ON-LINE TURBIDIMETERS COMPARISON SPREADSHEET

	SWAN AMI Turbitrace*	SWAN AMI Turbitrack*	SWAN AMI Turbiwell*	HF Scientific Micro TOL*	ATI A15/79*	ABB 4670 / 4675	Yokogawa TB750G	Yokogawa TB450G	Rosemount T 1056 Clarity II	Rosemount T 1055 Clarity II
Method	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Method	High Precision Nephelometer (LED)	High Precision Nephelometer (LED)	Laser-Based Optical, Non-Contact	Nephelometer (White Light or LED)	Nephelometer (White Light or LED)	Absorption or Nephelometric	Nephelometric (White Light)	Tungsten Lamp Surface Scatter	Nephelometric White Light or LED	Nephelometric White Light or LED
Consumables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Consumables	Sub-Micron Filter used for Automatic Zeroing, Humidity Absorbing Cartridge	Humidity Absorbing Cartridge	None	Cuvet Bottles, Desiccant Pouches	None	Not Stated	Filter Element (if using zero water filter), Desiccant, Lamp Assembly?	Lamp (2 per year), Filters for Zero Water	Not Stated	Not Stated
Measuring Range	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Measuring Range	0.000-100.0 NTU	0.000-100.0 NTU	0.000-200.0 NTU	0-100 or 0-1000 NTU	0-4 NTU up to 0-4000 NTU	0.00-1.00 NTU up to 0-1000 NTU depending on sensor unit	0-0.2 NTU up to 0-100 NTU	0-0.1 to 0-100 NTU Low Range 0-10 to 0-2000 NTU High Range	0.001-200 NTU	0.001-200 NTU
Accuracy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accuracy	± 0.001 NTU or 1% of Reading	± 0.001 NTU or 1% of Reading	± 0.003 NTU or 1% of Reading	2% of reading or ±0.02 Below 40 NTU 5% of reading above 40 NTU	± 5% of reading or ± 0.02 NTU, whichever is greater, on 40/400 scale ± 10% of reading or ±2 NTU, whichever is greater, on 400/4000 scale	±2 % of reading (limited by uncertainty in Formazine standards) from 0-100 NTU ±5 % from 100-250 NTU up to ±10 % FSD with high range models	Not Stated	Not Stated	0-1 NTU: ±2% of reading or ±0.015 NTU, whichever is greater. 0 - 20 NTU: ±2% of reading	0-1 NTU: ±2% of reading or ±0.015 NTU, whichever is greater. 0 - 20 NTU: ±2% of reading
Sample Temperature	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Temperature	1 to 40°C	1 to 40°C	Up to 40°C	0 to 50°C	0 to 50°C	0 to 50°C	0 to 50°C	0 to 50°C	5 - 35°C	5 - 35°C
Calibration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calibration	Automatic or manual zero with built-in sub-micron filter, span calibration not required however it can be checked manually with test unit	Low & high level span verification with 2 test units	Factory calibrated with Formazine No field calibration - verification only	Manual with HF Scientific reuseable standards or with Formazine standards 2 or 3 point calibration depending on range	Manual zero and span	Manual with Formazine or dry secondary standards	Manual Zero and Span (Formazine) or grab sample Span verification check block	Automatic zero with zero water (2 hrs.) or with light source off Manual span with formazine (10+ litres) or with calibration disk	Manual zero and span with DI water and Formazine or commercial standard, or grab sample	Manual zero and span with DI water and Formazine or commercial standard, or grab sample, or lamp calibration
Sensor Cleaning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sensor Cleaning	Manually (auto-zero prolongs cleaning intervals)	Manually Automatic purging of optical chamber, tubing, and pressure valve	Not required on optics Manual cleaning of sample chamber, optional cleaning module available	Ultrasonic autoclean available for most ranges	Optional with LED version sensor only	Wiper system on some models	Optional ultrasonic transducer	Automatic (2 hr. cycle)	Manual	Manual
Response Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Response Time	Typically T90 < 15 seconds with sample set at 10 lph	Typically T90 < 15 seconds with sample set at 10 lph	T90 typically 3 minutes	Adjustable (5 to 500 seconds)	95% in 10 seconds	Varies with flow rate, typically 90 % step change in 2 minutes at 1 lpm or in 45 sec. with high range unit	Not Stated	Not Stated	90% of final value after a step change in 4.5 minutes	90% of final value after a step change in 4.5 minutes
Water Usage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Water Usage	5 to 20 lph	5 to 20 lph	20 to 60 lph	100 mlmin to 1 lpm	Not Stated	0.5 to 1.5 lpm	0.05 to 20 lpm	1.5 to 2 lpm	250 - 750 ml/min	250 - 750 ml/min
Flow Monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flow Monitoring	Integral paddlewheel flow sensor with monitoring	Integral paddlewheel flow sensor with monitoring	No	Flow alarm optional	None	Not Stated	Not Stated	None	None	None
Flow Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flow Control	Built-In manual flow control valve	Built-In manual flow control valve	Constant-head flow assembly	Built-In regulator and backpressure valve	None	By User	By User Optional head hanks	By user with numerous available parts from Yokogawa - see manual	By User	Optional rotameter
Sample Inlet Pressure	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Inlet Pressure	15 to 145 psi	15 to 145 psi	Not Stated	1 to 200 psi (built-in regulator set at 15 psi)	0 to 100 psig	Up to 43.5 psi	72.5 psi max.	14 to 72.5 psi	30 psig max.	30 psig max.
Analog Outputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Analog Outputs	2 x standard 0/4-20mA 1 x optional 0/4-20mA	2 x standard 0/4-20mA 1 x optional 0/4-20mA	2 x standard 0/4-20mA 1 x optional 0/4-20mA	4-20mA (supercedes RS-485)	1 x 4-20mA	1 x 0-10 mA, 0-20 mA or 4-20 mA Optional 2nd current output supercedes the RS485 output	1 x 4-20 mA, 1 x 0/4-20mA	1 x 4-20mA or 0-5VDC Output	2 x 0/4-20mA, optional superimposed HART on Output 1	1 or 2 x 0/4-20mA, depending on number of sensor inputs
Relay Outputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Relay Outputs	3 x Relays 1A/250 VAC	3 x Relays 1A/250 VAC	3 x Relays 1A/250 VAC	2 x HiLow 2A/240VAC	3 x Relays 5A/220 VAC	2 x Relays 3A/250 VAC/VDC	3 x Relays 2A/250VAC, 3A/30VDC 1 Digital Output	1 x 250VAC or 220VDC, 2A for range 3 x Contacts for alarms	4 x Relays	3 x Optional Relay Outputs
Inputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inputs	1 x Potential-free contact, for hold or remote off	1 x Potential-free contact, for hold or remote off	1 x Potential-free contact, for hold or remote off	None	None	None	2 Contacts	1 Digital input for range switching	None	None
Digital Communications	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digital Communications	Optional Profibus DP Interface Optional Modbus Interface Optional HyperTerminal Interface (RS232)	Optional Profibus DP Interface Optional Modbus Interface Optional HyperTerminal Interface (RS232)	Optional Profibus DP Interface Optional Modbus Interface Optional HyperTerminal Interface (RS232)	RS-485 (supercedes 4-20mA) for Modbus, HF Simplebus, HF Online Interface	None	Optional RS485 Modbus	Serial RS422 or RS232C	RS-232C	HART Optional	None
Control Function	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Function	Programmable P, PI, PID, or PD for 2 x relays or 2 x 0/4-20mA	Programmable P, PI, PID, or PD for 2 x relays or 2 x 0/4-20mA	Programmable P, PI, PID, or PD for 2 x relays or 2 x 0/4-20mA	None	On/Off	None	None	None	None	None
Power	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power	85-265 VAC, 47-63 Hz or 24 VDC (optional)	85-265 VAC, 47-63 Hz or 24 VDC (optional)	85-265 VAC, 47-63 Hz or 24 VDC (optional)	100-240 VAC, 47-63 Hz	110/220 VAC ±10%, 50/60 Hz	100-130 VAC, 200-260 VAC, 50/60 Hz	100-240 VAC -15%/+10%, 50/60 Hz	100/110/200/220 VAC, 50/60 Hz	20-30 VDC, 85-265 VAC, 47.5 to 65.0 Hz	85-265 VAC, 47.5-65.0 Hz
Display	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display	Multi-function backlit LCD	Multi-function backlit LCD	Multi-function backlit LCD	Multiline Backlit LCD	16 character alphanumeric backlit LCD	Backlit 2-line LCD with alarm LED's	Multi-function LCD	4-digit LED with LED indicators	Graphic backlit LCD	2-Line 16-character backlit LCD
Datalogging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Datalogging	Yes	Yes	Yes	None	None	None	None	None	None	None
Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Protection	IP66	IP66	IP66	NEMA 4X, IP66	NEMA 4X Wall-Mount or Panel-Mount	IP66 / NEMA 4X (front only on panel)	IP65	Not Stated	NEMA 4X / CSA 4 (IP65)	NEMA 4X / CSA 4 (IP65)
Mounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mounting	Wall (all components on panel)	Wall (all components on panel)	Wall (all components on panel)	Wall	Panel, Wall (optional)	Wall, Panel	Pipe, Panel, Rack, Wall	Pipe or Rack	Panel, Pipe, Rack	Panel, Pipe, Wall
Password Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Password Protection	Yes	Yes	Yes	Yes	Keypad Lock	Yes	Yes	Yes	Yes	Yes
Country of Origin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of Origin	Switzerland	Switzerland	Switzerland	U.S.A.	U.S.A	U.K.	Japan	Japan	U.S.A.	U.S.A.
Features	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Features	- Automatic zero function with sub-micron filter - Sample measured at line pressure to eliminate bubble interference - Error diagnostics - Electronic record of major process events and calibration data - Automatic purging of optical chamber in programmable intervals - Overvoltage protection - Non-volatile data storage - Case temperature monitoring - Built-In 5-way valve - Real-time clock with calendar	- Sample measured at line pressure to eliminate bubble interference - Error diagnostics - Electronic record of major process events and calibration data - Automatic purging of optical chamber in programmable intervals - Overvoltage protection - Non-volatile data storage - Case temperature monitoring - Real-time clock with calendar	- Non-contact turbidimeter - Overvoltage protection - Non-volatile data storage - Case temperature monitoring - All components pre-mounted on PVC panel for wall-mounting - Error diagnostics - Automatic purging of optical chamber in programmable intervals - Heated optics, windows, and sample compartment to avoid condensation - Laser beam automatically switches off when turbidimeter is opened - Real-time clock with calendar	- Dessicant alarm - Optional ultrasonic cleaning - Cuvette monitoring - Cuvette eliminates direct contact with optics - Bubble rejection system - Reusable Calibration Kit	- Sample can be measured at line pressure to eliminate bubble interference - Sensor monitoring - Optional sensor cleaning with IR version - Multiple sensor mounting options	- Bubble rejection function - 1m or 2m submersible version available - Autocleaning on some models	- Bubble trap system - Self-diagnostics - Non-volatile data storage	- Self-diagnostics - Automatic water jet cleaning - Signal smoothing of air bubbles - Automatic zero with zero water	- 1 or 2 Sensor Inputs - Debubbler - Self-diagnostics - Bubble-rejection	- 1 or 2 sensor inputs - CSA Class I Div. 2 Gropus A,B,C,D - Debubbler - Self-diagnostics - Bubble rejection
Options	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options	- 24 VDC power - Digital communications - RS-232 output	- 24 VDC power - Digital communications - RS-232 output	- 24 VDC power - Digital communications - RS-232 output - Sample degasser - Cleaning module - Verification kits	- Flow alarm - Flow controller - Remote panel meter - Software for data collection	- Submersion sensor for wastewater or raw water - 1.5" In-line tee assembly	- Dry secondary calibration standard - Dip System - De-Bubbler	- In-Line analysis - Two head tanks available (pressurized or simple) - Epoxy paint	- Head tank	- DC power supply - 2nd sensor Input	- Backplate mounted system - 2nd sensor input
Other Parameters Available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Parameters Available	Flow, Temperature, FTU	Flow, Temperature, FTU	ppm (Oil-in-Water), Flow, Temperature, FTU	None	mg/l or ppm (suspended solids)	FTU, mg/l (up to 0-2000 mg/l range) on some models	None	None	FTU, FNU, mg/l, ppm, or no units	FTU, FNU, mg/l, ppm, or no units
Restrictions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restrictions	Not Stated	Not Stated	Sample temperature max. 5°C over ambient temperature	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated
Website Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Website Information	http://www.swan.ch/products/potablewater/turb	http://www.swan.ch/products/potablewater/turb	http://www.swan.ch/products/potablewater/turb	http://www.hfscientific.com/micro_tol_specs.htm	http://analyticaltechnology.com/cms/Default.as	http://www.abb.com/product/seitp330/0a8791a	http://www.yokogawa.com/an/turbidity/an-B750	http://www.yokogawa.com/an/turbidity/an-B750	http://www.emersonprocess.com/rosemount/Rosu	http://www.emersonprocess.com/rosemount/Rosu
Photo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Photo										
Notes:	* WJF Instrumentation is a distributor for SWAN Analytical Instruments, HF Scientific, and Analytical Technology Inc. **Wallace & Tiernen (W&T) may also affiliated with Siemens and U.S. Filter. The specifications and information have been gathered from the public domain i.e. websites, product brochures, manuals, etc. "Not Stated" means no information could be found relating to that topic. The information in this comparison has been compiled by Sheldon Wrubleski of WJF Instrumentation Ltd. In no way does WJF Instrumentation Ltd. warrant this information to be 100% accurate. If in doubt, please contact the manufacturer of the equipment directly. If you wish to contact WJF Instrumentation, we can be reached at (403)291-5570 or at info@wjf.ca. You can find additional free product comparisons at www.wjf.ca/articles . Your feedback of this comparison is always appreciated. Ref. TUR090308-1.0										

	Rosemount T 1055 Clarity II	Rosemount T 1055 Clarity II	Hach 1720E with sc100	Hach 1720E with sc100	Hach FilterTrak 660 sc with sc100	Hach FilterTrak 660 sc with sc100	GLI (Hach) Accu4	GLI (Hach) Accu4	Sigrist AquaScat WTMHT	Sigrist AquaScat WTMHT
Method	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Method	Nephelometric White Light or LED	Nephelometric White Light or LED	Nephelometric with LED	Nephelometric with LED	Nephelometric with Laser	Nephelometric with Laser	Nephelometric with LED	Nephelometric with LED	90° LED in Free Falling Water	90° LED in Free Falling Water
Consumables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Consumables	Not Stated	Not Stated	Lamp Once per Year Recommended	Lamp Once per Year Recommended	Not Stated	Not Stated	None	None	Not Stated	Not Stated
Measuring Range	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Measuring Range	0.001-200 NTU	0.001-200 NTU	0-4.000 NTU up to 0-4000 NTU, manually selectable	0-4.000 NTU up to 0-4000 NTU, manually selectable	0.000-100.0 NTU	0.000-5000 mNTU	0.000-100.0 NTU	0.000-100.0 NTU	From 0.0-0.1 up to 0-4000 FNU	From 0.0-0.1 up to 0-4000 FNU
Accuracy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accuracy	0-1 NTU: ±2% of reading or ±0.015 NTU, whichever is greater. 0 - 20 NTU: ±2% of reading	0-1 NTU: ±2% of reading or ±0.015 NTU, whichever is greater. 0 - 20 NTU: ±2% of reading	±2% of reading or ±0.015 NTU (whichever is greater) from 0 to 40 NTU; ±5% of reading from 40 to 100 NTU	±2% of reading or ±0.015 NTU (whichever is greater) from 0 to 40 NTU; ±5% of reading from 40 to 100 NTU	± 5% of reading for 0/400 NTU ± 10% of reading for 400/4000 NTU	From 0 to 1000 mNTU: ±3% of reading or ±5 mNTU, whichever is greater From 1000 to 5000 mNTU: ±2% of reading	2% of reading	2% of reading	Not Stated	Not Stated
Sample Temperature	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Temperature	5 - 35°C	5 - 35°C	0 to 50°C	0 to 50°C	0 to 50°C	0 to 50°C	0-60°C	0-60°C	0 to 40°C	0 to 40°C
Calibration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calibration	Manual zero and span with DI water and Formazine or commercial standard, or grab sample	Manual zero and span with DI water and Formazine or commercial standard, or grab sample, or lamp calibration	Manual with Formazine	Manual with Formazine or Hach standards	Single point at 800 mNTU ± 50 mNTU, with Hach standard	Manual with Formazine or lab sample Periodic verification with Cal-Cube	Manual with Formazine or lab sample Periodic verification with Cal-Cube	Manual with Formazine or lab sample Periodic verification with Cal-Cube	Optional automatic with internal reference standard	Optional automatic with internal reference standard
Sensor Cleaning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sensor Cleaning	Manual	Manual	With submersible probe using air blast initiated by controller or manual	Manual	Manual	Manual	Manual	Manual	Not Stated	Not Stated
Response Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Response Time	90% of final value after a step change in 4.5 minutes	90% of final value after a step change in 4.5 minutes	10 seconds for 98% of input	Initial response in 1 minute 15 seconds for a full-scale step change	Not Stated	Not Stated	9.5 seconds at 1 GPM (residence time)	9.5 seconds at 1 GPM (residence time)	Not Stated	Not Stated
Water Usage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Water Usage	250 - 750 ml/min	250 - 750 ml/min	0.2 to 25 lpm (if using flow cell)	200 to 750 ml/min	100 to 750 mL/min	100 to 750 mL/min	0.19 to 26.5 lpm	0.19 to 26.5 lpm	2.5 to 7 lpm	2.5 to 7 lpm
Flow Monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flow Monitoring	None	None	None	None	None	None	None	None	None	None
Flow Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flow Control	By User	By User	Yes, on flow cell	By User	By User	By User	By User	By User	By User	By User
Sample Inlet Pressure	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Inlet Pressure	30 psig max.	30 psig max.	87 psi max. at 20°C	Not Stated	Not Stated	Not Stated	0-50 psig at 20°C 0-150 psig at 20°C (high pressure design)	0-50 psig at 20°C 0-150 psig at 20°C (high pressure design)	Pressureless	Pressureless
Analog Outputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Analog Outputs	1 x 4-20mA standard, 1 optional, also available with none	1 x 4-20mA standard, 1 optional, also available with none	1 x 0/4-20mA	2 x 0/4-20mA	2 x 0/4-20mA	2 x 0/4-20mA	2 x 0/4-20mA	2 x 0/4-20mA	2 x 0/4-20mA	2 x 0/4-20mA (one for each measuring angle)
Relay Outputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Relay Outputs	2 x SA 220V	2 x SA 220V	3 x Relays 5A/230 VAC	3 x Relays 5A/230 VAC	3 x Relays 5A/230 VAC	3 x Relays 5A/230 VAC	4 x Relays 5A 115/230VAC, 5A @ 30VDC resistive	4 x Relays 5A 115/230VAC, 5A @ 30VDC resistive	2 x Relays 250VAC, 4 A	2 x Relays 250VAC, 4 A
Inputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inputs	None	None	None	None	None	None	None	None	None	None
Digital Communications	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digital Communications	Optional RS232 Output	None	Optional Modbus RS232 or RS485 Optional LonWorks Wireless IR Port	Optional Modbus RS232 or RS485 Optional LonWorks Wireless IR Port	Optional Modbus RS232 or RS485 Optional LonWorks Wireless IR Port	Optional Modbus RS232 or RS485 Optional LonWorks Wireless IR Port	HART Protocol RS-232 Interface	HART Protocol RS-232 Interface	Optional Profibus DP	Optional Profibus DP
Control Function	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Function	Not Stated	Not Stated	None	None	None	None	With relays: high/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay	With relays: high/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay	None	None
Power	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power	110/220 VAC +/-10% 50/60 Hz	110/220 VAC +/-10% 50/60 Hz	100-230 VAC, 50/60 Hz	100-230 VAC, 50/60 Hz	100-230 VAC, 50/60 Hz	100-230 VAC, 50/60 Hz	90-130 VAC or 180-260 VAC, 50/60 Hz	90-130 VAC or 180-260 VAC, 50/60 Hz	85-264 VAC 47-63 Hz, or 24 VDC	85-264 VAC 47-63 Hz, or 24 VDC
Display	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display	Single line alphanumeric backlit	Graphical LCD	Graphical LCD	Graphical LCD	Graphical LCD	Graphical LCD	Graphical backlit LCD	Graphical backlit LCD	Plain-text LCD	Plain-text LCD
Datalogging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Datalogging	None	None	None	None	None	None	None	None	None	None
Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Protection	Not Stated	NEMA 4X / IP66	NEMA 4X / IP66	NEMA 4X / IP66	NEMA 4X	NEMA 4X	IP54	IP54	IP65	IP65
Mounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mounting	Pipe	Panel, Wall	Wall, Floor Stand (optional)	Wall, Floor Stand (optional)	Wall, Floor Stand (optional)	Wall, Floor Stand (optional)	Panel, Wall, Pipe	Panel, Wall, Pipe	Wall	Wall for Controller, In-Pipe (1" to 6") for Sensor
Password Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Password Protection	Not Stated	Yes	Not Stated	Not Stated	Not Stated	Not Stated	Yes	Yes	Not Stated	Not Stated
Country of Origin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of Origin	Australia?	U.S.A.	U.S.A.	U.S.A.	U.S.A.	U.S.A.	U.S.A.	U.S.A.	Switzerland	Switzerland
Features	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Features	- Optional submersible probe - Autoclean relay for air pressure blast - Flow control to avoid air bubbles - Dirty lens monitoring	- Bubble rejection system - Controller accepts up to 2 turbidity sensors - Electronic record of major process events and calibration data - Compatible with Hach networks - Error diagnostics	- Bubble rejection system - Controller accepts up to 2 turbidity sensors - Electronic record of major process events and calibration data - Compatible with Hach networks - Error diagnostics - Logs 12 calibrations and verifications	- Bubble trap - System diagnostics - User settings stored in EEPROM	- Bubble trap - System diagnostics - User settings stored in EEPROM	- Non-contact sensor	- Non-contact sensor	- CIP/SIP-compatible - Manual or automatic sensor-check function	- CIP/SIP-compatible - Manual or automatic sensor-check function
Options	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options	- Flow, inline, submersible sensors	- LonWorks card - Add-on sensor - sc1000 controller	- LonWorks card - Add-on sensor - sc1000 controller	- HART Interface - Software for data collection from multiple units - Low and high pressure pipe mount kits	- HART Interface - Software for data collection from multiple units - Low and high pressure pipe mount kits	- 24VDC Power - High pressure flow cell (P Model) for pressure to 87psi, 0.2-2 lpm flow rate	- 24VDC Power - High pressure flow cell (P Model) for pressure to 87psi, 0.2-2 lpm flow rate	- 24VDC power - EEx-d II - High temperature options	- 24VDC power - EEx-d II - High temperature options
Other Parameters Available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not Stated	Not Stated
Other Parameters Available	mg/l, ppm	mg/l, TE/F, FTU, Degree	mg/l, Degree	mg/l, Degree	FTU, FNU, TEF (German unit)	FTU, FNU, TEF (German unit)	FTU, EBC, ppm, g/l	FTU, EBC, ppm, g/l	EBC (default)	EBC (default)
Restrictions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restrictions	Not Stated	Not Stated	Not Stated	Not Stated	Installation of restrictor valve on the sensor outlet is recommended for flows above 1.8 lpm with air in sample	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated
Website Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Website Information	http://www.hach.com/hach/search.product.details	http://www.hach.com/hach/search.product.details	http://www.hach.com/hach/search.product.details	http://www.photometer.com/en/products/detail	http://www.automation.siemens.co.uk/manufac	http://ca.mt.com/mt/filters/products-application	http://www.brankuebbe.com/sites/brankuebbe/p	http://www.aquasensors.com/e/aquacatalog/ch	http://container-andress.com/Product/Container	http://www.usfwt.com/prod/prodspec.cfm?id=8
Photo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Photo										
Notes:										

	Sigrist (Siemens) DualScat	Sigrist (Siemens) DualScat	Mettler Toledo Trb 8300/8400/8500	Mettler Toledo Trb 8300/8400/8500	Bran + Luebbe Turbidity Sensor	Bran + Luebbe Turbidity Sensor	AquaSensors Turbidity with AV08	AquaSensors Turbidity with AV08	E & H CUE21 & CUE22	Wallace & Tiernen** TWS 561
Method	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Method	90° / 25° Scattered Light 850 nm	90° / 25° Scattered Light 850 nm	Forward (8400) or Forward with 90° scattered light (8500), Both LED	Forward (8400) or Forward with 90° scattered light (8500), Both LED	nephelometric, with LED	nephelometric, with LED	White Light (tungsten lamp)	White Light (tungsten lamp)	Buyout of HF Scientific MicroTOL	Buyout of HF Scientific MicroTOL
Consumables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Consumables	None	None	Not Stated	Not Stated	None	None	None	None	See HF Scientific MicroTOL	See HF Scientific MicroTOL
Measuring Range	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Measuring Range	0-2000 NTU	0-2000 NTU	0.00-400 NTU	0.00-400 NTU	2-1000 FNU	2-1000 FNU	0.001-100 NTU	0.001-100 NTU	See HF Scientific MicroTOL	See HF Scientific MicroTOL
Accuracy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accuracy	Not Stated	Not Stated	<+/- 1%	<+/- 1%	3% of measured value	3% of measured value	±2% of reading or ±0.015 NTU whichever is greater ±5% of reading above 40 NTU.	±2% of reading or ±0.015 NTU whichever is greater ±5% of reading above 40 NTU.	See HF Scientific MicroTOL	See HF Scientific MicroTOL
Sample Temperature	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Temperature	0 to 40°C	0 to 40°C	0 to 140°C	0 to 140°C	-4°C to 45°C	-4°C to 45°C	-5°C to 50°C	-5°C to 50°C	See HF Scientific MicroTOL	See HF Scientific MicroTOL
Calibration	Yes	Yes	Yes	Yes	Not Stated	Not Stated	Manual zero and span	Manual zero and span	See HF Scientific MicroTOL	See HF Scientific MicroTOL
Calibration	Manual with a solid reference	Calibration unit with a solid reference	Factory defined (from sensor), single-point with sampling, 2-5 point with standards, pre-defined from factory, or Cal-Cap offline tool	Factory defined (from sensor), single-point with sampling, 2-5 point with standards, pre-defined from factory, or Cal-Cap offline tool	Not Stated	Not Stated	Function available on relays for external wash	Function available on relays for external wash	See HF Scientific MicroTOL	See HF Scientific MicroTOL
Sensor Cleaning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sensor Cleaning	Manual	Manual	Relay provided for external cleaning system	Relay provided for external cleaning system	Not Stated	Not Stated	Not Stated	Not Stated	See HF Scientific M