



## 4-Beam-Turbidity Meter

### Application

- turbidity measurement from 0 up to 5000NTU resp. 0 up to 1250EBC
- filter monitoring
- phase separation of low turbid media

### Application Examples

- process control of brewing processes
- fresh water control in the beverage industry
- water- / waste water control e.g. in dairys
- quality control

### Hygienic Design / Process Connection

- CIP-/ SIP-cleaning up to 130°C
- fitting completely made of stainless steel, optical block made of PEEK, glass panes made of sapphire glass (FDA-conform)
- further process connections: dairy flange DIN11851; hygienic thread connection DIN11864; TriClamp; DIN flange

### Features

- pollution of the glass panes will be compensated
- compact device, no separate evaluation unit necessary
- units NTU and EBC switchable (11 ranges per unit)
- smallest measurement range 0-5NTU resp. 0-1EBC
- highest measurement range 0-5000NTU resp. 0-1250EBC
- 4 externally switchable measurement ranges
- smallest pipe diameter DN40
- colour independent measurement principle (wave length 860nm)
- switching and analog output

### Options / Accessories

- electrical connection with M12 plug-in
- cable ex factory for M12 plug-in
- other process connections on request



itm-4

### Specification

Process connection	dairy flange DIN 11851	DN 40; 50; 65; 80; 100
	hyg. conn. DIN 11864	DN 40; 50; 65; 80; 100
	DIN-flange	DN 40; 50; 65; 80; 100
	TriClamp	DN 40; 50; 65; 80; 100
Materials	connection head	SS V2A (1.4305), 89mm dia.
	fitting	SS V4A (1.4404)
	optical block	PEEK
	glass panes	sapphire glass
Temperature ranges	ambient	-10...+60°C
	process	0...100°C
	CIP-/ SIP-cleaning	up to 130°C 30 min max
Pressure		6bar max
Protection type		IP69K
Measurement principle	acc. to EN 7027	4-beam-altern. light
Wave length	acc. to EN 7027	860nm ± 60nm
LCD-Indicator	with illumination	2x8-digit
Accuracy		see page 4

Electr. connection	cable entry	2xPG (M16x1,5)
	cable connection	2xM12 plug-in (SS 316)
	supply voltage	18...36V DC 160mA max.
Input	range switching	E1 and E2 (24V DC) DC decoupled
	output	analog
short circuit proof		4-20mA
	switching	DC decoupled 24V DC 80mA max. respectively to GND of power supply
Measurement ranges	NTU	0-5; 10; 20; 50; 100; 200; 500; 1000; 2000; 4000; 5000
	EBC	0-1; 2; 5; 10; 20; 50; 100; 200; 500; 1000; 1250
Damping time	seconds	0; 1; 2; 4; 8; 16; 32; 64; 128

### Order Code

Device	Process connection	Pipe diameter	Electr. connection	
itm-4	gg (dairy flange DIN 11851) hh (hygienic thread connection DIN 11864) df (DIN flange) tc (TriClamp)	DN 40 / 50 / 65 / 80 / 100	PG* M12	*standard, no declaration necessary.
Order example:	itm-4-gg-65 / M12			



## Mechanical connection / Mounting instructions

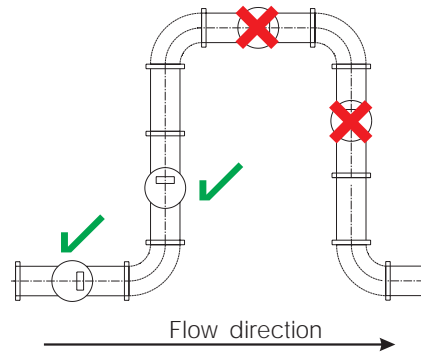
- Ensure that the mounting position of the turbidity meter guarantees that the fitting is always full with media. Air or airbubbles are measured like turbidity.

### Correct installation:

- In or in front of ascending pipes!

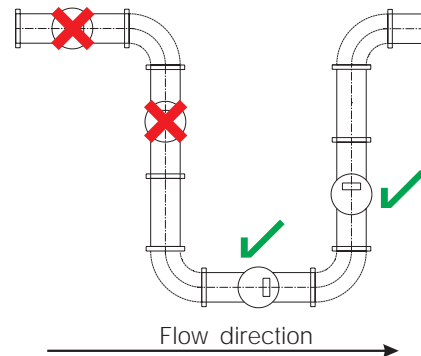
### Wrong installation:

- In or in front of descending pipes!
- Into the highest point of a pipe. Air or airbubbles will concentrate there.



Take attention to the margin drawings!

- Do not open the screws at the optical block of PEEK!



## External measurement range selection

- The turbidity meter is delivered with measurement range 1 (0...1000NTU / 0-1000EBC = 4-20mA)
- Range 2 (E1=24VDC), range 3 (E2=24VDC) and range 4 (E1=24VDC and E2=24VDC) can be chosen by means of the rated signal +24VDC (18...36VDC) at the inputs on pin 7, 8 and 9. Please take note of the connection plan and the table below.
- If these inputs are not connected, measurement range 1 always will be active!

## Measurement range selection

E1	E2	Range
0	0	1
1	0	2
0	1	3
1	1	4

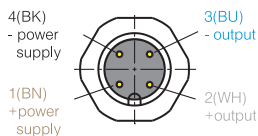
0 ≙ 0V DC; 1 ≙ 24V DC

The digital inputs E1 and E2 are DC decoupled to the power supply.

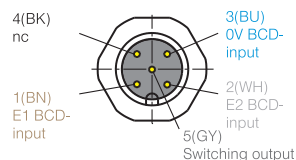
Reference ground: pin 9

## Connecting Diagram itm-4 / M12 with M12 plug-in

M12 plug-in left  
power supply/ output 4-20mA



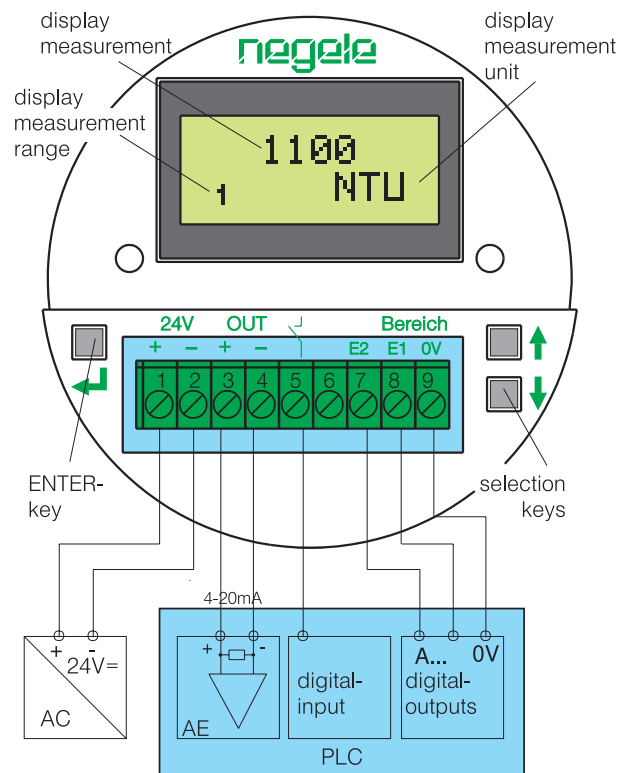
M12 plug-in right  
control voltage



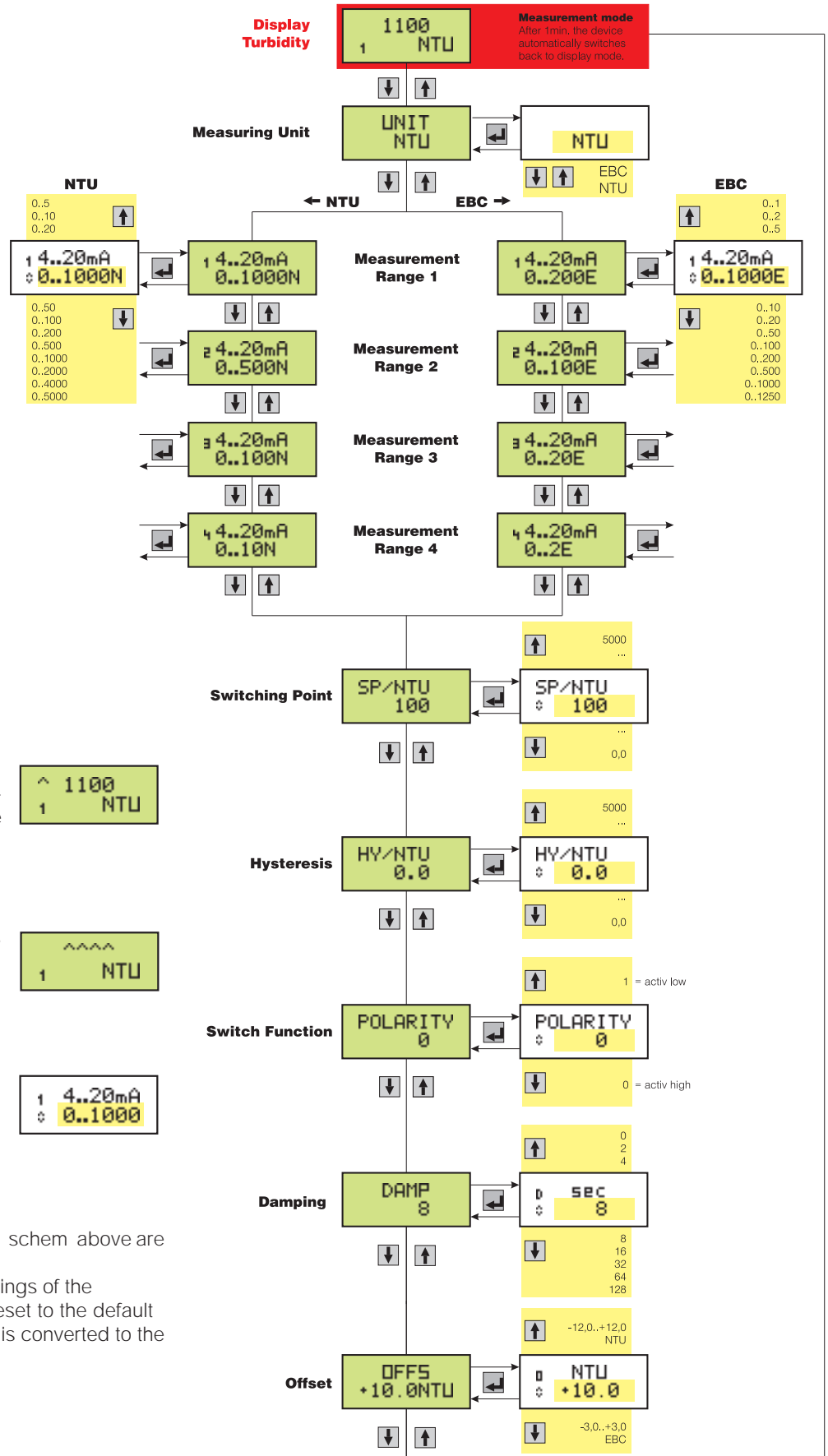
## Note: Switching output

- If the output current is higher than the specified current (80mA) an electronic fuse switches off the output.
- To reset the switch output disconnect the output (or deactivate and activate the turbidity meter).

## Electrical Connection



## Adjustment itm-4



### Legend

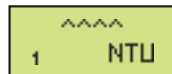
#### ^ -Symbol

"current output overload":  
will be displayed if the measured value is higher than the measurement range.  
 $I_{out} > 20mA$  (21,6mA max.)



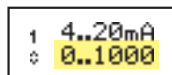
#### ^^^ -Symbol

the current measured value is higher than 5000NTU resp. 1250EBC  
 $I_{out} > 20mA$  (21,6mA max.)



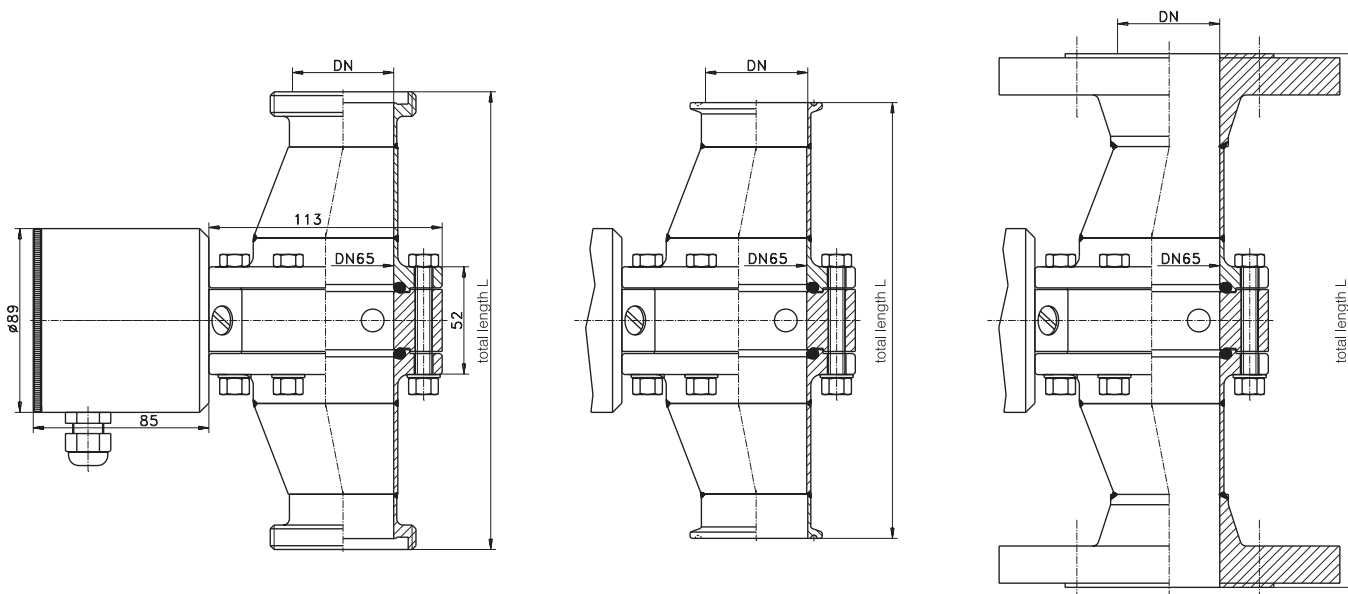
#### 1 (left side above)

current editable measurement range  
◇ -Symbol  
the value in the margin is now editable by using the arrow-buttons



### Default Settings

- The values in the adjustment schem above are the default settings.
- If the unit is changed, all settings of the measurement ranges are preset to the default settings. The adjusted offset is converted to the other unit.



*itm-4-gg / itm-4-hh*  
dairy flange / hygienic thread connection

*itm-4-tc*  
TriClamp

*itm-4-df*  
DIN flange

Table total length of the fitting (tol.: ±2mm)

Process-connection / nominal width	dairy flange (-gg) acc. to DIN11851	hygienic screw connection (-hh) acc. to DIN11864	TriClamp (-tc) acc. to DIN32676	DIN flange (-df) acc. to DIN2632/33
DN40	298,0mm	284,0mm	275,0mm	316,0mm
DN50	236,0mm	226,0mm	209,0mm	256,0mm
DN65	250,0mm	236,0mm	256,0mm	290,0mm
DN80	250,0mm	236,0mm	216,4mm	260,4mm
DN100	378,0mm	362,0mm	320,8mm	368,8mm

## Accuracy:

Accuracy	at the calibration points (20; 200; 2000NTU)			+ -2%
Offset dirt				< + -0,3NTU (+ -0,075EBC)
Slope accuracy	Range	0...1000NTU	(0...250EBC)	<3%
	Range	1001...2000NTU	(250...500EBC)	<4%
	Range	2001...5000NTU	(500...1250EBC)	<6%
Reproducibility	Range	0...1000NTU	(0...250EBC)	<2%
	Range	1001...2000NTU	(250...500EBC)	<3%
	Range	2001...5000NTU	(500...1250EBC)	<4%
Resolution	Range	0...100NTU	(0...25EBC)	0,1NTU (0,025EBC)
	Range	100...1000NTU	(25...250EBC)	1NTU (0,25EBC)
	Range	1001...5000NTU	(250...1250EBC)	10NTU (2,5EBC)

To ensure the accuracy data above, we suggest you to send back the turbidity meter every two years for checking it.