

Foldout pages for:  
Theory of operation & Parts list

SECTION

9

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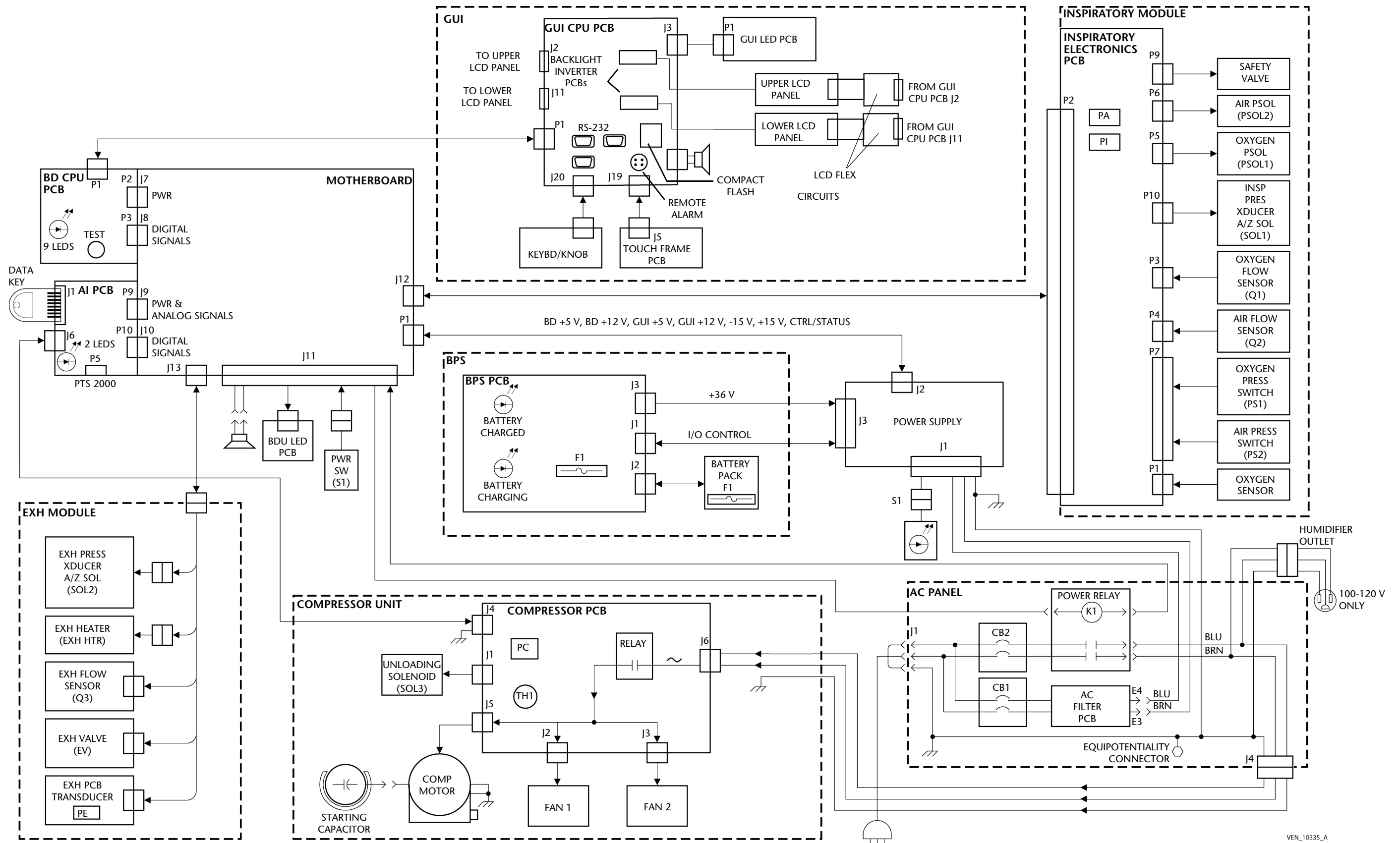


Figure 2-42. Electrical system block diagram (10.4-inch GUI—Trending-enabled CPU PCB shown)

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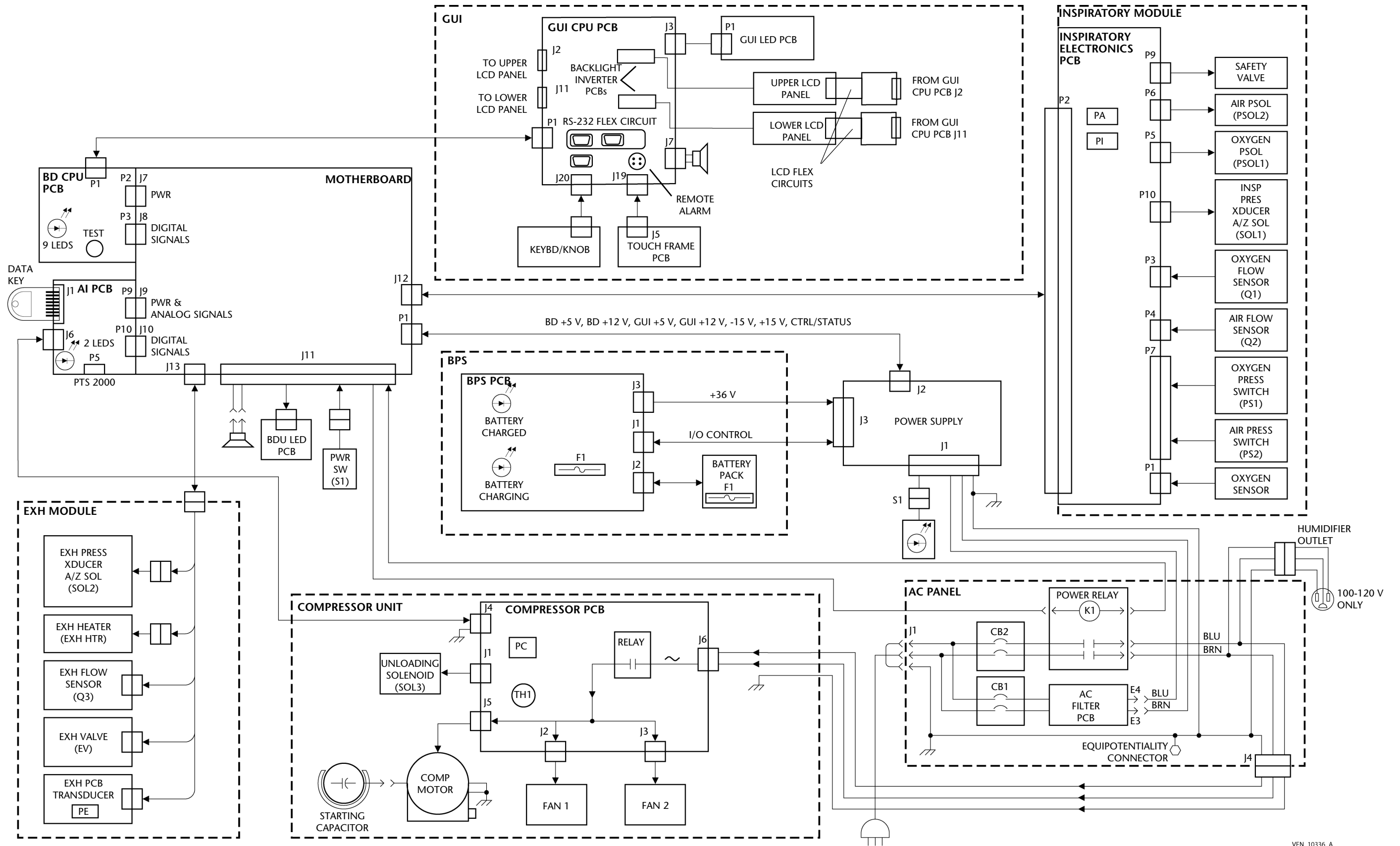


Figure 2-43. Electrical system block diagram (10.4-inch GUI—Non-Trending-enabled CPU PCB shown)

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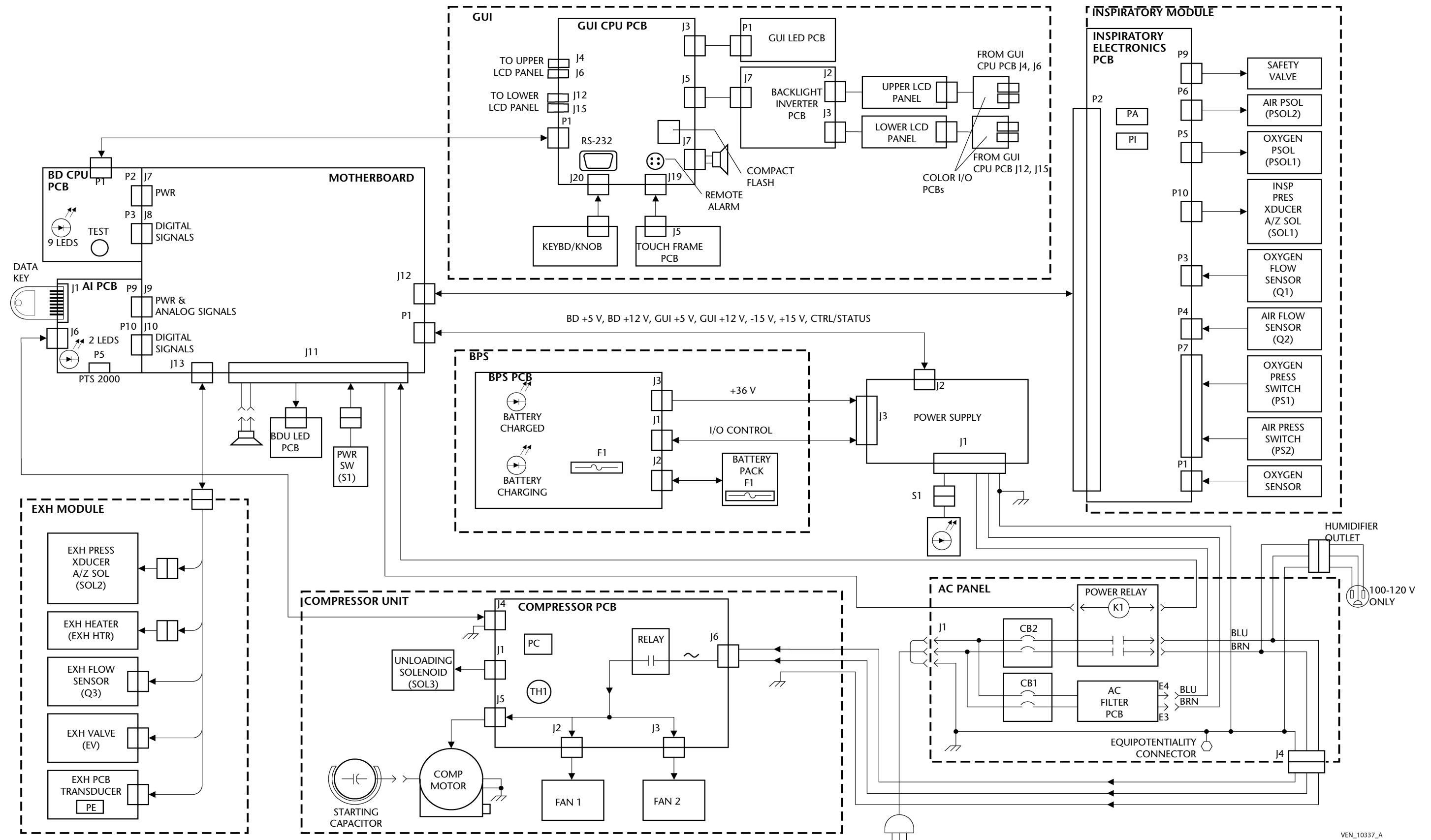


Figure 2-44. Electrical system block diagram (9.4-inch GUI—Trending-enabled CPU PCB shown)

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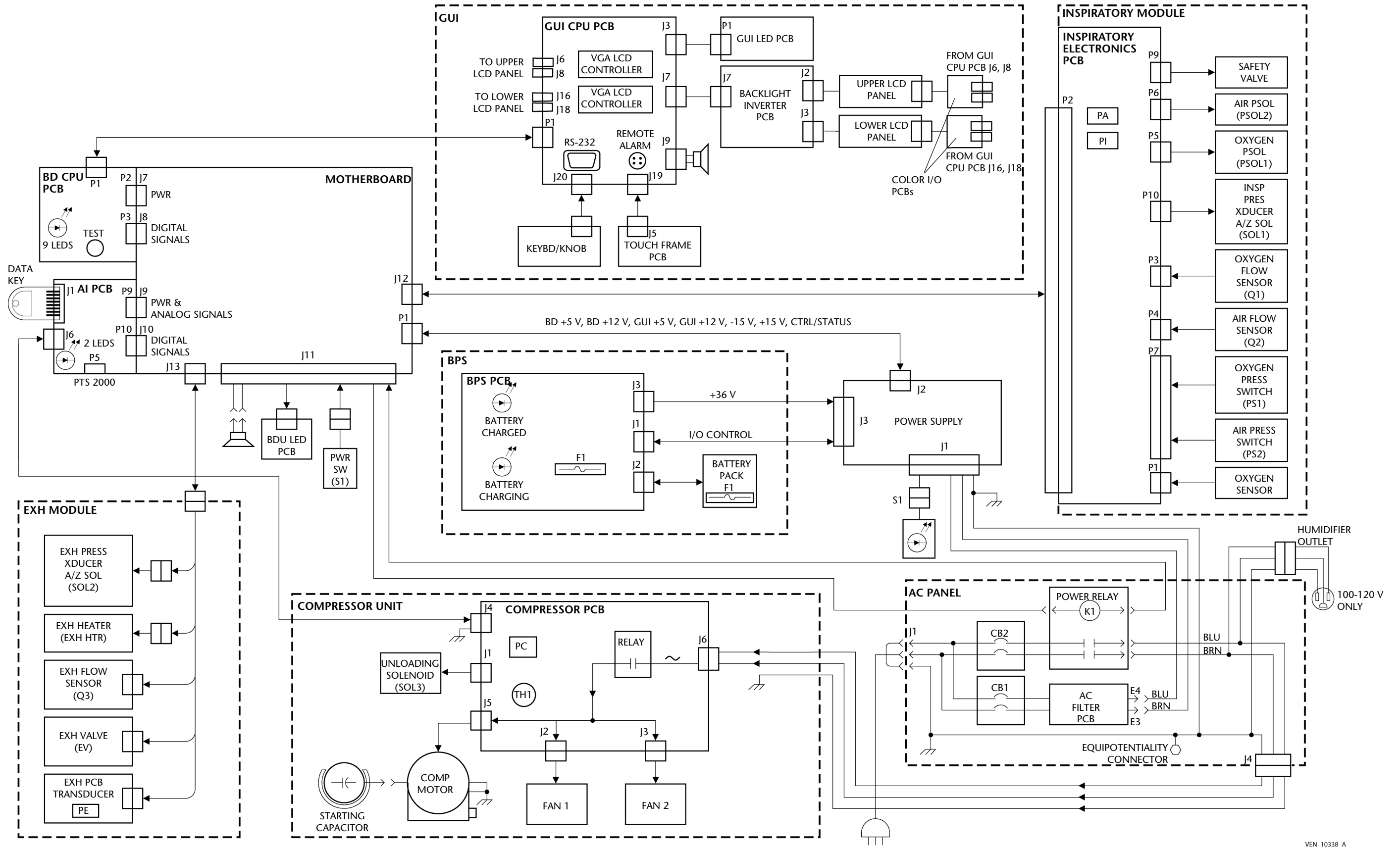


Figure 2-45. Electrical system block diagram (older 9.4-inch GUI shown)

### 2.4.3 AC distribution components

The AC distribution components include

- a power cord
- AC panel
- power switch
- interfacing cables, wires, and components

Mains (AC) power (or facility power) is applied through the power cord to the AC receptacle and main and auxiliary circuit breakers. From the main circuit breaker, power is applied through the AC filter PCB directly to the power supply. Power to the power supply bypasses the power switch, enabling the power supply to continually charge the BPS. When the power switch is set to off, the secondaries that power the ventilator electronics are not active. From the auxiliary circuit breaker, power is applied via the power relay to the compressor compartment AC receptacle and the humidifier receptacle. The compressor compartment power cord plugs into receptacle J4, supplying AC power to the compressor unit, while the humidifier receptacle is intended to power an optional humidifier.

#### 2.4.3.1 Power cord

The 840 Ventilator System includes a detachable power cord. The power cord has an IEC-standard, three-prong connector. The plug end varies, corresponding to different country requirements.

#### 2.4.3.2 AC panel

The AC panel ( Figure 2-45 and Figure 2-46), a single field-replaceable unit (FRU), includes components that apply AC to the ventilator head, compressor unit, and optional humidifier. The AC panel includes AC receptacle J1, circuit breakers CB1 and CB2, AC filter PCB, power relay K1, compressor receptacle J4, and potential equalization connector J2. A humidifier receptacle (J3), which is connected to but is not a part of the AC panel, is on the front of the ventilator.

- The **AC receptacle (J1)** receives facility AC power via the power cord.

#### Warning

Ensure that the power cord retainer bracket is properly installed and secures the power cord to the AC receptacle (J1).

- The AC panel houses two push-to-reset type circuit breakers. The 5 A **main circuit breaker (CB1)** limits current to the power supply. The 10 A (100 – 120 V) or 5 A (220 – 240 V) **auxiliary circuit breaker (CB2)** limits current to the compressor and humidifier circuits.
- The **AC filter PCB** reduces AC line noise to and from the ventilator.
- The **power relay (K1)** switches power to humidifier receptacle J3 and compressor receptacle J4 when the power switch (S1) is on. The relay is powered from a dedicated +12 V power supply output, which is active when the power switch is on.
- The **compressor receptacle (J4)** receives AC power via K1 and provides the AC power outlet for the compressor power cord.
- The **humidifier receptacle (J3)** receives AC power via K1 and provides an AC power outlet for the humidifier power cord.
- The **potential equalization connector (J2)** interfaces the equipment and the potential equalization bus bar.

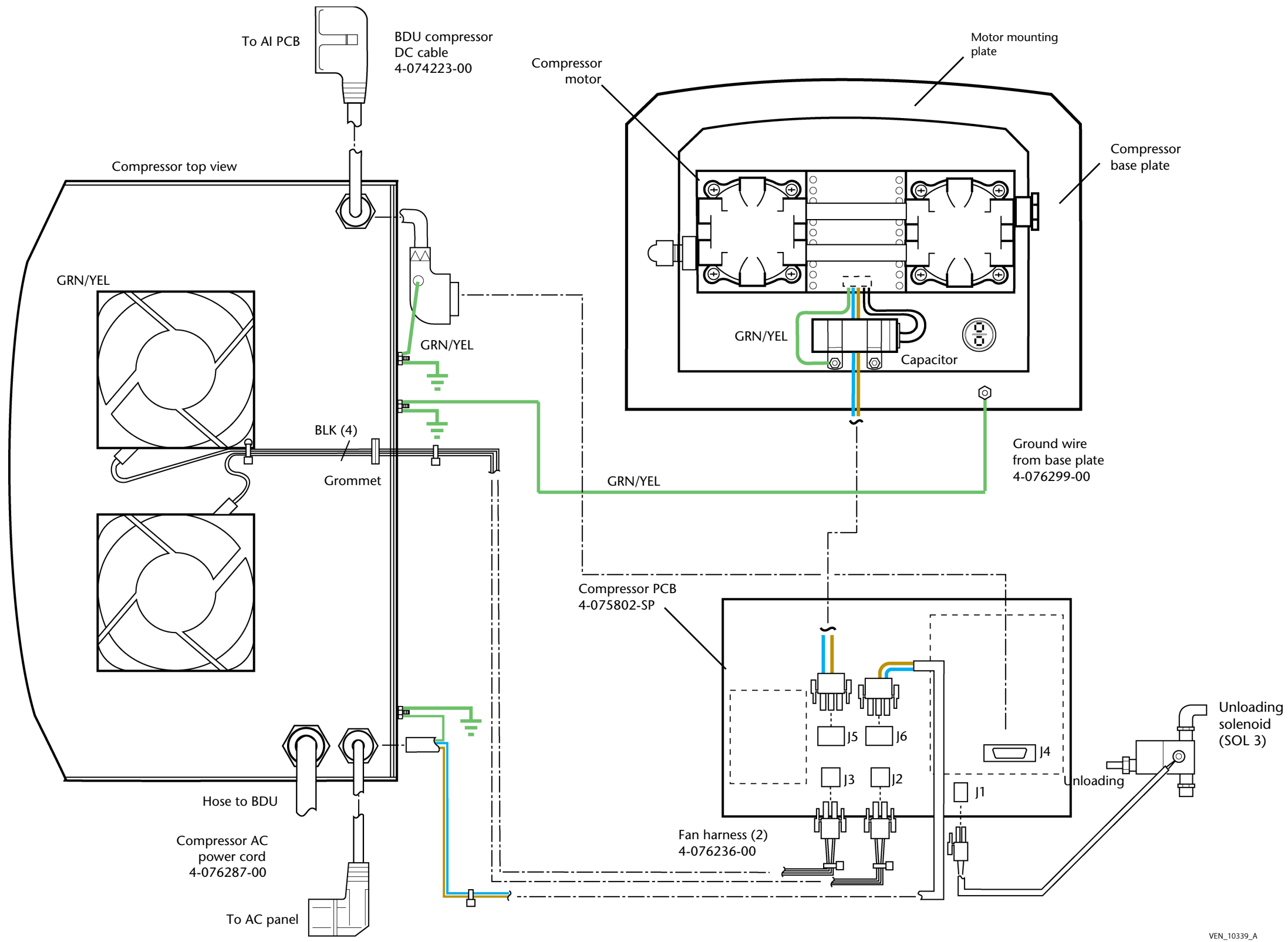


Figure 2-86. Puritan Bennett 840 Ventilator System interconnect diagram – Compressor unit

### **2.4.12.3 806 Compressor unit operation**

The 806 compressor operates in two modes: run and standby. A special start-up sequence ensures that the motor starts with an unloaded compressor head.

#### **2.4.12.3.1 Run mode**

When AC mains power is > 80% of nominal, the compressor is available for use if wall air is unavailable or the pressure is < 26 psig. In run mode, the compressor acts as the air source for the ventilator, continuously supplying air to meet the ventilator's full flow requirements (200 L/min peak flow, 2.5 L breath volume). When accumulator pressure reaches 27 psig, SOL3 is energized, venting excess flow to assist transporting water vapor out of the air dryer. The solenoid becomes de-energized when the pressure drops below 22.5 psig (see Figure 2-85). This cycle repeats as pressure rises and falls in the accumulator.

#### **2.4.12.3.2 Standby mode**

The compressor enters stand-by mode when there is sufficient wall air pressure to supply the ventilator. When the ventilator is powered up, it runs through POST and detects the presence of the compressor. The compressor turns on and pressurizes the accumulator. During this cycle, the green compressor ready indicator on the GUI illuminates when the accumulator pressure reaches at least 13 psig. When the accumulator pressure reaches 27 psig, the compressor turns off. If pressure in the accumulator drops below 22.5 psig (due to small leaks in the system or cooling of compressed air), the compressor starts and recharges the accumulator to 27 psig (see Figure 2-85).

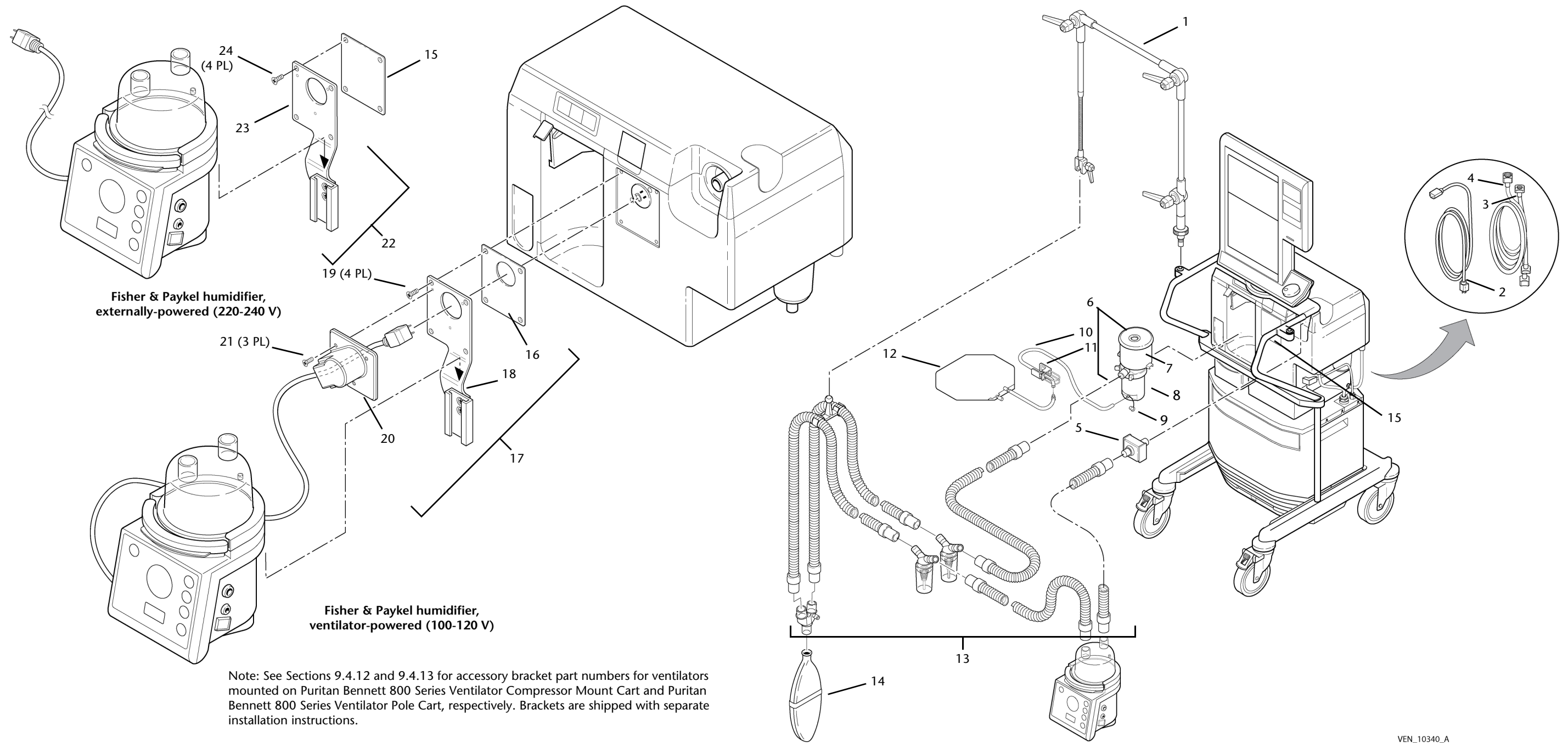
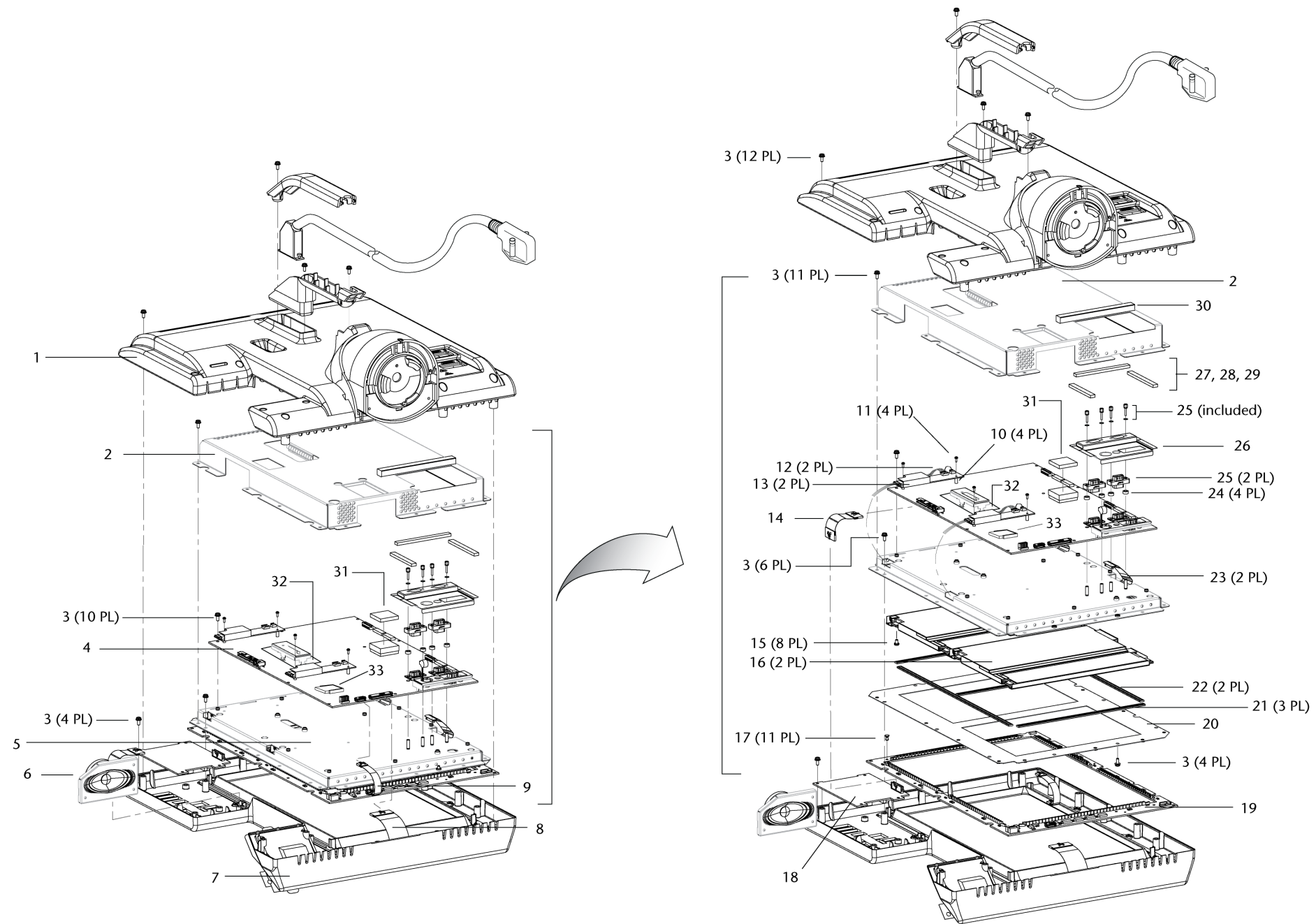


Figure 9-1. 840 Ventilator System patient system and accessories

## 9.2.1 840 Ventilator System NeoMode patient system and accessories

## NeoMode patient system and accessories parts list

Item no. (Figure 9-2)	Part no.	Quantity	Description
--	4-076440-00	1	• Upgrade Kit, NeoMode, English, Non-US
--	4-076441-00	1	• Upgrade Kit, NeoMode, English, US only
--	4-076442-00	1	• Upgrade Kit, NeoMode, German
--	4-076443-00	1	• Upgrade Kit, NeoMode, French
--	4-076444-00	1	• Upgrade Kit, NeoMode, Italian
--	4-076445-00	1	• Upgrade Kit, NeoMode, Japanese
--	4-076446-00	1	• Upgrade Kit, NeoMode, Spanish
--	4-076447-00	1	• Upgrade Kit, NeoMode, Portuguese
1	307/6922		• Ventilator breathing circuit, neonatal, disposable (DAR)
--	7441-4S2		• Ventilator breathing circuit, neonatal, disposable, 4 feet (Allegiance Healthcare Corporation )
2	4-076408-00	1	• Filter, expiratory, NeoMode
--	DAR part number 351P19005 Order part number 4-076408-00	Box of 12	• Expiratory bacteria filter (DAR), disposable
3	4-074601-00	Box of 12	• Inspiratory bacteria filter, 22-mm ISO connectors, disposable, D/Flex
4	4-076405-00	1	• Adapter plate, NeoMode
--	4-076589-00	1	• Label, adapter, NeoMode



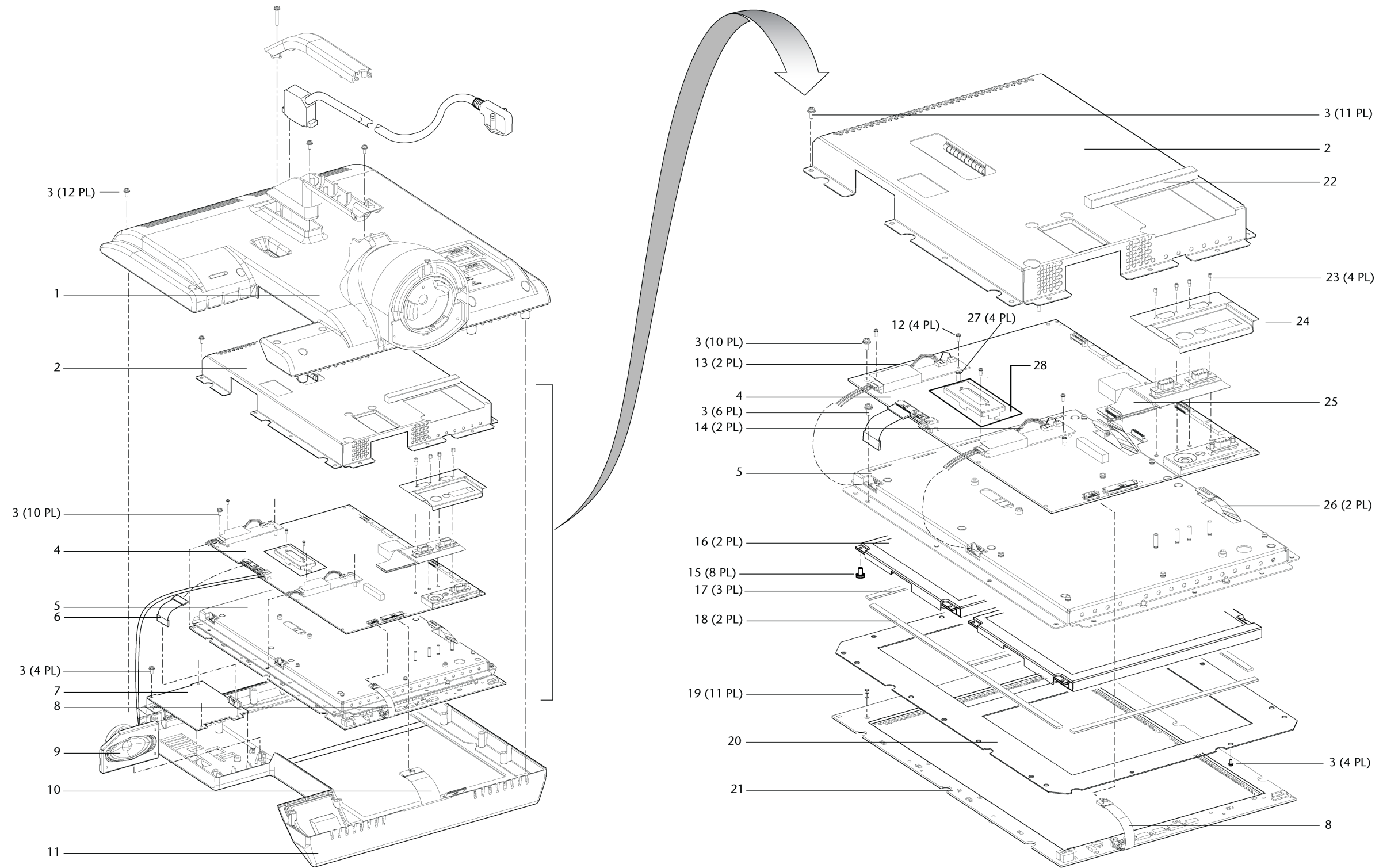
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Figure 9-10. 10.4-inch GUI assembly with TE GUI CPU PCB

## 9.4.3 10.4-inch GUI (graphic user interface) assembly

## 10.4-inch GUI assembly parts list

Item no. (Figure 9-12)	Part no.	Quantity	Description
1	4-076672-SP	1	• Housing assembly, GUI rear
2	4-076678-SP	1	• Shield, CPU PCB
3	4-070034-00	47	• Screw, 6-32 X 0.38, sems, SQCN
4	4-075727-SP	1	• PCB, GUI CPU
5	4-076675-00	1	• Bracket, LCD panels and GUI CPU PCB
6	4-076656-00	1	• Cable assembly, GUI alarm
7	4-073500-SP	1	• PCB, GUI LED
8	4-076651-00	1	• Cable assembly, touchframe
9	4-079013-SP	1	• Speaker, GUI alarm, 16 OHM
10	4-076652-00	1	• Cable assembly, keyboard
11	4-076671-SP	1	• Housing assembly, GUI front
12	4-076687-00	4	• Screw, 2-56 X 1/4 PH, nylon
13	4-076855-SP	2	• Inverter, backlight, 10.4-inch GUI
14	4-076653-00	2	• Cable assembly, backlight, 10.4-inch GUI
15	4-076658-00	8	• Screw, 6-32 X 1/4 PH sem
16	4-078267-SP	2	• Display, LCD, 10.4-inch color
17	4-076684-00	3	• Gasket, EMC, Chrometrics, 8.5"
18	4-076685-00	2	• Gasket, EMC, Chrometrics, 13"
19	4-076660-00	11	• Rivet, snap, H type
20	4-076676-00	1	• Shield, LCD
21	4-076530-SP	1	• PCB, touchframe
22	4-076686-00	1	• Gasket, EMC, Chrometrics, RS-232, 5"
23	4-076665-00	4	• Screw, lock, fem, 4-40, 0.75L
24	4-076677-00	1	• Shield, RS-232
25	4-071944-SP	1	• Cable, flex circuit assembly, RS-232
26	4-076856-SP	2	• Cable, flex circuit assembly, video
27	4-076688-00	4	• Washer, nylon
28	4-075865-00	1	• Shield, dielectric, GUI
--	10021120	1	• FRU, IC, real-time clock (not shown)



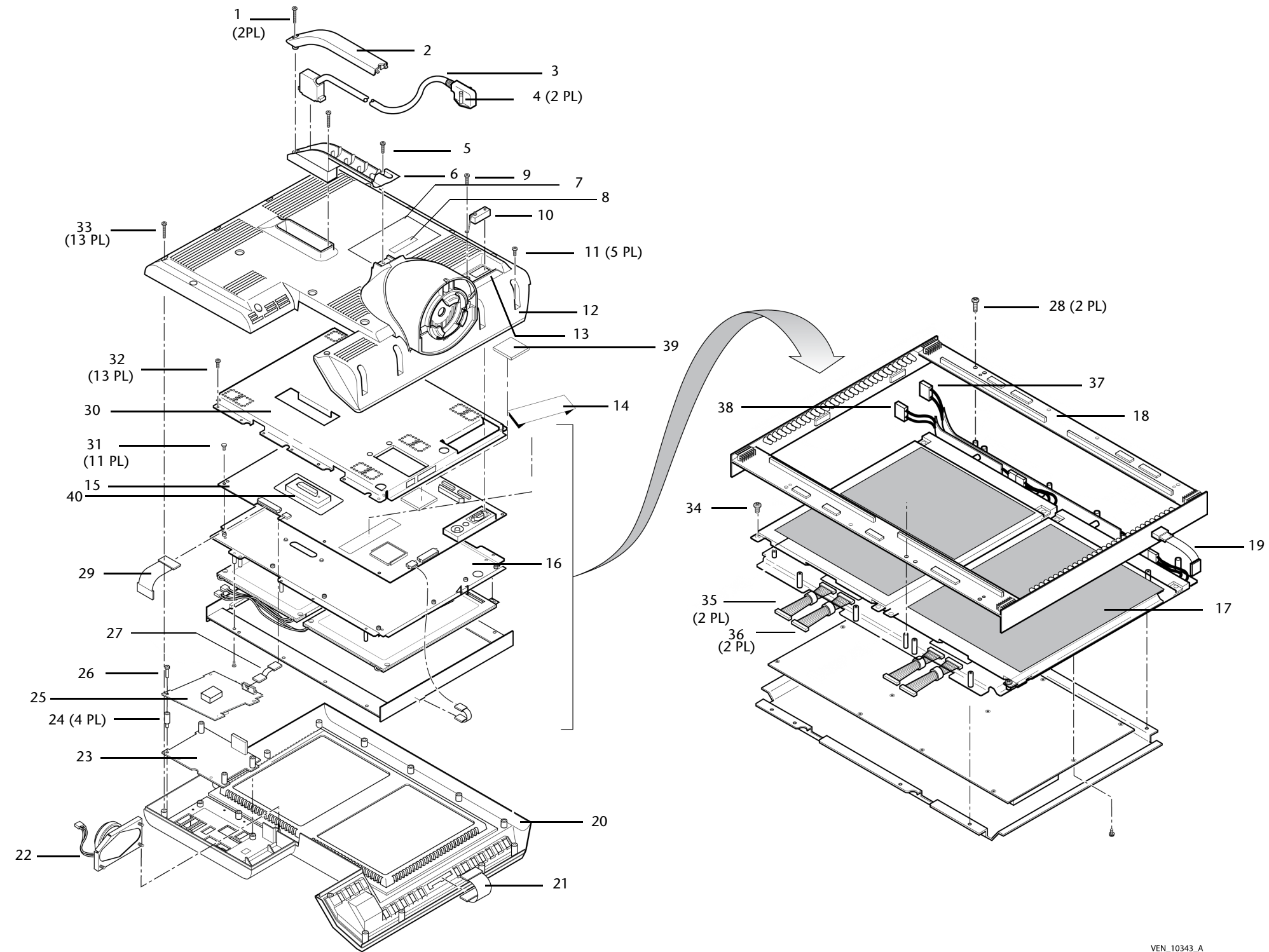
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Figure 9-11. 10.4-inch GUI assembly

## 9.4.4 10.4-inch GUI (graphic user interface) handle

10.4-inch GUI handle parts list

Item no. (Figure 9-13)	Part no.	Quantity	Description
--	--	1	Graphic user interface (GUI) (See Section 9.4 for NHA.)
--	4-078179-00	1	10,000 hour preventative maintenance kit
1	4-070039-00	2	<ul style="list-style-type: none"> <li>Screw, PAN, 6-32 x 1.5", sems (Attach top and bottom handles to rear housing.)</li> </ul>
2	4-073008-00	1	<ul style="list-style-type: none"> <li>Handle, GUI top</li> </ul>
3	4-075864-00	1	<ul style="list-style-type: none"> <li>Cable assembly, GUI-to-BDU, 3-ft (0.9-m)</li> </ul>
	4-071441-00		<ul style="list-style-type: none"> <li>Cable assembly, GUI-to-BDU extension, 10-ft (3.0-m) (for shelf mount)</li> </ul>
4	4-075684-00	2	<ul style="list-style-type: none"> <li>Jackscrew</li> </ul>
5	4-070036-00	1	<ul style="list-style-type: none"> <li>Screw, PAN, 6-32 x 0.75, sems</li> </ul>
6	4-073007-00	1	<ul style="list-style-type: none"> <li>Handle, GUI bottom</li> </ul>
7	--	1	<ul style="list-style-type: none"> <li>Kit, Label, Product information (Refer to Section 9.4.1 for part number.)</li> </ul>
8	--	1	<ul style="list-style-type: none"> <li>Label, serial number (Contact your Puritan Bennett representative for ordering information.)</li> </ul>
9	4-076663-00	1	<ul style="list-style-type: none"> <li>Window, LED status, GUI</li> </ul>



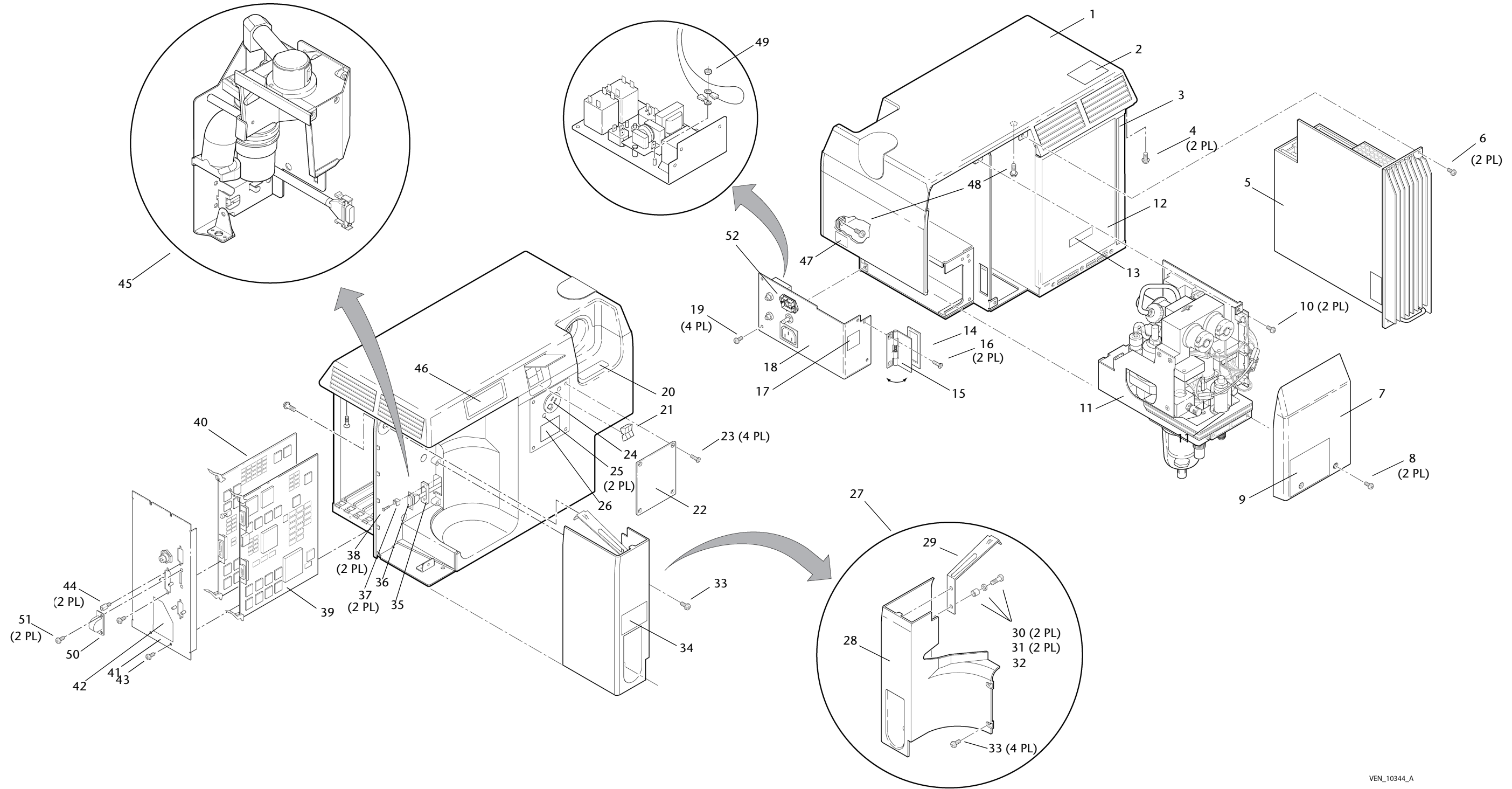
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Figure 9-15. 9.4-inch GUI assembly

## 9.4.7.1 9.4-inch GUI front housing assembly

## 9.4-inch GUI front housing assembly parts list

Item no. (Figure 9-17)	Part no.	Quantity	Description
--	--	1	Housing assembly, GUI front (See Section 9.4.7 for NHA.)
1	4-073003-00	1	• Bezel, GUI
2	4-073043-00	1	• Gasket, window
3	4-073036-00	1	• Window, GUI
4	4-073033-00	1	• Gasket, housing
5	4-073028-00	1	• Label, alarm graphics, GUI, non-US
	4-075429-00		• Label, alarm graphics, GUI, US
6	4-073001-00	1	• Housing, GUI front
7	4-075828-SP	1	• Keyboard assembly, English, non-US (Includes PCB and knob)
	4-075834-SP		• Keyboard assembly, English, US (Includes PCB and knob)
	4-075829-SP		• Keyboard assembly, French (Includes PCB and knob)
	4-075830-SP		• Keyboard assembly, German (Includes PCB and knob)
	4-075832-SP		• Keyboard assembly, Italian (Includes PCB and knob)
	4-075835-SP		• Keyboard assembly, Japanese (Includes PCB and knob)
	4-075833-SP		• Keyboard assembly, Portuguese (Includes PCB and knob)
	4-075831-SP		• Keyboard assembly, Spanish (Includes PCB and knob)
8	4-071313-00	1	• Cable assembly, keyboard



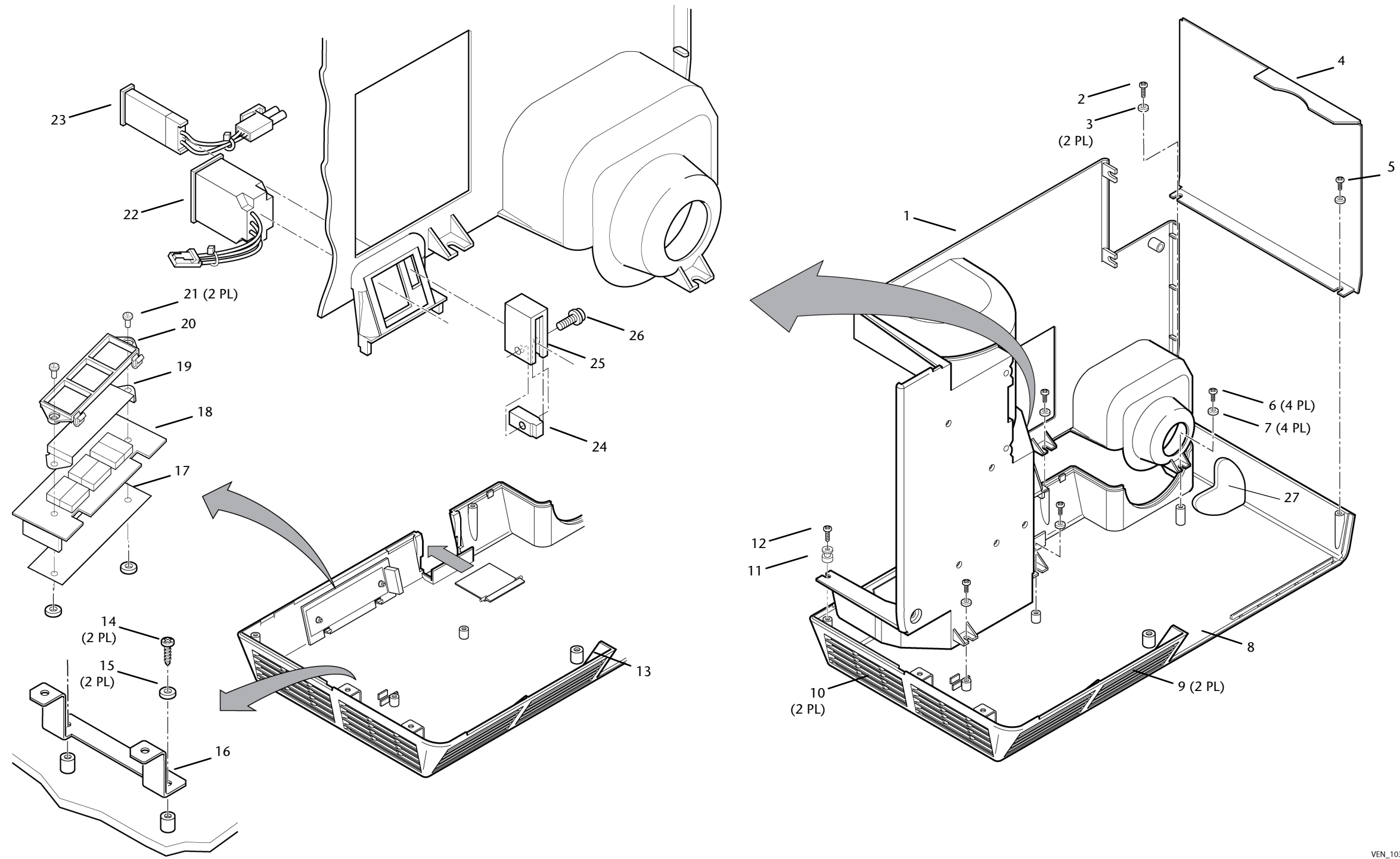
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Figure 9-18. Breath delivery unit (BDU)

## 9.4.8.1 Exhalation Module

## Exhalation module assembly parts list

Item no. (Figure 9-20)	Part no.	Quantity	Description
--	4-072600-SP	--	Exhalation module (See Section 9.4.9 for NHA.)
1	4-079022-SP	1	• Heater assembly, exhalation
2	4-070048-00	3	• Screw, PAN, 6-32 x 5/8 (Attach heater assembly to latch assembly)
3	4-079054-SP	1	• Check valve assembly with seal, exhalation (CV5)
4	--	1	• • Check valve assembly
5	--	1	• • Seal, check valve, exhalation
6	--	1	• Manifold, expiratory filter
7	4-072607-00	1	• Seal, exhalation
8	4-072218-SP	1	• Solenoid valve assembly, 3-way, +6 V (expiratory pressure transducer autozero solenoid, SOL2)
9	--	1	• Chassis assembly, exhalation
10	4-072623-00	3	• Screw, FH, 8-32 x 3/8 (Attach exhalation filter manifold and fascia to exhalation chassis)
11	4-078141-00 or 4-078220-SP	1	• Harness assembly, exhalation module • Harness assembly, exhalation module, EMI (Phase II) (Use only with EMI exhalation cover and EMI exhalation transducer PCB)
12	4-070300-SP or 4-075226-SP	1	• PCB, exhalation transducer • PCB, exhalation transducer, EMI (Phase II) (Use only with EMI exhalation harness)
13	4-070034-00	3	• Screw, PAN, 6-32 x 0.38, sems (Attach exhalation transducer PCB to exhalation chassis)
14	4-076461-SP	1	• Valve assembly, exhalation (EV)
15	--	1	• • Valve, exhalation (EV)
16	--	1	• • Port, exhalation
17	4-072212-SP	1	• Sensor with O-rings, flow, exhalation (Q3)
18	--	1	• • Sensor, flow, exhalation (Q3)
19	--	2	• • O-ring
20	4-070034-00	4	• Screw, PAN, 6-32 x 0.38, sems (Attach exhalation valve to exhalation chassis)
21	4-070047-00	2	• Screw, PH, 6-32 x 5/16, sems (Attach expiratory pressure transducer autozero solenoid (SOL2) to exhalation chassis)
22	4-076392-00	1	• Fascia, exhalation
23	4-072625-00	1	• Latch assembly, exhalation
24	4-072614-00	1	• Ring, retaining (Attaches latch to manifold)
25	4-072623-00	1	• Screw, FH, 8-32 x 3/8 (Attach latch to manifold)



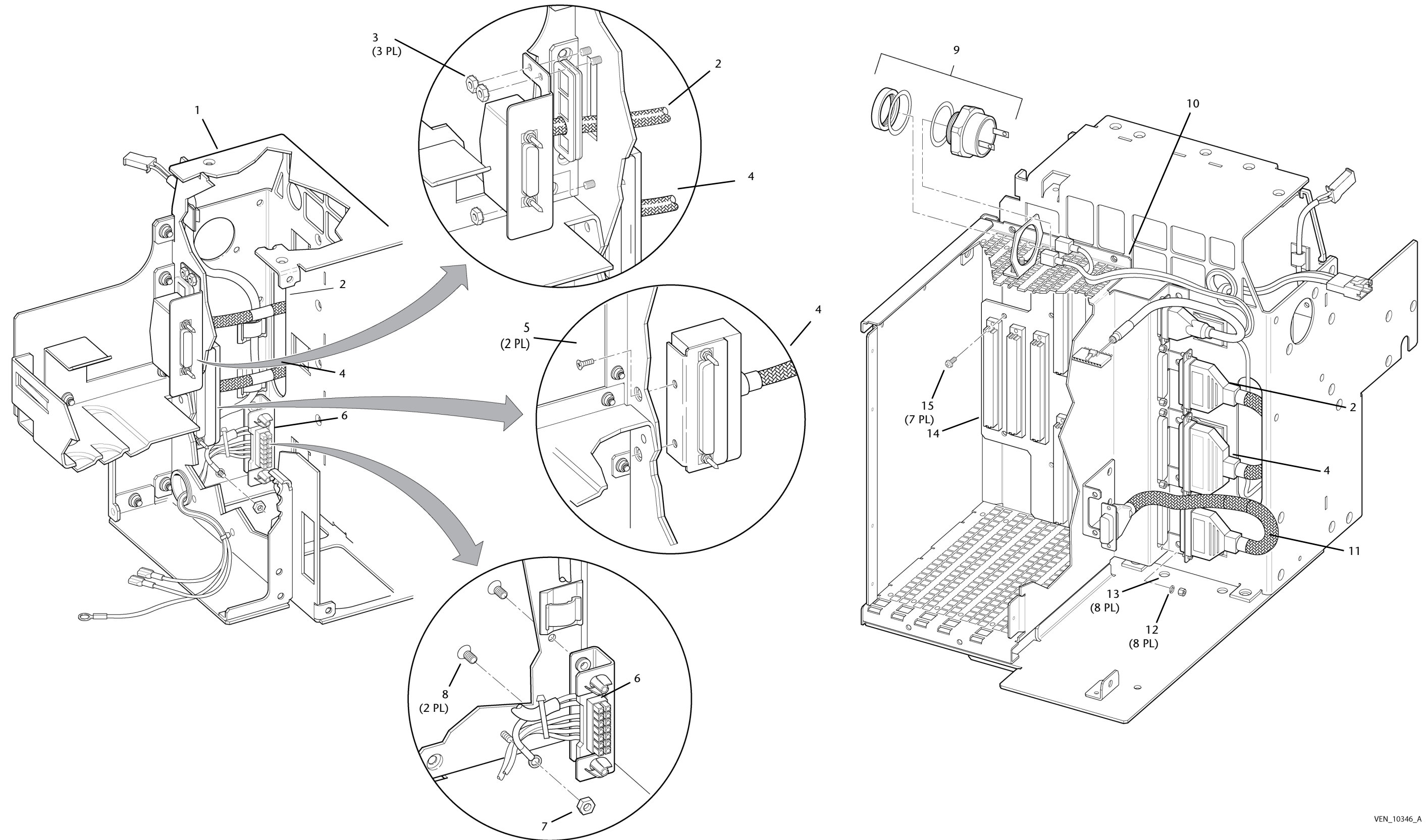
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Figure 9-23. BDU cover assembly

## 9.4.8.4 BDU chassis assembly

## BDU chassis assembly parts list

Item no. (Figure 9-25)	Part no.	Quantity	Description
--	--	1	Chassis assembly, BDU (See Section 9.4.9 for NHA.)
1	4-079032-SP	1	• Chassis kit, BDU (See Figure 9-24 for parts breakdown.)
2	4-079019-SP	1	• Cable assembly, inspiratory blindmate
3	4-005482-00	3	• Nut, HEX, 8-32, keps (Attach inspiratory blindmate cable to chassis)
4	4-079018-SP	1	• Cable assembly, DC blindmate
5	4-070055-00	2	• Screw, FH, 8-32 x 1/4 (Attach DC blindmate cable to chassis)
6	4-079017-SP	1	• Cable assembly, AC blindmate
7	4-016142-00	1	• Nut, HEX, 6-32, keps (Attaches AC blindmate assembly ground wire to chassis)
8	4-072623-00	2	• Screw, FH, 8-32 x 3/8 (Attach AC blindmate assembly to chassis)
9	4-023138-SP	1	• Audio alarm assembly with barrier, BD
10	4-071452-00	1	• Cable assembly, BDU LED PCB/alarm/power switch
11	4-074901-00	1	• Cable assembly, exhalation I/O
12	4-073041-00	8	• Standoff, #4, M/F (Attach motherboard PCB to enclosure)
13	4-007566-00	8	• Washer, SR, #4 (Attach motherboard PCB to enclosure)
14	4-070900-SP	1	• PCB, motherboard
15	4-070034-00	7	• Screw, PAN, 6-32 x 0.38, sems (Attach motherboard PCB to enclosure)



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Figure 9-24. BDU chassis assembly

## 9.4.8.5 BDU chassis kit

## BDU chassis kit parts list

Item no. (Figure 9-26)	Part no.	Quantity	Description
--	4-079032-SP	1	Chassis kit, BDU (See Section 9.4.9.4 for NHA.)
1	--	1	• Chassis, enclosure, BDU
2	4-071549-00	1	• Slide, mount, BDU latch
3	4-070064-00	3	• Screw, FH, 10-32 x 3/8 (Attach slide to chassis)
4	4-079015-SP	1	• Handle kit, BDU release
5	--	1	• • Release and pin assembly, BDU latch
6	4-072614-00	1	• • Ring, retaining
7	4-071546-00	1	• • Spring, BDU latch
8	4-071558-00	10	• Card guide
9	4-070057-00	9.75 in. (24.8 cm), cut into 2 4.875 in. (12.4 cm) pieces	• Grommet, serrated strip (Available in multiples of 1-ft lengths. Minimum order is 10 ft.)
10	4-070056-00	2	• Grommet
11	4-071583-00	1	• Gasket, chassis, enclosure
12	4-071535-00	4	• Foot
13	4-070041-00	4	• Screw, PAN, 8-32 x 1/2, sems (Attach feet to chassis)

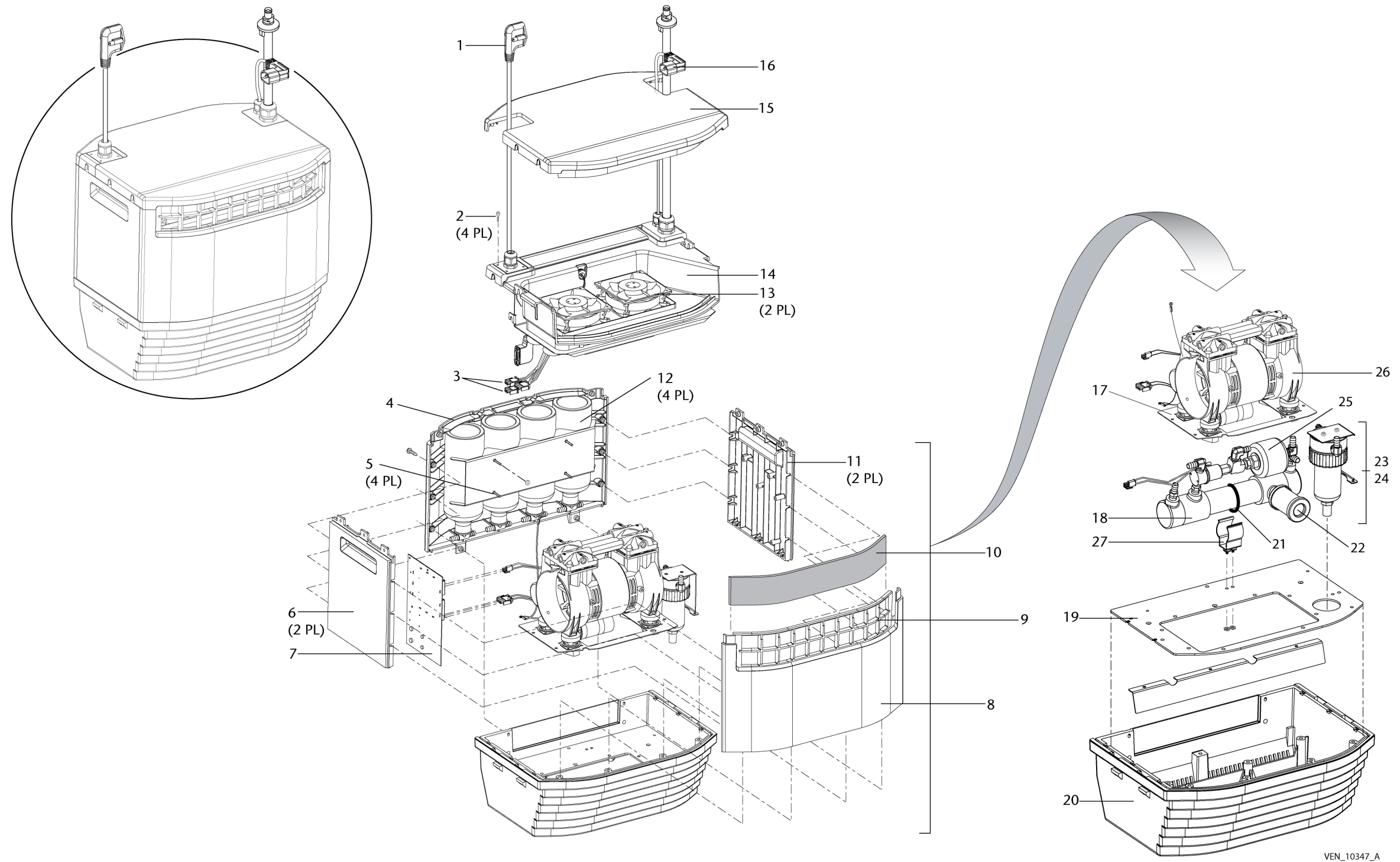


Figure 9-26. 806 Compressor unit

## 9.4.9.1 806 compressor base assembly

## 806 compressor base assembly parts list

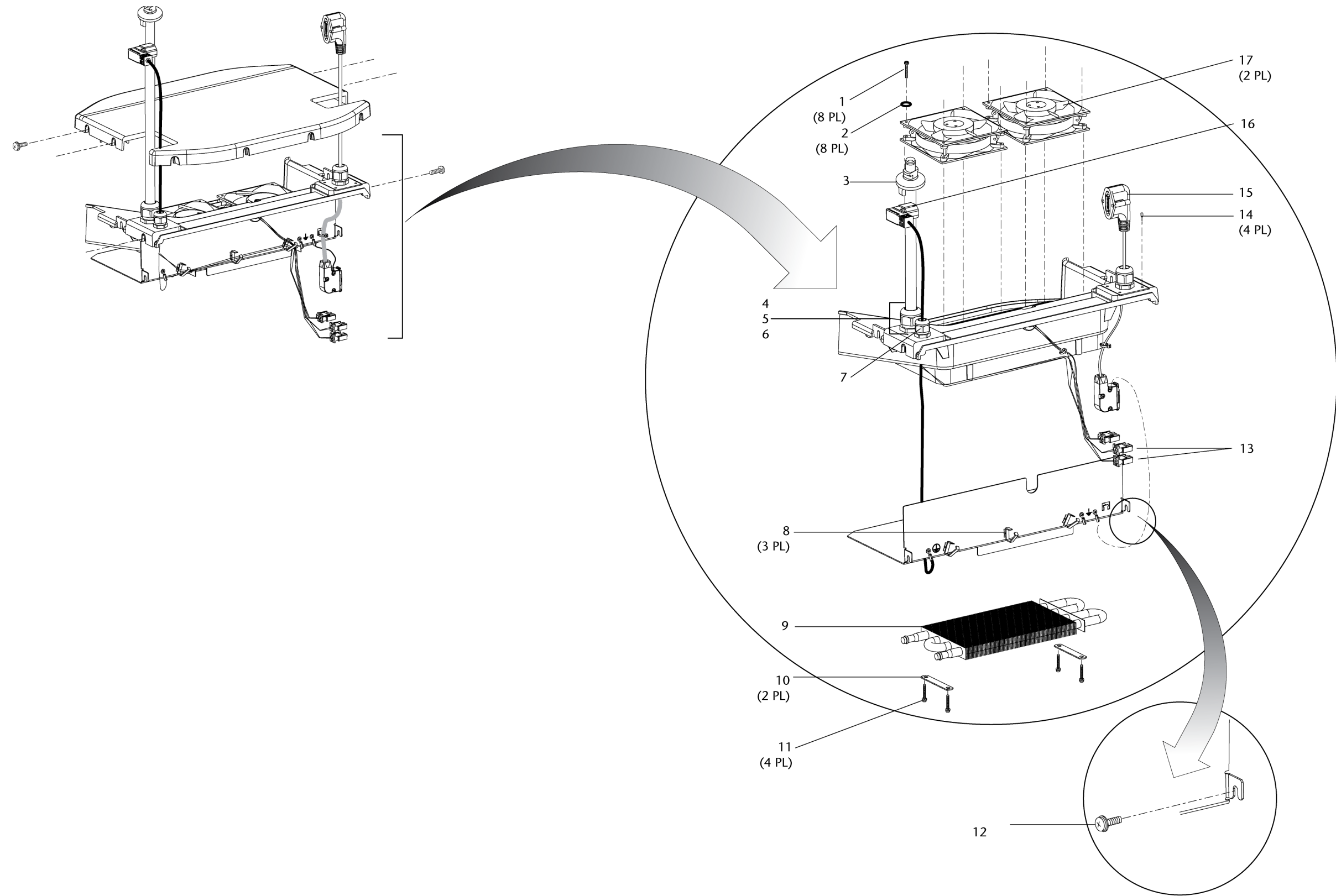
Item no. (Figure 9-28)	Part no.	Quantity	Description
1	4-076299-00	1	• Cable, ground
2	4-00 1138-00	1	• Lockwasher, #8 (not shown)
3	4-005482-00	1	• Nut, captive, 8-32, zinc (not shown)
4	--	1	• Assembly, compressor (Refer to appropriate 806 compressor preventative maintenance kit.)
5	4-075214-00	4	• Lower stopper
6	4-003941-00	4	• Washer, flat
7	4-007654-00	4	• Lockwasher, SR, zinc PL 1/4"
8	4-074339-00	4	• Screw, hex head, 1/4 - 20 x 2
9	4-079058-SP	1	• Assembly, solenoid valve
	4-076257-00	1	• • Outlet filter
10	4-076319-00	1	• Clip holder, air dryer assembly
11	4-072623-00	3	• Screw, FH, 8-32 x 3/8
12	4-076220-00	1	• Baffle, sound, base plate
13	4-076241-00	1	• Foam kit, sound, base
14	4-079064-SP	1	• Assembly, base (includes air dryer clamp assembly)
15	4-076289-00	1	• Air dryer filter and muffler assembly (Included in the preventative maintenance kit)
16	4-079059-SP	1	• Assembly, air dryer
17	4-079067-SP	1	• Assembly, coalescing filter
18	4-076728-00	1	• Coalescing filter element (also included in PM kit)
19	4-076219-00	1	• Bracket, H <sub>2</sub> O water trap, 806
20	4-076291-00	1	• Elbow, 1/4 NPT x 3/8 TU
21	4-070041-00	18	• Screw, 8-32 x 0.38 (not all screws shown)
22	4-000697-00	2	• Screw, pan, 1/4-20 x 1/2, zinc
23	4-076210-00	1	• Plate, motor mount
24	--	1	• Capacitor, motor (Refer to appropriate preventative maintenance kit.)
25	--	1	• Clamp, capacitor, motor, 1.75" diam (120V & 100V)
	--		• Clamp, capacitor, motor, 1.379" (220V)
26	4-075215-00	4	• Upper stopper
27	4-076318-00	4	• Pop rivet (not shown)
28	4-075247-00	4	• Sleeve, shock mount
29	4-076290-00	4	• Vibration mount
30	4-076282-00	1	• Pressure relief valve, 36 PSIG (not shown)



## 9.4.9.3 806 compressor unit plenum assembly

## 806 compressor plenum assembly parts list

Item no. (Figure 9-30)	Part no.	Quantity	Description
1	4-002568-00	8	• Screw, pan, 6-32 x 2
2	4-001056-00	8	• Washer, #6
3	4-079065-SP	1	• Assembly, outlet air tube
4	--	1	• Nut, dome, strain relief
5	4-074505-00	1	• Strain relief
6	4-076724-00	1	• Spacer, strain relief
7	--	1	• Strain relief
8	--	--	• Wire saddle
9	4-079066-SP	1	• Assembly, heat exchanger
10	4-076212-00	1	• Plate, heat exchanger
11	4-072623-00	4	• Screw, FH, 8-32 x 3/8
12	4-070041-00	1	• Screw, 8-32 X 0.5
13	4-0776236-00	2	• Fan cord
14	4-070034-00	4	• Screw, 6-32 x 0.38
15	4-076297-00	1	• Cable, data, DC
16	4-076287-00	1	• Power cord, AC, 806
17	4-019135-00	2 (Included in PM kit)	• Cooling fan, 115V
	4-020303-00		• Cooling fan, 100V
	4-020305-00		• Cooling fan, 220-240V



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Figure 9-29. Compressor plenum assembly

## 9.4.10 Backup power source (BPS)

## BPS parts list

Item no. (Figure 9-31)	Part no.	Quantity	Description
--	4-070520-SP	--	Backup power source (BPS) (See Section 9.4 for NHA.)
1	4-074678-00	1	• Bezel, BPS, front
2	4-072510-00	2	• Screw, PAN, 6-32 x 1/4, black oxide (Attach bezel)
3	4-074677-00	1	• Panel, BPS front
4	4-071599-00	4	• Screw, FH, 6-32 x 1/4 (Attach front panel)
5	4-074532-00	1	• Fuse, 15 A, fast-acting, cartridge-type
6	4-000003-00	1	• Tie wrap, small
7	4-070523-SP	1	• Battery pack
8	4-074665-00	1	• Floor assembly, BPS enclosure
9	4-079031-SP	1	• Chassis with cable, BPS
10	--	1	• Standoff, battery
11	4-003443-00	1	• Coupling
12	4-070062-00	2	• Screw, FH, 6-32 x 1/2 (Attach floor to cover)
13	4-016142-00	4	• Nut, HEX, 6-32, keps (Attach PCB to chassis)
14	4-076727-SP	1	• PCB, backup power source (BPS)
15	N-7600028	1	• • Fuse, 15 A, fast-acting
16	4-071599-00	6	• Screw, FH, 6-32 x 1/4 (Attach floor to cover)
17	4-004994-00	2-1/4 in. (5.7 cm)	• Molding, plastic (Available in multiples of 1-ft lengths. Minimum order is 10 ft.)
18	4-072505-00	1	Label, display, BPS, non-US
	4-075430-00		Label, display, BPS, US
--	4-075427-00	1	Label, product information, BPS, English, US (not shown)
	4-072504-00		Label, product information, BPS, English/French (not shown)
	4-075071-00		Label, product information, BPS, German (not shown)
	4-075146-00		Label, product information, BPS, Japanese (not shown)
	4-075412-00		Label, product information, BPS, Portuguese (not shown)
	4-075085-00		Label, product information, BPS, Spanish/Italian (not shown)
	4-075098-00		Label, product information, BPS, Spanish/Portuguese (not shown)