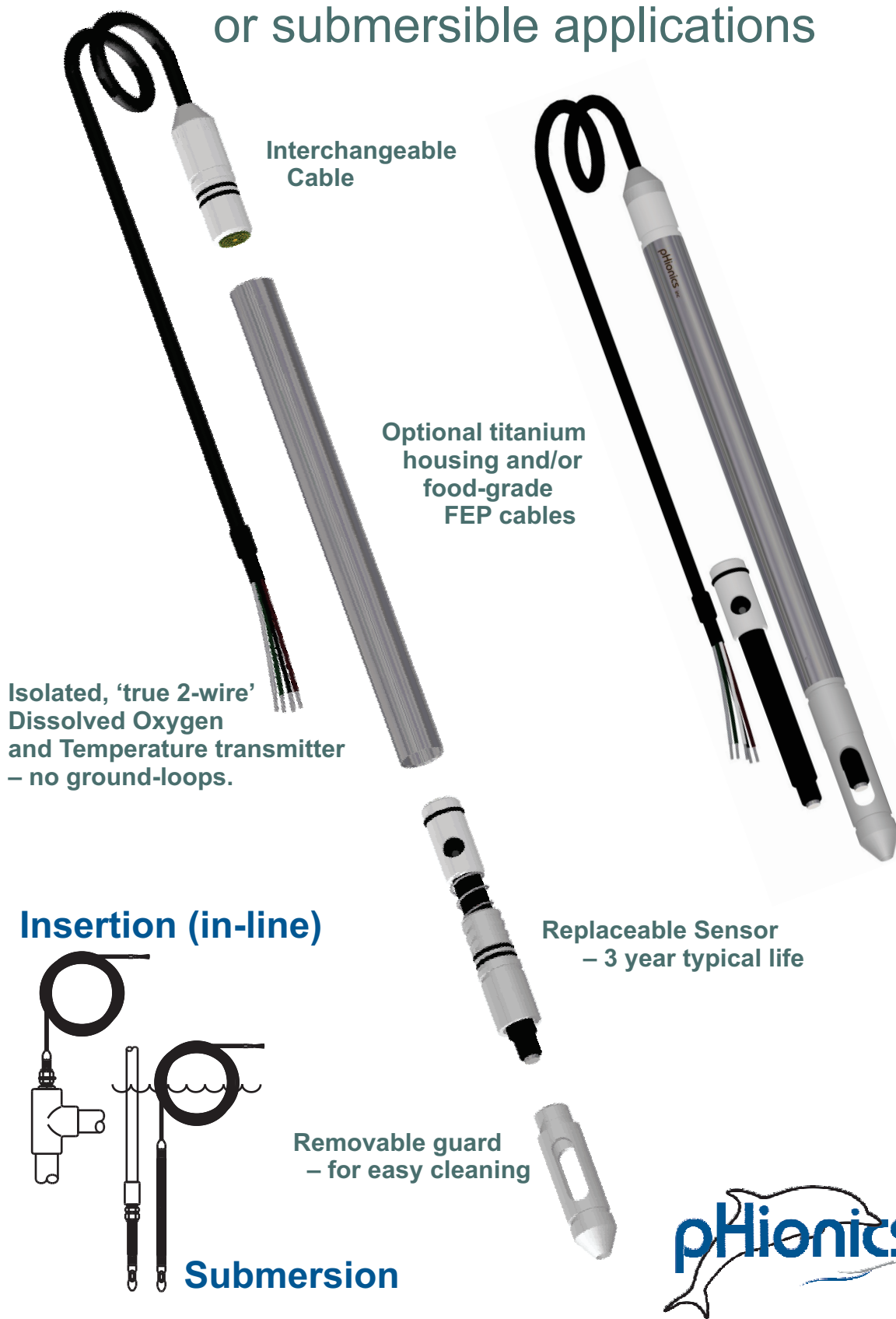


# Isolated STs Series, 4-20 ma **Dissolved Oxygen and Temperature** transmitter for in-line or submersible applications



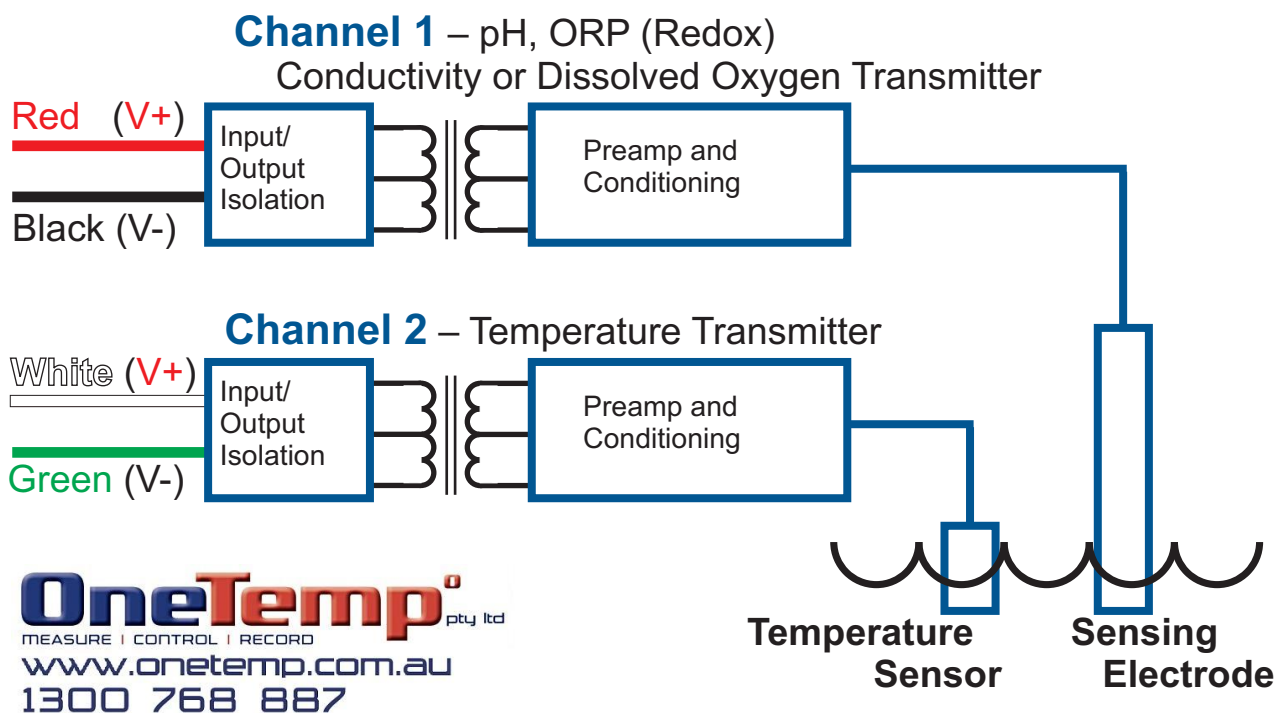
# Product Description

The STs series of submersible water quality transmitters have an integrated preamp and an isolated 'true 2-wire', 4-20 ma transmitter. Two independent channels simultaneously transmit a dissolved oxygen (DO) and temperature signal -- two wires for DO and two wires for temperature. The compact design afforded by the patented pHiConn (TM) keyless connection system -- and the 316SS (titanium optional) and Delrin construction -- make the rugged sensor/transmitter ideal for applications such as process control, data acquisition, wastewater treatment, and, groundwater monitoring. The units can be submersed to 200 feet (approximately 100 psi). Individual units can be combined to make redundant or multiparameter modules using the pHionics' patented pHiKlip (TM) array system. The pHiKlip (TM) system also allows for the units to be used in in-line (insertion) applications without fear of blow-out. As with all pHionics' designs, the sensor/transmitters are designed with 'ease of service' as a primary goal.

The 'true 2-wire', 4-20 ma STs series sensor/transmitters send a current proportional to the parameter being measured on the same two wires that provide the power (7 to 40 volts dc). Current transmission allows for long runs of inexpensive cable or wire (up to three miles) that is virtually noise-free without any signal loss that is common to voltage (IR drop) or digital (capacitance affecting 'rise/fall' timing). The seven volt operation allows the units to be powered by 12 volt battery systems with 5 volts of compliance, making them compatible with RTU's and solar powered applications. The units are intended for calibration via software supplied with the datalogger, PLC, or through the DCS.

The dissolved oxygen signal on Channel 1 is automatically temperature compensated -- correcting for membrane and solution temperature changes. This is not to be confused with the temperature channel of the transmitter, which provides an independent, isolated, 4-20 ma output proportional to the 0 to 50 Celsius range on Channel 2. The auto-polarity correction feature directs the applied supply voltage to allow for proper operation regardless of wire hookup. The Red and Black wires are for Channel 1 -- dissolved oxygen, and the White and Green wires are for Channel 2 -- temperature.

The large surface area of the sealed, galvanic measuring cartridge allows for accurate operation of the transmitter within minutes of installation. This is unlike the delays common to typical sensors that can sometimes take 24 hours to stabilize after installation or membrane/solution replacement. The sealed cartridge concept also reduces the man-power that is required with other sensors that often need to be refilled and have the membrane replaced every six months -- and the inherent problems associated with the process. The 30 month typical cartridge life results in a nominal cost of ownership of \$10/per month, and can be replaced within 15 seconds -- further lowering costs, and simplifying use.



cbs025p

hsgs

sbd100

scs3010

grd100

7.62 meters (25 feet)  
standard cable length

362 mm (14.25")

19 mm (0.750") DIA

## Specifications:

### Series STs Channel 1, Dissolved Oxygen transmitter

O <sub>2</sub> sensing range	0-20 mg/l (0 to 10 mg/l optional)
Output	4 to 20 ma
Power supply voltage	7 to 40 vdc
Loop impedance (max)	250 ohms at 12 vdc, 850 ohms at 24 vdc, 1650 ohms at 40 vdc
Isolation	600 vdc, >70 db at 50/60 hz
Linearity (of electronics)	± 0.5% of full scale
Accuracy	± 2.0% of full scale
Sensitivity	± 0.05% of full scale
Stability	± 2.0% of full scale
Repeatability	± 1.0% of full scale
Electrode type	galvanic, cartridge
Response time (including electrodes)	98% < 60 seconds
Temperature compensation	automatic, 0-50 °C
Pressure	0-100 psi
Humidity	0-100%
Wetted materials	316 ss, PVDF or Delrin, Viton, glass, titanium optional
Length	362 mm (14.25 in.)
Diameter	19 mm (0.750 in.) maximum
Weight (excluding cable)	< 0.22 kg (0.5 lb.)
Cable type	Removeable, shielded polyurethane, water-blocked Kevlar reinforced, 1.36 kg/100 feet
Cable length (standard)	7.6 meters (25 feet)
Cable from transmitter to power supply	4 conductor, twisted pair, 3 mile maximum
ORP channel wire colors	<b>Red (+), Black (-)</b>

### Channel 2, temperature transmitter

Range	0-50 °C
Output Current	4 to 20 ma, true 2-wire
Linearity	± 0.5 °C
Accuracy	± 1 °C
Power supply voltage	7 to 36 vdc
Isolation	600 vdc, >70 db at 50/60 hz
Cable from transmitter to power supply	4 conductor, twisted pair, 3 mile maximum
Temperature channel wire colors	<b>White (+), Green (-)</b>

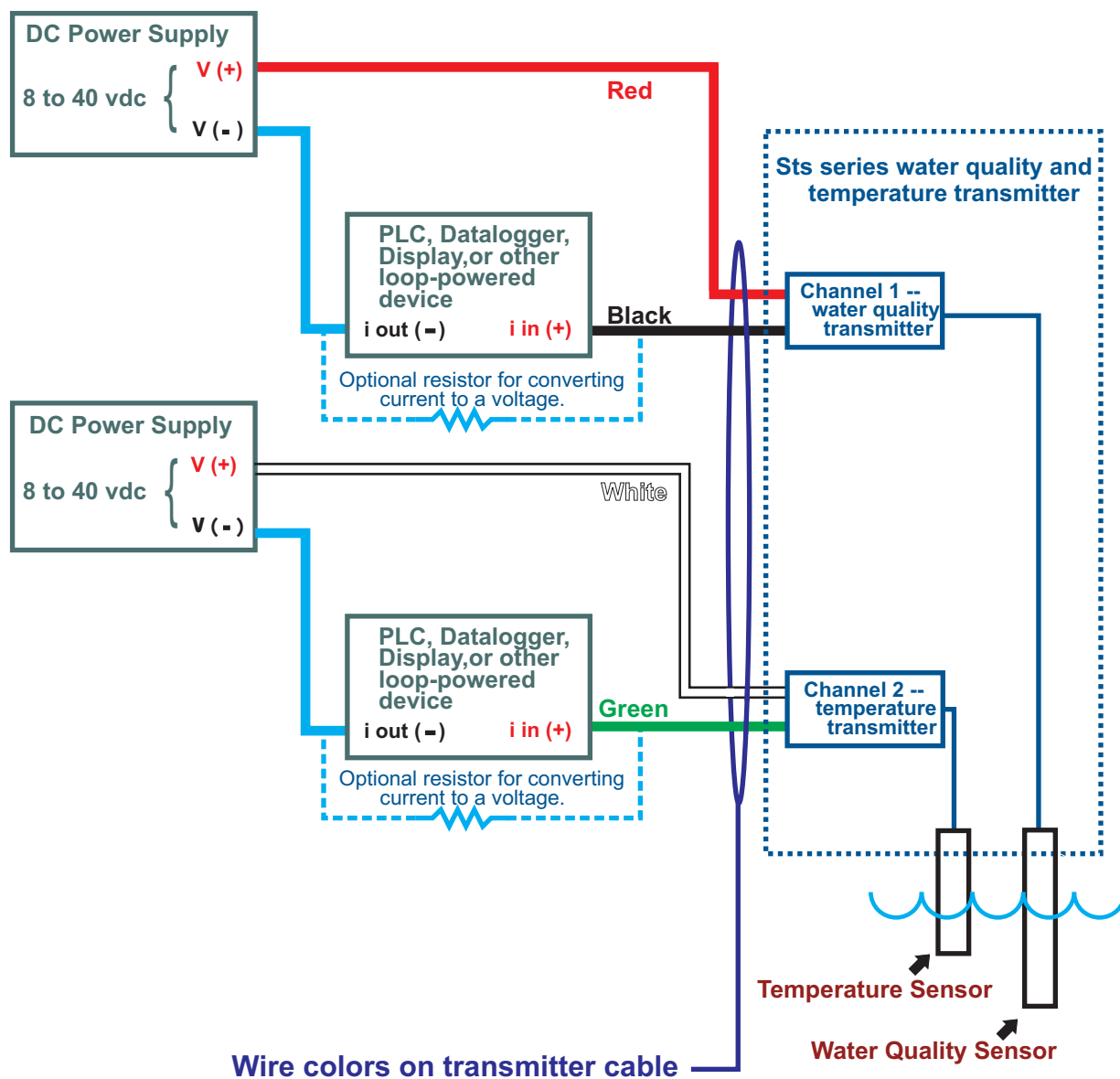
Viton, Teflon, Kevlar, Delrin, and Kynar are registered trademarks of the DuPont company



© 2013 pHionics Inc. All rights reserved.

[www.pHionics.com](http://www.pHionics.com)

# Wiring diagram for 4-20 ma current output water quality transmitters





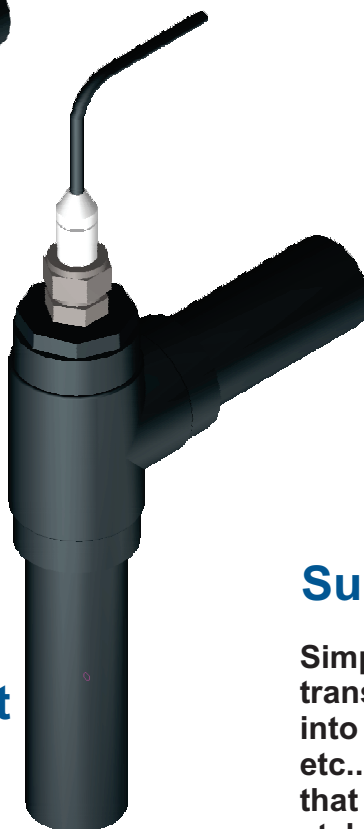
cmp34s/ab

## Insertion (in-line)

typical application  
shown with  
anti-blow-out  
316 SS compression fitting  
(P/N cmp34s/ab)

## Mounting

1-1/2 inch PVC  
or equivalent



## Submersion

Simply lower the transmitter and cable into the tank, lake, well, etc.. For applications that require more stability and/or protection of the cable and transmitter from mixers, chemical injection points, etc. -- reverse the cmp34s compression fitting and mount at the end of a standpipe or equivalent, as shown. (Conductivity transmitter shown in example at right)



## Order Code for STs series

### 4-20 ma Dissolved Oxygen and Temperature transmitter

Price includes sensor, transmitters, and housing – cable must be ordered separately.



#### Transmitter, Sensor, and Housing (for compatible cable -- see below)

STs			
	Range		
	020d	0 to 20 mg/l (ppm) -- <b>typ. stocked</b>	
	010d	0 to 10 mg/l (ppm)	
	Output		
	4_20	4 to 20 ma output	
	Housing Material		
	s	316 Stainless Steel	
	t	Titanium	
Series	Range	Output	Housing
<u>S</u> <u>I</u> <u>s</u>	---	4_20	-

The second channel Temperature transmitter is 0 to 50 Celsius with a 4 to 20 ma output. N/C



#### Submersible Cable for STs Series Transmitters (1 required per transmitter)

The 25 foot **CBs025p** is the standard **stocked** cable for

The CBs025p is a shielded, water-blocked, polyurethane-jacketed cable

with Kevlar reinforcement

#### Custom cable lengths and Jacket Materials can be ordered as follows:

CBs		
	Length (feet)	
	xxx	Specify xxx in feet, such as 010, 045, 425, etc.
	Jacket Material (Polyurethane or FEP)	
	p	Poly
	f	FEP
Series	Length	Jacket Material
<u>C</u> <u>B</u> <u>s</u>	---	-

**OneTemp**<sup>o</sup> pty ltd  
 MEASURE | CONTROL | RECORD  
[www.onetemp.com.au](http://www.onetemp.com.au)  
 1300 768 887

