

# **GENERAC<sup>®</sup>**

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**POWER SYSTEMS, INC.**

## **Remote Relay Panel User Guide**

**This manual should remain with the unit.**

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**DETAILED SPECIFICATIONS**

**◆ ENVIRONMENTAL SPECS**

Temperature	-20°C to +50°C
Humidity	0 to 95% Non Condensing

**◆ POWER SUPPLY REQUIREMENTS**

Power Supply Source	Generator battery to comply with NFPA.
Nominal Supply	+12VDC to +24VDC
Transient protection	Spikes clamped to 40V
Power Usage	600mA maximum.
Battery Supply cable	Two wire - DC resist- ance less than six Ohms per conductor.
Fuse on circuit board	One Amp, 5 x 20mm. Generac p/n 0A4016.

**◆ RELAY OUTPUTS (8)**

Contact per channel	One pair NO/NC (1xSPDT) Voltage-free contacts
Maximum contact rating	30VDC/1A or 120VAC/0.5A

**◆ COMMUNICATION WITH GENERATOR CONTROL PANEL**

Communication link	Two wire RS485 fully isolated.
Cable	Two wire - twisted pair with overall screen
Cable size	24 AWG 0-250 feet 18 AWG 0-1,200 feet.
Baud rate	2400/4800/9600 bd Auto detect.

**◆ PACKAGING AND MOUNTING**

Enclosure type	Sheet metal Nema 1 box.
Base Panel	Wall/Flush mount #0A6985/#0A7437
Front Panel	Wall/Flush mount #0A6987/#0A9698
Mounting	Wall or Flush.
Weight requirements	None
Manuals	Yes - Operator guide

**◆ TRANSPORTATION AND STORAGE**

Temperature	-20°C to +80°C
Humidity	0-95% Non Condensing

**SYSTEM SPECIFICATION**

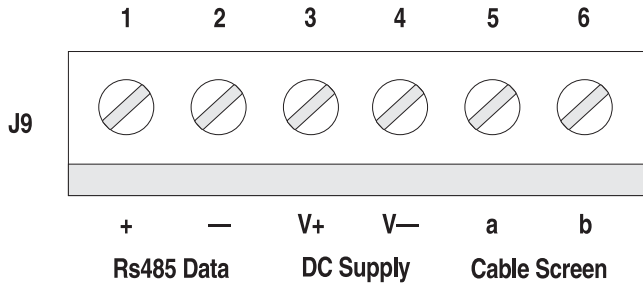
The Panel Remote Relay Panel (RRP) provides remote monitoring and activation of up to eight generator parameters.

It is functionally similar to a 20 Light Remote Annunciator. The difference being that it provides relay outputs for each channel rather than a visual display.

Each RRP can monitor up to eight channels, but multiple units may be used to obtain all 18 parameters.

Power to the RRP is supplied from the generator battery (+12VDC to +24VDC) via a two wire link. Communication with the generator control panel is via a two wire RS485 serial data link. See Figure 1.

Figure 1



◆ **HARDWARE FUNCTIONAL DESCRIPTION**

The RRP normally polls the generator control panel every 10 seconds and receives the 18 generator status parameters. It then activates/deactivates the relay outputs to reflect the status of up to eight selected parameters.

The relay outputs match exactly the status of the indicators on the generator control panel. There is no facility to override or accept alarms locally either by the operator or automatically at the RRP.

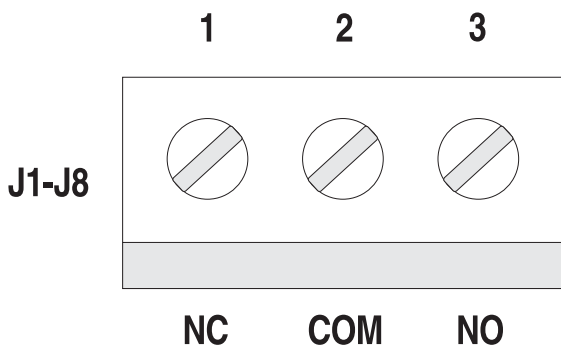
**Relay Outputs**

Each channel provides one pair of Normally Open/Normally Closed contacts. See Figure 2.

The relay status is fail-safe when using the NC contacts as the alarm output i.e.:

- Alarm OFF = Relay On = NC contact open
- Alarm On = Relay OFF = NC contact closed

Figure 2



A DC supply failure resets the relay to Off = alarm ON - N/C Closed.

**Selected Parameters**

The user can select up to eight of the following 18 parameters using the 10/8 way dip switches S1/S2 on the PCB.

S1	Parameter	S2	Parameter
1	RPM Sensor Loss	1	Battery Charger AC Failure
2	Overcrank	2	Low Battery Voltage
3	Overspeed	3	High Battery Voltage
4	Low Oil Pressure	4	Generator Run
5	High Water Temp.	5	Generator Power
6	Emergency Stop	6	System Ready
7	Pre-Low Oil Pressure	7	Line Power - Not Used
8	Pre-High Water Temp.	8	Spare Channel
9	Pre-Low Water Temp.		
10	Pre-Low Fuel		

**Parameter Notes**

**Parameters S1.1 - S1.10 and S2.1 - S2.3:** When this remote relay panel is used in a Modular Power System (MPS), an alarm on any one of the generators causes the associated relays to activate.

**Parameters S2.4 “Generator Run”:** This parameter is defined as any one or more generators in the system running.

**Parameters S2.5 “Generator Power”:** This parameter is defined as any one or more generators in the system running and supply power to the load.

**Parameters S2.6 “System Ready”:** This parameter is defined as ALL “in service” generators are ready to start, run, and supply power. Any generators manually declared as “out of service”, will not affect this parameter.

The relay outputs are assigned to the selected parameters in sequential order. For example, if DIP1-1 through 8 are selected, these are assigned to relays 1 through 8 respectively as shown in Figures 3 and 4.

Figure 3 — S1

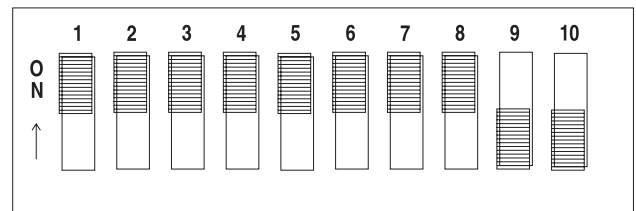
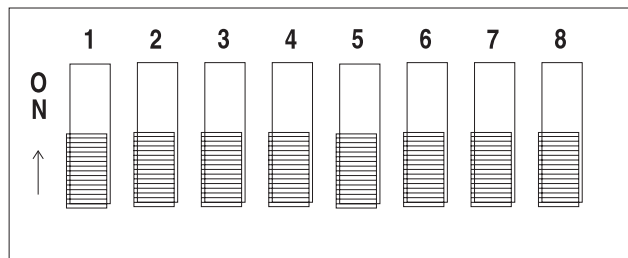


Figure 4 — S2



**NOTE:**

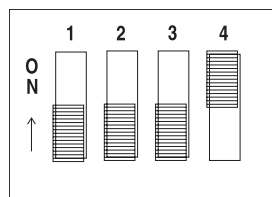
If a unit is wired up and then subsequently an additional DIP is selected or deselected, all the relay outputs are re-assigned sequentially and therefore, may require re-wiring.

**RRP Address**

Each RRP has a user selectable address (0-3) which is used during the communication process. It must be set to a unique value for each RRP using DIP switch S3.1 & S3.2 as shown in Figure 5.

Figure 5 — RRP Value

Address	S3.1	S3.2
0	0	0
1	0	1
2	1	0
3	1	1



The default address is 0 as shown and should be used for a single RRP.

**NOTE:**

**S3.3 is unused and should be set to OFF.**

**RS485 Line Termination**

An RS485 terminating resistor is switched in (ON) or out (OFF) using DIP switch S3.4. Normally, for a single RRP configuration, the DIP switch should be ON (default as shown in Figure 5).

If, however, the configuration includes more than one RRP or also includes a RAP then either of the next two options should be used:

- a. If more than one RRP is present on the same RS485 line, this switch must be re-positioned to OFF on every additional RRP.
- b. With a Remote Annunciator Panel (RAP) present on the same RS485 line, this switch must be re-positioned to OFF on every RRP.

**RS485 Communication**

There are no options available, the jumpers J1 & J2 must both be set to positions 1-2.

Communication	Jumper	Position
RS485	J1	1-2
(default)	J2	1-2

**◆ SOFTWARE SPECIFICATION**

**Serial Interface**

Default 4800, n, 8, 1  
Auto-detect 2400, 9600 bd.

**Request Frequency**

Nominally once every 10 seconds

To enable more than one RRP to co-exist with other RRP's or with a Remote Annunciator Panel (RAP), the individual communication process of each RRP dynamically adapts to the overall user configuration.

When a new RRP or RAP is powered up onto an existing RS485 network, there may be a period of time, during which any or all of the units may report "Communication Failure". The system goes to normal operation automatically without user intervention.

**Error Detection**

The generator control panel should respond to a data request within one second for each transaction.

The RRP will continuously try three times at each of three baud rates (4800, 9600, 2400 bd) before reporting a communication error by **switching all the relays off**.

**Limits of Operation**

The following communication restrictions apply for multiple units on a common RS485 line:

- Up to four RRP's may be used together.
- An RRP/RAP can only communicate with one generator control panel.
- Each RRP should be set to a different "address".
- Only one RRP should have the RS485 termination resistor selected.

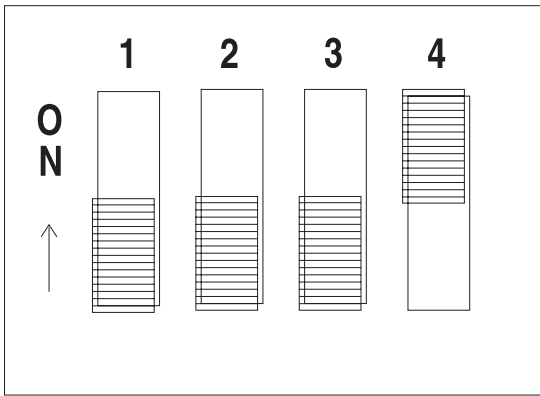
## CONFIGURATION EXAMPLES

### ◆ EXAMPLE 1

A single RRP is connected to a generator control panel (Figure 6).

- S3.1, 3.2            Address 0, S3.1 and S3.2 OFF
- S3.2                Unused is OFF
- S3.4                RS485 termination resistor is ON

Figure 6 — Single RRP Connected to Panel



DIP S1-1, 3, 5, 10 are initially selected, these are assigned to relays 1, 2, 3, 4 (Figures 7 and 8).

DIP	Parameter	Relay
1, 1	RPM Sensor Loss	1
1, 3	Overspeed	2
1, 5	High Water Temp	3
1, 10	Pre-Low Fuel	4

Figure 7 — S1

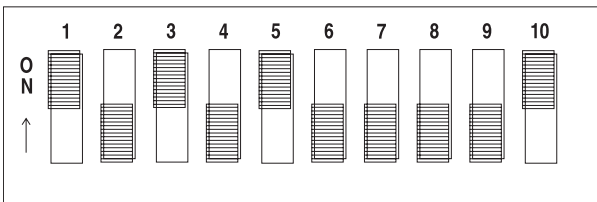
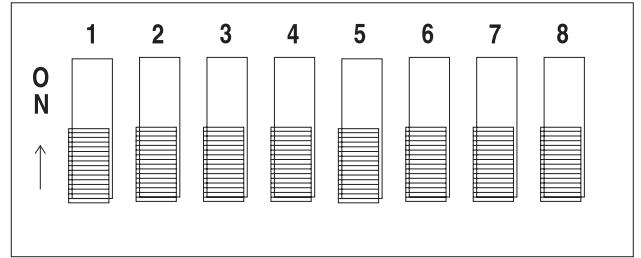


Figure 8 — S2



### ◆ EXAMPLE 2

If subsequently DIP1-3 is removed, and DIP2-5 is added, then relays will be re-assigned as (Figures 9 and 10).

DIP	Parameter	Relay
1, 1	RPM Sensor Loss	1
1, 5	High Water Temp	2
1, 10	Pre-Low Fuel	3
2, 5	Generator Power	4

Figure 9 — S1

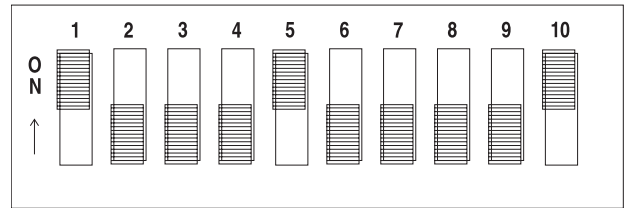
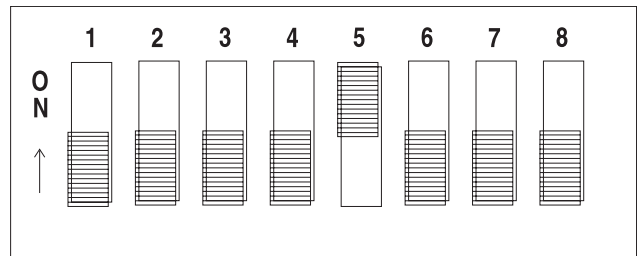
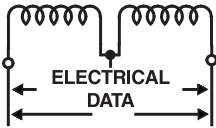


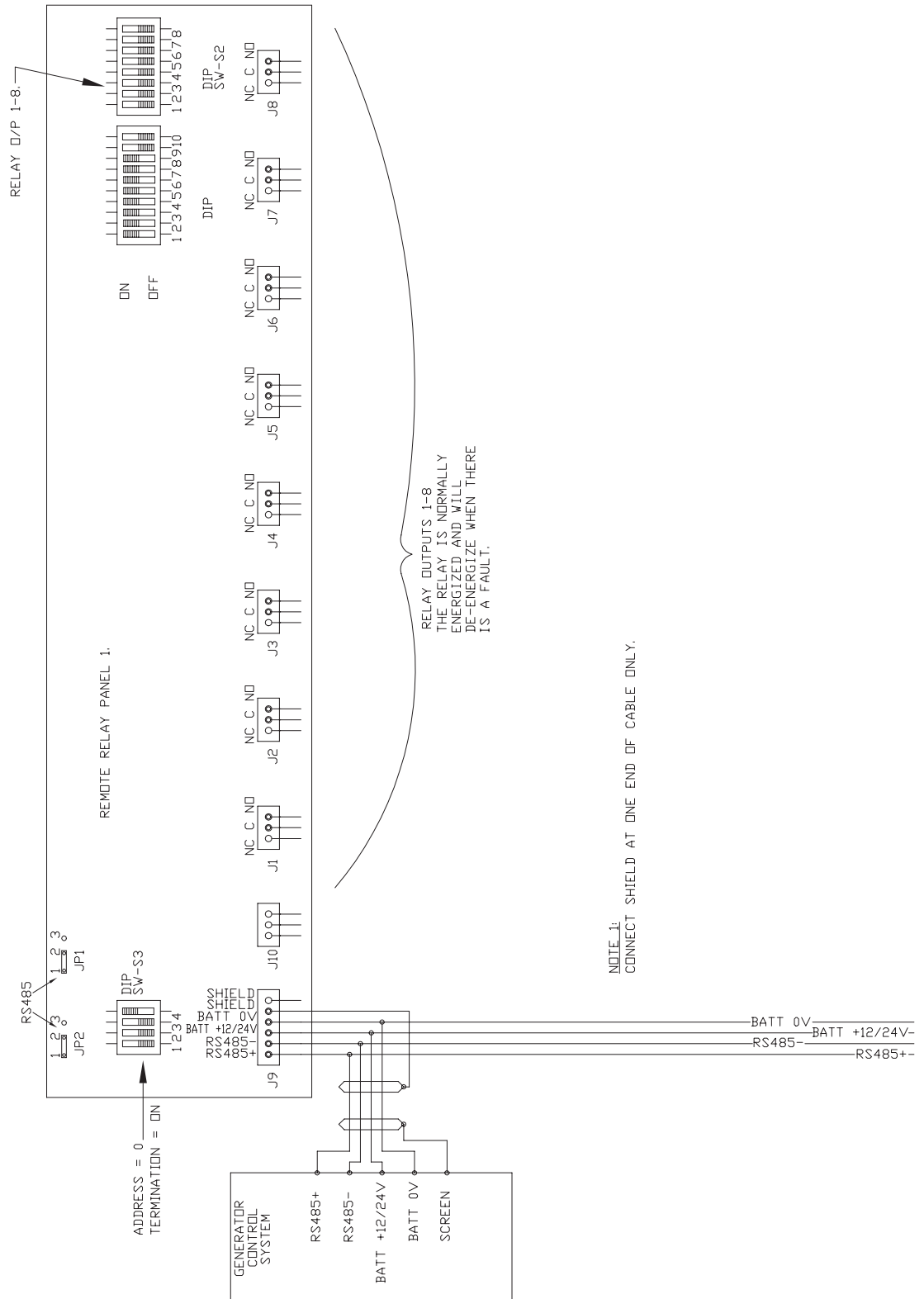
Figure 10 — S2



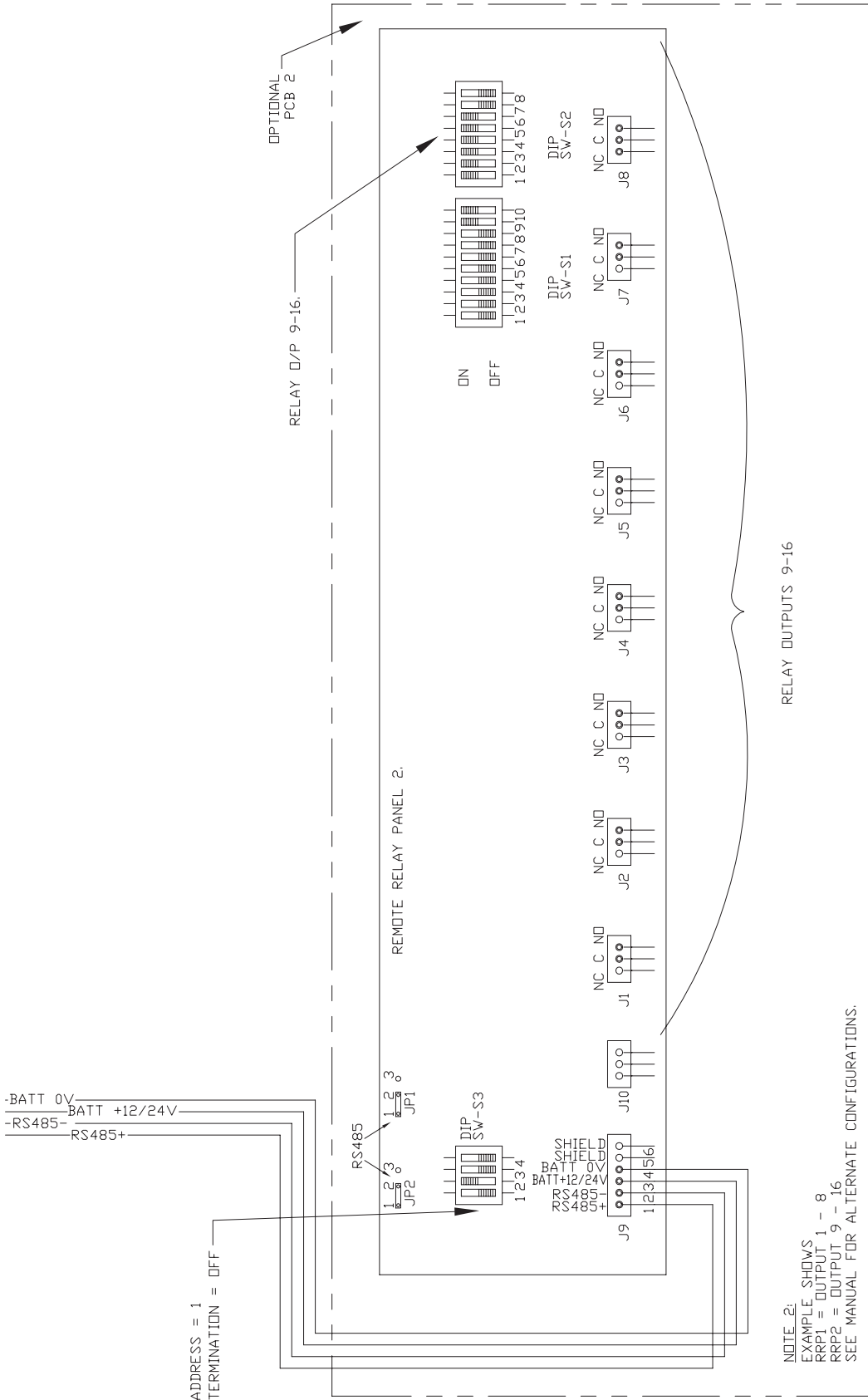
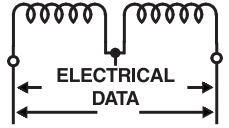


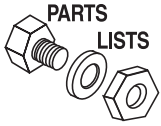
## Electrical Data

### Remote Relay Panel Electrical Schematic – Drawing No. 0E5879-A



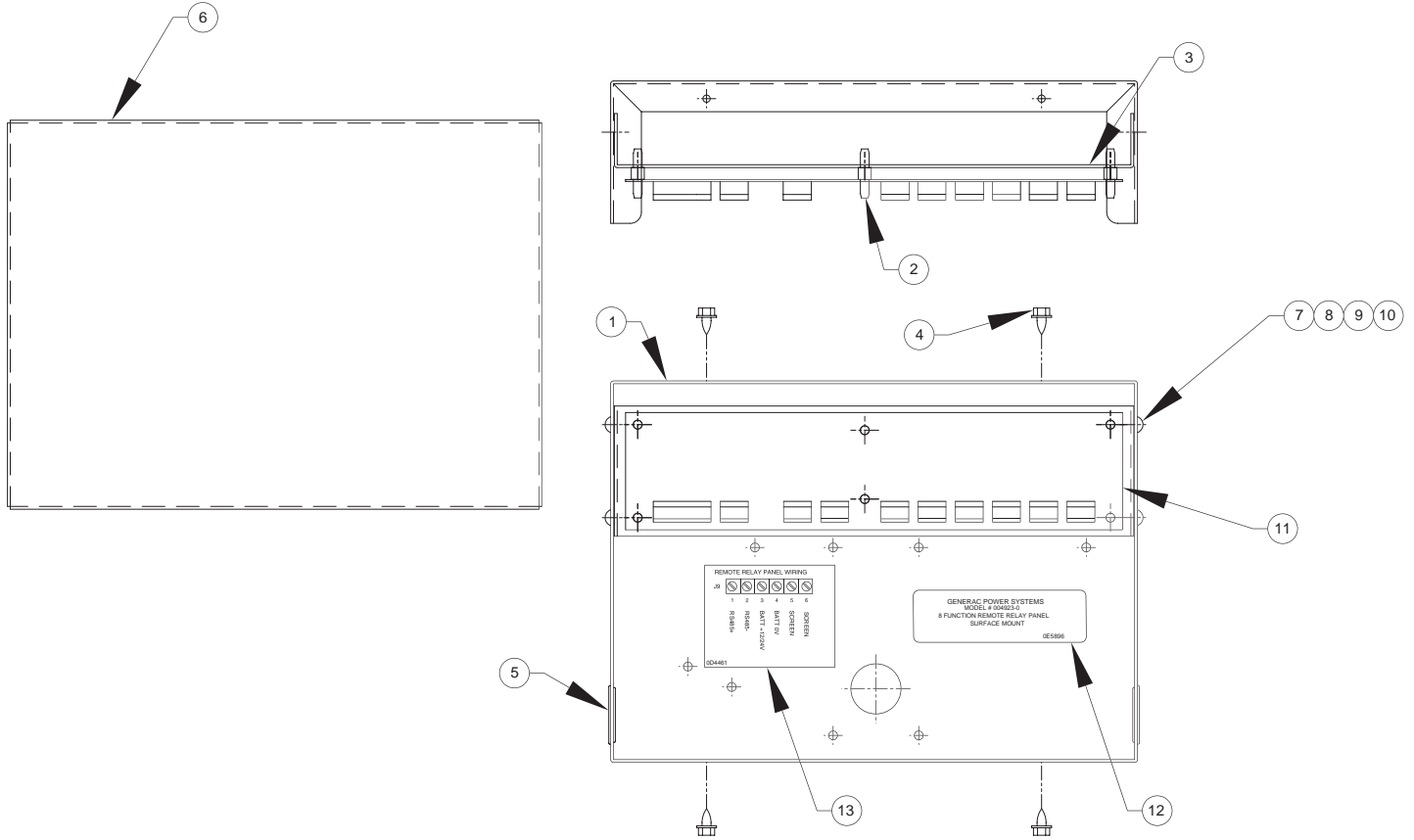
Remote Relay Panel Electrical Schematic – Drawing No. 0E5879-A





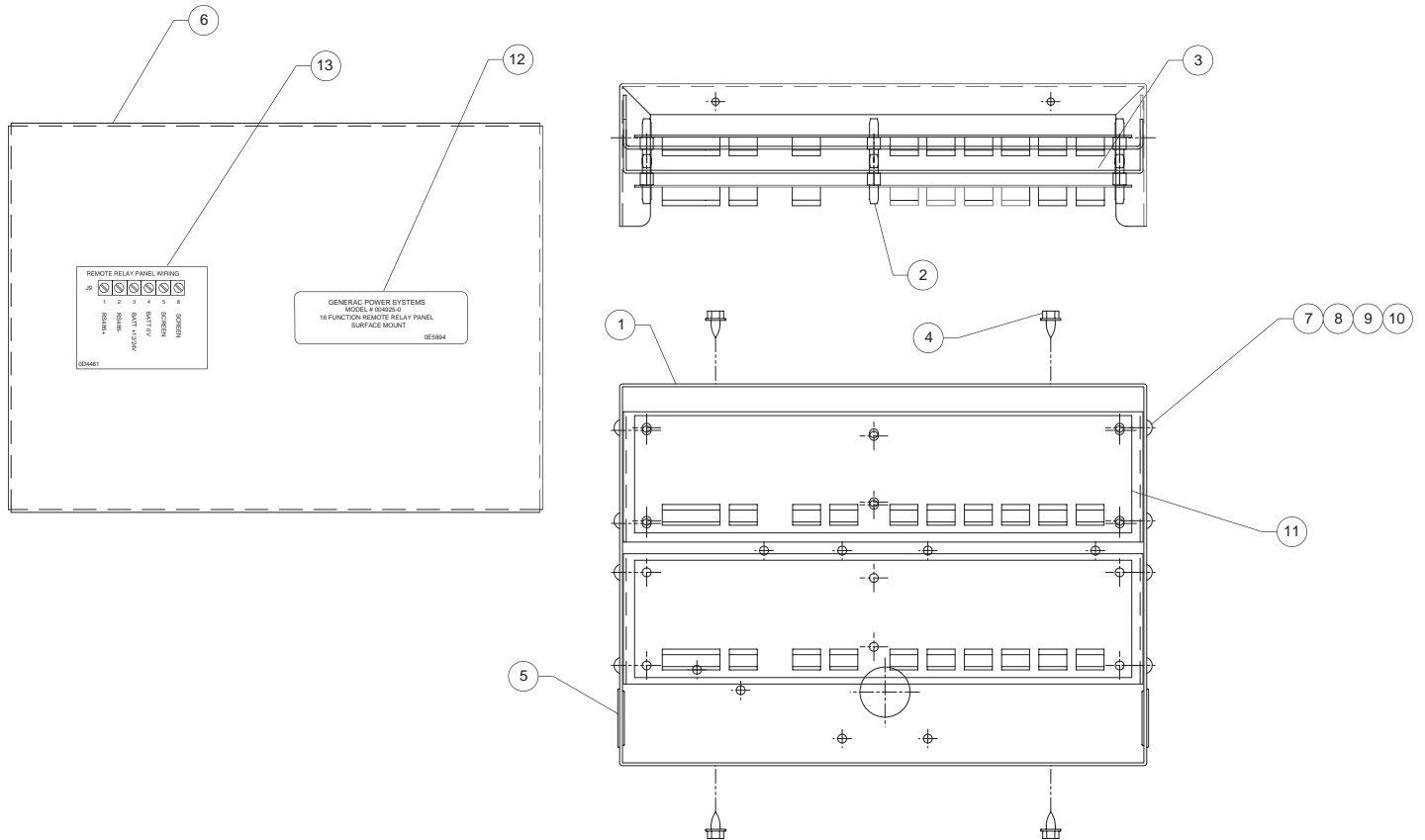
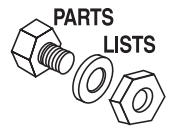
## Exploded Views and Parts Lists

### Surface Mount – Drawing No. 0E5880

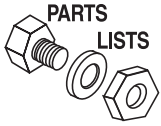


ITEM	PART NO.	QTY.	DESCRIPTION
1	0A6985	1	PANEL ANNUNCIATOR REAR
2	040213	6	PCB SUPPORT SNAP-IN 1/4"
3	0A6990	1	SUPPORT, PC BOARD
4	056892	4	SCREW CRIMPTITE 10-24 X 3/8
5	025034	2	PLUG STEEL 1.0625
6	0A9697	1	PNL,ANNUNCIATOR FRONT
7	036901	4	SCREW PPHM #6-32 X 3/8
8	022985	4	WASHER FLAT #6 ZINC
9	022155	4	WASHER LOCK #6
10	022188	4	NUT HEX #6-32 STEEL
11	0A9036A	2	8-CH REMOTE RLY PNL MODBUS RRP
12	0E5896	1	DECAL, MODEL NUMBER FOR/0E5880
13	0D4461	1	DECAL,WIRING,REMOTE RELAY PNL

**Exploded Views and Parts Lists**  
**Surface Mount – Drawing No. 0E5883**

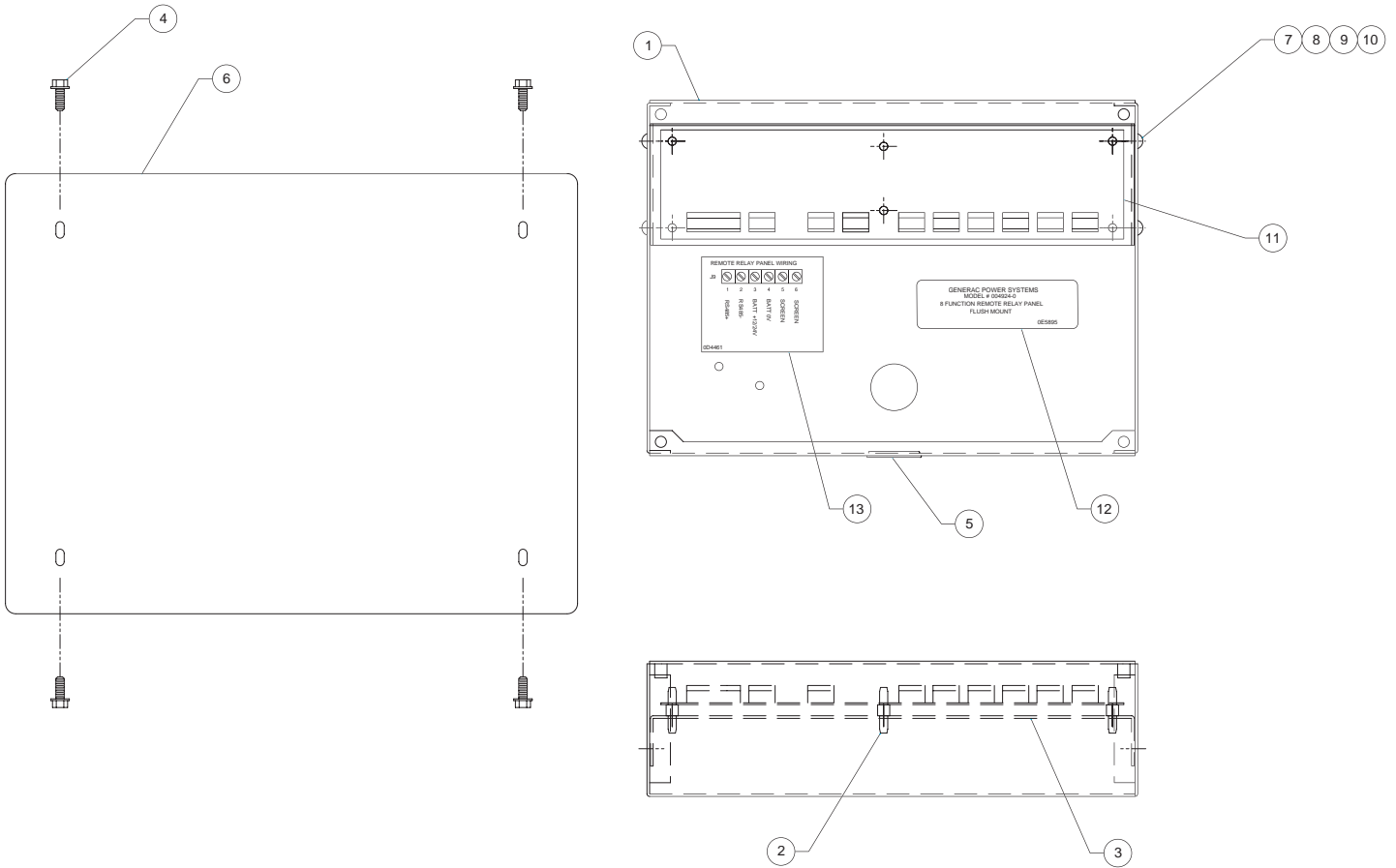


ITEM	PART NO.	QTY.	DESCRIPTION
1	0A6985	1	PANEL ANNUNCIATOR REAR
2	040213	12	PCB SUPPORT SNAP-IN 1/4"
3	0A6990	2	SUPPORT, PC BOARD
4	056892	4	SCREW CRIMPTITE 10-24 X 3/8
5	025034	2	PLUG STEEL 1.0625
6	0A9697	1	PNL,ANNUNCIATOR FRONT
7	036901	8	SCREW PPHM #6-32 X 3/8
8	022985	8	WASHER FLAT #6 ZINC
9	022155	8	WASHER LOCK #6
10	022188	8	NUT HEX #6-32 STEEL
11	0A9036A	2	8-CH REMOTE RLY PNL MODBUS RRP
12	0E5894	1	DECAL, MODEL NUMBER FOR/0E5883
13	0D4461	1	DECAL,WIRING,REMOTE RELAY PNL



## Exploded Views and Parts Lists

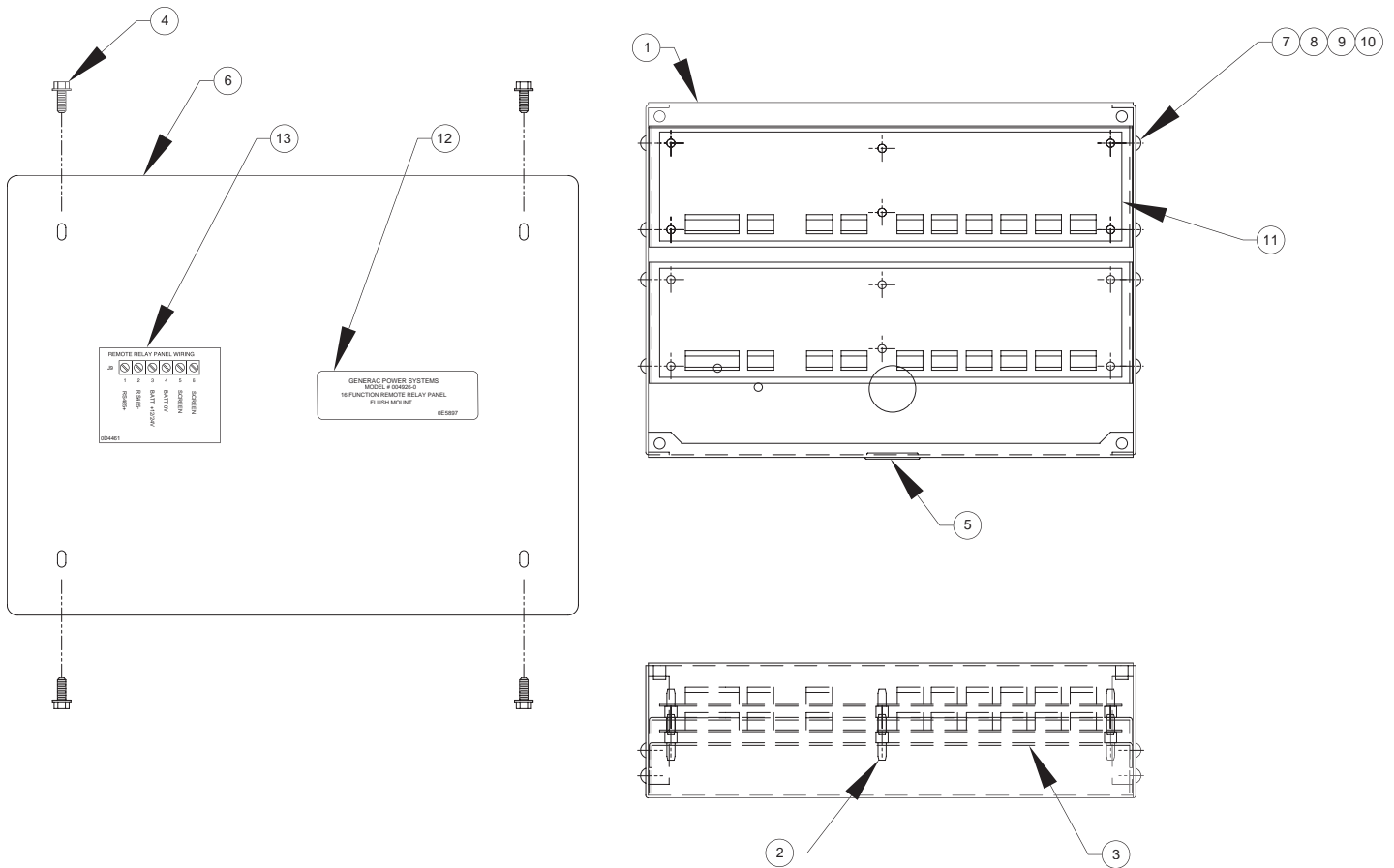
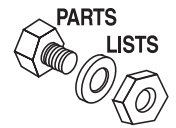
### Flush Mount – Drawing No. 0E5882



ITEM	PART NO.	QTY.	DESCRIPTION
1	0A7437	1	PANEL ANNUNCIATOR REAR
2	040213	6	PCB SUPPORT SNAP-IN 1/4"
3	0A6990	1	SUPPORT, PC BOARD
4	036918	4	SCREW PPHM #8-32 X 1/2
5	025034	1	PLUG STEEL 1.0625
6	0A9698	1	PNL,ANNUNCIATOR FRONT
7	036901	4	SCREW PPHM #6-32 X 3/8
8	022985	4	WASHER FLAT #6 ZINC
9	022155	4	WASHER LOCK #6
10	022188	4	NUT HEX #6-32 STEEL
11	0A9036A	1	8-CH REMOTE RLY PNL MODBUS RRP
12	0E5895	1	DECAL, MODEL NUMBER FOR/0E5882
13	0D4461	1	DECAL,WIRING,REMOTE RELAY PNL

## Exploded Views and Parts Lists

Flush Mount – Drawing No. 0E5884



ITEM	PART NO.	QTY.	DESCRIPTION
1	0A7437	1	PANEL ANNUNCIATOR REAR
2	040213	12	PCB SUPPORT SNAP-IN 1/4"
3	0A6990	2	SUPPORT, PC BOARD
4	036918	4	SCREW PPHM #8-32 X 1/2
5	025034	1	PLUG STEEL 1.0625
6	0A9698	1	PNL,ANNUNCIATOR FRONT
7	036901	8	SCREW PPHM #6-32 X 3/8
8	022985	8	WASHER FLAT #6 ZINC
9	022155	8	WASHER LOCK #6
10	022188	8	NUT HEX #6-32 STEEL
11	0A9036A	2	8-CH REMOTE RLY PNL MODBUS RRP
12	0E5897	1	DECAL, MODEL NUMBER FOR/0E5884
13	0D4461	1	DECAL,WIRING,REMOTE RELAY PNL

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