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# VPFLOWSCOPE M

Your next step in gas flow measurement





The Internet of things / Industry 4.0 is rapidly transforming our world. Production becomes smart, intelligent and autonomous. Production lines will make their own decisions and human intervention will only be needed when things go wrong. With the VPFlowScope M, you invest in an industry 4.0 ready platform, as it has a built-in Ethernet interface.

# VPFLOWSCOPE M

- > Four-in-one flow meter
- > For compressed air and technical gases
- > Patented VPSensorCartridge®: no more recalibration required
- > Optional direction measurement
- > Ethernet interface: Industry 4.0/IOT ready
- > Ultra compact size and low weight

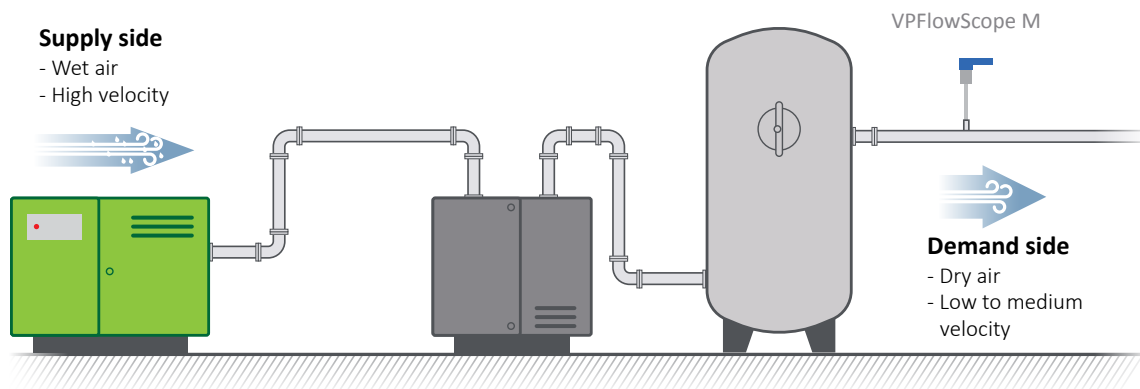
## The next step in flow measurement

The VPFlowScope M is a four-in-one insertion flow meter for compressed air and technical gases. It can be installed under pressure and measures flow, pressure, temperature and total flow simultaneously. With the introduction of the VPFlowScope M, recalibration becomes history.

Unlike traditional flow meters, the VPFlowScope M does not require traditional recalibration, where you have to ship the unit back. Instead, the VPFlowScope M consists of a Transmitter and the patented VPSensorCartridge® which reduces recalibration to a simple exchange.

### Applications

- > Demand side compressed air monitoring
- > Air audits
- > Submetering of compressed air
- > Ring networks (bi-directional)
- > Cost allocation
- > Industrial gas monitoring (air, nitrogen, carbon dioxide, argon and other dry, noncorrosive industrial gases)
- > Leak detection

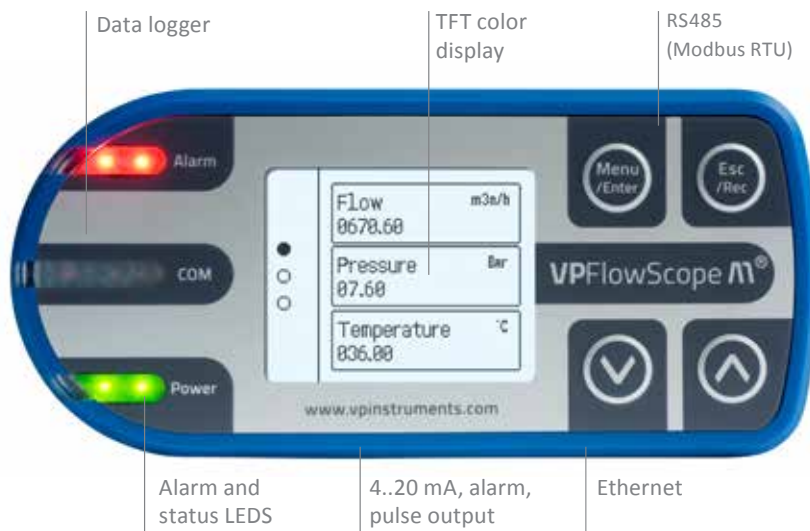


# Industry 4.0 ready

With its standard internal Ethernet interface, the VPFlowScope M will connect directly to any network and will form seamlessly one of the cornerstones of any real-time energy management platform. But it is also compatible with the traditional world, thanks to the standard 4..20 mA signals and RS485 (Modbus RTU) interface.

## Features

- > Ethernet (Modbus/ TCP)
- > RS485 (Modbus RTU)
- > 4..20 mA linearized, alarm or pulse output
- > USB interface for configuration and downloading of data log files
- > Optional display with real-time information with possibility to visualize 1, 2 or 3 parameters simultaneously
- > Optional data logger with 1-year automated retention policy



## One Transmitter. Many possibilities!

Thanks to the versatile IO, the VPFlowScope M Transmitter can be connected to both the traditional 4..20 mA, RS485 (Modbus RTU), and modern Ethernet based systems. The Transmitter is available in three versions.

TRANSMITTER MODEL	ETHERNET	RS485	4..20 ALARM PULSE	DISPLAY	DATA LOGGER	APPLICATION
VPM.T001.D000	•	•	•			VPVision, BMS, remote monitoring
VPM.T001.D010	•	•	•	•		Remote monitoring and local read-out
VPM.T001.D011	•	•	•	•	•	Audits

# No more recalibration

With the patented VPSensorCartridge®, traditional recalibration is something of the past. From now on, you simply exchange the VPSensorCartridge® and continue your measurements. No more waiting, no more downtime.

## Your benefits

- > Near zero down-time
- > Less customs/on-site paperwork
- > Less transport costs
- > Consistent, reliable measurements

VSENSORCARTRIDGE® MODEL	DESCRIPTION	APPLICATIONS
VPM.R150.P350.PN10	Thermabridge™ thermal sensor: flow, pressure, temperature and calibration report.	Leakage management, demand and supply side flow measurements and general purpose flow measurements.
VPM.R150.P351.PN10	Thermabridge™ thermal mass sensor: <b>bi-directional</b> flow, pressure, temperature and calibration report.	Audits, internal billing and cost allocation, ring networks, multi plant compressor installations and shared compressor facilities.

## VPM.R150.P35X flow range table

The VPFlowScope M is extremely flexible to use. The following table shows you the minimum and maximum flow for various pipe diameters between 2 and 16 inch. Please note that flow ranges apply only to compressed air and nitrogen. The ranges may vary when used with other technical gases. Contact us for more details.

SCHEDULE 40 STANDARD SEAMLESS CARBON STEEL PIPE							
Size (inch)	DN	ID (inch)	ID (mm)	Min flow (scfm)	Max flow (scfm)	Min flow (m³ <sub>n</sub> /hr)	Max flow (m³ <sub>n</sub> /hr)
2	50	2.1	52.5	2	688	4	1,169
3	80	3.1	77.9	5	1,516	9	2,576
4	100	4.0	102.3	9	2,610	15	4,435
6	150	6.1	154.1	20	5,924	34	10,065
8	200	8.0	202.7	34	10,259	58	17,429
10	250	10.2	259.1	56	16,756	95	28,468
12	300	11.9	303.2	77	22,953	130	38,995
16	400	15.0	381.0	121	36,237	205	61,565

SCHEDULE 10 STANDARD SEAMLESS CARBON STEEL PIPE					
ID (inch)	ID (mm)	Min flow (scfm)	Max flow (scfm)	Min flow (m³ <sub>n</sub> /hr)	Max flow (m³ <sub>n</sub> /hr)
2.2	54.8	2.5	749	4.2	1,273
3.3	82.8	5.7	1,712	10	2,908
4.3	108.2	9.7	2,923	17	4,966
6.4	161.5	22	6,508	37	11,057
8.3	211.6	37	11,173	63	18,982
10.4	264.7	58	17,487	99	29,709
12.4	314.7	82	24,724	140	42,004
15.6	396.8	131	39,315	223	66,794

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## Measure more in less time

VPStudio takes flow measurement to the next level. Install and configure your flow meter in less time, thanks to the intuitive interface and the advanced data processing. Simply connect your flow meter and get the job done.

You can use VPStudio for configuration, read-out (real-time) and processing of data log sessions.

### Features and benefits

- > Fully intuitive interface
- > Auto device detection
- > For VPFlowScope M
- > Processing of data sessions
- > CSV and XLSX data export



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## Start Kit

Begin measuring energy savings immediately with a VPFlowScope Start Kit. The Start Kit contains all items needed to perform air audits or permanent measurements. You can install the unit right out of the box and connect it to your laptop, company network or building management system.



### VPFlowScope M Start Kit model - VPM.T001.D011.KIT

- > VPSensorCartridge® (VPM.R150.P351) including bi-directional flow sensitivity
- > VPFlowScope M Transmitter (VPM.T001.D011) with display and integrated data logger
- > Compression fitting for VPFlowScope M with integrated safety cable
- > Mini USB cable
- > Power supply adapter 12V with 5 pin M12 connector
- > Ethernet cable 5m/16.4 ft. with 4 pin M12 on one side and RJ45 connector on the other side
- > Rugged explorer case with pre-cut foam
- > ISO Calibration report
- > VPStudio software, free available at [www.vpinstruments.com](http://www.vpinstruments.com)

# Order codes and accessories

START KITS AND MODELS		
	VPM.T001.D011.KIT	VPFlowScope M Auditor Start Kit
	VPM.T001.D000	VPFlowscope M Transmitter without display
	VPM.T001.D010	VPFlowscope M Transmitter with display
	VPM.T001.D011	VPFlowscope M Transmitter with display and datalogger
	VPM.R150.P350.PN10	VPSensorCartridge
	VPM.R150.P351.PN10	VPSensorCartridge bi-directional For bi-directional flow, temperature and pressure
ACCESSORIES		
	VPA.5000.005	Cable, 5m / 16.4 ft. with M12 5pin connector on one side The other side is open wires (0V, 24V, Modbus A, Modbus B and Analog out). For permanent connection.
	VPA.5000.010	Cable, 10m / 32.9 ft. with M12 5pin connector on one side The other side is open wires (0V, 24V, Modbus A, Modbus B and Analog out). For permanent connection.
	VPA.5004.0005	Ethernet cable 5m/16.4 ft. With 4 pin M12 on one side and RJ45 connector on other side.
	VPA.5004.0006	Extension cable 5m/16.4ft for Ethernet with RJ45 connectors
	VPA.5003.010	Mini USB cable For use with VPStudio software.
	VPA.0000.200	Power supply adapter 12V 90 .. 240 VAC to 12 Volt DC, with 5 pin M12 connector.
	VPA.5014.003	Explorer® Case for VPFlowScope M Transport case for the VPFlowScope M with pre-cut foam inside.

# Specifications – VPSensorCartridge®

## FLOW SENSOR

Measuring principle	Thermabridge™ Thermal Mass Flow sensor
Flow range	0 (0.5) .. 150 m <sub>n</sub> /sec   0 .. 500 sfps
Bi-directional flow	Model VPM.R150.P351.PN10 only
Accuracy	2% of reading under calibration conditions; Please refer to the user manual for details. Recommended pipe diameter: 25 mm (1") and up.
Reference conditions	0 °C, 1013.25 mbar   32 °F, 14.65 psi
Gases	Compressed air, nitrogen and inert, non condensing gases
Gas temperature range	0 .. +60 °C   0 .. +140 °F

## PRESSURE SENSOR

Pressure sensor range	0 .. 10 bar   0 .. 145 psi gage
Accuracy	+/- 1% FSS (total error band) Temperature compensated

## TEMPERATURE SENSOR

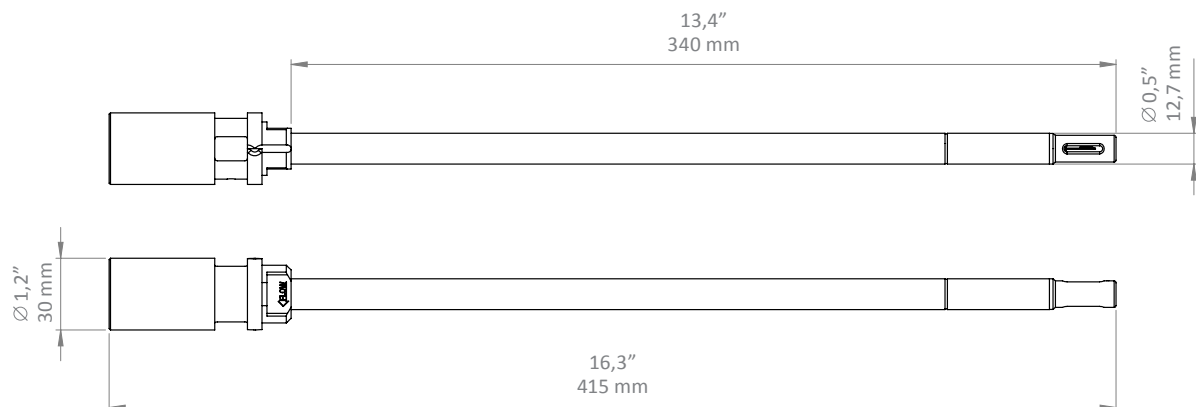
Temperature sensor range	0 .. +60 °C   32 .. +140 °F
Accuracy	> 10 m/sec: +/- 1 °C   1.8 °F < 10 m/sec: + 5 °C   9 °F

## MECHANICAL & ENVIRONMENTAL

Probe lengths	340 mm   13.4"
Weight	200 grams   7.05 ounces
Process connection	Compression fitting, 1/2" NPT, Tapered
Pressure rating	PN10
Protection grade	IP65   NEMA 4 when mated to Transmitter
Ambient temperature range	0 .. +60 °C   32 .. 140 °F. Avoid direct sunlight or radiant heat
Wetted materials	Anodized Aluminum, Stainless steel 316, Glass, Epoxy
Corrosion resistance	Highly corrosive or acid environments should be avoided

## ELECTRICAL

Connection type	VPSensorCartridge® proprietary
Power consumption	See Transmitter specifications for combined power consumption
CE	See Transmitter
UL	See Transmitter

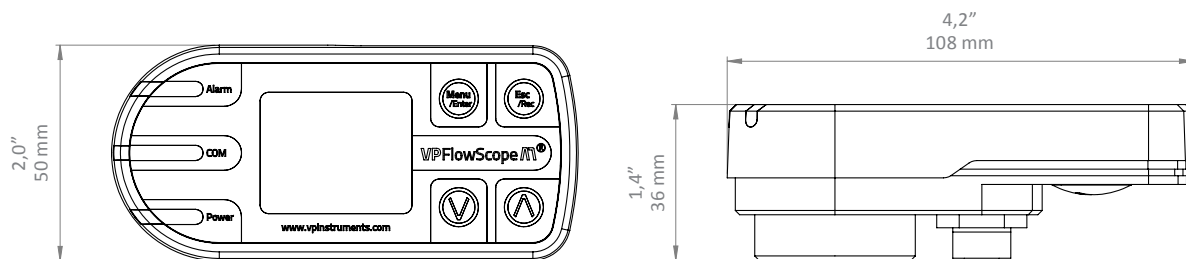




# Specifications – Transmitter

SENSOR INTERFACE	
VPSensorCartridge®	Proprietary interface, rotational 360 degrees
DISPLAY	
Display type (D010 and D011)	1.8" TFT with auto power save (option)
LED status (All models)	LED indicators on all models for power, communication and alarm
DATA LOGGER (D011 ONLY)	
Memory	One-year circular memory, 1 x per second logging interval for all parameters
Logging mode	Cyclic
OUPUTS	
RS485	Modbus RTU
Analog / digital	Configurable: 4 .. 20mA, pulse, alarm
USB	Mini USB, behind sealed cap (for configuration)
Ethernet	Modbus / TCP
MECHANICAL & ENVIRONMENTAL	
Dimensions	50 x 108 x 36 mm   1.97 x 4.25 x 1.42 inch
Weight	220 grams   7.76 ounces including locking ring
Material	Aluminum, anodized body with polycarbonate cover
O-ring seals	NBR
Protection grade	IP65   NEMA 4 when mated to VPSensorCartridge® and USB cap tightened
ELECTRICAL	
Power supply	14 .. 24 VDC +10% CLASS 2 (UL)
Power / RS485 / 4 .. 20 mA	M12, 5 pin
Ethernet	M12, 4 pin d-coded
Power consumption	1 Watt (no flow) 3.5 Watt (full flow) +/- 10% Varies per VPSensorCartridge® type and Transmitter type
CE	EN 60950-1, EN 61326-1, EN 61000-3-2, EN 61000-3-3, EN 61326-1
UL	UL 508

(1) 12 Volt should be available at the input terminal under all flow conditions and all environmental conditions. Cable resistance and power supply impedance, which are temperature dependent, will cause permanent and transient voltage drops. These voltage drops have to be taken into account when designing and implementing the electrical installation. The VPFlowScope M continuously monitors available input voltage and will automatically turn into power save mode when the supply voltage drops below 11 Volt. For startup, a minimum voltage of 11.9 volt is required. For maximum power reliability under all circumstances, we recommend to use 24 VDC.

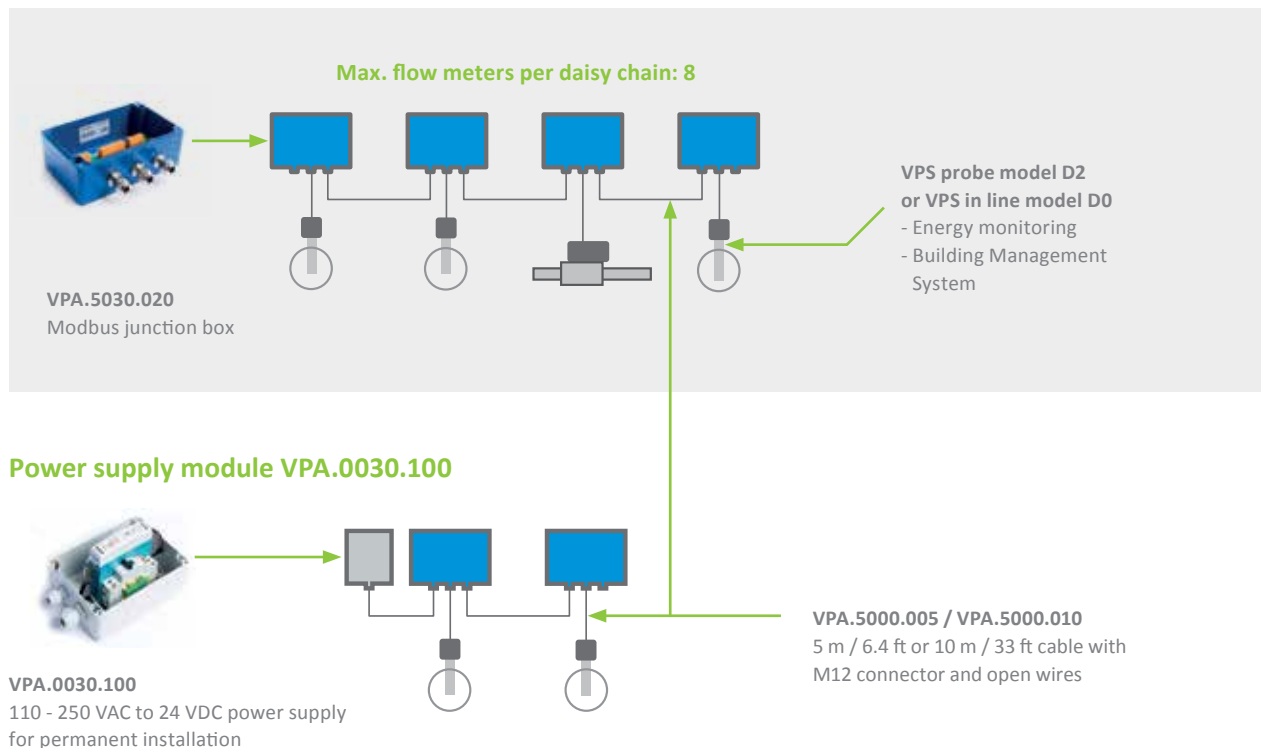


## Ease of connection

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..20mA/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.

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



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# 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.



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# VPFlowScope family

## Other VPFlowScope products:



### VPFlowScope Probe

The VPFlowScope Probe 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.



### VPFlowScope In-line

The VPFlowScope In-line is the ideal flow meter for point of use consumption measurement. It is perfect for smaller diameters where it produces all the data you need to optimize your compressed air consumption.



easy insight into energy flows™

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