

# VAF

INSTRUMENTS



## MilliFlow<sup>®</sup>

Piston Meters DN8 mm

# 110

Product Bulletin

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TO BE  
REALLY  
SURE

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## Introduction

VAF Instruments MilliFlow® piston Flowmeters, operating on the positive displacement principle, are used in continuous metering applications, in-line blending processes and batch applications. The accuracy of the MilliFlow® meter is better than 0,5% and the repeatability is 0,05%.

### Experience in flow measurement

In 1938 VAF Instruments started as a manufacturer of petrol delivery pumps. The Flowmeters made by VAF Instruments for this pump already had the highest accuracy and met the demands of the board of weights and measures. Since 1938, innovation and research helped VAF Instruments to develop new types of Flowmeters bearing in mind customer requirements and the need for accurate flow measurement. VAF Instruments Flowmeters are available in sizes from 8 mm up to 300 mm (1 l/hr up to 960 m<sup>3</sup>/hr). MilliFlow® Flowmeters cover the lower part of the range.

### Available MilliFlow® meter

MilliFlow® meters are available in connection sizes from 8 mm up to 12 mm representing maximum flow ranges from 1 l/hr up to 20 l/hr. For registration of the measured amount of liquid MilliFlow® meters can be fitted with various combinations of counters and pulse transmitters.

### Liquids

MilliFlow® meters are suitable for a wide range of liquids; acids, alkalines, cleansing liquids, solvents, water, edible oils and fats, liquor, glucose, paint, all kind of petro-chemical liquids, alcohol, printing ink, glue and many other organic and inorganic liquids.

### Special versions

This brochure comprises only VAF Instruments' standard delivery program. Special Flowmeter variants can be offered as tailor-made solutions.

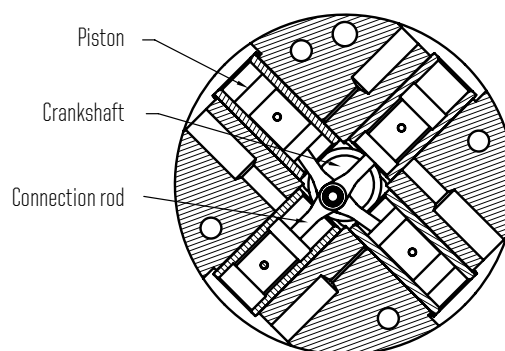
Consult VAF Instruments for more information.

MilliFlow® is a registered trade mark of VAF Instruments B.V.

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## Principle of operation

Operating on the positive displacement principle the Flowmeter consists of four radial pistons, actuated in turn by the head pressure of the liquid. The pistons are linked to a crankshaft which is connected by a magnetic coupling to an LCD type rate-totaliser or to a mechanical totaliser with or without electric pulse transmitter.



Sectional view of piston meter

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## Features and benefits

### Features

**Designed for rough industrial environments as well as for laboratory use**

**Dependable micro-precision piston operation**

**Measuring accuracy is better than  $\pm 0,5\%$  of rate**

**Handles viscosities up to 500 mPa.s**  
(consult factory for higher viscosities)

**Local totaliser and/or pulse transmitters according Namur for data processing**

**Pressure ratings up to 100 bar**

### Benefits

Easy to install and operate

Suitable for very low flow rates

Blending and batching system accuracy

Saves on raw materials.  
Consistent end-product quality

Handles a wide variety of liquids

Connectable to signal processing instrumentation, including flow computers, available from one supplier

Suitable for suction and pressure lines in various processes

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## Applications

The MilliFlow® meter is widely used for flow measurement, batching and in-line blending operations in the process industry, pilot plants and laboratories, e.g.:

- Colouring fuel oil, textile, paper, leather and plastics;
- Paint regulation in automatic spray booths;
- Blending of additives with oils and fats;
- Applying corrosion inhibitor fluid to prevent oxidation of metal surfaces;
- Dosing of additives to concrete mixers;
- Calibration of positive displacement pumps;
- Control of catalysts in chemical reactors;
- Addition of chemicals to boiler feed water;
- Accurate filling of hydraulic shock absorbers;
- And many other applications.

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## Options and accessories

### Available models

- MilliFlow® meter with mechanical totaliser and optional inductive pulse transmitter;
- MilliFlow® meter with FlowCount Rate Totaliser;
- Non-indicating MilliFlow® meter with pulse transmitterbox.

### Transmitter variants

- Inductive pulse transmitter with optional pulse discriminator; 1 or 2 passive proximity switches acc. Namur DIN 19234; Protection class IP55; intrinsically safe, if used with a suitable safety barrier;
- Incremental pulse encoder, comprising of a double pulse generator and a pulse discriminator. Open collector or active pulse output.

### Pulse discriminator

The pulse discriminator prevents measuring errors caused by pipeline vibrations and unsteady flow conditions. By using two pulse transmitters in the Flowmeter, generating two identical pulse trains with a signal phase shift of 90 degrees, it is possible to eliminate these measuring errors. The pulse discriminator comprises of a printed circuit board installed in the pulse transmitter box. The discriminator is standard with incremental pulse encoders and is recommended for use with inductive pulse transmitters.

### Built-on Totaliser, FlowCount Rate Totaliser and Pulse Box

MilliFlow® meter can be equipped with a built-on totaliser, a FlowCount rate totaliser or a pulse box. See tables for counter reading units and combinations of totaliser and pulse transmitter.

The LCD type rate totaliser is battery operated and has no need for external power supply. The instrument is mounted onto the Flowmeter and is housed in a dustproof and watertight enclosure according IP67 and NEMA4X standards.

The FlowCount is fully programmable with user configurable K-factor, reading units, decimal point position, filter constant and timebase. Flowrate and totals can be displayed in millilitres, litres, gallons or cubic metres, per second, minute, hour or day.

Options include a two-wire 4-20 mA output. When this option is installed, all operating power for the rate totaliser is drawn from the 4-20 mA loop, thereby extending battery life. A second option combines a DC power input with high and low flow alarms. The milliampere option and the flow alarm option cannot be combined in one instrument.

A pulse transmitter box is a non-indicating box which is built directly onto the Flowmeter, and holds the inductive transmitter(s) according to Namur with optional pulse discriminator, or the incremental pulse encoder that includes a discriminator.



Totaliser



Pulse box



FlowCount

# Technical specification

<b>Connections</b>	Pipe couplings	8 mm, 12 mm
	Male thread NPT	1/4"
	Flanges	DIN DN 15 and DN 25 / PN 10/16/25 / 1/2 " and 1 " ANSI class 150 or 300 RF
<b>Materials</b>	Body	AISI 316
	Bearings	Rulon, AISI 316
	Packing	Gylon (Teflon compound)
	Seal ring	PTFE, AISI 316
	Cylinder linings	Carbon, ferrallium
<b>Flowrange</b>	1- 20 litres/h	
<b>Temperature</b>	Liquid: -15 to 75°C / Ambient: -15 to 55°C	
<b>Body pressure rating [kPa (bar)]</b>	2.500 (25), 3.500 (35), 10.000 (100)	
<b>Counter reading</b>	Red pointer	0,01 litre
	Counter	0,1 litre
<b>Minimum starting pressure [kPa (bar)]</b>	5 (0,05)	
<b>Accuracy at 2 mPa.s</b>	Better than $\pm 0,5$ % of rate	
<b>Repeatability</b>	$\pm 0,05$ %	
<b>Viscosity</b>	Up to 500 mPa.s is standard	
<b>Mounting</b>	In horizontal process piping with counter on top Wall mounting bracket optional	
<b>Flow direction</b>	Left-to-right is standard For right-to-left the counter or pulse transmitter box can be turned 180°	
<b>Liquid filter</b>	Particles larger than 0,05 mm must be filtered out by installing a suitable filter at the inlet of the Flowmeter	
<b>Pulse transmitters</b>	Inductive type	1 or 2 passive proximity switches according DIN 19234 (Namur). Protection class IP55, intrinsically safe
	Incremental type	Incremental type includes pulse discriminator. Supply voltage 12 - 35 VDC. Max. frequency 5 kHz

Flowmeters with inductive pulse transmitter in totaliser:

Pulse rate [pulses/ml]					
N=1	N=2	N=5	N=10	N=20	N=25
0,01; 0,5	1	2,5	0,1; 5	10	12,5

Non-indicating Flowmeters with inductive pulse transmitter in pulse box

Pulse rate [pulses/ml]						
N=1	N=2	N=5	N=10	N=20	N=25	N=50
0,5	1	2,5	5	10	12,5	25

Non-indicating Flowmeters with incremental pulse transmitter in pulse box

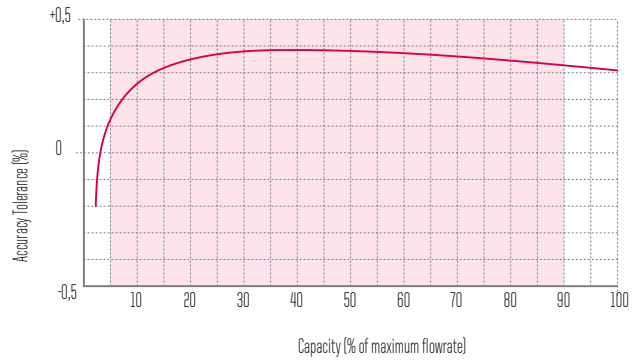
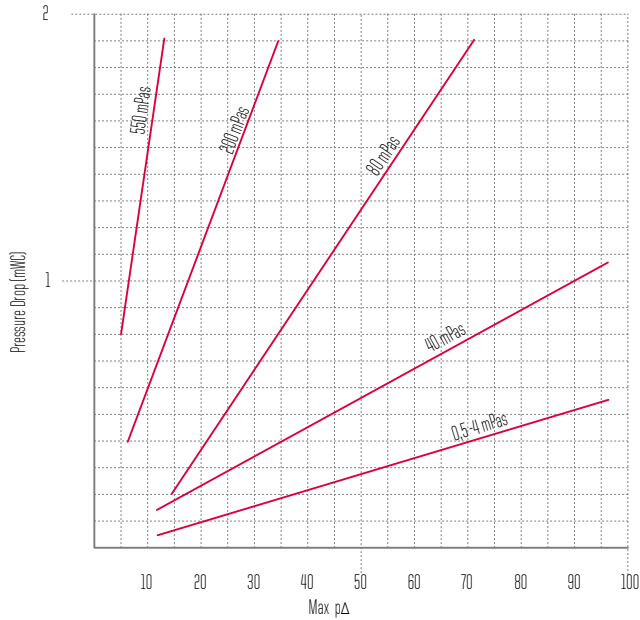
Pulse rate [pulses/ml]		
N=100	N=250	N=500
50	125	250

## Typical accuracy

Limits in red area are guaranteed by factory calibration.

Within a narrower measuring range the accuracy will be better.

### Pressure drop



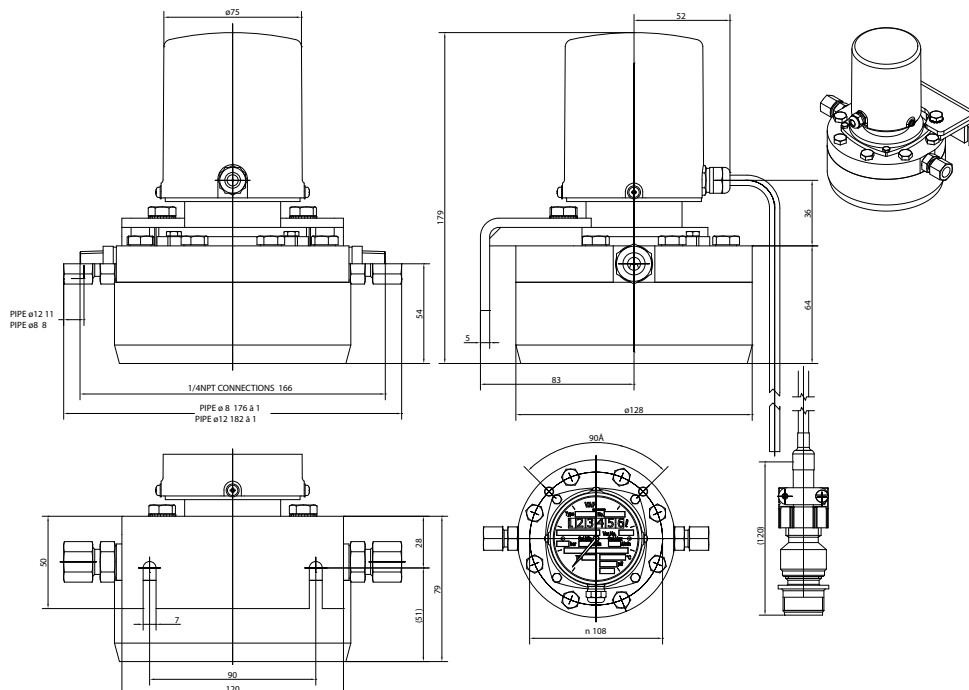
Capacity Model No. M31 (100% = 20 l/h)

Capacity Model No. M31 (100% = 20 l/h)

## Dimensions

Except where noted all dimensions are in millimetres.

Dimensions of other versions not shown here are available on request.





# Quotation and ordering information

For proper selection of the suitable MilliFlow® meter the following data should be determined:

## Fluid data:

1. **Process liquid** (trade name or chemical composition):
2. **Flowrate** (l/h) minimum:                      normal:                      maximum:
3. **Operating pressure range** [bar]:                      allowable pressure drop [bar]:
4. **Operating temperature range** [°C]:
5. **Specific gravity at operating conditions** [kg/l]:
6. **Viscosity at operating conditions** [mPa.s]:

## Flowmeter data:

7. **Connections:**                       threaded                       pipe couplings  
     DIN flanges                       ANSI flanges
8. **Flange size:**                       DN 15 (½")                       DN 25 (1")
9. **Local counter:**                       totaliser                       no local counter (continue with step 10)  
     totaliser with inductive pulse transmitter  
    no. of pulse generators:                      no. of pulses/ml:  
     flowcount rate totaliser  
    reading unit:                       ml                       litres                       per minute                       per hour  
    other reading unit:  
    flowcount options:                       4-20 mA output                       intrinsically safe  
     Other options consult factory

10. **Non-indicating pulse transmitter box:**  
 inductive pulse transmitter                      no. of pulse transmitters (max. 2):                      no. of pulses/ml:  
    pulse discriminator:                       required                       not required  
 incremental pulse encoder (includes pulse discriminator)                      no. of pulses/ml:  
    electrical connection:                       6 pin connector                       cable gland  
    output for discriminator:                       active pulse output                       open collector output

## Options and accessories:

11. **Wall mounting bracket:**                       required                       not required
12. **Liquid filter:**                       required                       not required
13. **Certification:**                       standard factory calibration  
     material certificate acc. EN 10204 3.1  
     other:
14. **Associated electronic signal processing instrumentation** (please specify):

Name:

Place and date:

Please fill out this form and send it to sales@vaf.nl. We will reply with a quotation and ordering information for the requested product or solution a.s.a.p.

For further information see relevant Product Bulletins or www.vaf.nl



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