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Environment Conservation
ENTEC E&E

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Solid Insulated Vacuum Recloser for power distribution system thru 15.5kV, 27kV and 38kV

Version 4.2

ENTEC
ELECTRIC & ELECTRONIC CO., LTD.

General features

ENTEC Single/Three Phase Solid Insulated Recloser (EPRIS/EPR-1, EPR-2 and EPR-3) have proven its advance technology as reliable and maintenance-free product designed for using on overhead lines as well as substation application for all voltage up to 15.5kV, 27kV and 38kV.
Main mechanism of solid recloser is magnetic actuator, and bushing material is made of HCEP (Hydrophobic Cycloaliphatic Epoxy Resin). It is fully encapsulated with vacuum interrupters.
Recloser is protected with Stainless-Steel Material Enclosure and able to be used where tropical, moderate and severe humidity area with corrosion resistance. ENTEC control consists of RTU(Remote Terminal Unit)in one control cubicle with space for modem.
Also, ENTEC Recloser have been fully type-tested at the accredited laboratory such as KEMA, CESI or KERI according to International Standard ANSI 37.60 and IEEE 62271-111.

HECP (Hydrophobic Cycloaliphatic Epoxy)

- Advanced Outdoor Solid Dielectric Material
- Proven Performance in heavily polluted area
- Environment-Friendly, Oil/SF_6 Gas Free
- Reliable and Enhanced Life Expectancy
- Superior Surface Arc Tracking Resistance
- UV Protection, Resistant to Vandalism
- Complied with ANSI standard requirement for contamination Requirements for creepage / leakage distance

Installation Environment

- Pole Mounting/Substation Available
- All accessories included such as Control Power cable, Mounting bracket etc
- Operating Temperature: -40°C to 80°C
- Altitude : up to 3000M

※ Remarks: Altitude above 1000m should be corrected in accordance with ANSI C37.60 – 2012.

Magnetic Actuator

- Guarantee 10,000 operation time
- Eliminate mechanical latches
- Minimized moving components and reliable maintenance free
- Reduced Installation and Operating Cost

Other Technical Features

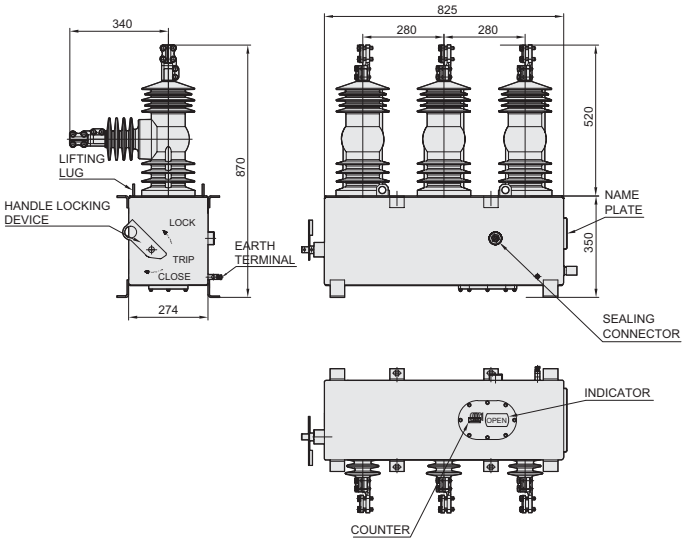
- RVD: Resistive Voltage Sensor(1%)
  CVD: Capacitive Voltage Sensor(2.5%)
- Manual Trip Operation Available
- In case of loss of control power, over hundreds of open/close operations with fully charged battery(18AH/30HOURS)
- Various CT Ratio available

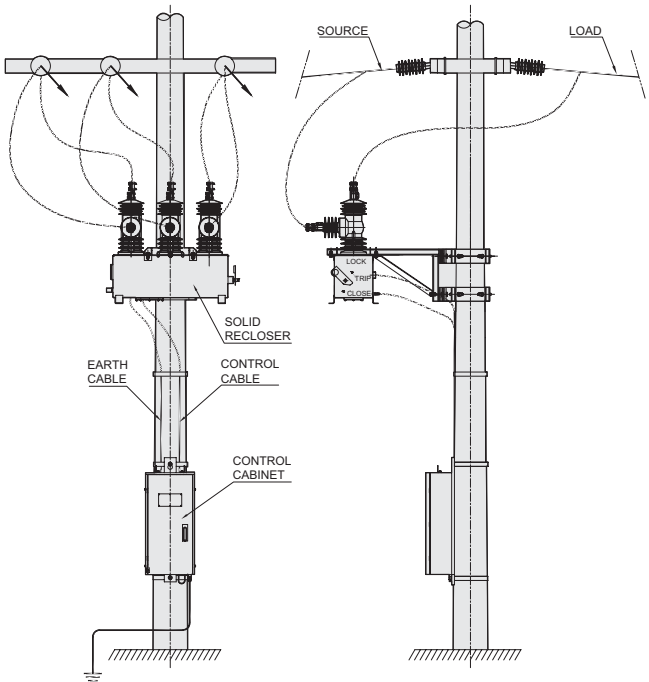
Installation Pictures



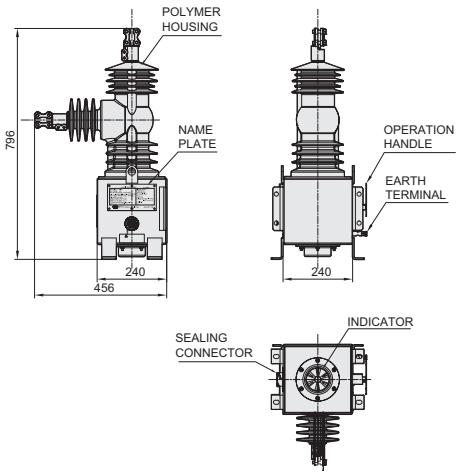

Installation Drawing

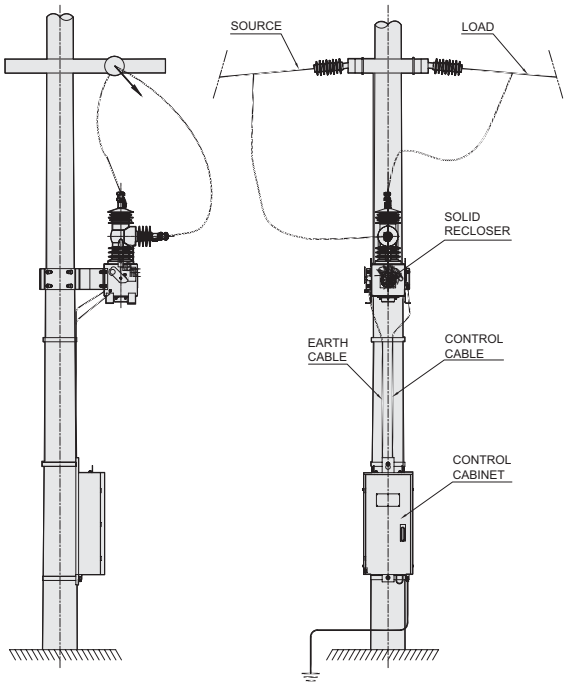
Three Phase Solid Recloser





Single Phase Solid Recloser





Microprocessor Based Recloser Control EVRC2A-NT

Features

EVRC2A-NT cubicle

- Reduced distribution automation costs
- RTU and control mounted in one control cubicle with space for modem
- DNP 3.0, MODBUS, IEC60870-5-101/104 communication protocols and SCADA capability
- 12Vdc ~ 24Vdc auxiliary power available for modem
- Voltage, current and power metering
- Record of operation, fault waveform data for line and load profile data
- Uninterruptable power supply with trip and close
- Inner heat insulation for polyurethane foaming
- Microsoft Windows-based ETIMS interface software
- Monitoring of Power Quality Management (PQM) - Supply Outage, Sag, Swell, Unbalance and Harmonics
- Monitoring of recloser contact maintenance (contact wear & trip count)
- Live Load Blocking

Protections

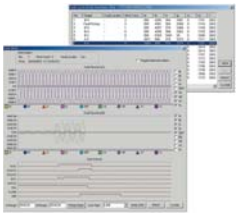
- User TCC construction capability
- Time synchronization and Position Information by time synchronization module (GPS/IRIG) support
- Curve Type: IEEE, IEC, ESB, McGraw-Edison, User Programmable Curve
- Protective settings in nonvolatile memory
- Delay time overcurrent protection(51P, 51G)
- Instantaneous overcurrent protection(50P, 50G)
- Negative sequence overcurrent protection(46)
- SEF protection
- Source and load side synchronism check
- Cold load pickup and sequence coordination
- Under/Over-frequency and load shedding(81)
- Under/Over-voltage, detection and alarm(27,59)
- Directional controls(67)
- Fault Locator
- Hotline Tag
- Loss of phase
- Loop control Function

Measuring

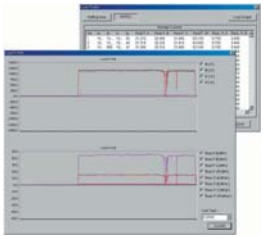
- Current
- Voltage (Source Side & Load Side)
- Measures KW, KWH, power factor, demand Watts, VARs, frequency and Energy
- Load profile data & oscillogram
- Unbalance & Harmonics

Remote Communication

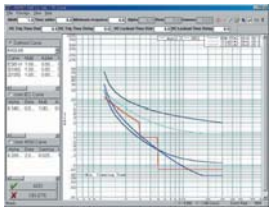
- RS-232 & 485 ports, RJ45(TCP/IP)
- DNP3.0, MODBUS, IEC60870-5-101/104
- Complete remotely access for Operations settings, meterings and data records
- SMS, Bluetooth, Fiber Optic available



Fault events & 15 Cycles waveform



Average load profile & waveform



Editor for TCC modification

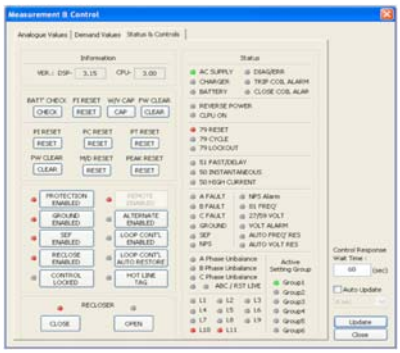
Microprocessor Based Recloser Control ETR300-R

ETR300-R includes common features associated with EVRC2A-NT and provides more enhanced functions in protection, monitoring, metering, communication and recording. ETR300-R can also support your power distribution system to be more reliable with power quality management (PQM) function.

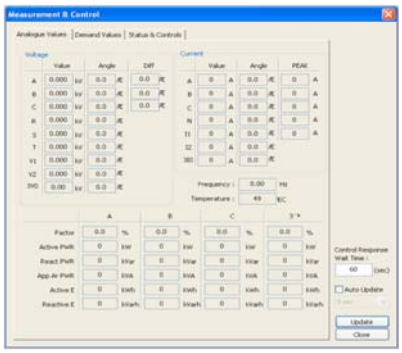
Enhanced features

- Analysis of current/voltage normal & negative sequence for power quality monitoring.
- Recording of PQM with fault waveform of 32 events with Max 20 cycles.
- Harmonics analysis of electric data. (THD/TDD content ratio)
- Monitoring of Sag, Swell, Interruption, Over & Under voltage, Unbalance, Over & Under Frequency, Harmonics and etc.
- Improvement of fault detection algorithm
- Improved measuring accuracy
- Multi-Protocol support. (DNP3.0, MODBUS, IEC60870-5-101/104 & IEC61850)
- User programmable logic(PLC) support
- Alarm Current Monitoring.
- Loop control

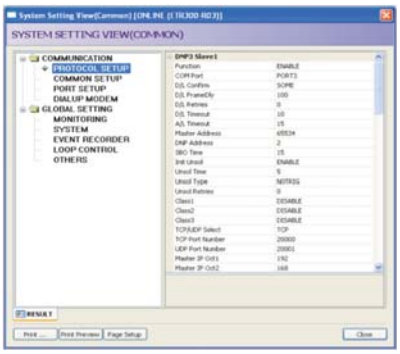
ETR 300-R cubicle



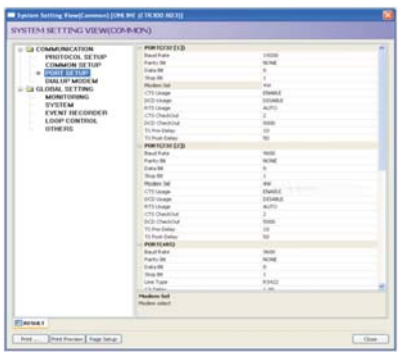
Analogue Value



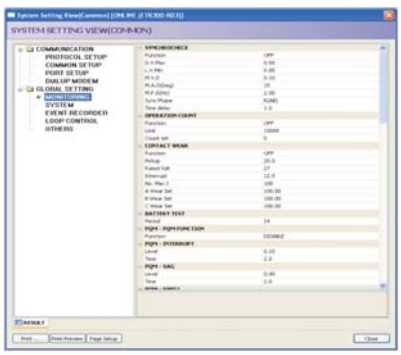
Status and Controls



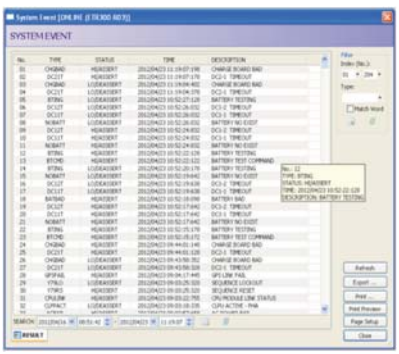
System Setting View



Setting Change



Monitoring Elements



System Event

Control Technical Specifications

RATINGS

Rated frequency	50 / 60 Hz
Control voltage	110-240VAC / 125VDC(Option)

ENVIRONMENTAL

Operating temperature	-40℃ to +80℃
Humidity	99%
Degree of protection	Box (IP55), Electronic elements (IP65)
Insulation test voltage	2kV 50/60Hz, One minute
Impulse voltage withstand	6kV Peak, 1.2/50μs ANSI C62.45, IEC 61000-4-5
Interference test withstand	SWC ANSI C37.90.1, IEC 61000-4-4
Radio frequency interference	IEC 255-22-3 Class III, ANSI C37.90.2

GENERAL PROTECTION (CT ratio 1000:1A)

Phase time overcurrent	10 to 1,600 Amps in steps of 1A
Phase instantaneous overcurrent	10 to 20,000 Amps in steps of 1A
Ground time overcurrent	10 to 1,600 Amps in steps of 1A
Ground instantaneous overcurrent	10 to 20,000 Amps in steps of 1A
Sensitive earth fault(SEF)	1 to 160 Amps in steps of 1A
Phase and ground time curves	IEEE C37.112, IEC255-3, User programmable curves non standard inverse time curves

RECLOSE

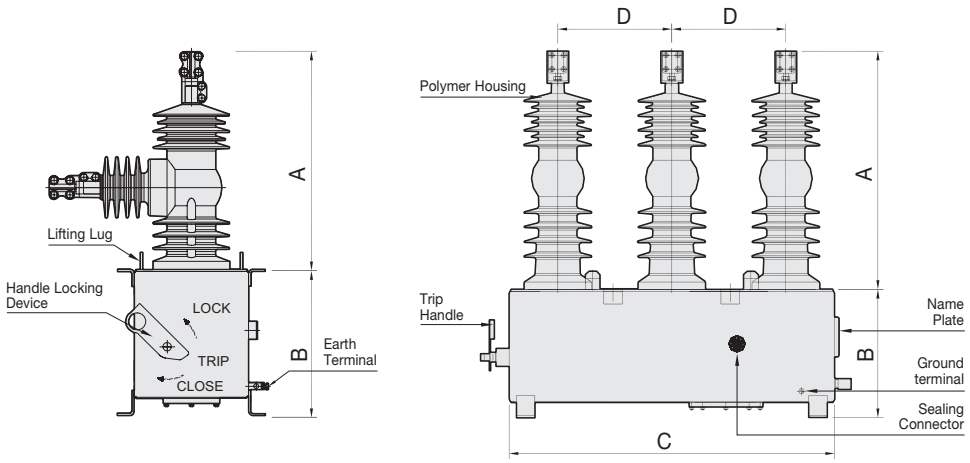
Reclose times	Programmable from 1 to 4
Reclosing(Dead) times	1st reclose : 0.3-600 sec in 0.01sec steps 2nd reclose : 1.0-600 sec in 0.01sec steps 3rd reclose : 1.0-600 sec in 0.01sec steps 4th reclose : 1.0-600 sec in 0.01sec steps
Reset (Reclaim) times	1 to 600 sec in 0.01 sec steps

METERING (At rated voltage and current)

	CVD	RVD
Current	±1%	±1%
Voltage	±2.5%	±1%
Watt hours	±5%	±2%
Vars hours	±3%	±2%
Demands	±3%	±2.5%
Power factor	±0.05	±0.02
Frequency	±0.05Hz	±0.02Hz

RECORDING	EVRC2A-NT	ETR300-R
Waveform capture	Last 32 events with 15 cycles &	Last 32 events with Max 20 cycles
System event	Last 2048 events	Last 2048 events
Diagnostic event	Last 512 events	Last 512 events
Fault event	Last 512 events	Last 256 events
Load profile	Last 5120 events, 213 days/60Min. (5, 10, 15, 20, 30, 60, min interval)	Last 6144 events, 256 days / 60Min. (5, 10, 15, 20, 30, 60min interval)
PQM	Last 512 events	Last 512 events
Fault events	Last 512 events	Last 256 events
Operation events		Last 256 events
Set Change events		Last 100 events
Alarm Current event		Last 512 events
Counter	Trip, fault, system restart, PQM	Trip, fault, system restart, PQM
Recloser wear	Phase A,B,C	Phase A,B,C

Recloser Lay-Out



Recloser Lay-Out

Dimension

kV	A	B	C	D
15.5(1 phase)	435	350	240	-
15.5(3 phase)	435	350	825	280
27 (12.5kA/16kA)	710	350	885	310
38	784	350	965	350

Electrical ratings

Description	Unit	EPRIS	EPR-1	EPR-2	EPR-2-16	EPR-3
		Single Phase	Three Phase			
Rated maximum voltage	kV rms	15.5	15.5	27		38
Continuous current	A rms	630	630	630	630/800	800
Frequency	Hz	50/60	50/60	50/60	50/60	50/60
Short circuit interrupting current	kA rms	16	16	12.5	16	16
Short time withstand current. 3sec	kA rms	16	16	12.5	16	16
Making current	kA peak	41.6	41.6	32.5	41.6	41.6
Cable charging interrupting current	A rms	10	10	25		40
Line charging interrupting current	A rms	2	2	5		5
Basic impulse withstand voltage	kV crest	110	110	150		170
Power frequency withstand voltage, dry	kV	50	50	60		70
Power frequency withstand voltage, wet	kV	45	45	50		60
-Operating control voltage	110-240VAC/125VDC(Option)					
-Operating temperature	℃	-40 to + 80				
-Degree of protection		IP 65				
-Maximum mechanical and electrical operations (c-o)	Number	10,000				
International Standard : ANSI 37.60, IEC 62271-111						

※ Other ratings are available upon request.
※ ENTEC reserves the right to change the design and specification without notice

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