

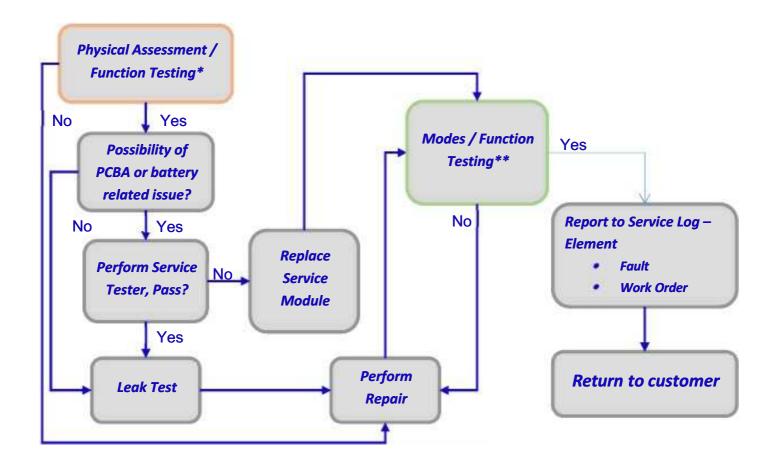
# Suunto Traverse/Kailash/Ambit 3 Vertical Service Manual

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# 1 Analysis / repair flow

# 1.1 Analysis flowchart



# \*PHYSICAL ASSESSMENT / Function Testing Inspect unit for:

- O Damage to case, lens and strap
- O Visible Water Damage

#### Test

- O Button Functionality
- O PCI Contact Functionality / Charging
- O Vibra Functionality
- o Buzzer
- O Display / backlight
- O Accurate temperature, pressure and Compass readings
- O Software Check/Update

#### \*\*Modes / Function Testing

#### Test

- O Button Functionality
- O PCI Contact Functionality / Charging
- O Vibra Functionality
- o Buzzer
- O Display / backlight
- O Accurate temperature, pressure and Compass readings

# 2 Troubleshooting

### 2.1 Device Faults

#### 2.1.1 Shows wrong temperature / air pressure / altitude

Compare unit's raw pressure readings (Found from Service Menu > Info) to reference barometer. A broken pressure sensor will in most cases also cause abnormal temperature readings. If the reading varies over 5 Hpa, or readings wander when unit is held in place, pressure sensor is most likely faulty.

Possible Fault	Action	How to report
Faulty pressure sensor or pressure sensor connector	Replace the pressure sensor and light shield	Sensor Pressure > Defective Material / Component
Fault is in the connector of the PCBA (connector is visually damaged)	Replace for a Service Module	Sensor Pressure > Defective Assembly
Leakage through the pressure sensor o-rings	Replace for a Service Module	O-ring > Missing O-ring > Dirty O-ring > Cracked / Cut O-ring > Loose O-ring > Defective assembly

#### 2.1.2 Does not connect to satellites / too slow fix / loses fix

Without updating satellite location data, or after performing a GPS reset from the service menu, initial location fix should take at most 120 seconds in ideal outdoor conditions. Please note, standing next to large flat vertical surfaces will add significant signal noise that will degrade signal quality and extend time required for initial fix.

Possible Fault	Action	How to report
GPS antenna contact surfaces damaged or visibly dirty	Clean Contact surfaces with Textwipe and Industol	Antenna > Dirty
Display frame cracked.	Replace the display frame.	Antenna > Cracked / cut
Faulty PCBA	Replace for a Service Module	PCBA > Defective Material / Component

#### 2.1.3 Does not show heart rate

HR BELT: Check the electrode surfaces of the belt are wet enough (water or gel.) Check and replace the battery / bend battery contact to correct position. Pair the belt to the wrist unit. Test that the belt is communicating with wrist unit. Check the search settings in Movescount. Unit reset (Resetting device) can be used as a first solution if wrist unit doesn't find the belt.

Possible Fault	Action	How to report
Worn HR belt strap (poor conductivity)	Replace the strap	Contact pad > Worn out
Faulty HR module	Replace the HR module	Wireless Communication/Pairing → Not able to pair
HR belt battery voltage low	Replace the battery	Unit > No fault
Unit not pairing with HR Module	Replace the unit	Unit > Unable to pair

#### 2.1.4 Broken strap / strap loop

Strap warranty on wrist unit straps and heart rate sensor straps is 1 year.

Kailash: If strap is loose when attached, examine strap and casing for any cracks/breakage.

Possible Fault	Action	How to report
Normal wear	Replace the strap	Strap/Band/Bracelet > Cracked / Cut
	Replace the strap loop	Strap Loop > Cracked / Cut Strap loop > Missing

#### 2.1.5 Springbar/Strap Pin loose/missing

If the Springbar or Strap Pin has become damagedor is missing, inspect the lower casing for any possible defects or damage.

Possible Fault	Action	How to report
Springbar / Strap Pin missing	Replace all Springbars / Pins with ones	Springbar / Pin / Screwbar > Missing
Strap Pin (Kailash) loose	Replace Strap	Strap Band / Bracelet > Defective Material / Component
Springbar / Strap Pin bent	Replace springbar	Springbar / Pin / Screwbar > Deformed

#### 2.1.6 Button jammed / does not connect

Examine whether the casing or the button is causing the jam.

Possible Fault	Action	How to report
Button and casing visually intact, but button jammed or stiff to use.	Replace the button	Button > Jammed
Visible damage or deformation on the casing, near the button slot.	Replace for a Service Module	Case bottom > Deformed
Faulty button switch on PCBA	Replace for a Service Module	PCBA > Defective material

#### 2.1.7 Display blank, unit reacts when pushing buttons

Test to see if device reacts to pressing buttons (Does the backlight still light up, does the device beep to button presses?) if not try the 2 button reset. (Resetting device)

Possible Fault	Action	How to report
Faulty display connection.	Fix the flex connector position	PCBA > Defective assembly
Faulty display connector.	Replace for a Service Module	PCBA > Defective material
Faulty LCD	Replace the LCD	Display > Defective Material / Component
Faulty Pressure Sensor	Replace pressure sensor and lightshield.	Sensor Pressure > Defective material

#### 2.1.8 Segment missing

Be sure to set units display contrast to the default 50% before examining.

Pos	sible Fault	Action	How to report
Fault	ty LCD	Replace the LCD	Display > Defective Material / Component

#### 2.1.9 Bad contrast / LCD fading / LCD flushed

Be sure to set units display contrast to the default 50% before examining.

Check termperature readings, if it displays 0 or --, the fault is always in the pressure sensor.

Extreme temperature change will cause the display to dim and darken, make sure to ask the customer if the unit is being kept at proper operating temperatures. Wearing the unit externally, or over a jacket might cause these issues.

Possible Fault	Action	How to report
Incorrect settings of the contrast	Set the contrast in service menu	Unit > No fault
Faulty LCD	Replace LCD	Display > Defective Material / Component
Faulty Pressure Sensor	Replace Pressure Sensor	Sensor Pressure > Defective Material / Component

#### 2.1.10 Back light doesn't work

Check the backlight brightness setting, the unit will sometimes not turn the backlight on if it is set to the lowest possible settings.

Possible Fault	Action	How to report
Incorrect setting of the backlight brightness	Adjust the brightness in general settings	Unit > No fault
Faulty LCD	Replace LCD	Display > Defective Material / Component
Display Flex Connector loose	Install flex connector	Display > Defective Assembly

#### 2.1.11 No sound

Make sure to check the device settings for device sounds.

Possible Fault	Action	How to report
Faulty buzzer contact pins	Replace the buzzer contact pins	Spring > Defective assembly

#### 2.1.12 Resets

Device clearly resets from normal usage, and bumps of the unit.

See energy consumption test in service tester manual (test 5 – battery gauge)

Possible Fault	Action	How to report
Faulty battery	Replace the battery	Battery > Defective Material / Component
Connector of the battery is faulty	Replace the battery or Service Module	Contact, battery > Cracked / Cut
Unit is suffering from a ESD shock	Replace for a Service Module	Contact, battery > Cracked / Cut
Connector of the PCBA is damaged	Replace for a Service Module	Battery > Defective assembly
Battery connector is not attached	Attach the cable to the connector	Contact battery > Defective assembled

#### 2.1.13 Leakage / water inside the unit / moisture under the glass

It is normal to have humidity inside the unit which may cause the unit to fog when temperature varies.

Possible Fault	Action	How to report
Form gasket / O-ring not properly positioned	If the unit has leaked, replace with a service module	If the gasket is broken, use: Gasket/O-Ring > Cracked / Cut If the gasket is improperly seated during manufacturing, use: Gasket/O-Ring > Defective assembly If the gasket is mishaped, use: Gasket/O-Ring > Deformed If the gasket is missing, use: Gasket/O-Ring > Missing
Humidity inside the unit which may cause the unit to fog when temperature varies	Check the functions and perform a leakage test	If fogging is caused by normal humidity inside the unit use: Unit > No fault

#### **Humidity underneath the glass?**

Condensation inside a watch is a common phenomenon (or a challenge) in the watch industry

- What actually happens?
  - Normal air always contains some amount of humidity which ends up inside the watch in when it is assembled in a factory or a repair centre
  - –When the watch is subject to a rapid change of temperature (e.g. jumping into cold water in a warm environment) the humidity condenses on the surface which cools down fastest – typically the lens
  - -The humidity disappears when the temperature differences even out
- Consequently the level of humidity needs to be controlled whenever the product is opened
- Condensation can be tested with the heat plate + water droplet test

#### 2.1.14 Current consumption too high / battery life is significantly reduced

Service tester software can be used to find defects that may cause higher current consumption.

Possible Fault	Action	How to report
Faulty LCD	Replace the LCD	Display > Current consumption
The battery is faulty	Replace the battery	Battery > Defective Material / Component
The battery is just empty	Recharge the battery	Unit > No fault
Current consumption too high (PCBA)	Replace for a Service Module	Unit > Current consumption
Unit has suffered ESD shock	Replace for a Service Module	Contact, battery > Cracked / Cut
Faulty Pressure Sensor	Replace Pressure Sensor	Report: Sensor Pressure > Defective Material / Component

#### 2.1.15 Does not charge.

Always request a customer bring the cable used to charge the device, or ask if the unit can be charged with a different cable.

Possible Fault	Action	How to report
Battery connector is not attached	Attach the cable to the connector	Contact battery > Defective assembled
Charging cable, pins or latch broken.	Replace the USB cable.	Cable > Not connecting

#### 2.1.16 Battery charges only partially / discharges too quickly

Rechargeable batteries ability to hold charge will decline over time. Low temperature shortens the length of single charge.

Service tester software can be used to determine the amount of times a device has been charged, normally a rechargeable battery will be reduced to 70-80% capacity after 500 charge cycles.

A visual inspection of the battery should also be done, any punctures or depressions in the surface of the battery should be noted and reported as a faulty battery.

Possible Fault	Action	How to report
Worn battery	Replace the battery	Unit / No fault
Faulty battery	Replace the battery	Battery > Defective Material / Component
High current consumption	Replace for a Service Module	Unit > High current consumption

#### 2.1.17 Does not connect to Moveslink / Movescount

Check the settings in Moveslink or replace a possible faulty PC cable. Advise the consumer to contact Suunto Contact Centre. Check the condition of the PCI contacts.

Possible Fault	Action	How to report
Faulty PC cable	Replace the cable	Cable > Not connecting
Cracked USB cable (visible breakage)	Replace the cable	Cable > cracked / cut
Incorrect settings	Replace the cable	Unit > No fault
Faulty PCI connector	Replace the PCI contact pins	Connector PCI > Defective Assembly
Charging but not communicating with Moveslink	Replace for a Service Module	PCBA > Defective Material / Component

#### 2.1.18 Unit jammed on the Suunto screen

Possible Fault	Action	How to report
Wrist unit prematurely released from the cable during update	Connect to the PC and update the SW	Unit > Completely dead
Software Jammed (Suunto E02 on the screen)	Force Firmware Update	Report: Embeded Software > Jammed

#### 2.1.19 Unit jammed on the connect to Moveslink display

Unit may be recovered by forcing firmware update or resetting device but the defect may reappear.

Possible Fault	Action	How to report
Memory fault	Replace for a service Module	Embedded Software > Known Bug

### 2.2 Service Commands

### 2.2.1 Resetting Device

Some device problems can be software related. Be sure that the product has latest available software. Updating software to the latest version can fix some issues. Also performing software reset can fix software related issues.

# TRAVERSE/AMBIT3 VERTICAL TWO BUTTON RESET:

Press and hold up and down buttons down at the same time for 10 seconds.

# KAILASH THREE BUTTON RESET:

Press and hold all three buttons at the same time for 10 seconds.





#### 2.2.2 Setting Device to Sleep

After the service it is recommended to put the device to sleep mode. This will allow the customer to easily reconfigure the device to their needs.

#### **Go to SERVICE MENU:**

Traverse/Ambit3 Vertical: Press Back/Lap and Start/Stop down at the same time (10sec).

**Kailash**: Press **Up** and **Down** down at the same time (10sec).

#### **Go to SLEEP MODE:**

**Select ACTION** 

Select FACTORY RESET





Unit is now in sleep mode, please note that waking the unit will cause a reset of the device.

# 3 Steps to determine the warranty

#### 1. Warranty terms:

 Read the warranty terms and conditions carefully at: http://www.suunto.com/en-US/Support/

#### 2. Condition of the product:

- Check the device for visually: Signs of impact, etc. hard use?
- Are there any signs that the device has been opened and repaired by other parties other than an authorized Suunto Service Center (improperly installed battery, missing parts, markings underneath the lens of the unit)

#### 3. Proof of purchase:

Check the proof or purchase. The warranty is valid for 2 years from date of purchase

#### 4. Serial number:

- If the proof of purchase cannot be found, the unit is granted a 25 month warranty from on the date of manufacture, based on the original unit's serial number.

#### 5. Service history:

- Check the service history in service log
- Service warranty including exchanged / repaired parts
- Service Warranty 3 months from the date of repair

#### 6. Suunto's flexibility list:

- Check extended warranty list

# 4 Spare parts and tools

## 4.1 Tools and Test Equipment

- Only use tools approved by Suunto for servicing Suunto Products. In case you have test equipment which is not listed as approved Suunto test equipment, please contact Suunto with name and model of the equipment to confirm compatibility.
- O General requirement for hand tools is ESD (electro static discharge) safety.
- O Use only ionized pressurized air on PCBA and other ESD sensitive material. Unionized air may be used on casing but still needs to be filtered to prevent humidity or oil.
- O Tools and test equipment have to be calibrated according to frequency set by manufacturer.

#### 4.1.1 **Tools**

Item name	Order code
ESD TWEEZERS (wide blade)	100015252
ESD TWEEZERS (SHARP CURVED BLADE)	100019184
TWEEZERS SIPEL 1303-SA	100015353
FORK TOOL FOR SPRING BAR	1000K5857
TORX SCREW DRIVER 5IPX40	100013533
TORX SCREWDRIVER T4X40	100013030
AMBIT PRESSURE SENSOR TOOL	100019500
ESD NOSE CUTTER	100020548
CUTTER	100019522
ASSEMBLY JIG GENERAL	100022448
ASSEMBLY JIG ADAPTER PLATE TRAVERSE / KAILASH / VERTICAL	100022449

#### 4.1.2 Test Equipment

Item name		Order code
Leakage test equipment Witschi ALC 2000	/Proofmaster M (or equivalent)	Not available in web

#### 4.1.3 Cleaning Equipment

Item name	Order code
TEXWIPE CLEANING STICK	100016925
ESD BRUSH	1000K5115

#### 4.1.4 Chemicals and Lubricants

Item name	Order code
LUBRICANT, CHEM KRYTOX GPL 205 56G TUBE	100016299
LOCTITE 242	10000M233

#### 4.1.5 ESD Equipment

Item name	Order code
ESD GLOVES	different sizes in web
ESD TABLE MAT WITH EARTH GROUNDING INTERFACE	100019574

### 4.2 Handling and storage of spare parts

- O Spare parts must be stored in a dry and dark place. Make sure spare parts are not exposed to dirt or other contaminants. Take special care of sealing gasket's and oring's cleanliness.
- O Spare parts has to be organized in a way that oldest parts are always used first and received batches can be identified from each other. This improves traceability in case such is needed.
- O NOTE! ESD sensitive materials such as PCBAs, inner modules and sensors have
- O to be stored in original packages until assembled and handled only at EPA area. Please see ESD requirements at Material Bank.
- O Do not handle gold plated parts (or batteries) with your bare hands. Oily or sweaty fingers may smear the gold plating and cause contact problems or be a reason for later damage on the gold plating. Always use protective ESD gloves. Gloves must be replaced if dirty.

NOTE! Authorized Suunto Services may only use batteries approved by Suunto and distributed by Suunto. Suunto performs tests for battery batches, distributes and guarantees best possible performance in Suunto products.

NOTE! Take special caution also with used batteries. Piling up and allowing them to be in contact with each other may cause smoke or risk of fire.

NOTE! Only genuine unused spare parts are allowed to be used at Authorized Suunto Service Centers. Do not use spare parts taken from other Suunto products and never use parts from salesman samples or dummies.

NOTE! Only use Suunto recommended chemicals such as lubricants and greases. Please read safety data sheet before use.

# 4.3 Available spare parts

# 4.3.1 Straps

Item name	Order code
KAILASH STRAP PIN	100021399
KAILASH STRAP PIN BLACK	100021802
KAILASH STRAP CARBON	100021809
KAILASH STRAP COPPER	100021812
KAILASH STRAP SLATE	100021810
KAILASH STRAP SILVER	100021811
TRAVERSE STRAP PIN	100022285
TRAVERSE STRAP AMBER (WITH SPRINGBAR)	100022192
TRAVERSE STRAP BLACK (WITH SPRINGBAR)	100022190
TRAVERSE STRAP GRAPHITE (WITH SPRINGBAR)	100022270
TRAVERSE STRAP WHITE (WITH SPRINGBAR)	100022191
TRAVERSE STRAP SAPPHIRE BLACK	100022635
TRAVERSE ALPHA / AMBIT3 VERTICAL SPRINGBAR	100021875
TRAVERSE ALPHA STRAP FOLIAGE	100022472
TRAVERSE ALPHA STRAP STEALTH	100022470
AMBIT3 VERTICAL STRAP WHITE	100022125
AMBIT3 VERTICAL STRAP BLACK	100022124
AMBIT3 VERTICAL STRAP BLUE	100022126
AMBIT3 VERTICAL STRAP LIME	100022127

### 4.3.2 Pushers

Item name	Order code
AMBIT3 / TRAVERSE PUSHER FLAT STEEL	100020844
AMBIT3 VERTICAL PUSHER MATTE BLACK	100022172
TRAVERSE PUSHER GRAY	100021939
AMBIT3 / TRAVERSE PUSHER FLAT BLACK	100020842
TRAVERSE PUSHER KNURLED BLACK	100022463
TRAVERSE PUSHER KNURLED GRAY	100022464
KAILASH 7R BUTTON MATT BLACK	100021413
KAILASH BUTTON MATT BLACK	100021414
KAILASH 7R BUTTON CLEAR	100021443
KAILASH BUTTON CLEAR	100021444
KAILASH 7R BUTTON LIGHT GRAY	100021419
KAILASH BUTTON MATT LIGHT GRAY	100021420
KAILASH 7R BUTTON BROWN	100021437
KAILASH BUTTON BROWN	100021438

### 4.3.3 Casing & Lens

Item name	Order code
VERTICAL / KAILASH / TRAVERSE GASKET	100021398
AMBIT / KAILASH / TRAVERSE BEZEL SCREW	100018391
AMBIT3 / KAILASH BEZEL SCREW NATURAL	100019619
KAILASH / TRAVERSE BEZEL SCREW LIGHT GRAY	100021485
KAILASH BEZEL SCREW BROWN	100021488
AMBIT3 VERTICAL BEZEL	100022171
KAILASH BEZEL COPPER	100021813
KAILASH BEZEL CARBON	100021411
KAILASH BEZEL SLATE	100021417
KAILASH BEZEL SILVER	100021423
TRAVERSE BEZEL BLACK	100021861
TRAVERSE BEZEL GREY	100021862
TRAVERSE BEZEL SAPPHIRE BLACK	100022194
TRAVERSE BEZEL KNURLED BLACK	100022461
TRAVERSE BEZEL KNURLED GRAY	100022462

## 4.3.4 Inner Modules & PCBA Components

Item name	Order code
KAILASH / TRAVERSE / VERTICAL PCI CONTACT PIN	100019590
KAILASH / TRAVERSE / VERTICAL POGO PIN	100021062
KAILASH / TRAVERSE / VERTICAL PIEZO	100021787
KAILASH / TRAVERSE / VERTICAL PIEZO AHDESIVE	100018656
KAILASH / TRAVERSE / VERTICAL PCBA VIBRA	100021396
KAILASH / TRAVERSE / VERTICAL DISPLAY	100021401
KAILASH / TRAVERSE / VERTICAL ANTENNA FRAME	100021400
LIGHT SHIELD PLASTIC	100022977
KAILASH / TRAVERSE / VERTICAL PRESSURE SENSOR	100021395
WTC / DIVING PRESS.SENS. O-RING	1000K4803
WTC / DIVING PRESS.SENS. SUPPORT BUSHING	100019722
KAILASH / TRAVERSE / VERTICAL LATCH	100021393
AMBIT / KAILASH/TRAVERSE BATTERY TAPE	100018380
AMBIT 2S/2R/3 SPORT / KAILASH / TRAVERSE BATTERY 3,7V/240mAh	100019195

#### 4.3.5 Service Modules

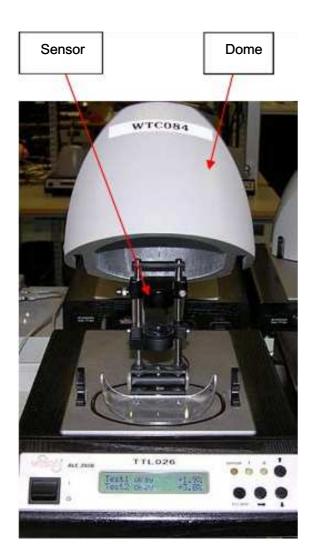
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Order code		
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SS022027000		



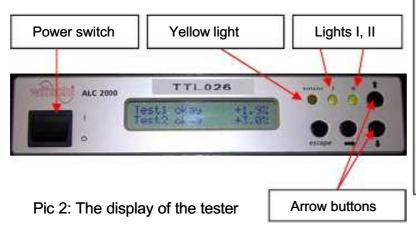
# 5 Repair instructions

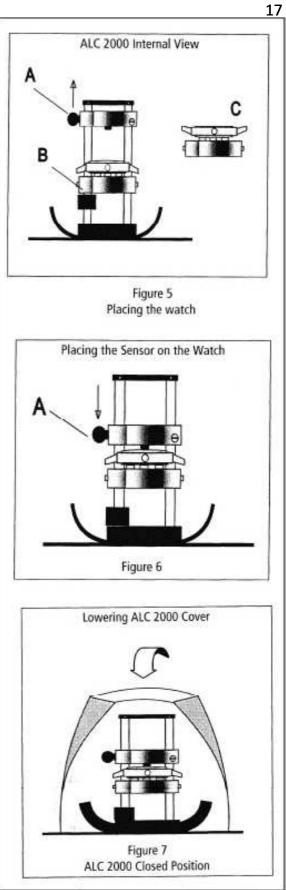
# 5.1 Leakage test

Description	<ol> <li>Turn the leakage tester ON from the power switch (Pic 1)</li> <li>Check the program/pressure settings (check nominal values)</li> <li>Place the module underneath the tester sensor glass side up</li> <li>Lower the sensor down towards the glass until the yellow sensor light turns on. The yellow light should be on during the whole test (pic 2)</li> <li>Close the leakage tester dome (Pic 3)</li> <li>After completing the test successfully both indicator lights (I and II) should be green to show the tested unit to be waterproof. In case one or both of the lights are yellow or red the unit is leaking.</li> <li>After the test the dome rises up. Lift the sensor and remove the tested unit</li> <li>Report the repair in Service Log using the correct fault code</li> </ol>
Material safety data	
The nominal and limit values	Measuring time: Automatic -0,4 / +0,5 bar Tightness tolerance: 1,0 % Shell analysis: Std
Quality control	Indicator lights (I and II) are green when a unit is waterproof and has passed the test.
Other	Protective stickers have to be removed during the test In case a unit needs to be retested immediately, the unit should be opened to allow the inner pressure of the unit to normalize with the exterior pressure in between the tests.  Humidity underneath the class, waterproofness tested ok:  Condensation inside a watch is a common phenomenon (or a challenge) in the watch industry  What actually happens  Normal air always contains some amount of humidity which ends up inside the watch in when it is assembled in a factory or a repair center  When the watch is subject to a rapid change of temperature (e.g. jumping into cold water in tropical environment) the humidity condenses on the surface which cools down fastest, typically the lens.  The humidity disappears when the temperature differences even out  Consequently the level of humidity needs to be controlled whenever the product is opened  Condensation can be tested with the heat plate test in the repair centers



Pic 1: Leakage test equipment Witschi ALC 2000





Pic 3: Lower the leakage tester dome with its own weight

# 5.2 Strap Change

Used / interchangeable parts and materials	Material code
KAILASH STRAP PIN	100021399
KAILASH STRAP PIN BLACK	100021802
TRAVERSE STRAP PIN	100022285
TRAVERSE ALPHA / AMBIT3 VERTICAL SPRINGBAR	100021875
Check Strap variation availability on Spare Parts Webshop	

Tools, equipment, security	Material code
CUTTER	100019522
FORK TOOL FOR SPRING BAR	1000K5857

Description Traverse	<ol> <li>Hold the unit in your hand.</li> <li>Pull aside the silicon strap to reveal the strap spring bar.</li> <li>Using wire cutters, cut the spring bar at least 2 mm down towards the center of the springbar. (Pic 1)</li> <li>Remove the broken spring bar.</li> <li>Place a new strap pin in the new strap, and slot one end into the unit.</li> <li>Using the Strap Fork Tool depress the other end of the strap pin and slide it into place.</li> <li>The strap attachment should be tested by pulling on the strap after installation.</li> </ol>
Description Kailash	<ol> <li>The Kailash strap is connected by a strap pin. The strap pin has slightly different sides, a flat end and the other has a small bump on the tip. The flat side has the locking teeth, so make sure to always push this side away from the unit when removing a strap.</li> <li>Holding the unit in your hands, use the push rod side of the strap removal fork to push the strap pin out by pushing on the end with the small bump. (Pic 2)</li> <li>Pull the strap pin out.</li> <li>With the new strap in place, push the strap pin in, and make sure the pin is evenly centered, and is not sticking out on either side.</li> </ol>
Description Traverse Alpha / Ambit3 Vertical	<ol> <li>Use a fork tool to remove the strap by pressing the tip of the springbar out from the hole. (Pic 3)</li> <li>Insert springbar to new strap.</li> <li>Insert one end of the springbar in the case.</li> <li>Push the other end of the springbar in the hole by using fork tool.</li> <li>The strap attachment should be tested by pulling on the strap after installation.</li> </ol>
Other	The original Traverse Silicon straps required a single shoulder springbar (100022285) that needs to be cut to be removed. Newer generation Traverse straps include a metal support tube on the inside of the silicon strap silo. This allows them to use the more easily removable double flanged springbars used in the Traverse Alpha and Ambit 3 Vertical straps (100021875). Make sure to examine whether the Traverse strap you are using has this metal cylinder inside the strap before choosing which strap pin to use.



The older Traverse strap bar must be cut to be removed without damaging the lower casing. See Pic 3 below for an example of the newer Traverse Alpha /Ambit3 Vertical strap bar, which can be found on newer Traverse units.



Using the push rod end of the strap removal fork tool, push the strap bar from the button side of the unit.



The Traverse Alpha and Ambit 3 Vertical Straps have standard strap pins that can be re used.

# 5.3 Button Replacement

Needed parts	Order code
AMBIT3/TRAVERSE PUSHER FLAT STEEL	100020844
AMBIT3 VERTICAL PUSHER MATTE BLACK	100022172
TRAVERSE PUSHER GRAY	100021939
TRAVERSE PUSHER KNURLED BLACK	100022463
TRAVERSE PUSHER KNURLED GRAY	100022464
KAILASH 7R BUTTON MATT BLACK	100021413
KAILASH BUTTON MATT BLACK	100021414
KAILASH 7R BUTTON LIGHT GRAY	100021419
KAILASH BUTTON CLEAR	100021444
KAILASH BUTTON MATT LIGHT GRAY	100021420
KAILASH 7R BUTTON BROWN	100021437
KAILASH BUTTON BROWN	100021438
KAILASH 7R BUTTON CLEAR	100021443

Tools, equipment, security	Material code
ESD NOSE CUTTER	100020548
TEXWIPE CLEANING STICK	100016925

Description	<ol> <li>Using a pair of sharp wire cutters grab a button from the sides, making sure not to damage the lower casing, and pull the button out. (Pic 1)</li> <li>Clean the button slot with an ESD texwipe cleaning stick (Pic 2)</li> <li>Make sure there are no old pusher o-rings left in place.</li> <li>Check to see that the new pusher has an o-ring in place. (Pic 3)</li> <li>Place the button in its slot and press in slightly using your fingers.</li> <li>To ensure the button is fully depressed in place, press the unit with the new button against a firm surface. (Pic 4)</li> </ol>
Quality control	Do not use any solvent cleaners when cleaning the case as these may cause damage to the casing.



The button slot should be cleared of any dust or grime.

After wiping the grime loose with the texwipe cleaning stick use ionizer air pressure to remove any other loose particles from the slot.

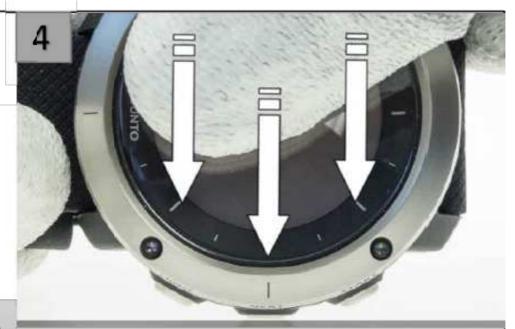
Do not use any solvants to clean the slot, as the liquid may enter the device or these may leave behind trace amounts of fluid that may cause problems with the new o-ring, or damage the casing.



3



All new Suunto supplied buttons come with a gasket in place. However this oring may come off during handling.



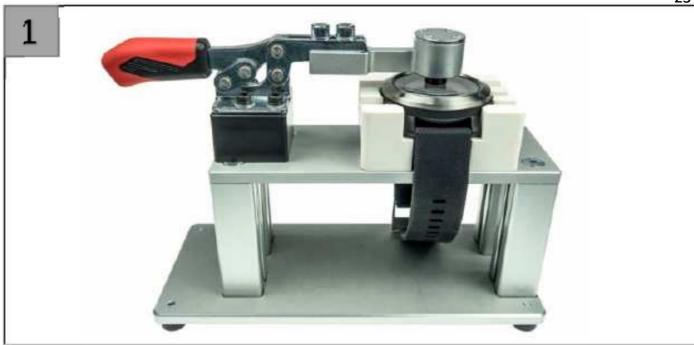
When installing the new pusher, press the button against the ESD work surface, to ensure the button sits in place as snugly as possible.

# 5.4 Bezel / Lens change

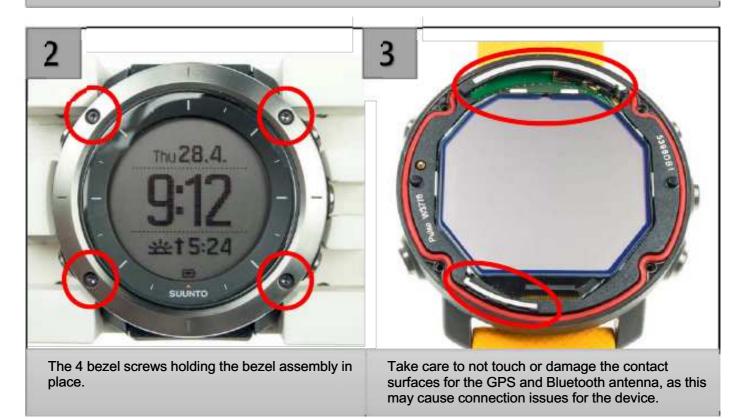
Used / interchangeable parts and materials	Material code
AMBIT / KAILASH / TRAVERSE BEZEL SCREW	100018391
AMBIT2 / KAILASH BEZEL SCREW NATURAL	100019619
KAILASH BEZEL SCREW BROWN	100021488
KAILASH / TRAVERSE BEZEL SCREW LIGHT GRAY	100021485
KAILASH / TRAVERSE / VERTICAL GASKET	100021398
Check Spare Parts Webshop availability for different bezel and lens assembly.	

Tools, equipment, security	Material code
TORX SCREW DRIVER 5IPX40	100013533
TWEEZERS SIPEL 1303-SA	100015353
ESD TWEEZERS (wide blade)	100015252
TEXWIPE CLEANING STICK	100016925

Description	<ol> <li>Remove the strap (6300154CE), or use the disassembly jig. (Pic 1)</li> <li>Unscrew the 4 bezel screws using the 5IP screwdriver. (Pic 2)</li> <li>Remove the old bezel assembly and the old form gasket, be mindful of the antenna connection surface on the display frame and avoid directly touching the surfaces (Pic 3)</li> <li>Clean the gasket surface and place a new form gasket, making sure it is sitting in its groove. (Check Other)</li> <li>Take the new lens assembly and remove the protective film, making sure to examine the lens assembly gasket surface and the back of the lens for dust or markings. Clean using ionized air pressure.</li> <li>Holding the lens assembly down with your hand, or use the assembly jig, make sure that the form gasket is not visible through the 4 screw holes and that no dust has been left visibly behind the lens.</li> <li>Before attaching the screws, make sure nothing is left between the screw and the bezel surface, as the two parts are part of the antenna assembly of the unit.</li> <li>Tighten the screws using the given screw torque and do a final visual inspection of dust behind the lens.</li> <li>Perform a leakage test (instruction 6300161CE)</li> <li>Check the functions of the unit and wipe off any external dust and fingerprints</li> <li>Report the repair in Service Log using the correct fault code</li> </ol>
The nominal and limit values	Bezel screw torque = 15 ±1 Ncm
Quality control	Bezel screws should be tightened in a cross tightening pattern. Screws should be replaced when opened Make sure there is no dust between glass and mask before assembling the bezel to avoid unnecessary work
Other	Please note Traverse/Kailash/Vertical form gasket is made from different materials then the Ambit form gasket. Also note that the form gasket should not be greased.



The Assembly Jig can allow a technician to repair a unit without removing the strap.





When removing bezel gaskets, avoid using metal tools to avoid damaging or scratching casing gasket surfaces.

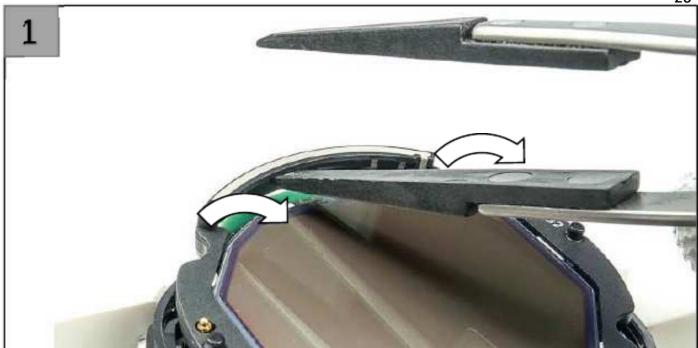


# 5.5 Display module change

Used / interchangeable parts and materials	Material code
KAILASH / TRAVERSE / VERTICAL DISPLAY	100021401
KAILASH / TRAVERSE / VERTICAL ANTENNA FRAME	100021400
KAILASH / TRAVERSE / VERTICAL GASKET	100021398
KAILASH / TRAVERSE / VERTICAL POGO PIN	100021062

Tools, equipment, security	Material code
TWEEZERS SIPEL 1303-SA	100015353
ESD TWEEZERS (SHARP CURVED BLADE)	100019184

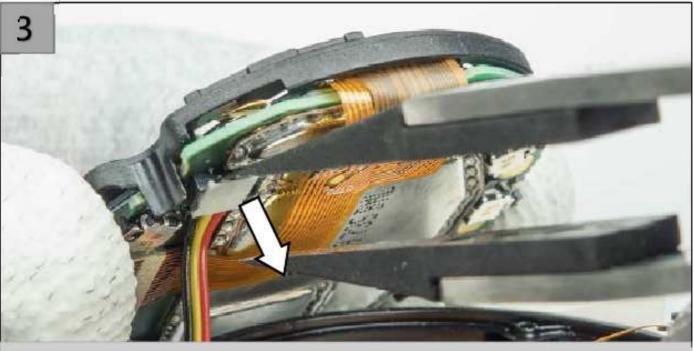
The nominal and limit values	<ol> <li>Remove the bezel and the old form gasket (instruction 6300156CE steps 1-3)</li> <li>Lift the display package from the lower casing by gently grabbing the bottom edge of the bezel contact antenna. Avoid scratching the antenna contact surfaces on the top and bottom of the display frame. (Pic1)</li> <li>The inner module assembly can be lifted out of the casing to assist in removing the battery and pressure sensor connectors. (Pic 2)</li> <li>Remove the battery cable from the PCBA by carefully lifting from the middle of the connector with tweezers (Pic 3)</li> <li>Remove the pressure sensor flex connector by carefully lifting from the center of the connector on the PCBA. (Pic 4)</li> <li>Take the lens and bezel assembly and turn it to face the work surface, we will use it as a jig to hold the display package on the work surface. (Pic 5)</li> <li>Open the LCD flex cable on the PCBA by carefully lifting from the middle of the connector with tweezers and pull the flex cable out from the connector. (Pic 6 &amp; 7)</li> <li>Detach the PCBA from the display frame by lifting the 4 retaining clips. (Pic 8 &amp; 9)</li> <li>Should the Antenna Frame (display frame) need to be replaced, remember to also replace the grounding Pogo Pin. (Pic 10b)</li> <li>The LCD is now loose and can be replaced.</li> <li>Take a new LCD assembly and remove the protective sheet. Place the LCD into the display frame as shown. (Pic 10) Be cautious of the new LCD surface, any contact may leave marks that will be difficult to remove without damaging the new part.</li> <li>Assemble the PCBA to the LCD package so the retaining clips of the frame will lock properly.</li> <li>Attach the display flex connector to the PCBA.</li> <li>Holding the inner module on the edge of the lower casing attach the pressure sensor flex cable to the connector by pressing from the middle of the connector.</li> <li>Attach the battery cable by pressing from the middle of the connector.</li> <li>Attach the batte</li></ol>
	When opening pressure sensor flex connector on the PCBA, the tweezers can touch only
Quality control	the black latch! Connector contacts and the solder joints break very easily  Bezel screws have to be tightened in a crosswise sequence  Screws have to be replaced when opened
Other	Always disconnect the power from the unit first when disassembling, and attach the power last when assembling the unit.



When lifting the display frame, lift with flat tweezers at an angle, to avoid scratching the contact surface on the under side.



The inner module can be held outside of the case while the connectors are still attached, for easier access to detaching the connectors.



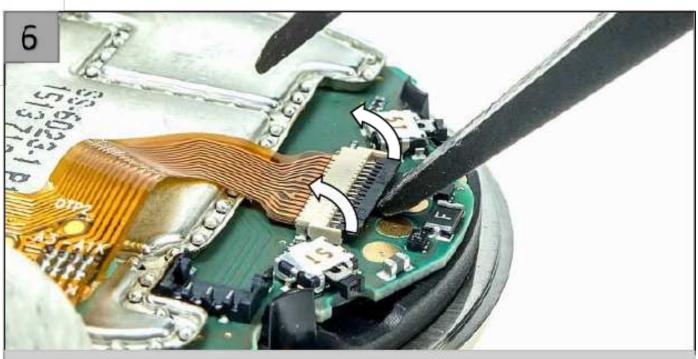
When removing the power connector, avoid bridging the contacts of the battery and causing a short circuit. Use of wide bladed tweezers is recommended.



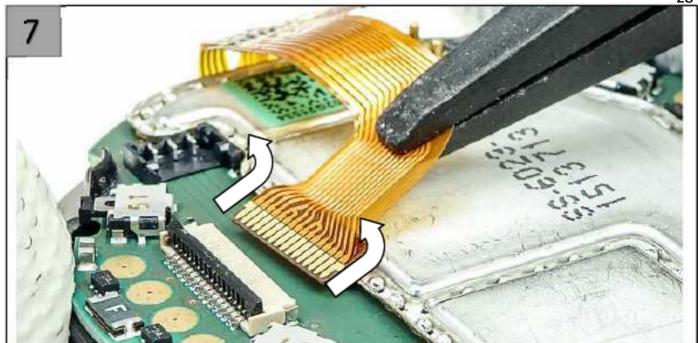
When disconnecting the display connector, be careful not to bend the flex connector too much near the base of the connector.



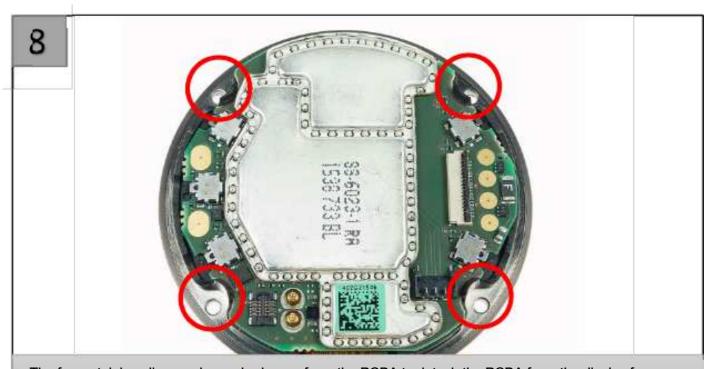
The device lens and bezel assembly should be used as a holding frame for the inner module to prevent the display or antenna contact pads from being damaged or dirtied.



When disconnecting the display connector, be careful not to bend the flex connector too much near the base of the connector.



Pull the flex cable out of the connector using plastic ESD tweezers.



The four retaining clips can be pushed away from the PCBA to detach the PCBA from the display frame.



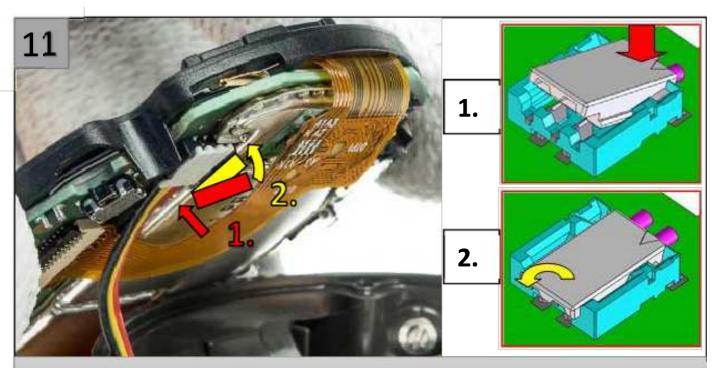
The wide bladed tweezers can be used to help lift the PCBA from the display frame.





10: The display placed into the display frame.

10b:The bezel grounding Pogo Pin needs to be replaced, if the Antenna Frame is replaced.



The accumulator connector latch should be attached from the back side of the latch, to make sure the latch attaches and aligns correctly.

### 5.6 Pressure sensor change

6300158CE

**Nominal** and

limit values

Used / interchangeable parts and materials	Material code
KAILASH / TRAVERSE / VERTICAL PRESSURE SENSOR	100021395
LIGHT SHIELD PLASTIC	100022977
WTC / DIVING PRESS.SENS. O-RING	1000K4803
WTC/DIVING PRESS.SENS. SUPPORT BUSHING	100019722

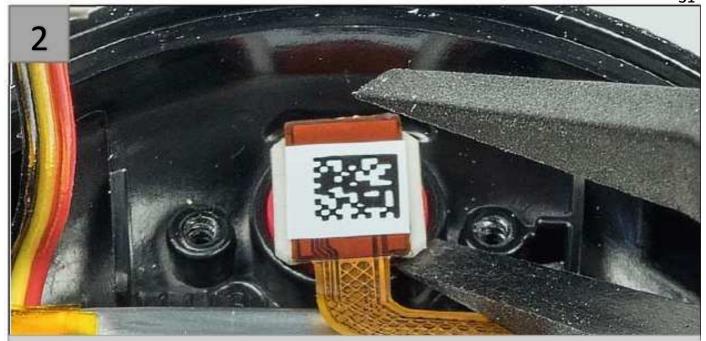
Tools, equipment, security	Material code
TORX SCREW DRIVER 4X40	100013030
AMBIT PRESSURE SENSOR TOOL	100019500
ESD TWEEZERS (SHARP CURVED BLADE)	100019184
ESD TWEEZERS (wide blade)	100015252

#### **Description** Remove the lens, bezel assembly, and inner module (instruction 6300157CE steps 2. Remove the pressure sensor latch by opening the screws with a Torx 4 screwdriver. Remove the pressure sensor by lifting with tweezers from the side, along the ceramic pressure sensor plate. (Pic 2) Remove the pressure sensor supports, and sensor o-ring. These may be attached to the old pressure sensor as well. If the pressure sensor is to be re-used, be careful when removing them, use only plastic ESD tools if necessary to remove them. 5. If the light shield is the old metallic part, replace it and one of the support bushings with the newer red lightshield. 6. Assemble the first pressure sensor support bushing and a new pressure sensor oring on to the pressure sensor itself. There should be 1 support, 1 o-ring and 1 plastic lightshield. (Pic 3) Gently place the new pressure sensor with the assembled supports and o-ring into the pressure sensor slot. The pressure sensor should sit evenly in place before installing it fully. (Pic 4) Press the pressure sensor into its socket using the Ambit pressure sensor tool, carefully nudging with the tool until the sensor is in correct position. It should not slip out of place if installed correctly. (Pic 5) Assemble the pressure sensor latch and attach the latch with the latch screws but be careful not to tighten them too hard (See nominal values) 10. Assemble the inner module, bezel assembly, perform a leakage test, and report the repair. (Instruction <u>6300157CE</u> 13-17)

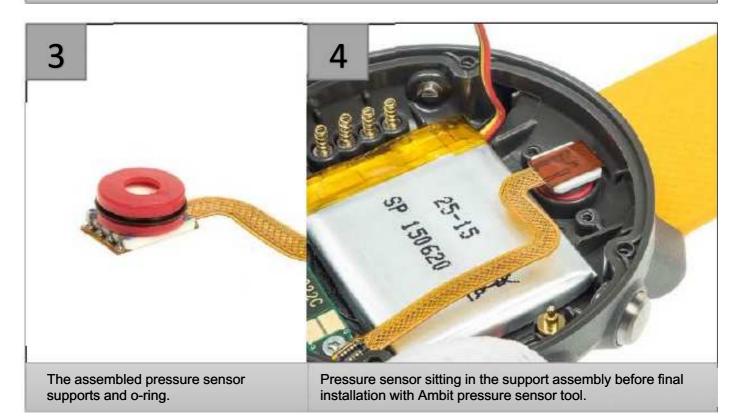


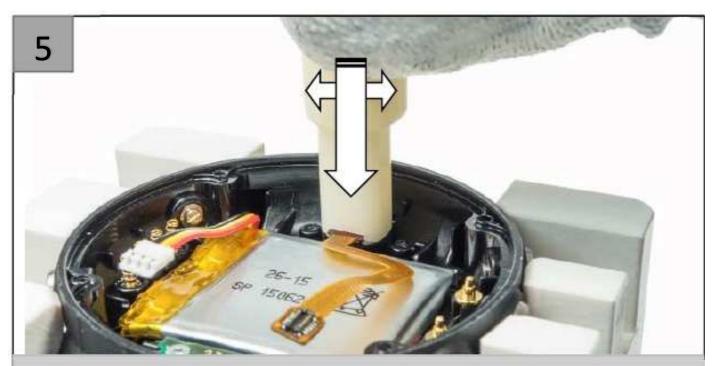
Vibra PCBA and Pressure sensor latch screws 7 ± 1 Ncm

The two Torx 4 Screws holding the Pressure Sensor Latch.



Lift the pressure sensor from its slot by gently lifting from the white ceramic sides of the pressure sensor assembly. Avoid applying too much pressure, by switching sides until it pops out, and be careful not to scratch the pressure sensor barrel.





Press the pressure sensor into place with the Ambit pressure sensor tool. Tilting the tool from side to side until the pressure sensor stays in place by itself.

### 5.7 Accumulator change

6300159CE

	Used / interchangeable parts and materials	Material code
3	AMBIT / KAILASH / TRAVERSE BATTERY TAPE	100018380
	AMBIT 2S/2R/3 SPORT / KAILASH / TRAVERSE BATTERY 3,7V/240mAh	100019195

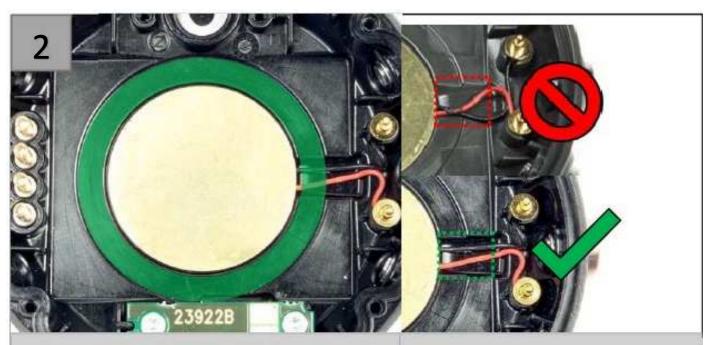
Tools, equipment, security	Material code
PCI CABLE AO GPS AMBIT	100018617
TWEEZERS SIPEL 1303 - SA	100015353

#### **Description**

- 1. Follow instructions for removing the bezel assembly, inner module assembly and pressure sensor assembly. (Instructions <u>6300158CE</u> 1-4)
- Using the wide bladed tweezers pry the accumulator out of the lower casing. Make sure to not damage the lower casing gasket grooves when prying the accumulator out and be mindful that the units piezo plate is behind the accumulator and may on occasion come off with the accumulator. (Pic1)
- 3. Remove any leftover adhesive tape.
- 4. Inspect the Piezo plate for any cracks or looseness. If needed see Instruction 6300162CE for Piezo replacement.
- 5. It is recommended with all new accumulators to make sure the piezo wires are in no way overlapping each other, most initial production units will have wires that have not been installed this way, but for all new accumulator installations it is highly recommended to straiten them to avoid damaging the accumulator during installation. (Pic 2)
- 6. Apply a new accumulator tape, making sure to not place any onto the piezo plate itself. (Pic 2)
- 7. With the new accumulator align it by pressing it into the corner of the lower casing with the vibration module and press firmly into place with the tip of your fingers. (Pic 3)
- 8. Check to make sure the accumulator is not overlapping any part of the PCI connector pins.
- 9. Assemble the rest of the unit following instructions 6300158CE steps 5-9.



When prying the accumulator away from the case, be cautious and check to see if the piezo element has become stuck to the accumulator.



Apply the accumulator tape only on to the ledge around the piezo marked in green. Avoid overlapping onto the piezo or placing the tape too near the Vibration module. Piezo wires should be straitened along the portion that lies under the accumulator before any new accumulator installation.



When installing the new accumulator, install it as close to the vibration module before pressing in to place.

## 5.8 Piezo change

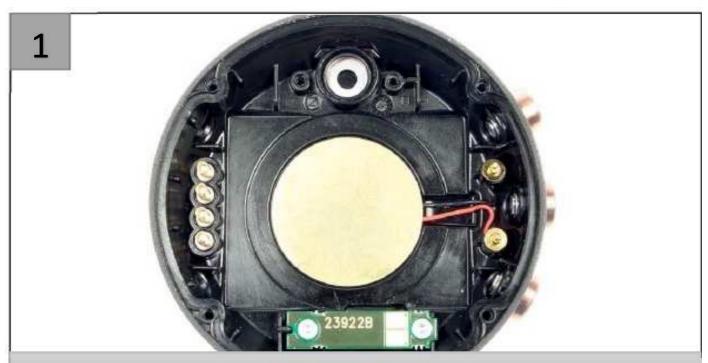
6300162CE

Used / interchangeable parts and materials	Material code
KAILASH / TRAVERSE / VERTICAL PIEZO	100021787
KAILASH / TRAVERSE / VERTICAL PIEZO ADHESIVE	100018656

Tools, equipment, security	Material code
TWEEZERS SIPEL 1303 - SA	100015353

#### Description

- 1. Follow instructions for removing the bezel, inner module, pressure sensor and accumulator assembly. (Instructions <u>6300159CE</u> 1-3)
- 2. Remove the piezo plate with tweezers.
- 3. The piezo is held in place with a ring of double sided adhesive, and may crack during removal, only remove the piezo element if it is cracked or damaged.
- 4. Clean all left over piezo adhesive from the lower casing.
- 5. Place the new adhesive, making sure to not have any is left outside the piezo divet.
- 6. Place the new Piezo element onto the adhesive, making sure the wires are aligned properly in their recess and not being pinched between the lower casing and piezo plate.
- 7. Carefully press the piezo in place along the edges using a a ESD gloved finger tip.
- 8. Place the piezo contact pins into their respective slots. Note, the contact pin wires may need to be crossed, and this will not effect device function. (Pic 1)
- 9. Assemble the Unit following instructions 6300159CE 5-7.



The Piezo element place with the wires in their correct locations.

# 5.9 Vibra change

Used / interchangeable parts and materials	Material code
WTC / DIVE LATCH / PCBA VIBRA SCREW	100021394
KAILASH / TRAVERSE / VERTICAL PCBA VIBRA	100021396

Tools, equipment, security	Material code
TORX SCREWDRIVER T4X40	100013030
ESD TWEEZERS (wide blade)	100015252

Description	<ol> <li>Remove the lens, bezel assembly, and inner module (instruction 6300157CE steps 1-6)</li> <li>Unscrew the 2 screws holding the Vibration Module in place.</li> <li>Lift the vibration module out of the casing holding the part from the sides of the PCBA.</li> <li>Insert the new Vibration module and tighten the screws lightly.</li> <li>Assemble the inner module, bezel assembly, perform a leakage test, and report the repair. (Instruction 6300157CE 13-17)</li> </ol>
Nominal and limit values	Vibra PCBA and Pressure sensor latch screws: 7 ± 1 Ncm



Holding the Vibration module. Please note that the pressure sensor and accumulator do not need to be removed for Vibration Module replacement.

# 6 Nominal values

Bezel screws	15 ± 1 Ncm
Vibra PCBA and Pressure sensor latch screws	7 ± 1 Ncm
Display angle tolerance	±1°
Leakage tester Witschi ALC 2000 Witchi proofmaster S	Measuring time: 30s Stabilization time: 30s -0,4 / +0,5 bar Tightness tolerance: 1,0 % Shell analysis: Std

### 7 General

#### 7.1 Authorized Service

This manual is intended as a guide for authorized service personnel that have been trained to service and repair the Suunto Traverse, Kailash and Ambit3 Vertical. It is not intended for unauthorized or untrained service personnel or the consumer.

All instructions are categorized in header for Level 1, Level 2 and Level 3 repairs. According to this activity repair action is allowed to perform in particular service center.

In general: L1 can perform services that does not require opening the product namely exchanging batteries, straps, bezels, user support and product exchanges according to instructions.

L2 can perform all L1 service activities and also activities that require opening of the product namely reprogramming the product or exchanging LCD, inner module, PCBA, contact plates, pushers and casing.

L3 performs repairs which require tools and equipment not available for L1 and L2 service centers as equipment for sensor calibrations.

### 7.2 Service Warranty

Each service or repair activity will be covered with 3 months of service warranty starting from date of repair.

#### 7.3 Service Center Facilities

- O The service activities must be performed in a dry (relative humidity maximum 50%) and clean place at room temperature (18-25°C [65-78°F]).
- O ESD protection instructed by Suunto is required at Service Center.
- O See ESD requirements for each level at Material Bank.
- O Technician has to have easy access to internet in order to find support and report repairs.
- O Consumer satisfaction and even safety depends on a quality of the service.
- O Service must be performed in correct conditions and by authorized person.

#### 7.4 SUUNTO CONSUMER CARE CONTACT POINTS

#### **CONTACT POINTS FOR SERVICE PARTNERS**

#### Contacts related to...

- o Sparepart webshop orders (e.g. "where is my spare part order going?")
- o Spare parts availability (e.g. "Is spare part 1000xxxxx still available? I cannot find it in the webshop.")
- o Monthly replacement shipments (e.g. "I have not reveiced my replacement shipment from last month, when can I expect to get it?")
- O Shipping details of the spare parts (e.g. "I want my spare part order to ship into different address.")
- O Changes to existing orders (e.g. "I still need to add 10 pcs of spare part 1000xxxxx in my order.") Please note that changes may not be possible unless in exception cases!
- Invoicing of spare parts (e.g. "I have not received an invoice on my order, how can I get it?")
- Topics related to invoices or customs invoices (e.g. "I need the invoice immediately for customs purposes.")
- → The right point of contact is <a href="mailto:SPAREPARTS@SUUNTO.COM">SPAREPARTS@SUUNTO.COM</a>

#### Contacts related to...

- Topics related to cost estimations (e.g. "we have received a cost estimation, why is this?")
- o Status of products sent to Suunto Finland for repair (e.g. "I sent an unit for repair 3 weeks ago, where is it?")
- o Details of the units sent to Finland for repair (e.g. "Was the unit repaired under warranty?")
- Topics related to shipping units to Suunto Finland (e.g. "Is my attached proforma document suitable?")
- o Changes in address or contact person for repair shipments (e.g. "Ms.XYZ will be handling the shipments at our end from now on.")
- → The right point of contact is <a href="mailto:SERVICE@SUUNTO.COM">SERVICE@SUUNTO.COM</a>

#### Contacts related to...

- Functionalities of products or services (e.g. "Does Suunto Ambit2 S have altimeter?")
- O How to use a product or service (e.g. "How do I change the units in D6i from metric to imperial?")
- O Problems encountered with Suuntolink/Moveslink/Movescount (e.g. I'm using Windows 8 on my computer and I'm having problems with syncing my moves. What should I do?)
- → The right point of contact is <a href="mailto:SUPPORT@SUUNTO.COM">SUPPORT@SUUNTO.COM</a>

NOTE! When contacting please inform that you are from a Suunto service partner.

#### Contacts related to...

- o Changes in contact person, address or details of the service center (e.g. "We have a new person responsible for the service center who will act as your contact person.")
- o Changes in spare part webshop or service log profile details (e.g. "I want to change the email address in my webshop profile")
- O Questions or feedback on Suunto processes or ways of working (e.g. "How does the quarterly returns of defected warranty replacements work?")
- o Escalations (e.g. "A consumer contacted us about his product breaking already 3 times within a year and he is angry. How should we handle this?")
- o General or specific needs for improvement (e.g. "I think you the component X should be available for the service centers")
- o Borderline cases (e.g. "There is a customer with a broken unit and the unit is just out of warranty. How should be handle this?")
- o Technical repair related questions to which you cannot find answer in Service Manuals (e.g. "I could not find the instructions for fixing display in XYZ. How can I do it?")
- Questions on service policy or warranty instructions (e.g. "How long is the warranty on heartrate belts?")
- o All other questions that are not covered above (e.g. "Is there any possibility to get further hands-on training of the repairs of Suunto D-series?")
- → The right point of contact is your regional SERVICE NETWORK MANAGER

#### **CONTACT POINTS FOR CONSUMERS AND RETAILERS**

#### ALL CONTACTS FROM CONSUMERS AND RETAILERS SHOULD BE DIRECTED TO SUUNTO **CONTACT CENTER**

- Local telephone numbers (where applicable) available at <a href="www.suunto.com/support">www.suunto.com/support</a>
- Email: SUPPORT@SUUNTO.COM

#### You can contact our Contact Center by phone at the numbers below:

Support in English available 24/7: Australia +61 1800 240 498 (toll free) New Zealand +64 988 75 223 United Kingdom +44 20 360 805 34 USA +1 855 258 0900 (toll free) Canada +1 855 624 9080 (toll free)

Austria +43 72 088 3104 Canada +1 855 624 9084 (toll free) - (in French) China +86 010 84 054 725 Finland +358 94 245 0127 France +33 48 168 0926 Germany +49 893 803 8778 Italy +39 029 475 1965 Japan +81 34 520 9417 Netherlands +31 10 713 7269 (in English) Russia +7 499 918 7148 Spain +34 911 143 175 Sweden +46 85 250 0730 Switzerland +41 44 580 9988

Support available from 9 am to 5 pm local time:

Email us at support@suunto.com.

http://www.suunto.com/en-US/Support/