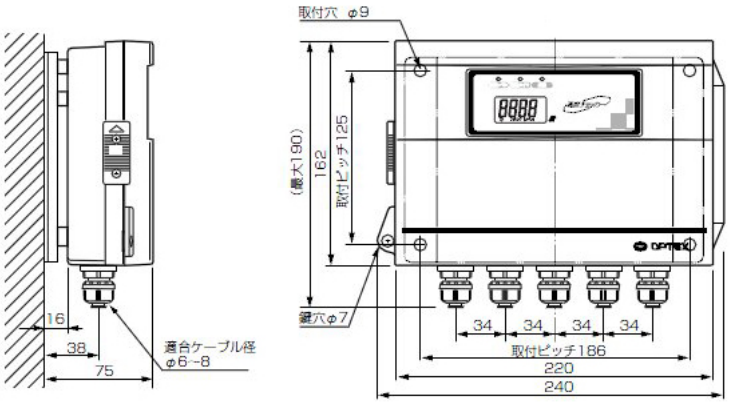
Turbidity Transmitter TC-100, TC-500, TC 3000, SC-T3(변환기)



Description

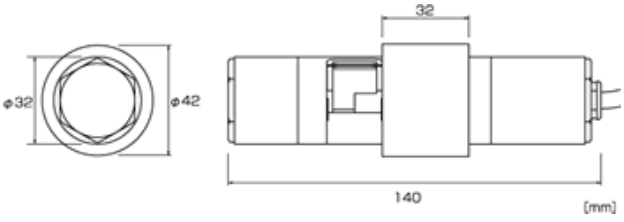
탁도 간단 MONITERING 실현
COMPACT SIZE 디자인 실현,
SENSOR 만으로 연속측정이 가능
아나로그 출력 내장, 용도에 맞게 다양한 기기에 Data를 보냅니다.

와이퍼 세정기능 장착으로 유지 보수 최소화
재질 SUS316L.광학창은 사파이어유리 채용
해수 전용센서 채택시 해수 모니터링 가능
(해수: 아연필터, 및 Sampling 챔버 필수)

특 징

Data를 받는 기기를 자유롭게 선택하여 탁도를 감시 하는 SYSTEM을 구성할수 있습니다.
표시 기능
산업용 Indicator에 센서를 연결하여 측정값을 표시할 수 있읍니다.
통보 기능
무선통보 장치와 결합하여 탁도가 설정 된 값을 넘으면 경보를 발신하는 것이 가능합니다.

Sensor Dimension



Specification(Sensor)

형식	TC-100	TC-500	TC-3000
측정범위	0-100 FTU	0-500 FTU	0-3000 FTU
전 원	DC 12V ± 10 or SC-T3		
소비전류	평상시:30mA이하,세정시120mA이하		
출 력	아나로그(4-20mA)신호출력 측정 범위 내 임의 설정가능 자기진단출력: 오픈 컨넥터		
입 력	교정 신호입력		
세정장치	와이핑세정 30분1회, 10분1회(500,3000)		
사용온도범위	0~40℃		
주요재질	SUS 316L,사이이어유리,EPDM		
크 기	¢32 x 140mm		
보호구조	IP 68 (수심최대 5m 이내)		
검출기길이	10 M (연장가능)		
표 시	SC-T3, or Indicator(산업용)		

Transmitter

형식	SC-T3
전원	AC100-240V(Free Voltage)
표시분해능	TC-100:0.1,TC-500:1,TC-3000:5
출력	교정출력,신호출력,자기진단출력,경보출력
세정장치	와이핑 세정(세정시간 임의설정 가능)
사용온도	-20 ~50도
크기,IP등급	162(h) x 240(w) x 75(d) , IP65

OPTEX

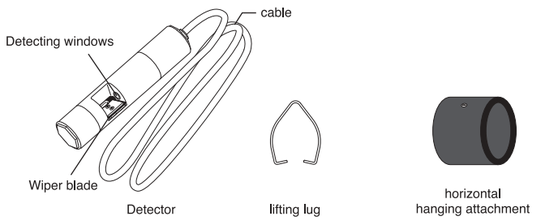
Turbidity Checker

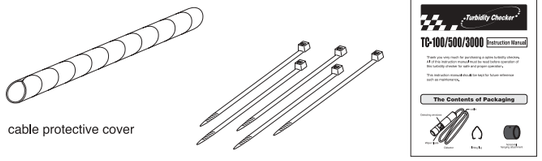
TC-100/500/3000 Instruction Manual

Thank you very much for purchasing a optex turbidity checker.
All of this instruction manual must be read before operation of this turbidity checker for safe and proper operation.

This instruction manual should be kept for future reference such as maintenance.

The Contents of Packaging





In the unlikely event of missing components or defectives, please contact your dealer.

1 For safe use

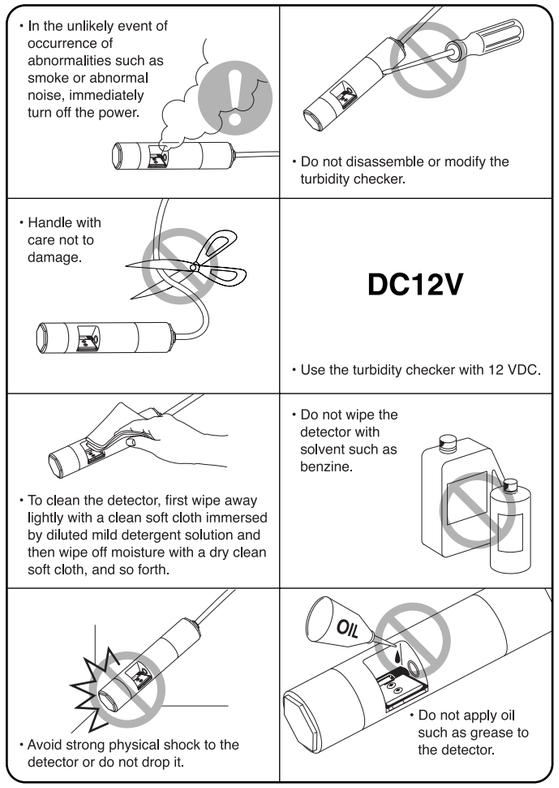
Be sure to read this instruction manual in order to use the turbidity checker properly.

- Please read the “For safe use” thoroughly before using the turbidity checker properly.
- Because these precautions are related to failure or malfunction, observe the precautions for use without fail.

⚠ Do not use the turbidity checker except for measurement of water quality.

In order to use the turbidity checker properly, observe the following precautions:

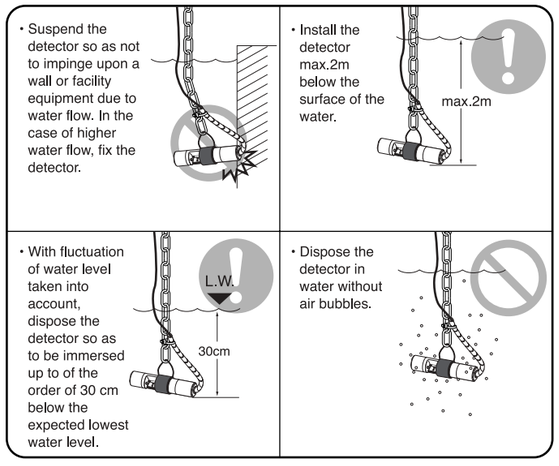
“ ⃠ ” denotes “Prohibited action”, and “ ❗ ” denotes “Required action ” .



2 Installation

⚠ Make sure the cable is separated from the power supply before opening the unit.

“ ⃠ ” denotes “Prohibited action”, and “ ❗ ” denotes “Required action ” .



CAUTION:

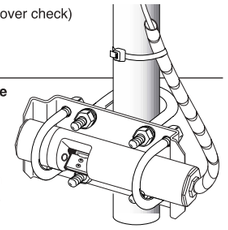
For users who use the turbidity checker under the following operating requirements (one example), it is recommended to dispose it sideways with a horizontal hanging attachment. If the following requirements are not met and stability of signal cannot be ensured, it is recommended to make sure of stability of signal by disposing the turbidity checker sideways once in order to confirm whether or not it is due to property of water (concentration change).

Operating requirements (one example):

Water quality
1) Much suspended solids with higher settling property
2) High concentration water
3) Slow water flow (accumulated water)

Disposed place
1) Settling tank (for interfacial check or carry-over check)
2) Batch processing bath
3) Bath susceptible to accumulation

When using a turbidity checker at a place at high water flow (for reference):
An optional mounting attachment (TA-1) is prepared for users who use the turbidity checker at a place at high water flow. This attachment serves to prevent a detector from impinging upon a side wall or turning around. For details, contact your dealer or see our website (http://www.optex.co.jp/env/eng/index.html).

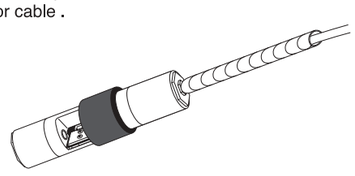


When horizontally hanging a turbidity checker

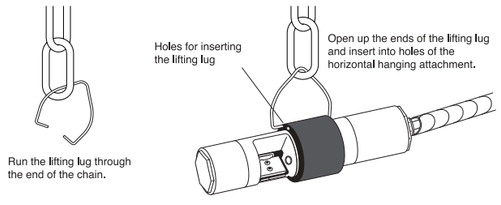
CAUTION:

- Read precautions described in an instruction manual thoroughly before using a turbidity checker.
- When hanging a turbidity checker sideways, attach a cable protective cover without fail. Otherwise, there is a possibility that a cable is scratched during maintenance operation and water intrudes.
- Do not hang a detector with a detector cable.
- Do not cover over measuring surface by a horizontal hanging attachment.

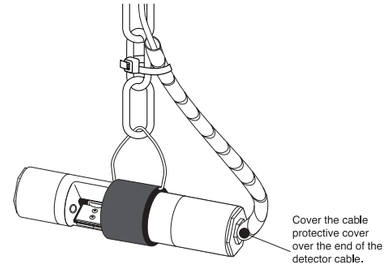
1 Wrap a cable protective cover on the detector side of the detector cable .



2 Hang the detector by a chain wire and so forth with an attached lifting lug
(A chain wire and so forth should be supplied by a user).



3 Fasten the end of the cable protective cover on to the chain wire and so forth with a cable tying band.



CAUTION:

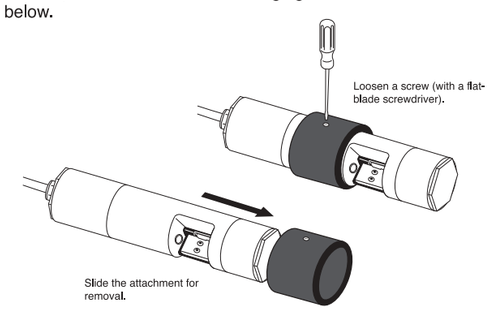
- An opening having the detecting window faces immediately lateral when hanging the detector.
- If the detector inclines at the time of hanging, make horizontal adjustments by changing a point where the cable is fastened on the chain wire and so forth.

When vertically hanging the turbidity checker

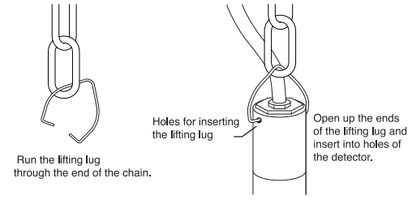
CAUTION:

When vertically hanging the detector, There are the cases where stability of signal cannot be ensured depending on the property of water. In these cases, use the detector according to the horizontal hanging method.

1 When using the detector according to the vertical hanging method, remove the horizontal hanging attachment as shown below.

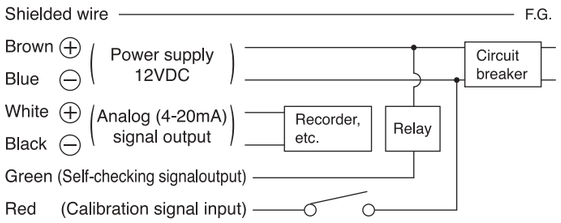


2 Do not hang the detector by the detector cable. Hang the detector by a chain wire and so forth with an attached lifting lug (A chain wire and so forth should be supplied by a user).

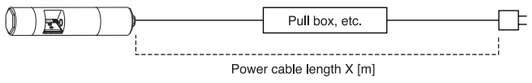


3 Wiring

⚠ During wiring operations, disconnect the power cable from the power supply and wire the power cable at the last.



- Use a circuit breaker with rated current of 1A or more for power supply.
- When extending a detector cable, use a shielded cable (CVV-S) with a pull box, etc.
- For power cable length, refer to the Table below.



Nominal sectional area	Max. cable length X [m]
0.2[mm²]	10[m]
0.3[mm²]	20[m]
0.5[mm²]	40[m]
0.75[mm²]	50[m]

- For connection to the analog (4-20mA) signal output terminal, load resistance should be 300Ω or less (including wiring resistance).
- After operating the washing device, the analog (4-20mA) output is held for a certain period. Since this period differs depending on the type of turbidity checker, confirm it in the Table below.
  In reference to washing immediately after power-on, however, the analog (4-20mA) output is not held.

Type	Hold time (sec.)
TC-100	1
TC-500	60
TC-3000	60

- Output of self-detection output terminal is transistor output (open collector).
  When connecting to external equipment and so forth, connect between +12VDC and self-checking output by referring to the following items as occasion demands.
  (When external equipment is not connected, self-checking output terminal should be made open.)
  ◎Connect a resistor of 600Ω or more;
  ◎Connect a relay and so forth (Omron G6B series rated voltage 12VDC is recommended).
- Calibration signal input terminal should be pulled up to open or +12VDC during measurement.
- Adjust the analog (4-20mA) signal output receiving side as occasion demands.

CAUTION:

- The analog (4-20mA) signal output becomes of the order of 20mA for TC-100, 8mA for TC-500, and 4.5mA approx. for TC-3000 depending on the properties of equipment in the air, but this does not signify abnormalities.
- When two or more turbidity checkers are installed, use a power supply separately. Since +12VDC and +analog (4 to 20mA) signal output are not insulated, the analog (4 to 20mA) signal output will not be produced properly when two or more turbidity checkers are connected with one power supply.

Adjustment of analog (4 to 20mA) signal output

- There may be difference between measured water (forumajin, etc.) of known concentration and analog (4 to 20mA) signal output.
  In this case, make adjustments on the analog (4 to 20mA) signal output receiving side.

Output method of 4 or 20mA

4mA: Immerse in distilled water or ion-exchange water;
20mA: Cut off the detecting windows for 30 seconds or more.
* When the detecting window are continuously cut off for ten minutes or more, self-checking output will be produced. (TC-3000 has not this function.)

4 Calibration

CAUTION:

The turbidity checker is designed to be able to measure stably for a prolonged period of time. In order to maintain the reliability of measurement, however, calibration should be carried out at least once a year.

When calibration is carried out, exercise care for the following points. Failure to observe these precautions may not carry out calibration properly.

- Clean the turbidity checker before carrying out calibration.
- Use distilled water or ion-exchange water for calibration.

When distilled water or ion-exchange water is not available, use tap water while taking care for red water, and so forth.

- When air bubbles are produced on the detecting window, get rid of air bubbles before carrying out calibration.

1. Pull up the detector from water and clean the detector body and the detecting windows cleanly.
2. Immerse the detector in distilled water or ion-exchange water.
3. After accustoming the detector to water temperature for five minutes or so, make sure that air bubbles are not produced on the detecting windows and connect the calibration signal input terminal to -12 VDC for two seconds or more.
4. After two seconds or more is elapsed, disconnect the calibration signal input terminal from the -12 VDC. Calibration signal input terminal should be pulled up to open or +12VDC during measurement.
5. Immerse the detector in the measured water (forumajin, etc.) of known concentration and make sure of analog (4-20mA) signal output.
6. Adjust the analog (4-20mA) signal output receiving side as occasion demands.

5 Maintenance

CAUTION:

- To clean the detector, first wipe away lightly with a clean soft cloth, and so forth immersed by diluted mild detergent solution and then wipe off moisture with a dry clean soft cloth, and so forth.
- Do not wipe the detector with organic solvent such as benzine.
- Do not put oil such as grease on a wiper blade.

Maintenance (rough standard: once a month)

- Clean and wash the detecting windows and the wiper blade with tap water.
- Check whether or not the detecting windows are scratched or deteriorated.
- Check whether or not the wiper blade is worn or deformed.
- Make sure that the wiper blade is fixed securely.
- Check whether or not the detector cable is scratched or deteriorated.
- Check the lifting lug for corrosion.
- Immerse the detector in the measured water (forumajin, etc.) of known concentration and make sure of analog (4-20mA) signal output.

Replacement of consumables

- Replace the wiper blade once a year as rough standard. Besides, replace it when adequate wiping effect cannot be produced.
- Replace the lifting lug once a year as rough standard. Besides, replace it when it is corroded significantly.
- In reference to the wiper blade and lifting lug, purchase a maintenance kit (TC-MK).

Storage for a long time

- When the turbidity checker is not used over a prolonged period, keep it as follows:
  Disconnect the power supply from the power source;
  Pull up the detector from water and clean it.
  Keep the detector at a place not being exposed to direct sunshine.

6 Troubleshooting

If self-detection output is produced, check the detector according to the following procedure.

1. Check if the detector is wired properly?
   →If there is any improper wiring, carry out wiring properly once again.
2. Check if the detector cable is disconnected or scratched or deteriorated?
   →If the detector cable is scratched or deteriorated, disconnect the power supply from the power source and contact your dealer.
3. Check if 12 VDC is supplied to the power supply?
4. Check whether or not the detecting windows are soiled?
   →If the detecting windows are soiled, clean it.
5. Check whether or not the measured water is abnormally turbid?
   →If the measured water is abnormally turbid, self-checking output will be produced.

   * The TC-3000 will not produce self-diagnostic output even in the case of abnormal turbid water.

If self-checking output is produced even when there is not any aforementioned abnormality, the detector may be considered to be out of order. Accordingly, contact your dealer.

7 Specifications

Model No.	TC-100	TC-500	TC-3000
Measuring range	0-100 (FTU)	0-500 (FTU)	0-3000 (FTU)
Power supply	DC 12V±10%		
Current draw	At regular operation: 30mA (Max.), At cleaning operation: 240mA (Max.) (excluding analog signal output)		
Output	Analog (4-20mA) signal output: resistance load of 300Ω(Max.) 4mA: 0 FTU 20mA: 100 FTU (TC-100), 500 FTU (TC-500), 3000 FTU (TC-3000) Self-checking output: open collector (12VDC 20mA Max.)		
Input	calibration signal input		
Cleaning system	Both sided swing wiper cleaning system		
Time interval for cleaning	Clean once immediately after power-on, and subsequently clean once every 30 minutes	Clean once immediately after power-on, and subsequently clean once every 10 minutes	
Operationg Temperature	0~40ºC (unfrozen)		
Major Material	SUS 316L, sapphire glass, fluorocarbon rubber, EPDM, POM		
Dimensions	ø32x163mm (excluding horizontal hanging attachment)		
Weight	approx. 930g		
Degree of Protection	IP 68, maximam depth of 2 meters (underwater type)		
Detector cable length	10m		
Option	Display (TC-100H), Transmitter (SC-T3), Mounting attachment (TA-1), Maintenance kit (TC-MK)		

Note: Specifications and design are subject to change without prior notice.

8 Dimensions