

# MASS VIEW

The intelligent alternative for VA meters: mass flow meters for gases with flow display

## > 介绍

Bronkhorst High-Tech B.V., 公司，熱導式質量流量計/控制器和電子壓力控制器，歐洲市場的領導者，有多年的經驗，在於設計和製造，可靠的測量和控制裝置。儀器的範圍很寬 Bronkhorst High-Tech B.V.提供了很多不同的應用製程和在各種不同的市場中的創新。

## > 說明

根據這新系列的質量流量計提供現代的、創新的、經濟型替代浮子式流量計也稱為 rotameters 或 purgemeters。與傳統浮子式流量計不同是這個新的流量計測量質量流量而非體積流量。易於替換傳統的浮子式流量計 MASS-VIEW® 提供與市場上最常用的浮子式流量計完全一致的安裝位置。

## > MASS-VIEW® 系列熱導式品質流量計

Bronkhorst High-Tech設計熱傳式MASS-VIEW® 系列直接熱流量測量(無旁路)的原則運作。使用這種類型的優點是使用此種感測器的儀器直接量測而不需要的溫度和壓力校正的質量流量。與其他傳統浮子式流量計相比，其精度高、更廣的流量比turn down (至1:100)，更是可免除玻璃元件的視差和一個更安全的施工。傳感式MASS-VIEW® 流量計耐壓10 bar(g) 或150 psi(g)。提供量測範圍從0.2到200 l/min(空氣)。明亮的OLED顯示清晰可見，廣角度視角，使閱讀的實際流量值和條形圖，總流量和氣體的種類。切換顯示功能可利用一個4方向導航按鈕的設置。預設多種的氣體參數，使用於不同氣體環境中，不必重新校準，因此降低的成本。附加功能包括報警和計數器功能、一個類比輸出信號、數位介面和兩個繼電器觸點。流量控制可選加裝針閥。這些高品質針形閥提供暢順及精細調整的氣體的流率。

## > 特点

- ◆ 實際的流量(條形圖和值)
- ◆ 顯示流量單位
- ◆ 氣體種類
- ◆ 累積流量
- ◆ 反應時間快高精度
- ◆ 使用者密碼設定
- ◆ 預設多種氣體校正儀值儀器內
- ◆ 類比/數位傳輸功能RS232和Modbus ASCII/RTU通訊介面
- ◆ 高亮度、廣角度的OLED視窗
- ◆ 免現覺誤差
- ◆ 無溫度壓力補償問題
- ◆ 低壓損使用範圍廣
- ◆ 警報和累計功能
- ◆ 多種氣體/多範圍使用
- ◆ 提供免費軟體



## > Technical specifications

| Performance                                                                               |                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accuracy                                                                                  | : $\pm 2\%$ RD for flow $> 50\%$ of max. capacity;<br>$\pm (1\% \text{ RD} + 0.5\% \text{ FS})$ on lower flows                                                                                                                       |
| Repeatability                                                                             | : $< 0.1\%$ FS typical                                                                                                                                                                                                               |
| Pre-installed gases                                                                       | : Air, Ar, N <sub>2</sub> , O <sub>2</sub> , CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , N <sub>2</sub> O, CO and C <sub>4</sub> H <sub>10</sub><br>(special models available for H <sub>2</sub> and Helium) |
| Standard calibration gas                                                                  | : Air, other gases are converted using<br>our Fluidat® conversion model which<br>will introduce extra inaccuracy                                                                                                                     |
| Rangeability                                                                              | : up to 1:100                                                                                                                                                                                                                        |
| Operating pressure                                                                        | : 0...10 bar(g) / 0...150 psi(g)                                                                                                                                                                                                     |
| Pressure coefficient                                                                      | : 0.2%/bar typical at Air                                                                                                                                                                                                            |
| Operating temperature                                                                     | : 0...50°C (32...122°F)                                                                                                                                                                                                              |
| Temperature coefficient                                                                   | : Zero: $< 0.1\% \text{FS}/^{\circ}\text{C}$ , Span: $< 0.2\% \text{RD}/^{\circ}\text{C}$                                                                                                                                            |
| Attitude sensitivity                                                                      | : $< 0.1\% \text{FS}$                                                                                                                                                                                                                |
| Response time (t <sub>63%</sub> )                                                         | : 2 s                                                                                                                                                                                                                                |
| Mechanical specifications                                                                 |                                                                                                                                                                                                                                      |
| Materials                                                                                 | : Meter: aluminium, Viton                                                                                                                                                                                                            |
| (wetted parts)                                                                            | Needle valve: SS316, Viton, PTFE                                                                                                                                                                                                     |
| Gas connections (in/out)                                                                  | : G 1/4" BSPP female thread<br>(compression fittings optional)                                                                                                                                                                       |
| Weight                                                                                    | : 0.7 kg                                                                                                                                                                                                                             |
| Electrical specifications                                                                 |                                                                                                                                                                                                                                      |
| Electrical connection                                                                     | : 8-pin RJ-45 modular jack                                                                                                                                                                                                           |
| Output                                                                                    | : analog: 0...5 Vdc<br>digital: RS232 / RS485 (Modbus ASCII/RTU)                                                                                                                                                                     |
| Required supply voltage                                                                   | : 15...24 Vdc (+/-10%)                                                                                                                                                                                                               |
| Power consumption                                                                         | : approx. 135 mA                                                                                                                                                                                                                     |
| Min. and max. relay contacts                                                              | : switching current 0.5 A, 24 Vdc,<br>one side grounded (0 Vdc power)                                                                                                                                                                |
| Safety                                                                                    |                                                                                                                                                                                                                                      |
| Test pressure                                                                             | : 21 bar (a) / 300 psi (a)                                                                                                                                                                                                           |
| Ingress protection                                                                        | : IP-50                                                                                                                                                                                                                              |
| Leak integrity (outboard)                                                                 | : $< 1 \times 10^{-9}$ mbar l/s He                                                                                                                                                                                                   |
| EMC                                                                                       | : CE declaration                                                                                                                                                                                                                     |
| Warranty                                                                                  |                                                                                                                                                                                                                                      |
| All instruments and accessories are warranted for a period of 3 years<br>from order date. |                                                                                                                                                                                                                                      |

## > Capacities

| Selectable ranges in l <sub>v</sub> /min (SLM) | Air        | N <sub>2</sub> | O <sub>2</sub> | CO         | Ar         | CO <sub>2</sub> | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | N <sub>2</sub> O | C <sub>4</sub> H <sub>10</sub> |
|------------------------------------------------|------------|----------------|----------------|------------|------------|-----------------|-----------------|-------------------------------|------------------|--------------------------------|
| MV-102 and MV-302                              |            |                |                |            |            |                 |                 |                               |                  |                                |
| Range 1 (max.)                                 | 0.02...2   | 0.02...2       | 0.02...2       | 0.02...2   | 0.04...4   | 0.02...2        | 0.01...1        | 0.01...1                      | 0.02...2         | 0.01...1                       |
| Range 2                                        | 0.01...1   | 0.01...1       | 0.01...1       | 0.01...1   | 0.02...2   | 0.01...1        | 0.005...0.5     | 0.005...0.5                   | 0.01...1         | 0.005...0.5                    |
| Range 3                                        | 0.01...0.5 | 0.01...0.5     | 0.01...0.5     | 0.01...0.5 | 0.02...1   | 0.01...0.5      | 0.005...0.2     | 0.005...0.2                   | 0.01...0.5       | 0.005...0.2                    |
| Range 4 (min.)                                 | 0.01...0.2 | 0.01...0.2     | 0.01...0.2     | 0.01...0.2 | 0.02...0.5 | 0.01...0.2      | 0.005...0.1     | 0.005...0.1                   | 0.01...0.2       | 0.005...0.1                    |
| MV-104 and MV-304                              |            |                |                |            |            |                 |                 |                               |                  |                                |
| Range 1 (max.)                                 | 0.2...20   | 0.2...20       | 0.2...20       | 0.2...20   | 0.4...40   | 0.2...20        | 0.1...10        | 0.1...10                      | 0.2...20         | 0.1...10                       |
| Range 2                                        | 0.1...10   | 0.1...10       | 0.1...10       | 0.1...10   | 0.2...20   | 0.1...10        | 0.05...5        | 0.05...5                      | 0.1...10         | 0.05...5                       |
| Range 3                                        | 0.05...5   | 0.05...5       | 0.05...5       | 0.05...5   | 0.1...10   | 0.05...5        | 0.02...2        | 0.02...2                      | 0.05...5         | 0.02...2                       |
| Range 4 (min.)                                 | 0.04...2   | 0.04...2       | 0.04...2       | 0.04...2   | 0.08...5   | 0.04...2        | 0.02...1        | 0.02...1                      | 0.04...2         | 0.02...1                       |
| MV-106 and MV-306                              |            |                |                |            |            |                 |                 |                               |                  |                                |
| Range 1 (max.)                                 | 2...200    | 2...200        | 2...200        | 2...200    | 4...400    | 2...200         | 1...100         | 1...100                       | 2...200          | 1...100                        |
| Range 2                                        | 1...100    | 1...100        | 1...100        | 1...100    | 2...200    | 1...100         | 0.5...50        | 0.5...50                      | 1...100          | 0.5...50                       |
| Range 3                                        | 0.5...50   | 0.5...50       | 0.5...50       | 0.5...50   | 1...100    | 0.5...50        | 0.2...20        | 0.2...20                      | 0.5...50         | 0.2...20                       |
| Range 4 (min.)                                 | 0.4...20   | 0.4...20       | 0.4...20       | 0.4...20   | 0.8...50   | 0.4...20        | 0.2...10        | 0.2...10                      | 0.4...20         | 0.2...10                       |

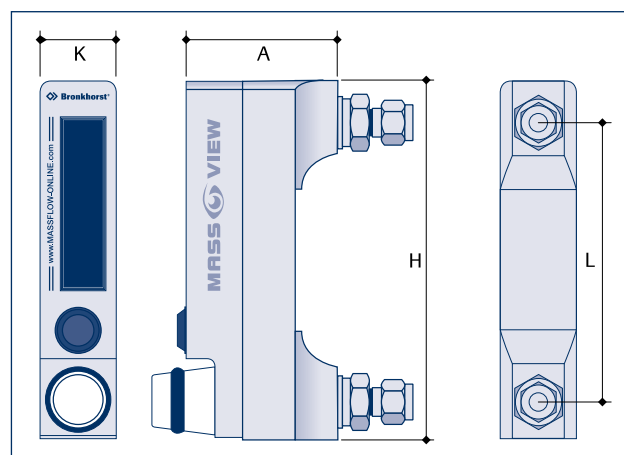
## > Models and flow capacities

| Model     | Description                        | Max. capacity                 |
|-----------|------------------------------------|-------------------------------|
|           | (relative Air)                     |                               |
| MV-102    | MASS-VIEW® meter                   | 2 l <sub>v</sub> /min (SLM)   |
| MV-104    | MASS-VIEW® meter                   | 20 l <sub>v</sub> /min (SLM)  |
| MV-106    | MASS-VIEW® meter with needle valve | 200 l <sub>v</sub> /min (SLM) |
| MV-302    | MASS-VIEW® meter with needle valve | 2 l <sub>v</sub> /min (SLM)   |
| MV-304    | MASS-VIEW® meter with needle valve | 20 l <sub>v</sub> /min (SLM)  |
| MV-306    | MASS-VIEW® meter with needle valve | 200 l <sub>v</sub> /min (SLM) |
| MV-192-He | MASS-VIEW® meter                   | 1 l <sub>v</sub> /min (SLM)   |
| MV-194-He | MASS-VIEW® meter                   | 10 l <sub>v</sub> /min (SLM)  |
| MV-196-He | MASS-VIEW® meter                   | 100 l <sub>v</sub> /min (SLM) |
| MV-192-H2 | MASS-VIEW® meter                   | 1 l <sub>v</sub> /min (SLM)   |
| MV-194-H2 | MASS-VIEW® meter                   | 10 l <sub>v</sub> /min (SLM)  |
| MV-196-H2 | MASS-VIEW® meter                   | 100 l <sub>v</sub> /min (SLM) |
| MV-392-He | MASS-VIEW® meter with needle valve | 1 l <sub>v</sub> /min (SLM)   |
| MV-394-He | MASS-VIEW® meter with needle valve | 10 l <sub>v</sub> /min (SLM)  |
| MV-396-He | MASS-VIEW® meter with needle valve | 100 l <sub>v</sub> /min (SLM) |
| MV-392-H2 | MASS-VIEW® meter with needle valve | 1 l <sub>v</sub> /min (SLM)   |
| MV-394-H2 | MASS-VIEW® meter with needle valve | 10 l <sub>v</sub> /min (SLM)  |
| MV-396-H2 | MASS-VIEW® meter with needle valve | 100 l <sub>v</sub> /min (SLM) |

Notes:

- Mass flow units l<sub>v</sub>/min and SLM refer to normal operating conditions, i.e. 0°C (32°F) and 1013 mbar (14.7 psi)
- Technical specifications are based on Air at maximum FS
- All specifications subject to change without notice

## > Dimensions



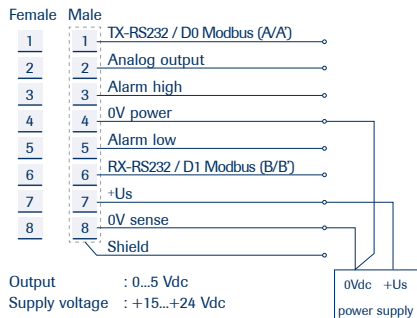
| Model                      | A  | H   | K  | L   |
|----------------------------|----|-----|----|-----|
| MV-102/104/106/192/194/196 | 63 | 159 | 38 | 114 |
| MV-302/304/306/392/394/396 | 63 | 159 | 38 | 114 |

Dimensions in mm.

| Selectable ranges in l <sub>v</sub> /min (SLM) | Air        | N <sub>2</sub> | O <sub>2</sub> | CO         | Ar         | CO <sub>2</sub> | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | N <sub>2</sub> O | C <sub>4</sub> H <sub>10</sub> |
|------------------------------------------------|------------|----------------|----------------|------------|------------|-----------------|-----------------|-------------------------------|------------------|--------------------------------|
| MV-102 and MV-302                              |            |                |                |            |            |                 |                 |                               |                  |                                |
| Range 1 (max.)                                 | 0.02...2   | 0.02...2       | 0.02...2       | 0.02...2   | 0.04...4   | 0.02...2        | 0.01...1        | 0.01...1                      | 0.02...2         | 0.01...1                       |
| Range 2                                        | 0.01...1   | 0.01...1       | 0.01...1       | 0.01...1   | 0.02...2   | 0.01...1        | 0.005...0.5     | 0.005...0.5                   | 0.01...1         | 0.005...0.5                    |
| Range 3                                        | 0.01...0.5 | 0.01...0.5     | 0.01...0.5     | 0.01...0.5 | 0.02...1   | 0.01...0.5      | 0.005...0.2     | 0.005...0.2                   | 0.01...0.5       | 0.005...0.2                    |
| Range 4 (min.)                                 | 0.01...0.2 | 0.01...0.2     | 0.01...0.2     | 0.01...0.2 | 0.02...0.5 | 0.01...0.2      | 0.005...0.1     | 0.005...0.1                   | 0.01...0.2       | 0.005...0.1                    |
| MV-104 and MV-304                              |            |                |                |            |            |                 |                 |                               |                  |                                |
| Range 1 (max.)                                 | 0.2...20   | 0.2...20       | 0.2...20       | 0.2...20   | 0.4...40   | 0.2...20        | 0.1...10        | 0.1...10                      | 0.2...20         | 0.1...10                       |
| Range 2                                        | 0.1...10   | 0.1...10       | 0.1...10       | 0.1...10   | 0.2...20   | 0.1...10        | 0.05...5        | 0.05...5                      | 0.1...10         | 0.05...5                       |
| Range 3                                        | 0.05...5   | 0.05...5       | 0.05...5       | 0.05...5   | 0.1...10   | 0.05...5        | 0.02...2        | 0.02...2                      | 0.05...5         | 0.02...2                       |
| Range 4 (min.)                                 | 0.04...2   | 0.04...2       | 0.04...2       | 0.04...2   | 0.08...5   | 0.04...2        | 0.02...1        | 0.02...1                      | 0.04...2         | 0.02...1                       |
| MV-106 and MV-306                              |            |                |                |            |            |                 |                 |                               |                  |                                |
| Range 1 (max.)                                 | 2...200    | 2...200        | 2...200        | 2...200    | 4...400    | 2...200         | 1...100         | 1...100                       | 2...200          | 1...100                        |
| Range 2                                        | 1...100    | 1...100        | 1...100        | 1...100    | 2...200    | 1...100         | 0.5...50        | 0.5...50                      | 1...100          | 0.5...50                       |
| Range 3                                        | 0.5...50   | 0.5...50       | 0.5...50       | 0.5...50   | 1...100    | 0.5...50        | 0.2...20        | 0.2...20                      | 0.5...50         | 0.2...20                       |
| Range 4 (min.)                                 | 0.4...20   | 0.4...20       | 0.4...20       | 0.4...20   | 0.8...50   | 0.4...20        | 0.2...10        | 0.2...10                      | 0.4...20         | 0.2...10                       |

## > Electrical connection

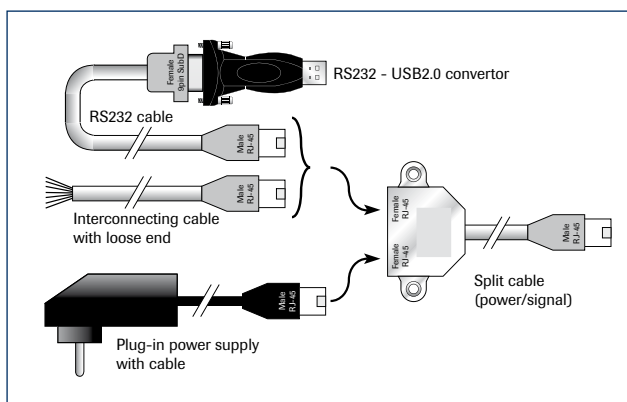
### Hook-up diagram



**Note:** 0V power (pin 4) and 0V sense (pin 8) should be separately connected to the 0V terminal at the power supply

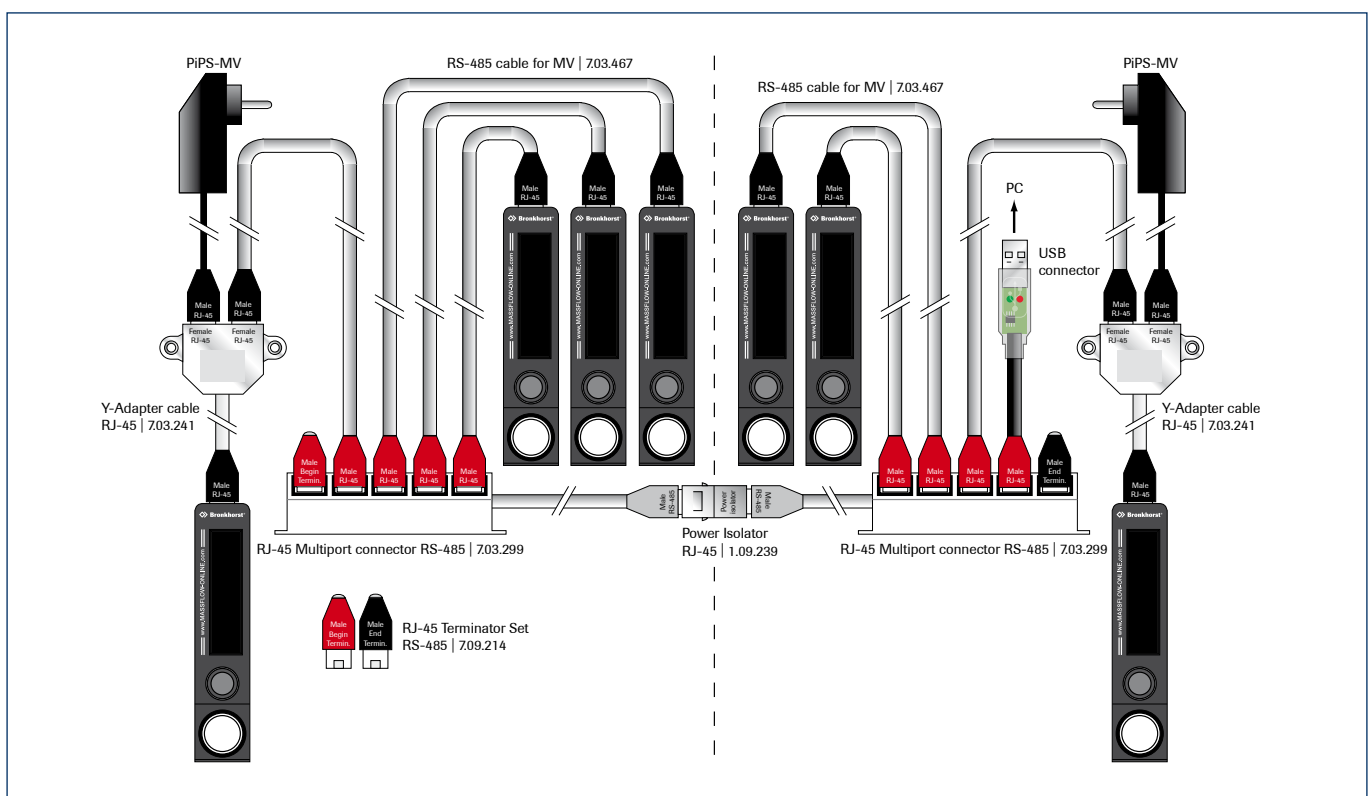
## > Cabling options

Combinations for separate connection of power and I/O signals.



## > Cabling example

Example for 7 MASS-VIEW meters/regulators with RS485 - USB signal connection. Two separated power networks are required due to the maximum power supply of 15 Watt for one PIPS-MV.



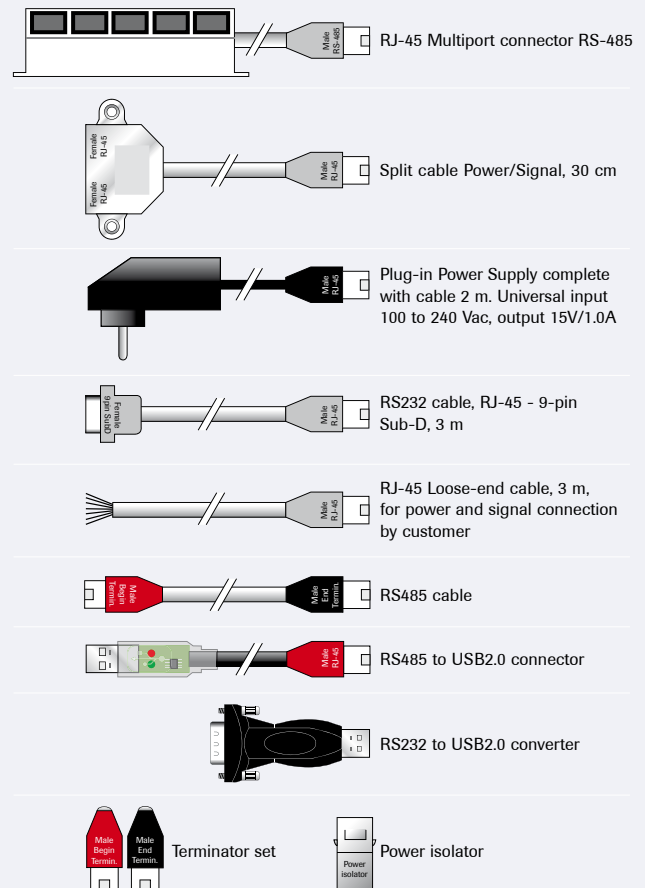
## > Accessories

The following accessories are offered for the MASS-VIEW® mass flow meters:

### Adapter sets (inlet and outlet)

| Metric sizes              | Inch sizes               |
|---------------------------|--------------------------|
| 3 mm OD compression type  | 1/8" OD compression type |
| 6 mm OD compression type  | 1/4" OD compression type |
| 12 mm OD compression type | 1/2" OD compression type |

### Power supply and electrical connection



## > 應用

MASS-VIEW® 的應用領域:

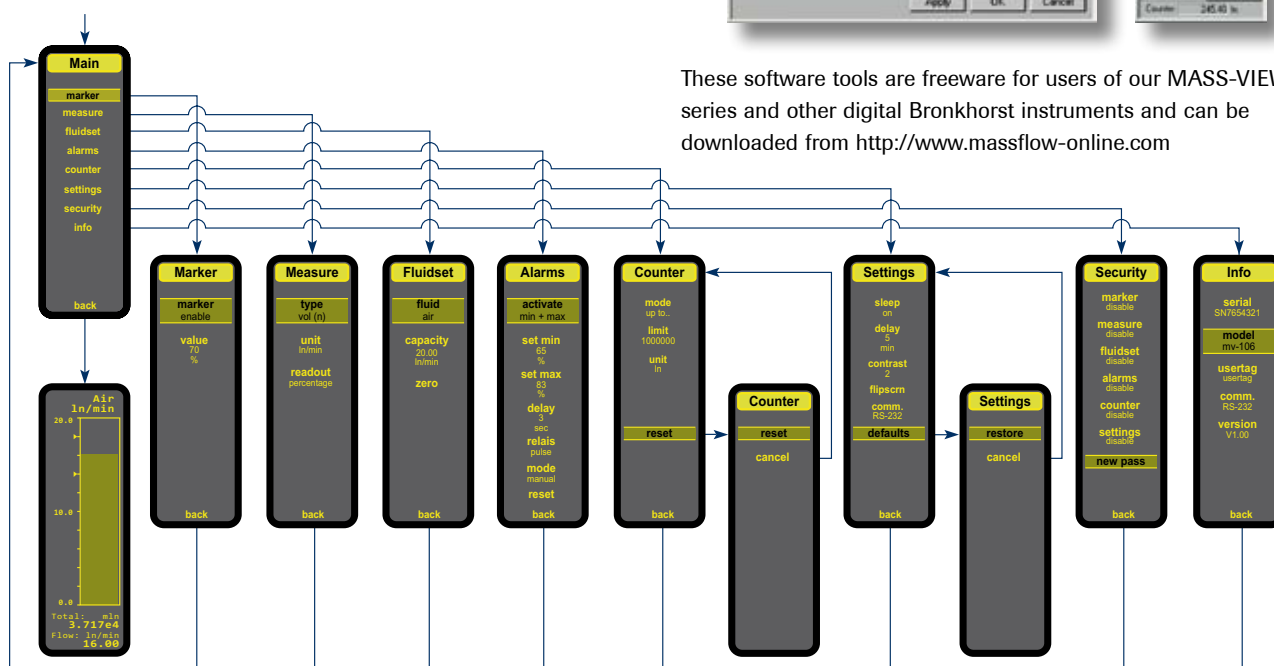
- ◆ 高溫鍋爐控制
- ◆ 焊接(焊氣體監測)
- ◆ 鋼材切割
- ◆ 塗料
- ◆ 環境用氣體的規管(生物技術)
- ◆ 氣體混合物的製備
- ◆ 氣體耗費量(醫院)
- ◆ 流量監測 (實驗室)
- ◆ 測試設備 (生產維修)
- ◆ 洩漏測量 (品管, 設備)
- ◆ 分析儀器
- ◆ 通氣/排氣(食品的產品、製冰 / 食用油脂)
- ◆ 食物儲藏保鮮
- ◆ 發酵食品(生物技術、制藥)



MASS-VIEW® Mass Flow Meter

## > 顯示功能表

4方向導航按鈕提供了, 一個用戶友善的功能操作方式。可用於零點校正、預裝的範圍、氣體的選擇、流程的單位, 報警功能(最小值/最大值/計數器值)和計數器。我們提供了密碼保護, 以防止未經授權的更改的人。下面的MASS-VIEW® 功能表功能概述說明了此產品系列中的很多功能。

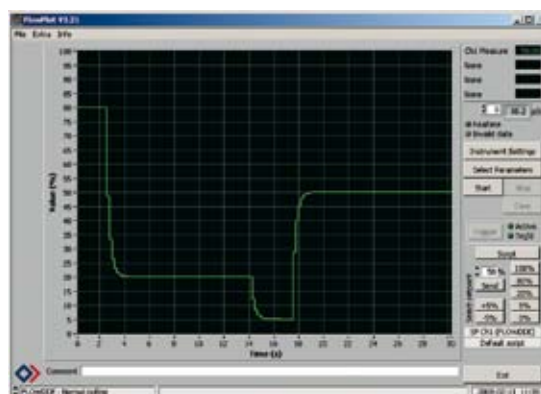


## > Bronkhorst FlowWare, free software tools

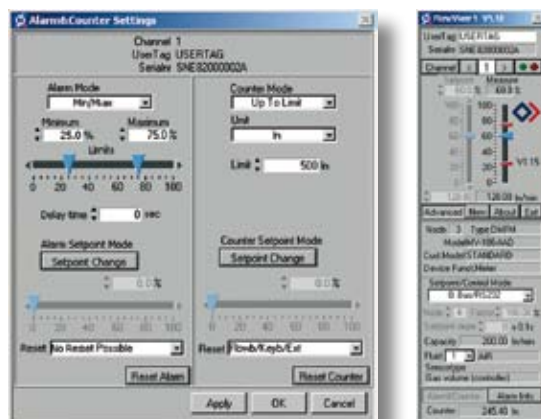
Bronkhorst High-Tech 提供下列軟體產品在個人電腦上使用:

**FlowDDE** : Software tool to interface between digital instruments and MS Windows software.

**FlowPlot** : Software tool for monitoring and optimizing digital instruments parameters.



**FlowView** : Software tool to operate Bronkhorst digital instruments.



These software tools are freeware for users of our MASS-VIEW® series and other digital Bronkhorst instruments and can be downloaded from <http://www.massflow-online.com>

Bronkhorst distributor



MASS-FLOW ONLINE BV  
[www.massflow-online.com](http://www.massflow-online.com)