

# R603

Load Break Switch Controller



## Hardware

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### CPU

Dual Core 32M512

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### Memory

Non Volatile Memory : 4 Mbytes Flash Memory

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### 24-bit A/D Converter

Sampling Rate : 64 Samples / Cycle

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## HMI

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### Display

160\*160 Graphic Lcd (B/W)

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### Keyboard

12 Button

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### Indicator

27 LED Indicator

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## Communication Port

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### Serial Port

Front Panel : HMI Connection

Side Panel : DNP3.0, IEC60870-5-101/104, AES 128 Supporting

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### Ethernet

DNP3.0, IEC 60870-5-101/104, HMI Connection, AES128 Supporting

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### RS485

Modbus RTU

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## Digital Input

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### 10 Points

Open, Close, Mechanical Locked, Gas Low, Door Open, etc.

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### Opto-Isolation

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### Debounce

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### Chattering

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## Digital Output

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### 5 Points

Open, Close, Battery Test, Dummy, Reserve

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### Dry Relay

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## Analog Input

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### 10 Points

6 Voltage (A,B,C/R,S,T)

4 Current (A,B,C,N)

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## Measurement

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### Voltage

Source, Load  
Phase, Line  
True RMS, Fundamental Harmonic & 2<sup>nd</sup> Harmonic

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### Current

Phase, Neutral, Calculated Neutral, Average  
True RMS, Fundamental Harmonic & 2<sup>nd</sup> Harmonic

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### Power Active

Phase, Total

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### Power Reactive

Phase, Total

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### Power Apparent

Phase, Total

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### Power Factor

Phase, Average

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### Frequency

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### Temperature

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## Power Quality Monitoring

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### Sag, Swell, Interruption Detection

Status  
Events : Time stamp, Magnitude, Duration  
Counters : Statistics For Each Phase, Duration Classified by IEEE 1159.  
Waveform Recording On Events

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### THD

Voltage  
Current

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### Unbalance

Voltage  
Current

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### Displacement Power Factor

Phase, Average

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### Sequence Components

Voltage  
Current

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### Harmonic

2<sup>nd</sup> 31<sup>st</sup> Harmonic (Odd/Even)

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## Demand

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### Block Interval

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### Parameter

Phase Current, Neutral  
Active Power (Phase, Total)  
Reactive Power (Phase, Total)

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## Energy Metering

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### 4-Quadrant Metering, Import / Export Active Energy, Inductive / Capacitive Energy

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### Reset Time

Scheduled : Weekly, Monthly

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## Status Monitoring

Open/Close
Mechanical Locked
Gas pressure Low
Door Open
External AC Power
Fault Indicator Ia, Ib, Ic, In SEF
Voltage Indicator Source, Load
Sectionalizer Function Trip
Sync. Fail
Fault Reset
Controller Status(Battery & Battery Charger Test Result) Battery Status (Normal, Week, Fail) Battery Voltage Test Battery voltage Charger Status Charger Voltage Battery Test
Control Status Operator Place (Local/Remote) Control Lock / Unlock
Switch Control Operator Place : Remote, Local (Front Panel/PC Tool) Interlocks : Control Lock, Gas Low, Mechanical Lock, Current Switch Close interlock Conditions (Selective) : Live Load, Phase Sync. Fail
SBO (Select Before Operate) Secure Switch Operation SBO Timeout (Settable)

## Fault Detection

Over Current Phase Ground
SEF (Sensitive Earth Fault) Detection
NPS (Negative Phase Sequence) Detection
Cold Load Protection (Pickup Adjustment)
Synchronism Check
Direction Detection
2 <sup>nd</sup> Harmonic Detection
Open Line Detection
Over Voltage
Under Voltage
Over Frequency
Under Frequency
Auto Sectionalizing
Analog Hi/Low Alarm

## Event/Fault Recording

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### Event History Buffers Are Categorized by Group

Fault Current Events  
Switching Events  
PQM Events  
Counter Input

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### Fault waveform Recording

8 Faults, 6 PQM Waveforms Can be Stored On Non Volatile Memory  
64 Samples/Cycle, 20Cycle

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## Auxiliary Function

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PC Software For Setting & Maintenance

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Waveform Evaluation Software

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Firmware Upgradable

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## Accuracy

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Voltage

±0.5 %

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Current

±0.5 %

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Power Factor

±0.5%

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Power (Active, Reactive, Apparent)

±1%

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Energy (Active, Reactive)

±4%

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Frequency

±0.02%

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## Ac Rating

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Network Frequency

50/60 HZ

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Rated Voltage

1000 – 40000 V

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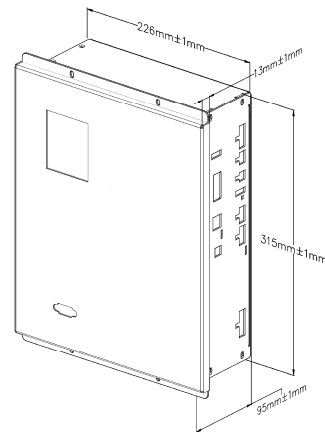
CT Ratio

100 – 5000 A

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## Installation

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## Environment Conditions

Operating temperature

-25 ~ +70 °C

Humidity < 95% RH

Altitude < 2000m

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## Standard

Insulation resistance	IEC 60255-27
Impulse voltage	IEC 60255-27
Insulation surface	IEC 60255-27
Electrostatic discharge immunity test	IEC 61000-4-2
Radiated, radio-frequency, electromagnetic field immunity	IEC 61000-4-3
Fast transient noise	IEC 61000-4-4
Impulse Surge	IEC 61000-4-5
Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6
Power frequency magnetic field immunity test	IEC 61000-4-8
Damped oscillatory wave immunity test	IEC 61000-4-18
Voltage dips, short interruptions and voltage variations on DC	IEC 61000-4-29
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6
NPS (Negative Phase Sequence)	IEC 60255-151
SEF (Sensitive Earth Fault)	IEC 60255-151
Phase Sync	IEC 60255-151
Digital Output Test	
Select Before Operate (SBO)	IEEE C37.1
Monitor output command	IEEE C37.1
Test the activation time of a digital output	IEEE C37.1
Debounce	IEEE C37.1
Chattering	IEEE C37.1
Burden	IEEE C37.1
Over Input Signal Rating	IEEE C37.1
Maximum Operating Common mode Voltage	IEEE C37.1
Common mode Rejection Ratio	IEEE C37.1
Positive Ground Protection	IEEE C37.1
Reverse Polarity	IEEE C37.1
Over load Protection	IEEE C37.1
Short Circuit Protection	IEEE C37.1
CISPR22	