Lovato electric

Characteristics

	ENGINE PROTECTION CONTROLLERS		STAND ALONE GEN-SET CONTROLLERS			
	RGK30	RGK20	RGK40	RGK600 SA RGK601 SA	RGK700 SA	RGK800 SA
Generator voltage control	–	L-N ❶	L1-L2-L3/N	L1-L2-L3-N	L1-L2-L3-N	L1-L2-L3-N
Current control	–	–	L1	L1-L2-L3	L1-L2-L3	L1-L2-L3-N
Rated frequency	–	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60/400Hz
Digital inputs n°	4	4	6	5	7	9
Digital outputs n°	2 (Relay)	3 (SSR)	1 (Relay) + 4 (SSR)	6 (SSR)	3 (Relay) + 4 (SSR)	3 (Relay)+6 (SSR)+1(SO)
Engine running inputs	"D+" and "AC"	"D+" and "AC"	"D+" and "AC"	"D+"	"D+" and "AC"	"D+" and "AC"
Ohmic inputs for fuel-pressure-temperature	–	–	–	●	●	●
Remote control	–	–	–	–	●	●
CANbus interface	–	–	–	RGK601SA	●	●
Rated battery voltage	12/24VDC	12/24VDC	12/24VDC	12/24VDC	12/24VDC	12/24VDC
Power supply range	9-33VDC	9-35VDC	9-35VDC	7-33VDC	7-33VDC	7-33VDC
Mains voltage control	–	–	–	–	–	–
Rated voltage range	–	10-277VAC	100-415VAC	100-480VAC	30-600VAC	30-600VAC
VT programming	–	–	●	●	●	●
Rated input current	–	–	5A	5A/1A	5A/1A	5A/1A
TRMS voltage measurement	–	–	●	●	●	●
TRMS current measurement	–	–	●	●	●	●
Display	–	7 digit LCD	4-digit LCD	Graphic backlight LCD, 128x80 pixels	Graphic backlight LCD, 128x80 pixels	Graphic backlight LCD, 128x80 pixels
Engine running magnetic pick-up input	–	–	–	RGK600SA	●	●
Engine speed input	"W"	"W" or generator frequency	"W" or generator frequency	"W" or generator frequency or "Pick-up" (RGK600SA)	"W" or generator frequency or "Pick-up"	"W" or generator frequency or "Pick-up"
Auxiliary analog input	–	–	–	–	–	●
I/O expansion	–	–	–	RGK RR	RGK RR	3 x EXP... + RGK RR
USB/Optical port on front	–	–	–	●	●	●
Wi-Fi port on front	–	–	–	●	●	●
USB port at rear	–	–	–	–	–	EXP1010
Ethernet port with Web server function	–	–	–	–	–	EXP1013
GPRS/GSM modem	–	–	–	–	–	EXP1015
RS232 serial port	–	● (TTL)	● (TTL)	–	●	EXP1011
RS485 serial port	–	–	–	–	–	●
Event logging	–	–	–	●	●	●
RTC (Real Time Clock)	–	–	–	–	–	●
Programmable Inputs/Outputs	–	●	●	●	●	●
PLC logic function	–	–	–	–	●	●
Alarms n°	6	13	25	59	60	60
User alarms n°	–	1	1	4	8	8
Alarm property customising	–	●	●	●	●	●
Texts for alarms, events and parameters	–	–	–	●	●	●
Multilanguage (type) n°	–	–	–	5 (GB - I - F - P - E)❷	5 (GB - I - F - P - E)❷	5 (GB - I - F - P - E)❷
Upload languages	–	–	–	●	●	●
Load sharing	–	–	–	–	–	–
Generator paralleling	–	–	–	–	–	–
Mains-generator synchronising (closed transition)	–	–	–	–	–	–
IEC front degree of protection	IP41	IP41	IP54	IP54 ❸	IP65	IP65
Certifications	cULus, EAC	cULus, EAC	cULus, EAC	cULus, EAC	cULus, EAC	cULus, EAC

❶ Frequency only.
❷ Controller uploading of other mutilanguage sets.
❸ IP65 with optional gasket seal.

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	AUTO MAINS (AMF) GEN-SET CONTROLLERS			PARALLELING / LOAD SHARING	
	RGK600 RGK601	RGK700	RGK800	RGK900	RGK900 SA
Generator voltage control	L1-L2-L3-N	L1-L2-L3-N	L1-L2-L3-N	L1-L2-L3-N	L1-L2-L3-N
Current control	L1-L2-L3	L1-L2-L3	L1-L2-L3-N	L1-L2-L3-N	L1-L2-L3-N
Rated frequency	50/60Hz	50/60Hz	50/60/400Hz	50/60/400Hz	50/60/400Hz
Digital inputs n°	5	7	9	13	13
Digital outputs n°	6 (SSR)	3 (Relay) + 4 (SSR)	3 (Relay) + 6 (SSR) + 1 (SO)	3 (Relay) + 6 (SSR) + 1 (SO)	3 (Relay) + 6 (SSR) + 1 (SO)
Engine running inputs	"D+"	"D+" and "AC"	"D+" and "AC"	"D+" and "AC"	"D+" and "AC"
Ohmic inputs for fuel-pressure-temperature	●	●	●	●	●
Remote control	–	●	●	●	●
CANbus interface	RGK601	●	●	●	●
Rated battery voltage	12/24VDC	12/24VDC	12/24VDC	12/24VDC	12/24VDC
Power supply range	7-33VDC	7-33VDC	7-33VDC	7-36VDC	7-36VDC
Mains voltage control	–	L1-L2-L3-N	L1-L2-L3-N	L1-L2-L3-N	–
Rated voltage range	100-480VAC	30-600VAC	30-600VAC	30-600VAC	30-600VAC
VT programming	●	●	●	●	●
Rated input current	5A/1A	5A/1A	5A/1A	5A/1A	5A/1A
TRMS voltage measurement	●	●	●	●	●
TRMS current measurement	●	●	●	●	●
Display	Graphic backlight LCD, 192x112 pixels	Graphic backlight LCD, 128x80 pixels	Graphic backlight LCD, 128x80 pixels	Graphic backlight LCD, 128x112 pixels	Graphic backlight LCD, 128x112 pixels
Engine running magnetic pick-up input	RGK600	●	●	●	●
Engine speed input	"W" or generator frequency (RGK600) or "Pick-up"	"W" or generator frequency or "Pick-up"	"W" or generator frequency or "Pick-up"	"W" or generator frequency or "Pick-up"	"W" or generator frequency or "Pick-up"
Auxiliary analog input	–	–	●	●	●
I/O expansion	RGK RR	RGK RR	3 x EXP... + RGK RR	4 x EXP... + RGK RR	4 x EXP... + RGK RR
USB/Optical port on front	●	●	●	●	●
Wi-Fi port on front	●	●	●	●	●
USB port at rear	–	–	EXP1010	EXP1010	EXP1010
Ethernet port with Web server function	–	–	EXP1013	EXP1013	EXP1013
GPRS/GSM modem	–	–	EXP1015	EXP1015	EXP1015
RS232 serial port	–	●	EXP1011	EXP1011	EXP1011
RS485 serial port	–	–	●	●	●
Event logging	●	●	●	●	●
RTC (Real Time Clock)	–	–	●	●	●
Programmable Inputs/Outputs	●	●	●	●	●
PLC logic function	–	●	●	●	●
Alarms n°	59	60	60	67	67
User alarms n°	4	8	8	16	16
Alarm property customising	●	●	●	●	●
Texts for alarms, events and parameters	●	●	●	●	●
Multilanguage (type) n°	5 (GB - I - F - P - E)❷	5 (GB - I - F - P - E)❷	5 (GB - I - F - P - E)❷	5 (GB - I - F - P - E)❷	5 (GB - I - F - P - E)❷
Upload languages	–	●	●	●	●
Load sharing	–	–	–	●	●
Generator paralleling	–	–	–	–	●
Mains-generator synchronising (closed transition)	–	–	–	●	–
IEC front degree of protection	IP54 ❸	IP65	IP65	IP65	IP65
Certifications	cULus, EAC	cULus, EAC	cULus, EAC	cULus	cULus

Lovato electric

Stand alone gen-set controllers

RGK 40

RGK 600SA - RGK 601SA

RGK 700SA - RGK 800SA

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK 40	12/24VDC, built-in power key switch, with TTL programming port	1	0.400
RGK 600SA	12/24VDC, graphic LCD, USB/optical and Wi-Fi point programming port on front, W/Pick-up speed input, IP54	1	0.540
RGK 601SA	12/24VDC, graphic LCD, USB/optical and Wi-Fi point programming port on front, CANbus port, IP54	1	0.540
RGK 700SA	12/24VDC, graphic LCD, RS232 serial port and USB/optical and Wi-Fi point programming port on front, CANbus port, IP65	1	0.900
RGK 800SA	12/24VDC, graphic LCD, RS485 serial port and USB/optical and Wi-Fi point programming port on front, CANbus port, IP65. Expandible with EXP... modules	1	0.980

Programmable functions and properties

Characteristics	RGK 6...SA	RGK 700SA	RGK 800SA
Inputs	5	7	9
Relay outputs	–	3	3
Protected static outputs	6	4	7

EXP 10…

Order code	Description
ACCESSORY FOR RGK 600SA AND RGK 601SA	
RGK X00	IP65 gasket seal for internal display frame
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 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
EXP10 15	GPRS/GSM modem

STAND ALONE APPLICATION

G

CONTROL PANEL

LOAD

Synergy supervision software
See Section 27.

EXP series expansion modules
See Section 27, page 2.

General characteristics for RGK 40
OPERATOR INTERFACE
– 1 ON-OFF power supply key selector switch
– 1 semi-automatic engine START button
– 2 programming key buttons
– 4 digit LED display (V, A, kVA, Hours, Vbatt, Hz)
– 6 LED indicators for measurements/readings
– 2 LED indicators for genset status indication
– 1 LED indicator for glow plug pre-heating
– 8 LED indicators s for alarm status
– Local and remote starting.

INPUTS/OUTPUTS
Programmable functions:
– VAC inputs: Generator L1-L2-L3/N
– Digital inputs: 5 negative and 1 positive
– Digital outputs: 1 relay and 4 static
– Programmable properties for inputs, outputs and alarms.

ADDITIONAL FEATURES
– Quick set-up with PC software (TTL/RS232 port)
– Certifications: EAC; UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Generator controller.

General characteristics for
RGK 600SA - RGK 601SA - RGK 700SA - RGK 800SA
– VAC inputs: Generator L1-L2-L3-N
– Single, two and three phase voltage control, with or without neutral
– Rated measurement voltage range:
  • 50-576VAC for RGK 600SA and RGK 601SA
  • 30-720VAC for RGK 700SA and RGK 800SA
– 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 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)
– Event log
– Modbus-RTU and Modbus-ASCII protocols
– Customisation manager software available; compatible with Synergy software
– Certifications: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices – Generator controllers.

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).

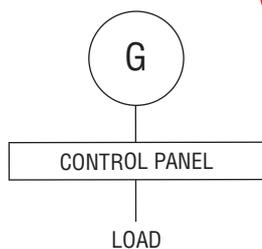MAIN FUNCTIONS FOR RGK 600SA-RGK 601SA-RGK 700SA-RGK 800SA
– Menus for quick selection of rated parameter settings
– "Autocall" function for automatic sending of emails and/or SMS at predefined events/alarms
– Generator controls: phase sequence, maximum and minimum voltage and frequency, voltage asymmetry
– Programmable maintenance.

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Automatic mains failure (AMF) gen-set controllers

new
new

RGK 600 - RGK 601

RGK 700 - RGK 800

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK 600	12/24VDC, graphic LCD, USB/optical and Wi-Fi point programming port on front, W/Pick-up speed input	1	0.540
RGK 601	12/24VDC, graphic LCD, USB/optical and Wi-Fi point programming port on front, CANbus port	1	0.540
RGK 700	12/24VDC, graphic LCD, with RS232 port and USB/optical and Wi-Fi point programming port on front, CANbus port, IP65	1	0.880
RGK 800	12/24VDC, graphic LCD with RS485 port and USB/optical and Wi-Fi point programming port on front, CANbus port, IP65. Expandible with EXP... modules	1	0.880

Programmable functions and properties

Characteristic	RGK 600	RGK 601	RGK 700	RGK 800
Inputs	5	5	7	9
Relay outputs	–	–	3	3
Protected static outputs	6	6	4	7

Order code	Description
ACCESSORY FOR RGK 600 AND RGK 601	
RGK X00	IP65 gasket seal for internal display frame
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 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
EXP10 15	GPRS/GSM modem

new
new

EXP 10…

AMF (AUTOMATIC MAINS FAILURE) APPLICATION

AMF PANEL

LOAD
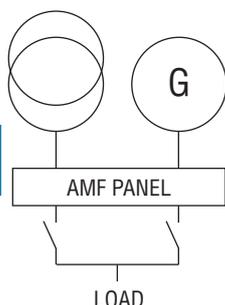
General characteristics for RGK 600 - RGK 601 - RGK 700 - RGK 800
– VAC inputs: Mains and generator L1-L2-L3-N
– Voltage control for one, two and three phase systems with or without neutral
– Rated measurement voltage:
  • 480VAC for RGK 600 and RGK 601
  • 600VAC for RGK 700 and RGK 800
– Rated measurement voltage range:
  • 50-576VAC for RGK 600 and RGK 601
  • 30-720VAC 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 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
– Customisation manager software available; compatible with **Synergy** software.

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).

MAIN FUNCTIONS FOR RGK 600-RGK 601-RGK 700-RGK 800
– Menus for quick selection of rated parameter settings
– "Autocall" function for automatic sending of emails and/or SMS at predefined events/alarms
– Generator controls: Phase sequence, maximum and minimum voltage and frequency, voltage asymmetry
– Programmable maintenance.

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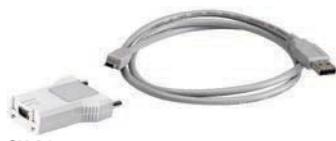Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

Synergy supervision software
See Section 27.

EXP series expansion modules
See Section 28, page 2.

Engine and generator controllers

image: Lovato electric

Communication devices for RGK 600… - RGK 700… RGK 800… - RGK 900…

CX 01

CX 02

CX 03

Order code	Description	Qty per pkg	Wt
		n°	[kg]
CX 01	USB/optical dongle with PC↔controller connecting cable for programming, data download, diagonistics and firmware upgrade	1	0.090
CX 02	Wi-Fi dongle for PC ↔ controller programming, data download, diagnotics and firmware upgrade, project upload/download and controller cloning	1	0.090
CX 03	GSM/GPRS quad-band antenna (800/900/1800/1900MHz) for EXP10 15 expansion module for RGK 800... - RGK 900...	1	0.090

General characteristics
Communication and connection devices for generating set controllers RGK 600-RGK 700-RGK 800-RGK 900... for personal computers, smartphones, tablets, modems, bus drives.

CX 01
The USB/optical connector, complete with cable, allows to connect RGK 600-RGK 700-RGK 800-RGK 900... controllers to a PC without having to disconnect the power supply from the electric panel and to carry out parameter programming, data and event download, diagnostics and firmware upgrade.
The PC identifies the connection as a standard USB.

CX 02
By Wi-Fi connection, RGK 600..., RGK 700..., RGK 800... and RGK 900... controllers can be viewed by PC, smartphone and tablet with no need for cabling and to carry out parameter programming, data and event download, diagnostics project upload/download and controller cloning.

CX 03
Compatible with the major part of worldwide mobile networks thanks to the available frequencies at 800/900/1800/1900MHz.
IP67 IEC protection degree. Fixing by Ø12mm/0.04" drilling.

For wiring schemes and technical characteristics, refer to technical instructions in Downloads of local or global website or consult Customer Service; see contact details on inside front cover.

Accessories

51 C4

Order code	Description	Qty per pkg	Wt
		n°	[kg]
Connecting cables.			
51 C2	For PC ↔ controller, 1.8m/2yd long	1	0.090
51 C3	For PC ↔ GSM modem 1.8/2yd long	1	0.210
51 C4	For PC ↔ RS232/RS485, converter drive, 1.8m/2yd long	1	0.147
51 C11	For PC ↔ TTL/RS232 communication port 2.8m/3yd long	1	0.090
RS232/485 converter drive.			
4 PX1	Opto-isolated, 220-240VAC power supply (110-120VAC on request) ❶	1	0.600
For RGK 600…. and RGK 601… controllers.			
RGK X00	IP65 gasket seal for internal dislpay frame	1	0.100

❶ RS232/RS485 opto-isolated converter drive, 38,400 Baud rate maximum, automatic or manual TRANSMIT line supervision, 220-240VAC ±10% (110-120VAC supply on request).

General characteristics
CONNECTING CABLES 51 C…
They are used to link the RGK… controllers to personal computers, modems, bus converters.

RS232/RS485 CONVERTER DRIVE
It can interface "slave" devices connected in an RS485 bus with a "master" equipped with RS232 interface port. When configured appropriately, it can also be used as RS485 repeater whenever the devices connected to the bus are many or the maximum distance among the bus devices is longer than the allowed.

GASKET SEAL
To increase the protection degree of RGK600/610 types to IEC IP65, the gasket needs to be installed in the fixing slot on the inside surface of the display frame.

Software

RGK SW10

Order code	Description	Qty per pkg	Wt
		n°	[kg]
RGK SW10	Customisation manager software complete with 51 C2 connecting cable	1	0.246

APP

Customisation manager software

Once installed on a personal computer, besides setting up all functional parameters of the controllers, this **RGK SW10** software allows to handle many types of data such as texts, analog sensor response definition (for fuel, pressure, temperature), current overload protection, logo or trademark display at power up and setup exit, custom information pages.

The user can enable and disable alarms along with defining the controller feedback for alarm conditions and saving projects with the described types of files in single blocks despite the fact that different projects can share certain files. For instance, two projects can have the same text file but distinct sensor response files.

The **Synergy** software provides for the remote control and supervision of the RGK… controllers.

See details given in Section 27.

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.

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. For more details, see Section 27 or consult Customer Service; see contact details on inside front cover.
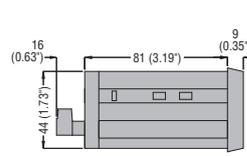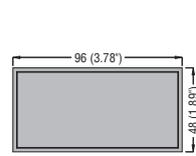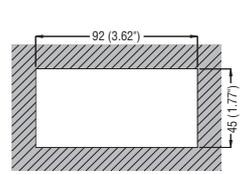
ENGINE PROTECTION CONTROLLERS
RGK 20

Cutout

RGK 30

Cutout

72 (2.83") · 72 (2.83") · 10 (0.39") · 9 (0.35") · 73.5 (2.89") · 27 (1.06") · 68 (2.68") · 68 (2.68")

96 (3.78") · 48 (1.89") · 16 (0.63") · 44 (1.73") · 81 (3.19") · 9 (0.35") · 92 (3.62") · 45 (1.77")
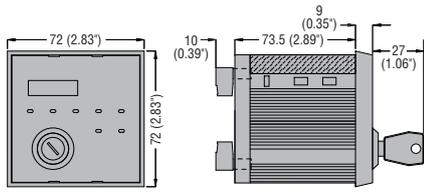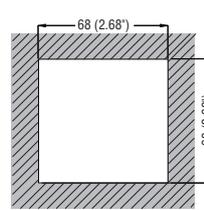
STAND-ALONE GEN-SET CONTROLLER RGK 40

Cutout

96 (3.78") · 96 (3.78") · 14 (0.55") · 62 (2.44") · 6 (0.24") · 27 (1.06") · 90 (3.54") · 92 (3.62") · 92 (3.62")
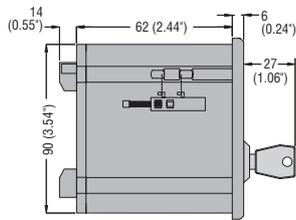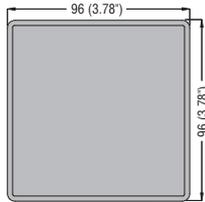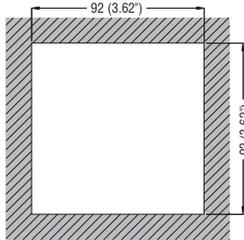
GEN-SET CONTROLLERS RGK 600… - RGK 601…

Cutout

144 (5.67") · 144 (5.67") · 43.3 (1.70") · 10 (0.39") · 35 (1.38") · 138 (5.43") · 138 (5.43")
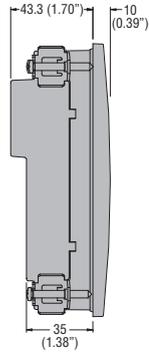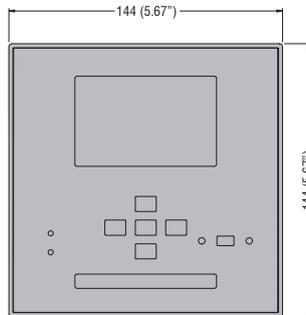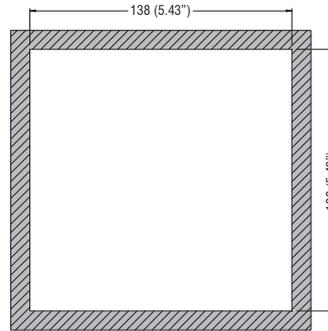
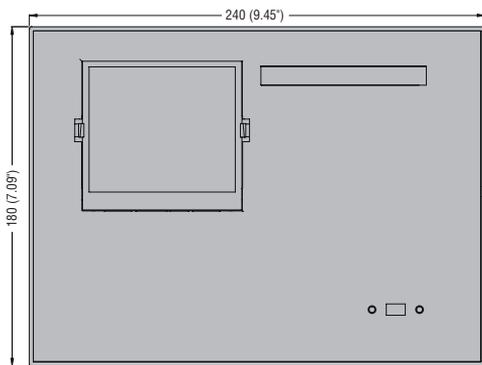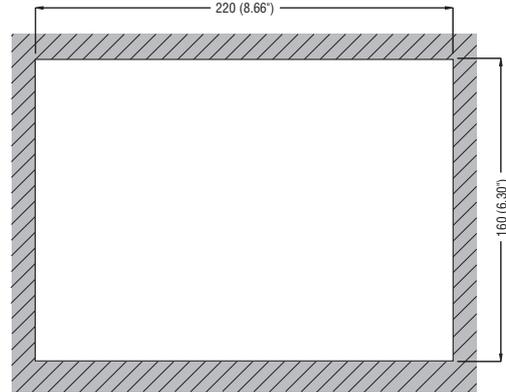**GEN-SET CONTROLLERS RGK 700… - RGK 800… - RGK 900… - REMOTE DISPLAYS PANELS RGK 800RD - RGK 800RDSA - RGK 900RD - RGK 900RDSA**

Cutout

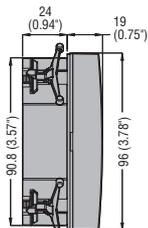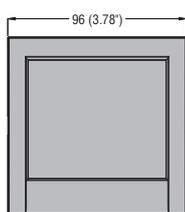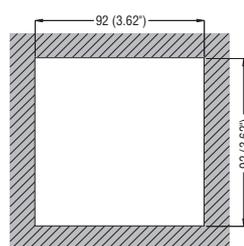240 (9.45") · 180 (7.09") · 33 (1.30") · EXP...❶ · 157 (6.18") · 56 (2.20") · 59 (2.32") · 12 (0.47") · 220 (8.66") · 160 (6.30")
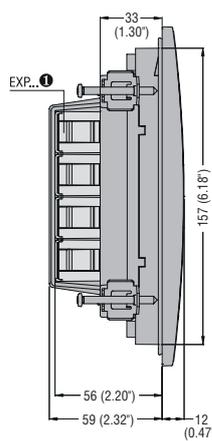
❶ RGK 700, RGK 800RD..., RGK 900RD... excluded.

REMOTE DISPLAY RGK RA

Cutout

ALARM-STATUS RELAY UNIT RGK RR

96 (3.78") · 24 (0.94") · 19 (0.75") · 90.8 (3.57") · 96 (3.78") · 92 (3.62") · 92 (3.62")

19.8 (0.78") · 54.2 (2.13") · 99.6 (3.92") · 116 (4.57") · 96 (3.78") · 107 (4.21") · 46.5 (1.83")

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