TURBISWITCH GS4

Turbidity controller

INSTRUCTIONS MANUAL

BAMO MESURES
22, Rue de la Voie des Bans - Z.I. de la Gare - 95100 ARGENTEUIL
Tél : (+33) 01 30 25 83 20 - Web : www.bamo.fr
Fax : (+33) 01 34 10 16 05 - E-mail : info@bamo.fr

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TURBISWITCH GS4
410 M1 02 B 06-11-2013

MES
410-02/1

Introduction

- Installation, initial start-up and maintenance may only be performed by trained personnel.
- Electrical plant must be in accordance with European and national standards and regulations in force.
- The device may only be connected to power which complies with the specifications included in the technical data and on the serial plate.
- The device must be disconnected from all sources of power during installation and maintenance work.
- The device may only be operated under the conditions specified in the operating instructions.

1. TECHNICAL FEATURES

Power supply	: 100 - 255V AC / 50 - 60Hz option 10 – 30 V DC, 12 - 24V AC
Power consumption	: 1 – 5 VA
Ambient temperature	: -10…+45°C
Output relay	: 1 SPDT contact
Switching capacity	: 250V AC, 3A / 30V DC, 1A

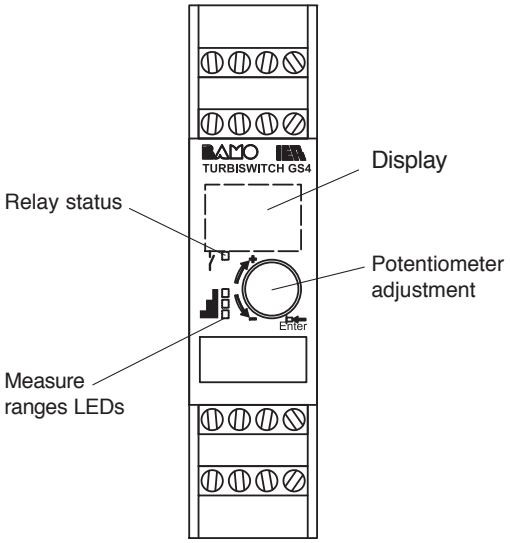
Caution:
Contacts are not protected against overload.
Use external protective device.

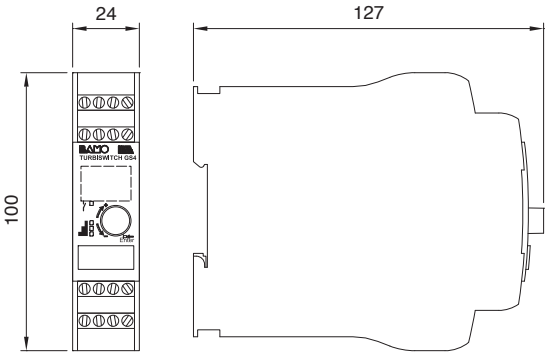
Housing	: 22.5 x 100 x 122mm, IP40,
Mounting	: top-hat rail 35 x 7.5mm (DIN EN 50 022)

Caution:
Contact protection in accordance with standard DIN EN 610010-1 is obtained when device is put inside closed cabinet to perform IP54 index protection

Terminals	: Screw terminals for wire cross-sections of up to 1.5mm^2
Threshold value adjustment	: 3 adjustable ranges High range 0 - 100% full scale (5% steps) Medium range 0 – 10% full scale (2% steps) Low range 0 – 1% full scale (1% steps) *Threshold is displayed in percentage of the selected range*
Temporization	: Adjustable in front from 0,1 up to 9,9 sec
Hysteresis	: Adjustable in front from 1 to 25%
Sensor power supply	: 15V DC maxi - 100mA
Display	: 2 1/2-place LED

CE Mark In accordance with low-voltage directive (2006/95/EC) and EMC directive (89/336/ECC)





2. DESCRIPTION

Turbidity controller **TURBISWITCH GS4** connected to a **CP2** probe or to a **GA..** in-line probes, triggers a contact as soon as the setup turbidity level is over passed.
Turbidity controller TURBISWITCH GS4 + GA or CP2 probe makes a comparison measure and it is not pre calibrated. It detects a threshold set up by the user, who sets where the limit has to be, between clear and turbid, in the liquid. We can detect thresholds in most parts of the liquids, whether clear or turbid they are.

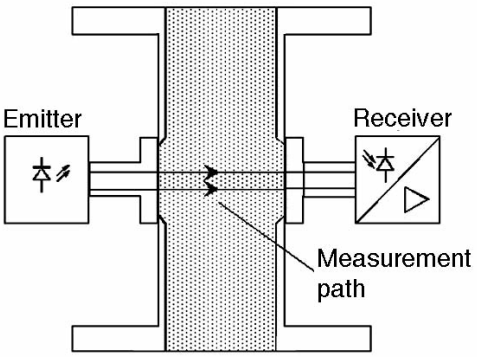
A complete turbidity control unit includes:

1 TURBISWITCH GS4 turbidity relay **+ 1 CP2** immersion probe, with integrated emitter and receiver.

Either,

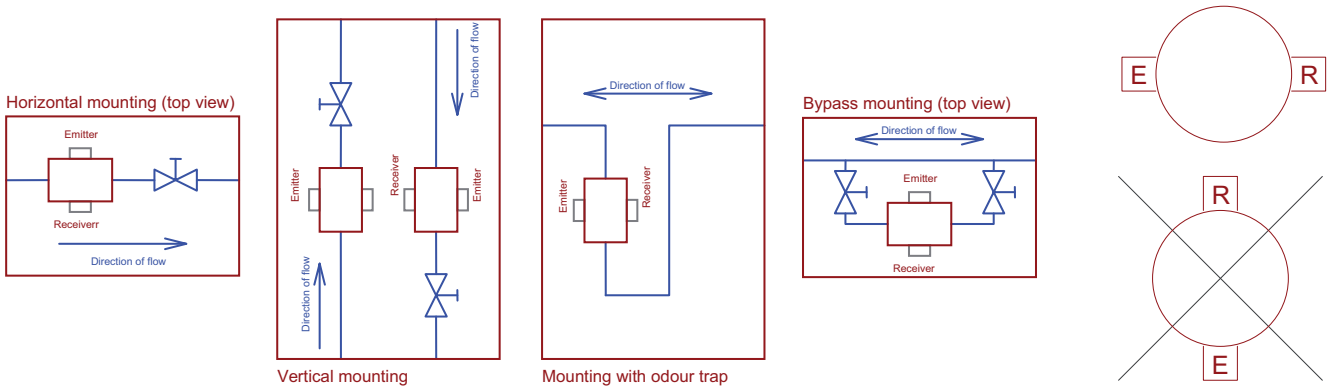
1 TURBISWITCH GS4 turbidity relay **+ 1 GA** in-line probe, with integrated emitter and receiver.

GA.. turbidity in-line probes can be put as well in by-pass as on main pipes from DN 15 up to DN 125 pipe diameters.



3. MOUNTING

G.. in-line probes: Probe includes one emitter and one receiver mounted on a cross support for in line use as well main pipe as by-pass. The following sides have to be enforced for an optimal measuring.



- Plan a removable mounting in anticipation of maintenance operations
- Lenses must always be kept clean. Cleaning intervals depend on operating conditions.
- Always align the emitter and the receiver horizontally.
- The measuring sensor must always be filled during measurement. If the system comes to a standstill, liquid should remain in the measuring sensor in order to prevent suspended solids in the liquid from becoming caked onto the lenses.
- The liquid to be measured must be free of gas bubbles. Gas bubbles distort measurement results. Installation of a trap is advantageous.
- Make sure of the water tightness (gasket between emitter or receiver and lens) by pressing emitter or receiver during tightening.

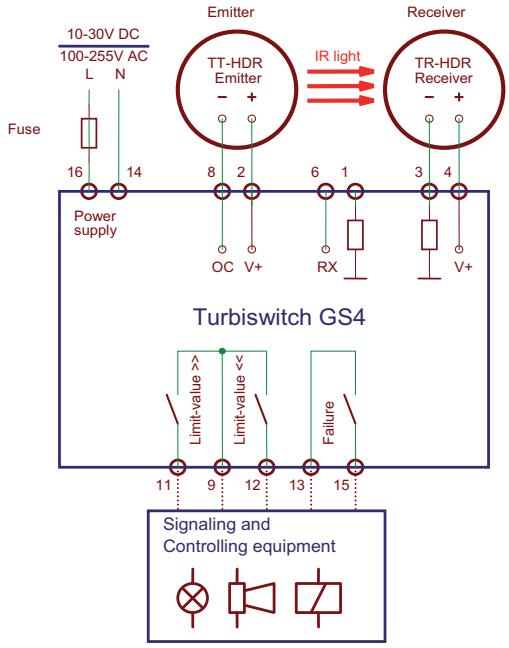
CP2 immersion probes: CP2 immersion probe is allowed for a mounting in settling tanks or wherever a vertical profile is present. Plan a removable mounting in anticipation of maintenance operations. Lenses must always be kept clean. Cleaning intervals depend on operating conditions.

Never use abrasive chemicals for cleaning lenses

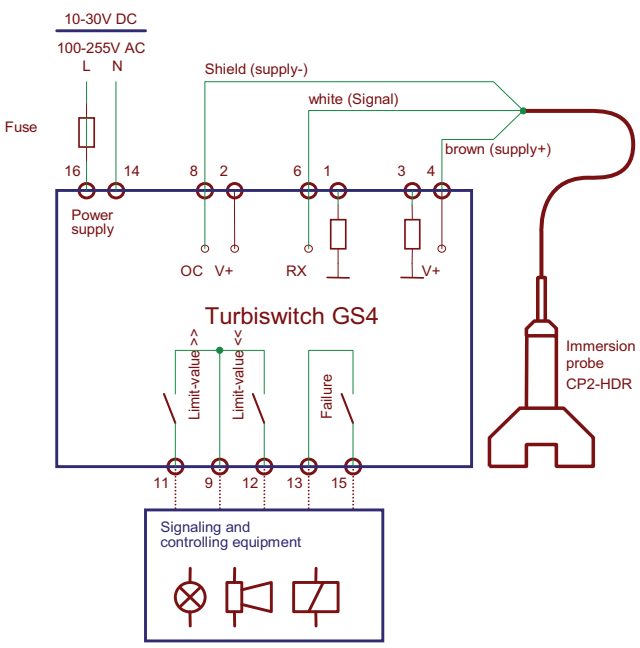
CP2 ZO /ZK immersion probes mounting: Mount the probe with supplied accessories (bracket and bolting).
Caution: make sure that probe cable does not handle any strength twist because of possible turbulences or liquid viscosity. For any fixed mounting, please use the two Dia.6mm holes at the bottom of the probe.

4. ELECTRICAL CONNECTIONS

GA.. in-line probes:



CP2 immersion probes:



5. COMMISSIONING, MENU AND SET UP

After first power up, device starts a routine test where all displayed LED are lighted. After 1 second, software version is displayed, and then level 0 menu is active displaying threshold limit value.

To reset the device, you have to press over 3 seconds the rotating knob in front of the device. Workshop set up becomes active again.

5.1. DETECTION MINIMUM AND AVAILABLE RANGES

5.1.1 GA HDR PROBES

Turbidity possible values change, depending on liquid nature and space between emitter and receiver.
This space changes in all models.
Minimum acquirable turbidity in the low range begins at roughly 50 to 100 FAU.

Maximum acquirable turbidity in the high range is around 3000 to 10,000 FAU i.e. roughly 10 to 30 g/l SiO2
Maximum acquirable turbidity in the medium range is 10% of the high range
Maximum acquirable turbidity in the low range is 1% of the high range

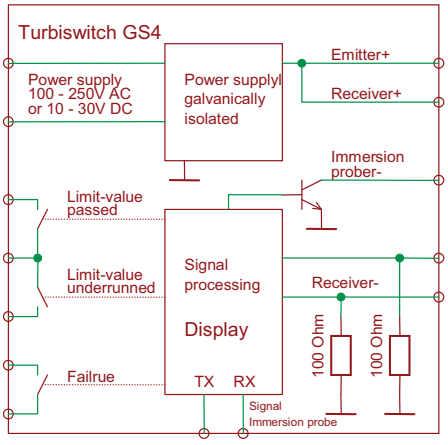
5.1.2 CP2 PROBES

Minimum acquirable turbidity in the low range begins at roughly 100 to 300 FAU.

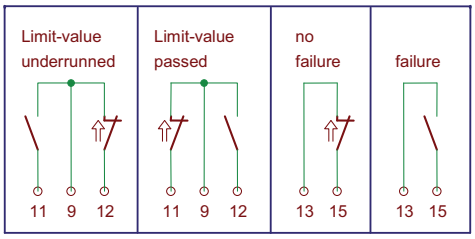
Maximum acquirable turbidity in the high range is around 30,000 FAU i.e. roughly 100 g/l SiO2
Maximum acquirable turbidity in the medium range is 10% of the high range
Maximum acquirable turbidity in the low range is 1% of the high range

5.2 AVAILABLE MENUS AND DISPLAYS

Block schematic

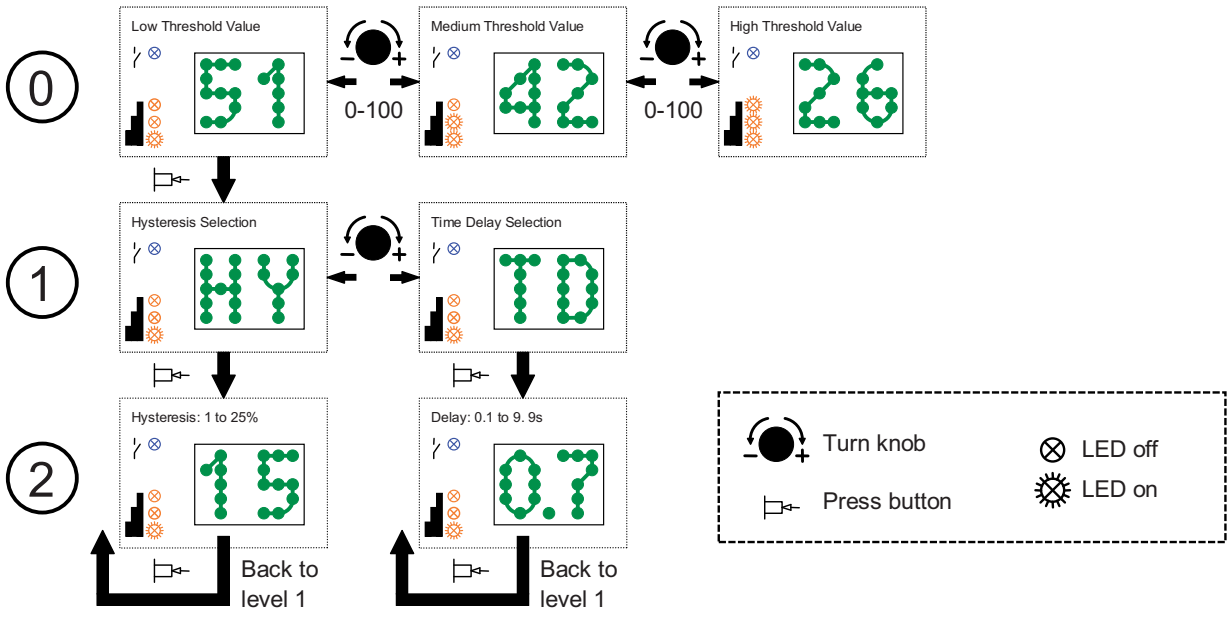


Switching logic



CAUTION: All relays contacts are open when supply power is switched off.

Operating menu



Turn knob:

The threshold value is adjusted in level 0menu (clockwise = + and anticlockwise = –).
Hysteresis and time delay are selected in level 1 menu.
The desired numeric value is selected in level 2 menu.

Press button:

Press knob to select submenus 1 and 2.
Press knob in submenu 2 makes you come back to display menu 1.

Note: If none of the controls are activated for 10 seconds, the device comes back automatically to menu 0.

LEDs possible displays:

In case of receiver default either no receiver connection, display is TR
In case of emitter default either no emitter connection, display is TT
If receiver and emitter are well connected, LEDs flash
Lighted LED means default
Lighted blue LED means the default is over passed.
1 (low), 2 (medium) or 3 (high) lighted LEDs indicate the selected range.

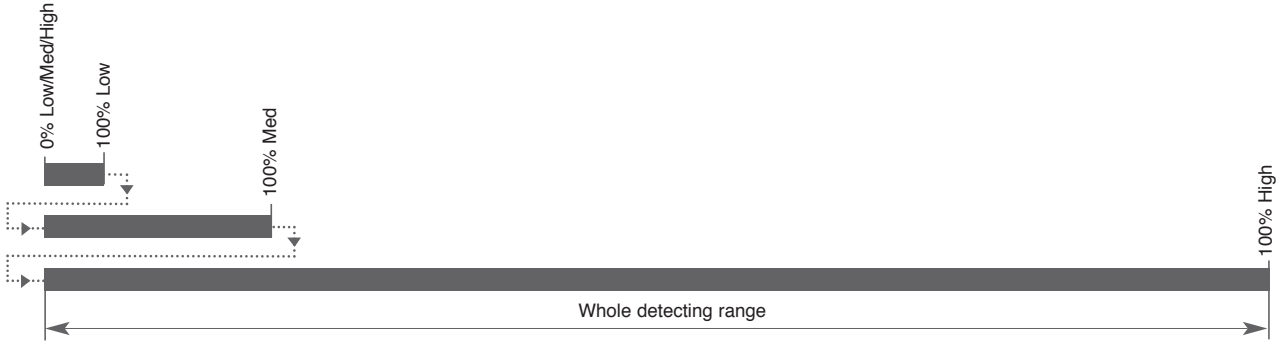
Delay time set up: from 0.1 up to 9.9 sec to avoid inconvenient threshold trigger (default setting: 0.1 s)
Hysteresis set up: from 1 up to 25 % to stop threshold stimulus (default setting: 1%)
Relay default set up: relay contact is normally closed type. In case of receiver or emitter default (TR or TT display) contact opens.

5.3. COMMISSIONING SET UP

- Set to smallest possible values in the hysteresis and time delay menus (1% and 1 s).
- Wait 10 seconds until menu level 0 is displayed.
- Turn the rotary knob clockwise to 100% in the high range.
- The blue LED does not light up.
- Fill the measuring sensor with liquid or submerge the immersion fitting.
- Slowly turn the rotary knob anticlockwise towards 0% until the blue LED lights up (current turbidity value).
- If the switching point is below 10% in the high range, keep on turning anticlockwise into the medium range in order to allow for more accurate adjustment.
- If the switching point is below 10% in the medium range, continue turning anticlockwise into the low range in order to allow for more accurate adjustment.
- Then adjust down a few more percentage steps from the current switching point. The closer the value is to the switching point, the more sensitively the device reacts to increasing turbidity.
- If a larger change is desired, the value must be set correspondingly higher (empirical value).
- In order to prevent erroneous switching due to air bubbles or isolated turbidity particles, the switching
- Contact can be delayed by adjusting delay time (TD) to a value of up to 9.9 seconds.
- A fluttering switching point can be avoided by increasing reset hysteresis (HY)

Ranges detail running:

Device scans range after range to find detection threshold.
Setting step changes according to the selected range (Low range: 5%, Medium range: 2%, High range: 1%)



Trouble shooting and possible causes

Error	Cause	Remedy
Blue LED does not light up	Turbidity in the measuring section is greater than the selected range.	Inspect the measuring section and remove obstacles or clean the lenses.
‘’TR” appears on the display.	Emitter / Receiver error, or not connected.	Check receiver connection.
Incorrect switching point	Deposits on lenses	Clean the lenses.
	Fill-level too low	Fill up the frame work.
	Incorrect turbidity range has been selected.	Change the turbidity range.

6. MAINTENANCE

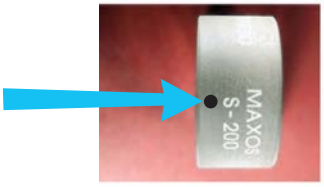
6.1 GA PROBES

Lenses have to be kept in good condition. For that purpose use the specific tool to remove the lenses.

Prior to any cleaning or maintaining operation, fully empty the pipe of the device.

Emitter, receiver and amplificatory do not required any maintenance.
Cleaning frequency depends on working conditions.

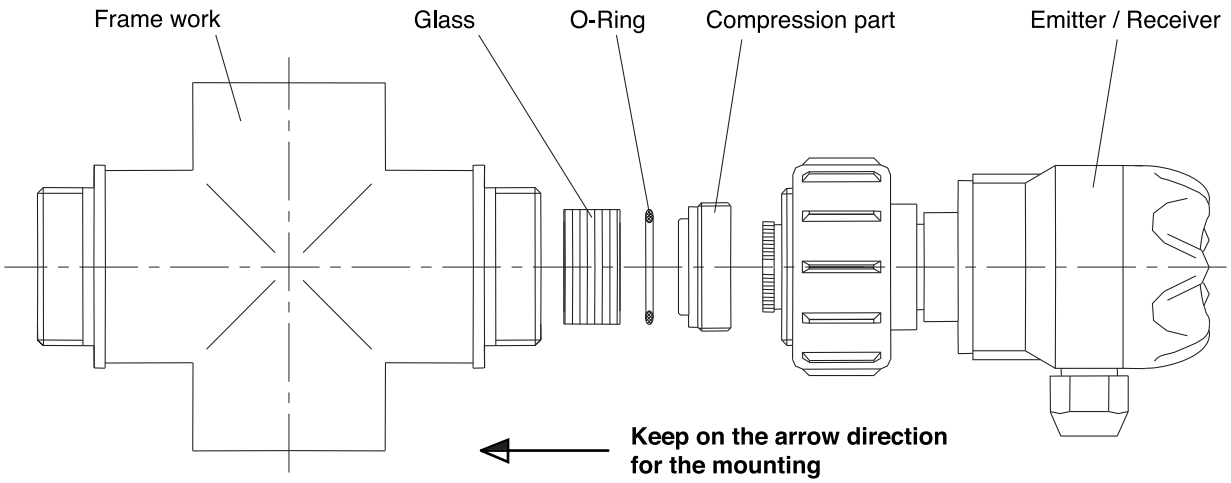
The side with the dot has an anti-contamination coating. Install this end towards the medium.



Observe in case of lenses with anti-contamination coating.

Note: If dirty parts damage the coating, it means that lenses have become waste.

MOUNTING SCHEME



6.2 CP2 PROBES

Remove the probe from the tank. Clean the glasses with water and wipe them with a dry soft tissue to avoid scratches.