

# InPro® 8300 RAMS Series

## Product Monitoring and Identification Systems

### Technical data

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InPro 8300 RAMS

#### Short description

The InPro 8300 RAMS is an optical device for monitoring product/water phase separation processes and for the identification of products in the process.

In process automation applications, the unit supplies the switching signal for product/water or product/product phase separation. When a range of products is manufactured, it allows clear identification of the different products.

8 parameters are registered about 5 times a second; using 4 different wavelengths, the transmitted light and the back-scattered light are measured. This method allows virtually all liquids to be monitored, independently of their colour and turbidity.

#### Outstanding sensor features are:

- Use of durable and long-lasting LEDs
- No cumbersome and expensive lamp replacement
- Excellent zero stability
- Configuration using a commercial PC or notebook
- Easy to retrofit to VARINLINE® access units or VARINLINE® sight glasses without the need of welding
- In parallel to processing the switching outputs and the analog output in the PLC, visualization via a separate PC is possible
- A PC can be connected to record measured data
- Product identification can be displayed in table or chart form
- Easy copying of data into Excel
- An additional mA signal can be input for product identification together with the 8 InPro 8300 RAMS parameters.
- Monitoring of turbidity and colour using one single unit
- Automatic self-monitoring of condensation forming on the optical windows
- Sapphire windows available as an option
- High-temperature version available as an option

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## InPro 8300 RAMS



## InPro 8300 RAMS types

**InPro 8300 RAMS TCS**

Turbidity or Colour System

InPro 8300 RAMS optimized for phase separation. A jumper is used to determine whether the unit is used for turbid or clear or coloured products. It works as absorption monitor. The InPro 8300 RAMS TCS does not have any reflection parameters (see manual). Unlike all the other InPro 8300 RAMS types, the InPro 8300 RAMS TCS does not have an additional communication interface, but a 4–20 mA analog output.

**InPro 8300 RAMS-BASIC**

Basic version of the InPro 8300 RAMS.

It is mainly used for product monitoring, product identification and phase separation. It is used where turbid, clear or coloured products flow through one and the same pipe.

**InPro 8300 RAMS-CALI**

InPro 8300 RAMS suitable for calibration.

Up to 3 calibration curves can be implemented with the InPro 8300 RAMS-CALI. This enables you e.g. to continuously measure the turbidity and colour of different products at the same time. External digital signals are used to switch between these measurements.

**InPro 8300 RAMS-COMBINE**

InPro 8300 RAMS suitable for calibration with special functions:

- Used to measure low turbidities e.g. in water supply systems or in swimming baths.
- In the brewery it is used for turbidity measurements at the lauter tun.
- Apart from turbidity, the product can also be monitored for colour changes (e.g. for SAC [436 nm] in water supply systems).
- Calculation of the yeast cell count in yeast pitching control

## Sensor specifications InPro 8300 RAMS

**InPro 8300 RAMS**

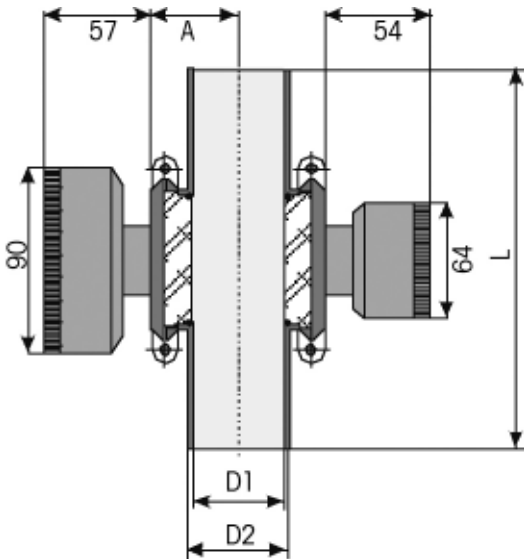
Measuring cycle (all 8 parameters)	approx. 5 measurements per second
Span	400 ... 2000 RAMS units
Repeatability	± 1 % of measuring range
Power supply	24 V DC ± 5 %
Power consumption	< 50 mA plus total of output currents, polarity reversal protection up to 30 V
Digital inputs (in analog mode)	
Input voltage Low	max. 2 V
Residual current of driver	max. 0.1 mA
Input voltage High	16...28 V
Input current High	max. 1.6 mA
Digital outputs (in digital mode)	
Output current	max. 350 mA (total of all output currents)
Output voltage High	Power supply – 3.0 V
Output voltage Low	max. 2.0 V
Analog input (ext. mA)	
Input resistance	0/4 ... 20 mA
Measuring error	max. 222 Ohm
Measuring resolution	< 0.3 %
Measuring cycle	approx. 25 µA
Admissible input current	200 ms
Analog output	
Load	–22 ... +44 mA
Output current resolution	4 ... 20 mA
Response time	max. 500 Ohm
Parameter setting interface	approx. 2.5 µA
Operating conditions	< 10 ms
Ambient temperature	RS-232
Product temperature	0 ... 40 °C
Temperature compensation	0 ... 105 °C (140 °C as an option)
Rel. humidity	0 ... 50 °C in steps of 0.1 °C > 50 °C in steps of 0.5 °C
Protection class	0 ... 100 %
Storage temperature	IP 67
Temperature measurement (in the electronics)	–40 ... +125 °C
Measuring range	–40 ... +120 °C
Accuracy tolerance	max. ± 3 °C absolute
Humidity measurement (in the electronics)	
Measuring range	0 ... 100 %
Accuracy tolerance	max. ± 2.5 % absolute
Materials	
Optics housing	1.4404
Seals	EPDM
Viewing window	PVC
Cable glands	brass/nickel plated
Connecting cable	Ölflex, 4 × 0.75 mm <sup>2</sup>

Sensor specifications InPro 8300 RAMS

**Measuring Cell**

Housing material	1.4404
Sealing material	EPDM
Glass quality	Borosilicate
Option:	Sapphire (only in connection with OPL bits)
Operating pressure	max. 10 bar
Product temperature	-5 ... + 180 °C (depending on the sealing material)

Dimensional drawing InPro 8300 RAMS



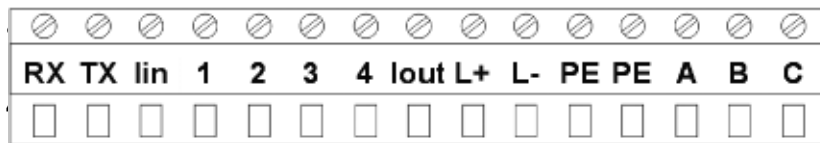
DN	D1	D2	L	A
40	38 mm	42 mm	180 mm	37 mm
50	50 mm	54 mm	180 mm	44 mm
65	66 mm	70 mm	250 mm	52 mm
80	81 mm	85 mm	250 mm	60 mm
100	100 mm	104 mm	250 mm	69 mm
125	125 mm	129 mm	250 mm	82 mm

Outer diam.	D1	D2	L	A
1"	22.2 mm	25.4 mm	90 mm	60 mm
1½"	34.9 mm	38.1 mm	90 mm	73 mm
2"	47.6 mm	50.8 mm	90 mm	85.5 mm
2½"	60.3 mm	63.5 mm	125 mm	98 mm
3"	73 mm	76.2 mm	125 mm	111 mm
4"	97.4 mm	101.6 mm	125 mm	135.5 mm

I.P.S.	D1	D2	L	A
2"	56.3 mm	60.3 mm	114.3 mm	95 mm
3"	84.3 mm	88.9 mm	152.4 mm	123 mm
4"	109.7 mm	114.3 mm	152.4 mm	148 mm
6"	162.7 mm	168.3 mm	152.4 mm	200 mm

**Electrical connection InPro 8300 RAMS**

The InPro 8300 RAMS is supplied with the connection cable firmly connected between active and passive part. Once the InPro 8300 RAMS has been installed mechanically, the electrical connections can be established.



- RX = receiving line of the serial interface
- TX = sending line of the serial interface
- lin = external mA input (+)
- 1 – 4 = digital inputs / outputs (in analog mode inputs to the InPro 8300 RAMS in digital mode outputs of the InPro 8300 RAMS)
- lout = mA output (+)
- L+ = power supply, 24V DC
- L- = ground





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