



AUTOMATIC TRANSFER SWITCH

Changeover Type from 250A to 2500A



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The logo for TECO GROUP features a central grey triangle pointing upwards, flanked by two yellow curved shapes that resemble stylized wings or a sunburst. Below the graphic, the words "TECO GROUP" are written in a large, outlined, sans-serif font.

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Product Description

Automatic Transfer Switch from **Jundi Electrical industry (TECO)** is designed to provide unmatched performance, reliability and versatility for critical standby power applications. The switches can be equipped with controllers to match your application needs. All the controllers offer rock-solid monitoring, front panel status reporting and transfer control operation. Superior design and robust construction make Jundi Electrical Industry (TECO) automatic transfer switch the industry benchmark for critical and distributed power systems. We follow 100% testing that includes the following (Visual and dimensional check, Mechanical operation check, Applied voltage test to earth on power circuits: 3kV for 1 minute, Electrical and functional operational check) after passing a Routine Factory Test (RFT) Certificate is issued with every panel manufactured. All the panels are Assembled in Jordan with European components.

Electrical Ratings

Ratings 250, 400, 800, 1000, 1250, 1600, 2000, 2500 amps Change over type (other ratings are available on Request). 3 or 4-poles. Up to 690 VAC, 50 Hz. IP 55 indoor (outdoor ratings also available).

According IEC 439-1

Industrial Design Highlights

- Enclosure from RITTAL, triple coated, Surface finish: steel is cleaned, degreased, phosphated, electrophoretic dipcoat primed and polyester powder-coated.
- Double-throw, mechanically interlocked transfer mechanism.
- Mechanically and Electrically interlocked.
- Open Transition Automatic Transfer Switch.

Standard Features

- Power Busbar and Control wiring are **color coded**.
- Auxiliary **Free Contact interface**:
- Generator Running 1 NO, Load on Generator 1 NO, Load on Main 1 NO.
- Main Source sensing: Undervoltage/Overvoltage, 3-phase rotation protection. 3-phase voltage unbalance/loss.
- Emergency Stop Terminal (Shorted at Factory when delivered).
- Engine Cool-down Timer adjustable timer allows the engine to run at no load after the transfer.
- Engine Warm-up Timer adjustable timer allows engine to operate at no load before transfer.
- Utility interrupt delay adjustable timer. Mimic diagram with (Generator Running, Load on Generator, Load on Mains).
- Programmable plant exerciser 7 day weekly timer. Generator Start retry logic and Generator fail to Start (Generator over-cranking protection).

1.1 Theoretical base

A **transfer switch** is an electrical switch that reconnects electric power source from its primary source to a standby source. Switches may be manually or automatically operated. An Automatic Transfer Switch (ATS) is often installed where a **backup generator** is located, so that the generator may provide temporary electrical power if the utility source fails.

An ATS not only safely switches-in the backup generator as a temporary source of electric power; it also commands the backup generator to start, based on certain conditions it continuously monitors on the primary feed. The transfer switch isolates the backup generator from the electric utility, when the generator is on and is providing temporary power. The control capability of a transfer switch may be manual only, or a combination of automatic and manual. The switch transition mode (see below) of a transfer switch may be Open Transition (OT) (the usual type), or Closed Transition (CT).

For example, in a home equipped with a backup generator and an ATS, when an electric utility outage occurs, the ATS will tell the backup generator to start. Once the ATS sees that the generator is ready to provide electric power, the ATS breaks the home's connection to the electric utility and connects the generator to the home's main electrical panel. The generator supply power to the home's electric load, but is not connected to the electric utility. Isolation of the generator from the distribution system is required to protect the generator from overload, and to prevent accidental energization of the service wiring.

When utility power returns for a set time, the transfer switch will transfer back to utility power and command the generator to turn off, after another specified amount of "cool down" time with no load on the generator.

A transfer switch can be set up to provide power to only critical circuits or entire electrical (sub) panels. Some transfer switches

allow for load shedding or prioritization of optional circuits, such as heating and cooling equipment. More complex emergency switchgear used in large backup generator installations permits soft loading, allowing load to be smoothly transferred from the utility to the **synchronized generators**, and back; such installations are useful for reducing peak load demand from a utility.

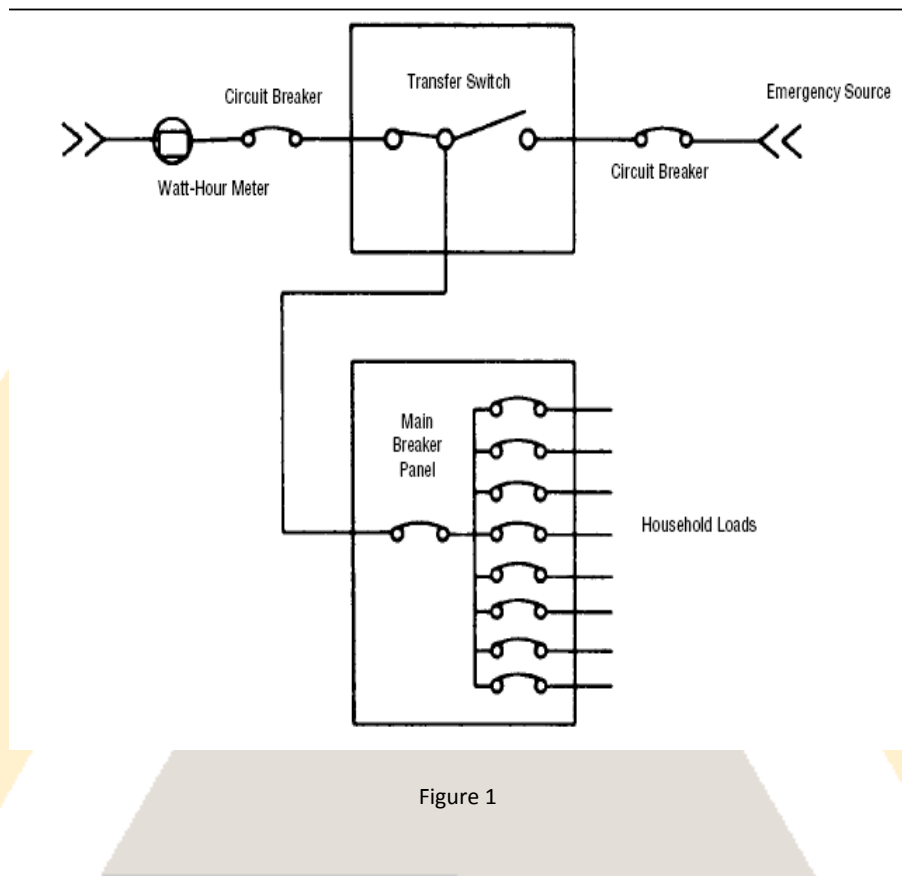


Figure 1

Note:

TECO is able to provide a complete solution when it comes to synchronization of multiple generators, load shedding and custom made Emergency Distribution Boards (EMBDs).

1.2 Selection of the Size of Automatic Transfer Switch

If you want to run your entire load in case of a power outage, and you have a **large enough generator**, you need a transfer switch that is the same rating as your main breaker panel. For a home this will normally be either 60A or more likely 200 amps. The transfer switch would be installed between your main breaker (normally at the meter) and your main electrical panel.

If you want to run only certain loads during a power outage you can install a **sub panel (EMDB)** off of your main panel and use a less amper transfer switch depend on the load. This is a great idea if you don't have a generator big enough to run everything.

Our home is an excellent example.

We have a 100 amp main feed and a 60 KW diesel generator. The generator is big enough for the entire house. During a power outage everything in the house works normally, and we sometimes don't even know there's a power outage going on.

$$P_{GEN} = 1.73 * V * I * \cos\theta$$
$$I_n = P_{GEN} / (1.73 * V * \cos\theta)$$

$$60 * 10^3 = 1.73 * 400 * I * 0.8$$

$$I = 60 * 10^3 / (1.73 * 400 * 0.8) = 108A$$

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1.3 Automatic transfer switch components

There are three (3) basic components of a transfer switch:

- 1- Power switching device to shift the load circuits to and from the power source (contactors, changeover, or Circuit breakers).
- 2- Transfer Logic Controller to monitor the condition of the power sources and provide the control signals to the power switching device.
- 3- Control power source to supply operational power to the controller and switching device (battery).

1.4 Modes of operation

Manual Mode: The module is placed into Manual mode by pressing hand/auto button. Manual mode is used for control the ATS manually and to start & stopping the generator engine.

AUTO Mode: The module is placed into auto mode by pressing hand/auto button. If a mains failure on any phase is detected after the mains failure delay timer expires, the load is switched off from the mains and the ATS unit will automatically issue a start command to the genset controller by using the parameters settings. When the generator operates within the limits the load is transferred to the generator by the ATS module .When the mains supply has been restored after the mains transition delay timer expires, the ATS module will transfer the load back from the generator to the mains supply and remove the start command from the genset controller after the cooling time. In case of a failure while operating, the unit will stop the generator automatically. A clear mimic diagram and LEDs provide information about the load status and voltages.

1.5 Schematic circuit diagram for automatic transfer switch

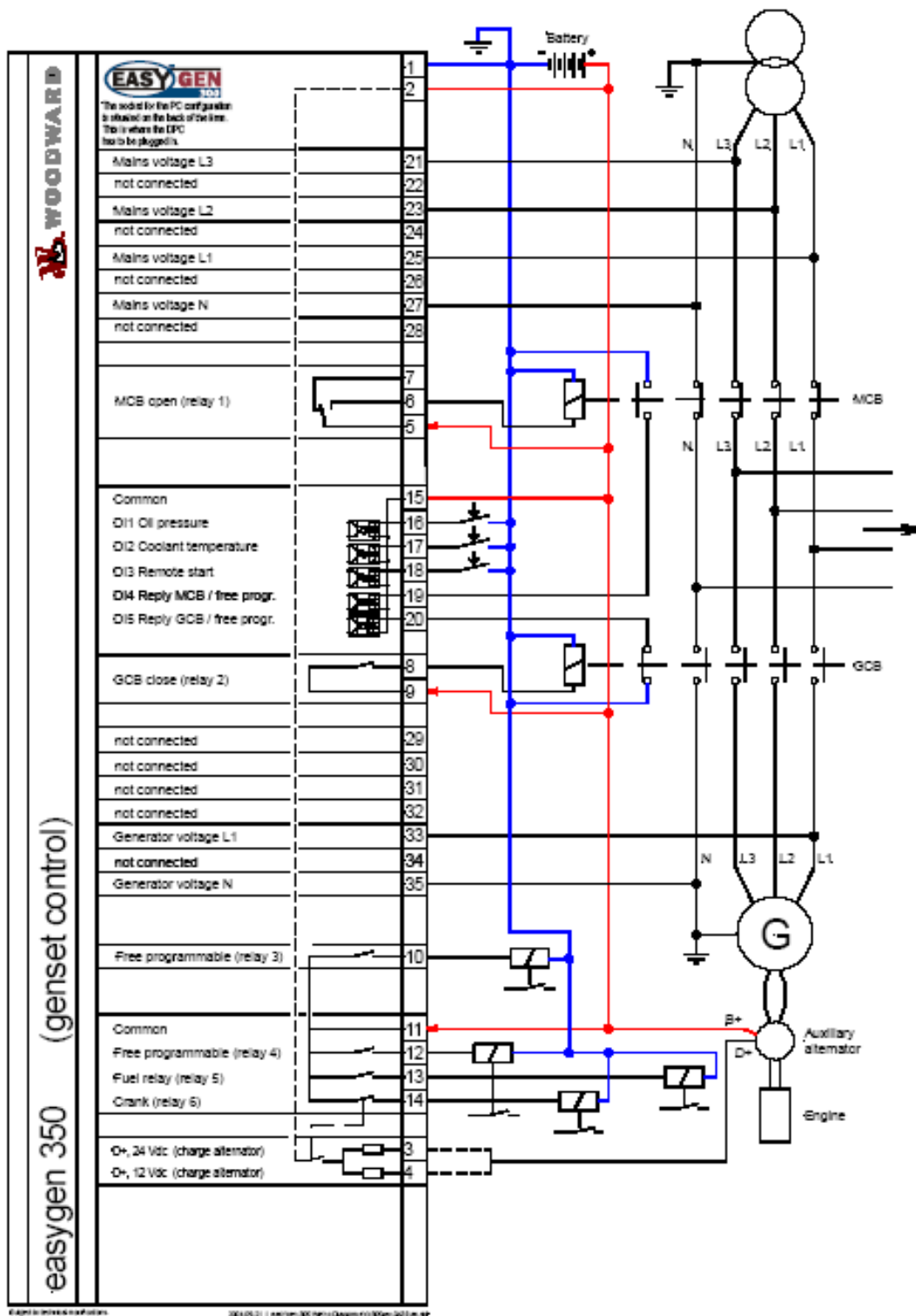


Figure 2

The above information is indicative only and subject to change without any further notice

1.6 Connection cables

Continuous Current Rating for Single/Three Core Cables with Copper Conductor				
Nominal Cross Sectional Area of Conductor	Continuous Current Rating for Three Core Cable		Continuous Current Rating for Single Core Cable (Single End bonding)	
	When Laid in Ground	When Laid in Air	When Laid in Ground	When Laid in Air
Sq.mm.	A	A	A	A
35	115	125	115	140
	145	165	150	180
50	130	150	140	170
	170	195	175	215
70	160	190	170	210
	210	240	215	270
95	190	230	200	255
	250	295	260	325
120	220	260	230	295
	280	335	295	375
150	245	295	255	335
	310	380	320	425
185	275	335	290	385
	350	430	370	495
240	315	395	330	455
	400	500	425	580
300	355	450	375	520
	450	570	475	670
400	400	520	425	610
	500	650	540	760
500	455	600	485	720
	550	740	600	900
630	--	--	550	830
	--	--	670	1010
800	--	--	620	950
	--	--	730	1140
1000	--	--	670	1070
	--	--	790	1250

The above information is used for reference only

1.7.1 General Specifications

Rated thermal current at 50 °C	As Rated
Rated insulation voltage, U_i	1000V
Rated dielectric strength, 50 Hz., 1 min	3500V
Rated impulse withstand voltage, U_{imp}	8kV
AC rated operational current *(1) (Rated operational frequency 50 / 60 Hz, voltage 400V)	As Rated

1.7.2 Controller specification

Power supply	12/24 Vdc (6.5 to 32.0 Vdc)
Intrinsic consumption	.max. 10 W
Degree of pollution	2
Ambient temperature (operation)	-20 to 70 °C / -4 to 158 °F
Ambient temperature (storage)	-20 to 85 °C / -4 to 185 °F
Ambient humidity	95 %, non-condensing
Linear measuring range	1.3 x V_{rated}
Accuracy	Class 1
Input resistance	2.0 MΩ
Max. power consumption per path	< 0.15 W
Discrete inputs	isolated
Input range	12/24 Vdc (6.5 to 32.0 Vdc)
Input resistance.	approx. 6.7 kΩ
Relay outputs	isolated
Pilot duty (PD)	1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Housing	Flush-mount
Connection.	screw/plug terminals 2.5 mm ²
Housing	insulating surface
Protection system	with correct installation front IP54
Disturbance test (CE)	tested according to applicable EN guidelines

1.8 Ordering Information

T E C O - 1 2 3 4 A - 5 6 - X X X X

Optional Features

1-4 ATS Current:

- A- 250A
- B- 400A
- C- 630A
- D- 800A
- E- 1000A
- F- 1250A
- G- 1600A
- H- 2000A
- I- 2500A

5-6 ATS Type:

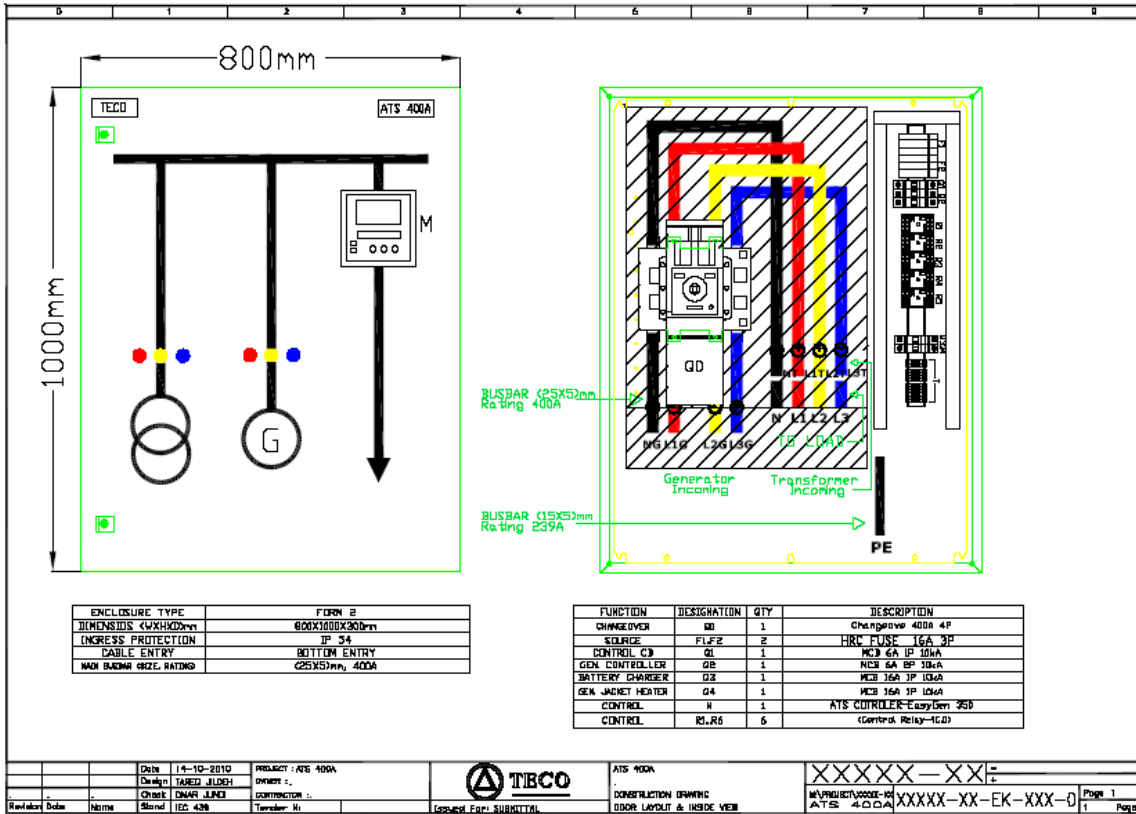
- A- CO (Change Over Type) ← Described in this catalogue
- B- MB (MCCB Type)
- C- AB (ACB Type)
- D- CN (Contactor Type)

Optional Items: (Ordered Separately)

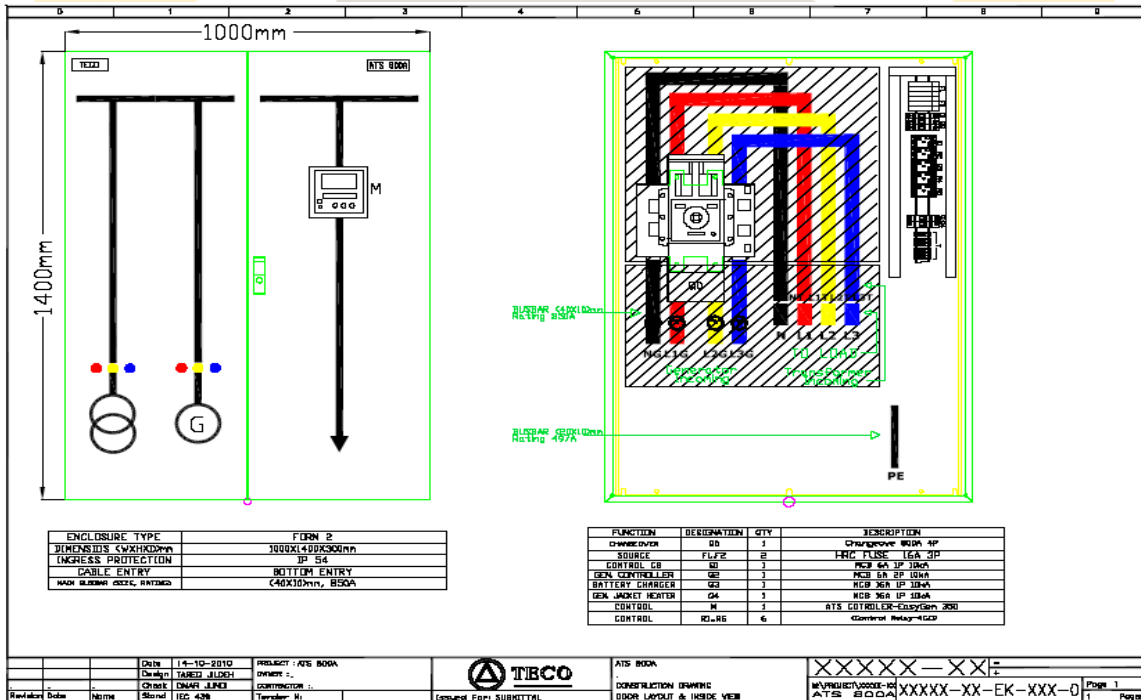
1	MODBUS/RTU Slave communication interface
2	Integration of Battery charger.
3	Integration of Yellow Horn 24VDC or
4	Space heater with thermostat.
5	Analog Conventional Measuring Set ((1)Voltmeter,(1) 7 position voltage selector switch, (3) ammeters, (3) current transformers) on Load side.
6	Digital Microprocessor measuring relay over 20 different electrical measurements can be measured

• Other protection features could be added (Temperature, Low Fuel, etc).

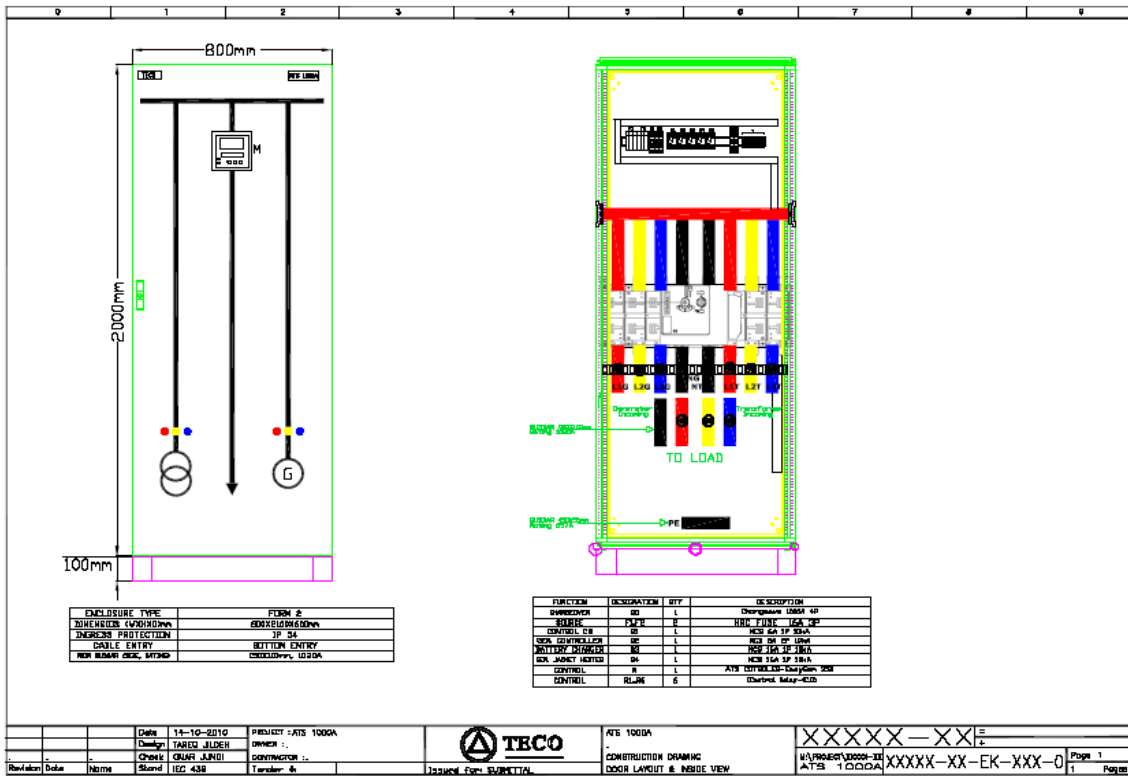
1.9 Detailed Drawings



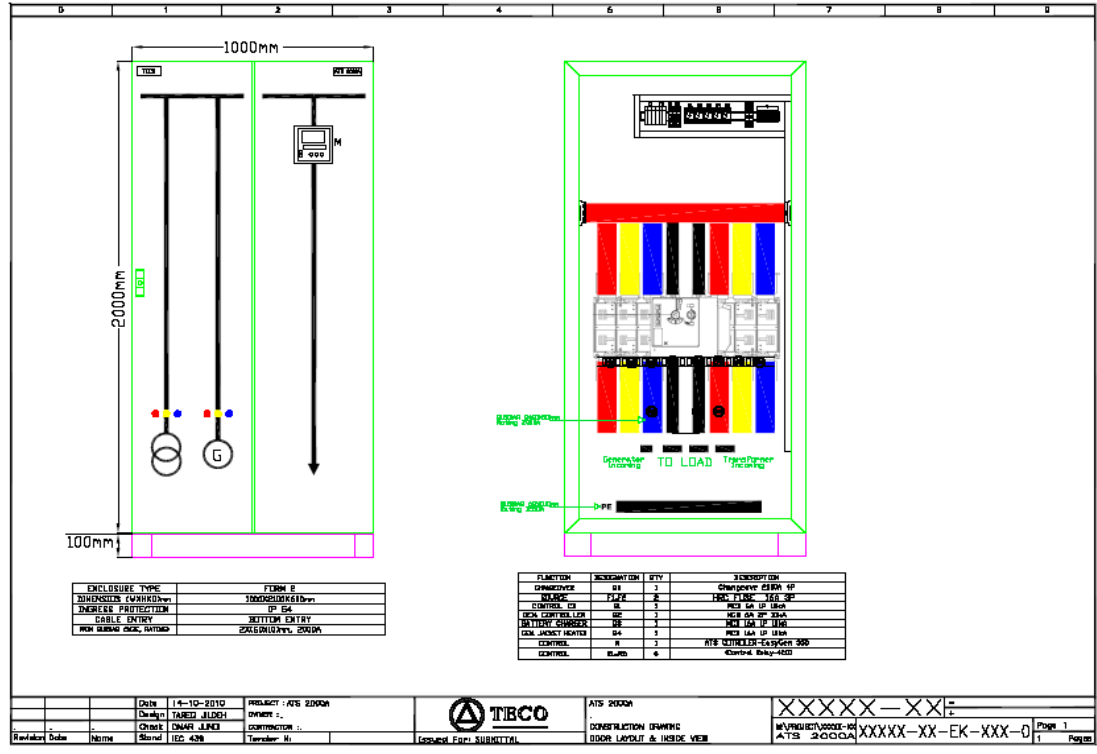
ATS 250A / ATS 400A



ATS 800A



ATS 1000A / 1250A / 1600A



ATS 2000A / 2500A

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