


# INVESTIGATION REPORT

Our ref. 299260

Report No. 23222

<b>Product</b>	Fresh air purifier
<b>Type</b>	AAVI Leaf Medic (Modified from type AAVI Leaf Pro (on marking plate). See additional product information below.)
<b>Trade mark</b>	AAVI Product Trademark: AAVI LEAF MEDIC
<b>Applicant</b>	Aavi Technologies Oy, Köysikuja 1, 01640 VANTAA, FINLAND
<b>Manufacturer</b>	Aavi Technologies Ltd. Finland, Tulppatie 1, FI-00880 Helsinki, Finland
<b>Technical information</b>	220-240V~, 50Hz, IP20, Max. input power 100W, Rated input power 50W.
<b>Additional product information</b>	Tested sample is AAVI Leaf Medic, which is modified from AAVI Leaf Pro, including following changes: <ul style="list-style-type: none"> <li>• Power supply filters changed from Schaffner FN 9233-6-1 to Schaffner FN 9233EB-6-1</li> <li>• +12V Power supplier changed from Meanwell LRS-100-12 to Meanwell RPS-200-12-C</li> </ul>
<b>The product has been tested according to following parts of the standard</b>	IEC 60601-1:2005 + Am1:2012: Earth leakage current and touch current measurements according to clause 8.7
<b>Extent of the testing</b>	The product has been subjected to partial testing in the form of a spot check. In a complete type test according to the standard other defects may be found.
<b>Investigation result</b>	The product complies with the standard clause applied; See test results on page 3-10.
<b>Other information</b>	This test result is valid only for the product tested. The product has not been granted the right to use the FI mark.
<b>Date</b>	16 April 2020
<b>Signature</b>	<p><b>SGS Fimko Ltd</b></p>  <p>Minna Seppä-Murto Senior Testing Engineer</p>

**Additional information**

This partial testing is not sufficient to verify that the product complies with the standard or the requirement of the directive.

The investigation report does not give the right to use the FI mark, SGS Fimko's EMC mark or refer to SGS Fimko's testing when marketing the product.

**Is based on test**

299260-1



## Test results

### 1. IEC 60601-1:2005 + Am1:2012; clause 8.7 (earth leakage current and touch current measurements)

In this partial testing earth leakage current and touch current measurements were made according to clause 8.7 in following conditions:

- at normal room temperature; before and following the humidity preconditioning treatment as described in clause 5.7 of IEC 60601-1:2005 + Am1:2012;
- with the highest rated supply frequency;
- with a supply equal to 110 % of the highest rated mains voltage;
- with measuring device (MD) according to Figure 12 of IEC 60601-1:2005 + Am1:2012 and additionally with non-frequency-weighted device (NFWD);
- with detachable power supply cord provided by the manufacturer;
- with measuring circuit according to Figure 13 of IEC 60601-1:2005 + Am1:2012 for earth leakage current;
- with considering only single fault condition for the earth leakage current: the interruption of one supply conductor at a time
- with measuring circuit according to Figure 14 of IEC 60601-1:2005 + Am1:2012 for touch current;
- with considering following single fault conditions for the touch current: the interruption of one supply conductor at a time and interruption of a single protective earth conductor;
- with equipment turned on, fan speed: slow.

According to clause 8.7.3c) of IEC 60601-1:2005 + Am1:2012: allowable values of the touch current are 100  $\mu$ A in normal condition (NC) and 500  $\mu$ A in single fault condition (SFC)

According to clause 8.7.3 d) of IEC 60601-1:2005 + Am1:2012: The allowable values of the earth leakage current are 5 mA in normal condition and 10 mA in single fault condition;

According to clause 8.7.3 e) of IEC 60601-1:2005 + Am1:2012: additionally, regardless of waveform and frequency, no leakage current shall exceed 10 mA r.m.s. in normal condition or in single fault condition when measured with a non-frequency-weighted device.

**Conclusion:** Allowable values of earth leakage current and touch current were not exceeded. See table below.

8.7	TABLE: leakage current				Pass
Type of leakage current and test condition (including single faults)	Supply voltage (V)	Supply frequency (Hz)	Measured max. value (µA)	Remarks	
Fig. 13 - Earth Leakage (ER)	—	—	—	Maximum allowed values: MD: 5 mA NC; 10 mA SFC NFWD: 10mA	
ER- B- NC, S1=1, S5=1	264	50	MD: 367 NFWD: 371		
ER- B- NC, S1=1, S5=0	264	50	MD: 344 NFWD: 349		
ER- B- SFC, S1=0, S5=1	264	50	MD: 264 NFWD: 273		
ER- B- SFC, S1=0, S5=0	264	50	MD: 264 NFWD: 273		
ER- A- NC, S1=1, S5=1	264	50	MD: 380 NFWD: 386		
ER- A- NC, S1=1, S5=0	264	50	MD:333 NFWD: 340		
ER- A- SFC, S1=0, S5=1	264	50	MD:257 NFWD: 269		
ER- A- SFC, S1=0, S5=0	264	50	MD: 258 NFWD: 269		
Fig. 14 - Touch Current (TC)	—	—	—	Maximum allowed values: MD: 100 µA NC; 500 µA SFC NFWD: 10mA	
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,7	With test finger pushed through ventilation openings in top (on the leaf).	
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 3,7		
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD: 4,9		
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,9		
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,3 NFWD: 4,0		
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,4 NFWD: 4,4		
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,8		
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,2		



TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,8 NFWD: 5,2	Enclosure, above ventilation openings in top (metal foil used)
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,8 NFWD: 5,5	
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,1 NFWD: 4,2	
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,1 NFWD: 4,4	
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 1,1 NFWD: 3,4	
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD:1,0 NFWD: 3,4	
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 1,1 NFWD: 4,3	
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 1,1 NFWD: 4,3	
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 5,2 NFWD: 6,2	
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 4,9 NFWD: 6,0	
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD:3,3	
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD:3,3	
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD:4,3	
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,8 NFWD: 4,3	
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,6 NFWD: 3,8	Enclosure, side (metal foil used)
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,4 NFWD: 3,8	
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,8	
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 3,9	
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD: 4,6	
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,6	

TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 2,5 NFWD: 4,7
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 2,4 NFWD: 4,5
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 4,4
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,3
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,8 NFWD: 5,1
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD:0,9 NFWD: 5,0
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD:1,9 NFWD: 4,9
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,6 NFWD: 4,7
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,4
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 3,4
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD:3,9
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,8 NFWD: 3,9
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,6 NFWD: 3,7
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,5 NFWD: 3,7
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,5
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD:0,8 NFWD: 3,6
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD: 4,1
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,2
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,6 NFWD: 3,9
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD:1,5 NFWD: 3,8

Handle of the door/cover (metal foil used)



TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 2,9	Plastic part (collector) inside (metal foil used, cover/door open)
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD:3,0	
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,6	
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD: 3,6	
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,2 NFWD: 3,2	
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,2 NFWD: 3,2	
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 3,1	
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,8 NFWD: 3,1	
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,8 NFWD: 3,8	
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD: 3,9	
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,2 NFWD: 3,5	
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,1 NFWD: 3,3	
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD:6,5	
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 6,5	
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD:17,7	
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD:17,7	
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 13,9 NFWD:21,2	
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 13,6 NFWD:21,0	
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 6,0	
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 6,0	

TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD:16,7		
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD:16,6		
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD:15,0 NFWD:20,9		
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 14,6 NFWD:20,6		
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,9 NFWD: 4,1	Enclosure, above black ventilation openings (metal foil used)	
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,1		
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,9 NFWD: 4,8		
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,9 NFWD: 4,8		
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,5 NFWD: 4,4		
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,5 NFWD: 4,4		
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,8 NFWD: 4,1		
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,8 NFWD: 4,1		
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,8 NFWD: 4,9		
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,8 NFWD: 4,9		
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,7 NFWD: 4,5		
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,6 NFWD: 4,5		
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,2 NFWD: 4,6		Between enclosure, above ventilation openings in top (metal foil used) and enclosure, side (metal foil used)
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,2 NFWD: 4,6		
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,3 NFWD: 5,4		
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,2 NFWD: 5,6		



TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 1,8 NFWD: 5,1
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 1,6 NFWD: 5,0
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,2 NFWD: 4,1
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,2 NFWD: 4,1
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,2 NFWD: 4,8
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,2 NFWD: 4,8
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 0,4 NFWD: 3,8
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 0,4 NFWD: 3,8
TC-B-NC, S1=1, S5=1, S7=1	264	50	MD: 0,5 NFWD: 2,8
TC-B-NC, S1=1, S5=0, S7=1	264	50	MD: 0,5 NFWD: 2,8
TC-B-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,6 NFWD: 4,1
TC-B-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,6 NFWD: 4,1
TC-B-SFC, S1=1, S5=1, S7=0	264	50	MD: 0,8 NFWD: 1,7
TC-B-SFC, S1=1, S5=0, S7=0	264	50	MD: 0,8 NFWD: 1,7
TC-A-NC, S1=1, S5=1, S7=1	264	50	MD: 0,5 NFWD: 2,7
TC-A-NC, S1=1, S5=0, S7=1	264	50	MD: 0,5 NFWD: 2,6
TC-A-SFC, S1=0, S5=1, S7=1	264	50	MD: 0,6 NFWD: 3,8
TC-A-SFC, S1=0, S5=0, S7=1	264	50	MD: 0,5 NFWD: 3,8
TC-A-SFC, S1=1, S5=1, S7=0	264	50	MD: 0,9 NFWD: 1,7
TC-A-SFC, S1=1, S5=0, S7=0	264	50	MD: 0,9 NFWD: 1,7

Between enclosure, above ventilation openings in top (metal foil used) and metal parts inside (cover/door open)

**Supplementary information:**

Before humidity conditioning: Tested on 7.4.2020/MAJ (21,5°C, 17,5%, 1000,3mbar).

After humidity conditioning: Tested on 9.4.2020/MAJ (22,5°C, 13,7%, 990,3mbar)

Testing devices: 9005, 9088, 9728, 9101, 9832, 9275, 4331.

Humidity conditioning (30°C, 93%): 7.-9.4.2020 (48h).

Ratings of the equipment: 220-240V~/50Hz, IP20.

Note 1: For EARTH LEAKAGE CURRENT see 8.7.3 d) and 8.7.4.5;

Note 2: For TOUCH CURRENT see 8.7.3 c) and 8.7.4.6;

Note 3: For PATIENT LEAKAGE CURRENT SEE 8.7.3.b) and 8.7.4.7

Note 4: Total PATIENT LEAKAGE CURRENT values are only relative to equipment with multiple APPLIED PARTS of the same type. See 8.7.4.7 h). The individual APPLIED PARTS complied with the PATIENT LEAKAGE CURRENT values.

Note 5: In addition to conditions indicated in the Table, tests conducted at operating temperature and after humidity preconditioning of 5.7, EQUIPMENT energized in stand-by condition and fully operating, max rated supply frequency, at 110 % of the max RATED MAINS VOLTAGE, and after relevant tests of Clause 11.6 (i.e., overflow, spillage, leakage, ingress of water and particulate matter, cleaning & disinfection, & sterilization).

ER - Earth leakage current

TC – Touch current

P - Patient leakage current

PA – Patient auxiliary current

TP – Total Patient current

PM - Patient leakage current with mains on the applied parts

MD - Measuring device

A - After humidity conditioning

B - Before humidity conditioning

1 - Switch closed or set to normal polarity

0 - Switch open or set to reversed polarity

NC - Normal condition

SFC - Single fault condition

NFWD - Non-frequency weighed device

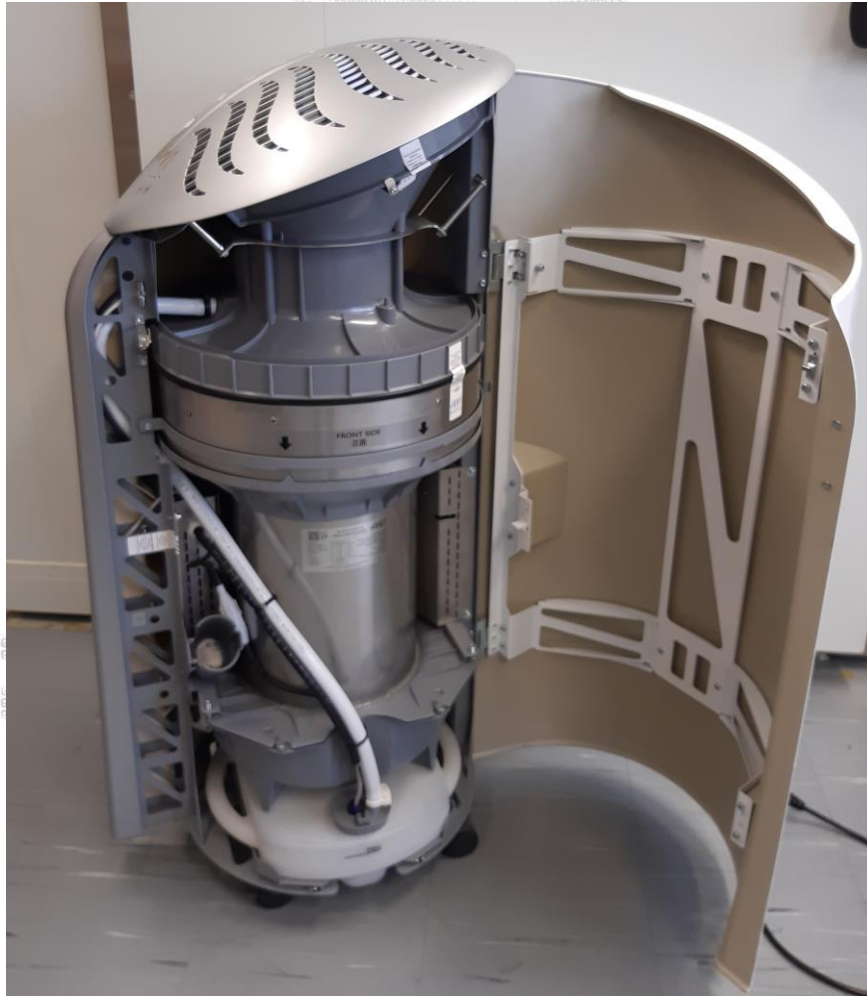


Picture 1. Marking plate of tested product





Picture 2. Tested product



Picture 3. Tested product cover/door open