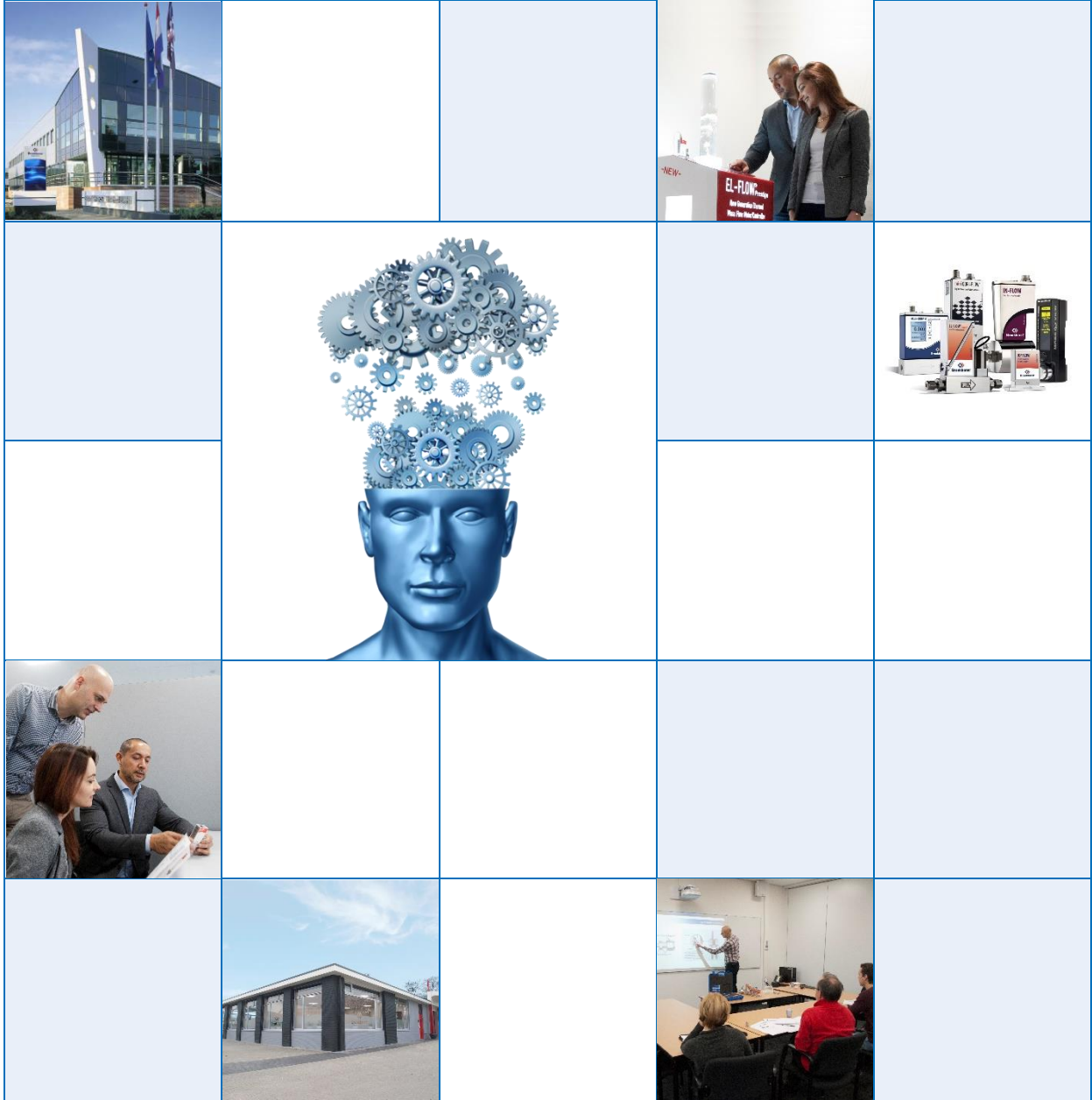


# CUSTOMER PRODUCT TRAINING

## CATALOGUE 2020



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# EL-FLOW Select & EL-FLOW Prestige

## Training objectives

In this course you will gain knowledge about the principles of mass flow measurement and control for gases based on thermal measurement technology. You will get insight in the construction, operation principles and typical applications of the Bronkhorst EL-FLOW Select and EL-FLOW Prestige product series. In a practical setting you will get the opportunity to operate an EL-FLOW instrument yourself.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required

## Content

In this course the following topics will be discussed:

- Introduction
- Product differentiation
- Construction principles
- Model numbering
- Models and ranges
- Operating principles
- Features and benefits
- Examples of applications
- Installation and start-up
- Read out and control options:
  - Bright
  - E-8000
- Bronkhorst user software: FlowDDE, FlowView, FlowPlot
- Hands-on



Duration  
3 hours

Location  
Bronkhorst Training Centre,  
Ruurlo, The Netherlands

Date  
Ask your local Sales Representative for available dates

Attendees  
1-4 persons

Executive trainer(s)  
Bronkhorst Specialists

Certificate  
A certificate of participation will be supplied

Course number: 7.26.040 / 7.26.041



# Flow solutions

## Training objectives

In this course you will gain insight in the extended options within the Bronkhorst product range to engineer and construct customer specific integral solutions for mass flow and pressure measurement and control. You will get insight in the construction and the operation principles of the Bronkhorst

IQ+FLOW, FLOW-SMS and MANI-FLOW product series. In a practical setting the advantages of the Customized Manifold Solutions will be demonstrated.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required

## Content

In this course the following topics will be discussed:

- > Introduction
- > Construction principles
- > Model numbering
- > Models and ranges:
  - > FLOW-SMS
  - > MANI-FLOW
  - > IQ+FLOW
- > Operating principles
- > Features and benefits
- > Examples of applications
- > Installation and start-up
- > Hands-on



**Duration**  
3 hours

**Location**  
Bronkhorst Training Centre,  
Ruurlo, The Netherlands

**Date**  
Ask your local Sales Representative for available dates

**Attendees**  
1-4 persons

**Executive trainer(s)**  
Bronkhorst Specialists

**Certificate**  
A certificate of participation will be supplied

**Course number: 7.26.050**



# MASS-STREAM

## Training objectives

In this course you will gain knowledge about the principles of mass flow measurement and control for gases based on thermal direct through-flow measurement technology. You will get insight in the construction, operation principles and typical applications of the Bronkhorst MASS-STREAM™ product series. In a practical setting you will get the opportunity to operate a MASS-STREAM™ instrument yourself.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required

## Content

In this course the following topics will be discussed:

- Introduction
- Product differentiation
- Construction principles
- Model numbering
- Models and ranges
- Operating principles
- Features and benefits
- Examples of applications
- Installation and start-up
- Bronkhorst user software like FlowDDE, FlowView, FlowPlot
- Hands-on



**Duration**  
3 hours

**Location**  
Bronkhorst Training Centre,  
Ruurlo, The Netherlands

**Date**  
Ask your local Sales Representative for available dates

**Attendees**  
1-4 persons

**Executive trainer(s)**  
Bronkhorst Specialists

**Certificate**  
A certificate of participation will be supplied

**Course number: 7.26.042**



# Derived products and EL-PRESS / IN-PRESS

IN-FLOW / LOW- $\Delta$ P-FLOW / EX-FLOW / METAL SEALED / EL-PRESS / IN-PRESS

## Training objectives

In this course the content will specifically be adopted to your individual interest. Based on your request you will gain knowledge about the principles of mass flow and pressure measurement and control for gases. You will get insight in the construction, operation principles and typical applications of the different Bronkhorst mass flow and pressure measurement and control product series. In a practical setting you will get the opportunity to handle and operate an instrument yourself.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required



Duration  
3 hours

Location  
Bronkhorst Training Centre,  
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Date  
Ask your local Sales Representative for available dates

## Content

In this course the following topics will be discussed:

- Introduction
- Models and ranges available (specific to be selected by attendees):
  - IN-FLOW
  - LOW- $\Delta$ P-FLOW
  - EX-FLOW
  - METAL SEALED
  - EL-PRESS / IN-PRESS
- Construction principles
- Model numbering
- Operating principles
- Features and benefits
- Examples of applications
- Installation and start-up
- Hands-on

## Attendees

1-4 persons

## Executive trainer(s)

Bronkhorst Specialists

## Certificate

A certificate of participation will be supplied

Course number: 7.26.043



# (mini) CORI-FLOW & LIQUI-FLOW

## Training objectives

In this course you will gain knowledge about the principles of mass flow measurement and control based on the Coriolis- as well as the thermal measurement technology. You will get insight in the construction, operation principles and typical applications of the different Bronkhorst (mini) CORI-FLOW and LIQUI-FLOW product series including the advanced CORI-FILL dosing application. In a practical setting you will get the opportunity to operate a (mini) CORI-FLOW instrument and CORI-FILL application yourself.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required

## Content

In this course the following topics will be discussed:

- > Introduction
- > Construction principles
- > Model numbering
- > Models and ranges:
  - > CORI-FLOW
  - > mini CORI-FLOW
  - > Pumps
- > Models and ranges:
  - >  $\mu$ -FLOW
  - > LIQUI-FLOW L13/L23
- > Operating principles
- > Features and benefits
- > Examples of applications
- > CORI-FILL advanced dosing technology
- > Installation and start-up
- > Hands-on



Duration

3 hours

Location

Bronkhorst Training Centre,  
Ruurlo, The Netherlands

Date

Ask your local Sales Representative for available dates

Attendees

1-4 persons

Executive trainer(s)

Bronkhorst Specialists

Certificate

A certificate of participation will be supplied

Course number: 7.26.044 / 7.26.045



# ES-FLOW

## Training objectives

In this course you will gain knowledge about the principle of volume flow measurement and control for liquids. You will get insight in volume flow measurement based on the ultrasonic measurement technology. You will develop your insights in the construction, operation principles, typical markets and applications of the Bronkhorst ES-FLOW product series.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required



**Duration**  
3 hours

**Location**  
Bronkhorst Training Centre,  
Ruurlo, The Netherlands

**Date**  
Ask your local Sales Representative for available dates

## Content

In this course the following topics will be discussed:

- > Mass flow versus volume flow definitions
- > ES-FLOW key features and benefits
- > Ultrasonic flow measurement technology
- > Construction and operation of an ES-FLOW meter and controller
- > Model numbering and range
- > Examples of applications
- > Installation and start-up
- > Control (basic) of an ES-FLOW volume flow controller with pump and valve
- > Hands-on

**Attendees**  
1-4 persons

**Executive trainer(s)**  
Bronkhorst Specialists

**Certificate**  
A certificate of participation will be supplied

**Course number: 7.26.071**





# Vapour flow control

## Training objectives

In this course you will gain knowledge about the principles of liquid vaporization. You will get insight in the technology, construction and the operation principles of the Bronkhorst Controlled Evaporation Mixing (CEM) equipment. The advantages and typical applications will be explained including the compact Vapour Delivery Module (VDM). In a practical setting you will get the opportunity to operate a Bronkhorst CEM system yourself.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

Course: EL-FLOW Select

Course: (mini) CORI-FLOW and/or LIQUI-FLOW



**Duration**  
3 hours

**Location**  
Bronkhorst Training Centre,  
Ruurlo, The Netherlands

**Date**  
Ask your local Sales Representative for available dates

## Content

In this course the following topics will be discussed:

- > Introduction
- > Construction principles
- > Model numbering
- > Models and ranges:
  - > CEM (Controlled Evaporation and Mixing)
  - > VDM (compact Vapour Delivery Module)
- > Operating principles
- > Features and benefits
- > Examples of applications
- > Installation and start-up
- > Hands-on

## Attendees

1-4 persons

## Executive trainer(s)

Bronkhorst Specialists

## Certificate

A certificate of participation will be supplied

**Course number: 7.26.049**



# Control valves

## Training objectives

In this course you will gain knowledge about the principles of mass flow control using proportional control valves. You will get insight in the construction, the operation principles and application advantages of the Bronkhorst Control Valves range. In a practical setting the installation, start-up and maintenance of Bronkhorst control valves will be explained.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required



**Duration**  
3 hours

**Location**  
Bronkhorst Training Centre,  
Ruurlo, The Netherlands

**Date**  
Ask your local Sales Representative for available dates

## Content

In this course the following topics will be discussed:

- Introduction and construction principles
- Model numbering, models and ranges:
  - Direct acting solenoid valves
  - Vary-P valves
  - Pilot valves
  - Bellow valves
  - Membrane valves
  - Pneumatic valves
- Operating principles
- Valve selection, based on:
  - $K_v$ -value and orifice calculation
  - Pressure rating
  - Minimum and maximum Delta-P
  - Medium and sealing material
- Features and benefits
- Examples of applications
- Installation and start-up

## Attendees

1-4 persons

## Executive trainer(s)

Bronkhorst Specialists

## Certificate

A certificate of participation will be supplied

**Course number: 7.26.046**



# Digital communication and fieldbus interfaces

## Training objectives

In this course you will gain knowledge about the principles of digital communication and fieldbus interface technology. You will get insight in the available fieldbus interfaces including the Bronkhorst specific FLOW-BUS technology. In a practical setting you will get the opportunity to install and operate a bus system yourself based on the Bronkhorst FLOW-BUS system.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

No specific prerequisites required



Duration  
3 hours

Location  
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Date  
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## Content

In this course the following topics will be discussed:

- > Introduction
- > Basic Multi-Bus Controller board
- > Optional fieldbus interfaces:
  - > FLOW-BUS
  - > DeviceNet™
  - > EtherCAT®
  - > Modbus-RTU /ASCII
  - > PROFIBUS DP
  - > PROFINET
  - > FLOW-BUS to fieldbus Gateway
- > Features and benefits
- > Hands-on: installation and operation
- > Bronkhorst software tools:
  - > FlowDDE
  - > FlowView
  - > FlowPlot
  - > FlowFix

## Attendees

1-4 persons

## Executive trainer(s)

Bronkhorst Specialists

## Certificate

A certificate of participation will be supplied

Course number: 7.26.047



# Gas calibration

## Training objectives

In this course you will gain knowledge about the principles of a mass flow meter calibration. You will get insight in the construction and the operation principles of the Bronkhorst gas calibration equipment. The calibration methods and conversion models used at Bronkhorst will be explained. In a practical setting a calibration demonstration will be given with an EL-FLOW Select Mass Flow Controller.

## Audience

This training course is intended for attendees who are interested in the field of low flow fluidics handling technology.

## Level

Attendees are supposed to be experienced or educated on vocational or bachelor level in the field of engineering.

## Prerequisites

Course: EL-FLOW

## Content

In this course the following topics will be discussed:

- Introduction
- Calibration definitions
- Calibration methods
- Calibration equipment
- Linearisation and adjustment methods
- Basic functions of FLUICAL® calibration software
- Adjustment and calibration of an EL-FLOW Select mass flow controller (with Look Up Table) using a portable calibrator
- Hands-on



## Duration

3 hours

## Location

Bronkhorst Training Centre,  
Ruurlo, The Netherlands

## Date

Ask your local Sales Representative for available dates

## Attendees

1-4 persons

## Executive trainer(s)

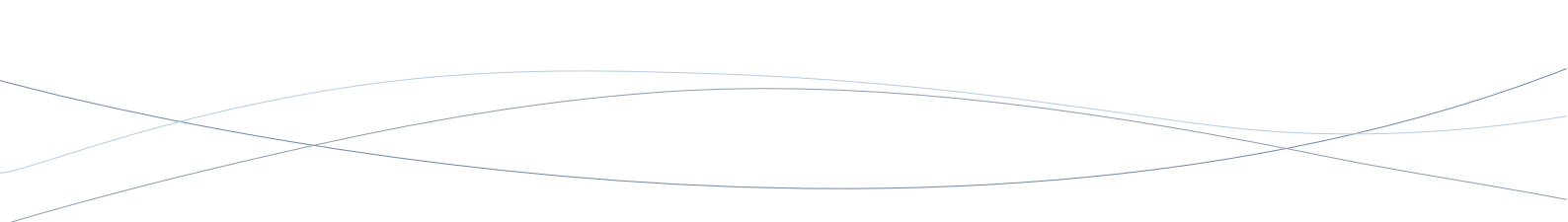
Bronkhorst Specialists

## Certificate

A certificate of participation will be supplied

Course number: 7.26.051





## **Contact**

Bronkhorst Training Centre  
E: [training@bronkhorst.com](mailto:training@bronkhorst.com)

Bronkhorst High-Tech B.V.  
Nijverheidsstraat 1a  
NL-7261 AK Ruurlo, The Netherlands  
T: + 31 573 45 88 00  
F: + 31 573 45 88 08  
I : [www.bronkhorst.com](http://www.bronkhorst.com)

