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INSTRUCTIONS
FOR USE

A-dec DV

DRY VACUUM



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Regulatory Information and Warranty

For additional required regulatory information and the A-dec warranty, see the *Regulatory Information, Specifications, and Warranty* document (p/n 86.0221.00) available in the Resource Center at www.a-dec.com.

Intended Use

A dental vacuum system is intended to provide suction to dental devices for use during diagnostic and therapeutic treatment by licensed health care professionals.

Expected Service Life

The Expected Service Life of A-dec vacuum systems is 10 years when following the recommended maintenance schedule.*

Product Service

Product service is available through your local authorized A-dec dealer. To locate an authorized dealer, or for additional service information, visit www.a-dec.com or contact A-dec at 1.800.547.1883 in the USA and Canada or 1.503.538.7478 worldwide.

Product Models and Versions Covered in This Document

Model	Version	Description
DV5/DV7 DV10/DV12	n/a	Dry Vacuum

* *Service Life information is provided for general planning purposes only and should not be relied upon for any reason. Service Life does not include normal service "wear and tear" components and is separate from the warranty period. There are no implied or explicit extensions of the warranty period. For complete warranty details, see the* Regulatory Information, Specifications, and Warranty *document referenced above.*

86.0888.00 Rev B

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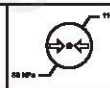
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Safety Precautions and Other Regulatory Information

Identification of Symbols

These symbols appear on the actual product or are used in documentation to alert the user about cautions, warnings, hazards, or tips.

Symbol	Description
	Protective earth (ground).
	Electrical and electronic waste. Do not dispose of with domestic waste.
	Date of manufacture.
	Manufacturer of equipment.
	General mandatory action sign. Not a caution. Take note of additional important instructions. e.g., NOTE: Assemble parts as shown.
	Caution. Failure to follow instructions may result in product damage or minor injury. e.g., CAUTION: Do not overtighten the adjustment screw. Overtightening could break the screw.
	Warning. Biological hazard. e.g., WARNING: Infectious waste may be present. Follow asepsis protocol to prevent cross contamination.
	Warning. Failure to follow instructions may result in product damage or serious injury or death. e.g., WARNING: Turn off the power before removing the pump cover. Failure to turn off the power before you begin this procedure can lead to product damage and result in serious injury or death.

 Temperature shipping and storage limits.		 Relative humidity shipping and storage limits.	 Atmospheric pressure shipping and storage limits.
 This way up.	 Fragile.	 Keep dry.	 Do not stack.
REF Model Number	SN Serial number.	PN Part Number.	LOT Lot Code.

Safety Precautions



WARNING Failure to follow these safety and operation precautions can result in injuries or equipment damage.



WARNING Do not attempt to access or service any DV dry vacuum components other than the separator tank filter. All other service must be performed by a qualified service technician. Some components (shown throughout this document) are intended for informational purposes only.

The following safety precautions listed below must be observed:

- Read all instructions completely before operating the vacuum unit.
- For installation, follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
- Protect the power cable from coming into contact with sharp objects. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
- Make certain that the power source conforms to the requirements of your equipment.
- Pull main electrical disconnect switch and disconnect any separate control lines, if used, before attempting to work or perform maintenance on the vacuum unit. "Tag Out" or "Lock Out" all power sources.
- Do not attempt to service any part while the vacuum is in an operational mode.
- Exercise cleanliness during maintenance and when making repairs. Use a clean piece of paper or cloth to cover and keep dirt away from parts and openings.
- Be sure that no tools, rags, or loose parts are left on the vacuum.
- Do not use flammable solvents for cleaning any parts.
- Do not operate the vacuum without the service panel in place.
- Do not operate the vacuum unit in rooms where flammable or toxic fumes may be present.

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Safety Precautions *(continued)*

- Do not operate the vacuum unit in an environment that exceeds 104°F (40°C).
- Be careful when touching the exterior of a recently run vacuum motor—it may be hot enough to cause pain or injury. Modern motors are built to operate at higher temperatures, so this condition is normal if the motor is operated at rated load.
- Inspect the unit daily to observe and correct any unsafe operating condition.
- Check hoses for weak or worn condition before each use, and make certain that all connections are secure.

Decommissioning and Disposal of A-dec Equipment

A-dec dental equipment removed from service should be decommissioned in accordance with local regulatory requirements. Circuit boards and electrical cabling should be recycled as electrical salvage. Aluminum, brass, iron, and steel components should be recycled as metal salvage. Molded plastic components include mold marks indicating the type of plastic and should be recycled accordingly. The separator tank, drain lines, and extraction lines of the vacuum system should be treated as biologically contaminated materials and handled with appropriate precautions during dismantling. Any material unsuitable for recycling should be disposed of appropriately. For information regarding material type of A-dec equipment, please contact A-dec Customer Service.



WARNING Do not attempt to access or service any DV dry vacuum components other than the separator tank filter. All other service must be performed by a qualified service technician. Some components (shown below and throughout this document) are intended for informational purposes only.

Environmental Specifications

Temperature/Humidity	Specification
Storage/Transportation Temperature	32°F to 158°F (0°C to 70°C); relative humidity to 90%, no condensation.
Operating Temperature (Room Ambient Temperature)	40°F to 104°F (4°C to 40°C); relative humidity to 80%, no condensation.

Classification of Equipment (IEC-60601-1)

Type/Mode	Classification
Types of Shock Protection	CLASS I EQUIPMENT: All A-dec products with mains voltage.
Degree of Shock Protection	Not Classified—no applied parts.
Degree of Protection Against Water Ingress	Not Classified—IPX0.
Mode of Operation	Continuous with 50% full load duty cycle.
Flammable Gasses	Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide, where such gasses may accumulate in concentration (closed space).



NOTE Allowable mains voltage fluctuations ± 10% of rated voltage.

Electromagnetic Interference

A-dec mechanical room systems are designed and built to minimize electromagnetic interference with other devices. However, if interference is noticed between another device and your vacuum system:

- Remove interfering device from room.
- Plug interfering device into an isolated circuit.
- Increase separation between unit and interfering device.
- Contact your authorized A-dec dealer if interference persists.

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Operate

Turn On/Turn Off Power



LED Push-Button Control
(single-button)



LED Push-Button Control
(four-button)



NOTE If you turn off the vacuum unit for long periods of non-use, like an extended office shutdown, ensure that the power remains connected. The vacuum will automatically turn on, momentarily, every 12 hours to prevent components from seizing. This also helps extend the life of the motor.

Master Power Switch

The master power switch turns the vacuum unit on or off. It also overrides the other remote power functions. If your vacuum is connected to remote LED push-button controls or a Smart Shield touchscreen, this switch should be in the REMOTE position.

Optional LED Push-Button Controls

If you have LED push-button controls, press the button once to turn the vacuum unit on or off. Blue LED lighting indicates that the vacuum is on. If the LED does not illuminate, check and verify that the master power switch on the vacuum is in the REMOTE position.

Optional Smart Shield Touchscreen Controls

For configurations with the Smart Shield touchscreen, use the power switch icon at the bottom of the screen or tap the VAC icon to turn the vacuum unit on or off. If the Smart Shield does not operate, check and verify that the master power switch on the vacuum is in the REMOTE position. For more information on the touchscreen, see "Smart Shield Touchscreen Controls," on page 6.



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Vacuum Gauge and Operation





Vacuum Gauge

The vacuum gauge is located next to the master power switch on the top panel of the vacuum. This gauge provides a real-time level of the negative pressure inside the separator tank. The DV dry vacuum is factory preset to maintain about 10 inHg (34 kPa)* during normal operation.

Vacuum Startup and Normal Operation

At initial startup, the vacuum motor runs until the system reaches the factory preset of 10 inHg (34 kPa).* As vacuum instruments are opened and closed, the motor rpm will increase or decrease (depending on demand) to maintain that level.

NOTE You may hear the vacuum motor frequently speeding up or slowing down as it compensates for various levels of demand. This is normal. However, if the motor does not slow down after all vacuum instruments are closed, or if your system is unable to maintain about 10 inHg (34 kPa),* see "Troubleshooting Tasks" on page 11, or contact your authorized A-dec dealer for service.

Separator Tank Drain and Washdown Cycles

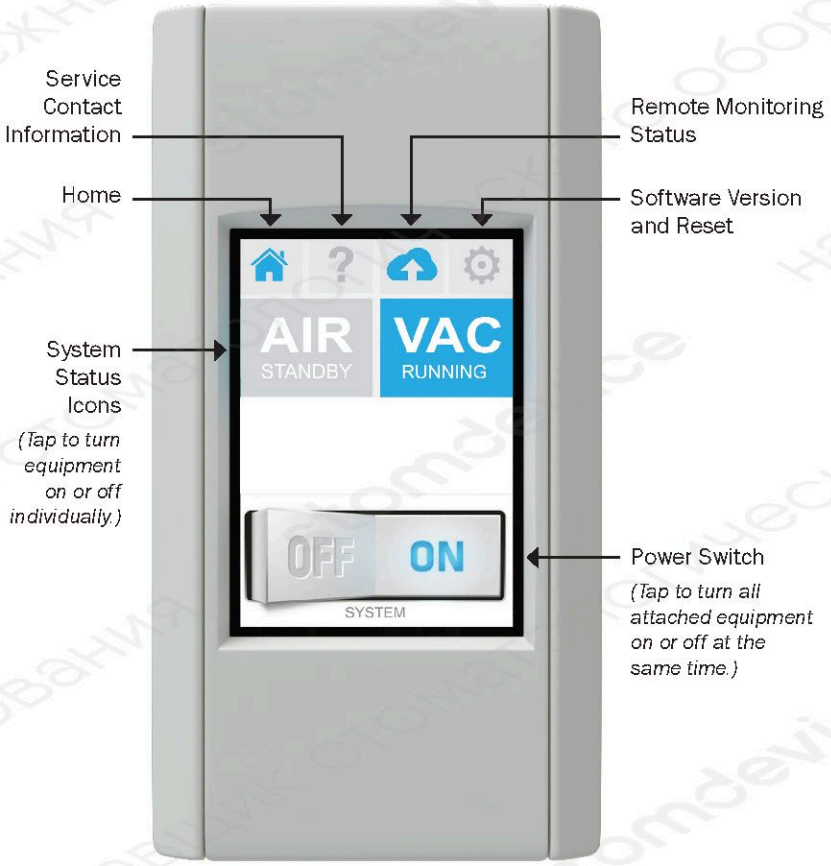
The vacuum removes liquid from the air and collects it in the separator tank. When more than 10 gallons (38 L) are collected, a float switch in the tank stops the vacuum and drains the tank. Once the water level drops and the float switch turns off, the vacuum will turn back on in about 10 seconds.

To manually initiate the drain and washdown cycles, you must turn off the vacuum. Combined, both cycles take less than 2 minutes. A-dec recommends that you turn off the vacuum to activate this process at least once a day. For more information, see "Regular Maintenance Tasks" on page 9.

** (or your adjusted preset level)*

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Smart Shield Touchscreen Controls



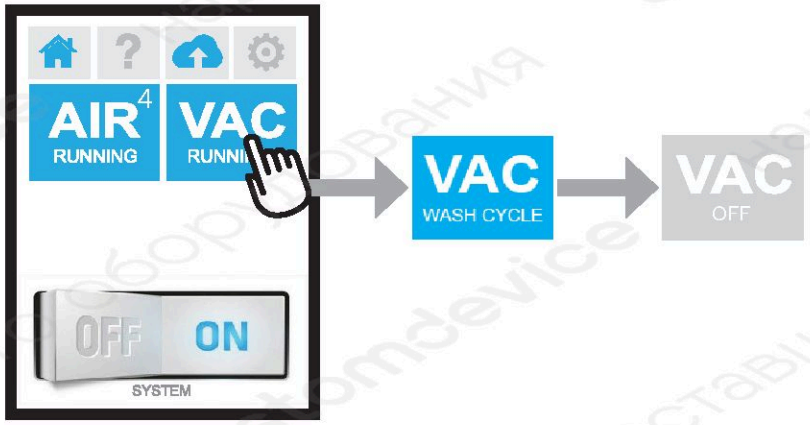
The optional Smart Shield touchscreen provides power control and system status of your mechanical room equipment.

Tap the power switch icon at the bottom of the screen to turn on or turn off all connected equipment at the same time. Tap the blue system status icons to turn on or turn off individual equipment. These status icons also dynamically change according to the operational state of the equipment.

Vacuum Startup and Shutdown

When you turn on the vacuum system, Smart Shield displays the VAC RUNNING icon. When you tap the VAC RUNNING icon, the VAC OFF icon appears, indicating the start of the separator tank drain cycle. Once the drain cycle is complete, the VAC WASH CYCLE appears, indicating the start of the washdown cycle. After that cycle is complete, the VAC OFF icon reappears.

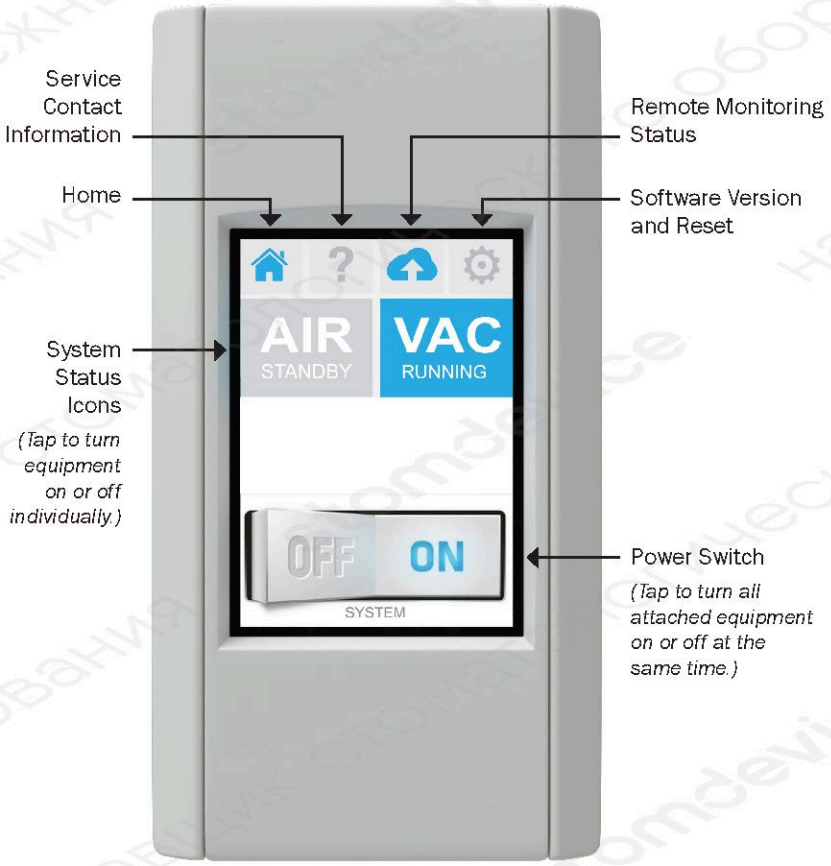
Vacuum Shutdown
(Tap to Initiate)



NOTE If the Smart Shield does not operate, check and verify that the master power switch on the vacuum is in the REMOTE position. For more information, see "Troubleshooting Tasks" on page 12.

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Smart Shield Touchscreen Controls *(continued)*



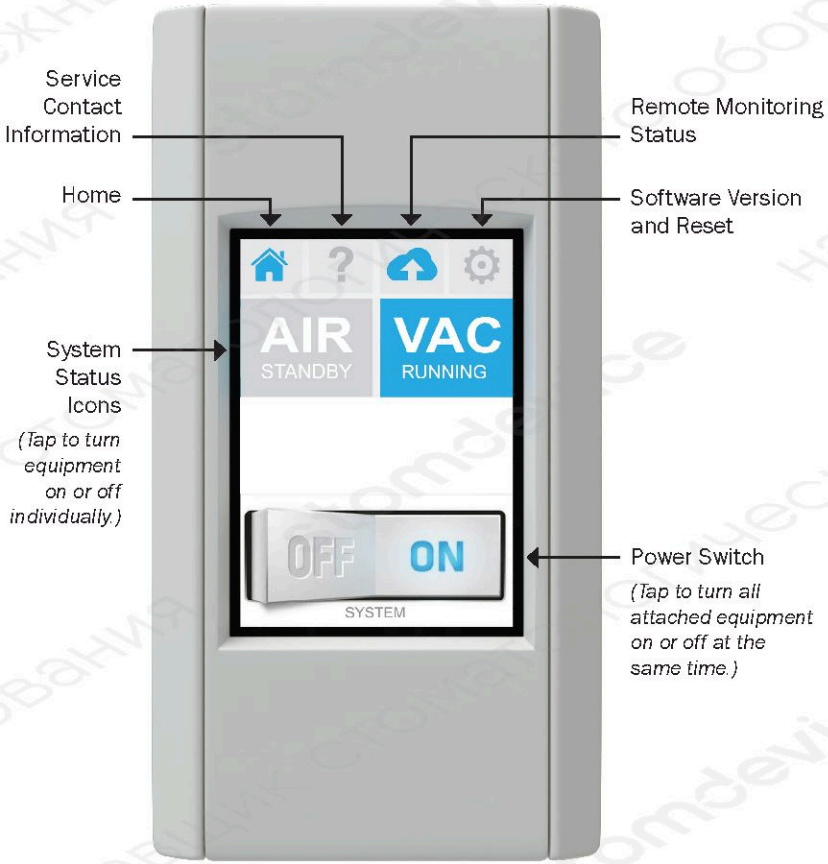
NOTE If additional warning icons appear on your screen and are not shown here, contact your authorized A-dec dealer for more information.

Vacuum System Status Icons

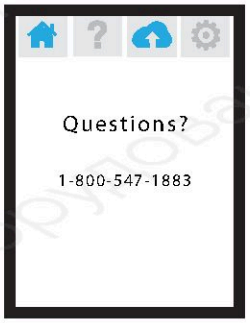
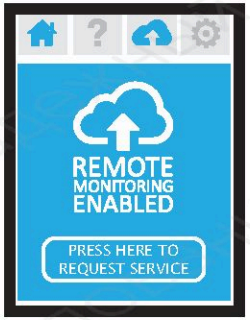
Icon	State/Status
VAC RUNNING	Displays during initial system startup and normal operation mode.
VAC RUNNING MANUAL	"Manual" appears on status icons when the master power switch on the vacuum is in the ON or OFF position. To control power through the Smart Shield touchscreen, ensure that the master power switch on the vacuum is in the REMOTE position.
VAC OFF	Displays when the vacuum is turned off from the Smart Shield touchscreen controls.
VAC WASH CYCLE	Displays after the vacuum is turned off and the drain cycle is complete.
VAC MAINTENANCE REQUIRED	Displays when the annual maintenance interval is reached. This caution/reminder is reset whenever power to the system is disconnected.
VAC FAULT	Displays when there is a fault in the system. Contact your authorized A-dec dealer for service.

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Smart Shield Touchscreen Controls *(continued)*



Additional Smart Shield Functions

Icon	State/Status	
		Displays contact information that will route you to A-dec, Inc.
		Displays your status as enabled if you are registered with the remote monitoring service. For questions, contact your authorized A-dec dealer, or call A-dec Customer Service.
		Displays software version. The reset button turns off the screen, reboots the software, and reloads the equipment status. You can use RESET during specific faults with the equipment. For more information, see “Troubleshooting Tasks” on page 12.

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Maintain/Troubleshoot

Regular Maintenance Tasks

WARNING Before performing any maintenance function, turn off the vacuum unit and disconnect main power to the vacuum. Failure to do so may result in injury or equipment damage.

Do not open the service panel. That access is only for service technicians. Do not service the vacuum for issues other than those described in this section, or you may risk injury or equipment damage. All other service requires a qualified service technician from your authorized A-dec dealer.



CAUTION Do not clean the vacuum lines with oxidizing or acidic cleaners with a pH less than 6 or greater than 8 (including bleach, chlorine, iodine and peroxide). These may lead to the dissolution of solid mercury which can corrode and damage components in your system. Use a non-foaming vacuum-line cleaner and always follow the manufacturer's instructions. For recommendations on vacuum-line cleaners, contact your authorized A-dec dealer.

To keep your vacuum system running smoothly, be sure to schedule a service checkup with your authorized A-dec dealer every year. And although the DV dry vacuum requires very little maintenance, see the table below for important recommended maintenance tasks.

Frequency	Item	Task/Procedure
Once or Twice Daily	Vacuum-line cleaning.	Follow your normal vacuum-line cleaning protocols to help prevent debris from settling in the vacuum plumbing.
	Separator tank drain and rinse.	Turn off the vacuum at the end of the day *(from the master power switch or remote on/off controls)* to initiate the separator tank drain and rinse cycles. For busier days and larger clinics, turn off the vacuum once at lunchtime and once at the end of the day. This will also help you avoid an unplanned shutoff/drain cycle during a procedure.

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Regular Maintenance Tasks *(continued)*

WARNING Before performing any maintenance function, turn off the vacuum unit and disconnect main power to the vacuum. Failure to do so may result in injury or equipment damage.

Do not open the service panel. That access is only for service technicians. Do not service the vacuum for issues other than those described in this section, or you may risk injury or equipment damage. All other service requires a qualified service technician from your authorized A-dec dealer.



WARNING Infectious biohazardous waste may be present. To prevent cross contamination, follow all infection control and personal protective equipment (PPE) protocols.

Danger

In addition to biohazardous waste, the separator tank filter may contain amalgam particles. Follow your local regulations when you dispose of the old filter.

Frequency	Item	Task/Procedure
Weekly/ Monthly	Exterior case and tubing connections.	Use a dry, lint-free cloth to dust off and clean the exterior. Turn on the system, listen, and inspect the tubing. If you discover any leaks or debris, contact your authorized A-dec dealer for assistance.
Yearly	Tank filter.	Replace the tank filter* once a year. Before following these steps, turn off the vacuum and wait a few minutes to ensure that the drain and rinse cycle have finished, then disconnect main power to the vacuum. 1. Press and release the three safety clamp latches securing the tank lid. 2. Remove the lid and *(as per your infection control protocols)* carefully set it aside. Ensure that the tank is empty. 3. Remove the wing-nut and plate, then remove the tank filter *(dispose of according to your local regulations)* and replace with a new one. **For the separator tank filter replacement kit, order p/n A0049.*
	Vacuum Drain Check Valve.	A qualified technician is required to install this component. Contact your authorized A-dec dealer for assistance.

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Troubleshooting Tasks

WARNING Do not attempt to open the vacuum service panel. This is intended for qualified service technician access only.

The following table is intended to help you identify common issues with your vacuum that may or may not require attention. For problems that require access to internal components, always contact your local authorized A-dec dealer for service.

Condition	Potential Cause	Procedure/Remedy
Vacuum motor runs continuously with little to no suction.	Leak in the vacuum system.	Turn on the vacuum unit. Close all vacuum instruments and listen for leaks throughout the system. Check the vacuum gauge. If the vacuum runs continuously and cannot reach or maintain about 10 inHg (34 kPa) *(or your adjusted preset level)*, contact your authorized A-dec dealer for service.
	Pinched or kinked vacuum tubing.	Check to see if the dental equipment vacuum tubing is pinched or kinked. If the tubing is damaged, contact your authorized A-dec dealer for service.
	Stuck separator tank drain check valve (open).	Turn off the vacuum to initiate drain and rinse cycles. If this does not remedy the condition, contact your authorized A-dec dealer for service.
Vacuum motor won't run while the master power switch is on.	Stuck separator tank float switch.	Turn off the vacuum to initiate drain and rinse cycles. If this does not remedy the condition, contact your authorized A-dec dealer for service.
	Vacuum is in power safe mode. *(Note: power safe mode occurs when the vacuum loses power and cannot restart within 15 seconds.)*	To resume normal operation: 1. Turn off the master power switch on the vacuum. 2. Disconnect the power to the vacuum for 3 minutes. 3. Reconnect the power. 4. Turn on the master power switch on the vacuum or put the switch in the REMOTE position. If this does not remedy the condition, contact your authorized A-dec dealer for service.

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Troubleshooting Tasks *(continued)*

Condition	Potential Cause	Procedure/Remedy
LED push-button or Smart Shield controls do not function.	Master power switch on the vacuum is not in the REMOTE position.	Ensure that the master power switch on the vacuum is in the REMOTE position. If it is, and you have push-button controls, contact your authorized A-dec dealer for service. If the master power switch is in the REMOTE position and you have the Smart Shield touchscreen, see the remedy below.
	Communication disruption/fault between system and Smart Shield touchscreen.	Tap on  at the top of the touchscreen, then tap RESET. If this does not resolve the condition, unplug the Smart Hub router power cord, wait 10 seconds, then plug it back in. If this does not resolve the condition, contact your authorized A-dec dealer for service.

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