



HT MODEM

USER MANUAL



Design / Manufacturer



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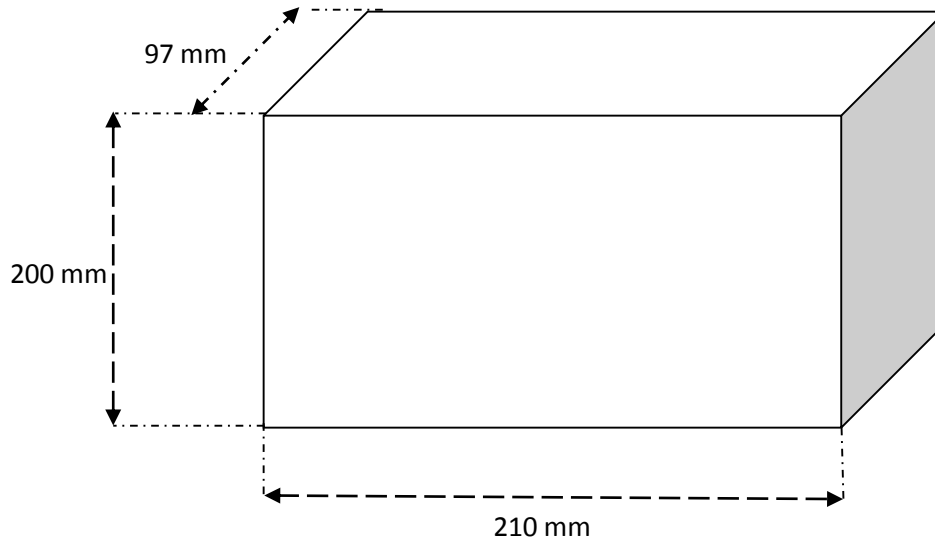
OverSeas Partner



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GENERAL DESCRIPTION:

Mechanical Dimension:



TERMINAL IMAGE:



HT Modem communicates data through PLC (Power Line Communication) technology that enables sending data over existing power cables. This means that with just power cables running to an electronic device one can both power it up and at the same time control/retrieve data from it.

Modem employs a HT Coupler in between HT MODEM and 11KV power line for communication which can withstand up to 12KV with inbuilt fuse (2A) setup.

HT Coupler: The capacitive coupling applies to the medium voltage electrical power system between 6KV and 12KV. It connects between the high tension line and ground. It can realize electricity isolation and the impedance matching between high voltage facility and digital transceiver. Then it completes transmission or receive intelligence signal of electricity line through the high-frequency cables and the high voltage transmission line and insert small signal attenuation. Finally the system has provided the economically effective equipment for realizing the modernization and digitization of the medium voltage electrical network.

Working concept: In this particular application, when the HT panel door is opened, the limit switch changes its state from NO to NC. When this is sensed by HT modem-1 (Transmitter side), a control signal is sent through power line to HT Modem-2 (Receiver side) to deactivate the VCB to shut down the supply and safe guard human life.

Note Both Modems act as a trans receiver, so that the above function can be performed vice versa.



Front Panel description:

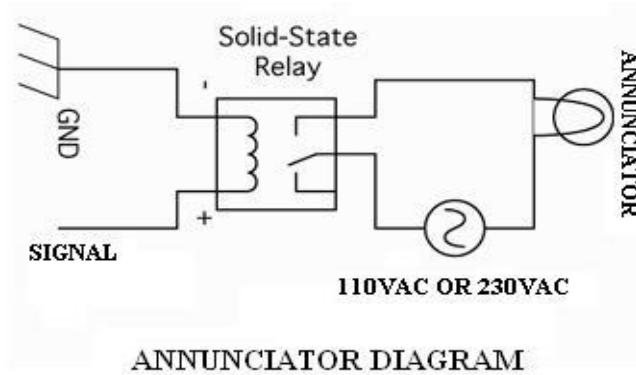
Modem Front panel has 6 way connector for control signal termination , 4 way connector for Auxiliary supply , a Acknowledge Key , a Co-Axial Connector for HT coupler connection, and a Power On Indicator.

1. Terminal Connector:
 - Door sense : from limit switch
 - Alarm : Potential Free
 - Trip Relay : Potential free
2. Acknowledge Key:
 - Type : Push button
 - Purpose : To Reset the Alarm/Trip manually.
3. Co-Axial Connector:
 - To communicate the signal in power line via coupler.
4. LED :-
 - Power ON Indication
 - TX and RX Indication
 - Acknowledgement

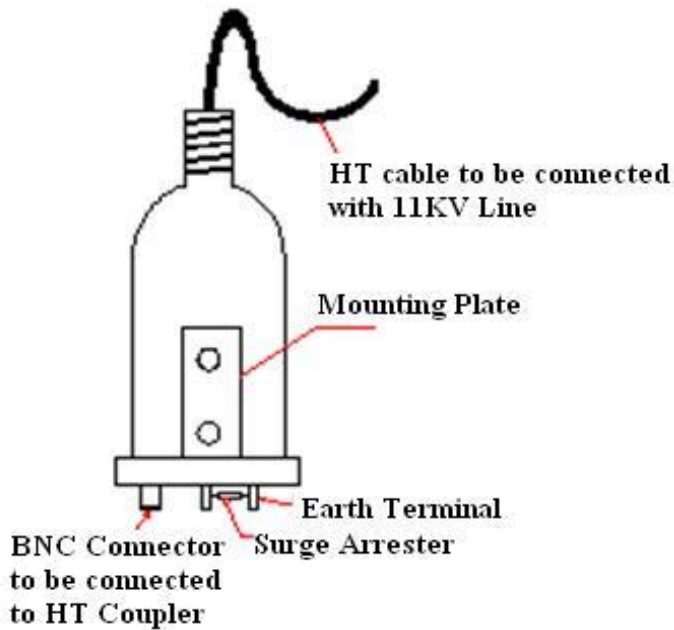
HT Coupler Unique Feature:

- The coupler uses the dry-type high grade primary capacitor which is highly reliable, with medium losses and exempts maintenance,
- We have established fuse in the coupler, which can blow a fuse when the high voltage capacitor occurs, short-Circuits. So the fuse can be very effectively protecting the coupler, not cause the harm to the electrical network and enhanced the security.
- The insulation strength between one and two time circles of the coupler internal resistance matching unit (high frequency transformer) not to be lower than 10^4 V. And that can avoid the high voltage danger which generated from the coupler grounding broken line forms (7000V).
- The high voltage connecting terminal of the coupler does not need binding connecting clamp but the high tension cable directly to draw out from the coupler. So there are not the exposed charged parts on the coupler. And it also brought convenient for the installment. Moreover it reduced the space which the coupler took.
- Because the coupler equipment side wiring uses the copper axis cable connector to draw out, the installment and the maintenance is convenient.

Alarm/Trip Diagram:



HT COUPLER:



OPERATING PROCEDURE:

- Make the connections as per the instruction given in the manual .Ensure that both the Modems and Couplers are connected in the same phase. It may be either R, Y or B.
- When door sensor of either load or source side is activated, immediately the MODEM (in the door sensor activation side) deactivates the VCB of both side, so that the HT power is switched off.



- The Alarm (Hooter or Indicator) connected to the Modem's Alarm contact , is activated and will be stay on till it is acknowledged by pressing Acknowledge key

HT MODEM SPECIFICATION

System	: Single Phase system
Technology	: PLC (power line communication)
Relay Contacts	: For Alarm – 1 NO. Contact rating 230V/5A For TRIP - 1 NO. Contact rating 230V/15A
MODEM	: Dimension – 210 X 97 X 200 mm Mounting- Wall hanging type Weight - 2.680 Kgs
Aux supply	: 110V / 230V AC

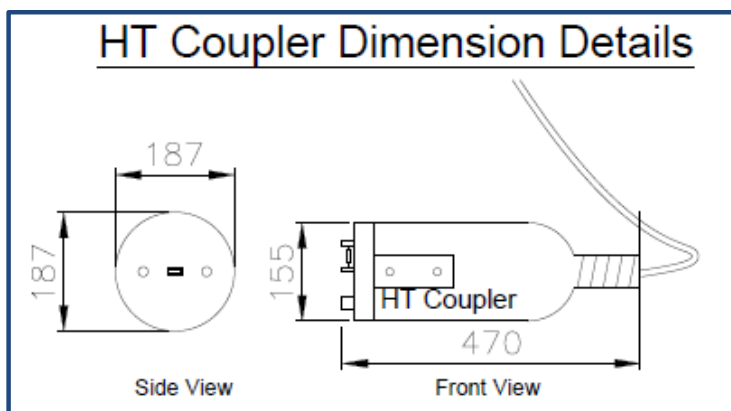
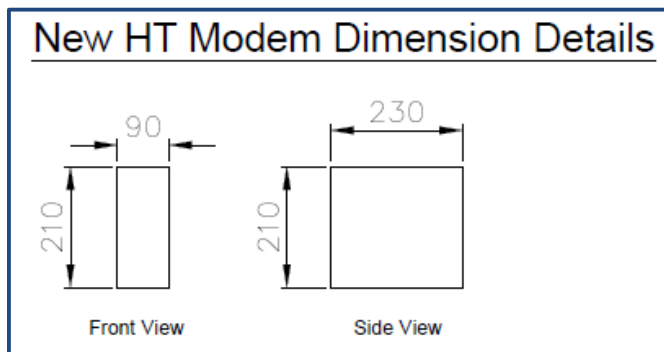
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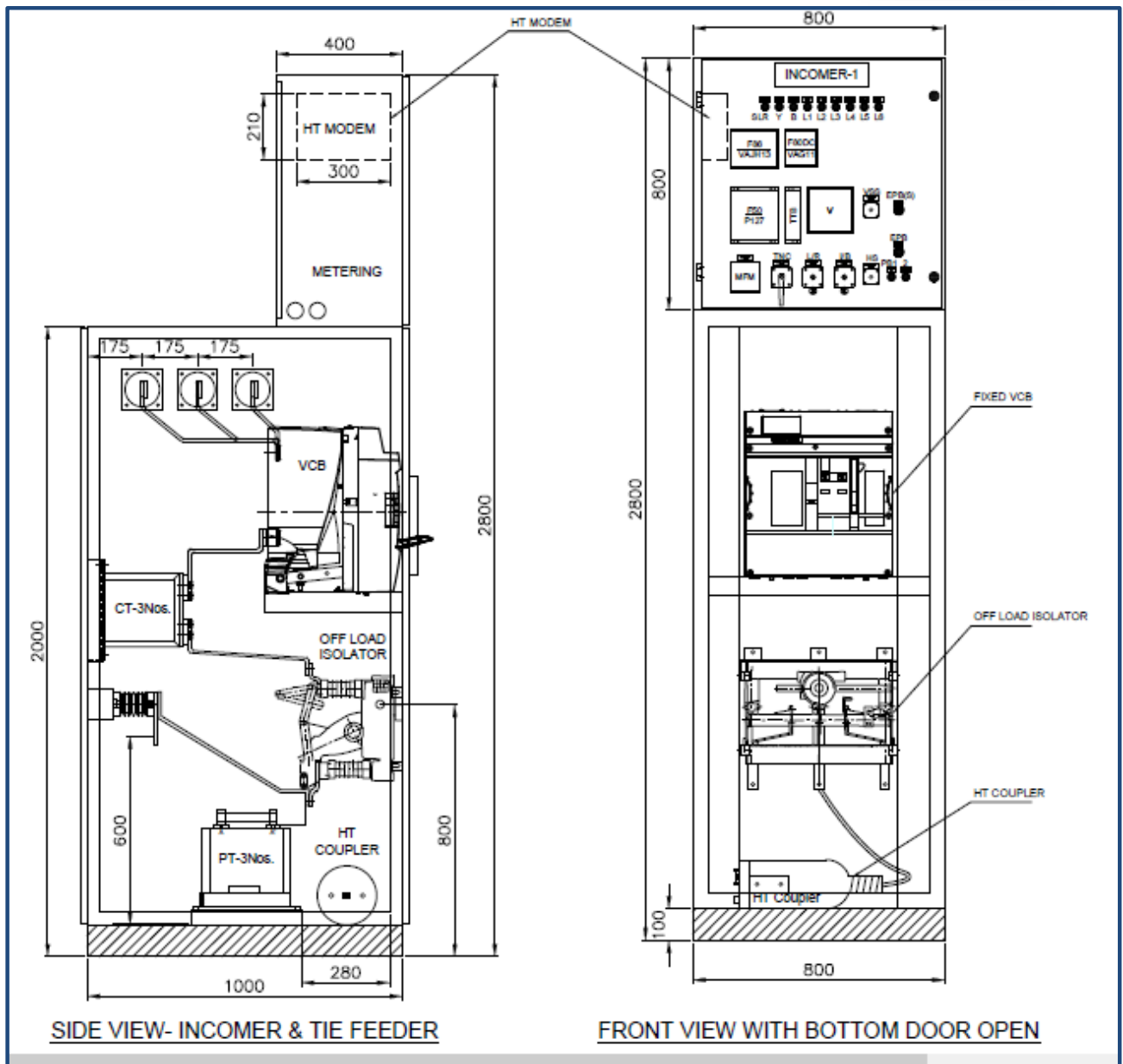
Operating Voltage	: $12\sqrt{3}$ KV, $6\sqrt{3}$ KV, 50Hz.
Input impedance	: 75Ω (Low voltage line of force digital transceiver side)
Output impedance	: 300Ω (high tension side)
Application of frequency	: 65 KHz – 500 KHz.
Capacitors loss tangents value:	≤0.001 (10 KHz)

Over Voltage protection:

Higher voltage side	: Protection Voltage: 2000VDC; : Surge Current: 5KA 8/20μs; : Electric Capacity between two pole : <1pF.
Lower voltage side	: Protection Voltage : 500VDC; : Surge Current : 5KA 8/20μs; : Electric Capacity between two pole: <1pF.
Signal attenuation	: ≤1.3dB (Line impedance / equipment impedance 300Ω / 75Ω)
Rated peak power	: 400W
Fuse rating current	: 2A
Weight	: 5 Kg (approx.)

- Withstand voltage between first and second of the high frequency transformer and impedance matching $\geq 10\text{KV}$ (1min, 50Hz.)
- Environment:
 - ✓ Indoor or outdoor is general,
 - ✓ Installation sites elevation cannot surpass 1,000 meters,
 - ✓ Wind speeds should not surpass 150KM/hr.,
 - ✓ Ambient temperatures: -40°C to 65°C .
- Because this coupler is the dry like structure, the maintenance exempted and its service life is long.
- Annotation:
 - ✓ This capacitive coupling can be separately installed on the electricity line pole (uses cross rod), the box type transformer substation and in the high-voltage switch cabinet according to the scene situation.
 - ✓ The grounding line of the capacitive coupling must be many copper wires, their cross sectional area not smaller than 16mm^2 stocks and connect with 75Ω co-axial cables and the co-axial coupling.
 - ✓ Resistances which join to the earth is generally not bigger than 4Ω .





TYPICAL ERECTION IN A HT (11kV) PANEL

INSTALLATIONS AT SITE

