



VARIABLE SPEED DRIVE

RENEWAL PARTS

Supersedes: 160.00-RP4 (1012)

Form 160.00-RP4 (813)

292 HP – 50 HZ, 400VAC (P/N 371-03700-XXX)

351 HP – 60 HZ, 460VAC (P/N 371-02767-XXX)

419 HP – 50 HZ, 400VAC (P/N 371-03789-XXX)

424 HP – 60 HZ, 575VAC (P/N 371-04881-XXX)

503 HP – 60 HZ, 460VAC (P/N 371-03789-XXX)

608 HP – 60 HZ, 575VAC (P/N 371-04563-XXX)



00616VIP

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IMPORTANT!

READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During installation, operation maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in

which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that these individuals possess independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to specific situations:



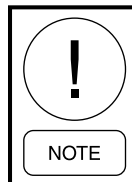
Indicates a possible hazardous situation which will result in death or serious injury if proper care is not taken.



Identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution if proper care is not taken or instructions are not followed.



Indicates a potentially hazardous situation which will result in possible injuries or damage to equipment if proper care is not taken.



Highlights additional information useful to the technician in completing the work being performed properly.



External wiring, unless specified as an optional connection in the manufacturer's product line, is not to be connected inside the control cabinet. Devices such as relays, switches, transducers and controls and any external wiring must not be installed inside the micro panel. All wiring must be in accordance with Johnson Controls' published specifications and must be performed only by a qualified electrician. Johnson Controls will NOT be responsible for damage/problems resulting from improper connections to the controls or application of improper control signals. Failure to follow this warning will void the manufacturer's warranty and cause serious damage to property or personal injury.

CHANGEABILITY OF THIS DOCUMENT

In complying with Johnson Controls' policy for continuous product improvement, the information contained in this document is subject to change without notice. Johnson Controls makes no commitment to update or provide current information automatically to the manual owner. Updated manuals, if applicable, can be obtained by contacting the nearest Johnson Controls Service office.

Operating/service personnel maintain responsibility for the applicability of these documents to the equipment. If there is any question regarding the applicability of

these documents, the technician should verify whether the equipment has been modified and if current literature is available from the owner of the equipment prior to performing any work on the chiller.

CHANGE BARS

Revisions made to this document are indicated with a line along the left or right hand column in the area the revision was made. These revisions are to technical information and any other changes in spelling, grammar or formatting are not included.



Although many of these parts are similar to the parts used in previous Variable Speed Drive (VSD) designs, these parts are only compatible with drives of the following base part numbers (371-02767-XXX, 371-03700-XXX, 371-03787-XXX, 371-04881-XXX, and 371 04563-XXX). For example, if the VSD logic board 031-02077-000 were used in place of the 031-01433-000 logic board, as used on the previous VSD designs, major damage to other components will occur.

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NOTES

The footnotes referenced within the tables appear below.

1. On the 292, 351, 419, and 503 Hp drives built before 5/05, the bleeder resistors have a value of 2K ohms, and required the application of thermal grease. These drives now use a 2.4 K ohm resistor, and require the application of a silicon pad. If one of the 2K ohm resistors were to fail, then both resistors will need to be replaced. The bleeder resistors for the harmonic filter will also use a thermal pad, but the resistor value does not change.
2. The harmonic filter main contactor changed styles in 6/06. The old style was a contactor that used compression fittings. The old style is still available as a repair part, but new production will switch to a style of contactor that will accept ring tong lugs. This will improve the installation of a retrofit harmonic filter.
3. The trap assembly on the 424 and 608 Hp drives has a different design than on the other drives. The 3 resistors at the top of the trap assembly are mounted on a silicon pad. The other drives still need to use thermal grease in the mounting process.
4. Snubber modules were added to all styles of drives covered by this parts book. The snubber module protects the input SCR from voltage transients that may occur on the incoming supply voltage. The snubber modules maybe applied on existing drives, but warranty would not apply.
5. The drive logic and the filter logic replacement boards are not shipped with new software. The software must be removed from the old board and installed in the new board. This also includes the U40 chip on the drive logic board, and the U26 chip on the filter logic board. If there is concern that the old board had a power supply problem, then new software may need to be ordered.
6. Part number 031-02077-000 is no longer available. This part number is replaced with a kit that includes new software and instructions. Installing the old software into the new board may cause a drive failure.
7. Part number 031-01632-XXX is no longer available. This part number is replaced with a kit that includes new software and instructions. When installing the new board 031-02932 board reuse the U42 chip from the old board.
8. There were cases where the line voltage became unstable and caused a single phase fault. Software was changed to extend the time required for a single phase fault to occur.

TABLE 1 - VSD PARTS LIST 292 HP AND 351 HP

ITEM	DESCRIPTION	PART NUMBER	FIGURE
1	AC Line Inductor	025-35176-000	2
2	Bus Isolator Board	031-01624-000	4
3	Bus Plate Kit	371-03710-001	4
62	Bus Snubber Capacitor	025-35972-000	4
4	Circuit Breaker (used before 6/06) 400 Amp	224-30987-000	2
4	Circuit Breaker (used after 6/06) 600 Amp	224-35428-000	2
*	Circuit Breaker Operator Door Kit	024-35429-000	*
5	Control Transformer, 120 VAC 60 Hz, 3 KVA	025-31499-000	1
5	Control Transformer, 120 VAC 50 Hz, 3 KVA	025-32983-000	1
6	Coolant Manifold Plastic	371-02767-371	6
6	Coolant Manifold Copper without Harmonic Filter	023-20842-000	7
6	Coolant Manifold Copper with Harmonic Filter	023-20822-000	7
7	Coolant Pump	026-33890-000	6
8	Coolant Reservoir 3" PVC with Fill Plug	371-02767-361	6
*	Door Latch	029-25614-000	*
9	2 Pole Fuse Holder (2 per unit)	025-35172-000	1
10	3 Pole Fuse Holder	025-35915-000	1
11	5 AMP Cartridge Fuse (YT Style Chillers 60 Hz)	025-27922-000	1
11	6 AMP Cartridge Fuse (YT Style Chillers 50 Hz)	025-27970-000	1
11	7 AMP Cartridge Fuse (YK Style Chillers 50/60 Hz)	025-25515-000	1
12	10 AMP Cartridge Fuse	025-27971-000	1
13	15 AMP Cartridge Fuse	025-25584-000	1
14	20 AMP Cartridge Fuse	025-28967-000	1
*	50/60 Hz Inverter (used on 50 Hz drive only)	371-02202-101	*
15	Input Rectifiers (1 SCR, 2 SCR, 3 SCR) one each Kit	371-03709-001	4
17	Internal Cabinet Fan	025-32557-000	3
18	Internal Cooling Coil	026-37566-000	3
19	Output Current Transformer	531-01672-001	3
20	Power Module Chill Plate Kit	371-05143-001	4
21	Relay, Control Fan / Pump	024-30441-000	4
22	SCR Trigger Board 60 Hz	031-02060-001	4
22	SCR Trigger Board 50 Hz	031-02060-002	4
*	SCR Trigger Board Cable Between J7 on Trigger to J1 in Gate Driver Board	571-02767-251	*
23	Shell and Tube Heat Exchanger	026-37572-000	6
*	Shell and Tube Heat Exchanger Head Gaskets (set of two)	371-03716-001	*
63	Silicon Pad (1 each) ¹	028-15299-000	3, 4
66	Snubber Capacitor (.047uF, 1600 VAC)	025-35188-000	3
65	Snubber Module as applied to the SCR/Diode module ⁴	331-02556-001	4
16	Snubber Resistor (10 ohm)	025-35953-000	3
24	Transformer, 24 VAC, Class 2	025-27911-000	4
*	Temperature Sensor Supplied on chill plate with the SCR/Diode modules (As Separate Item)	571-01484-212	*
60	Voltage Transient Board	031-02453-000	3
61	Voltage Transient Board Fuses	025-38523-000	3
25	VSD DC Balancing Resistor ¹	025-35157-000	4

* Items are **NOT** shown. 1-8 Important Changes refer to page 6.

TABLE 1 - VSD PARTS LIST 292 HP AND 351 HP (CONT'D)

ITEM	DESCRIPTION	PART NUMBER	FIGURE
26	VSD Logic Board (if board P/N is 031-02077-000, order this kit) ^{5,6} (USE ON PART # 371-02767-XXX, and 371-03700-XXX ONLY)	331-02506-602	5
26	VSD Logic Board (if board P/N is 031-02506-002, order this part) ^{5,6} (USE ON PART # 371-02767-XXX, & 371-03700-XXX ONLY)	031-02506-002	5
27	VSD Power Module Kit	371-03708-001	4
*	VSD Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-02769-401	*
*	Wiring (J8, J9, and J10 from drive logic board to IGBT module)	571-02767-291	*
OPTIONAL HARMONIC FILTER PARTS LIST 292 HP AND 351 HP			
ITEM	DESCRIPTION	PART NUMBER	FIGURE
2	Bus Isolator Board	031-01624-000	4
3	Bus Plate Kit	371-03710-001	4
62	Bus Snubber Capacitor	025-35972-000	4
*	DCCT #1 Cable (cable between the filter logic board and the DCCT)	571-02768-271	*
*	DCCT #2 Cable (cable between the filter logic board and the DCCT)	571-02768-272	*
30	Direct Current Transducer, 200 AMP (DCCT)	025-32582-000	4
31	Filter DC Balancing Resistor	025-35955-000	4
32	Filter Inductor	025-35177-000	2
34	Filter Input Fuse	025-32581-000	2
35	Filter Logic Board (if board P/N is 031-01632-031, order this kit) ^{5,7} (USE ON PART # 371-02767-XXX, and 371-03700-XXX ONLY)	331-02932-631	5
35	Filter Logic Board (if board P/N is 031-02932-031, order this kit) ^{5,7} (USE ON PART # 371-02767-XXX, & 371-03700-XXX ONLY)	031-02932-031	5
33	Filter Main Contactor with compression lugs ²	024-30984-000	1
33	Filter Main Contactor use with ring tong lugs ²	024-35434-000	1
36	Filter Power Module Kit	371-03707-001	4
*	Filter Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-02768-401	*
37	Filter Pre-Charge Contactor	024-30985-000	1
38	Filter Pre-Charge Resistor	025-32502-000	1
39	Filter Trap Assembly	371-03711-001	3
64	Filter Trap Resistor Kit (Trap Resistors only)	371-02768-355	3
40	Input Current Transformer	531-01672-001	1
41	Line Isolator Board	031-02022-000	4
20	Power Module Chill Plate Kit	071-02769-309	4
42	16 Conductor Ribbon Cable - VSD Logic to Filter Logic Jumper	031-01658-000	5
63	Silicon Pad (1 each) ¹	028-15299-000	4
HARMONIC FILTER UPGRADE KITS (TO RETROFIT FILTER TO A NON-FILTER UNIT)			
*	Filter Upgrade (60 Hz) 351 Hp	371-03717-001	
*	Filter Upgrade (50 Hz) 292 Hp	371-03717-002	

* Items are **NOT** shown. 1-8 Important Changes refer to page 6.

TABLE 2 - VSD PARTS LIST 424 HP 575 VAC

ITEM	DESCRIPTION	PART NUMBER	FIGURE
1	AC Line Inductor	025-40388-000	2
2	Bus Isolator Board	031-01624-000	4
3	Bus Plate Kit	371-03710-001	4
62	Bus Snubber Capacitor	025-35972-000	4
4	Circuit Breaker	224-35428-000	2
*	Circuit Breaker Operator Door Kit	024-35429-000	*
5	Control Transformer, 120 VAC 60 Hz, 3 KVA	025-40381-000	1
6	Coolant Manifold Copper without Harmonic Filter	023-20842-000	7
6	Coolant Manifold Copper with Harmonic Filter	023-20822-000	7
7	Coolant Pump	026-33890-000	6
8	Coolant Reservoir 3" PVC with Fill Plug	371-02767-361	6
*	Door Latch	029-25614-000	*
9	2 Pole Fuse Holder (2) per unit	025-38196-000	1
10	3 Pole Fuse Holder	025-34185-000	1
11	4 AMP Cartridge Fuse (YT Style Chillers 60 Hz)	025-35911-000	1
11	5 AMP Cartridge Fuse (YK Style Chillers 60 Hz)	025-35901-000	1
12	10 AMP Cartridge Fuse	025-35905-000	1
13	12 AMP Cartridge Fuse	025-35906-000	1
14	20 AMP Cartridge Fuse	025-35908-000	1
15	Input Rectifiers (1 SCR, 2 SCR, 3 SCR) one each Kit	371-05156-001	4
17	Internal Cabinet Fan	025-32557-000	3
18	Internal Cooling Coil	026-37566-000	3
19	Output Current Transformer	531-01672-001	3
20	Power Module Chill Plate Kit	371-05143-001	4
21	Relay, Control Fan / Pump	024-30441-000	4
22	SCR Trigger Board 60 Hz	031-02060-003	4
*	SCR Trigger Board Cable Between J7 on Trigger to J1 on Gate Driver Board	571-02767-251	*
23	Shell and Tube Heat Exchanger	026-37572-000	6
*	Shell and Tube Heat Exchanger Head Gaskets (set of two)	371-03716-001	*
63	Silicon Pad (1 each)	028-15299-000	3, 4
66	Snubber Capacitor	025-39806-000	3
65	Snubber Module complete assembly for SCR/Diode module	371-05898-100	4
16	Snubber Resistor	025-35953-000	3
24	Transformer, 24 VAC, Class 2	025-27911-000	4
*	Temperature Sensor Supplied on chillplate with the SCR/Diode modules (As Separate Item)	571-01484-212	*
60	Voltage Transient Board	031-02453-001	3
61	Voltage Transient Board Fuses	025-38523-000	3
25	VSD DC Balancing Resistor	025-40408-000	4
26	VSD Logic Board (if board P/N is 031-02077-001, order this kit) ^{5,6} (USE ON PART # 371-04881-XXX ONLY)	331-02506-603	5
26	VSD Logic Board (if board P/N is 031-02506-003, order this part) ^{5,6} (USE ON PART # 371-04881-XXX ONLY)	031-02506-003	5
27	VSD Power Module Kit	371-05157-001	4
*	VSD Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-02769-403	*
*	Wiring (J8, J9, and J10 from drive logic board to IGBT module)	571-02767-291	*

* Items are **NOT** shown.

1-8 Important Changes refer to page 6.

TABLE 2 - VSD PARTS LIST 424 HP 575 VAC (CONT'D)

OPTIONAL HARMONIC FILTER PARTS LIST 424 HP 575 VAC			
ITEM	DESCRIPTION	PART NUMBER	FIGURE
2	Bus Isolator Board	031-01624-000	4
3	Bus Plate Kit	371-03710-001	4
62	Bus Snubber Capacitor	025-40526-000	4
*	DCCT #1 Cable (cable between the filter logic board and the DCCT)	571-02768-271	*
*	DCCT #2 Cable (cable between the filter logic board and the DCCT)	571-02768-272	*
30	Direct Current Current Transducer, 200 AMP (DCCT)	025-32582-000	4
31	Filter DC Balancing Resistor	025-40408-000	4
32	Filter Inductor	025-40374-000	2
34	Filter Input Fuse	025-40404-000	2
35	Filter Logic Board (if board P/N is 031-01632-101, order this kit) ^{5,7} (USE ON PART # 371-04881-XXX ONLY)	331 02932 101	5
35	Filter Logic Board (if board P/N is 031-02932-101, order this part) ^{5,7} (USE ON PART # 371-04881-XXX ONLY)	031-02932 101	5
33	Filter Main Contactor use with ring tong lugs	024-35434-000	1
36	Filter Power Module Kit	371-05158-001	4
*	Filter Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-02768-403	*
37	Filter Pre-Charge Contactor	024-30983-000	1
38	Filter Pre-Charge Resistor	025-40425-000	1
39	Filter Trap Assembly ³	371-04881-349	3
40	Input Current Transformer	531-01672-001	1
41	Line Isolator Board	031-02022-001	4
20	Power Module Chill Plate Kit	071-02769-309	4
42	16 Conductor Ribbon Cable - VSD Logic to Filter Logic Jumper	031-01658-000	5
63	Silicon Pad (1 each)	028-15299-000	3, 4
HARMONIC FILTER UPGRADE KITS (TO RETROFIT FILTER TO A NON-FILTER UNIT)			
*	Filter Upgrade (60 Hz) 424 Hp (575VAC)	371-03717-003	

* Items are **NOT** shown.

1-8 Important Changes refer to page 6.

TABLE 3 - VSD PARTS LIST 419 HP AND 503 HP

ITEM	DESCRIPTION	PART NUMBER	FIGURE
1	AC Line Inductor	025-38134-000	9
2	Bus Isolator Board	031-01624-000	10
3	Bus Plate Kit	371-04163-001	12
62	Bus Snubber Capacitor	025-35972-000	12
4	Circuit Breaker	224-34025-000	9
*	Circuit Breaker Lug Kit	025-34027-000	*
5	Control Transformer, 120 VAC 60 Hz, 3 KVA	025-31499-000	9
5	Control Transformer, 120 VAC 50 Hz, 3 KVA	025-32983-000	9
6	Coolant Manifold Copper with or without Harmonic Filter	023-21710-000	8
7	Coolant Pump	026-33890-000	8
8	Coolant Reservoir 3" PVC with Fill Plug	371-03789-361	8
*	Door Latch	029-25614-000	*
9	2 Pole Fuse Holder (2) per unit	025-38196-000	1
10	3 Pole Fuse Holder	025-34185-000	1
11	5 AMP Cartridge Fuse (YT Style Chillers 60 Hz)	025-35901-000	1
11	6 AMP Cartridge Fuse (YT Style Chillers 50 Hz)	025-35902-000	1
11	7 AMP Cartridge Fuse (YK Style Chillers 50/60 Hz)	025-35903-000	1
12	10 AMP Cartridge Fuse	025-35905-000	1
13	15 AMP Cartridge Fuse	025-35907-000	1
14	20 AMP Cartridge Fuse	025-35908-000	1
*	50/60 Hz Inverter (Used On 50 Hz Drive Only)	371-022202-101	*
15	Input Rectifiers (1 SCR, 2 SCR, 3 SCR) one each Kit	371-04162-001	12
17	Internal Cabinet Fan	025-32577-000	3
18	Internal Cooling Coil	026-37990-000	3
19	Output Current Transformer	025-21173-003	10
20	Power Module Chill Plate Kit	071-03787-309	12
21	Relay, Control Fan / Pump	024-30441-000	11
22	SCR Trigger Board 60 Hz	031-02060-001	11
22	SCR Trigger Board 50 Hz	031-02060-002	11
*	SCR Trigger Board Cable Between J7 on Trigger to J1 on Gate Driver Board	571-03789-251	*
23	Shell and Tube Heat Exchanger	026-37572-000	8
*	Shell and Tube Heat Exchanger Head Gaskets (set of two)	371-03716-001	*
63	Silicon Pad (1 each) ¹	028-15299-000	11, 12
66	Snubber Capacitor	025-35188-000	11
65	Snubber Module as applied to the SCR/Diode module ⁴	331-02556-001	12
16	Snubber Resistor	025-35953-000	11
24	Transformer, 24 VAC, Class 2	025-27911-000	11
*	Temperature Sensor Supplied on chill plate with the SCR/Diode modules (As Separate Item)	571-01484-212	*
25	VSD DC Balancing Resistor ¹	025-35157-000	12
26	VSD Logic Board (if board P/N is 031-02077-000, order this kit) ^{5,6} (USE ON PART # 371-03789-XXX ONLY)	331-02506-602	5
26	VSD Logic Board (if board P/N is 031-02506-002, order this part) ^{5,6} (USE ON PART # 371-02767-XXX, & 371-03700-XXX ONLY)	031-02506-002	5
27	VSD Power Module Kit	371-04164-001	12
60	Voltage Transient Board	031-02453-000	10
61	Voltage Transient Board Fuses	025-38523-000	10
*	VSD Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-03787-401	*
*	Wiring (J8 from Drive Logic Board to IGBT Module Phase A)	571-03789-291	*
*	Wiring (J9 from Drive Logic Board to IGBT Module Phase B)	571-03789-293	*
*	Wiring (J10 from Drive Logic Board to IGBT Module Phase A)	571-03789-295	*

TABLE 3 - VSD PARTS LIST 419 HP AND 503 HP (CONT'D)

OPTIONAL HARMONIC FILTER PARTS LIST 419 HP AND 503 HP			
ITEM	DESCRIPTION	PART NUMBER	FIGURE
2	Bus Isolator Board	031-01624-000	11
3	Bus Plate Kit	371-03710-001	13
62	Bus Snubber Capacitor	025-35972-000	13
*	DCCT Cable (cable between the filter logic board and the DCCT 1)	571-03788-271	10
*	DCCT Cable (cable between the filter logic board and the DCCT 2)	571-03788-272	10
30	Direct Current Current Transducer, 300 AMP (DCCT)	025-30994-000	10
31	Filter DC Balancing Resistor	025-35955-000	13
32	Filter Inductor	025-38135-000	10
34	Filter Input Fuse	025-30992-000	10
35	Filter Logic Board (if board P/N is 031-01632-042, order this kit) ^{5,7} (USE ON PART # 371-03789-XXX ONLY)	331-02932-642	5
35	Filter Logic Board (if board P/N is 031-02932-042, order this kit) ^{5,7} (USE ON PART # 371-02767-XXX, & 371-03700-XXX ONLY)	031-02932-042	5
33	Filter Main Contactor with compression lugs ²	024-34028-000	9
33	Filter Main Contactor use with ring tong lugs ²	024-35433-000	9
36	Filter Power Module Kit	371-04165-001	13
*	Filter Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-03788-401	*
37	Filter Pre-Charge Contactor	024-30985-000	9
38	Filter Pre-Charge Resistor	025-38197-000	9
39	Filter Trap Assembly	371-03788-349	10
64	Filter Trap Resistor Kit (Trap Resistors only)	371-02768-355	10
40	Input Current Transformer	531-01660-001	9
41	Line Isolator Board	031-02022-000	11
20	Power Module Chill Plate	071-02769-309	13
63	Silicon Pad (1 each) ¹	028-15299-000	13
42	16 Conductor Ribbon Cable - VSD Logic to Filter Logic Jumper	031-01658-000	5
HARMONIC FILTER UPGRADE KITS (TO RETROFIT FILTER TO A NON-FILTER UNIT)			
*	Filter Upgrade (60 Hz) 503 Hp	371-04167-001	
*	Filter Upgrade (50 Hz) 419 Hp	371-04167-002	

* Items are **NOT** shown.

1-8 Important Changes refer to page 6.

TABLE 4 - VSD PARTS LIST 608 HP 575 VAC

ITEM	DESCRIPTION	PART NUMBER	FIGURE
1	AC Line Inductor	025-40384-000	9
2	Bus Isolator Board	031-01624-000	10
3	Bus Plate Kit	371-04163-001	12
62	Bus Snubber Capcitor	025-35972-000	12
4	Circuit Breaker	224-34025-000	9
5	Control Transformer, 120 VAC 60 Hz, 3 KVA	025-40381-000	9
6	Coolant Manifold Copper with or without Harmonic Filter	023-21710-000	8
7	Coolant Pump	026-33890-000	8
8	Coolant Reservoir 3" PVC with Fill Plug	371-03789-361	8
*	Door Latch	029-25614-000	*
9	2 Pole Fuse Holder (2) per unit	025-38196-000	1
10	3 Pole Fuse Holder	025-34185-000	1
11	4 AMP Cartridge Fuse (YT Style Chillers 60 Hz)	025-35911-000	1
11	5 AMP Cartridge Fuse (YK Style Chillers 60 Hz)	025-35901-000	1
12	10 AMP Cartridge Fuse	025-35905-000	1
13	12 AMP Cartridge Fuse	025-35906-000	1
14	20 AMP Cartridge Fuse	025-35908-000	1
15	Input Rectifiers (1 SCR, 2 SCR, 3 SCR) one each Kit	371-05156-001	12
17	Internal Cabinet Fan	025-32577-000	3
18	Internal Cooling Coil	026-37990-000	3
19	Output Current Transformer	025-21173-003	10
20	Power Module Chill Plate Kit	071-03787-309	12
21	Relay, Control Fan / Pump	024-30441-000	11
22	SCR Trigger Board 60 Hz	031-02060-003	11
*	SCR trigger board cable between J7 on trigger to J1 on gate driver board.	571-03789-251	*
23	Shell and Tube Heat Exchanger	026-37572-000	8
*	Shell and Tube Heat Exchanger Head Gaskets (set of two)	371-03716-001	*
63	Silicon Pad (1 each)	028-15299-000	11, 12
66	Snubber Capacitor	025-39806-000	11
65	Snubber Module complete assembly for SCR/Diode module	371-05890-100	12
16	Snubber Resistor	025-35953-000	11
24	Transformer, 24 VAC, Class 2	025-27911-000	11
*	Temperature Sensor Supplied on chill plate with the SCR/Diode modules (As Separate Item)	571-01484-212	*
60	Voltage Transient Board	031-02453-001	8
61	Voltage Transient Board Fuses	025-38523-000	8
25	VSD DC Balancing Resistor	025-40408-000	12
26	VSD Logic Board (if board P/N is 031-02077-001, order this kit) ^{5,6} (USE ON PART # 371-04563-XXX ONLY)	331 02506-603	5
26	VSD Logic Board (if board P/N is 031-02506-003, order this part) ^{5,6} (USE ON PART # 371-04563-XXX ONLY)	031-02506-003	5
27	VSD Power Module Kit	371-05159-001	12
*	VSD Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-03787-403	*
*	Wiring (J8 from Drive Logic Board to IGBT Module Phase A)	571-03789-291	*
*	Wiring (J9 from Drive Logic Board to IGBT Module Phase 3)	571-03789-293	*
*	Wiring (J10 from Drive Logic Board to IGBT Module Phase C)	571-03789-295	*

TABLE 4 - VSD PARTS LIST 608 HP 575 VAC (CONT'D)

OPTIONAL HARMONIC FILTER PARTS LIST 608 HP 575 VAC			
ITEM	DESCRIPTION	PART NUMBER	FIGURE
2	Bus Isolator Board	031-01624-000	11
3	Bus Plate Kit	371-03710-001	13
62	Bus Snubber Capacitor	025-40526-000	13
*	DCCT Cable (cable between the filter logic board and the DCCT 1)	571-03788-271	10
*	DCCT Cable (cable between the filter logic board and the DCCT 2)	571-02767-272	*
30	Direct Current Current Transducer, 300 AMP (DCCT)	025-30994-000	8
31	Filter DC Balancing Resistor	025-40408-000	13
32	Filter Inductor	025-40375-000	10
34	Filter Input Fuse	025-40405-000	10
35	Filter Logic Board (if board P/N is 031-01632-102, order this kit) ^{5,7} (USE ON PART # 371-04563-XXX ONLY)	331-02932-102	5
35	Filter Logic Board (if board P/N is 031-02932-102, order this part) ^{5,7} (USE ON PART # 371-04563-XXX ONLY)	031-02932-102	5
33	Filter Main Contactor use with ring tong lugs	024-35433-000	9
36	Filter Power Module Kit	371-05160-001	13
*	Filter Power Unit Complete Kit (IGBT, Capacitors, Heatsink, etc.)	371-03788-403	*
37	Filter Pre-Charge Contactor	024-30985-000	9
38	Filter Pre-Charge Resistor	025-40424-000	9
39	Filter Trap Assembly ³	371-04563-349	10
40	Input Current Transformer	531-01660-001	9
41	Line Isolator Board	031-02022-001	11
20	Power Module Chill Plate	071-02769-309	13
63	Silicon Pad (1 each)	028-15299-000	10, 13
42	16 Conductor Ribbon Cable - VSD Logic to Filter Logic Jumper	031-01658-000	5
HARMONIC FILTER UPGRADE KITS (TO RETROFIT FILTER TO A NON-FILTER UNIT)			
*	Filter Upgrade (60 Hz) 608 Hp (575VAC)	371-04167-003	

* Items are **NOT** shown.

1-8 Important Changes refer to page 6.

TABLE 5 - MISCELLANEOUS

ITEM	DESCRIPTION	PART NUMBER
Not Shown	Pre-Mixed Coolant (Inhibitor) 1 gallon container	013-02987-000
Not Shown	Snubber for Motor Terminal Box – Remote Retrofits - 400-460 VAC	375-22732-000
Not Shown	Snubber for Motor Terminal Box – Remote Retrofits - 575 VAC	375-22732-001
Not Shown	50/60 Hz Inverter for 50 Hz VSD Units	371-02202-101
Not Shown	Vane Pot with Couplings	371-02012-001
Not Shown	Bracket for Vane Pot Mtg. to Compressor	064-48851-000
Not Shown	Ferrite Beads	025-32843-000
Not Shown	Motor Adapter Plate (4" Deep) - 405S Frame Motors	025-28400-001
Not Shown	Motor Adapter Plate (4" Deep) - 404R, 405R, 444S, 445S, 447S, 449S, 503S, 504S, 505S, 507S, 509S, 588S and 5011S Frame Motors	025-28400-002
Not Shown	Motor Adapter Plate (4" Deep) - 445R, 447R Frame Motors	025-28400-003
Not Shown	Motor Adapter Plate (5 ¾" Deep) - 405T Frame Motors	025-28400-004
Not Shown	Motor Adapter Plate (7 ¾" Deep) - 405T, 445T, 447T Frame Motors	025-28400-005
MICRO-COMPUTER CONTROL CENTER PARTS FOR VSD APPLICATION (ONE LINE DISPLAY)		
Not Shown	Adaptive Capacity Control Board	031-01579-000
Not Shown	Membrane Keypad for Control Panel	024-26943-000
Not Shown	ACC Installation Kit – Mounting rails, ribbon cables, hardware. Does not include ACC Board. (YT)	375-22734-000
Not Shown	ACC Installation Kit – Mounting rails, ribbon cables, hardware. Does not include ACC Board. (YK)	375-22733-000
Not Shown	Replacement Ribbon Cable – Micro Board to ACC (Quant. = 1)	031-01322-000
Not Shown	Condenser Transducer for R-11, R-123	025-29148-009
OPTIVIEW CONTROL CENTER PARTS FOR VSD APPLICATION		
Not Shown	Adaptive Capacity Control Board	031-01782-000
Not Shown	ACC Installation Kit – (YT) includes mounting hardware, cables, and ACC Board.	371-02725-001
Not Shown	ACC Installation Kit – (YK) includes mounting hardware, cables, and ACC Board.	371-02724-001
Not Shown	Replacement Shielded Cable – Micro Board to ACC (Quant. = 1)	571-02264-411
HARNESSES		
Not Shown	Vane Pot Wiring from Vane Pot to ACC Board	375-22735-402
Not Shown	VSD Cabinet to Control Center Wiring Kit - 10 Feet	375-22736-000
Not Shown	VSD Cabinet to Control Center Wiring Kit - 50 Feet	375-22737-000
PIPING		
28	Clear PVC Tubing, 3/4" I.D. (Figures 6, 7, 8)	028-14491-000
29	Clear PVC Tubing, 1/2" I.D. (Figures 6, 7)	028-14439-000
62	Clear PVC Tubing, 1" I.D. (Figure 8)	028-13553-000
Not Shown	Rubber Hose, Black, 150# DWP, 1 ½" ID	028-15001-000
Not Shown	Rubber Hose, Red, 300# DWP, 1 ½" ID	028-15028-000
Not Shown	Hose Clamp for 150# DWP, 1 ½" ID hose	021-30656-000
Not Shown	Hose Clamp for 300# DWP, 1 ½" ID hose	023-40048-000

* Items are **NOT** shown.

1-8 Important Changes refer to page 6.

TABLE 5 - MISCELLANEOUS (CONT'D)

DRIVE SOFTWARE 292, 351, 419, AND 503 HP			
ITEM	DESCRIPTION	PART NUMBER	FIGURE
51	U33 Battery Backed RAM for the VSD Logic Board and ACC board	031-01620-000	5
52	U34 VSD Logic Board EPROM (60Hz used on 031-02077 board)	031-01617-006	5
52	U34 VSD Logic Board EPROM (50Hz used on 031-02077 board)	031-01617-007	5
53	U40 VSD Logic Board Serial PROM used on 031-02077 board	031-01619-003	5
*	U42 VSD Logic Board 485 communications driver	031-02074-000	*
54	U45 VSD Logic Board EPROM (60 Hz used on 031-02506 board only)	031-01618-001	5
54	U45 VSD Logic Board EPROM (50 Hz used on 031-02077 board)	031-01618-002	5
*	U22 VSD Logic Board EPROM used on 031-02506 board Rev. F and later	031-03420-001	*
*	U34 VSD Logic Board EPROM used on 031-02506 board (460v/60Hz, 400v/50Hz)	031-02547-002	*
*	U34 VSD Logic Board EPROM used on 031-02506 board (400v/60Hz, 415v/50Hz)	031-02547-005	*
*	U45 VSD Logic Board EPROM used on 031-02506 board	031-02572-001	*
*	U6 SCR Trigger Board ⁸	331-02065-601	*
55	U26 Harmonic Filter Logic Board Serial PROM used on 031-01632 board	031-01680-003	5
56	U42 Harmonic Filter Logic Board EPROM (60Hz)	031-01633-006	5
56	U42 Harmonic Filter Logic Board EPROM (50Hz)	031-01633-007	5
57	U78 Harmonic Filter Logic Board Serial PROM used on 031-01632 board	031-02091-001	5
DRIVE SOFTWARE 424 AND 608 HP			
51	U33 Battery Backed RAM for the VSD Logic Board and ACC board	031-01620-000	5
52	U34 VSD Logic Board EPROM (60Hz used on 031-02077 board)	031-01617-009	5
53	U40 VSD Logic Board Serial PROM used on 031-02077 board	031-01619-003	5
*	U42 VSD Logic Board 485 communications driver (Used on 031-02506-xxx board only)	031-02074-000	*
54	U45 VSD Logic Board EPROM (60 Hz used on 031-02077 board)	031-01618-001	5
*	U34 VSD Logic Board EPROM used on 031-02506 board (575v/60Hz)	031-02547-003	*
*	U22 VSD Logic Board EPROM used on 031-02506 board Rev. F and later	031-03420-001	*
*	U6 SCR Trigger Board ⁸	331-02065-601	*
55	U26 Harmonic Filter Logic Board Serial PROM used on 031-01632 board	031-01680-003	5
56	U42 Harmonic Filter Logic Board EPROM (60Hz)	031-01633-008	5
57	U78 Harmonic Filter Logic Board Serial PROM	031-02091-001	5
SOFTWARE FOR THE MICRO-COMPUTER CONTROL CENTER WITH VSD			
Not Shown	U17 Micro Board EPROM (VSD 60 Hz) YT chiller		031-01676-003
Not Shown	U17 Micro Board EPROM (VSD 50 Hz) YT chiller		031-01676-002
Not Shown	U17 Micro Board EPROM (VSD 60 Hz) YK chiller		031-01675-003
Not Shown	U17 Micro Board EPROM (VSD 50 Hz) YK chiller		031-01675-002
Not Shown	U22 Adaptive Capacity Control Board EPROM		031-01674-002
Not Shown	U21 Battery Backed RAM for the ACC Board		031-01620-000

* Items are **NOT** shown.

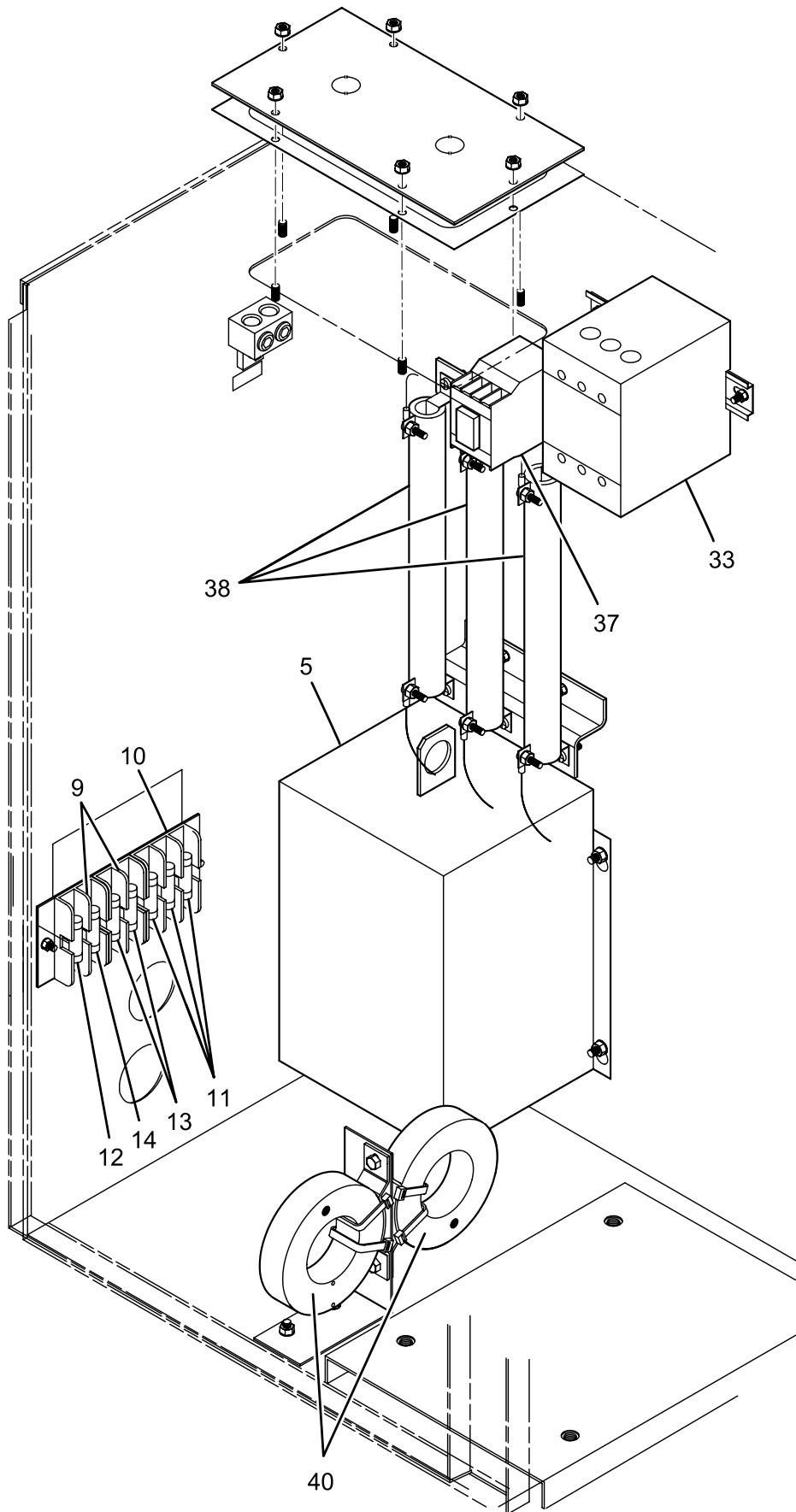
1-8 Important Changes refer to page 6.

TABLE 5 - MISCELLANEOUS (CONT'D)

SOFTWARE FOR THE OPTIVIEW CONTROL CENTER WITH VSD			
ITEM	DESCRIPTION	PART NUMBER	FIGURE
Not Shown	U46 Micro Board Flash Card (YK 50 / 60 Hz) (031-01730-XXX Board only)		031-01797-001
Not Shown	U46 Micro Board Flash Card (YK 50 / 60 Hz) (031-01730-XXX Board only) (P Compressor only)		031-02073-001
Not Shown	U46 Micro Board Flash Card (YT 50 / 60 Hz) (031-01730-XXX Board only)		031-02004-001
Not Shown	Program Card (YK) (031-02430-XXX Board only)		031-02474-001
Not Shown	Program Card (YT) (031-02430-XXX Board only)		031-02469-001
Not Shown	U16 Adaptive Capacity Control Board EPROM		031-01674-002
Not Shown	U15 Battery Backed RAM for the ACC Board		031-01620-000

* Items are **NOT** shown.

1-8 Important Changes refer to page 6.



LD07014

FIGURE 1 - LEFT SIDE OF CABINET (DETAILED) 292/351/424 HP

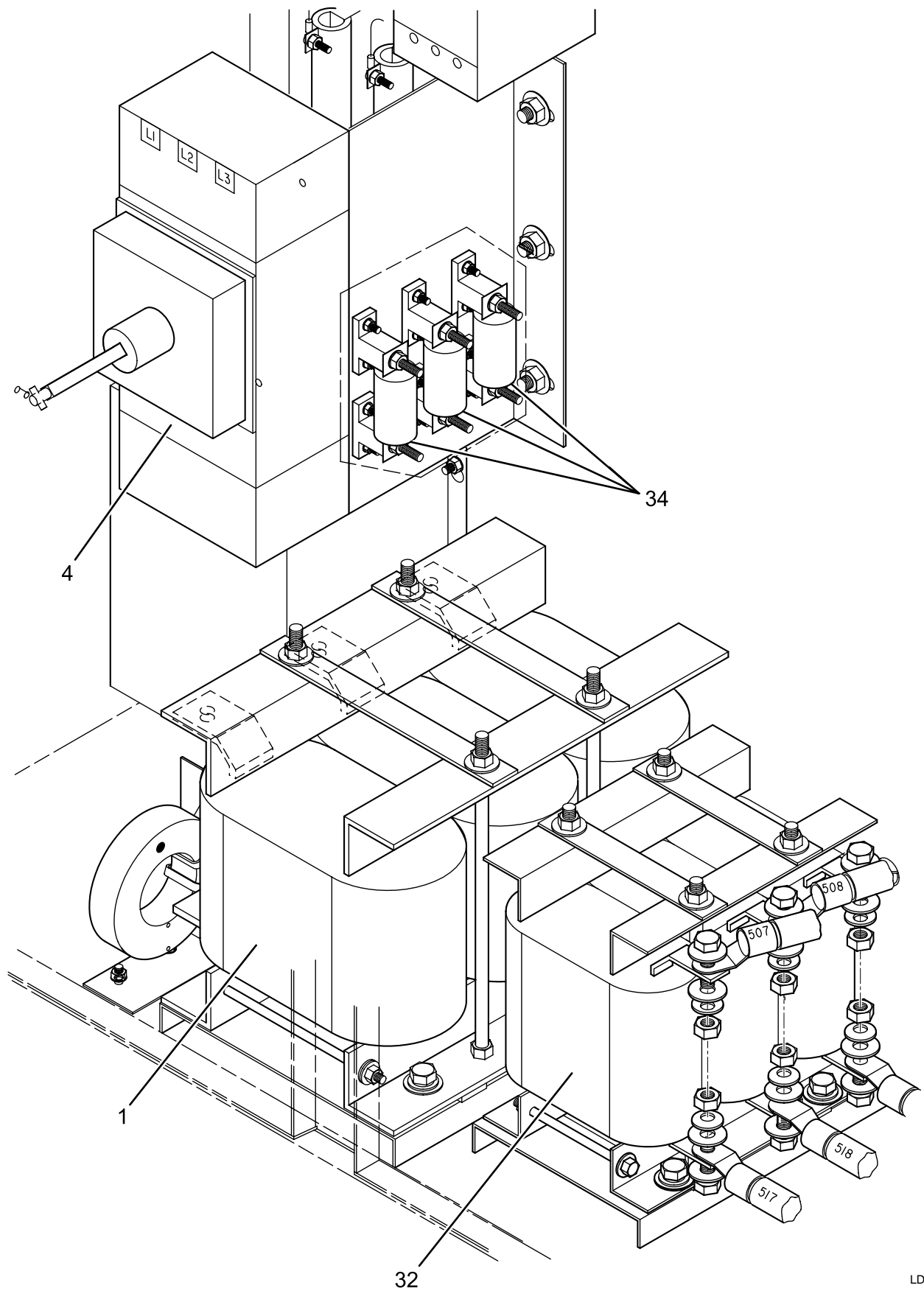
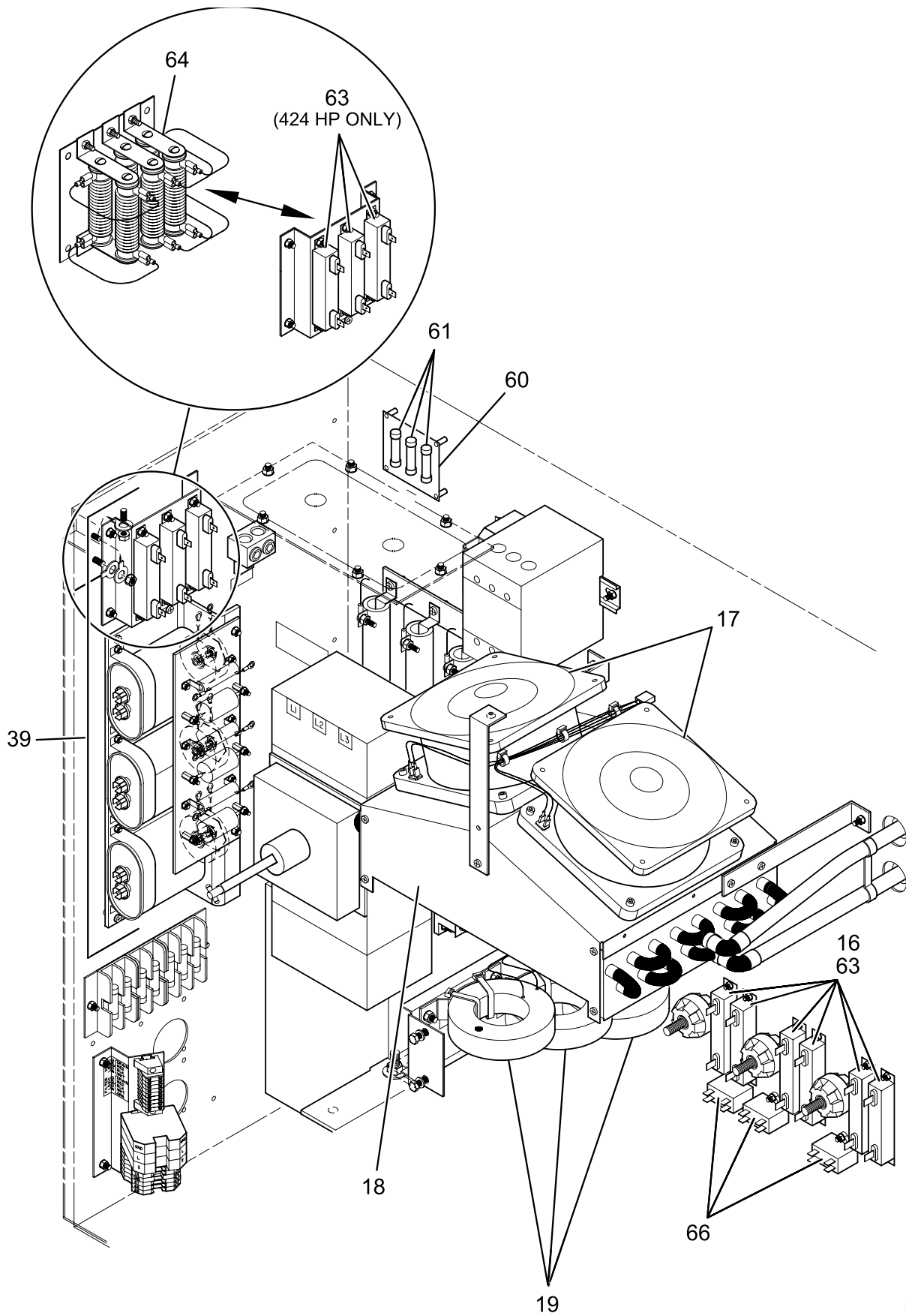


FIGURE 2 - LEFT SIDE OF CABINET 292/351/424 HP



LD09128a

FIGURE 3 - LEFT CENTER OF CABINET 292/351/424 HP

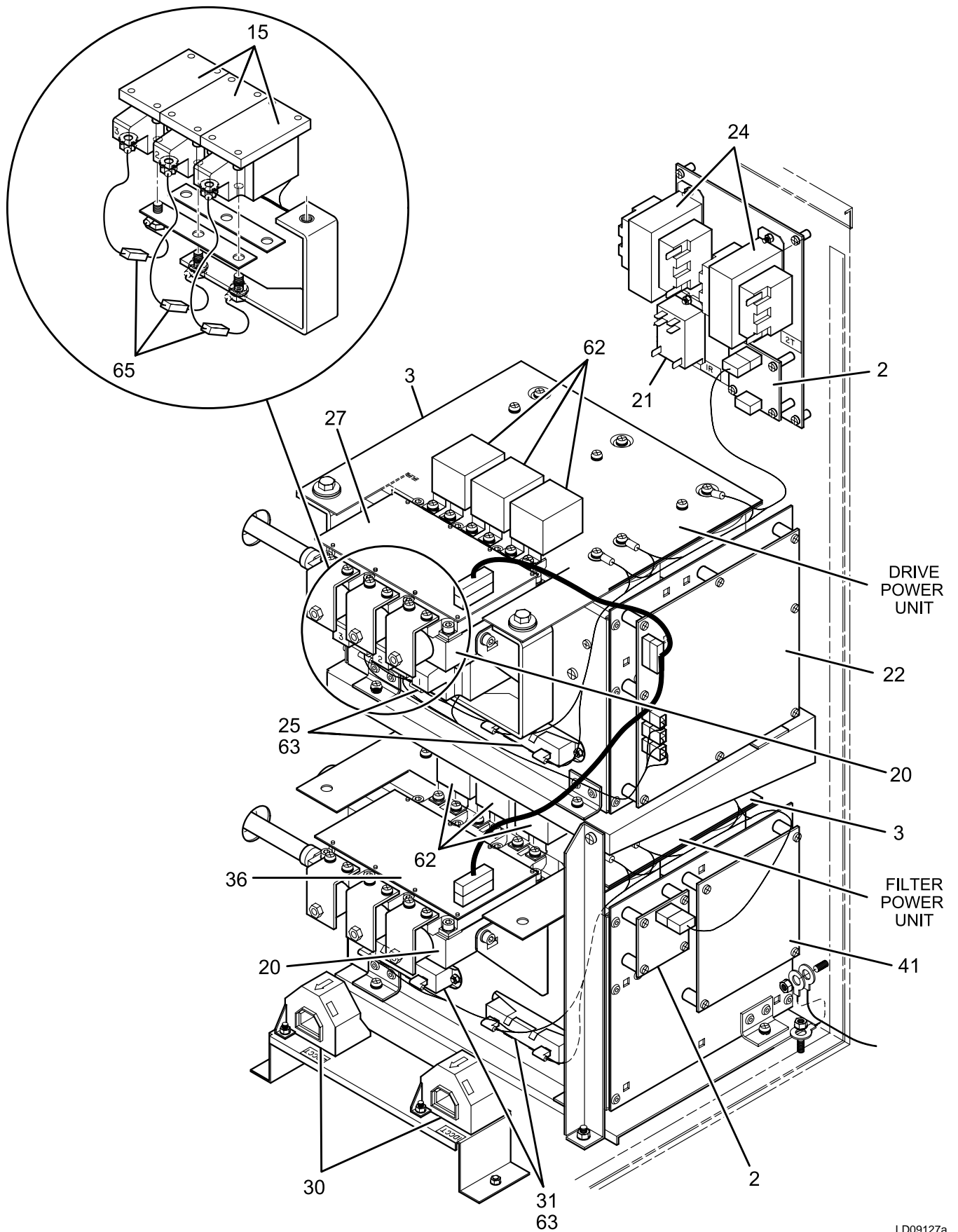
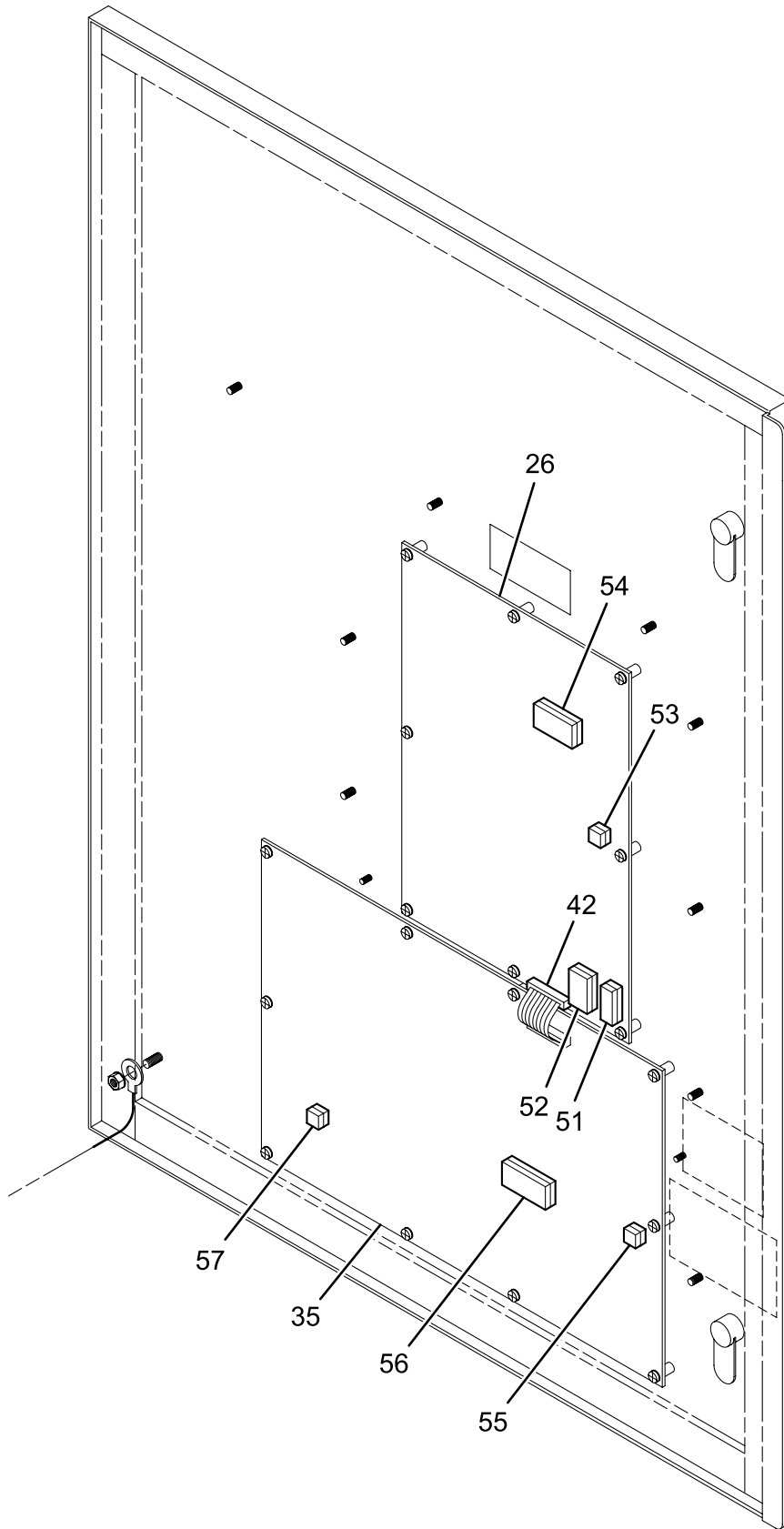
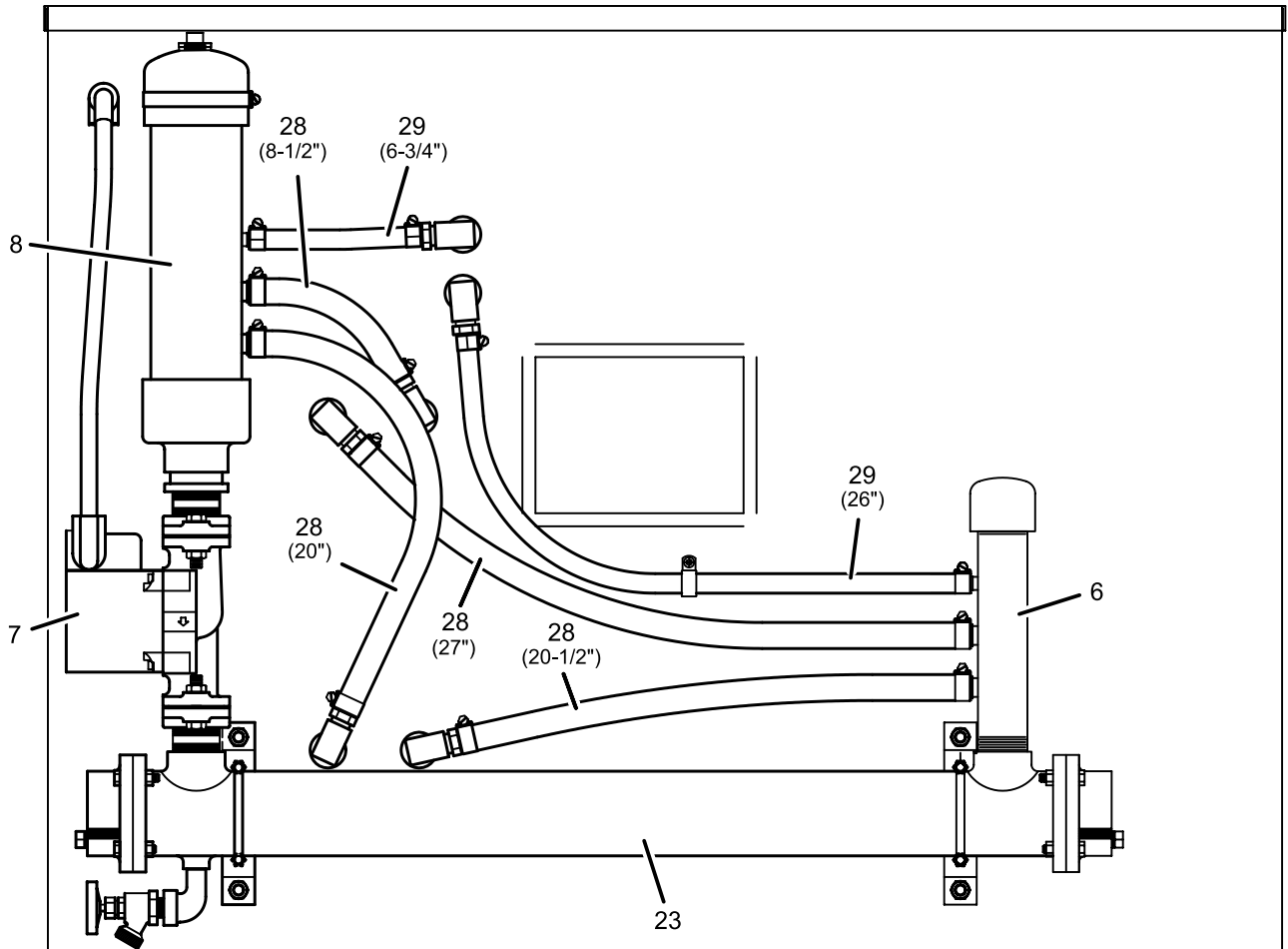


FIGURE 4 - RIGHT SIDE OF CABINET 292/351/424 HP



LD07018

FIGURE 5 - INSIDE RIGHT DOOR ALL HORSE POWERS



LD07019

FIGURE 6 - BACK OF CABINET 292/351/424 HP

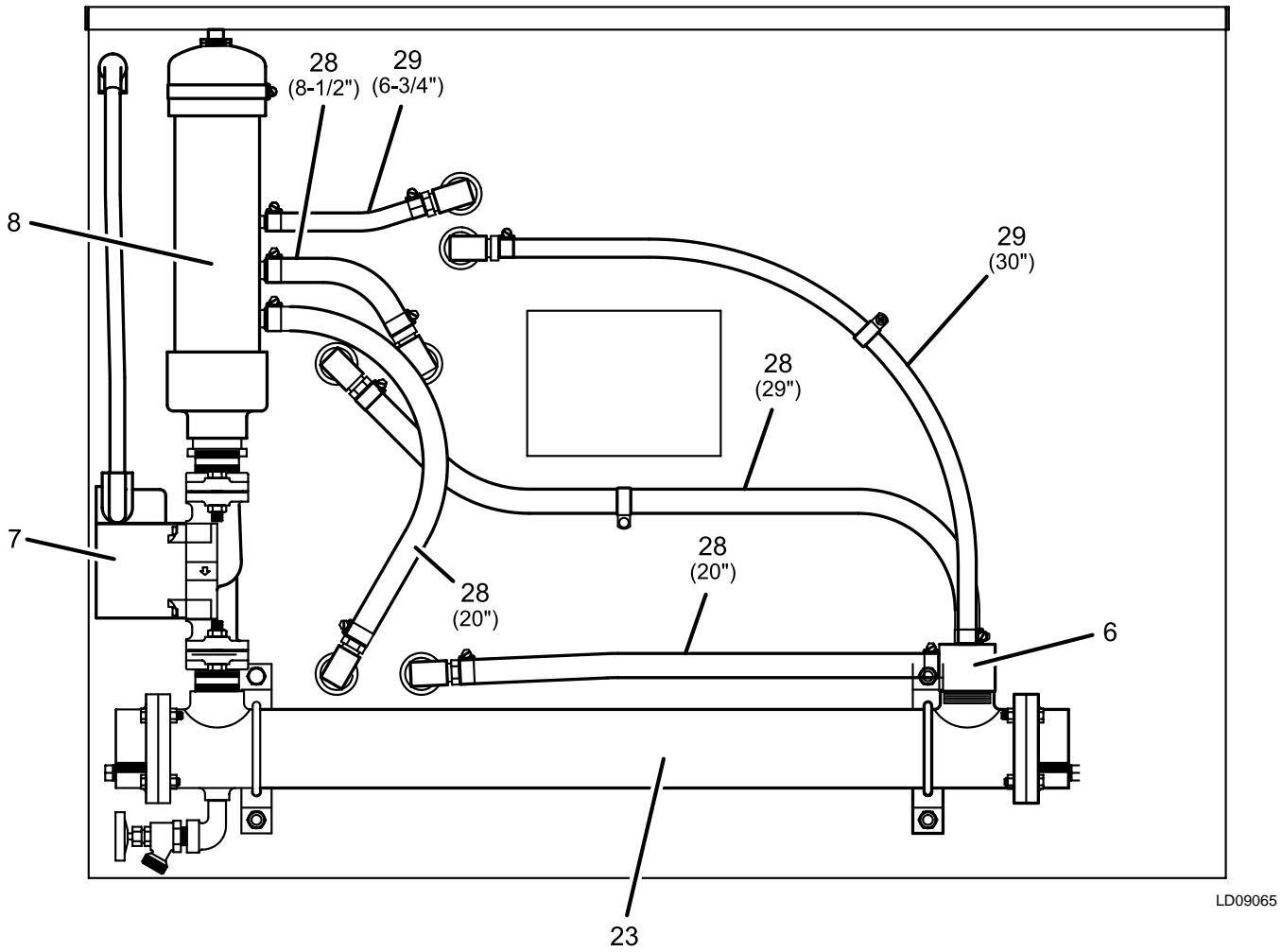


FIGURE 7 - COOLING SYSTEM 292/351/424 HP

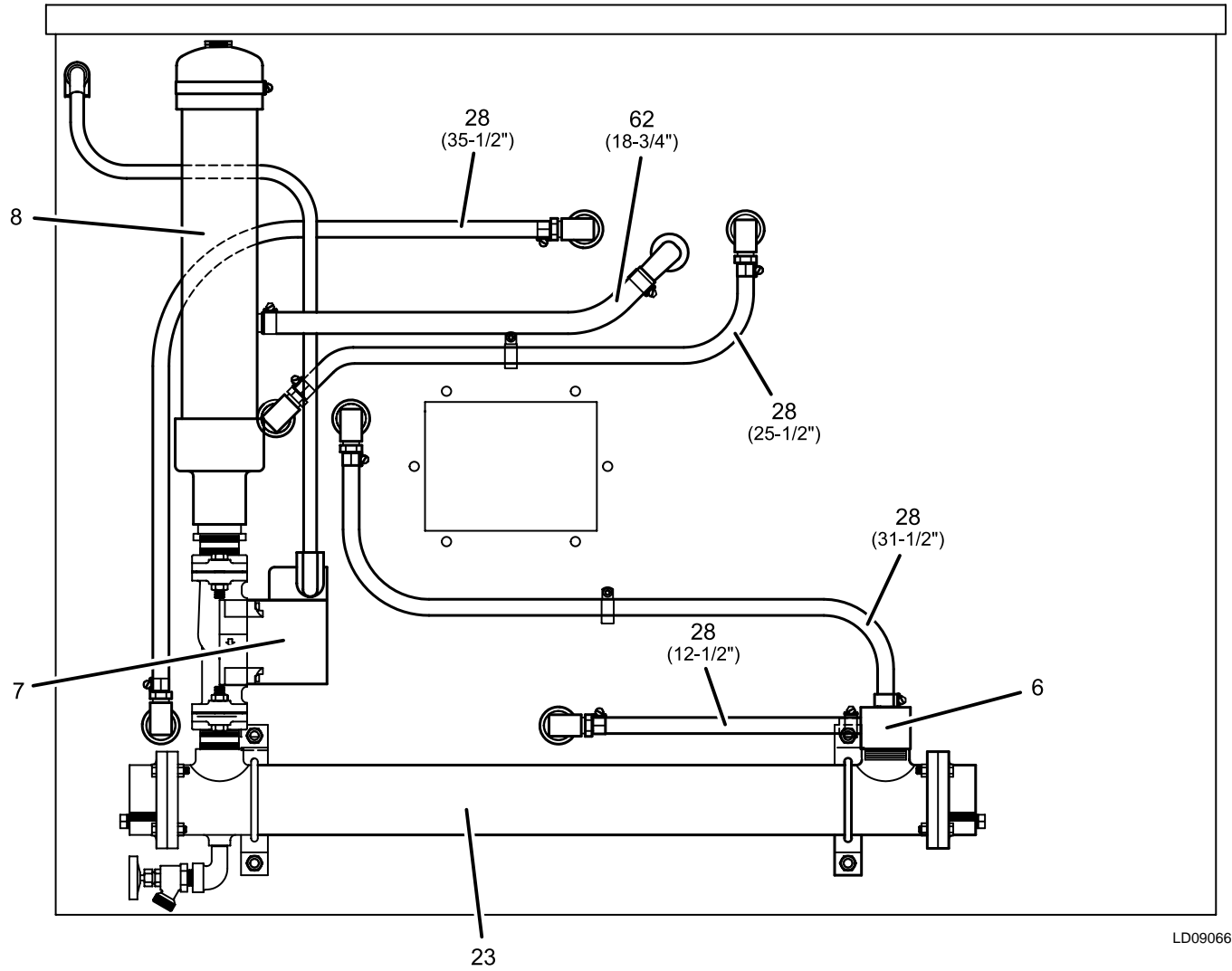
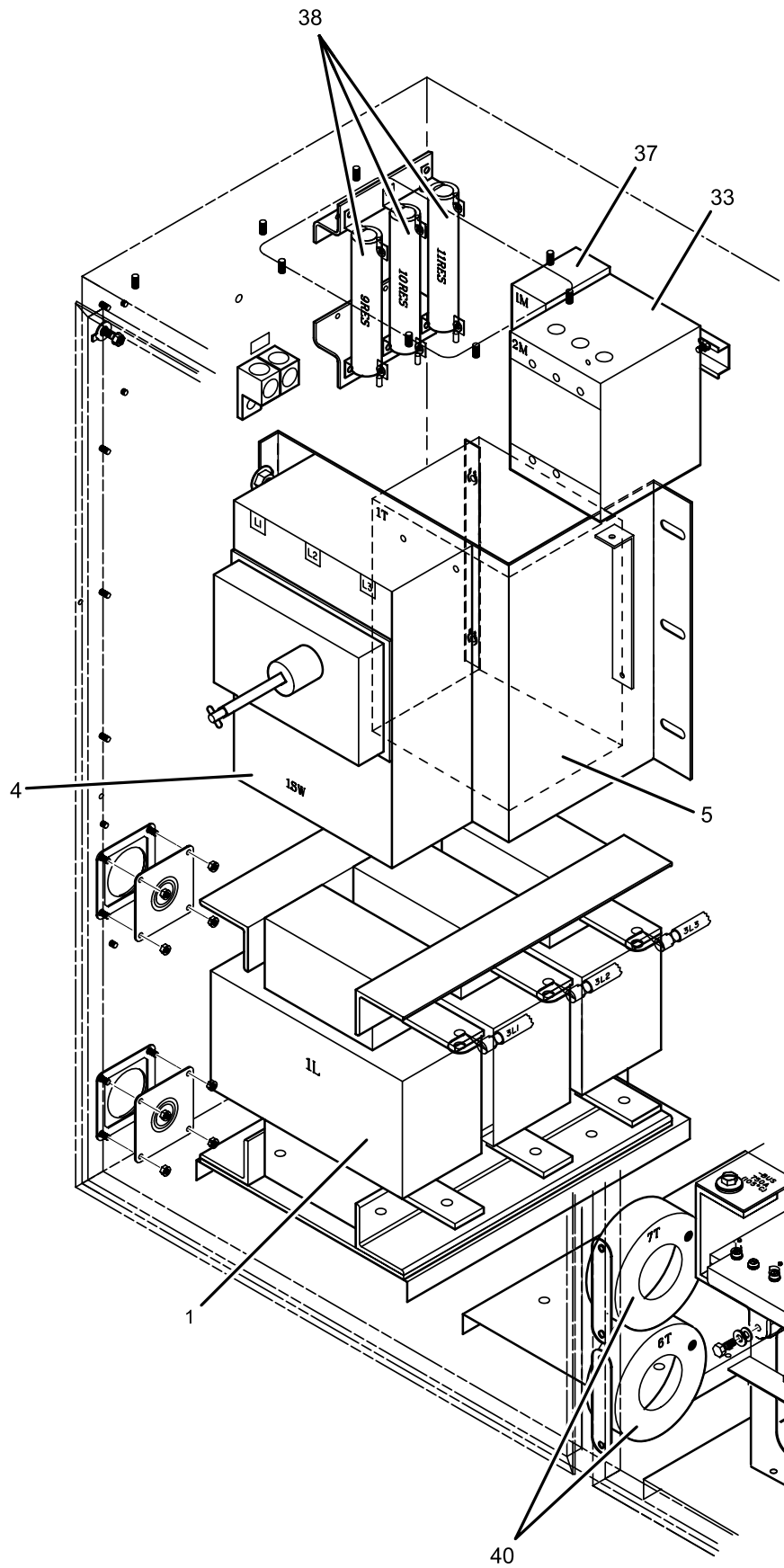
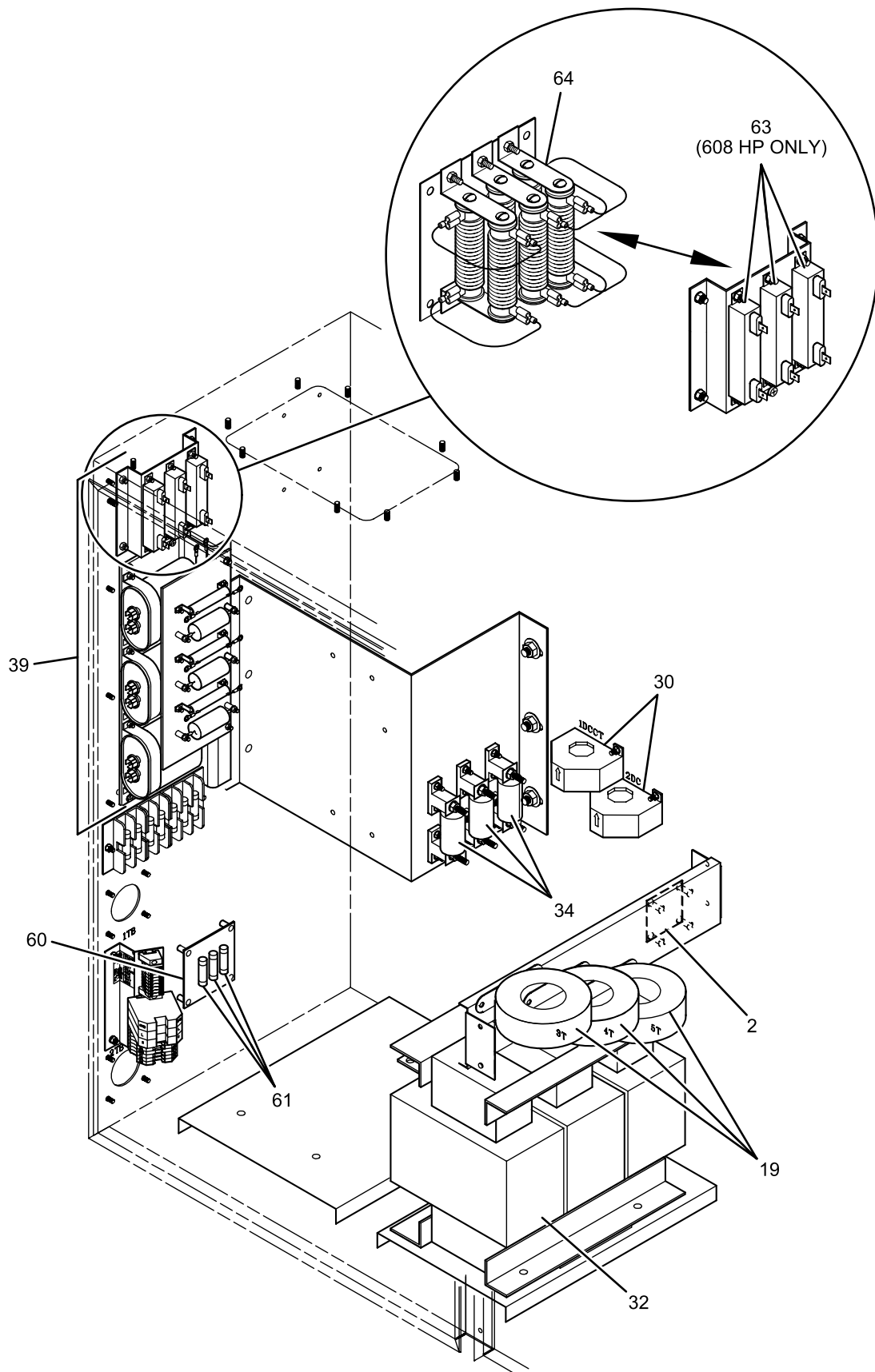


FIGURE 8 - COOLING SYSTEM 419/503/608 HP



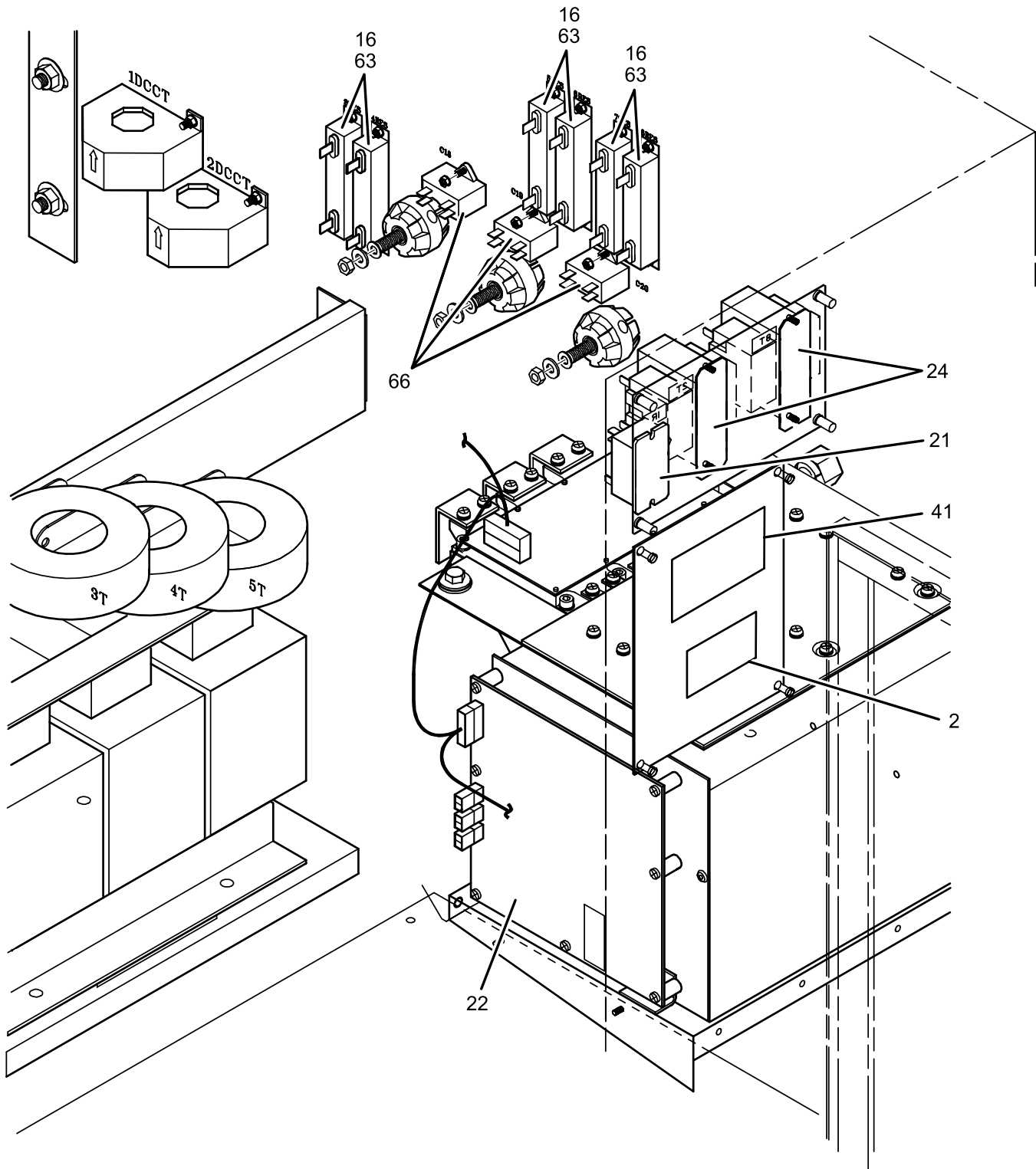
LD09064

FIGURE 9 - LEFT SIDE OF CABINET 419/503/608 HP



LD09063a

FIGURE 10 - LEFT SIDE OF CABINET (DETAILED) 419/503/608 HP



LD09062a

FIGURE 11 - UPPER RIGHT SIDE OF CABINET 419/503/608 HP

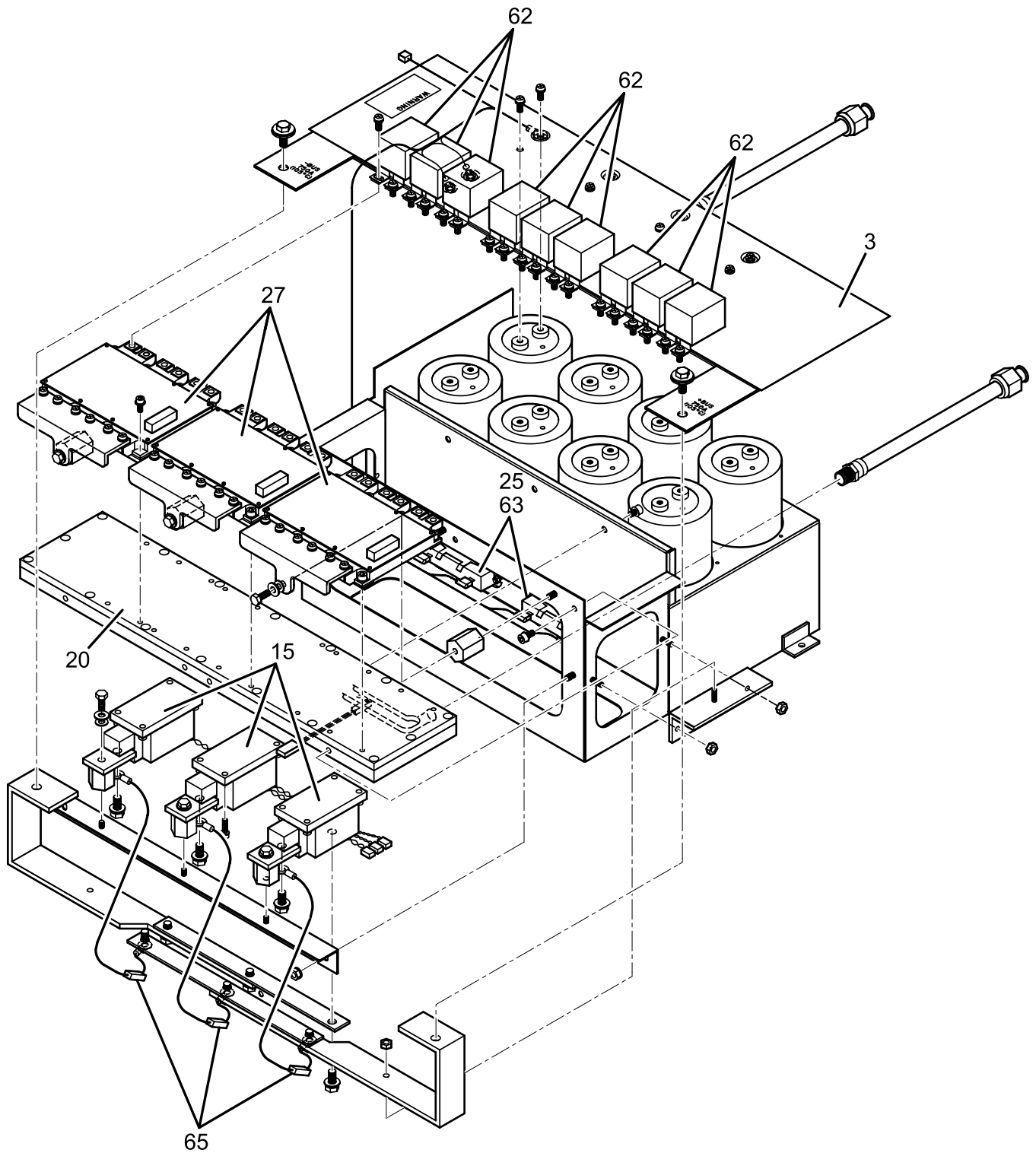


FIGURE 12 - OPTI SPEED POWER UNIT DETAIL 419/503/608 HP

LD12020

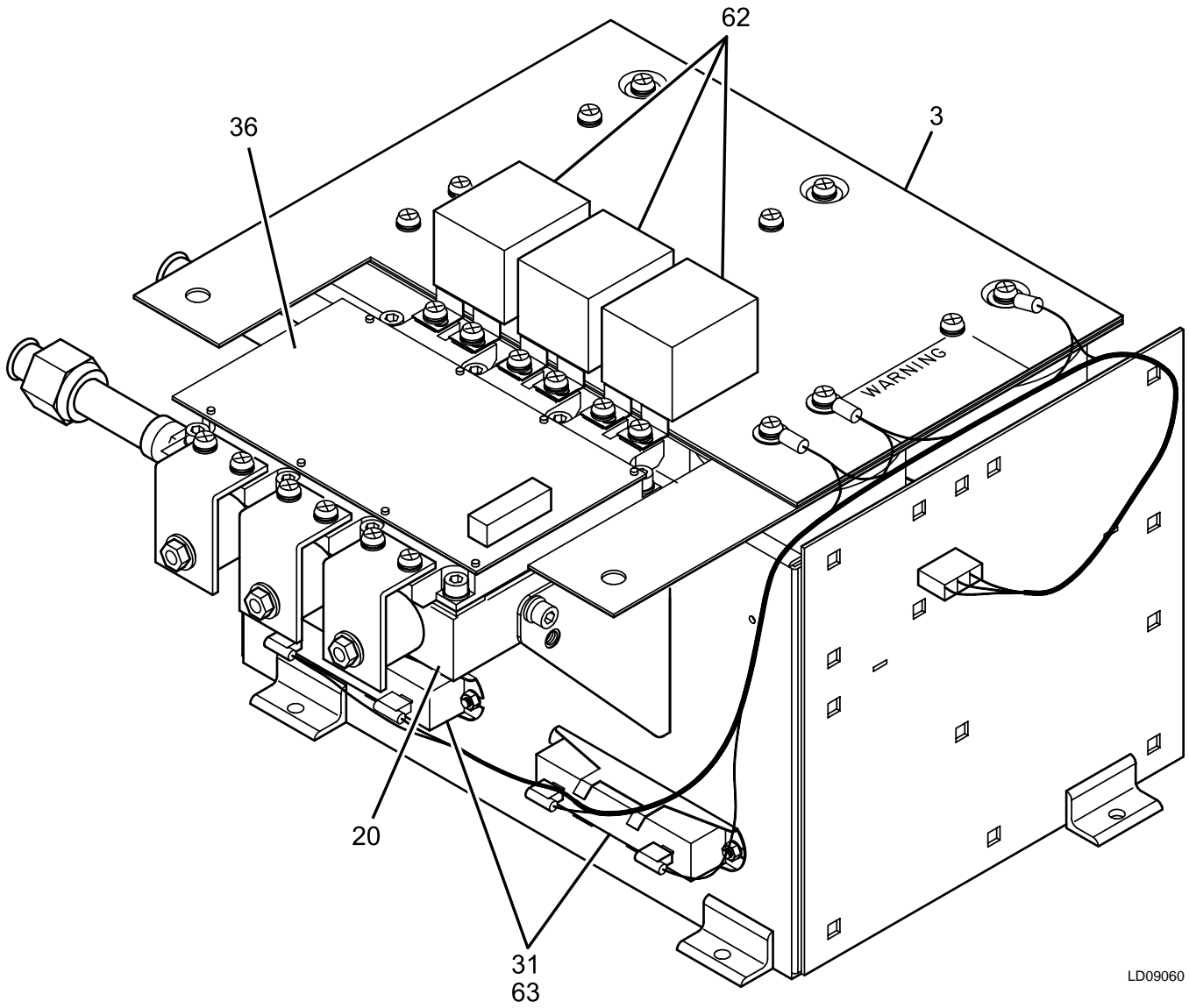


FIGURE 13 - OPTI SPEED HARMONIC FILTER POWER UNIT DETAIL 419/503/608 HP

The following factors can be used to convert from English to the most common SI Metric values.

TABLE 6 - SI METRIC CONVERSION

MEASUREMENT	MULTIPLY ENGLISH UNIT	BY FACTOR	TO OBTAIN METRIC UNIT
Capacity	Tons Refrigerant Effect (ton)	3.516	Kilowatts (kW)
Power	Horsepower	0.7457	Kilowatts (kW)
Flow Rate	Gallons / Minute (gpm)	0.0631	Liters / Second (l/s)
Length	Feet (ft)	0.3048	Meters (m)
	Inches (in)	25.4	Millimeters (mm)
Weight	Pounds (lbs)	0.4538	Kilograms (kg)
Velocity	Feet / Second (fps)	0.3048	Meters / Second (m/s)
Pressure Drop	Feet of Water (ft)	2.989	Kilopascals (kPa)
	Pounds / Square Inch (psi)	6.895	Kilopascals (kPa)

TEMPERATURE

To convert degrees Fahrenheit (°F) to degrees Celsius (°C), subtract 32° and multiply by 5/9 or 0.5556.

Example: $(45.0^{\circ}\text{F} - 32^{\circ}) \times 0.5556 = 27.2^{\circ}\text{C}$

To convert a temperature range (i.e., a range of 10°F) from Fahrenheit to Celsius, multiply by 5/9 or 0.5556.

Example: $10.0^{\circ}\text{F range} \times 0.5556 = 5.6^{\circ}\text{C range}$



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