ACTEON PIEZO ULTRASONIC

Integrated into ASI Delivery Systems

Operation & Service Manual

Document No. 65-OS02, Rev-B, June, 17, 2021

This guide provides important steps for setup, use, and maintenance of the Acteon Piezo Ultrasonic as installed in ASI Dental Delivery Systems. It includes important details which must be followed to ensure safety and proper use.

ASI MEDICAL INC. | 8811 American Way, Suite 130, Englewood, CO 80112
Advanced Dental Systems® & Advanced Endodontic Systems®
Customer Support Team | www.asisupport.com | 303-407-6072

SYMBOLS & SAFETY PRECAUTIONS

Reference section 1 of the delivery system operation and service manual for detailed information about symbols and safety precautions.

PRODUCT DESCRIPTION

Intended Use

Visit manufacturer's website, *https://www.acteongroup.com/us/* for full information.

Warranty

Reference section 3 of the delivery system operation and service manual for detailed information about system warranty.

Product Description & Theory of Operation

The ultrasonic integrated into the ASI delivery system simplifies cord management, reduces clutter of separate control boxes, and allows operation from one foot control. The Acteon handpiece and tubing are mounted to the delivery system and is secured into a holder. The Acteon power control for the piezo function is mounted internally and can be controlled by either a knob or digital display panel mounted on the front of the delivery system.

Electrical power (115volt/230volt) is supplied from the terminal block and is sent to the transformer where it is reduced to a 24-volt AC supply to the Newtron ultrasonic module. The ultrasonic module is then connected to a wire harness that is connected to a display board which allows changes to the power intensity of the handpiece (see Fig. 1). Two wires run from the module through the tubing up to the ultrasonic handpiece where it creates vibration of the internal piezo ceramic in the handpiece. The tubing also contains a water line that allows water coolant spray to be used on the tip.

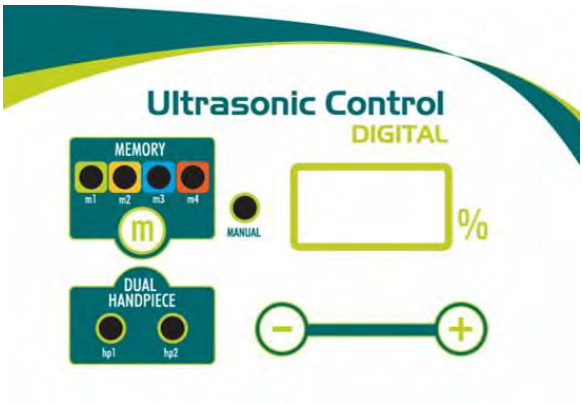


Fig. 1 (digital display)

The handpiece is activated by lifting the handpiece out of its auto holder and pressing the foot control. Air pressure is sent from the foot control through the control block and to an air/electric switch. The air pressure pushes a plunger that closes the contacts in the switch which signals the ultrasonic module to provide power to the handpiece. When the foot control is released, the air pressure exhausts off and the spring loaded air/electric switch opens up and turns off the power to the handpiece.

Instrument Set up

Prior to use, place an ultrasonic tip onto the handpiece and secure. Not all tips provide compatible performance with the ultrasonic system. Use name brand Acteon tip or equivalent available for purchase through ASI.

OPERATION

To use a handpiece, pick it up from the holder and adjust the power setting to the desired level. For digital panels, use the "Up" or "Down" power buttons to change the power from 0-100%. For analog versions, use the knob to adjust the power from 1-10.

> ***IMPORTANT NOTE:*** *Many fine tips will break if they receive too much power. Always start at a lower level and gradually increase to avoid damaging tips. The power indication represents the power to the tip ranging from zero to 100% or 1-10 with 10 being 100%. Use the ultrasonic power setting table to determine the power range for the respective tip being used.*

Memory Settings (Digital Panel only)

The Ultrasonic Control System will retain the last power setting used when the handpiece is hung up.

The digital panel also has four memory positions that can be programmed to desired levels. To use: remove a handpiece; select the desired power range using the "Up" or "Down" power buttons; then press the memory button and hold for three seconds. The numerical display will flash momentarily to indicate the power setting has been saved into memory. To reprogram, simply repeat the above procedure.

To use memory settings, remove the handpiece from its holder and press the memory button. The saved power setting will automatically be indicated on the display. The power settings may still adjust up or down after selecting a memory position without affecting the saved setting.

Memory slots (M1, M2, M3, and M4) are preconfigured to 25, 50, 75, and 100 prior to shipping.

Two Handpiece Operation - Optional Upgrade (Digital only)

The digital panel will automatically recognize and operate the handpiece that is first removed from its holder. To use, remove the handpiece and adjust the power to the desired setting. To use the second handpiece, hang up the first handpiece, then remove the second handpiece and it will be activated. The last power setting used for each handpiece will be retained by the system. This will allow different tips and power settings for each handpiece to be used.

Compatibility of Ultrasonic Tip with ASI Delivery Systems

Compatible ultrasonic tip brands

- Satelec/Acteon
- Dentsply Sirona (Tulsa)
- EIE
- Obtura/Spartan

Non-compatible ultrasonic tip brands

- EMS
- NSK or Brasseler
- Kerr/Sybron

Using non-compatible ultrasonic tips may cause risks and premature wear of equipment, including but not limited to, the following:

- Risks for the patient, such as damaging tissues and the potential for ingesting a broken tip.
- Risk of the handpiece overheating (meaning a loss in electromechanical output), leading to handpiece damage.
- Loss of efficiency from a worn tip (-2mm = -50% efficiency). Wear will also reduce roughness, vibration, and movement.

Brands not listed have not been tested for compatibility on the ASI Piezo Ultrasonic system.

Table for Ultrasonic Power Settings with Satelec Brand Tips

Satelec Tip	Digital Display	Analog Dial	Satelec Tip	Digital Display	Analog Dial	Satelec Tip	Digital Display	Analog Dial
No. 1	70 to 80	7-8	ET40	30 to 50	3-5	FILES	30 to 40	3-4
No. 1-S	70 to 80	7-8	ET40D	30 to 50	3-5	P14D	30 to 50	3-5
No. 2	70 to 80	7-8	ETBD	30 to 40	3-5	P15LD	30 to 50	3-5
No. 3	70 to 80	7-8	ETPR	100	10	P15RD	30 to 50	3-5
No. 5AE	100	10	EX1	60 to 70	6-7	P2L	20 to 50	2-5
No. 10P	70 to 80	7-8	EX2	60 to 70	6-7	P2R	20 to 50	2-5
No. 10X	60 to 70	6-7	EX3	60 to 70	6-7	PH1	10 to 20	1-2
No. 10Z	60 to 70	6-7	EXL	60 to 70	6-7	PH2L	10 to 20	1-2
AS3D	10 to 30	1-3	EXR	60 to 70	6-7	PH2R	10 to 20	1-2
AS6D	10 to 30	1-3	GI-1	90 to 100	9-10	PM1/PMS1	70 to 80	7-8
AS9D	20 to 40	2-4	H1	10 to 20	1-2	PM2	70 to 80	7-8
ASLD	30 to 50	3-5	H2L	10 to 20	1-2	PMS2	40 to 50	4-5
ASRD	30 to 50	3-5	H2R	10 to 20	1-2	PM3/PMS3	50	5
C20	70 to 80	7-8	H3	10 to 20	1-2	PM4	70 to 80	7-8
ET18D	30 to 50	3-5	H4L	10 to 20	1-2	SO4	40 to 50	4-5
ET20	30 to 50	3-5	H4R	10 to 20	1-2	TK1-1S	10 to 20	1-2
ET20D	30 to 50	3-5	IRR20-21	30 to 40	3-4	TK1-1L	10 to 20	1-2
ET25	30 to 50	3-5	IRR20-25	30 to 40	3-4	TK2-1L	10 to 20	1-2
ET25S	30 to 50	3-5	IRR25-21	30 to 40	3-4	TK21R	10 to 20	1-2
ET25L	30 to 50	3-5	IRR25-25	30 to 40	3-4			

CLEANING

To clean, wipe down the tubing and display panel with recognized disinfection wipes for dental equipment. To avoid staining, do not use Cavicide type wipes as they will discolor tubing. To autoclave the handpiece, follow the Acteon guidelines.

TROUBLESHOOTING

Ultrasonic Handpiece or Instrument Does Not Operate

- Ensure ultrasonic tip is tight on handpiece.
- Verify the dental unit has air pressure at 80 psi and that the foot control is working correctly.
- Verify lock lever on side of holder is pointing straight down to floor, and that ball/toggle actuator in the holder is exhausting correctly when handpiece is removed from holder.
- Check circuit breaker for the ultrasonic located on the back of the dental unit is pressed in.
- Check handpiece pressure gauge is reading between 60 to 80 psi when pressing the foot control with the ultrasonic handpiece removed from the holder. If no reading, make sure the correct adjustment stem on the control block portion for the ultrasonic [marked "US"] is open sufficiently to allow the air pressure to reach the air/electric switch. To open, turn the stem in a counter-clockwise direction to fully open. This ensures the Normally Open Air Electric Switch is receiving pressure from control block.
- Check continuity output from Newtron Module (5.0 v DC @ 100% intensity), Transformer (24v AC), Terminal Block (120v AC) (see figure).
    - Order ASI PN 95-0300 for replacement transformer
    - Order ASI PN 95-0198 for replacement Newtron module

Fig. 2

Low or Intermittent Power to Ultrasonic Tip

- Using a worn tip or "incorrect brand" of tip with module. Replace the tip with a new and correct brand style to match the brand of ultrasonic system. Satelec Ultrasonic tips are available through ASI.
- Check wire connections on circuit board and Newtron module are tight.
- Check Potentiometer/Satelec on panel is connected properly. Potentiometer may require replacement. Replace if required
    - ASI PN 95-0201, Acteon/Satelec Wiring Harness for Analog Display Ultrasonic
- Ultrasonic handpiece runs when not pressing foot control, stops running when foot control is pressed. Contacts in air electric switch are not working or stuck resulting in reversed operation. Replace switch.
    - ASI PN 95-0137, Normally Open Assembly Switch

- Make sure the correct adjustment stem on the control block portion for the Ultrasonic [marked "US"]. Turning the stem in a counter-clockwise direction to fully open ensures the Normally Open Air Electric Switch is receiving pressure from control block.

No Water through Ultrasonic Handpiece, Water to Other Handpieces

- Make sure switch on foot pedal is in correct water position indicated by blue dot.
- Check the adjustment needle valve is fully open on front of cart.
- Check that the ultrasonic tip is secure and is correct type with a water port. (Some tips are made to run dry.) If in doubt, remove the tip and run the handpiece to see if water exits the handpiece.
- Check flow of water through handpiece tubing. Remove handpiece from holder, remove handpiece, depress foot pedal to check water flow through tubing. If water flows through tubing, clean the handpiece or replace with a new handpiece. Replace if required.
    - ASI PN 92-ASF12281, *Acteon US Handpiece GII Handpiece Only*
- Check gauge on water bracket system are pressurized between 30-35 psi. Ensure bottles are filled with water.
- Trace where water is stopping from control block Ultrasonic port, needle adjustment valve, handpiece tubing and correct accordingly.
- Ensure stem on control block port marked "US" is opened.
- Control block diaphragm may have hole/tear if water is intermittent. Replace if required.
    - ASI PN 95-0215, *Control Block Diaphragm Pucks Full Set*

Threaded Stem on Handpiece Broken/Worn where Tip Attaches

This problem is not repairable; replace the handpiece.

- ASI PN 92-ASF12281, *Acteon US Handpiece GII Handpiece Only*

ULTRASONIC TESTING

Testing Ultrasonic Tubing Line Continuity

Testing line continuity using a multimeter will determine broken wires in the tubing. (Fig. 3)

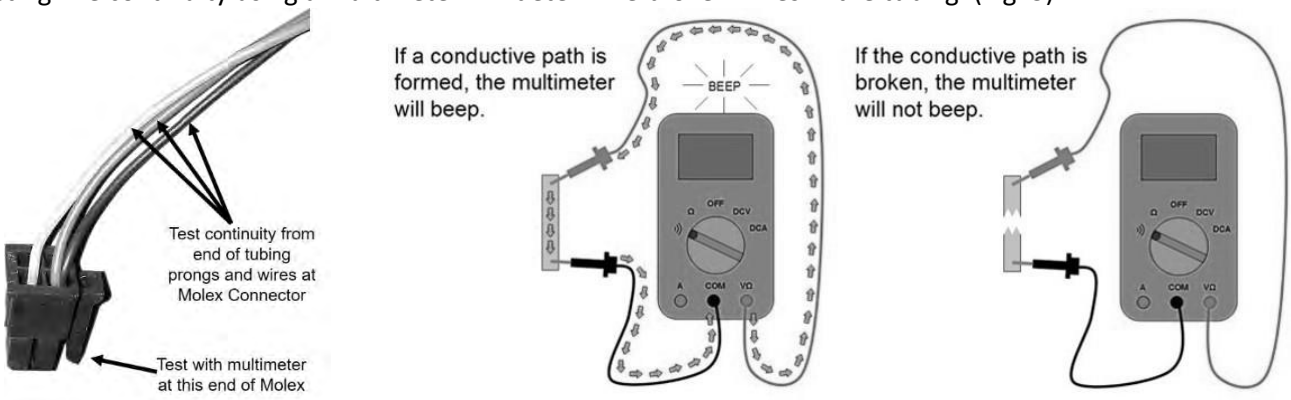
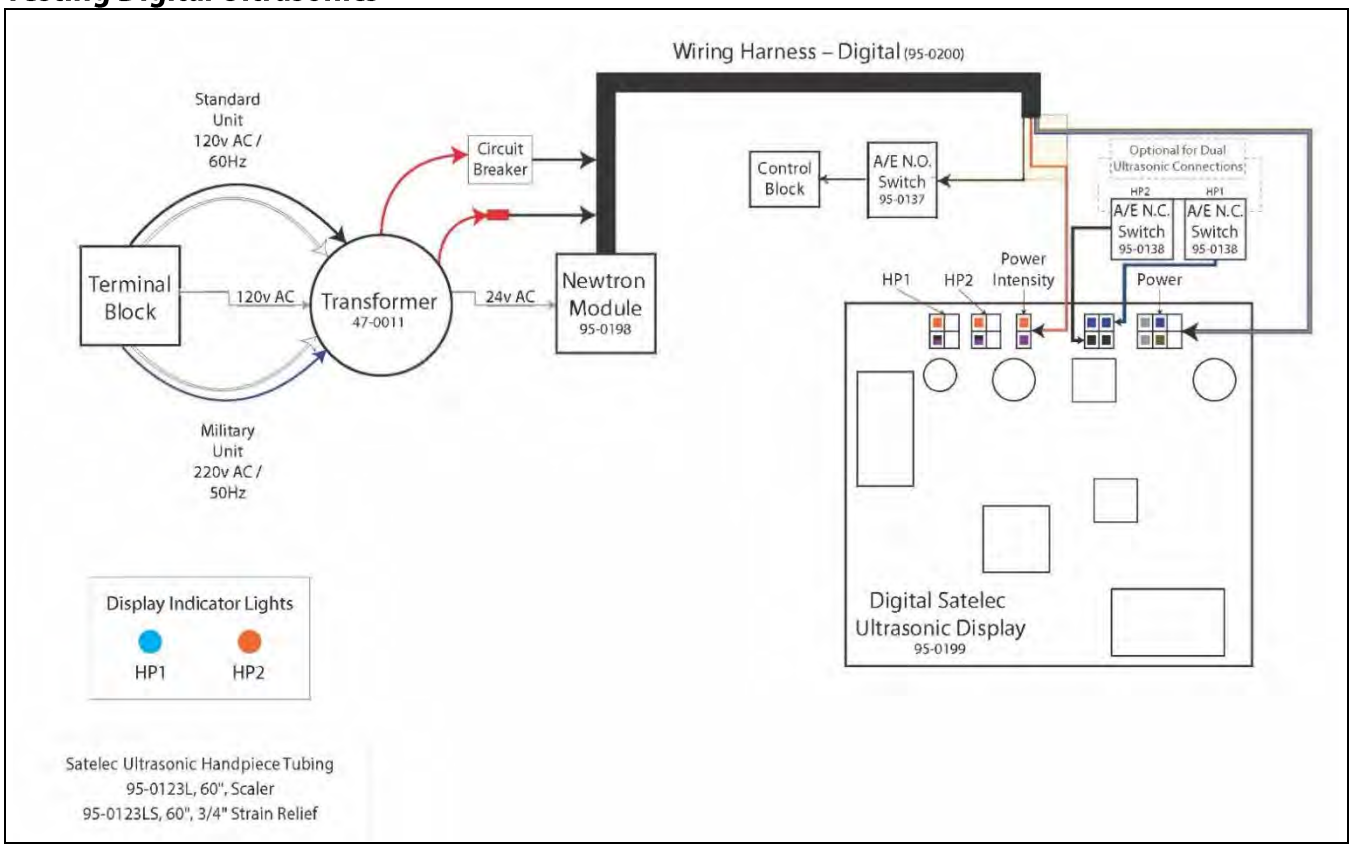


Fig. 3

Testing Digital Ultrasonics



Digital Ultrasonic Wiring Diagram

Testing of 24 AC Volt Supply to the Acteon/Satelec Brand Newtron Module

To test that the transformer is providing a 24 (±10%) volt AC to the Newtron module, locate the six-pin connector on the harness. Depending on the model provided, disconnect the connector from either the digital display board as shown or the connection to the manual potentiometer. Use a multimeter set to low AC voltage and place into the connector to measure the voltage provided by the two gray wires.

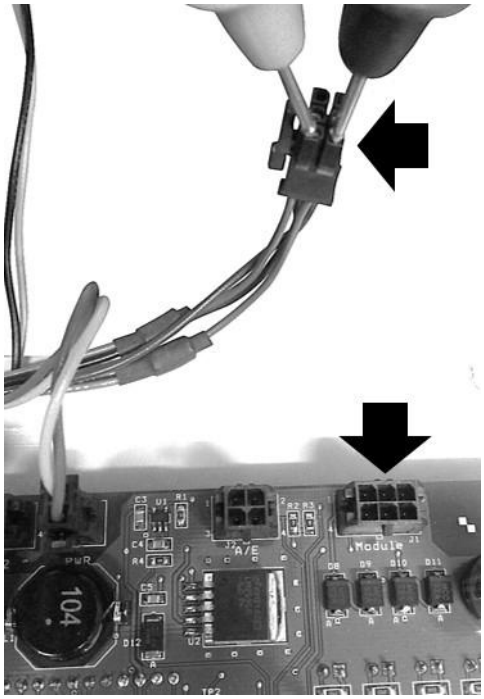


Fig. 4

Testing of the 5 DC Volt Supply from the Acteon/Satelec Brand Newtron Module

To test that the Newtron module is providing up to 5 volts, remove the six-pin connector. Set the power on the display to 100% in order to increase the voltage output. Then use a multimeter set to DC voltage. Place the probes into the middle two positions of the six-pin socket on the display board as shown.

Fig. 5

Testing Analog Ultrasonics

Testing of 24 AC Volt supply to the Acteon brand Newtron Module

Find the Molex connector that connects the Newtron Module to the wiring harness. (Fig 6) With a multimeter, test the BROWN and WHITE wires on the module side of the Molex connector. (Fig. 7) Turn the potentiometer knob up to 10. The results should show up to 5 volts DC.

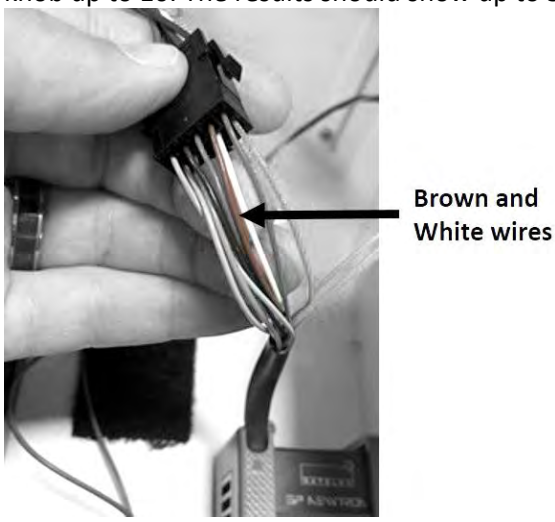


Fig. 6

Fig. 7

If it shows 0 volts, the module is bad. Replace the module:

- ASI PN 95-0198, *Acteon US Newtron Module (Module Only)*

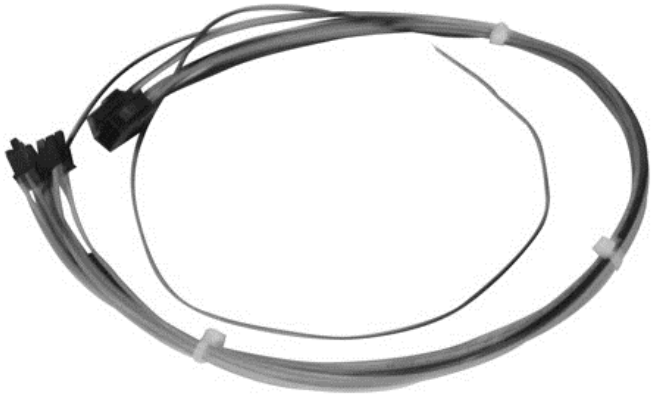
If the Newtron Module pass the voltage test, test the potentiometer with an Ohm meter. Place the prongs of the Ohm meter into the same WHITE and BROWN wire spots on the Molex connector and rotate the potentiometer up and down. (Fig. 7) The Ohm meter should read between 0 and 4000 Ohms when rotating the knob. If not, replace the potentiometer.

- ASI PN 95-0201, *Acteon/Satelec Wiring Harness with Potentiometer*

REPLACEMENT PARTS

The following are replacement parts for Acteon Ultrasonic Systems (analog and/or digital, as noted). Parts may be purchased from ASI at *asisupport.com.*

92-ASF12281	Analog or Digital	
95-0123L Handpiece Tubing, 60", 7/8” Strain Relief **95-0123LS** Handpiece Tubing, 60", 3/4” Strain Relief ℹ *For analog systems, also order ASI PN 95-0316, Analog Ultrasonic Adapter Harness (adapter)*	Analog or Digital	
95-0137 Switch, N.O. Assembly	Analog or Digital	
95-0198 Satelec Wiring Harness For Digital Display Ultrasonic	Analog or Digital	

95-0199 **Digital US Display Seven Segment**	Digital only	
95-0200 Satelec Wiring Harness For Digital Display Ultrasonic	Digital only	
95-0201 Acteon/Satelec Wiring Harness for Analog Display	Analog only