

## INSTALLATION INSTRUCTIONS

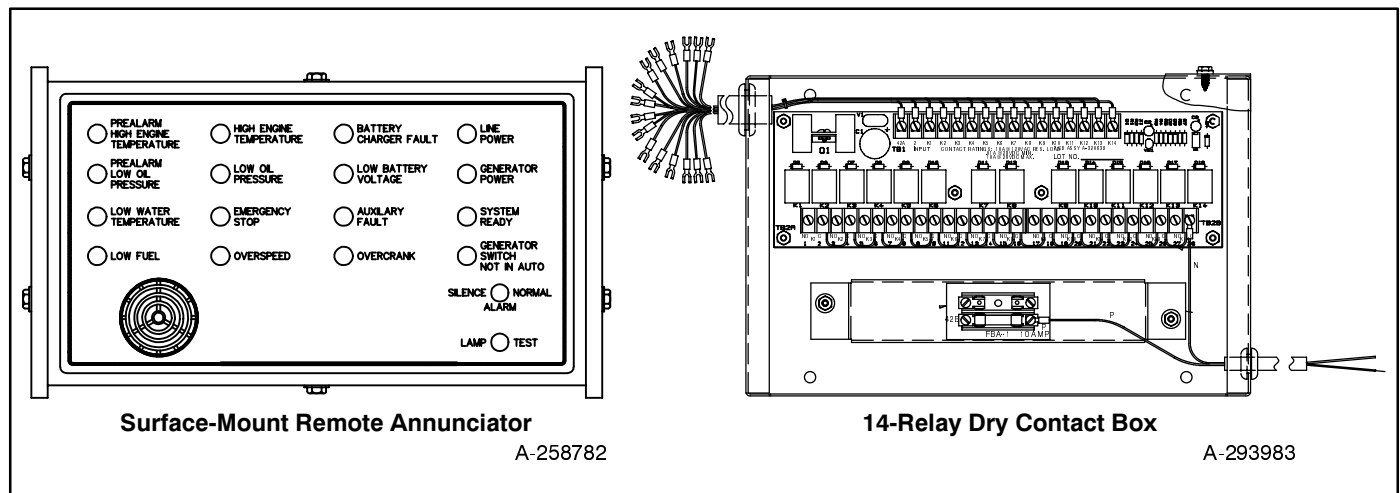
Original Issue Date: **2/99**  
 Model: **1250–2000 kW (Detroit Diesel Series 4000 Engines)**  
 Market: **Industrial**  
 Subject: **Flush- or Surface-Mount Remote Annunciator Kits**  
**PA-361938 and PA-361938-SD**

The remote annunciator monitors the condition of the generator set from a location remote from the generator set. If a generator alarm condition occurs, the remote annunciator alerts the operator through visual and audible signals. The remote annunciator kit includes a 14-relay dry contact box to isolate the annunciator from the controller and to protect the controller from voltage surges and stray voltage. If a generator alarm condition occurs, the appropriate relay contacts close to activate the horn and corresponding lamp on the remote annunciator. The following paragraphs describe specific features of the remote annunciator.

Determine which wiring diagram to use by identifying the type of generator set controller by the circuit board part number on the controller circuit board. The alphacharacter in the circuit board part number may be different from the one shown. See Figure 1.

Circuit Board Part Number	Terminal Strip Qty.	Wiring Diagram
A-336415	TB1 and TB2	Figure 4
A-352160	TB1, TB2, TB3, and TB4	Figure 5

**Figure 1. Generator Set Controller Identification**



**Figure 2. Remote Annunciator Kit Components**

## Features

### Horn

**Alarm Horn.** The alarm horn sounds when a fault or prealarm condition exists, except emergency stop, battery charger fault, or low battery volts. Silence the alarm horn with the generator master switch in the AUTO position. See the Resetting section following.

### Lamps

**Auxiliary Fault.** The lamp flashes or remains on to indicate that a fault occurred. Auxiliary fault does not apply to 20–2000 kW generator set controllers with TB1, TB2, TB3, and TB4.

### Flashing Lamp Condition:

- The auxiliary lamp flashes immediately when the controller senses no AC output while the generator set is running, except during the first 10 seconds after startup. When AC output is sensed, the lamp stops flashing and turns off. No manual reset is required.
- The auxiliary lamp flashes when the battery power is reconnected or low and then regains full power while the generator master switch is in the RUN or AUTO position. A temporary low battery condition may result from a weak battery or from an undersized battery for the application. Place the generator set master switch in the OFF/RESET position to clear this condition.

### Continuous On Lamp Condition:

- The auxiliary lamp illuminates when the optional emergency stop switch is reset while the generator set master switch is in the AUTO or RUN position. Place the generator set master switch in the OFF/RESET position to clear this condition.
- The auxiliary lamp illuminates and the engine shuts down 5 seconds after high oil temperature (P1-13), low coolant level (P1-14), or auxiliary delay shutdown (P1-15) faults occur, if the generator set is so equipped. These conditions are inhibited during the first 30 seconds after a crank disconnect.
- The auxiliary lamp illuminates and the engine shuts down immediately when an overvoltage condition occurs, if the generator set is equipped with the voltage shutdown kit.
- The auxiliary lamp illuminates and the engine shuts down immediately when activated by a customer-supplied sensing device connected to the auxiliary immediate shutdown ports (P1-17 and P1-18).

### Battery Charger Fault, if battery charger equipped.

The lamp illuminates when the generator set battery charger malfunctions.

**Emergency Stop.** The lamp illuminates when the generator stops by local or optional emergency stop switch, if the generator set is equipped with an emergency stop switch.

**Generator Power.** The lamp illuminates when the generator set supplies the power.

**Generator Switch Not In Auto.** The lamp illuminates when the generator set master switch is not in the AUTO position.

**High Engine Temperature.** The lamp illuminates when the high engine coolant temperature shuts down the generator set.

**Line Power.** The lamp illuminates when a power supply other than the generator set supplies the power. When the

lamp illuminates, the SYSTEM READY lamp also illuminates.

### Low Battery Voltage, if battery charger equipped.

Lamp illuminates when the battery or charging voltage drops below a preset level on the charger. The lamp also illuminates when an undervoltage condition occurs from a battery or charger malfunction while the generator set is running.

**Low Fuel.** The lamp illuminates when the fuel tank level approaches empty. The annunciator requires a fuel tank low-fuel sensor for the lamp to function.

**Low Oil Pressure.** The lamp illuminates when the generator shuts down because of low engine oil pressure.

**Low Water Temperature.** The lamp illuminates when the optional engine block heater malfunctions and/or the temperature is too low (below 70°F, 21°C) for ten-second startup. The annunciator requires the optional prealarm sender kit for the lamp to function.

**Overcrank.** The lamp illuminates and the cranking stops when the generator set does not start within the defined cranking period.

**Overspeed.** The lamp illuminates when the generator set shuts down because of an overspeed condition.

**Prealarm High Engine Temperature.** The lamp illuminates when the engine coolant temperature approaches the shutdown range. The annunciator requires the optional prealarm sender kit for the lamp to function.

**Prealarm Low Oil Pressure.** The lamp illuminates when the engine oil pressure approaches the shutdown range. The annunciator requires the optional prealarm sender kit for the lamp to function.

**System Ready.** The lamp illuminates when the generator set master switch is in the AUTO position and the system has no fault conditions.

## Mounting

**Flush- or Surface-Mounting Capability.** This instruction includes installation information for both flush- and surface-mount models.

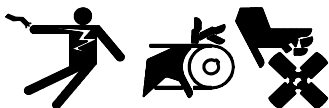
## Switches

**Alarm Silence.** The switch disconnects the alarm during servicing. Place the generator set master switch in the AUTO position to reset. See Resetting section following.

**Lamp Test.** The switch tests the remote annunciator indicator lamps.

# Installation

## ⚠ WARNING



### Accidental starting. Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

**Disabling the generator set. Accidental starting can cause severe injury or death.** Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

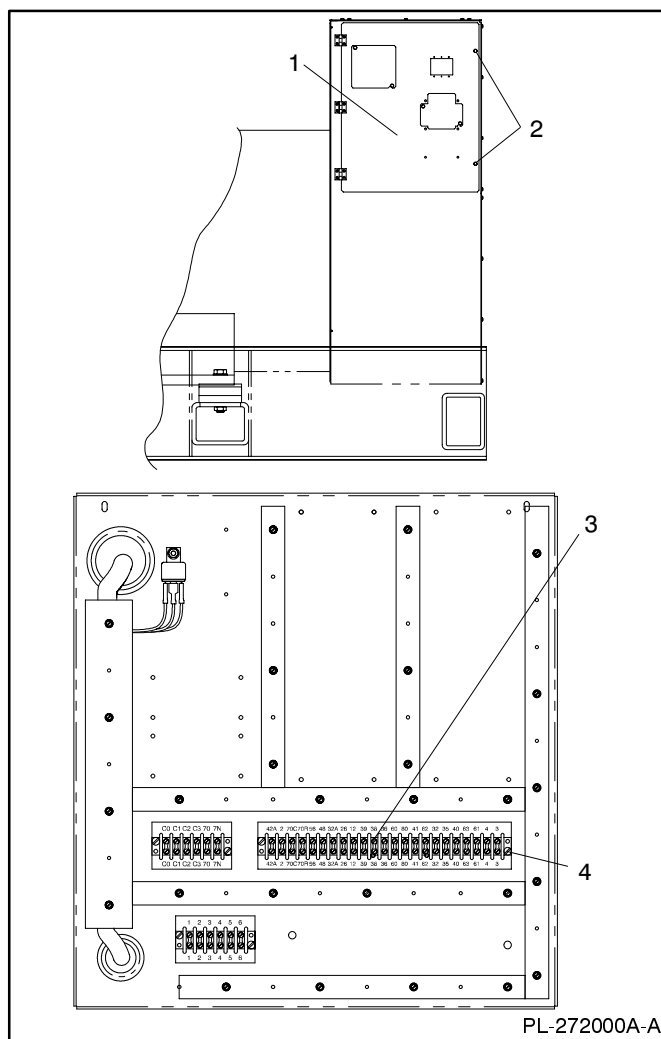
## NOTE

Connect any combination of remote annunciators and audio-visual alarms totaling three to the customer interface terminal strip.

## NOTE

Observe all applicable national, state, and local electrical codes during remote annunciator installation.

5. Secure the customer interface terminal strip (328913) and the terminal strip marker (328914) to the junction box inner panel with screws (X-49-36) and whiz nuts (X-6210-3). See Figure 3 for the mounting location.



1. Inner panel access door
2. Access door bolts
3. Customer interface terminal strip (328913) and terminal strip marker (328914)
4. Screws, 6-32 x 0.625 in. (X-49-36), and 6-32 whiz nuts (X-6210-3)

**Figure 3. Inner Panel**

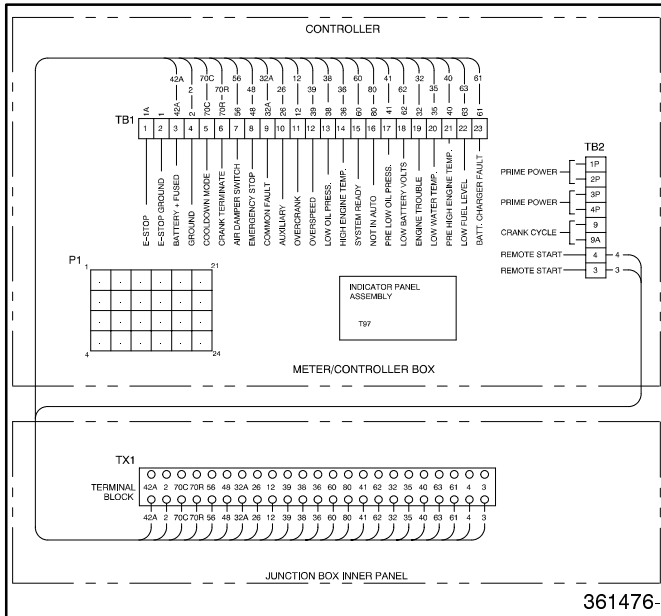
6. Remove the controller cover to access the controller circuit board.

1. Place the generator set master switch in the OFF/RESET position.
2. Disconnect the power to the battery charger, if equipped.
3. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
4. Remove the two screws securing the inner panel access door to the junction box. See Figure 3.

7. Connect the kit-supplied leads between the controller circuit board and the customer interface terminal strip. Route the leads through the junction box and up into the controller through the controller port and harness loops. See Figure 4 or Figure 5 for wiring.
8. Reinstall the controller cover.

## 14-Relay Dry Contact Box Installation

1. Determine a mounting location for the 14-relay dry contact box. Consider the length of the supplied wiring harness when choosing a mounting location. If the most suitable location requires a longer harness, fabricate a new harness using the supplied harness as a guide.



### NOTE

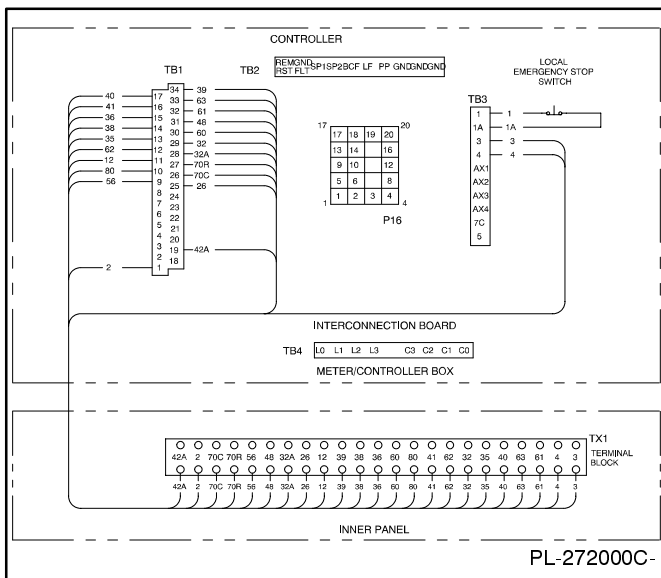
The supplied wiring harness allows a maximum distance of approximately 5 ft. (1.5 m) between the 14-relay dry contact box and the inner panel customer interface terminal strip.

Choose one of the following mounting locations for the 14-relay dry contact box, in order of acceptability:

- On top of the junction box. The size of the controller and the size of the junction box limits the mounting location.
- On top of the generator skid. The clearance and housing options limit the mounting location.
- In an area as near to the generator set controller as practical.

Mount the 14-relay dry contact box in a location selected using customer-supplied mounting hardware.

**Figure 4. Customer Interface Terminal Strip Wiring for Controllers with Terminal Strips TB1, and TB2**



**Figure 5. Customer Interface Terminal Strip Wiring for Controllers with Terminal Strips TB1, TB2, TB3, and TB4**

2. Connect the 14-relay dry contact box to the inner panel customer interface terminal strip. See Figure 6 for 14-relay dry contact/remote annunciator connections.

3. Connect lead P of the wiring harness from the 14-relay dry contact box to the battery positive (+) at the starter solenoid. Lead N of the wiring harness connects to the battery negative (-) at the engine ground. Do not use terminals 42A and 2 of the 14-relay dry contact box terminal strip to supply voltage to the relay contacts. Use separate leads directly from the battery for leads P and N.

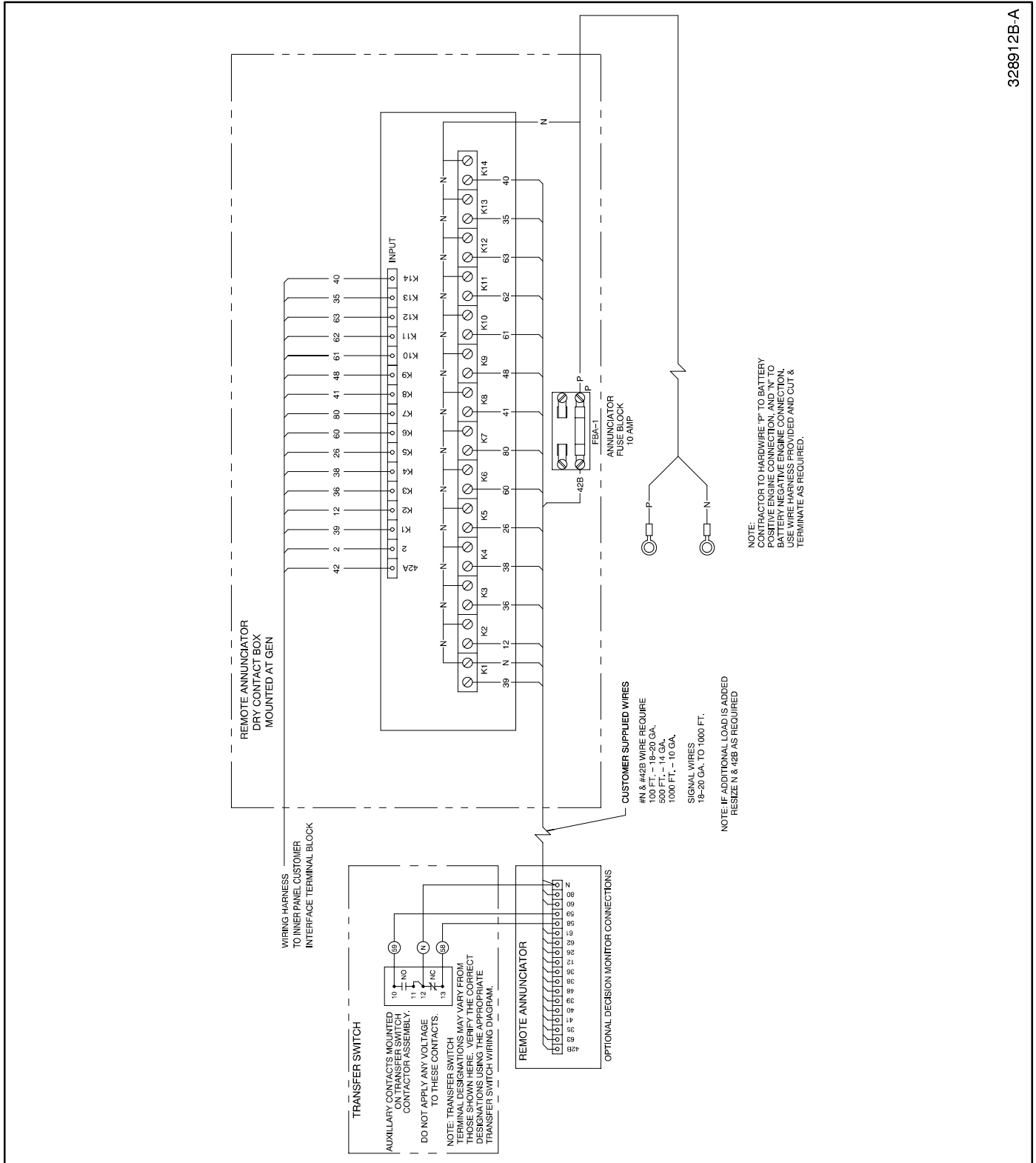
If additional load, lights, or alarms are connected to the 14-relay dry contact box, resize leads P and N accordingly.

Connect customer interface terminal strip terminals 2 (ground) and 42A (battery voltage) to the 14-relay dry contact box terminal strip to provide an electrical source to operate the K1-K14 relays. When a generator fault condition occurs, the 14-relay dry contact box relay (K1-K14) tied to that function energizes and the corresponding lamp on the remote annunciator illuminates.

- Select a visible location for mounting the remote annunciator. Install the remote annunciator panel, either surface- or flush-mounted, in a location easily observed by the operating personnel at their work station.
- Prepare the mounting site. Drill pilot holes for anchors, if used. Create an opening for surface

mounting, if used. See Figure 7 for remote annunciator dimensions and mounting hole dimensions.

- Proceed to either the Surface-Mount or Flush-Mount Annunciator Installation section following.



328912B-A

Figure 6. 14-Relay Dry Contact /Remote Annunciator Connection

## Surface-Mount Annunciator Installation

1. Disassemble the annunciator box. Remove the side panels and separate the front and back annunciator panels.

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### NOTE

Retain the side panels and the drill screws for reassembling.

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2. Proceed to the Remote Annunciator Wiring section following. After wiring the remote annunciator, return to step 3 below.
3. After wiring the 14-relay dry contact box to the annunciator panel, mount the back panel of the annunciator to the wall. See Figure 7 for mounting hole dimensions. Protect the annunciator from dust and debris when drilling the holes.

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### NOTE

The annunciator kit mounts to a standard 4 in. (10 cm) square electrical box installed in the wall. Mount the back plate to the box in the wall and reassemble the box.

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4. Reassemble the front and back panels of the annunciator box with the drill screws removed in step 1 above.
5. Reattach the side panels.
6. Reconnect the generator set engine starting battery, negative (-) lead last.
7. Move the generator set master switch to the AUTO position for startup by a remote transfer switch or remote start/stop switch. Move the remote annunciator alarm horn switch to the NORMAL position. If the horn sounds or the lamp(s) illuminate, see the Resetting instructions following.

## Flush-Mount Annunciator Installation

1. Disassemble the annunciator box. Remove the side panels and separate the front and back annunciator panels. The side panels will not be reused. Retain the drill screws (X-794-2) for reassembly. See Figure 8 for additional flush-mount instructions.
2. Proceed to the Remote Annunciator Wiring section following. After wiring the remote annunciator, return to step 3 below.
3. After wiring the 14-relay dry contact box to the annunciator panel, reassemble the front panel to the back panel using the existing drill screws. See Figure 8.
4. Loosely attach the L-shaped side mounting brackets (293993) to the back panel using the existing drill screws. See Figure 8.
5. Loosely attach the front adapter panel studs to the L-shaped side mounting brackets using 6-32 hex nuts (X-71-2). See Figure 8.
6. Center the remote annunciator in the adapter panel and tighten the hardware.
7. Mount the assembly in the opening. Protect the remote annunciator from dust and debris when drilling the holes.

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### NOTE

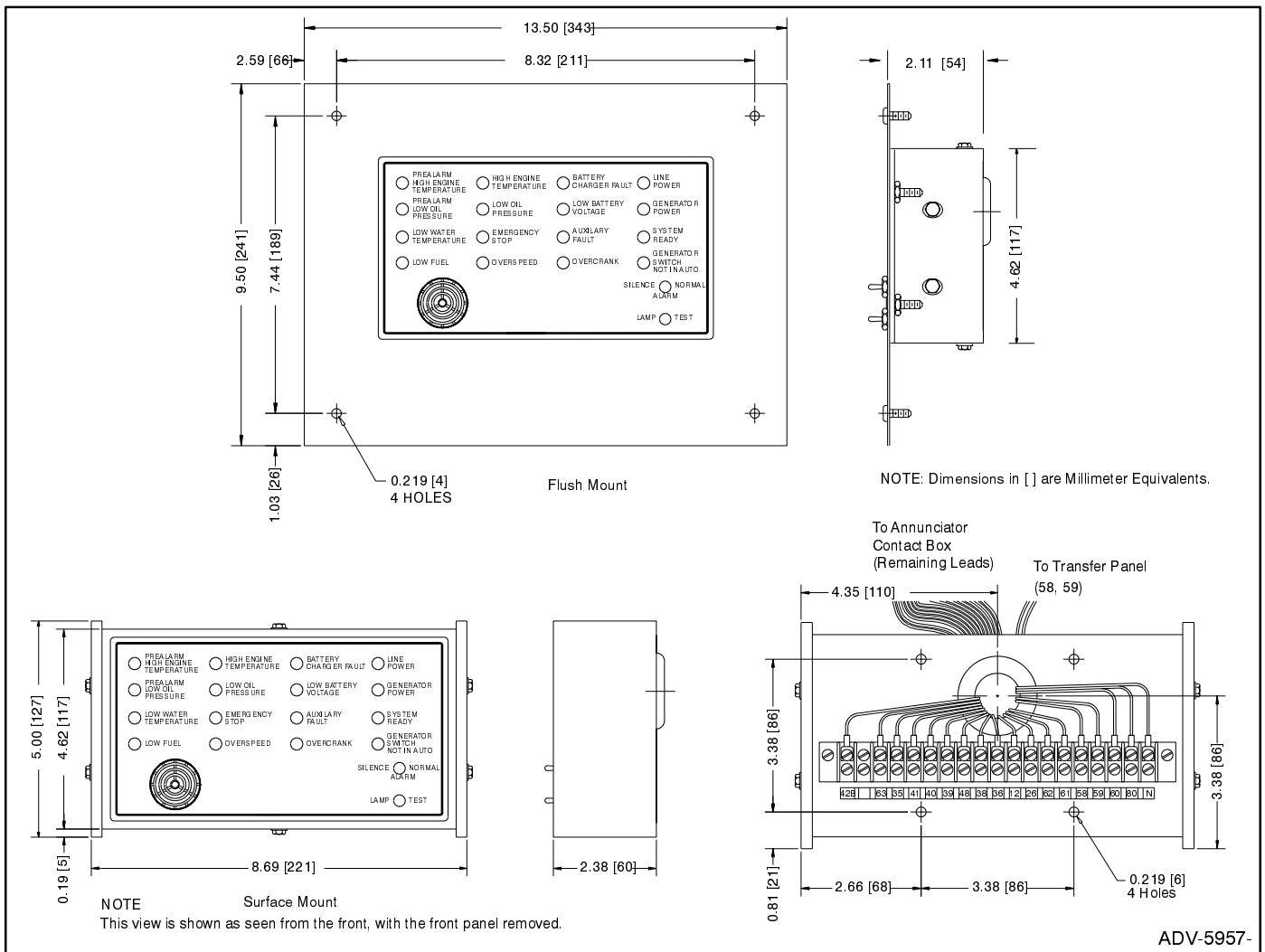
Mount the annunciator inside a standard Hoffmann® 12 x 8 x 4 in. (30 x 20 x 10 cm) pull box installed in the wall. Mount the kit inside the pull box using black 10-32 screws supplied.

### NOTE

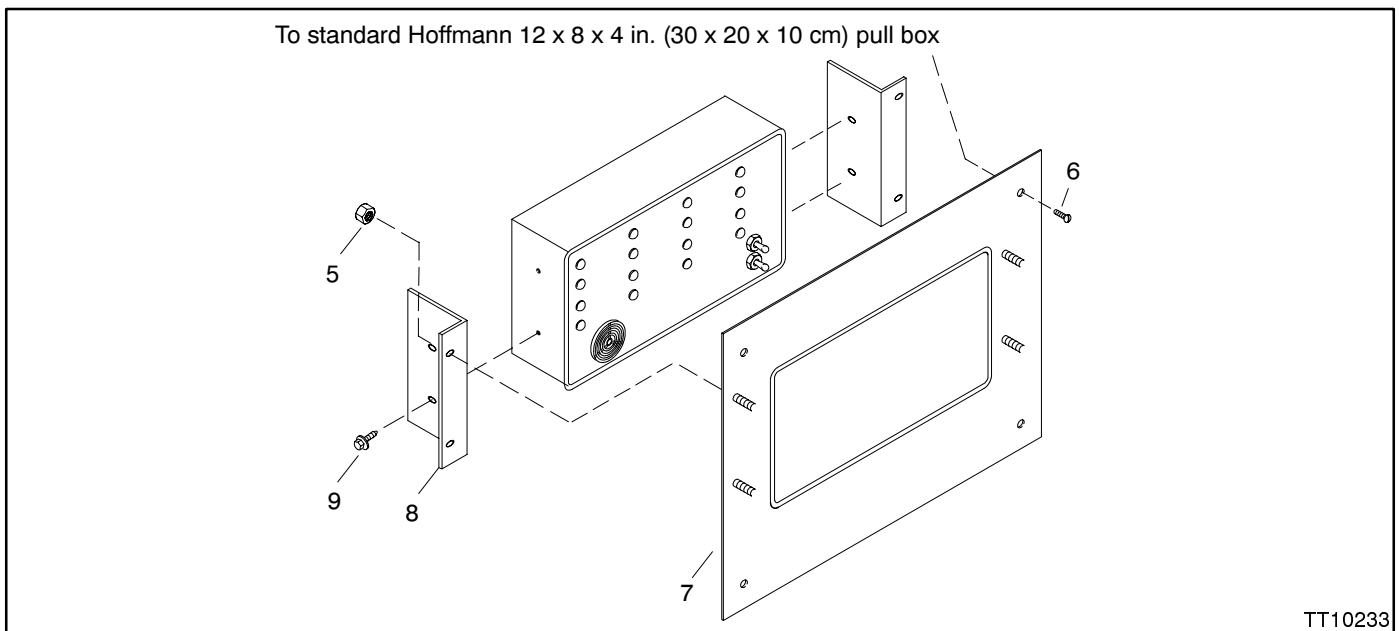
Use mounting hardware suitable for the wall composition and thickness.

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8. Reconnect the generator set engine starting battery, negative (-) lead last.
9. Move the generator set master switch to the AUTO position for startup by a remote transfer switch or remote start/stop switch. Move the remote annunciator alarm horn switch to the NORMAL position. If the horn sounds or the lamp(s) illuminates, see the Resetting instructions following.



**Figure 7. Component Dimensions**



**Figure 8. Flush-Mount Annunciator Installation**

## Remote Annunciator Wiring

- The customer must supply all leads between the 14-relay dry contact box and the remote annunciator. Isolate the leads from all other voltages. Observe the following guidelines during installation:
  - Always use separate conduit for the remote annunciator leads.
  - Use grounded metallic conduit for leads or use shielded cable in nonmetallic conduit.
  - Use dry contact kits located at the generator set for all signal leads and a separate power source for the remote annunciator.

To determine the gauge wire, stranded or solid, for leads N and 42B, measure the distance between the 14-relay dry contact box and the remote annunciator. For example, if the distance between the remote annunciator and the 14-relay dry-contact box is 400 ft (122 m), then the total wire length for each conductor is 400 ft (122 m). According to the chart in Figure 9, this example requires 14-gauge wire for leads N and 42B only.

Leads	Length	Wire Gauge
N, 42B	0–100 ft. (0–21 m)	18-20
	100–500 ft. (31–152 m)	14
	500–1000 ft. (152–305 m)	10
39, 12, 36, etc.	0–1000 ft. (305 m)	18–20

**Figure 9. Wire Specifications Between Remote Annunciator and Dry Contact Box**

Use stranded or solid 18- or 20-gauge wire for signal leads (39, 12, 36, etc.) at lengths up to 1000 ft. (305 m). Never mount the remote annunciator more than 1000 ft. (305 m) from the 14-relay dry contact box.

- Attach wiring of correct length and gauge to the 14-relay dry contact box.
- Route the wiring from the 14-relay dry contact box through the opening in the back of the annunciator panel.
- Attach the leads to the terminal strip. Be sure to connect the 14-relay dry contact box leads to the corresponding terminals in the remote annunciator. See Figure 10.

- Connect transfer switch terminals 10, 12, and 13 to the remote annunciator terminals 59, N, and 58, respectively, if transfer switch equipped.
- Return to the Surface-Mount or Flush-Mount Installation section to complete the annunciator installation.

Dry Contact Box Terminal	Connects To:	Remote Annunciator Terminal
42B		42B
K1, C terminal		N
K1, NO terminal		39
K2, NO terminal		12
K3, NO terminal		36
K4, NO terminal		38
K5, NO terminal		26*
K6, NO terminal		60
K7, NO terminal		80
K8, NO terminal		41
K9, NO terminal		48
K10, NO terminal		61
K11, NO terminal		62
K12, NO terminal		63
K13, NO terminal		35
K14, NO terminal		40
TX1 Terminal Strip Terminal	Connects To:	Dry Contact Box Terminal
42		42A
2		2
TB1-39		K1 Input
TB1-12		K2 Input
TB1-36		K3 Input
TB1-38		K4 Input
TB1-26*		K5 Input
TB1-60		K6 Input
TB1-80		K7 Input
TB1-41		K8 Input
TB1-48		K9 Input
TB1-61		K10 Input
TB1-62		K11 Input
TB1-63		K12 Input
TB1-35		K13 Input
TB1-40		K14 Input
Connect dry contact box N terminal to battery negative (-) on engine and P terminal to battery positive (+) on engine.		
*Does not apply to 20–2000 kW controller with TB1, TB2, and TB3.		

**Figure 10. Remote Annunciator Kit Wiring Connections**

## **Resetting the Controller and Remote Annunciator**

Use the following procedure to reset the controller and remote annunciator after a fault alarm.

1. Move the controller alarm horn switch to the SILENCE position. Move the remote annunciator alarm switch to the SILENCE position to stop the alarm horn. The remote annunciator lamp remains lit.
2. Disconnect the generator set from the load with the line circuit breaker or automatic transfer switch.
3. Correct the cause of the fault alarm. See the generator service manual.
4. Move the generator set master switch to the OFF/RESET position and then to the RUN position for startup. The remote annunciator alarm horn sounds and the lamp darkens.
5. Correct the cause of the alarm.
6. Reconnect the generator to load via the line circuit breaker or automatic transfer switch.
7. Move the generator set master switch to the AUTO position for start-up by the remote transfer switch or the remote start/stop switch. Move the remote annunciator alarm switch to the NORMAL position.
8. Move the controller alarm horn switch to the NORMAL position.

## Remote Annunciator Kits

Parts List				
Kits: PA-361938 and PA-361938-SD			Unique Parts	
Qty.	Description	Common Parts	PA-361938	PA-361938-SD
1	Panel Assembly, annunciator (includes *)		A-258782	A-258782-SD
1	*Circuit Board Assy., 16-light	A-292885		
1	*Grommet	X-284-3		
2	*Screw, 6-32 x 0.50 in.	X-49-26		
4	*Screw, hex, 8-32 x 0.375 in.	X-67-43		
6	*Screw, drill, 8-18 x 0.50 in.	X-794-2		
1	*Bracket, wall mount		253346-BLK	253346-SD
1	*Panel, front		253350-BLK	253350-SD
1	*Decal, marker	258832		
1	*Nameplate		258834	325376
1	*Harness, wiring	258890		
1	*Block, terminal	258891		
2	*Panel, side	287798		
1	Assembly, dry contact box		A-293983	A-293983-SD
1	*Circuit Board Assy, 14-relay dry contact	A-320639		
13	*Lead	LW-1803		
1	*Grommet	X-284-7		
2	*Tie, cable	X-468-5		
2	*Screw, 6-32 x 0.50 in.	X-49-26		
4	*Screw, 10-24 x 0.50 in.	X-6216-1		
6	*Nut, hex, 8-32	X-70-12		
6	*Spacer	X-712-9		
1	*Fuse, 10-amp	223316		
1	*Bracket, fuse holder	226675		
1	*Box, dry contact		226676-KCB	226676-SD
1	*Grommet	243488		
1	*Block, fuse	256493		
1	*Marker, strip	256494		
1	*Harness, annunciator	256495		
1	*Cover, dry contact		256880-KCB	256880-SD
1	*Harness, wiring	293982		
2	Terminal, 16-14 wire	X-283-32		
2	Terminal	X-283-4		
2	Terminal	X-283-5		
2	Screw, 6-32 x 0.625 in.	X-49-36		
4	Screw, pan head	X-50-72		
4	Nut, hex	X-71-2		
2	Nut, 6-32	X-6210-3		
1	Panel, front annunciator		293992-BLK	293992-SD
2	Bracket, mounting	293993		
1	Strip, terminal	328913		
1	Strip, marker	328914		
1	Lead, 2	SW02-1873-2222		
1	Lead, 3	SW03-1861-2222		
1	Lead, 4	SW04-1861-2222		
1	Lead, 12	SW12-1873-2222		

Parts List (continued)				
Kits: PA-361938 and PA-361938-SD			Unique Parts	
Qty.	Description	Common Parts	PA-361938	PA-361938-SD
1	Lead, 26	SW26-1873-2222		
1	Lead, 32	SW32-1873-2222		
1	Lead, 35	SW35-1873-2222		
1	Lead, 36	SW36-1873-2222		
1	Lead, 38	SW38-1873-2222		
1	Lead, 39	SW39-1873-2222		
1	Lead, 40	SW40-1873-2222		
1	Lead, 41	SW41-1873-2222		
1	Lead, 48	SW48-1873-2222		
1	Lead, 56	SW56-1873-2222		
1	Lead, 60	SW60-1873-2222		
1	Lead, 61	SW61-1873-2222		
1	Lead, 62	SW62-1873-2222		
1	Lead, 63	SW63-1873-2222		
1	Lead, 80	SW80-1873-2222		
1	Lead, 32A	T32A-1873-2222		
1	Lead, 42A	T42A-1873-2222		
1	Lead, 70C	T70C-1873-2222		
1	Lead, 70R	T70R-1873-2222		