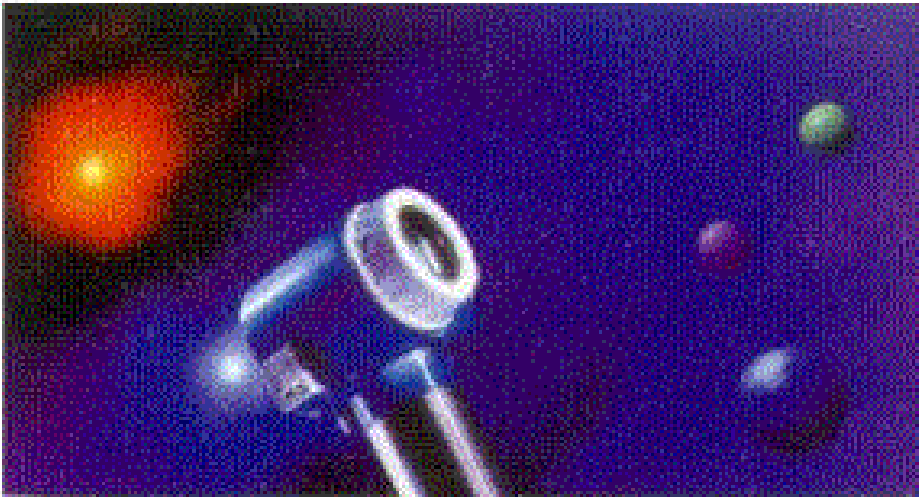


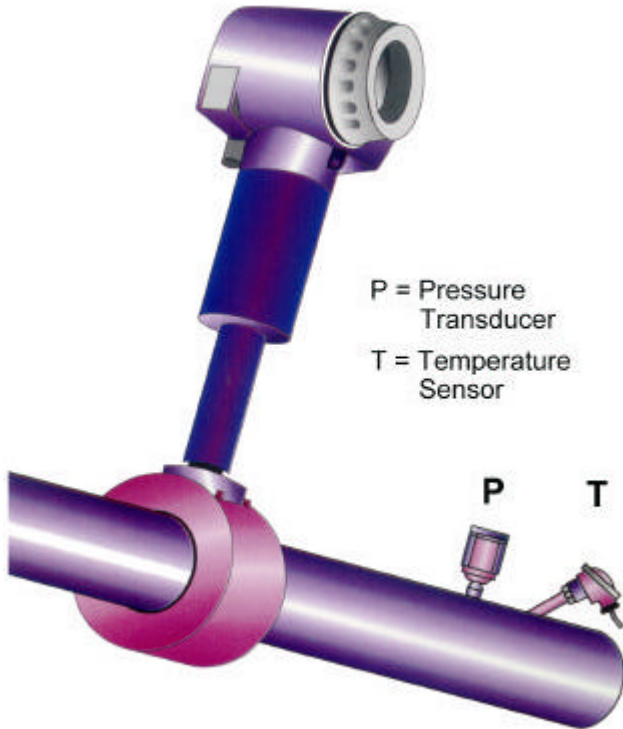
Clorius vortex meters



Steam, compressed air
and other gases

Clorius Compensated Vortex Flow Meter

Steam, compressed air and other gases can be measured.



Since steam is normally described in units of mass, measurement of mass flow is obviously required.

The density of steam varies directly with changes in pressure, therefore, unless the steam pressure is held absolutely constant at the point of measurement, the volumetric flow reading will not give an accurate indication of mass flow. In order to calculate the mass flow, it is necessary to determine the steam density and to apply "density compensation" to the volumetric information.

Density calculations are normally made by measuring the pressure for saturated steam or both pressure and temperature for superheated steam.

A similar principle applies to compressed air and other gases when the standard volume of gas is required. This calculation is carried out by measuring the actual volume of gas via the Vortex flow meter, pressure using a pipe mounted pressure transducer and the temperature using Pt 100 temperature sensor.

Outputs from these devices are connected to a 415 flow computer, which carries out the calculation to display the reading in the required format, kg or lb. of steam and S.C.F. or Nm³ of compressed air or gas.

Using simple flow metering devices, particularly when monitoring steam, measuring only volumetric flowrate or total volume will be of limited use.

The same flow computer can also provide indications of the pressure and temperature being measured and has output facilities for remote reading via a BMS or connection to a chart recorder.

Typical Flow Ranges for Vortex Meters

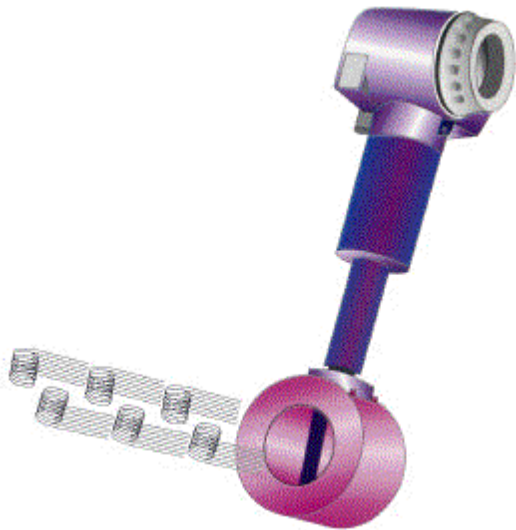
Meter Size	Meter Type	Flow Range for sat/steam @ 7 bar g	Flow range for air @ 100 PSI & 15°C
15mm	RK101	9 – 105 kg/h	11.1 – 190 Nm ³ /h
25mm	RK102	25 – 625 kg/h	29.5 – 1,120 Nm ³ /h
40mm	RK104	59 – 1,480 kg/h	77.3 – 2,940 Nm ³ /h
50mm	RK105	101.3 – 2,474.4 kg/h	124 – 4,710 Nm ³ /h
80mm	RK108	211 – 5,360 kg/h	284 – 10,800 Nm ³ /h
100mm	RK110	370 – 9,350 kg/h	478 – 18,200 Nm ³ /h
150mm	RK115	830 – 20,900 kg/h	1,060 – 40,200 Nm ³ /h
200mm	RK120	1,370 – 32,700 kg/h	1,750 – 66,700 Nm ³ /h
250mm	RK125	2,190 – 52,100 kg/h	2,800 – 106,000 Nm ³ /h
300mm	RK130	3,090 – 73,700 kg/h	3,950 – 150,000 Nm ³ /h

Clorius Vortex Flowmeter

Characteristics

The Vortex flow meter is a volume based flow meter for a wide range of applications including steam, gas and aggressive liquids.

The vortex meter establishes fluid flow by measuring the rate at which vortices are shed from a bluff body mounted in the flow. This “shedder bar” produces alternate vortices on either side creating local pressure changes.



These pressure differences are detected by a sensor mounted outside the flow line. There are no moving parts in the meter, and no measuring sensors or diaphragms in the flow to be contaminated or damaged by the fluid.

The sensor output can be transmitted as a high frequency pulse as by 415 flow computers, or the signal can be interpreted in the meter using assumed process conditions for the fluid. There is a potential error in this calculation if process conditions vary from the fixed values programmed into the meter. The meter can be supplied with the integral totaliser or a 0-100% display of flow rate.

The Clorius Vortex meter features:

Simple, rugged construction.

Reliability – no moving parts, no direct fluid-sensor contact.

Wide rangeability, high accuracy.

Pulse and current output.

Specification

Nominal Diameters

15 – 300mm

Measurable Fluids

Steam, air, gas, liquid

Accuracy

For Reynolds number 20,000 or greater $\pm 1\%$ of rate, turndown of up to 45 : 1

Output Signal

High frequency or scaled pulse and analogue 4 – 20 mA DC two-wire signal.

Process Temperature

-200°C to + 400°C

Process Pressure

Max. PN100 or ANSI900. High pressure ratings on request.

Process Connection

DIN flange or wafer Other options available on request.

Material

Din 1.4552 Stainless Steel body.

Approvals

Cenelec intrinsically safe.
Eex ib IIC T6
IEC 801 Part 3 & 6 10 V/m
C.E. Mark

Other Options

Build in indicator or totaliser
DIN 2512 safety groove etc.

Protection Class

IP 65.

415 Steam and Gas Flow Computers

The 415 flow computer is designed to accept a wide variety of inputs including high frequency pulse from the Vortex type flow meter and 4-20mA analogue signals of the pressure and the temperature transducers.

The flow computer then calculates the rate of flow and totalised volume of the fluid being measured.

The 415 steam computer calculates the specific weight of steam from internally stored tables for saturated or superheated steam.

The 415 gas computer provides temperature and pressure correction for most gases according to the ideal gas law.

The 415 flow computer is normally supplied mounted in a field enclosure, but can be supplied for panel mounting if required.

The 415 flow computer has rate of flow and totalised standard displays, and can display the pressure and temperature.

The unit is supplied with a standard pulse output plus options of 4-20mA analogue output, RS232 and RS422/485 serial interfaces and a number of low/high limit alarms.



PTP-1 Pressure Transducer

The PTP-1 provides a 4-20mA analogue output directly proportional to system pressure measured.

The PTP-1 is normally supplied with ¼" BSP male screwed connection, a ¼" x ¼" female gaugecock for isolation, and a ¼" steel siphon for transducer protection.

The accuracy of the PTP-1 pressure transducer is +0.2% full scale



TMT-1 Temperature Sensor



The TMT-1 temperature sensor is used for measuring either the over temperature of superheated steam or the temperature of a gas.

The TMT-1 is supplied with a ½" BSP screwed pocket for direct installation on the pipework. The TMT-1 consists of a Pt 100 2 wire resistance temperature sensor. The accuracy of the TMT-1 is +1% full scale.

Switch2 Energy Solutions Limited
High Mill, Cullingworth Bradford,
BD13 5HA
Tel: 01535 270266 Fax: 01535 270282
e-mail: sales@switch2.com
www.switch2.com www.metersdirect.co.uk