

## Flow-How

### About the Seminar

Every year at TrigasFI we calibrate, adjust and repair thousands of flowmeters. Through this experience we have acquired deep knowledge about the specifics of the various flow measuring principles. We know how they are best calibrated, installed and operated for best possible accuracy and reliability.

We love to share this knowledge with our customers through our Training Seminars and on-site Consulting Services.

This Training Seminar is intended for individuals with responsibility to select, calibrate and use liquid and gas flowmeters.

It is designed to be an objective, independent review and evaluation of the current state of flow metering and calibration theory and technology for flowmeter users and metrologists.

### About us

Europe-wide, TrigasFI GmbH was the first measurement laboratory to be accredited by the German Accreditation authority DAkkS for both liquid and gas flow calibrations, and still the only one that specializes exclusively in Flow. Today, we are pioneers in hydrogen custody transfer.

Our competence is the result of our more than 20 years of dedication to advancing the Flow Measurement and Calibration state of the art and is guaranteed by our DIN EN ISO 9001-2008 TÜV certification and DAkkS accreditation according to DIN EN ISO/IEC 17025

Working with TrigasFI, you are not only assured of the services of a versatile and innovative laboratory, but first and foremost precise and meaningful flow measurement values.

We are a dedicated flow specialist independent from commercial obligations to any flow meter manufacturer or allegiance to any particular flow measurement technology.

### TrigasFI GmbH

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# Flow Measurement and Calibration

# Training Seminars

*Liquid and Gas*

## GENERAL INFORMATION

### Registration

The number of participants is limited to 15 persons per seminar. The minimum number of participants is five persons. Registrations are accepted on a first-come, first serve basis.

### Confirmation of registration

Confirmation of registration will be sent after registration. All further documents such as a detailed seminar agenda, traveling information and the hotel address will be sent to you in due time before the date of the seminar.

### Certificate of attendance

At the end of each seminar, every participant will get a certificate of attendance.

### Participation fee

1,299 € plus VAT(\*) per person for the seminar.  
Special price 995 € plus VAT(\*) if ordered before 30 June 22.  
The fee includes course material (binder and memory stick), lunches as well snacks and soft drinks during the time of the seminar.

Please only transfer the seminar fees to our bank account after receipt of the invoice

\*- According to EU tax law, VAT must in this case be charged to non-German EU residents as well.

### Cancellation

No cancellation fees up to the 31<sup>st</sup> of July. If cancellation takes place in August, the charge will be 50% of the participation fees and the cancellation fees for the hotel reservation, if applicable. In case of later cancellation, the full amount of the participation fees will be charged and the cancellation fees for the hotel reservation, if applicable. You can at any time name a substitute participant of your company for the respective seminar. If the minimum number of participants for a seminar is not reached during the month of August, we reserve the right to cancel the seminar or to fix an alternative date.

### Schedule

Day 1: Morning / Afternoon - Seminar

Day 2: Morning - Seminar / Afternoon - Oktoberfest

Day 3: Morning - Lab Tour and discussion

## PROGRAM OUTLINE

### Introduction

- Liquid Flow Principles
- Gas Flow Principles
- Actual vs Normal Flow

### Practical aspects of Flow Metering

- Installation Effects / Flow conditioning
- Viscosity / Moisture effects
- Pressure, Temperature, Compressibility
- Reynolds, Strouhal and Roshko Numbers
- Response time considerations

### Flowmeter Types Review

- Types of flowmeters – Liquid and Gas
- Flowmeter Selection
- Flowmeter Specification Analysis
- Uncertainty Considerations

### Practical aspects of Flow Calibration

- Methodology of Liquid and Gas Calibrations
- Uncertainty Considerations

### Liquid Calibration Technologies

- Piston and Displacer Calibrators / Provers
- Gravimetric Calibrators (Catch-and-Weight)
- Ball or Pipe Provers

### Gas Calibration Technologies

- Bell Prover
- Mercury Seal / Graphite Piston Calibrator
- Sonic Nozzle Transfer System (high flow)
- LFE Transfer System (low flow)
- Catch-and-Weight / PVTT method
- Closed Loop Piston Hi-Pressure Calibrator

### Transfer Calibration for Liquids and Gases

- Selecting and Using Master Flowmeters

### Errors and Uncertainty

- Statistical Methods - GUM
- Traceability / Certification
- Interlaboratory comparisons

## REGISTRATION FORM

### Flow Measurement and Calibration Seminar

1,299 € per seminar per person

995 € if ordered by 30.06.22

English  September 21-23 2022

German  September 27-29 2022

Participant's name\*

\_\_\_\_\_ (one participant per form)

Company Name\*

Address\*

Tel.: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

\* - Information will appear in Training Certificate.

Hotel reservation wished? Yes  No

Circle nights you plan to stay in Hotel:

English Seminar: Tue Wed Thu Fri

German Seminar: Mon Tue Wed Thu

(Training Days are underlined)

Authorized Signature \_\_\_\_\_ Date: \_\_\_\_\_

**Fill out completely and return:**

Per Fax: +49 (0) 8165 64 72 29

Per e-mail: [sales@trigasfi.com](mailto:sales@trigasfi.com)