ANALITE

The ANALITE 180, 190 and 195 Turbidity Probe

Introduction

Thank you for purchasing an ANALITE turbidity probe. It will give you years of service if you maintain it according to guidelines set out in these instructions.

The ANALITE 180 probe uses optical retro-scatter technology to measure very high turbidity levels up to 30,000NTU. The standard range is 10,000NTU, but other optional ranges are available.

The ANALITE 190 series turbidity probes are designed for monitoring and process applications where turbidity levels of up to 1,000NTU may be encountered. Standard ranges are 100NTU and 400NTU, but other optional ranges are available. Specifically the ANALITE 180 and 190 probes are designed for applications that will not allow bio-fouling to build up such as short monitoring deployment or placement in fast and cold running water. The ANALITE 195 however, with its integral wiper assembly, is designed where bio-fouling or sedimentation buildup is likely. The ANALITE 180, 190 and 195 probes may be submerged to a depth rating of 30 meters (approx. 100 feet). This pressure rating applies to static (non-flowing) water.

The ANALITE 190 and 195 probes uses 90° optics and employs infrared light in accordance with ISO7027. All probes use a unique modulation technique that ensures almost total rejection of ambient light conditions.

Applications

The applications that the ANALITE 180, 190 and 195 are so extensive and too numerous to elaborate on in this document but generally they include:

1) Monitoring of streams and rivers.

2) Monitoring of water storage bodies including stratification studies.

3) Intermediate and final effluent treatment monitoring.

4) Hydrological run off studies.

5) Ground and bore water analysis.

6) Drinking water filtration efficiency.

7) Industrial process monitoring.

8) Flocculation efficiency.

9) Sludge and dredge monitoring.

Which model is best used is dependent on the application, the measuring environment, the logging equipment and the monitoring period (deployment times) required.

The ANALITE turbidity probes are not suitable in situations where they may be abraded by large particles such as sand and under these circumstances the reading may become erratic due to the large particles passing the optic sensor. Measuring turbidity under these circumstances will require a stilling well to allow the sand particles to settle away from the optic sensor in the probe tip.

Specifications

Parameter	NEP190/1/30G	NEP190/4/30G	NEP195/1/30G	NEP195/4/30G	NEP180/30G
Measurement					
Technique	ISO7027 - 90°	ISO7027 - 90°	ISO7027 - 90°	ISO7027 - 90°	Retro-scatter
Range	400NTU max.	1000NTU max.	400NTU max.	1000NTU max.	30,000NTU
Output	100NTU = 1 volt 4V max.	400NTU = 1 volt 4V max.	100NTU = 1 volt 4V max.	400NTU = 1 volt 4V max.	10,000NTU = 1 volt. 4V max.
Linearity	1% (0 to 1 volt)	3% (0 to 1 volt)	1% (0 to 1volt)	3% (0 to 1 volt)	3% (0 to 1 volt)
Zero Offset @ 25°C	±1mV max.	±1mV max.	±1mV max.	±1mV max.	±3mV max.
Repeatability @ 25°C	±1%	±1%	±1%	±1%	±2%
Temperature Coefficient (0 to 40°C)	< -0.3%/°C	< -0.3%/°C	< -0.3%/°C	< -0.3%/°C	< -0.3%/°C
Calibration using APS AEPA solutions	3 point 0, 10, 100NTU	3 point 0, 10, 100NTU	3 point 0, 100, 400NTU	3 point 0, 100, 400NTU	2 point 0 & 10,000NTU
Physical					
Probe Diameter	32mm	32mm	32mm	32mm	32 (44)mm
Probe Length	181mm	181mm	188mm	188mm	171 (211.6)mm
Overall Length (Tip to strain relief)	238mm	238mm	245mm	245mm	224(263)mm ()=cone fitted.
Weight (probe only)	120gms	120gms	190gms	190gms	400gms
Cable	6 core + shield 6mm dia. PUR	6 core + shield 6mm dia. PUR	6 core + shield 6mm dia. PUR	6 core + shield 6mm dia. PUR	6 core + shield 6mm dia. PUR
Cable Length	Specify at time of order. 100m max.				
Environmental					
Static Depth Rating	30m	30m	30m	30m	30m
Operating Temperature	-10°C to +40°C	-10°C to +40°C	-10°C to +40°C	-10°C to +40°C	-10°C to +40°C
Storage Temperature	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C
Wiper					
Wiper Arrangement	N/A	N/A	Disposable - Foam Pad on PVC or Acetal arm. Field replaceable. Mounted on central shaft, fixed by hex set screw.		N/A
Wiper Kit Part Number (4 in kit).	N/A	N/A	NEP19WIPE		N/A
Actuation	N/A	N/A	TTL/CMOS active low or contacting the wiper actuation conductor to 0V.		N/A
Actuation Pulse Duration	N/A	N/A	>50mSec		N/A
Actuation Pulse Current Sink	N/A	N/A	1mA max.		N/A
Wiping Time	N/A	N/A	8 second nom.		N/A
Power					
Operating Supply	10 - 16V dc	10 - 16V dc	10 - 16V dc	10 - 16V dc	10 - 16V dc
Probe Current Consumption	15mA max.	15mA max	15mA max.	15mA max.	15mA max
Power Settling Time	150mSec	150mSec	150mSec	150mSec	150mSec
Motor Current	N/A	N/A	25mA nom.	25mA nom.	N/A

Accessories			
NEP19SHRD	Protective Shroud - Stainless steel, OD 38.2mm, length 203mm		N/A
NEP19WIPE	N/A	Wiper Kit comprising 4 replacement wipers for the ANALITE 195 only	N/A
NEP19CBL	Shielded multicore cable for the NEP180, 190 and 195 probes. Length to be determined at time of probe order. Cable is glanded into the probe and so not easily replaced. Field replacement of cable is not possible.		

Installation

There are two aspects to consider when preparing to install the ANALITE 180, 190 or 195 in the field.

1) Installation of the probe proper into the environment where measurements are to take place.

2) Connection of the probe into the data collection and control system.

Probe Installation

The probe is normally installed with the optics pointing downwards or in a horizontal alignment. In a simple application the probe is simply immersed into the water to the desired depth, but within the depth rating of the probe. Please note the depth rating is based on static water. Allowances must be made for the effect of flowing water to ensure the static depth rating is not exceeded.

Do not cut or damage the outer sheath of the cable. Water may enter the probe through holes or cuts in the cable sheath.

It is important that the optic end of the probe is kept clear of obstruction such as the river bed. The minimum distance between the optic head and any object should be 25mm (1”) but can be as little as 5mm under controlled conditions.

Where damage may occur due to river rocks striking or rolling over the probe body, a stainless steel shroud should be used when using the NEP190 series. A shroud is available for the NEP190 and NEP195 as an accessory from your ANALITE distributor under the part number NEP19SHRD. Such a shroud not only protects the probe but also ensures a minimum distance between probe optics and any local obstructions.

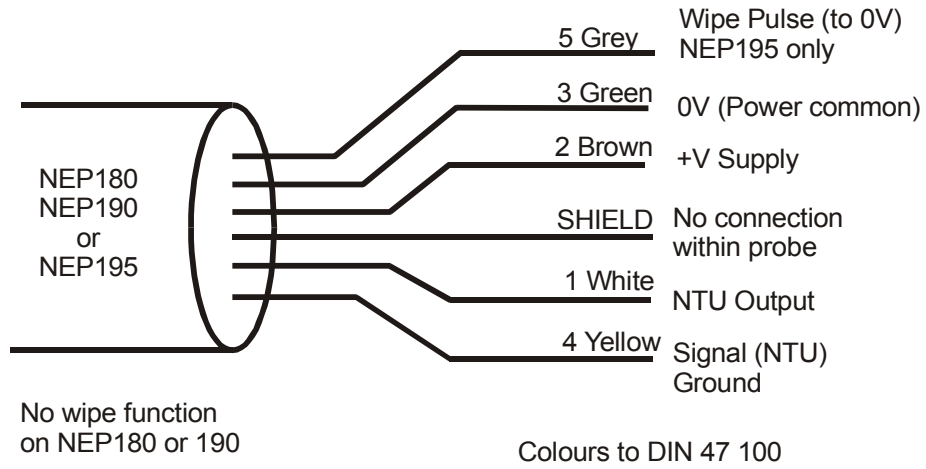
If the probe body is to be installed in a glanded fitting (for insertion into a pipe etc.) then care must be taken to ensure the sealing surface pressures offered by the gland fitting are not excessive so as to not cause distortion of the probe casing and force leakage. The NEP190 and NEP195 probes are thin wall instrument and so glanding pressure must be minimal and spread over the largest possible area. The NEP180 has a stainless steel casing and so better suited to glanded fittings where substantial pressures may exist.

The NEP180 has a depth of vision that requires an unobstructed view for at least 30mm beyond its optic face if the cone is not used. The NEP180 optic cone supplied should be used when ever possible as it establishes a stable measurement environment.

Probe Connection

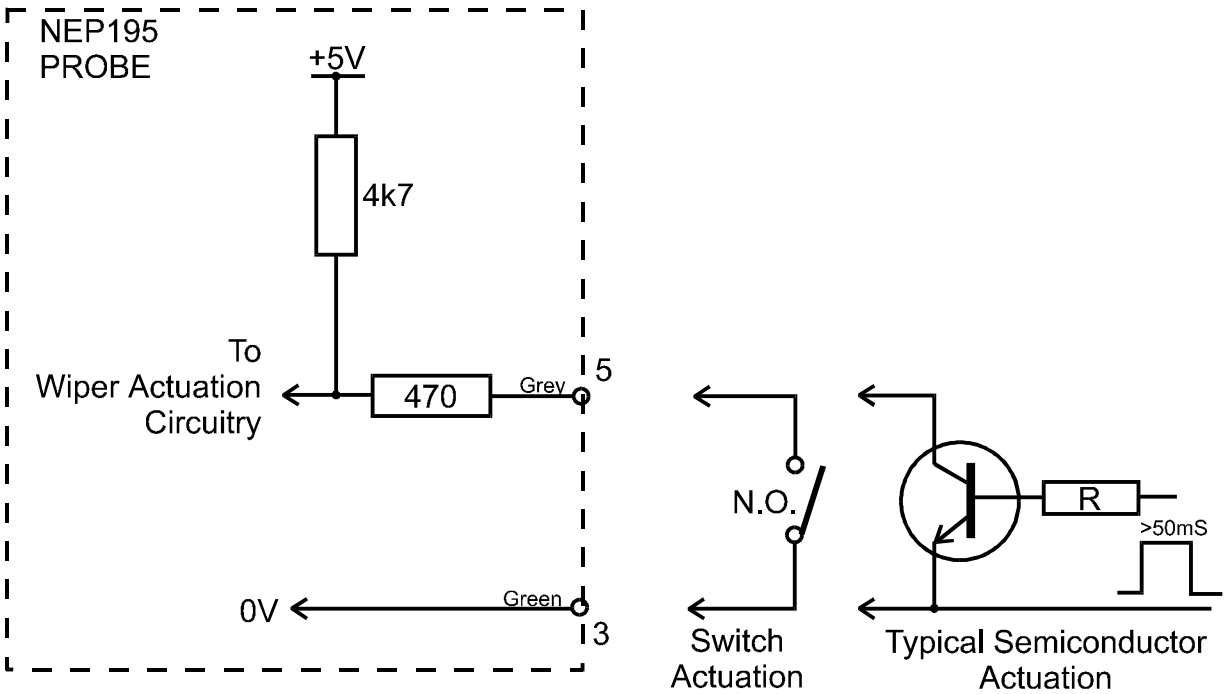
The probe is designed to operate with most data loggers and DAS systems available today. When using the ANALITE 195 models some form of wiper actuation control is also required.

Conductor assignment is as shown below:



The wiper on the ANALITE 195 probes can be actuated by momentarily connecting the Wipe Pulse wire (5) to the Power common wire (3) (>50msec). This can be done using a mechanical switch arrangement or open collector (drain) output available on most loggers. For multiple wipes each consecutive wipe must be actuated after the wiper has parked in its rest position (approx. 5 seconds after a wipe actuation). Wipe pulses applied during a wipe action will be ignored. Note that when the wiper passes over the optics the NTU output may rise to as much as 4 volts.

The recommended wiper activation interface arrangements are shown schematically below:



Wiper Replacement

The effectiveness of the wiper in maintaining a clean optical surface will eventually be compromised. the time being dependent on the water under investigation and the number of wiping cycles carried out. We recommend periodic inspection of the wiper pad to determine if the material is deteriorating or is impregnated with material from biofouling. In addition, as a precaution we recommend changing the wiper prior to each long term deployment. The wiper is a wear item and a spare is provided with each probe along with a hex key to loosen the wiper set screw. Wiper packs are available (Part Number NEP19WIPE) as a standard accessory.

To change the wiper, loosen the set screw in the wiper arm until the wiper assembly can be removed from the wiping shaft. Place a new wiper assembly on the shaft with the set screw aligned with the flat on the wiping shaft. Gently press the wiper arm down until the wiper arm hits the stop on the shaft. The wiper pad should now be compressed to roughly one half its original thickness. Tighten the set screw. It is important that the wiper arm body does not make contact with the probe face - only the pad should be in contact. A gap of 0.5mm between the wiper arm and the optic face is typical when a new pad has been properly installed.

CAUTION: Do not over tighten the set screw or manually attempt to rotate the wiper arm once set onto the shaft. Any attempt to manually rotate the wiper may cause gearbox damage and void the warranty.

Calibration Solutions

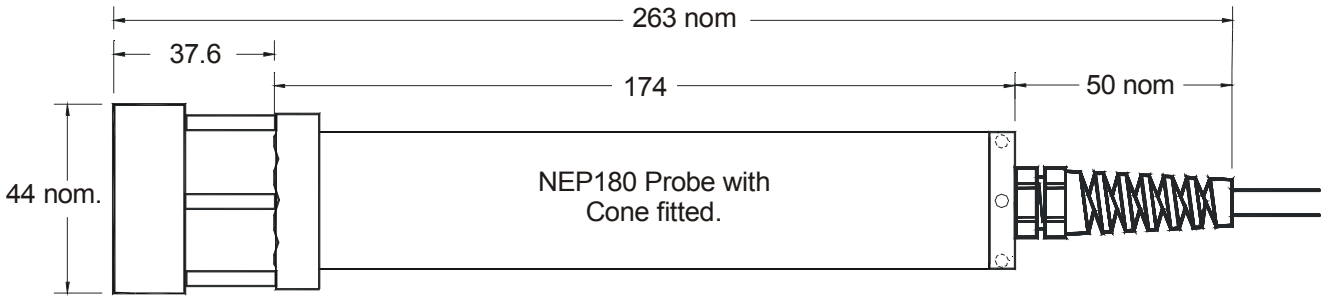
100 NTU, 400NTU and 1,000NTU neutral-density polymer-based turbidity standards are available from McVan Instruments and their distributors. We recommend the use of one of these standards and clear water for a 2-point calibration. If calibration at a lower turbidity value is desired, we recommend volumetric dilution of the standard suspension to attain the required turbidity value. For example, to prepare a 10 NTU standard, mix 25 ml of the 100 NTU standard with 225 ml of clear water (a 10:1 dilution of the original suspension).

Formazin-based turbidity standards can also be used to calibrate the system. These standards can either be prepared as described in Standard Methods for the Examination of Water and Wastewater or by volumetric dilution of 4,000 NTU Formazin standard that can be purchased from the Hach Company (USA).

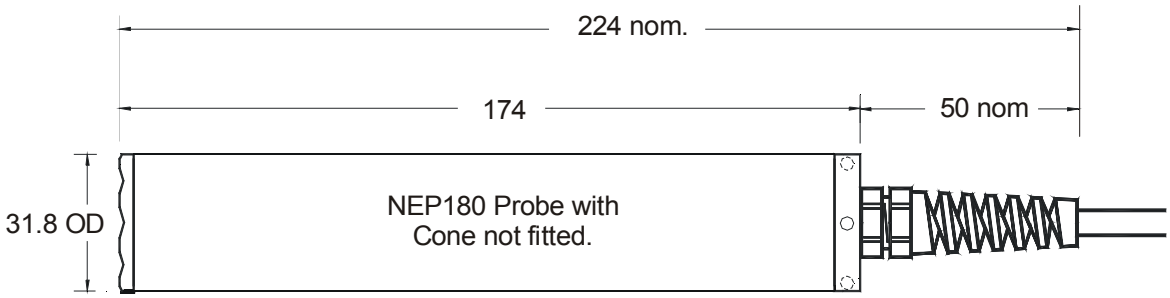
NOTE: Formazin contains material that can cause cancer. If you use this material for a calibrant, be certain to pay close attention to the warnings provided by the supplier.

Physical Dimensions

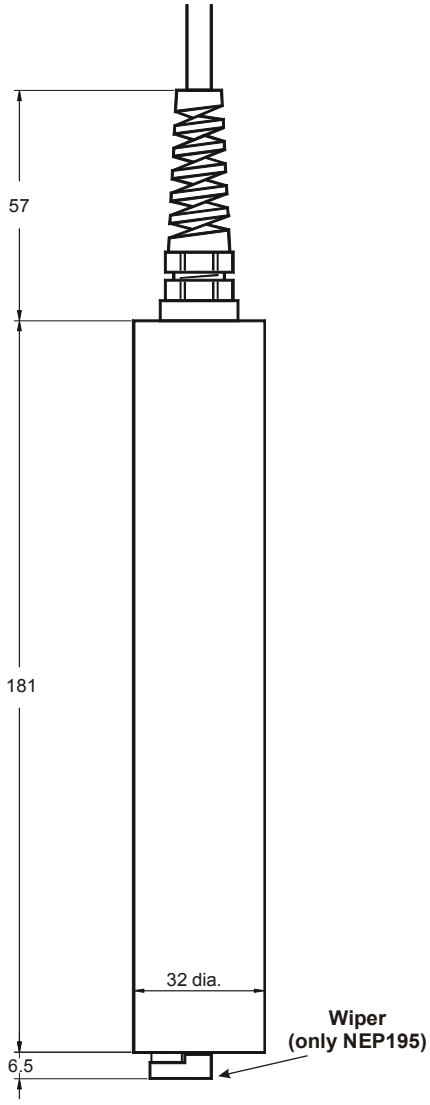
NEP180 Probe



CASING - 316 STAINLESS STEEL



NEP190/195 Probe



Warranty

The ANALITE 180, 190 and 195 turbidity probes are warranted against defects in material and workmanship for one year from date of purchase, exclusive of the wiper assembly. Unauthorized service, tampering or abuse will void this warranty. Damage as a result of improper installation will also void this warranty.

Should you require service (under warranty or otherwise) please contact the McVan Instrument distributor from whom you purchased the probe, or our Service Centre. If the probe is being returned for service under warranty please supply proof of purchase.

McVan Instrument's Service Centre
58 Geddes Street, Mulgrave
Vic. AUSTRALIA. 3170
Tel: (+61-3) 9582-7333, Fax: (+61-3) 9560-1164

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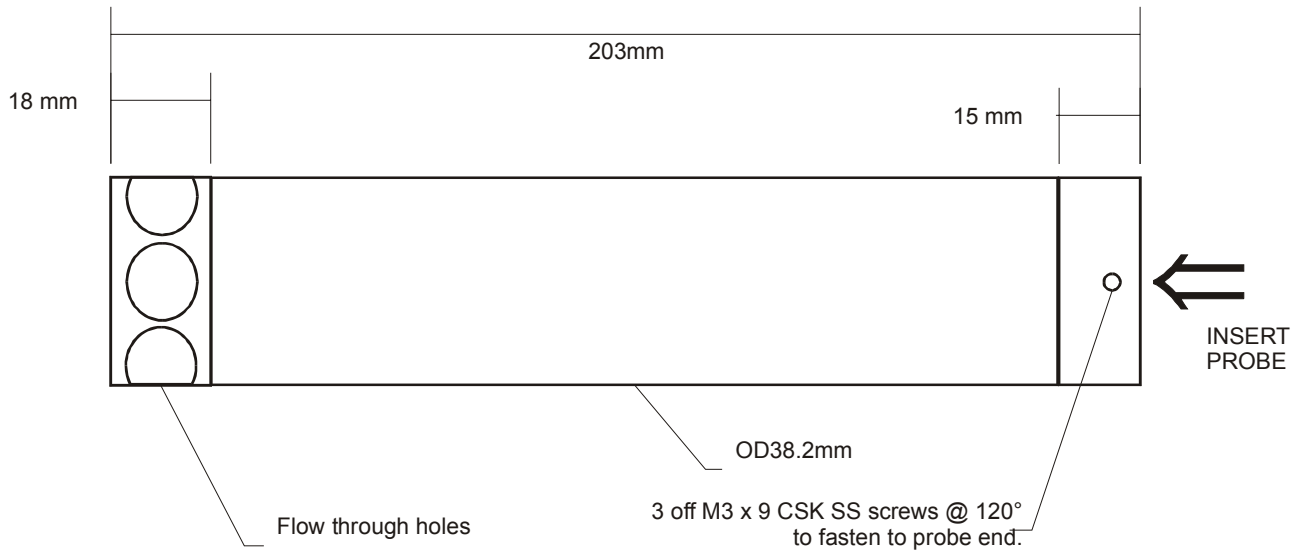
OPTIONAL ANALITE PROTECTIVE SHROUD - NEP19SHRD
for ANALITE NEP190 & 195 probes.



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FITTING

Insert the Analite turbidity probe into the shroud as shown.
Ensure end of probe is against internal stop at other end of shroud.
Rotate the probe in the shroud so as to give the
lowest possible (NTU) output when in clear water.
Fasten the M3 screws onto the probe end. (Do not over tighten).
Re-zero the instrument with the shroud fitted.

Material: 316 Stainless Steel

File: NEP SHROUD for NEP160 and NEP190.cdr