

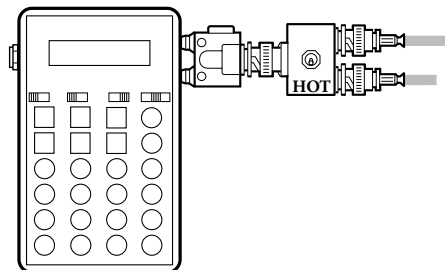
Thermo Scientific Orion Electronic Test Kit

Introduction

The Thermo Scientific Orion electronic test kit, Cat. No. 180029, allows testing of Thermo Scientific Orion 1500/1700/1800/2100 series online process monitors by simulating the output of an ion selective electrode. The electronic test kit is not intended for use with the Thermo Scientific Orion 1816A0 monitor.

Ion selective electrodes (ISE) can be shown as DC-voltage sources with a very high output impedance (50 to 1000 megohm). They respond to ion concentration changes with a voltage change of approximately 60 mV/decade for monovalent ions or approximately 30 mV/decade for divalent ions. Knowing electrode and instrument parameters like offset potential, slope, etc. allows testing of various instruments by applying a known mV voltage.

The electronic test kit has been proven to minimize maintenance costs and analyzer downtime. It is compact, battery-operated and thus handy to use. The cables provided allow testing of Orion 1500, 1700, 1800 and 2100 series instruments.



Electronic Test Kit Components

Cat. No. 180029 Includes:

- Datel DVC-350 hand-held, battery-powered, microprocessor-operated voltage calibrator with carrying case and battery.
- Banana to BNC female adapter
- Impedance box assembly
- Two screw-cap cables
- Two SHV cables

Operation For a detailed discussion of all functions, refer to DVC-350 manual.

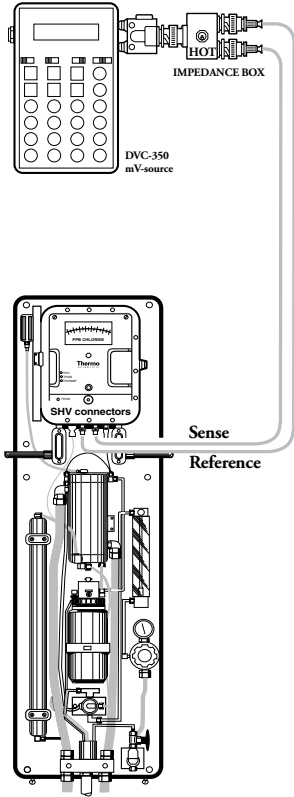
1. Connect the impedance box to the DVC-350.
2. Connect the appropriate cables to the impedance box.
3. Ensure that the DVC-350 controls are set to:
 - a. ON
 - b. DEC
 - c. 1.2V
 - d. + or -
 - e. LOW BATTERY sign is off
4. Connect the cables to the monitor to be tested. .
5. Key in the voltage needed in volts (mV/1000). For example, with + 60 mV:
 - a. Set the slide switch to “+”
 - b. Press “.”
 - c. Press “0”
 - d. Press “6”
 - e. Press “Ent”

Note: If during the test the monitor shows a reversed voltage or the concentration in the wrong range, try to reverse the polarity on the DVC-350. Scroll the display up or down using the up/down arrow keys.

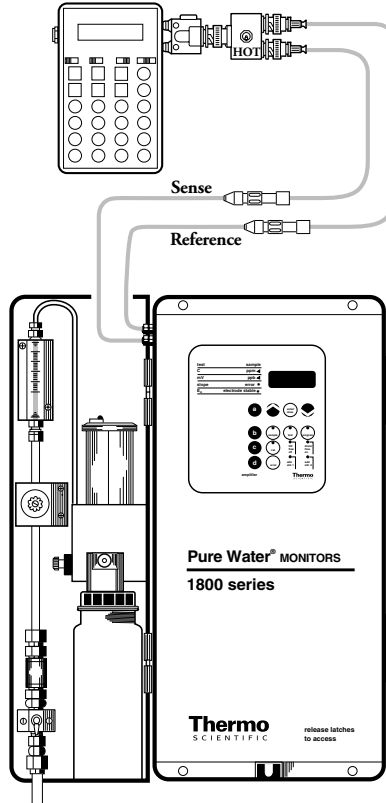
Note: Do not use this test kit to calibrate the monitor electronically. A Previous calibration with reagents is required.

6. Be aware, if you use the Electronic Test Kit in its high impedance mode:
 - The mV reading of the monitor during the test might read up to a 1 mV difference from the low impedance mode.
 - The electronic test kit and its cables should not be moved to achieve a stable reading.

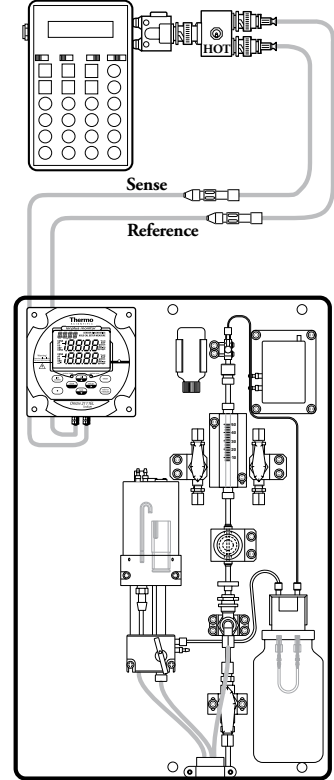
Electronic Test Kit Connections



1500 and 1700 Series Monitors



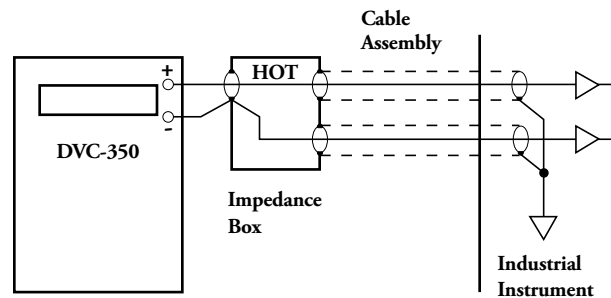
1800 Series Monitors



2100 Series Monitors

Shield And Ground

If the electronic test kit is used with the provided cables and impedance box, it is not necessary to connect the instrument or fluid ground to the test setup. The simplified circuit diagram shows the ground and shield situation when used with an instrument.



Output Settings for Monitors

The listed values are used for instrument calibration in manufacturing. They do not necessarily correlate exactly with the actual electrode millivolts (mV). All 1500 and 1700 series monitors have slopes set at 100%, except the 1517 chloride, 1518 hydrazine, and 1721 alkalinity monitors, which should always have a slope at mid-range. The 1800 series monitors should have a slope in the normal range or the monitor should be reset. Refer to the monitor user guide for instructions on how to reset the monitor. For the 2100 series monitors, use the setup menu to set the monitor to display mV readings and compare the readings with the input from the test box. Use the listed values if the instrument has been reset to factory default settings.

1511 Sodium Monitor and 1811AO Cation Sodium Monitor*					1810 Ammonia Monitor				
- 60	mV	▶	10	ppb	- 120	mV	▶	1	ppm
0	mV	▶	100	ppb	- 60	mV	▶	10	ppm
+ 60	mV	▶	1000	ppb	0	mV	▶	100	ppm
1517 Chloride Monitor					1811LL Low-Level Sodium Monitor				
+ 380	mV	▶	0	ppb	- 120	mV	▶	1	ppb
+ 375	mV	▶	10	ppb	- 60	mV	▶	10	ppb
+ 370	mV	▶	25	ppb	0	mV	▶	100	ppb
+ 360	mV	▶	50	ppb	1811EL Low-Level Sodium Monitor** and 1818 Hydrazine Monitor				
+ 320	mV	▶	500	ppb	- 320	mV	▶	0.1	ppb
1518 Hydrazine Monitor					- 260	mV	▶	1	ppb
+ 90	mV	▶	1	ppb	- 200	mV	▶	10	ppb
+ 45	mV	▶	10	ppb	1817HL High-Level Chloride Monitor and 1818 ELIMIN-OX Monitor				
0	mV	▶	100	ppb	+ 370	mV	▶	0.1	ppm
- 45	mV	▶	1000	ppb	+ 310	mV	▶	1	ppm
- 90	mV	▶	1	ppm	+ 250	mV	▶	10	ppm
1570 and 1770 Chlorine Monitors					1820 Calcium Hardness Monitor				
+ 532	mV	▶	0.001	ppm	- 75	mV	▶	100	ppb
+ 592	mV	▶	0.1	ppm	- 45	mV	▶	1	ppm
+ 652	mV	▶	10	ppm	- 15	mV	▶	10	ppm
1709 and 1809 Fluoride Monitors					2111LLL Low-Level Sodium Monitor***				
+ 180	mV	▶	0.1	ppm	-487.6	mV	▶	0.01	ppb
+ 120	mV	▶	1	ppm	-428.5	mV	▶	0.1	ppb
+ 60	mV	▶	10	ppm	-369.3	mV	▶	1	ppb
1721 Alkalinity Monitor					-310.2	mV	▶	10	ppb
+ 200	mV	▶	0	ppm	-251.0	mV	▶	100	ppb
+ 150	mV	▶	50	ppm	-191.9	mV	▶	1000	ppb
+ 100	mV	▶	100	ppm	-132.7	mV	▶	10000	ppb

* Non-upgraded units using 100045 sodium and 100056 reference electrodes.

** Upgraded units using 100048 sodium and 100058 reference electrodes.

*** Units using 210048 sodium and 210058 reference electrodes only. Monitor is not compatible with 100048 and 100059 electrodes.

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