



Applications

- Phase separation by turbidity or color
- Product identification and differentiation
- Measurement of medium and high turbidity levels
- Ventilation control

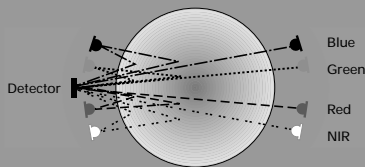
In food, chemical and pharmaceutical industry processes

Features

- Easy installation on a standard in-line housing
- Simple calibration correction with tap water
- Parametrization using PC software
- Output of product type by means of digital signals or RS232
- Hygienic design
- Moisture sensor for condensate monitoring

IN-LINE PRODUCT MONITOR RAMS

IN-LINE PRODUCT MONITOR RAMS



The RAMS (Reflection/Absorption Multi-Switch) simultaneously measures reflection and absorption of the liquid in the product pipe at 4 different wavelengths (blue, green, red, near-infrared). This makes it possible to determine the color and turbidity of a given product or to distinguish various products from one another. Depending on the application, one of these 8 parameters or a suitable combination of them can be monitored and evaluated.

Limit switch

In its most straightforward application, the RAMS is used as a limit switch for detecting phase transitions. Depending on the parameter settings, this detection is based either on turbidity (change from turbid to clear) or color (change from colored to colorless or from color 1 to color 2). The output of the relevant parameter takes the form of a current signal; limit formation can be handled externally in the DCS.

Turbidity measurement

Medium and high turbidity levels are measured continuously by means of infrared absorption. The higher the turbidity, the stronger the absorption. The use of IR radiation makes the results virtually independent of product coloration. Output is a 4 .. 20 mA signal in the 0 .. 100 % range. Optionally, a calibration can be carried out in FTU (Formazine Turbidity Units) or in EBC.

Product identification

For product identification, a fingerprint of the product in question is first taken and stored in the RAMS. This is done by measuring one or more parameters (e. g. turbidity/IR absorption, blue and green transmission) and applying certain tolerances to these figures. As soon as a product exhibiting these figures (within the tolerances) is in the pipe, it will be unmistakably identified and signaled. This is possible for up to 8 products employing either digital signals or the software. For more than 8 products, the evaluation can take place via DCS/PLC. Frequently even products that look identical to the naked eye can be differentiated by means of a color measurement. Should optical measurement prove insufficient for the differentiation of certain products, an external variable such as conductivity can also be read in and evaluated.

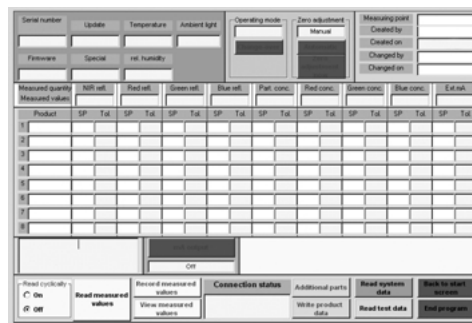
Calibration

The only calibration procedure necessary for RAMS is a zero correction following installation using clear water. A version suitable for calibration in EBC/FTU turbidity units is available optionally.

Operation and communication

Operating and indicating elements and also the signal interfaces (current output, digital inputs/outputs, RS232) are integrated right into the sensor head. This makes it possible to start running simple applications like the limit switch immediately without further ado.

A PC software package is available optionally for running in new products, for FTU/EBC calibration, for simple and neat presentation and saving of readings, and for parametrization of the RAMS. It is used by connecting the PC to the RAMS with an RS232 interface.



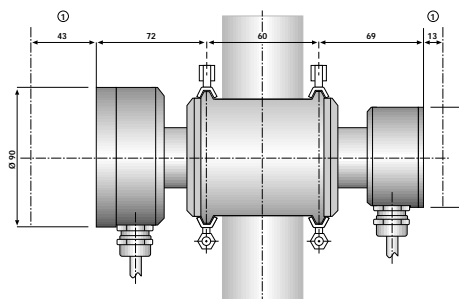
Fitting to process

The RAMS is fitted into the product pipe with a standard in-line housing. These housings are commercially available as accessories for pipes with diameters from DN40 to 6". The housings ensure both easy installation and optimal cleaning characteristics for CIP/SIP processes.

Installation/Mounting

The RAMS can be installed in either horizontal or vertical product pipes. In the case of horizontal pipes, the sensor should be installed on the side of the pipe. An adequate distance should be maintained to inspection windows or other sources of stray light.

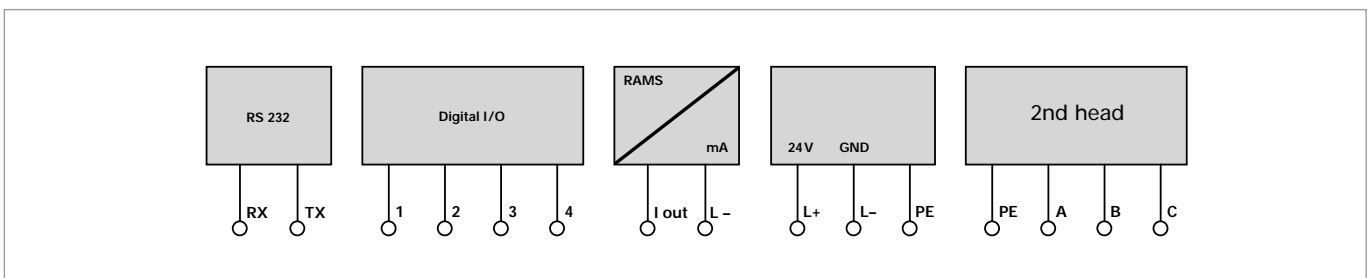
Dimensions



RAMS
on Varivent® housing DN40

① for installation

Wiring diagram



SPECIFICATIONS

Measurement

Measuring principle:	transmission und reflection at 4 wavelengths (blue, green, red, NIR)
Measuring span:	0 .. 100 %

RAMS sensor

Installation:	in-line housing (Varivent [®] or equivalent)
Flow cell material:	stainless steel 1.4404
Windows:	borosilicate glass / sapphire
Seals:	EPDM
Enclosure material:	stainless steel 1.4404 (316L), PVC inspection window
Sample temperature:	-10 °C .. +105 °C
Cleaning:	CIP/SIP-compatible (max. 125 °C; measurement cuts out at 75 °C electronics temperature)
Pressure:	10 bar
Ambient temperature:	0 °C .. +50 °C
Ambient humidity:	0 .. 100 % r. h.
Degree of protection:	IP 67
Weight:	2,8 kg

Connections

Power supply:	24 V DC ±5 %
Power input:	2 W
Current output:	4 .. 20 mA; burden max. 500 ?
Interface:	RS 232

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