



DIONEX

SC20 SUPPRESSOR CONTROLLER INSTALLATION AND OPERATION INSTRUCTIONS

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SC20 Suppressor Controller Installation and Operation

The SC20 Suppressor Controller is the external power supply required when the Atlas™ Electrolytic Suppressor (AES) is installed in a DX-320, DX-500, or DX-600 system, or in a DX-120 Ion Chromatograph. If desired, the SC20 can also be used with an SRS® Self-Regenerating Suppressor.

This manual provides detailed instructions for installing and operating the SC20. For more information about the suppressors, refer to the appropriate manual:

- *Installation Instructions and Troubleshooting Guide for the Anion Atlas Electrolytic Suppressor and Cation Atlas Electrolytic Suppressor*
(Document No. 031770)
- *Installation Instructions and Troubleshooting Guide for the Anion Self-Regenerating Suppressor-Ultra (4-mm and 2-mm)*
(Document No. 031367)
- *Installation Instructions and Troubleshooting Guide for the Cation Self-Regenerating Suppressor-Ultra (4-mm and 2-mm)*
(Document No. 031370)

1. Unpacking the SC20

1. Remove the SC20 from the packing box.
2. Inspect the SC20 and the power cable for any signs of shipping damage. If there is damage, notify the carrier and Dionex immediately.

NOTE Save the packing box and packing materials in case the SC20 must be transported in the future. If you return the SC20 for service, attach a tag that identifies the owner and includes a brief description of the problem.

3. Check the SC20 rear panel label to verify that you received the correct version of the SC20.

SC20 Version	Part Number
100 V	057756
115 V	057755
230 V	057757

2. Installing the SC20 in a DX-320 or DX-320J System

2.1 Moduleware Compatibility

Atlas support for the DX-320 and DX-320J requires IC20 Moduleware version 3.09 (or higher) or IC25 Moduleware version 1.05 (or higher). Before installing the SC20, verify that the correct Moduleware version is installed. If a Moduleware upgrade is required, contact Dionex.

2.2 Initial Setup

1. Turn off the power to the chromatography system (including the pump, detector, automated sampler, and chromatography compartment).
2. Place the SC20 in the desired location; Dionex recommends installing the SC20 near the chromatography compartment. Allow at least 15 cm (6 in) behind the SC20 for ventilation. Ambient temperature should not exceed 40 °C (104 °F).

2.3 Connecting the SC20 Suppressor Cable

NOTE If the system already contains an Atlas suppressor, disregard Step 1 and go on to Step 2.

1. If the system currently includes an SRS suppressor, you must disconnect the SRS from the internal power supply. To disconnect the SRS suppressor, do the following:
 - a. Open the door of the detector and locate the SRS cable connected to J3 (SRS) of the SCR card in slot 2. (The label on the inside of the door identifies the electronics cards.)
 - b. Unplug the SRS cable from the J3 connector (see Figure 1).

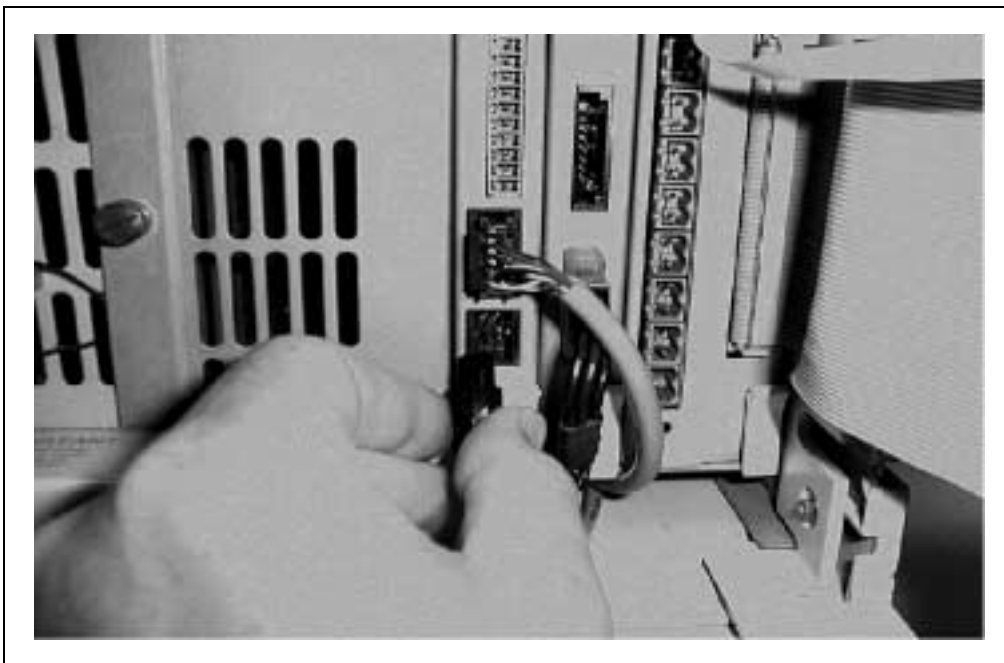


Figure 1. Disconnecting the SRS Cable from the SCR Card

- c. Locate the suppressor in the chromatography compartment.
- d. Disconnect the SRS power source cable from the SRS cable (see Figure 2). You may remove the cable from the system, or leave it for future use.

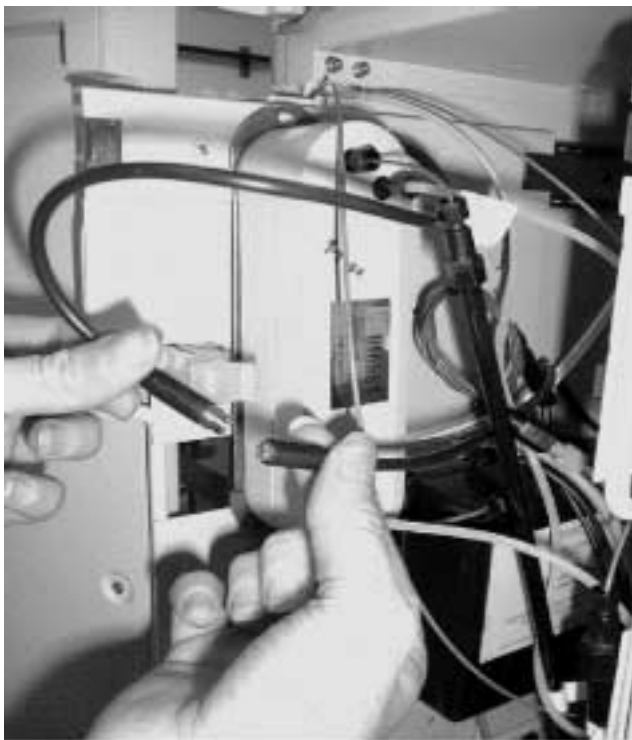


Figure 2. Disconnecting the SRS Power Source Cable from the SRS Cable

2. Locate the **SUPPRESSOR** cable extending from the front panel of the SC20 Suppressor Controller (see Figure 3). Route this cable to the chromatography compartment.

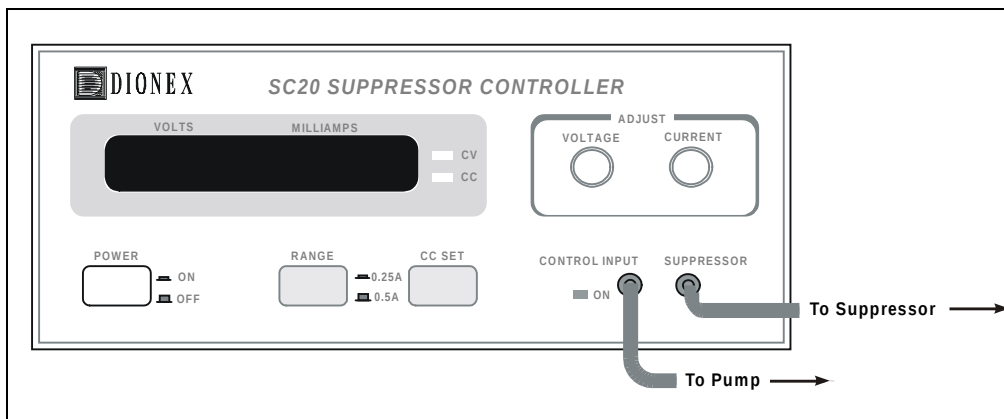


Figure 3. SC20 Suppressor Controller Front Panel

3. The SC20 **SUPPRESSOR** cable can be connected to an Atlas or SRS suppressor:
 - If you plan to operate with an Atlas suppressor, install it now. (Refer to the Atlas suppressor manual for installation instructions.) Connect the Atlas to the SC20 **SUPPRESSOR** cable you routed to the chromatography compartment in Step 2.
 - If you plan to operate with an existing SRS suppressor, connect the SRS to the SC20 **SUPPRESSOR** cable you routed to the chromatography compartment in Step 2.

2.4 Connecting the Control Input Cable to the Pump

1. Locate the **CONTROL INPUT** cable extending from the SC20 front panel (see Figure 3).
2. Open the upper door of the pump enclosure. Locate the TTL-2 OUT connector in slot 4 of the electronics chassis.

3. Connect the SC20 **CONTROL INPUT** cable to the TTL-2 OUT connector (see Figure 4). Be sure to route the cable through the slot in the side of the module; this will ensure that the door closes completely.

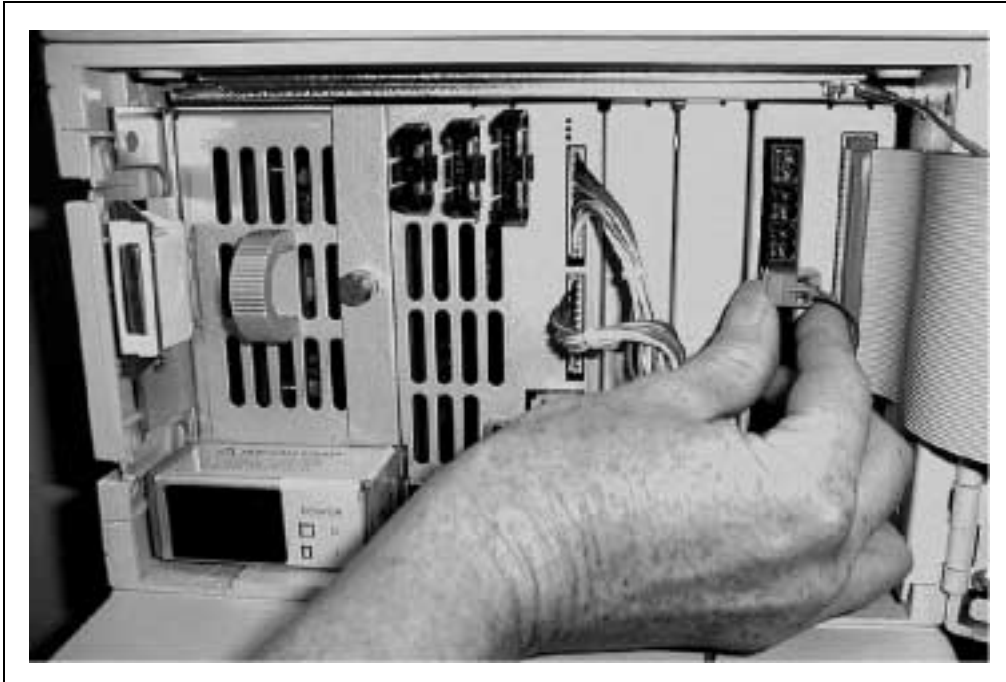


Figure 4. Connecting the Control Input Cable to the Pump TTL Connector

2.5 Setting the Pump Options

1. Turn on the main power switch to the IC20 or IC25.
2. After the module has completed the power-up diagnostic tests, press **Menu** to display the **MENU of SCREENS**.
3. From the **MENU of SCREENS**, select the **SETUP** screen and then select **PUMP OPTIONS** and press **Enter**.

- Use the cursor arrow buttons to navigate to the **TTL2 OUTPUT USAGE** field (see Figure 5). Use the **Select** buttons to set the **TTL2 OUTPUT USAGE** to **0 FLOW**. Press **Enter** to save the entry.

PUMP OPTIONS	
PUMP HEAD MATERIAL:	INERT
PUMP HEAD VOLUME:	25 uL
CONTROL MODE:	PRESSURE
TTL2 OUTPUT USAGE:	0 FLOW
PRESSURE UNITS:	PSI

Figure 5. DX-320/DX-320J Pump Options Screen

- Press **Menu** twice to exit the **PUMP OPTIONS** screen and return to the **MENU of SCREENS**.
- From the **MENU of SCREENS**, select the **DETAIL** screen and press **Enter** (see Figure 6).

0 PSI	OUTPUT	0.05uS	TTL1	0
5.00 mL/MIN	OFFSET	189.13 uS	TTL2	0
LOAD	TOTAL	189.18 uS	RLY1	0
SRS OFF mA	RANGE	100uS	RLY2	0
TEMP COMP 1.7	OVEN TEMP	25 C	READY	
LIMIT 200 - 5000 PSI	P-POINT L= 0 R=0			
LOCAL	DIRECT CNTRL			

Figure 6. DX-320/DX-320J Detail Screen

7. Navigate to the **LIMIT** field and set the pump low pressure limit to 1.38 MPa (200 psi):
 - When pump operation is controlled by PeakNet®, select the low pressure limit from the software.
 - For front panel control, enter the low pressure limit on the **DETAIL** screen (see Figure 6).

NOTE To protect the suppressor from alarm conditions, Dionex recommends always entering a low pressure limit of 1.38 MPa (200 psi).

2.6 Final Setup

1. Turn the **VOLTAGE** and **CURRENT** knobs on the SC20 front panel (see Figure 3) fully counterclockwise to prevent high voltage and current when the system is turned on.
2. Plug the SC20 power cord into an AC outlet.



The third conductor in the power cable is the ground conductor. When the cable is plugged into an appropriate receptacle, the SC20 is grounded. Never operate the SC20 without an adequate cabinet ground connection.



Le troisième conducteur dans le câble d'alimentation électrique est le conducteur de mise à la masse. Lorsque le câble est branché dans une prise correcte, le SC20 est mis à la masse. N'utilisez jamais le SC20 sans un branchement correct à la masse de l'armoire.



Die dritte Ader im Netzkabel ist die Masseleitung. Sobald das Kabel in die entsprechende Steckdose eingesteckt wird, ist das SC20 geerdet. Betreiben Sie das SC20 unter keinen Umständen ohne geeignete Masseverbindung des Gehäuses.

3. This completes the SC20 installation procedure. Turn on the power to all system components, including the SC20, and go on to Section 5 for SC20 operating instructions.

3. Installing the SC20 in a DX-500 or DX-600 System

NOTE This procedure applies to the following pump modules:
the GP40, GP50, and GS50 Gradient Pumps and the
IP20, IP25, and IS25 Isocratic Pumps.

3.1 Initial Setup

1. Turn off the power to the chromatography system (including the pump, detector, automated sampler, and chromatography compartment).
2. Place the SC20 in the desired location; Dionex recommends installing the SC20 near the chromatography compartment. Allow at least 15 cm (6 in) behind the SC20 for ventilation. Ambient temperature should not exceed 40 °C (104 °F).

3.2 Connecting the SC20 Suppressor Cable

NOTE If the system already contains an Atlas suppressor, disregard Step 1 and go on to Step 2.

1. If the system currently includes an SRS suppressor, you must disconnect the SRS from the internal power supply. To disconnect the SRS suppressor, do the following:
 - a. Open the door of the detector and locate the SRS cable connected to J3 (SRS) of the SCR card in slot 2. (The label on the inside of the door identifies the electronics cards.)

- b. Unplug the SRS cable from the J3 connector (see Figure 7).

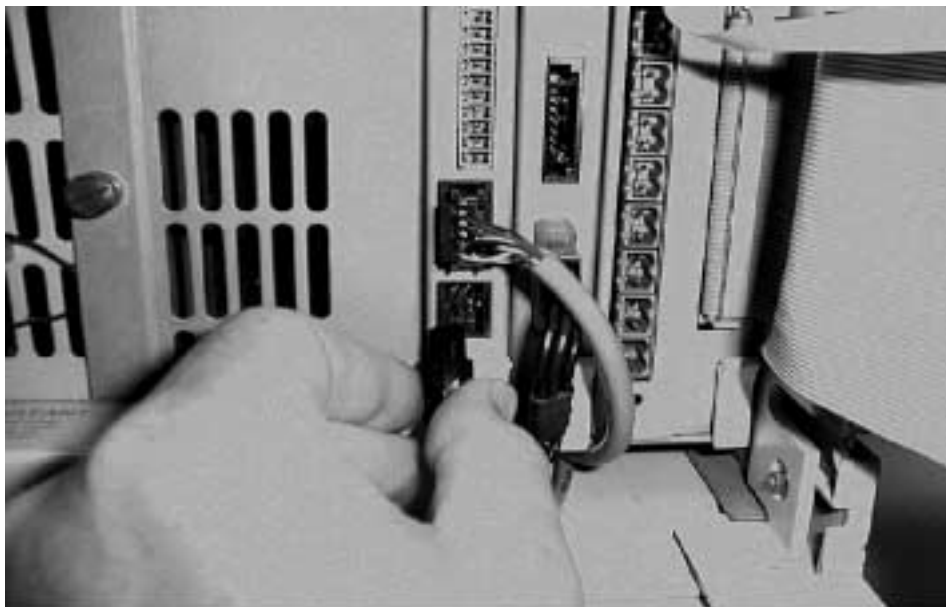


Figure 7. Disconnecting the SRS Cable from the SCR Card

- c. Locate the suppressor in the chromatography compartment.
- d. Disconnect the SRS power source cable from the SRS cable (see Figure 8). You may remove the cable from the system, or leave it for future use.

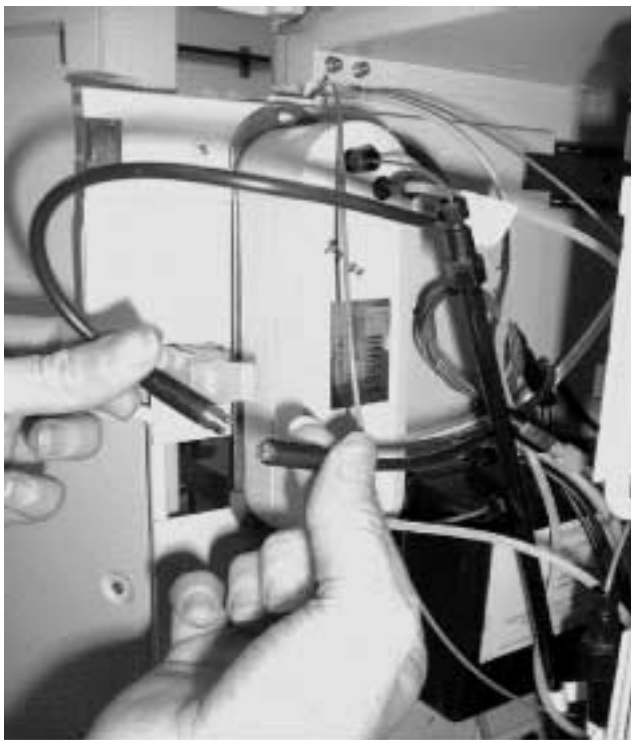


Figure 8. Disconnecting the SRS Power Source Cable from the SRS Cable

2. Locate the **SUPPRESSOR** cable extending from the front panel of the SC20 Suppressor Controller (see Figure 9). Route this cable to the chromatography compartment.

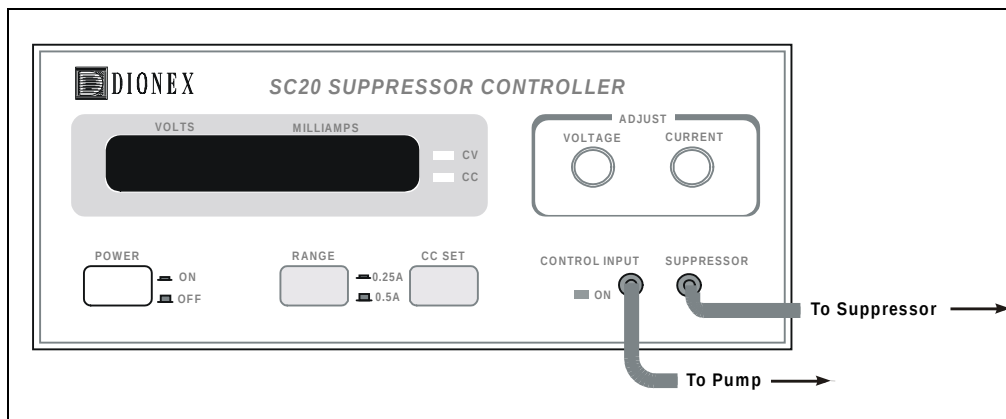


Figure 9. SC20 Suppressor Controller Front Panel

3. The SC20 **SUPPRESSOR** cable can be connected to an Atlas or SRS suppressor:
 - If you plan to operate with an Atlas suppressor, install it now. (Refer to the Atlas suppressor manual for installation instructions.) Connect the Atlas to the SC20 **SUPPRESSOR** cable you routed to the chromatography compartment in Step 2.
 - If you plan to operate with an existing SRS suppressor, connect the SRS to the SC20 **SUPPRESSOR** cable you routed to the chromatography compartment in Step 2.

3.3 Connecting the Control Input Cable to the Pump

1. Locate the **CONTROL INPUT** cable extending from the SC20 front panel (see Figure 9).
2. Open the upper door of the pump enclosure. Locate the TTL-2 OUT connector in slot 4 of the electronics chassis.

3. Connect the SC20 **CONTROL INPUT** cable to the TTL-2 OUT connector (see Figure 10). Be sure to route the cable through the slot in the side of the module; this will ensure that the door closes completely.

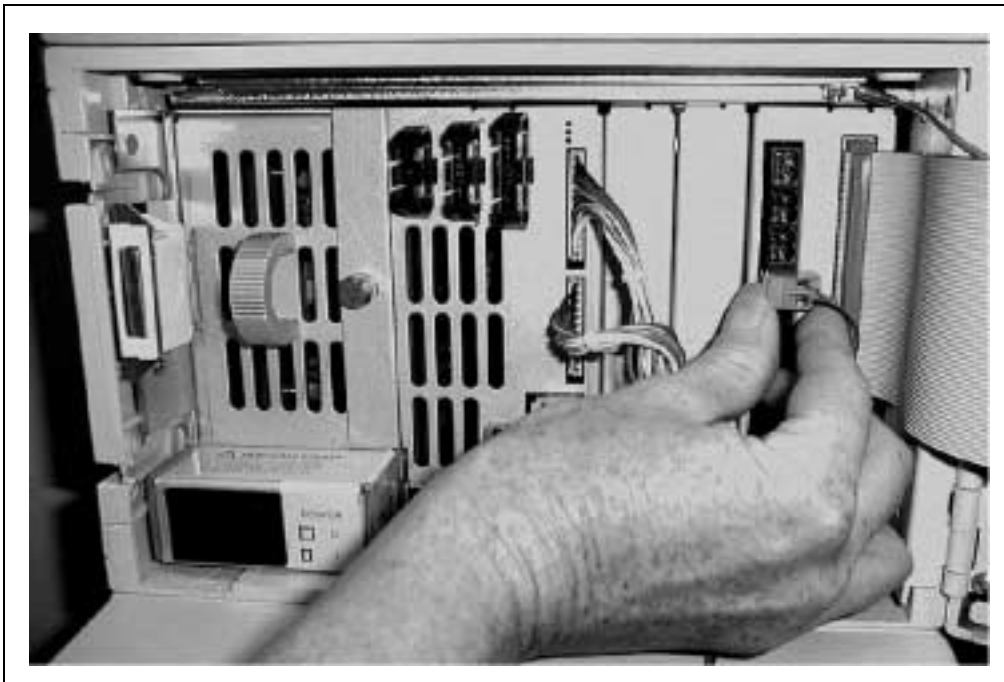


Figure 10. Connecting the Control Input Cable to the Pump TTL Connector

3.4 Setting the Pump Options

1. Turn on the main power switch to the pump.
2. After the pump has completed the power-up diagnostic tests, press **Menu** to display the **MENU of SCREENS**.
3. From the **MENU of SCREENS**, select **PUMP OPTIONS** and press **Enter**.

4. Use the cursor arrow buttons to navigate to the **TTL2 OUTPUT USAGE** field (see Figure 11). Use the **Select** buttons to set the **TTL2 OUTPUT USAGE** to **0 FLOW**. Press **Enter** to save the entry.

PUMP OPTIONS	
PUMP HEAD MATERIAL:	INERT
PUMP HEAD VOLUME:	25 uL
CONTROL MODE:	PRESSURE
TTL2 OUTPUT USAGE:	0 FLOW
PRESSURE UNITS:	PSI

Figure 11. DX-500/DX-600 Pump Options Screen

5. Press **Menu** to exit the **PUMP OPTIONS** screen and return to the **MENU of SCREENS**.
6. From the **MENU of SCREENS**, select the **DETAIL** screen and press **Enter** (see Figure 12).

DETAIL SCREEN			TTL1	0
100.0 %A	59	PSI	TTL2	0
0.0 %B	0.30	mL/MIN	RLY1	0
0.0 %C	LOAD	SAMPLE	RLY2	0
0.0 %D	COLUMN	A		
	LIMIT	200-5000	PSI	
LOCKED RMT	DIRECT CNTRL			

Figure 12. DX-500/DX-600 Detail Screen

7. Navigate to the **LIMIT** field and set the pump low pressure limit to 1.38 MPa (200 psi).
 - When pump operation is controlled by PeakNet, select the low pressure limit from the software.
 - For front panel control and when creating methods, set the low pressure limit on the **DETAIL** screen (see Figure 12).

NOTE To protect the suppressor from alarm conditions, Dionex recommends always entering a low pressure limit of 1.38 MPa (200 psi).

3.5 Final Setup

1. Turn the **VOLTAGE** and **CURRENT** knobs on the SC20 front panel (see Figure 9) fully counterclockwise to prevent high voltage and current when the system is turned on.
2. Plug the SC20 power cord into an AC outlet.



The third conductor in the power cable is the ground conductor. When the cable is plugged into an appropriate receptacle, the SC20 is grounded. Never operate the SC20 without an adequate cabinet ground connection.



Le troisième conducteur dans le câble d'alimentation électrique est le conducteur de mise à la masse. Lorsque le câble est branché dans une prise correcte, le SC20 est mis à la masse. N'utilisez jamais le SC20 sans un branchement correct à la masse de l'armoire.



Die dritte Ader im Netzkabel ist die Masseleitung. Sobald das Kabel in die entsprechende Steckdose eingesteckt wird, ist das SC20 geerdet. Betreiben Sie das SC20 unter keinen Umständen ohne geeignete Masseverbindung des Gehäuses.

3. This completes the SC20 installation procedure. Turn on the power to all system components, including the SC20, and go on to Section 5 for SC20 operating instructions.

4. Installing the SC20 in a DX-120

4.1 Initial Setup

1. Turn off the power to the DX-120.
2. Place the SC20 in the desired location; Dionex recommends installing the SC20 near the DX-120. Allow at least 15 cm (6 in) behind the SC20 for ventilation. Ambient temperature should not exceed 40 °C (104 °F).

4.2 Disconnecting the SRS A Power Source Cable

NOTE Complete this section only if an SRS suppressor is already installed. Otherwise, go on to Section 4.3.

1. Open the front door of the DX-120.
2. Locate the SRS A Power Source cable in the main compartment (see Figure 13).

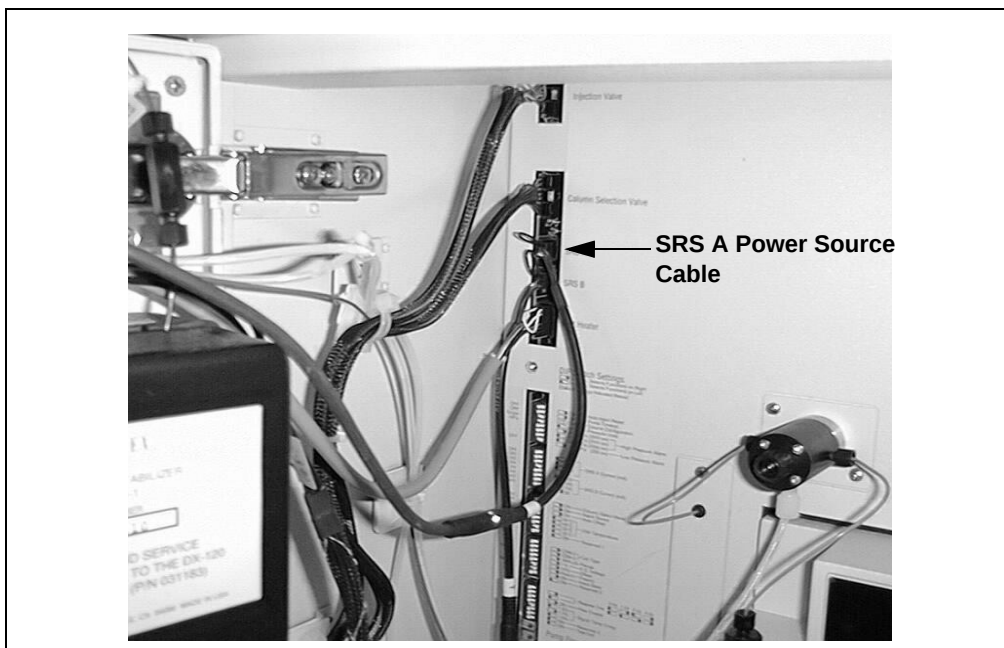


Figure 13. The DX-120 SRS A Power Source Cable

3. Firmly grip the SRS A power source cable at the connector and unplug it from the electronics card.
4. Disconnect the SRS A power source cable from the suppressor cable and remove it (see Figure 14). Store the cable for future use.



Figure 14. Disconnecting the SRS A Power Source Cable from the Suppressor Cable

4.3 Connecting the SC20 Suppressor Cable

1. Locate the **SUPPRESSOR** and **CONTROL INPUT** cables extending from the front panel of the SC20 (see Figure 15). Route the cables to the DX-120 as follows:
 - a. Cables exit the DX-120 via a through hole in either side of the enclosure (see Figure 17). Open the DX-120 front door and press from the inside to pop out the grommet on the side nearest to the SC20's location.
 - b. Run the **SUPPRESSOR** and **CONTROL INPUT** cables through the new grommet (P/N 059089) provided with the DX-120 adapter (see Section 4.4).
 - c. Route the **SUPPRESSOR** and **CONTROL INPUT** cables through the through hole in the side of the DX-120.
 - d. Press the new grommet into the through hole.

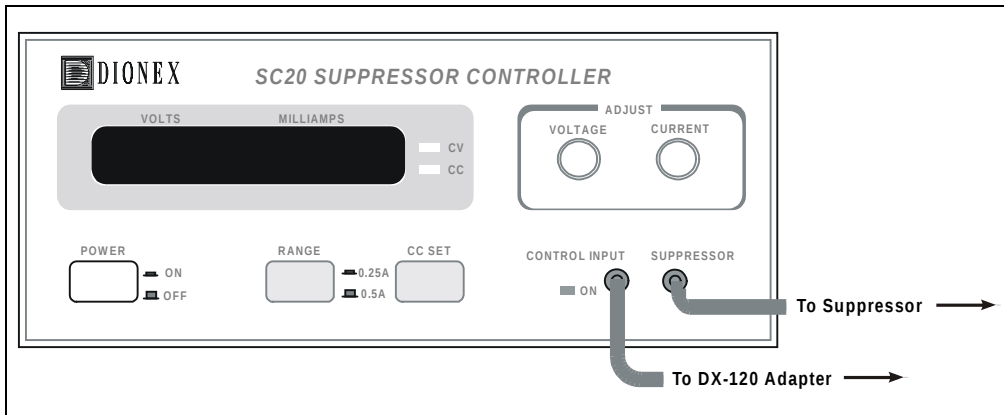


Figure 15. SC20 Suppressor Controller Front Panel

2. If you plan to operate with an Atlas suppressor, install it now. (Refer to the Atlas suppressor manual for installation instructions.) Connect the Atlas to the SC20 **SUPPRESSOR** cable you just routed inside the DX-120 main compartment.
3. If you plan to operate with an existing SRS suppressor, connect it to the SC20 **SUPPRESSOR** cable you just routed inside the DX-120 main compartment.

4.4 Connecting the DX-120 Adapter

A special DX-120 adapter (P/N 057861) must be installed between the SC20 and the DX-120. The adapter ensures that all current to the suppressor stops if there is no flow to the pump.

1. Connect the 2-pin connector on the DX-120 adapter (see Figure 16) to the **CONTROL INPUT** cable you routed inside the DX-120 main compartment.

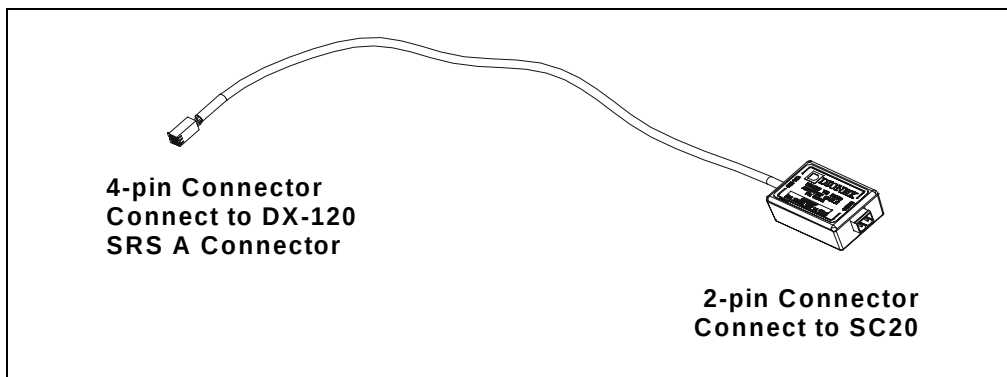


Figure 16. DX-120 Adapter

2. Plug the 4-pin connector on the DX-120 adapter (see Figure 16) into the SRS A connector inside the DX-120 main compartment (see Figure 17).

NOTE Connect the Atlas suppressor to the SRS A connector for both a single-column and dual-column system. If you have both an Atlas and an SRS suppressor, connect the SRS to the SRS B channel. If you install two Atlas suppressors, you must have two SC20 Suppressor Controllers and two DX-120 adapter cables.

3. Using the DIP switches, make sure the SRS A current is set to 50 mA (see the *DX-120 Ion Chromatograph Operator's Manual* (Document No. 031183) for more information).

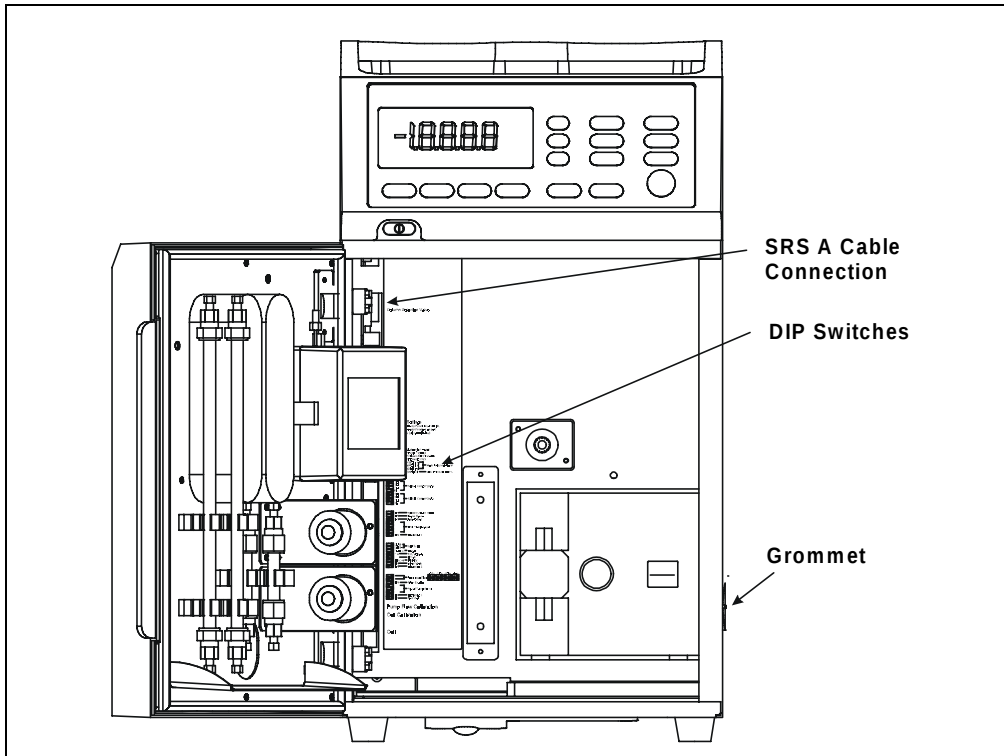


Figure 17. DX-120 SRS A Cable Connection

4. A strip of VELCRO® on the back of the DX-120 adapter holds the adapter in place when installed. Remove the covering from the adhesive side of the VELCRO strip.
5. Position the adapter against an interior wall of the DX-120. Make sure the adapter is in the preferred location, and then press the adapter firmly into place.

4.5 Final Setup

1. Turn the **VOLTAGE** and **CURRENT** knobs on the SC20 front panel (see Figure 15) fully counterclockwise to prevent high voltage and current when the system is turned on.
2. Plug the SC20 power cord into an AC outlet.



The third conductor in the power cable is the ground conductor. When the cable is plugged into an appropriate receptacle, the SC20 is grounded. Never operate the SC20 without an adequate cabinet ground connection.



Le troisième conducteur dans le câble d'alimentation électrique est le conducteur de mise à la masse. Lorsque le câble est branché dans une prise correcte, le SC20 est mis à la masse. N'utilisez jamais le SC20 sans un branchement correct à la masse de l'armoire.



Die dritte Ader im Netzkabel ist die Masseleitung. Sobald das Kabel in die entsprechende Steckdose eingesteckt wird, ist das SC20 geerdet. Betreiben Sie das SC20 unter keinen Umständen ohne geeignete Masseverbindung des Gehäuses.

3. This completes the SC20 installation procedure. Turn on the power to all system components, including the SC20, and go on to Section 5 for SC20 operating instructions.

5. Operating the SC20

1. If you have not turned on the SC20, push the **POWER** button on the SC20 front panel to **On** (see Figure 15).
2. Set the **RANGE** button to the appropriate current setting for the suppressor (0.25 A for the AES or 0.5 A for the SRS).
3. Set the **VOLTAGE** to the appropriate voltage limit for the suppressor (50 V for the AES or 10 V for the SRS). To do this:
 - a. Turn the **CURRENT** knob (to the right of the **VOLTAGE** knob) clockwise one complete turn or until the **CV** LED next to the display lights.
 - b. When the **CV** LED lights, adjust the **VOLTAGE** knob to the appropriate limit.
4. Set the **CURRENT** to the current setting recommended in the Atlas or SRS suppressor manual. To do this:
 - If the suppressor is not connected or the pump is off, press the **CC SET** button and keep it depressed while you turn the **CURRENT** knob fully counterclockwise, and then turn it to the required current setting.
 - If the suppressor is connected or the pump is on, turn the **CURRENT** knob fully counterclockwise and then turn it to the required current setting (you do not need to press the **CC SET** button).

IMPORTANT

The **VOLTAGE** and **CURRENT** knobs turn easily. When adjusting these knobs, be careful not to accidentally move the knobs beyond their intended set points.

5. To begin supplying current (mA) to the suppressor, turn on the pump and set the flow rate above 0.1 mL/min. For a DX-120 installation, also press the **SRS** button on the DX-120 front panel. If the SC20 is installed correctly, the **CONTROL INPUT ON** LED on the SC20 front panel will now be lighted.
6. See the following tables for summaries of the SC20 operational safety features.

DX-320/320J and DX-500/DX-600 SC20 Safety Features

- The **CONTROL INPUT ON** LED on the SC20 front panel indicates whether the SC20 is supplying current to the suppressor. If the LED is not lighted, current is not being supplied.
- Use the Pump On/Off function to toggle the **CONTROL INPUT ON** LED. A flow rate of more than 0.1 mL/min will turn on the current to the suppressor.
- The low and high pressure alarms will turn off the SC20 under alarm conditions. Dionex recommends setting the low pressure limit to 1.38 MPa (200 psi).
- If the pump flow rate is set to 0.00 mL/min (zero flow), the SC20 will turn off the current to the suppressor.

DX-120 SC20 Safety Features

- The **CONTROL INPUT ON** LED on the SC20 front panel indicates whether the SC20 is supplying current to the suppressor. If the LED is not lighted, current is not being supplied.
- The SC20 provides current to the suppressor only when the pump is on and the suppressor has been turned on via the **SRS** button on the DX-120 front panel or through the software.
- Turning off the pump also toggles off the current to the suppressor.

6. Shutting Down the SC20

IMPORTANT

In order to protect the suppressor, be sure to turn off the pump flow when you shut down the SC20.

DX-120 Shutdown

Front panel control Turn off the pump.

Software control Turn off the pump from the software.

DX-320/DX-320J Shutdown

Front panel control Set flow to 0 *or*
Turn off the pump motor.

Software control Write a method or program to set the flow to 0. Include a TTL-2 command to disable the TTL and shut off current to the suppressor.

DX-500/DX-600 Shutdown

Front panel control Set the flow to 0 *or*
Turn off the pump motor.

Software control Write a program or method to set the flow to 0. This disables the TTL and shuts off current to the suppressor.

SC20 Manual Shutdown

- Turn off the pump motor.
- Turn the **CURRENT** and **VOLTAGE** knobs on the SC20 front panel counterclockwise until the digital readout says 0.0 V and 0.0 mA.
- Turn off the power to the SC20.

7. Troubleshooting

The table below lists some routine problems that may occur when installing or operating the SC20.

Problem	Solution
When I turn the VOLTAGE knob, nothing happens.	Before setting the voltage, be sure to turn the CURRENT knob clockwise one full turn or until the CV LED lights.
I can't set the current high enough.	The flow rate or the current setting may be incorrect. Verify that the voltage setting is appropriate for the suppressor type. See the Atlas or SRS suppressor manual for troubleshooting instructions.
The SC20 is "not enabled" although the pump is on.	Check the TTL-2 OUT connector for a loose wire. Check that the TTL OUTPUT USAGE is set to 0 FLOW on the PUMP OPTIONS screen.

8. SC20 Specifications

Input Voltage	100 VAC +/- 10%, 47–63 Hz, 0.8A, 70W 120 VA Max 115 VAC +/- 10%, 47–63 Hz, 0.8A, 70W 120 VA Max 230 VAC +/- 10%, 47–63 Hz, 0.4A, 70W 120 VA Max
Output	0–50 VDC, 0–500 mA  If the display does not show a steady voltage reading between 0 and 60 V, immediately discontinue use and contact your Dionex Service Representative.  Si l'écran n'affiche pas une tension constante entre 0 et 60 V, cessez-en immédiatement l'utilisation et contactez votre représentant Dionex.  Wird auf dem Display keine gleichmäßige Spannung zwischen 0 und 60 V angezeigt, so ist der Betrieb unverzüglich zu unterbrechen. Wenden Sie sich in diesem Fall bitte an den Dionex Service.
Fuses	<i>Internal:</i> Two 125 V, 1A One Fusible Resistor 1 OHM 5% 0.5W <i>External:</i> 100 VAC: One 250V, 2A NTD 115 VAC: One 250V, 2A NTD 230 VAC: One 250V, 1A
Ripple and Noise	Constant current supply with <200 μ A rms and 1 mA P-P
Temperature Range	0–40 °C (32–104 °F); convection cooling is employed
Output Drift	Less than 0.1% total drift for 8 hours after initial warm-up of 30 minutes

Overload Protection	A continuously acting constant current circuit protects the power supply for all overloads, including a direct short on its power output
Weight (net)	3.9 kg (8.6 lbs)

