

NOJA POWER[®]

Empower the world.



RC20

RECLOSER CONTROL SYSTEM

Security in Reliability
The Ultimate Recloser Control

PRODUCT GUIDE

RC20, RC20-4GA AND RC20-4GB MODELS





PRODUCT OVERVIEW

Driven by widespread uptake of distributed generation, utility big data and cybersecurity compliance, the NOJA Power RC20 represents the benchmark for cybersecure switchgear control devices. With integrated Synchrophasors, Hardware Cryptographic Accelerators and RTU communications, the RC20 Recloser Control provides Power Systems Engineers with a future-proof platform to handle the challenges of the evolving electricity distribution grid.

A comprehensive suite of protection functionality is included as standard, augmented by high resolution data capture and reporting, providing unparalleled visibility and control and solving both traditional and emergent distribution protection, control and automation applications. The NOJA Power RC20 is the future-proofing choice of controller in the NOJA Power OSM Recloser System.

YOUR BENEFITS

- » Comprehensive Protection, Automation and Control Relay System for NOJA Power® Reclosers
- » Hardware Cryptography and Cybersecure System
- » Extensive Data Acquisition, Phasor Measurement Unit (PMU) and Reporting Capability on GPS Enabled RC20

SUMMARY OF APPLICATIONS

The RC20 is the flagship Controller for NOJA Power’s OSM Series Reclosers. Deployed as a system, the OSM Recloser with RC20 control has a wide range of Distribution Network applications up to 38kV. Applications include:

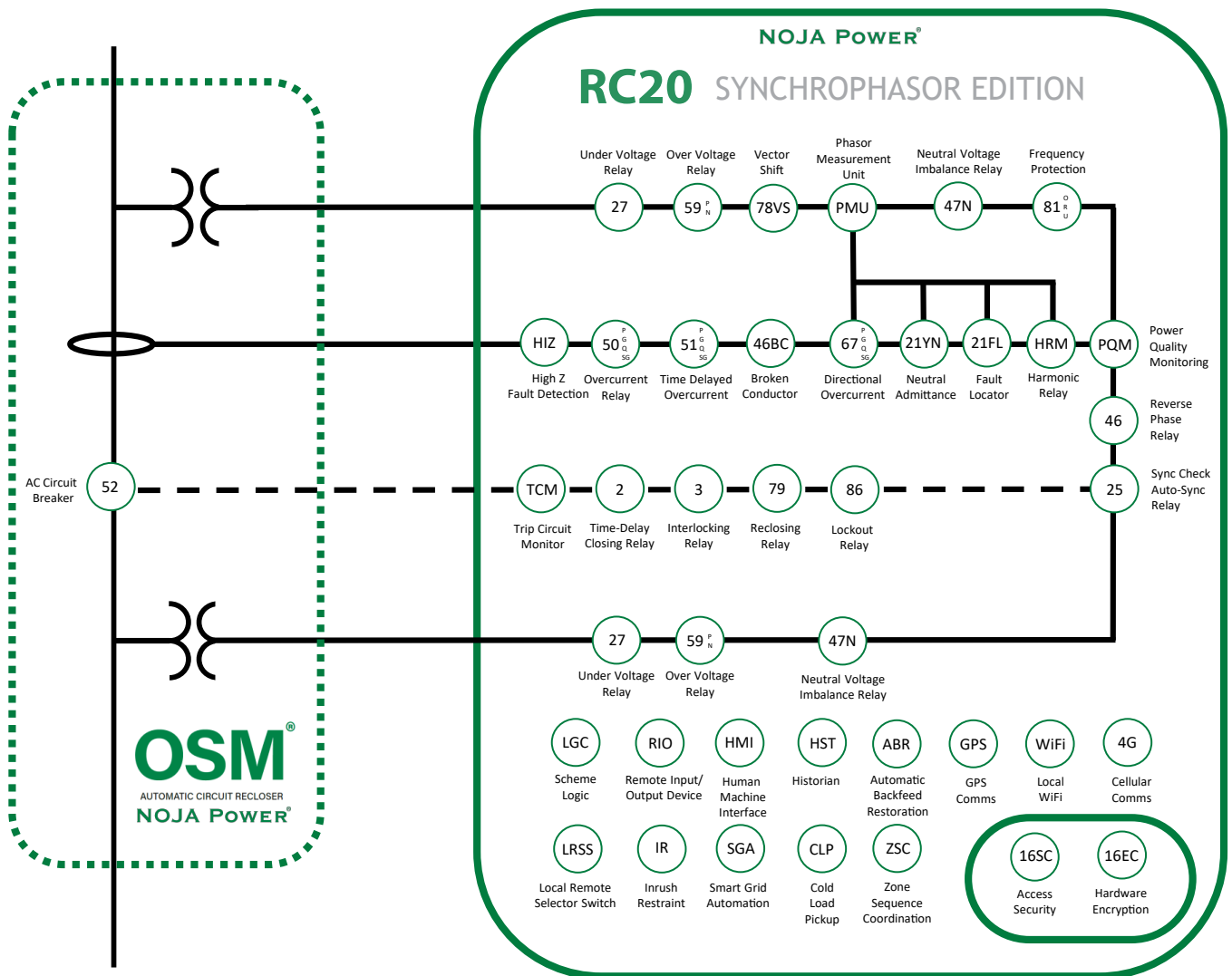
- » Overhead Line Protection
- » Underground Cable Protection (used in NOJA Power’s Ground Mount Kiosk product)
- » Renewable and Generation Connection to the MV Grid
- » Distribution Grid Synchrophasor Data Acquisition
- » Smart Grid, Automatic Changeover Distribution Network Automation
- » Mining and Capital Equipment Protection
- » Substation Circuit Breaker Applications

Get in touch with us to find out more:
sales@nojapower.com.au

PART CODE	CAPABILITY
RC20	Standard Functionality set as per the Protection Diagram, with onboard WiFi
RC20-4GA	Standard RC20 + GPS and 4G/3G/2G Communications with Synchrophasors (European Region*)
RC20-4GB	Standard RC20 + GPS and 4G/3G/2G Communications with Synchrophasors (Americas Region*)

*Contact NOJA Power for available bandwidths of communications for each region.

The RC20 provides an extensive suite of functionality. The ANSI feature diagram demonstrates the feature set of this protection relaying equipment, along with signal topology to the OSM Recloser under control.

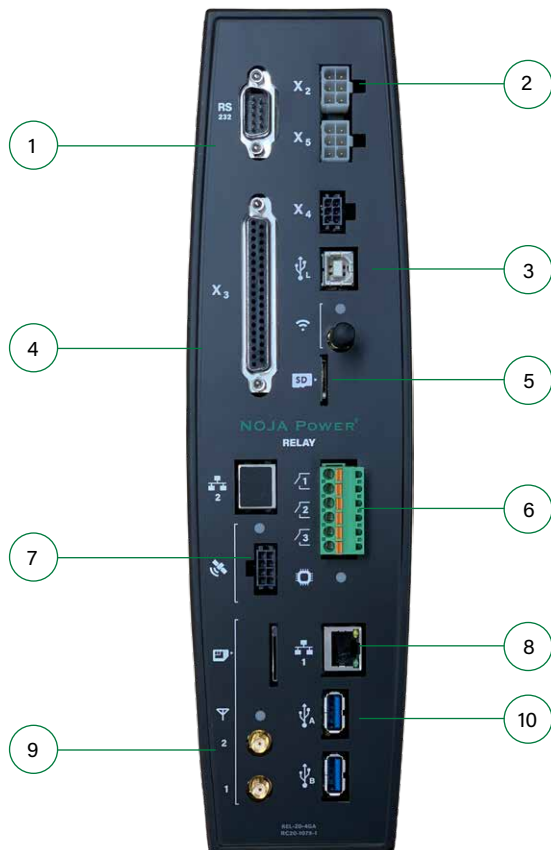
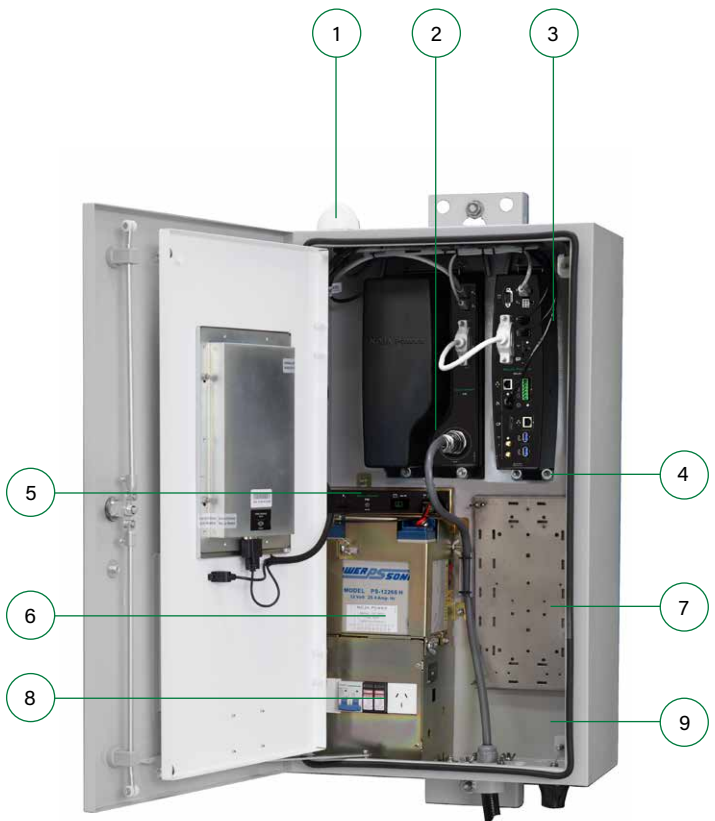


RC20 ANSI Protection Feature Diagram

MECHANICAL INNOVATION

Driven by decades of experience in distribution recloser controllers, the RC20's mechanical layout is a paradigm shift in design. Simplified connections, improved physical access modularized components lead provide exceptional reliability and cost savings over the operational life of the equipment.

1. GPS Radome
2. Improved Switchgear terminal Access
3. Refined Controller Ergonomics
4. Simplified Module Fixings
5. Intelligent Power Management
6. Safe Battery Access
7. Improver Radio Tray Cable Access
8. Upgraded Power Supply
9. Power Coated Stainless Steel



RC20, UNRIVALLED CONNECTIVITY IN RECLOSER CONTROL RELAYS.

At the heart of the RC20 Recloser Control System is the Relay-20, NOJA Power's flagship comprehensive Protection, Automation and SCADA RTU. 256 Samples per Cycle, 10x processing power improvement over the RC10 control and class leading hardware encryption, the NOJA Power RC20 is a future proofed Recloser Control system for the modern Electricity Distribution Network.

A simple labelling system for connection ports using Automotive and Military grade connectors ensures maximum field uptime of both the protection asset and the network it is charged with protecting.

In the modern digitized distribution grid, the RC20 is optimized for effective and accurate data capture and throughput. Expandable SD card storage, 2 x Gigabit Ethernet ports and USB ports backed by hardware encryption gives utility engineers secure access to field data.

1. Serial Comms Support
2. Molex Connectors
3. USB-B Support
4. Analogues
5. SD Card Storage
6. Local Binary Inputs
7. GPS
8. Gigabit Ethernet x 2
9. 4G, Main Diversity and SIM Card
10. USB3

RELEVANT STANDARDS

- » ANSI/IEEE C37-60
- » IEC 62271 Part 111 and Part 200

BASIC OPERATING PARAMETERS

PARAMETER	RATING
Rated Frequency, Hz	50 / 60
Rated Cubicle Auxiliary Supply Voltage (V)	110 / 220
DC Supply Voltage, V	110 – 377
AC Supply CB	4 A
Standard Operating Duty	O – 0.1s – CO – 1s – CO – 1s – CO – 60s
Degree of Protection	IP66 / NEMA4
Minimum Operating Temperature 0C	-40
Maximum Operating Temperature 0C	55
Maximum Humidity, %	100
Maximum Altitude, m	3,000
Weight, kg	49
Dimensions (width x height x depth) mm	460 x 950 x 309

PROTECTION ACCURACY

PARAMETER	ACCURACY	ACCURACY RANGE
Operational Pickup Current - For Phase OC Elements	The greater of $\pm 1\%$ or ± 1 A $\pm 5\%$	0 – 800 A 800 A – 16,000 A
- For Earth OC Elements	The greater of $\pm 2\%$ or ± 1 A The greater of $\pm 1\%$ or ± 4 A	0 – 80 A 80 A – 800 A
- For Earth OC Elements (0.2A SEF OSM Model)	The greater of $\pm 0.5\%$ or ± 0.1 A	0.2 – 80 A
- For NPS Current Elements	The greater of $\pm 3\%$ or ± 3 A $\pm 10\%$	0 – 800 A 800 A – 16,000 A
Admittance Protection - Gn Accuracy - Bn Accuracy	The greater of $\pm 5\%$ or ± 0.05 mSi The greater of $\pm 5\%$ or ± 0.05 mSi	$0.05 \leq G_n \leq 32700$ mSi $0.05 \leq G_n \leq 32700$ mS
Operational Pickup Voltage	The greater of $\pm 1\%$ or ± 0.1 kV	0.5 – 38 kV
Operational Pickup Frequency	± 0.05 Hz	46 – 55 Hz for a 50 Hz System 55 – 65 Hz for a 60 Hz System
Rate of Change of Frequency	0.4 Hz/s	0.4 – 10 Hz/s
Voltage Vector Shift	10	2° – 40°
Tripping Time for Time Current Characteristics Definite Time ANSI / IEC / UDC / Additional IDMT Curves	The Greater of: +1 % or +35 ms / -10 ms +3 % or +50 ms / -10 ms	0 – 120 s for all-time current characteristics
Reclose Time	The greater of $\pm 1\%$ or 10ms	0.1 – 180 s
Reset Time	The greater of $\pm 1\%$ or +10 ms	0 – 10 s for overcurrent 5 – 180 s for reclosing
Restoration time for ABR element	The greater of $\pm 1\%$ or +10 ms	0 – 180 s

TECHNICAL SPECIFICATIONS - SYNCHROPHASOR MEASUREMENT ACCURACY

(RC20-4G* Models Only)

MEASURED VALUE	ACCURACY	ACCURACY RANGE
Signal Frequency - Max Total Vector Error - Max Frequency Error - Max ROCOF Error	1 % 0.005 Hz 0.4 Hz/s	$\pm 2\%$
Voltage Signal Magnitude - Max TVE	1%	80% to 120% of System Nominal Voltage
Current Signal Magnitude (rated current = 800A) - Max TVE	1%	80 A to 1,600 A
Harmonic Distortion (THD <0.2 %) - Max TVE - Max Frequency Error - Max ROCOF Error	1 % 0.005 Hz 0.4 Hz/s	1%, each harmonic up to 50th

FEEDER PROTECTION

The RC20 Control provides class leading precision, selectivity and sensitivity for modern distribution network feeder protection up to 38 kV. The extensive functionality available in the RC20 is designed to tackle the distribution challenges of increased distributed generation and non-linear load profiles, where modern fault conditions can occur below typical load currents. Voltage gated protection and advanced protection logic enable protection engineers to mitigate spurious tripping, capitalizing on the available network data to drive reliability improvements on the network.

Whilst fully capable for traditional Recloser applications, the RC20 provides additional data-driven functionality and security far beyond existing recloser relay control platforms



SMART GRID AUTOMATION

The RC20 Control system is supplied with a comprehensive automation toolkit capable of executing both distributed sensor-driven automation and centralized automation methods. From simple distribution loop automation through to interlocked peer to peer Auto-Changeover schemes, the OSM Recloser paired with RC20 control provides control and automation engineers with the capabilities they need to drive reliability and operations cost savings.

At the forefront of distributed automation technology, the flagship RC20 Recloser controller supports IEC 61850 R-GOOSE and IEC 61499, capable of publishing and subscribing to automation signals over an IP network to achieve protection grading previously thought impossible. For the most demanding protection and control applications, the NOJA Power RC20 has an answer.

Supported Protocols:

- » IEC 61850 MMS
- » IEC 61850 R-GOOSE
- » IEC 60870-5-101/104
- » DNP3
- » DNP3-SAv5
- » IEC 61499
- » NOJA Power ACO
- » OPC-UA (Coming_Soon)

RENEWABLE GENERATION CONNECTION

With Rate of Change of Frequency (ROCOF), Voltage Vector Shift (VVS) and Synchrocheck with Autosynchroniser included in the RC20 standard protection suite, the OSM Recloser with RC20 control can meet most global protection requirements for medium scale distributed energy connection. The added reporting value of Synchrophasors for site performance, fault detection, condition monitoring and data analysis sets the RC20 in a new class of distribution protection equipment geared for the modern grid. The OSM Recloser with RC20 control can even be installed in a NOJA Power GMK coupled with a metering unit, allowing for a single product solution for the entire renewable integration project – saving a fortune on commissioning, design and operating costs.

NOJA POWER®

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NOJA POWER AUSTRALIA

CORPORATE OFFICE AND FACTORY

16 Archimedes Place, Murarrie, Brisbane Queensland, Australia 4172.

Phone: +61 (7) 3907 8777, Fax: +61 (7) 3399 6777, Email: sales@nojapower.com.au

www.nojapower.com.au

NOJA POWER BRAZIL

OFFICE AND FACTORY

NOJA Power do Brasil Ltda, Avenida Pierre Simon de Laplace, 965A Techno Park – Campinas – SP, Brasil

Phone: +55 (19) 3283 0041, Fax: +55 (19) 3283 0041, Email: vendas@nojapower.com.br

www.nojapower.com.br

NOJA POWER USA

SALES OFFICE

NOJA Power LLC, Office: 333 SE 2nd Ave., Suite 2053, Miami, FL 33131, United States of America

Phone: +1.484-515-4880, Email: sales@nojapower.com

www.nojapower.com

NOJA POWER UK

SALES OFFICE

NOJA Power Limited, Smart Zone 5, Tredomen Innovation & Technology Centre, Tredomen Park

Ystrad Mynach, Hengoed, South Wales, CF82 7FN, United Kingdom

Phone: +44 7487 557 599, Email: sales@nojapower.co.uk

www.nojapower.co.uk

NOJA POWER EUROPE

SALES OFFICE

NOJA Power Switchgear Pty Ltd, Sebastianstrasse 38, 53115, Poppenlendorf, Bonn, Germany

Phone: +49 (0) 228 8236 9408, Email: sales@nojapower.eu

www.nojapower.eu