VPFLOWSCOPE IN-LINE

The flow meter for point of use measurements

VPFlowScope In-line

The VPFlowScope® In-line is the ideal flow meter for point-of-use consumption measurements of compressed air and other industrial gases, including nitrogen, oxygen, CO_2, helium, and argon. This thermal mass flow sensor measures bi-directional flow, pressure, temperature, and total flow simultaneously.

The VPFlowScope In-line is perfect for smaller diameters where it provides all the data you need to optimize your compressed air consumption. You can choose between a 16 bar and 35 bar version. The basic model comes without display. The most advanced model has a built-in display with an integrated two-million-point data logger. Due to the range of versions, there is a model of the VPFlowScope In-line for all your applications; from stand alone to integration into an energy management system like VPVision.

"With the VPFlowScope In-line we tested to best solution for our air knives and nozzles. We identified an annual costs savings of 7.5 K Euro (8 K USD) with engineered venturi nozzles compared to our old open blow pipes. The ROI on the venturi nozzles was a couple of months."
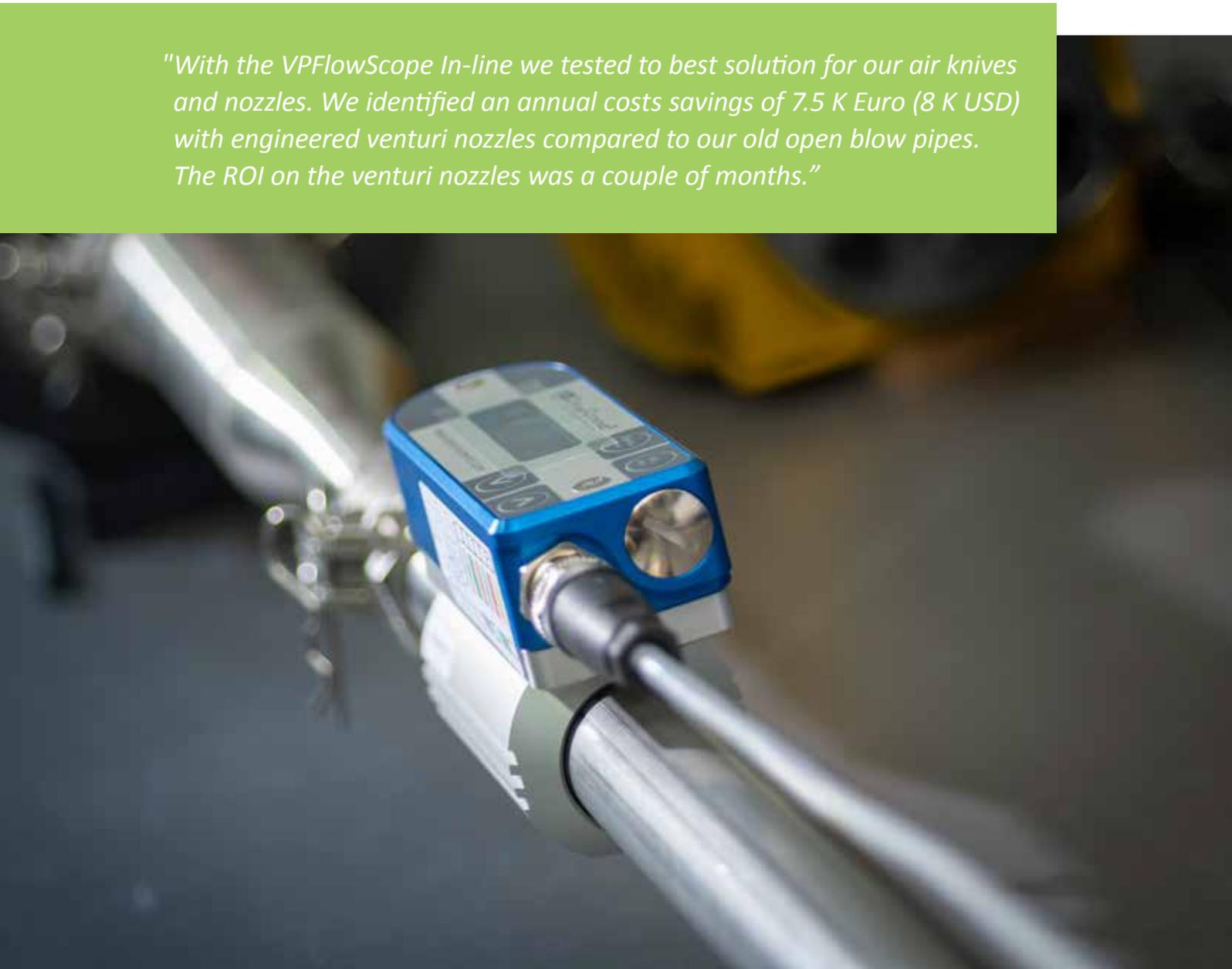
Highlights

> 4-in-1 sensor: flow, pressure, temperature, and total flow
> Bi-directional flow measurement (optional)
> Patented Thermabridge™ technology for dry, clean gas measurements
> Standard RS485 (Modbus RTU), 4..20mA and pulse output
> 3-line LCD display (optional) with real-time information and configuration keys
> Built-in data logger with 2 million points (optional)
> Reversible display text

Applications

> Submetering of compressed air
> Leakage management
> Energy monitoring
> Cost allocation
> Industrial gas flow monitoring and submetering (N_2, O_2, He, Ar, CO_2, and other dry, non-corrosive industrial gases)
> Condition monitoring of pneumatic equipment
> 16 bar (250 psi) and 35 bar (500 psi) versions available for compressed air

VPFlowScope
In-line
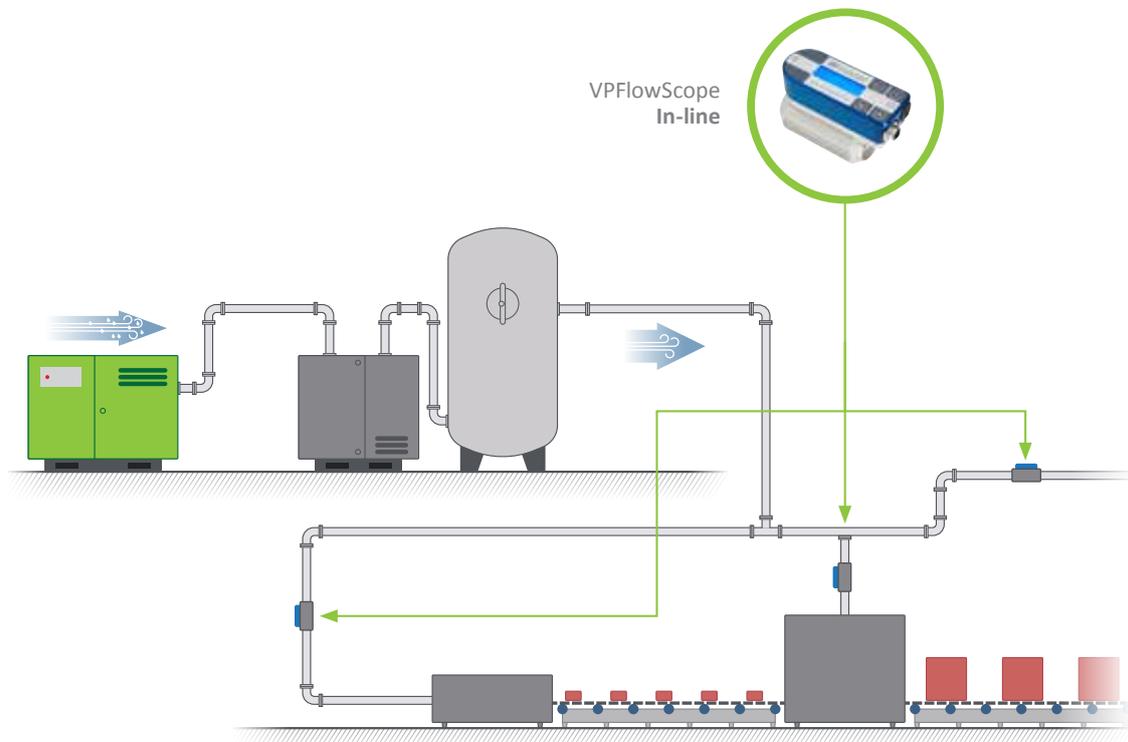
Power of combined measurement

Get the complete picture by measuring flow, pressure, and temperature simultaneously. Examples are: The pressure drop caused by excessive flow and an investigation to determine if a machine can use less air at a lower pressure.

Bi-directional flow measurement

Bi-directional flow occurs frequently in compressed air systems. Examples are in ring networks, overseen branches or a leaking non-return valve. Discover the actual consumption and avoid mis-readings with VPFlowScope bi-directional flow measurement option.

Display options

The VPFlowScope In-line comes in three sizes; 0.5 inch (VPS.R080.M050), 1 inch (VPS.R250.M100), and 2 inch (VPS.R01K.M200). In these three sizes, you can choose three display options.

DISPLAY	MODEL	RS485	4 .. 20 MA/ PULSE	3 LINE DISPLAY	2M POINT DATA LOGGER	APPLICATIONS
No display	D0	*	*			BMS, Remote monitoring, OEM. Order C8 model for VPFlowTerminal
Display	D10	*	*	*		BMS, Point of use measurement
Display with data logger	D11	*	*	*	*	Auditing, machine testing, portable use

The display provides real-time information that can be recorded with the optional data logger. The display is reversible and shows all information on three lines, which are fully configurable. You can choose from SI and Imperial display units. The data logger offers 2 million data points, which makes recording as easy as taking pictures. This is enough storage to measure flow, pressure and temperature once per second for more than a week.

- 3-Row display with backlight

- Thermabridge™ flow sensor
  Pressure sensor
  Temperature sensor

- Two million point data logger

- Keypad to configure
  your flow meter

- RS485 (Modbus RTU)
  4..20 mA
  Pulse
  USB interface

Tubing kits

Tubing kits are offered to integrate VPFlowScope In-line sensors more easily and to assure accuracy. The tubes are made of stainless steel. The tubing kits for the 0.5 inch and 1 inch have respective lengths of 20x diameters before and 5x diameters after the flow sensor. For the 2 inch, due to weight, the tube has 15x diameters before and 5x diameters after the flow sensor. We offer tubing kits in BSP and NPT thread styles.

Point of use measurement

The VPFlowScope In-line flow meter is available for flows up to 1000 m^3_n/hr (600 SCFM) and thereby it is the perfect tool to measure the consumption of your machines. Allocate costs or improve your production process, as you can determine per machine and per product type its consumption.

Software

VPStudio software

Our VPStudio software is available for your VPFlowScope, free of charge. VPStudio is available on our website and can be installed on your PC. It communicates via the JB5 interface kit (for non-display models) or via the USB cable (display models) with your VPFlowScope In-line.
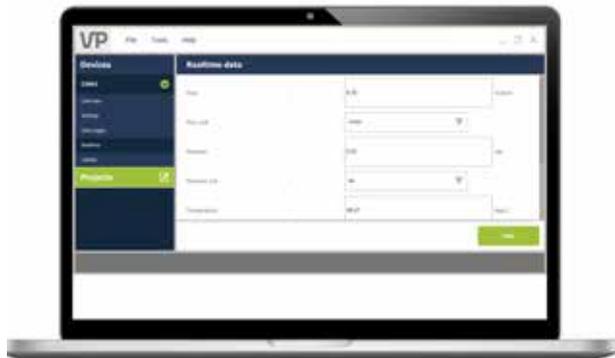
Features of VPStudio:
> View real time measurements
> Viewing and retrieving your (air audit) data log sessions in a structured manner in the Projects module
> Setting your logging intervals
> Setting your Modbus and networking parameters
> Spanning the analogue output to 4..20 mA or Pulse

Download from www.vpinstruments.com.

"Thanks to the VPFlowScope In-line we found nearly 80,000 USD of argon leaks in our system. This was really an eye opener for us.
We now implemented a new maintenance program based on permanent monitoring of our Argon consumption."

Specifications

FLOW SENSOR

Measuring principle	Thermabridge™ Thermal Mass flow sensor
Flow range 0.5 inch	0.23 .. 80 m^3_n/hr | 0.13 .. 50 SCFM
Flow range 1 inch	0.91 .. 250 m^3_n/hr | 0.54 .. 150 SCFM
Flow range 2 inch	3.55 .. 1000 m^3_n/hr | 2.15 .. 600 SCFM
Accuracy	0.5% FSS with calibration report under calibration conditions with air
Reference conditions	0 °C, 1013.25 mbar | 32 °F, 14.695 psi
Gases	Compressed air, nitrogen, oxygen and inert, non-condensing gases, 95% non-condensing gases
Gas temperature range	0 .. 60 °C | 32 .. 140 °F

PRESSURE SENSOR

Pressure sensor range	0 .. 16 bar | 0 .. 250 psi gauge (35 bar | 500 psi on request)
Accuracy	± 1.5% FSS (0 .. 60 °C) ± 1.5% FSS (32 .. 140 °F)

TEMPERATURE SENSOR

Temperature sensor range	0 .. 60 °C | 32 .. 140 °F
Accuracy	> 10 m_n/sec: +/- 1 °C | 1.8 °F < 10 m_n/sec: + 5 °C | 9 °F due to self-heating of the flow sensor

DATA OUTPUTS

Analog	4 .. 20 mA or pulse, selectable via installation software
Serial IO	RS485 (Modbus RTU)
USB	Mini USB interface for configuration (display version only)

DISPLAY/DATA LOGGER

Technology	Liquid Crystal (LCD)
Back light	Blue, with auto power save
Data logger (option)	2 million points memory

DIMENSIONS & WEIGHT

0.5 inch	135 mm x 50 mm x 85 mm | 5.31" x 1.97" x 3.35"	0.7 Kg | 1.54 lbs
1 inch	135 mm x 55 mm x 91 mm | 5.31" x 1.97" x 3.58"	0.7 Kg | 1.54 lbs
2 inch	155 mm x 90 mm x 125 mm | 6.10" x 3.54" x 4.92"	1.6 Kg | 3.58 lbs

MECHANICAL & ENVIRONMENTAL

Ingress Protection (IP) grade	IP65 when mated to connector, at room temperature; direct rain and sunlight should be avoided. Extreme temperature fluctuations may affect the IP grade over time.
Ambient temperature range	0 .. 60 °C | 32 .. 140 °F
Wetted materials	Body: Anodized aluminum | Sensor: Silicon, epoxy, glass | Sealing: FTM 60, Polyurethane

ELECTRICAL

Connection type	M12, 5-pin connector, female and optional USB mini connector
Power supply	12 .. 24 VDC +/- 10 % Class 2 (UL)
Power consumption	2.4 Watt (no flow) 4.8 Watt (full flow) +/- 10% 100 mA (no flow) 200 mA (full flow) +/- 10% @24VDC
UL/ CUL	14 AZ, Industrial Control Equipment
CE	EN 61326-1(2006) Class A, EN61000-6-1 (2007)

* Decreasing for oxygen use double-bog product sealing available on request
** Other sensor body materials available on request

Order codes and accessories

MODELS	ORDERCODE	DESCRIPTION
	VPS.R080.M050.D0	VPFlowScope In-line 0,5" without display without datalogger
	VPS.R080.M050.D10	VPFlowScope In-line 0.5" with display without datalogger
	VPS.R080.M050.D11	VPFlowScope In-line 0.5" with display and datalogger
	VPS.R250.M100.D0	VPFlowScope In-line 1" without display without datalogger
	VPS.R250.M100.D10	VPFlowScope In-line 1" with display without datalogger
	VPS.R250.M100.D11	VPFlowScope In-line 1" with display and datalogger
	VPS.R01K.M200.D0	VPFlowScope In-line 2" without display without datalogger
	VPS.R01K.M200.D10	VPFlowScope In-line 2" with display without datalogger
	VPS.R01K.M200.D11	VPFlowScope In-line 2" with display and datalogger

Our VPFlowScope In-line products will be supplied with an ISO calibration report (all models)
and mini USB cable (display models).

VPFlowTerminal kits

Includes 1 x VPFlowScope In-line D0 with the
VPFlowTerminal remote display, ISO calibration report,
mini USB cable, in- and outlet tubes and 10m/32.8ft.
cable with 8 pin M12 on one side.

ORDER CODE	DESCRIPTION
VPS.R080.M050.VPT.KIT.BSP	With 0.5" In-line and BSP tubes
VPS.R250.M100.VPT.KIT.BSP	With 1" In-line and BSP tubes
VPS.R01K.M200.VPT.KIT.BSP	With 2" In-line and BSP tubes
VPS.R080.M050.VPT.KIT.NPT	With 0.5" In-line and NPT tubes
VPS.R250.M100.VPT.KIT.NPT	With 1" In-line and NPT tubes
VPS.R01K.M200.VPT.KIT.NPT	With 2" In-line and NPT tubes

OPTIONS		
	VPA.5000.912	Bi-directional flow option for VPFlowScope In-line
35bar	VPA.0001.093	Upgrade pressure to 35 bar | 500 psi for VPFlowScope In-line
	VPA.0001.912*	Helium gas calibration for In-line flow meters Including calibration certificate
	VPA.0001.915*	Special gas calibration for In-line flow meters Other gases then helium calibration. Including calibration certificate.

* Quantity discount possible for multiple flow meter in same order.

ACCESSORIES

|		
	VPA.1200.005	VPFlowScope In-line 0.5" tubing kit BSP in- and outlet tubes in one kit
	VPA.1200.010	VPFlowScope In-line 1" tubing kit BSP in- and outlet tubes in one kit
	VPA.1200.020	VPFlowScope In-line 2" tubing kit BSP in- and outlet tubes in one kit
	VPA.1200.105	VPFlowScope In-line 0.5" tubing kit NPT in- and outlet tubes in one kit
	VPA.1200.110	VPFlowScope In-line 1" tubing kit NPT in- and outlet tubes in one kit
	VPA.1200.120	VPFlowScope In-line 2" tubing kit NPT in- and outlet tubes in one kit
	VPA.5000.005	Cable 5m/16.4ft. with 5 pin M12 on one side. For permanent installation
	VPA.5000.010	Cable 10m/32.8ft. with 5 pin M12 on one side. For permanent installation
	VPA.5001.205	VPFlowScope JB5 interface KIT for programming your flow meter. via VPStudio. Interface box JB5 + 5m/16,4 ft cable (M12 connector) + 12V power supply + RS485 to USB cable. Only for D0 models - without display.
	VPA.0000.200	Power supply adapter with 5 pin connector. Useful for air audits.

Ease of connection

The VPFlowScope features an RS485 (Modbus RTU) interface, which is especially useful in energy monitoring applications, like VPVision. You can connect up to eight VPFlowScope flow meters in one daisy chain. It is recommended to use a junction box for each flow meter to ease proper connection to the Modbus network. The junction box has biasing, termination resistors and provides feedback by LED on the power supply.

However, if you would like to connect your flow meter to an existing Modbus network or 4..20 mA / pulse based data acquisition system, you can use the power supply module to supply DC power to the flow meter. The power supply module can supply power to two flow meters at the same time. You will find screw terminals in the power supply module for both RS485 and the 4..20 mA / pulse output at your convenience. If you require more installation examples, please refer to the user manual.

"With the VPFlowScope In-lines we can set the right dose of oxygen in our fish farms for faster growth rates and better quality of our fish."

Modbus network with multiple flow meters (DC power supplied from VPVision)

Max. flow meters per daisy chain: 8

VPS probe model D2
or VPS in line model D0
- Energy monitoring
- Building Management
  System

VPA.5030.020
Modbus junction box

Power supply module VPA.0030.100

VPA.0030.100
110 - 250 VAC to 24 VDC power supply
for permanent installation

VPA.5000.005 / VPA.5000.010
5 m / 6.4 ft or 10 m / 33 ft cable with
M12 connector and open wires
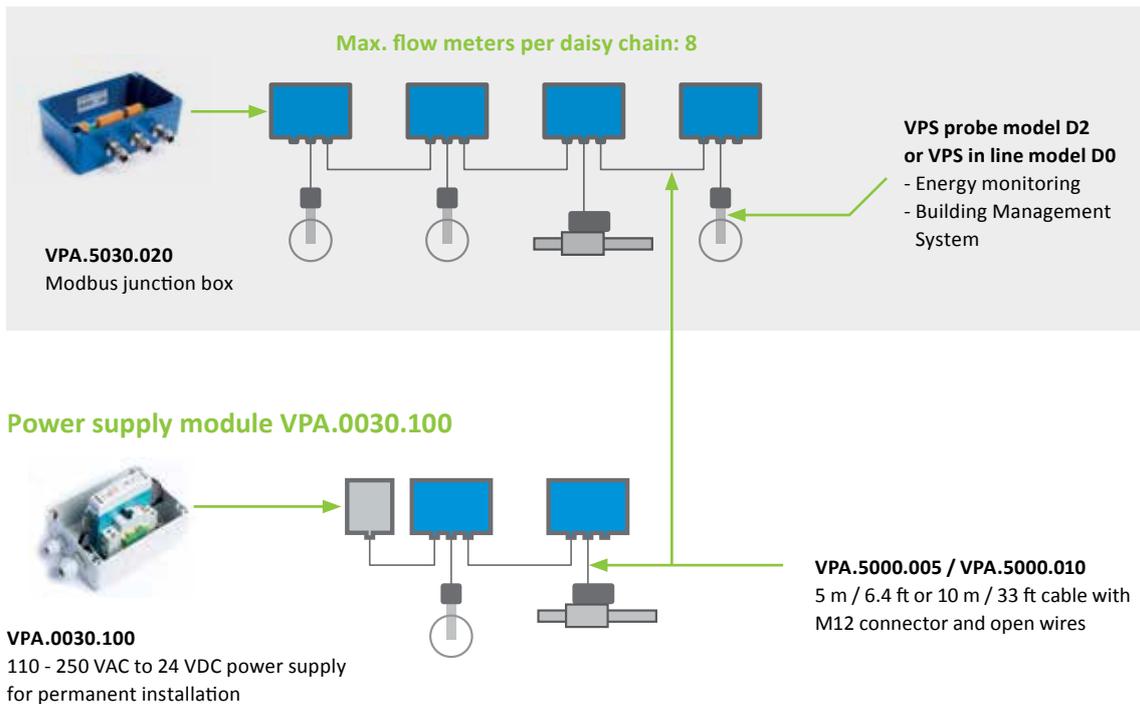
VPVision and energy monitoring applications

VPVision

VPVision is the complete real time energy monitoring solution for all utilities within your company. Get real-time data on your usage and see the patterns on your supply and demand side. Take factual and well-founded decisions on your costs and investments. Reveal the consumption of all utilities, including compressed air, technical gases, steam, vacuum, natural gas, electricity, waste water, heating fuels etc. VPVision enables you to view data on any platform; from PC to smartphone. It will help your organization raise the energy awareness among your staff. It will be your guiding hand to target energy savings for individuals, teams or at company-wide level.

VPFlowScope family

Other VPFlowScope products:

VPFlowScope M
The VPFlowScope M is the next step in gas measurement. Unlike traditional flow meters, the VPFlowScope M consists of a Transmitter and the patented VPSensorCartridge® which reduces recalibration to a simple exchange.

VPFlowScope Probe
The VPFlowScope® is the measurement tool for dry compressed air and other technical gases like nitrogen, carbon dioxide and argon. The VPFlowScope Probe measures thermal mass flow, pressure, temperature and total flow simultaneously.

VPFlowScope DP
The patented VPFlowScope DP enables you to take measurements in the discharge pipe of a compressor under 100% saturated conditions.

easy insight into energy flows™

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