

Turbidity controller TURBISWITCH GS4



- Low-cost turbidity limit detector
- 3 adjustable limit ranges (LOW / Medium / HIGH)
- Adjustable delay and hysteresis
- 2 Output relays (N.O. contact)
- 1 Output fault relay (N.O. contact)

APPLICATIONS

In conjunction with the corresponding sensors TURBISWITCH CP2 or TURBISWITCH GA

Monitoring of:

- Filtering units
- Ultrafiltration
- Reverse osmosis

Monitoring from:

- Centrifuges - Separators
- Condensates
- Processed water - Wastewater

Phase control of:

- Product: raw and clear phase

Sludge level detection in:

- Settling tank
- Sedimentation tanks

And much more...

DESCRIPTION

TURBISWITCH GS4 in use with a probe CP2 or a cell TURBISWITCH GA is an optical turbidity detector for determining the proportions of solids in a liquid. The output signal (On/Off) is triggered when the detection value is reached. The turbidity measurement is based on the optical attenuation of light beam : loss due to undissolved solids in the liquid.

Light beam in infrared wave lengths makes the measurement insensitive to extraneous light.

When exceeding or falling below the set turbidity value, the output relay of control unit GS4, switches.

A complete system for turbidity control includes:

- 1 Control unit TURBISWITCH GS4
- + 1 Immersion probe CP2 (data-sheet 425-02)

Or

- 1 Control unit TURBISWITCH GS4
- 1 Cell TURBISWITCH GA.. for in-line measurement (data-sheet 422-01)

The plastic or metallic measuring cells TURBISWITCH GA .. can be installed in pipping from DN15 to DN125.

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Turbidity controller
TURBISWITCH GS4

09-07-2019

D-410.02-EN-AC

TUR

410-02/1

TECHNICAL FEATURES

Main supply	GS4 G: Version 100 ... 255 V AC ; 50/60 Hz GS4 D: Version 10 ... 30 V DC and 12 ... 24 V AC
Consumption	1 ... 5 W
Operating temperature	-10 ... +45°C
Relay outputs	2 Relay outputs, potential-free, N.O. contact (Limit exceeded; Below the limit) 1 Relay output, fault of system, potential-free, N.O. contact

When the supply voltage is switched off, all contacts are open.

Switching power: 250 V AC, 3 A / 30 V DC, 1 A

Note: The contacts are not protected against overload; Provide an external protective device.

Housing dimensions:	22.5 x 100 x 122 mm
DIN Rail:	35 x 7.5 mm (DIN EN 60715)
Protection:	IP 40
Terminals:	Screw connectors, max. 1.5 mm ²
Limit setting:	0... 100% in 3 measuring ranges (depending on the solids content) LOW (by steps of 5%); Medium (by steps of 2%); HIGH (by steps of 1%)
Reset hysteresis:	Adjustable from 1 to 25 % of set limit
Cable length:	Max. 100 m between sensor and control unit
Display:	2-1 / 2-digit 5x7 LED dot matrix display
Settings:	Rotary/ pressure switch on front

EC Conformity: The instrument meets the legal requirements of the current European Directives

CODE NUMBERS AND REFERENCES

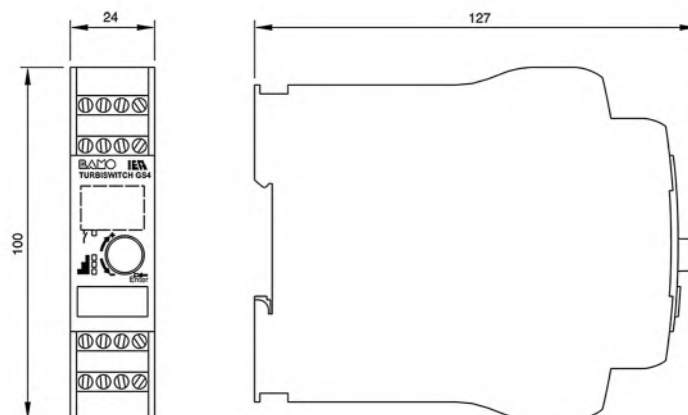
Code	Reference	Description
410 101	TURBISWITCH GS4 G	Control unit 100 ... 255 V AC ; 50/60 Hz
410 102	TURBISWITCH GS4 D	Control unit 10 ... 30 V DC and 12 ... 24 V AC

(Not suitable for previous models TT-GS, TR-GS and CP1)

Accessories:

Code	Reference	Description
232 122	Cabinet	Wall-mount cabinet, IP 65
410 901	TT-HDR	Emitter for replacement on GA1, GA5, GA11
410 931	TR-HDR	Receiver for replacement on GA1, GA5, GA11

DIMENSIONS



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TURBISWITCH GS4

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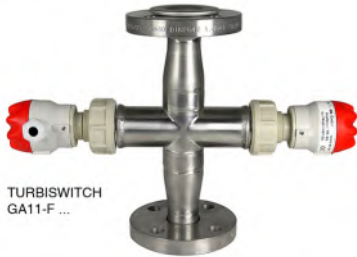
410-02/2

Turbidity measuring cells

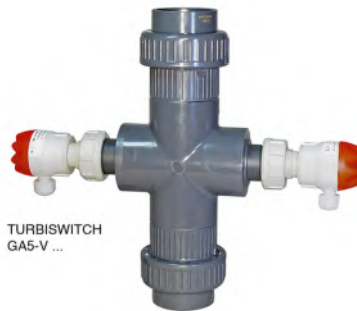
TURBISWITCH GA1 / GA5 / GA11



TURBISWITCH
GA1-F ...



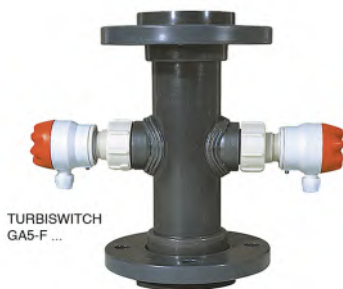
TURBISWITCH
GA11-F ...



TURBISWITCH
GA5-V ...



TURBISWITCH
GA5-V ...



TURBISWITCH
GA5-F ...

- Turbidity limit value detection
- From DN15 up to DN100
- For TURBISWITCH GS4 controller
- In-line or by-pass assembly
- PVC, PP or stainless steel versions

APPLICATIONS

For monitoring process of:

- Filtration / Ultrafiltration
- Reverse osmosis
- Cooling units
- Centrifuges / Separators
- Condensates
- Wasted water / Industrial water

DESCRIPTION

Turbidity is the result of existing particles in the liquid. TURBISWITCH GA is designed for installation in pipeline; It measures optically the turbidity of the flowing liquid.

Transmitted light measurement is done between an emitter and a receiver, in front of each other. Attenuated light measurement is convert by the TURBISWITCH GS4, which compares the signal against the threshold set by the operator.

The limits of turbidity detection depend of the liquid's properties and nominal diameter of the measuring cell.

Measuring range is between 50 FAU min. (or above depending of liquid) and 10,000 FAU max.

Optical windows are of borosilicate glass with CLEANOSIL anti-fouling coating.

A turbidity control system includes:

- 1 Controller TURBISWITCH GS4 (data-sheet 410-02)
- 1 Measuring cell TURBISWITCH GA.. that includes fitted emitter (TT-HDR) and receiver (TR-HDR)

TECHNICAL FEATURES

TURBISWITCH GA1

Material	AISI 316 L (1.4404)
Fittings	Flanges DIN 2633, PN10
Liquid temperature	-10 ... +100 °C
Pressure limit	10 bar
Seals	EPDM (others on request)

TURBISWITCH GA11

Material	AISI 304 (1.4301)
Fittings	Loose flanges, DIN 2642, PN 10, AISI 316Ti (1.4541)
Liquid temperature	-10 ... +100 °C
Pressure limit	10 bar
Seals	EPDM (others on request)

NOTE: Measuring cells design does not correspond to aseptic standards

Other versions on request

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Turbidity measuring cells
TURBISWITCH GA1 / GA5 / GA11

01-08-2019

D-422.01-EN-AD

TUR

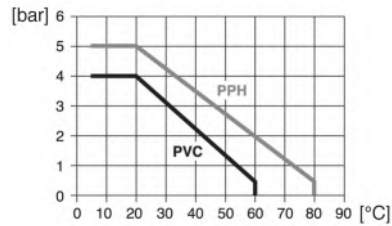
422-01 /1

FEATURES (continued)

TURBISWITCH GA5

Material	Or PVC, or PPH
Fittings	Solvent welding (PVC) or fusion welding (PPH)
Seals	Loose flanges DIN 2642 (with inserts and O-ring seals)
	EPDM (others on request)

Diagram: Operating pressure vs. Liquid temperature



Measuring cells GA1, GA5 and GA11 are supplied with one of each: emitter (TT-HDR) and receiver (TR-HDR).

EC Conformity: The instrument meets the legal requirements of the current European Directives

REFERENCES FOR SPARE PARTS AND ACCESORIES

The TT-HDR transmitter and the TR-HDR receiver are compatible with all GA... measuring cells and are available as spare parts.

Code	Reference	Description
410 901	TT-HDR	Emitter to use with a turbidity controller TURBISWITCH GS4
410 931	TR-HDR	Receiver to use with a turbidity controller TURBISWITCH GS4
410 101	TURBISWITCH GS4 G	TURBISWITCH GS4, power 100 ... 255 V AC, 50/60 Hz
410 102	TURBISWITCH GS4 D	TURBISWITCH GS4, power 10 ... 30 V DC or 12 ... 24 V AC

Code	Reference	Description
444 907	M 55x10	Set of 2 optical windows (CLEANOSIL coating), Ø 55, 10 mm thick With EPDM O-ring seals; For measuring cells GA1
444 908	M 30x15	Set of 2 optical windows (CLEANOSIL coating), Ø 30, 15 mm thick With EPDM O-ring seals; For measuring cells GA11 and GA5
421 602	Seal kit	1 Set of 4 o-ring seals, in EPDM

Other versions on request.



A TURBISWITCH GS4 is necessary to operate the measuring cell

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Turbidity measuring cells
TURBISWITCH GA1 / GA5 / GA11

01-08-2019

D-422.01-EN-AD

TUR

422-01 /2

CODE NUMBERS AND REFERENCES

Code	Reference	Description
TURBISWITCH GA1-.. (Body: AISI 316L; Fittings: flanges, DIN 2633)		
422 116	TURBISWITCH GA1-F3	TURBISWITCH GA1; AISI 316 L flanges, ND25, PN10
422 118	TURBISWITCH GA1-F4	TURBISWITCH GA1; AISI 316 L flanges, ND32, PN10
422 120	TURBISWITCH GA1-F5	TURBISWITCH GA1; AISI 316 L flanges, ND40, PN10
422 122	TURBISWITCH GA1-F6	TURBISWITCH GA1; AISI 316 L flanges, ND50, PN10
412 124	TURBISWITCH GA1-F7	TURBISWITCH GA1; AISI 316 L flanges, ND65, PN10
412 126	TURBISWITCH GA1-F8	TURBISWITCH GA1; AISI 316 L flanges, ND80, PN10
422 128	TURBISWITCH GA1-F9	TURBISWITCH GA1; AISI 316 L flanges, ND100, PN10
TURBISWITCH GA11-.. (Body: AISI 304; Fittings: AISI 316 Ti loose flanges, DIN 2642)		
422 144	TURBISWITCH GA11-F3D	TURBISWITCH GA11; AISI 316 Ti loose flanges ND25, PN10
422 145	TURBISWITCH GA11-F4D	TURBISWITCH GA11; AISI 316 Ti loose flanges ND32, PN10
TURBISWITCH GA5-VV.. (Body: PVC; Fittings: PVC unions)		
422 500	TURBISWITCH GA5-VV11	TURBISWITCH GA5; PVC unions ND15
422 502	TURBISWITCH GA5-VV12	TURBISWITCH GA5; PVC unions ND20
422 504	TURBISWITCH GA5-VV13	TURBISWITCH GA5; PVC unions ND25
422 506	TURBISWITCH GA5-VV14	TURBISWITCH GA5; PVC unions ND32
422 508	TURBISWITCH GA5-VV15	TURBISWITCH GA5; PVC unions ND40
422 510	TURBISWITCH GA5-VV16	TURBISWITCH GA5; PVC unions ND50
422 560	TURBISWITCH GA5-VV17	TURBISWITCH GA5; PVC unions ND65
422 565	TURBISWITCH GA5-VV18	TURBISWITCH GA5; PVC unions ND80
TURBISWITCH GA5-VV.. (Body: PPH; Fittings: PPH unions)		
422 501	TURBISWITCH GA5-VV21	TURBISWITCH GA5; PPH unions ND15
422 503	TURBISWITCH GA5-VV22	TURBISWITCH GA5; PPH unions ND20
422 505	TURBISWITCH GA5-VV23	TURBISWITCH GA5; PPH unions ND25
422 507	TURBISWITCH GA5-VV24	TURBISWITCH GA5; PPH unions ND32
422 509	TURBISWITCH GA5-VV25	TURBISWITCH GA5; PPH unions ND40
422 511	TURBISWITCH GA5-VV26	TURBISWITCH GA5; PPH unions ND50
TURBISWITCH GA5-FF.. (Body: PVC; Fittings: PVC loose flanges DIN 2642)		
422 541	TURBISWITCH GA5-FF11	TURBISWITCH GA5; PVC loose flanges ND15
422 543	TURBISWITCH GA5-FF12	TURBISWITCH GA5; PVC loose flanges ND20
422 545	TURBISWITCH GA5-FF13	TURBISWITCH GA5; PVC loose flanges ND25
422 547	TURBISWITCH GA5-FF14	TURBISWITCH GA5; PVC loose flanges ND32
422 549	TURBISWITCH GA5-FF15	TURBISWITCH GA5; PVC loose flanges ND40
422 561	TURBISWITCH GA5-FF16	TURBISWITCH GA5; PVC loose flanges ND50
422 540	TURBISWITCH GA5-FF17	TURBISWITCH GA5; PVC loose flanges ND65
422 542	TURBISWITCH GA5-FF18	TURBISWITCH GA5; PVC loose flanges ND80
422 544	TURBISWITCH GA5-FF19	TURBISWITCH GA5; PVC loose flanges ND100
TURBISWITCH GA5-FF.. (Body: PPH; Fittings: PPH loose flanges, DIN 2642)		
422 551	TURBISWITCH GA5-FF21	TURBISWITCH GA5; PPH loose flanges ND15
422 553	TURBISWITCH GA5-FF22	TURBISWITCH GA5; PPH loose flanges ND20
422 555	TURBISWITCH GA5-FF23	TURBISWITCH GA5; PPH loose flanges ND25
422 556	TURBISWITCH GA5-FF24	TURBISWITCH GA5; PPH loose flanges ND32
422 557	TURBISWITCH GA5-FF25	TURBISWITCH GA5; PPH loose flanges ND40
422 558	TURBISWITCH GA5-FF26	TURBISWITCH GA5; PPH loose flanges ND50
422 559	TURBISWITCH GA5-FF27	TURBISWITCH GA5; PPH loose flanges ND65
422 552	TURBISWITCH GA5-FF28	TURBISWITCH GA5; PPH loose flanges ND80
422 554	TURBISWITCH GA5-FF29	TURBISWITCH GA5; PPH loose flanges ND100

Other versions on request

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Turbidity measuring cells
TURBISWITCH GA1 / GA5 / GA11

01-08-2019

D-422.01-EN-AD

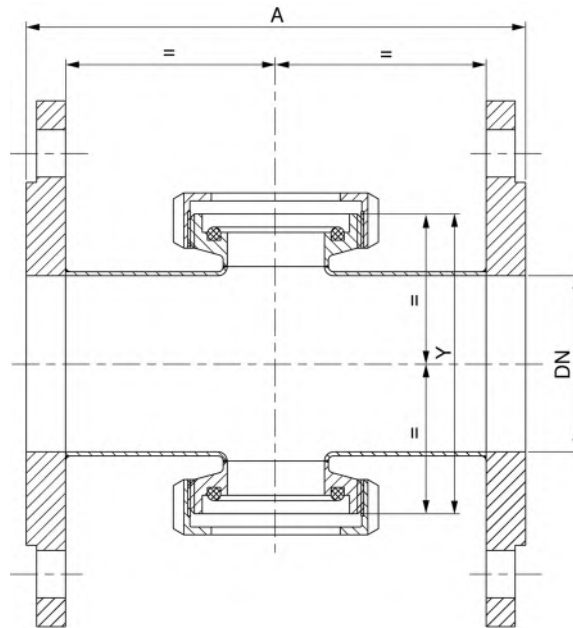
TUR

422-01 /3

DIMENSIONS

TURBISWITCH GA1-F...

DIN 2633



ND	A =	Y =
25	188	92
32	140	92
40	140	92
50	140	102
65	158	122
80	160	138
100	194	158

Other design (materials, fittings, etc.) on request

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Turbidity measuring cells

TURBISWITCH GA1 / GA5 / GA11

01-08-2019

D-422.01-EN-AD

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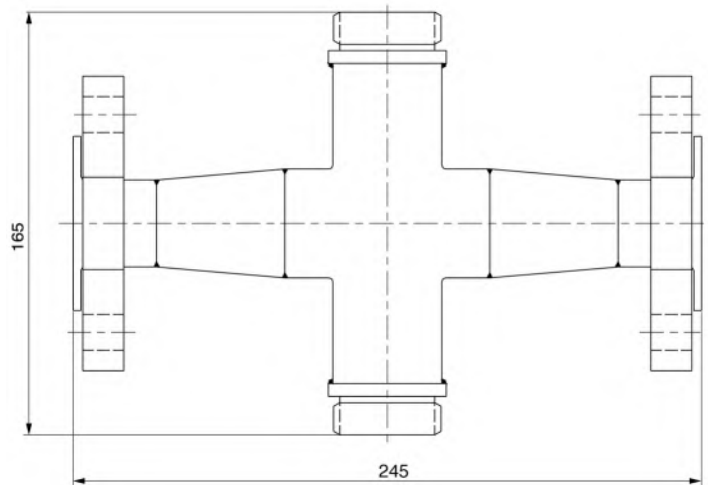
422-01 /4

DIMENSIONS

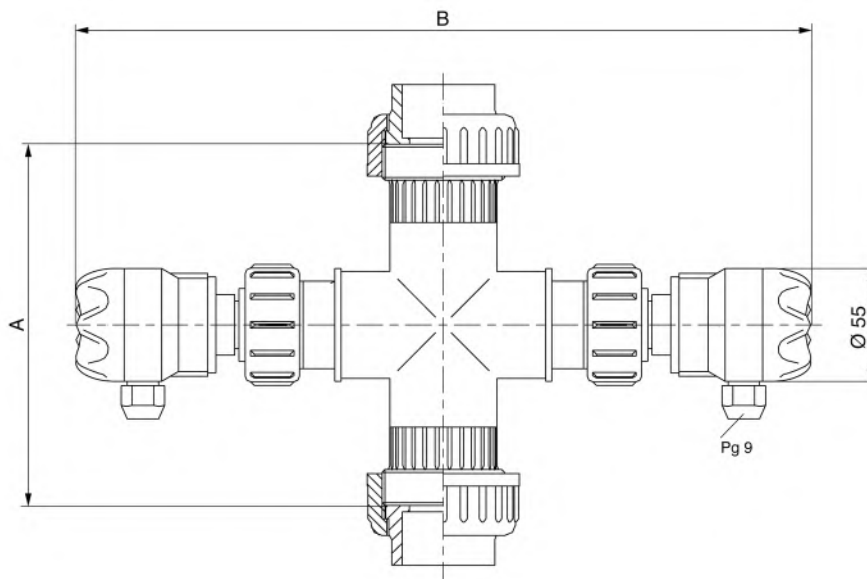
TURBISWITCH GA11-F...

DIN 2642

(Same dimensions for both ND 25 and ND 32 models)



TURBISWITCH GA5-VV...



TURBISWITCH GA5-VV 1.. (material: PVC)			TURBISWITCH GA5-VV 2.. (Material: PPH)	
ND	A (±2 mm)	B (±2 mm)	A (±2 mm)	B (±2 mm)
15	152	358	214	359
20	158	358	218	359
25	164	358	222	359
32	176	358	230	359
40	210	358	248	367
50	258	404	281	348
65	202	360	273	360
80	208	375	261	375
100	228	371	247	371

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Turbidity measuring cells
TURBISWITCH GA1 / GA5 / GA11

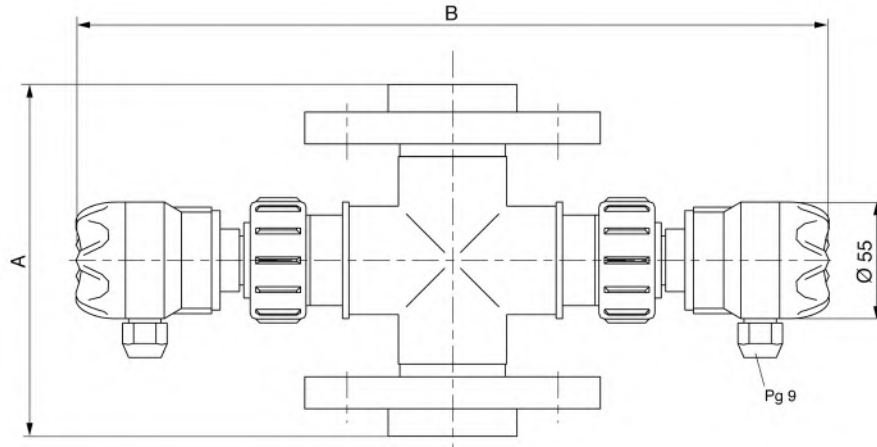
01-08-2019

D-422.01-EN-AD

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422-01 /5

DIMENSIONS (continued)



ND	TURBISWITCH GA5-FF 1.. (Material: PVC)		TURBISWITCH GA5-FF 2.. (Material: PPH)	
	A (±2 mm)	B (±2 mm)	A (±2 mm)	B (±2 mm)
15	143	358	214	359
20	149	358	218	359
25	155	358	222	359
32	167	358	230	359
40	197	358	254	367
50	237	404	290	348
65	290	360	290	360
80	310	375	310	375
100	350	371	350	371
125	350	401	350	401
150	350	421	350	421
200	350	461	350	461

Immersion probe TURBISWITCH CP2



TURBISWITCH CP2 Z0



TURBISWITCH CP2 ZR

- Turbidity control on adjustable threshold
- PVC probe, IP 68
- Detection range: within 100 ... 30 000 FAU
- Immersion depth: Max. 10 m
- To connect to a TURBISWITCH GS4

APPLICATIONS

- Level detection of blanket sludge
- Phase separation detection
- Effluents monitoring
- Monitoring of turbidity limit of liquids

DESCRIPTION

A complete system includes a CP2 probe connected to a TURBISWITCH GS4 controller. It provides a contact as soon as the turbidity reaches the preset value.

The emitter sends the infra-red light beam through the liquid to the receiver. The signal variations due to the turbidity changes are analysed by the TURBISWITCH GS4 to detect an override threshold and then to actuate the relay output.

To avoid false alarms due to air bubbles or accidental excess of turbidity, delays are adjustable between 0.1 and 9.9 s on both increasing and decreasing turbidity.

TECHNICAL FEATURES

Construction	PVC
Protection	IP 68
Detection range	100 ... 30000 FAU
Immersion depth	Max.: 10 m
Liquid temperature	0... +60 °C
Cable	TPK Shielded cable, 2 x 0.5 mm ² , resistant to acid and base liquids, standard length 6 m (other on request)
Mounting	Cable suspended With PVC extension tube, standard length 1 m or 1.5 m (other on request, max. 2 m) With mounting clamp Ø40mm

EC Conformity: The instrument meets the legal requirements of the current European Directives

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Immersion probe
TURBISWITCH CP2

01-08-2018

D-425.02-EN-AD

TUR

425-02/1

CODE NUMBERS AND REFERENCES

Code	Reference	Description
425 011	TURBISWITCH CP2 Z0	CP2 100 ... 30000 FAU, cable length 6 m
425 021	TURBISWITCH CP2 ZK	CP2 100 ... 30000 FAU, cable length 6 m; With fastening angle bracket and cable gland
425 031	TURBISWITCH CP2 ZR1000	CP2 100 ... 30000 FAU, cable length 6 m; With extension tube 1000 mm long
425 041	TURBISWITCH CP2 ZR1500	CP2 100 ... 30000 FAU, cable length 6 m; With extension tube 1500 mm long

Special types on request:

Detection probe

Type

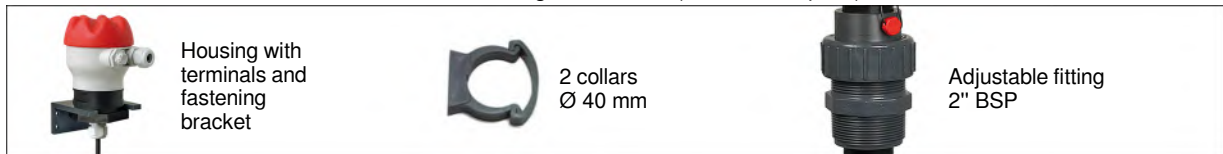
- Z0** Detection probe with 6 m long cable
- ZK** Detection probe with 6 m long cable
+ Fastening angle bracket and cable gland
- ZR** Detection probe with 6 m long cable
+ Extension tube (Standard length 1000 mm)

ZR version

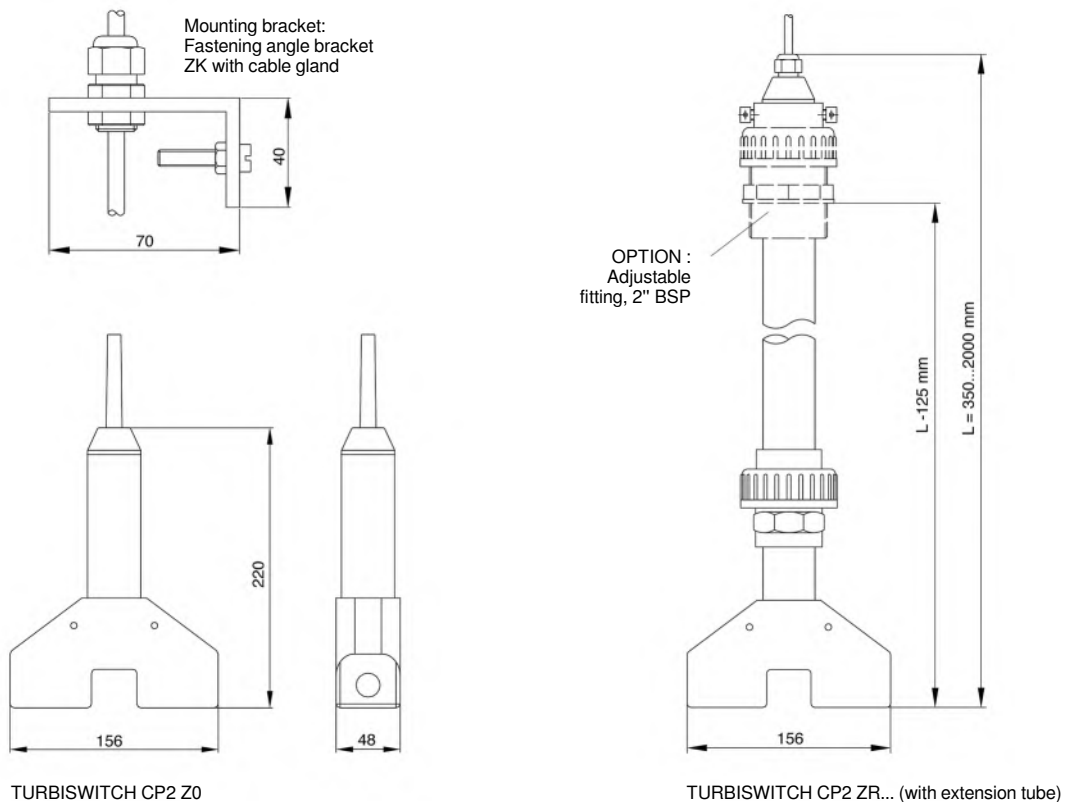
Length L (min. 350 mm; max. 2000 mm)

TURBISWITCH CP2 L mm

OPTIONS: Fitting accessories (others on request)



DIMENSIONS



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Immersion probe
TURBISWITCH CP2

01-08-2018

D-425.02-EN-AD

TUR

425-02/2

Battery operated sludge level controller MUDLine® TGS



- Portable equipment, battery operated
- Sludge level detection adjustable on site
- Display of depth up to 10 m
- Signaling: Buzzer and LED
- Including: Battery charger 230 V AC

DESCRIPTION

Sludge level controller for:

- Sedimentation basins
- Primary and secondary clarifiers
- Septic tanks

OPERATION

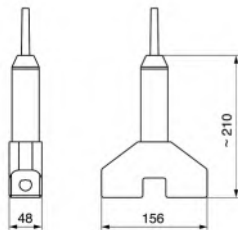
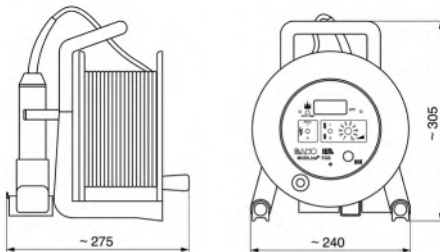
MUDLine consists of a control unit mounted on a cable-drum and a submersible probe with a 10 m long cable.

The probe is equipped with a turbidity sensor for detection of interface between water and sludge, as well as an hydrostatic level sensor to measure the depth of immersion. The depth is permanently displayed on the LCD screen of the control unit. Sensitivity of sensor is switchable between two ranges of sludge concentrations (Low and High).

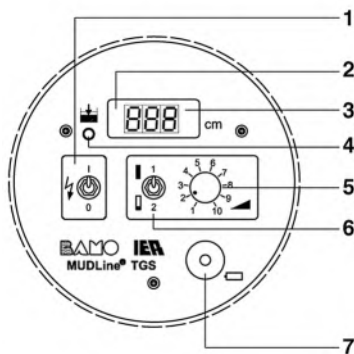
When sludge is detected, a buzzer sounds and light (red LED) is emitted. A self-hold function of display allows the reading of the depth.

TECHNICAL FEATURES

Measuring range	0... 10 m
Measuring accuracy	About 1 cm
Automatic shutdown	After 7 min of non activity
Autonomy	More than 100 detections of 7 minutes each
Ambient temperature	0... +50 °C
Cable	TPE cable, 10 m long
Material	Probe in PVC
Protection	Probe: IP 68; Handheld housing: IP 44 - EN 60 529
Mass	3.5 kg
Battery charger supply	230 V AC



Control unit



1	On/Off switch
2	Low battery indicator
3	LCD Display, 3 digits
4	Red LED: sludge detected
5	Adjustment potentiometer for threshold of sludge concentration
6	Selector for concentration range
7	Connector for battery charger

EC Conformity: Guidelines, Low Voltages (2006/95/EC) and Electromagnetic Compatibility (2004/108/EG)

CODE NUMBER AND REFERENCE

Code	Reference
426 100	MUDLine® portable and autonomous sludge level controller

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Battery operated sludge level controller
MUDLine® TGS

02-07-2018

D-426.01-EN-AC

TUR

426-01 /1

Underwater settled solids detector MUDSonic



MUDSonic MF

- Detection of settled solid particles in water
- Level monitoring with ultrasonic detector
- Output: 2 limit contacts, 1 fault contact
- Adjustable timer
- Adjustment along 3 measuring ranges (For sludge densities within 50 to 250 g/l)

APPLICATIONS

- Iron filings detection
- Salt detection in brine tank
- Sludge height monitoring in:
 - Thickeners
 - Primary clarifiers
 - Industrial processes (sludges with iron hydroxide, high density slurry, etc.)

DESCRIPTION

A complete system includes a MUDSonic TS immersion probe and a MUDSONIC MF operating unit. The detection is done between emitter and receiver of ultrasonic waves. The probe evaluates the concentration of solid particles by attenuation of the signal. The probe is immersed at a fixed height in the tank; It triggers a switch when the concentration (predefined) is reached (sludge level rising by settlement). The trigger point and timer are adjustable on site (real operating conditions).

TECHNICAL FEATURES

Operating unit MUDSonic MF

Power supply	100 to 255 V AC - 50/60 Hz (model MF G) or 10 to 30 V DC and 12 to 24 V AC (model MF D)
Consumption	1 ... 5 W
Ambient temperature	-10 ... +45 °C
Relay outputs	2 contacts, 1 threshold, potential-free (N.O.) (Limit exceeded, below the limit) 1 potential-free contact, fault alarm (N.O.)

When the supply voltage is off or in case of power failure, all contacts are open.

Switching power	250 V AC, 3A / 30 V DC, 1 A
-----------------	-----------------------------

Caution: The contacts are not protected against overload. Provide an external protective device.

Housing dimensions:	22.5 x 100 x (h)122 mm
DIN Rail:	35 x 7.5 mm (DIN EN 60715)
Protection:	IP 40
Electrical connections:	Screw connectors; Cables 1.5 mm ² max.



MUDSonic TS

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Underwater settled solids
detector
MUDSonic

02-07-2019

D-426.02-EN-AD

TUR

426-02/1

FEATURES (continued)

Display:	2½ digit LED, 5x7 dot matrix display 1 Blue LED, relay energized 3 Yellow LEDs, measuring range (LOW / Medium / HIGH)
Settings:	Through a rotary switch on front
Delay:	Adjustable from 0.1 up to 9.9 s

Probe MUDSonic TS

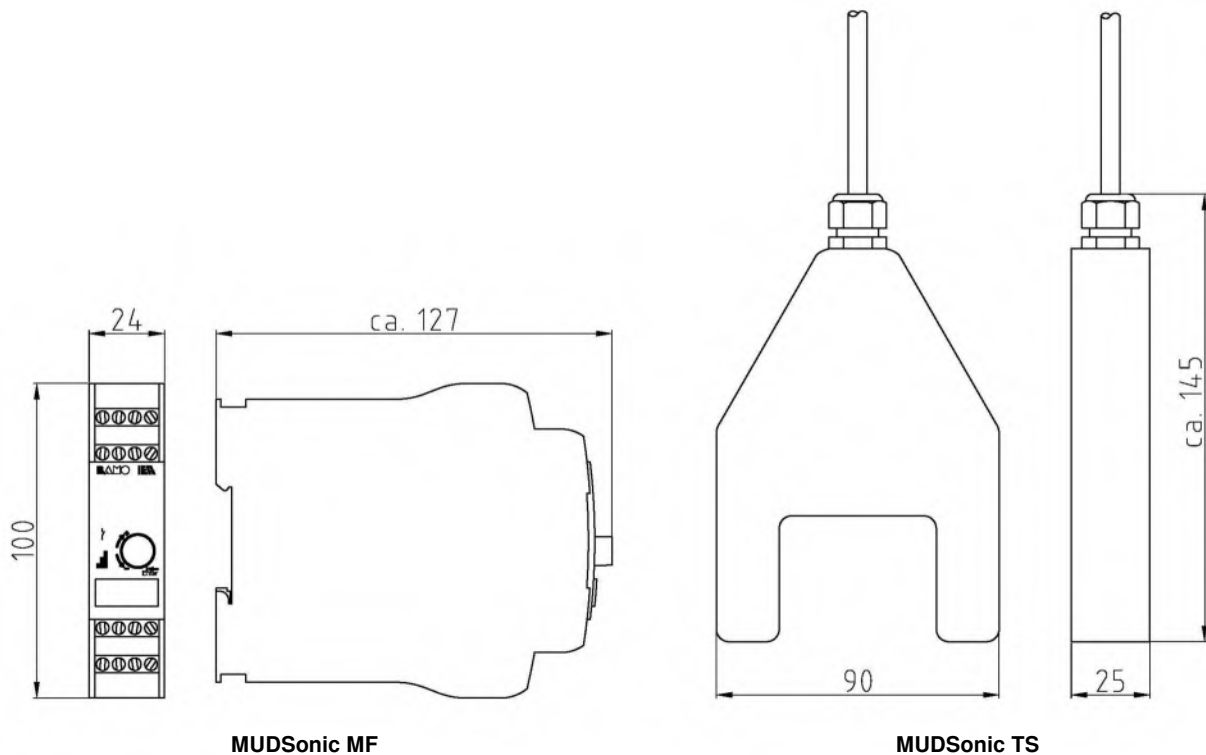
Detector material:	PVC
Cable:	TPK, 10 m long, shielded, 2 x1 mm ² Other cable materials and lengths request (PVC, oil and hydrocarbons-proof, etc.). (Max. length 50 m)
Dimensions	145 x 90 x 25 mm
Protection:	IP 68 acc. EN 60529
Measuring principle:	Ultrasonic signal attenuation
Operating temperature	-20 ... +45 °C

EC Conformity: The instrument meets the legal requirements of the current European Directives

CODE NUMBERS AND REFERENCES

Code	Reference	Description
426 200	MUDSonic TS	Probe MUDSonic TS , 10 m long cable
426 300	MUDSonic MF G	Operating unit MUDSonic 100 ... 255 V AC
426 305	MUDSonic MF D	Operating unit MUDSonic 10 ... 30 V DC & 12 ... 24 V AC
<i>Accessories</i>		
232 122	Cabinet	Wall mount cabinet, IP 65

DIMENSIONS



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Underwater settled solids
 detector
MUDSonic

02-07-2019

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426-02/2

Turbidity monitor BAMOPHAR 436



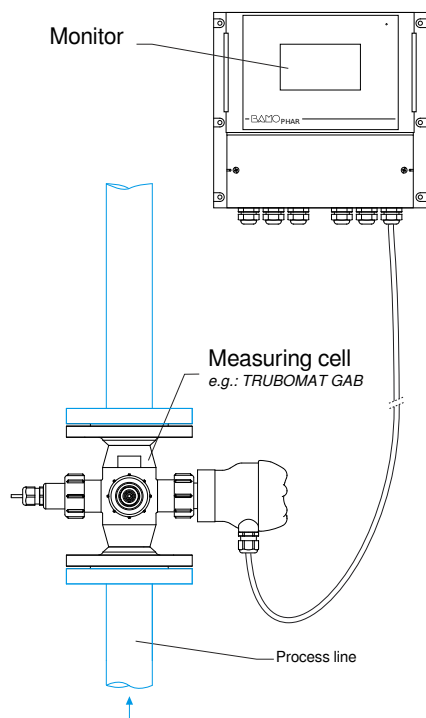
- Color touch screen
- Available scales:
0.001 to 9999 FNU, FAU, NTU, mg/l, g/l
- 2 outputs 0/4-20mA (measurement & T. °C)
- 3 Independent relays
- 1 Relay for alarming function
- **OPTIONS:**
RS 422 /J-BUS + LOGGER
Extension terminal for a 2nd measurement parameter

APPLICATIONS

Turbidity measurement for monitoring and processing water treatment:

- Monitoring of source or wells for drinkable water
- Monitoring of filtering diaphragms, ultra-pure water production units, reverse osmosis plants
- Measurements in basins, decanting process
- Monitoring of clogging and rinsing of filtering units
- Monitoring of cooling towers
- Control of wastewater before discharge

Complete system (example)



DESCRIPTION

BAMOPHAR 436 is equipped with a color touch screen to set up the configuration and to display the turbidity, temperature and state of thresholds. Copies of measurement are available on 2 outputs 4-20 mA.

BAMOPHAR 436 displays the turbidity value measured by one of our transmitters, to respond to process requirements.

- TURBICUBE in PVC or PPH and TRUBOMAT GAB in stainless steel, are dedicated to in-line measurement (see data-sheet 444-01 & 446-01)
- TURBISENS in PVC is an immersion probe with transmitter for measurements in tanks, basins, channels (See data-sheet 443-01).

A complete measuring system includes:

- One monitor BAMOPHAR 436
- One turbidity transmitter

OPTION: Extension terminal for a second parameter

- Allows a second measurement (pH, Flow rate, Conductivity, etc.) (Configuration and display on the main unit)
- Connected to main unit with 2 x 2-wire shielded cable (Cable length between both devices: max. 500 m)
- RS422 and Data Logger of main unit are shared between both units
- Wall or panel or DIN rail mounting: according to the model

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Turbidity monitor
BAMOPHAR 436

12-07-2018

D-436.02-EN-AD

TUR

436-02/1

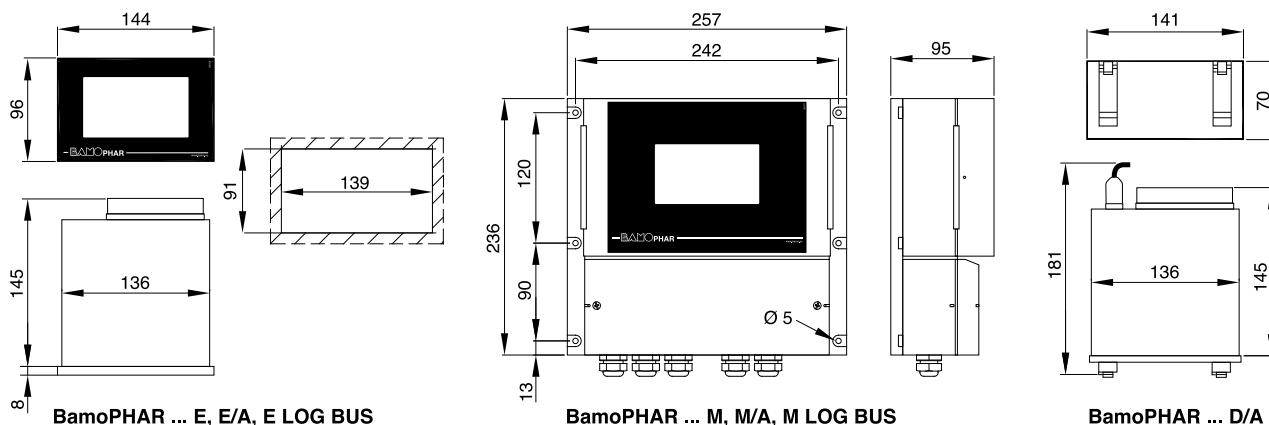
TECHNICAL FEATURES

End-user interface	Color touch screen 4.3", resolution 480x272 pixels Display of measurements, menus, temperature, relay status Configuration - Keyword protected
Measuring scales	To set up according the turbidity transmitter in use (from 0.001 to 9999 FNU, FAU, NTU, mg/l, g/l)
Sensor signal input	For Turbidity transmitter 4-20 mA, 2-wire or 4-wire technique
Temperature display	Input signal for Pt 100 Ω 3-wire sensor, within the range 0 to 100 °C Or manually set up of operating temperature.
Relay outputs	4 contacts N.O., potential free
Configurable thresholds	2 Independent thresholds, for measurement or temperature 1 Independent threshold, for measurement or temperature or to external function 1 threshold for alarming function (Temperature sensor fault) or measurement out of range
Contact Initial resistance	100 m Ω max. (voltage drop 6 V DC 1 A)
Switching power	831 VA AC / 3 A / 277 V AC 90 W / 3 A / 30 V DC
Switching capacity (min.)	100 mA, 5 V DC (variable according to switching frequency, environmental conditions and accuracy).
Measurement output	0/4-20 mA (max. 600 Ω) proportional to measurement
Temperature output	0/4-20 mA (max. 600 Ω) within the range 0 to 100 °C
Main power supply	230 V - 50/60 Hz (others on request) - Consumption 10 VA
Models	Panel mounting, 96x144 mm; Front IP65; Rear IP4, screw terminals Wall mounting, IP65, cable glands
Storage	-10 ... +70 °C
Operating temperature	-5 ... +50 °C

OPTION (RS 422 + Logger)

Interface	RS422 output, J-BUS link - Binary slave mode - 2400 to 9600 bauds Data Logger; Record of cycle average measurement - 150 000 records max. on memory card.
-----------	--

DIMENSIONS



CODE NUMBERS AND REFERENCES

Code	Reference	Description
436 400	BAMOPHAR 436 E	Panel mounting 96x144 mm - Front IP 65; Rear IP 40
436 401	BAMOPHAR 436 E/A	Panel mounting 96x144 m- Extension, blind monitor
436 403	BAMOPHAR 436 D/A	Rail mounting - Extension, blind monitor / IP40
436 450	BAMOPHAR 436 E LOG BUS	Panel mounting 96x144 m - RS422 + LOGGER - Front IP 65; Rear IP 40
436 500	BAMOPHAR 436 M	Wall mounting, IP 65, cable glands
436 501	BAMOPHAR 436 M/A	Wall mounting - Extension, blind monitor - IP 65, cable glands
436 520	BAMOPHAR 436 M LOG BUS	Wall mounting - RS 422 + LOGGER - IP 65, cable glands

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Turbidity monitor
BAMOPHAR 436

12-07-2018

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436-02/2

Turbidity transmitter, immersion probe

TURBISENS



- Compact transmitter, 4-20 mA output
- In conformity with EN ISO 7027, infrared light (860 nm), 90° scattered light
- Selectable ranges:
0 to 50 / 100 / 200 / 500 / 1000 / 2000 FNU
- High resolution from 0.01 FNU
- Integrated 4 digits display
- Anti-fouling coating on optical windows
- Beam windows fouling compensation
- Alarm for defective compensation
- Max. immersion depth: 10 m
- Testing unit for equipment monitoring

MEASURING PRINCIPLE

TURBISENS applies recommendations of Standard ISO 7027 to measure the turbidity of a liquid with scattered light (90° of angle) and infra-red light source (860 nm).

DESCRIPTION

The measuring cell, integrated in the probe, includes 2 emitters and 1 receiver. The electronic calculator (in the probe head) provides a 4-20 mA signal, proportional to the measured turbidity.

APPLICATIONS

Monitoring

- WWTP
- Sedimentation process

Survey

- Wells
- Water storage tanks

CODE NUMBERS AND REFERENCES

Code	Reference	Description
443 100	TURBISENS	Turbidity transmitter with immersion probe
OPTIONS		
443 099		Control kit
436 ___	BAMOPHAR 436	Turbidity controller, touch sensitive screen (option RS 422 + LOGGER)

Complete information on BAMOPHAR 436: data-sheet 436-02.

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Turbidity transmitter,
immersion probe
TURBISENS

02-07-2018

D-443.01-EN-AB

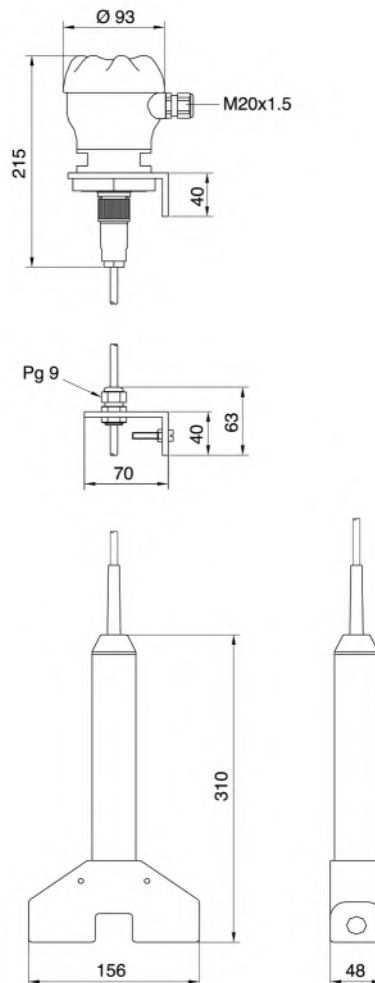
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443-01 /1

TECHNICAL FEATURES

Output signal	4-20 mA
Power supply	10 ... 30 V DC
Consumption	1.2 W 0.7 W when measuring loop is powered separately
Selectable Ranges	0 to 50 / 100 / 200 / 500 / 1000 / 2000 FNU
Color compensation	Light compensation on low ranges: 50 and 100 FNU
Resolution	Or 0.01 FNU, or 1 FNU, according to measuring range
Accuracy	±5 % of reading ±1 % F.S. in use
Head	PBT Housing
Protection	IP65 (EN 60 529)
Ambient temperature	0... +45 °C
Display	4 digits for measurement, programming and settings
LED status	On function and alarms
Settings	Rotating potentiometer and push button
Fitting	2" BSP male, counter-nut and Angle bracket
Sensor	PVC immersion probe
Protection	IP 68 (EN 60 529)
Immersion depth	Max. 10 m
Temperature	0... 60 °C
Cable	TPK, Length 6 m (other length on request) Terminal connector: IP 67

CE Mark The instrument meets the legal requirements of the current European Directives



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Turbidity transmitter,
 immersion probe
TURBISENS

02-07-2018

D-443.01-EN-AB

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443-01 /2

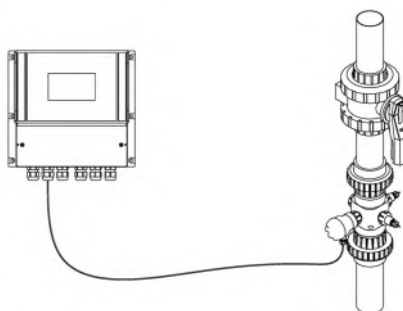
In-line turbidity system TURBICUBE



TURBICUBE 20 or 1000, PVC version



TURBICUBE 20 or 1000, PPH version



Remote signal to monitor BAMOPHAR
(option)

- **Continuous turbidity measurement according to ISO 7027:**
90° scattered light measurement and 180° attenuated light measurement
- **Smooth cell surfaces - no settling of particles**
- **Measurement ranges:**
0.01 ... 20 FNU
0.1 ... 500 FNU & 100 ... 1000 FAU
- **Output signal: 4-20 mA**
- **Process connections:**
Flanges or unions

APPLICATIONS

- Well water monitoring
- Monitoring of filtering or reverse osmosis units.
- Control of the sewage plant outlet
- Cooling water monitoring
- Filter clogging monitoring

DESCRIPTION

TURBICUBE measures the turbidity of the liquid using attenuated light beam (at 180°) and a scattered light beam (at 90°) with a 860 nm wavelength light, according to european standard ISO 7027
The measurement system integrates an assembly with 2 emitters and 1 receiver with a micro-processor in the main housing.
The 4-20 mA output signal corresponds to the selected scale in use.

TURBICUBE 20:

5 scale ranges to select by DIP switches from 0.01 ... 1 up to 0.01 ... 20 FNU

TURBICUBE 1000:

5 ranges to select by DIP from 0.1 ... 500 FNU and 100 ... 1000 FAU

MOUNTING

Only for vertical fully loaded pipe, with ascending flow.
Slow down sections: 600 mm before device and 400 mm after device.

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In-line turbidity system
TURBICUBE

10-06-2020

D-444.01-EN-AI

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444-01 /1

TECHNICAL FEATURES

Power supply	24 V DC stabilized (10 ... 30 V DC)
Consumption	0.5 ... 1 W
Output signal	4-20 mA
Ambient temperature	+5 ... +45 °C
Liquid temperature	PVC: +5 ... +60 °C PPH: +5 ... +80 °C
Pressure limits	Max. 6 bar at 20 °C (PVC and PPH) and 1 bar at 60 °C (PVC and PPH)

MATERIALS

Measuring cell	PVC or PP
Connection head	PBT housing (glass fiber reinforced); IP 65 according to EN 60529
Sealings	EPDM (others on request)
Optical windows	Borosilicate glass, Cleanosil coating

MEASURING SCALES

TURBICUBE 20					
ND 20 to ND 100	0.01 ... 1 FNU	0.01 ... 2 FNU	0.01 ... 5 FNU	0.01 ... 10 FNU	0.01 ... 20 FNU

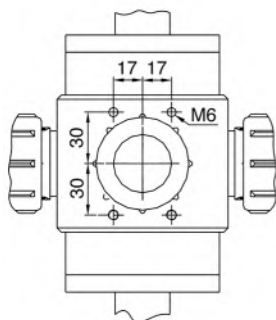
TURBICUBE 1000					
ND 20 ... ND 65	0.1 ... 50 FNU	0.1 ... 100 FNU	0.1 ... 200 FNU	0.1 ... 500 FNU	100 ... 1000 FAU
ND 80 & ND 100	0.1 ... 50 FNU	0.1 ... 100 FNU	0.1 ... 200 FNU	0.1 ... 300 FNU	100 ... 1000 FAU

Accuracy	±5 % of reading, ±1 % of full scale in use
Resolution	0.001 ... 0.2 FNU depending of scale in use
Colour/ Fouling compensation	With TURBICUBE 20 up to ND 65
Configuration	DIP switches, calibration potentiometer
Displayed information	Status: Green LED; Fault: Red LED
Process connections	PVC unions, solvent welding - ND 20 ... ND 100 PPH unions, for welding - ND 20 ... ND 100 Loose flanges ISO 7005, EN 1092, DIN 2501; PVC or PPH - ND 20 ... ND 100

EC Conformity: The instrument meets the legal requirements of the current European Directives

FASTENING

On the measuring cell there are 4x M6 thread tap holes, which can be used for additional support. A bracket (PVC) is also available to fit the TURBICUBE on a wall (option).



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In-line turbidity system
TURBICUBE

10-06-2020

D-444.01-EN-AI

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444-01 /2

CODE NUMBERS AND REFERENCES

ND	Range	Fittings	PVC version		PP version	
			Code	Reference	Code	Reference
20	0.1 ... 1000	Threaded Unions	444 112	TURBICUBE VV 1000 1 2 M	444 322	TURBICUBE VV 1000 2 2 M
25			444 113	TURBICUBE VV 1000 1 3 M	444 323	TURBICUBE VV 1000 2 3 M
32			444 114	TURBICUBE VV 1000 1 4 M	444 324	TURBICUBE VV 1000 2 4 M
40			444 115	TURBICUBE VV 1000 1 5 M	444 325	TURBICUBE VV 1000 2 5 M
50			444 116	TURBICUBE VV 1000 1 6 M	444 326	TURBICUBE VV 1000 2 6 M
65			444 117	TURBICUBE VV 1000 1 7 M	444 327	TURBICUBE VV 1000 2 7 M
80			444 118	TURBICUBE VV 1000 1 8 M	444 328	TURBICUBE VV 1000 2 8 M
100			444 119	TURBICUBE VV 1000 1 9 M	444 329	TURBICUBE VV 1000 2 9 M
20	0.01 ... 20	Threaded Unions	444 212	TURBICUBE VV 20 1 2 M	444 222	TURBICUBE VV 20 2 2 M
25			444 213	TURBICUBE VV 20 1 3 M	444 223	TURBICUBE VV 20 2 3 M
32			444 214	TURBICUBE VV 20 1 4 M	444 224	TURBICUBE VV 20 2 4 M
40			444 215	TURBICUBE VV 20 1 5 M	444 225	TURBICUBE VV 20 2 5 M
50			444 216	TURBICUBE VV 20 1 6 M	444 226	TURBICUBE VV 20 2 6 M
65			444 217	TURBICUBE VV 20 1 7 M	444 227	TURBICUBE VV 20 2 7 M
80			444 218	TURBICUBE VV 20 1 8 M	444 228	TURBICUBE VV 20 2 8 M
100			444 219	TURBICUBE VV 20 1 9 M	444 229	TURBICUBE VV 20 2 9 M
20	0.1 ... 1000	Flanges	444 122	TURBICUBE FF 1000 1 2 M	444 332	TURBICUBE FF 1000 2 2 M
25			444 123	TURBICUBE FF 1000 1 3 M	444 333	TURBICUBE FF 1000 2 3 M
32			444 124	TURBICUBE FF 1000 1 4 M	444 334	TURBICUBE FF 1000 2 4 M
40			444 125	TURBICUBE FF 1000 1 5 M	444 335	TURBICUBE FF 1000 2 5 M
50			444 126	TURBICUBE FF 1000 1 6 M	444 336	TURBICUBE FF 1000 2 6 M
65			444 127	TURBICUBE FF 1000 1 7 M	444 337	TURBICUBE FF 1000 2 7 M
80			444 128	TURBICUBE FF 1000 1 8 M	444 338	TURBICUBE FF 1000 2 8 M
100			444 129	TURBICUBE FF 1000 1 9 M	444 339	TURBICUBE FF 1000 2 9 M
20	0.01 ... 20	Flanges	444 222	TURBICUBE FF 20 1 2 M	444 432	TURBICUBE FF 20 2 2 M
25			444 223	TURBICUBE FF 20 1 3 M	444 433	TURBICUBE FF 20 2 3 M
32			444 224	TURBICUBE FF 20 1 4 M	444 434	TURBICUBE FF 20 2 4 M
40			444 225	TURBICUBE FF 20 1 5 M	444 435	TURBICUBE FF 20 2 5 M
50			444 226	TURBICUBE FF 20 1 6 M	444 436	TURBICUBE FF 20 2 6 M
65			444 227	TURBICUBE FF 20 1 7 M	444 437	TURBICUBE FF 20 2 7 M
80			444 228	TURBICUBE FF 20 1 8 M	444 438	TURBICUBE FF 20 2 8 M
100			444 229	TURBICUBE FF 20 1 9 M	444 439	TURBICUBE FF 20 2 9 M

Accessories:

Code	Description	Description
444 910	TURBICLICK 5.7	Torque wrench for tight mounting of optical windows.
444 903	O-rings for TURBICUBE	Set of EPDM O-rings for TURBICUBE (10 pieces)
444 900	ETR optical windows for TURBICUBE (PVC model)	4 windows, with fittings (PVC) and O-rings
444 901	ETR optical windows for TURBICUBE (PP model)	4 windows, with fittings (PP) and O-rings
444 905	Control kit for TURBICUBE 20	Control kit for TURBICUBE 20 with dry standard rod
444 906	Control kit for TURBICUBE 1000	Control kit for TURBICUBE 1000 with dry standard rod

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In-line turbidity system
TURBICUBE

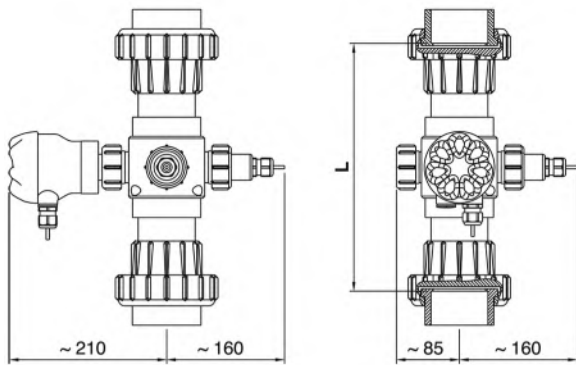
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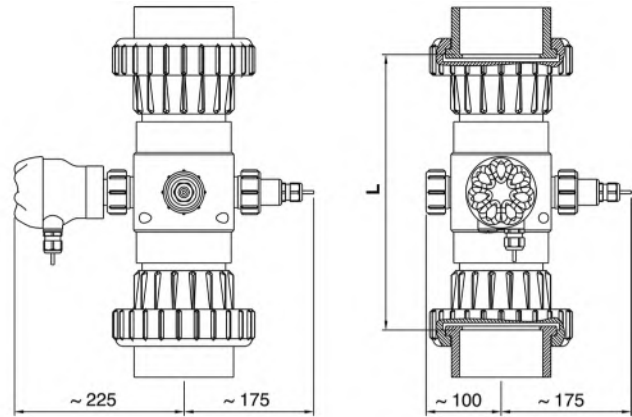
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444-01/3

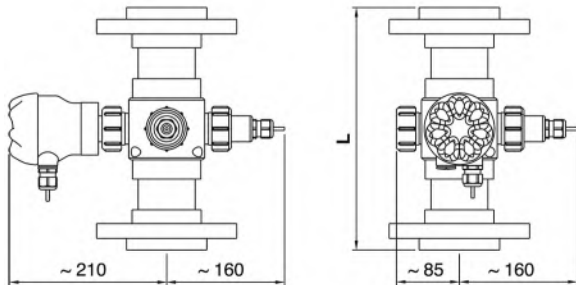
DIMENSIONS



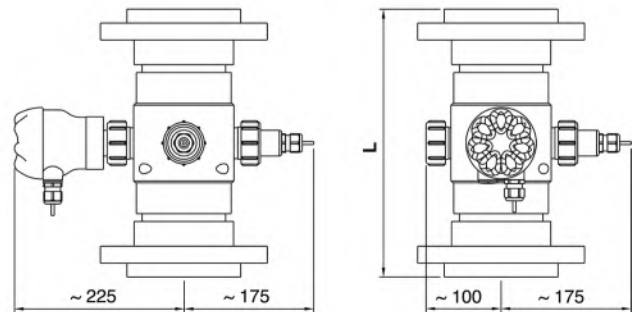
TURBICUBE VV... DN 20 - DN 65



TURBICUBE VV... DN 80, DN 100



TURBICUBE FF... DN 20 - DN 65



TURBICUBE FF... DN 80, DN 100

Dimensions (tolerance: ± 2 mm)

ND	Ø D	L → PVC; Unions	L → PVC; Flanges	L → PP; Unions	L → PP; Flanges
20	25	240	240	300	300
25	32	240	240	300	300
32	40	240	240	300	300
40	50	240	240	300	300
50	63	262	262	342	300
65	75	314	314	342	300
80	90	347	347	394	400
100	110	347	347	394	400

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In-line turbidity system
TURBICUBE

10-06-2020

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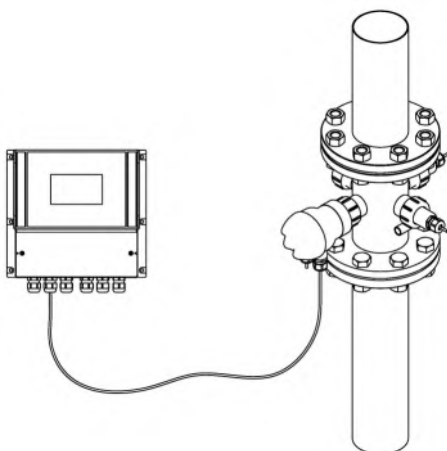
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444-01 /4

In-line turbidity system TRUBOMAT GAB



- Continuous turbidity measurement according to ISO 7027
90 ° scattered light measurement and 180 ° transmitted light measurement
- Measuring cell: AISI 316 L
- Measuring ranges:
0.01 ... 20 FNU
0.1 ... 500 FNU & 100 ... 1000 FAU
- Output signal: 4-20 mA (4-wire)
- Process connections:
DIN flanges or Triclamp



Remote signal to a monitor BAMOPHAR (option)

APPLICATIONS

- Well water monitoring
- Monitoring of membranes for filtration or reverse osmosis
- Wastewater control in outlet of WWTP
- Cooling plant monitoring
- Filter monitoring

DESCRIPTION

TRUBOMAT GAB measures the turbidity of liquid applying nephelometric method. For this purpose, a combined transmitted & scattered beams measurements are used, in which a transmitter and a receiver face each other and another transmitter is arranged orthogonally (at an angle of 90 °). The attenuated and scattered lights are recorded by the electronic module (in the connection head) and process the results to transmit a linear output signal. TRUBOMAT GAB delivers a 4-20 mA signal, according to the set measuring range.

TRUBOMAT GAB 20:

5 scales to select by DIP switches from 0.01 ... 1 up to 0.01 ... 20 FNU

TRUBOMAT GAB 1000:

5 scales to select by DIP switches from 0.1 ... 500 FNU up to 100 ... 1000 FAU

INSTALLATION

Installation only in vertical piping and rising flow.

Optimal condition: tranquilization distances of 600 mm before and 400 mm after, the TRUBOMAT.

TECHNICAL FEATURES

Power supply	24 V DC nominal (10 ... 30 V DC)
Consumption	0.5 ... 1 W
Output signal	4-20 mA
Ambient temperature	+5 ... +45 °C
Liquid temperature	+5 ... +100 °C
Pressure limit	10 bar at 60 °C

Materials:

Measuring cell	AISI 316 L (1.4404)
Connection heads	PBT housing, glass fiber reinforced; IP65 according to EN 60529
Seals	EPDM (others on request)
Optical windows	Borosilicate glass with Cleanosil nanocoating

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In-line turbidity system
TRUBOMAT GAB

10-06-2020

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TUR

446-01 /1

TECHNICAL FEATURES (continued)

Measuring ranges

TRUBOMAT GAB 20					
ND 25 to ND 100	0.01 ... 1 FNU	0.01 ... 2 FNU	0.01 ... 5 FNU	0.01 ... 10 FNU	0.01 ... 20 FNU
TRUBOMAT GAB 1000					
ND 20 to ND 65	0.1 ... 50 FNU	0.1 ... 100 FNU	0.1 ... 200 FNU	0.1 ... 500 FNU	100 ... 1000 FAU
ND 80 to ND 100	0.1 ... 50 FNU	0.1 ... 100 FNU	0.1 ... 200 FNU	0.1 ... 300 FNU	100 ... 1000 FAU

Accuracy	±5 % of reading, ±1 % of full scale in use
Resolution	From 0.001 to 0.2 FNU according the scale in use
Color / contamination compensation	Only for TRUBOMAT GAB 20 up to ND 65
Set up	Through DIP switches (6)
Displayed information	Operating: Green LED; Fault: Red LED
Process connections	Flanges DIN 2633 - ND 25 to ND 100 / PN 10 On request: Triclamp DIN 32676 (specific) from ND 25 to ND 100 others on request

EC Conformity: The instrument meets the legal requirements of the current European Directives

CODE NUMBERS AND REFERENCES

Standard models with flanges DIN 2633:

ND	Measuring range: 0.01 ... 20 FNU			Measuring range: 0.1 ... 500 FNU - 100 ... 1000 FAU	
	Code	Reference		Code	Reference
25	446 223	GAB FF 20 3		446 123	GAB FF 1000 3
32	446 224	GAB FF 20 4		446 124	GAB FF 1000 4
40	446 225	GAB FF 20 5		446 125	GAB FF 1000 5
50	446 226	GAB FF 20 6		446 126	GAB FF 1000 6
65	446 227	GAB FF 20 7		446 127	GAB FF 1000 7
80	446 228	GAB FF 20 8		446 128	GAB FF 1000 8
100	446 229	GAB FF 20 9		446 129	GAB FF 1000 9

Other versions: on request.

Code	Reference	Description
444 910	TURBICLICK 5.7	Torque wrench for optical windows assembly
444 911	O-ring seals for TRUBOMAT GAB	Set of 10 o-ring seals for TRUBOMAT GAB
444 902	Optical windows for TRUBOMAT GAB	Set of optical windows for TRUBOMAT GAB
444 920	Test equipment for GAB 20	Control kit, dry rod, for TRUBOMAT GAB 20
444 921	Test equipment for GAB 1000	Control kit, dry rod, for TRUBOMAT GAB 1000



Torque wrench
TURBICLICK 5.7 for optical
windows assembly (option)

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In-line turbidity system
TRUBOMAT GAB

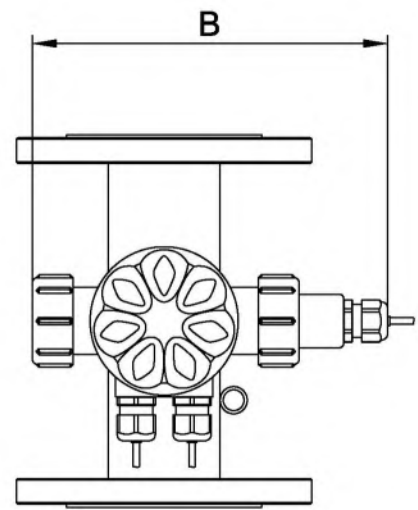
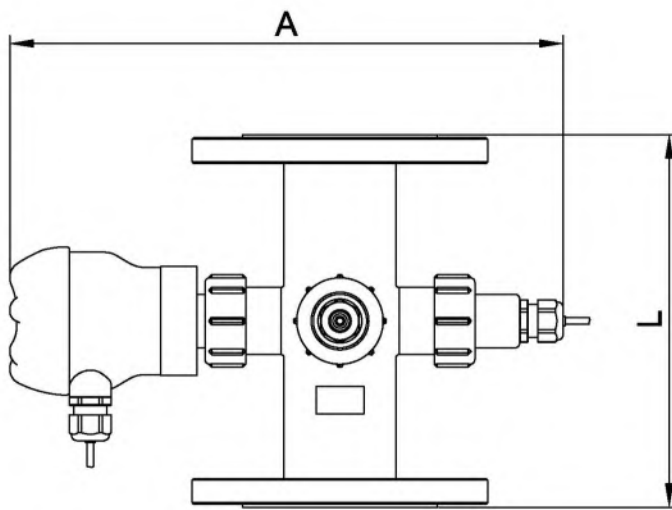
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DIMENSIONS



ND	A ± 1 mm	B ± 1 mm	L ± 1 mm Flanged fittings	L ± 1 mm Triclamp fittings	Measuring cell Inner Ø
25	346	222	274	287	65
32			252	265	
40			230	243	
50			190	199	
65			233	255	
80	384	260	208	224	100
100			240	256	

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