

Factory Hi-pot Testing

Approved Models with Gas Tubes (Gas Arrester)

uMP1 Series

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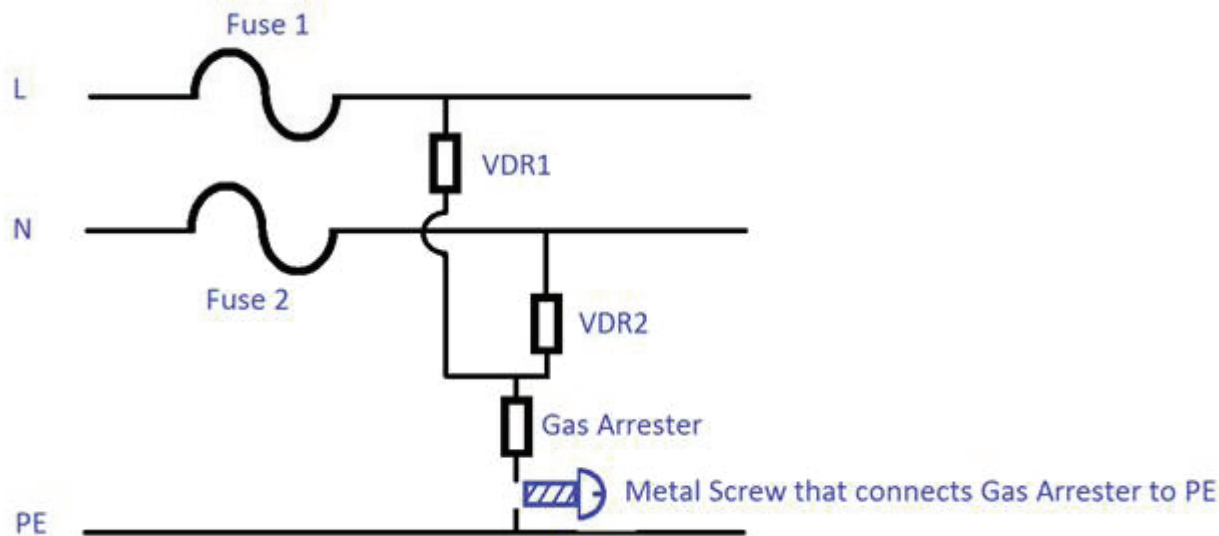
uMP1T / uMP1C Series - microMP

- Wide Range AC Input
- 400/600W – 1000/1200W
- 1U Form Factor
- 5V SB @ 0.5A (1.5A Optional)
- Fan Speed Control – OFF with INHIBIT
- PMBus/I2C Interface (Primary)
- **Medical safety** approval
- EMI Class B
- High Efficiency, >90% full load
- Topology
 - Active inrush
 - Continuous boost PFC converter
 - Flyback auxiliary converter
 - Full bridge converter (power drive only)



Safety Hi-pot Testing Standard

- uMP Series is an UL approved model UL60601-1 which is already in production stage. This model employs VDR and Gas Tube (Gas Arrester) in series from Line to PE. From the Illustration below, there is a "metal screw" that connects the gas tube to PE.



Safety Hi-pot Testing Standard

- A Surge Suppressor (Gas Tube X705) rated 380V or 277V is through a screw connect to protective earth ground. If it conducts the Hi-pot test - the screw needs to be removed to pass the Hi-pot test. Below is the Safety Standard under UL/IEC 60950-1 5.2.2:

To avoid damage to components or insulation that are not involved in the test, disconnection of integrated circuits or the like and the use of equipotential bonding are permitted.

For equipment incorporating both REINFORCED INSULATION and lower grades of insulation, care is taken that the voltage applied to the REINFORCED INSULATION does not overstress BASIC INSULATION OR SUPPLEMENTARY INSULATION.

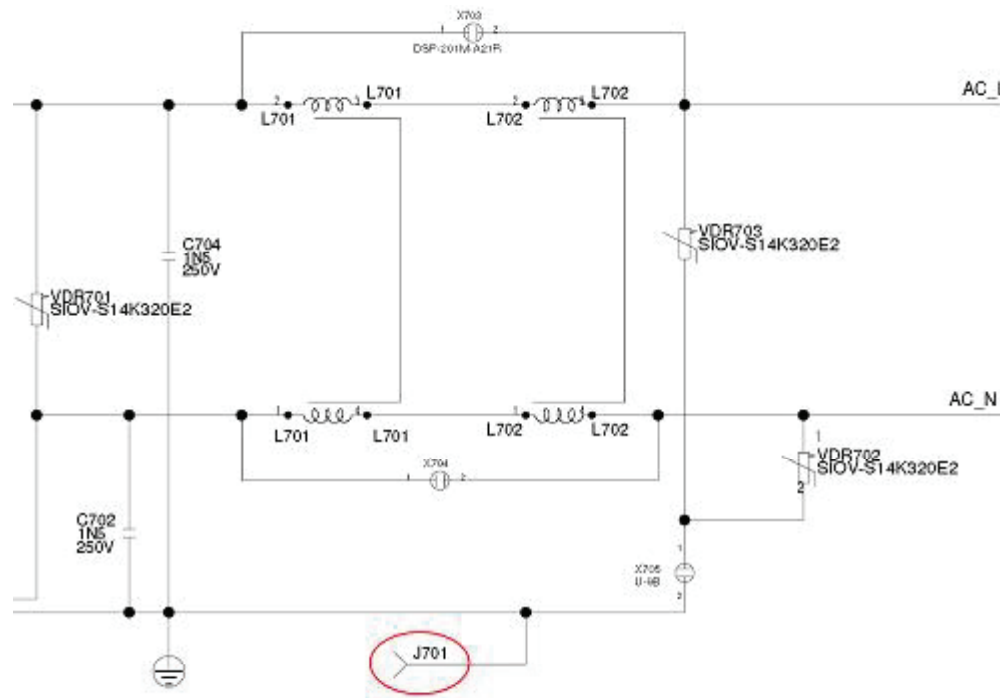
NOTE 3 Where there are capacitors across the insulation under test (for example, radio-frequency filter capacitors), it is recommended that d.c. test voltages are used.

NOTE 4 Components providing a d.c. path in parallel with the insulation to be tested, such as discharge resistors for filter capacitors, voltage limiting devices or surge suppressors, should be disconnected.

- Per UL60601-1, 1st Edition Clause 20.4j), it allowed any power-consuming voltage-limiting devices (Gas tubes - in uMP1 series) are disconnected from the earthed side of the circuit.

Test Procedure

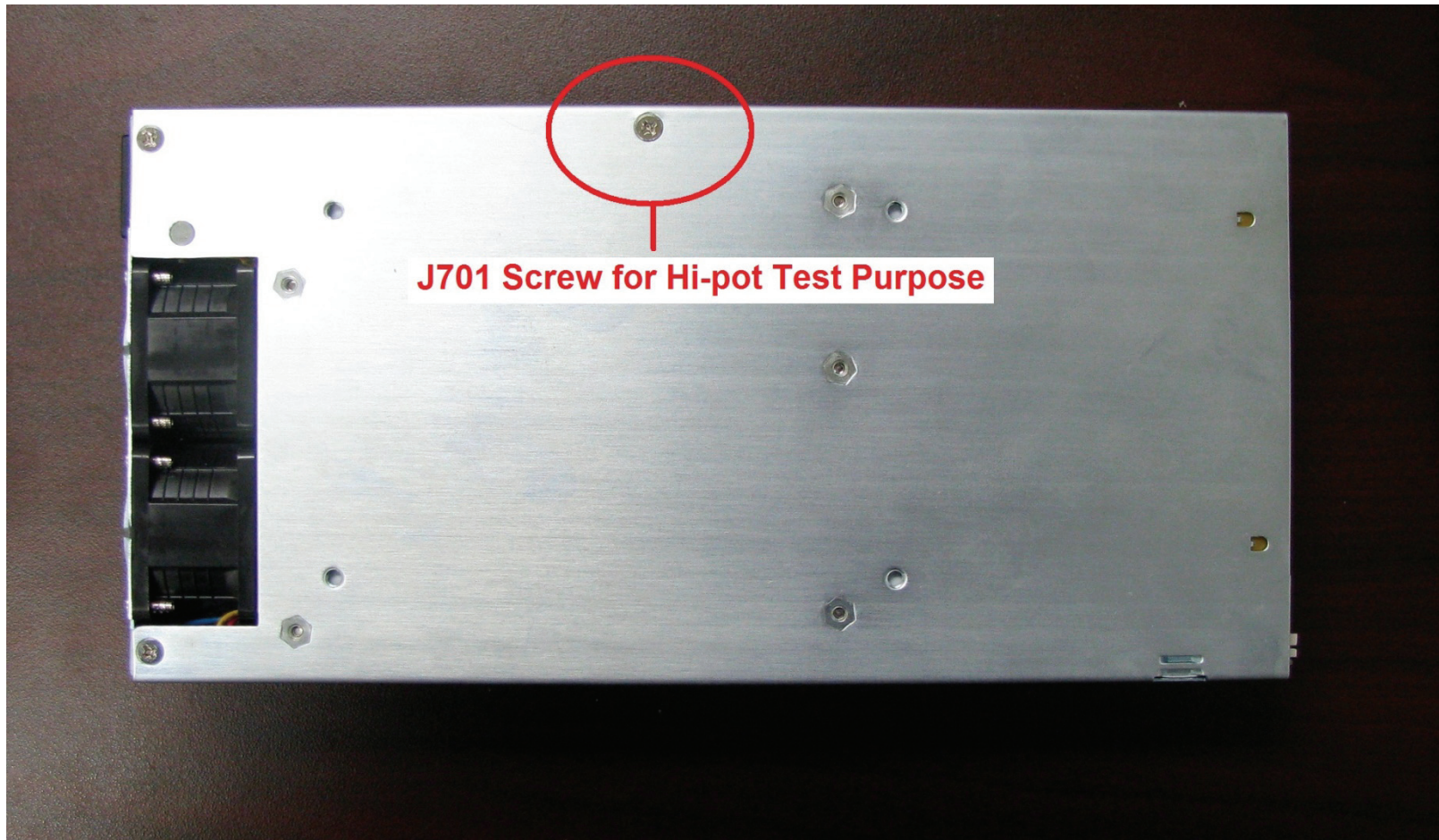
- During production hi-pot testing, that "metal screw" is temporarily being removed to avoid false trigger that leads to leakage from line to PE which can also cause false hi-pot failure.



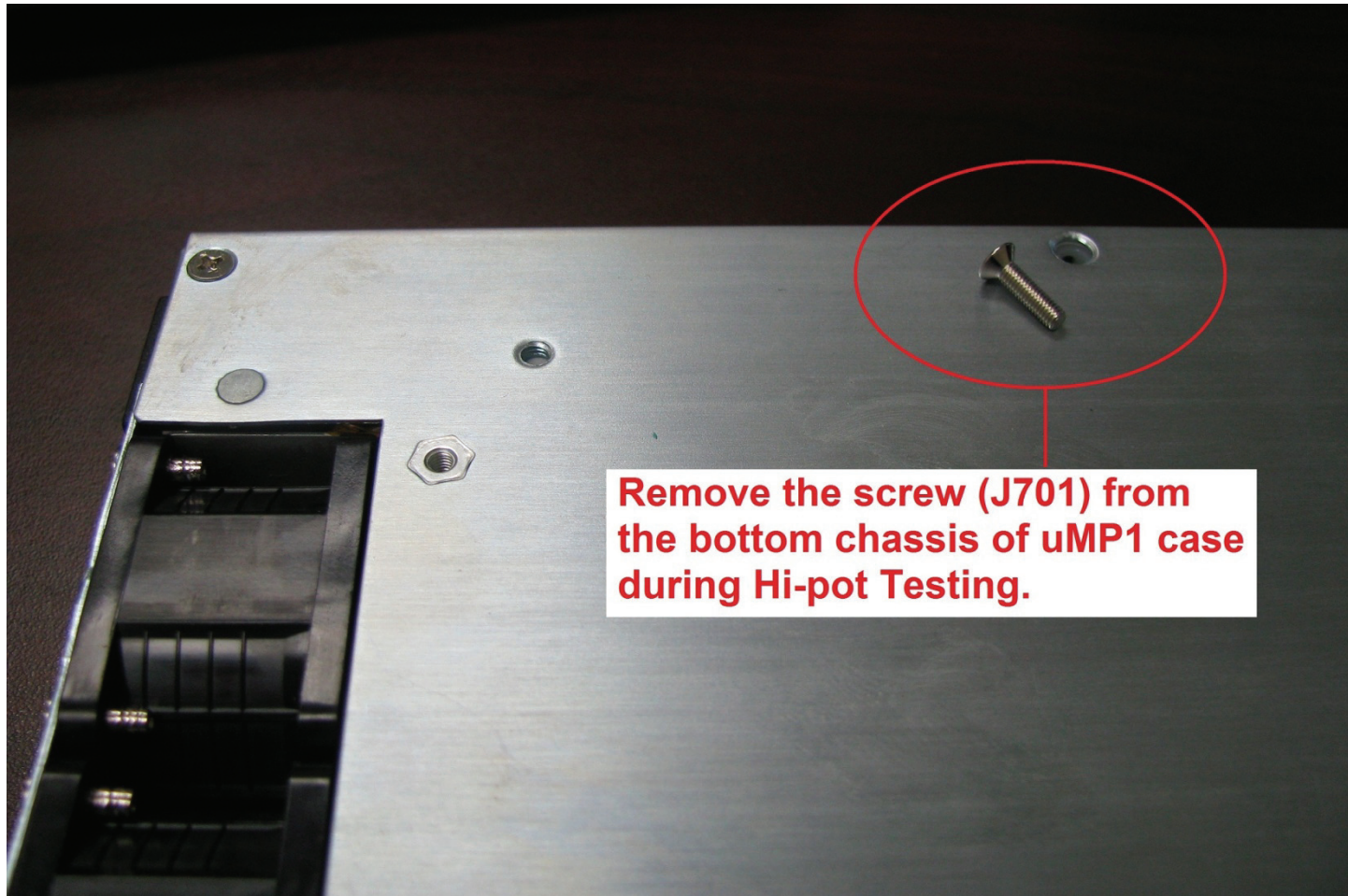
Test Procedure

- The screw needs to be removed only for hi-pot test and shall be returned after testing.
- This is a standard Factory Safety Testing procedure.
- Basically, the only purpose of removing the screw is to disconnect the gas arrester from the circuit. This is to prevent the gas arrester to conduct during hi-pot testing since we applied high voltage across.
- After circuit is disconnect, the unit shall passed Hi-pot without any dielectric insulation breakdown.

Mechanical Assembly – J701 Screw



Mechanical Assembly – J701 Screw



Safety Precautions

- Permanent removal of the J701 screw will not pass the surge test EN61000-4-5, therefore, it will not pass the CE requirement and EMC directive. The surge protection will be disconnected from the protective earth ground if the screw will be removed.
- It is recommend to review with respective Safety Compliance group – typically, hi-pot testing is being conducted in Safety lab for certification.
- The system is eventually needed to have an access on the J701 screw perform hi-pot testing if necessary.

Thank You