

# **Controllers / Instruments** Turbidity Controllers

Ordering Code	Description
EMEC TCS-100	Turbidity Control System, including: EMEC LDTORBM Turbidity Controller 0-100 NTU, ON/ OFF and proportional pulse output, isolated 4-20mA, plus EMEC ETORB2 Submersible turbidity probe with inte- grated motor driven wiper for self-cleaning, 10 metre lead fitted to probe
EMEC TCS-400	Above system but for 0-400 NTU with EMEC ETORB3 probe
EMEC TCS-1000	Above system but for 0-1000 NTU with EMEC ETORB4 probe



#### Description

A complete system for the monitoring and control of turbidity in water systems. The EMEC TCS systems consist of an IP65 controller in combination with a rugged turbidity probe incorporating an integral cleaning wiper assembly, useful for applications where bio-fouling or sedimentation build-up is likely. The system comes with a choice of turbidity probes, either 0-100 NTU, 0-400 NTU, or 0-1000 NTU. The probe cleaning output from the controller can be varied depending on the fouling potential of the system being monitored. The controller can be connected to an optional dosing pump to deliver the required amount of a coagulant / flocculant to control the turbidity of a system.



EMEC LDTORBM & ETORB3

### **Applications**

- Industrial process monitoring
- Waste water clarification processes e.g. DAF or floatation cells
- Monitoring of streams and rivers
- Intermediate and final effluent treatment monitoring
- Drinking water filtration efficiency
- Monitoring of water storage bodies

#### Features & Benefits

- Selectable range based on turbidity probe 0-100 NTU, 0-400 NTU, or 0-1000 NTU.
- The EMEC ETORB2, ETORB3 & ETORB4 probes, with their integral wiper assembly, are designed for operation where bio-fouling or sedimentation build-up is likely – provides excellent service in difficult environments.
- Robust probe design probes can be submerged to a depth of 50 metres.
- Easy to program and calibrate via superior user-friendly dot-matrix LCD interface

- Controller outputs can be used to control optional coagulant / flocculant dosing pump/s or can be used for high or low turbidity detection/ alarm.
- The isolated 4-20mA output can be used to either data log the recorded turbidity measurement, using an optional data logger, or for remote monitoring.
- Password protection prevents tampering with controller settings and/or calibration.
- Weatherproof can be mounted outside.

ver 3.0



Mounted on a vertical surface at eye level, and with the probe immersed in the water system, the turbidity controller performs its control and dosing functions to give complete peace-of-mind turbidity monitoring and/or control.

The LDTORBM turbidity controller has 2 ON/OFF outputs as well as 2 digital proportional outputs. The ON/OFF outputs can be independently programmed to activate when above or below a pre-determined setpoint. Each ON/OFF output supplies 240VAC power directly to an optional pump when it calls for dosing, or can alternatively be used to power a local visual or audible alarm.

Each proportional output has 2 programmable setpoints. One setpoint is the 0% NTU setpoint and the other is the 100% NTU setpoint. The 0% NTU setpoint is usually the desired NTU level. If dosing flocculant or coagulant, then at the 0% NTU setpoint and below, the pump will be OFF. At the 100% NTU setpoint and above, the pump will be ON

**Dimensional Drawings** 

and dosing at maximum speed. The pump will dose proportionally between the 0% and 100% NTU setpoints.

The controller features a potential free N/O and N/C relay contact as well as an isolated 4-20mA output for remote monitoring or data logging (with optional equipment).

The turbidity probe is fully submersible up to 50 metres. It is supplied standard with a 10 metre cable fitted to the probe and can simply be immersed in the water being monitored (other cable lengths can be supplied on request). With an integrated motor and wiper assembly, the interval between successive wipes and the restore time can be programmed in the controller in order to keep the probe's lenses free from bio-film and other sedimentation build-up. For each clean, the wiper performs one revolution. The turbidity probe uses a unique modulation technique that ensures almost total rejection of ambient light conditions, ensuring stable and reliable readings.



#### **Options & Accessories**

**EMEC LDTORBM Controller** 

Ordering Code	Description	
EMEC ETWK	Wiper kit for turbidity probes, includes 4 wipers & key	
Request Code	Metering pumps to dose coagulant or flocculant	



## **Specifications**

	EMEC TCS-100	EMEC TCS-400	EMEC TCS-1000		
<b>Controller Function</b>					
Controller Model		EMEC LDTORBM			
Variable Measured		Turbidity			
Range (Resolution)	0-100 NTU (±0.2 NTU)	0-400 NTU (±1 NTU)	0-1000 NTU (±3 NTU)		
Control Function	Dosing coagulant or flocculant				
Device Controlled	Switches 240VAC to power 1 or 2 optional dosing pumps, or pulsed output for 1 or 2 optional dosing pumps with pulse inputs				
Control Algorithm	ON/OFF or digital proportional				
Cleaning Function	Activation of wiper on ETORB probes with programmable restore time & time between successive cleans (the wiper performs 1 revolution every cleaning cycle)				
Re-transmission	Isolated 4-20mA				
Display	Dot matrix	x reverse backlit graphic LCD displays	s Turbidity		
Controller Alarms					
Activation	High or Low NTU with programmable delay				
Relay Contact	1 C/O (ie. fail-safe), 5A/250 VAC, resistive load, potential free				
Electrical					
Power Supply	90-240 VAC, 50/60Hz				
Control Outputs	ON/OFF relay outputs: switched 240VAC, Pulsed outputs: Proportional				
Relay Rating	5A/250VAC, resistive load (fuse protected)				
Physical					
Protection	IP65 (weatherproof) ABS enclosure				
Environment	0-50°C, 0-95% (non condensing) relative humidity				
Dimensions	225 (h) x 215 (w) x 110 (d) mm				
Packaged dimensions	310mm (l) x 260mm (w) x 190mm (h)				
Packaged weight	2 kg				

	EMEC ETORB2	EMEC ETORB3	EMEC ETORB4		
Probe Details					
Measurement Technique	90° modulated infra-red (ISO7027)				
Depth Rating	Submersible to 50m				
Range (Resolution)	0-100 NTU (±0.2 NTU)	0-400 NTU (±1 NTU)	0-1000 NTU (±3 NTU)		
Repeatability	±1% at 25°C	±1% at 25°C	±2% at 25°C		
Linearity	< 1%	< 1%	< 5%		
Temp Coefficient	< ±0.05% / °C				
Output	-2.5V to +2.5V, where 0V=50NTU	-2.5V to +2.5V, where 0V=200NTU	-2.5V to +2.5V, where 0V=500NTU		
Zero offset	±3mV (0 to 40°C)				
3 point Factory Calibration with APS AEPA polymer solutions	0, 20, 100 NTU	0, 100, 400 NTU	0, 400, 1000 NTU		
Construction	High grade Acetal casing with protruding castellations to protect plastic fibre-optic face (Stainless Steel 316 casing available on request)				
Cable Connection	10 metre (5 core + shield) probe PUR cable is glanded directly from the rear of the probe via an integrated plastic strain relief				
Temperature Rating	-20°C to +50°C (storage), -10°C to +40°C (operating)				
Probe Cleaning Wiper					
Wiper Arrangement	Post cured Silicon Wiper on PVC or Acetal arm. Field replaceable. Mounted on central shaft, fixed by hex grub screw.				
Spare Wiper Kit	Ordering code: EMEC ETWK (includes 4 wipers & key)				
Actuation	When powered up, or when called for by the program in the controller				
Wiping Time	The probe wiper performs 1 revolution every cleaning cycle, regardless of the cleaning time programmed in the controller. Probe output held to approx ONTU. (The controller's outputs are disabled during the clean and restore time)				