

Retrofit kit for Sigma SD900 controllers

Safety information

Please read this entire document before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To ensure that the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that specified in this document.

Use of hazard information

DANGER

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation that may result in minor or moderate injury.

Important note: Information that requires special emphasis.

Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol, if noted on the instrument, will be included with a danger or caution statement in the manual.

	<p>This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.</p>
	<p>Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user.</p> <p>Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment, producer-supplied electrical accessories, and all auxiliary items for proper disposal.</p>

Overview

This instruction sheet describes the replacement of a Sigma 900 controller with an SD900 controller on existing Sigma samplers. This instruction sheet should be used with one of the following retrofit kits:

Sampler type	Retrofit kit Cat. No.	Installation instructions
Portable	8759400	Page 2
Refrigerated	8759600US; 8759600UK; 8759600EU	Page 6
AWRS (all weather refrigerated sampler) ¹	8759500	Page 14

¹ The SD900 controller cannot be installed on an AWRS that contains a heater in the controller compartment.

Portable sampler

The components of the retrofit kit for the portable sampler are shown in [Figure 1](#).

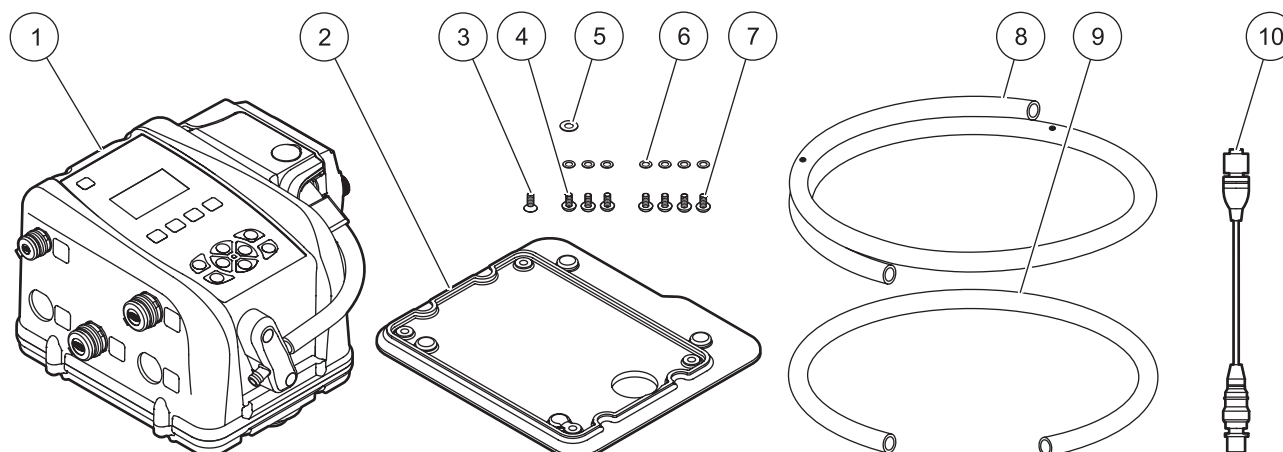


Figure 1 Components of retrofit kit 8759400 for the portable sampler

1	SD900 controller	7	Screw, ¼–20 x ½ inch, button head (4x)
2	Adapter mounting plate (Cat. No. 8741400)	8	Pump tube, replacement (Cat. No. 8753800)
3	Screw, ¼–20 x ½ inch flathead	9	Silicone tube (Cat. No. 3866)
4	Screw, ¼–20 x ½ inch truss head (3x)	10	Power adapter cable (Cat. No. 8739400)
5	Flat washer, ¼ inch	11	User manual, SD900 Portable Sampler (not shown)
6	Lock washer, ¼ inch (7x)	12	Silicone grease (not shown) (Cat. No. 8754700) ¹

¹ Silicone grease is supplied for the O-ring on the desiccant tube. See user manual for more information.

Remove the Sigma 900 controller

CAUTION

Biological sample hazard. Disconnect the sampler from the power source to disable the pump before attempting to remove the controller.

1. Remove power to the controller.
2. Disconnect all cables from the connectors on the side of the controller.
3. Remove the pump tube from the stainless steel fitting and from the plastic tube fitting on the sampler center section.
4. Remove the distributor or full bottle shut-off from the center section:
 - a. Place the center section upside down to access the distributor or full bottle shut-off.
 - b. Disconnect the distributor (or full bottle shut-off) cable from the controller.
 - c. Remove the distributor (or full bottle shut-off) tube from the plastic tube fitting on the inside of the center section.
 - d. Loosen the thumbscrew and remove the distributor or full bottle shut-off.
5. Remove the three screws from the distributor (or full bottle shut-off) mounting plate ([Figure 3 on page 4](#)). Remove the plate.
6. Remove the fourth screw that secures the controller to the center section ([Figure 3](#)).

- Lift the center section to separate the controller from the sampler housing.

Attach the adapter mounting plate to the SD900 controller

- Place the SD900 controller face down on a cloth-covered workbench.
- Position the adapter mounting plate on the bottom of the controller so that the holes in the plate align with the holes in the bottom of the controller ([Figure 2](#)).
- Secure the plate to the controller with the supplied screws and lock washers ([Figure 2](#)).

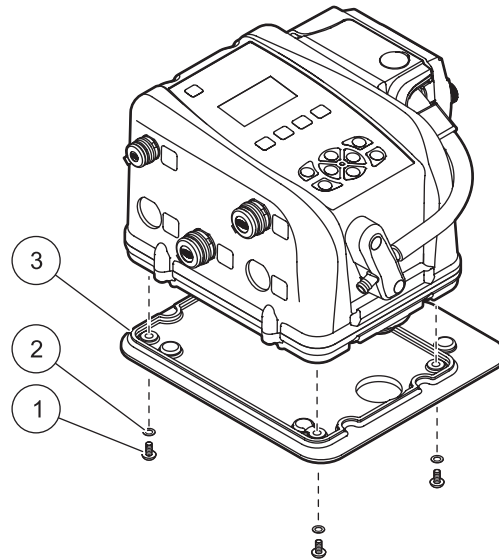


Figure 2 Installation of SD900 controller on the adapter mounting plate

1	Screw, ¼–20 x ½ inch button-head (4x)	3	Adapter mounting plate
2	Lock washer, ¼ inch (4x)		

Install the SD900 controller on the sampler

- With the SD900 controller face down, position the center section over the controller so that the holes in the center section line up with the holes in the adapter mounting plate ([Figure 3](#)).
- Position the distributor (or full bottle shut-off) mounting plate over the holes on the inside of the center section.
- Insert the flat-head screw into the recessed hole in the mounting plate and secure.
- Insert the remaining three screws with lock washers to secure the SD900 controller to the center section ([Figure 3](#)).
- Install the distributor or full bottle shut-off:
 - Slide the slots in the distributor (or full bottle shut-off) base plate under the holding screws on the distributor mounting plate. Position the thumbscrew over the hole and tighten by hand.
 - Connect the distributor (or full bottle shut-off) cable to the bottom of the controller.

- c. Rotate the distributor arm so that the arm is 180 degrees from the plastic tube fitting on the inside of the center section.
- d. Install the distributor (or full bottle shut-off) tube onto the plastic tube fitting.

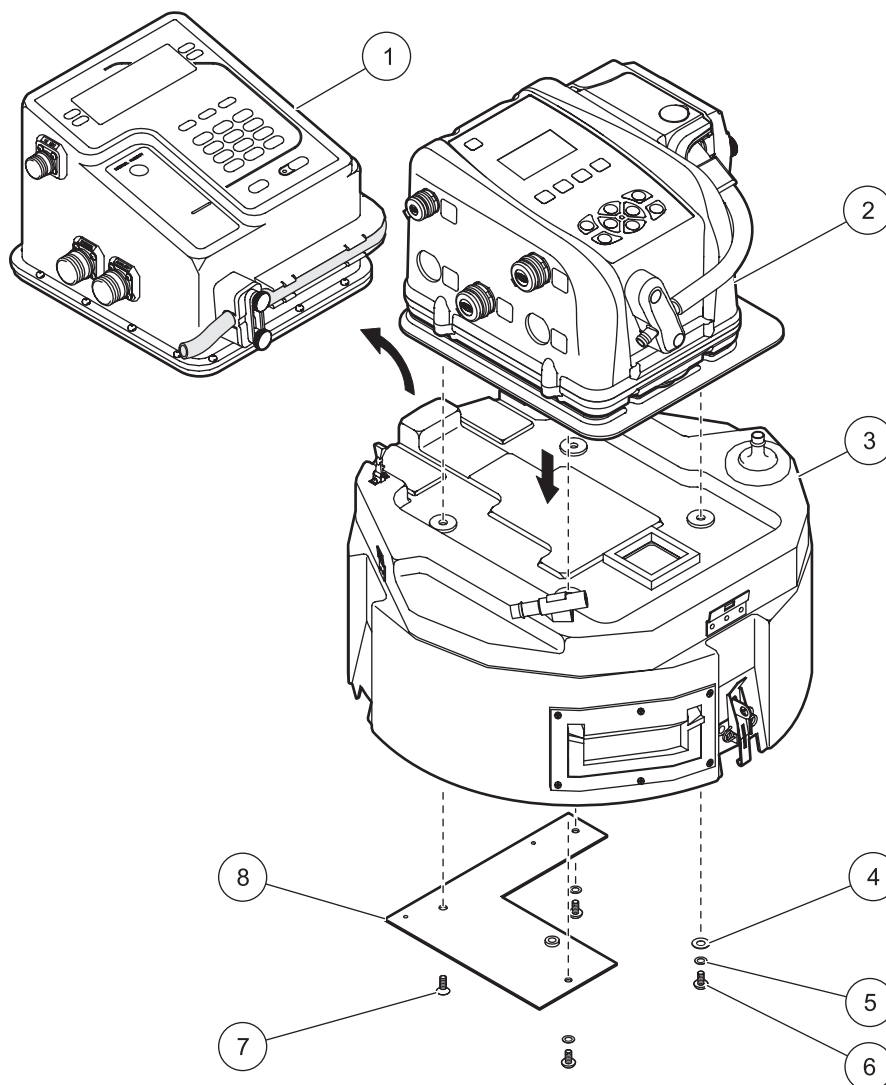


Figure 3 SD900 controller installation on the sampler center section

1	Sigma 900 controller (Cat. No. 8970)	5	Lock washer, ¼-inch (3x)
2	SD900 controller	6	Screw, ¼–20 x ½ inch machine (3x)
3	Sampler center section	7	Flathead screw
4	Flat washer, ¼-inch	8	Distributor/full bottle shut-off mounting plate

Install tubing

1. Cut a 5-inch piece from the supplied silicone tube.
2. Push one end of the tube on the stainless steel fitting on the sampler housing (Figure 4).
3. Push the other end of the tube on the liquid sensor fitting on the SD900 controller.

4. Push the tube from the pump on the plastic tube fitting on the sampler housing (Figure 4).

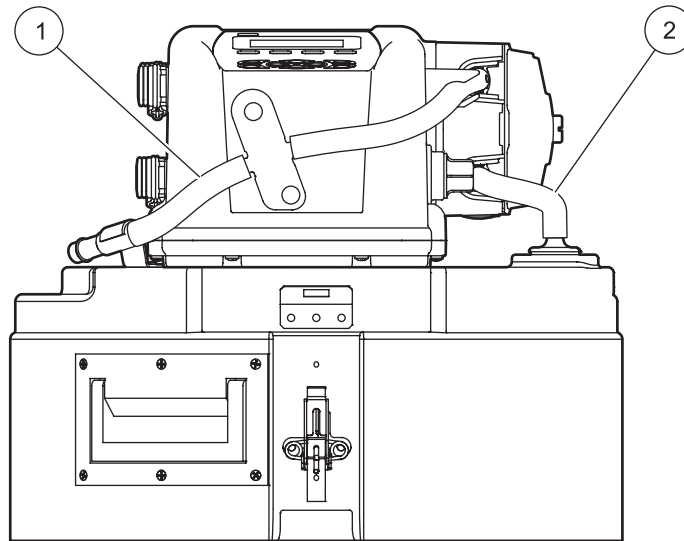


Figure 4 Tubing installation

1 Tube, silicone, 5-inch piece (Cat. No. 3866)	2 Pump tube connection to plastic tube fitting
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Install cables

Connect the supplied power adapter cable to the battery (2-pin connector) and SD900 controller (3-pin connector).

Note: Connection to the auxiliary and serial connectors requires an adapter cable or new cable. An auxiliary adapter cable can be used with existing cables that are no more than 10 feet long. Existing cables that are longer than 10 feet must be replaced with new cables. Refer to the user manual for ordering information.

Refer to the user manual for start-up and operation of the SD900 controller.

Refrigerated sampler

The components of the retrofit kit for the refrigerated sampler are shown in [Figure 5](#).

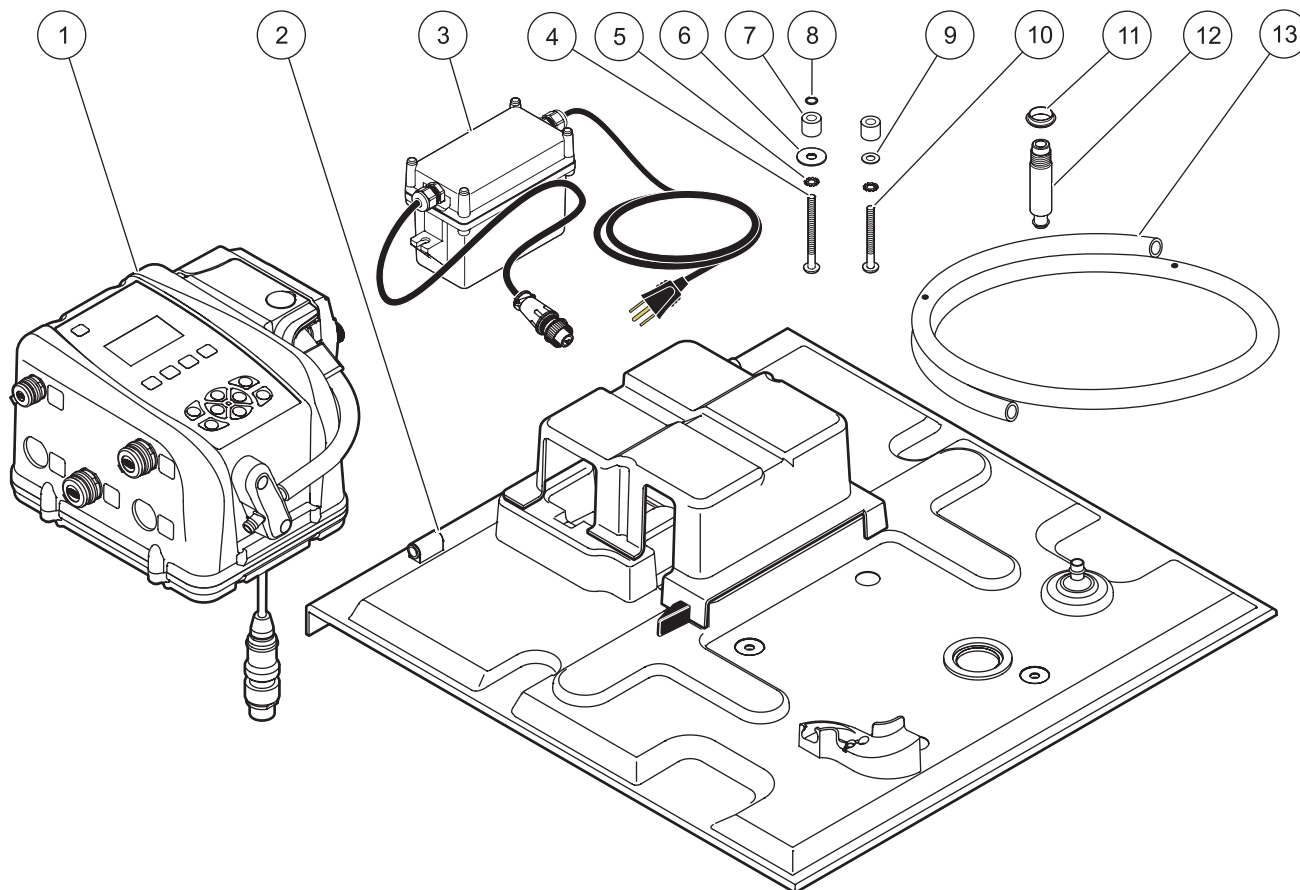


Figure 5 Components of retrofit kit 8759600 for the refrigerated sampler

1	SD900 controller (Cat. No. 8971SD)	9	Flat washer, ¼ inch
2	Transition plate with hold-down bracket	10	Screw, ¼–20 x 2½ inch
3	Power supply (Cat. No. 8754500US) ¹	11	Grommet (Cat. No. 2050)
4	Screw, ¼–20 x 3 inch	12	Sample extension fitting (Cat. No. 8966)
5	Lock washer, ¼ inch (2x)	13	Pump tube, replacement (Cat. No. 8753800)
6	Washer, fender, ¼ x 1 inch	14	User manual, SD900 Refrigerated Sampler (not shown)
7	Nylon spacer, ¼ x ½ x ¾ inch (2x) (Cat. No. 5696200)	15	Silicone grease (not shown) (Cat. No. 8754700) ²
8	O-ring, 7/32 x 11/32 x 1/16 inch (Cat. No. 5042)	16	Drill template (not shown) (Cat. No. 8760000)

¹ Other power supply options: Cat. No. 8754500UK, Cat. No. 8754500EU, 8754500IL.

² Silicone grease is supplied for the O-ring on the desiccant tube. See user manual for more information.

Remove the existing transition plate

CAUTION

Biological sample hazard. Disconnect the sampler from the power source to disable the pump before attempting to remove the controller.

1. Remove power to the controller.
2. Disconnect all cables from the connectors on the side of the controller.
3. Remove all sample bottles and retainers from the inside of the refrigerator.
4. Remove the pump tube from the stainless steel fitting and from the plastic tube fitting on the transition plate.
5. Remove the screws that secure the back edge of the transition plate from the back of the refrigerator ([Figure 8 on page 11](#)). Retain the screws.
6. Disconnect the distributor (or full bottle shut-off) cable from inside the refrigerator.
7. Remove the two screws from inside the refrigerator that secure the controller ([Figure 6](#)). Discard the screws.
8. Remove the controller from the plate. Remove the existing transition plate from the refrigerator and discard.
9. Remove the extension fitting grommet from the inside of the refrigerator ([Figure 6](#)).

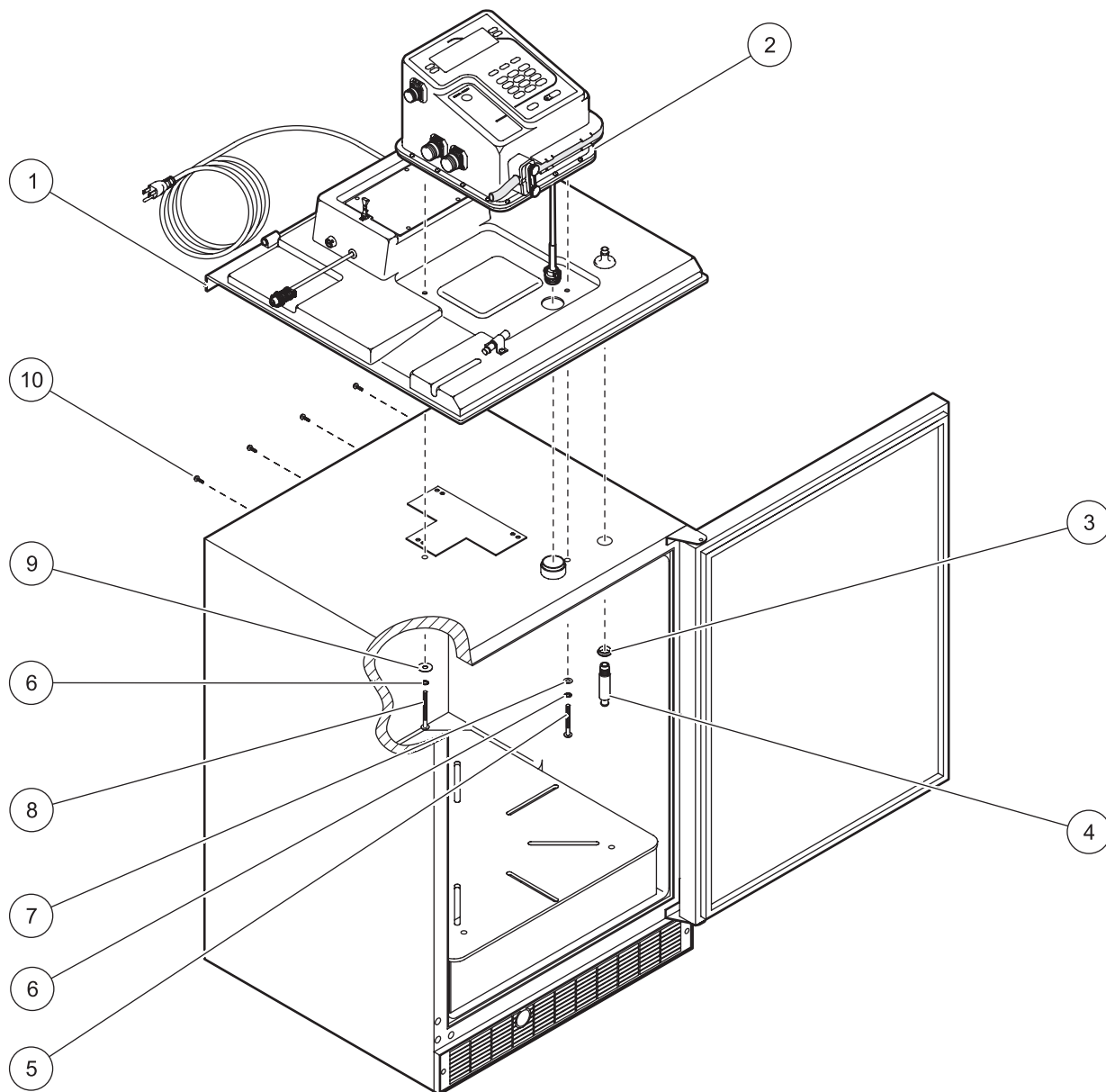


Figure 6 Transition plate removal from the refrigerated sampler

1	Transition plate	6	Lock washer, ¼ inch (2x)
2	Sigma 900 controller	7	Flat washer, ¼ inch
3	Grommet	8	Screw, ¼–20 x 3 inch
4	Sample extension fitting	9	Washer, fender, ¼ x 1 inch
5	Screw, ¼–20 x 2½ inch	10	Screw, refrigerator

Install new plate on refrigerator

Important note: Use a new drill bit when drilling holes in the refrigerator. If a dull drill bit is used, the refrigerator insulation may become wrapped around the bit and cause binding.

1. Position the new transition plate on top of the refrigerator so that the large hole in the transition plate aligns with the large hole in the refrigerator. Align the plastic tube fitting on the transition plate with the hole for the sample extension fitting (Figure 7).

2. Use the transition plate as a template and carefully mark the position of the two mounting holes on top of the refrigerator for the SD900 controller ([Figure 7](#), item 1).
3. Slide the back edge of the transition plate between the refrigerator and back panel of the refrigerator ([Figure 8](#)).
4. Mark the position of the holes to be drilled in the back edge of the transition plate. Remove the transition plate.
5. Drill the holes ($\frac{7}{32}$ inch I.D.) in the back edge of the transition plate where marked.
6. Use a $\frac{3}{8}$ -inch drill bit to drill the two holes in the top of the refrigerator where marked. Clean the debris from the top and inside of the refrigerator.
7. Plug the two holes that were used to secure the Sigma 900 controller with a water-tight caulk. The holes must be sealed to ensure that water does not contaminate the refrigeration compartment.
8. Install a lock washer and a $\frac{1}{4}$ x 1-inch fender washer on the 3-inch $\frac{1}{4}$ -20 screw ([Figure 5](#)). To install the screw, push it through the rear controller mounting hole until a $\frac{3}{4}$ -inch length protrudes above the refrigerator ([Figure 7](#)). To keep the screw from falling into the refrigerator, install the O-ring onto the screw ([Figure 5](#)). Install one of the $\frac{3}{4}$ -inch spacers onto the length of screw protruding above the refrigerator ([Figure 7](#)).
9. Place the transition plate back on the refrigerator with the back edge of the transition plate on the outside of the back panel ([Figure 8](#)). Align the holes in the plate with the holes in the refrigerator. Secure the back edge of the transition plate to the refrigerator with the refrigerator screws.

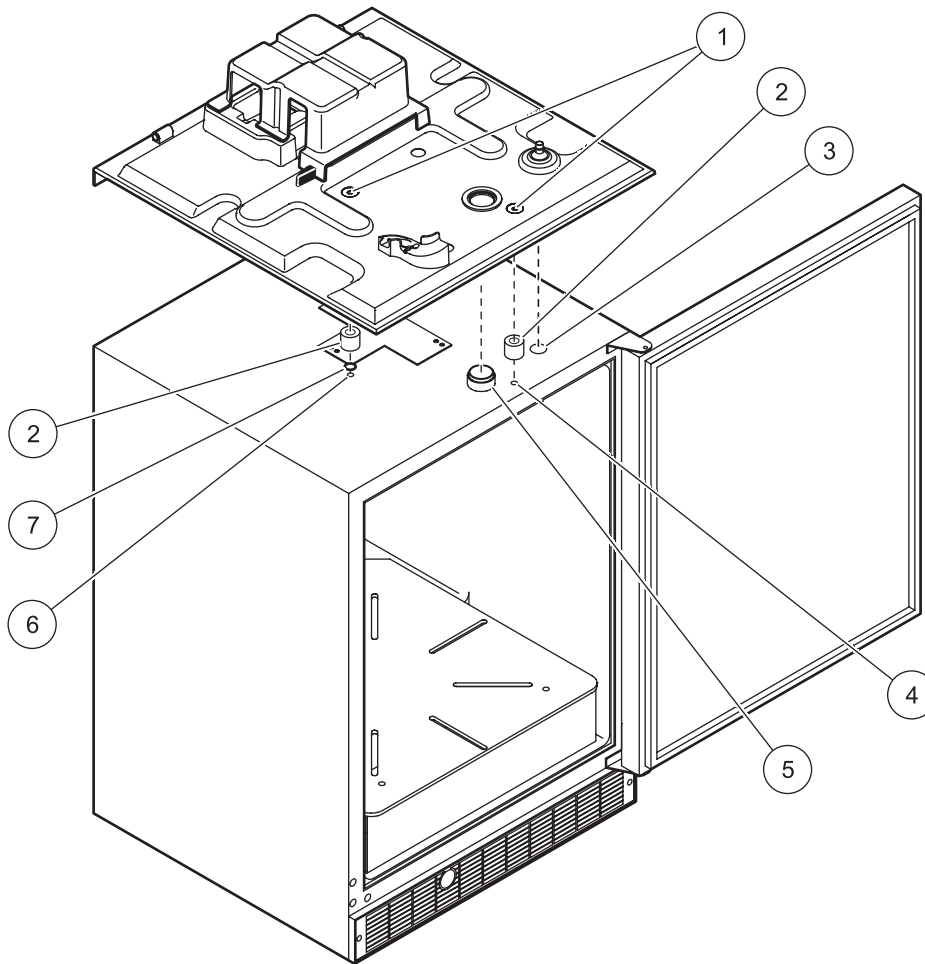


Figure 7 Transition plate installation on the refrigerated sampler

1	Mounting holes for SD900 controller	5	Pipe for the distributor/full bottle shut-off cable
2	Nylon spacer, $\frac{1}{4} \times \frac{1}{2} \times \frac{3}{4}$ inch (2x) (Cat. No. 5696200)	6	Rear mounting hole for controller
3	Hole for sample extension fitting	7	O-ring, $\frac{7}{32} \times \frac{11}{32} \times \frac{1}{16}$ inch (Cat. No. 5042)
4	Front mounting hole for controller		

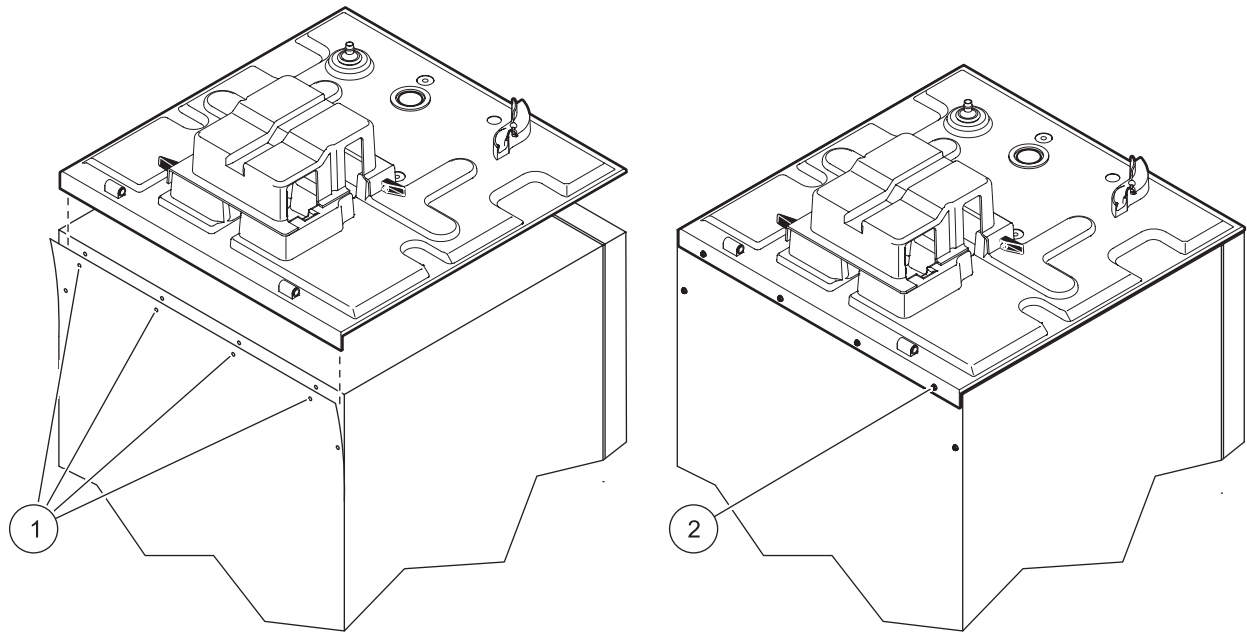


Figure 8 Secure the transition plate to the back panel of refrigerator

1 Holes in refrigerator back panel	2 Screw, refrigerator
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Install components on the transition plate

1. Position the SD900 controller so that the distributor (or full bottle shut-off) cable on the bottom of the controller goes through the hole to the refrigeration compartment. Make sure that the cable is not pinched between the controller and the refrigerator.
2. Secure the controller to the refrigerator with the supplied screws:
 - a. Place a lock washer and flat washer on the 2½-inch screw. Insert the screw in the front mounting hole. Install a ¾-inch spacer on the screw between the refrigerator top and the transition plate. Push the screw through the spacer and tighten into the controller (Figure 9).
 - b. Tighten the screw installed in step 8 on Page 9.
3. Insert the supplied grommet into the hole for the sample extension fitting on the inside of the refrigerator (Figure 9).
4. Insert the sample extension fitting through the grommet so that the threads on the fitting align with the threads from the plastic tube fitting on the transition plate. Tighten by hand to secure the extension fitting to the tube fitting.
5. Place the power supply in the compartment behind the controller. Position the cover over the power supply and secure with the hold-down latches (Figure 9).

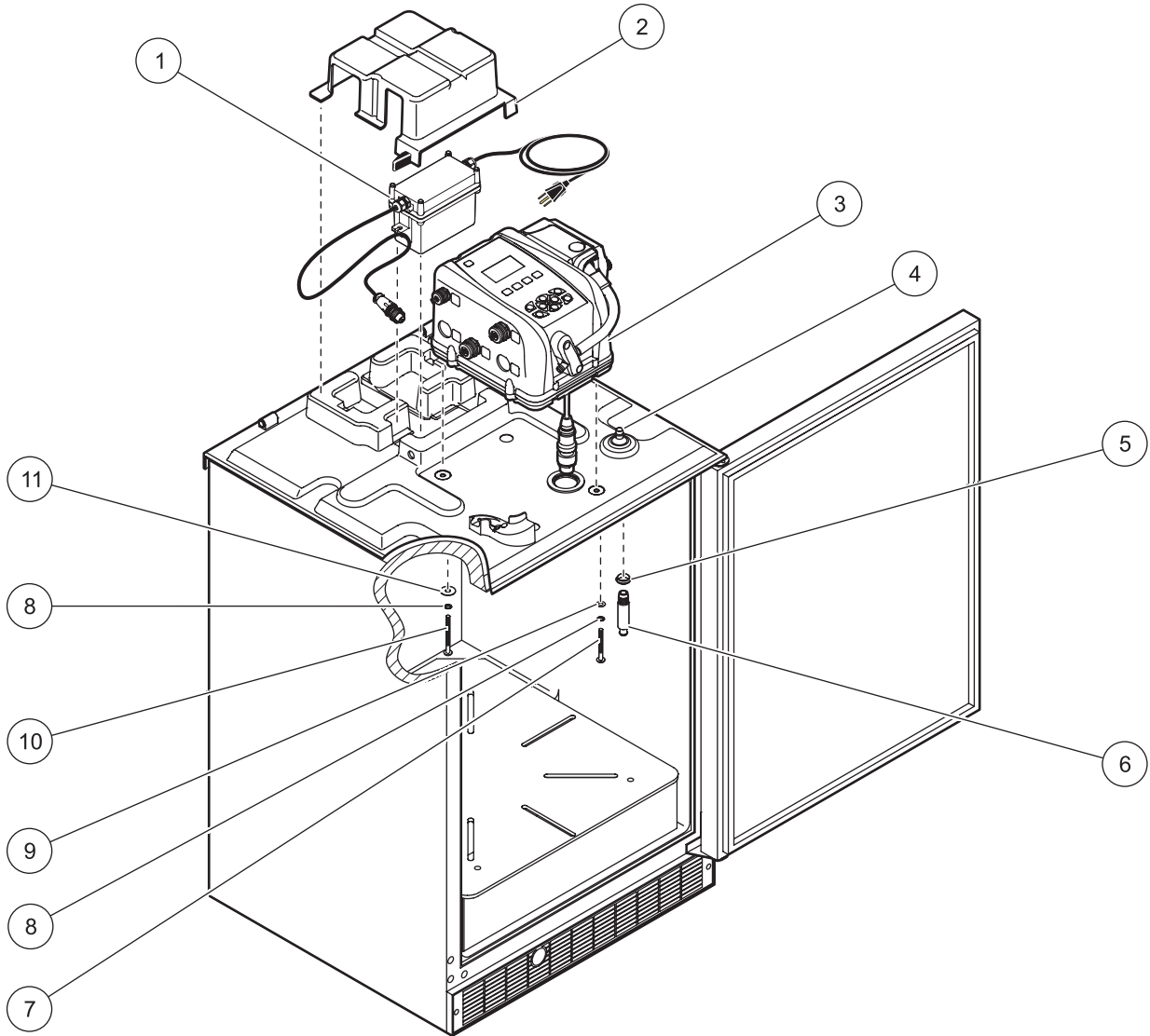


Figure 9 Component installation on refrigerated sampler

1	Power supply	7	Screw, ¼–20 x 2½ inch
2	Cover for power supply	8	Lock washer, ¼ inch (2x)
3	SD900 controller	9	Flat washer, ¼ inch
4	Plastic tube fitting	10	Screw, ¼–20 x 3 inch
5	Grommet	11	Washer, fender, ¼ x 1 inch
6	Sample extension fitting		

Install tubing

1. Push the pump tube on the plastic tube fitting on the transition plate (Figure 10).
2. Push the sample line on the liquid sensor on the SD900 controller. Press the sample line into the strain relief on the transition plate (Figure 10).

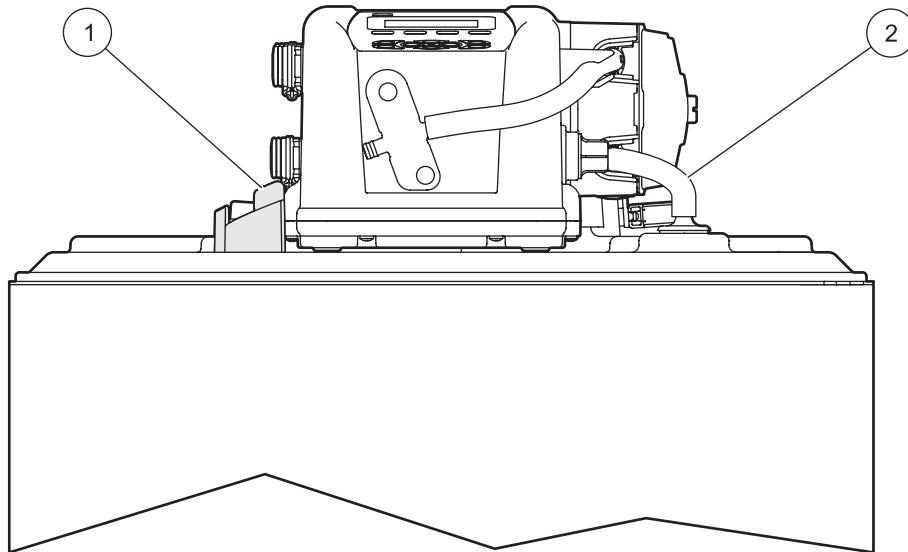


Figure 10 Tubing installation on the refrigerated sampler

1 Strain relief

2 Pump tube connection to plastic tube fitting

Install cables

1. Connect the cable on the bottom of the SD900 controller to the distributor (or full bottle shut-off) cable inside the refrigerator.
2. Connect the cable from the power supply to the power connector on the SD900 controller.

Note: Connection to the auxiliary and serial connectors requires an adapter cable or new cable. An auxiliary adapter cable can be used with existing cables that are no more than 10 feet long. Existing cables that are longer than 10 feet must be replaced with new cables. Refer to the user manual for ordering information.

Refer to the user manual for start-up and operation of the SD900 controller.

All weather refrigerated sampler (AWRS)

CAUTION

Fire/burn hazard. The SD900 controller cannot be installed on an AWRS that contains a heater in the controller compartment.

The components of the retrofit kit for the AWRS are shown in [Figure 11](#).

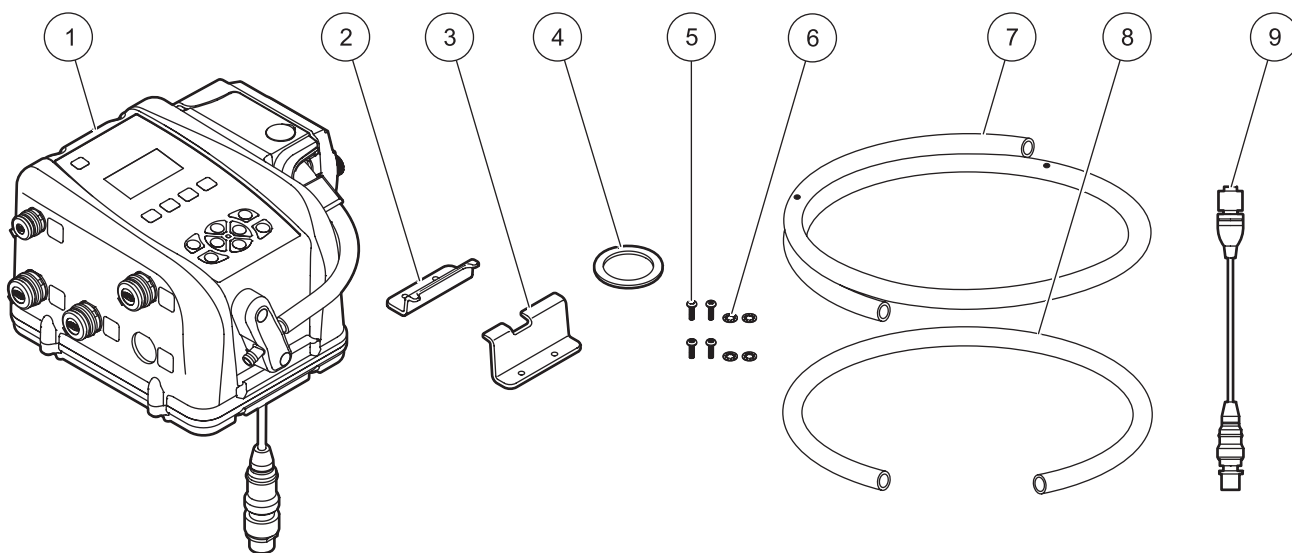


Figure 11 Components of retrofit kit 8759500 for the AWRS sampler

1	SD900 controller (Cat. No. 8900SD)	7	Pump tube, replacement (Cat. No. 8753900)
2	Rear bracket (Cat. No. 8741900)	8	Silicone tube (Cat. No. 3866)
3	Front bracket (Cat. No. 8741600)	9	Power adapter cable (Cat. No. 8739400)
4	Gasket (Cat. No. 8754300)	10	Silicone grease (not shown) (Cat. No. 8754700) ¹
5	Screw, 8–32 x 5/8 inch (4x)	11	User manual, SD900 AWRS Sampler (not shown)
6	Lock washer (4x)		

¹ Silicone grease is supplied for the O-ring on the desiccant tube. See user manual for more information.

Remove the Sigma 900 controller

CAUTION

Biological sample hazard. Disconnect the sampler from the power source to disable the pump before attempting to remove the controller.

1. Remove power to the controller.
2. Disconnect all cables from the connectors on the side of the controller.
3. Open the refrigeration compartment and disconnect the cable to the distributor or full bottle shut-off.
4. Remove the pump tube from the stainless steel fitting and from the plastic tube fitting on the sampler housing.
5. Remove the front and rear brackets that secure the controller ([Figure 12](#)). Discard the brackets.
6. Lift the controller to remove it from the sampler body ([Figure 12](#)).

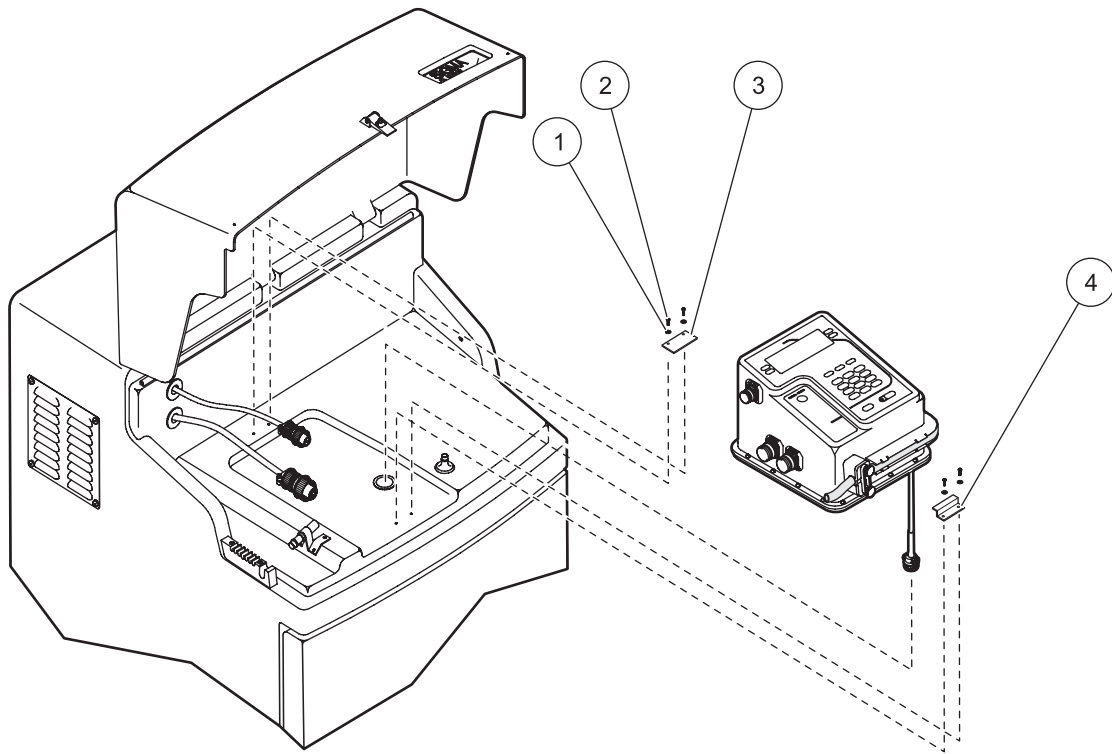


Figure 12 Removal of Sigma 900 controller from AWRS

1 Washer (4x)	3 Rear bracket
2 Screw (4x)	4 Front bracket

Install the SD900 controller

1. Remove the paper backing from the supplied gasket. Place the gasket adhesive-side down around the distributor/full bottle shut-off hole (Figure 13).
2. Position the SD900 controller so that the distributor/full bottle shut-off cable on the controller goes through the hole to the refrigeration compartment. Make sure that the cable is not pinched between the controller and AWRS cabinet.
3. Secure the controller to the AWRS cabinet with the supplied front and rear brackets (Figure 13).

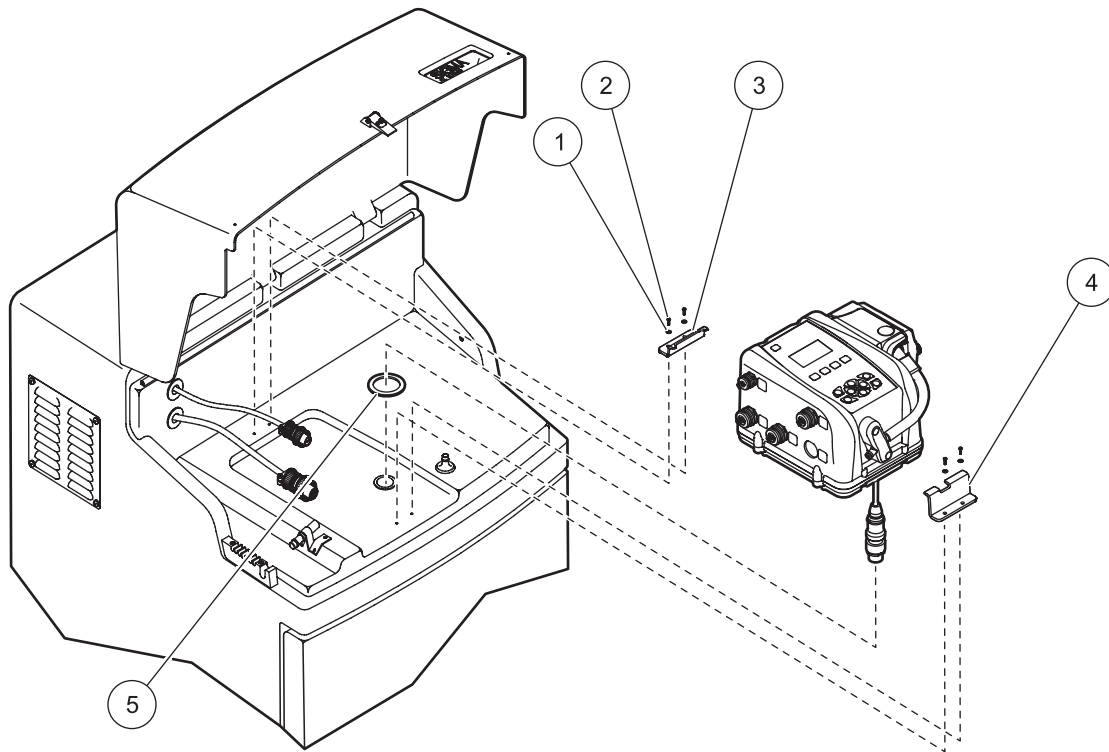


Figure 13 Installation of SD900 controller on AWRS

1 Washer (4x)	4 Front bracket
2 Screw (4x)	5 Gasket
3 Rear bracket	

Install tubing

1. Cut a 5½-inch piece from the supplied silicone tube (Cat. No. 3866).
2. Push one end of the tube on the stainless steel fitting on the AWRS cabinet ([Figure 14](#)).
3. Push the other end of the tube on the liquid sensor on the SD900 controller.
4. Push the pump tube on the plastic tube fitting on the AWRS cabinet.

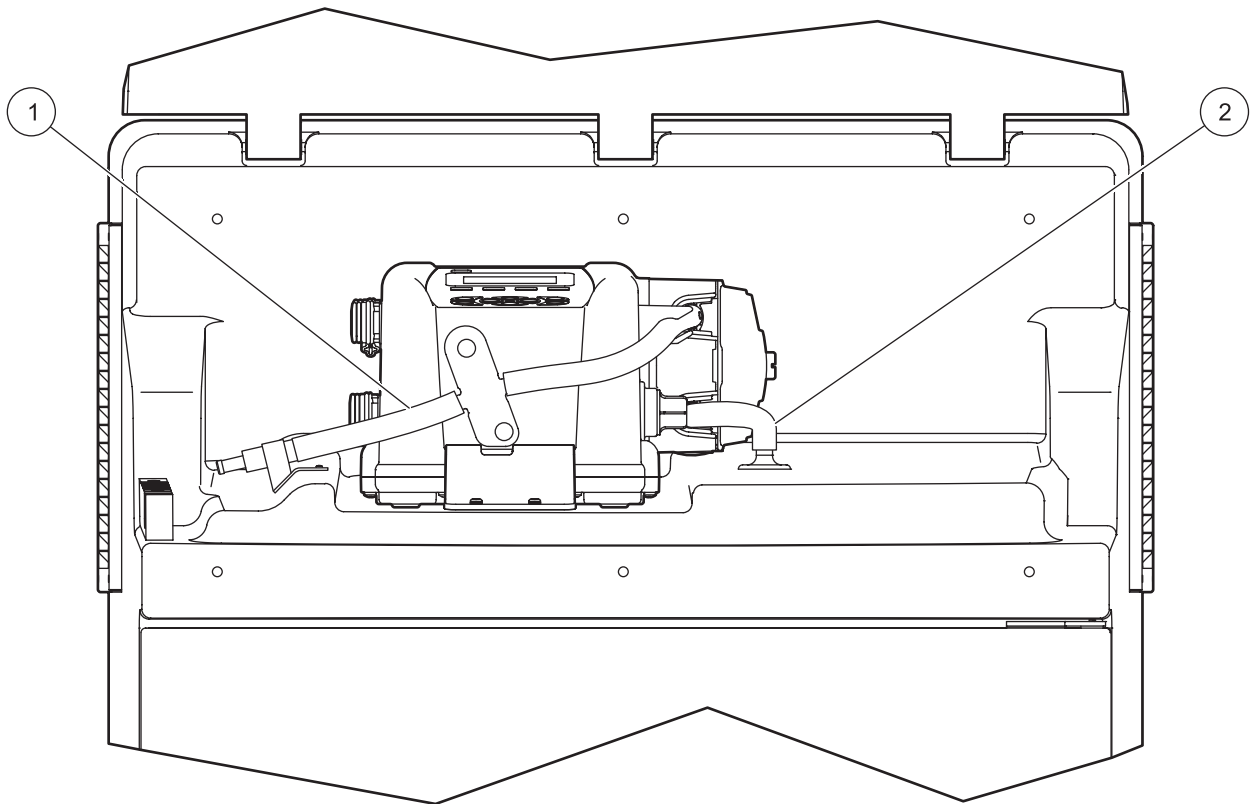


Figure 14 Tubing installation

<p>1 Tube, silicone, 5½-inch piece (Cat. No. 3866)</p>	<p>2 Pump tube connection to plastic tube fitting</p>
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Install cables

1. Connect the cable on the bottom of the SD900 controller to the distributor (or full bottle shut-off) cable inside the refrigerator.
2. Connect the supplied power adapter cable to the existing (2-pin) power connector and SD900 controller (3-pin connector).

Note: Connection to the auxiliary and serial connectors requires an adapter cable or new cable. An auxiliary adapter cable can be used with existing cables that are no more than 10 feet long. Existing cables that are longer than 10 feet must be replaced with new cables. Refer to the user manual for ordering information.

- Refer to the user manual for start-up and operation of the SD900 controller.



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:

In the U.S.A. – Call toll-free 800-227-4224

Outside the U.S.A. – Contact the HACH office or distributor serving you.

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