IVT-1260 & IVT-2460

Generator Auxiliary Excitation Booster
Operation Manual

(Patent Pending)

The IVT-1260 / IVT-2460 is used to boost motor starting capacity in shunt generators. It achieves boosting power by converting DC battery power to an AC source for use by the AVR. It boosts the motor capacity of shunt generators like a PMG, augmenting the generator's ability to handle a larger motor starting current, thereby exceeding its normal motor starting capabilities. It is easy to install, allowing the unit to be integrated to the generator excitation systems quickly.
Applicable for generator no-load excitation voltage between 20 – 50 Vdc.

Suitable for full wave AVR equipped with Auxiliary power input.
Applicable AVR Models (More models adding continuously) :
KUTAI EA08A, EA448, ADVR-12, ADVR-2200M
Basler AVC63-12, AVC125-10, CATERPILLAR VR6

KUTAI

KUTAI ELECTRONICS INDUSTRY CO., LTD.
TEL : +886-7-8121771 FAX : +886-7-8121775 Website : www.kutai.com.tw
Headquarters : No.3, Ln. 201, Qianfu St., Qianzhen Dist., Kaohsiung City 80664, Taiwan

SECTION 1 : SPECIFICATION

Sensing Input (S1, S2)

Voltage	80 – 600 Vac, 1 phase
Frequency	50/60 Hz

Power Output (OUT1, OUT2)

Voltage	180 Vac, 1 phase
Max. Output	500VA
Frequency	400/480 Hz

Battery Power (Input B+, B-)

Voltage	IVT-1260 12 Vdc (8 – 18 Vdc) / 60A
	IVT-2460 24 Vdc (16 – 36 Vdc) / 30A
Protections	Battery Voltage Reverse Polarity
	Battery Current Limit
Fuse Spec.	IVT-1260 (60A) / IVT-2460 (30A)

Typical System Response

10 ms

Static Power Dissipation

Less than 1 watt (hibernate Less than 0.5 watts)

Efficiency

greater than 90% @ Full load

Environment

Operation Temperature	-40 to +60 ˚C
Storage Temperature	-40 to +85 ˚C
Relative Humidity	Max. 95%
Vibration	3 Gs @ 100 – 2K Hz

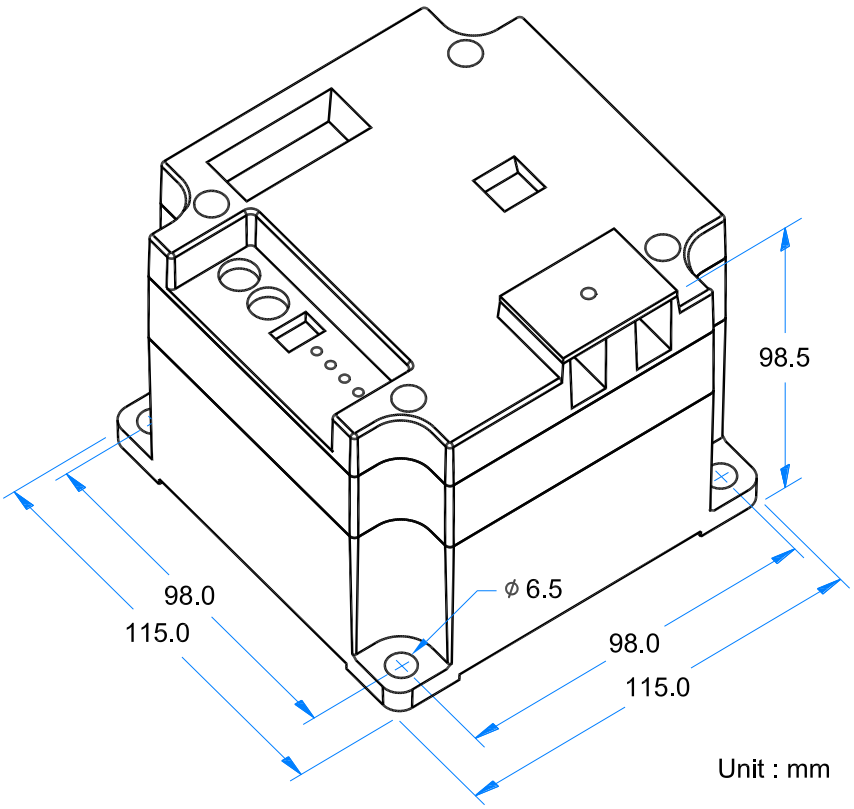
Dimensions

115.0 (L) x 115.0 (W) x 98.5 (H) mm

Weight

2400 g +/- 2%

SECTION 2 : OUTLINE / SIZE



Accessories :

1. Connection wires (White x 2, Brown x 2)
2. Screw bolt M6L20 x 4

SECTION 3 : DESCRIPTION

Item / Settings	0	1	2	3	4	5	6	7	8	9
Droop %	5 %	6 %	7 %	8 %	9 %	10 %	11 %	12 %	13 %	14 %
Time-ON	15 Sec	20 Sec	25 Sec	30 Sec	35 Sec	40 Sec	45 Sec	50 Sec	55 Sec	60 Sec

Table 1

Droop %

Is the level of sensitivity set on the trigger that turns the IVT "ON" when it senses a drop in voltage on terminals S1, S2.

This droop can be adjusted 5 to 14 percent of the preset working voltage.

Time-ON

Is the time in seconds that the IVT is activated every time it senses a drop in voltage.

This timer can be set from 15 to 60 seconds.

To Test the IVT by Moving DIP-SW1 to "ON"

1. Remove any wires from the Power Output Terminals OUT1 & 2 before starting.
2. Move DIP-SW1 to ON to start the test, terminals OUT1 & 2 will now energize for 5 Seconds.
3. The TEST LED should show a steady glow Indicating a good test or a flashing LED if the IVT is damaged.
4. Move the DIP-SW1 back to OFF and put back the wires OUT1 & 2.

WARNING *!!* When doing the Power Output Test DO NOT touch terminals (OUT1 & 2). These emit a dangerous 180 Vac / 400 Hz during the test. Also be careful not to short these terminals, as you can damage the IVT.

Output LED (Green)

Boost Power ON LED indicator

Ready LED (Green)

Flashing : Waiting

Steady Light : Sensing voltage is stable and boosting power is on standby ready for activation.

Test LED (Green)

When flashing : Power Output Test failed.

If LED is steady the test was successful.

Batt-Volt LED (Red) Battery-voltage abnormal indicator

Rated Voltage Range IVT-1260 : 8 – 18 Vdc / IVT-2460 : 16 – 36 Vdc

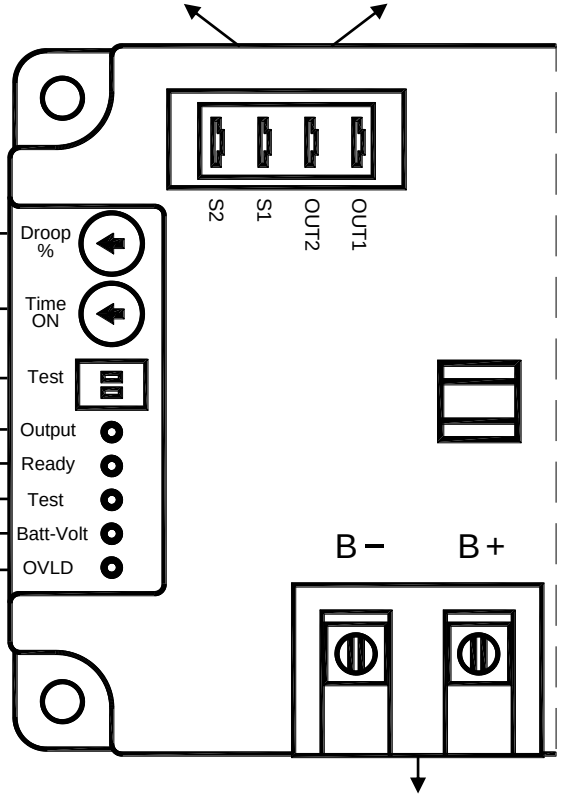
When Battery Voltage Abnormal :

IVT has no output, indicator illuminates and prevents output.

IVT has output, indicator illuminates and locks off power output, resets after the generator is shutdown.

S1 & S2
Are the voltage sensing input terminals.

OUT1 & OUT2
Are the power output terminals going to the AVR.



B+ & B- Battery Power Input

Connection Wire Sizes

IVT-1260 ≧ AWG 8 (8.3mm^2)

IVT-2460 ≧ AWG10 (5.3mm^2)

OVLD LED (Red) Power Output Overload Light

When Boost Power is ON and the current from the battery exceeds 60A at 12V or 30A at 24V, the IVT starts a current limiting function and the OVLD LED will turn on.

SECTION 4 : AUXILIARY BOOST POWER STARTING PROCEDURE

Without the IVT, when a heavy load is placed on a generator, its output voltage drops, as it tries to start large pumps or motors, etc.) The load will, momentarily, appear to have a short circuit to the generator, zapping the power to the AVR and excitation circuits, and the motors fail to start. With the IVT, however, as soon as the voltage drops between 5% to 14%, the ITV takes over, using the battery to immediately power the voltage regulator and the exciting system. Finally, when the IVT output times out (Time-ON setting), the auxiliary boost stops; the regulator returns to normal shunt operation; and, battery power is no longer needed. See the Auxiliary Power start process in Diagram 2 :

When the generator's load is within 100% of its rated power, its output voltage should be within 10%. However, to avoid the IVT starting frequently and consuming battery power, the Droop setting trigger voltage should be set higher than 10%. At higher than 10% Droop, when the load exceeds (overload) the rated power of the generator (for example, when starting a motor), the sensing voltage drops instantaneously to the Droop setting (5% to 14 %) and the ITV starts within 10ms, instantly delivering power to the AVR and excitation system. When the ITV times out when reaching the Time-ON setting of 15 to 60 seconds, the power from the ITV slowly turns off to avoid unstable voltage output from the generator.

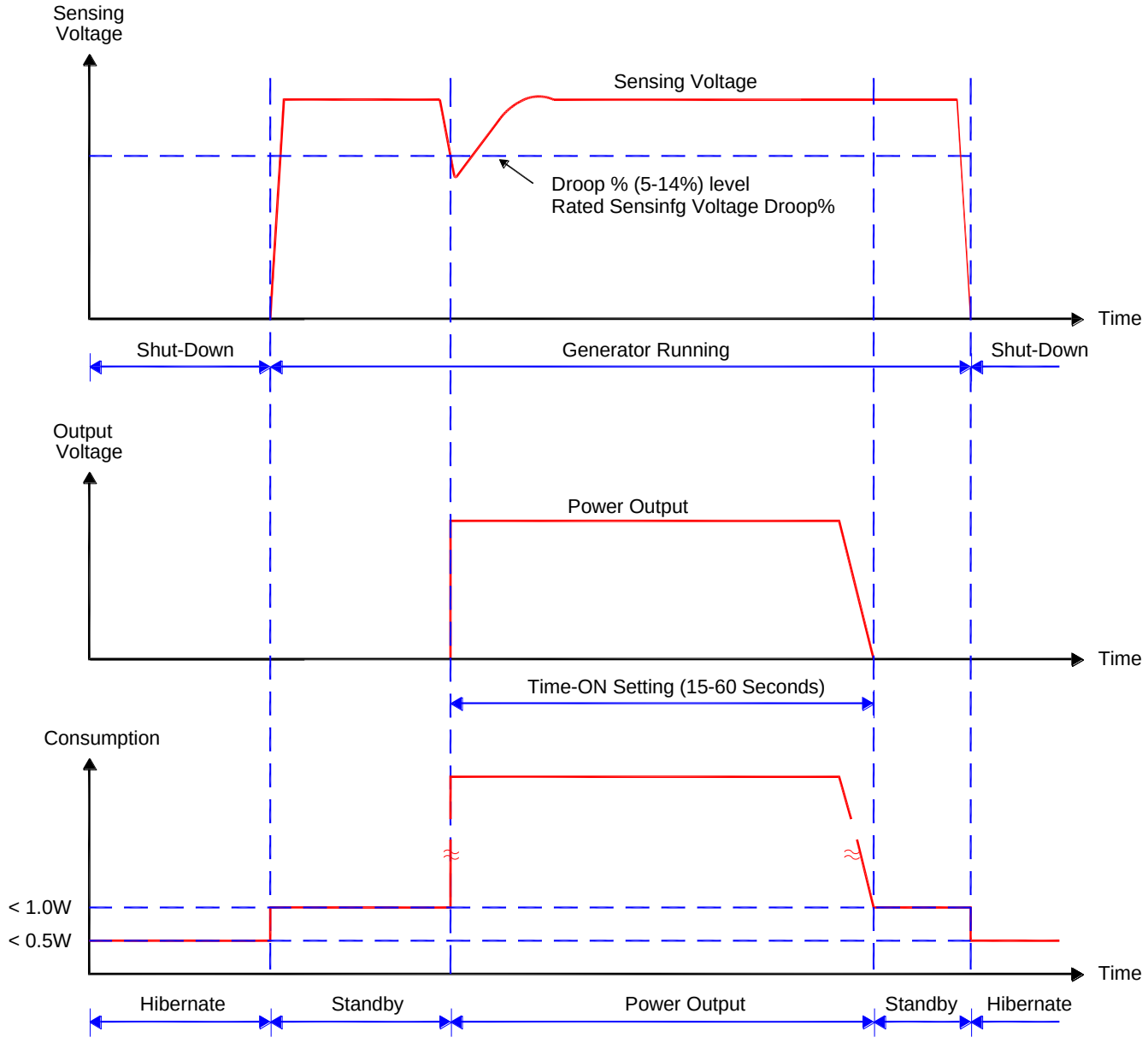


Figure 2 Power Initiation Process

SECTION 5 : WIRING CONNECTIONS

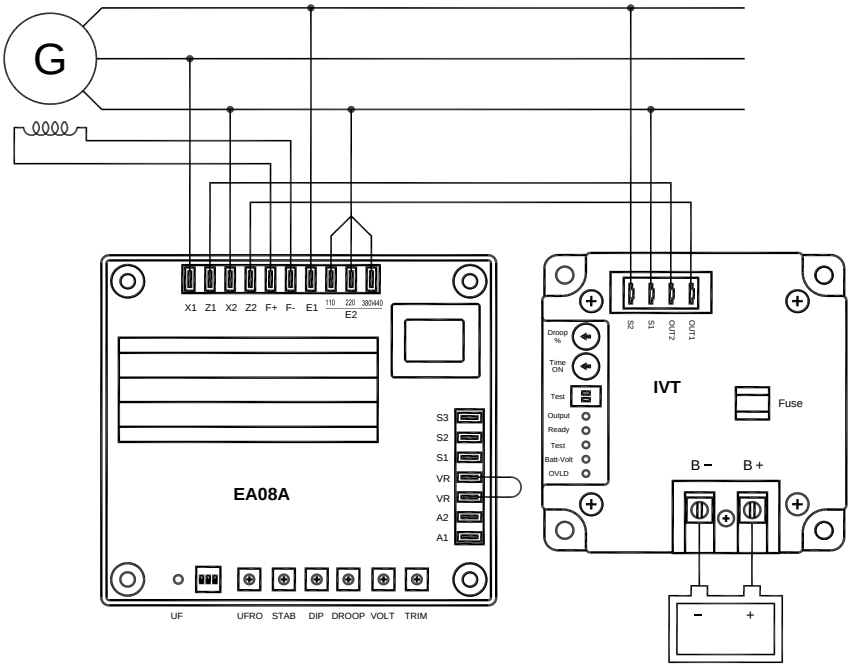


Figure 3 IVT-1260 / IVT-2460 & EA08A Wiring Connection

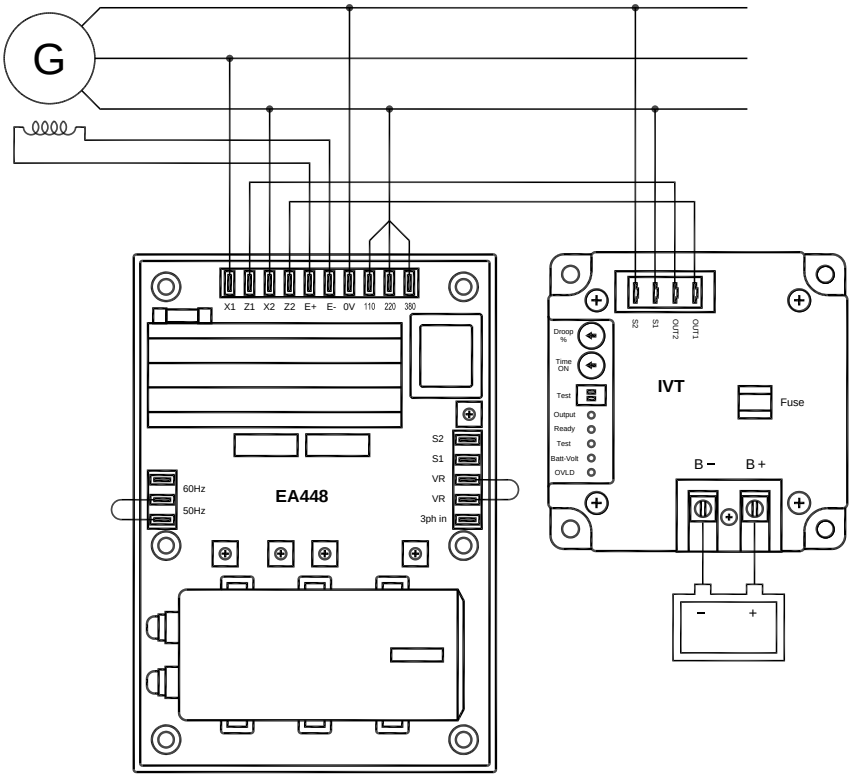


Figure 4 IVT-1260 / IVT-2460 & EA448 Wiring Connection

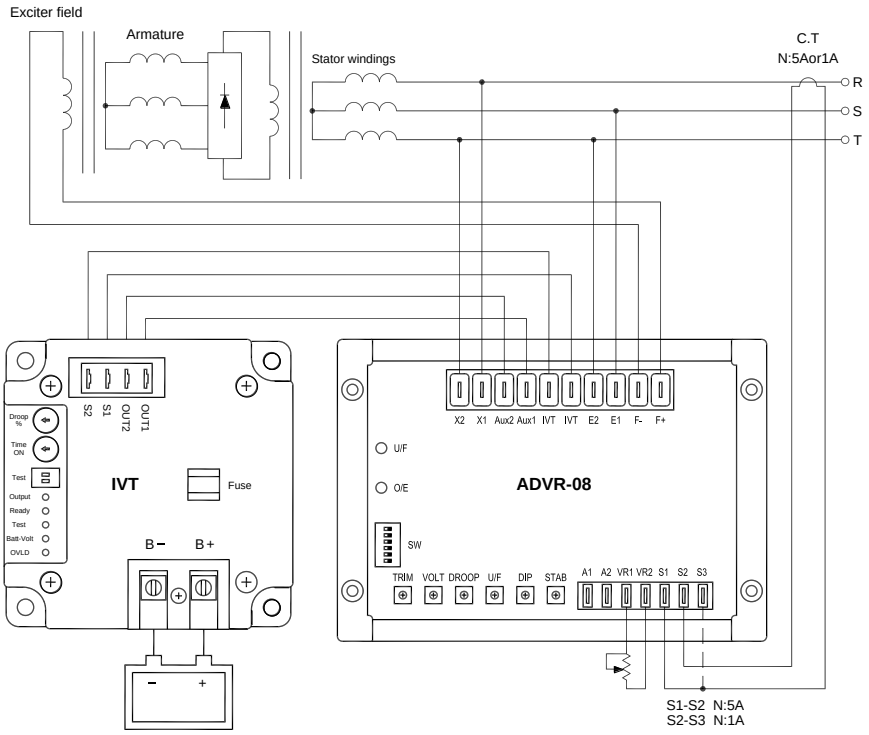


Figure 5 IVT-1260 / IVT-2460 & ADVR-08 Wiring Connection

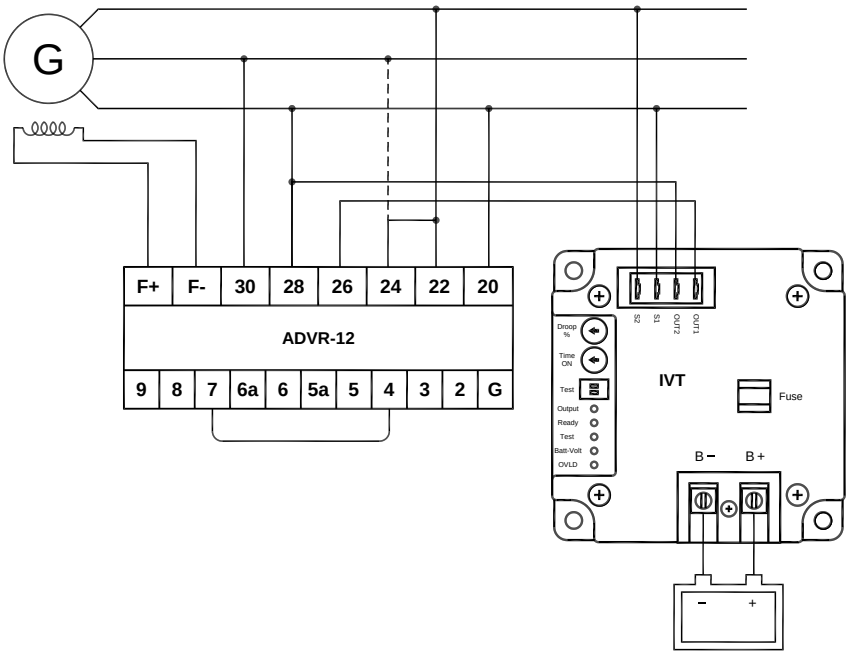


Figure 6 IVT-1260 / IVT-2460 & ADVR-12 Wiring Connection

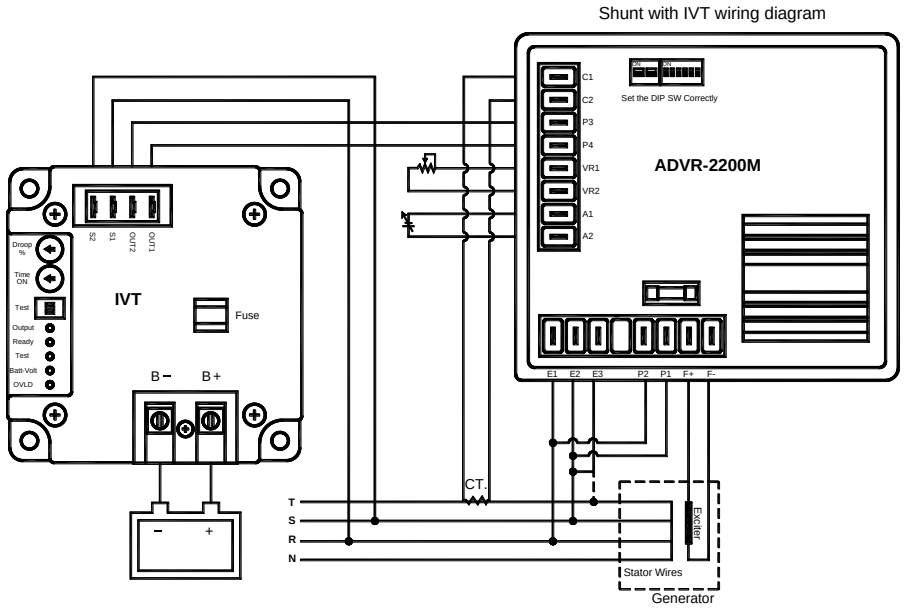


Figure 7 IVT-1260 / IVT-2460 & ADVR-2200M Wiring Connection

ATTENTION

1. **All AC voltage readings are average value only.**
2. **IVT-1260 / IVT-2460 highest auxiliary output power is 500 VA.**
3. **IVT-1260 / IVT-2460 can combine with an auxiliary power AVR.**

※ Use only the replacement fuses specified in this user manual.

※ Appearance and specifications of products are subject to change for improvement without prior notice.