

Quick Reference Set Up Guide

What do you need?

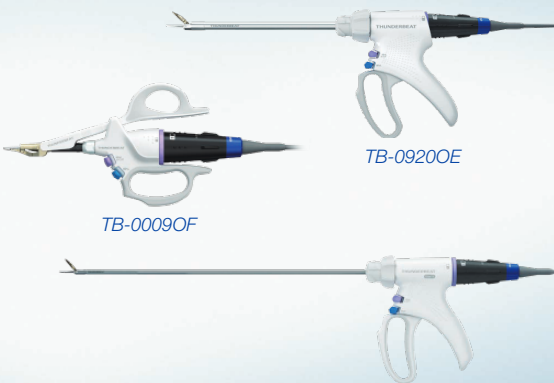
1

THUNDERBEAT generator system


ESG-400 + USG-400

2

THUNDERBEAT instrument


TB-0009OF
TB-0920OE
TB-0520FCS, TB-0535FCS, TB-0545FCS

3

THUNDERBEAT transducer


TD-TB400

How to Use?

1. Check the connections. Reconfirm that the accessories and peripheral instrument required for the procedure are connected properly and securely.

2. First, switch on the Electrosurgical Generator ESG-400.

3. Switch on the Ultrasonic Generator USG-400.

4. Fully insert the transducer plug into the THUNDERBEAT transducer socket (1) of the ultrasonic generator until it is fully seated. The “set” screen for THUNDERBEAT should be displayed (Figure 1).

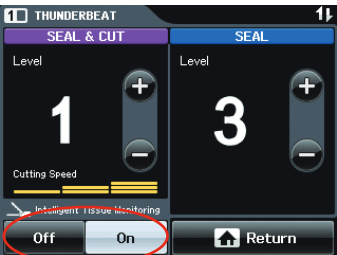
5. Set output mode levels with THUNDERBEAT standard settings (Figure 1):

- SEAL & CUT: Level 1
- SEAL: Level 3

(For more details on output mode levels, see Table 1)


Figure2. USG-400 menu

6. Tap the “On” or “Off” button and set the Intelligent Tissue Monitoring (ITM). When ITM is set to ON, it detects a small change of impedance on ultrasonic vibrations when a part of living tissue is divided. Ultrasonic and high-frequency output are stopped with a stop tone (Figure 1).


Figure1. THUNDERBEAT screen

SEAL & CUT
(Delay in activation time between Bipolar and Ultrasound energy. Ultrasound energy is delivered first)

Level 1	Level 2	Level 3
0 sec.	0.5 sec.	1 sec.

SEAL
(Minimum activation time for Bipolar energy)

Level 1	Level 2	Level 3
3 sec.	4 sec.	5 sec.

Table 1. Delay of activation time in the delivery of energy for SEAL & CUT and SEAL modes.

Assembly (THUNDERBEAT Type S, OEJ and OFJ)

THUNDERBEAT instrument: TB-0520FCS, TB-0535FCS, TB-0545FCS, TB-0920OE



1 Insert the instrument connection of the transducer into the transducer connection of the THUNDERBEAT instrument.



2 Turn the rotation knob clockwise with a light force, holding the transducer by the other hand until the rotation knob stops.



3 Mount the stabilizer on the transducer.



4 Grasp the stabilizer grip mounted on the transducer and attach the head of the torque wrench to the proximal end of the shaft with the side marked "THIS SIDE UP" facing the distal end of the shaft. Grasp both the grip of the torque wrench and the stabilizer mounted on the transducer. Then rotate the rotation knob clockwise slowly with the torque wrench until the torque wrench clicks once.



5 The instrument will be ready to use.

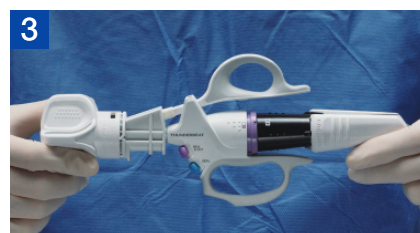
THUNDERBEAT instrument: TB-0009OF



1 Check the appearance of the instrument. The insertion section should not be torn, cut, peeled, or rolled up; the metallic section on the insertion section and the grasping section is not corroded or discolored; and The appearance is free of bending, deformation, and other irregularity.



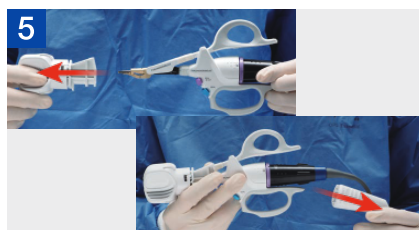
2 Mount the stabilizer on the transducer.



3 Insert the instrument connection of the transducer into the transducer connection of the THUNDERBEAT Instrument.



4 Grasp both the grip of the torque wrench and the stabilizer mounted on the transducer and then rotate the grip of the torque wrench clockwise slowly with the torque wrench until the torque wrench clicks.

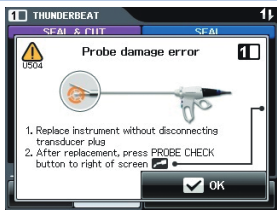
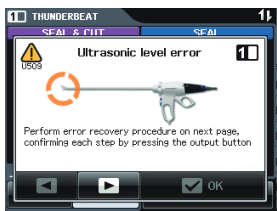
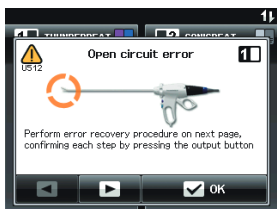
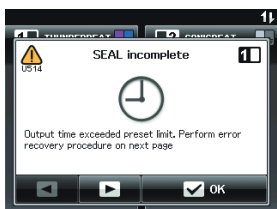


5 Detach the torque wrench and the stabilizer. Confirm that the grasping section at the distal end of the insertion section can be opened and closed smoothly.



Do not grasp both the grip handle and transducer together when securing them. Keep the torque wrench and the stabilizer in a sterile condition after use, because they will be needed for changing and withdrawing the transducer during and after-procedure.

Troubleshooting (The error messages will appear in the screen of the generator and an alarm will sound)

Error Message	Image in Screen	Possible Cause	Remedial Actions
U504 Probe Damage error		Cracked damaged probe.	1. Replace THUNDERBEAT without turning off the ultrasonic generator or disconnecting the transducer plug. 2. After replacement, press the PROBE CHECK push button to confirm that the new instrument works normally.
U508/U511 SEAL & CUT Short Circuit error / SEAL Short Circuit error		Output is generated while a metallic object is grasped or touched/ Output in body fluids/ Grasping section wear.	1. Confirm no metal object is grasped between jaw and probe tip, then confirm activation. 2. Withdraw excess fluids in the body. 3. If the error window is still displayed, replace the THUNDERBEAT instrument.
U509 Ultrasonic Level error		Excessive load is applied to the distal end.	1. Reduce the force applied to the distal end or to the probe tip. 2. Withdraw body fluid and tissue on grasping section, probe tip, and shaft surface.
		Connection of the transducer with THUNDERBEAT instrument is loose.	3. Check if the THUNDERBEAT instrument and transducer are connected firmly. If not, connect them firmly.
		Transducer plug is not connected to the THUNDERBEAT socket properly.	4. Confirm that the transducer plug is connected to the THUNDERBEAT socket on the front panel of the ultrasonic generator. If not, connect it properly.
		Probe damage or malfunction	5. Replace the THUNDERBEAT instrument.
		Transducer malfunction	6. Replace the transducer.
U510 Ultrasonic frequency error (which is detected during surgery)		Connection of the transducer with THUNDERBEAT instrument is loose.	1. Check if the THUNDERBEAT instrument and transducer are connected firmly. If not, connect them firmly.
		Excessive load is applied to the distal end.	2. Reduce the force applied to the distal end or to the probe tip. 3. Withdraw body fluid and tissue on grasping section, probe tip, and shaft surface.
		Transducer plug is not connected to the THUNDERBEAT socket properly.	4. Confirm that the transducer plug is connected to the THUNDERBEAT socket on the front panel of the ultrasonic generator. If not, connect it properly.
		Transducer temperature is too high due to use immediately after autoclaving / Transducer temperature is too high due to continuous output.	5. Stop output until the temperature cools down.
		Transducer malfunction.	6. Replace the transducer.
		Probe damage or malfunction.	7. Replace the THUNDERBEAT instrument.
		Ultrasonic generator malfunction.	8. Contact Olympus.
U512 Open Circuit error		The fully assembly instrument is activated without holding tissue.	1. Re-grasp tissue and confirm activation.
		Transducer and THUNDERBEAT instrument are not connected properly.	2. Check if the THUNDERBEAT instrument and transducer are connected. If not, connect them properly.
		Transducer plug is not connected to the THUNDERBEAT socket properly.	3. Confirm that the transducer plug is connected to the THUNDERBEAT socket on the front panel of the ultrasonic generator. If not, connect it properly.
		Transducer malfunction	4. Replace the transducer.
		The THUNDERBEAT instrument malfunction	5. Replace the THUNDERBEAT instrument.
U514 Time out error (SEAL incomplete)		Ultrasonic generator malfunction	6. Contact Olympus.
		The specified output time period has expired (maximum output time: 15 s).	Withdraw tissue or fluids from jaw and probe tip. Re-grasp tissue and confirm activation.

Cleaning and Sterilization procedures after Surgery (TD-TB400)



1 Fill a basin with detergent solutions at the temperature and concentration recommended by the detergent manufacturer. Use a basin that is large enough so that the components of the transducer may be completely immersed.



2 **Cleaning:** Immerse the transducer in the basin of detergent solutions for more than 15 minutes. Clean all surfaces of the transducer in the detergent solutions using a cleaning brush (A0451) or gauze. Perform this procedure until all visible dirt has been completely removed. Gently clean the gaps inside the transducer plug and the THUNDERBEAT instrument connection using a cleaning brush (MH-507).



3 **Rinsing and Drying:** Fill a basin with rinse water. Use a basin that is large enough so that the transducer is completely immersed. Using a lint-free cloth, rinse the transducer's external surface while it is immersed in the rinse water. Remove the transducer from the rinse water. Wipe and dry all surfaces of the transducer with a piece of clean, dry gauze or lint-free cloth.



4 **Disinfection:** Fill a basin with disinfectant solutions at the temperature and concentration recommended by the disinfectant manufacturer. Use a basin that is large enough so that the components of the transducer may be completely immersed. Immerse the transducer in the disinfectant solutions. Cover the basin with a tight fitting lid to minimize the disinfectant vapors. Immerse the transducer in disinfectant solutions for the amount of time and at the temperature and concentration recommended by the disinfectant manufacture. Dry as described in "3".



5 **Sterilization:** Check that debris and moisture do not remain on the surfaces of the transducer. Seal the transducer in packaging appropriate for steam sterilization according to your hospital's protocol. Steam sterilize the transducer. Following steam sterilization, let the transducer gradually cool down to room temperature. Finally, store the transducer.

This sheet is for quick reference only. Please refer to the instruction provided with the devices for instruction in details. Specifications, design and accessories are subject to change without any notice or obligation on the part of the manufacturer.

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