Conductivity, pH/ORP & Disinfection

OnGuard™ B600 Series

Water Treatment Controllers

Enjoy unparalleled versatility and a collection of sensors and powerful built-in algorithms for control of chemical metering pumps and valves in a broad range of water treatment applications

KEY BENEFITS

- Large touchscreen display with icon based programming makes setup easy
- Universal sensor input provides extraordinary flexibility; the same controller can be used with almost any type of sensor needed
- Six relay control outputs
- Combination sensor input & analog input board that adds even more flexibility
- Lead/Lag control of relays
- Optional dual analog (4-20 mA) input for fluorometers or nearly any other process value
- Multiple language support allows simple setup no matter where your business takes you
- Economical wall-mount package for easy installation
- On-screen and web page graphing of sensor values and control output status
- The OnGuard™ B600 with amperometric chlorine sensors can be used for reporting chlorine rural measurements in accordance with EPA Method 334.0
- Six virtual inputs and six virtual outputs
- Complete flexibility in the function of each relay
- Email alarm messages, datalogs, graphs, or system summary reports
- Ethernet option for remote access via the Internet, LAN, BACnet or Modbus/TCP

SOLENIS™

SPECIFICATIONS

MEASUREMENT PERFORMANCE

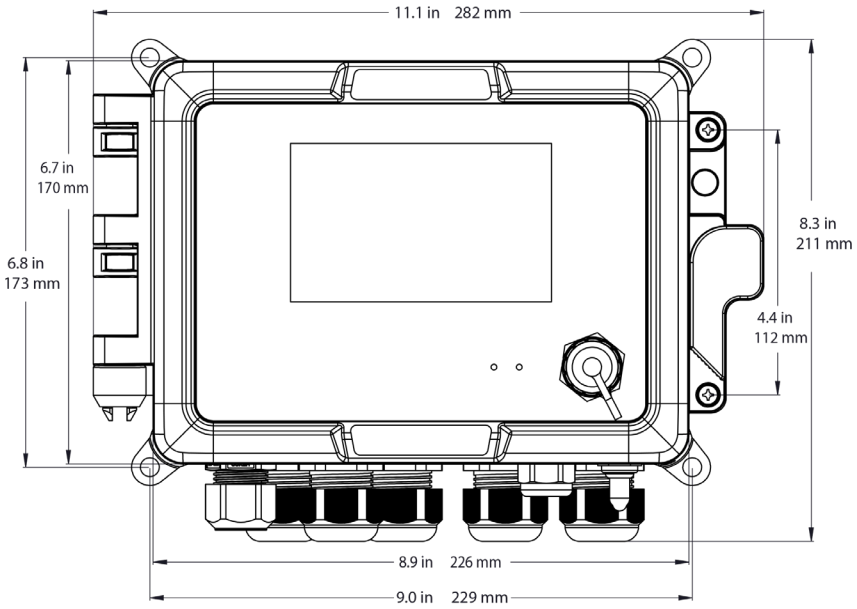
	Range	Resolution	Accuracy
0.01 Cell Contacting Conductivity	0-300 µS/cm	0.01 µS/cm, 0.0001 mS/cm, 0.001 mS/m, 0.0001 S/m, 0.01 ppm	±1% of reading
0.1 Cell Contacting Conductivity	0-3,000 µS/cm	0.1 µS/cm, 0.0001 mS/cm, 0.01 mS/m, 0.0001 S/m, 0.1 ppm	±1% of reading
1.0 Cell Contacting Conductivity	0-30,000 µS/cm	1 µS/cm, 0.001 mS/cm, 0.1 mS/m, 0.0001 S/m, 1 ppm	±1% of reading
10.0 Cell Contacting Conductivity	0-300,000 µS/cm	10 µS/cm, 0.01 mS/cm, 1 mS/m, 0.001 S/m, 10 ppm	±1% of reading
pH	-2 to 16 pH units	0.01 pH units	±0.01% of reading
ORP/Ion Selective Electrode	-1500 to 1500 mV	0.1 mV	±1 mV
Disinfection sensors	-2000 to 1500 mV	0.1 mV	±1 mV
	0 - 2 ppm to 0 - 20,000 ppm	Varies with range and slope	Varies with range and slope
Electrodeless Conductivity	500 - 12,000 µS/cm	1 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	3,000-40,000 µS/cm	1 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	10,000-150,000 µS/cm	10 µS/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	50,000-500,000 µS/cm	10 µS/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	200,000-2,000,000 µS/cm	100 µS/cm, 0.1 mS/cm, 1 mS/m, 0.1 S/m, 100 ppm	±1% of reading
Temperature	23 to 500°F (-5 to 260°C)	0.1°F (0.1°C)	±1% of reading within range

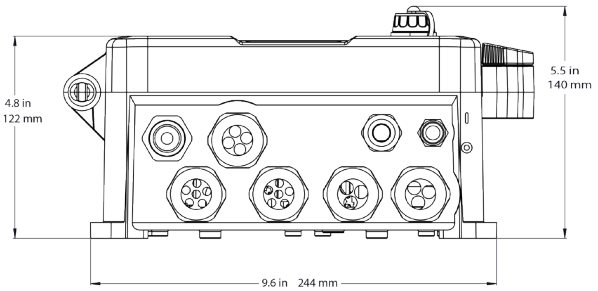
Temperature°C	Range Multiplier%
0	181.3
10	139.9
15	124.2
20	111.1
25	100.0
30	90.6
35	82.5
40	75.5
50	64.3
60	55.6
70	48.9

Temperature°C	Range Multiplier%
80	43.5
90	39.2
100	35.7
110	32.8
120	30.4
130	28.5
140	26.9
150	25.5
160	24.4
170	23.6
180	22.9

Note: Conductivity ranges above apply at 25°C.
At higher temperatures, the range is reduced per the range multiplier chart.

DIMENSIONS





SPECIFICATIONS

INPUTS

Power

100 to 240 VAC +/- 10%, 50 or 60 Hz, 7 A maximum
Fuse: 6.3 A

Sensor Input Signals (0, 1 or 2 depending on model code)

Contacting Conductivity: 0.01, 0.1, 1.0, or 10.0 cell constant, or Electrodeless Conductivity (not available on the combination sensor/analog input card) or Disinfection or Amplified pH, ORP, or Ion Selective Electrode which requires a preamplified signal. ±5VDC power available for external preamps. Walchem WEL or WDS series pH/ORP sensors recommended.
Each sensor input card contains a temperature input.
Temperature: 100 or 1000 ohm RTD, 10K or 100K Thermistor

Analog (4-20 mA) Sensor Input
(0, 1, 2 or 4 depending on model code)

2-wire loop powered and self-powered transmitters supported
3-wire and 4-wire transmitters supported
Each dual sensor input board has two channels: Channel 1, 130 ohm input resistance and Channel 2, 280 ohm input resistance. The combination input board has one channel, 280 ohm input resistance.

Available Power:
One independently isolated 24 VDC ±15% supply per channel. 2.0 W (83 mA at 24 VDC) maximum for each channel. Total power consumption for all channels is 2 to 8 W depending on the maximum ambient temperature: **(See Power Budget graph on pg 5)**

Digital Input Signals (6):
State-Type Digital Inputs
Electrical: Optically isolated and providing an electrically isolated 9V power with a nominal 2.3mA current when the digital input switch is closed.
Typical response time: < 2 seconds.
Devices supported: Any isolated dry contact (i.e. relay, reed switch).
Types: Interlock

Low Speed Counter-Type Digital Inputs
Electrical: Optically isolated and providing an electrically isolated 9V power with a nominal 2.3mA current when the digital input switch is closed, 0-10 Hz, 50 msec minimum width. Devices supported: Any device with isolated open drain, open collector, transistor or reed switch.
Types: Contacting Flowmeter

High Speed Counter-Type Digital Inputs
Electrical: Optically isolated and providing an electrically isolated 9V power with a nominal 2.3mA current when the digital input switch is closed, 0-500 Hz, 1.00 msec minimum width. Devices supported: Any device with isolated open drain, open collector, transistor or reed switch.
Types: Paddlewheel Flowmeter

OUTPUTS

Powered Mechanical Relays
(0 or 6 model code dependent)

Pre-powered on circuit board switching line voltage
All relays are fused together as one group, total current must not exceed 6A (resistive), 1/8 HP (93W)

Dry Contact Mechanical Relays
(0, 2 or 4 model code dependent)

6 A (resistive), 1/8 HP (93W)
Dry contact relays are not fuse protected.

Pulse Outputs (0, 2 or 4 model code dependent)

Opto-isolated, solid-state relay, 200mA, 40V DC
VLOWMAX = 0.05V @ 18mA

4 - 20 mA (0 or 2 model code dependent)

Internally powered, Fully isolated
600 Ohm max resistive load,
Resolution 0.0015% of span
Accuracy ± 0.5% of reading

Ethernet

10/100 802.3-2005
Auto MDIX support
Auto Negotiation

USB

Connector: Type A receptacle
Speed: High speed (480 Mbit)
Power: 0.5 A maximum

AGENCY CERTIFICATIONS

Safety: UL 61010-1:2012 3rd Ed + Rev:2019
CSA C22.2 No. 61010-1:2012 3rd Ed. + U1; U2
IEC 61010-1:2010 3rd Ed. + A1:2016
EN 61010-1:2010 3rd Ed. + A1:2019
BS EN 61010-1:2010 + A1:2019

EMC: IEC 61326-1:2020
EN 61326-1:2013
BS EN 61326-1:2013

Note: For EN 61000-4-3 Radiated RF Immunity, the controller meets Performance Criteria B.
*Class A equipment: Equipment suitable for use in establishments other than domestic, and those directly connected to a low voltage 100-240 VAC) power supply network which supplies buildings used for domestic purposes.

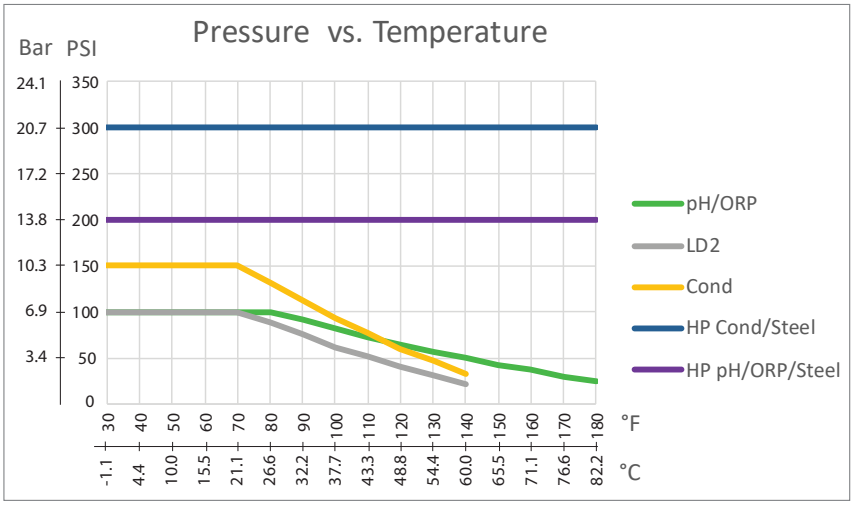
MECHANICAL (CONTROLLER)

Enclosure Material	Polycarbonate
Enclosure Rating	Certified to UL 50 and UL 50E Type 4X. IEC 60529 meets IP66
Environmental Conditions	Can be installed indoors and outdoors. Suitable for wet location
Dimensions	11.1" x 8.3" x 5.5" (282 mm x 211 mm x 140 mm)
Display	5" TFT color display, 800 x 480 pixels with capacitive touchscreen
Operating Ambient Temp	-4 to 131°F (-20 to 55°C)
Storage Temperature	-4 to 176°F (-20 to 80°C)
Humidity	10 to 90% non-condensing
Pollution Degree	2
Overvoltage Category	II
Altitude	2000 m (6560 ft) maximum

SPECIFICATIONS

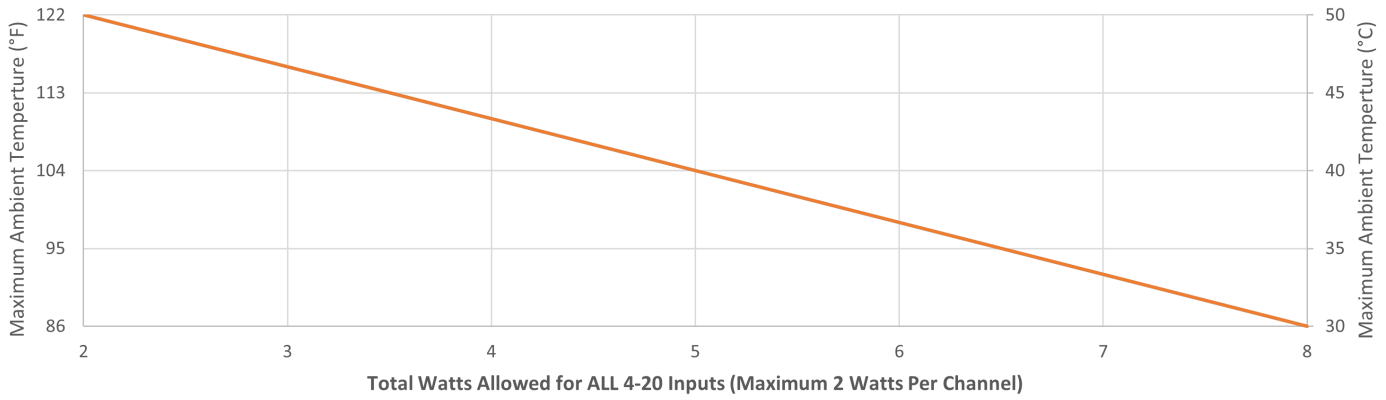
MECHANICAL (SENSORS) (*see graph)

Sensor	Pressure	Temperature	Materials	Process Connections
Electrodeless Conductivity	0-150 psi (0-10 bar)*	CPVC: 32-158°F (0 to 70°C)* PEEK: 32-190°F (0 to 88°C)	CPVC, FKM in-line o-ring PEEK, 316 SS in-line Adapter	1" NPTM submersion 2" NPTM in-line adapter
pH	0-100 psi (0-7 bar)*	50-158°F (10-70°C)*	CPVC, Glass, FKM o-rings, HDPE, Titanium Rod, glass-filled PP tee	1" NPTM submersion 3/4" NPTF in-line tee
ORP	0-100 psi (0-7bar)*	32-158°F (0-70°C)*		
Contacting Conductivity (Condensate)	0-200 psi (0-14 bar)	32-248°F (0-120°C)	316SS, PEEK	3/4" NPTM
Contacting Conductivity Graphite (Cooling Tower)	0-150 psi (0-10 bar)*	32-158°F (0-70°C)*	Graphite, Glass-filled PP, FKM o-ring	3/4" NPTM
Contacting Conductivity SS (Cooling Tower)	0-150 psi (0-10 bar)*	32-158°F (0-70°C)*	316SS, Glass-filled PP, FKM o-ring	3/4" NPTM
Contacting Conductivity (Boiler)	0-250 psi (0-17 bar)	32-401°F (0-205°C)	316SS, PEEK	3/4" NPTM
Contacting Conductivity (High Pressure Tower)	0-300 psi (0-21 bar)*	32-158°F (0-70°C)*	316SS, PEEK	3/4" NPTM
pH (High Pressure)	0-300 psi (0-21 bar)*	32-275°F (0-135°C)*	Glass, Polymer, PTFE, 316SS, FKM	1/2" NPTM gland
ORP (High Pressure)	0-300 psi (0-21 bar)*	32-275°F (0-135°C)*	Platinum, Polymer, PTFE, 316SS, FKM	1/2" NPTM gland
Free Chlorine/Bromine	0-14.7 psi (0-1 bar)	32-113°F (0-45°C)	PVC, Polycarbonate, Silicone Rubber, SS, PEEK, FKM, Isoplast	1/4" NPTF Inlet 3/4" NPTF Outlet
Extended pH Range Free Chlorine/Bromine	0-14.7 psi (0-1 bar)	32-113°F (0-45°C)		
Total Chlorine	0-14.7 psi (0-1 bar)	32-113°F (0-45°C)		
Chlorine Dioxide	0-14.7 psi (0-1 bar)	32-131°F (0-55°C)		
Ozone	0-14.7 psi (0-1 bar)	32-131°F (0-55°C)		
Peracetic Acid	0-14.7 psi (0-1 bar)	32-131°F (0-55°C)		
Hydrogen Peroxide	0-14.7 psi (0-1 bar)	32-113°F (0-45°C)		
Flow Switch Manifold	0-150 psi (0-10 bar) up to 100°F (38°C)* 0-50 psi (0-3 bar) at 140°F (60°C)	32-140°F (0-60°C)*	GFRPP, PVC, FKM, Isoplast	3/4" NPTF
Flow Switch Manifold (High Pressure)	0-300 psi (0-21 bar)*	32-158°F (0-70°C)*	Carbon Steel, Brass, 316SS, FKM	3/4" NPTF
Turner Little Dipper 2	0-100 psi (0-7 bar)*	32-122°F (0-50°C)*	PVC, GRFPP, FKM	3/4" NPTF in-line tee
Pyxis ST-500, 588, 590	0-100 psi (0-7 bar)*	40-104°F (4-40°C)*	CPVC, Quartz, FKM	3/4" NPTF in-line tee
Pyxis ST-765SS	0-100 psi (0-7 bar)	40-120°F (4-49°C)	304SS, 316SS, Glass, Gold, Platinum, CPVC, PTFE	See FR-50 or FR-300+
Pyxis FR-50	7.25-30 psi (0.5-2 bar)	40-120°F (4-49°C)	CPVC, PVC, PE, PMMA, 304SS, POM, NBR	1/4" OD PE tubing Inlet 2 x 20 mm ID hose barb Outlet
Pyxis FR-300+	7.25-30 psi (0.5-2 bar)	40-120°F (4-49°C)	PVC, POM, ABS, 316SS, PEEK, PET, NBR	3/8" OD tubing fittings



SPECIFICATIONS

OnGuard B600 Controller Power Budget for 4-20 mA Inputs



ORDERING INFORMATION

SOBL6 (Boiler Controller) **SOCT6** (Cooling Tower Controller) **SODS6** (Disinfectant Controller)
SOPH6 (pH Controller) **SOCN6** (Conductivity Controller) **SOPD6** (Pyxis Oxidizer + pH Controller)

SOBL6
SOCT6
SOPH6
SODS6
SOCN6
SOPD6

RELAYS/WIRING	POWER CORD	INPUT BOARD	ANALOG OUTPUTS	ETHERNET	-	SENSOR MOUNTING	SENSORS
A00	P	AA	A	M		P	BDNN

RELAYS/WIRING	
000	6 powered relays
100	2 powered 4 dry relays
200	2 opto 4 dry relays
400	4 opto 2 dry relays
A00	6 powered relays with USA pigtails prewired
B00	2 powered relays with USA pigtails prewired, 4 dry relays
C00	2 opto relays with 20 ft. pulse cables, 4 dry relays
D00	4 opto relays with 20 ft. pulse cables, 2 dry relays

POWER CORD	
B	Brazil power cord
D	DIN power cord
H	Hardwired - No power cord
P	USA power cord

INPUT BOARD (Choose 2 in alphabetical order)	
A	One sensor input board
B	One dual analog input board
C	One combination sensor/analog input board
N	No sensor input board

ANALOG OUTPUTS	
N	No analog outputs
A	One dual isolated analog output card

ETHERNET	
N	No Ethernet
E	Ethernet board
M	Ethernet board with Modbus TCP + BACnet

SOCT, SOPH SENSOR MOUNTING	
N	No Flow Switch, No mounting hardware, No Sensors
S	No Flow Switch, Submersion Sensors, 20 foot cables
I	No Flow Switch, Inline Sensors, 20 foot cables
L	Loose Flow Switch Manifold, 20 foot cables, Low Pressure
P	Flow Switch Manifold on Panel, 3 foot cables, Low Pressure
F	Loose Flow Switch Manifold, 4 foot cable, High Pressure
H	Flow Switch Manifold on Panel, 4 foot cables, High Pressure

SODS SENSOR MOUNTING	
N	No Flow Switch, No mounting hardware, No Sensors
I	No Flow Switch, Inline Sensors, 20 foot cables
L	Loose Flow Switch Manifold, 20 foot cables, Low Pressure
P	Flow Switch Manifold on Panel, 3 foot cables, Low Pressure

SOCN SENSOR MOUNTING	
N	No Flow Switch, No mounting hardware, No Sensors
S	No Flow Switch, Submersion Sensors
I	No Flow Switch, Inline Sensors

SOBL SENSOR MOUNTING
NOT APPLICABLE SEE SENSOR OPTIONS

SOPD SENSOR MOUNTING	
N	No Flow Switch, No mounting hardware, No Sensors
C	Clean water reservoir on a panel
D	Industrial water 115 V self-cleaning flow reservoir on a panel
E	Industrial water 230 V self-cleaning flow reservoir on a panel

ORDERING INFORMATION

SOBL6 (Boiler Controller) **SOCT6** (Cooling Tower Controller) **SODS6** (Disinfectant Controller)
SOPH6 (pH Controller) **SOCN6** (Conductivity Controller) **SOPD6** (Pyxis Oxidizer + pH Controller)

SOBL6 **SOCT6** **SOPH6** **SODS6** **SOCN6** **SOPD6**	**RELAYS/WIRING**	**POWER CORD**	**INPUT BOARD**	**ANALOG OUTPUTS**	**ETHERNET**	-	**SENSOR MOUNTING**	**SENSORS**

SOPH SENSORS (Choose 4 in alphabetical order)	
A	External pH/ORP Preamplifier, no sensor*
B	Flat surface WEL pH, with Pt1000 ATC
C	Flat surface WEL pH, No ATC
D	Rod Style WEL ORP
E	Flat surface WEL ORP
F	Flat surface WEL pH, 4-20 mA
G	Rod Style WEL ORP, 4-20 mA
H	Flat surface WEL ORP, 4-20 mA
N	No Sensor
X	Dual low pressure manifold**
* Order 102029 or 102963 electrodes separately. These sensors are allowed with high pressure manifold sensor mounting **Order WEL electrode(s) and Preamplifier housing(s) separately, for L or P mounting style only	

SOCT SENSORS (Choose 4 in alphabetical order, except N last)	
A	Graphite contacting conductivity
B	316SS contacting conductivity
C	Electrodeless conductivity***
D	High pressure contacting conductivity*
E	Graphite contacting conductivity for Makeup water, threaded mounting adapter
F	Flat surface WEL pH, No ATC
G	High pressure pH, No ATC*
H	Rod Style WEL ORP
I	Flat surface WEL ORP
J	High pressure ORP*
K	Free Chlorine, 20 ppm, extended pH range membrane-style**
L	Chlorine Dioxide 0-20 ppm membrane-style**
M	Little Dipper 2, 0-200 ppb PTSA** (Analog)
N	No Sensor
P	Pyxis PTSA** (Analog)
S	Disinfection, membrane-style, No Sensor
T	Pyxis Tagged Polymer (Analog)
U	Pyxis PTSA + Tagged Polymer (2 Analog)
V	Flat surface WEL pH, 4-20 mA (Analog)
W	Rod Style WEL ORP, 4-20 mA (Analog)
X	Flat surface WEL ORP, 4-20 mA (Analog)
* If a high pressure manifold for H is selected, only Hi P Sensors and Makeup available.	
** Dipper, Pyxis, Chlorine, ClO2, Disinfection Sensors NOT available with Submersion mounting.	
***Requires "A" Sensor Input, will not work with the "C" combination board	

SODS SENSORS (Choose 2 in alphabetical order)	
A	Free chlorine, 0-20 ppm
B	ClO2, 0-20 ppm
C	Ozone, 0-20 ppm
D	PAA, 0-2000 ppm
E	Extended pH range free chlorine, 0-20 ppm
F	Total chlorine, 0-20 ppm
G	Peroxide, 0-2000 ppm
H	Stabilized Bromine, 0-20 ppm
I	Chlorite, 0-2 ppm
J	Chlorine, for use in absence of chlorine, 0-2 ppm
N	No Sensor
X	DIS membrane-style manifold plus pH/ORP/cooling tower conductivity tee*
*Order disinfection sensor and WEL electrode and Preamplifier housing or cooling tower conductivity sensor separately, for L or P mounting style only	

SOCN SENSORS (Choose 2 in alphabetical order)	
A	PEEK electrodeless conductivity, 20 ft cable*
B	CPVC electrodeless conductivity, 20 ft cable*
C	Contacting conductivity,1.0 cell constant, 100 psi,10 ft cable
D	Contacting conductivity, 0.1 cell constant, 100 psi,10 ft cable
E	Contacting conductivity, 10.0 cell constant, 100 psi,10 ft cable
F	Contacting conductivity, 0.01 cell constant, 100 psi,10 ft cable
G	Contacting conductivity,1.0 cell constant, 200 psi,10 ft cable
H	Contacting conductivity, 0.1 cell constant, 200 psi,10 ft cable
I	Contacting conductivity, 10.0 cell constant, 200 psi,10 ft cable
J	Contacting conductivity, 0.01 cell constant, 200 psi,10 ft cable
N	No Sensor
*Requires "A" Sensor Input, will not work with the "C" combination board	

SOBL SENSORS (Choose 2 in alphabetical order)	
A	Boiler Sensor with ATC, 250 psi, 1.0 cell constant, 20 ft. cable
B	Boiler Sensor without ATC, 250 psi, 1.0 cell constant, 20 ft. cable
C	Condensate Sensor with ATC, 200 psi, 0.1 cell constant, 10 ft. cable
D	Boiler Sensor with ATC, 250 psi, 10 cell constant, 20 ft. cable
N	No Sensor

S)PD SENSORS (Choose 1)	
A	Free Chlorine (2 Analog)
B	Chlorine Dioxide (2 Analog)
N	No Sensor

NOTE: All sensors require sensor input type unless otherwise noted as Analog