Energypac®
Engineering

COMPREHENSIVE SOLUTIONS FROM DESIGN TO DELIVERY

CONTROL AND PROTECTION PANEL FOR

HIGH VOLTAGE SWITCHGEAR

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TECHNOLOGY PARTNERS

INDEX

CONTROL, RELAY & PROTECTION PANEL
UP TO 400kV FOR TRANSFORMER FEEDER

Transformer protection and control panel consists of all sorts of control, protection, metering and monitoring of the transformer feeder. This panel is a combination of transformer differential protection, over current, earth fault and restricted earth fault relays associated with other auxiliary relays in the protection part of the panel. We have flexibility to customize the requirement for any special scheme requirement. In the control panel parts, we are providing all sorts of metering like ampere, voltage, energy meter etc as per standard or client's requirement. Revenue metering (energy meter) may be added as an attractive feature. We use standard annunciator module, discrepancy control switches and different types of control switches as per scheme requirements.

Remote monitoring capabilities are also available and transfer of analog and digital data from control panel to SCADA system is also possible.

Protection system:

Rating: 1A or 5A, 50/60Hz, auxiliary supply 48-250V DC & AC both.

Relay type	Manufacturer's name	Feature
Differential relay & over current earth fault relay (only for transformer feeder panel)	Siemens	Numerical programmable
	ABB	
	Schneider	

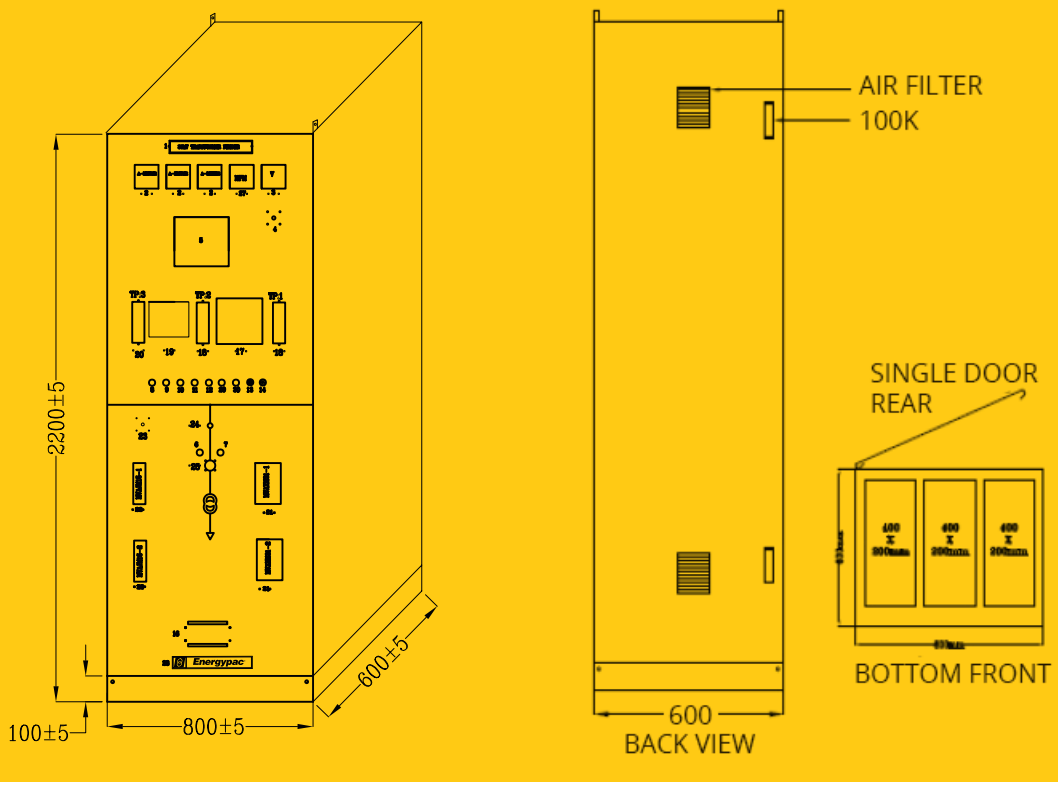

Fig: Transformer feeder

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CONTROL AND PROTECTION PANEL
UP TO 400kV FOR TRANSFORMER FEEDER

Control panel general arrangement

01. 3 nos. ammeter (digital/analogue)
02. 1 no. voltmeter (digital/analogue)
03. 7 position voltmeter selector switch
04. Multifunction meter (digital) [optional, if required]. A multifuntion can cover all kind of parameters like current, voltage, kW, kVAR, pF, Hz etc.
05. Overcurrent/earth fault relay (both in transformer & line feeder)
06. Differential/REF relay (only in transformer feeder)
07. Master trip relay (2 nos. in transformer feeder and 1 no. in line feeder)
08. Trip circuit supervision relay (2 nos. on each CRP)
09. Transformer auxiliary relay (1/2/3 nos. as per requirement, only on transformer feeder)
10. Local/remote switch
11. Annunciator (8/12/20 window)
12. Alarm
13. Test plug for relay (individual test plug for every O/C, E/F & differential relay)
14. Test terminal block for energy meter (if there is any energy meter)
15. Semaphore indicator (for isolator and earth switch)
16. Discrepancy switch (for VCB operation)
17. Energy meter (optional)
18. Breaker on lamp
19. Breaker off lamp
20. Spring charge lamp
21. DC available lamp
22. Trip circuit healthy lamp
23. Master trip relay reset push button (optional)
24. MCB (2A, 6A, 10 DP/TP)
25. Connector
26. Heater & thermostat
27. Air filter
28. Door lock
29. Name plate
30. Energypac logo

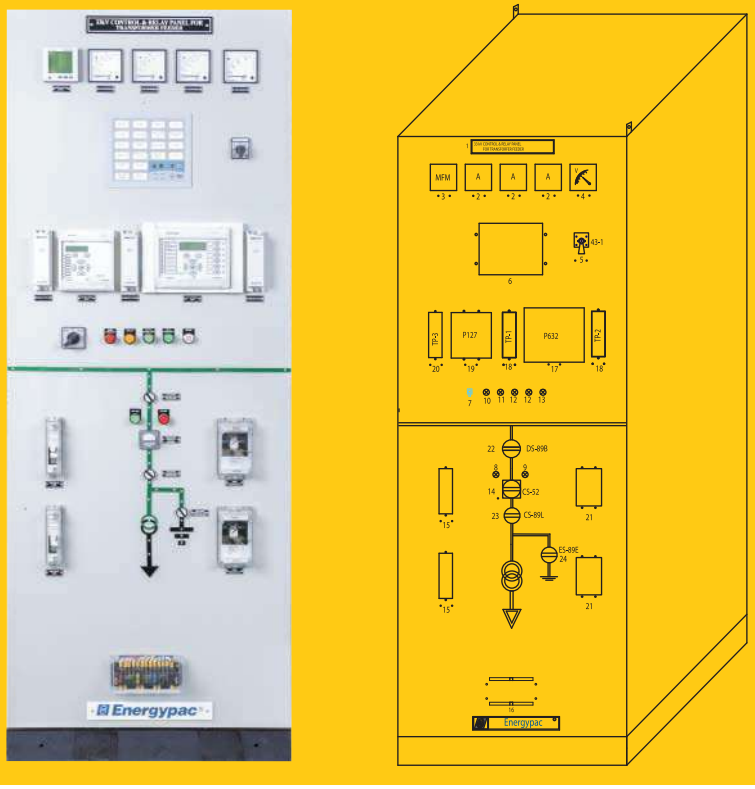

Fig: General arrangement of control panel

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CONTROL AND PROTECTION PANEL
UP TO 400kV FOR INCOMING & OUTGOING FEEDER

Incoming and outgoing feeder protection and control panel consists of control, protection, metering, monitoring of the bay. In the control panel equipment, we provide all kinds of metering like ammeter, voltmeter, energy meter etc. We also use standard annunciator module, discrepancy control switches, MIMIC indication and different control switches as per scheme requirements.

SCADA system is possible for incoming/outgoing CRPs also.

Features of Control & Relay Panel

1. Distance protection
2. Line differential protection
3. Overvoltage & undervoltage protection
4. Overcurrent & earth fault protection
5. Low & high impedance type busher protection
6. IEC & ANSI standard

*All the above features are as per client requirement

Protection system

IDMT-DMT directional, non-directional, over current, earth fault protection, line differential protection, distance protection, bay controling unit, synchronization, undervoltage, overvoltage protection.
We have been using above relay from the following manufacturer; Siemens/ Alstom/ Schneider/ SEL/ GE & ABB.

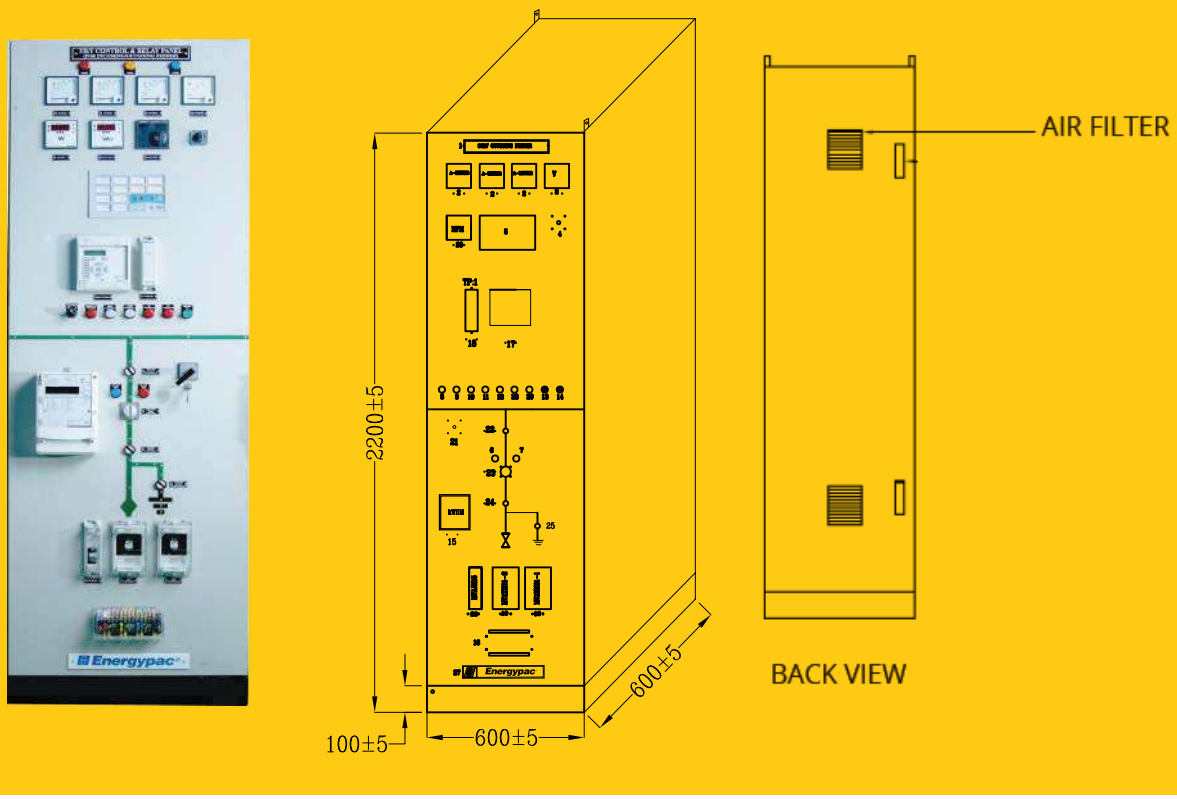

Fig: Incoming & outgoing feeder

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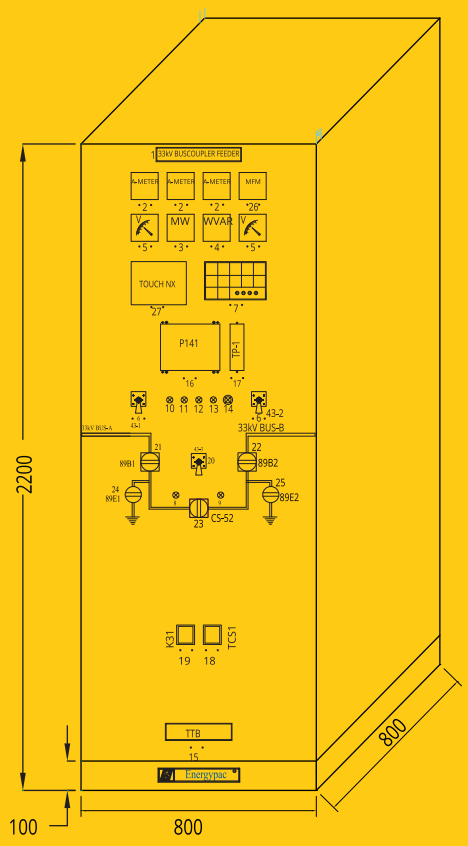
CONTROL AND PROTECTION PANEL
UP TO 400kV FOR BUS COUPLER

Bus coupler control and protection panel are used for control, monitoring and protection between two buses. The control panel contain all kinds of metering like ammeter, voltmeter etc. We also use standard annunciator module, discrepancy control switches, MIMIC indication and different control switches as per scheme requirements.

Protection systems:

Overcurrent and earth fault relay are used as protection purpose. A synchronizing check relay is provided when synchronization check for closing of two buses are required.



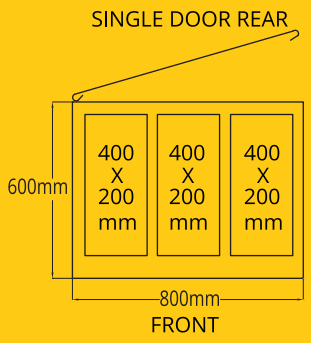


Fig: Bus coupler

BUSBAR PROTECTION PANEL

Busbar protection is a very vital protection in high voltage power system for monitoring, system stability and reliability. Busbar protections are available in high impedance and low impedance type.

We are manufacturing busbar protection panels as per requirements. Busbar protection relay are used for protection. We have supplied a great number of panels in the local utility companies like REB, PGCB, BPDB and various other local clients. Additionally. we have supplied a number of busbar protection panel to Nepal Electricity Authority (NEA).

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AUTOMATION PANEL (M-RTU)

This is a data collecting device that obtains data from the electric equipment's in the field, analyzes and sends it to the host part. This helps efficient processing of measurement and control functions.

Equipment composition and functions:

- System configuration and complete SAS
- Disturbance recorder and metering data analysis
- Remote transfer of data and remote operations via GPRS and optical network

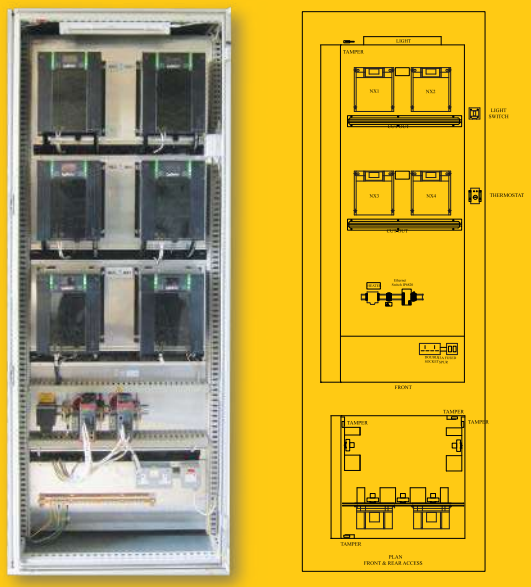

Fig: Automation panel

AC-DC DISTRIBUTION PANEL

Energypac manufactures AC & DC distribution panels with a wide range of circuit breakers of various ratings. We can provide a changeover scheme in AC-DC panel as per client requirement. Mainly, we can provide any ratings of miniature circuit breakers (MCB) as well as moulded case circuit breakers (MCCB) with three pole, double pole or single pole combinations. To distribute electricity in a lower voltage level such as 415V or 220V, these panels are the most suitable solutions.

DC distribution panel			
Enclosure	Thickness of sheet steel	mm	1.6-2 (approx.)
	Dimension	mm x mm x mm	600mm (W) x 600mm (D) x 2200mm (H)
	Weight	Kg	200-250 (Approx.)
MCCB/MCB	a) Manufacturer's name and country		ABB, EU

AC distribution panel			
Enclosure	Thickness of sheet steel (enclosure)	mm	1.6-2 (approx.)
	Standard dimension	mm x mm x mm	600mm (W) x 600mm (D) x 2200mm (H)
	Weight	Kg	200-250 (Approx.)
MCCB/MCB	a) Manufacturer's name and country		ABB, EU

⋆ Dimensions may vary according to the breaker numbers

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REMOTE TAP CHANGER CUBICLE

RTCC means remote tap changer control panel which can control the output of the transformer by a programmable device called AVR or manually through OLTC unit fitted in the transformer through control cables. It is a panel consisting of the AVR (Automatic Voltage Regulator), display for tap position, voltage, LEDs for raise and lower of taps relays, selector switches for auto manual selection etc. In auto mode, the voltage is controlled by the AVR. In manual mode, the operator can increase/decrease the voltage by changing the taps manually through the push button in the RTCC.

Energypac is manufacturing up to 230kV RTCC panels for up to 300 MVA transformers extensively and supplying a great number of panels in the local utility companies like REB, PGCB, BPDB as well as PWD and various local clients. Also, we have supplied a number of RTCC panels to Nepal Electricity Authority (NEA).

Fig: Remote tap changer cubicle

CRP = Control Relay Panel
MK = Marshalling Kiosk
VT JB = Voltage Transformer Junction Box

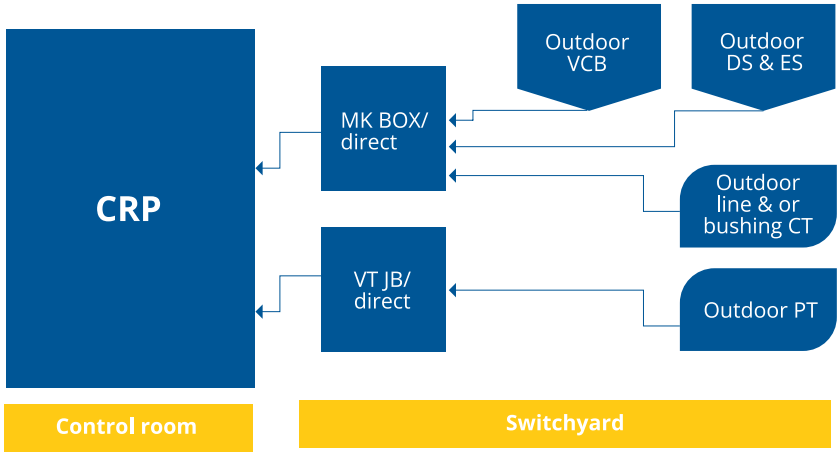

Fig: Block diagram of CRP connection

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EXPORT LEADER

IN RECOGNITION OF

GOLD MEDAL

NATIONAL EXPORT TROPHY FOR FISCAL YEARS
2016-17, 2017-18, 2018-19, 2019-20

ENERGYPAC ENGINEERING LIMITED IS PROUD TO BE AWARDED ITS FOURTH GOLD, NATIONAL EXPORT TROPHY FOR THE FISCAL YEAR 2019-2020 IN RECOGNITION OF ITS OUTSTANDING CONTRIBUTION IN THE HIGHEST EXPORT OF ELECTRIC AND ELECTRONIC PRODUCTS.

Energypac® Engineering

crafted with pride

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2. Wait for camera to recognize and scan QR code

3. Click proceed or view QR code details, when appears

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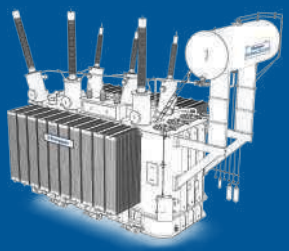


POWER TRANSFORMER

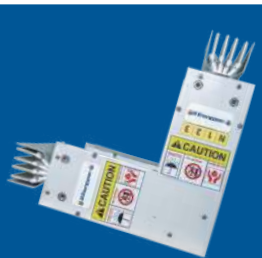
DISTRIBUTION TRANSFORMER
(OIL FILLED)

DISTRIBUTION TRANSFORMER
(DRY TYPE)

INSTRUMENT TRANSFORMER

VACUUM CIRCUIT BREAKER

SWITCHGEAR



BUSBAR TRUNKING SYSTEM

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