

# Specifications

## Input Specification

Digital protocol, all ECD S80 sensors, Liquid, Gas, Process sensors (Optional analog to digital input board for mV sensors)

## Input Ranges

pH	-1.00 – 15.00 pH
ORP	-1500 - +1500 mV
pION	000.1 – 999.9, Auto Ranging: ppb ↔ ppm ↔ppthousand
Dissolved Oxygen	000.1 – 999.9 Auto Ranging: ppb, ppm, % SAT, mg/L
Conductivity	0.055 $\mu$ S – 2.00S Auto Ranging: $\mu$ S, mS, S
Resistivity	0.001 - 20.00 meg-ohms
Turbidity	000.0 - 4000NTU Auto Ranging: NTU, FNU, mg/L, ppm, % Solids
Temperature	-30°C - 140°C

## Accuracy

pH	0.02 pH
ORP	± 1 mV
pION	Specific for ion type
Dissolved Oxygen	2% of calibrated range
Conductivity	2% of calibrated range
Resistivity	2% of calibrated range
Turbidity	4% of calibrated range
Temperature	± 0.3°C

## Enclosure

Polycarbonate, NEMA 4X, weatherproof, ½ DIN, (L x W x D) 5.7" X 5.7" X 3.5" (14.4cm X 14.4cm X 9.0cm)

## Environmental Conditions

Ambient Temperature	-20°C - 70°C
Storage Temperature	-30°C - 85°C
Relative Humidity	0 – 90% NC

## Display

128 x 64 pixels (2.75" x 1.5") LCD, Black/Grey background on loop powered instruments, Blue/White background LED

backlight on 100-250 VAC and 24 VDC powered instruments

## Input Power

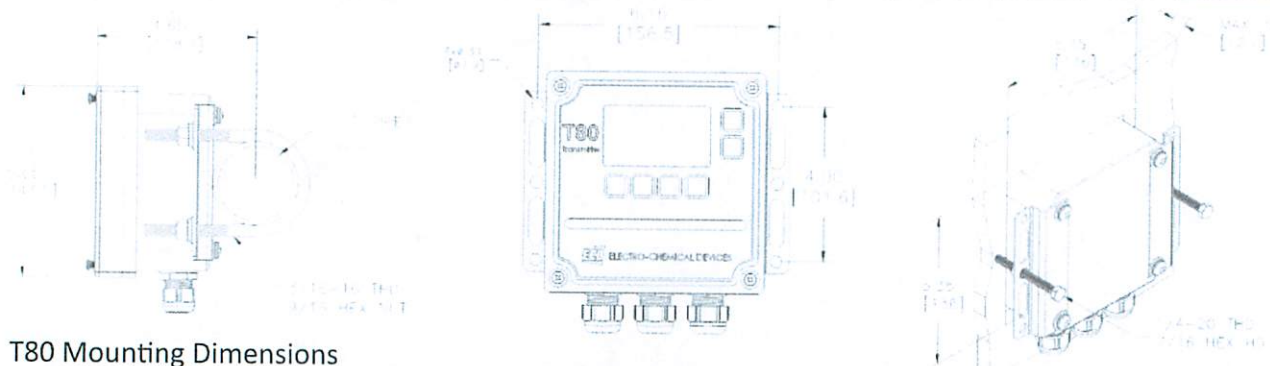
Code -0	Loop powered, 24 VDC, 600 $\Omega$ maximum load (18-36VDC @ 35 mW minimum)
Code -1	24 VDC (18-36 VDC @ 250 mW minimum)
Code -2	100-250 VAC, 50/60 Hz

## Outputs

**4-20 mA output** (standard), Fault Condition: 3.5 mA, 22 mA or none  
**Modbus RTU** (standard)  
**HART®** (optional)  
**Alarm Relays** (Optional) Three (3) SPDT, form 1C, 250 VAC, 3 Amp resistive maximum relays, user configurable as Hi/Lo or Fault alarms

## Shipping

Size 8" x 8" x 5" (20.5 x 20.5 x 12.7 cm)  
Weight 1.6 lbs. (0.75 kg)



T80 Mounting Dimensions

Model T80- Transmitter Part Number Guide					
Inputs	10	S80 Sensor, pH, ORP, pION, Conductivity, Resistivity and galvanic Dissolved Oxygen, Gas			
	20	TRITON® Optical DO and TRITON® ppb DO Sensors			
	30	Internal Digital Converter/Preamplifier (Inputs - mV+, mV-, 100kohm TC, Solution Ground)			
	60	TR6 Turbidity Sensors			
	Power Supply	-0	Loop Powered Transmitter		
		-1	24 VDC Powered Transmitter		
		-2	100/250 VAC powered Transmitter		
	Alarm Relays	0	No Relays		
		1	(3) formC 250 V 3A relays		
	Output	0	4-20 mA output and MODBUS RTU		
		1	HART®		
		2	2 x 4-20 mA with MODBUS RTU		
	Mounting Hardware	-00	No Mounting Hardware		
		-01	Universal Mount		
		-02	Panel Mount		
		-03	Handrail Mount		
		-04	Sunshield Vertical Rail Mount		
		-05	Sunshield Horizontal Rail Mount		
Model T80-	10	-0	0	1	-01

Specifications subject to change without notice.

Represented by:

## Electro-Chemical Devices

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# Model T80 Universal Transmitter

switchable Main Display screens; the Data Screen, the Millivolt Screen and the Graphical Display screen. The Data Screen displays the measurement type, the measured value with units, the % milliamp output of the 4-20 mA channel and the temperature. The mV Screen displays the measurement type, the raw millivolt signal from the sensor, the % milliamp output of the 4-20 mA channel and the temperature. The Graphical Screens display the measurement type, the measured value with units and a graphical representation of the % milliamp output. Three graphical styles are available; a Trend line, a Bar graph or a Gauge. The status of alarm relays, energized/de-energized is displayed on transmitters with relays.

## MENUS

Menu navigation is accomplished using membrane switch buttons. Soft keys display the function associated with each button. Pressing any of the buttons twice within 2 seconds activates the Model T80 soft key menus. The primary selections are the Calibration menu, Configuration menu, Info Screens and Simulate menu.

## CALIBRATION

Model S80 sensors come precalibrated from the factory. Field calibrations are easily performed with the Model T80. The Calibration menu includes the Auto Cal function, a two point calibration, the Standardize function, a single point calibration or the Manual Calibration, where previously determined Offset and Slope values are entered manually into the Model T80 transmitter.

## CONFIGURATION

The Configuration menus allow the Model T80 transmitter's Display and Output functions and the Model S80 sensor's characteristics to be configured or adjusted. Display screens include the Hold function, Graphical Display Style, Back Light and Contrast adjustments, Labels/Tags for naming the transmitter, Password Protection and a Factory Default reset. Output screens include setting the addresses for MODBUS or HART® outputs, setting the 4-20 mA Range and fault settings and configuring the Alarm Relays.

## INFO

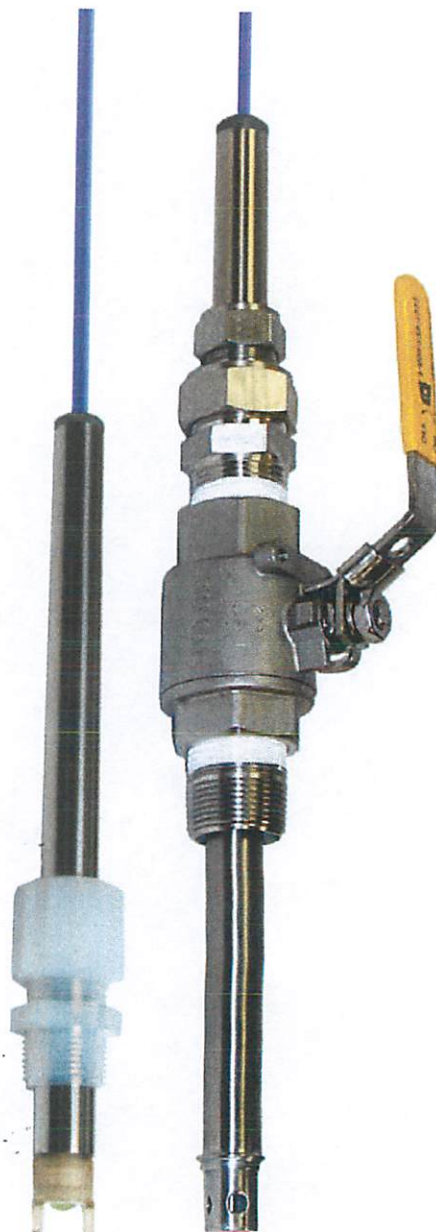
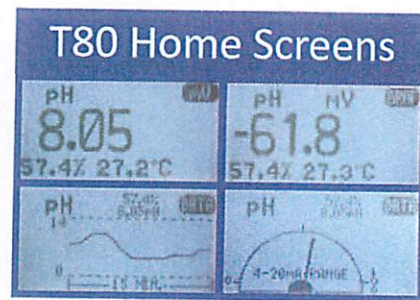
The Info screens provide Transmitter and Sensor Information. The transmitter screens display the Name, Power, Serial#, Firmware version and the output configuration. The sensor screens display the Name, Part #, Serial # and stored Calibration data.

## SIMULATE

The Simulate Menu allows the input and output signals to be simulated. The outputs are easily tested by entering a 4-20 mA output value or energizing and de-energizing a relay. The Ramp function cycles the signal across the configured 4-20 mA range, i.e. the transmitter generates a signal from 0 pH to 14 pH and back to 0 pH activating relays and generating a 4-20 mA output. The cycle time and the duration are adjustable allowing sufficient time for an individual to walk to the control room to verify the output.

## POWER SUPPLY and OUTPUTS

The Model T80 transmitter is available as a loop powered, a 24 VDC or a 100/250 VAC powered transmitter. The loop powered version has a 4-20 mA output or an optional HART® output. The line powered instruments have a 4-20 mA output and MODBUS RTU or HART® and can be ordered with a (3) Alarm Relay option. The relays can be configured as Alarm (set point) relays or Fault relays. An optional second 4-20 mA output is available for temperature.



**HART**  
COMMUNICATION PROTOCOL



# Model T80 Universal Transmitter

## The ECD **6** Point Advantage

- 1 Universal Transmitter:** measures pH, ORP, DO, Specific Ion, Turbidity, Conductivity or Resistivity
- 2 Graphic LCD Display:** Easy to Read Graphical and Numerical Information
- 3 Simple Menu Structure:** Intuitive, Easy to navigate and Configure
- 4 Use with ECD Digital Intelligent Sensors** that are factory calibrated sensors and store data
- 5 4-20 mA output with MODBUS RTU and Alarm Relays:** Flexible configurations for all applications
- 6 HART® communication**

## Description

The ECD Model T80 Universal Transmitter is a single channel transmitter designed for the continuous measurement of pH, ORP, pION, Dissolved Oxygen, Turbidity, Conductivity or Resistivity in a general purpose industrial environment. The Model T80 transmitter digitally communicates with any ECD Model S80 Intelligent Sensor, automatically configuring the transmitter's menus and display screens to the measured parameter. The same transmitter can be used for any of the measurements, i.e. plug an S80 Conductivity Sensor into a Model T80 pH transmitter and it will automatically reconfigure into a conductivity transmitter. There is no longer any need to inventory multiple instrument types, the one Model T80 transmitter will automatically configure to any of the listed measurements.

### SENSORS

The Model S80 Intelligent Sensors facilitate two way communication with the Model T80 transmitters. The type of sensor, identity and serial number are stored in the sensor's memory along with calibration registers. The Model S80 sensors are calibrated at the factory so they are ready to use when connected to a Model T80 transmitter. The Model S80 sensors are waterproof and submersible with all internal components epoxy encapsulated inside the ¾" O.D. housing. The Model S80 sensors use the same field proven, easily replaceable electrodes as the Model S10 and S17 sensors saving time and money. A digital converter option is available for the Model T80 transmitter to allow the use of non-digital sensors. The digital converter is only available on line powered instruments.

### DISPLAY

The Model T80 Transmitter features a large easily viewed LCD display. Loop powered instruments have Black lettering on a Grey background, while 100-250 VAC and 24 VDC powered instruments have Blue lettering on a White background when the LED backlight is on. The Model T80 has three easily







## Model T80 Universal Transmitter



Measure pH, ORP, Specific Ion, Dissolved Oxygen,  
Turbidity, Conductivity or Resistivity with  
**Model S80 Intelligent Sensors**





# FCA-22 Free Chlorine Analyzer

## Specifications

### Sensor and Flow Train

#### Sensor

Polarographic, Gold/Silver, PTFE membrane

#### Measurement Range

Chlorine: 0.05 to 20 ppm

pH: 0 to 14 pH

#### Operating Temperature

0° C to 50° C (32° F to 122° F)

#### Min/Max Flow

38 L/hr to 300 L/hr (10 gal/hr to 80 gal/hr)

#### Wetted Materials

PVC, PP, PVDF, PTFE, Glass, 316 SS

#### Process Connections

Input ¼" barb fitting, Drain ¾" barb fitting

#### Response Time

T90 in 2 minutes

#### Electrolyte Life

Up to 12 months

### C22 Analyzer

#### Measurements

Chlorine: 0.05 to 20 ppm

pH: 0 to 14 pH

Temperature: 0° C to 100° C (32° F to 212° F)

#### pH Compensation

pH 5 - 10

#### Display

2.5" X 1.75" backlit LCD, 4 lines for Text & Graphical

#### Enclosure

NEMA 4X, LxWxD: 5.7" x 5.7" x 7

#### Outputs

4-20 mA for Free Chlorine; 800 ohm@24 VDC

Optional PID output and additional 4-20 mA outputs

#### Input Power

110/220 VAC @ 50/60 Hz

Optional 24 VDC (12 to 50 VDC) @ 0.25A

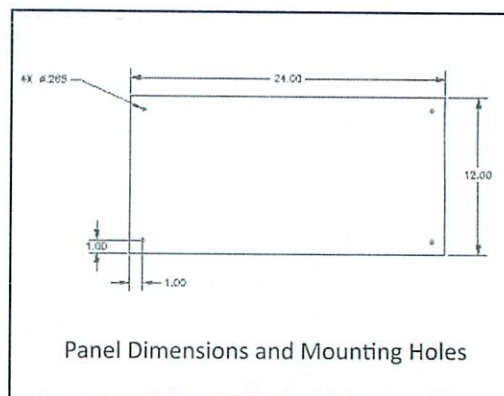
#### Alarm Relay Ratings

(2) SPDT 230 VAC/5A or 30 VDC/5A resistive max.

Optionally up to (8) Relays

Part No.	Model and Product Description
1290020-1	Free Chlorine Analyzer (FCA-22), complete, with automatic pH compensation
1290021-1	Free Chlorine Analyzer (FCA-22), complete, with manual pH compensation

Part No.	Spare Parts and Accessories Description
1390908	Free Chlorine Sensor, Complete
1000238	Membrane Replacement Kit with electrolyte
1408060	PHS10 Sensor, Complete
2005145.VIT	Replacement pH Cartridge
1406711.ECD	PHD10, PVC bodied disposable pH sensor
1000236-1	Chlorine Flow Cell
3501048-1	pH Flow Cell
1000237-1	Constant Flow Device



Specifications subject to change without notice.

### Represented by:

#### Electro-Chemical Devices

1681 Kettering

Irvine, California, USA 92614

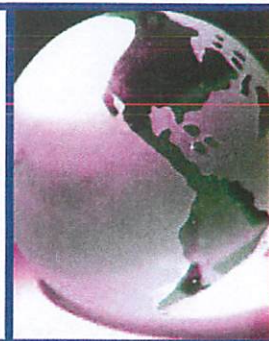
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FCA22 H0409





# FCA-22 Free Chlorine Analyzer



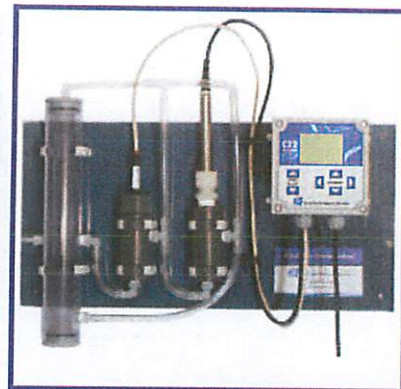
**ELECTRO-CHEMICAL DEVICES**

## Features

- Panel Mounted System Plumb and Play Design
- Automatic pH Compensation
- Automatic Flow Control
- C22 Analyzer Capability

## Benefits

- Complete System, Easy Installation, Ready to Use
- No Expensive Reagents
- Eliminates Pressure Regulators and Rotameters
- Dual Measurements  
24VDC or 110/220 VAC Power  
XY Graphical Plot  
Optional PID Control Output



Model FCA-22  
*Free Chlorine Analyzer*

## Description

The FCA-22 is a panel mounted, ready to use Free Chlorine Analyzer. It is designed to monitor free chlorine in drinking water, rinse water, cooling water or other fresh water samples from 0.05 – 20 ppm  $\text{Cl}_2$ . The FCA-22 features a plug and play design that incorporates a flow control device, a pH sensor, a chlorine sensor and the C22 analyzer/controller conveniently mounted on a PVC panel. Connect the sample and drain lines, connect the power and outputs and it is ready to use. Calibration is accomplished by DPD comparison.

Free chlorine exists in solution as a pH dependent ratio of hypochlorous acid (~100% at pH 5) and hypochlorite ion (~100% at pH 10). The Free Chlorine Sensor measures only the hypochlorous acid component of the free chlorine and the analyzer calculates the balance using either the

measured pH or a user defined fixed value. The use of the pH sensor provides accurate compensation for samples between pH 6 and pH 9.5 and eliminates the need for an expensive sample conditioning system to control the pH of the solution. The C22 allows either parameter to be graphically displayed with user defined ranges allowing easy trend analysis.

Amperometric chlorine sensors are flow sensitive, the minimum required flow by the sensor is 0.5 ft/sec, above this value the output is virtually flow independent. A "Constant head" Flow control Device (CFD) maintains the optimum flow by the sensor over a wide range of incoming sample flow rates. The minimum flow required for the CFD is 10 gal/hr and the maximum flow is 80 gal/hr with the sample going to drain at atmospheric pressure.



## S80

### All Sensors

#### Dimensions:

**S80 Insertion** - ¾"OD x 10" Length

**S80 Valve Retractable** - ¾" OD x 17"

#### Cable Length:

10 ft. standard, optional lengths in 10 ft increments, optional Detachable cable connection

#### Housing Materials:

Standard: 316 Stainless Steel  
Optional: Titanium (T), grade 2  
Hastelloy C-22 (H),  
PVDF (K)  
Polypropylene (P)

#### O-Ring Materials:

Standard: Viton® (VIT)  
Optional: Ethylene Propylene (EPR),  
VITON® 75 (VIT75)  
Kalrez® (KLZ)  
CV75 (CV)

#### Process Connections:

##### S80 Insertion/Immersion

- 75 ¾" 316 SS gland fitting with nylon ferrule
- 75HT ¾" 316 SS gland fitting with Teflon® ferrule
- 75SF ¾" 316 SS gland fitting with stainless steel ferrule
- 75TFE ¾" Teflon® gland fitting with Teflon™ ferrule
- 100P 1" Polypropylene gland fitting for Polypropylene housing only

##### S80 Valve Retractable

- VSS 1" 316 SS valve retraction assembly
- VSSE 1" 316 SS valve retraction assembly for Inductive sensors
- VKY 1" PVDF valve retraction assembly
- VPP 1" Polypropylene Valve Retraction assembly

## PHS80

### pH measurement

#### Measurement Range:

0-14 pH

#### Temperature Range:

0° - 90° C

#### Optional HT version:

0° - 140° C

#### Pressure Range:

0 - 100 psig @ 90° C

#### Temperature Compensation:

Automatic 0° - 100° C  
Accuracy ± 0.2° C

## MVS80

### ORP & Specific Ion

#### Measurement Range:

ORP: -2000 mV to 2000 mV

plon: Sensor Specific, ppb, ppm&ppt

#### Temperature Range:

ORP -0° - 90° C, plon Sensor Specific

#### Pressure Range:

0 - 100 psig @ 90° C

#### Temperature Compensation:

Automatic 0° - 100° C  
Accuracy ± 0.2° C

## DOS80

### Dissolved Oxygen

#### Measurement Range:

0-20 ppm, 0-150% SAT

#### Temperature Range:

0° - 90° C

#### Pressure Range:

0 - 65 psig @ 90° C

#### Temperature Compensation:

Automatic 0° - 100° C  
Accuracy ± 0.2° C

## CS80/RS80

### Conductivity/Resistivity

#### Measurement Ranges:

Conductivity: 1µS to 50 mS

Resistivity: 0 - 20 MΩ

#### Temperature Range:

-5° to 100° C

#### Optional HT version:

-5° to 150° C

#### Pressure Range:

CS/RS80 0 - 100 psig

#### Temperature Compensation:

Automatic 0° - 100° C  
Accuracy ± 0.2° C, 100K thermistor

## CS80

### Inductive Conductivity

#### Measurement Ranges:

0.5mS to 1000mS

#### Temperature Range:

-5° to 100° C

#### Pressure Range:

0 - 100 psig

#### Temperature Compensation:

Automatic 0° - 100° C  
Accuracy ± 0.2° C, 100K thermistor

#### Body material:

KYNAR (PVDF)

## CSX2 Series

### High Temperature Conductivity

#### Measurement Ranges:

1.0µS to 50mS

#### Temperature Range:

0° to 200° C

#### Pressure Range:

0 - 250 psig ( 400psig @100° C)

#### Temperature Compensation:

Automatic 0° - 200° C  
Accuracy ± 0.2° C, 10K ohm platinum RTD

#### Wetted Materials:

316 SS and PEEK

#### Shipping Weight:

S80 (10") 2.5 lbs (1.2 kg)

S80 (17") 2.75 lbs (1.25 kg)

S80-VSS 5.8 lbs (2.65 kg)

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#### Represented by:

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The proper installation and calibration of an analytical loop is critical for a successful measurement. Using the flow of the sample in an insertion application to maximize the cleaning potential can be as simple as changing the size of the Pipe Tee, changing the insertion depth or using an ECD Flow Cell with a spray cleaning port in the most difficult applications. Spray Cleaning heads are also available for immersion applications where the sample velocity is much lower and fouling is more common. Valve retractable units allow the sensor to be removed, serviced and installed without shutting down the sample flow in a pipe or emptying a tank. A compression gland fitting seals the sensor into a ball valve, loosening the gland fitting allows the sensor to be retracted through the ball valve which is then closed, isolating the process solution, before removing the sensor for service. Materials of construction for the Valves, Glands, Flanges and Immersion Assemblies vary from PVC, PVDF and polypropylene plastics to 316 SS, Titanium and Hastelloy C-22. Contact our application specialists for the most cost effective solution to your application.



## Calibration Solutions

All of the S80 sensors require periodic calibration and ECD offers a full range of calibration solutions. For pH applications we offer pH 4.00, 7.00 and 10.00 buffers. ORP calibrations can be accomplished with a +465 mV ferric-ferrous solution or by adding quinhydrone to pH 4 and pH 7 buffer solutions creating +267 Mora and +90 Mora respectively. Specific ion calibration solutions are standardly 10 ppm and 100 ppm although any value can be formulated at no extra cost. Conductivity solutions are made with KCl and Deionized water, values from 10  $\mu$ S to 500 mS are available. Solutions to simulate % acid or % caustic are labelled as the actual solution, i.e. 4% NaOH, even though the solution is made from KCl with an equivalent conductivity providing a safe and accurate calibration system.



## Fittings and Flow cells

The Model S80 sensors are offered with a wide array of fittings, flow cells, immersion assemblies and valve retraction assemblies.  $\frac{3}{4}$ " MNPT compression fittings are available for S80 insertion into pipe Tees or flow cells and when reversed, for coupling with Stand Pipes for immersion applications. Flow cells of PVC, PVDF or 316 SS have  $\frac{3}{8}$ " or  $\frac{1}{2}$ " FNPT ports on a 2" O.D. by 5" body. 316 SS Sanitary 3A Flanges and 150# Flanges can be adapted for insertion or valve retractable service. Contact our Technical support staff for other configurations.



## Model T80 Universal Transmitters

The ECD Model T80 transmitter is a single channel, universal transmitter for the measurement of pH, ORP, pION, Conductivity, Resistivity, Dissolved Oxygen or Turbidity. The Model T80 transmitter digitally communicates with any ECD intelligent S80 digital sensor, automatically configuring the transmitter's menus and display screens to the measured parameter. The ECD S80 digital sensors facilitate two way communication with the Model T80 transmitters. The type of sensor, identity and serial number are stored in the sensor's memory along with calibration registers. The S80 sensors are calibrated at the factory so they are ready to use when connected to a Model T80 transmitter.



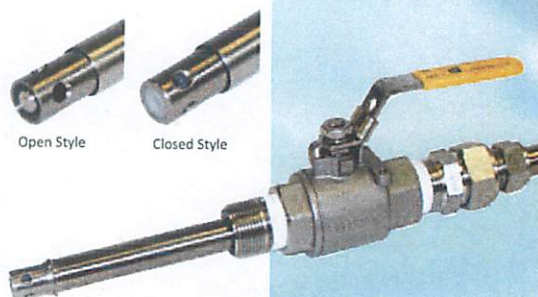
# Conductivity Measurements

Two technologies are used to measure Conductivity. **Contacting Conductivity** is an impedance measurement made between two metal contacts in the solution. **Inductive Conductivity** is a non-contacting measurement made between two toroidal coils inside the sensor that are inductively coupled through the solution's conductivity. Inductive sensors excel in the higher conductivity ranges and where coating is a problem. The chemically resistant PVDF (KYNAR) body is excellent for corrosive environments. Contacting sensors can measure from very low conductivities, (resistivity measurements) to very high conductivities but they are subject to coating and corrosion issues, conditions where the inductive sensors excel. The Contacting Conductivity S80 sensors come in three ranges, Low Range,  $1\mu\text{S} - 50\mu\text{S}$ , High Range,  $50\mu\text{S} - 50\text{mS}$  and Resistivity,  $0 - 20\text{M}\Omega$ . Inductive Sensors measure from  $50\text{ mS}$  to  $1000\text{ mS}$ .

## 6 Point Advantage

### Conductivity and Resistivity Sensors

The **Model S80 Conductivity** sensor is available in two ranges, a Low Range sensor for measurements from  $1\mu\text{S}$  to  $50\mu\text{S}$  and a High Range sensor for measurements from  $50\mu\text{S}$  to  $50\text{mS}$ . The **Model S80 Resistivity** sensor measures from  $0 - 20\text{M}\Omega$ . The design of the inner electrode defines the measurement range of the sensor. The Open Style with its large surface area inner electrode and short path length is best for resistivity and low conductivity measurements while the Closed Style is best suited to high conductivity measurements. The standard wetted materials are 316 Stainless Steel, PEEK insulators and VITON o-rings.



### Inductive Conductivity Sensors - (non-contacting)

The **Model S80 Inductive** sensors have a  $\frac{3}{4}$ " diameter PVDF body. These sensors are ideal for measuring high conductivity solutions and % concentration measurements. Since the toroidal electrodes are inside the PVDF body, the inductive sensors are ideal for any application that coats or corrodes the electrode of the standard contacting conductivity sensors. The measurement range of the inductive sensor is from  $50\text{ mS}$  to  $1000\text{ mS}$ .



### High Temperature/Pressure Sensors

The **CSX2** High Temperature- High Pressure sensor is designed for service to  $200^{\circ}\text{C}$  and  $250\text{ psig}$ ,  $400\text{ psig}$  at  $100^{\circ}\text{C}$ . This insertion style  $\frac{3}{4}$ " MNPT, 316 stainless steel sensor has PEEK insulators and is available with or without an integral signal conditioner. An aluminum junction box is mounted on the rear of the sensor that contains a terminal block and optional signal conditioner. The junction box is rated Class I, Div I, Groups C & D, Class II, Groups E, F and G hazardous locations. It is an ideal choice for boiler control applications, blowdown control, condensate monitoring, leak detection on heat exchangers, and steam purity measurements.



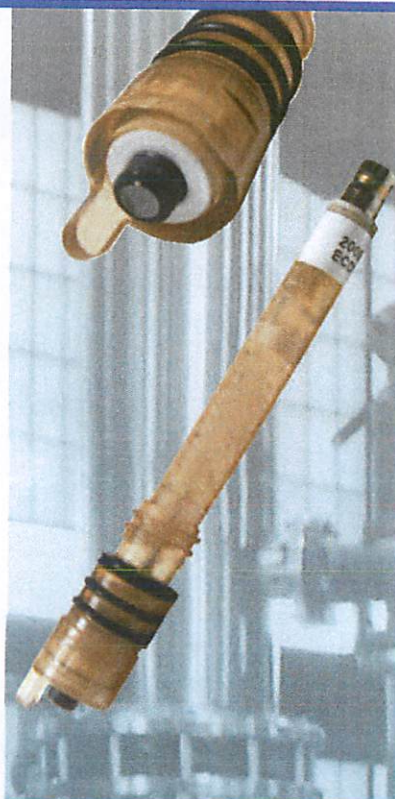


# Specific Ion & Dissolved Oxygen Electrodes

**Ion selective electrodes** are not limited to laboratory use; some are suitable for continuous online measurement. ECD offers Specific Ion Electrode cartridges to measure the various ions listed below. Specific Ion electrodes measure the activity (concentration) of the ion in solution, the "free" ion, not a complexed version. Cyanide, Fluoride and Sulfide ions only exist in a specific pH range as free ions and outside this pH range some percentage of the total concentration is complexed as  $H(X)$  which is not seen by the sensor. These measurements can be pH compensated using the dual channel transmitter or controller with a pH sensor to determine the total ion concentration. Most plon sensors are subject to interfering ion errors. A positive interference caused by similar ions in the solution. Consult with the factory on all new installations to determine the suitability of the measurement.

## Specific Ion (plon) Electrodes

Part#	Type	Measurement Range	pH Range	Temperature Range
2005083	Ammonium	0.05 - 18,000 ppm	2-10 pH	0°-40°C
2005062	Bromide	1 - 80,000 ppm	2 - 12pH	0°-50°C
2005140	Cadmium	0.1 - 11,200 ppm	3 - 9 pH	0°-80°C
2005143	Calcium	0.1 - 40,000 ppm	2.5 - 10 pH	0°-40°C
2005008	Chloride	2 - 35,000 ppm	2 - 12 pH	0°-50°C
2005142	Cyanide	0.1 - 260 ppm	11 - 13 pH	0°-80°C
2005058	Cupric	1.0 ppb -6,300 ppm	2 - 6 pH	0°-80°C
2005163	Fluoride	0.02 - 2,000 ppm	5 - 8 pH	0°-80°C
2005141	Lead	2.0 - 20,700 ppm	4 - 8 pH	0°-80°C
2005086	Nitrate	0.1 - 1000 ppm	2 - 12 pH	0°-40°C
2005161	Nitrite	0.5 - 500 ppm	4.5 - 8 pH	0°-40°C
2005034	Potassium	0.1 - 40,000 ppm	2 - 12 pH	0°-40°C
2005031	Sodium	0.2 - 23,000 ppm	2 - 14 pH	0°-80°C
2005122	Sulfide	0.01 - 32,000 ppm	11 - 14 pH	0°-80°C
2005016	Silver	0.1 - 107,000 ppm	2 - 14 pH	0°-80°C



## Dissolved Oxygen Electrodes

The **ECD Dissolved Oxygen** electrodes are galvanic cells with a lead anode, silver cathode and either the quick response 2 mil or rugged 5 mil Teflon membrane. The electrode is ready to use as received, there are no solutions or membranes to install before the electrode can be used. The membrane is protected by a double tine PEEK body allowing for easy cleaning. Designed for ppm level measurements it is ideal for environmental water measurements and aerobic waste treatment.

Part#	Type	Range	Pressure Range	Temperature Range
2005622 (2 mil)	Dissolved or Gaseous Oxygen	0 - 20 ppm (mg/L) 250% Saturation	0 - 50 psig	-5°- 80°C
2005623 (5 mil)	Dissolved or Gaseous Oxygen	0 - 20 ppm (mg/L) 250% Saturation	0 - 50 psig	-5°- 80°C





# pH and ORP Electrodes

The Model S80 Intelligent Sensors use replaceable electrode cartridges to provide application specific solutions for the most demanding pH measurements.

- Radel (PES) or PEEK construction
- Single tine, double tine or full crown style pH bulb protection.
- Spherical bulbs (best response), hemispherical bulbs (more durable) or a slightly radiused flat surface (easily cleaned)
- Platinum tip ORP electrodes.
- Double or Triple junction reference cells
- Porous Teflon® and ceramic junctions with various reference electrolytes.

One of these three widely used pH electrode cartridges will satisfy most installations, Consult our technical support staff for additional configurations.

## 6 Point Advantage



**2005145** – This **General Purpose Electrode** has a two tine Radel body, double junction reference and slightly radiused pH bulb. While suitable for higher temperatures it is optimized for fast and stable readings in ambient temperature applications. Neutralizations, waste effluent monitoring, rinse applications and potable water are just a few of the suggested applications.

**2005157** – This **High Temperature Electrode** has a two tine PEEK body, triple junction reference and hemispherical pH bulb. This electrode is designed for the process control or neutralization of most mineral acids and bases in applications up to 130°C. The triple junction design is resistant to sulfide ion poisoning making it ideal for use in petroleum refineries and metal processing plants.

**2005066** – This **Chemically Resistant Electrode** has a two tine PEEK body, double junction reference and slightly radiused pH bulb. The PEEK body is suitable for use in most aggressive solvents, oxidizing solutions and acids or bases. This electrode is optimized for a harsh chemical environment and is suitable for service up to 130°C. Chemical separations and solvent recovery in the CPI and pharmaceutical industries along with chlorine production and flotation in mining are suggested applications.

**2005167** – This **ORP (Oxidation Reduction Potential) Electrode** has a two tine PEEK body, double junction reference and a platinum tip. This general purpose sensor can be used for monitoring the oxidant level of cooling towers, swimming pools, aquariums or the de-chlorination of waste water. Metal finishing and mining also provide applications such as cyanide destruction and monitoring chrome plating baths.



# Model S80 Intelligent Sensors

**ECD Model S80 Sensor Overview** - The intelligent sensor choice to fit your application. The S80 sensors have two Universal Sensor Designs; Insertion/Submersion or Valve Retractable with flaired end to prevent blow out. The standard Model S80 sensors have a rugged  $\frac{3}{4}$ " O.D. 316 stainless steel body with a 10 ft. cable or an optional waterproof detachable cable assembly.

## S80 Sensor

### Insertion/Submersion

The S80 Sensor uses a  $\frac{3}{4}$ " MNPT compression fitting as the process connection. This allows a variable insertion length to accommodate installation in pipe tees, flow cells, or through tank walls. If the fitting is reversed the sensor can be installed in a stand pipe for submersion into a tank.

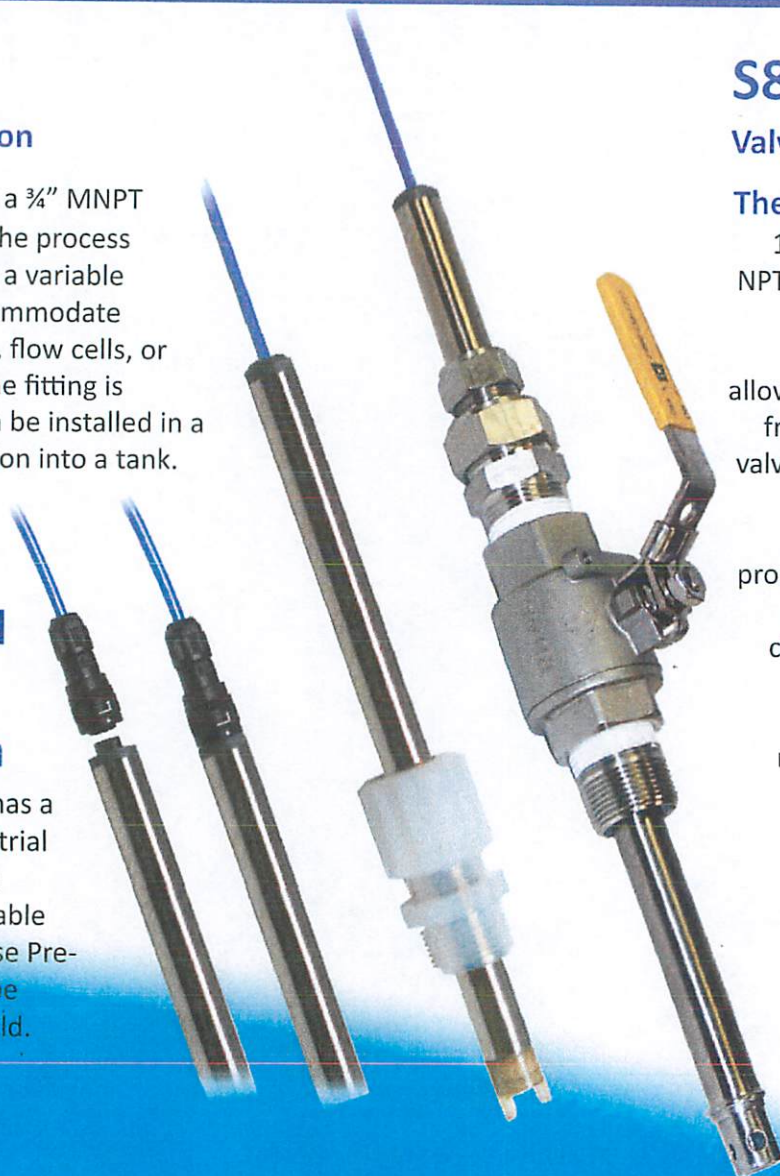
## Pre-Calibrated Detachable Sensor Option

this detachable sensor has a rugged IP68 rated industrial connector. Just a simple quarter turn locks the cable connector in place. These Pre-Calibrated sensors can be easily installed in the field.

## S80 Sensor

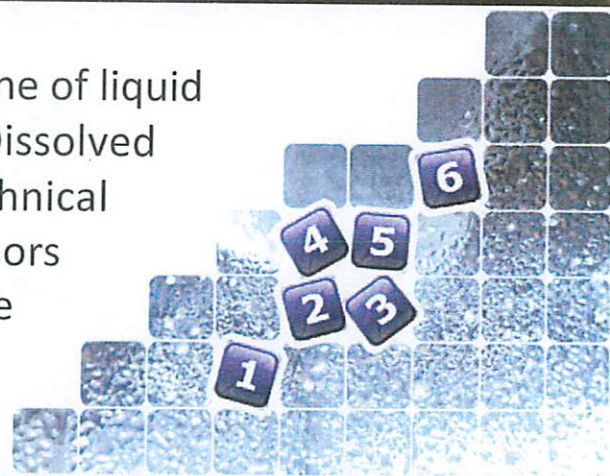
### Valve Retractable

The S80 Sensor uses a 1" ball valve with a 1" NPT process connection. Loosening the rear compression fitting allows the sensor to slide freely through the ball valve for either insertion into the process or retraction from the process. Once retracted, the ball valve can be closed and the sensor removed for maintenance or replacement without shutting down the process line.





**Electro-Chemical Devices** offers a complete line of liquid analytical sensors: pH, ORP, Specific Ion, Dissolved Oxygen, Conductivity & Resistivity. The technical advantage of the Model S80 Intelligent Sensors are the 6 points of design flexibility to configure a sensor that best fits your application.



## 6 Point Advantage

### 1 Intelligent sensor design with digital communication

Calibration data is stored in the sensor allowing field installation of a pre-calibrated sensor. Detachable cable option simplifies the installation of pre-calibrated sensors.

2

**Multiple individual measurement parameters** in the same mechanical configuration- pH, ORP, Specific Ion, Dissolved Oxygen, Conductivity & Resistivity

3

Readily available **application specific electrode cartridges**. Many unique pH electrode design formulations and materials of construction which are field proven and selected for long life and accuracy.

4

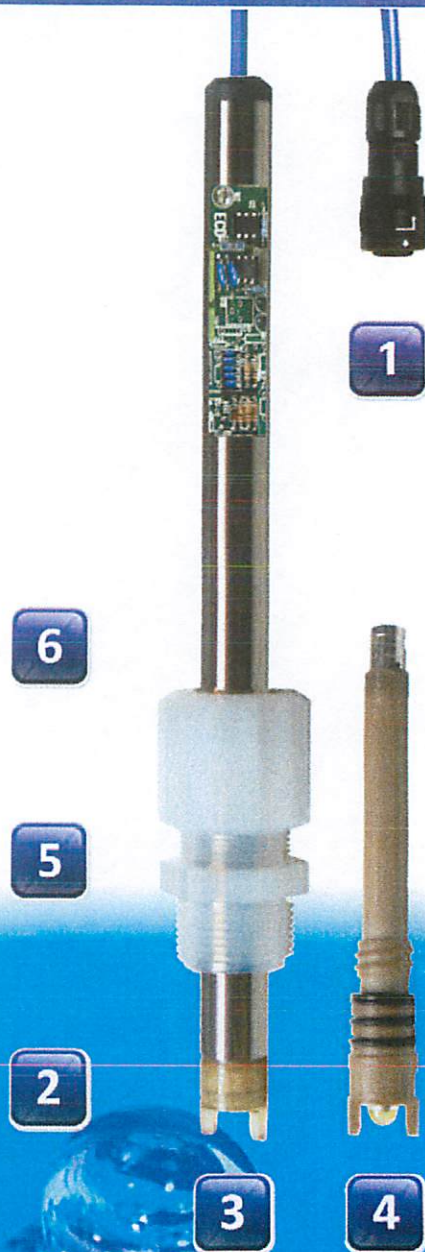
Long life **replaceable electrode cartridges** lower the over all operating cost.

5

**Submersible and Retractable Sensors** Various process fittings with adjustable insertion lengths - threaded fittings, sanitary fittings, flanges and valve retractable fittings.

6

**Industrial housing materials for compatibility with process fluid.** Stainless Steel, Titanium, Hastelloy C-22, Polypropylene or PVDF (Kynar™). Standard 10" or 17" lengths additional lengths available.





1

2

3

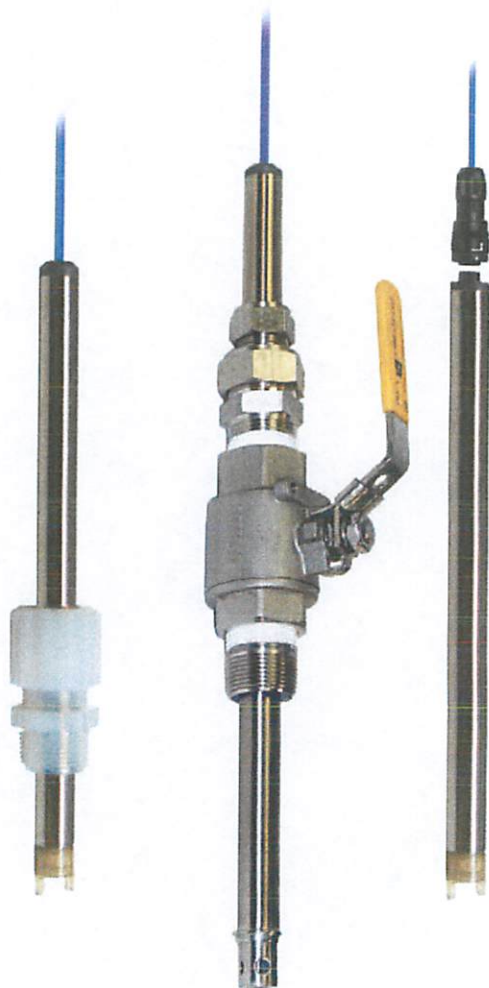
4

5

6

## Sensors and Electrodes

### Model S80 Intelligent Sensors



Measure pH, ORP, Specific Ion, Dissolved Oxygen,  
Turbidity, Conductivity or Resistivity with  
**Model T80 Universal Transmitter**



**ELECTRO-CHEMICAL DEVICES**





may contain or consist of open source software, which Buyer may use under the terms and conditions of the specific license under which the open source software is distributed. Buyer agrees that it will be bound by any and all such license agreements. Title to software remains with the applicable licensor(s).

**12. NONDISCLOSURE AND NONUSE OF HACH'S PROPRIETARY INFORMATION:** Hach may disclose PROPRIETARY Information during the performance or fulfillment of this Contract. "Proprietary Information" means any information, technical data or know-how in whatever form, including, but not limited to, documented information, machine readable or interpreted information, information contained in physical components, mask works and artwork, which Hach considers proprietary or Proprietary, including but not limited to Hach's service and maintenance manuals. Buyer and its customers, employees and agents will keep confidential all such Proprietary Information and will not transfer or disclose it without Hach's prior written consent, or use it for the manufacture, procurement, servicing or calibration of Products or any similar products, or cause such products to be manufactured, serviced or calibrated by or procured from any other source, or reproduce or otherwise appropriate it without Hach's prior written consent. All Proprietary Information obtained from or through Hach remains property of Hach. No right or license is granted hereby to Buyer or its customers, employees or agents, expressly or by implication, with respect to the Proprietary Information or any patent, patent application or other proprietary right of Hach, except for the limited use licenses implied by law.

**13. CHANGES AND ADDITIONAL CHARGES:** Hach reserves the right to make changes in design or additions or improvements to any products of the same general class as Products being delivered hereunder without liability or obligation to incorporate such changes, additions or improvements to Products ordered by Buyer unless specifically agreed upon in writing reasonably in advance of such Products' delivery date. Services which must be performed as a result of any of the following conditions are subject to additional charges for labor, travel and parts: (a) equipment alterations not authorized in writing by Hach; (b) damage resulting from improper use or handling, accident, neglect, power surge, or operation in an environment or manner in which the instrument is not designed to operate or is not in accordance with Hach's operating manuals; (c) the use of parts or accessories not provided by Hach; (d) damage resulting from acts of war, terrorism or nature; or (e) services outside standard business hours.

**14. SITE ACCESS / PREPARATION / WORKER SAFETY / ENVIRONMENTAL COMPLIANCE:** In connection with services provided by Hach, Buyer agrees to permit prompt access to equipment. Buyer assumes full responsibility to back-up or otherwise protect its data against loss, damage or destruction before services are performed. Buyer is the operator and in full control of its premises, including those parts of the premises where Hach employees or contractors are performing service, repair and maintenance activities. Buyer will ensure that all necessary measures are taken for safety and security of working conditions, sites and installations during the performance of services. Buyer is the generator of any wastes, including without limitation hazardous wastes, resulting from such services, repair and maintenance. Buyer is solely responsible to arrange for the disposal of any wastes at its own expense. Buyer will, at its own expense, provide Hach employees and contractors working on Buyer's premises with all information and training required under applicable safety compliance regulations and Buyer's policies. If the instrument to be serviced is in a Confined Space, as that term is defined under OSHA regulations, Buyer is solely responsible to make it available to be serviced in an unconfined space. Hach service technicians will not work in Confined Spaces. In the event that a Buyer requires Hach employees or contractors to attend safety or compliance training programs provided by Buyer, Buyer will pay Hach the standard hourly rate and expense reimbursement for such training attended. The attendance at or completion of such training does not create or expand any warranty or obligation of Hach and does not serve to alter, amend, limit or supersede any part of this Contract.

**15. LIMITATIONS ON USE:** Buyer will not use any Products for any purpose other than that identified in Hach's catalogs and literature as their intended use. Unless Hach has otherwise advised the Buyer in writing, in no event will Buyer use any Products in drugs, food additives, food or cosmetics, whether for humans or animals. In no event will Buyer use in a manufacturing process or in manufactured products any Products stipulated by Hach as intended for research and development. Any warranty granted by Hach is void if any goods covered by such warranty are used for any purpose not permitted hereunder.

**16. EXPORT AND IMPORT LICENSES AND COMPLIANCE WITH LAWS:** Unless otherwise specified in this Contract, Buyer is responsible for obtaining any required export or import licenses. Hach represents that all Products delivered hereunder will be produced and supplied in compliance with all applicable laws and regulations. Buyer will comply with all laws and regulations applicable to the installation, use, or export and import of all Products, including applicable export control laws and regulations of the U.S., E.U. and any other country having proper jurisdiction and will obtain all necessary export licenses in connection with any subsequent export, re-export, transfer and use of all Products and technology delivered hereunder. Buyer will not sell, transfer, export or re-export any Hach Products or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor use Hach Products or technology in any facility which engages in activities relating to such weapons. Buyer will comply with all local, national, and other laws of all jurisdictions globally relating to anti-corruption, bribery, extortion, kickbacks, or similar matters which are applicable to Buyer's business activities in connection with this Contract, including but not limited to the U.S. Foreign Corrupt Practices Act of 1977, as amended (the "FCPA"). Buyer agrees that no payment of

money or provision of anything of value will be offered, promised, paid or transferred, directly or indirectly, by any person or entity, to any government official, government employee, or employee of any company owned in part by a government, political party, political party of aid, or candidate for any government office or political party office to induce such organizations or persons to use their authority or influence to obtain or retain an improper business advantage for Buyer or for Hach, or which otherwise constitute or have the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion, kickbacks or other unlawful or improper means of obtaining business or any improper advantage, with respect to any of Buyer's activities related to this Contract.

**17. FORCE MAJEURE:** Hach is excused from delays in delivery and performance of other contractual obligations under this Contract caused by acts or omissions that are beyond the control of Hach, including but not limited to Government embargoes, blockades, seizures or freeze of assets, delays or refusals to grant an export or import license or the suspension or revocation thereof, or any other acts of any Government; fires, floods, severe weather conditions, or any other acts of God; quarantines; labor strikes or lockouts; riots; strife; insurrections; civil disobedience or acts of criminals or terrorists; war; material shortages or delays in deliveries to Hach by third parties. In the event of the existence of any force majeure circumstances, the period of time for delivery, payment terms and payments under any letters of credit will be extended for a period of time equal to the period of delay. If the force majeure circumstances extend for six months, Hach may, at its option, terminate this Contract without penalty and without being deemed in default or in breach thereof.

**18. NON ASSIGNMENT AND WAIVER:** Buyer will not transfer or assign this Contract or any rights or interests hereunder without Hach's prior written consent. Failure of either party to insist upon strict performance of any provision of this Contract, or to exercise any right or privilege contained herein, or the waiver of any breach of the terms or conditions of this Contract will not be construed as thereafter waiving any such terms, conditions, rights, or privileges, and the same will continue and remain in force and effect as if no waiver had occurred.

**19. LIMITATION OF LIABILITY.** None of the Hach Indemnified Parties will be liable to Buyer under any circumstances for any special, treble, incidental or consequential damages, including without limitation, damage to or loss of property other than for the Products purchased hereunder; damages incurred in installation, repair or replacement; lost profits, revenue or opportunity; loss of use; losses resulting from or related to downtime of the products or inaccurate measurements or reporting; the cost of substitute products; or claims of Buyer's customers for such damages, howsoever caused, and whether based on warranty, contract, and/or tort (including negligence, strict liability or otherwise). The total liability of the Hach Indemnified Parties arising out of the performance or nonperformance hereunder or Hach's obligations in connection with the design, manufacture, sale, delivery, and/or use of Products will in no circumstance exceed in the aggregate a sum equal to twice the amount actually paid to Hach for Products delivered hereunder.

**20. APPLICABLE LAW AND DISPUTE RESOLUTION:** The construction, interpretation and performance hereof and all transactions hereunder shall be governed by the laws of the State of Colorado, without regard to its principles or laws regarding conflicts of laws. Buyer and Hach expressly exclude from this Contract the UN Convention on Contracts for the International Sale of Goods 1980, and any successors thereto. If any provision of this Contract violates any Federal, State or local statutes or regulations of any countries having jurisdiction of this transaction, or is illegal for any reason, said provision shall be self-deleting without affecting the validity of the remaining provisions. Unless otherwise specifically agreed upon in writing between Hach and Buyer, any dispute relating to this Contract which is not resolved by the parties shall be adjudicated in order of preference by a court of competent jurisdiction (i) in the State of Colorado, U.S.A. if Buyer has minimum contacts with Colorado and the U.S., (ii) elsewhere in the U.S. if Buyer has minimum contacts with the U.S. but not Colorado, or (iii) in a neutral location if Buyer does not have minimum contacts with the United States.

**21. ENTIRE AGREEMENT & MODIFICATION:** These Terms & Conditions of Sale constitute the entire agreement between the parties and supersede any prior agreements or representations, whether oral or written. No change to or modification of these Terms & Conditions shall be binding upon Hach unless in a written instrument specifically referencing that it is amending these Terms & Conditions of Sale and signed by an authorized representative of Hach. Hach rejects any additional or inconsistent Terms & Conditions of Sale offered by Buyer at any time, whether or not such terms or conditions materially alter the Terms & Conditions herein and irrespective of Hach's acceptance of Buyer's order for the described goods and services.

\* \* \*



## Terms and Conditions of Sale

This document sets forth the Terms & Conditions of Sale for goods manufactured and/or supplied, and services provided, by Hach Company of Loveland, Colorado ("Hach") and sold to the original purchaser thereof ("Buyer"). Unless otherwise specifically stated herein, the term "Hach" includes only Hach Company and none of its affiliates. Unless otherwise specifically stated in a previously executed written purchase agreement signed by authorized representatives of Hach and Buyer, these Terms & Conditions of Sale establish the rights, obligations and remedies of Hach and Buyer which apply to this offer and any resulting order or contract for the sale of Hach's goods and/or services ("Products").

1. **APPLICABLE TERMS & CONDITIONS:** These Terms & Conditions of Sale are contained directly and/or by reference in Hach's offer, order acknowledgment, and invoice documents. The first of the following acts constitutes an acceptance of Hach's offer and not a counteroffer and creates a contract of sale ("Contract") in accordance with these Terms & Conditions, subject to final credit approval by Hach: (i) Buyer's issuance of a purchase order document against Hach's offer; (ii) acknowledgement of Buyer's order by Hach; or (iii) commencement of any performance by Hach pursuant to Buyer's order. Provisions contained in Buyer's purchase documents (including electronic commerce interfaces) that materially alter, add to or subtract from the provisions of these Terms & Conditions of Sale are not a part of the Contract.

2. **CANCELLATION:** Buyer may cancel goods orders subject to fair charges for Hach's expenses including handling, inspection, restocking, freight and invoicing charges as applicable, provided that Buyer returns such goods to Hach at Buyer's expense within 30 days of delivery and in the same condition as received. Buyer may cancel service orders on ninety(90) day's prior written notice, and refunds will be prorated based on the duration of the service plan. Inspections and re-instatement fees may apply upon cancellation or expiration of service programs.

3. **DELIVERY:** Delivery will be accomplished FCA Hach's facility located in Ames, Iowa or Loveland, Colorado, United States (Incoterms 2010). For orders having a final destination within the U.S., legal title and risk of loss or damage pass to Buyer upon transfer to the first carrier. For orders having a final destination outside the U.S., legal title and risk of loss or damage pass to Buyer when the Products enter international waters or airspace or cross an international frontier. Hach will use commercially reasonable efforts to deliver the Products ordered herein within the time specified on the face of this Contract or, if no time is specified, within Hach's normal leadtime necessary for Hach to deliver the Products sold hereunder. Upon prior agreement with Buyer and for an additional charge, Hach will deliver the Products on an expedited basis. Standard service delivery hours are 8 am - 5 pm Monday through Friday, excluding holidays.

4. **INSPECTION:** Buyer will promptly inspect and accept any Products delivered pursuant to this Contract after receipt of such Products. In the event the Products do not conform to any applicable specifications, Buyer will promptly notify Hach of such nonconformance in writing. Hach will have a reasonable opportunity to repair or replace the nonconforming product at its option. Buyer will be deemed to have accepted any Products delivered hereunder and to have waived any such nonconformance in the event such a written notification is not received by Hach within thirty(30) days of delivery.

5. **PRICES & ORDER SIZES:** All prices are in U.S. dollars and are based on delivery as stated above. Prices do not include any charges for services such as insurance; brokerage fees; sales, use, inventory or excise taxes; import or export duties; special financing fees; value added taxes; income or royalty taxes imposed outside the U.S.; consular fees; special permits or licenses; or similar charges imposed upon the production, sale, distribution, or delivery of Products hereunder. Buyer will either pay any and all such taxes and charges or provide Hach with acceptable exemption certificates, which obligation survives performance under this Contract. Hach reserves the right to establish minimum order sizes and will advise Buyer accordingly.

6. **PAYMENTS:** All payments must be made in U.S. dollars. For Internet orders, the purchase price is due at the time and in the manner set forth at [www.hach.com](http://www.hach.com). Invoices for all other orders are due and payable NET 30 DAYS from date of the invoice without regard to delays for inspection or transportation, with payments to be made by check to Hach at the above address or by wire transfer to the account stated on the front of Hach's invoice. In the event payments are not made or not made in a timely manner, Hach may, in addition to all other remedies provided at law, either: (1) declare Buyer's performance in breach and terminate this Contract for default; (2) withhold future shipments until delinquent payments are made; (3) deliver future shipments on a cash-with-order or cash-in-advance basis even after the delinquency is cured; (4) charge interest on the delinquency at a rate of 1-1/2% per month or the maximum rate permitted by law, if lower, for each month or part thereof of delinquency in payment plus applicable storage charges and/or inventory carrying charges; (5) repossess the Products for which payment has not been made; (6) recover all costs of collection including reasonable attorney's fees; or (7) combine any of the above rights and remedies as is practicable and permitted by law. Buyer is prohibited from setting off any and all monies owed under this from any other sums, whether liquidated or not, that are or may be due Buyer, which arise out of a different transaction with Hach or

any of its affiliates. Should Buyer's financial responsibility become unsatisfactory to Hach in its reasonable discretion, Hach may require cash payment or other security. If Buyer fails to meet these requirements, Hach may treat such failure as reasonable grounds for repudiation of this Contract, in which case reasonable cancellation charges shall be due Hach. Buyer grants Hach a security interest in the Products to secure payment in full, which payment releases the security interest but only if such payments could not be considered an avoidable transfer under the U.S. Bankruptcy Code or other applicable laws. Buyer's insolvency, bankruptcy, assignment for the benefit of creditors, or dissolution or termination of the existence of Buyer, constitutes a default under this Contract and affords Hach all the remedies of a secured party under the U.C.C., as well as the remedies stated above for late payment or non-payment.

7. **LIMITED WARRANTY:** Hach warrants that Products sold hereunder will be free from defects in material and workmanship and will conform to any express written warranty pertaining to the specific goods purchased, which for most Hach instruments is for a period of twelve (12) months from delivery. Hach warrants that services furnished hereunder will be free from defects in workmanship for a period of ninety(90) days from the completion of the services. Parts provided by Hach in the performance of services may be new or refurbished parts functioning equivalent to new parts. Any non-functioning parts that are repaired by Hach shall become the property of Hach. No warranties are extended to consumable items such as, without limitation, reagents, batteries, mercury cells, and light bulbs. All other guarantees, warranties, conditions and representations, either express or implied, whether arising under any statute, law, commercial usage or otherwise, including implied warranties of merchantability and fitness for a particular purpose, are hereby excluded. The sole remedy for Products not meeting this Limited Warranty is replacement, credit or refund of the purchase price. This remedy will not be deemed to have failed of its essential purpose so long as Hach is willing to provide such replacement, credit or refund.

8. **INDEMNIFICATION:** Indemnification applies to a party and to such party's successors-in-interest, assignees, affiliates, directors, officers, and employees ("Indemnified Parties"). Hach is responsible for and will defend, indemnify and hold harmless the Buyer Indemnified Parties against all losses, claims, expenses or damages which may result from accident, injury, damage, or death due to Hach's breach of the Limited Warranty. This indemnification is provided on the condition that the Buyer is likewise responsible for and will defend, indemnify and hold harmless the Hach Indemnified Parties against all losses, claims, expenses or damages which may result from accident, injury, damage, or death due to the negligence or misuse or misapplication of any goods or services by the Buyer or any third party affiliated or in privity with Buyer.

9. **PATENT PROTECTION:** Subject to all limitations of liability provided herein, Hach will, with respect to any Products of Hach's design or manufacture, indemnify Buyer from any and all damages and costs as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. patent (or European patent for Products that Hach sells to Buyer for end use in a member state of the E.U.) that has issued as of the delivery date, solely by reason of the sale or normal use of any Products sold to Buyer hereunder and from reasonable expenses incurred by Buyer in defense of such suit if Hach does not undertake the defense thereof, provided that Buyer promptly notifies Hach of such suit and offers Hach either (i) full and exclusive control of the defense of such suit when Products of Hach only are involved, or (ii) the right to participate in the defense of such suit when products other than those of Hach are also involved. Hach's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the Products according to their applications as envisioned by Hach's specifications. In case the Products are in such suit held to constitute infringement and the use of the Products is enjoined, Hach will, at its own expense and at its option, either procure for Buyer the right to continue using such Products or replace them with non-infringing products, or modify them so they become non-infringing, or remove the Products and refund the purchase price (prorated for depreciation) and the transportation costs thereof. The foregoing states the entire liability of Hach for patent infringement by the Products. Further, to the same extent as set forth in Hach's above obligation to Buyer, Buyer agrees to defend, indemnify and hold harmless Hach for patent infringement related to (x) any goods manufactured to the Buyer's design, (y) services provided in accordance with the Buyer's instructions, or (z) Hach's Products when used in combination with any other devices, parts or software not provided by Hach hereunder.

10. **TRADEMARKS AND OTHER LABELS:** Buyer agrees not to remove or alter any indicia of manufacturing origin or patent numbers contained on or within the Products, including without limitation the serial numbers or trademarks on nameplates or cast, molded or machined components.

11. **SOFTWARE:** All licenses to Hach's separately provided software products are subject to the separate software license agreement(s) accompanying the software media. In the absence of such terms and for all other software, Hach grants Buyer only a personal, non-exclusive license to access and use the software provided by Hach with Products purchased hereunder solely as necessary for Buyer to enjoy the benefit of the Products. A portion of the software



Thank you for the opportunity to provide this quotation, Please do not hesitate to contact us if you have any questions or need additional information regarding this quotation.

Please send confirming purchase orders to the address or fax number above.

<b>Payment Terms:</b>	Subject to credit review
<b>Delivery ARO:</b>	Within 30 Days
<b>FOB:</b>	Shipping Prepaid and Added to Invoice

All purchases of Hach Company products and/or services are expressly and without limitation subject to Hach Company's Terms & Conditions of Sale ("Hach TCS"), incorporated herein by reference and published on Hach Company's website at [www.hach.com/terms](http://www.hach.com/terms). Hach TCS are incorporated by reference into each of Hach's offers or quotations, order acknowledgments, and invoice and shipping documents. The first of the following acts shall constitute an acceptance of Hach's offer and not a counteroffer and shall create a contract of sale ("Contract") in accordance with the Hach TCS, subject to Hach's final credit approval: (i) Buyer's issuance of a purchase order document against Hach's offer or quotation; (ii) Hach's acknowledgement of Buyer's order; or (iii) commencement of any performance by Hach in response to Buyer's order. Provisions contained in Buyer's purchase documents that materially alter, add to or subtract from the provisions of these Terms and Conditions of Sale shall be null and void and not considered part of the Contract.

**ORDER TERMS:**

- \* Please reference the quotation number on your purchase order.
- \* Sales tax is not included. Applicable sales tax will be added to the invoice based on the U.S. destination, if applicable provide a valid resale/exemption certificate.
- \* Shipments will be prepaid and added to invoices unless otherwise specified.
- \* Equipment quoted operates with standard U.S. supply voltage.
- \* Hach standard terms and conditions apply to all sales.
- \* Additional terms and conditions apply to orders for service partnerships.
- \* Freight Charge Schedule Attached.
- \* Send confirming purchase order for orders \$25,000 or more to address or fax number above.



2.1.3



**Be Right™**

Hach Company  
 PO Box 608  
 Loveland, CO 80539-0608  
 Phone: (800) 227-4224  
 Fax: (970) 669-2932  
 Email: Quotes@Hach.com

**Quote Number:** 09C041201074R2  
**Quote Date:** 7/14/2014  
**Quote Valid Until:** 8/14/2014

**Quote For:**

**Account Manager:**

Paul Rafuse  
 Operations Manager  
 Townsend Water Dept  
 540 Main Street  
 Townsend, MA  
 prafuse@townsend.ma.us  
 Work: (978) 230-3001

Trina Picardi  
  
 978-551-6751

Hach has two options for pH sensors connecting to the same controller. The controller is the upgrade from the P53/63 the plant has right now in 1 station.

<u>Part Number</u>	<u>Item Description</u>	<u>Qty</u>	<u>Unit Price</u>	<u>Discount</u>	<u>Ext. Price</u>
PD1P1	pH Sensor, Peek Body, Rebuildable With Temperature	1	\$ 639.20		\$ 639.20
LXV404.99.00102	Single Input, pH controller with 4-20mA outputs	1	\$ 1,114.00		\$1,114.00
6131300	Union Tee for Mounting the pH sensor	1	\$ 263.50		\$ 263.50



**Total for Rebuildable Sensor \$ 2,016.70**

**Total for Throw-away Sensor \$ 1,629.50**



**AMCO INSTRUMENT GROUP**

Neal De Witt

4 Evergreen Lane, Unit 7

Hopedale, MA 01747

Phone: 508-966-3060

Cell: 781-727-5828

[neald@amcoig.com](mailto:neald@amcoig.com)



[FCA-22 Data.PDF](#)



[Model T80 L0612.pdf](#)



[Model S80 Brochure L1012.pdf](#)



2.1.3

From: "Neal Dewitt" <neald@AMCOig.com>  
To: <prafuse@townsend.ma.us>  
Cc: "Mary Saras" <MaryS@AMCOig ...snip... De Witt" <chrisd@AMCOig.com>  
Subject: Electro-Chemical Devices Pricing

Hello Paul,

Please take a moment to review the following:

- (1) ECD Model T80 pH Transmitter  
Digital Display, Push Button Programming  
(1) Isolated 4-20mA Output  
(3) Alarm Relays  
Nema 4X Wall Mount Enclosure  
Part Number: T80-10-21-0-01  
  
\$ 1045.00 Net
- (1) ECD Replacement pH Sensor Assembly with pH Electrode  
316SS Housing, 3/4" NPT PolyPro Fitting, 10' Cable  
With 2005145 pH Electrode  
  
\$ 415.00 Net
- (1) ECD Model S80 "Intelligent" pH Sensor  
316SS Housing, 3/4" NPT PolyPro Fitting  
10' Cable, with 2005145 pH Electrode  
Part Number: S80-0-0-00-06  
  
\$ 415.00 Net
- (1) ECD FCA-22 Free Chlorine Monitor/Transmitter with pH Sensor  
Includes: ECD C22 Indicating Transmitter (Dual Input)  
Free Chlorine Sensor with Flow Cell  
pH Sensor with Flow Cell  
Constant Head Controller  
All of the above mounted on a PolyPro BackBoard  
Part Number: 1290-02-0-2  
  
\$ 3900.00 Net

Delivery: 3-4 Weeks  
Terms: Net 30 Days  
F.O.B.: Irvine, CA

In the event of an order, please issue to: Electro-Chemical Devices c/o AMCO Instrument Group.



2.48

**FISCAL YEAR 14 SUMMARY**  
**TOWNSEND WATER DEPARTMENT - ACCOUNTS RECEIVABLE**  
**06/30/14**

UNCOLLECTED FROM JUNE 30, 2013

85,753.55

**CHARGED 07/01/13- 06/30/14**

	<b>5/31/2014</b>	<b>Previous Balance</b>	<b>Total</b>
USER CHARGES	389.50	976,219.75	976,609.25
SERVICE CHARGES	313.92	25,970.69	26,284.61
CONNECTION CHARGES	2,000.00	21,600.00	23,600.00
LATE CHARGES	1,243.37	19,144.72	20,388.09
BACKFLOW	0.00	6,750.00	6,750.00
SUBTOTAL	<b>3,946.79</b>		
TOTAL CHARGES			

1,053,631.95

**1,139,385.50**

**RECEIVED 07/01/13- 06/30/14**

	<b>5/31/2014</b>		
USER CHARGES	11,146.38	963,925.51	975,071.89
SERVICE CHARGES	792.02	25,066.56	25,858.58
CONNECTION CHARGES	2,000.00	21,600.00	23,600.00
LATE CHARGES	801.47	19,678.23	20,479.70
BACKFLOW	0.00	6,500.00	6,500.00
SUBTOTAL	<b>14,739.87</b>		
TOTAL RECEIPTS			

1,051,510.17

SENT TO LIEN

3,025.54

LIENS COLLECTED

0.00

ABATEMENTS

1,308.57

ADJUSTMENTS

-393.47

UNCOLLECTED

**83,934.69**

**1,139,385.50**

**OUTSTANDING:**

USER CHARGES	\$	<b>76,908.75</b>
SERVICE CHARGES		2,418.58
CONNECTION CHARGES		0.00
LATE CHARGES		4,307.36
BACKFLOW		300.00
TOTAL OUTSTANDING	\$	<b>83,934.69</b>



1:03 PM  
07/09/14  
Accrual Basis

Townsend Water Department  
Budget vs. Actual  
July 2013 through June 2014

2.1.1

Carry Forward Balances

	Jul '13 - Jun 14	Budget	\$ Over Budget
061.400 · Special Projects 400			
5005 · Master Plan Revision	0.00	0.00	0.00
5009 · Main St Station Upgrade	0.00	58,219.23	(58,219.23)
5012 · System Enhancement	218,885.82	1,068,565.47	(849,679.65)
5013 · Water Main Extensions	0.00	127,911.75	(127,911.75)
5014 · Well Development & Exploration	0.00	6,276.29	(6,276.29)
5016 · Harbor Trace Well Construction	0.00	0.00	0.00
Total 061.400 · Special Projects 400	218,885.82	1,260,972.74	(1,042,086.92)
061.500 · Special Articles 500			
5000 · Equipment Replacement Fund	8,573.93	10,000.00	(1,426.07)
5020 · Storage Tank Maintenance	0.00	13,883.40	(13,883.40)
5030 · Water Oper Emergency Res Fund	0.00	0.00	0.00
5035 · Water-CIP New Serv Truck	34,430.65	45,000.00	(10,569.35)
5040 · Water-CIP-Cross St Well Maint	10,873.50	20,000.00	(9,126.50)
5050 · Water-CIP-VFD&Elec SVS Pump	0.00	25,000.00	(25,000.00)
Total 061.500 · Special Articles 500	53,878.08	113,883.40	(60,005.32)
Total 061.000 · General Operations 000	756,504.57	1,896,353.43	(1,139,848.86)
061.009 · Debt Service 9			
5910 · Long Term Debt-East Side Phase1	33,002.00	33,002.00	0.00
5911 · Long Term Debt-East Side Ph 2	47,012.98	48,030.00	(1,017.02)
5920 · Long term Interest-Phase1	9,371.68	9,378.00	(6.32)
5921 · Long Term Int East Side Ph2	14,569.95	14,970.00	(400.05)
5975 · Intermunicipal Agreement	218,856.34	183,000.00	35,856.34
Total 061.009 · Debt Service 9	322,812.95	288,380.00	34,432.95
Total Expense	1,079,317.52	2,184,733.43	(1,105,415.91)
Net Ordinary Income	(1,078,011.42)	(2,184,733.43)	1,106,722.01
Net Income	(1,078,011.42)	(2,184,733.43)	1,106,722.01



12:00 PM  
 06/26/14  
 Accrual Basis

Townsend Water Department  
 Budget vs. Actual  
 July 2013 through May 2014

	Jul '13 - May 14	Budget	\$ Over Budget
<b>061.400 · Special Projects 400</b>			
5005 · Master Plan Revision	0.00	0.00	0.00
5009 · Main St Station Upgrade	0.00	58,219.23	(58,219.23)
5012 · System Enhancement	134,123.60	764,656.47	(630,532.87)
5013 · Water Main Extensions	0.00	127,911.75	(127,911.75)
5014 · Well Development & Exploration	0.00	6,276.29	(6,276.29)
5016 · Harbor Trace Well Construction	0.00	0.00	0.00
<b>Total 061.400 · Special Projects 400</b>	<b>134,123.60</b>	<b>957,063.74</b>	<b>(822,940.14)</b>
<b>061.500 · Special Articles 500</b>			
5000 · Equipment Replacement Fund	0.00	10,000.00	(10,000.00)
5020 · Storage Tank Maintenance	0.00	13,883.40	(13,883.40)
5030 · Water Oper Emergency Res Fund	0.00	20,000.00	(20,000.00)
5035 · Water-CIP New Serv Truck	34,430.65	45,000.00	(10,569.35)
5040 · Water-CIP-Cross St Well Maint	10,873.50	20,000.00	(9,126.50)
5050 · Water-CIP-VFD&Elec SVS Pump	0.00	25,000.00	(25,000.00)
<b>Total 061.500 · Special Articles 500</b>	<b>45,304.15</b>	<b>133,883.40</b>	<b>(88,579.25)</b>
<b>Total 061.000 · General Operations 000</b>	<b>631,910.17</b>	<b>1,592,444.43</b>	<b>(960,534.26)</b>
<b>061.009 · Debt Service 9</b>			
5910 · Long Term Debt-East Side Phase1	33,002.00	33,002.00	0.00
5911 · Long Term Debt-East Side Ph 2	47,012.98	48,030.00	(1,017.02)
5920 · Long term Interest-Phase1	9,371.68	9,378.00	(6.32)
5921 · Long Term Int East Side Ph2	14,569.95	14,970.00	(400.05)
5975 · Intermunicipal Agreement	79,539.89	183,000.00	(103,460.11)
<b>Total 061.009 · Debt Service 9</b>	<b>183,496.50</b>	<b>288,380.00</b>	<b>(104,883.50)</b>
<b>Expense</b>	<b>815,406.67</b>	<b>1,880,824.43</b>	<b>(1,065,417.76)</b>
<b>ry Income</b>	<b>(814,581.54)</b>	<b>(1,880,824.43)</b>	<b>1,066,242.89</b>
	<b>(814,581.54)</b>	<b>(1,880,824.43)</b>	<b>1,066,242.89</b>



Townsend Water Department  
Budget vs. Actual  
July 2013 through May 2014

	<u>Jul '13 - May 14</u>	<u>Budget</u>	<u>\$ Over Budget</u>
<b>061.004 · Purchased Supplies 4</b>			
<b>5420 · Office Supplies</b>	2,566.10	5,080.29	(2,514.19)
<b>5430 · Building Supplies</b>	0.00	1,500.00	(1,500.00)
<b>5435 · Equipment Maint Supplies</b>	0.00	1,500.00	(1,500.00)
<b>5460 · Groundskeeping Supplies</b>	25.73	500.00	(474.27)
<b>5480 · Vehicular Supplies</b>	12,273.76	8,000.00	4,273.76
<b>Total 061.004 · Purchased Supplies 4</b>	<u>14,865.59</u>	<u>16,580.29</u>	<u>(1,714.70)</u>
<b>061.005 · Purchased Supplies 5</b>			
<b>5530 · Public Works Supplies</b>	41,881.82	35,000.00	6,881.82
<b>5531 · Chemicals</b>	14,201.01	23,000.00	(8,798.99)
<b>5580 · Other Supplies</b>	80.64	1,250.00	(1,169.36)
<b>Total 061.005 · Purchased Supplies 5</b>	<u>56,163.47</u>	<u>59,250.00</u>	<u>(3,086.53)</u>
<b>061.007 · Other Charges &amp; Exp 7</b>			
<b>5710 · Travel/mileage-in state</b>	0.00	1,100.00	(1,100.00)
<b>5720 · Out of State Travel</b>	0.00	100.00	(100.00)
<b>5730 · Dues and Memberships</b>	1,929.00	1,500.00	429.00
<b>5780 · Other Charges</b>	60.00	500.00	(440.00)
<b>5785 · Water Assessment D.E.P.</b>	1,677.02	2,000.00	(322.98)
<b>Total 061.007 · Other Charges &amp; Exp 7</b>	<u>3,933.15</u>	<u>5,200.00</u>	<u>(1,266.85)</u>
<b>061.008 · Articles 8</b>			
<b>5850 · New Equipment</b>	1,654.00	10,000.00	(8,346.00)
<b>5870 · Replacement Equipment</b>	1,818.10	1.00	1,817.10
<b>Total 061.008 · Articles 8</b>	<u>3,472.10</u>	<u>10,001.00</u>	<u>(6,528.90)</u>



12:00 PM  
06/26/14  
Accrual Basis

Townsend Water Department  
Budget vs. Actual  
July 2013 through May 2014

2.4.2

	Jul '13 - May 14	Budget	\$ Over Budget
Ordinary Income/Expense			
Expense			
061.000 · General Operations 000			
061.001 · Personal Services 1			
5100 · Salaries & Wages-Water Super	63,074.00	70,055.00	(6,981.00)
5110 · Salary & Wages-Oper Staff	86,292.00	98,154.00	(11,862.00)
5112 · Salary & Wages-Support Staff	48,726.63	55,017.00	(6,290.37)
5120 · Salaries & Wages - Temp. Help	0.00	1.00	(1.00)
5130 · Additional Gross	2,526.75	10,460.00	(7,933.25)
5132 · Other-Longevity	0.00	0.00	0.00
5134 · Additional Gross-Reg&SpecOnc...	15,419.63	13,825.00	1,594.63
5190 · Other Stipened-Longevity	3,900.00	3,900.00	0.00
5191 · Other - Stipend BOWC	0.00	3.00	(3.00)
5193 · Retirement Benefit	0.00	2,000.00	(2,000.00)
5195 · Other-Clothing Allowance	722.52	2,850.00	(2,127.48)
Total 061.001 · Personal Services 1	220,661.53	256,265.00	(35,603.47)
061.002 · Purchased Services 2			
5210 · Energy	72,966.86	82,000.00	(9,033.14)
5240 · Repair & Maint Building	3,477.08	5,000.00	(1,522.92)
5245 · Repair & Maint Equipment	13,884.14	20,000.00	(6,115.86)
5245100 · Repair & Maintain Equip SC...	0.00	1.00	(1.00)
5270 · Rentals	315.00	1,000.00	(685.00)
Total 061.002 · Purchased Services 2	90,643.08	108,001.00	(17,357.92)
061.003 · Purchased Services 3			
5300 · Professional Services	44,752.51	20,000.00	24,752.51
5300100 · Proff Service Backflow	5,600.00	6,000.00	(400.00)
5340 · Communication	12,390.99	17,600.00	(5,209.01)
5380 · Other Services	0.00	2,600.00	(2,600.00)
Total 061.003 · Purchased Services 3	62,743.50	46,200.00	16,543.50



2.4.1

**TOWNSEND WATER DEPARTMENT**  
540 Main Street West Townsend, Massachusetts 01474

Michael MacEachern, Chairman

Niles Busler, Vice Chairman

Nathan Mattila, Clerk

Paul L. Rafuse,  
Water Superintendent

(978) 597-2212

Fax (978) 597-5611

NO. 14/15  
6/30/2014

SCHEDULE OF BILLS RECEIVABLE

To the Accountant:  
Treasurer:

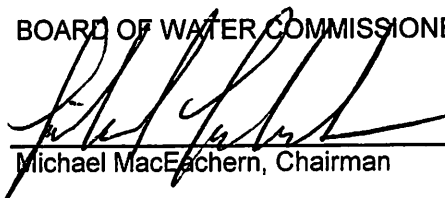
The following bills, amounting in the aggregate to

TWO THOUSAND SEVEN HUNDRED THREE AND 42/100\*\*\*\*\* Dollars

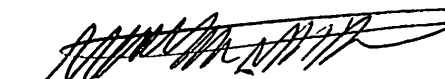
are herewith committed for collection.

<u>DATE</u>	<u>USER CHARGES</u>	<u>SERVICE CHARGES</u>	<u>CONN CHARGES</u>	<u>BACK FLOW</u>
06/30/14	389.50	313.92	2,000.00	0.00

BOARD OF WATER COMMISSIONERS

  
Michael MacEachern, Chairman

  
Niles Busler, Vice-Chairman

  
Nathan Mattila, Clerk





Office of the  
Townsend Water Department  
540 Main Street

West Townsend, MA 01474  
Tel: 978-597-2212  
Fax: 978-597-5611

Application No. 2014-07

Account No. 61707

Date Issued 7/3/2014

APPLICATION FOR WATER SERVICE

Name of Property Owner: Decca Corporation

Service Address: 2 Trophy Avenue

Townsend MA, 01469

Tel No.: 978-265-2020 Peter Cell No. \_\_\_\_\_

Billing Address:

(If different from service address): 171 Kendell Road

Tewksbury MA 01876

1" service. System Development Charge \$2,000.00.

Units (Check all that apply):

\_\_\_\_\_ Single Family (If Professional Bldg.) No. of Businesses \_\_\_\_\_

X \_\_\_\_\_ Multi Family (Apartment Building) No. Apartments \_\_\_\_\_

\_\_\_\_\_ Hotel/Motel No. Rooms: \_\_\_\_\_

Type of Use (Check One): X \_\_\_\_\_ Residential \_\_\_\_\_ Industrial

\_\_\_\_\_ Commercial/Business \_\_\_\_\_ Municipal

\_\_\_\_\_ Agricultural

Is a sprinkler system required for fire protection? \_\_\_\_\_ Yes X \_\_\_\_\_ No

If yes a proposed design plan of the system must be submitted including required flows, required pipe size, and size and backflow prevention device.

Is a flow test/s required? \_\_\_\_\_ Yes X \_\_\_\_\_ No

If yes the owner will be billed separately at the current rate per flow test.

Is there an existing or proposed automatic lawn irrigation system? X \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ On separate well

Has a sketch or plot plan been provided showing the location of the septic system, automatic lawn irrigation system and any known or proposed additions to the existing building? \_\_\_\_\_ Yes X \_\_\_\_\_ No \*\*\*\*\*Plot Plan Requested

I, the Owner understand this form is to be completed and all Fees, charges, and required documentation must be received before water service will be turned on. I also understand that I have from April 1st to November 1st of the same calendar year of the application date to complete the installation or this application shall be null and void and the Connection/System Development charge forfeited. In addition, I acknowledge receipt of the Townsend Water Department's current Rules and Regulations CN

Signature of Owner/Applicant

Date

BOARD OF WATER COMMISSIONERS

Chairman

Vice Chairman

Clerk

Date Signed by Board of Water Commissioners



Office of the  
Townsend Water Department  
540 Main Street

West Townsend, MA 01474  
Tel: 978-597-2212  
Fax: 978-597-5611

Application No. 2014-09

Account No. 61655

Date Issued 7/9/2014

APPLICATION FOR WATER SERVICE

Name of Property Owner: Transformations Inc.

Service Address: 9 Penny Lane

Townsend MA, 01469

Tel No.: \_\_\_\_\_ Cell No. \_\_\_\_\_

Billing Address:

(If different from service address): 8 Coppersmith Way

Townsend MA 01469

1" service. System Development Charge \$2,000.00.

Units (Check all that apply):

☒ Single Family (If Professional Bldg.) No. of Businesses \_\_\_\_\_  
☐ Multi Family (Apartment Building) No. Apartments \_\_\_\_\_  
☐ Hotel/Motel No. Rooms: \_\_\_\_\_

Type of Use (Check One): ☒ Residential ☐ Industrial  
☐ Commercial/Business ☐ Municipal  
☐ Agricultural

Is a sprinkler system required for fire protection? ☐ Yes ☒ No

If yes a proposed design plan of the system must be submitted including required flows, required pipe size, and size and backflow prevention device.

Is a flow test/s required? ☐ Yes ☒ No

If yes the owner will be billed separately at the current rate per flow test.

Is there an existing or proposed automatic lawn irrigation system? ☒ Yes ☐ No On separate well

Has a sketch or plot plan been provided showing the location of the septic system, automatic lawn irrigation system and any known or proposed additions to the existing building? ☐ Yes ☒ No \*\*\*\*\*Plot Plan Requested

I, the Owner understand this form is to be completed and all Fees, charges, and required documentation must be received before water service will be turned on. I also understand that I have from April 1st to November 1st of the same calendar year of the application date to complete the installation or this application shall be null and void and the Connection/System Development charge forfeited. In addition, I acknowledge receipt of the Townsend Water Department's current Rules and Regulations

Signature of Owner/Applicant

Date

BOARD OF WATER COMMISSIONERS

Chairman

Vice Chairman

Clerk

Date Signed by Board of Water Commissioners



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## **TOWNSEND FUEL EFFICIENT VEHICLE REPLACEMENT PLAN**

### **Overview:**

The Townsend Fuel Efficient Vehicle Replacement Plan (Plan) was developed as an attachment to the Fuel Efficient Vehicle Policy (Policy) adopted by the Board of Selectmen on June 19, 2012. The Plan applies to all vehicles owned by the Town of Townsend. Townsend municipal departments shall replace all non-exempt vehicles with fuel efficient vehicles as described in the Policy.

### **Replacement Process:**

All non-exempt vehicles shall be replaced with fuel efficient vehicles that meet the fuel efficiency ratings outlined in the Policy. Vehicles must be replaced when they are no longer operable and will not be recycled from one municipal department to another unless the replacement vehicle meets the fuel efficiency rating outlined in the Policy. It is anticipated that all non-exempt vehicles listed in the 2012 vehicle inventory will be replaced at some time in the next 5 years.

As stated in the Policy, police cruisers are currently exempt from this provision. New cruisers shall meet the fuel efficiency ratings when fuel efficient cruisers become commercially available.

### **Annual Review:**

This Fuel Efficient Vehicle Replacement Plan shall be reviewed by the Town on an annual basis.

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This Green Communities' Guidance for Criteria 4 must be checked for updates prior to ordering replacement vehicles.

#### **EXEMPTIONS**

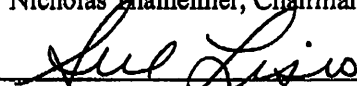
- Heavy-duty vehicles. Examples include fire-trucks, ambulances, and some public works trucks that meet the definition of Heavy-duty vehicle.
- Police cruisers, passenger vans and cargo vans are exempt from this criterion as fuel efficient models are not currently available. However, the Town commits to purchasing fuel efficient police cruisers, passenger vans and cargo vans when they become commercially available. Police and fire department administrative vehicles are NOT exempt and must meet fuel efficient requirements.

#### **QUESTIONS / ENFORCEMENT**

All inquiries should be directed to the Town Administrator. This policy is enforced by the Town Administrator and/or their designee(s).

#### **TOWNSEND BOARD OF SELECTMEN**

  
Nicholas Thalheimer, Chairman

  
Sue Lisio, Vice Chair

  
Robert Plamondon, Clerk





## TOWN OF TOWNSEND FUEL EFFICIENT VEHICLE POLICY

Policy #2012-03  
Adopted on June 19, 2012

### **POLICY STATEMENT:**

In an effort to reduce the Town of Townsend's fuel consumption and energy costs the Board of Selectmen hereby adopts this fuel efficient vehicle policy.

### **DEFINITIONS**

**Combined city and highway MPG (EPA Combined fuel economy):** Combined Fuel Economy means the fuel economy from driving a combination of 43% city and 57% highway miles and is calculated as follows:

$$=1/((0.43/\text{City MPG})+(0.57/\text{Highway MPG}))$$

**Drive System:** The manner in which mechanical power is directly transmitted from the drive shaft to the wheels. The following codes are used in the drive field:

- AWD = All Wheel Drive: four-wheel drive automatically controlled by the vehicle powertrain system
- 4WD = 4-Wheel Drive: driver selectable four-wheel drive with 2-wheel drive option
- 2WD = 2-Wheel Drive

**Heavy-duty vehicle:** A vehicle with a manufacturer's gross vehicle weight rating (GVWR) of more than 8,500 pound

### **POLICY STATEMENT**

In an effort to reduce the Town's fuel consumption and energy costs the Townsend Board of Selectmen hereby adopts a policy to purchase only fuel efficient vehicles to meet this goal.

### **PURPOSE**

To establish a requirement that the Town purchase only fuel efficient vehicles for municipal use whenever such vehicles are commercially available and practicable.

### **APPLICABILITY**

This policy applies to all divisions and departments of the Town.

### **GUIDELINES**

All departments shall purchase only fuel-efficient vehicles for municipal use whenever such vehicles are commercially available and practicable.

The Town will maintain an annual vehicle inventory for ALL vehicles and a plan for replacing any non-exempt vehicles with vehicles that meet, at a minimum, the fuel efficiency ratings contained in the most recent guidance for Criteria 4 published by the MA Department of Energy Resources' Green Communities Division.

**nbusler**

---

**From:** "Karen Chapman" <kchapman@townsend.ma.us>  
**To:** "Niles Busler" <nbusler@squanicook.com>  
**Sent:** Monday, July 14, 2014 10:53 AM  
**Attach:** Vehicle Policy.pdf  
**Subject:** Water Dept Vehicle

Hi Niles - I understand from Carolyn that Paul's vehicle needs to be replaced. Attached is the Vehicle Policy that the Selectmen created when we applied to become a Green Community. According to my records, Paul has a 2007 Ford F-150 with a rating of 16 mpg that is non-exempt with regards to our Green Community status. The vehicle to replace this must have better fuel efficiency. Would you consider purchasing an electric vehicle or a hybrid to replace Paul's truck?

Thanks  
Karen

Karen Chapman  
Co-Land Use Coordinator  
ZBA Administrative Assistant  
272 Main Street, Townsend, MA 01469  
(978)597-1723  
(978)597-1722 (FAX)  
[kchapman@townsend.ma.us](mailto:kchapman@townsend.ma.us)

*This electronic message (including any attachments) is confidential and intended for the named recipient only. Any dissemination, disclosure or distribution of the contents of this communication is unlawful and prohibited. If you have received this message in error, please contact by return email or telephone (978-597-1723), and delete the copy you received. Thank you.*

1. Engine & FRAME

7/14/2014



## 2.2 Commissioners Updates/Report.

NB expressed his disappointment with the Board as to the vote made approving the Lockbox with Century Bank in his absence. NB explained that he was working with Rollstone Bank to see if they could provide us with a lockbox system. Paul explained that he expressed that he was uncomfortable using Rollstone Bank. He wanted a more experienced system in place. NM recalled that the reason behind going with Century Bank was to avoid being a guinea pig for Rollstone Bank.

## 2.3 Water Superintendent Updates/Reports

2.3.1 Paul explained that the 2007 Ford F-150 engine is shot and the frame was comprised. Townsend Ford cannot help in any way due to the age of the truck. Carolyn had suggested purchasing an electric car. This would help the energy commission with their green communities' status grants. NM still would like to look into the cost of having the frame repaired. It was tabled.

2.3.2 Paul updated the Board on the delay of the July 2014 Billing.

## 2.4 Office Updates/Report.

2.4.1 The Board signed the June 2014 schedule of bills receivable report.

2.4.2 The Board reviewed the appropriation balance report.

2.4.3 The Board reviewed the June 2014 account receivable report.

## 2.5 Review and Sign Bills Payable Warrants

2.5.1 The Board reviewed the payroll warrants.

## III. ADJOURNMENT:

MM moved to adjourn the meeting at 6:34 p.m.

Respectfully submitted,

Brenda Boudreau  
Office Administrator



**TOWNSEND WATER DEPARTMENT**  
540 Main Street West Townsend, Massachusetts 01474

Michael MacEachern, *Chairman*  
Paul L. Rafuse,  
*Water Superintendent*

Niles Busler, *Vice-Chairman*

  
Nathan Mattila, *Clerk*  
(978) 597-2212  
Fax (978) 597-5561

**WATER COMMISSIONERS MEETING Minutes**

July 14, 2014 - 5:30P.M.

Water Department 540 Main Street, Meeting Room

**I. PRELIMINARIES:**

- 1.1 MM called the meeting to order at 5:31 p.m. At 540 Main Street, West Townsend.
- 1.2 Roll call showed Michael MacEachern (MM) Chairman, Niles Busler (NB), Vice-Chairman and Nathan Mattilla (NM) present.
- 1.3 MM announced that the meeting is being tape recorded
- 1.4 Chairman's additions or deletions. NB presented a memorandum from Kopelman & Paige regarding taking and maintain meeting minutes. Niles requested that all minutes follow this format and that the minutes presented at tonight's meeting be corrected and submitted at the August 2014 meeting. NB also expressed his displeasure with the board for making the decision to go with the Lockbox from Century bank while he was absent from the June 9, 2014 meeting.
- 1.5 Review/ Approve meeting minutes of August 13, 2013, June 9, 2014 and June 23, 2014.  
Tabled for corrections ( refer to 1.4)

**II. MEETING BUSINESS:**

2.1 Discussion/Update.

- 2.1.1 Vote to carry forward the balances on the special accounts. NB moved to carry forward the balance on the following accounts: nm seconded. Unanimous vote.  
061.400.5009  
061.400.5012  
061.400.5013  
061.400.5014  
061.500.5000  
061.500.5020
- 2.1.2 The Board reviewed and signed contracts from Stantec for the SCADA project.
- 2.1.3 The Board discussed the quotes to purchase new PH analyzers and probes at each pump station. It was tabled.
- 2.1.4 NM moved to approve 1" service #61707, Decca Corp, 2 Trophy Avenue. NB seconded. Unanimous vote.
- 2.1.5 NM moved to approve 1" service #61655, Transformations Inc, 9 Penny Lane. NB seconded, Unanimous vote.