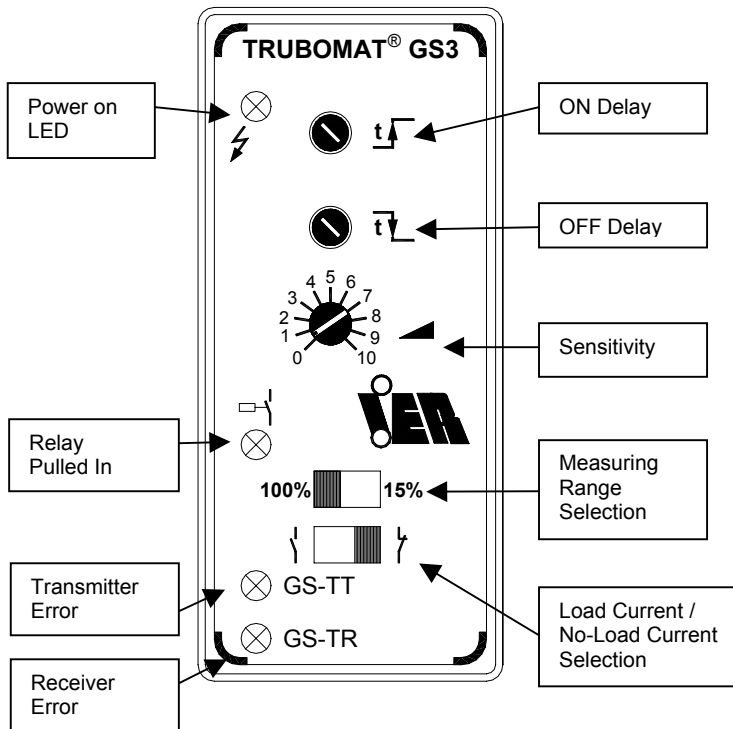


Turbidity Monitor for Liquid Media

# TRUBOMAT GS3

for connection to turbidity fixtures GA1 ... GA5 and immersion probe CP1



ON / OFF delay  
Sensitivity adjustment  
Range selection  
Sensor signal  
Relay output contact

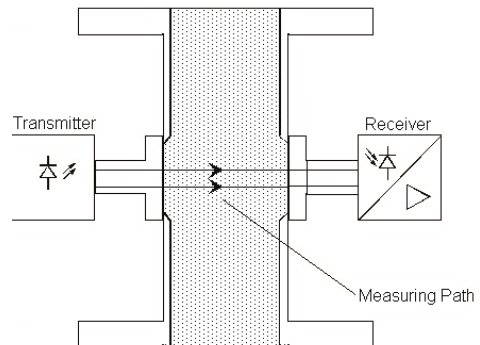
adjustable from 0 to 10 s  
with potentiometer  
with slide switch  
infrared: 940 nm, 8 kHz  
floating changeover

Transistor output

250 VAC, 5 A, 500 VA  
open-collector, NPN,  
2.5 to 30 V, max. 60 mA

## Functions Description

The turbidity meter functions as a limit monitor. Turbidity measurement is based upon absorption, i.e. it responds to loss of light caused by turbidity in the liquid medium. Thanks to the use of infrared light which is pulsed at a frequency of 8 kHz, measurement is insensitive to extraneous light. Measuring sensitivity depends upon the length of the measuring path. The measuring range extends from approximately 5...650 FAU if sensor fixture GA1 DN40 is utilised. The longer the measuring path, the clearer the liquid medium can be.



Pulsed infrared light is passed through the liquid medium from the transmitter to the receiver. If the selected turbidity value is exceeded or fallen short of, the output relay in the switching amplifier is triggered.

The turbidity measuring system consists of:

- TRUBOMAT GS3 turbidity monitor and
- GA.. sensor fixture plus transmitter and receiver for installation into pipes, or
- Cable probe CP1.. with integrated transmitter and receiver

## Safety Precautions

- Installation, initial start-up and maintenance work may only be performed by trained personnel! Applicable European and national regulations regarding the installation of electrical equipment must be observed.
- The device may only be connected to supply power which complies with the specifications listed under "Technical Data" and on the serial plate!
- The device must be disconnected from supply power before performing installation or maintenance work!
- The device may only be operated under the conditions specified in the operating instructions!

## Technical Data

<b>Supply power</b>	230 V, 40 to 60 Hz $\pm$ 15%
<b>Optional:</b>	24 VAC, 110 VAC $\pm$ 15%
	24 VDC $\pm$ 15%
<b>Power consumption</b>	approx. 3.5 VA
<b>Ambient temperature</b>	- 10 to + 50° C
<b>Relay indicator</b>	yellow LED
<b>Power on indicator</b>	green LED
<b>Transmitter error</b>	red LED
<b>Receiver error</b>	red LED

**Measuring ranges:**

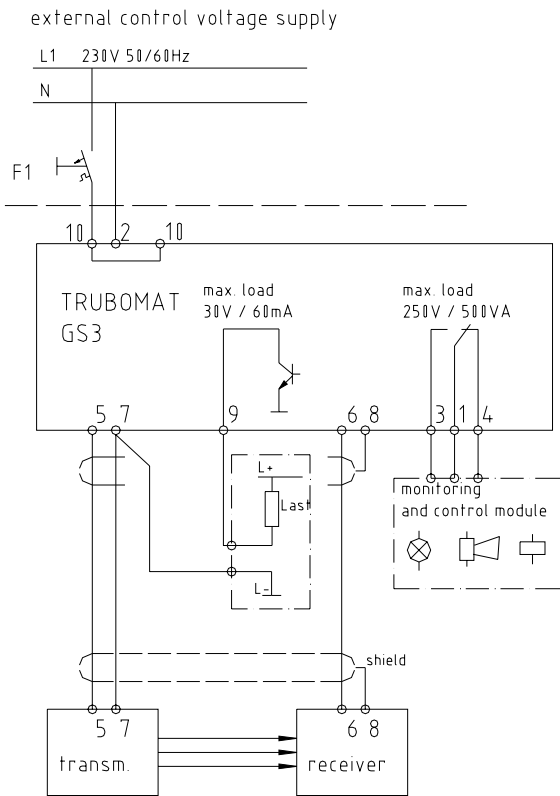
This results in the following measuring ranges with sensor fixture GA1 DN 40:

- Selector switch set to 15% = 5 - 350 FAU
- Selector switch set to 100% = 150 - 650 FAU

**Installing the TRUBOMAT GS3 Turbidity Monitor**

TRUBOMAT GS 3	Control cabinet installation: IP 40 Top-hat rail housing	11-pin socket connector, attachment to mounting rail per DIN 46 277
TRUBOMAT GS 3 W	Wall mount: IP 65	

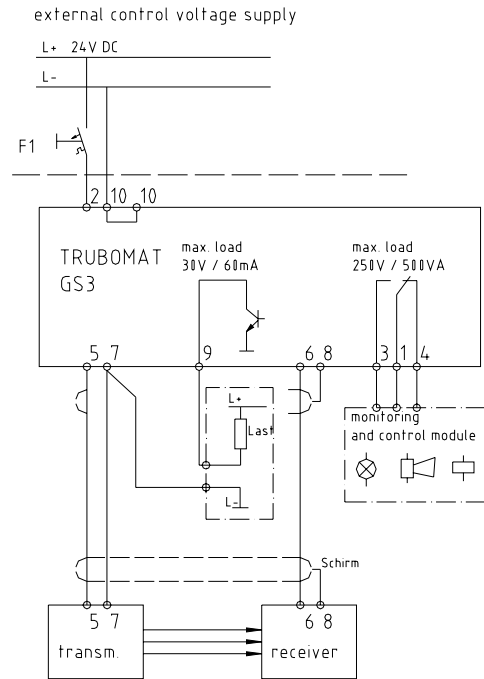
**Wiring Diagram, 230V 50/60 Hz**



**Observe:**

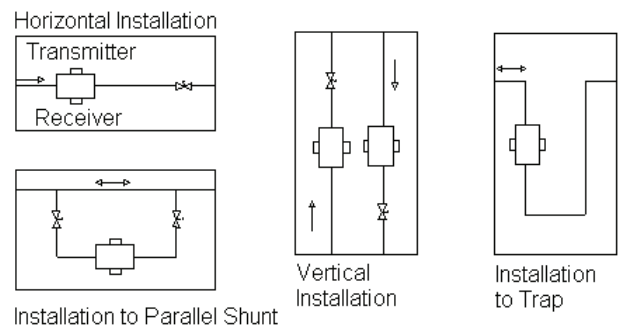
Electrical resistance of the connection cable between TRUBOMAT and transmitter/receiver/CP1 should be below 10 Ohms!

**Wiring Diagram, 24VDC**



**Installing GA 1.., GA 2.. and GA 5.. Fixtures to Pipes for Inline Monitoring**

Sensor fixtures can be installed to the main fluid line, or to a parallel shunt.



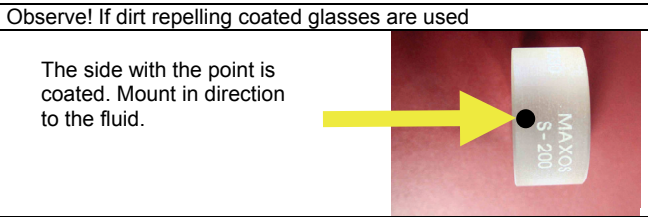
The following points must be observed in order to assure accurate measurement:

- Lenses must always be kept clean (cleaning interval depends upon operating conditions).
- The transmitter and the receiver must always be aligned horizontally to one another.



- The sensor fixture must always be full during operation.
- The fluid medium may not fall below the level of the light beam.
- If the fluid processing system comes to a standstill, fluid should be kept inside the sensor fixture in order to prevent residues from drying and becoming encrusted on the lenses.

- If necessary, generate back-pressure by throttling the discharge line, or install to a trap.
- The fluid to be measured must be free of gaseous bubbles. Gaseous bubbles distort measured values. Installation to a trap is advantageous.
- Snugly tighten the sleeve nuts at the transmitter and receiver seats by hand if the GA5... sensor fixture is used, in order to assure that the O-rings are adequately pressed against the lenses.
- Install a stopcock if mounted to a trap to assure that no fluid enters the transmitter or the receiver when the lenses are removed.
- Use the included suction cup when removing lenses from GA5... devices.



**Mounting of the immersion probe CP1**

The immersion probe CP1 is intended for the installation in basins, open gutters and containers for the monitoring of the turbidity or sludge level.

The probe is available for 2 measuring ranges:

**L**= approx. 40... 1400 FAU  
for over runs and sewers  
-> Observe: the L-version has a "L" punch marking on the bottom or **black side caps** (02/09).

**H**= approx. 500... 3000 FAU  
for sludge levels and interfaces.  
-> Observe: the H-version has a "H" punch marking on the bottom or **red side caps** (02/09).

Mount the probe in such a way that the probe is easily removable for cleaning. Cleaning intervals result from the operating conditions.  
Do not scratch the glasses with abrasive cleaning materials!

**Installation of the dipping probe CP1 Z0**

by means of assembly angles and placing screw connection

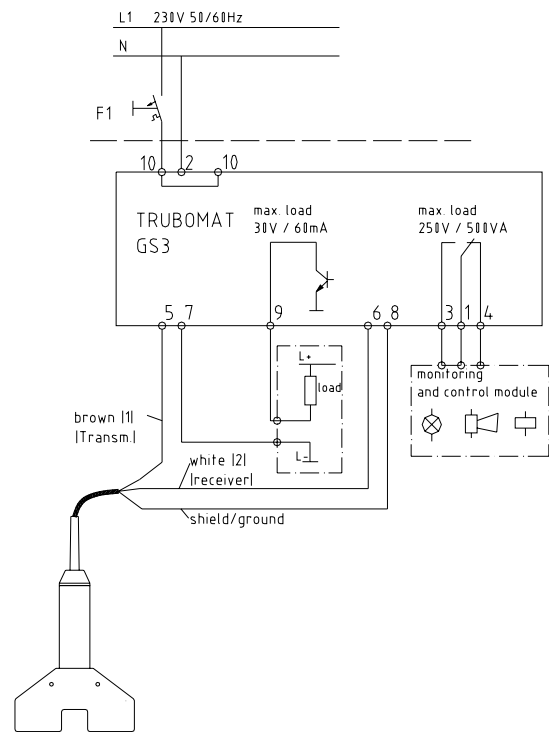
Consider! With strong current or viscous media the cable may not be overstretched. At the two drillings in the probe foot a strain relief in these cases (rope, support rod .... ) to be attached.  
The drillings are designed that into them if necessary a thread M6 can be cut.

**Mounting of the immersion probe CP1 ZR**

The probe is also available with extension tube.



**Electrical connection:**



Wire color	Terminal	Function
white or (1)	6	Receiver
brown or (2)	5	Transmitter
shield	7/8	Ground

**Initial Start-Up**

Adjust the switching point for the dark switching function (for fluid media which become more turbid):

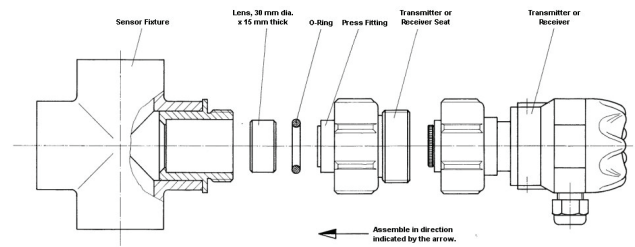
Adjustment is performed after installation and electrical connection.

- Set range selector switch to 15%.
  - Set sensitivity adjusting potentiometer to 0 – the yellow LED lights up.
  - Turn adjusting potentiometers “t - On” und “t - Off” all the way anticlockwise (0.5 s delay).
  - Fill sensor fixture with fluid medium or submerge immersion fixture.
  - Slowly turn the sensitivity adjusting potentiometer towards 10 until the yellow LED goes out.
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- The closer the potentiometer is set to the switching point, the more sensitively the device reacts to the onset of turbidity.
  - With clear water, a turbidity change of approximately 7 TE/F is sufficient to trigger the device if it has been precisely adjusted.
  - If a larger change is desired, turn the potentiometer to a correspondingly higher setting (actual settings must be determined by trial and error).
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- If the 15% range is inadequate, switch to the 100% range.
  - The switching command can be delayed by up to 10 seconds with the “t - On” und “t - Off” potentiometers in order to prevent erroneous switching due to air bubbles or isolated turbidity particles.

**Maintenance**

**Fixtures**

Glass lenses must be kept clean. A suction cup is provided with the GA 5.. sensor fixture to this end.



**Completely empty the fixture before cleaning or performing maintenance work!!!**

- Do not use hard objects for cleaning.
- Calcium deposits can be removed with commercially available decalcifying agents.
- Maintenance interval depends upon operating conditions.

**Transmitter**

The transmitter is maintenance-free.

**Receiver**

The receiver is maintenance-free.

**Switching Amplifier**

The switching amplifier is maintenance-free.

**Troubleshooting Chart**

Error	Cause	Remedy
Incorrect measuring results	Contaminated lenses	Clean lenses
	Fill-level too low	Fill sensor fixture
	Incorrect turbidity range has been selected	Change turbidity range
	Aperture plate contaminated	Clean
	Aperture too small	Drill larger aperture
	Transmitter / receiver too weak	Replace transmitter / receiver
No measuring results	Leaky O-ring	Replace O-ring
	Unit installed incorrectly	Reinstall correctly
	Transport damage	Return to IER

**CE Marks**

According to EC directives  
 Low Voltage Guidelines: RL 2006/95/EG  
 EMV Guidelines: RL 89/336/EWG (EN 61326)