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TVR AUTOMATIC THREE PHASE VOLTAGE REGULATOR

PRODUCT CATALOG

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ISO9001&ISO14001



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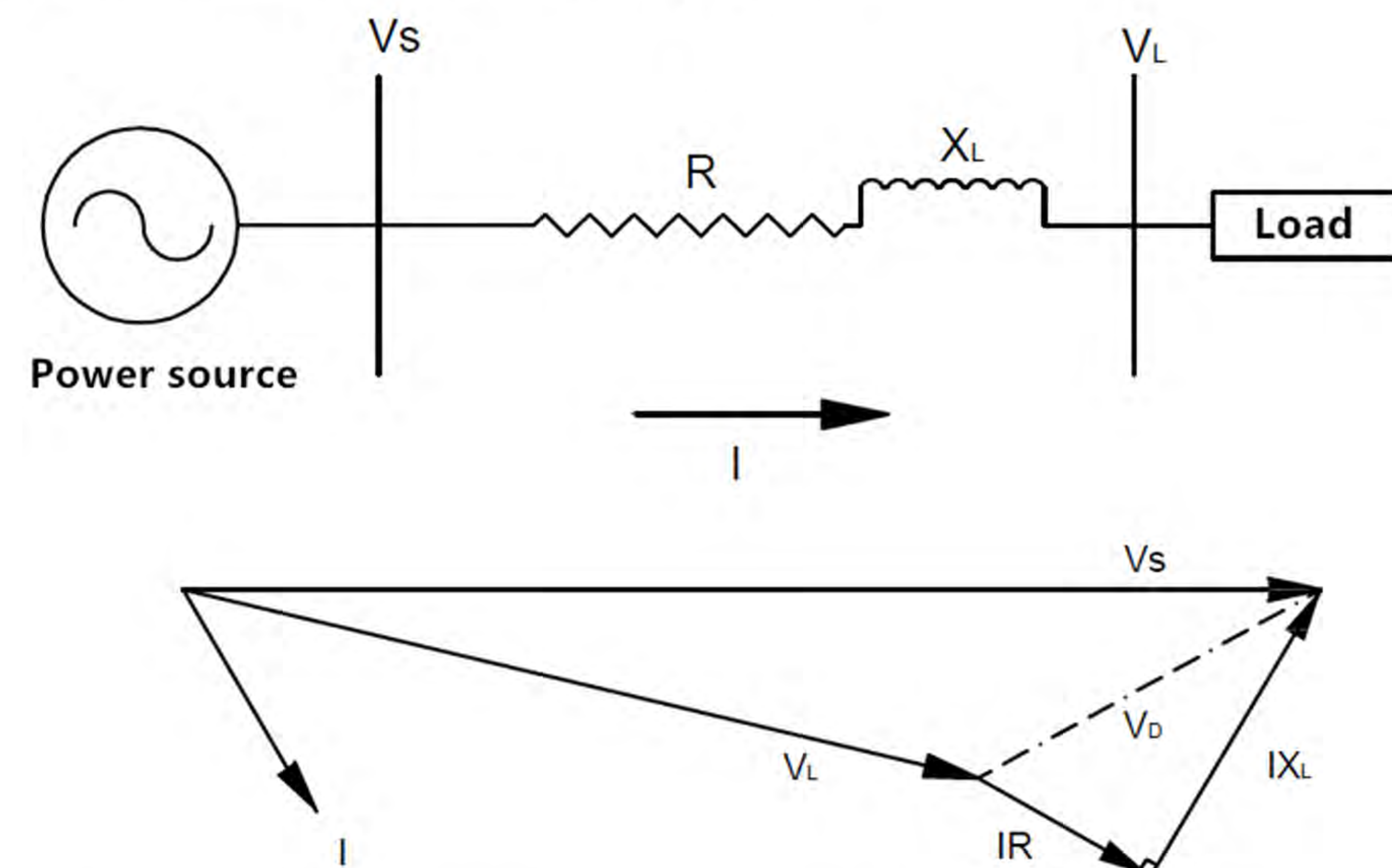
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TVR-Line
voltage regulator
voltage booster



General

Ideally the distribution lines should be able to keep the whole line of constant voltage, but in actual, the impedance of the distribution line will result in that the voltage of end and terminal is not same(Figure 1). The actual voltage from the rated voltage of the circuit size is an important measure of power quality, also is a important guarantee of power supply reliability and voltage quality.



Since the line voltage can not be kept constant, when the actual voltage levels exceed the normal range of fluctuation of voltage allowed, it will seriously affect the normal use of the system and electrical equipment.

Electric power system : Low voltage will affect the power supply equipment output, reducing supply reliability, but also affect their own economic power, voltage drops particularly severe, even voltage collapse may occur, the frequency of loss and blackouts and other incidents

Electric equipment : Voltage quality have an impact on safe and economic operation of various types of equipment such as the asynchronous motor, for example, if the voltage decreases, the voltage will reduce torque so that the slip is increased, so that the stator and rotor current significantly increases, resulting in motor temperature liter rise, possibly even burning motor; on the contrary, when the voltage is too high, due to the excitation current and iron loss greatly increased, resulting in motor overheating, efficiency is reduced.

Low voltage will affect the use of incandescent lamps. Voltage 10% lower than the rated voltage, incandescent light flux is reduced by 30% higher voltage than the rated voltage of 10%, the lamp life is reduced by half.

Low voltage will also affect the air conditioning running, cell phone charger, TV signal reception and other problems.

Power system losses : In conveying power certain time, the square of system losses and operating voltage, if the voltage decreases, the current increases and the loss, the loss will become larger system

3、WORK PRINCIPLE :

TVR-line voltage regulator is a special design autotransformer with on-load tap changer, it can automatically "monitoring" and smoothly adjusts the output voltage, and also guarantee the output voltage within the voltage requirement. 27 taps regulation can meet every step 0.75% regulation accuracy. See blow figure 5

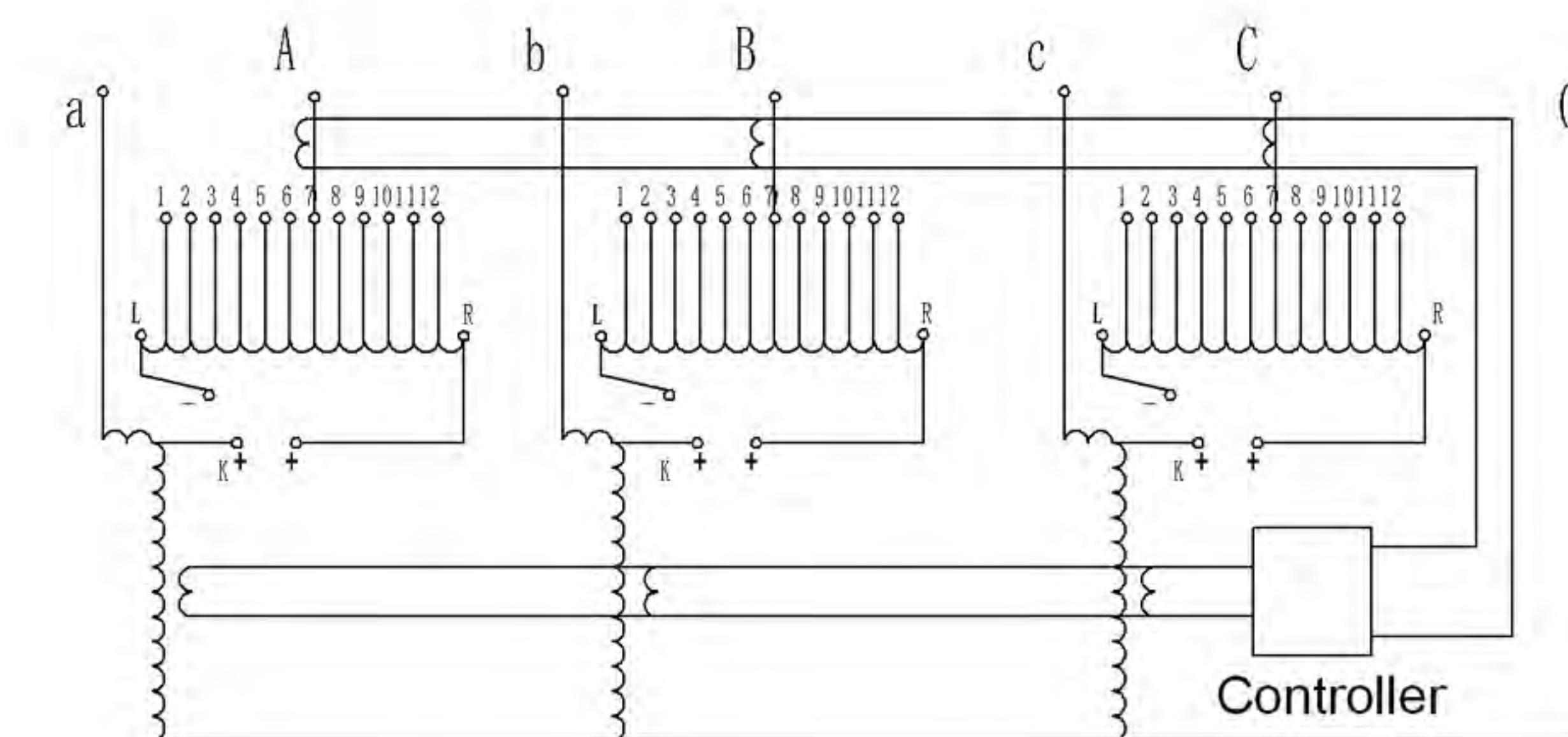


Figure 5 : work principle

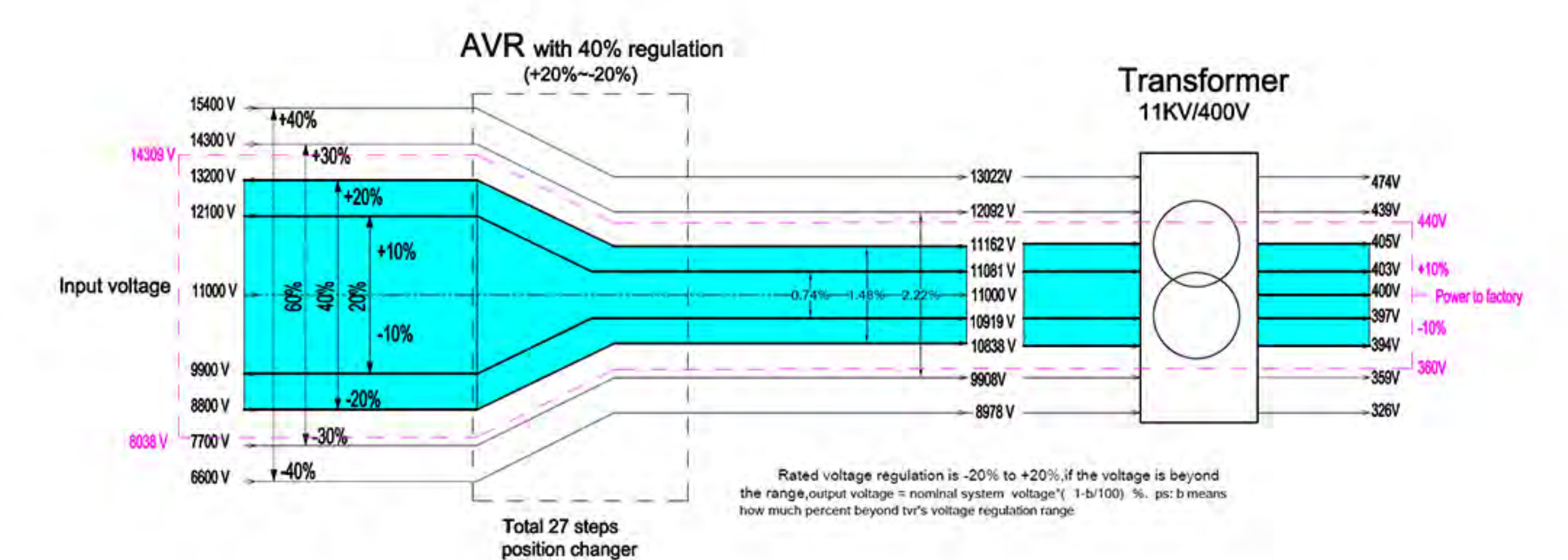


Figure 6. AVR Utility sample

In Figure 6, is an utility sample for a factory which require 400V electric power, but the power line is not stably in the summer because the load is 120% of rated capacity, so the power to the factory is lower than 360V, all the electric equipments in the factory can not use. After install Farady auto voltage regulator, it can adjust the power line voltage from 8038V to 11000V and keep it stable with 2% accuracy , so the power to factory can be keep at 400V(±8V accuracy).

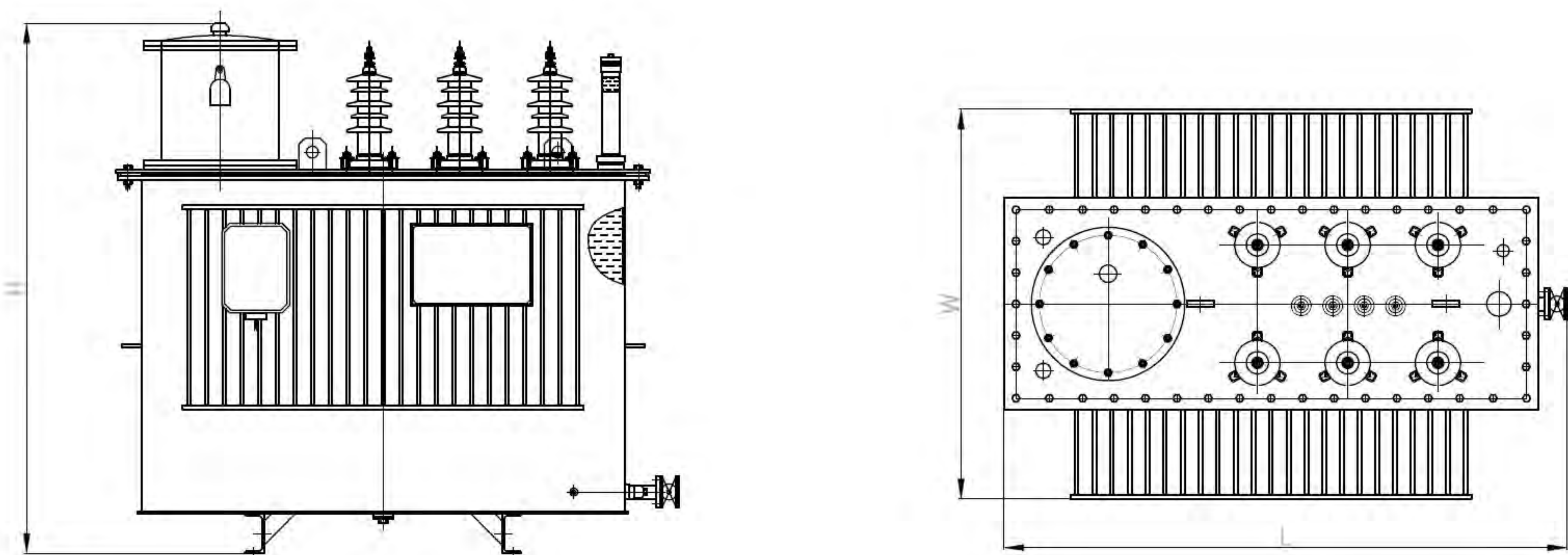
4、WORK CONDITION

- (1) Below 3000 meter ; (special altitude can be customized)
- (2) Work temperature: -25°C-65°C(special temperature can be customized)
- (3) Monthly humidity less than (25°C) 90% in 25°C
- (4) Pollution class : III class
- (5) Rating voltage : 11/22/33kV or customized
- (6) Rating capacity : 500kVA ~ 6300kVA
- (7) Frequency : 50/60Hz

- (8) Vector group : 3phase 3 wire single winding star/delta
- (9) tap change selector : 9/11/13/17/27/32 position
- (10) Cooling method : ONAN
- (11) PT : 10000/100V 50VA ;
- (12) CT : XXX/1A , 2 meter method ;
- (13) third winding rating voltage : 220V ;
- (14) regulator range : (-10% ~ +10%) , (-5% ~ +15%) , (0 ~ +20%) (0 ~ +30%) or customized

5、TECHNICAL SPECIFICATION

Transmission line use



Weights and dimensions are for reference only, and not for construction purposes. For exact dimensions, please contact Farady Electric co.,Ltd

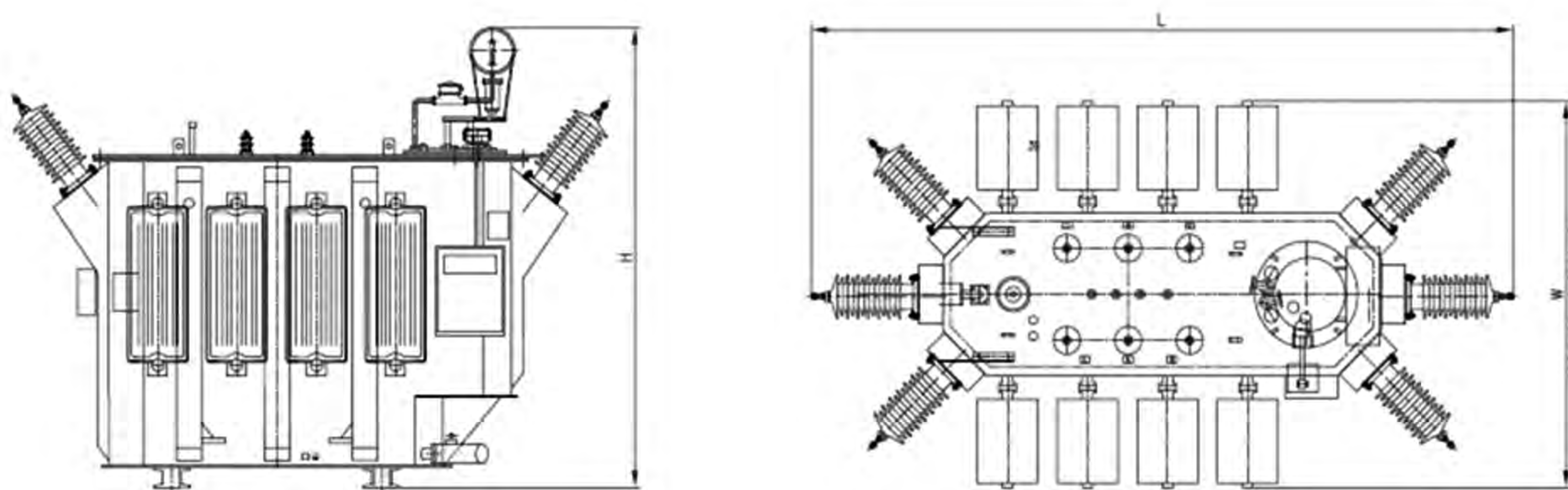
Technical Chart (50Hz/60Hz)

Line voltage	Power line capacity	Dimensions			Total weight
kV	kVA	Length (mm)	Width (mm)	Height (mm)	kGs
10~15kV (0%~±20% Regulation range)	1000	1760	960	1350	810
	2000	2050	1150	1350	1340
	3000	2200	1200	1400	1830
	4000	2350	1400	1450	2250
	5000	2455	1450	1490	2555
20~24kV (0%~±20% Regulation range)	6300	2485	1500	1490	3150
	1000	1910	1152	1450	920
	2000	2200	1380	1500	1550
	3000	2350	1440	1550	2150
	4000	2500	1500	1600	2600
30~35kV (0%~±20% Regulation range)	5000	2605	1500	1640	2950
	6300	2635	1550	1640	3465
	1000	2060	1302	1070	1070
	2000	2350	1530	1770	1770
	3000	2500	1590	2415	2415
	4000	2650	1650	2970	2970
	5000	2755	1650	3375	3375
	6300	2785	1700	4160	4160

Special design for custom please contact FARADY technical department.

TECHNICAL SPECIFICATION

Power Substation use



Weights and dimensions are for reference only, and not for construction purposes. For exact dimensions, please contact Farady Electric co.,Ltd

Technical Chart (50Hz/60Hz)

Line voltage	Power line capacity	Dimensions			Total weight
kV	MVA	Length (mm)	Width (mm)	Height (mm)	kGs
10~15kV (-20%~±20% Regulation range)	8	2200	2000	2500	6000
	10	2800	2200	2500	9000
	15	3000	2200	2600	14000
	20	3200	2800	3000	16000
	30	4000	3000	3000	18000
20~24kV (-20%~±20% Regulation range)	8	2800	2200	2500	8000
	10	3000	2200	2600	10000
	15	3200	2800	3000	16000
	20	4000	3000	3000	18000
	30	4300	3200	3500	20000
30~35kV (-20%~±20% Regulation range)	8	3000	2200	2600	10000
	10	3200	2800	3000	12000
	15	4000	3000	3000	18000
	20	4300	3200	3500	22000
	30	4500	3500	3500	25000

6.VOLTAGE REGULATOR STRUCTURE



6.1 ON LOAD TAP CHANGER

VACUUM TYPE ON LOAD TAP CHANGER

Regulator Vacuum type On load tap changer is of selector switch structure, which combines the functions of diverter and selector. The tap changer is mounted to the transformer tank cover by its head. When the tap changer is used without a change-over selector, the maximum operating positions available is 12, and it is up to 23 positions if with a change-over selector. APP material, popular mainstream material download service, thousand map network with its unique positioning and new operation mode, in the leading position of material website.

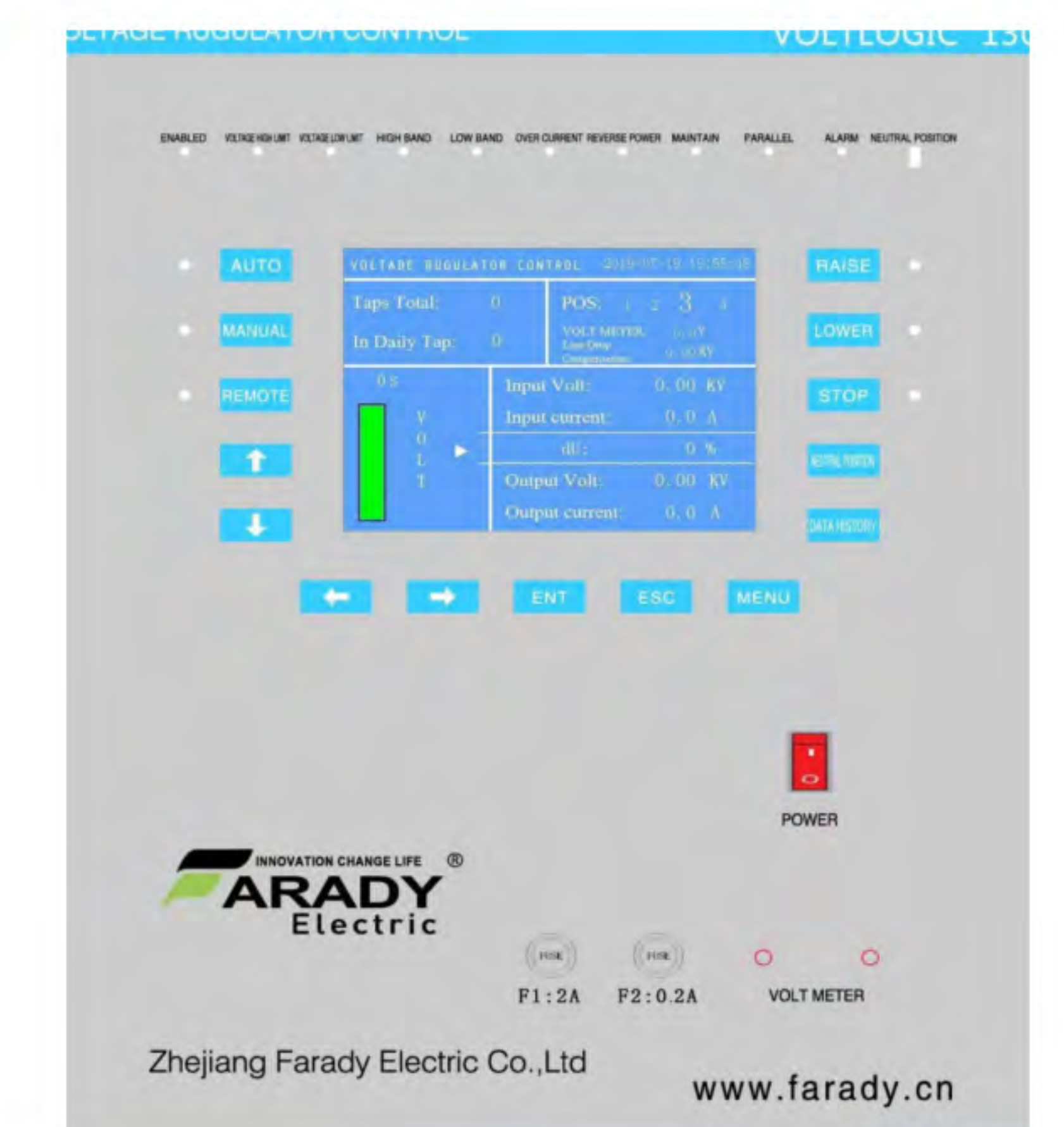
- 1.Maintenance-free up to 100,000 tap-change operations with no time component.
- 2.Exchange of the diverter switch insert after 1.2 million tap-change operations
- 3.Intended for selected alternative insulating fluids
- 4.Intended for operation in earthquake-prone areas
- 5.Max current up to 600A
- 6.Max voltage up to 145kV
- 7.Max positions up to 23

OIL IMMERSED TYPE ON LOAD TAP CHANGER

Oil immersed type Changer is a typical combined-structure tap changer applicable in oil-immersed transformer, comprising of two major parts: diverter switch and tap selector. The OLTC is put in transformer oil tank and its diverter switch has a separate oil compartment from transformer tank, while tap selector, together with transformer windings, is completely laid inside the tank. OLTC's installation is divided into two types - standard tank flange and bell-type flange.

- 1.Electrical life arrives 50000 times.
- 2.Mechanical life arrives 500000 times.
- 3.Max current up to 400A
- 4.Max voltage up to 35kV
- 5.Max positions up to 23
- 6.The contact resistance between joins not bigger than 500 $\mu\Omega$.
- 7.Cheaper than Vacuum type tap changer

7、 INTELLIGENT CONTROLLER



- 7.1 High accuracy:27 taps regulation in rated range
- 7.2 Long work life:Unique tap changer designed to avoid arcing ,the regulator can ensure the operating life of nearly a million times.
- 7.3 Maintenance-free:All sealing design□high IP protection degree□whole life maintenance-free
- 7.4 Flexible:Flexible mounting within the lines and substations, exit the operation and the opening and closing function when necessary.
- 7.5 Good function:Through RS232 adapter of controller, SCADA distribution automation
- 7.6 Low loss:Design to maximize the reduction of iron loss , reduce load loss.
- 7.7 Economic:Economically effective voltage regulation circuit, a significant reduction in line losses and extended equipment life.

8.FK FUNCTION FEATURES

- 8.1 Friendly user interface, can easily modify the settings and browse online data
- 8.2 Easy to set the voltage ,bandwidth, delay and offset voltage
- 8.3 Measurement of various data: load voltage, load current, apparent power, reactive power, power factor and so on.
- 8.4 Can be realized according to power flow direction, forward and reverse automatic voltage regulator (for ring network power supply), the completion of all the feature
- 8.5 Provide user RS232,RS485 data interface , can be long range remote control, telemetry, automation of distribution network
- 8.6 With a variety of communication protocols, it can be directly and master communication, no need to add RTU (FTU) devices.

09 PROJECT



10 INSTALLATION

