

Inductive Powering

Status: 2023-11-15

Commissioning Inductive Powering

General

Read the *imc MTP-NT User Manual* carefully to avoid hazard or harm.

<https://www.imc-tm.com/download-center/product-downloads/mtp-nt/manuals>

Basics

- Only use the Primary Coil (Power Head) and the Power Generator (IND-PWR-PG) in combination supplied in order to achieve the best possible efficiency.
- The following parameters are very important when setting up a new test setup!
 1. Number of windings of the Secondary Coil (Power Coil)
 2. Adjusting the balancing capacity on the MTP-NT-POWER-S module
 3. Distance between the Primary Coil (Power Head) and the Secondary Coil (Power Coil)

These parameters are optimally adapted once to the conditions prevailing on site.

(Example: Influence of the shaft material and shaft diameter)

Optimum balancing is achieved when the primary and the secondary resonant circuit oscillate in resonance! The secondary resonant circuit is formed by the Secondary Coil (Power Coil) and the internal capacity of the connected MTP-NT-POWER-S module. The alternating field created by the Primary Coil (Power Head) induces a voltage that must remain within certain limit values (voltage).

This rectified voltage is checked on the MTP-NT-POWER-S module via the *VDC* and *VMM (unregulated DC Voltage)* pins and is **ideally 25 V ±5 V**.

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Test setup for optimizing the resonance of the Secondary Coil

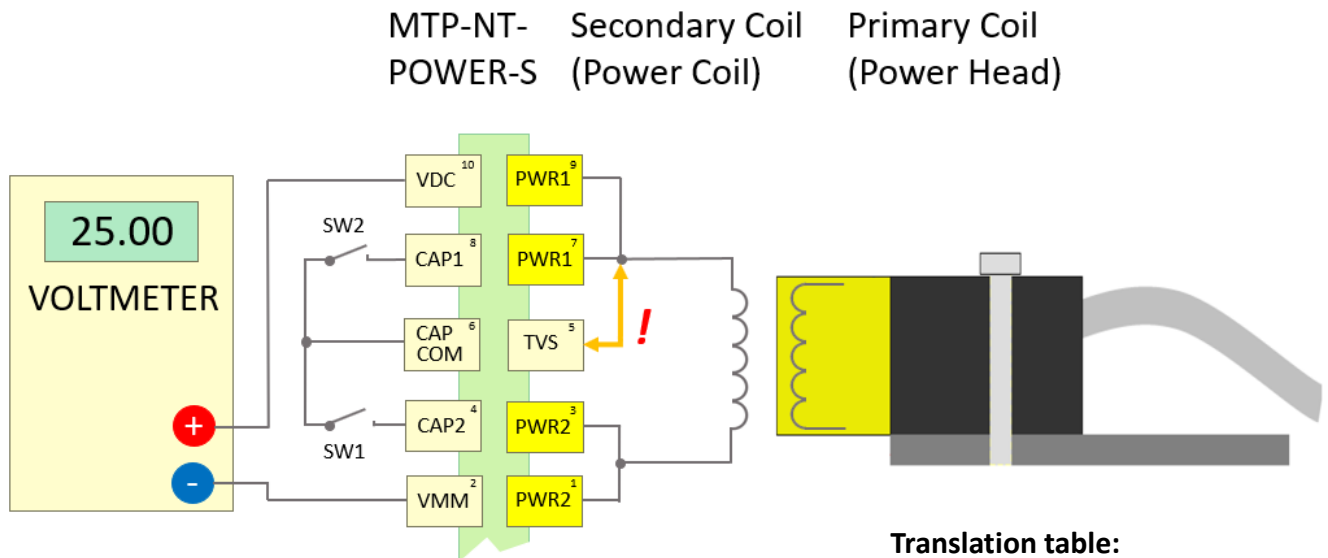


Fig.1 extract of the pin assignment of the MTP-NT-POWER-S module, see overview of the available module variants.

At resonance, the secondary resonant circuit is very stable. Disturbance variables have the least influence. This desired resonance state can be demonstrated by simple means, as changes to the balancing capacity (connection or disconnection of CAP1/CAP2) result in lower voltage increases, and voltage drops.

Translation table:

| Pin | Previous designation | New designation |
|-----|----------------------|-----------------|
| 1 | AC2 | PWR2 |
| 2 | VMM | VMM |
| 3 | AC2 | PWR2 |
| 4 | 100n | CAP2 |
| 5 | n.c. | TVS |
| 6 | COM | CAP COM |
| 7 | AC1 | PWR1 |
| 8 | 220n | CAP1 |
| 9 | AC1 | PWR1 |
| 10 | VDC | VDC |

Step by step

1. Check the number of windings applied to the Secondary Coil (Power Coil), see Table 6 in the imc MTP-NT User Manual.
2. Connect the MTP-NT-POWER-S module to the Secondary Coil (Power Coil).

Important: Please check whether the internal overvoltage protection is established by connecting the TVS – PWR1 connections, see Fig. 1.

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3. Connect all modules required for the measurement setup to the NT bus.

Important: The MTP-NT-POWER-S module must not be operated without connected modules (loads)!

4. Switch on the Power Generator (IND-PWR-PG) and ensure that the connected Primary Coil (Power Head) is not yet in the area of the Secondary Coil (Power Coil).

Important: The Primary Coil (Power Head) should not be on metal!

The flashing of the red **STATUS LED** on the Power Generator must change after approx. 60 seconds to a steady light (ON).

5. If available, the imc configuration box CONFIG-BOX-IND-PWR can be used. It enables a simple balance (if not available, please note point 5b).

- a. While the Primary Coil (Power Head) is slowly moved into the **working area of the Secondary Coil** (Power Coil) towards the intended mounting location, the voltage at the *VDC* and *VMM* pins of the MTP-NT-POWER-S module must be observed, see Fig. 1. The measured voltage should only reach 25 V at the intended mounting location of the Primary Coil (Power Head). If the voltage is already reached at a greater distance, the number of windings should be reduced.

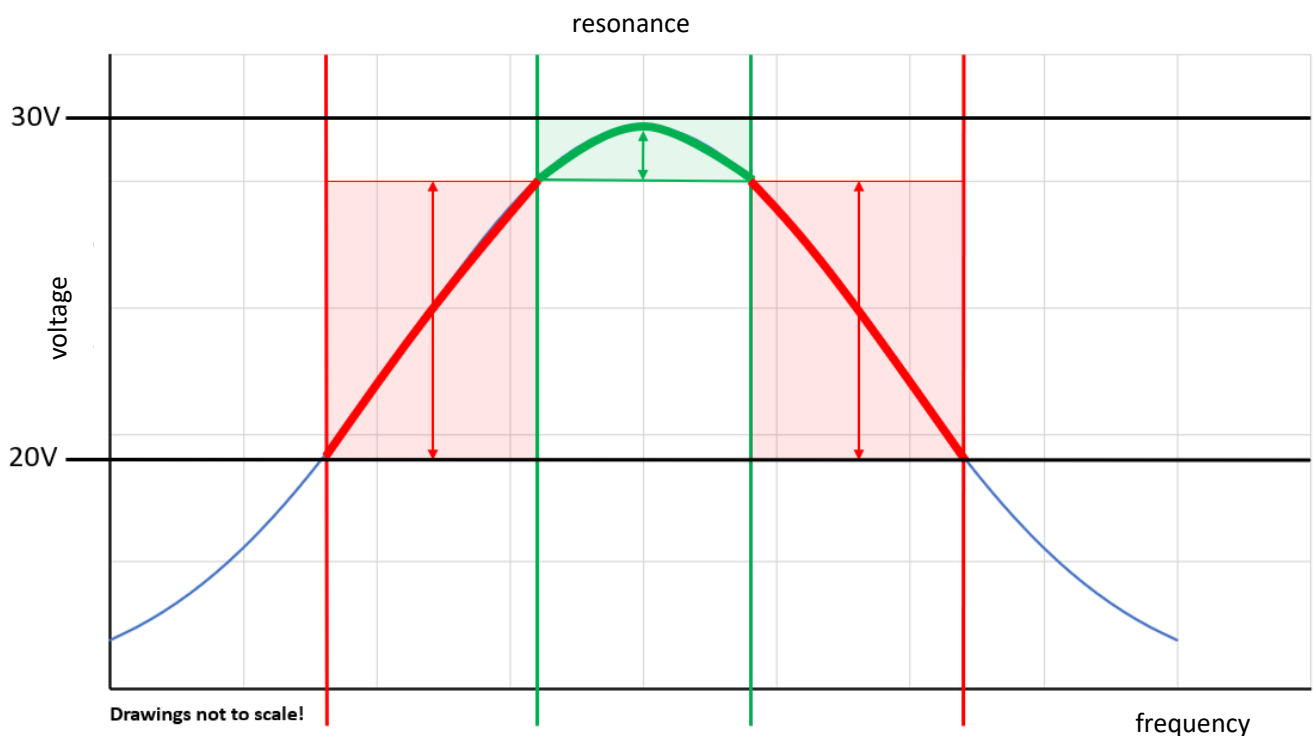
It is also **possible** to mount the Primary Coil (Power Head) at the current position if external conditions permit. It is possible that even with a correctly dimensioned Secondary Coil (Power Coil) the optimum 25 V balancing voltage is not achieved, even if the distance is as small as possible. In this case, it is necessary to check whether the secondary resonant circuit is actually resonating. The balancing capacity is changed by way of experiment.

Important: If the voltage is below 20 V despite resonance and the smallest possible distance, the number of windings must be increased.

- b. Alternatively, you can manually bridge the pins *CAP1* with *CAP COM* and/or *CAP2* with *CAM COM*.

- Once the number of windings, the balancing capacity and the head spacing have been determined as described above, **a final check must be made** to determine if the secondary circuit is operating at resonance.

Resonance is present if a change in the balancing capacity does not lead to a significant voltage increase or voltage drop!



*Fig.2 green marked area: a change in the balancing capacity does not lead to a significant voltage increase or voltage drop.
The secondary circuit is in resonance!*

If an adjustment of the balancing capacity is required, the necessary bridges must be permanently (e. g. soldering), see the following assignment.

| Switch Position | Bridge (Jumper) |
|------------------|-------------------------------|
| 0 (no capacitor) | No Jumper |
| CAP1 | Pin8 to Pin6 |
| CAP2 | Pin4 to Pin6 |
| CAP1+2 | Pin4 to Pin6 and Pin8 to Pin6 |

Please refer to the translation table (page 2): old pin designation vs. new designation

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Overview of the available MTP-NT-POWER-S variants:

| | Standard housing | Plug-in housing | | | Examples |
|--|-----------------------------------|------------------|----------|----------|---|
| Order code of the standard module variant: MTP-NT-POWER-S | | | | | |
| Extension of the order code by | <i>see above no extension</i> | -ET ¹ | -P | -P-ET | <i>for article no. 13220298 the valid designation is: MTP-NT-POWER-S-P-ET</i> |
| Article no. | 13220069 | 13220070 | 13220290 | 13220298 | |
| The MTP-NT-POWER-S modules are included in power supply sets. The following power supply sets are intended for direct supply . The order code of the sets begins with MTP-NT-POWER-S-SET | | | | | |
| Extension of the order code by | <i>see above no extension</i> | -ET | -P | -P-ET | <i>for article no. 13220346 the valid designation is: MTP-NT-POWER-S-SET-P</i> |
| Article no. | 13220127 | 13220189 | 13220346 | 13220352 | |
| The following power supply sets are intended for an inductive supply . The order code for the sets begins with MTP-NT-ENERGY-IND | | | | | |
| Extension of the order code by | <i>see above no extension</i> | -ET | -P | -P-ET | <i>for article no. 13220193 the valid designation is: MTP-NT-ENERGY-IND- 3XL-ET</i> |
| -L ² | 13220128 | 13220190 | 13220347 | 13220353 | |
| -XLS | 13220129 | 13220191 | 13220348 | 13220354 | |
| -2XL | 13220130 | 13220192 | 13220349 | 13220355 | |
| -3XL | 13220131 | 13220193 | 13220350 | 13220356 | |
| -4XL | 13220132 | 13220194 | 13220351 | 13220357 | |

Our technical assistance is at your disposal for technical support:

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¹ ET: variant in the extended temperature range

² The abbreviation „-L“ in the order code of the set stands for the induction feed head L. The example in the table above shows the order in which the abbreviations are added.