Mechtric

18

Lovato electric

Mechtric

RGK 30

RGK 20

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK 30	12/24VDC for external start-stop key switch, 96x48mm	1	0.160
RGK 20	12/24VDC, built-in power supply key switch, with TTL programming port, 72x72mm	1	0.270

General characteristics for RGK 30
OPERATOR INTERFACE
– 2 programming key buttons
– 1 LED indicator for engine status
– 1 LED indicator for glow plug pre-heating
– 5 LED indicators for alarm status
– Remote starting only.

INPUTS/OUTPUTS
– Digital inputs: 3 negative and 1 positive
  (start/stop by remote key switch)
– Digital outputs: 2 relay (1 programmable).

Certifications and compliance
Certifications obtained: EAC, UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices-Generator controllers.
Compliant with standards: IEC/EN 61010-1,
IEC/EN 61000-6-2, EN 55011, UL 508, CSA C22.2 n° 14.

General characteristics for RGK 20
OPERATOR INTERFACE
– 1 ON-OFF power supply key selector switch
– 1 semi-automatic engine START button
– 2 programmable key buttons
– 7 digit LCD display (Hours, Hz, VBatt)
– 1 LED indicator for engine status
– 1 LED indicator for glow plug pre-heating
– 5 LED indicators for alarm status
– Local or remote starting.

INPUTS/OUTPUTS
Programmable functions:
– Generator frequency input
– Digital inputs: 3 negative and 1 positive
– Digital outputs: 3 static (1 programmable)
– Inputs, outputs and alarms, all with programmable properties.

ADDITIONAL FEATURES
– Quick set-up with PC software (TTL/RS232 serial port).

Certifications and compliance
Certifications obtained: EAC, UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices-Generator controllers.
Compliant with standards: IEC/EN 61010-1,
IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508,
CSA C22.2 n° 14.

Lovato electric

RGK 400SA

NFC

new

RGK 420SA

NFC

RGK 600SA - RGK 601SA

RGK 700SA - RGK 800SA

new

EXP 10…

STAND ALONE APPLICATION

G

CONTROL PANEL

LOAD

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK 400SA	12/24VDC, icon LDC display, 5 inputs, 5 outputs	1	????
RGK 420SA	12/24VDC, icon LDC display, built-in 3 position key, 5 inputs, 5 outputs	1	????
RGK 600SA	12/24VDC, graphic LCD display, w/Pick-up speed input, 4 inputs, 6 outputs	1	0.540
RGK 601SA	12/24VDC, graphic LCD display, CANbus port, 4 inputs, 6 outputs	1	0.530
RGK 700SA	12/24VDC, graphic LCD display, RS232 serial port, CANbus port, IP65, 6 inputs, 7 outputs	1	0.900
RGK 800SA	12/24VDC, graphic LCD display, RS485 serial port, CANbus port, IP65. Expandible with EXP... modules, 8 inputs, 10 outputs	1	0.980

Programmable functions and properties

Charact.	RGK 4...SA	RGK 6...SA	RGK 700SA	RGK 800SA
Inputs	5	4	6	8
Relay outputs	–	–	3	3
Protected static outputs	5	6	4	7
Resistive/ Digital inputs	1	3	3	4

Order code	Description
EXPANSION MODULE AND ACCESSORY FOR RGK 4...SA	
EXP10 40	2 digital/resistive inputs, 2 static outputs
EXP80 05	IP65 110mm housing gasket
ACCESSORY FOR RGK 600SA AND RGK 601SA	
EXP80 01	IP65 144mm housing gasket
EXPANSION MODULES FOR RGK 800SA Inputs and outputs.	
EXP10 00	4 opto-isolated digital inputs
EXP10 01	4 opto-isolated static outputs
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated
EXP10 03	2 relay outputs rated 5A 250VAC
EXP10 04	2 opto-isolated analog inputs 0/4-20mA or PT100 or 0-10V or 0...±5V
EXP10 05	2 opto-isolated analog outputs 0/4-20mA or 0-10V or 0...±5V
EXP10 08	2 opto-isolated digital inputs and 2 relay outputs rated 5A 250VAC
Communications interfaces.	
EXP10 10	Opto-isolated USB interface
EXP10 11	Opto-isolated RS232 interface
EXP10 12	Opto-isolated RS485 interface
EXP10 13	Ethernet interface with Web server function

General characteristics for RGK 400SA - RGK 420SA
– Key with 3 positions (OFF, local start, remote start), removable in OFF and remote start position (for RGK 420SA)
– Power supply: 7.5...33V
– VAC inputs: Generator L1-L2-L3-N
– Single, two and three phase voltage control
– Rated measurement voltage range: 100...480VLL (3PH+N)
– Programmable VT ratio
– Frequency measurement range: 45...65Hz
– Current input: 1PH, /5A or /1A
– Display: LCD with icons (52x35mm)
– Programming port: IR with support of CX01 (USB) and CX02 (Wi-Fi) dongles
– NFC technology for parameter setup
– Powersave mode
– Inputs: 5 negative + 1 positive for emergency
– Outputs: 5 positive, 2A, protected
– Common pin dedicated to EV and START outputs to be used with emergency push button
– Engine running detection: "D+", Hz
– 2 engine speed inputs: "W" or Magnetic "Pick-up"
– 1 analog ohmic input for oil pressure, engine temperature or fuel level control
– Alarm and parameter text in 5 languages
– Alarm text customisable (2 alarms)
– Operating temperature: -30...+60°C
– Customisation manager software available; compatible with **Synergy** software.

General characteristics for RGK 600SA - RGK 601SA - RGK 700SA - RGK 800SA
– Power supply: 7...33V
– VAC inputs: Generator L1-L2-L3-N
– Single, two and three phase voltage control
– Rated measurement voltage range:
  • 100...480VAC for RGK 600SA and RGK 601SA
  • 30...600VAC for RGK 700SA and RGK 800SA
– Programmable VT ratio
– Frequency measurement range: 45...65Hz
– Current input: 3PH, /5A or /1A
– Graphic LCD: 128x80 pixels with backlight
– Programming port: IR with support of CX01 (USB) and CX02 (Wi-Fi) dongles
– Common pin dedicated to EV and START outputs to be used with emergency push button
– Engine running detection: "D+", Hz
– 2 engine speed inputs: "W" or Magnetic "Pick-up" (RGK 601SA excluded)
– 1 CANbus-J1939 port (RGK 600SA excluded)
– 3 analog ohmic inputs for oil pressure, engine temperature and fuel level control
– 1 built-in alarm remoting port
– Non-volatile memory for event storage
– Alarm, event and parameter text in 5 languages
– Alarm text customisable (8 alarms)
– Operating temperature: -30...+70°C.
– Modbus-RTU and Modbus-ASCII protocols
– Customisation manager software available; compatible with **Synergy** software.

For RGK 700SA – RGK 800SA only
– PLC logic for inputs, outputs and internal status
– 1 communication port: RS232 for RGK700SA; RS485 for RGK 800SA
– Degree of protection: IEC IP65 on front; suitable for use with UL/CSA Type 4X outdoor enclosure installation.

For RGK 800SA only
– Neutral current measurement range: 0.050...6A or 0.050...1.2A
– 400Hz frequency support
– 1 programmable analog input
– Modbus-TCP communication protocol
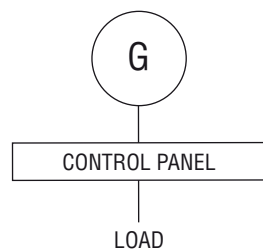– Current leakage control towards earth/ground
– Clock-calendar (RTC)

Certification and compliance
Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Generator controllers except pending for RGK4...SA.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

Synergy and **Xpress** software see Section 16.

EXP series expansion modules see Section 16.

Lovato electric

Mechtric

RGK 600 - RGK 601

new

RGK 700 - RGK 800

EXP 10…

AMF (AUTOMATIC MAINS FAILURE) APPLICATION

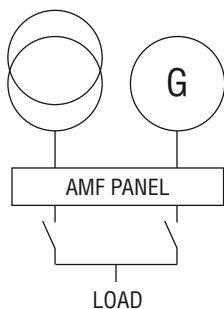| Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK 600	12/24VDC, graphic LCD display, w/Pick-up speed input, 4 inputs, 6 outputs	1	0.540
RGK 601	12/24VDC, graphic LCD display, CANbus port, 4 inputs, 6 outputs	1	0.540
RGK 610	12/24VDC, graphic LCD display, w/Pick-up speed input, 4 inputs, 6 outputs, Expandable with EXP... modules,	1	0.600
RGK 700	12/24VDC, graphic LCD display, RS232 serial port, CANbus port, IP65, 6 inputs, 7 outputs	1	0.880
RGK 800	12/24VDC, graphic LCD display, RS485 serial port, CANbus port, IP65. Expandable with EXP... modules, 8 inputs, 10 outputs	1	0.960

Programmable functions and properties

Characteristic	RGK 600 RGK 601 RGK 610	RGK 700	RGK 800
Inputs	4	6	8
Relay outputs	–	3	3
Protected static outputs	6	4	7
Resistive/ Digital inputs	3	3	4

Order code	Description
ACCESSORY FOR RGK 600, RGK 601 AND RGK 610	
EXP80 01	IP65 144mm housing gasket
EXPANSION MODULES FOR RGK 610 AND RGK 800 Communications interface.	
EXP10 10	Opto-isolated USB interface
EXP10 11	Opto-isolated RS232 interface
EXP10 12	Opto-isolated RS485 interface
EXPANSION MODULES FOR RGK 800 Inputs and outputs.	
EXP10 00	4 opto-isolated digital inputs
EXP10 01	4 opto-isolated static outputs
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated
EXP10 03	2 relay outputs rated 5A 250VAC
EXP10 04	2 opto-isolated analog inputs 0/4-20mA or PT100 or 0-10V or 0...±5V
EXP10 05	2 opto-isolated analog outputs 0/4-20mA or 0-10V or 0...±5V
EXP10 08	2 opto-isolated digital inputs and 2 relay outputs rated 5A 250VAC
Communications interface.	
EXP10 13	Ethernet interface with Web server function

General characteristics for RGK 600 - RGK 601 - RGK 610 - RGK 700 - RGK 800
– VAC inputs: Mains and generator L1-L2-L3-N
– Voltage control for one, two and three phase systems with or without neutral
– Rated measurement voltage:
   • 480VAC for RGK 600, RGK 601 and RGK 610
   • 600VAC for RGK 700 and RGK 800
– Rated measurement voltage range:
   • 100...480VAC for RGK 600, RGK 601 and RGK 610
   • 30...600VAC for RGK 700 and RGK 800
– Frequency measurement range: 45-65Hz
– Programmable VT ratio
– Current measurement range (3 PH): 0.050...6A or 0.050...1.2A
– Graphic LCD: 128x80 pixels with backlight
– 1 USB/optical and Wi-Fi port on front for programming
– Engine running detection: "D+", generator voltage and frequency
– 2 engine speed inputs: "W" or Magnetic "Pick-up" (RGK 601 excluded)
– 1 CANbus-J1939 port (RGK 600 and RGK 610 excluded)
– 3 analog ohmic inputs for oil pressure, engine temperture and fuel level control
– 1 built-in alarm remoting port
– Non-volatile memory for event storage
– Alarm, event and parameter text in 5 languages
– Alarm text customisable (8 alarms)
– Event log
– Modbus-RTU and Modbus-ASCII communication protocols (RGK 600 and RGK 601 excluded)
– Customisation manager software available; compatible with **Synergy** software.
– 1 slot for EXP module (EXP10 10, EXP10 11, EXP10 12) for RGK 610
– 3 slots for EXP modules for RGK 800.

For RGK 700 – RGK 800 only
– PLC logic for inputs, outputs and internal status
– 1 communication port: RS232 for RGK700; RS485 for RGK 800
– Degree of protection: IEC IP65 on front; suitable for use with UL/CSA Type 4X outdoor enclosure installation.

For RGK 800 only
– Neutral current measurement range: 0.050...6A or 0.050...1.2A
– 400Hz frequency support
– 1 programmable analog input
– Modbus-TCP communication protocol
– Current leakage control towards earth/ground
– Clock-calendar (RTC).

Certifications and compliance
Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Generator controllers except pending for RGK 610. Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

Synergy and Xpress software
See Section 16.

EXP series expansion modules
See Section 16.

Lovato electric

Paralleling controllers for mains-generator and generator-generator

RGK 900SA - RGK 900

EXP 10…

EXP series expansion modules
See Section 16.

Order code	Description	Qty per pkg	Wt
		n°	[kg]
Stand-alone controller.			
RGK 900SA	Paralleling control among generating sets. 12/24VDC, graphic LCD, RS485 port and USB/optical and Wi-Fi point programming port on front. Expandable with EXP... modules	1	1.040
AMF (Automatic Mains Failure) controller.			
RGK 900	Mains-generator paralleling control. 12/24VDC, graphic LCD, with RS485 port, USB/optical and Wi-Fi point programming port on front. Expandable with EXP... modules	1	1.040
Mains-ATS (Automatic Transfer Switching) controller.			
RGK 900 MC	Control of mains, automatic transfer switching (ATS), and paralleling on multiple generators controlled by RGK 900SA. 12/24VDC, graphic LCD, with RS485 port and USB/optical and Wi-Fi point programming port. Expandable with EXP... modules	1	1.040

Order code	Description
EXPANSION MODULES FOR RGK 900... Inputs and outputs.	
EXP10 00	4 opto-isolated digital inputs
EXP10 01	4 opto-isolated static outputs
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated
EXP10 03	2 relay outputs rated 5A 250VAC
EXP10 04	2 opto-isolated analog inputs 0/4-20mA or PT100 or 0-10V or 0...±5V
EXP10 05	2 opto-isolated static outputs 0/4-20mA or 0-10V or 0...±5V
EXP10 08	2 opto-isolated digital inputs and 2 relay outputs rated 5A 250VAC
Communications interface.	
EXP10 10	Opto-isolated USB interface
EXP10 11	Opto-isolated RS232 interface
EXP10 12	Opto-isolated RS485 interface
EXP10 13	Ethernet interface with web server function

General characteristics
- VAC inputs: Mains L1-L2-L3-N for RGK 900 only
- VAC inputs: Generator L1-L2-L3-N
- Voltage measurement rated value: 600VAC (UL/CSA)
- Voltage measurement range: 30-720VAC
- Frequency measurement range: 45...65Hz or 360...440Hz
- Programmable VT ratio
- Current measurement input (3 PH+N): 0.05-6A or 0.05...1.2A
- Fourth CT for neutral measurement or earth/ground leakage detection
- Graphic LCD, 128x112 pixels with backlight
- 13 digital inputs
- 3 relay outputs rated 8A 250VAC
- 6 static outputs rated 2A, protected
- 1 static output 50mA
- Engine running detection: "D+" generator voltage and frequency
- 1 engine speed input: "W" or "Magnetic Pick-up"
- 3 analog ohmic inputs for oil pressure, engine temperature and fuel level control
- 1 programmable analog input
- 2 analog outputs for engine speed control (governor) / voltage regulator (AVR)
- Alarm-event-parameter text in 5 languages (Web upload)
- Alarm text customisable (16 alarms)
- Event log
- Modbus-RTU, Modbus-ASCII and Modbus-TCP communication protocols
- Boolean logic for inputs, outputs and internal status
- Customisation manager software available; compatible with **S**ynergy and **X**press software
- Degree of protection: IEC IP65 on front; suitable for use with UL/CSA Type 4X outdoor enclosure installation
- Built-in buzzer
- Multi-level passwords
- Sleep function (power saving mode)
- Synchronising and load sharing.

MAIN FUNCTIONS
- Menus for quick selection of rated parameter settings
- "Autocall" function for automatic sending of emails and/or SMS at predefined events/alarms
- Mains (for RGK 900 only) / Generator controls: Phase sequence, phase loss, max and min voltage and frequency, voltage asymmetry
- Programmable maintenance at various intervals
- Current leakage control towards earth/ground
- Mains-generator synchronising (ATS closed transition)
- Mains in base-load with generator in peak shaving
- Paralleling supervision of generators (island mode)
- Generating set start scheduling.

Certifications and compliance
Certifications obtained: EAC; UL Listed for USA and Canada (cULus - File E93601), as Auxiliary Devices, Generator controllers.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

MAINS-GENERATOR PARALLELING	ISLAND MODE	ATS AND PARALLELING OF MAINS WITH MULTIPLE GENSETS

RGK 900 is designed for mains-generator synchronising applications, such as:
a) Single generator in maintained parallel with the mains in "base-load" mode (generator power supplied at a steady rate)
b) Single generator in maintained parallel with the mains, in peak-shaving mode (import-export – mains power is limited to constant value and load peaks during heavy demand for power are supplied by generator)
c) Single generator in AMF with temporary parallel with the mains (for emergency, with AMF in closed transition).

RGK 900SA is designed for applications with load sharing on an isolated bus, without mains:
a) Parallel among generators working together in island mode on power bus with load shared among them
b) Generators connected together to maintain the power reserve (total power available minus load power) within a preset range, switching on and off generators according to a priority level.

Combination of RGK 900SA and RGK 900MC units is designed for load govern controls with multiple generators in parallel on power bus and mains.
In these circumstances, the **RGK 900MC** unit controls, in base-load or peak-shaving mode, the mains and power bus composed by multiple generators, each controlled by an **RGK 900SA**.
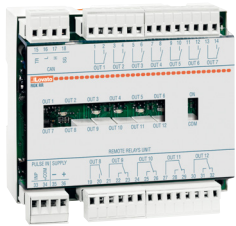
Lovato electric

Remote access devices

RGK 800 RD

RGK RA

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK 800 RD SA	Remote display panel for RGK 800SA, 12/24VDC, IP65 protection degree	1	0.820
RGK 800 RD	Remote display panel for RGK 800, 12/24VDC, IP65 protection degree	1	0.820
RGK 900 RD SA	Remote display panel for RGK 900SA, 12/24VDC, IP65 protection degree	1	0.980
RGK 900 RD	Remote display panel for RGK 900, 12/24VDC, IP65 protection degree	1	0.980
RGK RA	Remote display unit, graphic LCD, touch screen 128x112 pixels, IP54 protection	1	0.360

Alarm-status relay unit

RGK RR

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK RR	Remote unit for alarms/status, 12/24VDC, 12 relay outputs, pulse input, CANbus communication port	1	0.420

Remote display panel characteristics
For remote controller supervision and viewing, the user operates the remote display panel as if directly in front of the generating set.
– 12/24VDC battery power supply
– Graphic LCD with backlight:
  • 128x80 pixels for RGK 800...
  • 128x112 pixels for RGK 900...
– 13 function and setting keys
– 10 Indication LEDs for operating modes and status
– Built-in buzzer
– 4 digital inputs
– 2 digital outputs
– Conductor cross section: 0.2...2.5mm² (24...12 AWG; 18...12 AWG per UL/CSA)
– Tightening torque: 0.56Nm (4.5lbin)
– Front degree of protection: IEC IP65; UL/CSA Type 4X outdoor enclosure installation
– Serial interface ports: opto-isolated RS485 (RGK…RD); CANbus-J1979 (RGK…SA).

Remote display unit characteristics
Alarm conditions can be viewed on the remote display and alarm silencing can also be activated.
– Dual 100-240VAC / 12-24VDC power supply
– Touch screen 120x112 pixel backlight graphic LCD
– Built-in buzzer
– Static (SSR) output for global alarm signalling
– Opto-isolated RS485 interface port
– Conductor cross section: 0.2...2.5mm² (24...12 AWG; 18...12 AWG per UL/CSA)
– Tightening torque: 0.56Nm (4.5lbin)
– Front degree of protection: IEC IP54; UL Type 1.

Alarm-status relay unit characteristics
External relay expansion unit for alarm and status remoting.
Fixing on 35mm DIN rail (IEC/EN 60715).
Communication with RGK... controllers by CANbus or pulse inputs:
– 12 relay outputs of which 5 with changeover (SPDT) contact rated 5A 250VAC / B300 and 7 N/O (SPST) contact rated 2.5A 250VAC / C300
– 12/24VDC power supply
– Up to 2 RGK RR units can be connected in cascade for a total of 24 relays
– Maximum installation distance from the RGK 6... and RGK 700... RGK 900 controllers:
  • CANbus: 30m/33yd (high speed)
  • Inputs/Outputs: 1,000m/1,094yd (low speed)
– Conductor cross section: 0.2...2.5mm² (24...12 AWG)
– Tightening torque: 0.56 Nm/4.5lbin.

Certifications and compliance
Certifications obtained: EAC; UL Listed, for USA and Canada (cULus – File E93601), as Auxiliary Devices, Generator controllers remote and relay units for all except pending for RGK900… types.
Comply with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC 61000-6-3, UL508, CSA C22.2 n° 14.

For wiring schemes and technical characteristics, refer to technical instructions in Downloads at www.lovatoelectric.com

Non expandable

ATL 600

Order code	Description	Qty per pack	Wt
		n°	[kg]
ATL 600	Transfer switch controller automatic with optical port for 2-line control (144x144mm/5.7x5.7"), 110...240VAC supply	1	0.600

Expandable with EXP… modules

ATL 610

Order code	Description	Qty per pack	Wt
		n°	[kg]
ATL 610	Transfer switch controller automatic with optical port for 2-line control (144x144mm/5.7x5.7"), 110...240VAC supply and 12/24VDC, expandable with EXP… series modules	1	0.680

EXP10…

Order code	Description
ATL610 EXPANSION MODULES Snap in fixing of two modules on ATL 610 rear. Inputs and outputs.	
EXP10 00	4 opto-isolated digital inputs
EXP10 01	4 opto-isolated static outputs
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated
EXP10 03	2 relay outputs 5A 250VAC
EXP10 06	2 relay outputs, normally open contact 5A 250VAC
EXP10 07	3 relay outputs, normally open contact 5A 250VAC
EXP10 08	2 opto-isolated digital inputs and 2 5A relay outputs 250VAC
Communication ports.	
EXP10 10	Opto-isolated USB interface
EXP10 11	Opto-isolated RS232 interface
EXP10 12	Opto-isolated RS485 interface
EXP10 13	Opto-isolated Ethernet interface
EXP10 14	Opto-isolated Profibus-DP interface

Fixing EXP… expansion modules on ATL 610

MAX 2

General characteristics
The automatic transfer switch controllers ATL 600 / ATL 610 are used for the automatic or manual switching of the load from the MAIN LINE to a stand-by or emergency SECONDARY LINE and vice versa. They have two outputs for the "automatic" and/or "manual" control of contactors or motorised circuit breakers and switches. The main features are:
- Supply input
  - single in AC for ATL 600
  - dual in AC and DC for ATL 610
- Measurement inputs for three phase + neutral voltage values; also suitable for 1 and 2 phase lines
- 128x80 backlit graphic LCD to display measurements, events and alarms in 5 languages (English, Italian, French, Spanish and German)
- 2 status indication LEDs
- 6 programmable digital inputs
- 7 programmable relay outputs
- Viewing of L-L and L-N voltage values of the controlled lines
- Status viewing of contactor or motorised circuit breakers
- Configuration programming of lines, control and supervision parameters for emergency demand of generating set
- Event logging
- Microprocessor supervision of functions; including virtual real time clock for ATL 610
- Communication interface via front optical port with CX01 or CX02 dongle using USB or Wi-Fi
- Compatible with **Synergy** supervision and energy management software, **Xpress** remote control and configuration software and with the **Sam1** application for Android/iOS
- Modbus-RTU, ASCII and TCP communication protocol

CONTROL FUNCTIONS OF THE LINES
- Phase sequence and phase loss
- Minimum and maximum voltage
- Voltage asymmetry
- Minimum and maximum frequency.

Operational characteristics
- Auxiliary supply
  - auxiliary supply voltage: 110...240VAC 12/24VDC only for ATL 610
  - operating range: 90...264VAC; 9...36VDC only for ATL 610
- Voltage measurement inputs
  - rated voltage Ue: 100...480VAC (L-L)
  - measuring range: 50...576VAC (L-L)
  - frequency range: 45...65Hz.
- Programmable digital inputs
  - negative inputs
- Programmable relay outputs
  - 5 each with 1 normally open contact (NO - SPST) rated 8A 250VAC
  - 2 each with 1 changeover contact (NO/NC - SPDT) rated 8A 250VAC
- Enclosure
  - flush-mount housing: 144x144mm/5.7x5.7"
  - protection rating: IP40 on front; IP65 optional with seal EXP80 01; IP20 at rear.

Supervision and energy management software Synergy See Section 16.

Xpress configuration software and Sam1 application See Section 16.

EXP expansion modules See Section 16.

Certifications and compliance
Certifications obtained: cULus, EAC, RCM.
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-6-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL508, CSA C22.2 n°14.

Lovato electric

Expandable with EXP… modules

ATL 800

NFC

EXP10…

Order code	Description	Qty per pack	Wt
		n°	[kg]
ATL 800	Transfer switch controller automatic with optical port and NFC for controlling 2 lines and 1 tie breaker, 110...240VAC supply and 12/24/48VDC, expandable with EXP… series modules	1	1.000

Order code	Description
EXPANSION MODULES. Snap in fixing of three modules on rear. Digital inputs and outputs.	
EXP10 00	4 opto-isolated digital inputs
EXP10 01	4 opto-isolated static outputs
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated
EXP10 03	2 relay outputs 5A 250VAC
EXP10 06	2 relay outputs, normally open contact 5A 250VAC
EXP10 07	3 relay outputs, normally open contact 5A 250VAC
EXP10 08	2 opto-isolated digital inputs and 2 5A relay outputs 250VAC
Analogue inputs and outputs.	
EXP10 04	2 opto-isolated analogue inputs 0/4...20mA or PT100 or 0...10V or 0...+-5V
EXP10 05	2 opto-isolated 0/4...20mA or 0...10V or 0...+-5V
Communication ports.	
EXP10 10	Opto-isolated USB interface
EXP10 11	Opto-isolated RS232 interface
EXP10 12	Opto-isolated RS485 interface
EXP10 13	Opto-isolated Ethernet interface
EXP10 14	Opto-isolated Profibus-DP interface

EXP… expansion module fixing on ATL 800

MAX 3

General characteristics
The automatic transfer switch controller ATL 800 is used for the automatic or manual switching of the load between two lines in accordance with the selected switching logic. It has outputs for the "automatic" and/or "manual" control of contactors or motorised circuit breakers and switches.
It can also manage a third control device as tie breaker or non-priority load management. The layout and system status are displayed directly on the graphic LCD.
The main features are:
– AC and DC supply inputs
– Measurement inputs for three phase + neutral voltage values; also suitable for 1 and 2 phase lines
– 128x80 backlit graphic LCD to display measurements, events and alarms in 8 languages (English, Italian, French, Spanish, German, Portuguese, Polish and Russian)
– Active operating mode indicator LED
– Viewing of L-L and L-N voltage values of the controlled lines
– Viewing the status of contactors or motorised circuit breakers both via display and LED
– 6 system layouts available
– Management of a tie breaker
– 8 programmable digital inputs
– 7 programmable relay outputs
– Viewing of L-L and L-N voltage values of the controlled lines
– Configuration programming of lines, type of source (line/generator), control and supervision parameters for emergency demand of generating set
– Possibility of transferring load with closed transition and spontaneous or controlled genset synchronisation
– Non-priority load management
– Built-in programmable PLC logic
– Built-in RS485 communication
– Event logging
– Virtual calendar clock (RTC)
– Communication interface via front optical port with CX01 or CX02 dongle using USB or Wi-Fi
– Parameter programming via NFC technology and the App NFC
– Compatible with Synergy supervision and energy management software, Xpress remote control and configuration software and with the Sam1 application for Android/iOS
– Modbus-RTU, ASCII and TCP communication protocol

CONTROL FUNCTIONS OF THE LINES
– Phase sequence and phase loss
– Minimum and maximum voltage
– Voltage asymmetry
– Minimum and maximum frequency.

Operational characteristics
– Auxiliary supply
  • auxiliary supply voltage: 100...240VAC, 12/24/48VDC
– Voltage measurement inputs
  • rated voltage Ue: 100...600VAC (L-L)
  • frequency range: 45...65Hz.
– Programmable digital inputs
  • negative inputs
– Programmable relay outputs
  • 2 each with 1 normally open contact (NO - SPST) rated 12A 250VAC
  • 2 each with 1 normally open contact (NO - SPST) rated 8A 250VAC
  • 3 each with 1 changeover contact (NO/NC - SPDT) 8A 250VAC
– Enclosure
  • flush-mount housing: 180x240mm/5.7x5.7"
  • protection rating: IP65 on front; IP20 at back.

Synergy, Xpress, Sam1 and NFC software
See Section 16.

EXP expansion modules see Section 16.

Certifications and compliance
Certifications obtained: cULus, EAC, RCM.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61010-2, IEC/EN 61000-6-2, IEC/EN 61000-6-4, IEC/EN 60947-1, IEC/EN 60947-6-1, UL508 and CSA C22.2 n° 14.

Expandable with EXP… modules

ATL 900

NFC

Order code	Description	Qty per pack	Wt
		n°	[kg]
ATL 900	Transfer switch controller automatic with optical port and NFC for controlling 3 lines and 2 tie breakers, 110…240VAC supply and 12/24/48VDC, expandable with EXP… series modules	1	1.800

EXP10…

Order code	Description
EXPANSION MODULES. Snap in fixing of three modules on rear. Digital inputs and outputs.	
EXP10 00	4 opto-isolated digital inputs
EXP10 01	4 opto-isolated static outputs
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated
EXP10 03	2 relay outputs 5A 250VAC
EXP10 06	2 relay outputs, normally open contact 5A 250VAC
EXP10 07	3 relay outputs, normally open contact 5A 250VAC
EXP10 08	2 opto-isolated digital inputs and 2 5A relay outputs 250VAC
Analogue inputs and outputs.	
EXP10 04	2 opto-isolated analogue inputs 0/4…20mA or PT100 or 0…10V or 0…+-5V
EXP10 05	2 opto-isolated 0/4…20mA or 0…10V or 0…+-5V
Communication ports.	
EXP10 10	Opto-isolated USB interface
EXP10 11	Opto-isolated RS232 interface
EXP10 12	Opto-isolated RS485 interface
EXP10 13	Opto-isolated Ethernet interface
EXP10 14	Opto-isolated Profibus-DP interface

EXP… expansion module fixing on ATL 900

MAX 3

General characteristics
The automatic transfer switch controller ATL 900 is used for the automatic or manual switching of the load between three lines in accordance with the selected switching logic. It has outputs for the "automatic" and/or "manual" control of contactors or motorised circuit breakers and switches. It can also manage two more control devices as tie breakers or non-priority load management. It has four current inputs for managing switching with power thresholds. The layout and system status are displayed directly on the graphic LCD.
The main features are:
– AC and DC supply inputs
– Measurement inputs for three phase + neutral voltage values; also suitable for 1 and 2 phase lines
– 4 current measurement inputs
– 128x112 backlit graphic LCD to display measurements, events and alarms in 8 languages (English, Italian, French, Spanish, German, Portuguese, Polish and Russian)
– Active operating mode indicator LED
– Viewing of L-L and L-N voltage values of the controlled lines
– Viewing the status of contactors or motorised circuit breakers both via display and LED
– 6 system layouts available
– Management of a tie breaker
– 12 programmable digital inputs
– 10 programmable relay outputs
– 1 static output
– Viewing of L-L and L-N voltage values of the controlled lines
– Configuration programming of lines, type of source (line/generator), control and supervision parameters for emergency demand of generating set
– Possibility of transferring load with closed transition and spontaneous or controlled genset synchronisation
– Non-priority load management
– Built-in programmable PLC logic
– Built-in RS485 communication
– Event logging
– Virtual calendar clock (RTC)
– Communication interface by front optical port using USB CX01 or Wi-Fi CX02 dongle
– Parameter programming via NFC technology and the App **NFC**
– Compatible with **Synergy** supervision and energy management software, **Xpress** remote control and configuration software and with the **Sam1** application for Android/iOS
– Modbus-RTU ASCII and TCP communication protocol.

CONTROL FUNCTIONS OF THE LINES
– Phase sequence and phase loss
– Minimum and maximum voltage
– Voltage asymmetry
– Minimum and maximum frequency.

Operational characteristics
– Auxiliary supply
  • auxiliary supply voltage: 100…240VAC, 12/24/48VDC
– Voltage measurement inputs
  • rated voltage Ue: 100…600VAC (L-L)
  • frequency range: 45…65Hz.
– Programmable digital inputs
  • negative inputs
– Programmable relay outputs
  • 3 each with 1 normally open contact (NO - SPST) rated 12A 250VAC
  • 3 each with 1 normally open contact (NO - SPST) rated 8A 250VAC
  • 4 each with 1 changeover contact (NO/NC - SPDT) 8A 250VAC
  • 1 30VDC 50mA static output
– Enclosure
  • flush-mount housing: 180x240mm/5.7x5.7"
 • protection rating: IP65 on front; IP20 at back.

Synergy, **Xpress**, **Sam1** and **NFC** software
See Section 16.

EXP expansion modules see Section 16.
Certifications and compliance
Certifications obtained: cULus, EAC, RCM.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61010-2, IEC/EN 61000-6-2, IEC/EN 61000-6-4, IEC/EN 60947-1, IEC/EN 60947-6-1, UL508 and CSA C22.2 n° 14.

Lovato electric

Mechtric
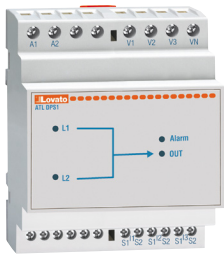
Order code	Description	Qty per pack	Wt
		n°	[kg]
ATL DPS1	For controlling and selecting supply for motorised breakers/switches, 110...230VAC configurable	1	0.300

ATL DPS1

new

General characteristics
ATL DPS1 is capable of measuring and controlling voltages at its inputs selecting the most ideal to connect to the output. It is suitable to supply motorised circuit breakers and changeover switches in automatic switching systems of 2 three phase supply lines.
The two voltage inputs of the module are independent and insulated; each is capable of supplying the internal measuring circuit managed by the microcontroller.
It reduces the number of components and improves installation safety.
Main ATL DPS1 features include:
– Voltage value selectable via bypass terminals
– Minimum and maximum voltage tripping thresholds
– 2 single phase L+N inputs
– 1 single phase L+N output
– L1 priority line
– Use with motorised control units powered at 110VAC or 230VAC
– Output voltage monitoring
– Internal relay self-diagnosis
– Indicating LEDs for abnormal conditions and status of inputs and outputs.

Operational characteristics
– Rated supply voltage: 110...230VAC configurable
– Frequency: 50/60Hz
– Input voltage range: 80…300VAC
– Voltage tripping thresholds min / max: 80% and 120% set value
– 2 line inputs L1-L2: Single phase, between phase and neutral
– Current output: 4A max.
– Priority line: L1 when both input values are within limits
– Fixed delay time between line switching: 0.5s
– 4 status indication LEDs for voltage of each line within limits, voltage present at output, relay output anomaly
– Mounting: 35mm DIN rail (IEC/EN 60715) or screw-type by means of removable clips
– Modular housing, 3-module
– Protection rating: IP40 on front; IP20 at rear.

Certifications and compliance
Certifications obtained: cULus, EAC, RCM.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61010-2, IEC/EN 61000-6-2, IEC/EN 61000-6-4, IEC/EN 60947-1, IEC/EN 60947-6-1, UL508 and C22.2 no. 14.

	110VAC		230VAC	
	MIN	MAX	MIN	MAX
Line absent	< 88V	> 152V	< 176V	> 288V
Line presence	< 92V	> 144V	< 185V	> 273V

Using the thresholds above ATL DPS1 outputs one of the power supplies available according to the logic shown in the table:

Status Line 1	LED Line 1	Status Line 2	LED Line 2	Output	LED Output	ATL DPS1	Alarm contact	LED Fault
OK	ON	<MIN OR >MAX	OFF	ON - from line 1	ON	ON - OK	Closed	OFF
OK	ON	OK	ON	ON - from line 1	ON	ON - OK	Closed	OFF
<MIN OR >MAX	OFF	OK	ON	ON - from line 2	ON	ON - OK	Closed	OFF
<MIN	OFF	<MIN	OFF	OFF	OFF	OFF	Open	OFF
>MAX	OFF	<MIN OR >MAX	OFF	OFF	OFF	ON	Open	ON
<MIN OR >MAX	OFF	>MAX	OFF	OFF	OFF	ON	Open	ON
>MIN	ON	OK	ON	OFF	OFF	ON - Fault Internal relays	Open	ON
		<MIN OR >MAX	OFF					
OK	ON					ON - Fault OFF	Open Internal relays	ON
	<MIN OR >MAX	OFF	>MIN	ON	OFF			

Lovato electric

Communication devices

CX 01

CX 02

Order code	Description	Qty per pack	Wt
		n°	[kg]
CX 01	Connection cable PC ↔ ATL... with optical port with optical USB connector for programming, data download, diagnostics and updating firmware	1	0.090
CX 02	Wi-Fi device for connecting PC ↔ ATL... with optical port for programming, downloading data, diagnostics, cloning	1	0.090

General characteristics
Communication devices for connection of LOVATO Electric products to personal computers, smartphones and tablets.

CX 01
The USB/optical dongle, complete with cable, allows the connection of products compatible with PCs without having to disconnect the power supply from the electric panel. The PC identifies the connection as a standard USB.

CX 02
By Wi-Fi connection, compatible LOVATO Electric products can be viewed on PCs, smartphones and tablets with no need for cabling.

For dimensions, wiring schemes and technical characteristics, refer to technical instructions in Downloads of **www.LovatoElectric.com**

Software and accessories

51 C4

4 PX1

EXC CON 01

EXC M3G 01
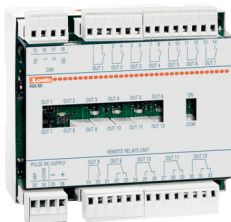
RGK RR

Order code	Description	Qty per pack	Wt
		n°	[kg]
EXP80 01	Protective seal IP65 for ATL 600 and ATL 610	1	0.150
51 C2	Connection cable PC ↔ ATL 610 with EXP10 11, length 1.8m	1	0.090
51 C4	Connection cable PC ↔ 4 PX1, length 1.8m	1	0.147
4 PX1	RS232/RS485 converter galvanically isolated, supply 220...240VAC (or 110...120VAC)❶	1	0.600
For RGK..., ATL 610 - ATL 800 - ATL 900.			
EXC CON 01	RS485/Ethernet converter, 12…48VDC, including kit for DIN rail fixing	1	0.400
EXC M3G 01	RS485 gateway/3G modem, 9.5…27VAC/9.5…35VDC, including antenna and cable for programming	1	0.340
For ATL 900.			
RGK RR	Remote unit for statuses and alarms, 12/24 VDC, 12 relay outputs, pulse input.	1	0.420
For RGK 600..., RGK 601... and RGK 610 controllers.			
EXP80 01	IP65 144mm housing gasket		
For RGK 4...SA			
EXP80 05	IP65 110mm housing gasket		

❶ Opto-isolated RS232/RS485 bench converter, 38,400 Baud-rate max., automatic or manual TRANSMIT line management, 220...240VAC ±10% supply (110...120VAC on request).

Software
By using the **Xpress** software, the quick set-up of the switch can be carried out via PC, avoiding parameter programming errors.
The parameter programming of ATL… controllers can also be PC saved and quickly uploaded into another device requiring the same programming.
It permits the correct operation of the system to be checked through graphic and numerical display of the measurements and controller status.

The **Synergy** software provides for the supervision of the ATL… transfer switch controllers.
This software has structures and applications based on MS SQL relational databases, and the data can be consulted using the most popular browsers.
It is highly versatile software, simultaneously accessible to a large number of users/workstations via intranets, VPN or Internet.
See Section 16 for details.

APP for smartphone and tablet
The **Sam1** (Setup And Maintenance 1) application allows the user to program the controller, view alarm conditions, send commands, read measurements, download statistical data and events and send retrieved data by email. The connection is made by Wi-Fi with a smartphone or tablet using the CX02 dongle.
It is iOS and Android compatible.

For ATL 800 and ATL 900, featuring built-in NFC technology, the LOVATO **NFC** application is available for parameter programming.
Available only for Android devices.

EXC CON 01
The EXC CON 01 converter allows "slave" devices connected on an RS485 network to interface with a "master" featuring Ethernet port:
– Kit comprising MOXA NPORT5230 converter and DIN rail mounting accessory DK35
– Programming via web interface
– Power supply not included.
See Section 16 for details.

EXC M3G 01
The EXC M3G 01 gateway allows "slave" devices connected on an RS485 network to interface with a "master" via 3G network.
See Section 16 for details.

RGK RR
It's an expansion unit for remoting statuses and alarms.
RGK RR can be connected at a maximum distance of 1000m39.37" using the static output of the ATL 900.
RGK RR has 12 output relays, 7 normally open (2.5A 250VAC/C38) and 5 changeover contacts (5A 250VAC/B300).

Lovato electric

APP

Supervision and Energy management software

The **Synergy** software provides for the remote control and supervision of the RGK… controllers.
See details given in Section 16.
Its structure and applications are based on MS SQL relational database management system. Consulting is made through popular programs for Internet browsing available across different platforms and operating systems. It is a highly versatile system, simultaneously accessible to a large number of users/workstations via intranets, VPN or Internet.

Configuration and remote control software

The **Xpress** is a parameter configuration and remote monitoring software shared by the entire latest generation of RGK generating set controller with communication port. It can be installed in the Windows© environment and connect individually (one node at a time) to the RGK generating set controller connected to the network.
– Supports connection via CX01 (USB) or CX02 (Wi-Fi) dongle, USB, RS232, RS485, Ethernet and modem
– Product configuration:
  • Parameter setting
  • Project file management
– Product firmware upgrade (via CX01)
– Remote control:
  • Monitoring of main measurements
  • Sending commands to products
– Reading alarms and events memory.
See details given in Section 16.

APP for smartphone and tablet

Sam1 (Setup And Maintenance 1) application allows the user to program the controller, view alarm conditions, send commands, read measurements, download statistical data and events and send retrieved data by email. The connection is made by Wi-Fi with a smartphone or tablet using the CX02 dongle.
It is iOS and Android compatible.

LOVATO NFC configurator

For RGK 4…SA, with integrated NFC tecnology, is available the LOVATO NFC Configurator App that allows remote parameter configuration. The parameters can be saved in a file for archive purposes. It is Android compatible.
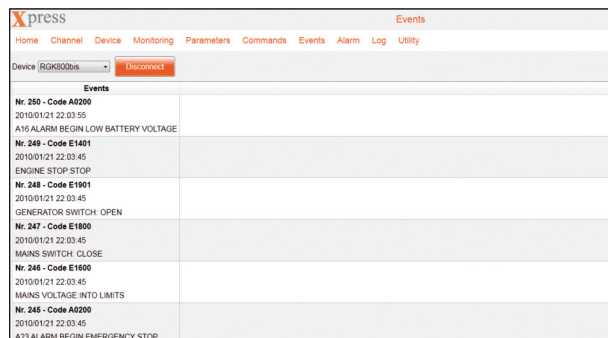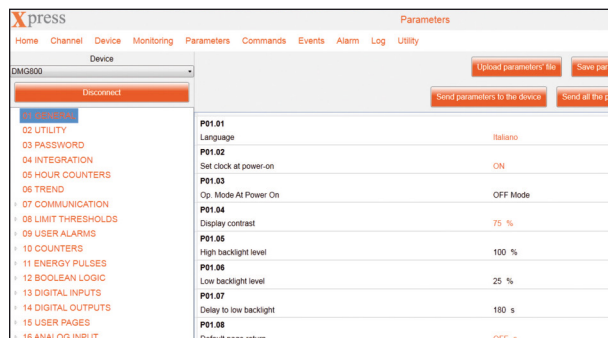
Engine Protection Controllers

RGK 20
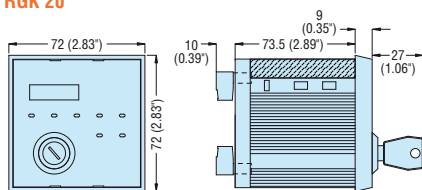
Cutout
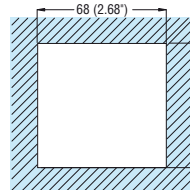
RGK 30
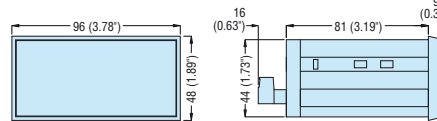
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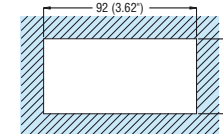
Stand-Alone Gen-set Controllers

RGK 400…SA
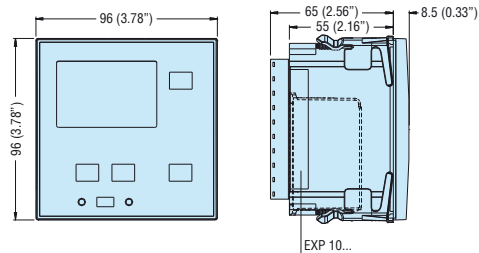
RGK 420…SA
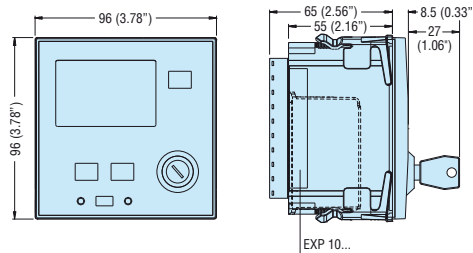
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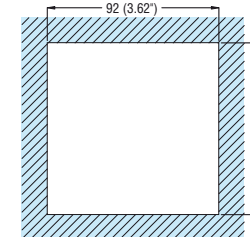
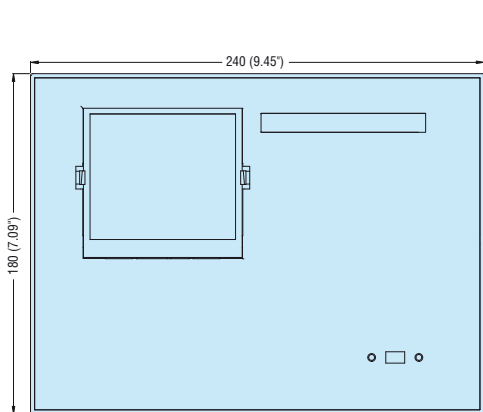## Gen-set Controllers RGK 600… - RGK 601… - RGK 610
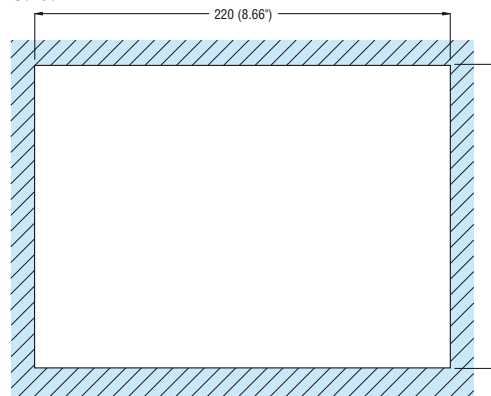
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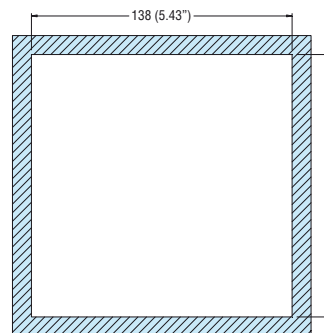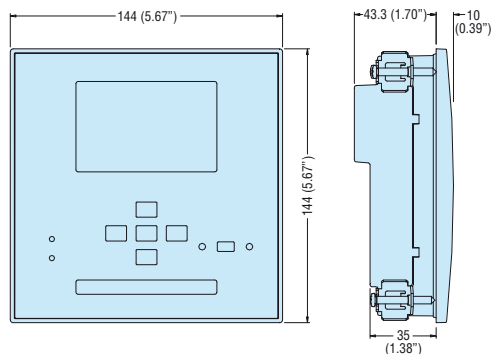
Gen-set Controllers RGK 700… - RGK 800… - RGK 900… Remote Display Panels RGK 800RD - RGK 800RDSA - RGK 900RD - RGK 900RDSA
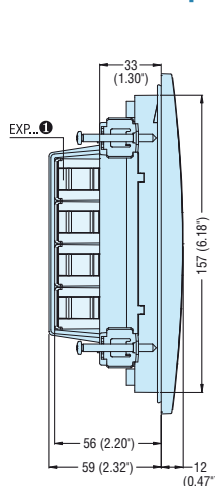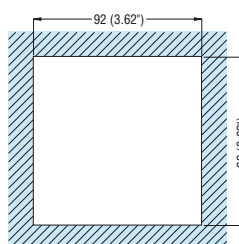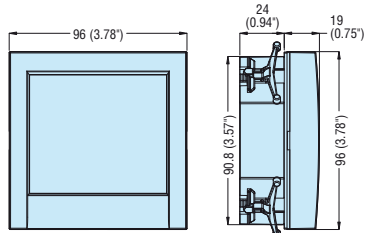
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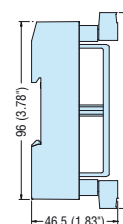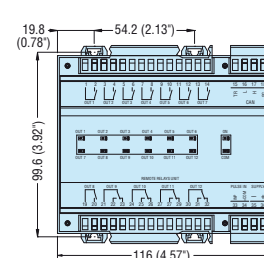❶ RGK 700, RGK 800RD…, RGK 900RD… excluded.

Remote Display Unit RGK RA
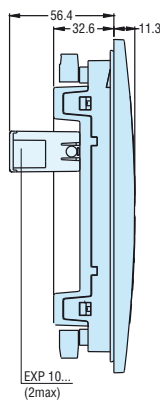
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Alarm-status Relay Unit RGK RR

Lovato electric
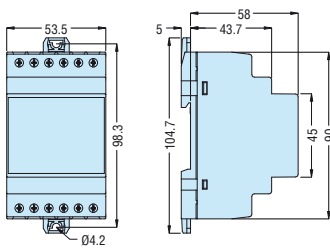
Automatic Transfer Switch Controllers
ATL 600 - ATL 610

Hole

ATL 800 - ATL 900

Hole
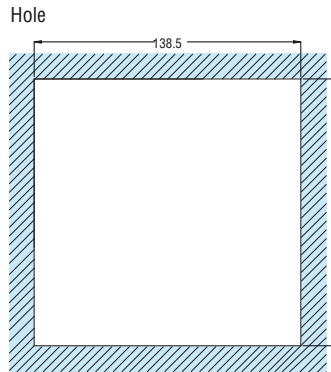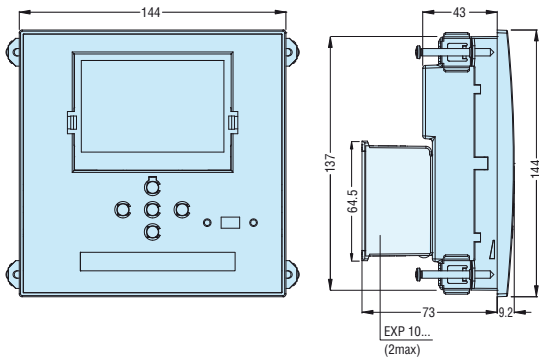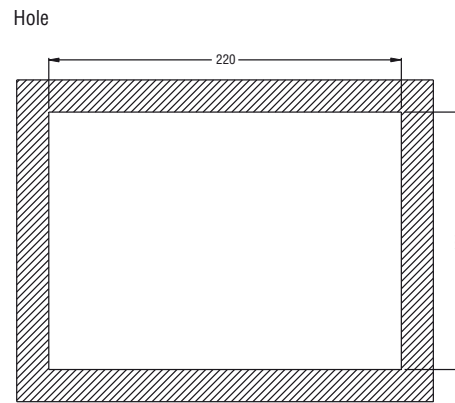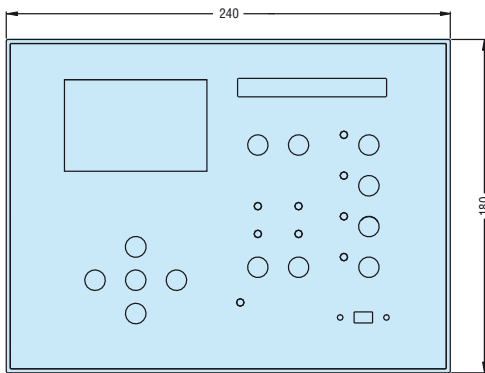
Dual Power Supply Module
ATL DPS1

Expansion Unit
RGK RR