

NEW ELEC

MOTOR PROTECTION & CONTROL TECHNOLOGY

KG / KH

Power Quality Monitoring Motor and Feeder Protection Relay



A South African Company to be Proud of

About

The KG/KH-RTU Relay is an ISO 9001:2015 compliant, local designed and manufactured three phase motor protection relay. It is a micro-controller-based precision instrument with protection, advanced control features and starter logic. The relay is designed to cater for the low voltage motor protection and feeder supply market and is available in different current models.

The KG/KH-RTU Relay is fully configurable with the aid of front-end software. Event records can also be downloaded with the aid of the front-end onto a memory stick for further analysis. All the settings are password protected. The relay has an on-board database where time and date stamped records are kept. Two types of records are kept namely fault records (208 last faults) and event records (882 events). In the case of event records, the user has limited access rights (read only).

The front-end also has a data recorder and a spectrum analyser, which could be used to analyse motor performance and supplied power quality respectively. The spectrum analyser can detect harmonics up to the 31st harmonic on any of the three phase currents and voltages.

A unique feature is added to the relay in the form of simulation. This function could be used for personnel training or relay functionality testing.

The relay offers a Modbus-RTU communication interface for two RJ11 connectors. The RJ11 connection point can be used to communicate to a PLC or the front-end.

Bluetooth connection can also be made from a smart device with Android. The KG/KH-RTU application is available from the Android Play Store. The KG/KH-RTU Application offer the same functionality as the front-end.

Protection Features:

- ANSI 37 - Phase Undercurrent or Under Power Detection
- ANSI 46 – Phase Negative Sequence / Unbalance
- ANSI 49 - Machine or Transformer Thermal (I²T) Detection
- ANSI 50P - Phase Instantaneous Over Current
- ANSI 51LS – Lock Rotor During Start Up
- ANSI 51LR – Locked Rotor During Running
- ANSI 51P – Phase Timed Over Current
- ANSI 27 - Under Voltage
- ANSI 47 – Phase-Sequence Voltage or Phase-Balance Overvoltage
- ANSI 59 - Over Voltage
- ANSI 78V – Voltage Loss of Power
- ANSI 81O - Over Frequency
- ANSI 81U - Under Frequency
- ANSI 50BF – Breaker Failure
- ANSI 50G/51G – Ground Instantaneous Overcurrent / Timed Ground Instantaneous Overcurrent
- ANSI 64 - Insulation Lockout
- ANSI 86RST – Lockout Reset
- ANSI 86L Lockout Logic (Custom Trip)
- ANSI 66 - Starts per Hour Control
- ANSI THD – Harmonics Monitor

Additional Features:

- Multiple overcurrent curves for feeder and motor protection.
- Wide current range selection.
- THD and specific harmonic protection up to 31st protection.
- Metering of power usage on individual phases.
- Modbus-RTU RS485 and Bluetooth LE build in.
- 1 x dedicated trip or control DPST (NO NC) relay output.
- 1 x programmable SPDT (B-M) relay output.
- 3 x single end field inputs fully programmable.
- Small footprint and rugged design for high vibration.
- Smart phone App for close cubical monitoring/configuration from up to 10 meters away through-door.



The KG/KH Relay is a locally designed, ISO 9001:2015 compliant protection and control relay for low-voltage three-phase motors and feeders. It combines precision motor protection with advanced control logic and power quality monitoring (PQM) capabilities. This microcontroller-based relay can be configured as either a motor protection unit (with integrated starter control logic) or a feeder protection relay, with model options covering a wide current range to suit motors of different sizes. The KG/KH series' rugged enclosure and vibration-resistant design make it suitable for harsh industrial environments (built to IEC 60255 standards for shock, vibration, and EMC). Its compact form-factor allows easy DIN-rail or panel mounting in space-constrained panels. The relay is fully Industry 4.0 ready, offering versatile connectivity for modern smart factories. Standard Modbus-RTU communication over RS-485 (via dual RJ11 ports) enables seamless integration with SCADA systems, PLCs, and HMIs. In addition, built-in Bluetooth Low Energy provides wireless access for configuration and monitoring via the KG/KH Android smartphone app. This allows technicians to interact with the relay from up to 10 meters away, even through closed flameproof enclosures, simplifying maintenance in hazardous or hard-to-access locations. All settings on the device are password-protected to prevent unauthorized changes. With its blend of protection, control, monitoring, and connectivity features, the KG/KH relay provides a comprehensive solution that is "more protection, more control, more monitoring," and fully ready for the Industrial IoT era.

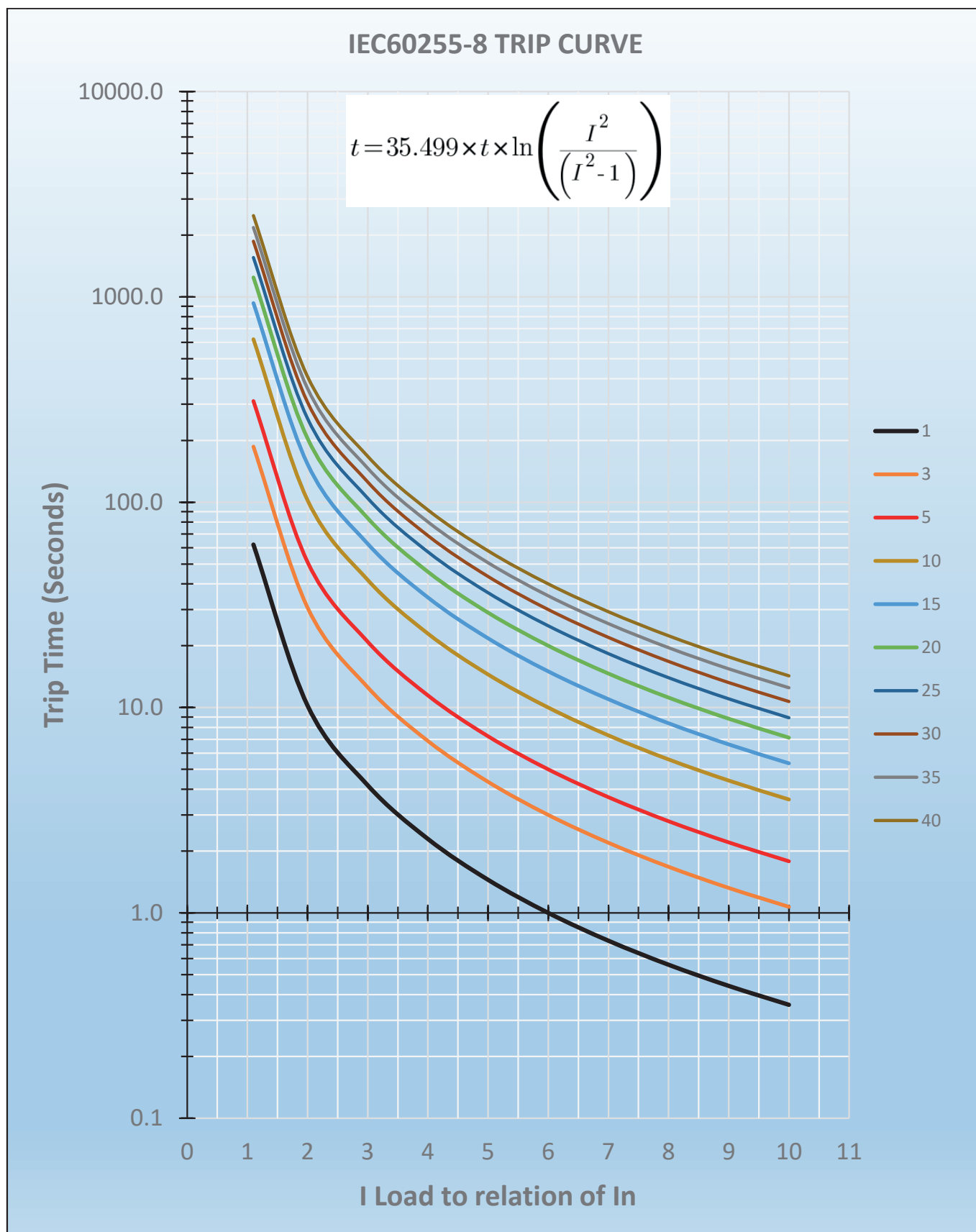
Technical Specifications

General Data	Dimensions	79 (W) mm x 141 mm (H) x 62 mm (D)
	Auxiliary supply	85 Vac/dc ~ 264 Vac/dc 50Hz / 60Hz
	Mounting	Din rail or panel.
Field Inputs	Amount	3 common field inputs
	Input Voltage Range	24Vac/dc to 220Vac/dc
Outputs	Amount	1 x NO and NC in depended relay (DPST). 1 x NO and NC change over relay (SPDT).
	Rating	5 Amps at 220Vac 5 Amps at 30 Vdc
Relay model range	KG-RTU 1 (FPR1200) KH-RTU 1 (FPR1206)	0.001 Amp to 10 Amp MLC 10%, 100% load 0.1 Amp MLC 100%, 100% load 1 Amp
	KG-RTU 5 (FPR1201) KH-RTU 5 (FPR1207)	0.005 Amp to 50 Amp MLC 10%, 100% load 0.5 Amp MLC 100%, 100% load 5 Amp
	KG-RTU 10 (FPR1202) KH-RTU 10 (FPR1208)	0.01 Amp to 100 Amp MLC 10%, 100% load 1 Amp MLC 100%, 100% load 10 Amp
	KG-RTU 25 (FPR1203) KH-RTU 25 (FPR1209)	0.025 Amp to 250 Amp MLC 10%, 100% load 2.5 Amp MLC 100%, 100% load 25 Amp
	KG-RTU 50 (FPR1204) KH-RTU 50 (FPR1210)	0.05 Amp to 500 Amp MLC 10%, 100% load 5 Amp MLC 100%, 100% load 50 Amp
	KG-RTU 100 (FPR1205) KH-RTU 100 (FPR1211)	0.10 Amp to 1000 Amp MLC 10%, 100% load 10 Amp MLC 100%, 100% load 100 Amp
Line Voltage on CT's	Direct Measurement	110Vac to 550Vac Line
	Voltage Transformer	3K3Vac to 110Vac Line 6K6Vac to 110Vac Line 11K0Vac to 110Vac Line
Earth leakage	CBCT in ME100 and 300 Fault Level	0.03 Amps to 3 Amps
	External core that can be used	57mm ID core. 63mm ID core. 104mm ID core. 150mm ID core.
Insulation lockout	Ohm reading	1 to 199 kOhm.
	Incremental	1 kOhm.
Communication interfaces	Communication interface	Modbus-RTU.
	Bluetooth low energy	GATT

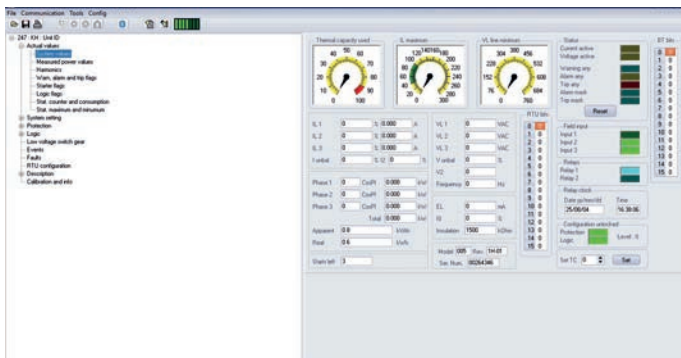
Enviromental specifications

Specification	Standard
Measuring relays and protection equipment	IEC 60255
Electromagnetic compatibility requirement	IEC 60255-26
Product safety requirements	IEC 60255-27
Vibration test sinusoidal	IEC 60255-21-1
Vibration test shock	IEC 60255-21-2
Vibration test seismic	IEC 60255-21-3

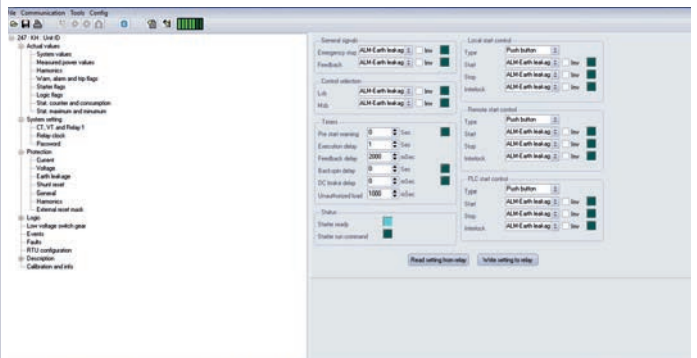
Thermal Curves



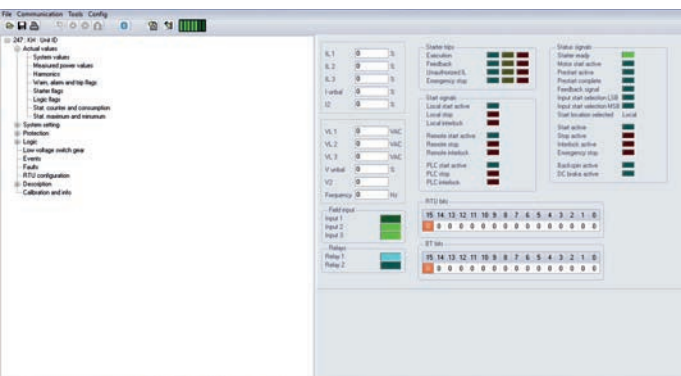
Frontend Actual Readings



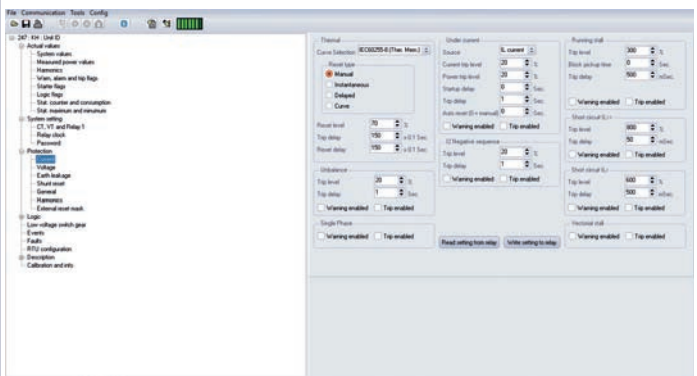
Frontend Settings



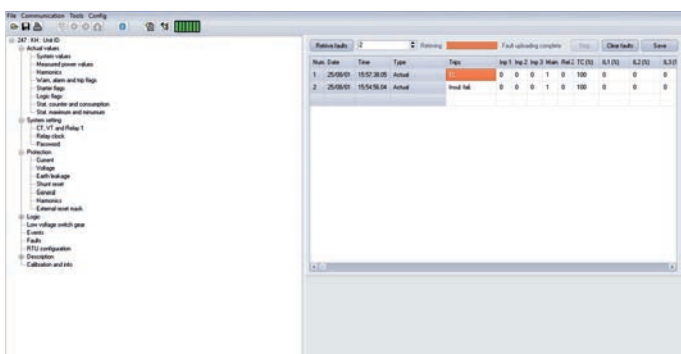
Starter Configuration



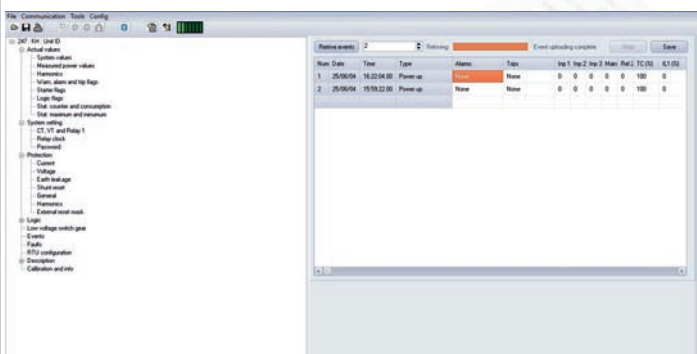
Statistical Screen



Time-Stamped Faults Screen



Time-Stamped Events Screen



Harmonics

Harmonic Levels

Indicate the harmonic parameter levels for current and voltages on all three phases. Harmonic levels f0 to f31 is displays as a bar graph, where each green bar indicates a harmonic level in the harmonics screen.

	Frontend	Android Application
Navigation		
Screens		
Parameters		
IL1, IL2, IL3, VL1, VL2 and VL3 fundamental 0 to 31 levels	Fundamental frequency of the selected voltage line frequency selected (See chapter 10.1.4).	

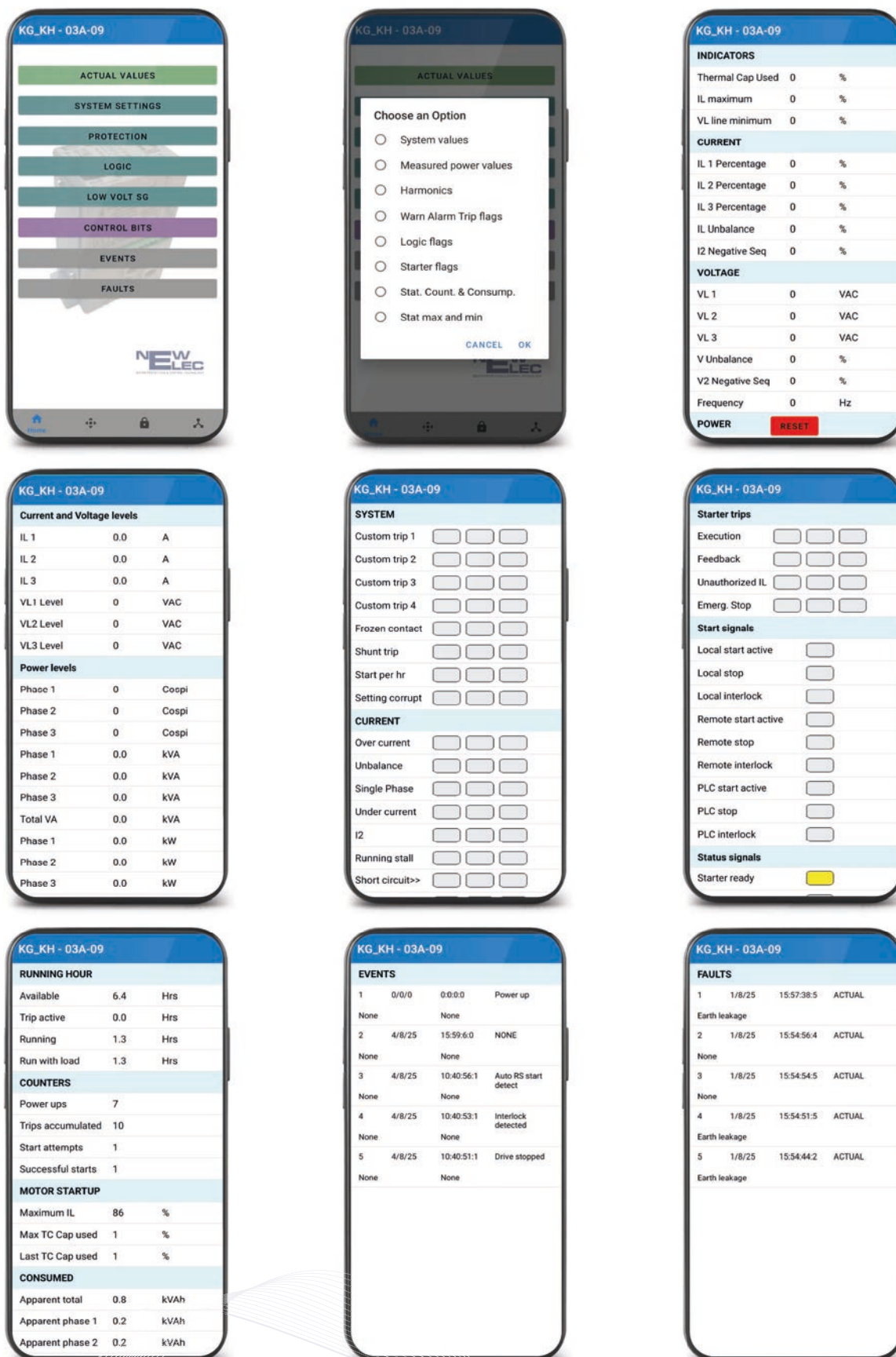
Harmonic Maximums

	Frontend	Android Application
Navigation		
Screens		
Parameters		
IL THD	IL maximum total harmonic distortion level between IL1, IL2 and IL3 in %.	
VL THD	VL maximum total harmonic distortion level between VL1, VL2 and VL3 in %.	
IL1, IL2 and IL3 THD	IL1, IL2 and IL3 measured and calculated total harmonic distortion level in %.	
VL1, VL2 and VL3 THD	VL1, VL2 and VL3 measured and calculated total harmonic distortion level in %.	

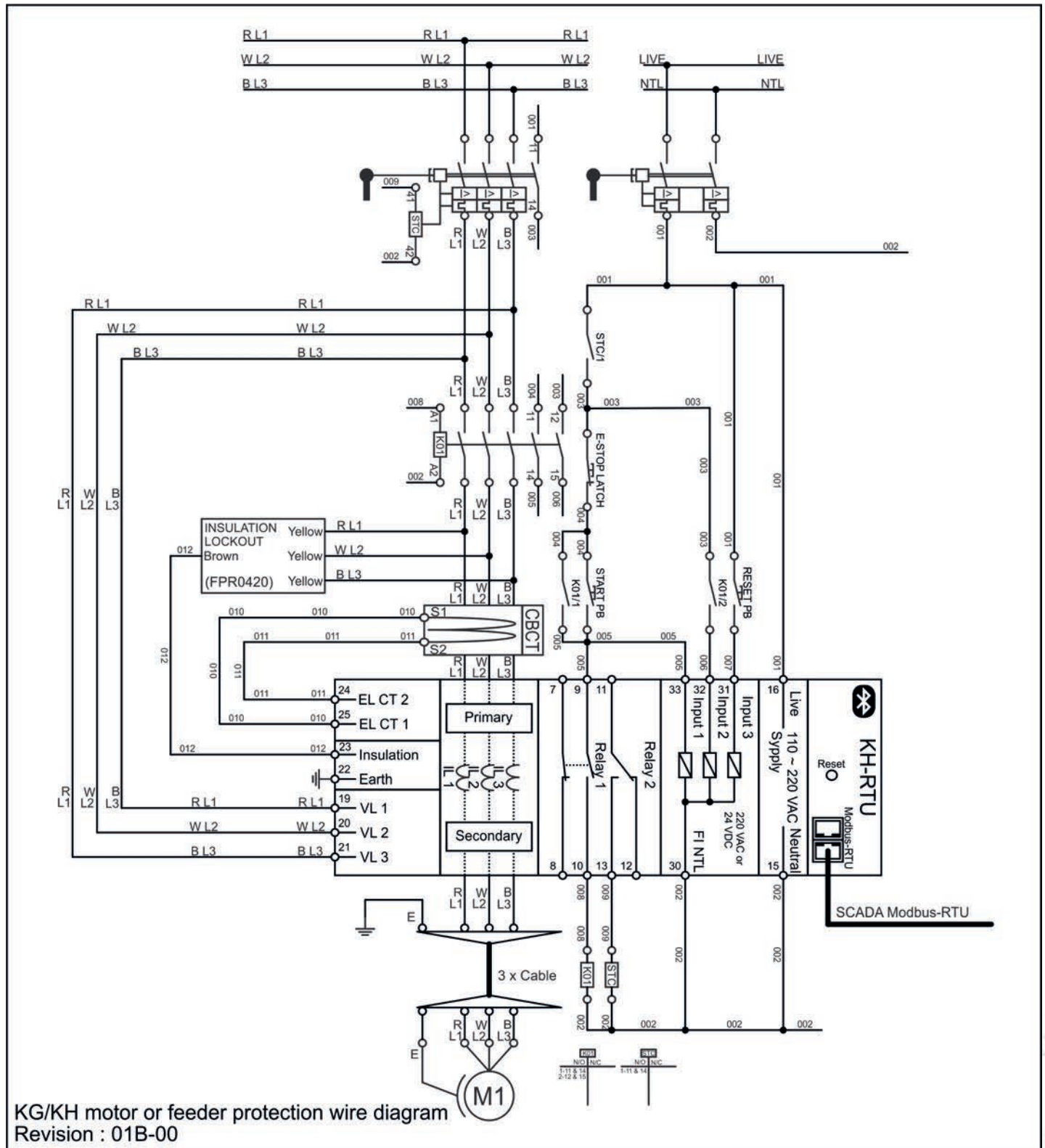
KG/KH-RTU Android Application Configuration Software

The KG/KH-RTU Android application configuration software (KG/KH-RTU app) will allow the KG/KH-RTU relay to be monitored and configured via a phone, tablet or any other smart device with Android installed and can support Bluetooth low energy.

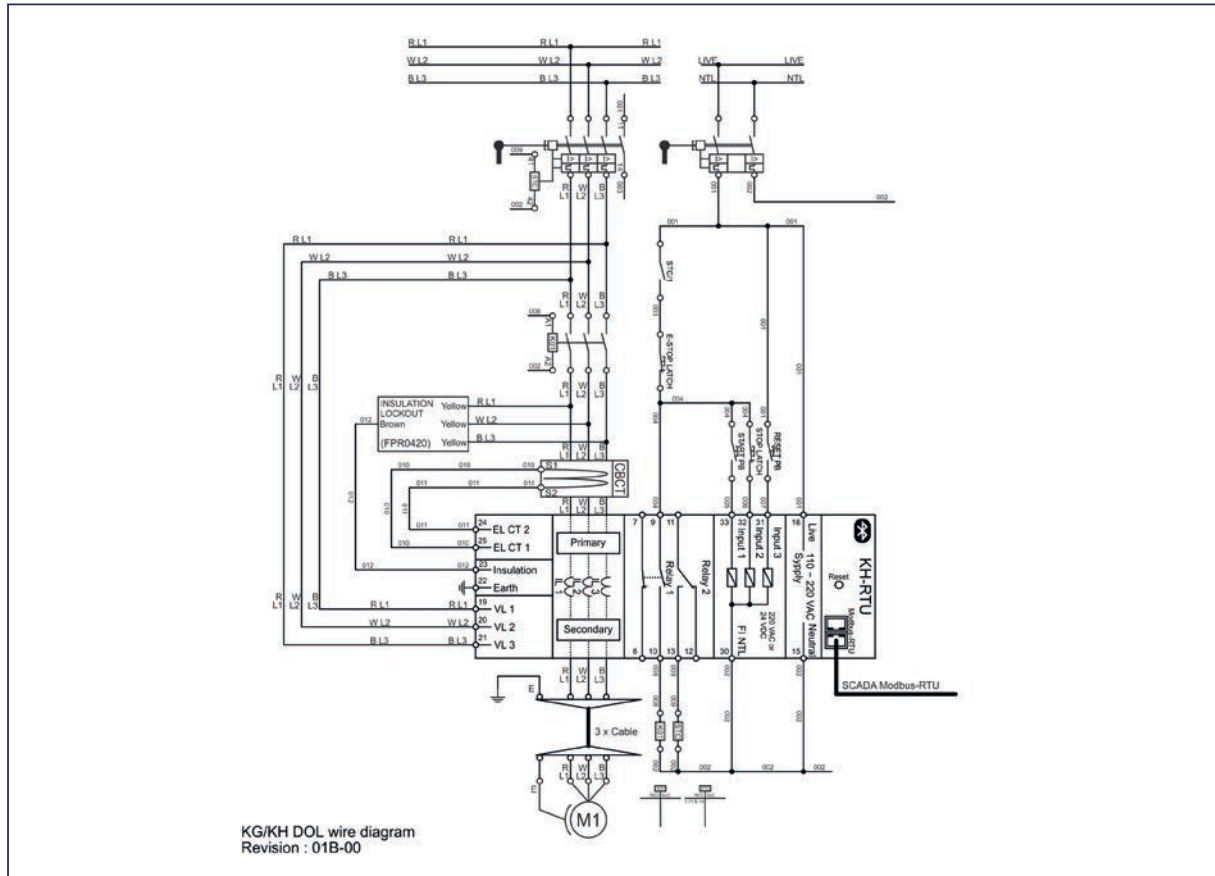
See below example screens for Android App:



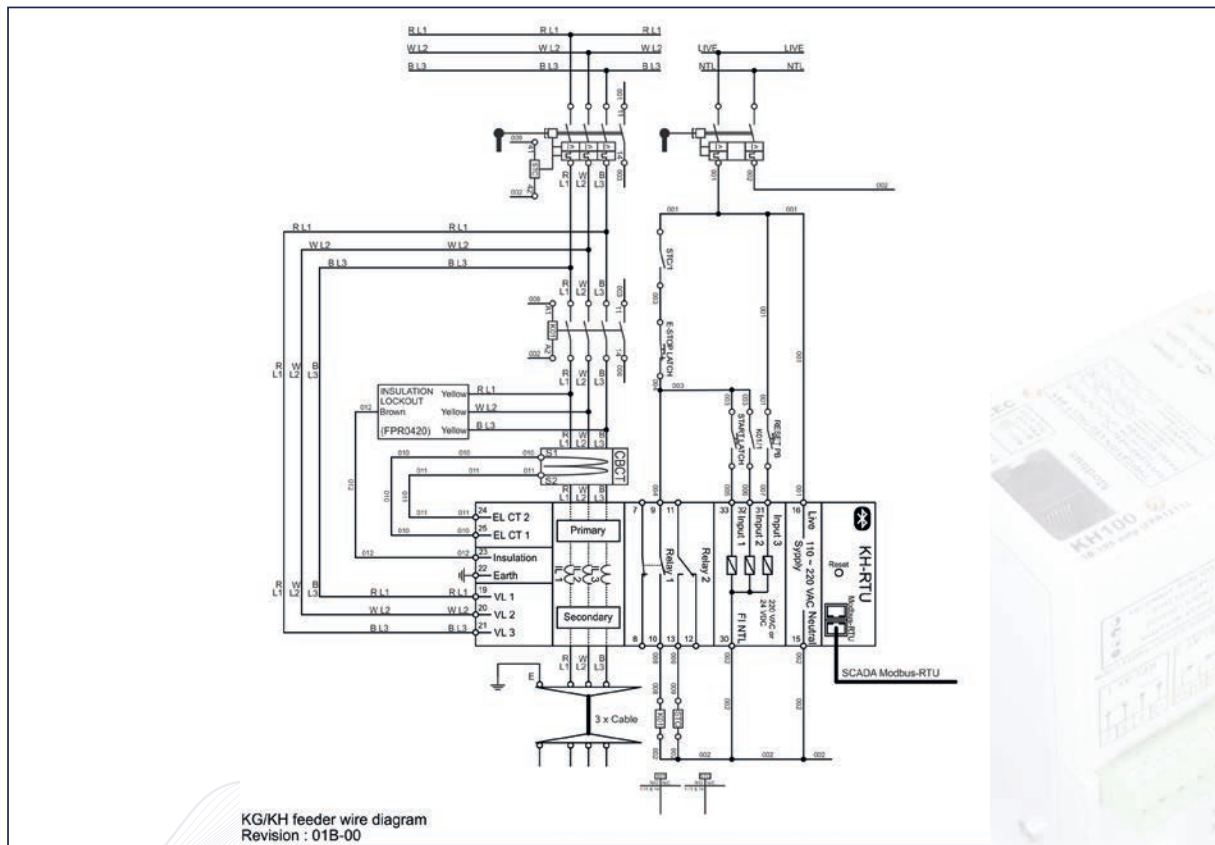
KG / KH Wiring Diagram for Motor or Feeder Protection



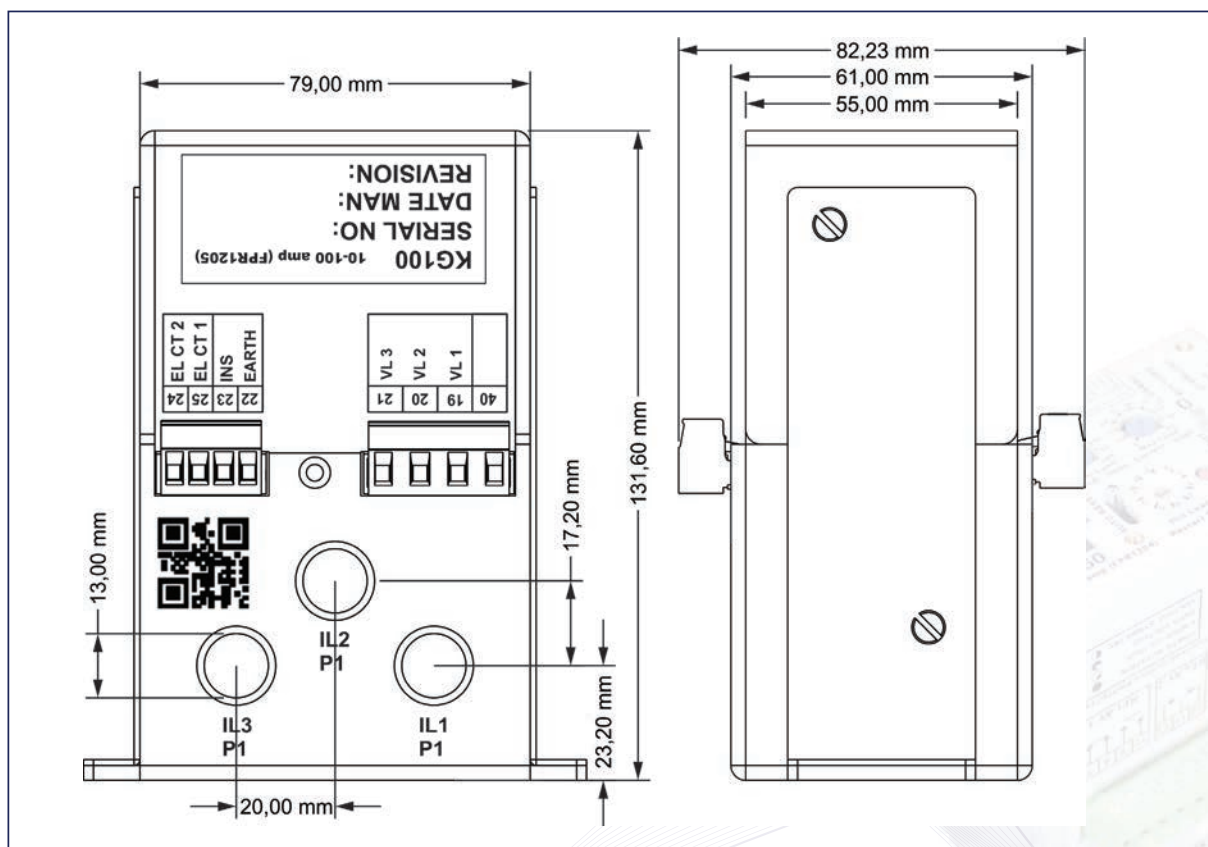
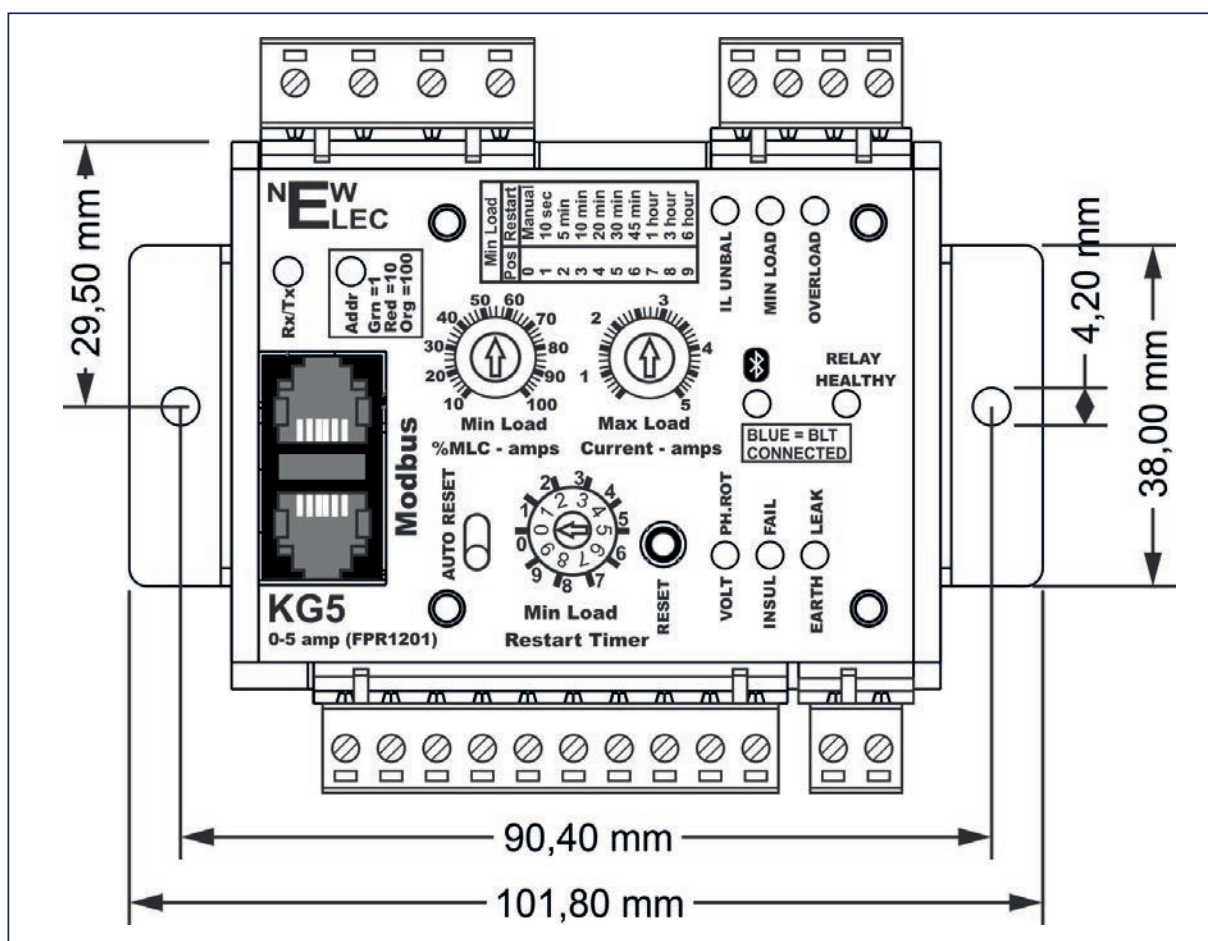
KG / KH DOL Wiring Diagram for Motor or Feeder Protection



KG / KH Wiring Diagram for Feeder Protection



Dimensions



Ordering information

Relay Models	Product Code
KG-RTU 1 Amp	FPR1200
KG-RTU 5 Amp	FPR1201
KG-RTU 10 Amp	FPR1202
KG-RTU 25 Amp	FPR1203
KG-RTU 50 Amp	FPR1204
KG-RTU 100 Amp	FPR1205
KH-RTU 1 Amp	FPR1206
KH-RTU 5 Amp	FPR1207
KH-RTU 10 Amp	FPR1208
KH-RTU 25 Amp	FPR1209
KH-RTU 50 Amp	FPR1210
KH-RTU 100 Amp	FPR1211
Communication Cables	Product Code
Comms Cable	CAB0012
USB to RS486 converter	CAB0013



NEW ELEC

MOTOR PROTECTION & CONTROL TECHNOLOGY

Physical Address:

298 Soutter Street,
Pretoria West

Tel: +27 12 327 1729

Fax: +27 (0)12 327 1733

www.newelec.co.za

info@newelec.co.za

KG / KH

Power Quality Monitoring Motor and Feeder Protection Relay

