# NorthDome

## GAS DENSITY METER

NORTHDOME® is a breakthrough gas sensing technology that in real time monitors gas density, specific gravity, pressure, temperature and average molecular weight. NORTHDOME® offers the monitoring and control of important fluidic properties. Such information is the enabler to a more efficient consumptiuon of precious gases. With its outstanding small and compact footprint, NORTHDOME® is ideal to be embedded in all kind of OEM applications, such as gas analytical instruments.

NORTHDOME® applications range from hydrocarbon gases found in propane-air gas blending, fiscal transfer of natural gas, synthesis gas composition to measuring blend composition of hydrogen-nitrogen forming gas blends, hydrogen purity in power plants. Electrically approved for hazardous areas, it can be used in process applications.

NORTHDOME® is flexible in these possible application configurations:

> Off-line, as a flow through sensor
> On-line, embedded in process piping
> In-situ, embedded in a process vessel
> Laboratory, as a benchtop instrument

DENSITY
SPECIFIC GRAVITY
MOLECULAR WEIGHT
TEMPERATURE

AVENI | SENSE

# NORTHDOME® SPECIFIC GRAVITY SENSOR

NORTHDOME® can be configured to measure gas specific gravity, average molecular weight and binary gas compositions. The innovative gas density sensor can be combined with the SPHERE® pressure and temperature sensor mounted onto a common header.

With a small footprint the specific gravity sensor is ideal for OEM applications embedded into gas analytical instruments such as Wobbe Index Analyzers for heating value determination. It is approved for use in hazardous areas.

## NORTHDOME® IS THE SUPERIOR CHOICE FOR GAS SPECIFIC GRAVITY MEASUREMENT

### SMALL IS PRODUCTIVE

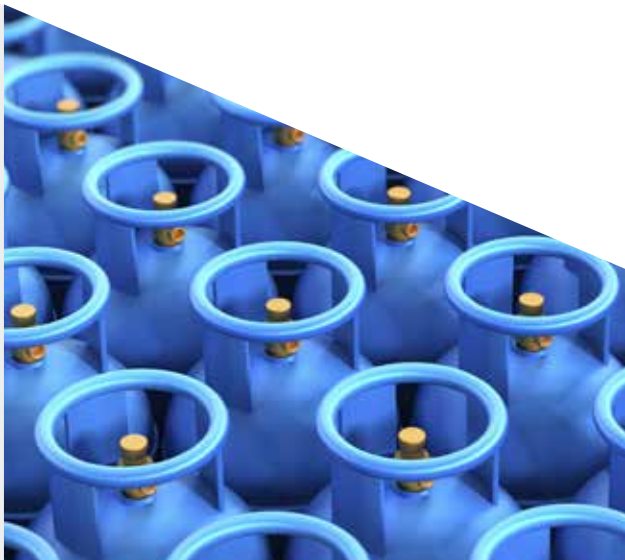
At only a few hundred grams and with small dimensions it can be easily and inexpensively integrated into process equipment or analytical equipment.

### OUTSTANDING PERFORMANCE AND ROBUSTNESS

Its unique design and its compactness results in the most accurate and reliable industrial gas density sensor. The wetted materials offer a high corrosion resistance. In combination with its industrial and rugged design, this guarantees a reliable performance of the entire life span.

### FAST, DYNAMIC BEHAVIOR AND PROCESS TOLERANCE

MesoScale® design principles reduces dimensions to generate high sensitivity to compositional changes and tolerance to process flow conditions.



# PERFORMANCES

| | | |
|---|---|---|
| Calibration ranges<br>(The calibration range can be selected for a specific density span) | Relative density:<br>Temperature: | 0.080 kg/m$^3$ … 8.000 kg/m$^3$<br>10°C ... 70°C |
| Accuracy (typical, max)<br>(Calibration accuracy performance is obtained under reference operating conditions) | Density:<br>Temperature: | 0.020 kg/m$^3$ for a calibrated range of 0.300...3.000 kg/m$^3$<br>0.2°C |
| Repeatability | Density:<br>Temperature: | 0.005 kg/m$^3$ for a calibrated range of 0.300...3.000 kg/m$^3$<br>0.2°C |

# SPECIFICATIONS

| | |
|---|---|
| Calibrated outputs | Density (kg.m$^{-3}$), Molar mass (g.mol$^{-1}$), Temperature (°C)<br>As an option, SPHERE® sensor : pressure (Pa) |
| Operating ranges | Temperature: 10°C ... 70°C (for safe areas and explosion hazardous area)<br>Pressure: Atm ... 20.0 bar |
| Communication options | RS232 TTL, USB, RS485 (ModBus RTU), 4 - 20mA, 0 - 10V, Frequency output, I2C-Bus |
| Mechanical integration | Base plate: 1/8" NPT, 1/4" Gas<br>Others on demand |
| Acquisition frequency | 1 Hz |
| Response time | ⩽ 4 sec |
| Sealing | Viton® ( standard), Kalrez® (option) |
| Wetted parts | 316L Stainless steel |
| Weight | 198g NORTHDOME® |
| Dimensions | 38.2 x 38.2 x 74.6 mm (L x W x H) sensor only<br>Dimensions can be modifed for OEM applications |
| Certifications | CE, ATEX - II 1G Ex ia IIC T4, IECEX Exia IIC T4 Ga, (FM/CSA Class I, Div 1 under preparation) |

Specifications are subject to change. For further specifications, please consult the Avenisense Web site (www.avenisense.com) or the Avenisense technical literature.

## APPLICATION EXAMPLES

> Binary Gas blending

> Synthesis gas mixtures

> Industrial gas purity

> Gas volume to mass measurement

> Enhanced gas flow control

> Fiscal custody transfer

> Wobbe index to calorific value

> Electric generator hydrogen purity

> Advanced burner combustion control

> Biogas composition

# MECHANICAL INTEGRATION

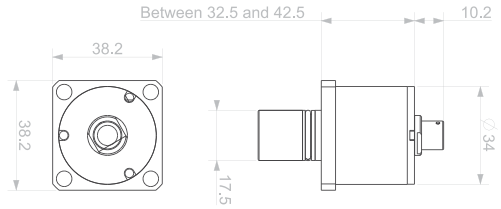
(DIMENSIONS IN mm.)

## NORTHDOME®

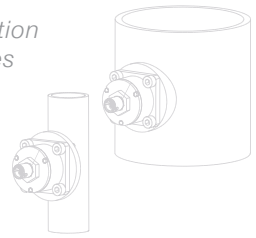
**GAS DENSITY SENSOR**

### GENERAL PURPOSE

Delivered without any base plate, ready for installation into pipings & large chambers.



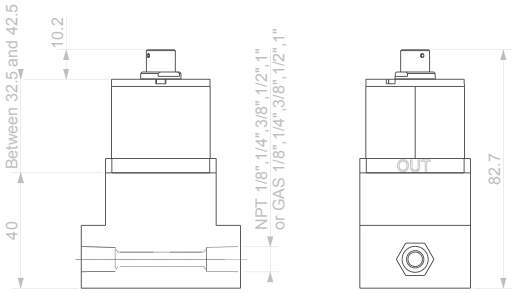

*Installation on pipes*



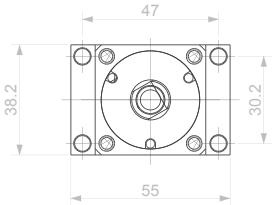
### SMALL PIPES & BYPASS

Used for integration into lab & process equipments, analyzers, microanalysis pipes, bypass main pipes.

Also available with NeSSI plate




*View with 1/8" tubing*



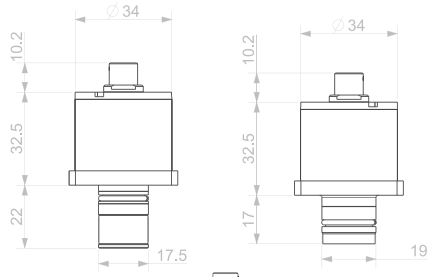

## NORTHDOME® & SPHERE®

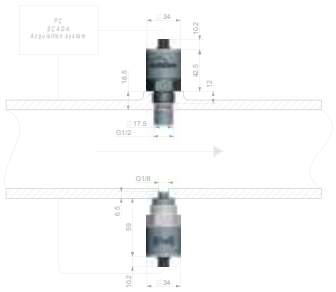
**THE SPECIFIC GRAVITY, RELATIVE DENSITY & MOLECULAR WEIGHT SENSOR**

### GENERAL PURPOSE

Delivered without any base plate, ready for installation into pipings & large chambers.

*Northdome®* *Sphere®*



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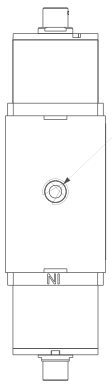


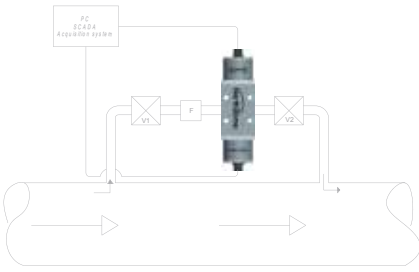


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