

ELECTRO - CHEMICAL DEVICES, INC.

23665 Via Del Rio, Yorba Linda, CA 92687 USA

SPECIFICATION SUMMARY CS10/17 TOROIDAL CONDUCTIVITY SENSOR for Model T23 Transmitters

MEASUREMENT RANGE

Conductivity: 50 mS through 1,000 mS.
(50,000 uS through 1 S)

SHIPPING WEIGHT

CS10: 2.50 lbs (1.13 kgs)
CS17 without VSS: 2.75 lbs (1.25 kgs)
CS17 with VSS: 5.80 lbs (2.63 kgs)

OUTPUT

Signal conditioned output, intrinsically-safe.

HOUSING & MATERIALS

Standard: Kynar
Optional: Polypropylene
Teflon
PVC

SIGNAL CONDITIONER:

Integral to sensor. Three types available:
T23: Models T23, T28, & T21 transmitter
C22: System C22 Controller

CABLE

Standard: 10 feet
Optional: Specify in 10' increments.
Maximum: 50 feet
Type: 6-conductor shielded (Belden 8786)

POWER SUPPLY

Provided by the transmitter.

OPERATING TEMPERATURE

Standard: +23°F to +302°F (-5°C to +150°C)

PROCESS CONNECTIONS (optional)

CS10: -100 1" Teflon gland fitting

CS17: -VSKT 1 1/2" NPT SS valve-retraction assembly.
-VCS 1" carbon steel valve-retraction assembly.
-VKYT 1 1/2" NPT Kynar valve-retraction assembly, including Teflon-Coated O-rings.

OPERATING PRESSURE

Standard:
CS10: 100 psig @ 80°C
CS17: 300 psig @ 100°C

All sensors ordered with valve-retraction assemblies are provided with safety lanyards.

DIMENSIONS

CS10: 1.00" dia x 13.00" lg.
(1.9 cm x 34.9 cm)
CS17: 1.00" dia x 21.00" lg.
(1.9 cm x 48.3 cm)

Dimensions are housing diameter x length of sensor. Length is measured from front of Toroidal to rear of cable seal.

TEMPERATURE COMPENSATION

Automatic, 0°C to +100°C.
Accuracy within +/-0.2°C over a +5°C to +95°C span.
Uses a 100,000 ohm thermistor, integral to sensor.

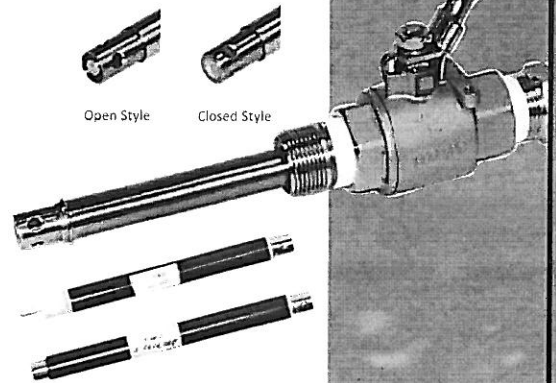
Conductivity Measurements

Two competing technologies are used to measure Conductivity; **Contacting Conductivity**, an impedance measurement between two metal contacts in the solution or **Toroidal Conductivity**, a **non-contacting measurement** made between two coils inside the sensor inductively coupled through the solution's conductivity. Toroidal sensors excel in the higher conductivity ranges and coating or 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. The Contacting Conductivity S10 and S17 sensors come in three ranges, Low Range, $1\mu\text{S} - 20\mu\text{S}$, High Range, $50\mu\text{S} - 20\text{mS}$ and Resistivity, $2\text{M}\Omega - 50\text{M}\Omega$.



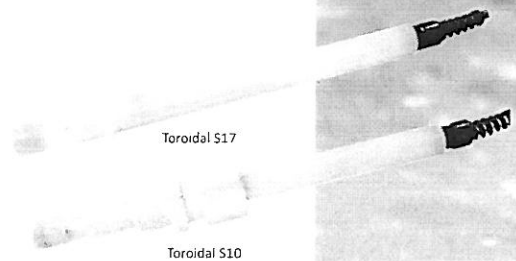
Conductivity and Resistivity Cartridges

Replaceable cartridges optimize the measurement over a specified range. Each cartridge has a specified range of $\frac{1}{2}$ to 2 times the specified value, i.e. a Specified Value of $20\mu\text{S}$ provides an optimal range of $10\mu\text{S} - 40\mu\text{S}$. Seventeen cartridges are available to cover the range of $50\text{M}\Omega$ resistivity to 50mS conductivity. The cartridge provides the inner contact of the measurement with the housing providing the other contact. The standard wetted materials are 316 Stainless Steel, PVDF and VITON o-rings. Three front end guard styles are offered; open for resistivity or low conductivity measurements, closed for high conductivity measurements and a 3A approved sanitary front end for food and pharmaceutical applications.



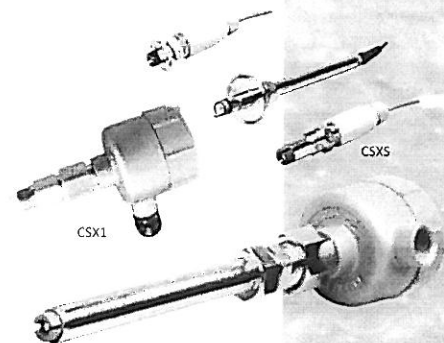
Toroidal Sensors - (non-contacting)

The S10 and S17 Toroidal sensors have a $\frac{3}{4}$ " diameter PVDF body, not the stainless steel used for the other measurements. The sensors are sealed and there are no replaceable cartridges. These sensors are ideal for high conductivity solutions like % concentration measurements or any application that coats or corrodes the standard contacting conductivity sensors. The measurement range is from 0.5 mS to 1000 mS.



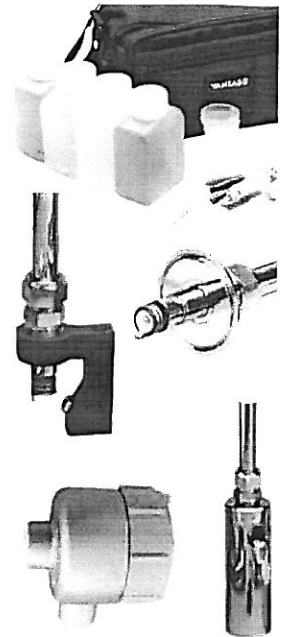
CSX Series Sensors

The CSX1 High Temperature- High Pressure sensors are designed for service to 230°C and 660 psig. These insertion style $\frac{3}{4}$ " MNPT, 316 stainless steel sensors have ceramic insulators and are available with or without an aluminum junction box. The junction box is rated Class I, Div I, Groups C & D, Class II, Groups E, F and G hazardous locations. The CSXS sensors are rated for service to 150°C and 225 psig and use RYTON®, KYNAR® or Teflon® insulators. These $\frac{3}{4}$ " MNPT, stainless steel insertion style sensors are available in various fixed insertion lengths. An aluminum junction box is mounted on the rear of the sensor that contains a terminal block and optional signal conditioner.



Accessories and Ordering Information

Part #	Description
1000070	Panel Mounted Flow Cell for S10, 1/2" FNPT through, PVC
1000071	Panel Mounted Flow Cell for S10, 1/2" FNPT through, PVDF
1000072	Panel Mounted Flow Cell for S10, 1/2" FNPT through, 316 SS
2000263	Handrail Mounting Kit, includes PVC extension pipe and 304 SS Hardware
1000235	Raft Float Assembly Kit, includes Float, Boom and Swivel Mount Hardware
1000122	PVC Spray Cleaning Nozzle for 3/4" Metallic Housings
1000154	PVC Spray Cleaning Nozzle for 1" PVDF or PP Housings
1000051	NEMA 4X Junction Box 5 point Terminal block, Remote mounting
2001030	ABS Black Plastic junction Box, Sensor Mounted
2000948	Aluminum Junction Box, sensor Mounted
2000756	Sanitary Flange Fitting, 2", for use with S10 (also in 1" and 2 1/2" size)
2000076	25 mm Port Fitting, Ingold Style, for use with S10
2010XXX	pH Calibration Solutions, pH 4.01(100), 7.00(101), 10.0(103), 500 ml bottles
2010XXX	Conductivity Cal Solutions, 1mS(150), 10mS(151), 100mS(155), 500 ml bottles
2010170	ORP Calibration Solution, 500 ml bottles



Ordering Information

PH S10		T23	CBL	S	EG	75HT
Function & Style		Instrument	Cable Length	Material	Electrode Guard	Process Connection
PH	S10	T23	CBL (10 ft. Std.)	Stainless Steel	75	3/4" 316 SS Gland nylon Ferrule (S10)
MV (ORP)	or	T28	CBL20 (20 ft.)	Titanium	75HT	3/4" 316 SS Gland Teflon Ferrule (S10)
MV (pION)	S17	C22	CBL** (** ft.)	Hastelloy C	75K	3/4" KYNAR Gland and Ferrule (S10)
DO			** Consult Factory	Kynar	VSS	1" 316 SS Valve Retraction Assembly
					VKY	1" KYNAR Valve Retraction Assembly

Toroidal Conductivity

CS17	CBL20	100 mS	K	TOR	EPR	VKY		
Function & Style	Cable Length	Range	Material	Toroidal	O-Ring Material	Process Connection		
Toroidal	CBL (10 ft. Std.)	0-0.5 mS 0-50 mS	Kynar	Viton (std)	75	3/4" KYNAR Gland		
CS10 (Insertion)	CBL20 (20 ft.)	0-1 mS 0-100 mS				EPR	SIL	VKY 1" KYNAR
CS17 (Retractable)	CBL** (** ft.)	0-2 mS 0-200 mS				FSIL	CV75	Valve Retractable Assembly
	** Consult Factory	0-5 mS 0-500 mS				KLZ	(KALREZ)	
		0-10 mS 0-1S						

Contacting Conductivity

CS17	T23	CBL20	T	2 μS	EPR	VTT
Function & Style	Instrument	Cable Length	Material	Range	O-Ring Material	Process Connection
RS10 (Insertion)	T23 T28 C22	CBL (10 ft. Std.)	Stainless Steel	Resistivity	Viton (std) EPR FSIL KLZ	75 75HT
RS17 (Retractable)		CBL20 (20 ft.)	Titanium	2, 20, 50 MΩ		75K VSS
CS10 (Insertion)		CBL** (** ft.)	Hastelloy C	Low Range		VKY (see above for explanation)
CS17 (Retractable)		** Consult Factory		1,2,5,10, 20μS High Range 0.1 to 50 mS		

S10 & S17

All Sensors

Dimensions:

S10 - 3/4" OD x 13 3/4" Length

S17 - 3/4" OD x 24" Length

Cable Length:

10 ft. standard

Optional lengths in 10 ft increments

6 conductor shielded (Belden 8786)

Housing Materials:

316 Stainless Steel, Standard

Titanium (T), grade 2, Optional

Hastelloy (H), C-22, Optional

PVDF (K), Optional

O-Ring Materials:

Viton™ (VIT), Standard

Ethylene Propylene (EPR), Optional

Fluorosilicone (FSIL), Optional

Silicone (SIL), Optional

Kalrez™ (KLZ), Optional

CV75 (CV), Optional

Process Connections:

S10

-75 3/4" 316 SS gland fitting with nylon ferrule

-75HT 3/4" 316 SS gland fitting with Teflon™ ferrule

-75SF 3/4" 316 SS gland fitting with stainless steel ferrule

-75TFE 3/4" Teflon™ gland fitting with Teflon™ ferrule

-100 1" Teflon™ gland fitting for PVDF housing only

S17

-VSS 1" 316 SS valve retraction assembly

-VKY 1" PVDF valve retraction assembly

Shipping Weight:

S10 2.5 lbs (1.2 kg)

S17 2.75 lbs (1.25 kg)

S17-VSS 5.8 lbs (2.65 kg)

PHS10 & PHS17

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

Optional HP version:

0 - 300 psig @ 140°C

Temperature Compensation:

Automatic 0° - 100°C

Accuracy ± 0.2°C over the range

3,000 ohm BALCO RTD

MVS10 & MVS17

ORP & Specific Ion

Measurement Range:

ORP: -2000 mV to 2000 mV

plon: Sensor Specific, ppb, ppm & ppt

Temperature Range:

0° - 90° C

Pressure Range:

0 - 100 psig @ 90°C

Temperature Compensation:

Automatic 0° - 100°C

Accuracy ± 0.2°C over the range

3,000 ohm BALCO RTD

DOS10 & DOS17

Dissolved Oxygen

Measurement Range:

0-20 ppm

0-150 % Saturation

Temperature Range:

0° - 90° C

Pressure Range:

0 - 65 psig @ 90°C

Temperature Compensation:

Automatic 0° - 100°C

Accuracy ± 0.2°C over the range

3,000 ohm BALCO RTD

CS10/RS10 & CS17/RS17

Conductivity/Resistivity

Measurement Range:

Low Range Sensor: 1µS to 20µS

High Range Sensor: 50µS to 20 mS

Resistivity: 2 MΩ to 50 MΩ

Temperature Range:

-5° to 100°C

Optional HT version:

-5° to 150°C

Pressure Range:

CS/RS10 0 - 100 psig

CS/RS17 0 - 300 psig

Optional HP version:

CS/RS10 0 - 300 psig

Temperature Compensation:

Automatic 0° - 100°C

Accuracy ± 0.2°C over the range

uses a 100K ohm thermistor

CS10 & CS17 ✓

Toroidal Conductivity

Measurement Range:

0.5mS to 1000mS

Temperature Range:

-5° to 100°C

Pressure Range:

CS10 0 - 100 psig

CS17 0 - 300 psig

Temperature Compensation:

Automatic 0° - 100°C

Accuracy ± 0.2°C over the range

uses a 100K ohm thermistor

Body material:

KYNAR (PVDF)

CSX Series

Measurement Range:

10µS to 5mS

Temperature Range:

0° to 150°C (CSX1to 230°C)

Pressure Range:

0 - 225 psig (CSX1to 440psig)

Temperature Compensation:

Automatic 0° - 150°C

Accuracy ± 0.2°C over the range

uses a 10K ohm platinum RTD

Wetted Materials:

316 SS and ceramic

Specifications subject to change without notice.

Represented by:



S10/17-H0409