Turbidity Meter   itm

General Function

Sensing turbidity is vital in food production and in environmental protection. For areas in which weak (visible) to heavy turbidity needs to be sensed for control purposes the turbidity meter **itm** has been developed. This rugged and simple fitting in conjunction with its well-protected electronic circuitry can be incorporated in an new or existing system with no problem. The analog output signal (0/4-20mA) permits connection of various evaluating hardware such as digital displays, MAX/MIN alarm units or an SPS control system.

Features

- 100% reliable phase separation of milk and water, product and water as well as waste water from water etc.
- complete unit for fitting in existing piping systems
- continuous output signal 0/4-20mA
- high temperature (CIP) compatibility
- direct field display 0...100%
- high resistance to chemicals

Specification

Fitting

|		
Style	itm-gg thread	DN40, 50, 65, 80, 100 acc. to DIN11851
	itm-ss welded	DN40, 50, 65, 80, 100
Ambient	operating pressure	10 bar
	operating temperature	0...90°C, transient ...120°C
Material	pipes	1.4301 (V2A)
	male grommet	1.4571 (V4A) w. inset quarz crystal glass disc

Input Transformer

Style	housing	75x160x55mm, polyester glass-fiber reinf.
Schutzart		IP65
Ambient	operating temperature	0...50°C
	shelf temperature	-20...+70°C
	humidity	0...95% no condensate
Sensor system		infrared light
Display	7-segment-LCD	0...100,0%, numeral height 12,7mm
Output	current	0/4-20mA, overcurrent limit <25mA
	burden	max. 500Ω
Supply voltage		24V DC, approx. 100mA

Options

Test disc	**itm-ps**	generates a defined turbidity value
		over 50%, incl. measurement certificate
Power supply	**vnt**	output 24V DC for supply of **itm**
Alarm relay	**vgw-dc**	with 2 change over relay outputs

Fitting itm-gg
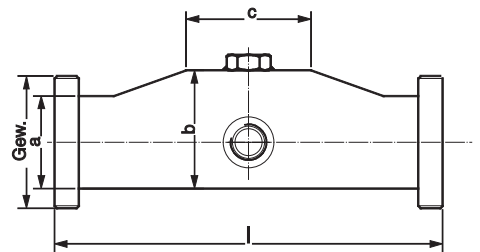
DN	a	b	c	l	Gew.
40	DN40	DN65	60	250	DIN 405
50	DN50	DN65	74	230	Rd 78 x1/6
65	DN65	DN80	88	250	Rd 95 x1/6
80	DN80	DN80	----	250	Rd 110x1/4
100	DN100	DN100	----	250	DIN 405

Fitting itm-ss
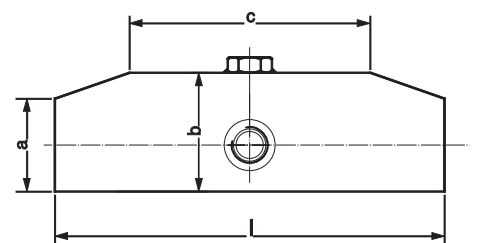
DN	a	b	c	l
40	DN40	DN65		230
50	DN50	DN65	142	230
65	DN65	DN80	168	250
80	DN80	DN80	----	250
100	DN100	DN100	----	250

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SPS connection (Fig. 1)

The 24V DC supply voltage of the **itm** can be taken from the SPS power supply. Evaluation (display and switchpoints) is then available via an analog input of SPS.

Connection with conventional evaluation (Fig. 2)

For the supply a separate power supply such as e.g. **vnt** is used (24 V DC approx. 100mA). For evaluation any number of instruments having a current input 0-20mA (or 4-20mA) can then be circuited in the current loop. For the switchpoints e.g. **vgw-dc** is suitable and for the digital display e.g. **dem-49**.

Fig. 1

Turbidity meter itm

%

100.0

IR-detector

evaluating unit
itm

IR-emitter

current output
0 ... 4mA

=

I

2 3 1 4 X1

AC
24V=

current loop 0-20mA

Feed and evaluating unit
(e.g. DDC alalog output)

Fig. 2

Turbidity meter itm

%

100.0

IR-detector

evaluating unit
itm

IR-emitter

current output
0 ... 4mA

=

I

power supply vnt

AC
230VAC   24V=
U=

2 3 1 4 X1

Alarm unit
(z.B. vgw-dc)

current loop
0-20mA

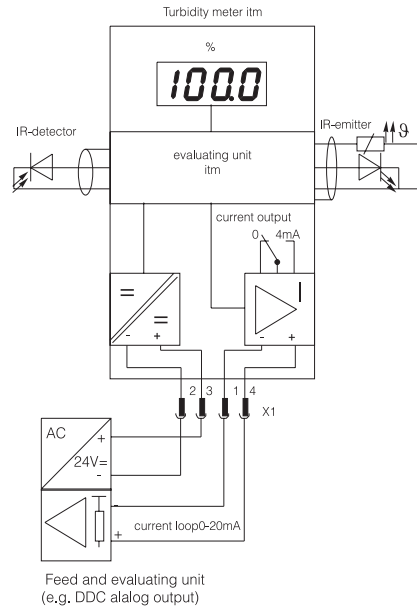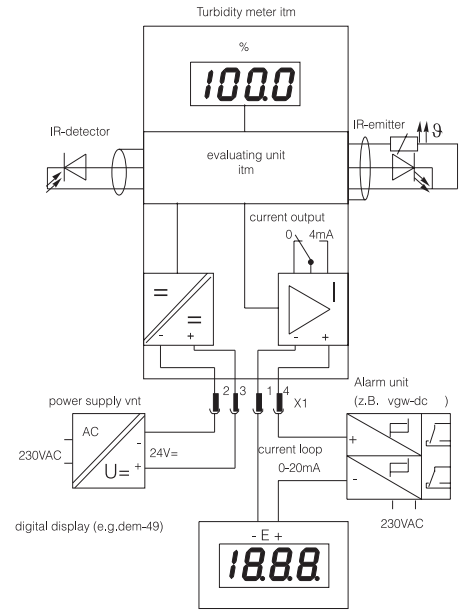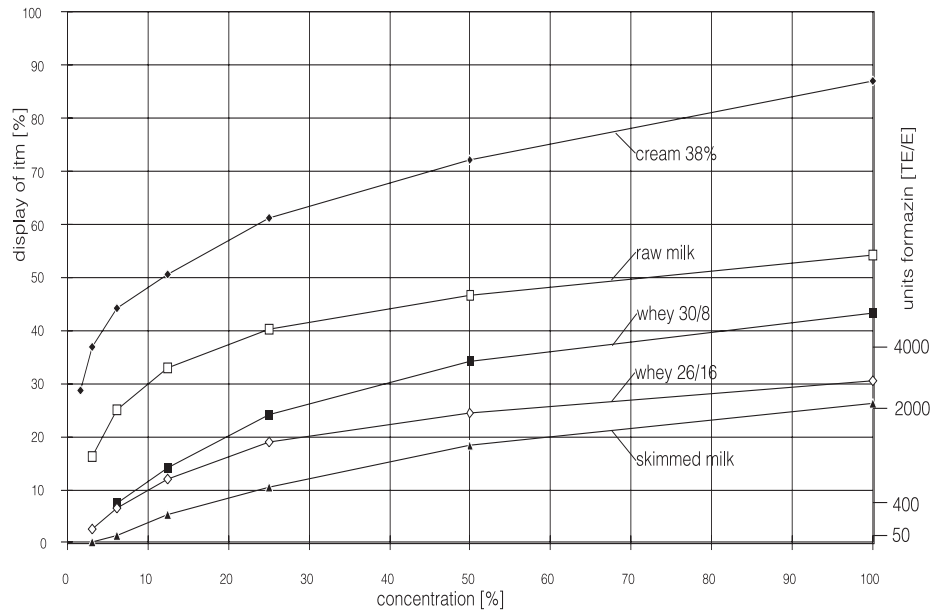230VAC

digital display (e.g.dem-49)

- E +

1 8.8.8.

Turbidity values

The adjacent graph shows the turbidity values for a few typical dairy products as measured by the turbidity meter **itm** (display 100% = 20mA current output).

Mounting requirements

The pipe fitting must be installed so that the medium to be measured fully surrounds the optics. The medium must be totally free of bubbles. Therefore mounting in ascending pipes is recommendable. To avoid distorted measurements no inspection glasses should be located in the vicinity of the meter where exposed to direct sunlight.

Diagram Turbidity values

cream 38%
raw milk
whey 30/8
whey 26/16
skimmed milk

display of itm [%] (y-axis: 0 to 100)
concentration [%] (x-axis: 0 to 100)
units formazin [TE/E] (right axis: 50, 400, 2000, 4000)

Conections

After the lid on the turbidity meter has been opened, the following settings can be made:

S1 selector for output current range
0-20mA or 4-20mA
N zero trimmer for recalibrating output and display zero with a non-turbid medium
V gain trimmer, adjustment only with test- and ajustment disc **itm-ps** possible
X1 supply voltage connector (24 V DC and current output (0-20mA or 4-20mA)

Zero adjustment
• clean fitting
• fill in clear (non-turbid) water
• adjust display to "0,0%" with trimmer "N"

Top view (cover open)

trimmer V

trimmer N

detector

switch S1

emitter

4-20mA
0-20mA

V

N

X1

conctor X1