



Chemical Instrument

CPT3200 Electrochemical STIM Series

Water Quality Transducer

Ref: CPT3200_DS_E
Version: 2005-07-07

___IEEE1451.2 STIM Compatible, 1451.1 NCAP Network support. Analog and Digital Signals Output. Remote Setup and Operate.

- **Continuous analysis. Direct measurement in sample**
- **Accurate and reliable, low-maintenance**
- **Self diagnostic, professional intelligent, Menu-driven digital user interface**
- **Auto diagnostic and alarm, optional purge or flush accessories**
- **Easy maintenance ___ on time clear or replacement of sensor in situ**

This series was designed for economical industry application. Any sensor was interfered by other ions. So this instrument is only idea for the samples where only the tested ion is to be changed in process. If other ions existed in concentration 100 times higher and might vary with time, attention to evaluate the accuracy in the sample is important.

The BD5 transmitter was fixed for each order, but it was actually alterative for pH, DO, (NH₃/NH₄⁺), Br⁻, Cd⁺², Ca⁺², CO₂/CO₃⁻², Cl⁻/Cl₂, ClO₄⁻, Cu⁺², CN⁻, F⁻, BF₄⁻, I⁻, Li⁺, Pb⁺², NO₃⁻, (NOx)i/NO₂⁻, K⁺, Ag⁺/S⁻², Na⁺, SCN⁻, Ca⁺²/Mg⁺², ORP, X⁺/X⁻ and other electrochemical ions or dissolved gases.

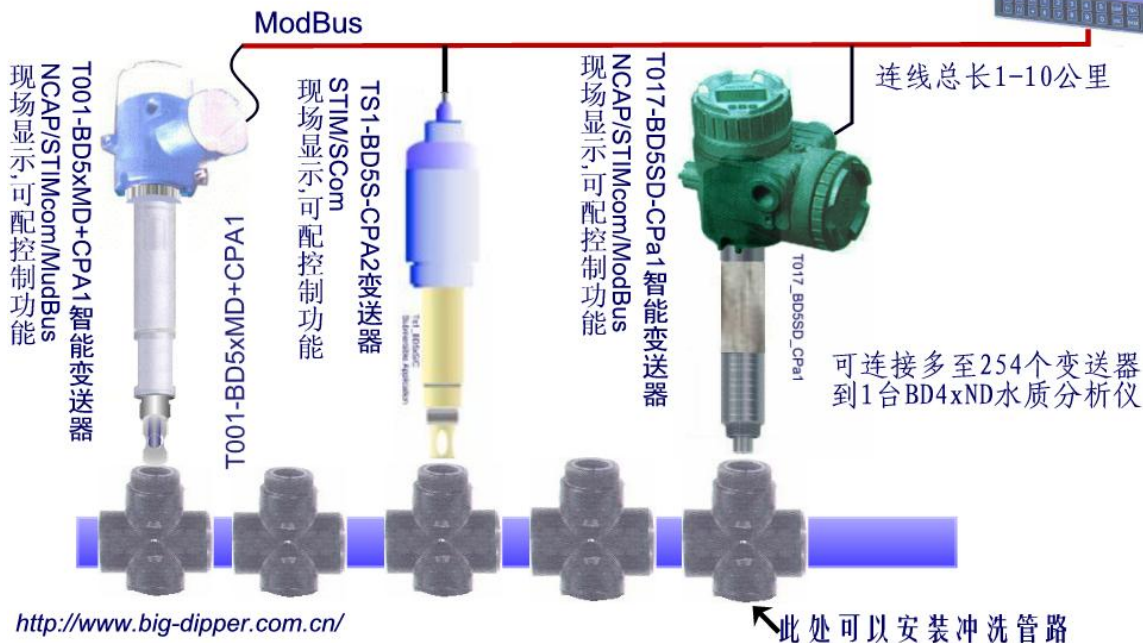
The system was designed popular to any sensors world wide. Just need routine calibration after replacement of sensors each time.

Pipe Line Application Configuration

管道在线水质变送器安装示意

STIM智能变送器_NCAP 测试仪

pBD4xND测控器



Application:

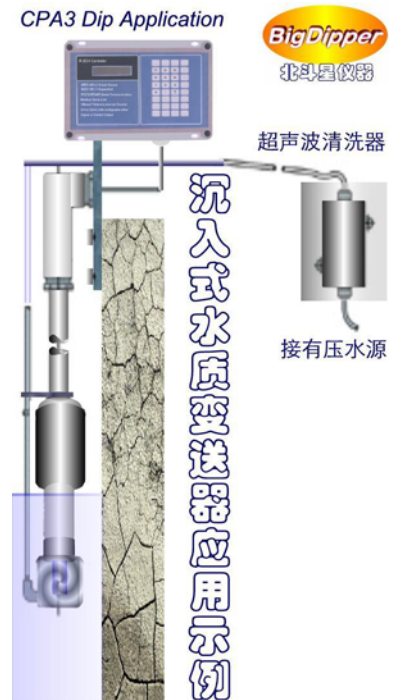
- Industrial Process Water
- Boiler/Cooling Water Flow Application
- Ultra pure Water Application
- Wastewater Treatment Application
- Drinking Water Treatment
- Boiler/Cooling Generation Flow Application
- Agriculture and Aquaculture Water

Feature

- Auto temperature compensation
- Professional data process with NERNST, NERNST+Debye-Huckel+Henderson. And Special calibration model of BigDipper Technochem
- User calibration at field to get high accuracy application
- Calibration method: Standard Addition(SA), Double Known Addition(DKA), Three Know Addition(3KA), function available
- Off-line sample calibration: Known Sample Calibration(KS), Tow Known Sample Calibration (TKS), Three Known Sample Calibration(3KS), function available
- Low power design, may be driven by battery or solar battery in remote area.
- Refer to <Introduction to BD4/5 Transducer and Controller> for electronic property and functions

Electronics of STIM Transducer

- Linear analog signal output, 0/4 to 20 mA select. default status is 0 to 20 mA
- RS232 serial port always available, RS485 attached as to BD5xB upper configuration.
- Power supply: DC 9 to 24 V; <100mAx5V
- Intrinsic safe design



	LCD&Keypad	SCom	STIM	Modbus	KA	KS	Other callibration
BD5xS	No	Y			Y	Y	
BD5xB	No		Y	Y	Y	Y	Ok if setup with NCAP
BD5xM	Ok		Y	Y	Y	Y	Y

For more details, please refer to : BD4&5IntE

Maintenance

- Periodically calibration requested to assure long time accuracy. Usually once a month is enough for normal surface water system.
- The life time of PVC sensor is about 3-12months if continuously sunk in water sample; solid state and glass sensor might lasting to 6-12months.
- If you can not get resolution when calibrating, it was recommended to replace the sensor.

Specifications for Electrochemical Sensors

General Type Specifications

	Solid	Glass	Gas sensing	PVC
Accuracy	+/- 2.5%R	+/- 2.5%R	+/- 2.5%R	+/- 2.5%R
Temperature	0-60℃	0-60℃	0-50℃	0-45℃
Drift	<1%R /day	<1%R /day	<1%R /day	<1%R /day
Response	90% <30s	90% <2min	90% <10 min	90% <10 min
Pressure	<1.7 kgf/cm ²	<3 kgf/cm ²	0.9~1.3 kgf/cm ² .	0.9~1.3 kgf/cm ² .

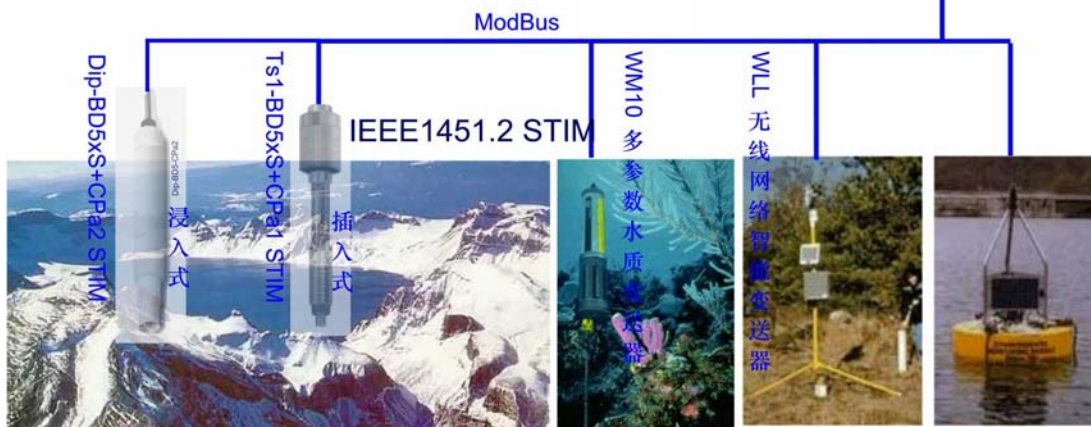
Popular Sensor Property

For More sensors,

Sensors	Parameters	Max Limit	LDL	Repeatability (100hr)
CPT 3200 Ca	Ca ²⁺	40,000ppm	0.2ppm	10%R
CPT 3200 Cl ⁻	Cl ⁻	35,500ppm	1.8ppm	+/- 10%R

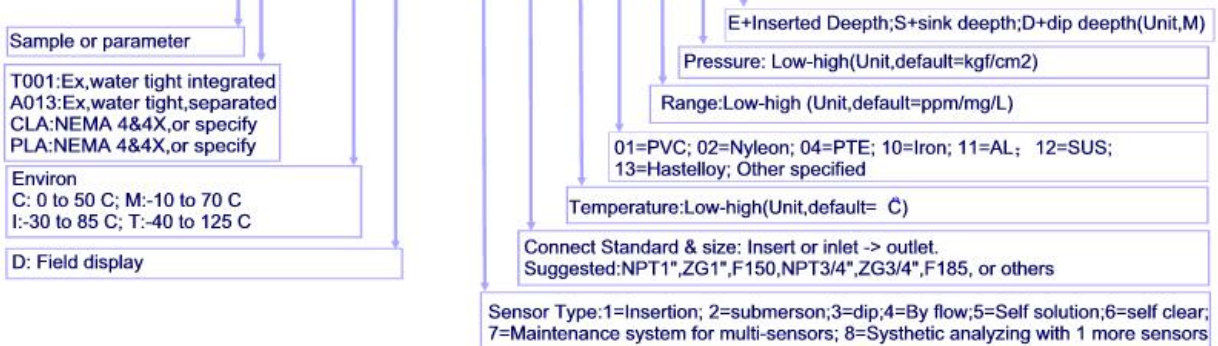
CPT 3200 Cl ₂	Cl ₂	79,000ppm	0.02ppm	+/- 10%R
CPT 3200 OCl ⁻	OCl ⁻	1.45-51400ppm	1.4ppm	+/- 10%R
CPT 3200 ClO ₂	ClO ₂	0.05-80ppm	0.05ppm	+/- 10%R
CPT 3200 O ₃	O ₃	0.02-0.7ppm	0.02ppm	+/- 10%R
CPT 3200 CO ₂	CO ₂	440ppm	4.4ppm	+/- 10%R
CPT 3200 DO	DO	0-20 mg/L 0-250 % air saturated	0.01ppm	+/- 2%
CPT 3200 F ⁻	F ⁻	saturated	0.02ppm	+/- 10%R
CPT 3200 Na	Na ¹⁺	saturated	0.02ppm	+/- 5%R
CPT 3200 NH ₃	NH ₃	17,000ppm	0.01ppm	+/- 5% R
CPT 3200 NO ₃ ⁻	NO ₃ ⁻	62,000ppm	0.5ppm	+/- 10%R
CPT 3200 pH	pH	14	0.01pH	+/- 5% R
CPT 3200 S ²⁻	S ²⁻	32,100ppm	0.003ppm	+/- 5% R
CPT 3200 ORP	ORP	-1.2 to 1.2 V		+/- 5% R

Submersion Water Transducer Application
 浸入式水分变送器监测系统
 江河湖泊、罐池场所应用



Selection

User Specify: I-T-BD5xMx-CPTx-Set_T_M_R_P_E_Version



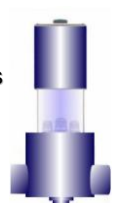
Ordering Information

- 1)Sample condition must be suitable, including temperature and pressure
- 2)Wet materials compatible
- 3)Connect standard

- 4) Select suitable BD5 electronic level, then structure, and also sensors
 5) User specified definition must be in formal sheet

Structural Property and Application Function for Transducer Accessories

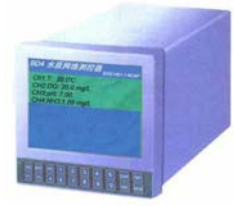
Type	Features and Application
Threaded Insert	<p>CPT 1 CPT1-10=1"NPT CPT1-20=Clamp CPT1-30Flange</p> <p>Pipe, pot wall installation with NPT1" Sensor replaceable Max sample pressure: 0.7 Mpa, depend on the property of sensors Standard wet materials: SS316, Nylon, Epoxy plastic Max sample temperature: 70 °C, might be higher if sensor is ok Always configured with BD5xMD Size: $\phi 104 \times 346$, ext160 Standard wet materials: SS316 Package: NEMA 4 and 4x, IP56 Order Code: CPT1-Connect-Wet material-Depth for insertion</p> <p>Fermfit 21-12-150 Fermfit 21-12-200 Fermfit 21-12-300</p> <p>For fermentation and sterilization application 25mm Hygienic Clamp Standard wet materials: Stainless steel and silicone O-rings Supporting sensors to pressure of < 300 psi/25°C, 100 psi/135°C Package: NEMA 4 and 4x, IP56 Order Code: Fermfit -Connect-Material-Sensor Length for insertion</p>
Submersion	<p>CPT 2 CPT2-00-01 PVC CPT2-00-02 Nylon CPT2-00-04 PTFE</p> <p>Pipe, and submersion versatile installation with 1"NPT1. Sensor replaceable Max sample pressure: 0.17 Mpa, depend on the property of employed sensors Standard wet materials: Nylon Default materials: Nylon Max sample temperature: 50 °C Size: $\phi 64 \times 346$ Package: NEMA 6 and 6p, IP67 Order Code: CPT2-Connect-Material-E=SensorLength for sink or insert</p> <p>CPT 26</p> <p>Submersion application, also 2"NPT threaded, for versatile usage Assembly of dissolved gas sensors, it often need 3 more sensors low temperature conditions only, <50 °C Size: $\phi 108 \times 346$ Sensor replaceable Standard wet materials: Nylon Package: NEMA 6 and 6p, IP67 Order Code: CPT26-Material-S=Wire length for sink</p>
Dipsys	<p>CPT 3</p> <p>Assembly of sink frame and clearance accessories for CPT1/2. Sensor replaceable Max sample pressure: 0.17 Mpa, depend on the property of sensors Standard wet materials: SS316, Nylon, Epoxy plastic Max sample temperature: 50 C Refer to the following sampling accessories table for detail configuration Order Code: CPT3-Material-D=Length for dip</p>
ByFlowsys	<p>CPT 4</p> <p>By flow assembly for 2-3 sensors transducer Sensor replaceable Max sample pressure: 0.17 Mpa, depend on the property of sensors Max sample temperature: 50 C Standard wet materials: SS316 Package: NEMA 4 and 4x, IP56 Order Code: CPT4-Connect- Material</p>



Wet material code: 01=PVC; 02=Nylon; 04=PTFE; 10=Iron; 11=AM alloy; 12=SS316; 13= Hastelloy - C
 Connect code: 0= none; 1=thread; 2=clamp; 3=Flange;

Remote Controller

- p-BD4w Water Analyzer: might connect to up to 247 STIM transducers.
- Power supply: 110/200 V AC, 50/60Hz.1A. Increase 0.1W for each STIM
- Display: 4x20 LCD
- Key Board: 2x10
- 7 Channel ADC
- 2 Channel DAC
- RS485 and RS232 Available



Economic Displayer

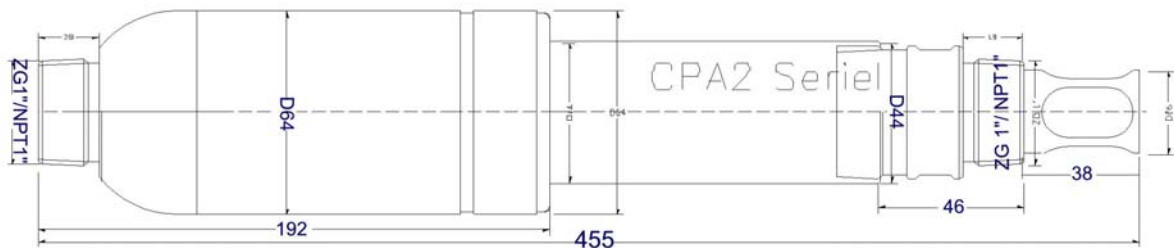
- Because the BD5 transducer finished all works of analysis, so the signal output is real linear, just select any data meter to display the concentration.
- XM 3.5 for narrow range dynamic
- XM 4.5 for wide range dynamic



Transducer Demissions

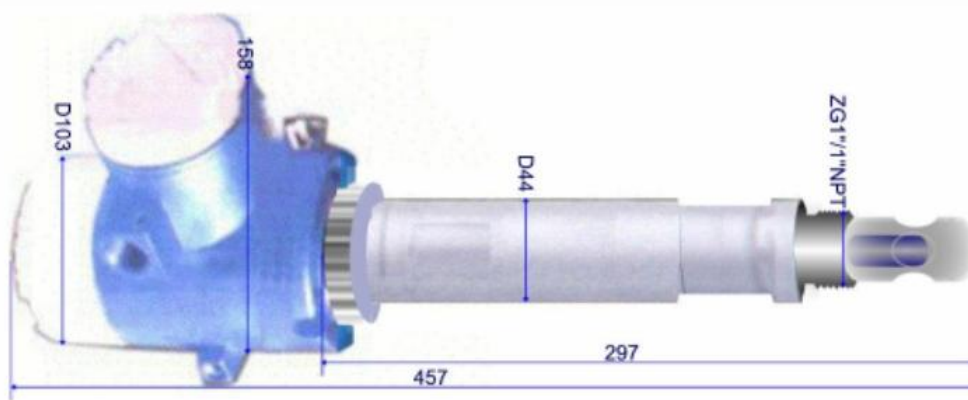
1)T-BD5xS (/B) CPT2 Transducer :

Small STIM, SCom Communication or 0/4-20mA(12bit) signal output. Setup by selection switch on board. None of operation keyboard and display.



2)T001-BD5xMD CPT1 Transducer:

Small STIM, SCom Communication or 0/4-20mA(12bit) signal output. Setup by selection switch on board. None of operation keyboard but display.



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P.o.Box: 603 BDTI Beijing, China 100080 <http://www.fullsense.com/>

Specifications of Electrodes__Information for replacement of sensors

Ion-Selective Electrode	Single-Junction Electrodes	Double-Junction Electrodes	Type	Concentration Range	Temperature/ pH Range	Interferences	Price RMB
Ammonia (NH ₃)	H-27502-00	-	Gas sensing	5 x 10 ⁻⁷ to 1.0 M (0.01 to 17,000 ppm)	0 to 50°C/ above 11	Volatile amines	329.00
Ammonium (NH ₄ ⁺)	H-27502-02	H-27502-03	PVC membrane	5x10 ⁻⁶ to1.0M (0.1 to 18,000 ppm)	0to50°C/ 4 to 10	K ⁺	382.00
Bromide (Br ⁻)	H-27502-04	H-27502-05	Solid-state	5 x 10 ⁻⁶ to 1.0 M (0.4 to 79,900 ppm)	0 to 80°C/ 2 to 14	S ⁻² ,I ⁻ , CN ⁻ ; high levels of Cl ⁻ and NH ₃	329.00
Cadmium (Cd ⁺²)	H-27502-06	H-27502-07	Solid-state	10 ⁻⁷ to 10 ⁻¹ M (0.01 to 11,200 ppm)	0 to 80°C/ 2 to 12	Ag ⁺ , Hg ⁺² , Cu ⁺² ; high levels of Pb ⁺² and Fe ⁺²	382.00
Calcium (Ca ⁺²)	H-27502-08	H-27502-09	PVC membrane	5 x 10 ⁻⁶ to 1.0 M (0.2 to 40,000 ppm)	0 to 50°C/ 3 to 10	Pb ⁺² , Hg ⁺² , Cu ⁺² , Ni ⁺²	382.00

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Carbon dioxide (CO ₂)	H-27502-10		Gas sensing	10 ⁻⁴ to 10 ⁻² M (4.4 to 440 ppm)	0 to 50°C/ 4.8 to 5.2	Volatile weak acids	324.00
Carbonate (CO ₃ ²⁻)							
Chloride (Cl ⁻)	H-27502-12	H-27502-13	Solid-state	5 x 10 ⁻⁵ to 1.0 M (1.8 to 35,500 ppm)	0 to 80°C/ 2 to 12	S ²⁻ , I ⁻ , CN ⁻ , Br ⁻ , OH ⁻ , NH ₃ , S ₂ O ₃ ²⁻	329.00
Chlorine (Cl ₂)	H-3221A-171	H-3221A-171D	Solid-state	5 x 10 ⁻⁵ to 1.0 M (3.6 to 71,000 ppm)	0 to 60°C/ 2 to 12		
Chlorine (Cl ₂)	H-3221A-172	H-3221A-172D	Solid-state	3 x 10 ⁻⁶ to 0.1 M (0.02 to 3,550 ppm of Cl)	0 to 60°C/ 2 to 12		
hypochlorite (OCl ⁻)	H-3221A-171	H-3221A-171D	Solid-state	3 x 10 ⁻⁶ to 0.1 M (0.03 to 5,140 ppm)	0 to 60°C/ 2 to 12		
Chlorine dioxide (ClO ₂)	H-3221A-172	H-3221A-172D	Solid-state	3 x 10 ⁻⁶ to 0.1 M (0.04 to 6,750 ppm)	0 to 60°C/ 2 to 12		
Perchlorate (ClO ₄ ⁻¹)	H-27502-38	H-27502-39	PVC membrane	5 x 10 ⁻⁶ to 10 ⁻¹ M (0.5 to 99,500 ppm)	0 to 60°C/ 2 to 12		
Perchlorate (ClO ₄)	H-27502-40	H-27502-41	PVC membrane	7 x 10 ⁻⁶ to 1.0 M (0.7 to 98,000 ppm)	0 to 50°C/ 2.5 to 11	No significant interferences	382.00
Copper (Cu ⁺²)	H-27502-14	H-27502-15	Solid-state	10 ⁻⁸ to 10 ⁻¹ M (0.0006 to 6350ppm)	0 to 80°C/ 2 to 12	Ag ⁺ , Hg ⁺² , high levels of Cl ⁻ , Br ⁻ , Fe ⁺² , Cd ⁺²	329.00
Cyanide (CN ⁻)	H-27502-16	H-27502-17	Solid-state	5 x 10 ⁻⁶ to 10 ⁻² M (0.1 to 260 ppm)	0 to 80°C/ 11 to 13	S ²⁻ , I ⁻ , Br ⁻ , Cl ⁻	329.00
Ferrous(Fe ⁺²)	H-27502-14	H-27502-15	Solid-state	7 x 10 ⁻⁶ to 10 ⁻² M (0.4 to 560 ppm)	0 to 60°C/ 11 to 13		
Fluoride (F ⁻)	H-27502-18	H-27502-19	Solid-state	10 ⁻⁶ to saturated (0.02 to saturated)	0 to 80°C/ 5 to 8	OH ⁻	329.00
Fluoroborate (BF ₄ ⁻)	H-27502-20	H-27502-21	PVC membrane	7 x 10 ⁻⁶ to 1.0 M (0.1 to 10,800ppm as B)	0 to 50°C/ 2.5 to 11	ClO ₄ ⁻ , I ⁻ , CN ⁻	382.00
Iodide (I ⁻)	H-27502-22	H-27502-23	Solid-state	5x10 ⁻⁶ to 1.0M (0.006 to 127,000 ppm)	0 to 80°C/ 0 to 14	S ²⁻ , CN ⁻ , Br ⁻ , Cl ⁻ , NH ₃ , S ₂ O ₃ ²⁻	329.00
Lead (Pb ⁺²)	H-27502-24	H-27502-25	Solid-state	10 ⁻⁶ to 10 ⁻¹ M (0.2 to 20,700 ppm)	0 to 80°C/ 3 to 8	Ag ⁺² , Hg ⁺² , Cu ⁺² , high levels of Cd ⁺² and Fe ⁺²	329.00
Lithium (Li ⁺)	H-27502-28	H-27502-29	PVC membrane	10 ⁻⁶ to 1.0M (0.7 to 6900 ppm)	0 to 50°C/ 5 to 10	Na ⁺ , K ⁺ , Ca ⁺²	382.00
Mercaptan(SH ⁻)	H-27502-30	H-27502-31	PVC membrane	0.003 to 3 ppm	0 to 50°C/ 5 to 10	Na ⁺ , K ⁺ , Ca ⁺²	
Nitrate (NO ₃ ⁻)	H-27502-30	H-27502-31	PVC membrane	7 x 10 ⁻⁶ to 1.0 M (0.5 to 62,000 ppm)	0 to 50°C/ 2.5 to 11	ClO ₄ ⁻ , I ⁻ , CN ⁻ , BF ₄ ⁻	382.00
Nitrite (NO ₂ ⁻)	H-27502-34	H-27502-35	PVC membrane	5 x 10 ⁻⁶ to 1.0 M (0.2 to 46,000 ppm)	0 to 50°C/ 2.5 to 11		
Nitrogen oxide (NO _x)	H-27502-32	-	Gas sensing	5x10 ⁻⁶ to 5x10 ⁻³ M (0.2 to 220 ppm)	0 to 50°C/ 1.1 to 1.7	CO ₂ , SO ₂ HF, acetic acid	329.00
pH (H ⁺)	H-27502-36		PVC membrane	10 ⁻⁷ to 10 ⁻¹ M (1 to 7 pH)	0 to 50°C/ 1 to 7	No significant interferences	pH 353.00
Potassium (K ⁺)	H-27502-38	H-27502-39	PVC membrane	10 ⁻⁶ to 1.0 M (0.04 to 39,000 ppm)	0 to 50°C/ 2 to 12	Cs ⁺ , NH ₄ ⁺	382.00
Silver/sulfide (Ag ⁺ /S ⁻²)	H-27502-40	H-27502-41	Solid-state	10 ⁻⁷ to 1.0 M(Ag ⁺ , S ⁻²) 0.01 to 107,900ppmAg ⁺ ; 0.003 to 32,100ppm S ⁻²	0 to 80°C/ 2 to 12	Hg ⁺²	329.00
Sodium (Na ⁺)	H-27502-42	H-27502-43	Glass membrane	10 ⁻⁶ M to saturated (0.02 ppm to saturated)	0 to 80°C/ 5 to 12	H ⁺ , K ⁺ , Li ⁺ , Ag ⁺ , Cs ⁺ , TI ⁺	285.00
Surfactant (X ⁺ /X ⁻)	H-27502-44	H-27502-45	PVC membrane	10 ⁻⁵ to 5 x 10 ⁻² M (1.0 to 12,000 ppm)	0 to 50°C/ 2 to 12	Similar types of surfactants	5640.00
Thiocyanate (SCN ⁻)	H-27502-46	H-27502-47	Solid-state	5 x 10 ⁻⁶ to 1.0 M (0.3 to 58,000 ppm)	0 to 80°C/ 2 to 10	S ²⁻ , CN ⁻ , I ⁻ , Br ⁻ , NH ₃ , S ₂ O ₃ ²⁻	329.00
Water hardness (Ca ⁺² /Mg ⁺²)	H-27502-48	H-27502-49	PVC membrane	10 ⁻⁵ to 1.0 M (0.4 to 40,000 ppm as Ca ⁺²)	0 to 50°C/ 5 to 10	Cu ⁺² , Zn ⁺² , Ni ⁺² , Fe ⁺²	382.00



More Information for Water Transducers

Water transducer: <http://www.fullsense.com/Products/Water/>
Electrochemical transducer: <http://www.fullsense.com/Products/BD3000/CPT3200/CPT3200IntE.htm>
Electrochemical sensor: http://www.fullsense.com/Products/BD3000/CPelectrodeList_E.htm
Conductivity transducer: <http://www.fullsense.com/Products/Liquid/Water/SCT/SCTIntE.htm>
Turbidity transducer: <http://www.fullsense.com/Products/Liquid/Water/Turbidity/TurbIntE.htm>
Mud concentration transducer: <http://www.fullsense.com/Products/Liquid/Water/Mud/MudIntE.htm>
TDO(TOC/COD/BOD) transducer: <http://www.fullsense.com/Products/Liquid/Water/TDO/UV4120TDOIntE.htm>
Multi-parameters transducer: <http://www.fullsense.com/Products/Liquid/Water/wm10/wm10IntE.htm>
Water transducer application: <examples>
Information for Accessories: http://www.big-dipper.com.cn/Products/Liquid/Water/Wt_Parts_IntE.htm

BD4Controller & BD5 STIM

<http://www.fullsense.com/Meters/>
BD4&5Introduction: http://www.fullsense.com/Meters/BD4_IntE.htm
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BD4&5 Selection: http://www.fullsense.com/Meters/BD4_Sel_E.htm
BD4_5Configuration: http://www.fullsense.com/MetersBD4_Cfg_E.htm
BD4Application: http://www.fullsense.com/Meters/BD4_AG_E.htm

Related Technical References:

<http://www.fullsense.com/Network/>
Scm Protocol
STIMcom Protocol
IEEE1451.1 NCAP Protocol
IEEE1451.2 STIM Protocol