coriolis flow meter installation and advise on remedial action