HOBART

SERVICE

ERA - EBD ELECTRIC FRYERS

Customer Maintenance Manual

SPECIFICATION SHEETS

INSTALLATION / OPERATION MANUAL

ADDITIONAL RESOURCES

SERVICE MANUALS

HOBART SERVICE PARTS STORE

CATALOG OF REPLACEMENT PARTS

F48021

FRYERS

ER KLEENSCREEN *PLUS*® FILTRATION SYSTEM
BUILT-IN FILTRATION SYSTEM FOR 2ERF, 3ERF & 4ERF FRYERS

Model 2ER85CF
Shown on casters (Accessory)

ENERGY STAR

C UL US LISTED 887F

UL LISTED 887F

NSF

SPECIFICATIONS

Built-in filter system, Vulcan Model No. (# of fryers – 2, 3 or 4) ER (50 or 85) (control type A, D, or C) F (add suffix -F to fryer battery Model No., i.e. 2ER50DF). Filter system accommodates a maximum of four cabinets for ER50F and maximum of three for ER85F. Drawer style filter pan assembly holds 70 lbs. shortening capacity for ER50F and 110 lbs. capacity for ER85F. Filter vessel constructed of drawn (seamless) 18 gauge stainless steel. The 2ER50F filter pan weighs only 12.2 lbs. and the filter pan for the 2ER85F weighs only 20.5 lbs. ⅓ H.P. motor and pump circulates hot frying compound at the rate of 8 gallons per minute, activated by a one touch push button switch. System provided standard with stainless steel mesh filter screen. Optional KleenScreen *PLUS*® envelopes filter out particulate down to .5 microns. Standard equipment comes on legs, has a tank brush and cleanout rod. Hands free oil return line connection. Drain valve interlock switch turns fryer's heating elements off when drain valve is opened. Power supply is 208 volt, 60 Hz, 3 phase.

UL listed. NSF listed.

STANDARD FEATURES

- Filter system accommodates maximum of four fryer cabinets (ER50F), maximum of three (ER85F).
- Boil Out ByPass™ easily removes boil out solution from fry tank without contact of drain manifold, filter pan or motor/ pump.
- Drain valve interlock switch (DVI). Turns off heating elements automatically when draining oil or lifting heating elements during cleaning.
- Drawn (seamless) 18 gauge stainless steel filter pan. 70 lbs. frying compound capacity on ER50F, 110 lbs. capacity on ER85F.
- 6" adjustable legs.
- Stainless steel mesh 2-sided filter screen – surface area 270 sq. in.
- ⅓ H.P. motor and pump circulates frying compound at a rate of 8.0 gallons per minute.
- One touch push button switch to engage pump and motor (solid state controls).
- Tank brush and clean-out rod.
- One year limited parts and labor warranty.
- 6' High Temperature Discard Hose.
- 10 year fry tank limited warranty.

ACCESSORIES (Packaged & Sold Separately)

- ☐ Stainless steel tank cover – doubles as a work surface top.
- ☐ Micro-Filtration Fabric Envelopes – 6 filters/per package.
- ☐ Casters, adjustable (2 locking, 2 non-locking).
- ☐ "Add-On" Frymate™ – VX15 or VX21S.
- ☐ Rear oil reclamation discard connection (factory installed).
- ☐ Prison Security Package (factory installed).
- ☐ Single Basket Lift (factory installed).

OPTIONS

- ☐ 480 volt, 3 phase (NEMA 5-15P). (Separate 120 volt, 20 amp electric supply required.)
- ☐ Second year extended limited parts and labor warranty.

REFERENCE MATERIALS

- See 1ER50 Spec Sheet F32900 for electrical specs.
- See 1ER85 Spec Sheet F32901 for electrical specs.
- See 1ERF Spec Sheet F32969 for single unit KleenScreen *PLUS*®.

VULCAN
a division of ITW Food Equipment Group LLC
P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

ER KLEENSCREEN *PLUS*® FILTRATION SYSTEM
BUILT-IN FILTRATION SYSTEM FOR 2ERF, 3ERF & 4ERF FRYERS

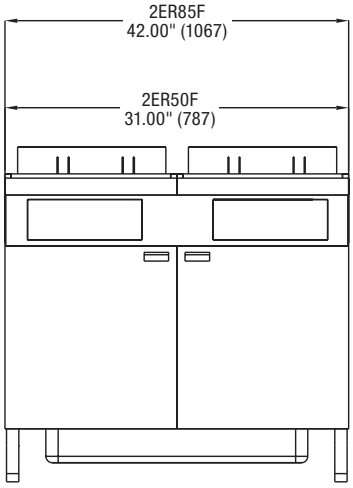
INSTALLATION INSTRUCTIONS

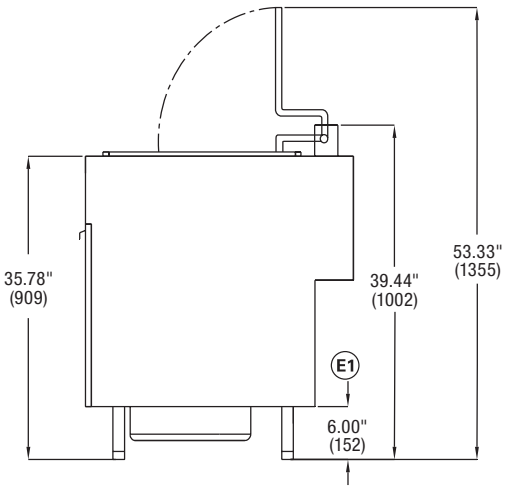
1. An adequate ventilation system is required for Commercial Cooking Equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. When writing refer to NFPA No. 96.
2. All models require a 6" clearance at both sides and rear adjacent to combustible construction.
3. All models require a 16" (407 mm) minimum clearance to adjacent open top burner units.
4. This appliance is manufactured for commercial installation only and is not intended for home use.

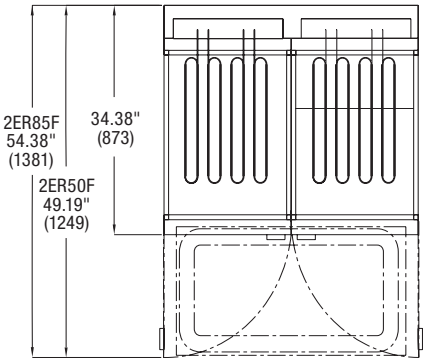
SERVICE CONNECTIONS:

(E1) 480 volt ER KleenScreen *PLUS*® require a separate 120 V, 60Hz, 1 phase (NEMA 5-15P) electrical power connection to operate the filter motor/pump and digital controls, (not supplied with the fryer).

NOTE: In line with its policy to continually improve its product, Vulcan reserves the right to change materials and specifications without notice.







FILTER SYSTEM SPECIFICATION:

Screen = 270 sq.
Micro Filtration Fabric Envelope = 350 sq. in

MOTOR/PUMP SPECIFICATIONS:

480V = ⅓ HP 1750 RPM 8.0 gal./min 120V / 5.0A 50/60Hz 1 Ph.
208V = ⅓ HP 1750 RPM 8.0 gal./min 208V / 3.6A 50/60Hz 1 Ph.

Model	Filter Pan Capacity	Electrical	Battery Dimensions (Widths)		
			2 Fryers	3 Fryers	4 Fryers
2ER50F	70 lbs.	17kW Refer to spec. sheet F-32900	31"	46½"	62"
3ER50F					
4ER50F					
2ER85F	110 lbs.	24kW Refer to spec. sheet F-32901	42"	63"	—
3ER85F					
NOTE: Fryer in battery with fuses (master) must add 5 amps for the motor / pump. Remaining fryers (slave) use amps per spec. sheet.					

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FRYERS

1ER50 SERIES
FREE STANDING ELECTRIC FRYERS

Model 1ER50D
Shown with caster accessory

SPECIFICATIONS

Electric deep fat fryer, Vulcan Model No. (1ER50A) (1ER50D) (1ER50C). Temperature controls are adjustable from 200°F to 390°F and multiple fat melt cycles and high limit control. Stainless steel cabinet with four 6" adjustable legs. 16 gauge stainless steel fry tank holds 50 lbs. of frying compound. 1¼" full port ball type drain valve. 17kW low watt density ribbon style heating elements. Twin fry baskets. Power supply is 208 volt, 50/60 Hz, 3 phase.

Overall Dimensions:
15½"w x 34⅜"d x 39⁷⁄₁₆"h working height is 35¾".

NSF listed. CSA design certified.

Specify voltage when ordering.

- ☐ **1ER50A** Solid state analog knob control.
- ☐ **1ER50D** Solid state digital controls.
- ☐ **1ER50C** Programmable computer controls.

STANDARD FEATURES

- Stainless steel cabinet.
- Set of four 6" adjustable legs.
- 16 gauge stainless steel fry tank, 50 lb. capacity.
- Ten year limited fry tank warranty.
- 1¼" full port ball type drain valve.
- 17 kW low watt density ribbon style heating elements.
- Multiple fat melt modes.
- High limit control.
- Twin fry baskets with plastic coated handles.
- 208 volt, 3 phase.
- One year limited parts and labor warranty.

CONTROLS

1ER50A Solid state knob control. Accurate temperature control 200°F to 390°F within +/- 2°. Multiple fat melt modes, fast recovery.

1ER50D Solid state digital read temperature control. Accurate temperature control 200°F to 390°F within +/- 2°. Multiple fat melt modes, fast recovery and boil out mode and two countdown timers.

1ER50C Computer control digital read temperature control. Accurate temperature control 200°F to 390°F within +/- 2°. Multiple fat melt modes, fast recovery and boil out mode. Ten programmable product keys and ten countdown timers. Secondary and advanced programming options.

OPTIONAL FEATURES (Factory Installed)

- ☐ Second year extended limited parts and labor warranty.

ACCESSORIES (Packaged & Sold Separately)

- ☐ Stainless Steel Tank Cover – doubles as a work surface top
- ☐ Set of four 6" adjustable casters (2 locking)
- ☐ Extra set of Twin Fry Baskets – 6½"w x 13¼"d x 6"h
- ☐ Large Single Fry Basket – 13"w x 13¼"d x 5½"h
- ☐ Frymate™ VX15S Dump Station
- ☐ Connecting Kit(s) – connect two fryers together (banking strip, brackets and hardware)
- ☐ 10" high stainless steel removable splash guard

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1ER50 SERIES
FREE STANDING ELECTRIC FRYERS

INSTALLATION INSTRUCTIONS

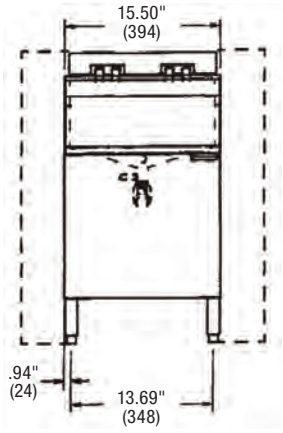
1. An adequate ventilation system is required for Commercial Cooking Equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. When writing refer to NFPA No. 96.
2. All models require a 6" clearance at both sides and rear adjacent to combustible construction.
3. All models require a 16" (407 mm) minimum clearance to adjacent open top burner units.
4. This appliance is manufactured for commercial installation only and is not intended for home use.

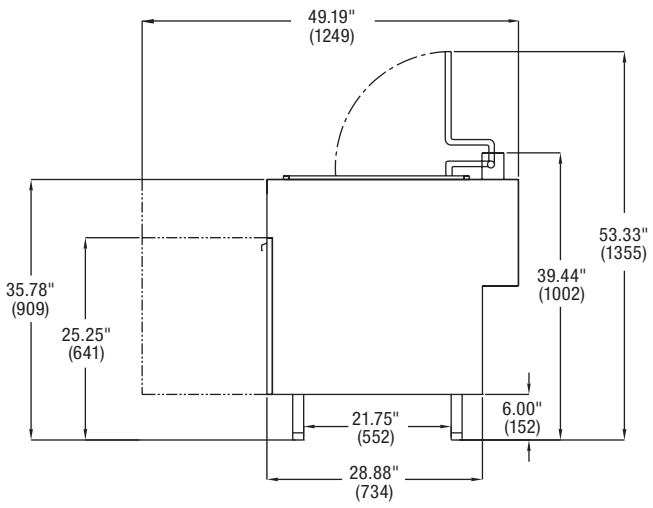
SERVICE CONNECTIONS:

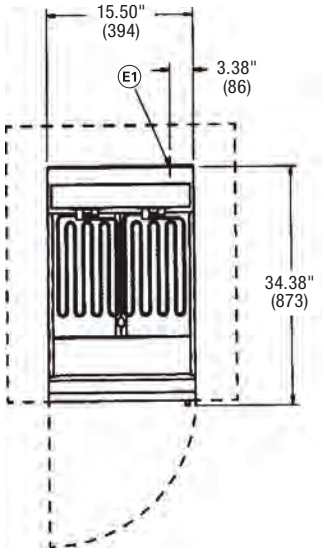
(E1) 1. Each tank requires it's own separate power supply.

2. Power supply for basket lifts and/or filter motor is wired into the fryer's high voltage line terminal block, except for 480V which requires a separate 120V single phase electrical power connection NEMA 5-15P service for the basket lifts and filter motor, (not supplied with fryer).

NOTE: In line with its policy to continually improve its product, Vulcan reserves the right to change materials and specifications without notice.







ELECTRICAL CHARACTERISTICS									
Model Number	Total kW Connection	3 PH Loading kW per Phase		Nominal Amps per Line Wire					
				3 Phase					
		208 volt	480 volt	208 volt			480 volt		
		X-Y	X-Z	X	Y	Z	X	Y	Z
1ER50	17	5.6	5.6	47	47	47	20	20	20

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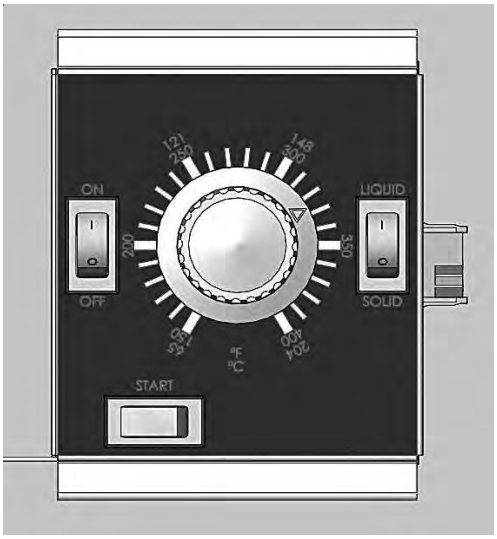
Item # _____

C.S.I. Section 11420

1E50BD SERIES

FREE STANDING ELECTRIC FRYERS



Solid State Knob Control

SPECIFICATIONS:
Electric deep fat fryer, Vulcan-Hart Model No. (1E50BD) Cabinet is stainless steel with 6" adustable legs. 16 gauge stainless steel fry tank holds 50 lbs. of frying compound. 1 1/4" full port ball type drain valve. 17 KW low watt density ribbon style heating elements. Solid state knob (BD) temperature control are adjustable from 200° to 390°F, and include two fat melt cycles and high limit control. Twin fry baskets. Power supply is 208 volt, 60 Hz, 3 phase.

Overall dimensions: 15 1/2"w x 34 1/8"d x 41 1/16"h.
Working height is 36 1/4".

NSF listed. CSA design certified.

SPECIFY VOLTAGE WHEN ORDERING.

☐ **1ER50D** Solid state knob controls

STANDARD FEATURES

- ☐ Stainless Steel Cabinet
- ☐ Set of four 6" adjustable legs.
- ☐ 16 gauge stainless steel fry tank, 50 lbs. capacity.
- ☐ Twelve year limited fry tank warranty.
- ☐ 1-1/4" full port ball type drain valve.
- ☐ 17 KW low watt density ribbon style heating elements.
- ☐ Two melt modes.
- ☐ High limit control.
- ☐ Twin fry baskets with plastic coated handles.
- ☐ 208 volt, 3 phase.
- ☐ One year limited parts and labor warranty.

CONTROLS:

1ER50BD Solid state digital read temperature control. Accurate temperature control 200°F to 390°F within +/- 2°. Two fat melt modes, fast recovery.

OPTIONS

- ☐ 480 volt, 3 phase. (Separate 120 volt, 20 amp Nema 15-5P electric supply required.)
- ☐ Second year extended limited parts and labor warranty.

ACCESSORIES

- ☐ Set of four 6" adjustable casters (2 locking).
- ☐ Extra set of twin fry baskets - 6.5"w x 13.25"d x 6"h
- ☐ Large single fry basket - 13"w x 13.25"d x 5.5"h
- ☐ Tri-baskets - 4.25"w x 13.25"d x 5.5"h
- ☐ Tank cover - Flat work top surface design. Cover Tank50
- ☐ Frymate™ VX15S dump station
- ☐ Set of four 6" adjustable casters (2 locking).
- ☐ Flanged feet.

OPTIONS

- ☐ Second year extended limited parts and labor warranty.

FILTRATION

- ☐ Available with our KleenScreen *PLUS*® filtration system with multiple fryers and/or Frymate™ dump station..

VULCAN MODELS: 1E50BD SERIES FREE STANDING ELECTRIC FRYER

VULCAN-HART COMPANY, P.O. BOX 696, LOUISVILLE, KY 40201, TEL. 1-800-814-2028
502-778-2791 QUOTE & ORDER FAX: 1-800-444-0602

1E50BD SERIES

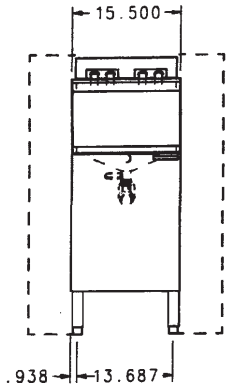
FREE STANDING ELECTRIC FRYERS

IMPORTANT:

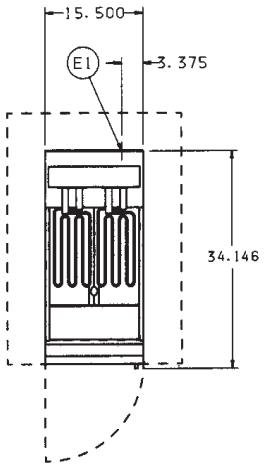
1. An adequate ventilation system required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. When writing refer to NFPA No. 96.
2. All models require a 6" clearance at both sides and rear adjacent to combustible construction.
3. This appliance is manufactured for commercial installation only and not intended for domestic/household installation.
4. All models require a 16" (407 mm) minimum clearance to adjacent open top burner units.
5. This appliance is manufactured for commercial installation only and is not intended for home use.

SERVICE CONNECTIONS:

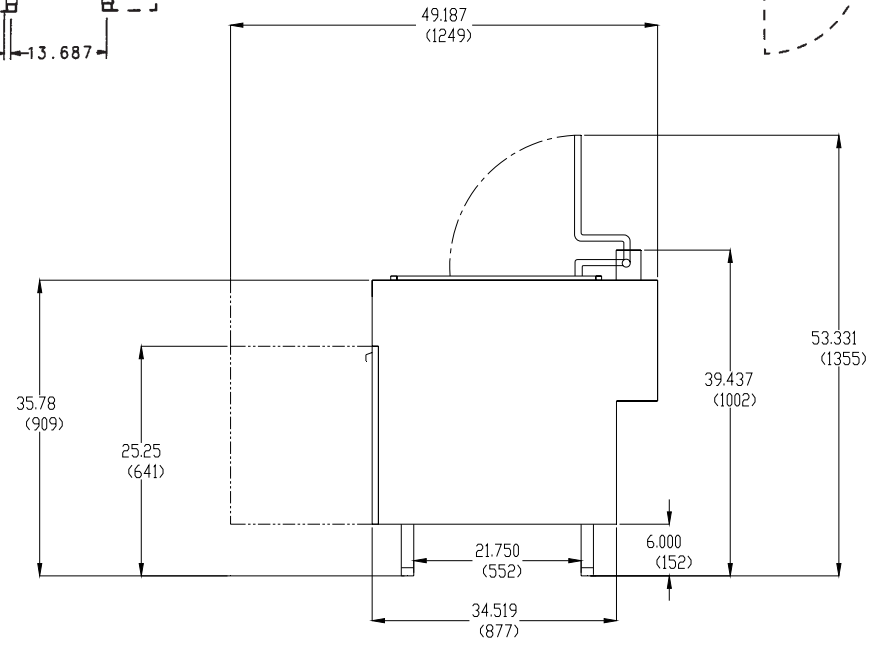
(E1) Electrical Connection
Nema 5-15P, 120 volt, 60 Hz, 1 phase electrical connection required for 480 volt fryers. Not supplied with fryer.



FRONT VIEW



TOP VIEW



SIDE VIEW

ELECTRICAL CHARACTERISTICS									
MODEL NO.	TOTAL KW CONN.	3 PH LOADING KW PER PHASE		NOMINAL AMPS PER LINE WIRE 3 PHASE					
		208	480V	208 VOLT			480 VOLT		
		X-Y	X-Z	X	Y	Z	X	Y	Z
1E50BD	17	5.6	5.6	47	47	47	20	20	20

NOTE: In line with its policy to continually improve its products, Vulcan-Hart Company reserves the right to change materials and specifications without notice.

VULCAN-HART COMPANY, P.O. BOX 696, LOUISVILLE, KY 40201, TEL. 1-800-814-2028
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F-32942 (5-08)

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ER KLEENSCREEN *PLUS*® FILTRATION SYSTEM
BUILT-IN FILTRATION SYSTEM FOR 1ERF FRYERS

Model 1ER50AF
Shown with optional caster accessory

C UL US LISTED 887F

UL LISTED 887F

NSF

SPECIFICATIONS

Built-in filter system, Vulcan Model No.1 ER (lb. capacity 50 or 85) (control type A, D, or C) F (add suffix -F to fryer battery Model No., i.e. 1ER50DF). Filter system accommodates one 50 lbs. or one 85 lbs. fryer. ⅓ H.P. motor and pump circulates hot frying compound at the rate of 8 gallons per minute, activated by a one touch push button switch. System provided standard with stainless steel mesh filter screen. Optional KleenScreen *PLUS*® envelopes filter out particulate down to .5 microns. Standard equipment comes on legs, has a tank brush and clean-out rod. Hands free oil return line connection. Drain valve interlock switch turns fryer's heating elements off when drain valve is opened. Power supply is 208 volt, 60 Hz, 3 phase.

UL Listed. NSF Listed.

STANDARD FEATURES

- Filter system accommodates 1ER50F or 1ER85F.
- Choose from Solid State Analog Knob Control (A), Solid State, Digital (D) or Computer (C) Controls.
- Boil Out ByPass™ easily removes boil out solution from fry tank without contact of drain manifold, filter pan or motor/ pump.
- Drain valve interlock switch (DVI) shuts off heating elements when drain valve is opened.
- 18 gauge stainless steel filter pan. 65 lbs. frying compound capacity on 1ER50F, 100 lbs. capacity on 1ER85F.
- 6" adjustable legs.
- Stainless steel mesh 2-sided filter screen; 1ER50F = 220 sq. inches; 1ER85F = 462 sq. inches.
- ⅓ H.P. motor and pump circulates frying compound at a rate of 8.0 gallons per minute.
- 4' high temperature discard hose.
- One touch push button switch to engage pump and motor (solid state controls).
- Tank brush and clean-out rod.
- One year limited parts and labor warranty.
- 10 year limited fry tank warranty.

ACCESSORIES (Packaged & Sold Separately)

- ☐ Stainless steel tank cover – doubles as a work surface top.
- ☐ Micro-Filtration Fabric Envelopes – 6 filters/per package.
- ☐ Casters, adjustable (2 locking, 2 non-locking).
- ☐ "Add-On" Frymate™ – VX15 or VX21S.
- ☐ Prison Security Package (Factory Installed).
- ☐ Single Basket Lift (Factory Installed).
- ☐ 10" high stainless steel splash guard.

OPTIONS

- ☐ 480 volt, 3 phase (NEMA 5-15P). (Separate 120 volt, 20 amp electric supply required.) Not for sale in Canada.
- ☐ Second year extended limited parts and labor warranty.

REFERENCE MATERIALS

- See 1ER50 Spec Sheet F32900 for electrical specs.
- See 1ER85 Spec Sheet F32901 for electrical specs.
- See ERF Spec Sheet F32456 for electric fryer batteries.

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ER KLEENSCREEN *PLUS*® FILTRATION SYSTEM
BUILT-IN FILTRATION SYSTEM FOR 1ERF FRYERS

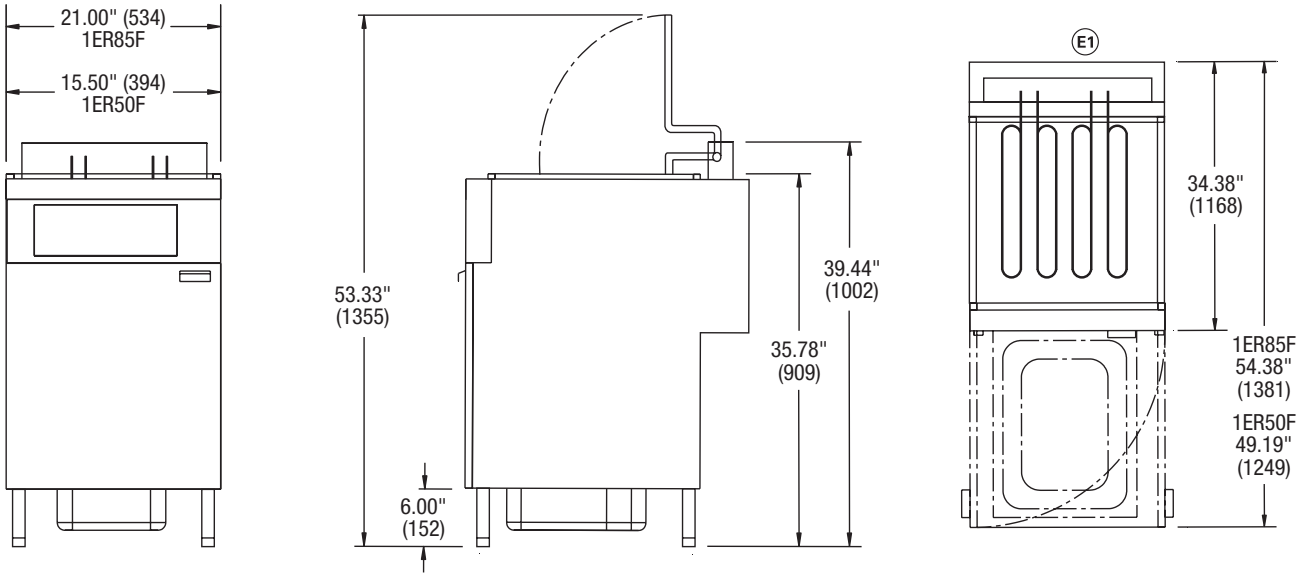
INSTALLATION INSTRUCTIONS

1. A combination valve with pressure regulator is provided with this unit. Natural Gas 4.0" (102 mm) W.C. Propane Gas 10.0" (254 mm) W.C.
2. An adequate ventilation system is required for Commercial Cooking Equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. When writing refer to NFPA No. 96.
3. All models require a 6" (152 mm) clearance at both sides and rear adjacent to combustible construction.
4. All models require a 16" (407 mm) minimum clearance to adjacent open top burner units.
5. This appliance is manufactured for commercial installation only and is not intended for home use.

SERVICE CONNECTIONS:

(E1) 480 volt ER KleenScreen *PLUS*® require a separate 120V (NEMA 5-15P), 60 Hz, 1 phase electrical power connection to operate the filter motor/ pump and digital controls, (not supplied with the fryer).

NOTE: In line with its policy to continually improve its product, Vulcan reserves the right to change materials and specifications without notice**.**



FILTRATION SYSTEM SPECIFICATIONS								
Model	Filter Pan Capacity	Filter Area		Motor / Pump				
		Screen	Micro-Filtration Fabric Envelope	H. P.	RPM	Gal./Min.	Electrical	
1ER50F	65 lbs.	220 sq. in.	225 sq. in.	1/3 H.P.	1750 RPM	8.0 Gal./min.	**208V Units:**	208V 3.6A 50/60Hz 1Ph
							408V Units:	120V 5.0A 50/60Hz 1Ph
1ER85F	100 lbs.	462 sq. in.	515 sq. in.	1/3 H.P.	1750 RPM	8.0 Gal./min.	**208V Units:**	208V 3.6A 50/60Hz 1Ph
							408V Units:	120V 5.0A 50/60Hz 1Ph

FRYER SPECIFICATIONS:

- **1ER50 (17 Kw)** – See Spec Sheet F32900
- **1ER85 (24 Kw)** – See Spec Sheet F32901

Note: Add 5 Amps for the motor / pump

This appliance is manufactured for commercial use only and is not intended for home use.

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FRYERS

1ER50 SERIES
FREE STANDING ELECTRIC FRYERS

Model 1ER50D
Shown with caster accessory

ENERGY STAR

US

SPECIFICATIONS

Electric deep fat fryer, Vulcan Model No. (1ER50A) (1ER50D) (1ER50C) temperature controls are adjustable from 200°F to 390°F and multiple fat melt cycles and high limit control. Stainless steel cabinet with four 6" adjustable legs. 16 gauge stainless steel fry tank holds 50 lbs. of frying compound. 1¼" full port ball type drain valve. 17kW low watt density ribbon style heating elements. Twin fry baskets. Power supply is 208 volt, 50/60 Hz, 3 phase.

Overall Dimensions:
15½"w x 34⅜"d x 39⅞"h. working height is 35¾".

NSF listed. CSA design certified.

Specify voltage when ordering.

- ☐ **1ER50A** Solid state analog knob control.
- ☐ **1ER50D** Solid state digital controls.
- ☐ **1ER50C** Programmable computer controls.

STANDARD FEATURES

- Stainless steel cabinet.
- Set of four 6" adjustable legs.
- 16 gauge stainless steel fry tank, 50 lb. capacity.
- Ten year limited fry tank warranty.
- 1¼" full port ball type drain valve.
- 17 kW low watt density ribbon style heating elements.
- Multiple fat melt modes.
- High limit control.
- Twin fry baskets with plastic coated handles.
- 208 volt, 3 phase.
- One year limited parts and labor warranty.

CONTROLS

1ER50A Solid state knob control. Accurate temperature control 200°F to 390°F within +/- 2°. Multiple fat melt modes, fast recovery.

1ER50D Solid state digital read temperature control. Accurate temperature control 200°F to 390°F within +/- 2°. Multiple fat melt modes, fast recovery and boil out mode and two countdown timers.

1ER50C Computer control digital read temperature control. Accurate temperature control 200°F to 390°F within +/- 2°. Multiple fat melt modes, fast recovery and boil out mode. Ten programmable product keys and ten countdown timers. Secondary and advanced programming options.

OPTIONAL FEATURES (Factory Installed)

- ☐ Second year extended limited parts and labor warranty.

ACCESSORIES (Packaged & Sold Separately)

- ☐ Stainless Steel Tank Cover – doubles as a work surface top
- ☐ Set of four 6" adjustable casters (2 locking)
- ☐ Extra set of Twin Fry Baskets – 6½"w x 13¼"d x 6"h
- ☐ Large Single Fry Basket – 13"w x 13¼"d x 5½"h
- ☐ Frymate™ VX15S Dump Station
- ☐ Connecting Kit(s) – connect two fryers together (banking strip, brackets and hardware)
- ☐ 10" high stainless steel removable splash guard

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ER KLEENSCREEN *PLUS*® FILTRATION SYSTEM
BUILT-IN FILTRATION SYSTEM FOR 2ERF, 3ERF & 4ERF FRYERS

Model 2ER85CF
Shown on casters (Accessory)

SPECIFICATIONS

Built-in filter system, Vulcan Model No. (# of fryers – 2, 3 or 4) ER50 (control type A, D, or C) F (add suffix -F to fryer battery Model No., i.e. 2ER50DF). Filter system accommodates a maximum of four cabinets. Drawer style filter pan assembly holds 70 lbs. shortening capacity. Filter vessel constructed of drawn (seamless) 18 gauge stainless steel. The 2ER50F filter pan weighs only 12.2 lbs. ⅓ H.P. motor and pump circulates hot frying compound at the rate of 8 gallons per minute, activated by a one touch push button switch. System provided standard with stainless steel mesh filter screen. Optional KleenScreen *PLUS*® envelopes filter out particulate down to .5 microns. Standard equipment comes on legs, has a tank brush and cleanout rod. Hands free oil return line connection. Drain valve interlock switch turns fryer's heating elements off when drain valve is opened. Power supply is 208 volt, 60 Hz, 3 phase.

CSA design certified. NSF listed.

STANDARD FEATURES

- Filter system accommodates maximum of four fryer cabinets.
- Boil Out ByPass™ easily removes boil out solution from fry tank without contact of drain manifold, filter pan or motor/ pump.
- Drain valve interlock switch (DVI). Turns off heating elements automatically when draining oil or lifting heating elements during cleaning.
- 18 gauge stainless steel filter pan. 70 lbs. frying compound capacity.
- 6" adjustable legs.
- Stainless steel mesh 2-sided filter screen – surface area 270 sq. in.
- ⅓ H.P. motor and pump circulates frying compound at a rate of 8.0 gallons per minute.
- One touch push button switch to engage pump and motor (solid state controls).
- Tank brush and clean-out rod.
- One year limited parts and labor warranty.
- 6' High Temperature Discard Hose.
- 10 year fry tank limited warranty.

ACCESSORIES (Packaged & Sold Separately)

- ☐ Stainless steel tank cover – doubles as a work surface top.
- ☐ Micro-Filtration Fabric Envelopes – 6 filters/per package.
- ☐ Casters, adjustable (2 locking, 2 non-locking).
- ☐ "Add-On" Frymate™ – VX15.
- ☐ Rear oil reclamation discard connection (factory installed).
- ☐ Prison Security Package (factory installed).
- ☐ Single Basket Lift (factory installed).

OPTIONS

- ☐ Second year extended limited parts and labor warranty.

REFERENCE MATERIALS

- See 1ER50 Spec Sheet F32900 for electrical specs.
- See 1ERF Spec Sheet F32969 for single unit KleenScreen *PLUS*®.

a division of ITW Food Equipment Group LLC
P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

Printed On Recycled Paper

Item # _____ C.S.I. Section 11420

F R Y E R S

ER KLEENSCREEN *PLUS*® FILTRATION SYSTEM
BUILT-IN FILTRATION SYSTEM FOR 2ERF, 3ERF & 4ERF FRYERS

INSTALLATION INSTRUCTIONS

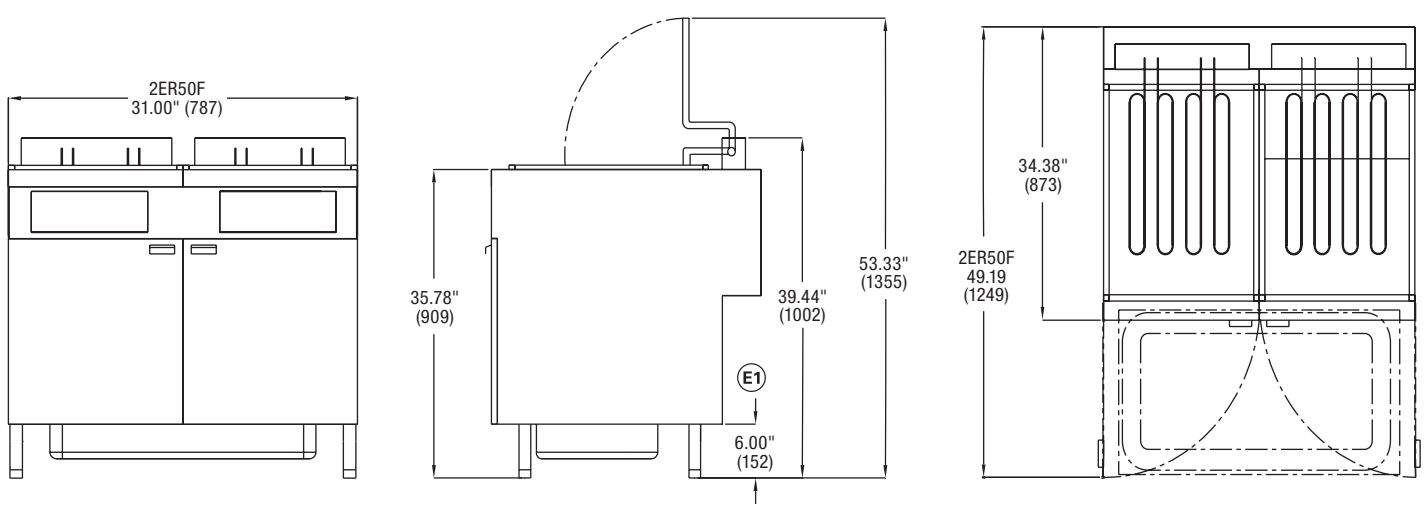
1. An adequate ventilation system is required for Commercial Cooking Equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. When writing refer to NFPA No. 96.
2. All models require a 6" clearance at both sides and rear adjacent to combustible construction.
3. All models require a 16" (407 mm) minimum clearance to adjacent open top burner units.
4. This appliance is manufactured for commercial installation only and is not intended for home use.

SERVICE CONNECTIONS:

(E1) 1. Each tank requires it's own separate power supply.

2. Power supply for basket lifts and/or filter motor is wired into the fryer's high voltage line terminal block, except for 480V which requires a separate 120V single phase electrical power connection NEMA 5-15P service for the basket lifts and filter motor, (not supplied with fryer).

NOTE: In line with its policy to continually improve its product, Vulcan reserves the right to change materials and specifications without notice.



FILTER SYSTEM SPECIFICATION:

Screen = 220 sq.
Micro Filtration Fabric Envelope = 220 sq. in

MOTOR/PUMP SPECIFICATIONS:

480V = ⅓ HP 1750 RPM 8.0 gal./min 120V / 5.0A 50/60Hz 1 Ph.
208V = ⅓ HP 1750 RPM 8.0 gal./min 208V / 3.6A 50/60Hz 1 Ph.

Model	Filter Pan Capacity	Electrical	Battery Dimensions (Widths)		
			2 Fryers	3 Fryers	4 Fryers
2ER50F	70 lbs.	17kW Refer to spec. sheet F32900	31"	46½"	62"
3ER50F					
4ER50F					
NOTE: Fryer in battery with fuses (master) must add 5 amps for the motor / pump. Remaining fryers (slave) use amps per spec. sheet.					

This appliance is manufactured for commercial use only and is not intended for home use.

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P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

INSTALLATION & OPERATIONAL MANUAL

ERA, ERD & ERC SERIES ELECTRIC FRYERS
With KleenScreen *PLUS*® Filtration Systems

1ER50A Shown - Solid State Digital Control
Casters - Accessory
ENERGY STAR® RATED

MODELS:

1ER50A
1ER50D
1ER50C
1ER85A
1ER85D
1ER85C
1ER50AF
1ER50DF
1ER50CF
1ER85AF
1ER85DF
1ER85CF
2ER50AF
2ER50DF
2ER50CF
2ER85AF
2ER85DF
2ER85CF
3ER50AF
3ER50DF
3ER50CF
3ER85AF
3ER85DF
3ER85CF
4ER50AF
4ER50DF
4ER50CF

For additional information on Vulcan-Hart or to locate an authorized parts and service provider in your area, visit out website at www.vulcanequipment.com

VULCAN
DIVISION OF ITW FOOD EQUIPMENT GROUP, LLC
WWW.VULCANEQUIPMENT.COM

3600 NORTH POINT BLVD.
BALTIMORE, MD 21222
F-32959 Rev H (MAY 2015)

IMPORTANT FOR YOUR SAFETY

THIS MANUAL HAS BEEN PREPARED FOR PERSONNEL QUALIFIED TO INSTALL ELECTRIC EQUIPMENT, WHO SHOULD PERFORM THE INITIAL FIELD START-UP AND ADJUSTMENTS OF THE EQUIPMENT COVERED BY THIS MANUAL.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

TABLE OF CONTENTS

INTRODUCTION

GENERAL

Vulcan Fryers are produced with quality workmanship and material. Proper installation, usage and maintenance will result in years of satisfactory performance.

Before installing the fryer, thoroughly read this manual and carefully follow all instruction.

This manual is applicable to model listed on the cover page. Procedures in this manual will apply to all models unless specified. Pictures and illustrations can be of any model unless the picture or illustration needs to be model specific.

ORDERING PARTS

Customers may order parts directly from their local authorized service center. If not known, call Vulcan Customer Service at 800-814-7028.

To speed up your order, provide the model number, serial number, electrical specifications, part needed, item part number (if known) and quantity needed.

UNPACKING

This fryer was carefully inspected before leaving the factory. Upon acceptance of the shipment, the transportation company assumes full responsibility for safe delivery.

Immediately after unpacking the fryer, check for possible shipping damage. If the fryer is damaged, save the packaging material and contact the carrier within 15 days of delivery.

Check that the following have been included:

- Basket Rack
- Tank Brush
- Adjustable (4) Legs. Fryer Batteries with the KleenScreen *PLUS*® Filtration System have legs installed from the factory.
- Drain Pipe Extension for freestanding fryers only.
- Twin Fry Baskets (2) per fry tank
- Cleanout Rod
- Fryer Batteries with the KleenScreen *PLUS*® Filtration System
  - Filter Pan
  - Suction Tube
  - Screen Assembly
  - Boil Out ByPass™ Extension
  - Complimentary Pack of Micro-Filtration Envelopes
  - 6’ high temperature discard hose
- Manual and Warranty

Do not use the door or its handle to lift the fryer.

Do not use the door or its handle to lift the fryer.

FRYER CAPACITY

MODEL - GMO	Kw per Fry Tank	Width Inch (cm) Total System	Shortening lbs. (kg) Each Fry Tank
1ER50BD	17	15.5" (39)	50 (23)
1ER50D	17	15.5" (39)	50 (23)
1ER85BD	24	21.0" (53)	85 (39)
1ER85D	24	21.0" (53)	85 (39)
1ER50C	17	15.5" (39)	50 (23)
1ER85C	24	21.0" (53)	85 (39)
1ER50AF	17	15.5" (39)	50 (23)
1ER50DF	17	15.5" (39)	50 (23)
1ER85AF	24	21.0" (53)	85 (39)
1ER85DF	24	21.0" (53)	85 (39)
1ER50CF	17	15.5" (39)	50 (23)
1ER85CF	24	21.0" (53)	85 (39)
2ER50AF	17	31.0" (79)	50 (23)
2ER50DF	17	31.0" (79)	50 (23)
2ER50CF	17	31.0" (79)	50 (23)
3RE50AF	17	46.5" (118)	50 (23)
3ER50DF	17	46.5" (118)	50 (23)
3ER50CF	17	46.5" (118)	50 (23)
4ER50AF	17	62.0" (158)	50 (23)
4ER50DF	17	62.0" (158)	50 (23)
4ER50CF	17	62.0" (158)	50 (23)
2ER85AF	24	42.0" (107)	85 (39)
2ER85DF	24	42.0" (107)	85 (39)
2ER85CF	24	42.0" (107)	85 (39)
3RE85AF	24	63.0" (160)	85 (39)
3ER85DF	24	63.0" (160)	85 (39)
3ER85CF	24	63.0" (160)	85 (39)

Voltage ranges are: 208, 3 Phase - 50 – 60 Hz
240, 3 Phase - 50 – 60 Hz
480, 3 Phase - 50 – 60 Hz

Model ERA, ERD and ERC Series Fryers can be freestanding or arranged in batteries of 2 to 4 fryers. The number preceding the model number of the fryer refers to the number of fryers in a battery.

INSTALLATION

Before installing the fryer, verify that the electrical requirements agree with the specifications on the fryer data plate, which is located on the inside of the door panel.

Record your fryer model, device, and serial numbers for future reference in the space provided below. This information can be found on the fryer data plate.

Fryer Model No: _____

Device: _____

Serial No: _____

CODES AND STANDARDS

The fryer must be installed in accordance with:

In the United States:

- State and local codes, or in the absence of local codes, with:
- National Electrical Code, ANSI/NFPA-70 (latest edition). Copies may be obtained from The National Fire Protection Association, Batterymarch Park, Quincy, MA. 02169-7471.

In Canada:

- Local codes
- CSA C22.1 Canadian Electric Code L4W 5N6.

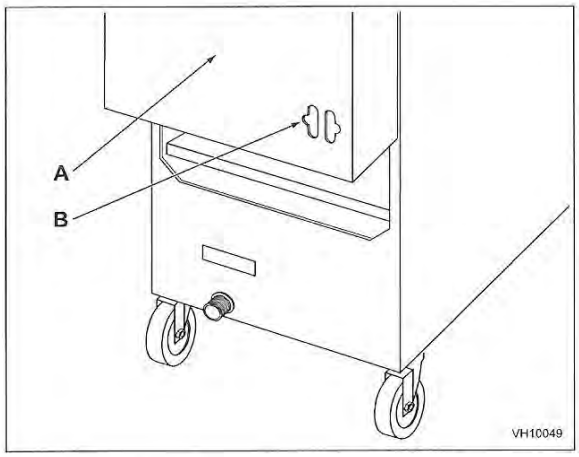
ASSEMBLY

The fryer must be restrained to prevent tipping and the splashing of hot liquid. The means of restraint may be the manner of installation, such as connection to a battery of appliances, installing the fryer in an alcove, or by separate means such as adequate ties.

Fryers with Casters: (Optional)

Separate instructions for installing casters are included with the casters:

- The restraining device should be attached to the cutout on the back panel. See illustration for location.



A Rear of Fryer
B Strain Relief Chain Connection (Chain supplied by others)

- Australia, use only the caster supplied by the manufacturer for the fryer device. The fryer must be installed using a hose assembly restraining device to limit the movement of the appliance in accordance with AS1869.
- The fryer must be installed with a connector (not supplied by Vulcan) complying with the above codes.
- The fryer must be installed with restraining means to guard against transmission of strain to the connector. See illustration.
- The fryer must be installed with the casters provided.
- If the restraint is ever to be disconnected, turn off electric supply to the fryer.
- If the fryer is installed on casters without a supply cord it must be hard wired using flexible conduit when making connection to the power supply.

ELECTRICAL CONNECTION

⚠ WARNING Electrical and Grounding connections must comply with the National Electrical Code and/or other local codes.

⚠ WARNING Disconnect the electrical power supply to the machine and follow lockout / tag out procedures.

⚠ WARNING Appliances equipped with a 120V flexible electric supply cord are provided with a three-prong grounding plug. It is imperative that this plug be connected into a properly grounded three-prong receptacle. If the receptacle is not the proper grounding type, contact an electrician. Do not remove the grounding prong from this plug.

For 480 volt fryers a separate cord and NEMA 15-5P plug is required (not supplied with the fryer). Plug in the wire connection into an approved outlet.

Place fryer as near to its final position as possible. Connect 3 phase line to X, Y and Z on terminal block. To reach terminal block, remove electric cover plate from fryer.

For each 15½" (39 cm) and 21" (53 cm) section, a 3 phase supply line capable of handling the required KW at the fryer's rated voltage (208, 240, and 480) is needed. Refer to the fryer data plate for this electrical information.

NOTICE To shield electric connection supply wiring, a permanently connected or direct wired device must be installed using flexible conduit sleeve with the appropriate connectors.

LEVELING THE FRYER

Check the level of the fryer by placing a level on top of the fryer after electrical connections have been made.

Ensure that the fryer is level front-to-back and side-to-side in the final installed position.

If using casters, lock the wheels after unit is level.

OPERATION

⚠ WARNING Hot oil and parts can cause burns. Use care when operating, cleaning and servicing the fryer.

⚠ WARNING Spilling hot frying compound can cause severe burns. Do not move fryer without draining all frying compound from the tank.

OVER-TEMPERATURE SHUTDOWN

If the shortening becomes overheated, a high-temperature shutoff device will turn the heating elements off shutting down the fryer.

If the fryer shuts down due to overheating, do not turn fryer on until the shortening temperature is below 300°F (149°C).

If an overheating situation persists, contact your local Vulcan-Hart authorized service office.

BEFORE FIRST USE

Cleaning

New units are wiped down at the factory to remove any visible signs of dirt, oil, grease, etc. remaining from the manufacturing process.

Before any food preparation, thoroughly wash the protective oil from all surface parts and the tank interior with hot soapy water to remove any film residue and dust or debris.

NOTICE Do not use chlorine or sulfate/sulfide cleaners.

- Wash any accessories shipped with unit.
- Rinse fryer and accessories thoroughly and drain the fryer.
- Wipe tank completely dry with a soft, clean cloth.

FILLING TANK WITH SHORTENING

- Close the drain valve.
- Fill the fryer tank with shortening. Vulcan recommends using liquid shortening.
- Shortening level should be between the MIN and MAX lines in the fryer tank.
- Shortening will expand when heated. Do not fill the fryer tank past the MAX line.
- Press the melt switch to liquid or solid shortening.
- Add fresh shortening as needed to maintain oil level.

⚠ WARNING **Solid Shortening:** Do not set a complete block of solid shortening on top of an electric fryer's heating elements. Doing this may damage the elements and increase the potential for shortening flash fire. If solid shortening is to be used in an electric fryer, remove the baskets and crumb screen (s), and raise the elements from the tank. Pack the bottom of the tank completely with solid shortening, lower the elements and then pack the shortening completely around and over top of the elements. Lay basket rack(s) in the tank on top of the packed shortening. Follow the melt instructions in this manual. Once all shortening has been melted and the fryer has met the set temperature, fill baskets and resume frying.

BASIC FRYING INSTRUCTION

- Set the desired temperature and allow shortening to heat up to that temperature.
- Fry items that are the same size to ensure equal doneness.
- Drain or wipe dry raw or wet foods to minimize splatter when lowering into hot shortening.
- Add fresh shortening as needed.

Fry Basket Guidelines

- Do not overfill baskets. (See fry basket capacity below) Carefully lower basket into oil.
- When frying doughnuts and fritters, turn product only once during frying.
- When cooking French fries or onion rings, shake the basket several times.
- Batter covered foods should be dropped carefully, one by one, into shortening or basket. If you use the basket, first dip the basket into the shortening to reduce batter-build up on basket surfaces.
- When frying is completed, remove basket or product. Hang basket on rear hanger.

Fry Basket Capacity:

ER50: Recommended pounds per basket are 2.5 lbs. (1.1 kg).
ER85: Recommended pounds per basket are 3.5 lbs. (1.6 kg).

EXTENDING SHORTENING LIFE

Shortening life can be extended by the following guidelines:

- Do not salt foods over the fryer.
- Use good-quality shortening.
- Filter shortening daily (at a minimum).
- Replace shortening if it becomes poorly flavored.
- Keep equipment and surrounding clean.
- Set thermostat correctly.
- Remove excess moisture and particles from food products before placing on fryer.

TURNING ON THE FRYER

- Open the door to the fryer. Turn the power switch to the on position.
- Set temperature by turning the knob to the desired temperatures. The heating elements will begin to heat automatically.
- The heating elements will cycle on and off, maintaining the set temperature.

VULCAN FRYERS
SOLID STATE CONTROLS GUIDE

VULCAN
DONE TO PERFECTION.

START UP in 4 Easy Steps

STEPS 1-4
TURNING ON THE FRYER

1. Fill fry tank with oil. Press the power switch **ON**. The red light will come on.

2. Set temperature knob to the desired set temperature.

3. Move the **MELT** switch to the correct shortening being used: Solid or Liquid.

4. Press the **START** switch and fryer will begin to heat. The burners or heating elements will cycle on and off through the melt cycle. When temperature reaches 135° F the burner or heating element will stay on until set temperature is reached. The red light will change to green. When the fryer calls for heat the yellow light with come on.

TURNING OFF THE FRYER

1. Open the door to the fryer. Press the power switch to the **OFF** position

SOLID STATE KNOB CONTROLS GUIDE

⚠WARNING

- HOT FRYING COMPOUND AND PARTS CAN CAUSE BURNS. USE CARE WHEN OPERATING, CLEANING, OR SERVICING THE FRYER. USE CARE WHEN FILTERING. DO NOT LEAVE UNATTENDED.
- SPILLING HOT FRYING COMPOUND CAN CAUSE SEVERE BURNS. DO NOT MOVE THE FRYER WITHOUT FIRST DRAINING ALL FRYING COMPOUND FROM TANK.

NOTICE IF POWER IS MISTAKENLY TURNED OFF DURING THE FILTERING OPERATION, THE CORRECTIVE ACTION IS AS FOLLOWS:

1. CLOSE DRAIN VALVE
2. TURN POWER SWITCH ON
3. **IMMEDIATELY** OPEN DRAIN VALVE
4. CONTINUE FILTERING OPERATION PER STEPS 1-7 USING FILTERING GUIDE

F-32948 (September 2011)

www.VulcanHart.com • Fryer Technical Support: 1-800-814-2028

Programming the Solid State Control

Programming in 7 Easy Steps (for revisions V3.00 or higher)

STEP 1

Fill fry tank with oil and then turn power on

Display will scroll through VULCAN ➤ FRYERS ➤ Rev. No. ➤ MELT CYCLE LIQUID

STEP 2-7 PROGRAMMING MODES

To make changes to your program:

1. If display is locked it must be unlocked using the unlock code.

To UNLOCK this control you must quickly press the LEFT LEFT RIGHT RIGHT buttons while the word 'LOCKED' is displayed

UNLOCK CODE

2. After unlocking go to steps 2 – 7

2

Press (V) program button to enter the program mode: LEFT TIMER displays

Press ▲ to increase time.

Press ▼ to decrease time.

Press (V) to go to Step 3.

3

RIGHT TIMER displays

Press ▲ to increase time.

Press ▼ to decrease time.

Press (V) to go to Step 4.

4

TEMPERATURE SETTING displays

Press ▲ to increase temp.

Press ▼ to decrease temp.

Press (V) to go to Step 5.

5

MELT CYCLE displays

Press ▲ to change to "S" Solid.

Press ▼ to change to NO MELT.

Press ▼ to change to "L" Liquid.

Press (V) to go to Step 6.

6

UNLOCK displays

Press ▲ to LOCK.

Press ▼ to UNLOCK.

Press (V) to go to Step 7.

Note: VULCAN recommends keeping the controls LOCKED after programming to prevent altering

7

Press (V) button and HOLD FOR 3-5 seconds to save and exit program mode.

Note: Programming modes can be initiated while the fryer is ON by pressing the (V) button. If 'LOCKED' appears refer to 'UNLOCK' code.

OPTIONAL DISPLAY MODES

After the program mode is completed, one of the following screens will be displayed.

TEMPERATURE SETTING RESULTS

Results of programming for oil temperature is at set temperature

Display shows ACTUAL TEMPERATURE

MELT CYCLE RESULTS

Results of programming MELT L

Display says MELT L

Results of programming MELT S

Display says MELT S

Results of programming NO MELT

Display says HEATING if oil temperature is below 135 º F

TO STOP A TIMER ONCE THE COUNTDOWN SEQUENCE HAS STARTED:

Press and hold the timer button until timer is reset and flashing light goes OFF.

Programming the Computer Control

VULCAN FRYERS
COMPUTER CONTROLS GUIDE

VULCAN
DONE TO PERFECTION.

PROGRAMMING in 7 Easy Steps (for revisions V1.06 or higher)

START
Fill fry tank with oil and then turn power on.

Display will scroll through VULCAN FRYER ➤ Rev. No. ➤ MELT CYCLE LIQUID

STEP 1-7 PROGRAMMING MODES

UNLOCK CODE

1. If display is locked it must be unlocked using the unlock code.

To UNLOCK this control, press buttons 1 2 3 4 while the word 'LOCKED' is displayed

2. After unlocking go to steps 1 - 7

1

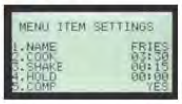
Press program button. USER SETTINGS displays.
To set cook temperature, press 1.
The current temperature will begin to flash. Type in the revised temperature.
Press to save your new cook temperature.

2

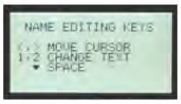
To set the melt cycle, press 2. The LIQUID display will begin to flash.
Press the button to select, LIQUID, SOLID, and NO MELT options.
Press to save your melt cycle.

3

To set Cook Time manually, press 3.
SELECT MENU ITEM will display.



Select an item to be edited by pressing the corresponding number 1-10. The menu will change to allow edits to the menu item selected using the MENU ITEM SETTINGS in the right display.



3a Press 1 to edit the NAME of the menu item and follow the directions on the right display. To change the letters press button 1 move towards the beginning of the alphabet and button 2 to move towards the end of the alphabet. The LED above the button selected for the menu item to be edited will be lit and the available parameters for editing will be listed in the right display.
Press to save the new NAME of the menu item.

3b Press 2 to change the COOK TIME. The current time will flash. Type in the new COOK TIME.
Press to save your new COOK TIME.

3c Press 3 to edit the SHAKE TIME.
The current shake time will flash. Type in the new SHAKE TIME.
Press to save your new SHAKE TIME.

3d Press 4 to change the HOLD TIME.
The HOLD TIME will flash. Type in the new HOLD TIME.
Press to save your new HOLD TIME.

3e Press 5 to choose COMPENSATING TIME or ACTUAL TIME.
YES will begin to flash. Press the button to select YES for COMP TIME or NO for ACTUAL TIME.
Press to save your selection.
Press again to exit MENU ITEM SELECTION and return to SELECT MENU ITEMS.

4

Press the program button. USER SETTINGS displays.
To Lock control or keep the computer UNLOCKED press 4.
The current setting will flash.
Press the button to select YES or NO.
Press to save your selection.

5

To adjust the Beeper VOLUME, press 5. The current setting will flash and will sound.
Press the button to select 1, 2 or 3.
Press to save your selection.

6

To set Language, press 6. The current setting will flash.
Press the button to select ENGLISH, SPANISH, or FRENCH.
Press to save your selection.

7

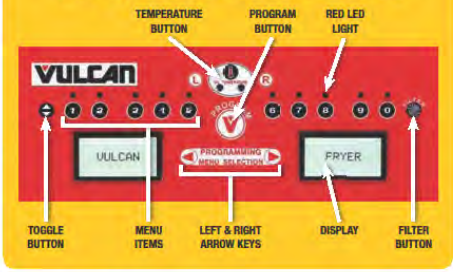
To set the IDLE SETBACK, press 7.
The current time will flash.
Type in the new IDLE TIME (10-99 minutes).
Press to save your new IDLE SETBACK time.

Press again to SAVE ALL OF YOUR SETTINGS and exit the programming mode. MENU ITEMS will display.

OPERATION TIPS:

- To scroll through Menu Items 1-10 press the button.
- To activate a cook cycle timer press a button 1 - 0. First push the desired cook timer button and then press L or R corresponding to which basket is being used. Example: 2 L, 5 R. NOTE: You can use the same button for both L and R baskets. For example, 4 L, 4 R.
- To cancel a cook timer, press and release the L or R button and the corresponding number button 1 - 0. The timer will stop and reset.
- With single basket lift fryers only press timer buttons 1 - 0 to activate the basket lift. There is no need to use the L and R buttons. To cancel the timer, press the same button again and the basket will raise up.
- Product keys blink when activated and are solid when programming.
- To silence alarm when timer is complete, press flashing menu item.
- VULCAN recommends keeping the controls LOCKED after programming to prevent altering.

DISPLAY PANEL CONTROL GUIDE



TO REVIEW SETTINGS:

To REVIEW SETTINGS, press the OIL TEMP button.
ACT temperature displays. Set temperature displays.

Hit ◀ LEFT or RIGHT ▶ arrow, followed by desired product key 1 - 0.
Display will scroll through settings for Time, Shake, Hold, and Cook Cycle.

OFFLINE PROGRAMMING WITH SOFTWARE MENU PROGRAM:

(Desktop or Laptop computer required. Menu Programming Software supplied with fryer).

To load a new product menu using the software menu program offline with a desktop or laptop computer:

1. Press USER SETTING displays.
2. Select 3. MENU ITEMS.
3. Insert USB memory drive with the new product menu files into USB Port.
4. Press button to display available product menu files by saved name.
5. Press 1 - 0 to select the new product menu name.
6. Press arrows ◀ ▶ to confirm selection within 23 seconds while the menu selected is flashing.
7. Remove USB memory drive.

F-32979 (August 2010)

www.vulcanequipment.com • Fryer Technical Support: 1-800-814-2028

TURNING OFF THE FRYER

- Open the door to the fryer. Press the power switch to the OFF position.

EXTENDED SHUTDOWN

1. Open the door to the fryer. Press the power switch to the OFF position.
2. Thoroughly drain the fryer. Refer to DRAINING THE FRYER.
3. Clean the fryer according to CLEANING.
4. Turn off the main electric circuit breaker to fryer.

FILTERING THE OIL

⚠ WARNING Hot oil and hot parts can cause burns. Use care when operating, cleaning, and servicing the fryer.

Filter shortening at least once a day.

1. A cold fryer will not drain properly. Always filter shortening between 250°F and 350°F. The shortening in the cold zone area will remain hard if not heated properly. If necessary, use the clean-out rod to carefully stir the hard shortening to an area above the cold zone where it will melt.
2. Open the door to the fryer. The power must remain ON for the fryer to filter correctly.
3. Insert the drain extension into the drain valve. Tighten only hand tight.
4. Direct the drain extension into Vulcan's 85MF mobile filter or equivalent mobile filtering device.
5. Use the provided crumb scoop to remove the heavy debris lying on the bottom of the tank.
6. Slowly open the drain valve to allow oil to flow from the fry tank to the filter pan or discard container. The heating elements will turn off automatically.
7. When fry tank is empty use the tank brush to remove any additional debris.
8. Close the drain valve.
9. Fill tank with new shortening. Fill to a minimum of the MIN level but no high that halfway between MIN and MAX. Oil will expand as it is heated.
10. Press the start button only after step 9 is fully completed. The fryer will begin to heat the shortening.

DRAINING THE TANK

1. Open the door to the fryer. The power must remain ON for the fryer to filter correctly.
2. Insert the drain extension into the drain valve. Tighten only hand tight.
3. Direct the drain spout into the container that you want to drain the shortening into.
4. Open the drain valve slowly allowing the oil to drain into the container. When the container is full or the fryer tank is empty, close the drain valve. Repeat this step until the fryer is empty. Remove the drain extension and place it back in holder.
5. It is recommended to now boil out your fry tank. Follow the BOIL OUT PROCEDURE. Then clean-out as described under CLEANING.

BOIL OUT PROCEDURE

Weekly or when oil is replaced:

1. Drain the tank as described under FILTERING THE OIL.
2. Close the drain valve and fill tank with water. Use Vulcan's Boil-Out solid degreaser low foaming cleaner tablets part number 956812-1 which can be ordered from your local dealer. Follow the instructions on the side of the package.

NOTICE Do not use chlorine or sulfate/sulfide cleaners.

3. Solution level must be between the MIN and MAX levels on the fryer tank.
4. Press the power switch to the on position. Set the temperature knob to 200°F. Water boils at 212°F. Do not bring water temperature to an overly active boil.
5. Press the start button to begin heating the boil out solution.
6. Use the tank brush; clean the sides, bottom and heat exchanger tubes.
7. Place the drain extension in the drain valve and hand tighten only. Drain the cleaning solution from the tank into a container.
8. Close the drain valve and refill the tank with water. Add 1 cup (1/4 L) of vinegar to neutralize alkaline left by the cleaner. Solution level must be between the MIN and MAX level on the fryer tank. Press the start button to allow the solution to heat up. Allow solution to stand for a few minutes.
9. Drain the tank according to DRAINING THE TANK. Rinse thoroughly with clear, hot water. All traces of cleaner must be removed. Dry the tank thoroughly.
10. Close the drain valve and add shortening. Follow the FILLING TANK WITH SHORTENING procedure in this manual. The fryer is now ready for use. Press the start button to begin heating the shortening.

CLEANING

⚠ WARNING **Hot oil and hot parts can cause burns. Use care when operating, cleaning, and servicing the fryer.**

Daily

Clean your fryer regularly with the tank brush along with a damp cloth, and polish with a soft dry cloth. If regular cleaning is neglected, grease will be burned on and discolorations may form.

Fingerprints are sometimes a problem on highly polished surfaces of stainless steel. They can be minimized by applying a cleaner that will leave a thin oily or waxy film.

- Clean all exterior surfaces of your fryer at least once daily.
- Use a damp cloth with warm water and a mild soap or detergent.

NOTICE Do not use chlorine or sulfate/sulfide cleaners.

- Rinse thoroughly, and then polish with a soft dry cloth.
- Keep the fryer exterior clean and free of accumulated grease to prevent stubborn stains from forming. If regular cleaning is neglected, grease will be burned on and discolorations may form.
- Remove discolorations by washing with any detergent or soap and water.
- Use a self-soaping, non-metallic scouring pad for particularly stubborn discolorations.
- Always rub with the grain of the stainless steel.
- Do not use a metallic scoring pad or harsh cleaners.

KleenScreen *PLUS*® Filtration System Installation and Operational Manual for "ERF" Models

2ER50DF Shown with Accessory Casters

Filtering Instructions for KleenScreen *PLUS*® Fryers

General

The KleenScreen *PLUS*® filtration system filters the oil as it is pumped back into its' respective tank(s). Only one tank can be drained and filtered at a time. Under no circumstances should both tanks be drained at the same time.

Assembly

- After unpacking, wash the filter pan, crumb basket and filter screen assembly. Make sure you remove the insert located inside the filter screen. Use dishwashing detergent and warm water, (parts are dishwasher safe). Rinse the filter pan, crumb basket and filter screen components completely and wipe all parts dry with a clean cloth.

- Pull out the filter drawer all the way leaving the filter pan opening exposed.

- Place the filter tank into the filter drawer making sure that the pins on the bottom of the filter pan line up with the holes in the filter drawer. Position the filter screen assembly into the suction tube clip in the filter pan positioning the filter screen assembly flat on the bottom of the filter pan. Place the primary crumb basket onto the left handle of the filter pan.

- Carefully line up the suction tube nozzle so that it mates with the oil receptacle block mounted on the frame of the fryer battery. Close the drawer. See Figures 1, 2 3 and 4.

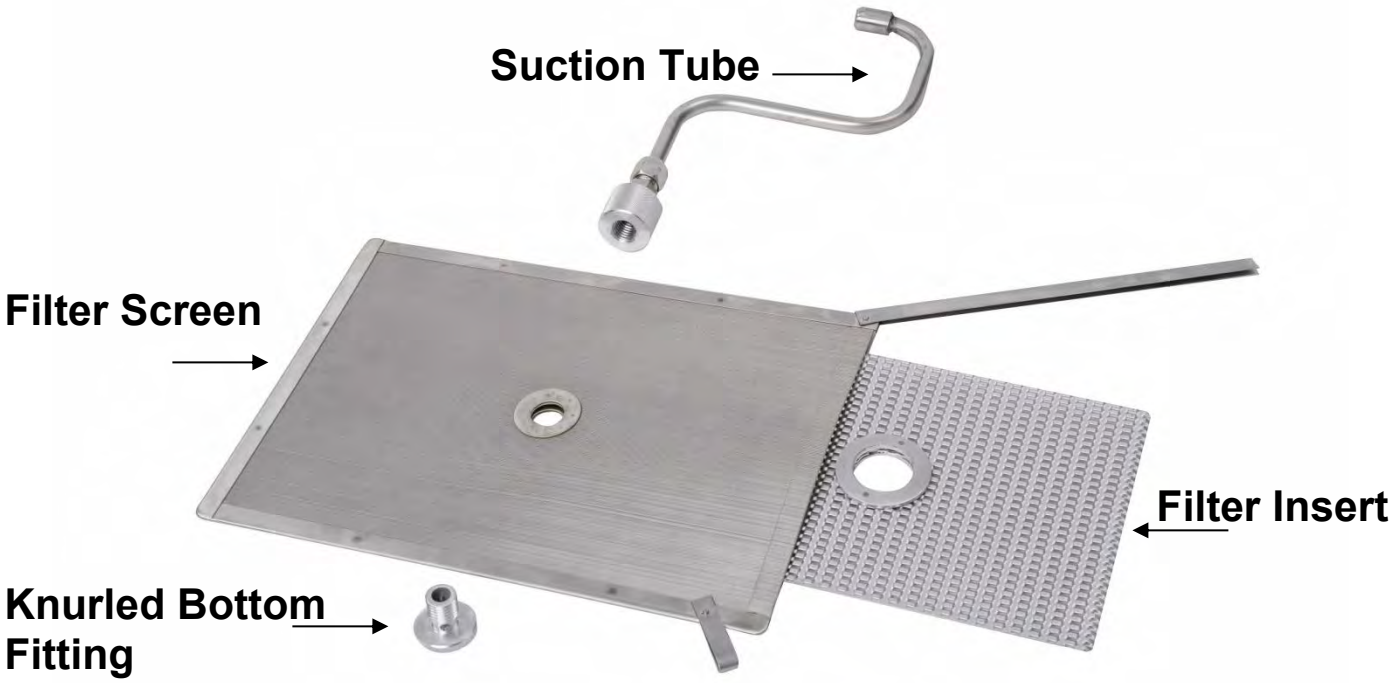
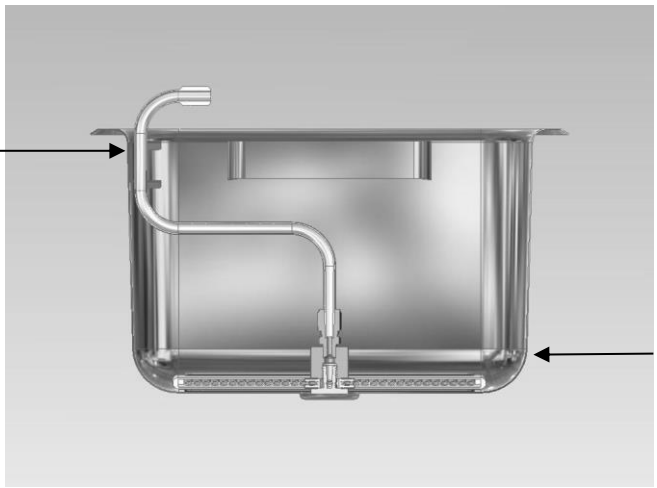


Fig. 1

Fully assembled filter screen assembly:

Fig. 2

Secure Tube with Suction Tube Clip



Filter Screen Lays Flat On Bottom of Filter Pan

Fig. 3

Micro-Filtration Fabric Envelope Assembly:

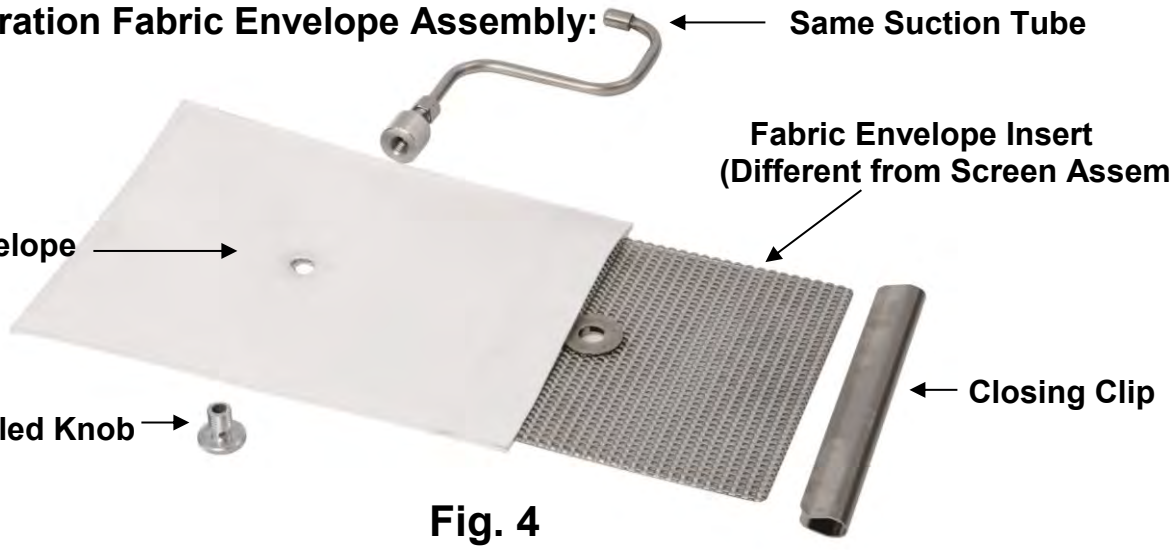


Fig. 4

INSTRUCTIONS TO REMOVE & REPLACE KLEENSCREEN *PLUS*® FILTER ENVELOPE

FOR ABSOLUTE FILTRATION & MAXIMUM FLOW RATE WE RECOMMEND YOU CHANGE YOUR FILTER ENVELOPES AT EVERY OIL CHANGE (10-14 DAYS DEPENDING ON OIL USAGE).

Step 1
Discard all oil from the filter vessel, (see pages 23 or 24). When the filter pan is empty, use a spatula and scrape off all debris left on the filter envelope and in the filter pan.

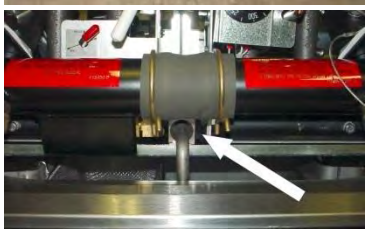
Step 2
Unscrew “S” Tube from filter by turning the Bottom Knurled fitting counter- clockwise.

Step 3
Remove SST Closure Clip by lifting off one side.

Step 4
Remove SST Filter Screen Insert and wash insert with hot water and dry thoroughly. The Filter Screen Insert is dishwasher safe. Place the insert into a new KleenScreen *PLUS*® Filter envelope.

DO NOT WASH FABRIC ENVELOPE

Step 5
Place Filter Screen Insert into the fabric envelope making sure that the holes line up. Fold over the other end of the envelope and place SST Closure Clip on – hinge over and firmly press clip all the way down to secure and seal filter assembly. Making sure that the folded end is face down; screw “S” Tube Assembly onto the Filter Assembly. Tighten the Bottom Knurled fitting. When tightened, the “S” Tube assembly should be perpendicular to the long side of the filter assembly.



Step 6
Reposition the filter tube into the provided clip. Align filter tube so that the end of the “S” Tube engages the Oil Receptacle fitting each time the drawer is opened and closed.

Operation

⚠ WARNING **Hot oil and parts can cause burns. Use care when operating, cleaning and servicing the fryer.**

⚠ WARNING **Spilling hot frying compound can cause severe burns. Do not move fryer without draining all frying compound from the tank.**

NOTICE Never run water or boil out solution through filter and motor / pump. Doing so will void your fryer warranty.

FILTERING PROCEDURE

Oil Temperature should be 300-350° F. Use the provided crumb scoop to remove and suspend crumbs on the bottom of the tank before proceeding to Step 1.

1. Do not turn off the Fryer. The power must be on throughout the entire filtering process.

NOTICE Do **NOT** heat the fryer during the filtering procedure. Permanent damage to your fry tank may occur and warranty may be voided.

2. Vulcan recommends adding an oil treatment media to the oil prior to filtering.

3. Make sure that the filter drawer is closed completely and that the suction tube and receptacle block are in the correct position. Fig. 5

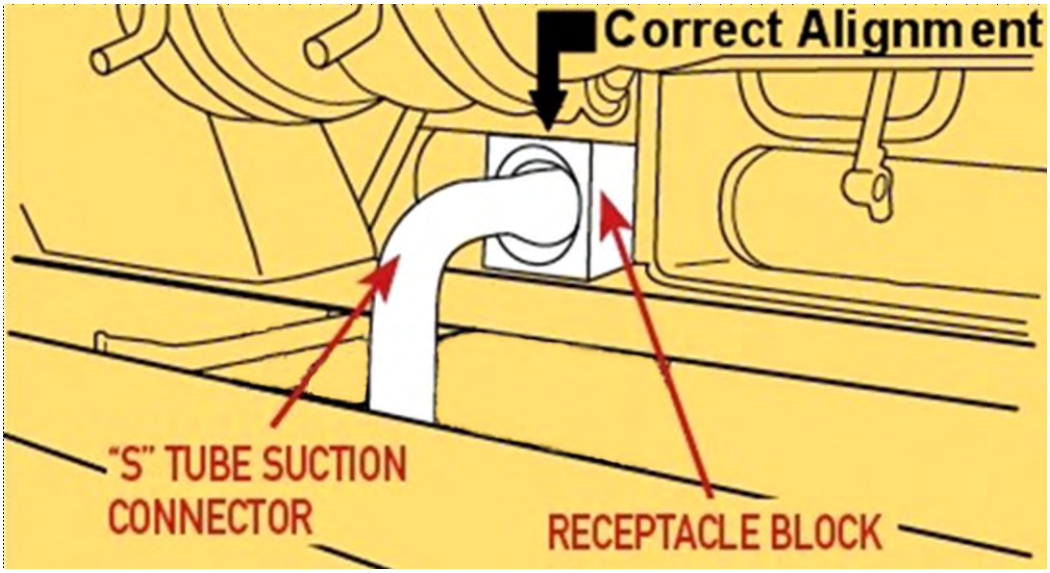


Fig. 5

FILTERING TIP:

Open the filtering drawer approximately 1” to allow any oil in the return line to run back into the filter pan. This will take about 30 seconds to complete. Then open the drawer completely to clean filter components.

REMOVING EXCESS DEBRIS FROM THE SCREEN FILTER:

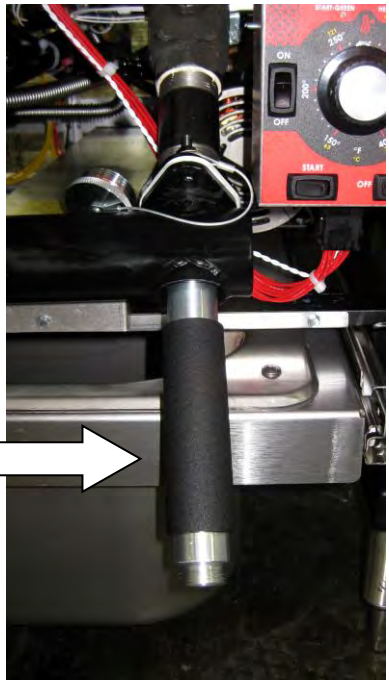
1. Pull the filter drawer out and remove the crumb basket and empty any debris into the trash.
2. Remove the filter screen assembly. Scrape debris from the filter screen. Then remove the insert by unlatching the latch. Clean all parts thoroughly.
3. Scrape debris from the bottom of the filter pan and discard in the trash.
4. Reassemble all filter components after being dried thoroughly.

FLUSH AND DISCARD:

1. Follow filtering instructions 1-3, however do not put oil treatment media into the fryer. Drain the fryer oil into the filter pan.
2. Attach the quick disconnect hose to the discard male quick disconnect fitting, (hose not supplied with fryer – Accessory Option).
3. Place other end of the discard hose into a container that is large enough to retain the discarded shortening.
4. With the power switch still ON; pull the Yellow Discard Handle Lever Rod towards you. Press the FILTER switch and the Motor/Pump will begin to operate. NOTE: Oil will come out immediately out of the nozzle end of the hose.
5. Once the oil has been discarded completely and the filter pan is empty, push the Discard Lever back in. Press the FILTER switch to the OFF position to stop motor/pump.
6. Disconnect the discard hose. The hose connection will be hot due to the temperature of the oil that was discarded. Be careful to let the hose drain before putting away. Close the drain valve and fill the fry tank with new oil.

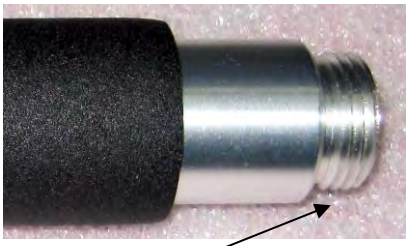
BOIL OUT PROCEDURE:

Use the Boil Out By-Pass™ drain extension allowing the boil out solution to exit the fry tank without using the filtering system. Do not allow water to run through the motor / pump. Drain the boil out solution into a bucket or place a hose on the end of the drain extension allowing the other end to flow into a floor drain. In Fig. 6 the arrow is pointing to the drain extension. It is threaded into the top coupling of the oil drain tube. Drain extension needs to be only hand tightened.



Boil Out By-Pass™ Extension Tube

Fig. 6



Standard Hose End

Drain Tube End

THERMAL OVERLOAD PROTECTION BUTTON:

The motor/pump supplied with the filtering system has a thermal overload protection circuit that senses when excess heat occurs due to filtering for long periods of time or under heavy load prior to discarding debris buildup. If the thermal overload protection is tripped, wait 5 minutes and then reset the motor by pushing in the red button. The arrow in Figure 7 shows the location of the reset button; located on the front of the motor / pump facing towards you.

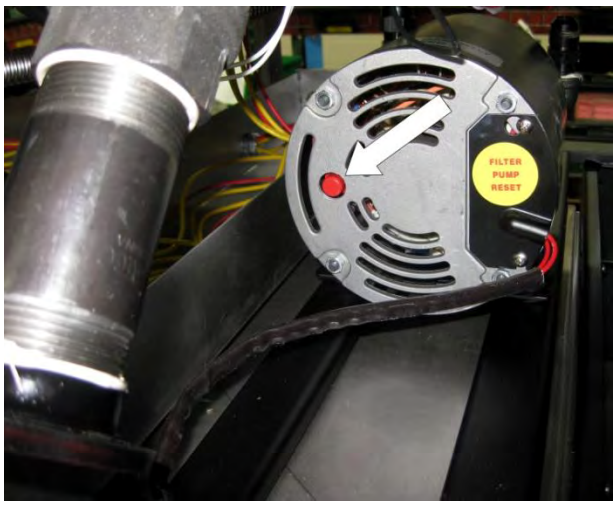


Fig. 7

MAINTENANCE

⚠ WARNING Hot oil and hot parts can cause burns. Use care when operating, cleaning, and servicing the fryer.

⚠ WARNING Spilling hot fryer compound can cause severe burns. Do not move fryer without draining all frying compound from the tank.

Service in the US and Canada

Contact your local Vulcan-Hart Service office or address on the front of this manual.

In Australia

Contact Hobart Food Equipment PTY. LTD., 16 Hilly Street Morlake, N.S.W. 2137 Australia; P.O. Box 100, Concord N.S.W. 2137; Tel: (02) 9736 1200; Fax: (02) 9736 1555. www.hobartfood.com.au

Troubleshooting Chart:

Problem:	Probable Cause:
No Heat:	Power switch not turned on. Wire connections loose (call service) Wires connections need cleaning High Limit (call service)
Insufficient or too much heat:	Temperature not set to desired temperature. High limit tripped (call service) Temperature probe (call service)
Tank will not drain:	Shortening too cold. Drain pipe clogged with debris.
Motor / pump will not pump oil:	Suction tube not seated correctly in receptacle block. Filter screen is clogged and needs cleaning. Shortening is too thick / cold. Heat oil up to min. 300º F. Discard valve lever not fully engaged either for filtering or discarding.

EXTENDED SHUTDOWN & RESTART OF YOUR VULCAN COOKING EQUIPMENT

Following you will find instructions on how to shut down your Vulcan cooking equipment for an extended period, and how to safely restart equipment after idle.

Always refer to the procedures as instructed in the Installation & Operation manual for your specific model. Manuals may be found by visiting the Vulcan website and clicking on RESOURCES at the top right of the home page.

Always remember that cooking equipment and its parts are hot. Use care when operating, cleaning or performing maintenance.

For additional product resources, please visit https://www.vulcanequipment.com/.

GAS & ELECTRIC FRYERS

EXTENDED SHUTDOWN – LG, VEG, GR GAS FRYERS

1. Turn the thermostat knob to off.
2. Thoroughly drain the fryer according to instructions outlined in “draining the fryer” section.
3. Clean the fryer according to instructions outlined in “cleaning” section.
4. Push in the pilot knob and turn to off.
5. Turn off the main gas shutoff valve.

Model 1VEG35M
Shown with accessory casters

EXTENDED SHUTDOWN – POWERFRY GAS FRYERS

1. Thoroughly drain the fryer. Refer to instructions outlined in “draining the fryer” section.
2. Clean the fryer according to instructions outlined in “cleaning” section.
3. Push power switch to the off position
4. Turn off the main gas shutoff valve.

EXTENDED SHUTDOWN – ER ELECTRIC FRYERS

1. Open the door to the fryer.
2. Press the power switch to the off position.
3. Thoroughly drain the fryer according to instructions outlined in “draining the fryer” section.
4. Clean the fryer according to instructions outlined in “cleaning” section.
5. Turn off the main electric circuit breaker to fryer.

GAS & ELECTRIC FRYERS *(CONTINUED)*

DRAINING THE TANK – FREESTANDING FRYERS WITHOUT FILTRATION

1. Turn off fryer.
2. Insert the drain extension into the drain valve. Tighten only hand tight.
3. Direct the drain spout into the container that you want to drain the shortening into.
4. Open the drain valve. The oil will drain into the container. When the container is full or the fryer tank is empty, close the drain valve. Repeat this step until the fryer is empty. Remove the drain extension and place it back into the provided holder.

DRAINING THE TANK – FRYERS WITH BUILT-IN FILTRATION

Fryers with Millivolt (M) controls:

1. Turn thermostat knob to off position.
2. Open drain valve and allow oil to drain into filter pan.
3. Close drain valve.
4. Attach high temperature hose to male quick disconnect.
5. Place nozzle end into a discard container.
6. Pull lever to turn on motor/pump.
7. Once oil is drained from filter pan push lever in to turn off motor/pump.

Fryers with Analog (A) Controls:

1. Do not turn off power.
2. Open drain valve and allow oil to drain into filter pan.
3. Close drain valve.
4. Discard oil using flush/discard hose. Make sure that the vertical filter switch is on discard.
5. Place nozzle end into a discard container.
6. Press filter switch on control panel to turn on motor/pump.
7. Once oil is drained from filter pan press filter switch to turn off motor/pump.
8. Press filter switch to flush/ filter and not discard.

Fryers with Digital (D) or Computer (C) Controls:

1. Do not turn off power.
2. Open drain valve and allow oil to drain into filter pan.
3. Close drain valve.
4. Discard oil using flush/discard hose. Make sure that the vertical filter switch is on discard.
5. Place nozzle end into a discard container.
6. Pull lever to turn on motor/pump.
7. Press filter switch on control panel to turn on motor/pump. Hold for at least 3 seconds.
8. Once oil is drained from filter pan press filter switch to turn off motor/pump.

GAS & ELECTRIC FRYERS *(CONTINUED)*

CLEANING

1. Clean your fryer regularly with the tank brush along with a damp cloth, and polish with a soft dry cloth. If regular cleaning is neglected, grease will be burned on and discolorations may form.
    a. Fingerprints are sometimes a problem on highly polished surfaces of stainless steel. They can be minimized by applying a cleaner that will leave a thin oily or waxy film.
2. Clean all exterior surfaces of your fryer at least once daily.
3. Use a damp cloth with warm water and a mild soap or detergent.
    a. Do not use chlorine or sulfate/sulfide cleaners.
4. Rinse thoroughly, and then dry with a soft dry cloth.
5. Keep the fryer exterior clean and free of accumulated grease to prevent stubborn stains from forming. If regular cleaning is neglected, grease will be burned on and discolorations may form.
6. Remove discolorations by washing with any detergent or soap and water.
7. Use a self-soaping, non-metallic scouring pad for particularly stubborn discolorations.
8. Always rub with the grain of the stainless steel.
    a. Do not use a metallic scoring pad or harsh cleaners.
9. Air Filter Cleaning (VK fryers only): The air filter needs to be cleaned at least once every three months. Pull the air filter off and clean in a dishwasher or by hand. Dry thoroughly before replacing it into position. There is no need to tighten the band clamp with tools.

RESTART FROM EXTENDED SHUTDOWN – ALL MODELS

1. Schedule a qualified gas service technician to be onsite upon restart if kitchen has been down for more than 30 days.
    a. Check all gas equipment in kitchen for gas leaks.
2. Perform a boil-out as instructed in the Installation & Operation manual for your specific model.
3. Perform the BEFORE FIRST USE cleaning instructions as instructed in the Installation & Operation manual for your specific model.
4. Fill the fry tank with oil and start fryer per the instructions of your model Installation & Operation manual guidelines.

VULCAN FRYERS
SOLID STATE KNOB CONTROLS GUIDE

VULCAN
DONE TO PERFECTION.

FILTERING in 7 Easy Steps

STEPS 1-4

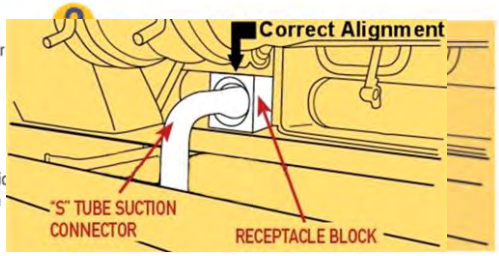
TIP: Use provided crumb scoop to remove and suspend crumbs on the bottom of tank before proceeding to Step 1.

1

Make sure that the Power is on.
Do NOT turn off the power to the fryer

- Vulcan recommends adding an oil treatment media to the oil prior to filtering.
- Make sure that the filter drawer is closed completely and that the suctio tube and receptacle block are in the correct position.

2



Open the fryer doors and ensure that the filter drawer is pushed back into place under the fryer with the "S" Tube Suction Connector and Receptacle Block engaged.

3

Open the drain valve slowly allowing the oil to drain down into the filter pan. The burners or heating elements will automatically turn off.

TIP: Use the provided tank brush to clean and remove food particles from the fry tank.

4

Press **FILTER** switch to engage the motor/ pump. Allow the oil to cycle for a few minutes until the oil and fryer are clean.

STEPS 5-7

5

Close the drain valve slowly allowing the oil to fill the fry tank with clean oil. The burners or heating elements will not turn on at this point. Allow the oil to fill back into the fry tank from the filter pan. It is normal to see a few air bubbles during this process.

6

When the filter pan is empty push the **FILTER** switch to turn off the motor / pump. Oil level should be between the MIN and MAX lines.

7

Once the level of the oil has been checked and verified, press the **START** switch. The red light will turn to green. The burners or heating elements will automatically turn back on and the fryer will resume heating. Yellow light will display when heating.

DRAINING AND DISCARDING OIL FROM THE FRYER

A Follow filtering instructions steps 2 - 3, however **DO NOT** put oil treatment media into fryer. Drain the fryer oil into the filter pan.

B Attach the quick disconnect hose to the discard male quick disconnect fitting. Do not connect hose while motor/pump is running.

C Place other end of the discard hose into a container that is large enough to retain the discarded shortening.

D To start the discard operation, filter switch behind door must be in the "use hose to discard only" position.

E Before pressing the FILTER button located behind the door, hold the hose firmly and point to the discard container. Press the FILTER button and the motor/pump will start immediately. Oil will begin to flow through the hose into the container.

F To turn off the motor/pump, simply push the FILTER button on the control again. Push the filter switch behind the door back to the "use hose to rinse & fill" position. Disconnect the discard hose. Be careful to let the hose drain before putting away. Close the drain valve and refill the fry tank with new oil.

NOTICE If discard vessel is not large enough to hold the entire shortening amount, stop the flow by pushing the FILTER button to turn the motor/pump off. Empty the container and resume discard operation by pushing the FILTER button and holding it for approximately 3 seconds.

NOTICE Open the filtering drawer approximately 1" to allow any oil in the return line to run back into the filter pan. This will take about 30 seconds to complete. Then open the drawer completely to clean filter components.

THESE INSTRUCTIONS ARE FOR FRYERS WITHOUT REAR OIL RECLAMATION CONNECTIONS.

⚠WARNING

HOT FRYING COMPOUND AND PARTS CAN CAUSE BURNS. USE CARE WHEN OPERATING, CLEANING, OR SERVICING THE FRYER. USE CARE WHEN FILTERING. DO NOT LEAVE UNATTENDED.

SPILLING HOT FRYING COMPOUND CAN CAUSE SEVERE BURNS. DO NOT MOVE THE FRYER WITHOUT FIRST DRAINING ALL FRYING COMPOUND FROM TANK.

NOTICE IF POWER IS MISTAKENLY TURNED OFF DURING THE FILTERING OPERATION, THE CORRECTIVE ACTION IS AS FOLLOWS:

1. CLOSE DRAIN VALVE
2. TURN POWER SWITCH ON
3. **IMMEDIATELY** OPEN DRAIN VALVE
4. CONTINUE FILTERING OPERATION PER STEPS 1-7

NOTICE NOT RECOMMENDED TO BE USED WITH SOLID SHORTENING.

F-32949 (September 2011)

www.VulcanHart.com • Fryer Technical Support: 1-800-814-2028

VULCAN FRYERS
SOLID STATE CONTROLS GUIDE

VULCAN
DONE TO PERFECTION.

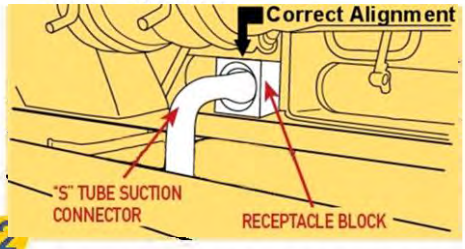
FILTERING in 7 Easy Steps (for revisions V4.00 or higher)

STEPS 1-3

TIP: Use provided crumb scoop to remove and suspend crumbs on the bottom of tank before proceeding to Step 1.

1

Make sure that the Power Switch is in the "ON" position.
Fryer must have power to operate the motor/pump.
Fryer Temperature should be between 300-350 Degrees Fahrenheit.
RECOMMENDED: ADD OIL TREATMENT MEDIA.



2

Open the fryer doors and ensure that the filter drawer is pushed back into place under the fryer with the "S" Tube Suction Connector and Receptacle Block engaged.

3

- Turn the drain valve to allow the oil to drain into the filter pan below. The burners will automatically turn off.
- While draining the tank, use the provided tank brush to move the residue at the bottom and sides of the tank down into drain tube.
- To turn on the filter motor/pump, push the FILTER button located on the control panel, holding it for approximately 3 seconds.
- Allow the oil to cycle through the filtering operation for about 3 minutes or until satisfied that the oil and fry tank are clean. **DRAINING displays.**

TIP: Use provided tank brush to clean and remove food particles on the fry tank.

STEPS 4-7

4

When filtering is finished, close the red drain valve by turning the red drain handle.
FILL VAT displays.

5

- Allow all of the oil to flow back into the fryer from the filter pan. It is normal to see air bubbles in the tank towards the end of filtering.
- When the filter pan is empty, push the FILTER button to turn off the motor/pump.
- Oil level should be between the Min/Max lines on the tank back. **VAT FULL displays.**

(Display is asking if the tank is full).

6

Once the oil level has been checked and verified, press the TEMP button. The burners will automatically turn back on and the fryer will resume heating. **HIT TEMP displays.**

7

After pressing the TEMP button the fryer resumes heating. **HEATING displays.**

DRAINING AND DISCARDING OIL FROM THE FRYER

A Follow filtering instructions steps 2 – 4, however **DO NOT** put oil treatment media into fryer. Drain the fryer oil into the filter pan.

B Attach the quick disconnect hose to the discard male quick disconnect fitting. Do not connect hose while motor/pump is running.

C Place other end of the discard hose into a container that is large enough to retain the discarded shortening.

D To start the discard operation, filter switch behind door must be in the "use hose to discard only" position.

YOU MUST USE THE FILTER BUTTON ON THE DIGITAL CONTROL TO DISCARD THE OIL. Press the FILTER button on the digital control and hold for approximately 3 seconds to activate the motor/pump. Oil will begin to flow through the hose and into the container. **PLEASE NOTE** that the display will not change for this operation.

E To turn off the motor/pump, simply push the FILTER button on the digital control again. Push the filter switch behind door back to the "use hose to rinse & fill" position. Disconnect the discard hose. Be careful to let the hose drain before putting away. Close the drain valve and refill the fry tank with new oil.

WARNING: Hose connection will be HOT. Use protective heat resistant gloves when handling.

NOTE: If discard vessel is not large enough to hold the entire shortening amount, stop the flow by pushing the FILTER button to turn the motor/pump off. Empty the container and resume discard operation by pushing the FILTER button and holding it for approximately 3 seconds.
THESE INSTRUCTIONS ARE FOR FRYERS WITHOUT REAR OIL RECLAMATION CONNECTIONS.

NOTICE Open the filtering drawer approximately 1" to allow any oil in the return line to run back into the filter pan. This will take about 30 seconds to complete. Then open the drawer completely to clean filter components.
THESE INSTRUCTIONS ARE FOR FRYERS WITHOUT REAR OIL RECLAMATION CONNECTIONS.

⚠ WARNING

- HOT FRYING COMPOUND AND PARTS CAN CAUSE BURNS. USE CARE WHEN OPERATING, CLEANING, OR SERVICING THE FRYER. USE CARE WHEN FILTERING. DO NOT LEAVE UNATTENDED.
- SPILLING HOT FRYING COMPOUND CAN CAUSE SEVERE BURNS. DO NOT MOVE THE FRYER WITHOUT FIRST DRAINING ALL FRYING COMPOUND FROM TANK.

IMPORTANT:
IF POWER IS MISTAKENLY TURNED OFF DURING THE FILTERING OPERATION, THE CORRECTIVE ACTION IS AS FOLLOWS:
1. CLOSE DRAIN VALVE
2. TURN POWER SWITCH ON
3. **IMMEDIATELY** OPEN DRAIN VALVE
4. CONTINUE FILTERING OPERATION PER STEPS 1-6

NOTE: NOT RECOMMENDED TO BE USED WITH SOLID SHORTENING.

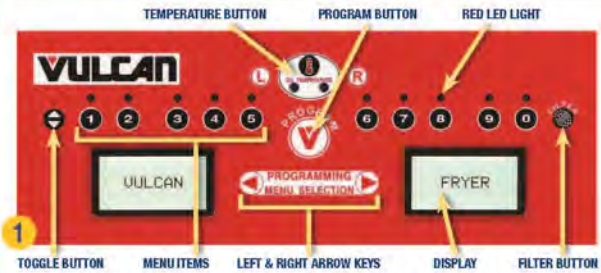
VULCAN FRYERS
COMPUTER CONTROLS GUIDE

VULCAN
DONE TO PERFECTION.

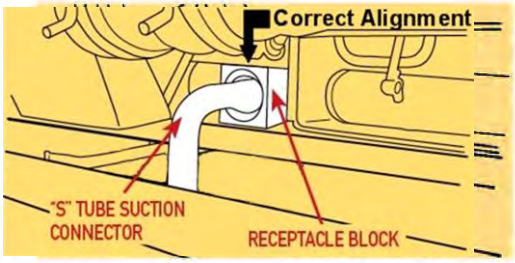
FILTERING in 6 Easy Steps (for revisions V2.70 or higher)

STEPS 1-3

TIP: Use provided crumb scoop to remove and suspend crumbs on the bottom of tank before proceeding to Step 1.



Make sure that the Power Switch is in the "ON" position. Fryer must have power to operate the motor/pump. Fryer Temperature should be between 300-350 Degrees Fahrenheit. RECOMMENDED: ADD OIL TREATMENT MEDIA.



Open the fryer doors and ensure that the filter drawer is pushed back into place under the fryer with the "S" Tube Suction Connector and Receptacle Block engaged. Filter switch behind the door must be in the filter position (not on hose).

- Turn the drain valve to allow the oil to drain into the filter pan below. The fryer will automatically turn off.
- While draining the tank, use a crumb scoop to move the residue at the bottom and sides of the tank down into drain tube.
- To turn on the filter motor/pump, push the FILTER button located on the control panel, holding it for approximately 3 seconds.
- Allow the oil to cycle through the filtering operation for about 3 minutes or until satisfied that the oil and fry tank are clean. DRAINING OIL displays.

TIPS: Use provided tank brush to clean and remove food particles on the fry tank. Use provided clean-out rod to clear drain if clogging occurs.

STEPS 4-6

- When filtering is finished, close the red drain valve by turning the red drain handle. FILL VAT displays.
- Allow all of the oil to flow back into the fryer from the filter pan. It is normal to see air bubbles in the tank toward the end of filtering.

- When the filter pan is empty, push the FILTER button to turn off the motor/pump.
- Oil level should be between the Min/Max lines on the tank back. VAT FULL ? PUSH TEMP displays. (Display is asking if the tank is full.)

Once the oil level has been checked and verified, press the TEMP button. The fryer will automatically turn back on and the fryer will resume heating. HEATING displays if oil temperature is below set temperature.

DRAINING AND DISCARDING OIL FROM THE FRYER

A Follow filtering instructions steps 2 – 4, however DO NOT put oil treatment media into fryer. Drain the fryer oil into the filter pan.

B Attach the quick disconnect hose to the discard male quick disconnect fitting. Do not connect hose while motor/pump is running.

C Place other end of the discard hose into a container that is large enough to retain the discarded shortening.

D To start the discard operation, filter switch behind door must be in the "use hose to discard only" position.

YOU MUST USE THE FILTER BUTTON ON THE COMPUTER CONTROL TO DISCARD THE OIL. Press the FILTER button on the computer control and hold for approximately 3 seconds to activate the motor/pump. Oil will begin to flow through the hose and into the container. PLEASE NOTE that the display will not change for this operation.

E To turn off the motor/pump, simply push the FILTER button on the computer control again. Push the filter switch behind door back to the "use hose to rinse & fill" position. Disconnect the discard hose. Be careful to let the hose drain before putting away. Close the drain valve and refill the fry tank with new oil.

WARNING: Hose connection will be HOT. Use protective heat resistant gloves when handling.

NOTE: If discard vessel is not large enough to hold the entire shortening amount, stop the flow by pushing the FILTER button to turn the motor/pump off. Empty the container and resume discard operation by pushing the FILTER button and holding it for approximately 3 seconds. THESE INSTRUCTIONS ARE FOR FRYERS WITHOUT REAR OIL RECLAMATION CONNECTIONS

NOTICE Open the filtering drawer approximately 1" to allow any oil in the return line to run back into the filter pan. This will take about 30 seconds to complete. Then open the drawer completely to clean filter components.
THESE INSTRUCTIONS ARE FOR FRYERS WITHOUT REAR OIL RECLAMATION CONNECTIONS.

⚠ WARNING

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NOTE: NOT RECOMMENDED TO BE USED WITH SOLID SHORTENING.

SERVICE MANUAL

MODEL ERD40 Shown

FLOOR MODEL ELECTRIC FRYERS

MODEL	ML	DESCRIPTION
ERD40	114614	15 ½" WIDE
ERD50	114615	15 ½" WIDE
ERD225	114616	15 ½" WIDE
ERD85	114617	21" WIDE
ERC40	114618	15 ½" WIDE
ERC50	114619	15 ½" WIDE
ERC225	114620	15 ½" WIDE
ERC85	114621	15 ½" WIDE
ERO15	114622	15 ½" WIDE FLOOR SERVE STATION
ERO21	114623	21" WIDE FLOOR SERVE STATION

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified. If you have attended a Vulcan Service School for this product, you may be qualified to perform all the procedures described in this manual.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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Form 24577 (12-96)

TABLE OF CONTENTS

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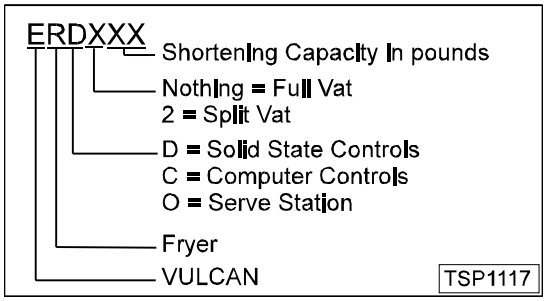
GENERAL

INTRODUCTION

This manual covers the following floor model fryers.

All fryer models are available with the following electrical specifications:
208/60/3, 240/60/3, 480/60/3, 220/380/60/3 4 wire, 240/415/60/3 4 wire

Serve station models are available in 120/60/1 if equipped with heat lamp.



MODEL	DESCRIPTION	CONTROLS	KW	SHORTENING CAPACITY IN POUNDS
ERD40	15 ½" wide	Solid State	14 & 17	40
ERD50	15 ½" wide	Solid State	14, 17 & 21	50
ERD225	15 ½" wide	Solid State	14, 17 & 21	25 for each vat
ERD85	21" wide	Solid State	24	85
ERC40	15 ½" wide	Computer	14 & 17	40
ERC50	15 ½" wide	Computer	14, 17 & 21	50
ERC225	15 ½" wide	Computer	14, 17 & 21	25 for each vat
ERC85	21" wide	Computer	24	85
ER015	15 ½" wide Serve Station			
ER021	21" wide Serve Station			

ERD225

ERC50 STATION

ERD85

ERO15 SERVE

BATTERY CONFIGURATION

Batteries of up to five fryers can be configured.

NOTE:

1. A filter dump station can be located under any position in a battery if it has been built without a serve station.
2. A filter dump station can be located under any position in a battery if the line-up has been built with a serve station located at either end of the battery.
3. When a serve station is built between two fryers within a battery, the filter dump station is located under the serve station.
4. In two-unit batteries utilizing a serve station, the filter dump station will always be located under the fryer.

543-1160

Three unit battery shown

TOOLS

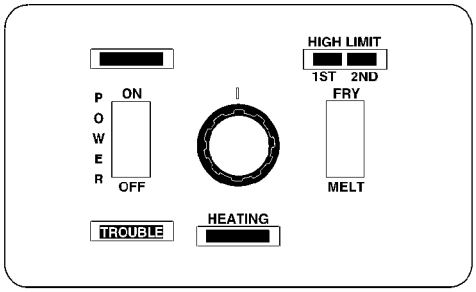
- Standard set of hand tools.
- VOM with AC current tester.

NOTE: Any quality VOM with a sensitivity of 20,000 ohms per volt can be used.

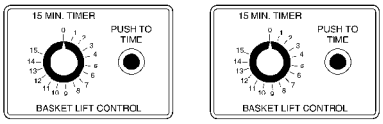
- Thermometer.
- Field service grounding kit Part #TL-84919.
- Loctite #242 Part #520228.

OPERATOR CONTROL LOCATION

Solid State Controls



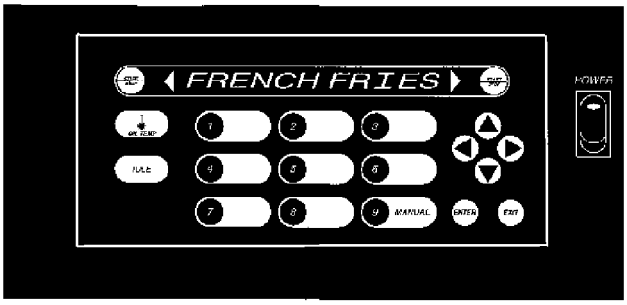
SOLID STATE CONTROL



SOLID STATE CONTROL
TIMED BASKETLIFT
OPTION

545-1162

Computer Controls



PL-52208

REMOVAL AND REPLACEMENT OF PARTS

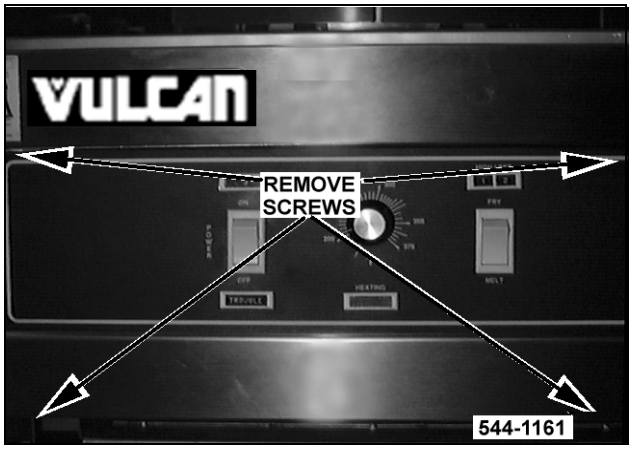
CONTROL PANELS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

WARNING: HOT OIL AND PARTS CAN CAUSE BURNS. USE CARE WHEN SERVICING THE FRYER.

1. Remove the two screws from the upper corners of the control panel and two screws in bottom lip.

Solid State Controls shown



2. Lift out to access the back of the control panel.
3. Disconnect the lead wires to the control panel components to remove it from the fryer.
4. Reverse procedure to install.

POTENTIOMETER (SOLID STATE MODELS)

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove the control panel as outlined under "CONTROL PANELS".
2. Unplug the lead wire connection.
4. Loosen the set screw and remove the knob.
5. Remove the nut from the shaft and remove the potentiometer.
6. Reverse procedure to install.

COMPUTER CONTROL

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

CAUTION: CERTAIN COMPONENTS IN THIS SYSTEM ARE SUBJECT TO DAMAGE BY ELECTROSTATIC DISCHARGE DURING FIELD REPAIRS. A FIELD SERVICE GROUND KIT IS AVAILABLE TO PREVENT DAMAGE. THE FIELD SERVICE GROUNDING KIT MUST BE USED ANYTIME THE CONTROL BOARD IS HANDLED.

1. Remove the control panel as outlined under "CONTROL PANELS".
2. Unplug the lead wire connections.
3. Remove computer control.
4. Reverse procedure to install.

NOTE: There are no setup procedures for installing new computer control board because wiring harness tells board what kind of fryer it is installed in.

5. Using the “INSTRUCTIONS” manual, program the controller with the customer’s settings and products.

HEATING ELEMENTS

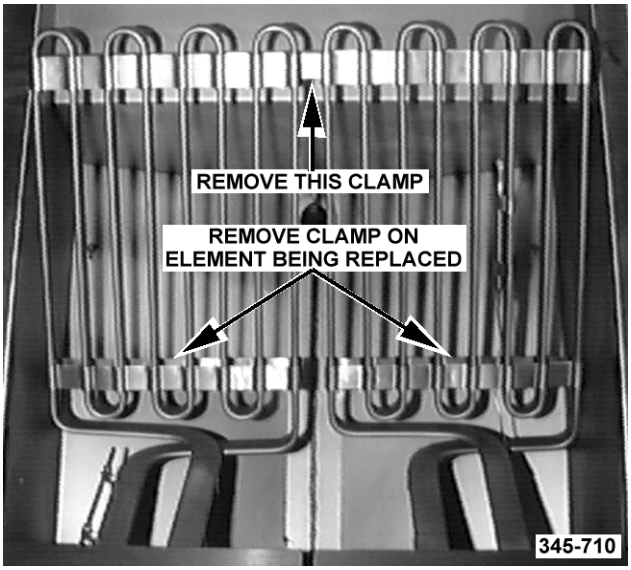
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

NOTE: Don't bend or kink high limit capillary tube.

1. Remove the basket hangers or guide block support (basket lift models).

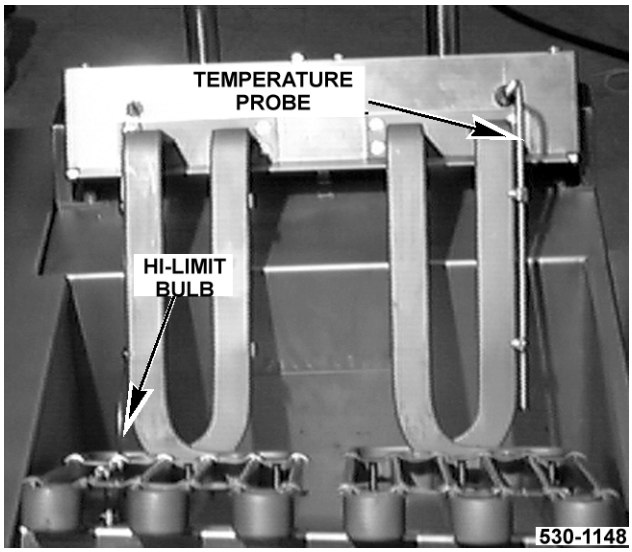
2. Lift the elements from the shortening and allow to drain.

3. Remove the element clamp from the end of the elements and the clamp at the other end of the element being replaced..

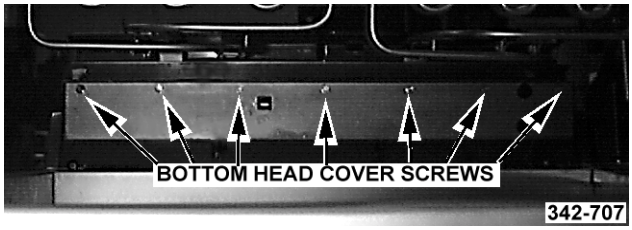


4. Remove bulb and capillary tube clamps and/or probe clamps from the element being replaced. Save for reuse if needed.

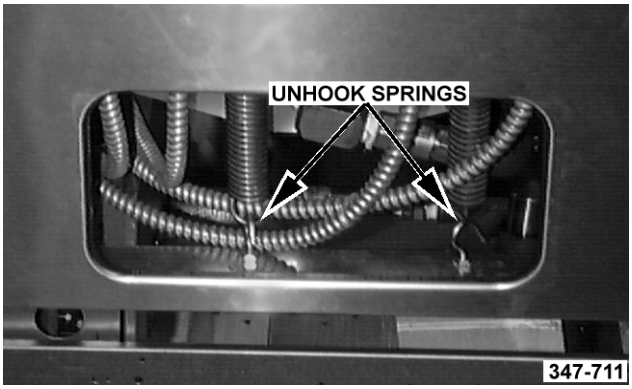
NOTE: Half of each clamp is permanently fixed in place on the element. Center the Hi-limit bulb in its clamps before tightening clamp. The Temperature Probe should be inserted in the grommet in the head then secured with the clamps.



5. Remove screws from the bottom of the element head cover.

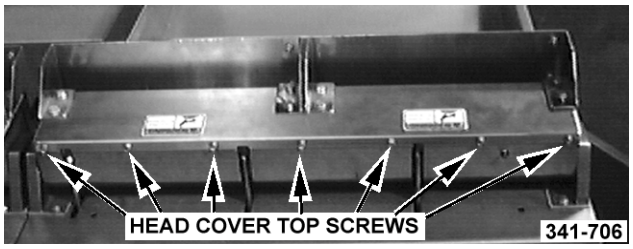


6. Lower the elements and remove the lift assist springs from the hooks at the rear of the machine.



7. Remove four screws securing element bracket.

8. Remove the screws from the rear top of the head cover.



9. Lift cover enough to access element wires. Identify the six lead wire connections for connection later. Then disconnect the six lead wires from the element being removed.

NOTE: Each heater has three elements inside and two wire connections for each element.

10. Remove the element.

11. Reverse procedure to install.

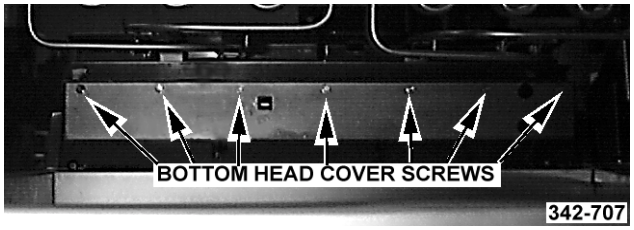
PROBE

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

NOTE: Don't bend or kink high limit capillary tube.

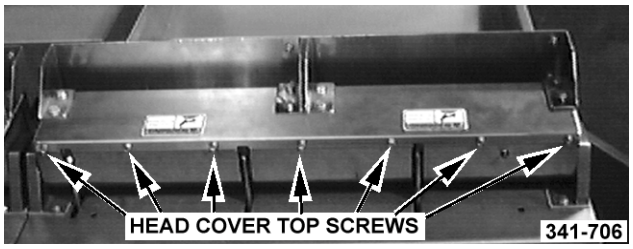
1. Raise the heating elements and allow to drain.

2. Remove screws securing the bottom of the head cover.



3. Remove the clamps from the probe.

4. Lower the element enough to remove the screws securing the top of the head cover.



5. Lift the head cover enough to access and disconnect the probe lead wires.

6. Reverse procedure to install.

7. Check temperature control for calibration as outline under "TEMPERATURE CONTROL CALIBRATION".

HIGH LIMIT THERMOSTAT

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

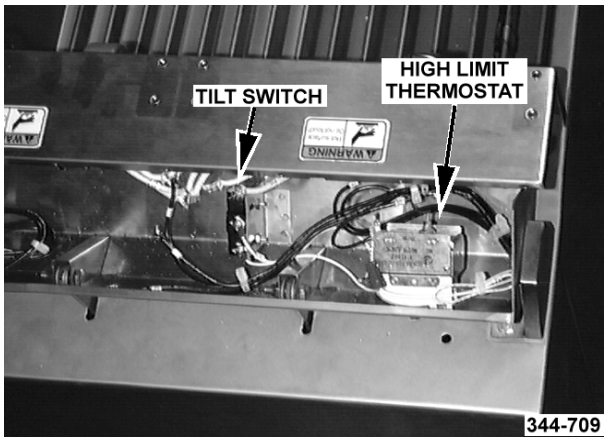
1. Raise the heating elements out of the shortening and allow to drain.

2. Loosen the clamps around the bulb and capillary tube.

3. Remove screws securing the bottom of the head cover.

4. Lower the element enough to remove the screws securing the top of the head cover.

5. Lift the head cover enough to access and disconnect the lead wires.



6. Remove the screws that secure the high limit thermostat.

7. Remove the grommet from the element head.

8. Remove the bulb, capillary tube and the high limit thermostat from the element head.

9. Reverse procedure to install.

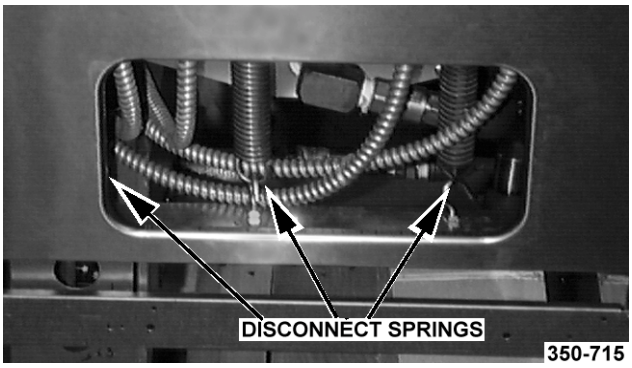
LIFT ASSIST SPRINGS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove head cover screws.

2. Remove access cover by prying out on top edge with small screwdriver.

3. Disconnect spring(s) at bottom.



4. Lift head cover enough to access hanger mounting bolts.

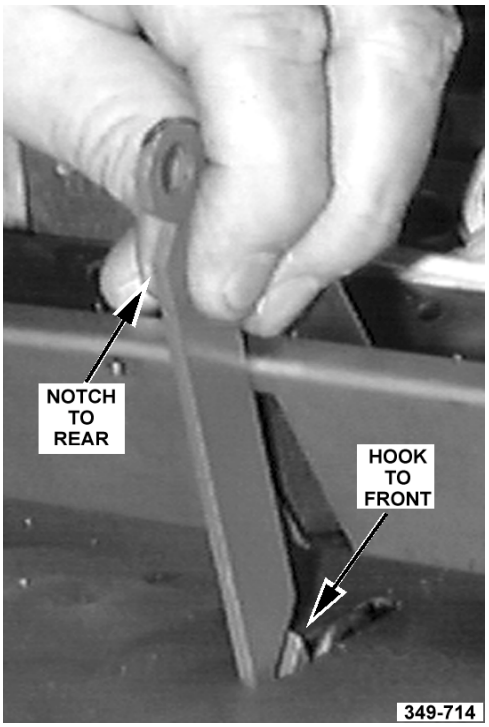
NOTE: Do not bend or kink high limit capillary tube.

5. Remove hanger mounting nut and bolt.

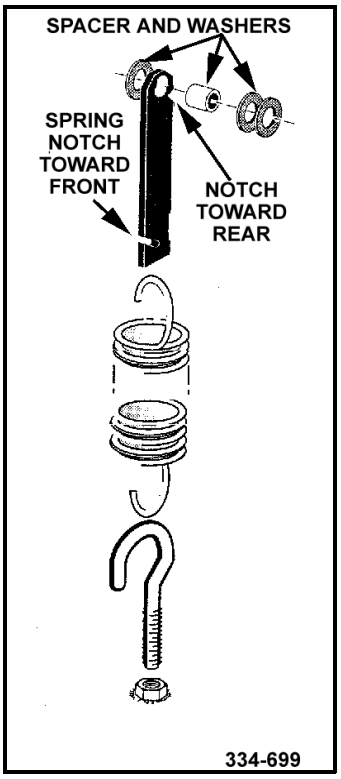
6. Remove spacer and washers.

7. Remove hanger and spring out from bottom.

8. To install spring, insert hanger from top with notch pointing to rear of unit and spring hook opening pointing to front of unit. Hold in place while inserting spring from bottom.



9. Hook spring onto hanger. Reassemble spacer and washers onto hanger and secure with bolt and nut.



10. Reconnect spring at bottom and adjust as outlined under “LIFT ASSIST SPRING ADJUSTMENT”.

11. Install covers.

TILT SWITCH

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

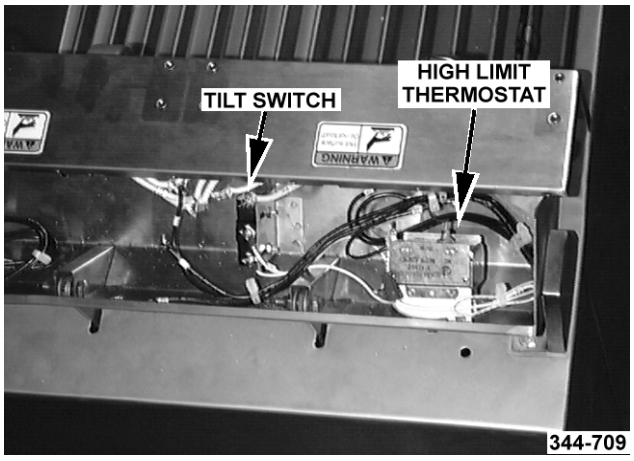
1. Remove head cover screws.

2. Lift head cover enough to access tilt switch mounting screws and remove screws.

NOTE: Do not bend or kink high limit capillary tube.

3. Disconnect tilt switch lead wires.

4. Remove tilt switch.



5. Reverse procedure to install and adjust as outlined under " TILT SWITCH ADJUSTMENT".

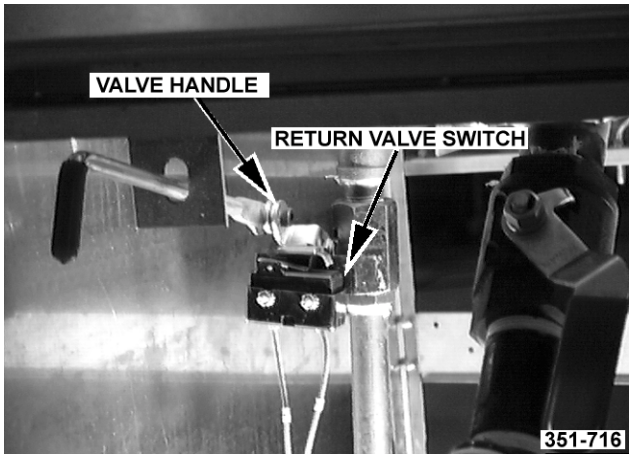
FILTER-READY RETURN VALVE SWITCH

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Open front door.

2. Disconnect lead wires to return valve switch.

3. Remove switch mounting screws.



4. Reverse procedure to install.

Note: Switch mounting is a fixed location and has no provision for adjustment. The normally open contacts close before the valve handle is in the full open position.

SERVICE PROCEDURES AND ADJUSTMENTS

WARNING: HOT OIL AND PARTS CAN CAUSE BURNS. USE CARE WHEN SERVICING THE FRYER.

WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TESTS OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

THERMISTOR PROBE RESISTANCE CHART

Solid State Control

°F	Resistance ± 10%
77	30,000 ohms
311	494 ohms
340	340 ohms

NOTE: If probe is opened or disconnected, the LED near the center of the Control Board will be on. If probe is shorted, the first high limit light will be on.

Computer Control

°F	Resistance ± 10%	°F	Resistance ± 10%
77	100,000 ohms	300	1394 ohms
212	5573 ohms	350	717.7 ohms
275	2004 ohms	392	434.5 ohms

TEMPERATURE CONTROL CALIBRATION

Solid State Control

1. Shortening in tank must be to fill line.
2. Allow the oil to cool below 300°F.
3. Place a thermometer in the center of the tank one inch below the oil surface.
4. Set the temperature control to 350°F and turn the fryer on.
5. After the thermometer reads 350°F, allow the temperature control to cycle three times.
6. Agitate the shortening, to eliminate any cold zones, while you record the temperatures to calculate average temperature.
7. Calculate the average temperature. Average temperature = (Temperature at "off" + temperature at "on") / 2 . (Example: (360° + 340°) / 2 = 350°F. The average temperature should be 350°F (± 5°F). The following steps should be taken if not.
   A. Carefully loosen the set screw in the temperature control knob.
   B. Rotate the knob and set the knob at the shortening temperature.
   C. Tighten the set screw.
   D. Allow the fryer to cycle and check for agreement with the thermometer.
8. If the above adjustments can not be obtained, check the control and temperature probe as outlined under "TEMPERATURE CONTROL TEST" and "THERMISTOR PROBE RESISTANCE CHART".

TEMPERATURE CONTROL TEST

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1. Remove screws securing control panel and let panel swing down.
2. Disconnect potentiometer plug.
3. Connect ohm meter to pins 1 and 3. Meter should read 10k ohms ± 10%.
4. Connect meter to pins 1 and 2. With knob turned clockwise to the stop, the meter should read zero ohms. Slowly rotate knob counterclockwise to stop and meter should change reading from 0 up to 10k ohms. Check that there are no dead spots and that wiper tracks smoothly as you rotate knob.
5. Connect meter to pins 3 and 2. With knob turned counterclockwise to the stop, the meter should read zero ohms. Slowly rotate knob clockwise to the stop and meter should change reading from 0 up to 10k ohms. Check that there are no dead spots and that wiper tracks smoothly as you rotate knob.

HEATING ELEMENT TEST

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Perform the appropriate test to obtain the desired information.

NOTE: Values in the chart are nominal values (± 10%).

				3 Phase, 3 Wire Supply Plus Ground								
TOTAL KW	**KW / PHASE**			**AMPS PER LINE 208V**			**AMPS PER LINE 240V**			**AMPS PER LINE 480V**		
	X-Y	X-Z	Y-Z	X	Y	Z	X	Y	Z	X	Y	Z
14	4.6	4.6	4.6	39	39	39	34	34	34	17	17	17
17	5.6	5.6	5.6	47	47	47	41	41	41	20	20	20
21	7	7	7	58	58	58	51	51	51	25	25	25
24	8	8	8	67	67	67	58	58	58	29	29	29

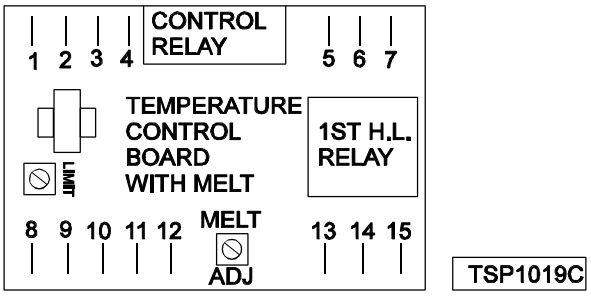
				3 Phase, 4 Wire Supply Plus Ground					
TOTAL KW	**KW / PHASE**			**AMPS PER LINE 220/380V**			**AMPS PER LINE 240/415V**		
	X-N	Y-N	Z-N	X	Y	Z	X	Y	Z
14	4.6	4.6	4.6	18	18	18	17	17	17
17	5.6	5.6	5.6	22	22	22	20	20	20
21	7	7	7	28	28	28	25	25	25
24	8	8	8	31	31	31	29	29	29

	3 Phase, 3 Wire Supply With Ground									3 Phase, 4 Wire Supply With Ground					
TOTAL KW	**RESISTANCE PER ELEMENT (OHMS) 208V**			**RESISTANCE PER ELEMENT (OHMS) 240V**			**RESISTANCE PER ELEMENT (OHMS) 480V**			**RESISTANCE PER ELEMENT (OHMS) 220/38OV**			**RESISTANCE PER ELEMENT (OHMS) 240/415V**		
	1L1 TO 1L1	1L2 TO 1L2	1L3 TO 1L3	1L1 TO 1L1	1L2 TO 1L2	1L3 TO 1L3	1L1 TO 1L1	1L2 TO 1L2	1L3 TO 1L3	1L1 TO 1L1	1L2 TO 1L2	1L3 TO 1L3	1L1 TO 1L1	1L2 TO 1L2	1L3 TO 1L3
14	18.3	18.3	18.3	24.2	24.2	24.2	97.6	97.6	97.6	42.2	42.2	42.2	48.7	48.7	48.7
17	15.2	15.2	15.2	20.4	20.4	20.4	83	83	83	34.6	34.6	34.6	41.5	41.5	41.5
21	12.4	12.4	12.4	16.3	16.3	16.3	66.4	66.4	66.4	27.3	27.3	27.3	33.2	33.2	33.2
24	10.7	10.7	10.7	14.2	14.2	14.2	57.4	57.4	57.4	24.6	24.6	24.6	28.7	28.7	28.7

MELT TEMPERATURE CALIBRATION (SOLID STATE CONTROL)

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

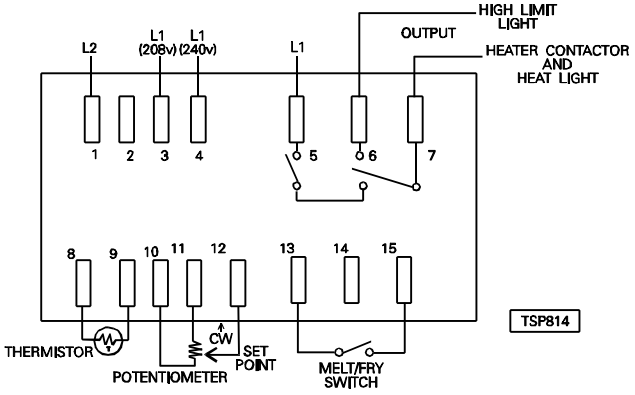
1. Place a thermometer in the center of the vat at one inch below the shortening surface.
2. Allow the shortening to cool below 135°F.
3. Remove the screws securing the control panel and allow it to swing downward.
4. Disconnect the electric harness and remove the control panel.
5. Remove the melt temperature adjustment screw sealant by gently chipping away with a screwdriver. (screw located to the right of pin #12)
6. Turn the adjustment screw clockwise to the stop position.



7. Connect a DC voltmeter between pins 13 and 15 on the electronic control board.
8. Reconnect the control panel wiring harness.
9. Reconnect the power supply.
10. While holding the control panel in your hand, turn the power switch on.
11. Set the temperature control to the frying temperature and the melt switch to melt.
12. The voltmeter should read 5 VDC.
13. When the shortening temperature reaches 135°F, turn the adjustment screw counterclockwise until the voltmeter reads 0 VDC.
14. Place a small drop of enamel paint or fingernail polish in the center of the screw.
15. Disconnect the power and remove the voltmeter.
16. Install the control panel.

CONTROL BOARD TEST (SOLID STATE CONTROL)

1. Check the temperature of the shortening. The temperature should be below 300°F and above 135°F.
2. Access the control board.
3. With the potentiometer set at 0°, turn the power switch on and check the incoming voltage.
   A. 120 volts, between pins 1 - 2 and I - 5.
   B. 208 or 240 Volts, between pins 1 - 3 and 1 - 5
   C. 240 Volts, between pins 1 - 4 and 1 - 5 (Export only)
4. Check the potentiometer as outlined under “TEMPERATURE CONTROL TEST”.
5. Check the thermistor temperature probe as outlined under “THERMISTOR PROBE RESISTANCE CHART”.
6. Set the control to call for heat, the heat light should light.
7. Check for output voltage between pins 1 - 7.



8. Replace the control board if there isn't any output.

COMPUTER CONTROL TEST

1. Check for 24 VAC at pin 1 (and pin 2 on split vat fryer) referenced to pin 13.

2. Check for 12 to 16 VDC between pins 23 and 24.

3. Verify probe thermistor operation as outlined under “THERMISTOR PROBE RESISTANCE CHART”.

4. Check output for 24 VAC at pin 15 (and pin 16 for split vat fryer) when calling for heat. Reference to pin 13.

5. Check output for 24 VAC at pin 14 (and pin 19 on split vat fryers) when in a cook cycle. Reference to pin 13.

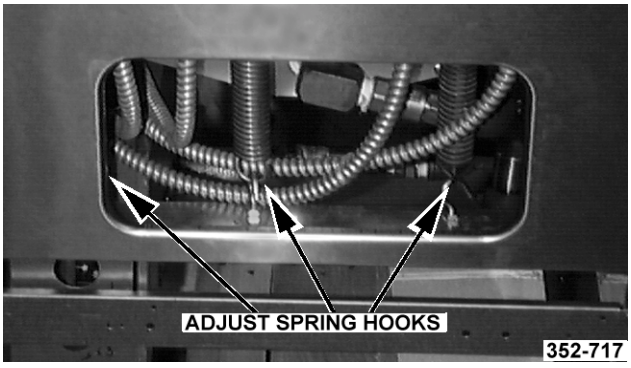
6. Replace computer control if outputs are not correct.

LIFT ASSIST SPRING ADJUSTMENT

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove rear access cover by prying out on top edge with small screwdriver.

2. Adjust all spring hooks evenly so that elements stay in the raised position when lifted.



3. Install rear cover.

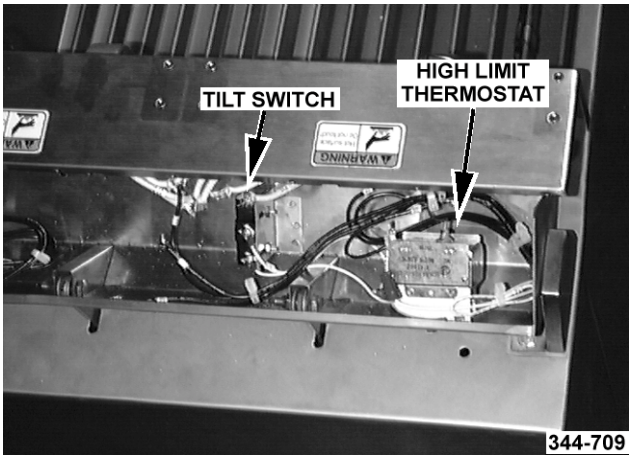
TILT SWITCH ADJUSTMENT

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE MAY BE TWO SEPARATE CIRCUITS. BE SURE BOTH ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove head cover screws.

2. Lift head cover enough to access tilt switch mounting screws.

NOTE: Do not bend or kink high limit capillary tube.



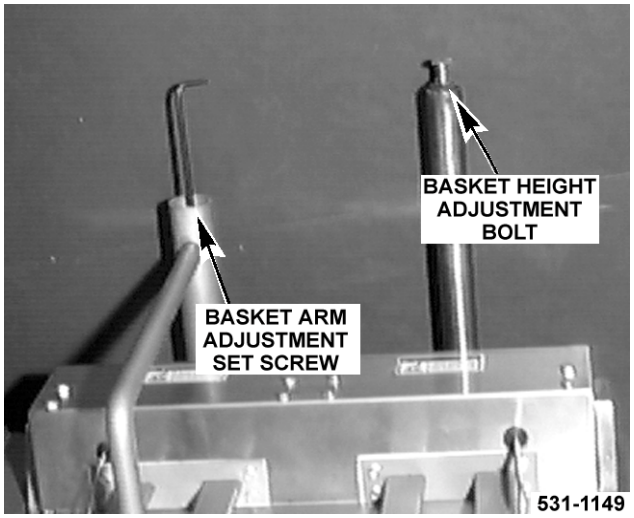
3. With oil at level mark on vat, switch should operate to shut off elements before front of elements leave oil. Loosen switch mounting screws and adjust switch as required.

4. Install head cover.

BASKET LIFT ARM ADJUSTMENT

1. When basket is in the down position, it should just clear the rack which is installed above the elements.
   A. To adjust, pull basket arm off lift shaft and adjust height adjustment bolt to raise or lower basket arm as required. Both baskets should be same height.

2. Rollers on basket arm should touch rear of tank and be square to tank.
   A. To adjust, loosen basket arm set screw and adjust arm in or out as required. Use Loctite #242 on set screw and tighten.

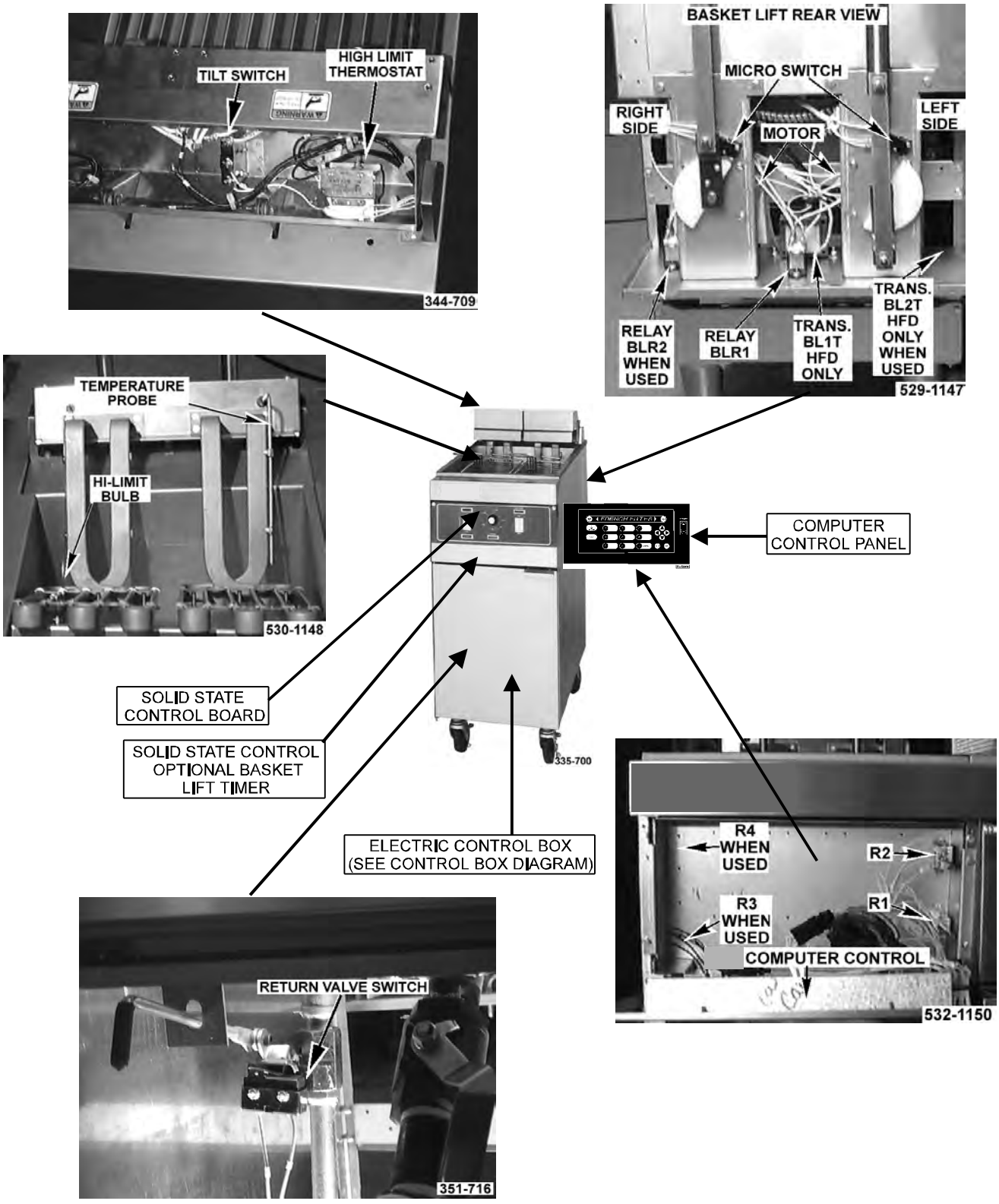


ELECTRICAL OPERATION

COMPONENT FUNCTION

1T TRANSFORMER	Supplies 12 VAC to computer power supply board.
2T TRANSFORMER	Supplies 24 VAC to computer control and/or inter-plumb system.
3T TRANSFORMER	Used in 480 VAC units.
BL1T TRANSFORMER	Supplies power to solid state model single and dual basket lifts.
BL2T TRANSFORMER	Used in addition to BL1T to supply power to solid state model split vat basket lift.
COMPUTER CONTROL	Monitors temperature probe to regulate the shorting temperature and controls cooking cycle.
CONTACTOR	Controls voltage to heating elements.
FUSES 1FU, 2FU	Protect control circuits.
IPR1 RELAY	Inter-plumb control relay which controls power to the filter motor.
HEAT LIGHT	Indicates power is being supplied to the heating elements.
HEATING ELEMENT(S)	Produces heat that is transferred to the shortening.
HIGH LIMIT THERMOSTAT	Prevents the oil from reaching temperatures over 435°F (manual reset)
HIGH TEMP LIMIT LIGHT	Signals that the high limit(s) operated.
POWER LIGHT	Indicates power switch is in the "on" position.
PS-1 COMPUTER POWER SUPPLY BOARD	Supplies 10 VDC to computer control.
POWER SWITCH	Supplies power to control circuit.
RETURN VALVE SWITCH	Controls IPR1 relay which starts filter motor when valve is opened.
RELAYS R1 thru R4	Control relays on computer control models which control power to computer and heat circuits.
TEMPERATURE CONTROL . . .	Monitors temperature probe to regulate the shortening temperature.
TEMPERATURE PROBE	Senses temperature of shortening.
TILT SWITCH	Removes power to heat circuit if elements are raised.

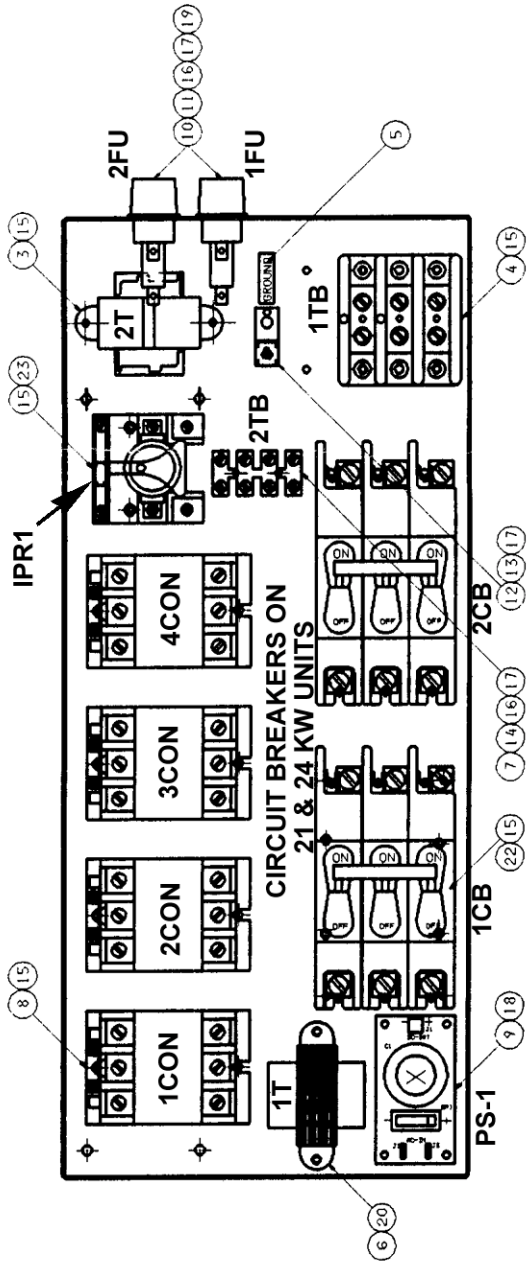
COMPONENT LOCATION



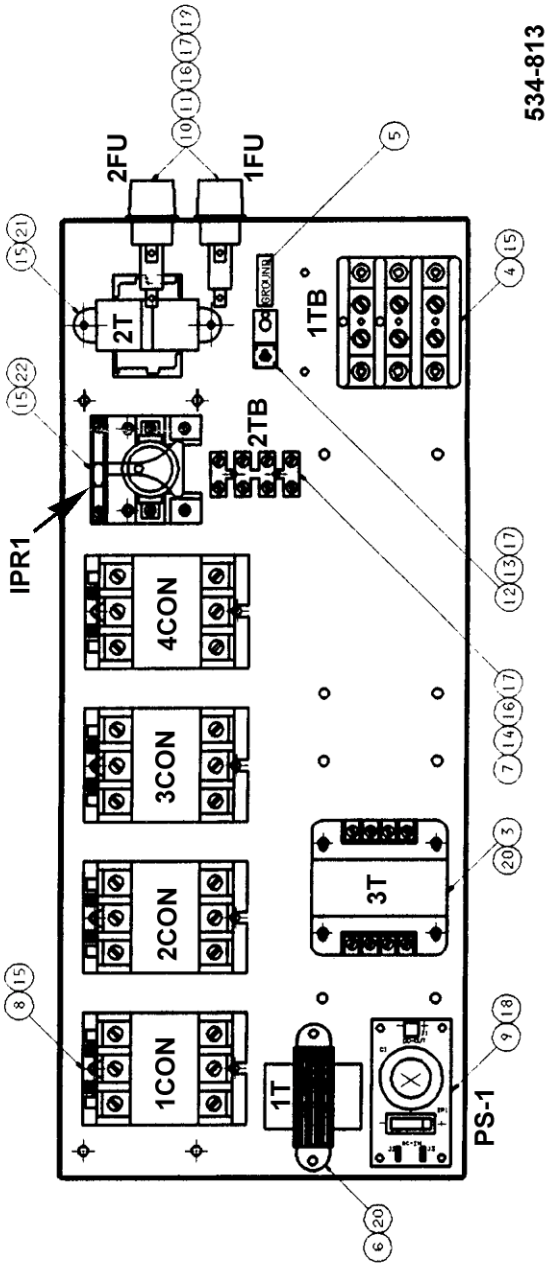
TSP 1115

CONTROL BOX

23	OPT. INTER PLUMB RELAY IPR1	
22	BREAKER ON 21 & 24 KW UNITS	
21	STAND. CONTACTOR	
20	SCREW	
19	SCREW	
18	NUT #6-32	
17	LOCKWASHER #10	
16	NUT #6	
15	SCREW. #10 X 1/2	
14	SCREW. #6 X 1/2	
13	SCREW	
12	LUG. GROUND	
11	FUSE	
10	HOLDER. FUSE	
9	BOARD. POWER	
8	CNTCTR. 3 POLE 40A 230V	
7	BLOCK. TERMINAL	
6	TRANSFORMER 12V	
5	DECAL. GROUND	
4	BLOCK. TERMINAL 3 POLE	
3	TRNSFRMR. 40VA 230/24VAC	
2	POWER SUPPLY BOX COVER	
1	POWER SUPPLY BOX	
03	PWR SUPPLY BOX ASSY 1 P	
ITEM	DESCRIPTION	



22	OPT. INTER PLUMB RELAY IPR1	
21	TRNSFRMR. 40VA 120/24VAC	
20	SCREW	
19	SCREW	
18	NUT #6-32	
17	LOCKWASHER #10	
16	NUT #6	
15	SCREW. #10 X 1/2	
14	SCREW. #6 X 1/2	
13	SCREW	
12	LUG. GROUND	
11	FUSE	
10	HOLDER. FUSE	
9	BOARD. POWER	
8	CNTCTR. 3 POLE 40A 230V	
7	BLOCK. TERMINAL	
6	TRANSFORMER 12V	
5	DECAL. GROUND	
4	BLOCK. TERMINAL 3 POLE	
3	TRANSFORMER 480V	
2	POWER SUPPLY BOX COVER	
1	POWER SUPPLY BOX	
03	PWR SUPPLY BOX ASSY 1 P	
ITEM	DESCRIPTION	



ELECTRONIC CONTROL (SOLID STATE) FULL VAT SEQUENCE OF OPERATION

1. Conditions
   A. Shortening at room temperature.
   B. Fryer circuit breaker "on".
   C. Melt/Fry switch in "melt".
   D. Power to pin 1 of control.
   E. Control set 350°F

2. Power switch to "on".
   A. Power to pin 2 or pin 3 or pin 4 on control depending on supply voltage.
   B. Power is jumpered to pin 5.
   C. When power switch is turned on, first high limit blinks on as control energizes relay to open path between pin 6 and pin 7. Pin 7 output is now controlled by another relay switching pin 5.
   D. Power is supplied to 1CON , 2CON, 3CON and 4CON. 1CON and 3CON will energize through the tilt switch and second high limit.

3. Control evaluates the input from the thermistor at pins 8 and 9.
   A. The melt cycle is initiated. Percent timer controls output at pin 7 to energize 2CON and 4CON.
      1) Initial condition is off (28 sec)
      2) Heat condition (2 sec)
   B. Control cycles output on time cycle of 28 sec off, then 2 sec on.

4. Shortening temperature reaches 135°F.
   A. Melt cycle is automatically over-ridden.
   B. Control uses thermistor to cycle output at pin 7.

5. Shortening temperature reaches 350°F.
   A. Control removes output from pin 7.

6. Control cycles output at pin 7 on temperature.

7. If shortening temp reaches 410°F, the control unenergizes relay which opens path from pin 7 to pin 5 and closes path from pin 7 to pin 6.
   A. The first high limit light lights.
   B. Power is removed from 2CON and 4CON.
   C. Output is removed from pin 6 when shortening temperature drops below 350°F.

8. If either the tilt switch or the second high limit open, power is removed from 1CON and 3CON and both the trouble and the second high limit lights will come on.

COMPUTER CONTROL FULL VAT SEQUENCE OF OPERATION

1. Conditions
   A. Shortening at room temperature.
   B. Fryer circuit breaker "on".
   C. 24 VAC power from 2T to pins 3, 4, 5, 6, 11, and 17 (reference to ground at pins 9 or 10) on computer main harness.
   D. 24 VAC ground to pins 9, 10, 12, and 13 (reference to pin 17).

   NOTE: Pin 12 on the main harness is used to indicate to the computer the type of fryer (full or split vat) that it is installed in. If the fryer is a full vat, pin 12 is tied to 24 VAC ground and if the fryer is a split vat, pin 12 is tied to 24 VAC.

2. Power switch to “on”.
   A. Plus 12 VDC from computer power supply board PS-1 to pin 23 on computer main harness.
   B. R1 control relay, 1CON and 2CON will energize.
   C. R1 relay energized, NO contacts close and supply power to pin 1 on computer main harness.

   NOTE: Pins 1 and 2 on the main harness are used to monitor the power status of the vat(s). Pin 1 is the power status input for the right vat and pin 2 is the input for the left vat. These inputs tell the computer which vat(s) are being used or which vat(s) have been turned off. 24 VAC is applied when on and 0 Volt when turned off. If configured as a full vat, only pin 1 is used. Pin 2 is left open.

3. Computer evaluates input from thermistor at pins 3 and 4 on temperature probe harness.
   A. Computer controls output at pin 15 to energize R2 control relay.
   B. Control relay R2 energizes.
   C. R2 NO contacts close to supply power to 2CON and 4CON.

   NOTE: Pin 15 on the main harness is the right heat output and pin 16 is the left heat output. These outputs provide 24 VAC to control relays which control the heat circuit. If the fryer is a full vat unit, only pin 15 is used. Pin 16 is left open.

4. Shortening temperature reaches set temperature.
   A. Computer turns off heat output and control relay R2 de-energizes.
   B. Power is removed from 2CON and 4CON.

5. Computer cycles heat output on temperature.

6. If the first high limit (410°F) trips, the display will indicate “HI TEMP”.

NOTE: For a full vat, the fryer will shut down and become inoperable. For a split vat, only the vat which experienced the failure becomes inoperable.

7. If the second high limit (435°F) trips or the tilt switch operates, the control relay R1 is de-energized removing 24 VAC power from pin 1 (full vat), pin 1 or pin 2 (split vat because its control relay is de-energized). The display will indicate “OFF” for a full vat and become inoperable . If a split vat, “OFF” will be displayed for the vat which experienced the failure and become inoperable.

BATTERY AND INTER PLUMB FILTER SEQUENCE OF OPERATION

NOTE: A battery of fryers equipped with optional interplumbing connects the vats to a common drain. Each vat has an individual drain valve. These valves should only be opened one at a time.

1. Conditions
   A. Empty filter in position and connected as outlined in filter Instructions manual.
   B. All drain valves and return valves closed.

2. Open desired vat drain valve.

3. Oil drains into filter.

4. Close drain valve.

5. Open return valve for vat oil is to be returned to.
   A. Return valve switch normally open contacts close energizing 24 VAC control relay IPR1.
   B. Control relay IPR1 normally open contacts close to provide line voltage to filter motor.

6. Oil is pumped back to vat.

7. Close the return valve.
   A. Return valve switch contacts open.
   B. Control relay IPR1 unenergizes.

8. Filter motor stops.

BASKET LIFT SEQUENCE OF OPERATION

1. Conditions
   A. Fryer at operating temperature.
   B. Basket lift in raised position.
   C. Basket lift micro switch operated, normally open contacts closed.
   D. BLR1 control relay unenergized.

2. Power is present at one side of gear motor and contact 5 of BLR1 control relay.

3. When either the Push To Time button (solid state models) or the Start button (computer control models) is pressed, BLR1 relay is energized closing contacts 5 and 3.

4. Power flows through BLR1 contacts 5 and 3 and normally open contacts of micro switch.

5. Motor runs until lift is lowered and cam unoperates micro switch.

6. Micro switch normally open contacts open removing power from motor.

7. Timer (solid state control) or cook cycle (computer control) is complete and power is removed from BLR1 control relay.

8. BLR1 normally closed contacts 5 and 1 close suppling power through micro switch normally closed contacts.

9. Motor runs and lift raises until cam operates micro switch opening the normally closed contacts and stopping the motor.

10. Cycle is repeated.

COMPUTER CONTROL BOARD DIAGNOSTICS

NOTE: The computer control is also used on other equipment and is capable of displaying many different prompts. Therefore some prompts not applicable may display when a problem occurs in the wiring harness. Since the computer is looking for either 24 VAC or 24 VAC ground on particular pins, an open connection can cause a non applicable prompt to appear. Refer to “Computer Control Harness Pin-outs Chart”

For operator programming and operation refer to that section in the Instructions Manual.

Diagnostics is divided into two areas, “operation” and “service”. Operation mode is the usual mode of fryer operation. Service mode is intended to give the service person more information regarding the nature of the failure. In either mode the unit operates normally until an error occurs. In that case what is displayed will be different. The chart below shows what is displayed for both “operation” and “service” modes.

Service mode is entered by pressing the product 3 and product 4 keys while turning on the power to the fryer computer. Once in service mode you can only exit it by turning off the power switch.

The following displays/system responses will be given for the noted failure conditions.

FAILURE	OPERATION MODE DIAGNOSTICS DISPLAY	SERVICE MODE DIAGNOSTICS DISPLAY	SYSTEM RESPONSE
Ignition (gas heat)	IGN FAILURE	IGN FAILURE with L or R for split vat	Heat off
Low Temperature (lack of heat)	LOW TEMP	LO TEMP XXXF	Heat off
High temperature (1st limit)	HIGH TEMP	HI TEMP XXX°F	Heat off
High Temperature (2nd limit)	OFF	OFF	Hardware limit, Vat off
Tilt Switch open	OFF	OFF	Vat off
Clogged Filter (gas heat)	turn on AIR indicator	turn on AIR indicator	none
Probe	CALL SERVICE	PROBE OPEN R or L for split vat PROBE SH R or L for split vat	Heat off
Door Open	CLOSE DOOR	CLOSE DOOR	Heat off
Self check	CALL SERVICE	MICRO FAIL	System to backup mode

POWER UP DIAGNOSTICS

On power up, the control will execute a self check. The failure of any of these tests will result in the message “CALL SERVICE” or “MICRO FAIL” being displayed.

This prompt will flash at approximately a 1 hertz rate. While the prompt is displayed, the computer will not function. If the failure is in the computer, the fryer will operate in backup mode.

When the fryer computer comes out of initialization and self check routines, it will either enter the heating mode or the melt mode (if programmed) of operation.

For a split vat fryer, one vat can be off while the other is in operation. If this occurs, the side that is off will be indicated by displaying the “OFF” prompt to the user. The message will be on the side of the display which corresponds to the vat which is off.

SYSTEM TESTS

The system diagnostics menu is intended to give you the ability to test the basic parts of the computer. It can be entered by pressing the 8 and 9 product keys simultaneously while turning on power to the fryer computer. The message “SYSTEM TESTS” is displayed. In this mode you can select one of three tests.

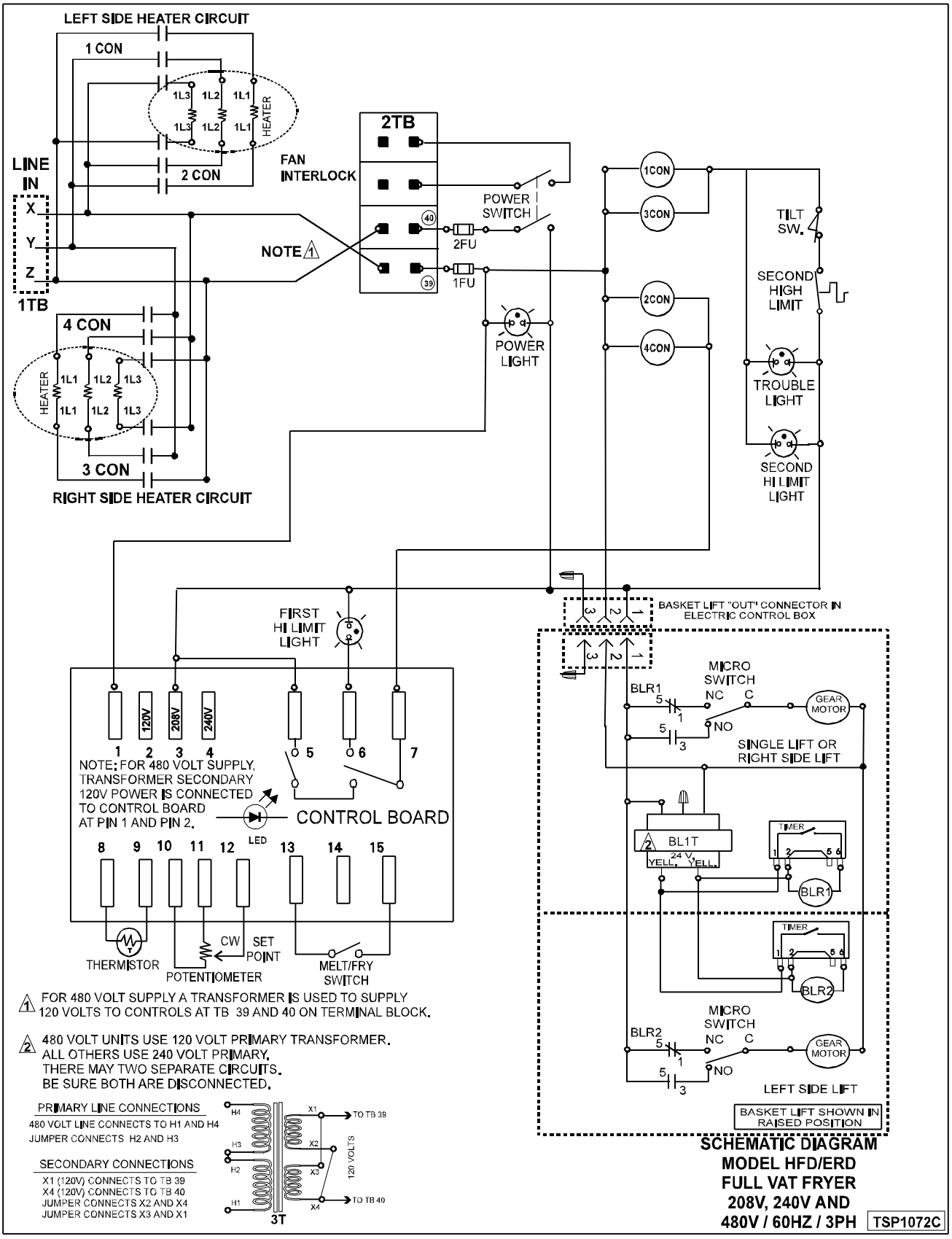
With DISPLAY TEST displayed, press enter to begin a test, use the up and down arrows to rotate through the screens. Press exit once to return to the test menu or twice to return to normal operation.

With KEYPAD TEST displayed, press enter to begin the test. The control will respond by displaying the name of the key pressed. Press exit once to return to the test menu or twice to return to normal operation.

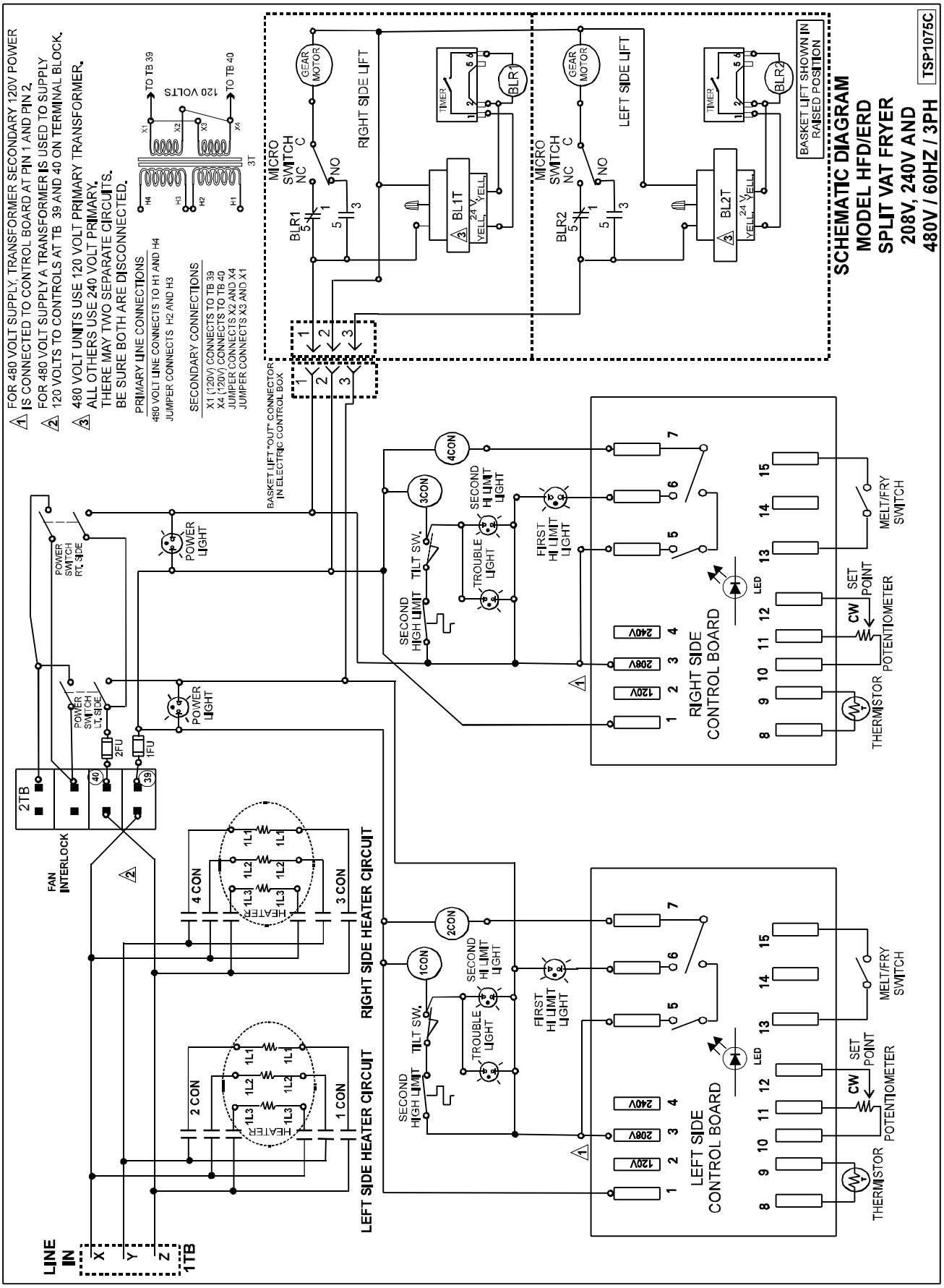
With VER xxx displayed, the release number is displayed as “VER XXX”

SCHEMATICS

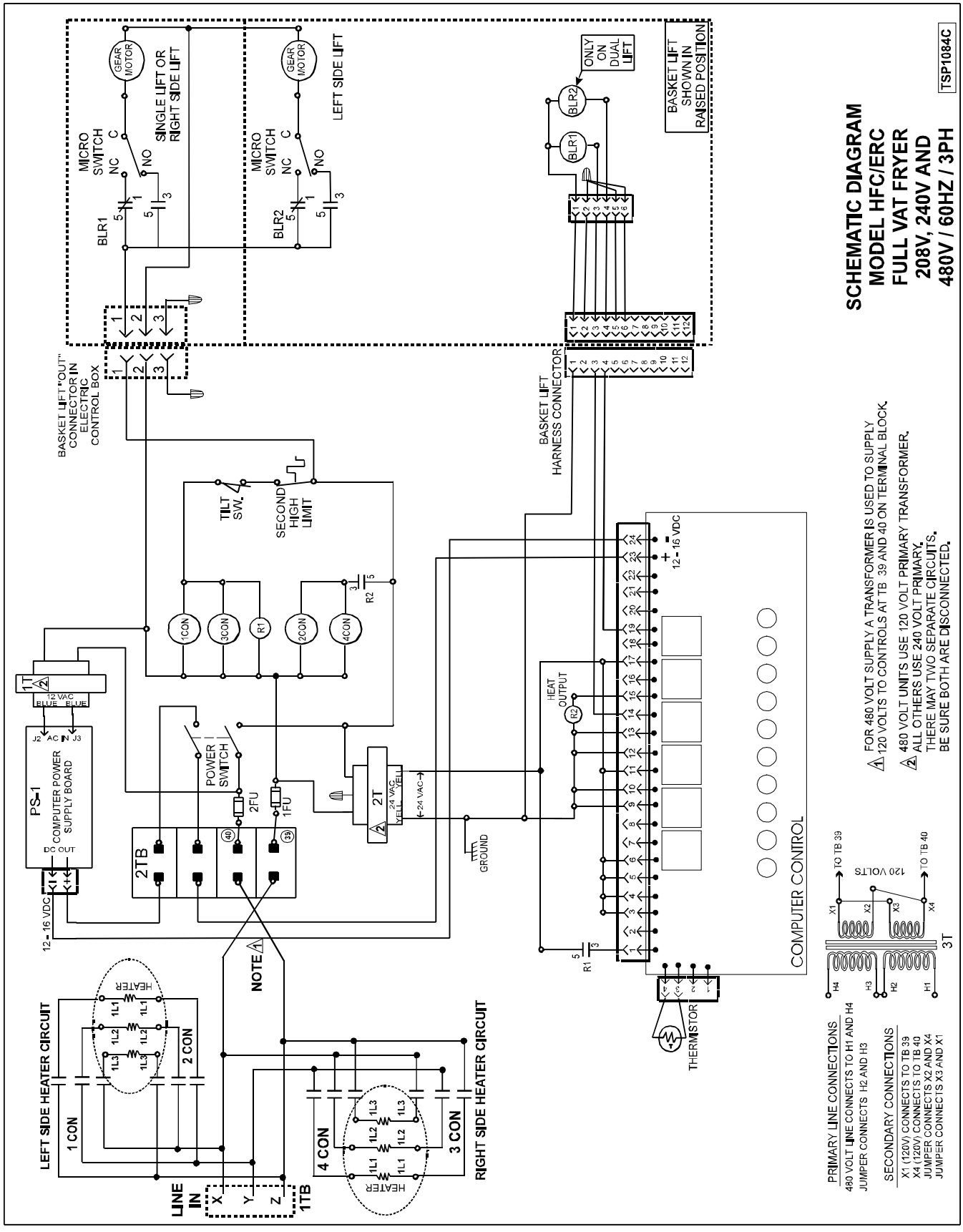
Full Vat With Solid State Control



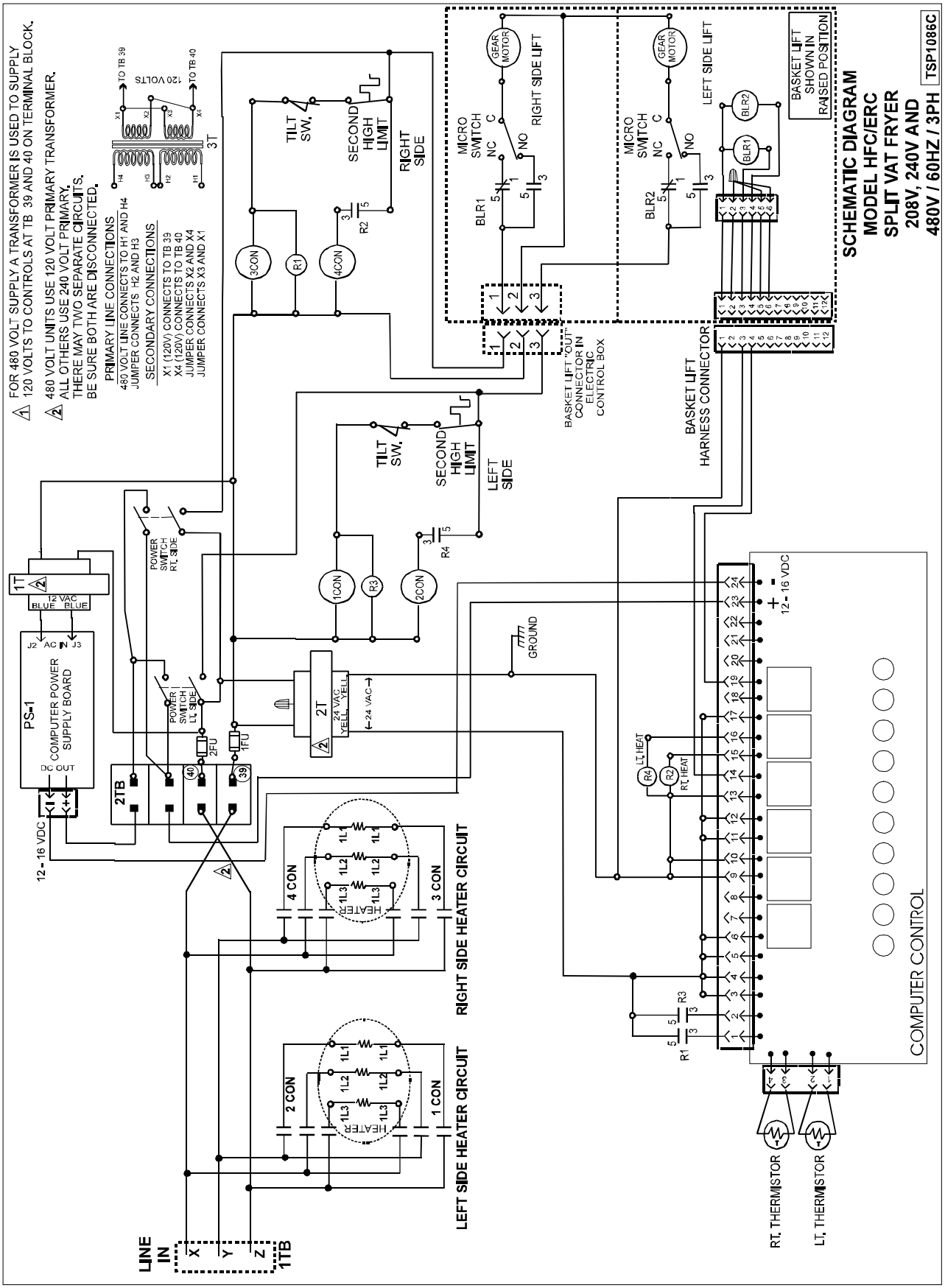
Split Vat With Solid State Control



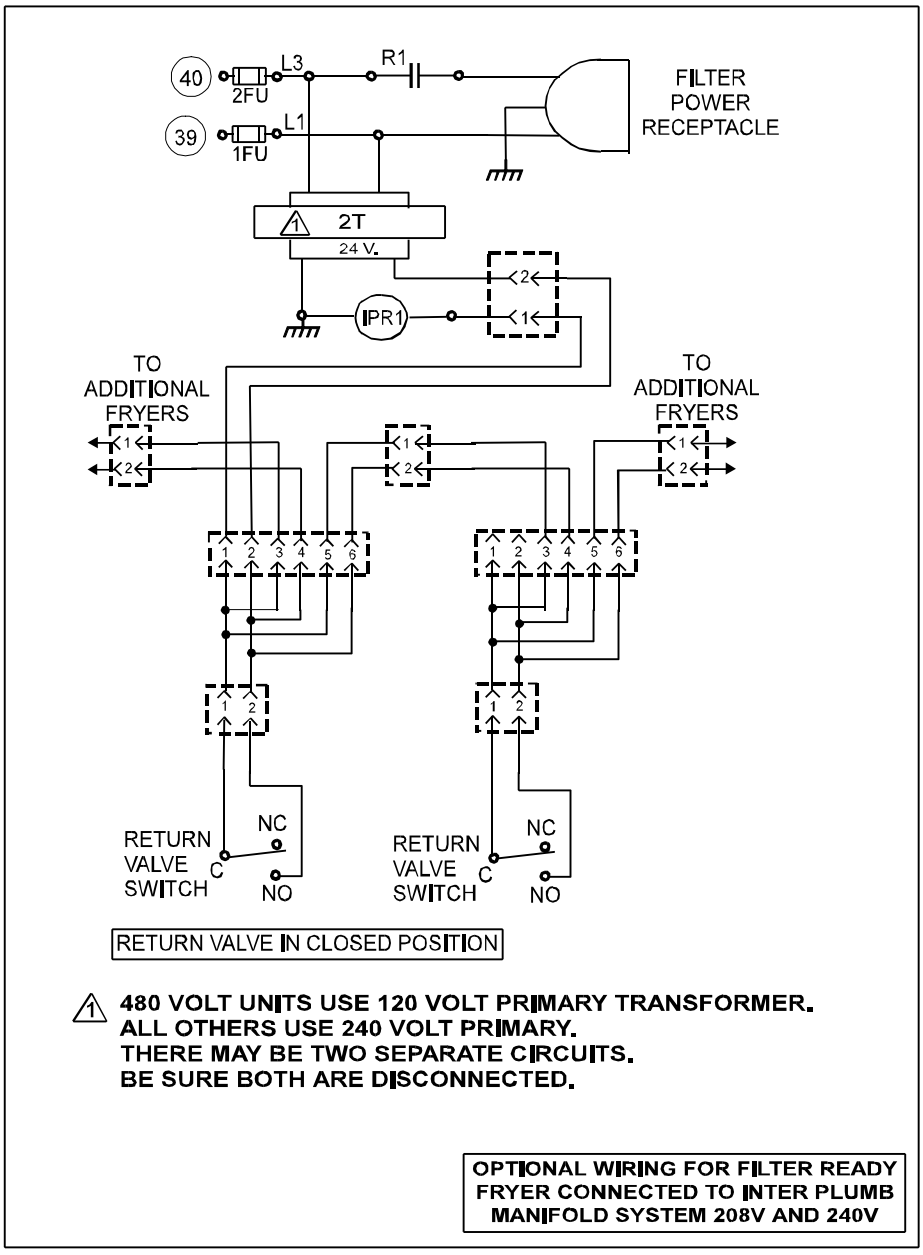
Full Vat With Computer Control

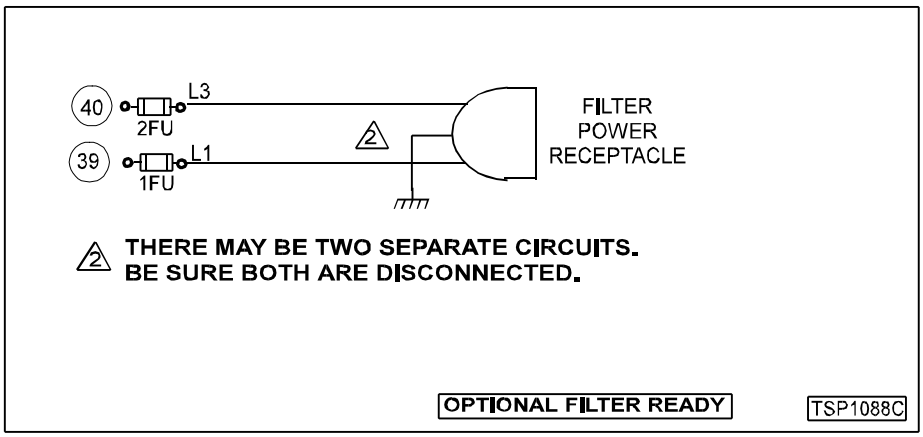


Split Vat With Computer Control



Filter Ready, Inter Plumb Options





WIRING DIAGRAM INDEX

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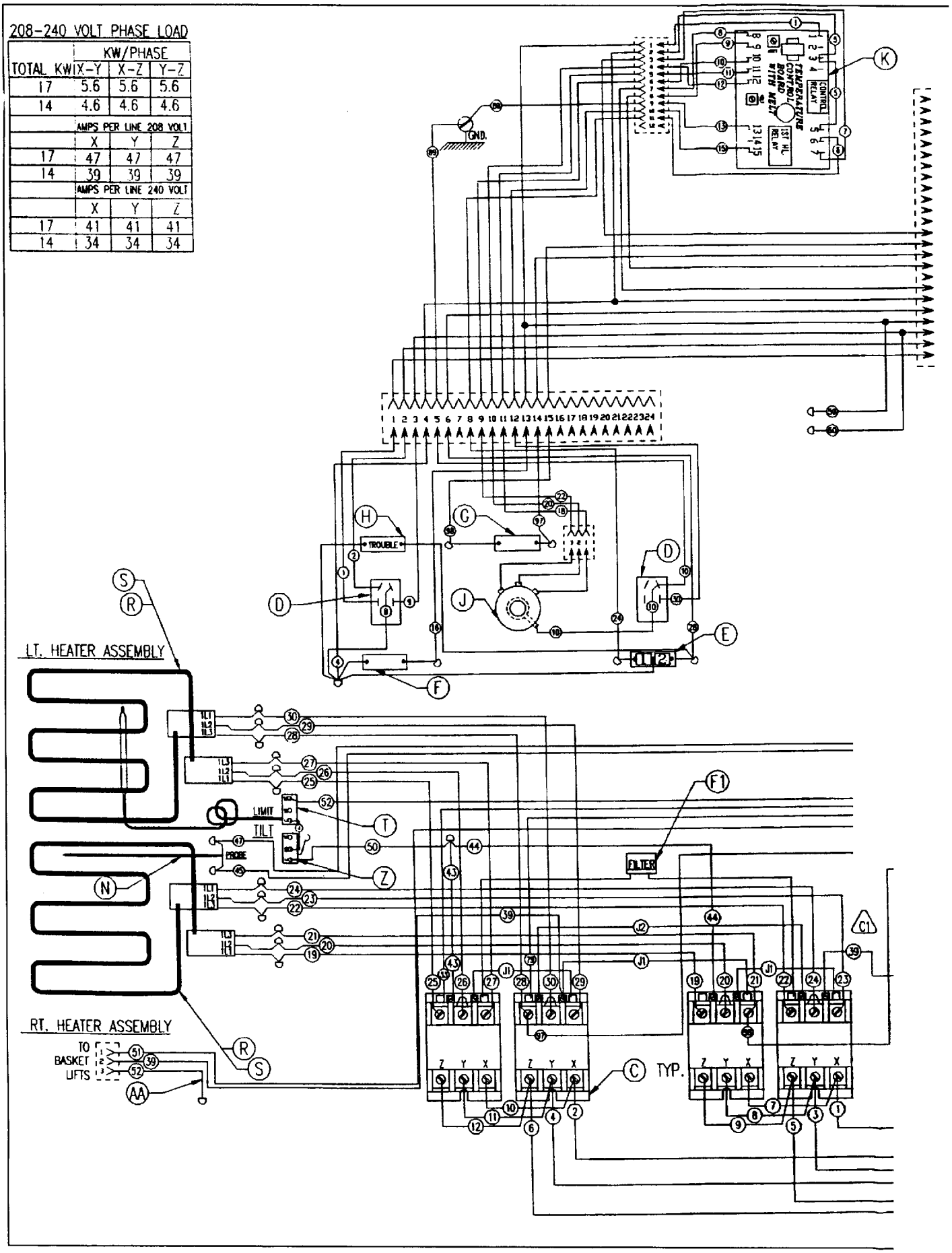
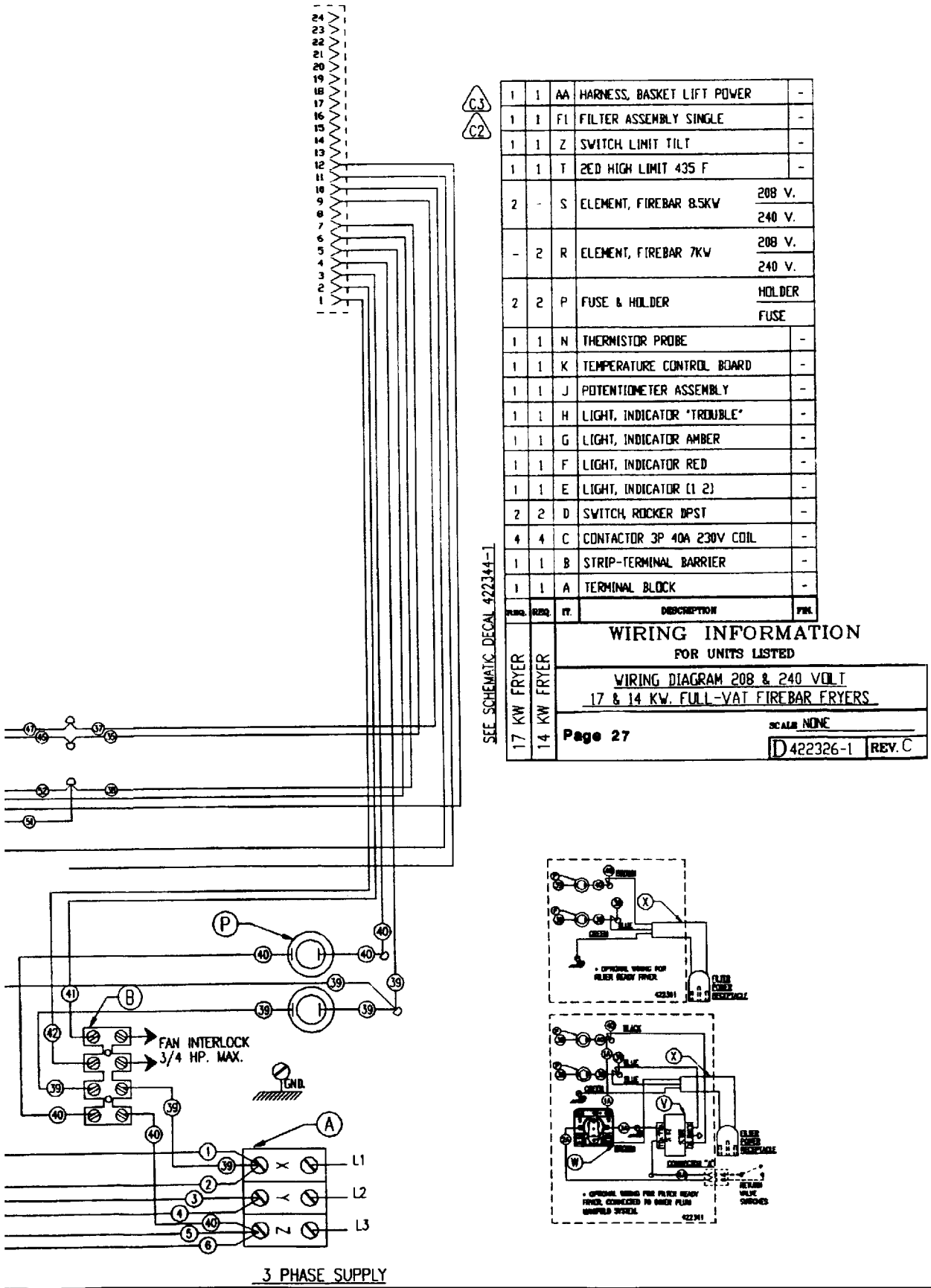
208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34





REQ.	REQ.	IT.	DESCRIPTION	PRT.
1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	Z	SWITCH LIMIT TILT	-
1	1	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 8.5KW	208 V. / 240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V. / 240 V.
2	2	P	FUSE & HOLDER	HOLDER / FUSE
1	1	N	THERMISTOR PROBE	-
1	1	K	TEMPERATURE CONTROL BOARD	-
1	1	J	POTENTIOMETER ASSEMBLY	-
1	1	H	LIGHT, INDICATOR "TROUBLE"	-
1	1	G	LIGHT, INDICATOR AMBER	-
1	1	F	LIGHT, INDICATOR RED	-
1	1	E	LIGHT, INDICATOR (1 2)	-
2	2	D	SWITCH, ROCKER DPST	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-

17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 208 & 240 VOLT
17 & 14 KW. FULL-VAT FIREBAR FRYERS

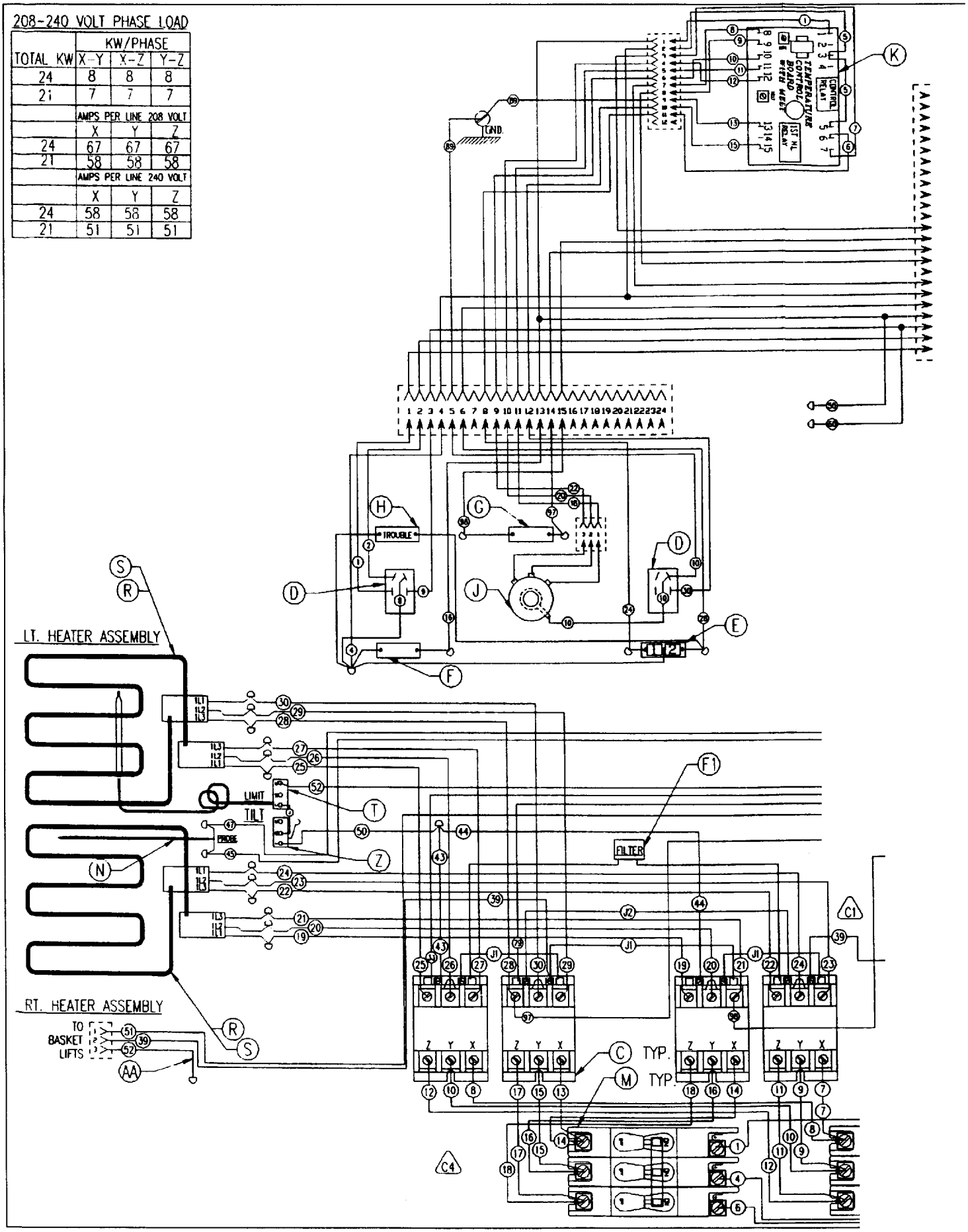
Page 27

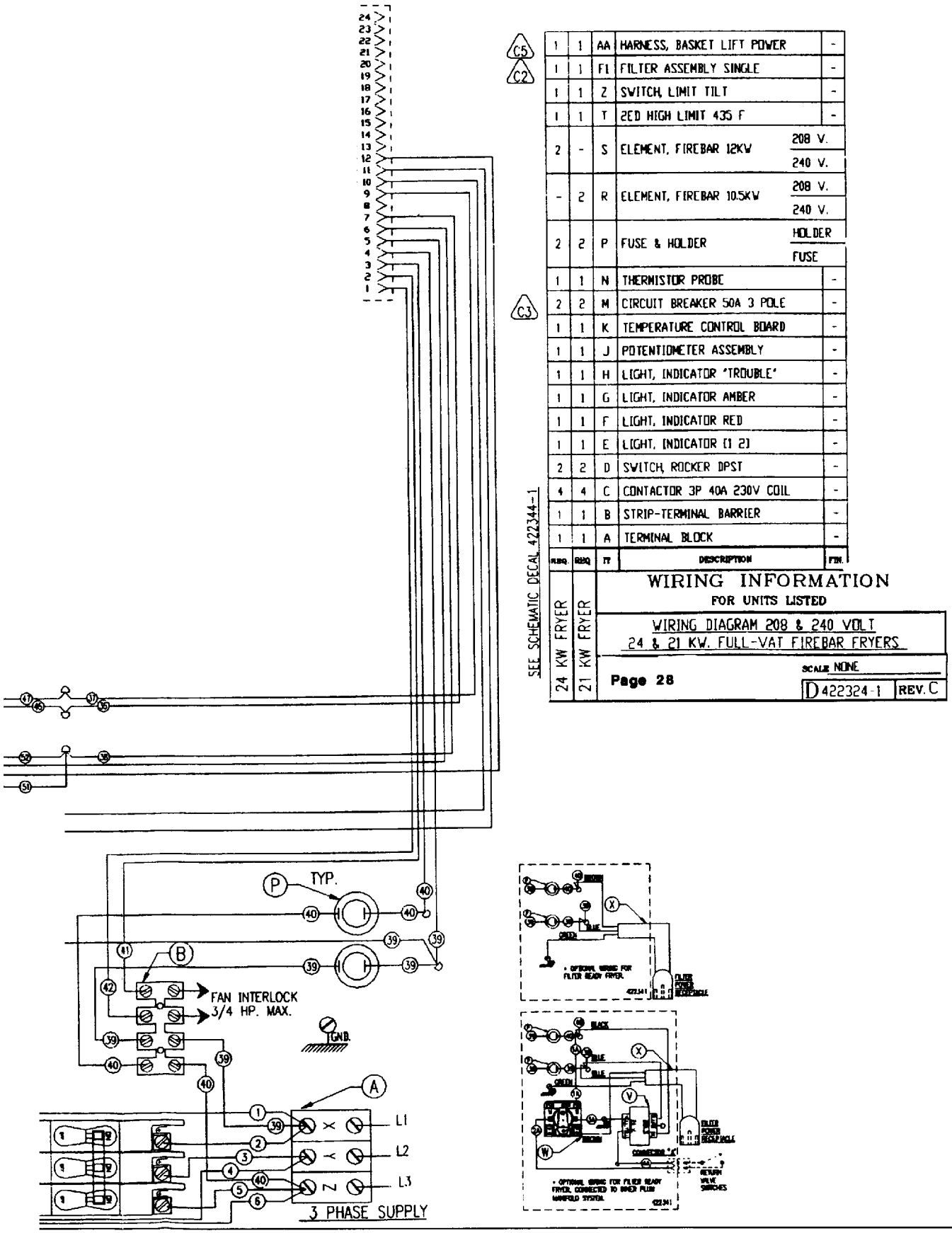
SCALE NONE

D 422326-1 REV. C

208-240 VOLT PHASE LOAD

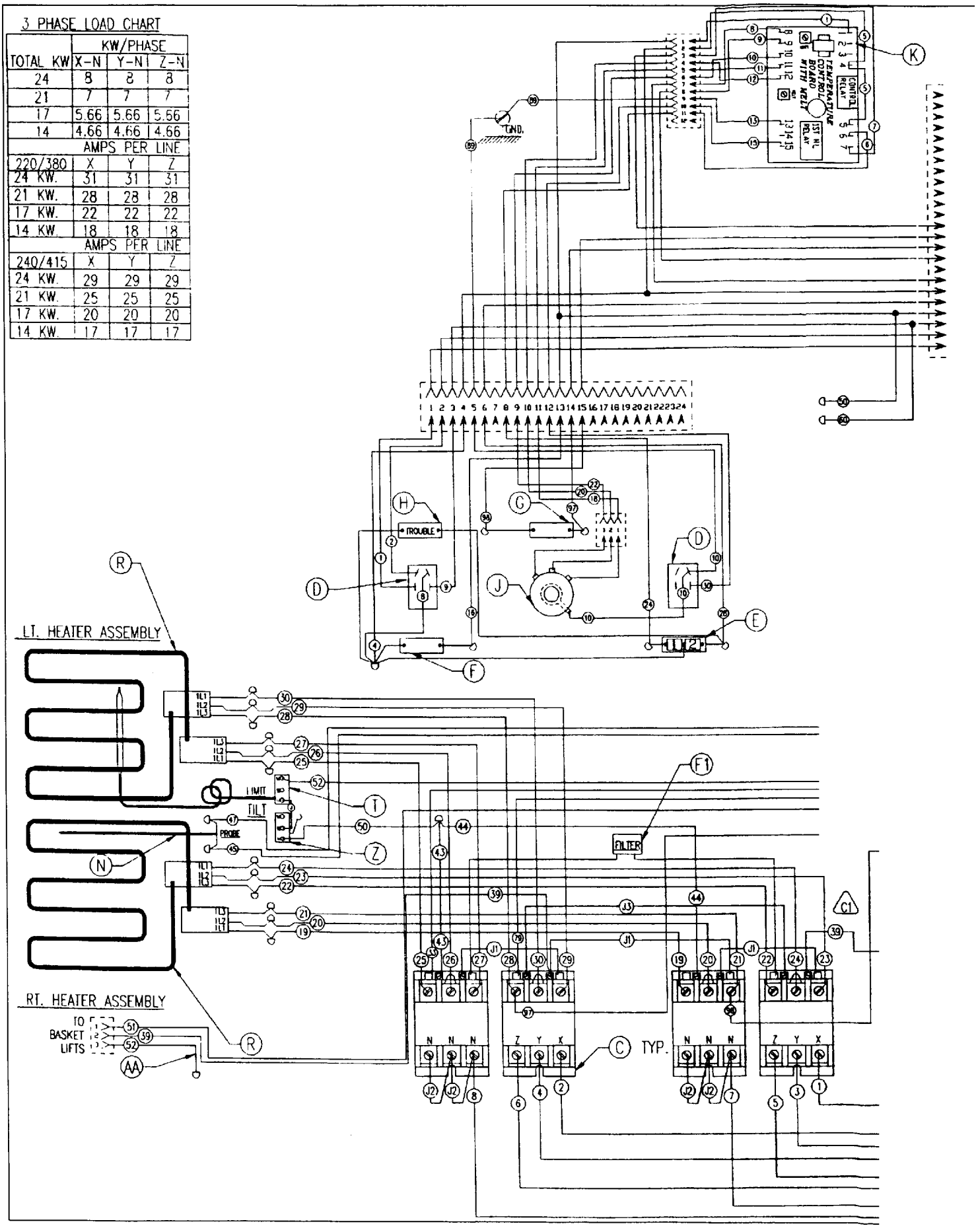
TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
21	51	51	51

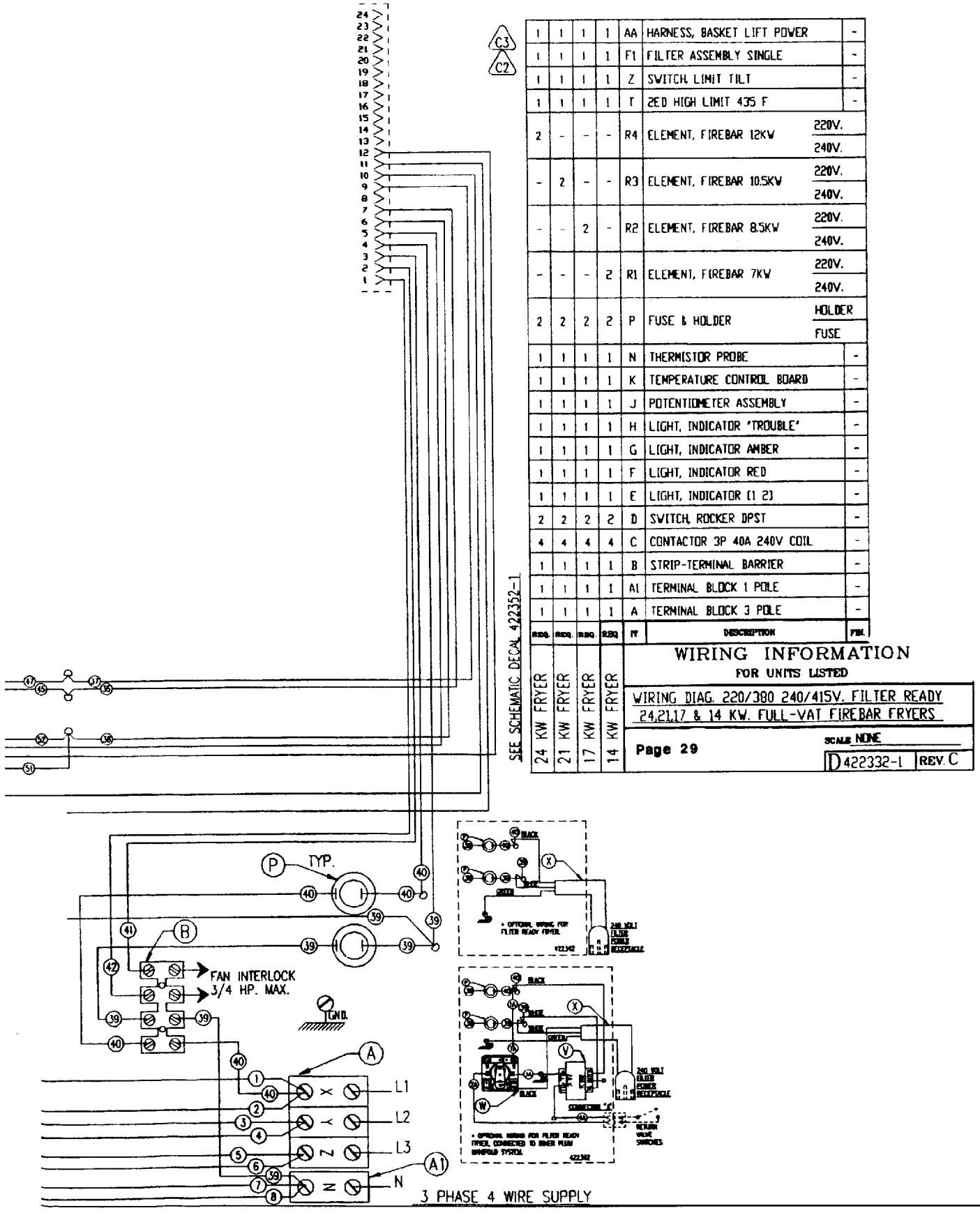



C5
C2
C3
1 1 AA HARNESS, BASKET LIFT POWER -
1 1 FI FILTER ASSEMBLY SINGLE -
1 1 Z SWITCH, LIMIT TILT -
1 1 T 2ED HIGH LIMIT 435 F -
2 - S ELEMENT, FIREBAR 12KW 208 V.
240 V.
- 2 R ELEMENT, FIREBAR 10.5KW 208 V.
240 V.
2 2 P FUSE & HOLDER HOLDER
FUSE
1 1 N THERMISTOR PROBE -
2 2 M CIRCUIT BREAKER 50A 3 POLE -
1 1 K TEMPERATURE CONTROL BOARD -
1 1 J POTENTIOMETER ASSEMBLY -
1 1 H LIGHT, INDICATOR 'TROUBLE' -
1 1 G LIGHT, INDICATOR AMBER -
1 1 F LIGHT, INDICATOR RED -
1 1 E LIGHT, INDICATOR (1 2) -
2 2 D SWITCH, ROCKER DPST -
4 4 C CONTACTOR 3P 40A 230V COIL -
1 1 B STRIP-TERMINAL BARRIER -
1 1 A TERMINAL BLOCK -
REQ. REQ IT DESCRIPTION ITM.
SEE SCHEMATIC DECAL 422344-1
24 KW FRYER
21 KW FRYER
WIRING INFORMATION
FOR UNITS LISTED
WIRING DIAGRAM 208 & 240 VOLT
24 & 21 KW. FULL-VAT FIREBAR FRYERS
Page 28
SCALE NONE
D 422324-1
REV. C
TYP.
FAN INTERLOCK
3/4 HP. MAX.
IGNB.
L1
L2
L3
3 PHASE SUPPLY

3 PHASE LOAD CHART

TOTAL KW	KW/PHASE X-N	Y-N	Z-N
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
AMPS PER LINE			
220/380	X	Y	Z
24 KW.	31	31	31
21 KW.	28	28	28
17 KW.	22	22	22
14 KW.	18	18	18
AMPS PER LINE			
240/415	X	Y	Z
24 KW.	29	29	29
21 KW.	25	25	25
17 KW.	20	20	20
14 KW.	17	17	17





24 KW FRYER	21 KW FRYER	17 KW FRYER	14 KW FRYER	ITEM	DESCRIPTION	
1	1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	1	1	Z	SWITCH, LIMIT TILT	-
1	1	1	1	T	2ED HIGH LIMIT 435 F	-
2	-	-	-	R4	ELEMENT, FIREBAR 12KW	220V. / 240V.
-	2	-	-	R3	ELEMENT, FIREBAR 10.5KW	220V. / 240V.
-	-	2	-	R2	ELEMENT, FIREBAR 8.5KW	220V. / 240V.
-	-	-	2	R1	ELEMENT, FIREBAR 7KW	220V. / 240V.
2	2	2	2	P	FUSE & HOLDER	HOLDER / FUSE
1	1	1	1	N	THERMISTOR PROBE	-
1	1	1	1	K	TEMPERATURE CONTROL BOARD	-
1	1	1	1	J	POTENTIOMETER ASSEMBLY	-
1	1	1	1	H	LIGHT, INDICATOR 'TROUBLE'	-
1	1	1	1	G	LIGHT, INDICATOR AMBER	-
1	1	1	1	F	LIGHT, INDICATOR RED	-
1	1	1	1	E	LIGHT, INDICATOR (1 2)	-
2	2	2	2	D	SWITCH, ROCKER DPST	-
4	4	4	4	C	CONTACTOR 3P 40A 240V COIL	-
1	1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	1	A1	TERMINAL BLOCK 1 POLE	-
1	1	1	1	A	TERMINAL BLOCK 3 POLE	-

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAG. 220/380 240/415V. FILTER READY
24,21,17 & 14 KW. FULL-VAT FIREBAR FRYERS

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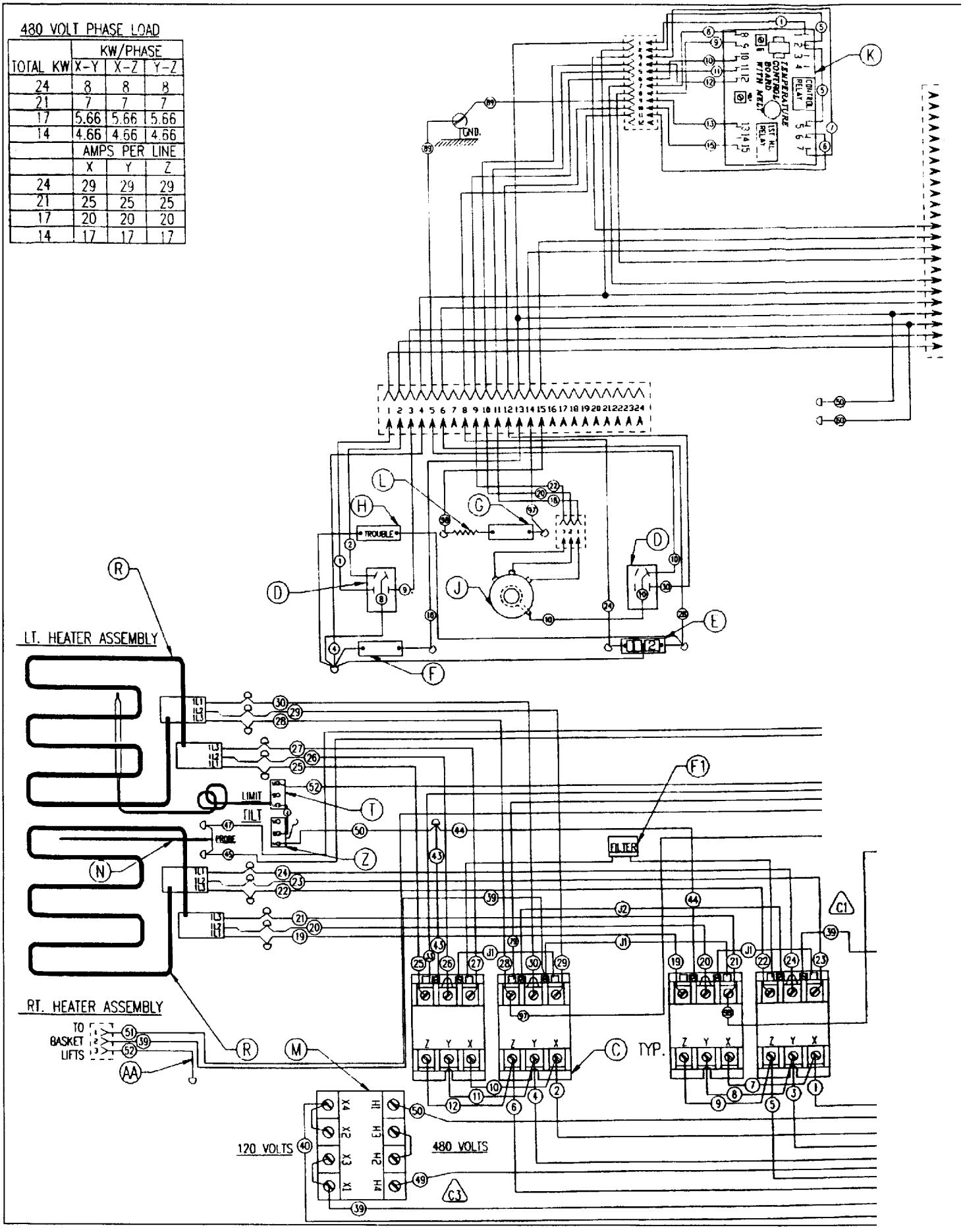
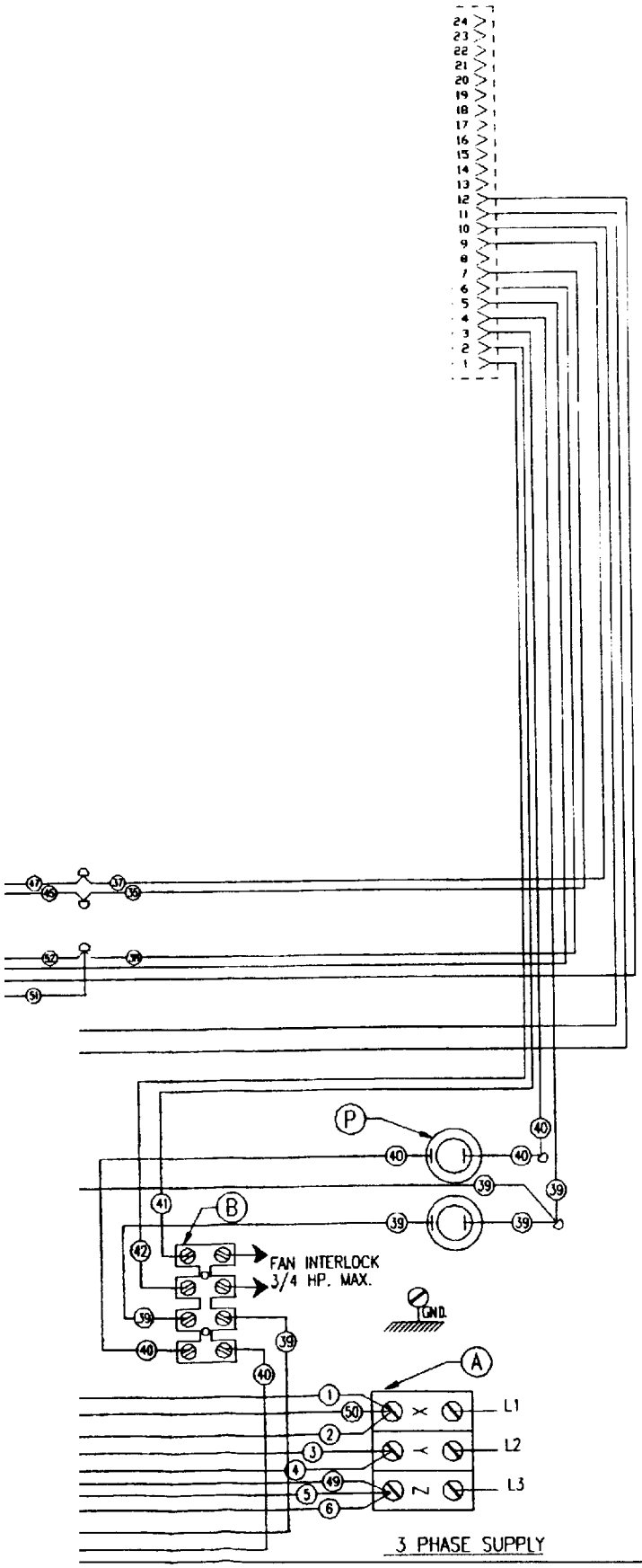
SCALE NONE

D 422332-1 REV. C

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE		
	X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
21	25	25	25
17	20	20	20
14	17	17	17





C4 C2	1	1	1	1	AA	HARNESS, BASKET LIFT POWER	-
	1	1	1	1	F1	FILTER ASSEMBLY SINGLE	-
	1	1	1	1	Z	SWITCH, LIMIT TILT	-
	1	1	1	1	T	2ED HIGH LIMIT 435 F	-
	2	-	-	-	R4	ELEMENT, FIREBAR 480V. 12 KW.	-
	-	2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
	-	-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
	-	-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
	2	2	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
	1	1	1	1	N	THERMISTOR PROBE	-
	1	1	1	1	M	TRANSFORMER, 50VA. 480-120V.	-
	1	1	1	1	L	RESISTOR, 300K 1/4W	-
	1	1	1	1	K	TEMPERATURE CONTROL BOARD	-
	1	1	1	1	J	POTENTIOMETER ASSEMBLY	-
	1	1	1	1	H	LIGHT, INDICATOR TROUBLE*	-
	1	1	1	1	G	LIGHT, INDICATOR AMBER	-
	1	1	1	1	F	LIGHT, INDICATOR RED	-
	1	1	1	1	E	LIGHT, INDICATOR (1 2)	-
	2	2	2	2	D	SWITCH, ROCKER DPST	-
	4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
	1	1	1	1	B	STRIP-TERMINAL BARRIER	-
	1	1	1	1	A	TERMINAL BLOCK	-
	REQ.	REQ.	REQ.	REQ	IT	DESCRIPTION	FIN.

SEE SCHEMATIC DECAL 422348-1

24 KW FRYER	21 KW FRYER	17 KW FRYER	14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 480 VOLT
24,21,17 & 14 KW. FULL-VAT FIREBAR FRYERS

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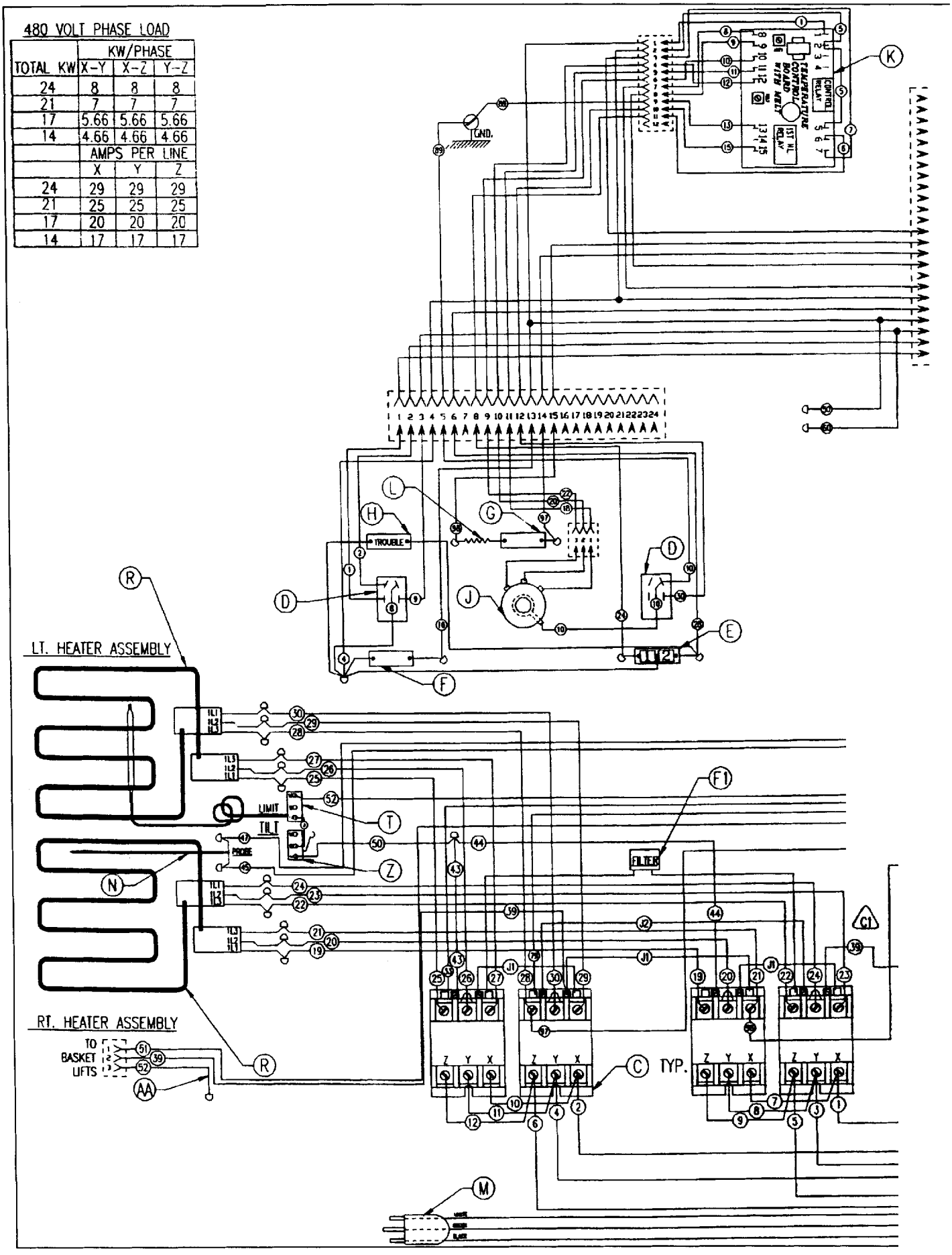
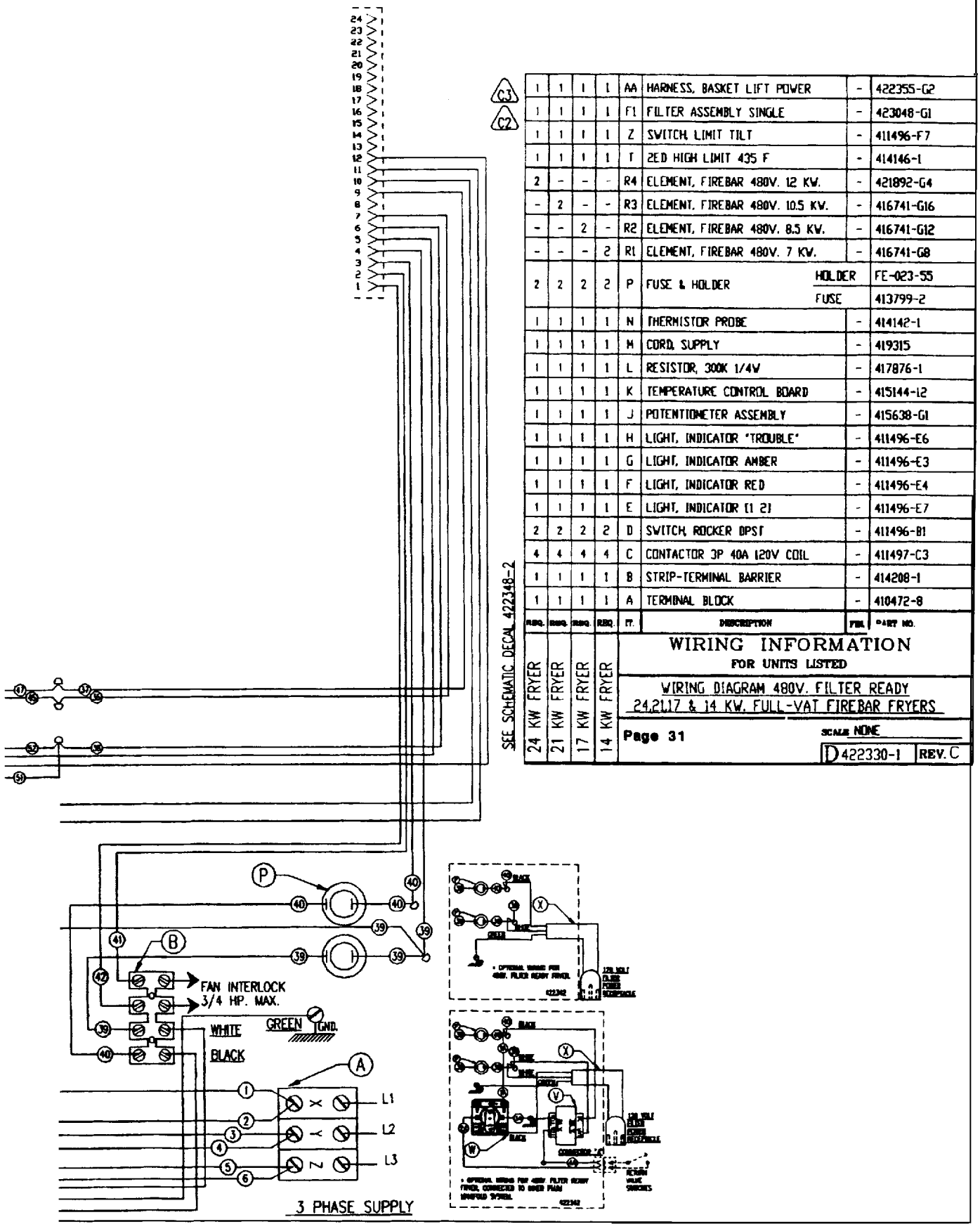
SCALE NONE

D 422328-1 REV. C

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
21	25	25	25
17	20	20	20
14	17	17	17





C3 C2	1	1	1	1	AA	HARNESS, BASKET LIFT POWER	-	422355-G2
	1	1	1	1	F1	FILTER ASSEMBLY SINGLE	-	423048-G1
	1	1	1	1	Z	SWITCH, LIMIT TILT	-	411496-F7
	1	1	1	1	T	2ED HIGH LIMIT 435 F	-	414146-1
	2	-	-	-	R4	ELEMENT, FIREBAR 480V. 12 KW.	-	421892-G4
	-	2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-	416741-G16
	-	-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-	416741-G12
	-	-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-	416741-G8
	2	2	2	2	P	FUSE & HOLDER	HOLDER	FE-023-55
							FUSE	413799-2
	1	1	1	1	N	THERMISTOR PROBE	-	414142-1
	1	1	1	1	M	CORD, SUPPLY	-	419315
	1	1	1	1	L	RESISTOR, 300K 1/4W	-	417876-1
	1	1	1	1	K	TEMPERATURE CONTROL BOARD	-	415144-12
	1	1	1	1	J	POTENTIOMETER ASSEMBLY	-	415638-G1
	1	1	1	1	H	LIGHT, INDICATOR 'TROUBLE'	-	411496-E6
	1	1	1	1	G	LIGHT, INDICATOR AMBER	-	411496-E3
	1	1	1	1	F	LIGHT, INDICATOR RED	-	411496-E4
	1	1	1	1	E	LIGHT, INDICATOR (1 2)	-	411496-E7
	2	2	2	2	D	SWITCH, ROCKER DPST	-	411496-B1
	4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	-	411497-C3
	1	1	1	1	B	STRIP-TERMINAL BARRIER	-	414208-1
	1	1	1	1	A	TERMINAL BLOCK	-	410472-8
	REQ.	REQ.	REQ.	REQ.	IT.	DESCRIPTION	FIG.	PART NO.

24 KW FRYER	21 KW FRYER	17 KW FRYER	14 KW FRYER

WIRING INFORMATION
FOR UNITS LISTED

WIRING DIAGRAM 480V. FILTER READY
24,21,17 & 14 KW. FULL-VAT FIREBAR FRYERS

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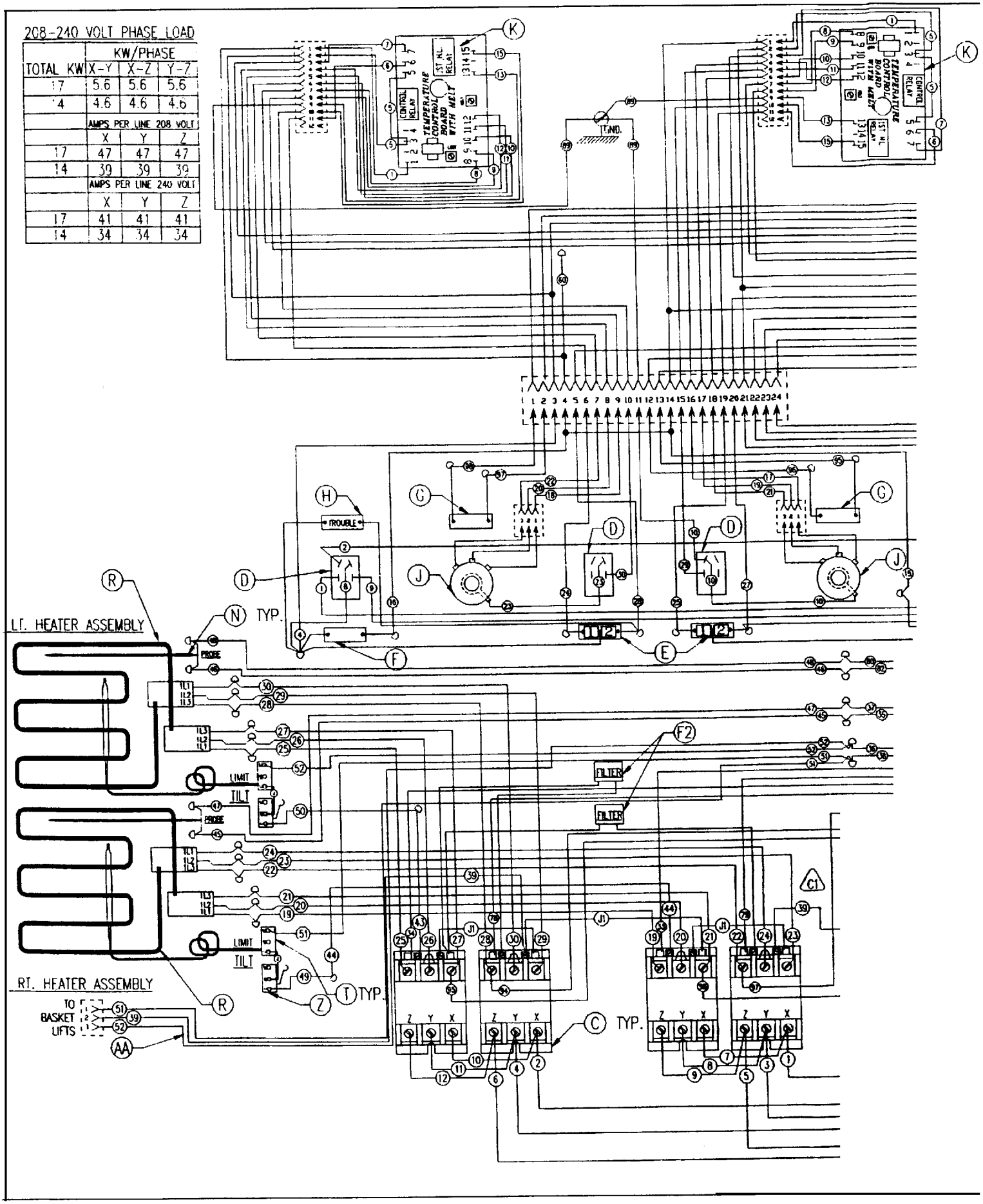
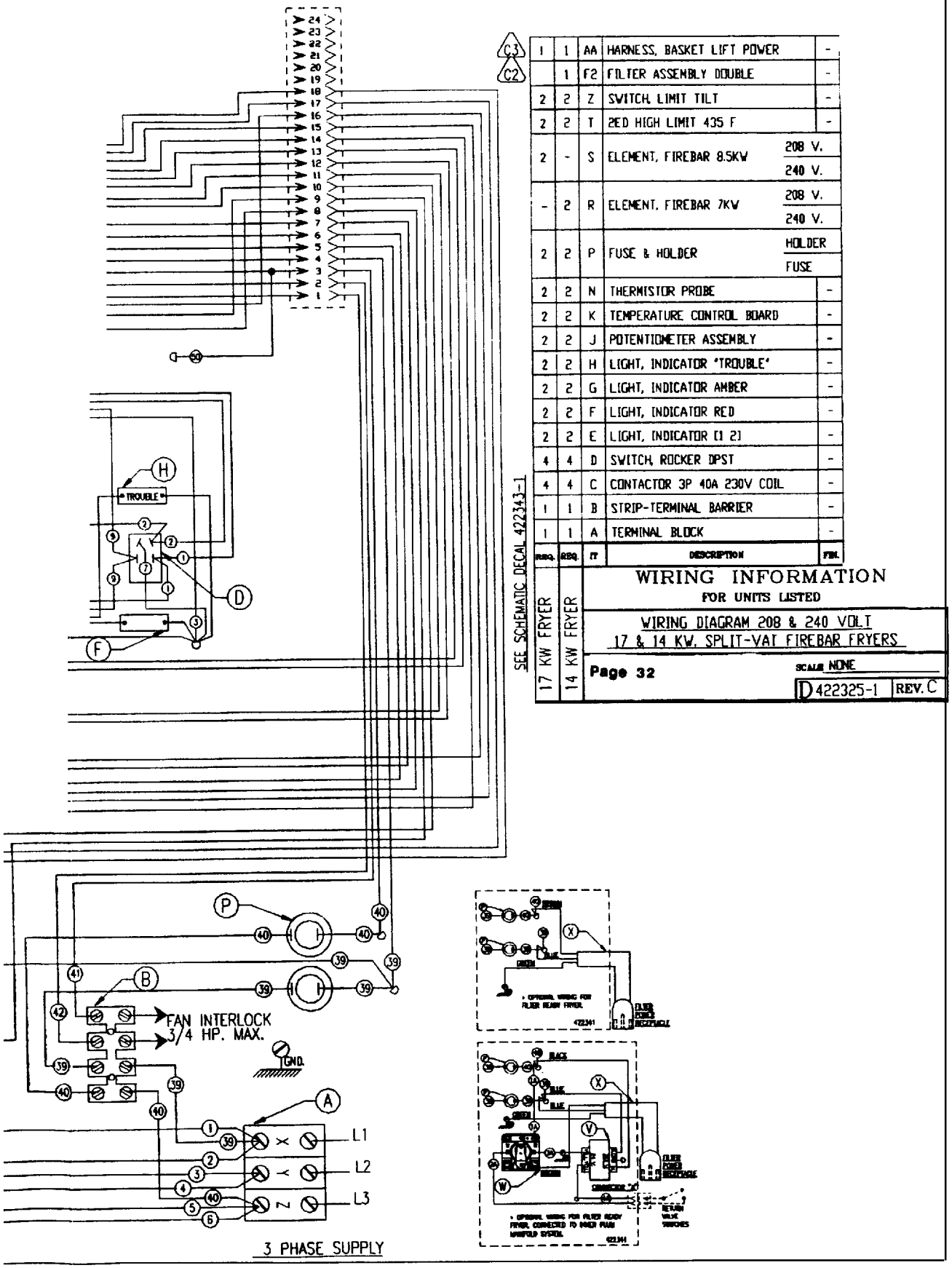
SCALE NONE

D 422330-1 REV. C

208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34





1	1	AA	HARNESS, BASKET LIFT POWER	-
	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	Z	SWITCH, LIMIT TILT	-
2	2	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 8.5KW	208 V. / 240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V. / 240 V.
2	2	P	FUSE & HOLDER	HOLDER / FUSE
2	2	N	THERMISTOR PROBE	-
2	2	K	TEMPERATURE CONTROL BOARD	-
2	2	J	POTENTIOMETER ASSEMBLY	-
2	2	H	LIGHT, INDICATOR "TROUBLE"	-
2	2	G	LIGHT, INDICATOR AMBER	-
2	2	F	LIGHT, INDICATOR RED	-
2	2	E	LIGHT, INDICATOR (1 2)	-
4	4	D	SWITCH, ROCKER DPST	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-
REQ.	REQ.	IT	DESCRIPTION	FIG.

17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 208 & 240 VOLT
17 & 14 KW. SPLIT-VAT FIREBAR FRYERS

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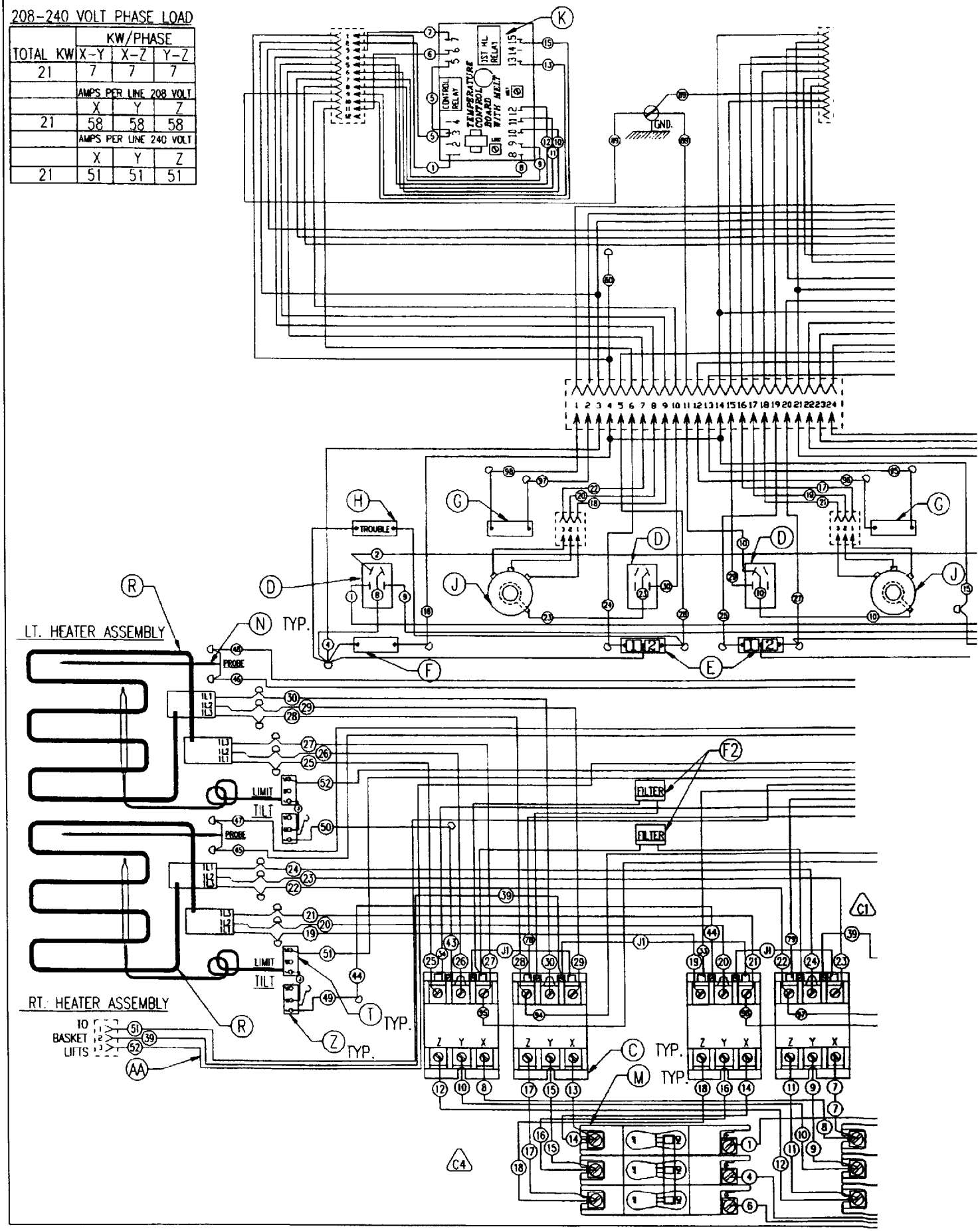
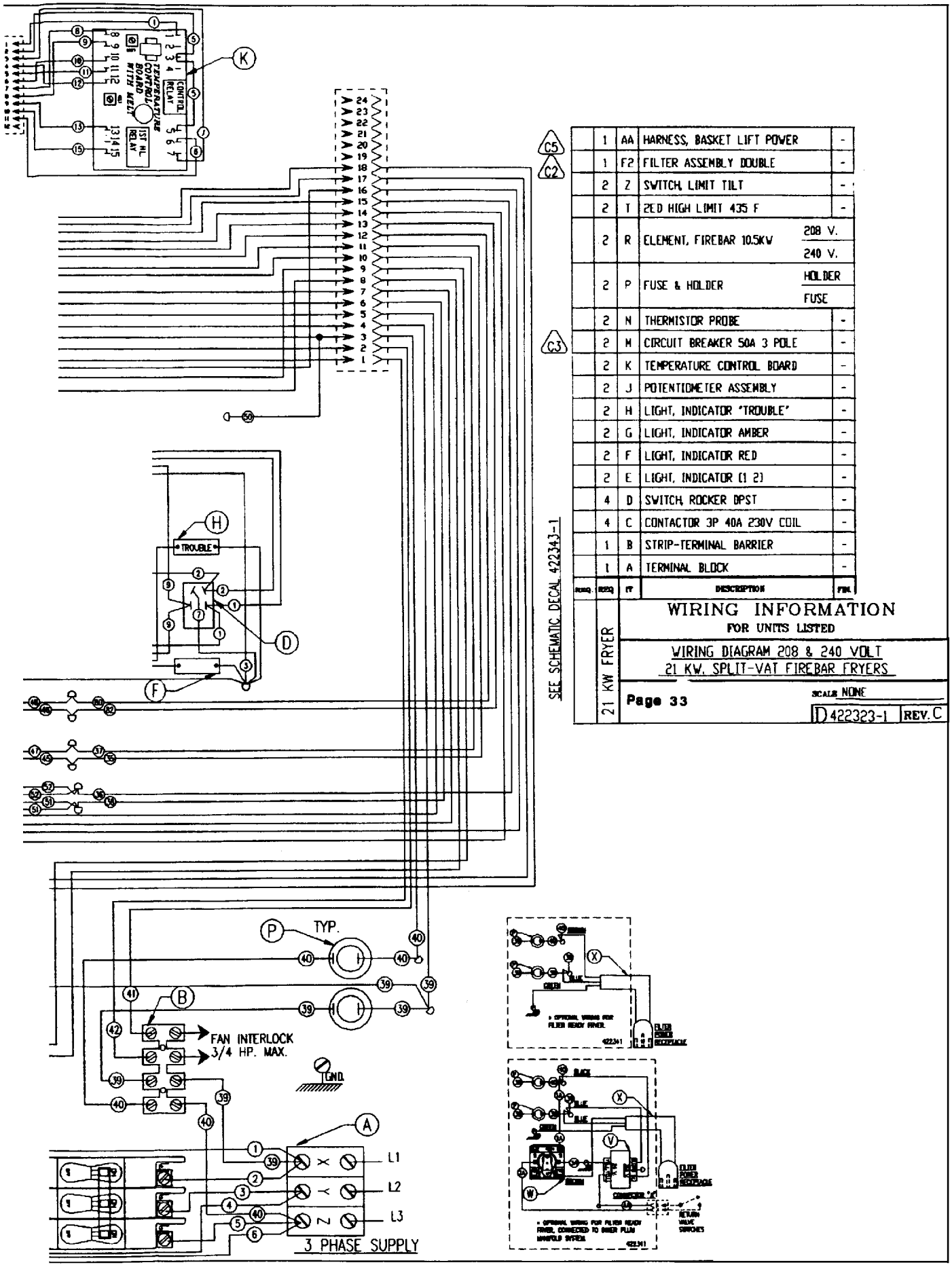
SCALE NONE

D 422325-1 REV. C

208-240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
21	51	51	51





	REQ.	IT	DESCRIPTION	PRT.
C5 C2	1	AA	HARNESS, BASKET LIFT POWER	-
	1	F2	FILTER ASSEMBLY DOUBLE	-
	2	Z	SWITCH, LIMIT TILT	-
	2	T	ZED HIGH LIMIT 435 F	-
	2	R	ELEMENT, FIREBAR 10.5KW 208 V. / 240 V.	-
	2	P	FUSE & HOLDER HOLDER / FUSE	-
	2	N	THERMISTOR PROBE	-
C3	2	M	CIRCUIT BREAKER 50A 3 POLE	-
	2	K	TEMPERATURE CONTROL BOARD	-
	2	J	POTENTIOMETER ASSEMBLY	-
	2	H	LIGHT, INDICATOR "TROUBLE"	-
	2	G	LIGHT, INDICATOR AMBER	-
	2	F	LIGHT, INDICATOR RED	-
	2	E	LIGHT, INDICATOR (1 2)	-
	4	D	SWITCH, ROCKER DPST	-
	4	C	CONTACTOR 3P 40A 230V COIL	-
	1	B	STRIP-TERMINAL BARRIER	-
	1	A	TERMINAL BLOCK	-

21 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 208 & 240 VOLT
21 KW. SPLIT-VAT FIREBAR FRYERS

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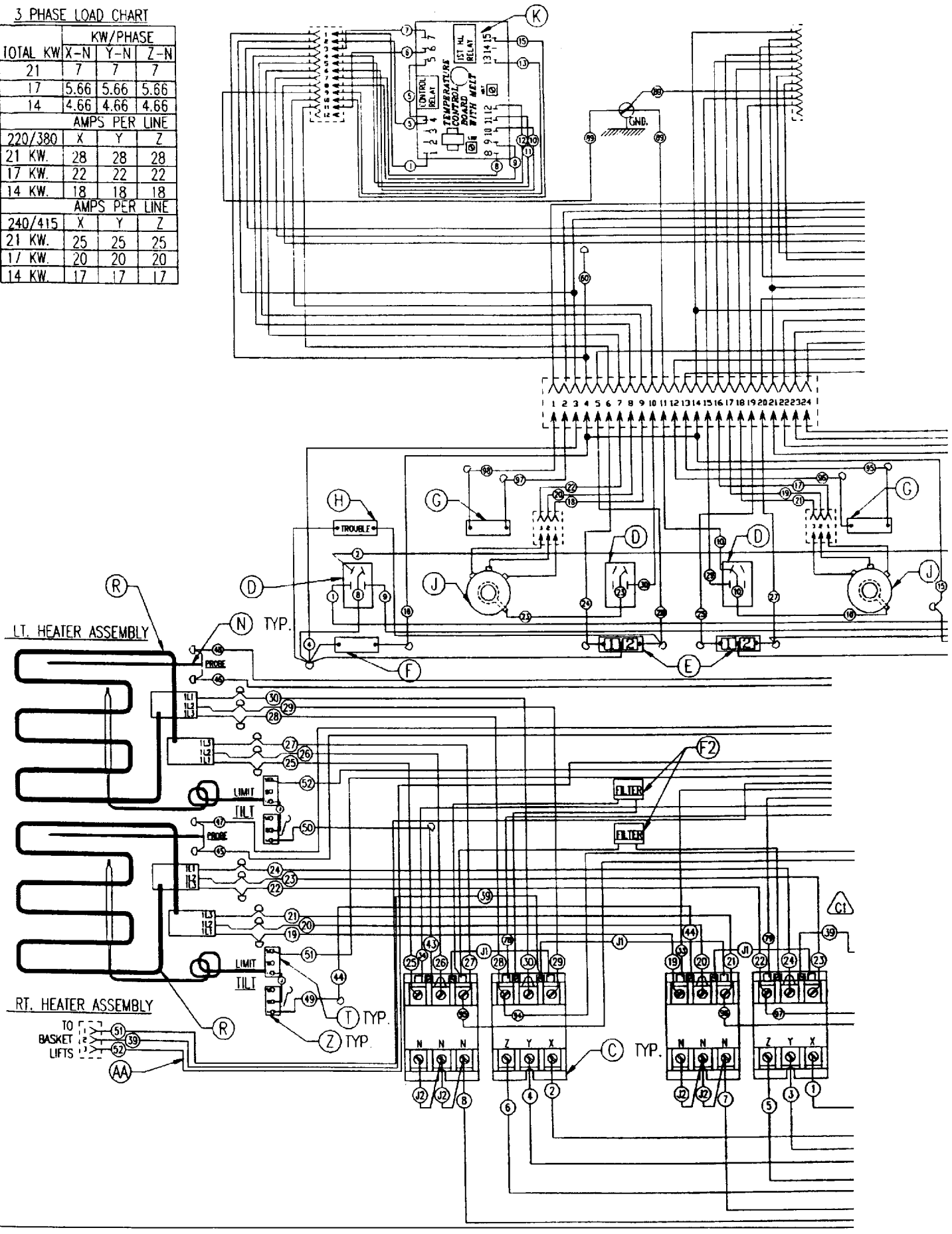
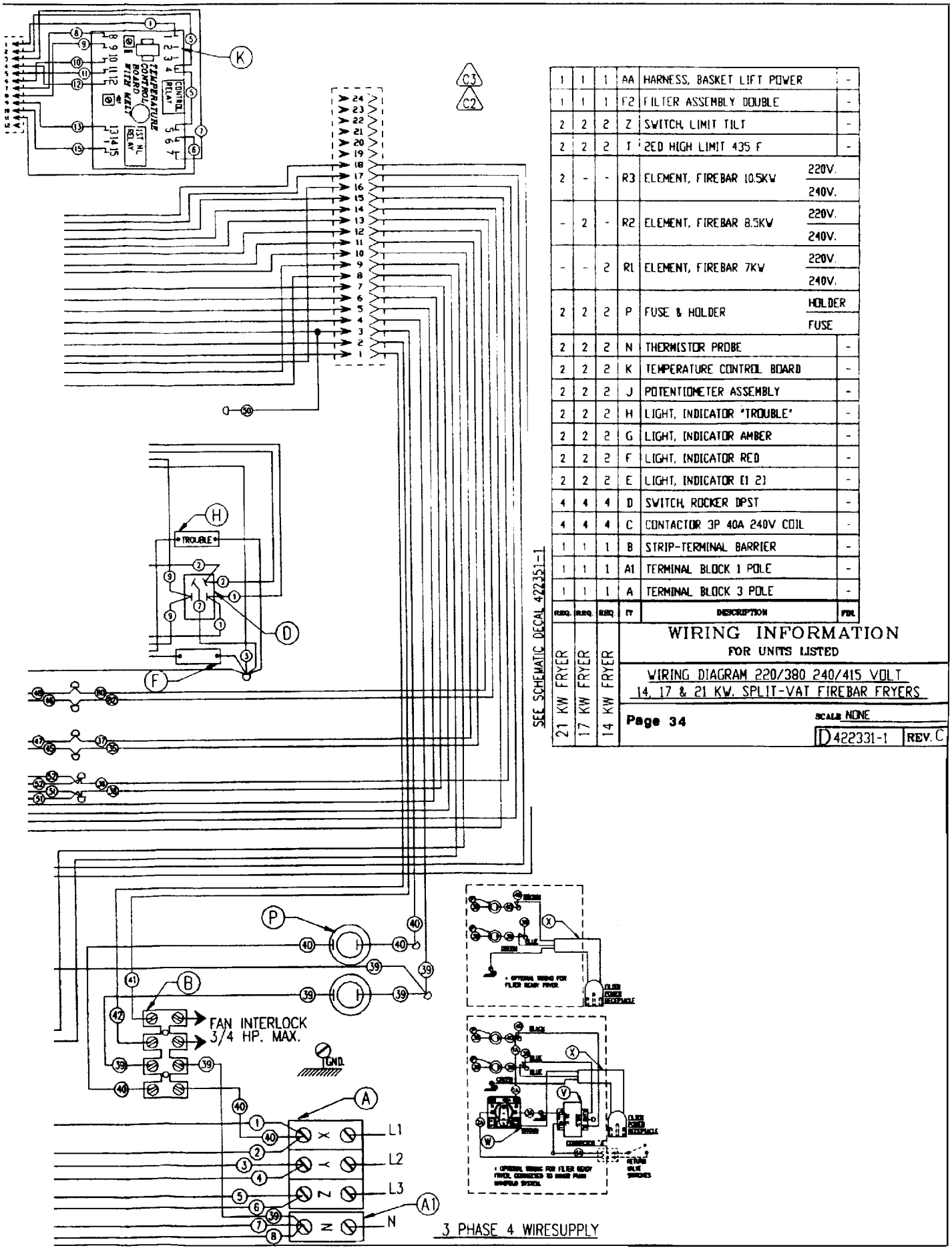
SCALE NONE

D 422323-1 REV. C

3 PHASE LOAD CHART

TOTAL KW	KW/PHASE X-N	Y-N	Z-N
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
220/380	X	Y	Z
21 KW.	28	28	28
17 KW.	22	22	22
14 KW.	18	18	18
	AMPS PER LINE		
240/415	X	Y	Z
21 KW.	25	25	25
17 KW.	20	20	20
14 KW.	17	17	17





1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 10.5KW	220V. / 240V.
-	2	-	R2	ELEMENT, FIREBAR 8.5KW	220V. / 240V.
-	-	2	R1	ELEMENT, FIREBAR 7KW	220V. / 240V.
2	2	2	P	FUSE & HOLDER	HOLDER / FUSE
2	2	2	N	THERMISTOR PROBE	-
2	2	2	K	TEMPERATURE CONTROL BOARD	-
2	2	2	J	POTENTIOMETER ASSEMBLY	-
2	2	2	H	LIGHT, INDICATOR 'TROUBLE'	-
2	2	2	G	LIGHT, INDICATOR AMBER	-
2	2	2	F	LIGHT, INDICATOR RED	-
2	2	2	E	LIGHT, INDICATOR (1 2)	-
4	4	4	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 240V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A1	TERMINAL BLOCK 1 POLE	-
1	1	1	A	TERMINAL BLOCK 3 POLE	-
REQ.	REQ.	REQ.	IT	DESCRIPTION	PER.

21 KW FRYER	17 KW FRYER	14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 220/380 240/415 VOLT
14, 17 & 21 KW. SPLIT-VAT FIREBAR FRYERS

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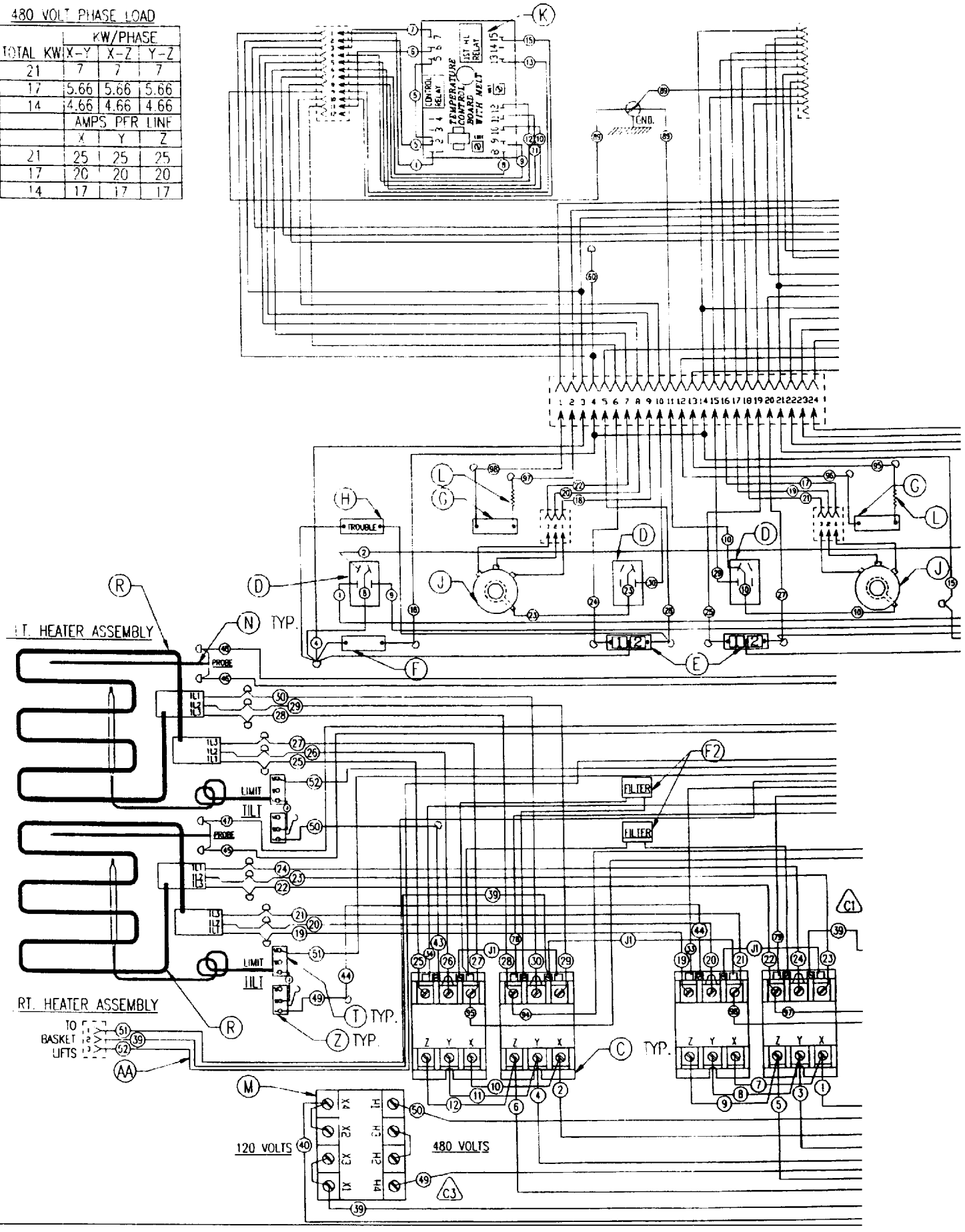
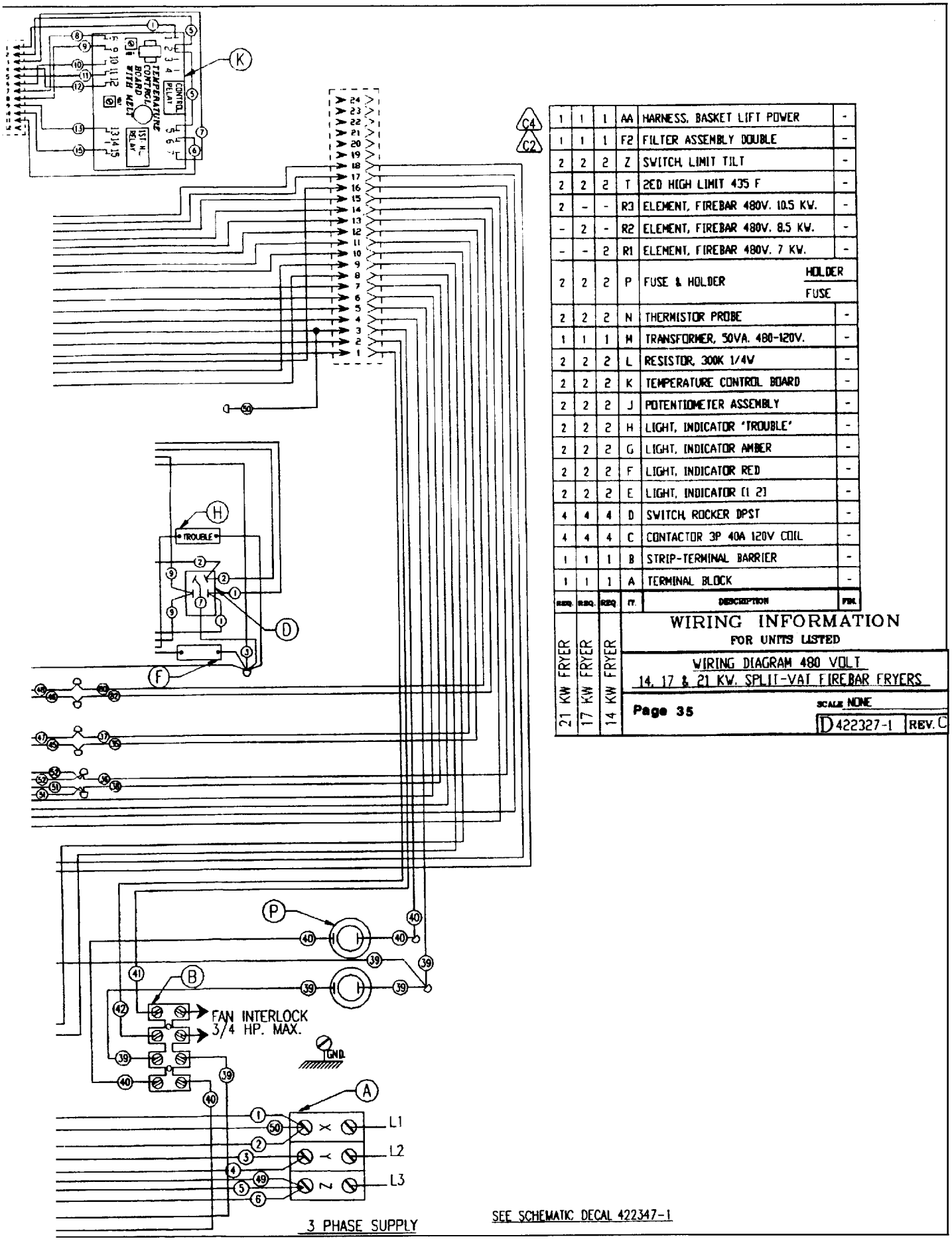
SCALE NONE

D422331-1 REV. C

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
21	25	25	25
17	20	20	20
14	17	17	17





1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	P	FUSE & HOLDER	HOLDER / FUSE
2	2	2	N	THERMISTOR PROBE	-
1	1	1	M	TRANSFORMER, 50VA. 480-120V.	-
2	2	2	L	RESISTOR, 300K 1/4W	-
2	2	2	K	TEMPERATURE CONTROL BOARD	-
2	2	2	J	POTENTIOMETER ASSEMBLY	-
2	2	2	H	LIGHT, INDICATOR 'TROUBLE'	-
2	2	2	G	LIGHT, INDICATOR AMBER	-
2	2	2	F	LIGHT, INDICATOR RED	-
2	2	2	E	LIGHT, INDICATOR (1 2)	-
4	4	4	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-
REQ.	REQ.	REQ	IT.	DESCRIPTION	PSN.

21 KW FRYER
17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 480 VOLT
14, 17 & 21 KW. SPLIT-VAT FIREBAR FRYERS

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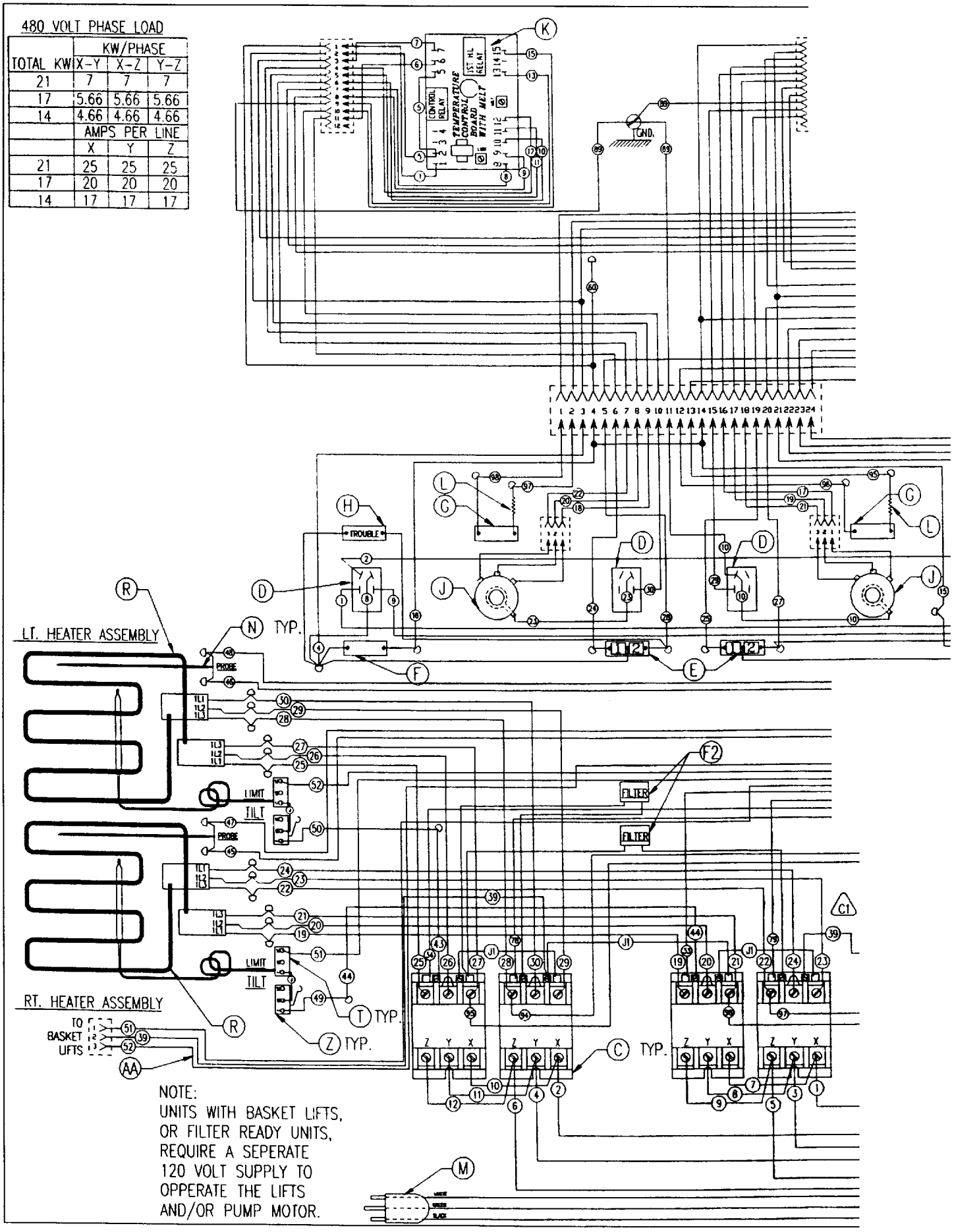
SCALE NONE

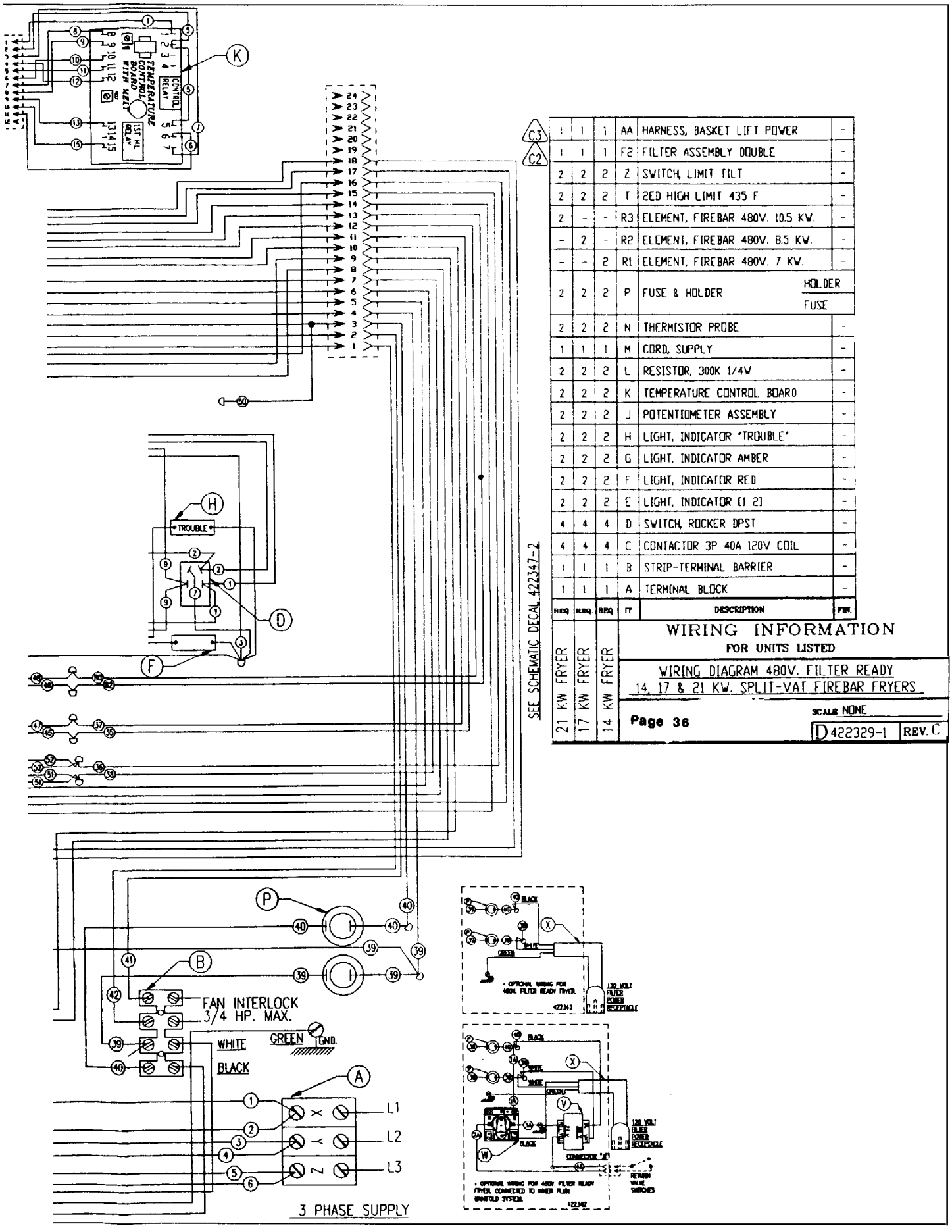
D 422327-1 REV. C

SEE SCHEMATIC DECAL 422347-1

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
21	25	25	25
17	20	20	20
14	17	17	17





1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	P	FUSE & HOLDER / FUSE	HOLDER / FUSE
2	2	2	N	THERMISTOR PROBE	-
1	1	1	M	CORD, SUPPLY	-
2	2	2	L	RESISTOR, 300K 1/4W	-
2	2	2	K	TEMPERATURE CONTROL BOARD	-
2	2	2	J	POTENTIOMETER ASSEMBLY	-
2	2	2	H	LIGHT, INDICATOR 'TROUBLE'	-
2	2	2	G	LIGHT, INDICATOR AMBER	-
2	2	2	F	LIGHT, INDICATOR RED	-
2	2	2	E	LIGHT, INDICATOR (1 2)	-
4	4	4	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-
REQ.	REQ.	REQ.	IT	DESCRIPTION	PER

21 KW FRYER	17 KW FRYER	14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 480V. FILTER READY
14, 17 & 21 KW. SPLIT-VAT FIREBAR FRYERS

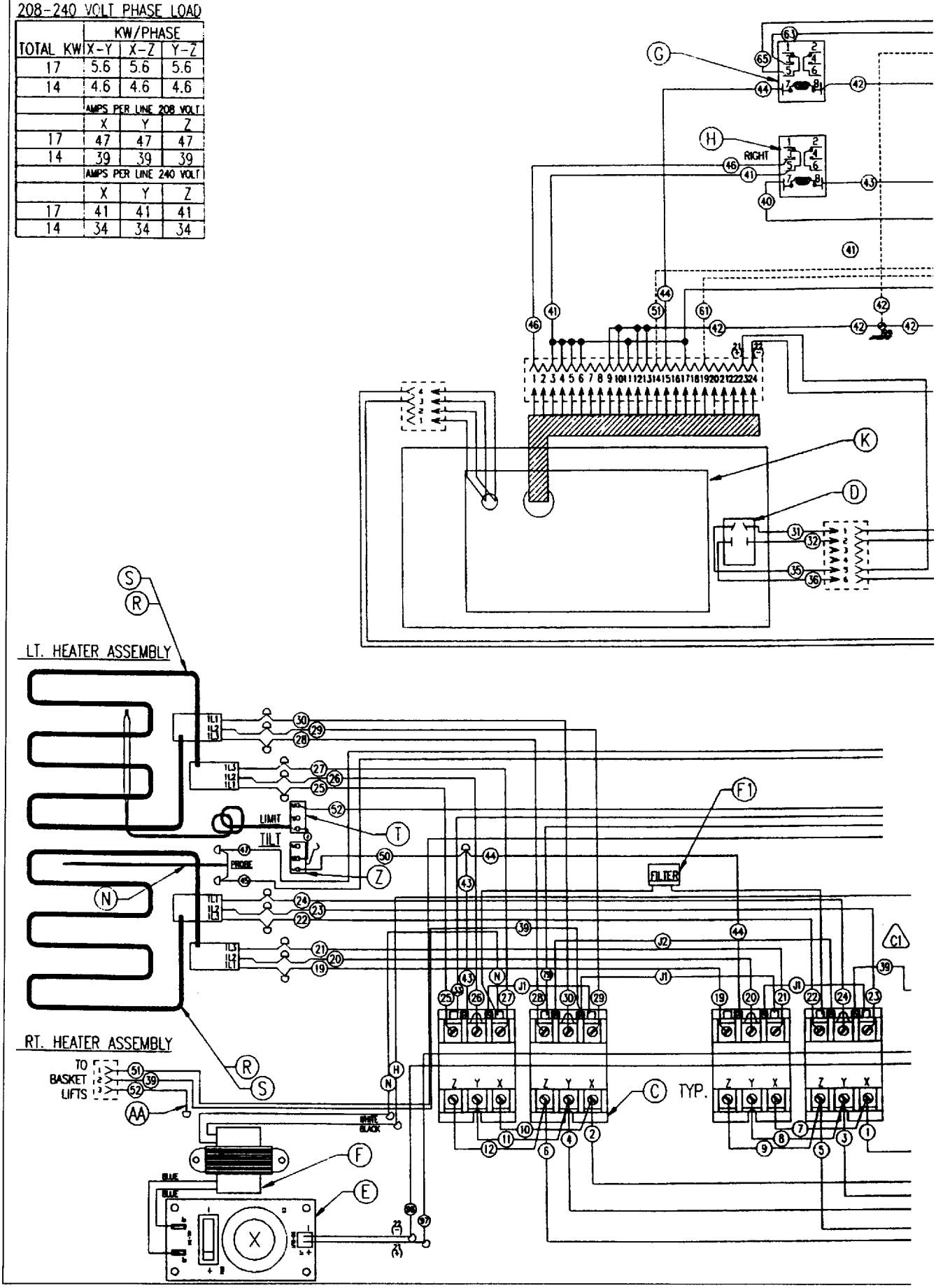
Page 36

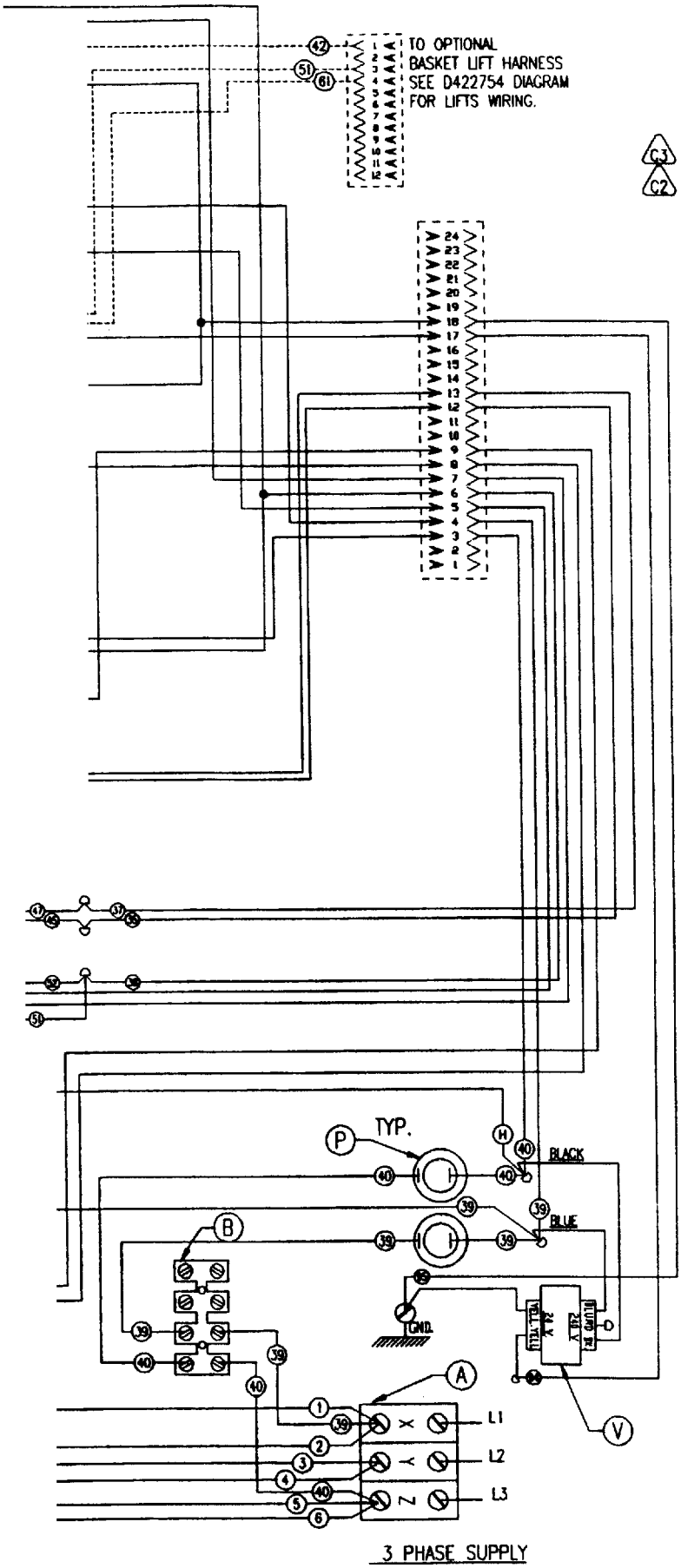
SCALE NONE

D 422329-1 REV. C

208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34





C3 C2	1	1	AA	HARNESS, BASKET LIFT POWER	-
	1	1	F1	FILTER ASSEMBLY SINGLE	-
	1	1	Z	SWITCH, LIMIT TILT	-
	1	1	V	TRANSFORMER, 40VA 230/24VAC	-
	1	1	T	ZED HIGH LIMIT 435 F	-
	2	-	S	ELEMENT, FIREBAR 8.5KW	208 V. / 240 V.
	-	2	R	ELEMENT, FIREBAR 7KW	208 V. / 240 V.
	2	2	P	FUSE & HOLDER	HOLDER / FUSE
	1	1	N	THERMISTOR PROBE	-
	1	1	K	COMPUTER CONTROL	-
	1	1	H	RELAY DPDT 240V COIL	-
	1	1	G	RELAY, DPDT 24V COIL	-
	1	1	F	TRANSFORMER 240-12V	-
	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
	1	1	D	SWITCH, ROCKER DPST	-
	4	4	C	CONTACTOR 3P 40A 230V COIL	-
	1	1	B	STRIP-TERMINAL BARRIER	-
	1	1	A	TERMINAL BLOCK	-
	REQ.	REQ	ITEM	DESCRIPTION	ITEM

17 KW FRYER
14 KW FRYER

WIRING INFORMATION

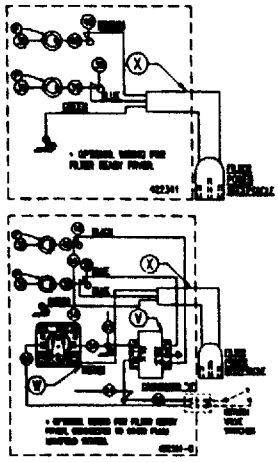
FOR UNITS LISTED

WIRING DIA. 208 & 240 VOLT COMPUTER CONTROL
17 & 14 KW. FULL-VAT FIREBAR FRYERS

Page 37

SCALE NONE

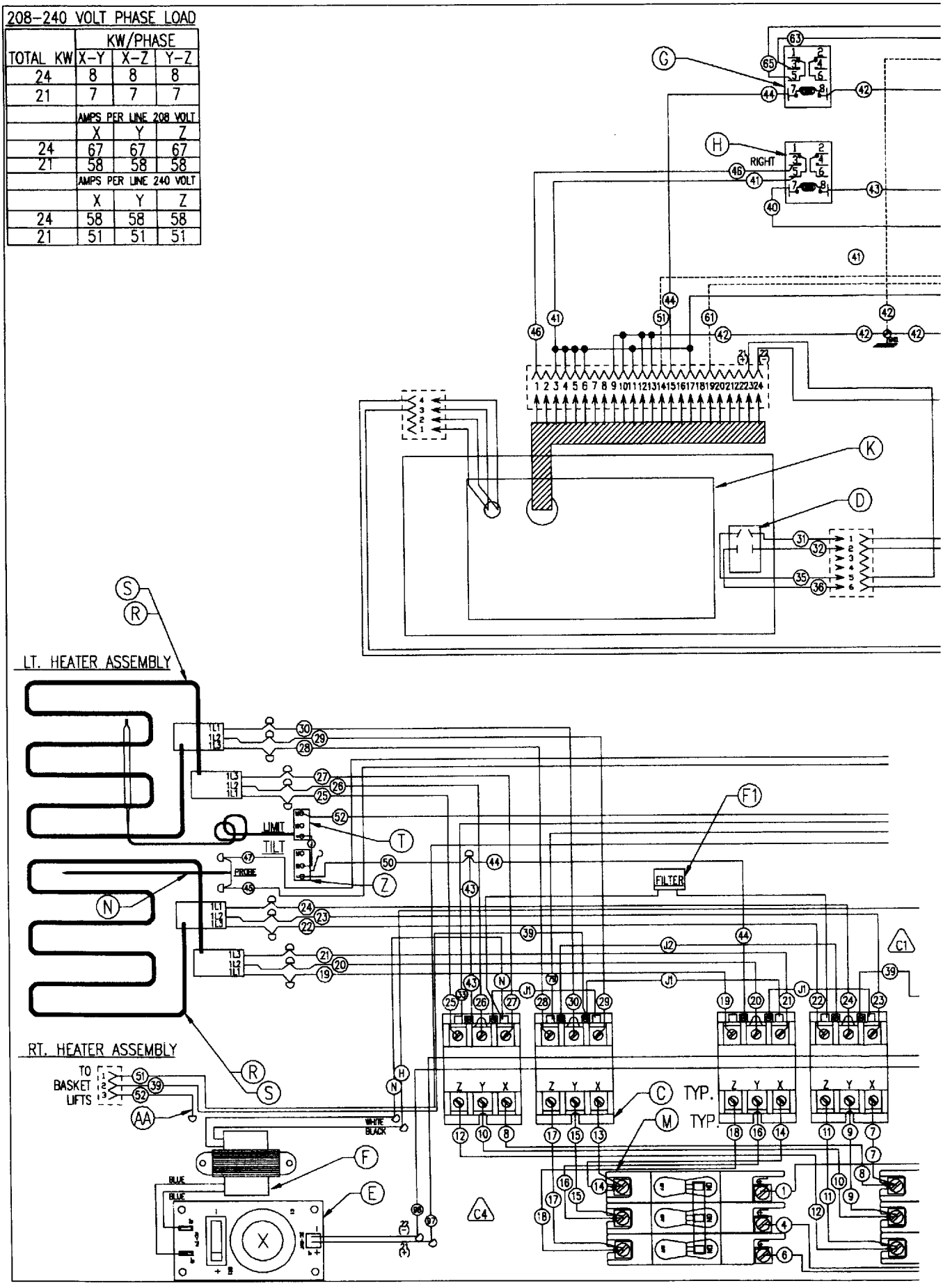
D422743-1 REV. C

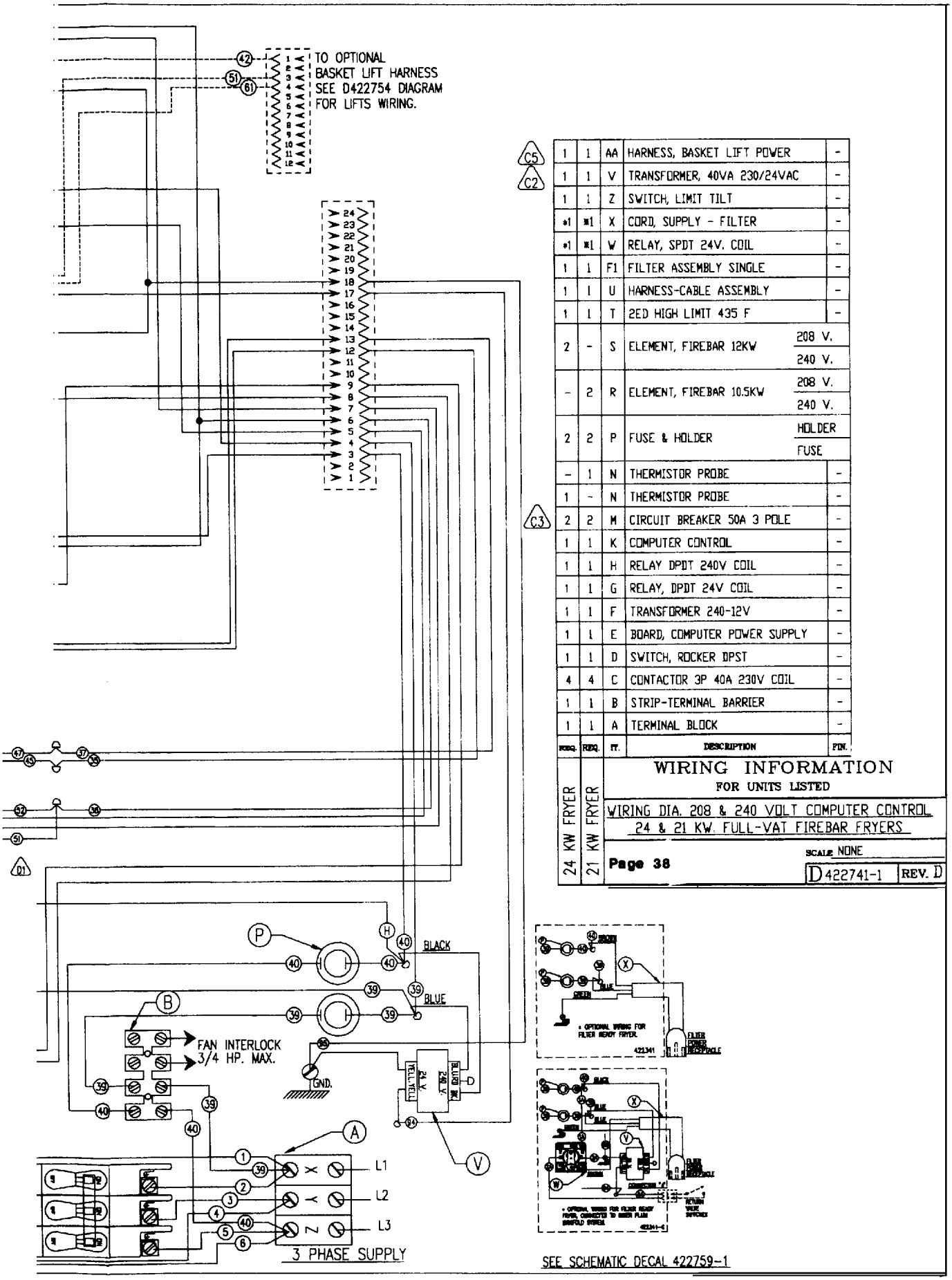


SEE SCHEMATIC DECAL 422759-1

208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
21	51	51	51





C5 C2	1	1	AA	HARNESS, BASKET LIFT POWER -
C2	1	1	V	TRANSFORMER, 40VA 230/24VAC -
	1	1	Z	SWITCH, LIMIT TILT -
	*1	*1	X	CORD, SUPPLY - FILTER -
	*1	*1	W	RELAY, SPDT 24V. COIL -
	1	1	F1	FILTER ASSEMBLY SINGLE -
	1	1	U	HARNESS-CABLE ASSEMBLY -
	1	1	T	2ED HIGH LIMIT 435 F -
	2	-	S	ELEMENT, FIREBAR 12KW 208 V. / 240 V.
	-	2	R	ELEMENT, FIREBAR 10.5KW 208 V. / 240 V.
	2	2	P	FUSE & HOLDER HOLDER / FUSE
	-	1	N	THERMISTOR PROBE -
	1	-	N	THERMISTOR PROBE -
C3	2	2	M	CIRCUIT BREAKER 50A 3 POLE -
	1	1	K	COMPUTER CONTROL -
	1	1	H	RELAY DPDT 240V COIL -
	1	1	G	RELAY, DPDT 24V COIL -
	1	1	F	TRANSFORMER 240-12V -
	1	1	E	BOARD, COMPUTER POWER SUPPLY -
	1	1	D	SWITCH, ROCKER DPST -
	4	4	C	CONTACTOR 3P 40A 230V COIL -
	1	1	B	STRIP-TERMINAL BARRIER -
	1	1	A	TERMINAL BLOCK -
	REQ.	REQ.	IT.	DESCRIPTION FIN.

24 KW FRYER
21 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIA. 208 & 240 VOLT COMPUTER CONTROL
24 & 21 KW. FULL-VAT FIREBAR FRYERS

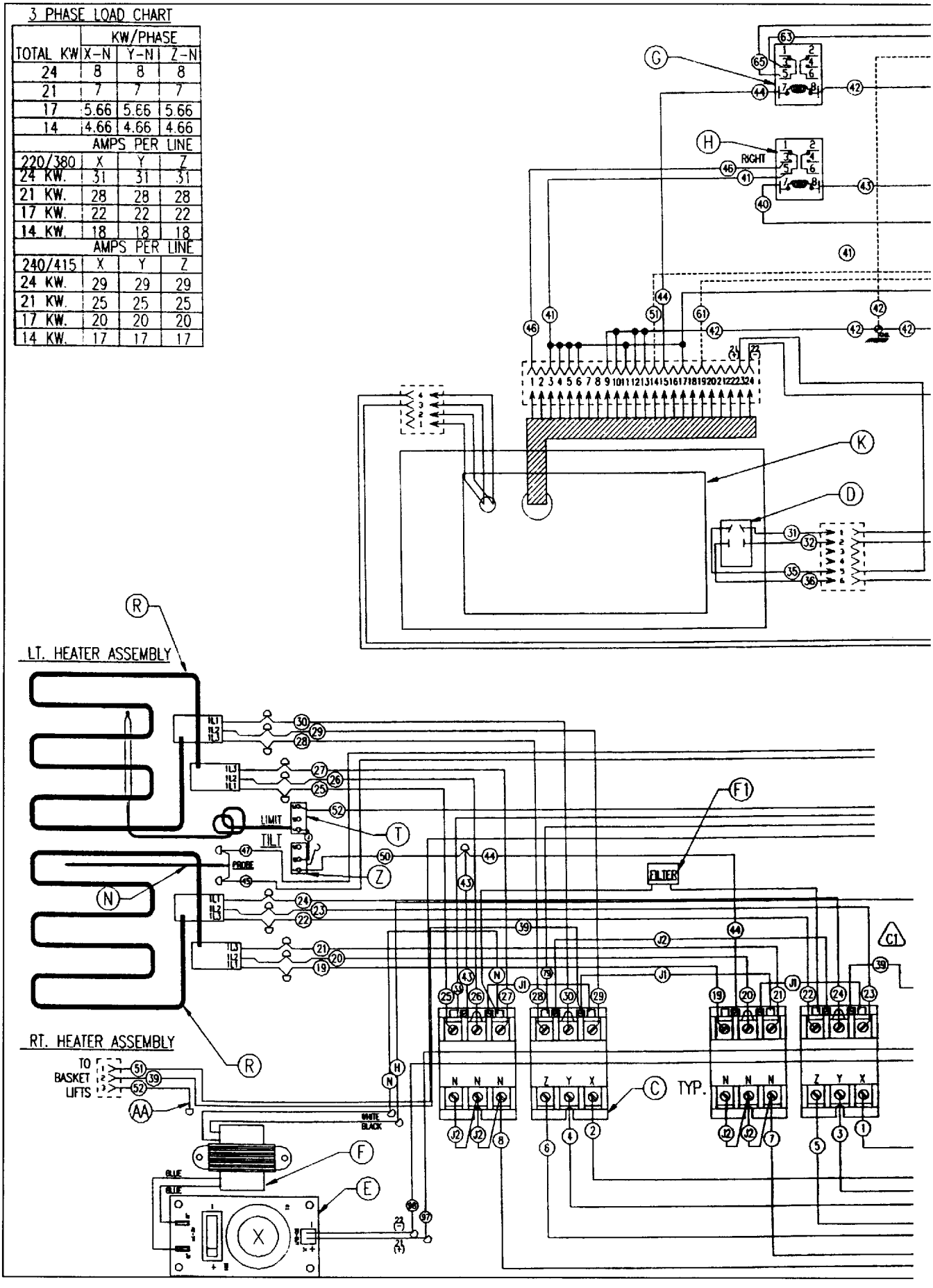
Page 38

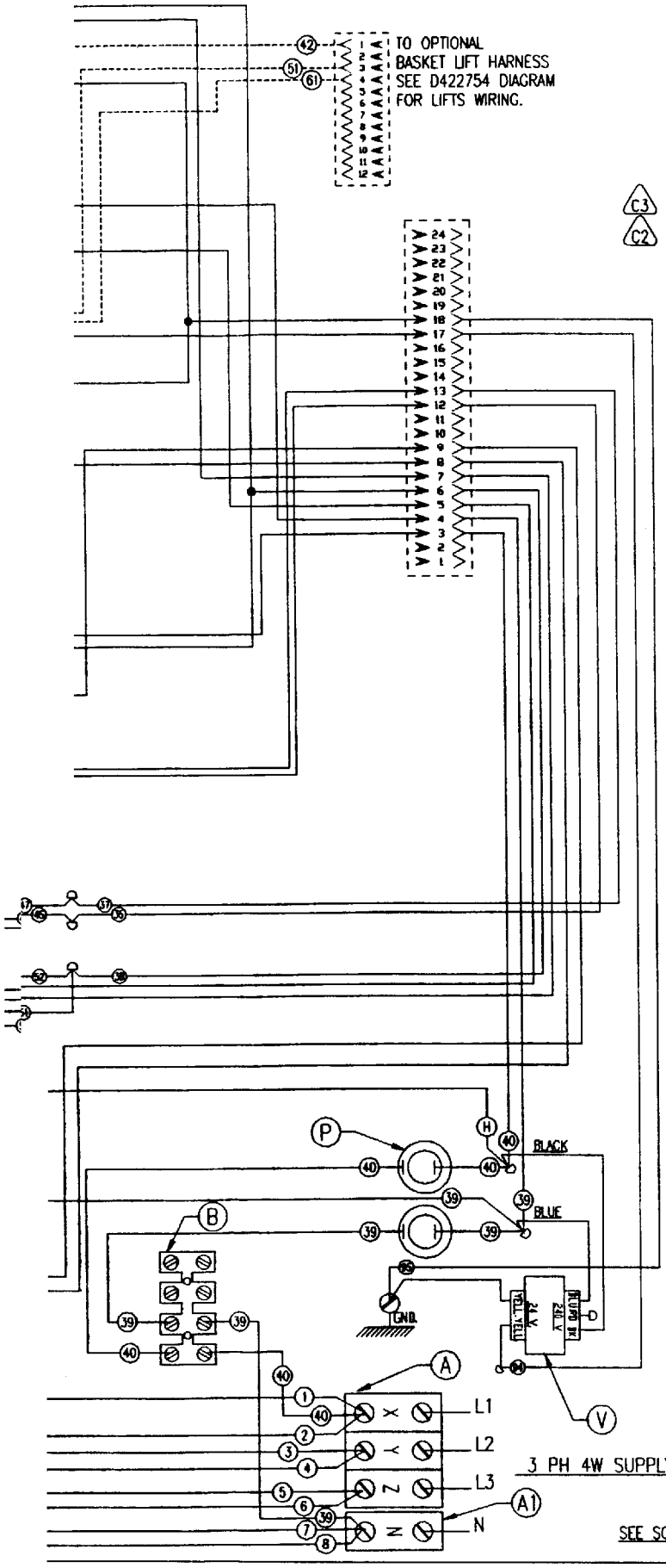
SCALE NONE

D422741-1 REV. D

3 PHASE LOAD CHART

	KW/PHASE		
TOTAL KW	X-N	Y-N	Z-N
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
AMPS PER LINE			
220/380	X	Y	Z
24 KW.	31	31	31
21 KW.	28	28	28
17 KW.	22	22	22
14 KW.	18	18	18
AMPS PER LINE			
240/415	X	Y	Z
24 KW.	29	29	29
21 KW.	25	25	25
17 KW.	20	20	20
14 KW.	17	17	17





C3 C2	1	1	1	1	AA	HARNESS, BASKET LIFT POWER	-
	1	1	1	1	F1	FILTER ASSEMBLY SINGLE	-
	1	1	1	1	Z	SWITCH, LIMIT TILT	-
	1	1	1	1	V	TRANSFORMER, 40VA 230/24VAC	-
	1	1	1	1	T	2ED HIGH LIMIT 435 F	-
	2	-	-	-	R4	ELEMENT, FIREBAR 12KW	220V. / 240V.
	-	2	-	-	R3	ELEMENT, FIREBAR 10.5KW	220V. / 240V.
	-	-	2	-	R2	ELEMENT, FIREBAR 8.5KW	220V. / 240V.
	-	-	-	2	R1	ELEMENT, FIREBAR 7KW	220V. / 240V.
	2	2	2	2	P	FUSE & HOLDER	HOLDER / FUSE
	1	1	1	1	N	THERMISTOR PROBE	-
	1	1	1	1	K	COMPUTER CONTROL	-
	1	1	1	1	H	RELAY DPDT 240V COIL	-
	1	1	1	1	G	RELAY, DPDT 24V COIL	-
	1	1	1	1	F	TRANSFORMER 240-12V	-
	1	1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
	1	1	1	1	D	SWITCH, ROCKER DPST	-
	4	4	4	4	C	CONTACTOR 3P 40A 230V COIL	-
	1	1	1	1	B	STRIP-TERMINAL BARRIER	-
	1	1	1	1	A	TERMINAL BLOCK	-
	REQ.	REQ.	REQ.	REQ.	IT	DESCRIPTION	REF.

24 KW FRYER
21 KW FRYER
17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIA. 220/380 240/415 V. COMP.CONTROL
24,21,17 & 14 KW. FULL-VAT FIREBAR FRYERS

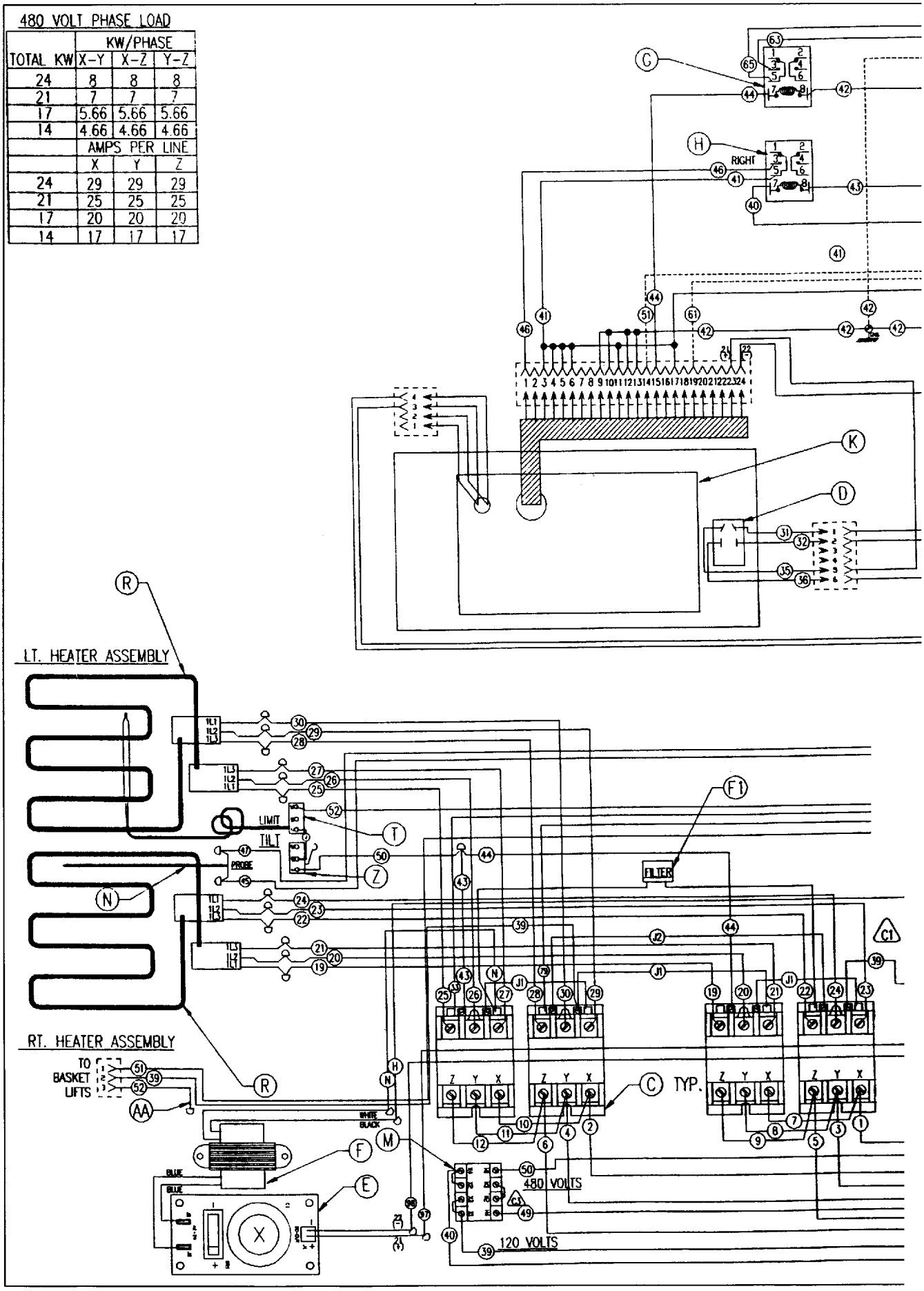
Page 39

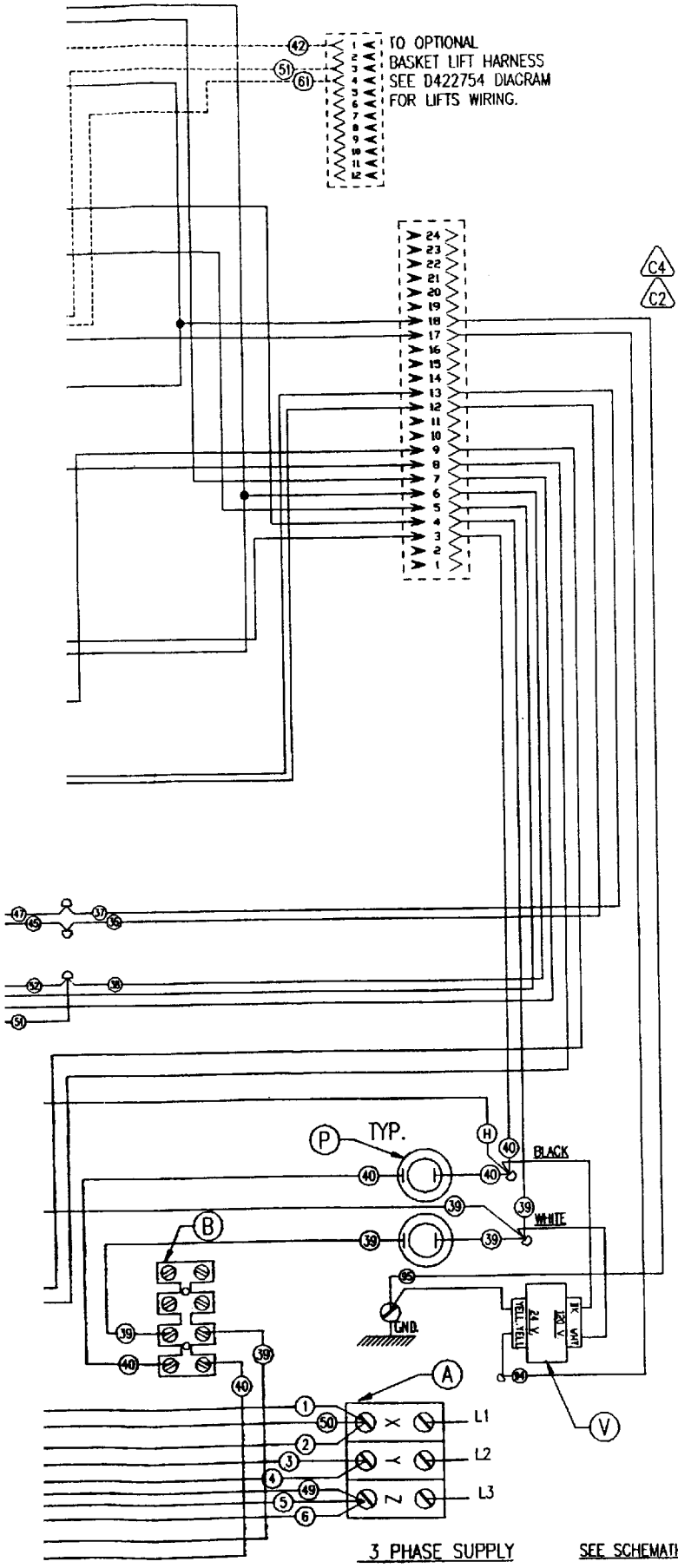
SCALE NONE

D422749-1 REV. C

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
21	25	25	25
17	20	20	20
14	17	17	17





REQ.	REQ.	REQ.	REQ.	ITT.	DESCRIPTION	FIG.
1	1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	1	FI	FILTER ASSEMBLY SINGLE	-
1	1	1	1	Z	SWITCH, LIMIT TILT	-
1	1	1	1	V	TRANSFORMER, 40VA 120/24VAC	-
1	1	1	1	T	2ED HIGH LIMIT 435 F	-
2	-	-	-	R3	ELEMENT, FIREBAR 480V. 12 KW.	-
-	2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
1	1	1	1	M	TRANSFORMER, 50VA. 480-120V.	-
1	-	-	-	N	THERMISTOR PROBE	-
-	1	1	1	N	THERMISTOR PROBE	-
1	1	1	1	K	COMPUTER CONTROL	-
1	1	1	1	H	RELAY DPDT 120V COIL	-
1	1	1	1	G	RELAY, DPDT 24V COIL	-
1	1	1	1	F	TRANSFORMER 120-12V	-
1	1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
1	1	1	1	D	SWITCH, ROCKER DPST	-
4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	1	A	TERMINAL BLOCK	-

24 KW FRYER
21 KW FRYER
17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIA. 480V COMPUTER CONTROL
24,21,17 & 14KW. FULL-VAT FIREBAR FRYERS

Page 40

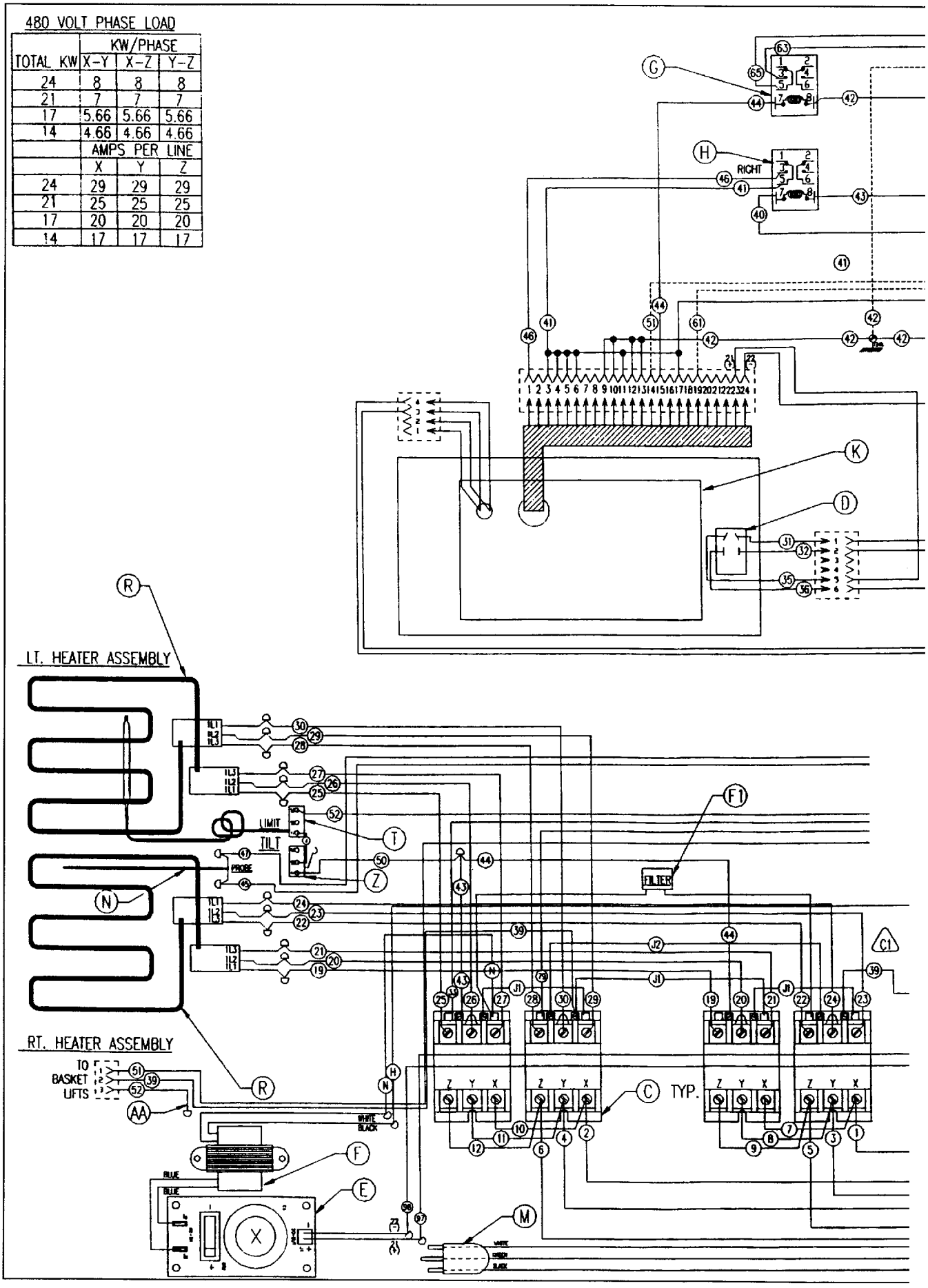
SCALE NONE

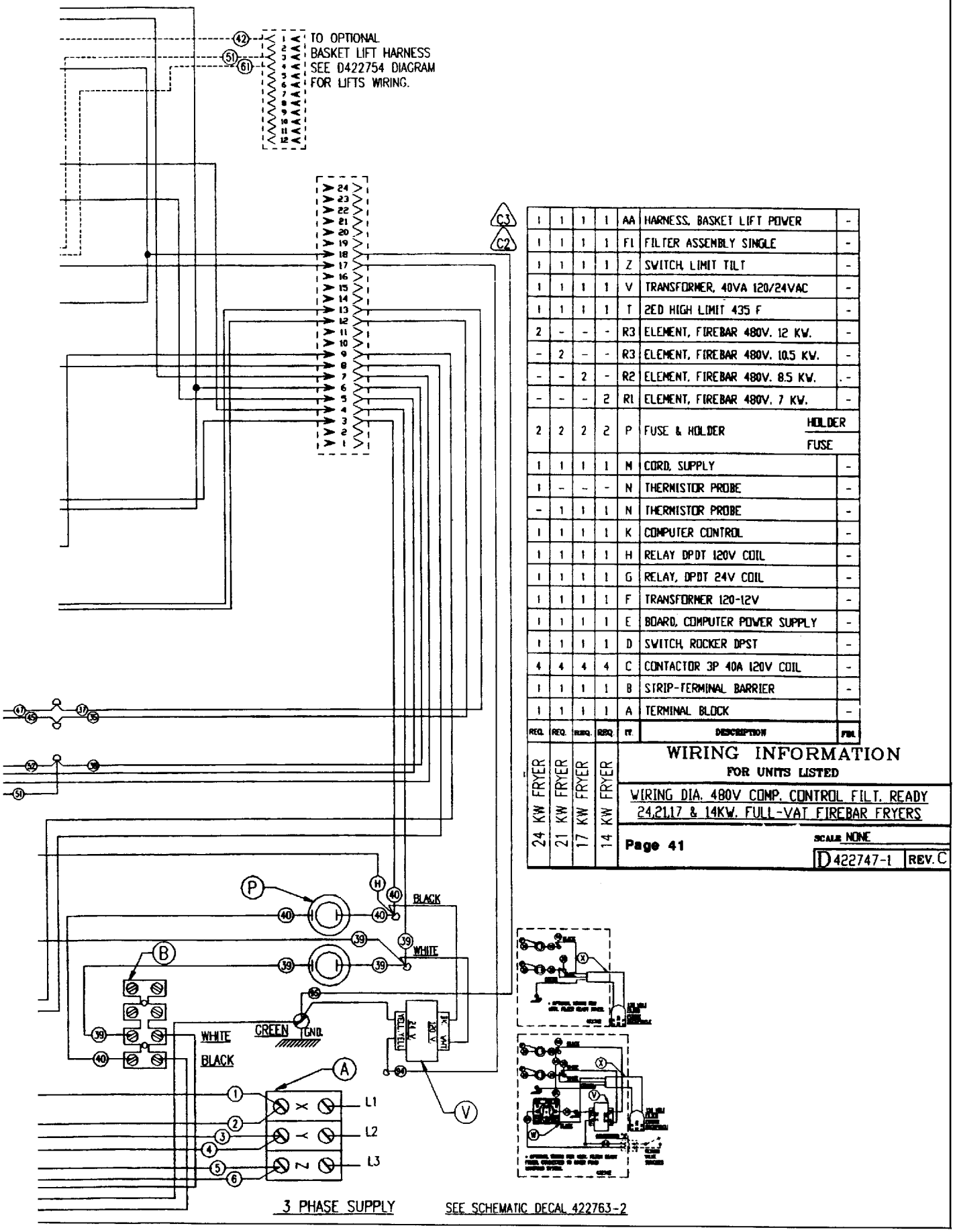
D422745-1 REV. C

SEE SCHEMATIC DECAL 422763-1

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
21	25	25	25
17	20	20	20
14	17	17	17





24 KW FRYER	21 KW FRYER	17 KW FRYER	14 KW FRYER	IT.	DESCRIPTION	FIG.
1	1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	1	FI	FILTER ASSEMBLY SINGLE	-
1	1	1	1	Z	SWITCH, LIMIT TILT	-
1	1	1	1	V	TRANSFORMER, 40VA 120/24VAC	-
1	1	1	1	T	2ED HIGH LIMIT 435 F	-
2	-	-	-	R3	ELEMENT, FIREBAR 480V. 12 KW.	-
-	2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	-	2	RI	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	2	P	FUSE & HOLDER	HOLDER FUSE
1	1	1	1	M	CORD, SUPPLY	-
1	-	-	-	N	THERMISTOR PROBE	-
-	1	1	1	N	THERMISTOR PROBE	-
1	1	1	1	K	COMPUTER CONTROL	-
1	1	1	1	H	RELAY DPDT 120V COIL	-
1	1	1	1	G	RELAY, DPDT 24V COIL	-
1	1	1	1	F	TRANSFORMER 120-12V	-
1	1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
1	1	1	1	D	SWITCH, ROCKER DPST	-
4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	1	A	TERMINAL BLOCK	-

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIA. 480V COMP. CONTROL FILT. READY
24,21,17 & 14KW. FULL-VAT FIREBAR FRYERS

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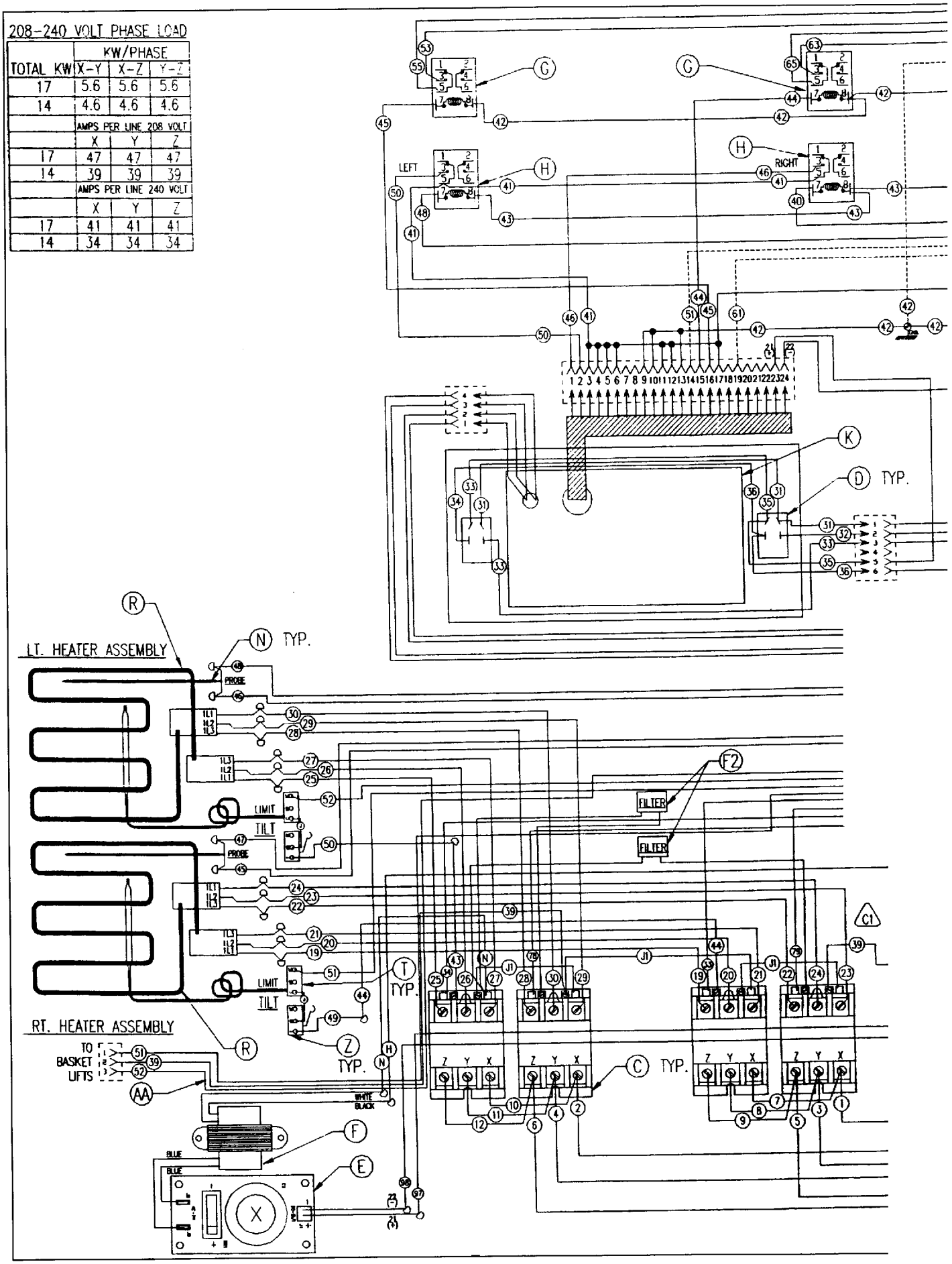
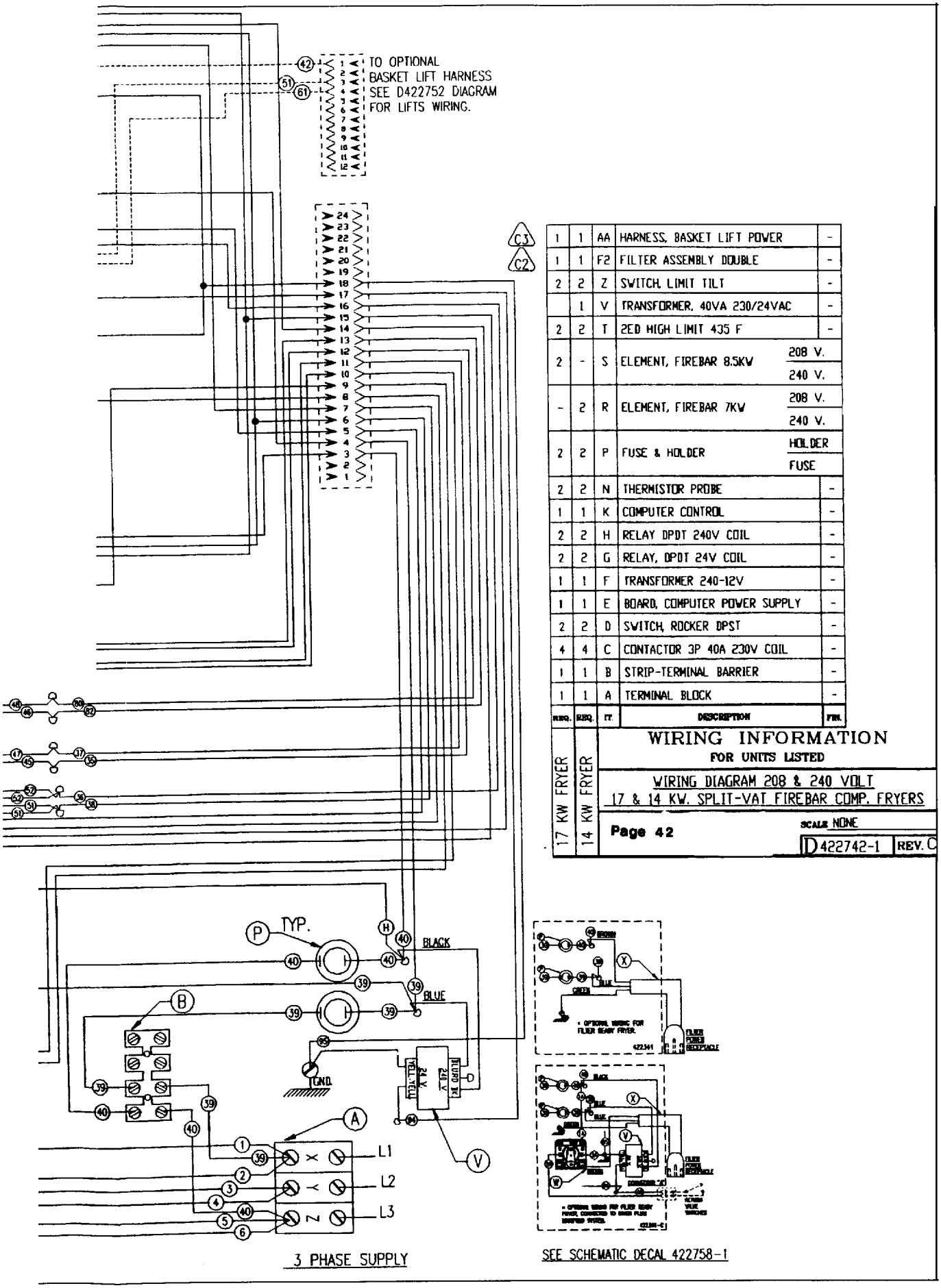
SCALE NONE

D422747-1 REV. C

208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE		
	X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34





1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	Z	SWITCH, LIMIT TILT	-
	1	V	TRANSFORMER, 40VA 230/24VAC	-
2	2	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 8.5KW	208 V. / 240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V. / 240 V.
2	2	P	FUSE & HOLDER	HOLDER / FUSE
2	2	N	THERMISTOR PROBE	-
1	1	K	COMPUTER CONTROL	-
2	2	H	RELAY DPDT 240V COIL	-
2	2	G	RELAY, DPDT 24V COIL	-
1	1	F	TRANSFORMER 240-12V	-
1	1	E	BOARD, COMPUTER POWER SUPPLY	-
2	2	D	SWITCH, ROCKER DPST	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-
REQ.	REQ.	IT.	DESCRIPTION	FIN.

17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 208 & 240 VOLT
17 & 14 KW. SPLIT-VAT FIREBAR COMP. FRYERS

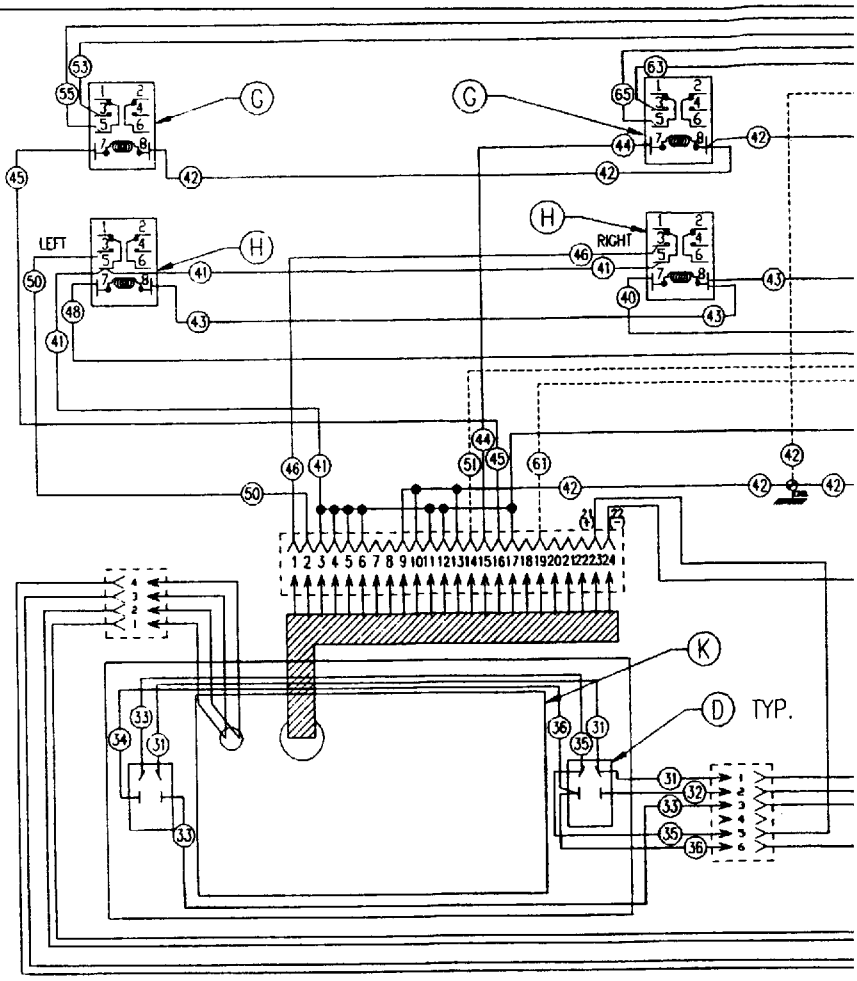
Page 42

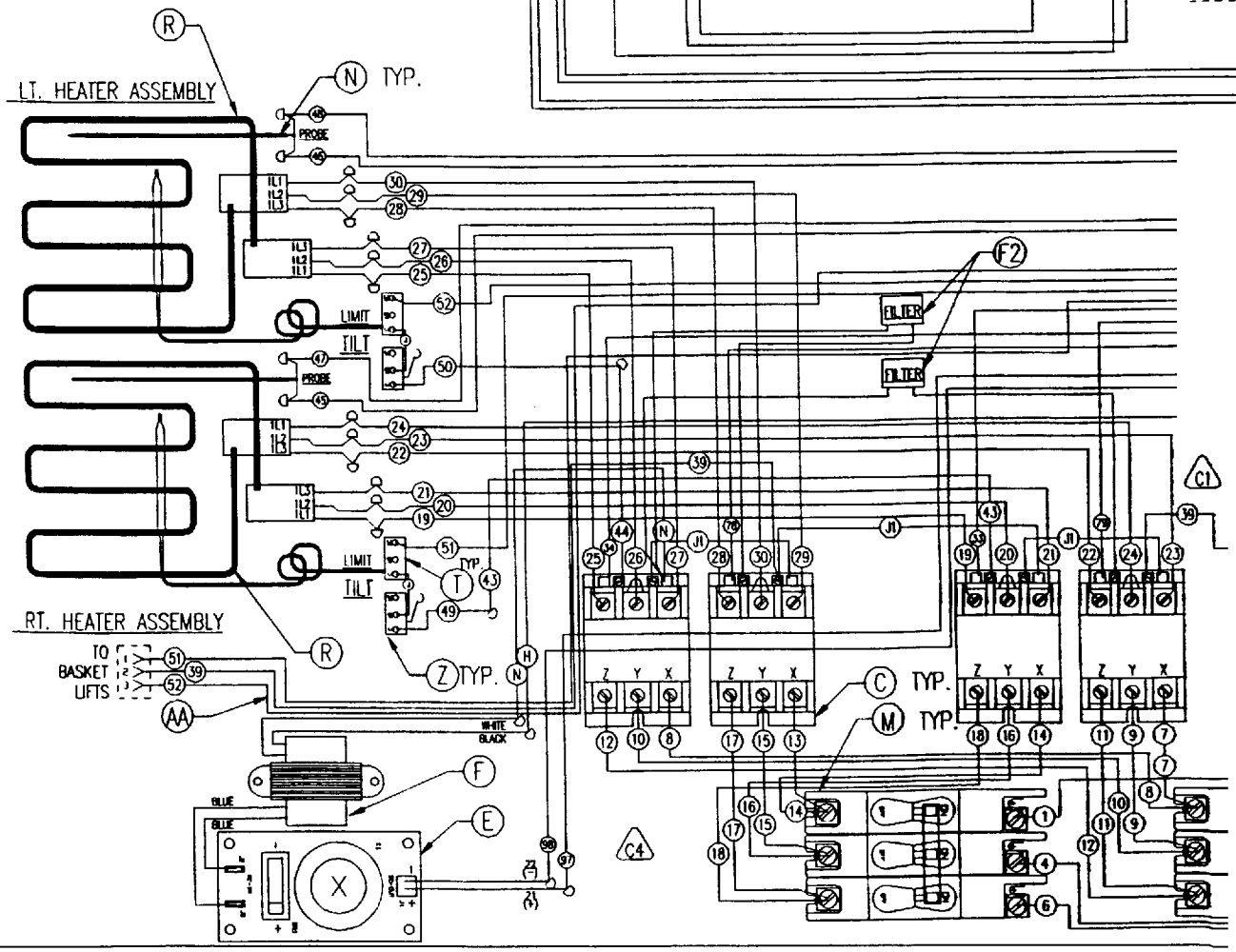
SCALE NONE

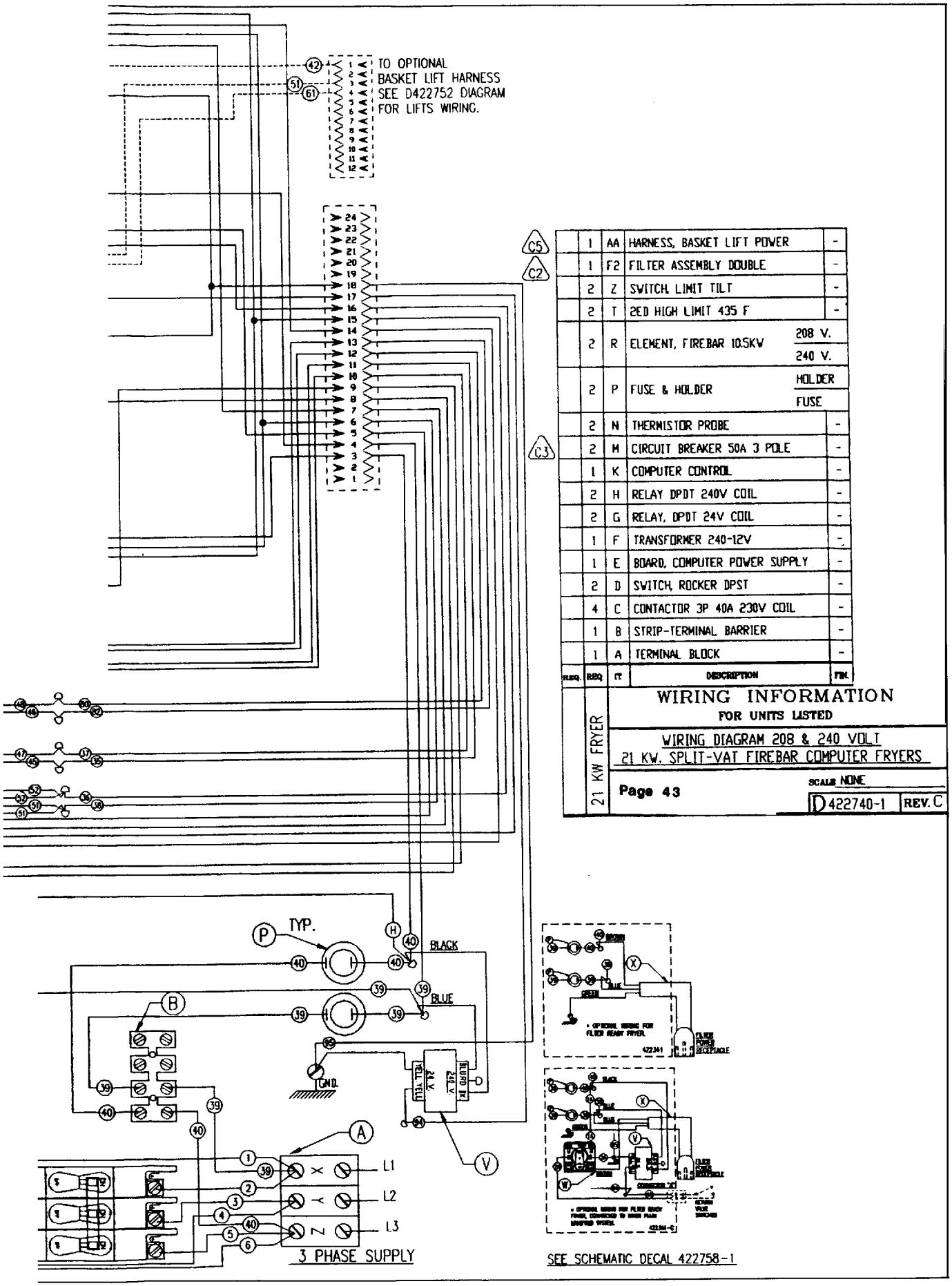
D422742-1 REV. C

208-240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
21	51	51	51







	QTY	REQ	PT	DESCRIPTION	FIN
C5		1	AA	HARNESS, BASKET LIFT POWER	-
C2		1	F2	FILTER ASSEMBLY DOUBLE	-
		2	Z	SWITCH, LIMIT TILT	-
		2	T	2ED HIGH LIMIT 435 F	-
		2	R	ELEMENT, FIREBAR 10.5KW	208 V. / 240 V.
		2	P	FUSE & HOLDER	HOLDER / FUSE
		2	N	THERMISTOR PROBE	-
C3		2	M	CIRCUIT BREAKER 50A 3 POLE	-
		1	K	COMPUTER CONTROL	-
		2	H	RELAY DPDT 240V COIL	-
		2	G	RELAY, DPDT 24V COIL	-
		1	F	TRANSFORMER 240-12V	-
		1	E	BOARD, COMPUTER POWER SUPPLY	-
		2	D	SWITCH, ROCKER DPST	-
		4	C	CONTACTOR 3P 40A 230V COIL	-
		1	B	STRIP-TERMINAL BARRIER	-
		1	A	TERMINAL BLOCK	-

WIRING INFORMATION
FOR UNITS LISTED

21 KW FRYER

WIRING DIAGRAM 208 & 240 VOLT
21 KW. SPLIT-VAT FIREBAR COMPUTER FRYERS

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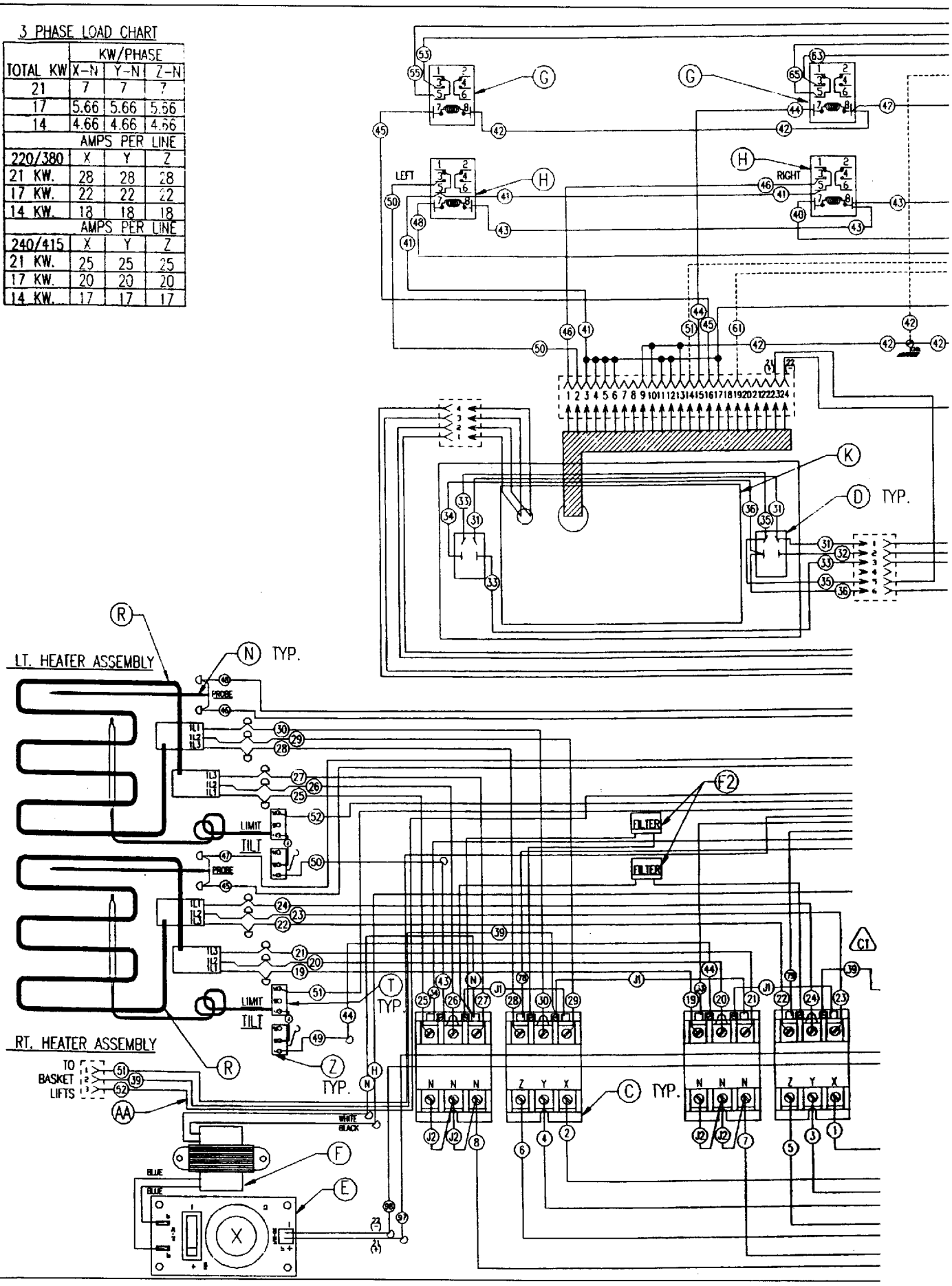
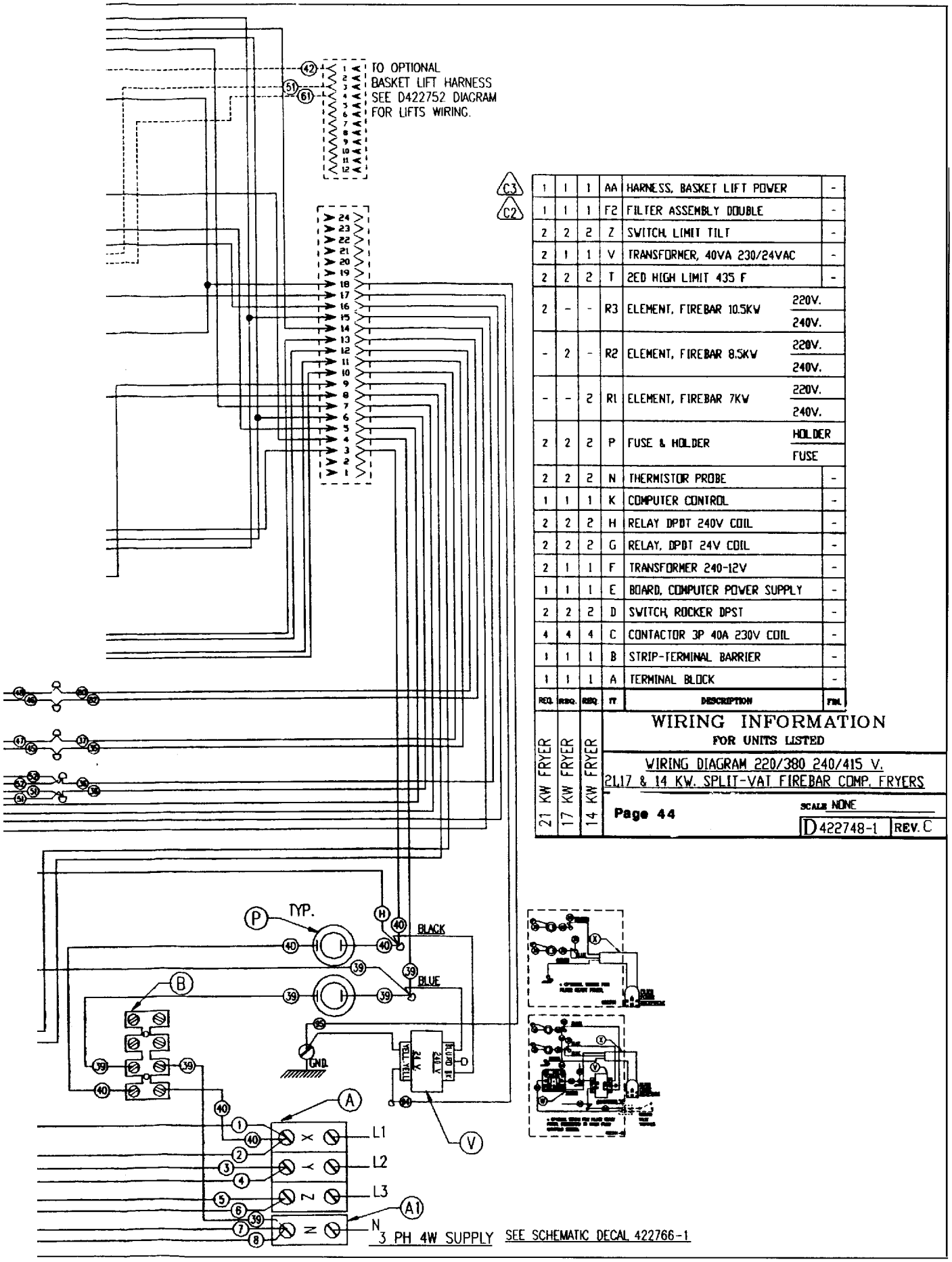
SCALE NONE

D422740-1 REV. C

3 PHASE LOAD CHART

	KW/PHASE		
TOTAL KW	X-N	Y-N	Z-N
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
220/380	X	Y	Z
21 KW.	28	28	28
17 KW.	22	22	22
14 KW.	18	18	18
	AMPS PER LINE		
240/415	X	Y	Z
21 KW.	25	25	25
17 KW.	20	20	20
14 KW.	17	17	17





1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
2	1	1	V	TRANSFORMER, 40VA 230/24VAC	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 10.5KW	220V. / 240V.
-	2	-	R2	ELEMENT, FIREBAR 8.5KW	220V. / 240V.
-	-	2	R1	ELEMENT, FIREBAR 7KW	220V. / 240V.
2	2	2	P	FUSE & HOLDER	HOLDER / FUSE
2	2	2	N	THERMISTOR PROBE	-
1	1	1	K	COMPUTER CONTROL	-
2	2	2	H	RELAY DPDT 240V COIL	-
2	2	2	G	RELAY, DPDT 24V COIL	-
2	1	1	F	TRANSFORMER 240-12V	-
1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
2	2	2	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-

REQ.	REQ.	REQ.	IT	DESCRIPTION	FIN.

21 KW FRYER
17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 220/380 240/415 V.
21,17 & 14 KW. SPLIT-VAT FIREBAR COMP. FRYERS

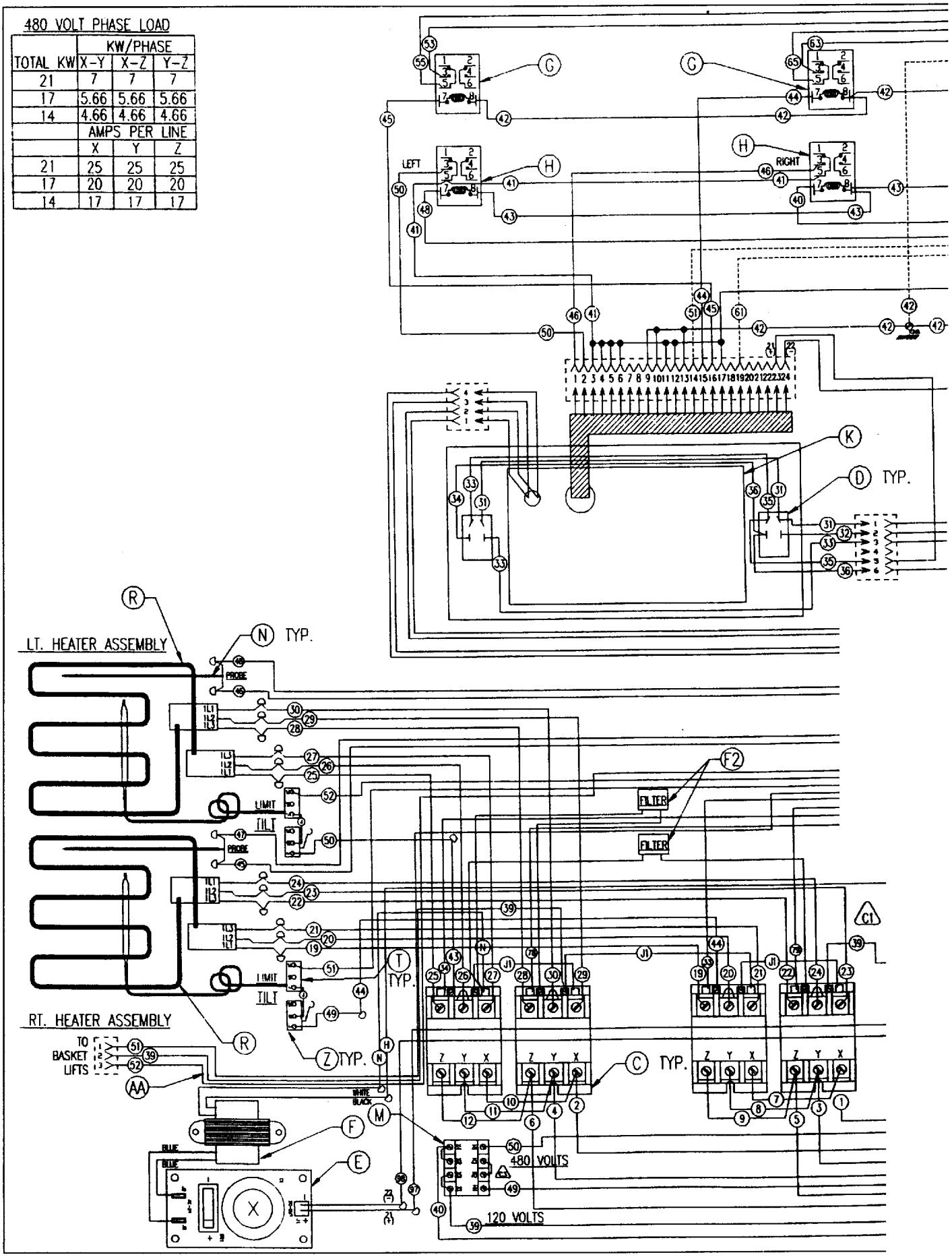
Page 44

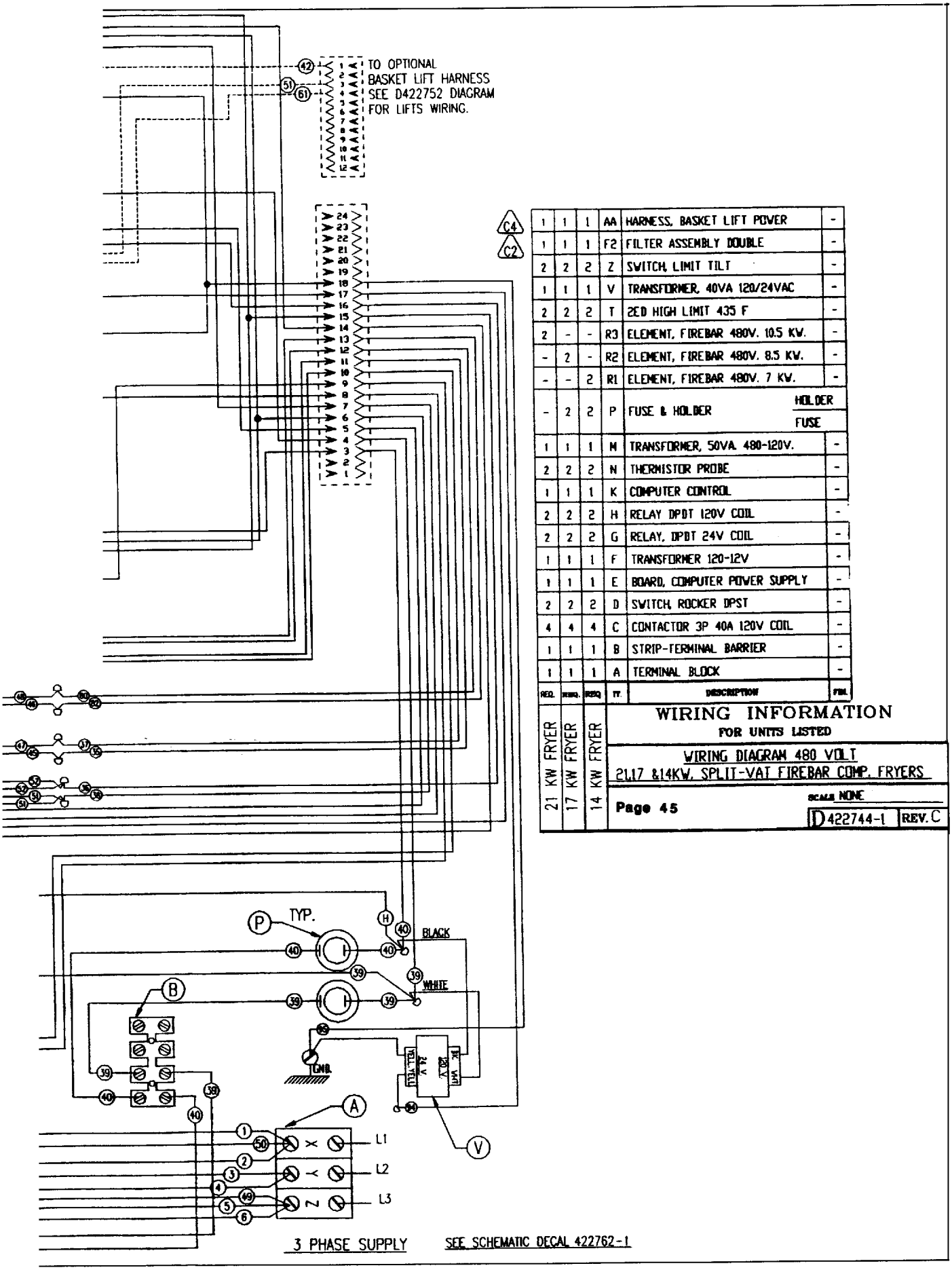
SCALE NONE

D422748-1 REV. C

480 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
21	25	25	25
17	20	20	20
14	17	17	17





1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
1	1	1	V	TRANSFORMER, 40VA 120/24VAC	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
-	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
1	1	1	M	TRANSFORMER, 50VA. 480-120V.	-
2	2	2	N	THERMISTOR PROBE	-
1	1	1	K	COMPUTER CONTROL	-
2	2	2	H	RELAY DPDT 120V COIL	-
2	2	2	G	RELAY, DPDT 24V COIL	-
1	1	1	F	TRANSFORMER 120-12V	-
1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
2	2	2	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-
REQ.	REQ.	REQ	IT.	DESCRIPTION	PRL

21 KW FRYER	17 KW FRYER	14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 480 VOLT
21,17 &14KW. SPLIT-VAT FIREBAR COMP. FRYERS

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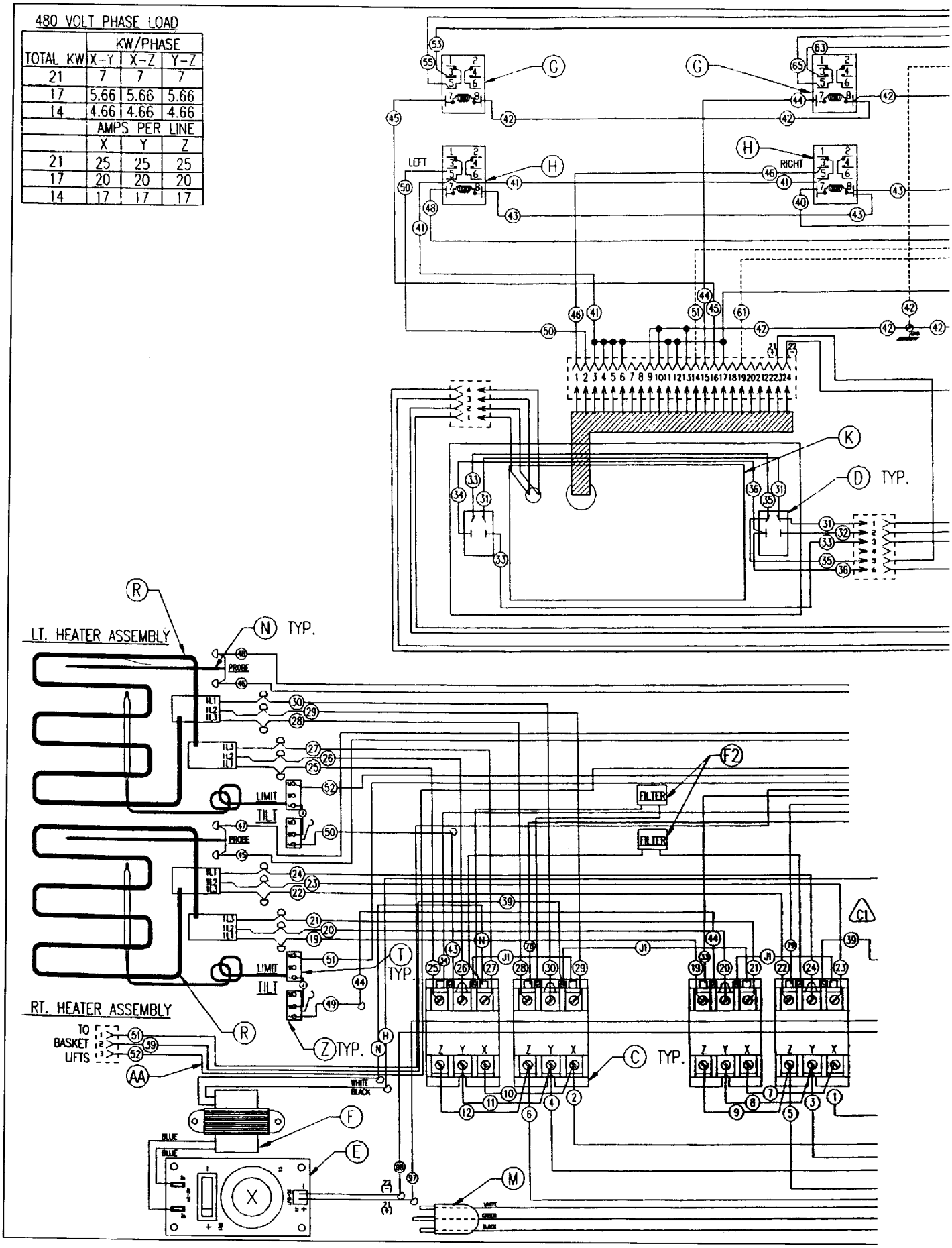
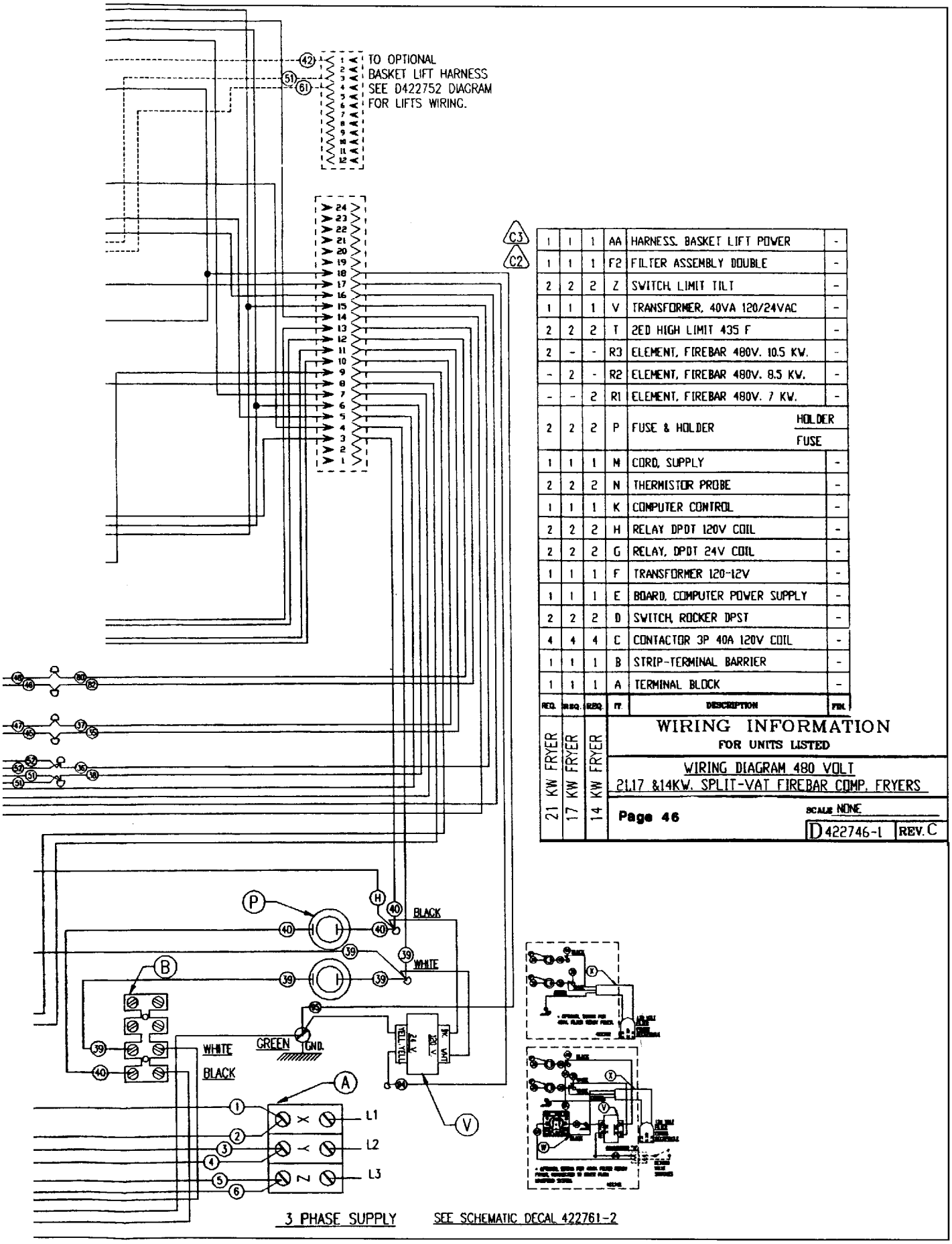
SCALE NONE

D422744-1 REV. C

480 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
21	25	25	25
17	20	20	20
14	17	17	17





1	1	1	AA	HARNESS, BASKET LIFT POWER	-
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
1	1	1	V	TRANSFORMER, 40VA 120/24VAC	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
1	1	1	M	CORD, SUPPLY	-
2	2	2	N	THERMISTOR PROBE	-
1	1	1	K	COMPUTER CONTROL	-
2	2	2	H	RELAY DPDT 120V COIL	-
2	2	2	G	RELAY, DPDT 24V COIL	-
1	1	1	F	TRANSFORMER 120-12V	-
1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
2	2	2	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-
REQ.	REQ.	REQ.	IT.	DESCRIPTION	REF.

21 KW FRYER
17 KW FRYER
14 KW FRYER

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM 480 VOLT
21,17 &14KW. SPLIT-VAT FIREBAR COMP. FRYERS

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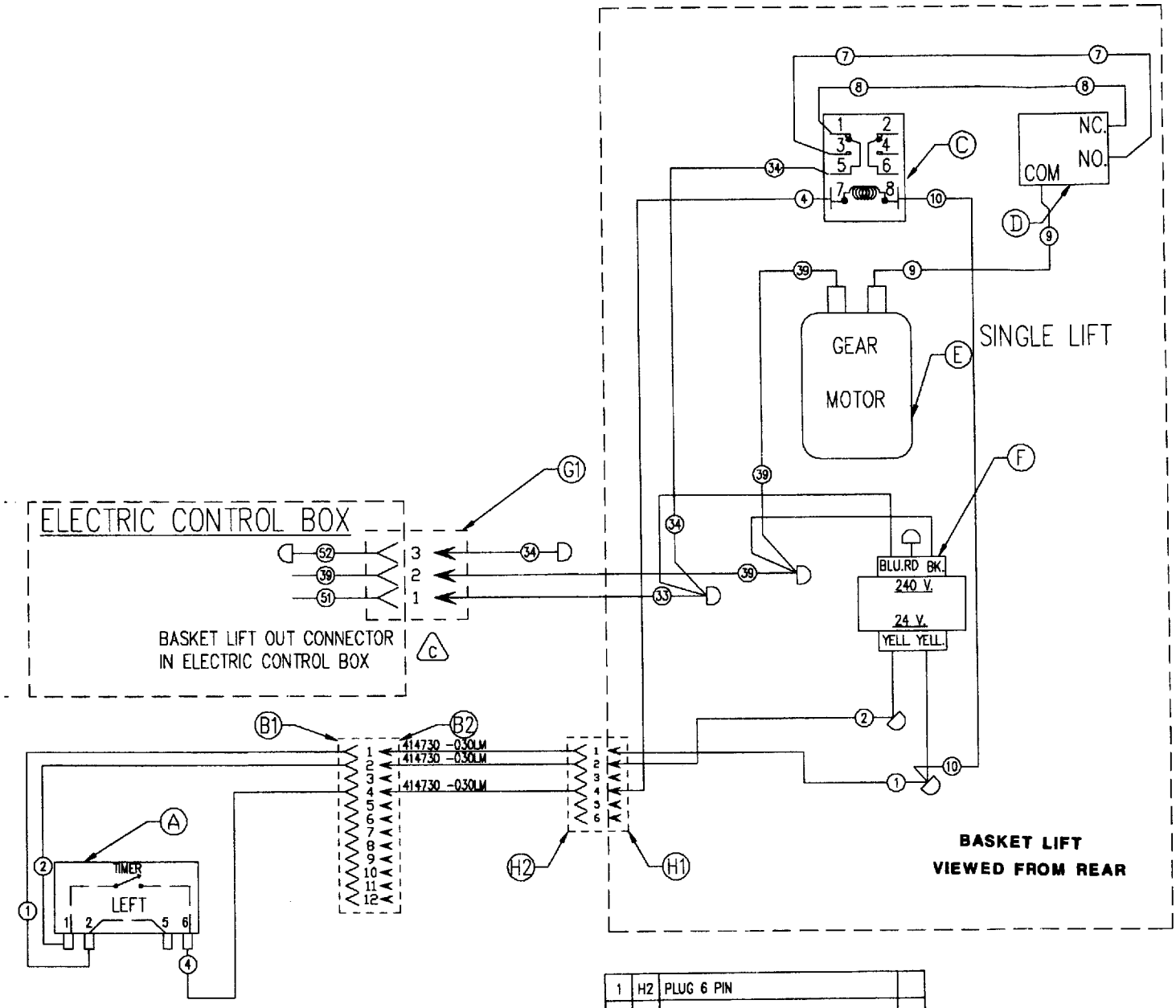
SCALE NONE

D422746-1 REV. C



TIMER VIEW FROM THE FRONT

REQ.	IT.	DESCRIPTION	FIG.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
1	G1	CABLE, LIFT POWER ASSEMBLY	
1	F	TRANSFORMER 40VA 208/240-24	-
1	E	MOTOR - GEAR 240 V. 60 HZ.	-
1	D	SWITCH MICRO	
1	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	
1	B1	RECEPTACLE 12 PIN	
1	A	TIMER, BASKET LIFT 24V. 15 MIN. / 7 MIN.	

WIRING INFORMATION

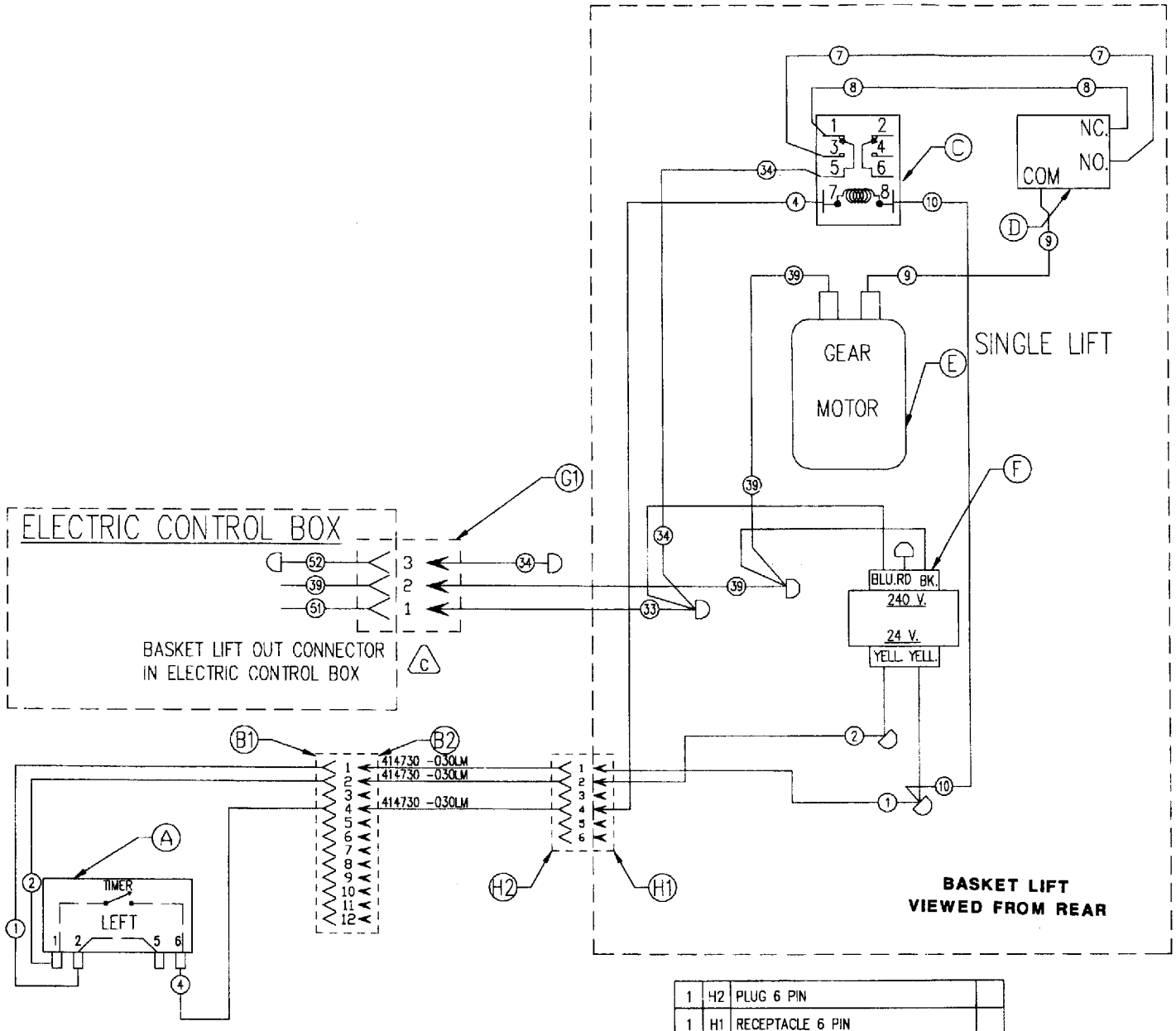
FOR UNITS LISTED

WIRING DIAGRAM SINGLE BASKET LIFTS, ELECTRIC
208 & 240 VOLT FULL VAT FRYERS

Page 47

SCALE NONE

D 422337-1 REV. D



TIMER VIEW FROM THE FRONT

	REQ.	IT.	DESCRIPTION	FIN.
	1	H2	PLUG 6 PIN	
	1	H1	RECEPTACLE 6 PIN	
C	1	G1	CABLE, LIFT POWER ASSEMBLY	
	1	F	TRANSFORMER 40VA 120-24	-
	1	E	MOTOR - GEAR 120 V. 60 HZ.	-
	1	D	SWITCH MICRO	
	1	C	RELAY DPDT 24 VAC. COIL	-
	1	B2	PLUG 12 PIN	
	1	B1	RECEPTACLE 12 PIN	
D	1	A	TIMER, BASKET LIFT 24V. 15 MIN. / 7 MIN.	

WIRING INFORMATION

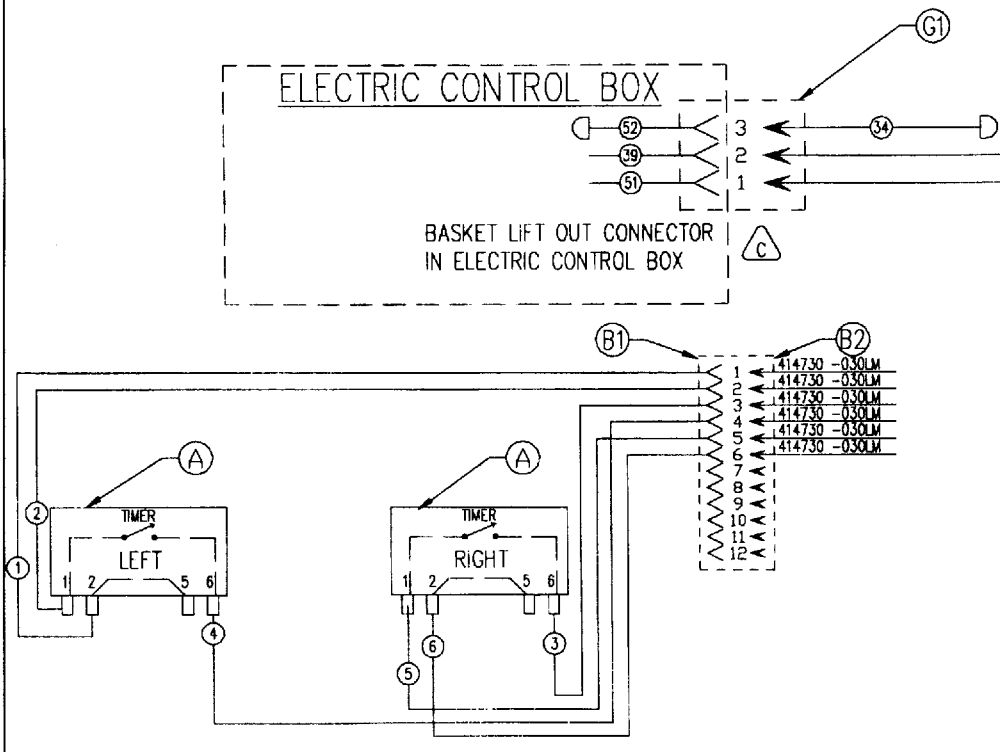
FOR UNITS LISTED

WIRING DIAGRAM SINGLE BASKET LIFTS, ELECTRIC
480 VOLT FULL VAT FRYERS

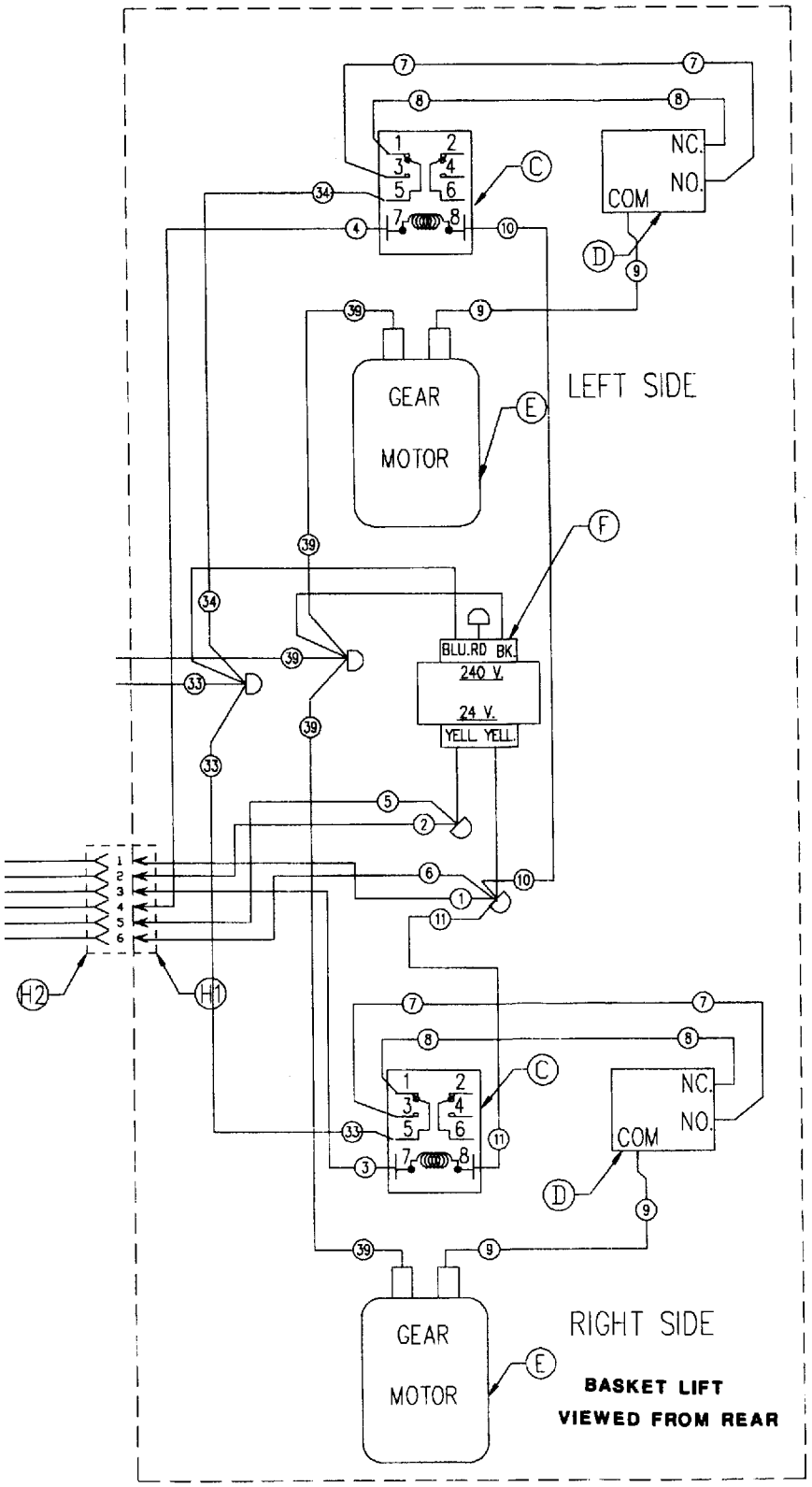
Page 48

SCALE NONE

D 422340-1 REV. D



TIMERS VIEW FROM THE FRONT



REQ.	IT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
C 1	G1	CABLE, LIFT POWER ASSEMBLY	
1	F	TRANSFORMER 40VA 208/240-24	-
2	E	MOTOR - GEAR 240 V. 60 HZ.	-
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	
1	B1	RECEPTACLE 12 PIN	
D 2	A	TIMER, BASKET LIFT 24V. 15 MIN. / 7 MIN.	

WIRING INFORMATION
FOR UNITS LISTED

WIRING DIAGRAM DUAL BASKET LIFTS, ELECTRIC
208 & 240 VOLT FULL VAT FRYERS

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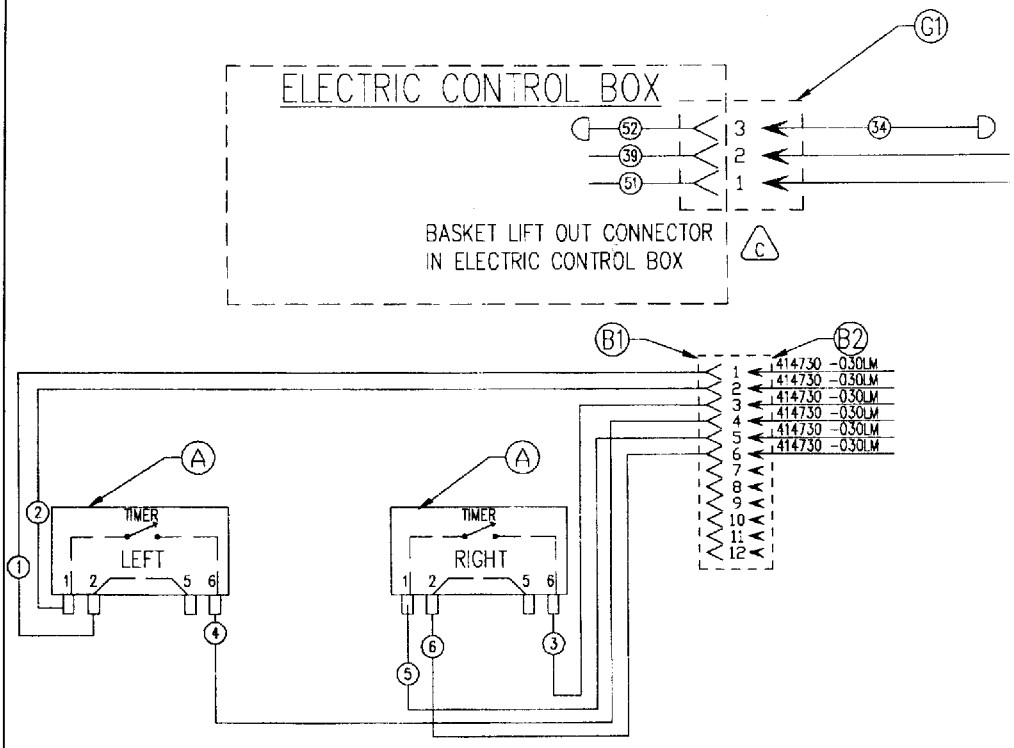
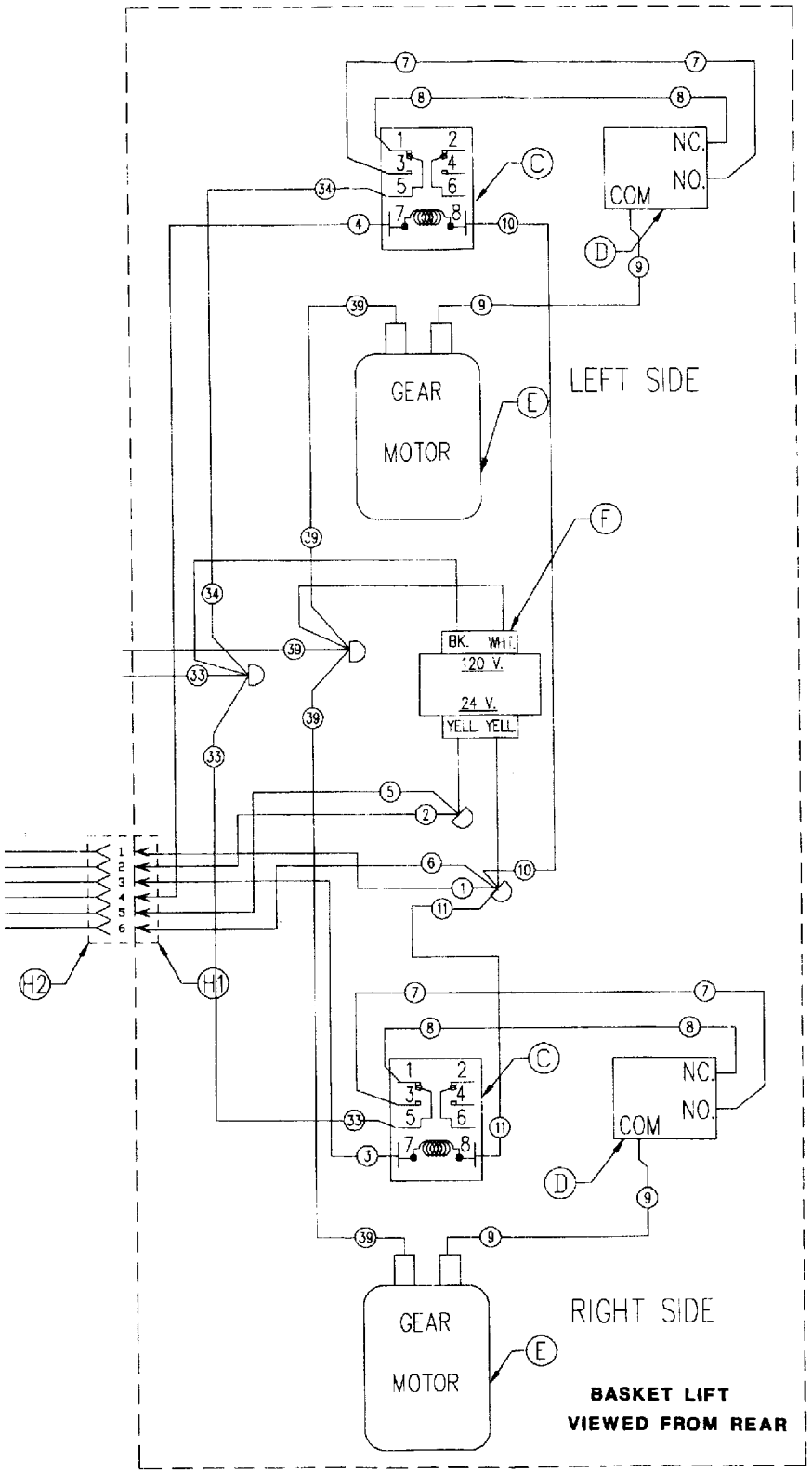
SCALE NONE

D 422336-1 REV. D



TIMERS VIEW FROM THE FRONT



REQ.	IT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
C 1	G1	CABLE, LIFT POWER ASSEMBLY	
1	F	TRANSFORMER 40VA 120-24	-
2	E	MOTOR - GEAR 120 V. 60 HZ.	-
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	
1	B1	RECEPTACLE 12 PIN	
D 2	A	TIMER, BASKET LIFT 24V. 15 MIN. / 7 MIN.	

WIRING INFORMATION

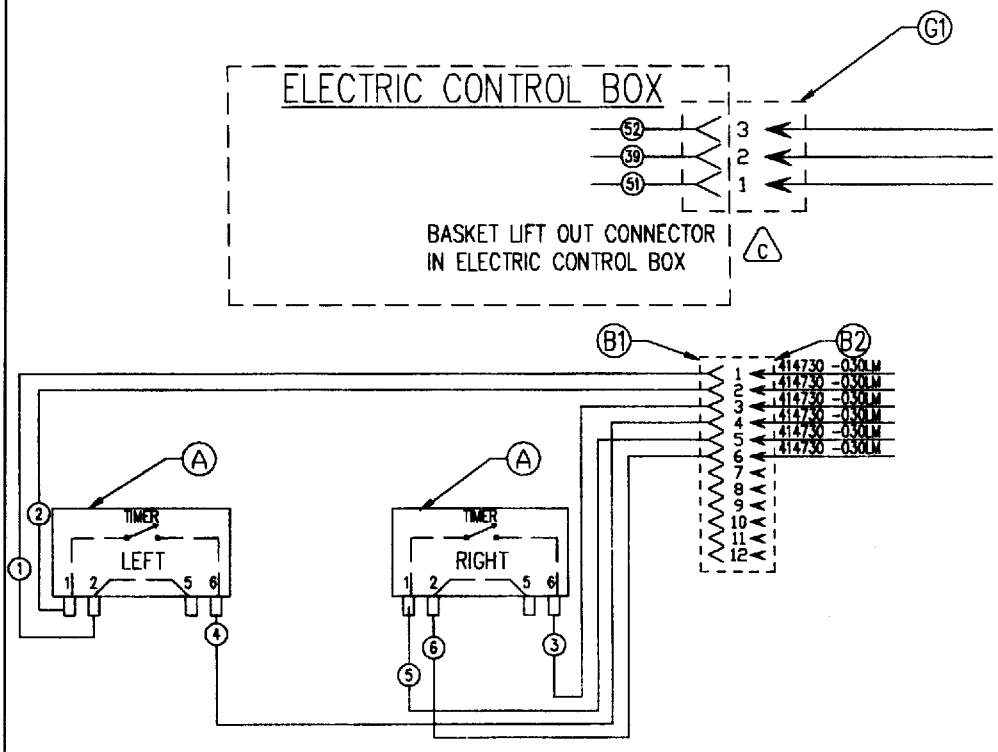
FOR UNITS LISTED

WIRING DIAGRAM DUAL BASKET LIFTS, ELECTRIC
480 VOLT FULL VAT FRYERS

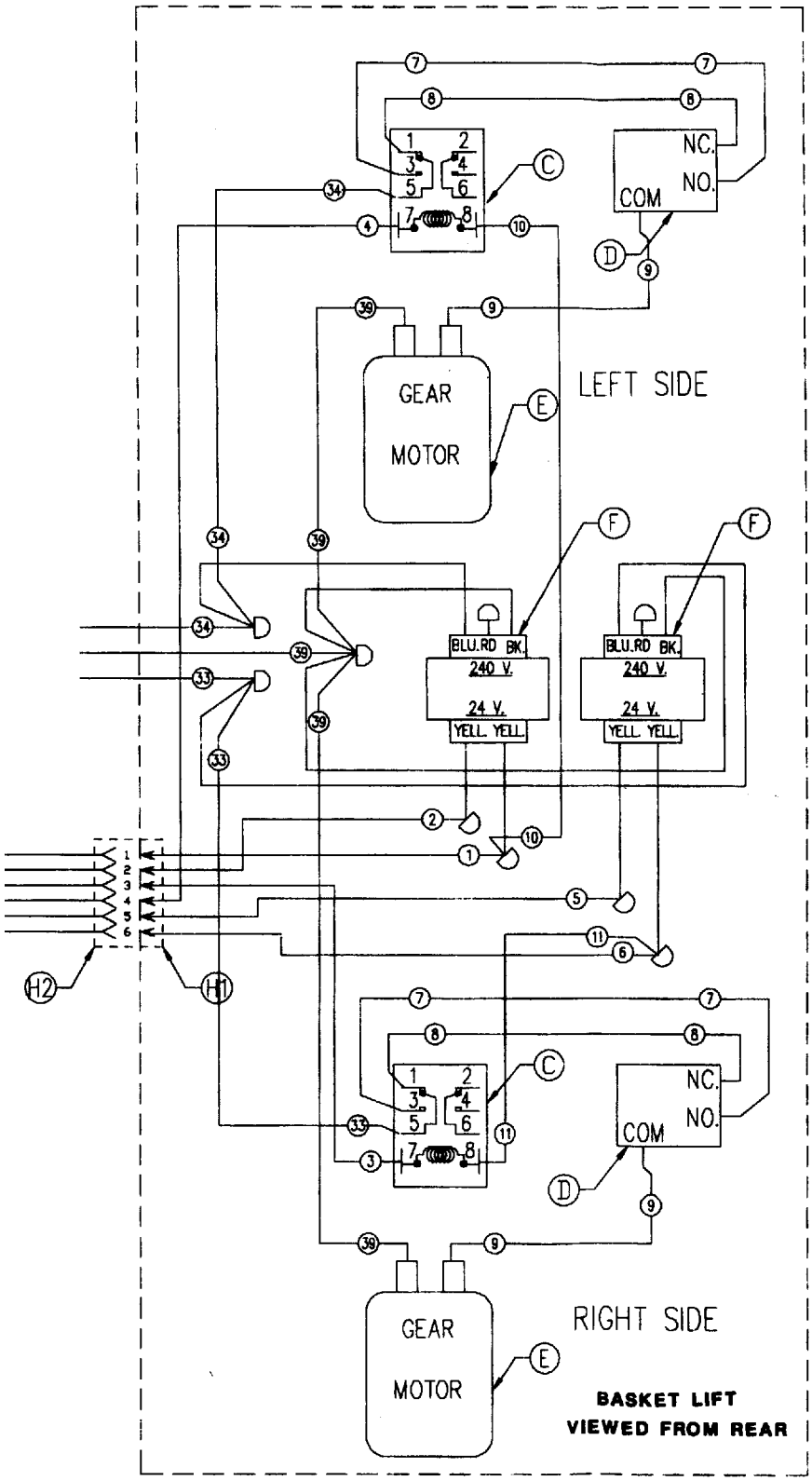
Page 50

SCALE NONE

D 422339-1 REV. D



TIMERS VIEW FROM THE FRONT



REQ.	IT.	DESCRIPTION	FIG.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
C 1	G1	CABLE, LIFT POWER ASSEMBLY	
2	F	TRANSFORMER 40VA 208/240-24	–
2	E	MOTOR – GEAR 240 V. 60 HZ.	–
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	–
1	B2	PLUG 12 PIN	
1	B1	RECEPTACLE 12 PIN	
D 2	A	TIMER, BASKET LIFT 24V. 15 MIN. / 7 MIN.	

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM BASKET LIFTS, ELECTRIC
208 & 240 VOLT SPLIT VAT FRYERS

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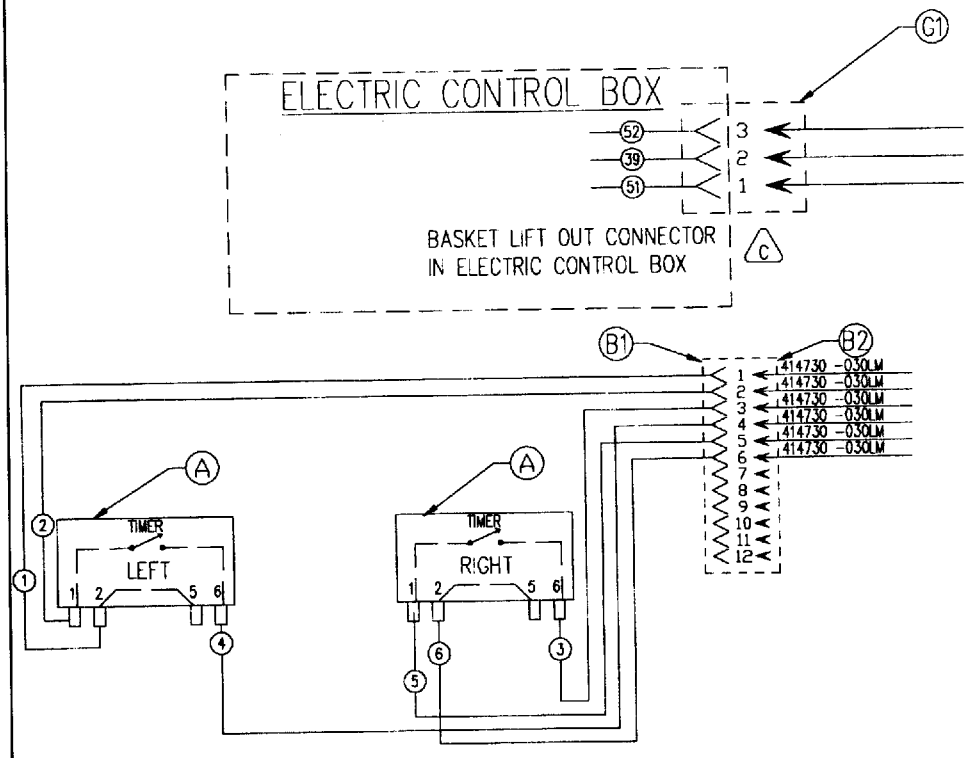
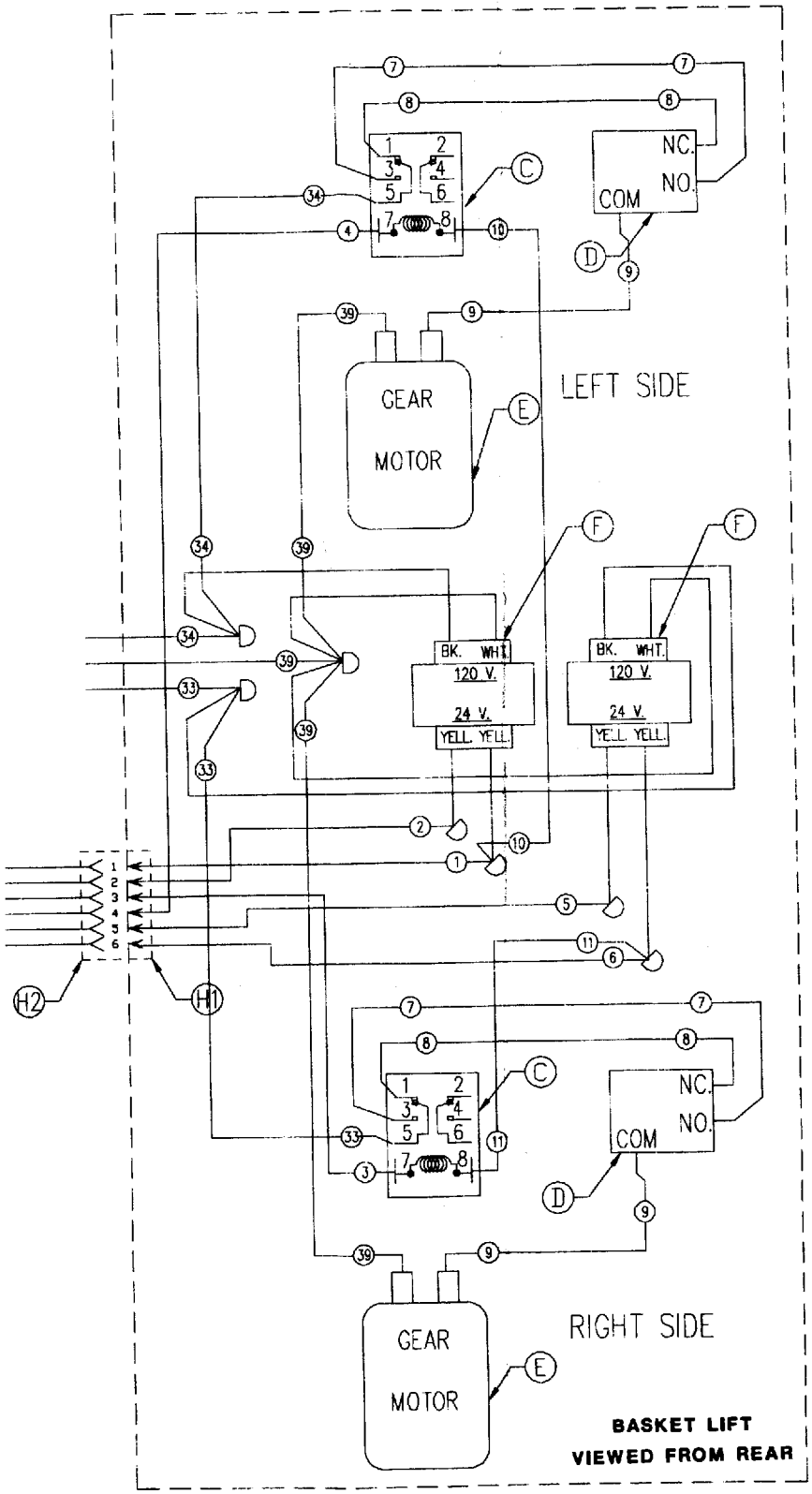
SCALE NONE

D 422335-1 REV. D



TIMERS VIEW FROM THE FRONT



REQ.	IT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
C 1	G1	CABLE, LIFT POWER ASSEMBLY	
2	F	TRANSFORMER 40VA 120-24	-
2	E	MOTOR - GEAR 120 V. 60 HZ.	-
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	
1	B1	RECEPTACLE 12 PIN	
D 2	A	TIMER, BASKET LIFT 24V. 15 MIN. / 7 MIN.	

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM, ELECTRIC, BASKET LIFTS
480V. FIREBAR SPLIT VAT FRYERS

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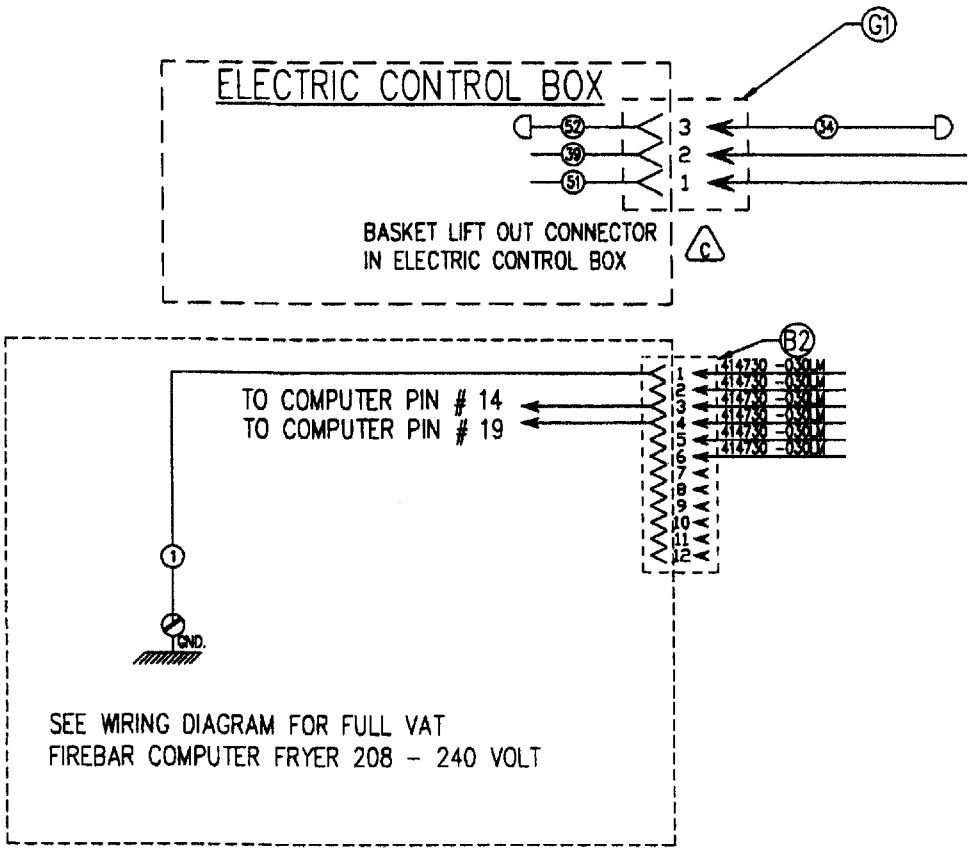
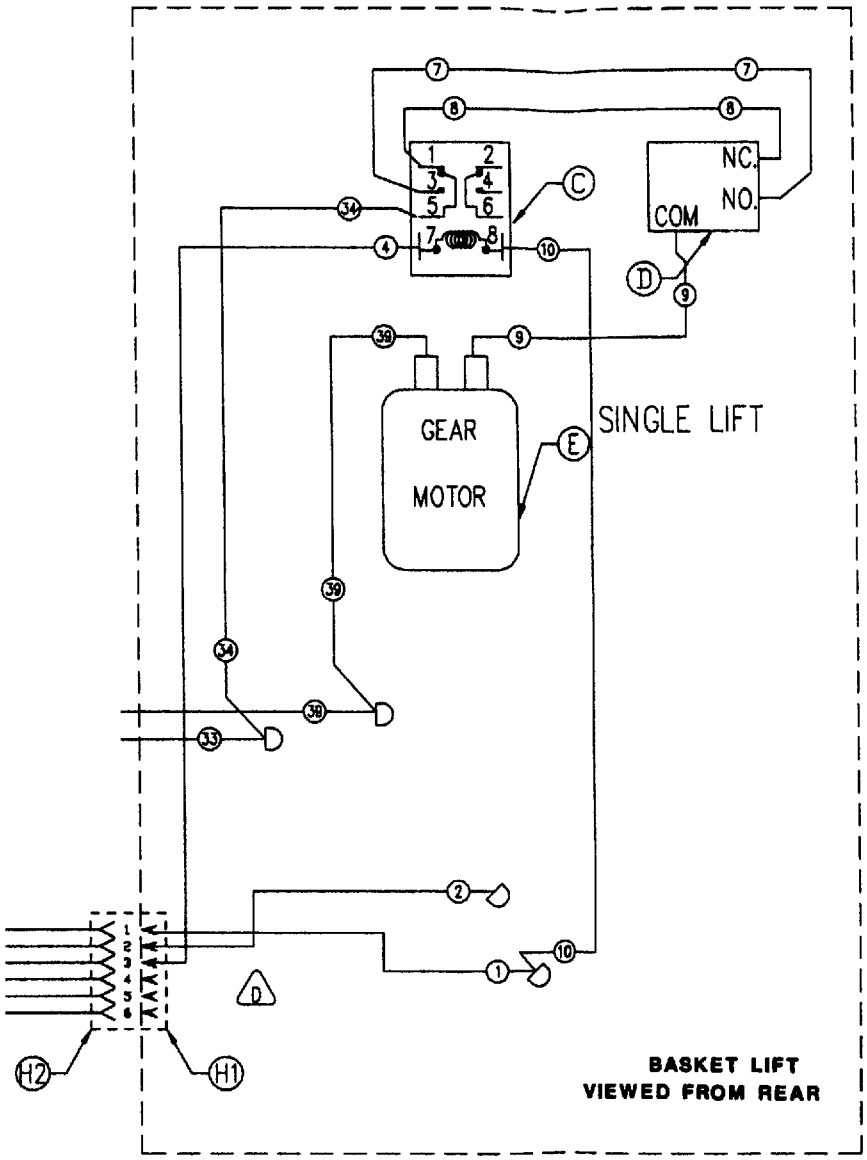
SCALE NONE

D422338-1 REV. D


G1
ELECTRIC CONTROL BOX
52
39
51
3
2
1
34
BASKET LIFT OUT CONNECTOR
IN ELECTRIC CONTROL BOX
C
B2
TO COMPUTER PIN # 14
TO COMPUTER PIN # 19
1
2
3
4
5
6
7
8
9
10
11
12
1
GND.
SEE WIRING DIAGRAM FOR FULL VAT
FIREBAR COMPUTER FRYER 208 - 240 VOLT



1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
C 1	G1	CABLE, LIFT POWER ASSEMBLY	
1	E	MOTOR - GEAR 240 V. 60 HZ.	-
1	D	SWITCH MICRO	
1	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	
REQ.	IT.	DESCRIPTION	FIX.

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM SINGLE BASKET LIFTS, ELECTRIC
208 & 240 VOLT FULL VAT COMPUTER FRYERS

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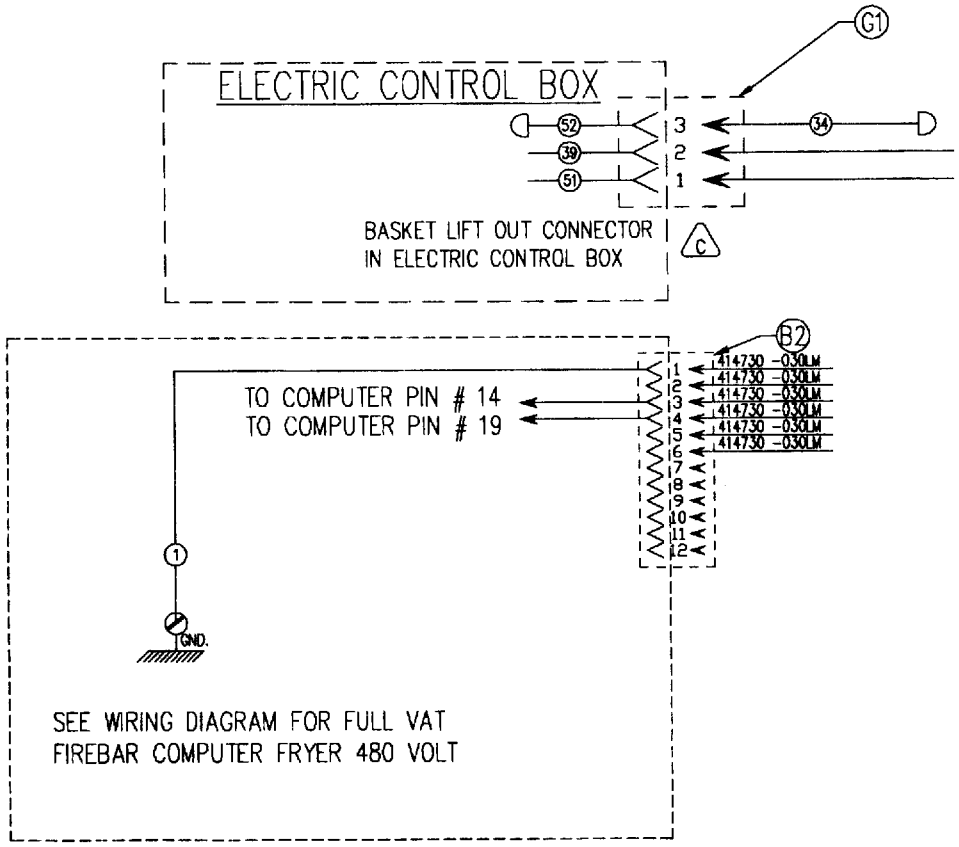
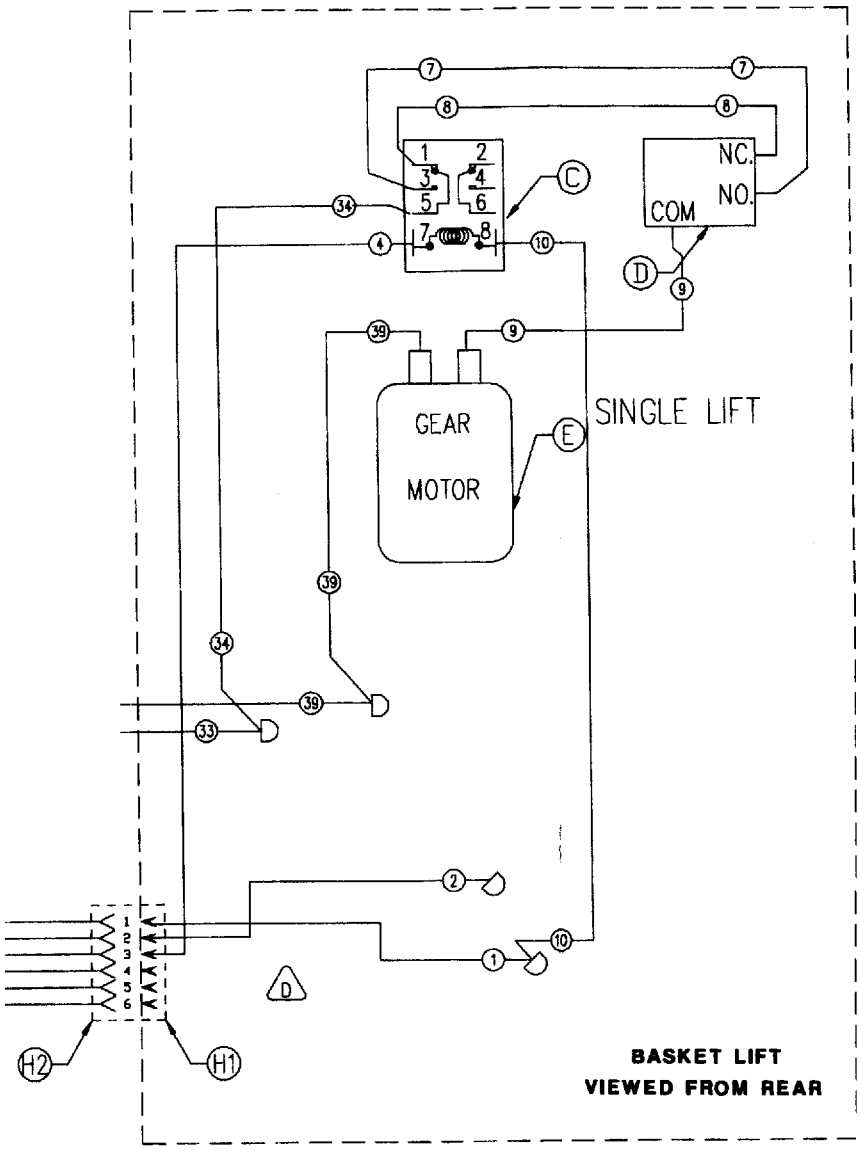
SCALE NONE

D 422754-1 REV. D


G1
ELECTRIC CONTROL BOX
52
39
51
3
2
1
34
BASKET LIFT OUT CONNECTOR
IN ELECTRIC CONTROL BOX
C
B2
TO COMPUTER PIN # 14
TO COMPUTER PIN # 19
1
GND.
SEE WIRING DIAGRAM FOR FULL VAT
FIREBAR COMPUTER FRYER 480 VOLT



REQ.	PT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
1	G1	CABLE, LIFT POWER ASSEMBLY	
1	E	MOTOR - GEAR 120 V. 60 HZ.	-
1	D	SWITCH MICRO	
1	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM SINGLE BASKET LIFTS, ELECTRIC
480 VOLT FULL VAT COMPUTER FRYERS

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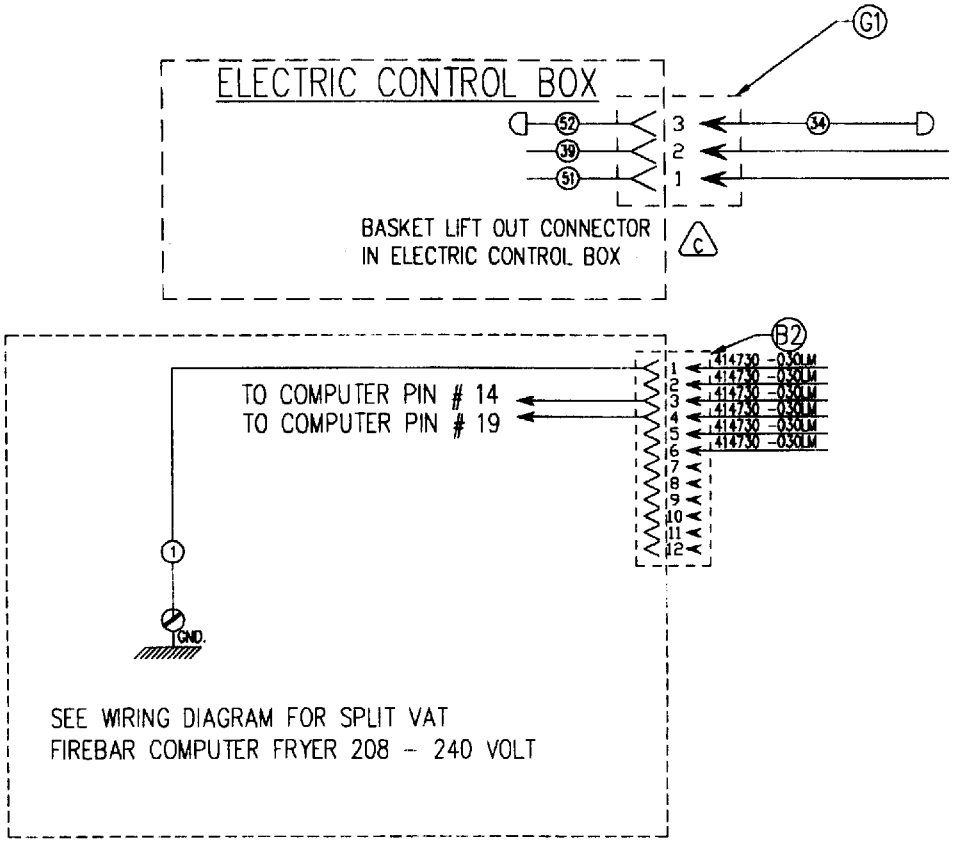
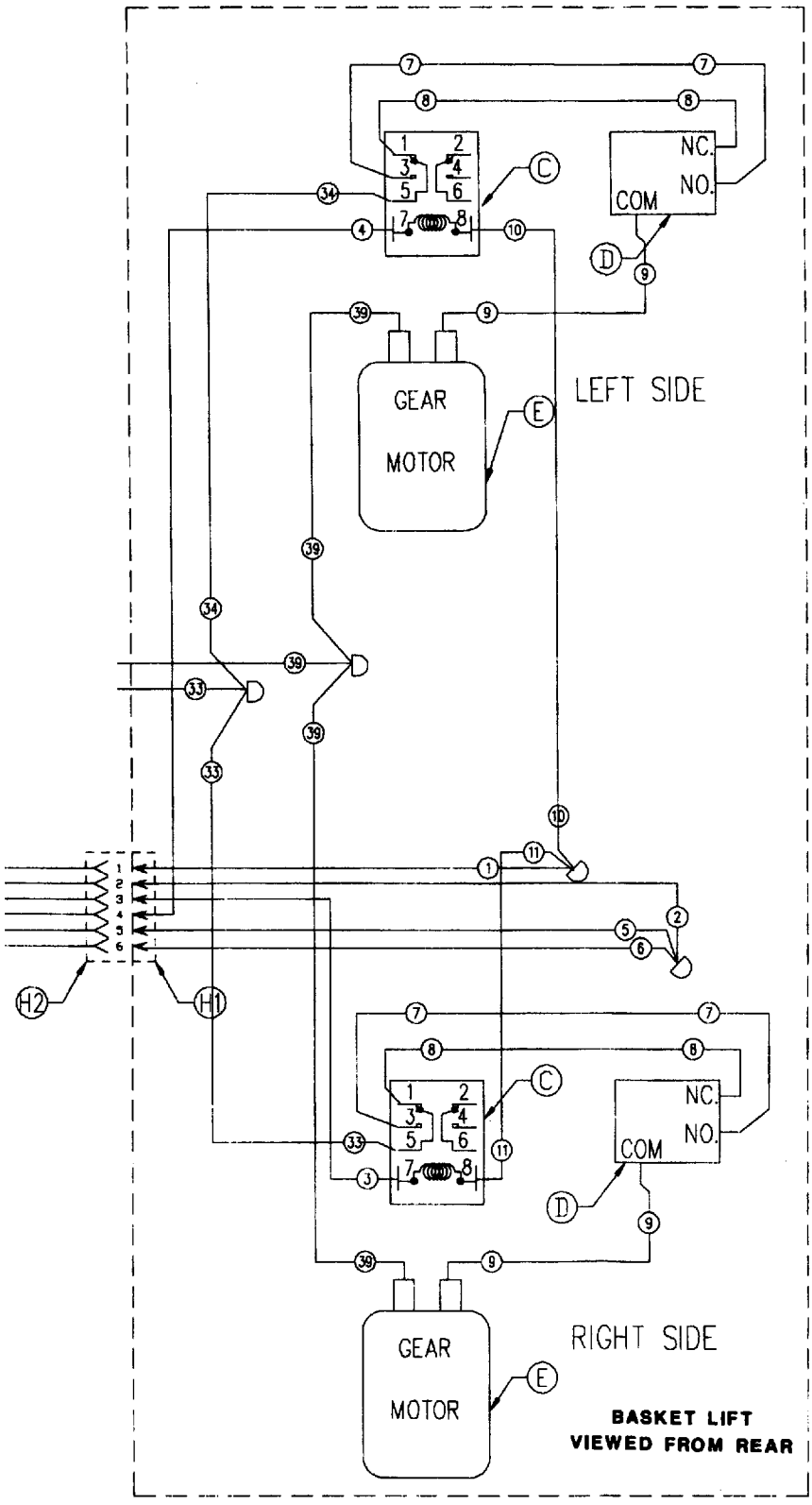
SCALE NONE

D 422757-1 REV. D


G1
ELECTRIC CONTROL BOX
52
39
51
3
2
1
34
BASKET LIFT OUT CONNECTOR
IN ELECTRIC CONTROL BOX
C
B2
TO COMPUTER PIN # 14
TO COMPUTER PIN # 19
1
GND.
SEE WIRING DIAGRAM FOR SPLIT VAT
FIREBAR COMPUTER FRYER 208 - 240 VOLT



REQ.	IT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
1	G1	CABLE, LIFT POWER ASSEMBLY	
2	E	MOTOR - GEAR 240 V. 60 HZ.	–
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	–
1	B2	PLUG 12 PIN	

WIRING INFORMATION
FOR UNITS LISTED

WIRING DIAGRAM BASKET LIFTS, ELECTRIC
208 & 240 VOLT FULL VAT COMPUTER FRYERS

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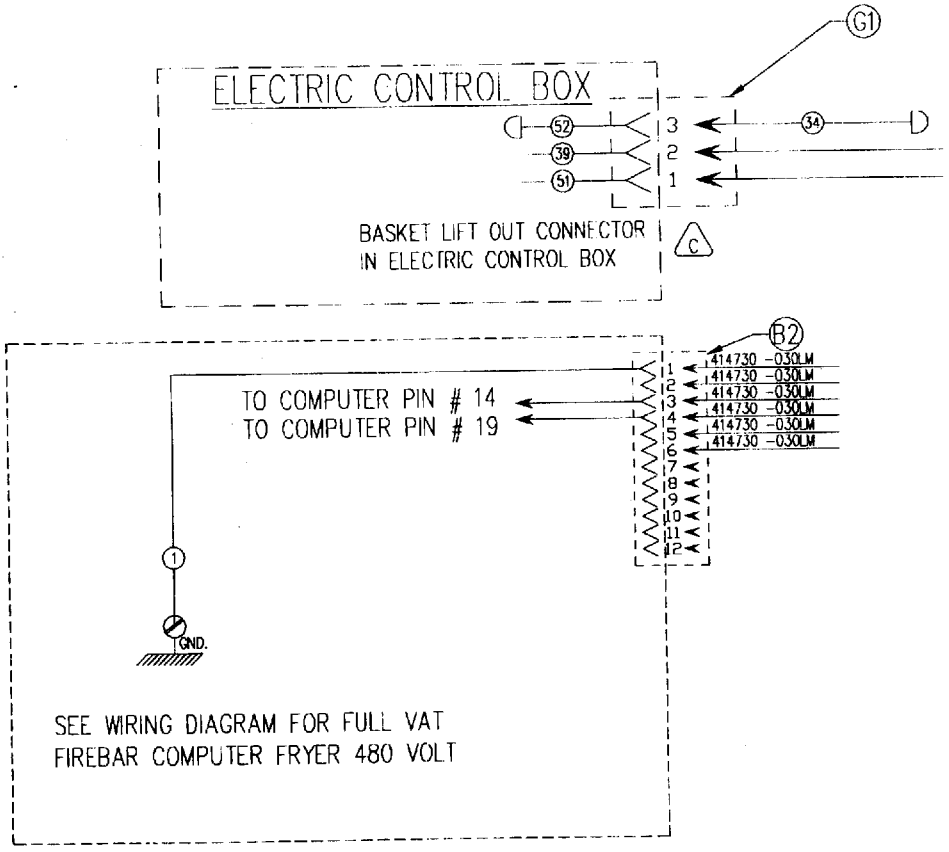
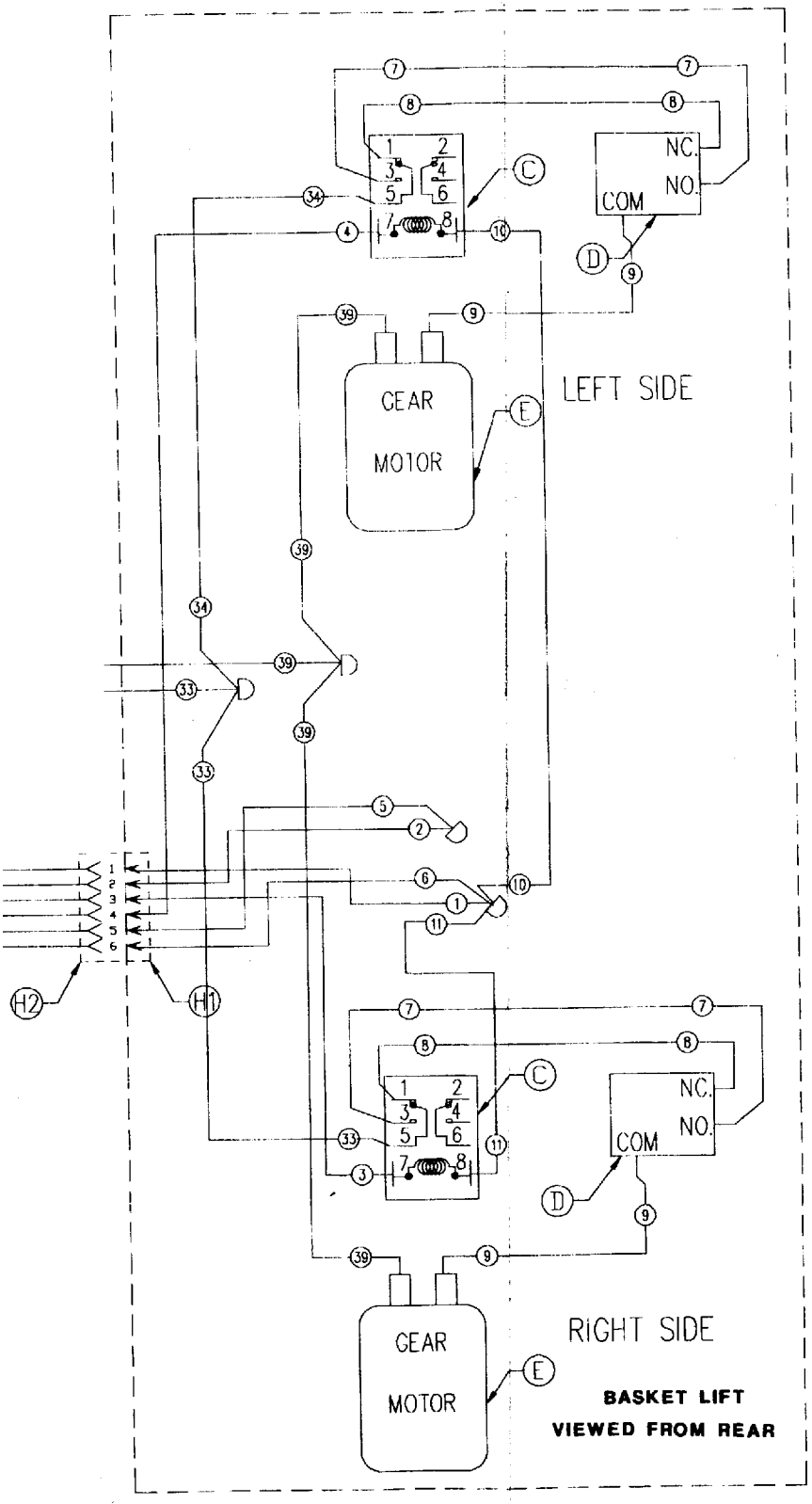
SCALE NONE

D 422753-1 REV. C


G1
ELECTRIC CONTROL BOX
52
39
51
3
2
1
34
BASKET LIFT OUT CONNECTOR
IN ELECTRIC CONTROL BOX
C
B2
414730 -030LM
414730 -030LM
414730 -030LM
414730 -030LM
414730 -030LM
414730 -030LM
1
2
3
4
5
6
7
8
9
10
11
12
TO COMPUTER PIN # 14
TO COMPUTER PIN # 19
1
GND.
SEE WIRING DIAGRAM FOR FULL VAT
FIREBAR COMPUTER FRYER 480 VOLT



	QTY.	ITEM	DESCRIPTION
	1	H2	PLUG 6 PIN
	1	H1	RECEPTACLE 6 PIN
C	1	G1	CABLE, LIFT POWER ASSEMBLY
	2	E	MOTOR -- GEAR 120 V. 60 HZ.
	2	D	SWITCH MICRO
	2	C	RELAY DPDT 24 VAC. COIL
	1	B2	PLUG 12 PIN

WIRING INFORMATION

FOR UNITS LISTED

WIRING DIAGRAM DUAL BASKET LIFTS, ELECTRIC
480 VOLT FULL VAT COMPUTER FRYERS

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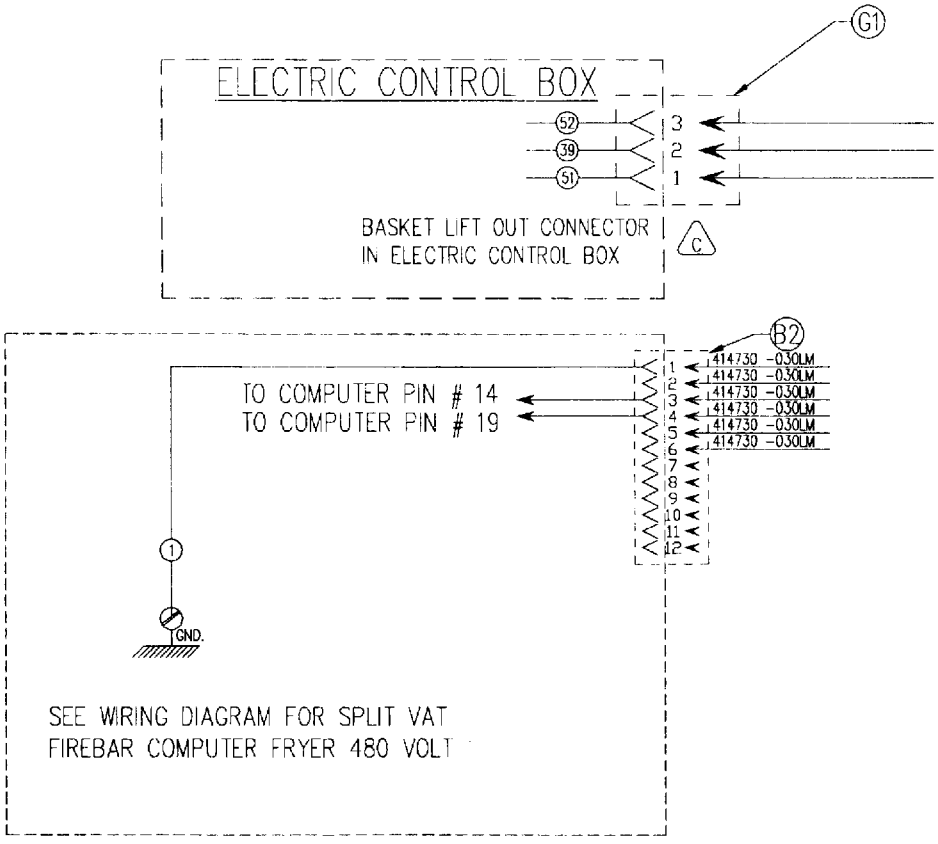
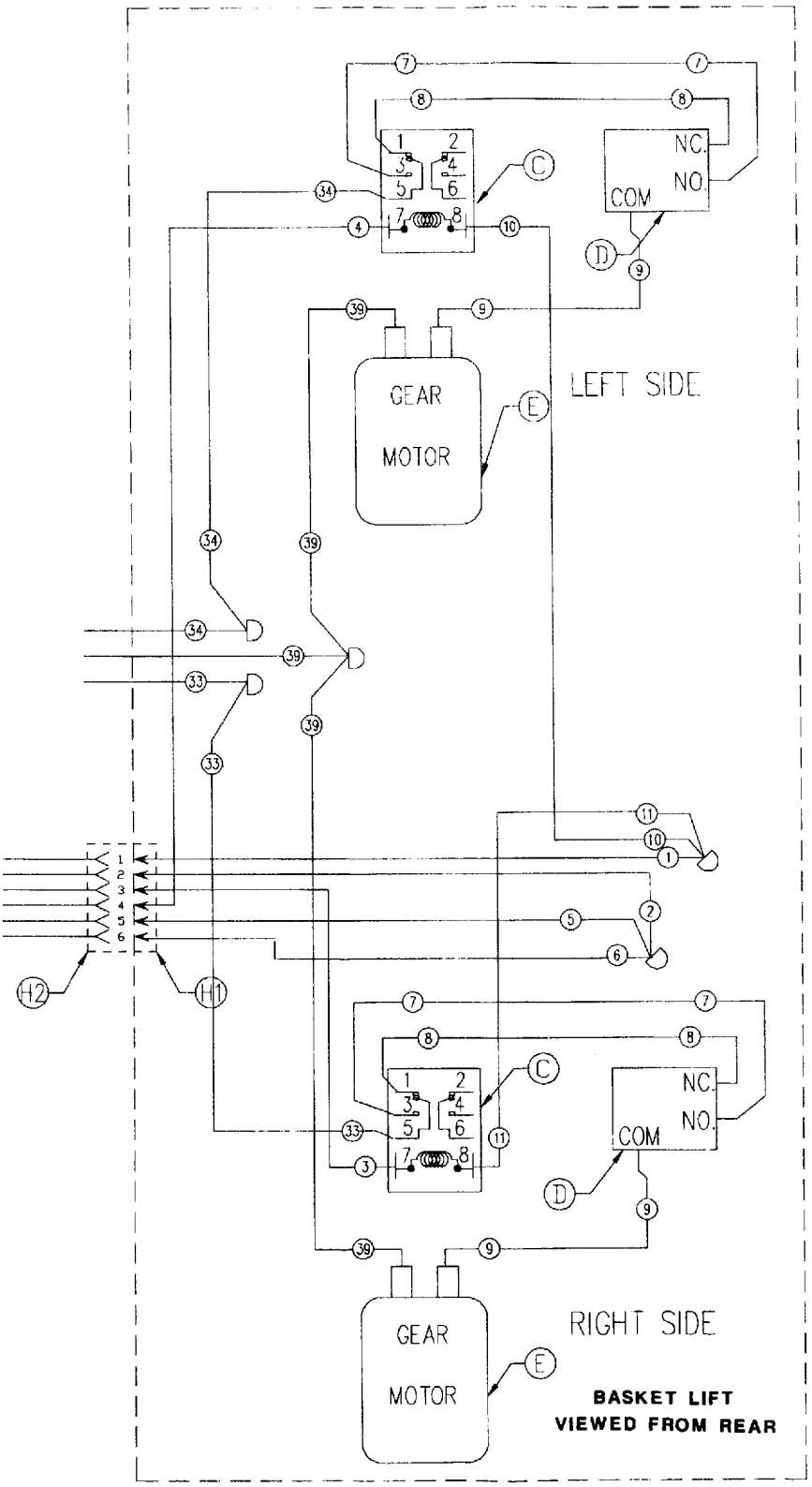
SCALE NONE

D 422756-1 REV. C


G1
ELECTRIC CONTROL BOX
52
39
51
3
2
1
BASKET LIFT OUT CONNECTOR
IN ELECTRIC CONTROL BOX
C
B2
TO COMPUTER PIN # 14
TO COMPUTER PIN # 19
414730 -030LM
1
2
3
4
5
6
7
8
9
10
11
12
GND.
SEE WIRING DIAGRAM FOR SPLIT VAT
FIREBAR COMPUTER FRYER 480 VOLT



REQ.	IT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
1	G1	CABLE, LIFT POWER ASSEMBLY	
2	E	MOTOR – GEAR 120 V. 60 HZ.	–
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	–
1	B2	PLUG 12 PIN	
1	B1	RECEPTACLE 12 PIN	

C

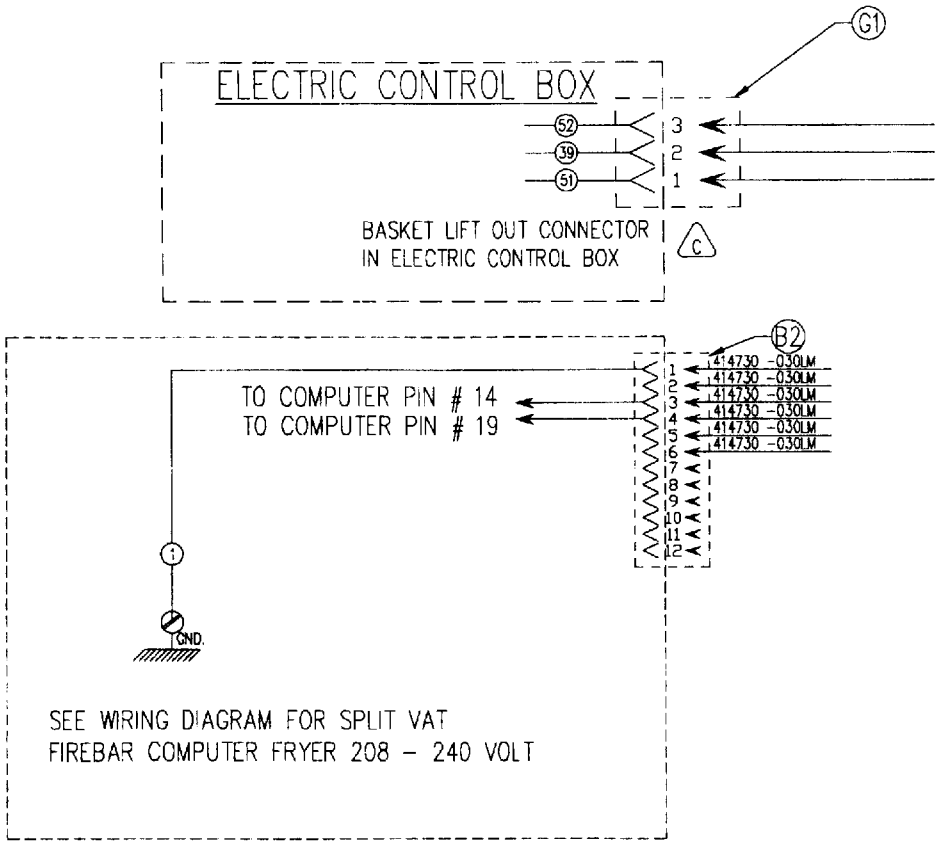
WIRING INFORMATION
FOR UNITS LISTED

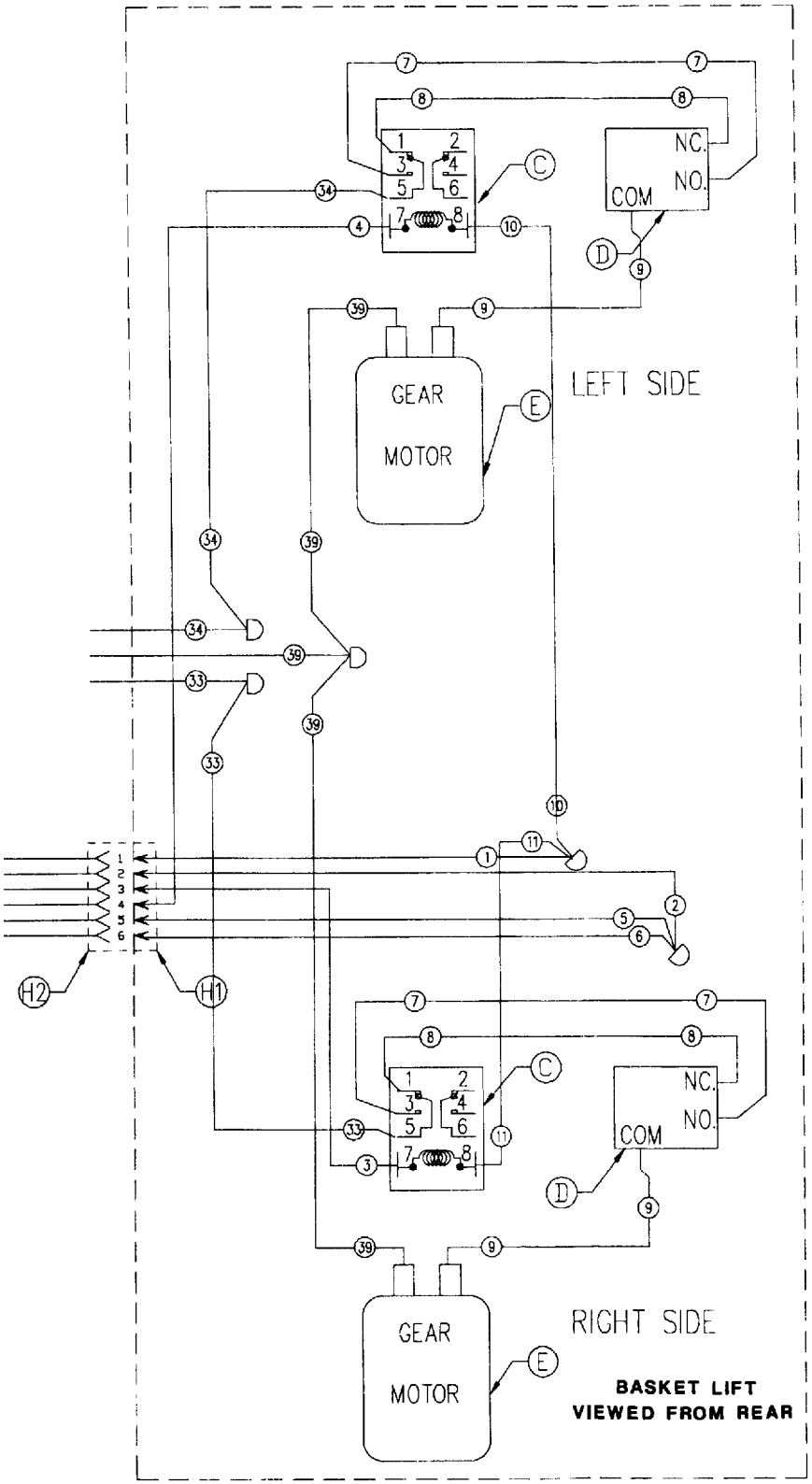
WIRING DIAGRAM, ELECTRIC, BASKET LIFTS
480V. FIREBAR SPLIT VAT COMPUTER FRYERS

Page 58

SCALE NONE

D 422755-1 REV. C


G1
ELECTRIC CONTROL BOX
52
39
51
3
2
1
BASKET LIFT OUT CONNECTOR
IN ELECTRIC CONTROL BOX
C
B2
TO COMPUTER PIN # 14
TO COMPUTER PIN # 19
414730 -030LM
414730 -030LM
414730 -030LM
414730 -030LM
414730 -030LM
414730 -030LM
1
GND.
SEE WIRING DIAGRAM FOR SPLIT VAT
FIREBAR COMPUTER FRYER 208 - 240 VOLT



REQ.	PT.	DESCRIPTION	FIN.
1	H2	PLUG 6 PIN	
1	H1	RECEPTACLE 6 PIN	
1	G1	CABLE, LIFT POWER ASSEMBLY	
2	E	MOTOR - GEAR 240 V. 60 HZ.	-
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	-
1	B2	PLUG 12 PIN	

WIRING INFORMATION
FOR UNITS LISTED

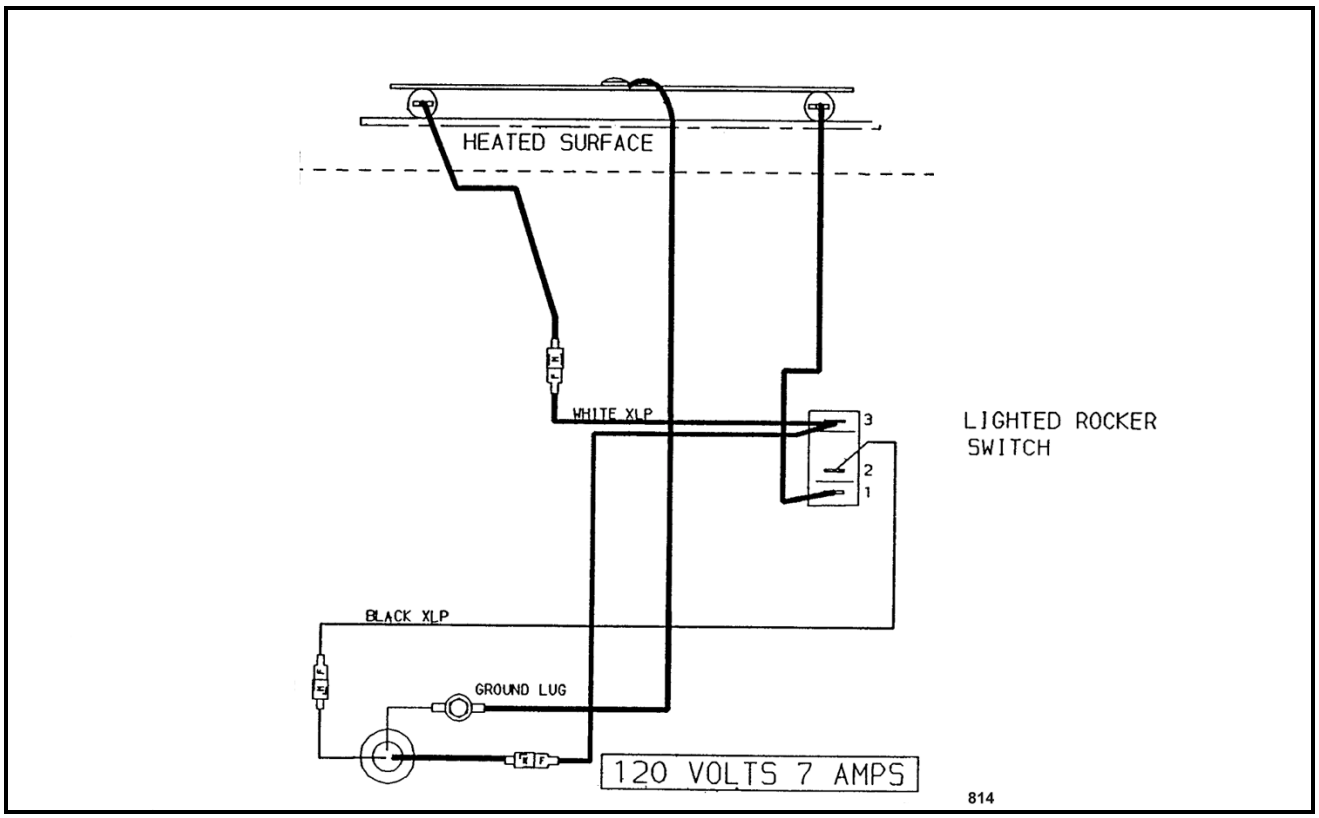
WIRING DIAGRAM BASKET LIFTS, ELECTRIC
208 & 240 VOLT SPLIT VAT COMPUTER FRYERS

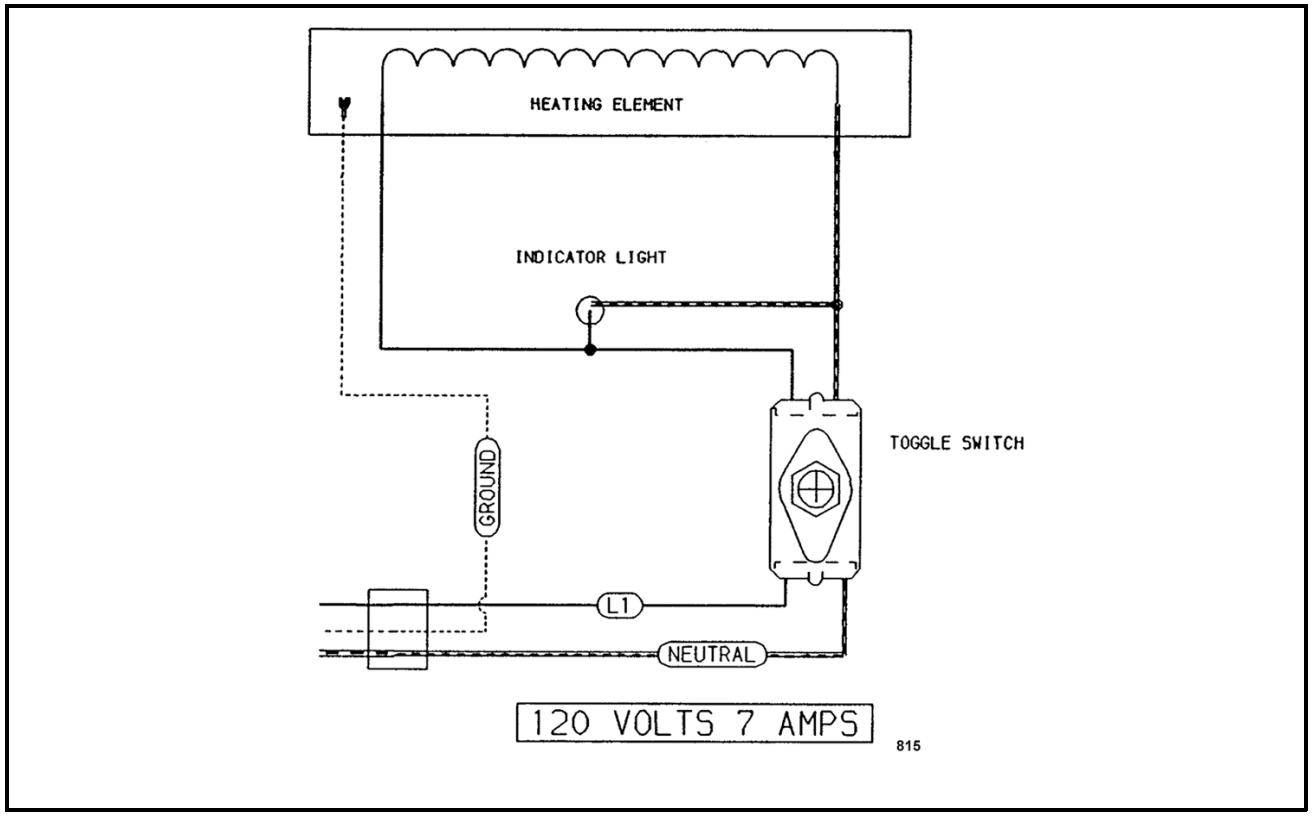
Page 57

SCALE NONE

D 422752-1 REV. C

Serve Station Units





TROUBLESHOOTING

COMPUTER CONTROL HARNESS PIN-OUTS CHART

COMPUTER CONTROL PIN-OUTS			
Pin #	Description	Pin #	Description
1	Right power input	13	24 VAC ground
2	Left power input	14	Right basket output
3	Right pilot valve input	15	Right heat output
4	Left pilot valve input	16	Left heat output
5	Right main valve input	17	24 VAC
6	Left main valve input	18	no connection
7	Right high limit	19	Left basket output
8	Left high limit	20	no connection
9	Ignition system type input	21	no connection
10	Air filter input	22	no connection
11	Door input	23	DC power input (+)
12	“Full” or “Split” mode input	24	DC power input (-)

SOLID STATE CONTROL

SYMPTOM	POSSIBLE CAUSES
Fryer does not heat. Power light is not on.	1. Power switch off or inoperative. 2. Main circuit breaker tripped. 3. Fuse in control circuit open.
Ventilator off, power switch on, power light on.	1. Ventilator hood circuit breaker open. 2. Interlock wiring open. 3. Power switch malfunction.
No heating light, power switch on, power light on.	1. Temperature control set too low or not calibrated. 2. Heating light inoperative. 3. Control board inoperative.
No heating light. Power switch on, power light on, trouble light and second high limit on.	1. Shortening temperature above 435°F, first high limit inoperative. 2. Second high limit inoperative.
Excessive time to melt shortening. (more than 45 minutes).	1. Melt cycle timing incorrect. 2. Heating elements malfunctioning. 3. Supply power incorrect voltage.
Fryer shuts down on first high limit.	1. Low oil. 2. Control not calibrated. 3. Contactor malfunction. 4. Control board inoperative.
Fryer shuts down on second high limit.	1. Low oil. 2. Control board inoperative. 3. High limit malfunction.
Thermostat out of calibration by more than 25°F.	1. Control board inoperative. 2. Probe touching element.
Light(s) not on when required.	1. Light inoperative. 2. Wiring problem.

COMPUTER CONTROL

NOTE: The computer control is also used in other equipment, therefore it is possible for unrelated error prompts to appear if a problem occurs in the computer main harness plug.

SYMPTOM	POSSIBLE CAUSES
Fryer does not heat.	1. Power switch off or inoperative. 2. Main circuit breaker off or open. 3. Open fuse in control box. 4. Malfunctioning heat control relay (2 relays for spilt vat). 5. Malfunctioning computer power input relay (2 relays for split vat). 6. Computer power supply board, transformer malfunctioning. 7. Open pins 23 or 24 (12 VDC). 8. Open 24 VAC pin 1 (full vat), pin 1 or pin 2 (split vat). 9. Open pin 15 (full vat), pin 15 right heat or pin 16 left heat for split vat. 10. Malfunctioning computer control.
Fryer displays "TEMP TOO HI"	1. Low oil. 2. High limit malfunction. 3. Malfunctioning computer control.
Fryer heats slowly.	1. Incoming voltage incorrect. 2. Heating element(s) malfunction.
Fryer displays "CALL SERVICE"	1. High limit malfunctioning. 2. Malfunctioning probe. 3. Failed self-check. 4. Malfunctioning control board.
Fryer displays " IGN FAILURE"	1. Pins 3, 4, 5 or 6 not connected to 24VAC.
Fryer displays " DOOR OPEN"	1. Pin 11 not connected to 24VAC.
Fryer displays "OFF"	1. Second high limit or tilt switch open.

SERVE STATION (with optional heater)

SYMPTOM	POSSIBLE CAUSES
No heat.	1. Unplugged. 2. Power switch off or inoperative. 3. Main circuit breaker off or open. 4. Malfunctioning heating unit assembly.

SERVICE MANUAL SUPPLEMENT

6106

2ERD40F SHOWN

KLEENSCREEN SERIES ELECTRIC FRYER BATTERY

MODEL	ML
ERD40F	126905
ERD50F	126906
ERD225F	126907
ERD85F	126908
ERC40F	126909
ERC50F	126910
ERC225F	126911
ERC85F	126912

This Service Manual Supplement should be used in addition to F24577 "FLOOR MODEL ELECTRIC FRYERS" for Service Information related to the Fryer and F24599 "MOBILE FILTERS" for Service Information related to the pump.

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified. If you have attended a Vulcan Service School for this product, you may be qualified to perform all the procedures described in this manual.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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TABLE OF CONTENTS

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GENERAL

INTRODUCTION

Description

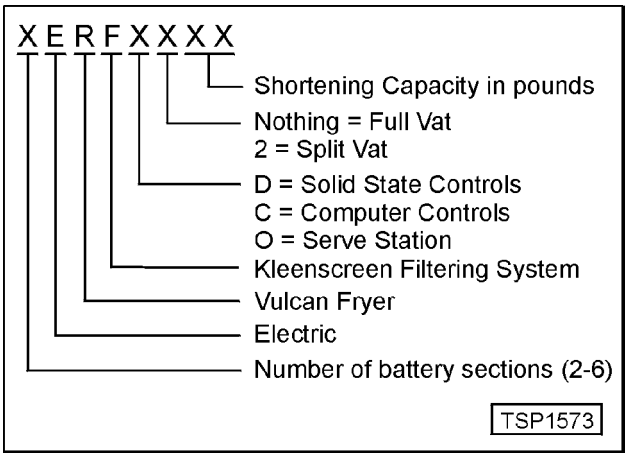
This Service Manual Supplement covers specific service information only related to the Vulcan Kleenscreen filter models listed on the front cover.

The fryer battery utilizes many of the same controls and components as the Vulcan ERD series (solid state control) and ERC series (computer control) fryers.

Kleenscreen fryer batteries are available in a minimum of two and a maximum of six fryer sections. The fryer size of each section is identical.

An ERO series Frymate (dump station) can also be included as one or more of the sections.

Model Designations



Models, Features and Options

MODEL	FEATURES				OPTIONS	
	FRYER WIDTH (INCHES)	FRYING COMPOUND PER FRYER (POUNDS)	VAT TYPE	CONTROL TYPE	BASKET LIFTS	
					AUTOMATIC	TIMERS (MIN)
2ERD40F [1]	31	40	Full	Solid State	Single or Dual	7.5 or 15
2ERD50F [1]	31	50	Full	Solid State	Single or Dual	7.5 or 15
2ERD225F [1]	31	50 (25 each vat)	Split	Solid State	Single (each vat)	7.5 or 15
2ERD85F [2]	42	85	Full	Solid State	Single or Dual	7.5 or 15
2ERC40F [1]	31	40	Full	Computer	Single or Dual	7.5 or 15
2ERC50F [1]	31	50	Full	Computer	Single or Dual	7.5 or 15
2ERC225F [1]	31	50 (25 each vat)	Split	Computer	Single (each vat)	7.5 or 15
2ERC85F [2]	42	85	Full	Computer	Single or Dual	7.5 or 15
ER015 (Frymate)	15 1/2					
ER021 (Frymate)	21					
NOTES:	1. For each additional fryer section, add 15 1/2 inches to the width. 2. For each additional fryer section, add 21 inches to the width.					

Kleenscreen Filtering System

The new "Kleenscreen" filtering system has been integrated into the ER Series fryer battery. The filter is housed in a pull-out drawer assembly at the base of the fryer. The filtering components in the drawer include a stainless steel filter tank, crumb-catch basket and fine mesh screen. With the filter drawer closed, a self-seating return oil line provides the path to return the filtered oil to the fry tank.

This system is designed to provide a thorough and easy method for filtering fryer oil.

Some of the benefits include:

- Self-contained system eliminating the use of external filter equipment.
- Paperless filtering system.
- Easy to clean and low maintenance.

Information Sources

Refer to the appropriate manual below for related information.

MANUAL	ER SERIES ELECTRIC FRYERS	PUMP INFORMATION	KLEEN SCREEN
Service	F24577	F24599	-
Parts	F31007	-	-
Installation and Operation	F30981	-	-
Filtration System User's Guide	-	-	F31150
F24696	Use the Service information found in this Service Manual Supplement. The Supplement covers additional Service Information specific to the Kleenscreen fryer and filtering system.		

INSTALLATION

Refer to the Installation and Operation Manual for specific installation instructions.

OPERATION

Refer to the Installation and Operation Manual for specific operating instructions.

CLEANING

Refer to the Installation and Operation Manual for specific cleaning instructions.

MAINTENANCE

Refer to the Installation and Operation Manual for specific maintenance instructions.

SPECIFICATIONS

Electrical

Separate electrical connections are required for each section of the battery.

- 208VAC, 240VAC or 480VAC (3 phase, 60HZ) to power the heating elements.
- On 208VAC and 240VAC models, step down transformer(s) provide power for the fryer controls, basket lift(s) if installed, and Kleenscreen filtering controls.
- On 480VAC models, a 120VAC connection is required for each fryer section.
- All models require a separate 120VAC connection for the pump motor.

NOTE: Pump motor for Kleenscreen filtering system draws 5.0 amps.

MODEL	KW PER FRYER SECTION [3]	AMPS - EACH FRYER SECTION (3 PHASE/ 60HZ) [1]					
		PER LINE			RECOMMENDED CIRCUIT PROTECTION [2]		
		208V	240V	480V	208V	240V	480V
ERD40F	14	39	34	17	50	45	25
	17	47	41	20	60	50	30
ERD50F	14	39	34	17	50	45	25
	17	47	41	20	60	50	30
	21	58	51	25	80	70	35
ERD225F	14	39	34	17	50	45	25
	17	47	41	20	60	50	30
	21	58	51	25	80	70	35
ERD85F	24	67	58	29	90	80	40
ERC40F	14	39	34	17	50	45	25
	17	47	41	20	60	50	30
ERC50F	14	39	34	17	50	45	25
	17	47	41	20	60	50	30
	21	58	51	25	80	70	35
ERC225F	14	39	34	17	50	45	25
	17	47	41	20	60	50	30
	21	58	51	25	80	70	35
ERC85F	24	67	58	29	90	80	40

NOTES:

1. Amperage values in the table are nominal. Tolerance is +5/-10%.
2. Complied in accordance with National Electric Code, ANSI/NFPA 70, latest edition.
3. 14kw is standard on all fryers except 85 lb. models which are 24kw.

REMOVAL AND REPLACEMENT OF PARTS

COVERS AND PANELS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE ARE SEVERAL SEPARATE CIRCUITS. BE SURE ALL ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX(ES) INDICATING THE CIRCUIT IS BEING SERVICED.

Front Control Panel

1. Open the cabinet door to the fryer section being serviced.
2. Remove the screws along the bottom lip and along the top of the of the control panel.

SINGLE 85 LB. FRYER SECTION SHOWN SOLID STATE CONTROLS, DUAL BASKET LIFT

3. Work the panel loose at each end and lift off.
4. Reverse procedure to install.

Basket lift Covers

1. Loosen bolt at the top of each basket lift hanger and lift the basket hangers from the support rod.
2. Remove the screws that secure the lower cover at the rear of the fryer section.
3. Remove the screws along each side of the cover.
4. Lift the cover and place to the side.
5. Reverse procedure to install.

PUMP AND MOTOR

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE ARE SEVERAL SEPARATE CIRCUITS. BE SURE ALL ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX(ES) INDICATING THE CIRCUIT IS BEING SERVICED.

NOTE: Refer to component location picture 6100 for location of pump motor.

1. Open the right side cabinet door of the filter section.
2. Pull the filter drawer out, remove the filter tank assembly and push the tank support arms back underneath the fryer.
3. Disconnect the electrical connection to the motor.

NOTE: The remaining steps are written for front removal of the pump assembly. If access to the back of the fryer is available, it may be easier to remove the pump from the rear.

4. Separate the swivel hose connection on the right side (intake) of the pump.
5. Separate the swivel hose connection on the left side (discharge) of the pump.
6. Remove the mounting bolts from the motor.
7. Remove the motor, pump and piping assembly.
   A. If replacing the pump and motor, remove the existing piping assemblies and reuse.
8. Reverse procedure to install.

NOTE: Ensure the rubber vibration pad or the grommets are installed under the motor mounting plate.

FILTER VALVE AND DISCARD VALVE SWITCHES

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE ARE SEVERAL SEPARATE CIRCUITS. BE SURE ALL ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX(ES) INDICATING THE CIRCUIT IS BEING SERVICED.

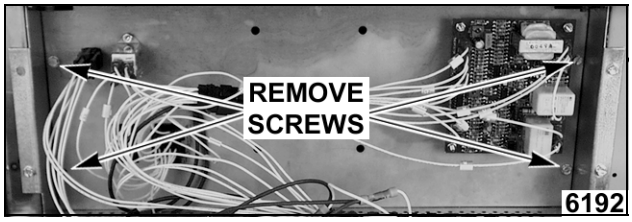
1. Open the cabinet door to the fryer section being serviced.
2. Disconnect lead wire connector from the appropriate switch.
3. Remove switch mounting screws.
4. Reverse procedure to install.

NOTE: Switch mounting is a fixed location and has no provision for adjustment.

HEATER CONTACTORS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. THERE ARE SEVERAL SEPARATE CIRCUITS. BE SURE ALL ARE DISCONNECTED. PLACE A TAG ON THE CIRCUIT BOX(ES) INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove the front control panel as outlined under "FRONT CONTROL PANEL" in "COVERS AND PANELS".
2. Remove the combination mounting and cover panel from the control area.



3. Contactors are now accessible.

NOTE: Refer to "COMPONENT LOCATION".

4. Reverse procedure to install.

SERVICE PROCEDURES AND ADJUSTMENTS

COMPUTER CONTROL BOARD DIAGNOSTICS

The computer control is used on other equipment and is capable of displaying many different prompts. Therefore, some prompts not applicable may display when a problem occurs in the wiring harness. Since the computer is looking for either 24 VAC or 24 VAC ground on particular pins, an open connection can cause a non-applicable prompt to appear. Refer to "COMPUTER CONTROL HARNESS PIN-OUTS CHART" under "TROUBLESHOOTING".

Diagnostics are divided into two areas, "OPERATION" and "SERVICE". Operation mode is the standard mode of fryer operation. Service mode is intended to give the service technician more information regarding the nature of a problem encountered. In either mode the fryer operates normally until an error occurs.

If an error occurs, the information displayed will be different. The chart below shows what is displayed for both "OPERATION" and "SERVICE" modes.

The "SERVICE" mode can only be entered while an error is occurring. To enter the service mode, press and hold the product 3 and 4 keys and turn the power switch ON. To exit, turn the power switch OFF.

The following displays/computer responses will be given for the noted conditions.

CONDITION	OPERATION MODE DIAGNOSTICS DISPLAY	SERVICE MODE DIAGNOSTICS DISPLAY	COMPUTER RESPONSE
No input on pins 3, 4, 5, or 6	IGN FAILURE	IGN FAILURE on left side or right side for split vat only	HEAT OFF
Low Temperature (lack of heat)	LOW TEMP	LO TEMP XXXF	HEAT OFF Temperature is below the lowest operational set point. Refer to "COMPUTER CONTROL" under "TROUBLESHOOTING".
High Temperature Alarm	HIGH TEMP	HI TEMP XXX°F	HIGH TEMP DISPLAYED Output at pin 15 and/or 16 (split vat) should already be OFF unless there is a problem with computer. Vat temperature is 410°F or higher which is well above the highest operational set point. Refer to "COMPUTER CONTROL" under "TROUBLESHOOTING".
High Temperature (high limit)	OFF	OFF	OFF DISPLAYED Mechanical high limit is OPEN (435°F), heat OFF and input is removed from pin 1 and/or pin 2 which indicates to the computer --- VAT TURNED OFF.
Tilt Switch OPEN	OFF	OFF	OFF DISPLAYED Heaters raised or problem with the tilt switch. Heat is OFF and input is removed from pin 1 and/or pin 2 which indicates to the computer --- VAT TURNED OFF.
Drain Valve Switch (if installed)	DRAIN OPEN	DRAIN OPEN	DRAIN OPEN DISPLAYED, HEAT OFF Input is removed from pin 10. Drain valve is OPEN or there is a problem with switch.
Probe Open or Short	CALL SERVICE	PROBE OPEN R or L for split vat PROBE SH R or L for split vat	HEAT OFF
No input on pin 11	CLOSE DOOR	CLOSE DOOR	HEAT OFF
Not passing Self Check	CALL SERVICE	MICRO FAIL	System will operate in backup mode

Power up Diagnostics

On power up, the control will execute a self check. The failure of any of these tests will result in the message “CALL SERVICE” or “MICRO FAIL” being displayed.

This prompt will flash at approximately a 1 hertz rate. While the prompt is displayed, the computer will not function. If the failure is in the computer, the fryer will operate in backup mode.

When the fryer computer comes out of initialization and self check routines, it will either enter the heating mode or the melt mode (if programmed) of operation.

For a split vat fryer, one vat can be OFF while the other is in operation. If this occurs, the side that is OFF will be indicated by displaying the OFF prompt to the user. The message will be on the side of the display which corresponds to the vat which is OFF.

System Tests

The system diagnostics menu is intended to give you the ability to test the basic parts of the computer. It can be entered by pressing the 8 and 9 product keys simultaneously while turning on power to the fryer computer. The message "SYSTEM TESTS" is displayed. In this mode you can select one of three tests.

With DISPLAY TEST displayed, press enter to begin a test, use the up and down arrows to rotate through the screens. Press exit once to return to the test menu or twice to return to normal operation.

With KEYPAD TEST displayed, press enter to begin the test. The control will respond by displaying the name of the key pressed. Press exit once to return to the test menu or twice to return to normal operation.

With VER xxx displayed, the release number is displayed as "VER XXX".

ELECTRICAL OPERATION

SEQUENCE OF OPERATION

Solid State Fryer Control, Full Vat

Refer to schematic diagram TSP1567C for both the "Fryer Controls" operation and the "Kleenscreen Filtering system" operation.

FRY CYCLE - LIQUID FRYING OIL

NOTE: If using solid shortening, refer to "MELT CYCLE - SOLID SHORTENING" in this section.

1. Conditions.
   - A. Fryer connected to correct supply voltage (separate connections are required for each section of the battery).
     1) 208, 240 or 480VAC - power for heating elements.
     2) 208 or 240VAC models - Step down transformer(s) provide power for the fryer controls, basket lift(s) if installed, and the Kleenscreen filtering controls.
     3) 480VAC models - A separate 120VAC connection is used along with step down transformer(s) to provide power for the fryer controls, basket lift(s) if installed, and the Kleenscreen filtering controls.
     4) All models require a separate 120VAC connection for the pump motor.
   - B. 24VAC transformer energized.
   - C. Fryer properly grounded.
   - D. Internal fryer circuit breakers ON.

   NOTE: 208 and 240VAC models at 21 and 24 KW only.
   - E. Power switch to the fryer section controls in center NEUTRAL (starting) position.
   - F. Tilt switch contacts CLOSED (N.O. - held CLOSED with heating elements down).
   - G. Second high limit thermostat CLOSED.
   - H. Frying oil at the proper level in vat and below 300°F.
   - I. Fry/Melt switch in FRY position.
   - J. Temperature control set to desired frying temperature.

2. Press power ON switch.
   A. 24VAC initially energizes relay coil R1 through the momentary ON power switch contacts (N.O.).
   B. When switch is released, relay coil R1 remains energized through R1-2 "latching circuit" contacts (N.O.) and the momentary OFF power switch contacts (N.C.).
      1) R1-1 CLOSED.
      2) R1-2 CLOSED.
   C. Supply voltage energizes the following components:
      1) Power ON light (red).
      2) Power supplied to basket lift controls, if installed.
      3) 1CON and 3CON through tilt switch and second high limit thermostat.
      4) Temperature control board at proper terminal (2, 3 or 4) for supply voltage and jumpered to terminal 5.
   D. Temperature control board evaluates the inputs from thermistor and set point potentiometer then energizes the board relays.
      1) The Control relay contacts (N.O.) at terminal 5 CLOSE.
      2) The first high limit relay contacts (N.C.) at terminal 6 change state to the normally OPEN position and provide a path to the output at terminal 7.

      NOTE: The first high limit "light" may quickly flash once, until the High limit relay is energized.

         a. 2CON and 4CON are energized and heating elements are powered.
         b. Heat light comes ON.

         NOTE: Refer to "SCHEMATIC TSP1569C" under "SCHEMATIC DIAGRAMS".

3. Oil reaches set point temperature.
   A. Temperature control de-energizes the "control relay" on board, contacts at terminal 5 OPEN and the output at terminal 7 is removed.
      1) 2CON and 4CON are de-energized and power is removed from the heating elements.
      2) Heat light goes OFF.
4. Temperature control cycles output to terminal 7 until power switch is turned OFF, heating elements are raised or a high limit condition occurs.
   A. If oil reaches 410°F ±5, the temperature control de-energizes "high limit relay" on board, contacts revert back to the normally CLOSED position and the output changes to terminal 6.
      1) The first high limit light comes ON.
      2) 2CON and 4CON are de-energized and power is removed from the heating elements.
      3) Output is removed from terminal 6 when oil temperature drops below set point temperature and is returned to terminal 7.
   B. If the second high limit OPENS (435°F ±15) or the tilt switch operates, 1CON and 3CON are de-energized and power is removed from the heating elements and heating stops.
      1) Trouble "light" and second high limit "light" come ON.

MELT CYCLE - SOLID SHORTENING

1. Conditions.
   A. Same as outlined in steps 1A thru 1G under "FRY CYCLE - LIQUID FRYING OIL".
   B. Solid shortening at the proper pounds in vat and at room temperature.
   C. Fry/Melt switch in MELT position.
   D. Temperature Control set to desired frying temperature.
2. Same as outlined in steps 2 thru 2. C. 4) under "FRY CYCLE - LIQUID FRYING OIL".
3. Temperature control board evaluates the inputs from thermistor then energizes the board relays.
   A. Melt cycle is initiated and the temperature control functions as a percent ON/OFF timer.
      1) The control relay contacts (N.O.) at terminal 5, cycle the output at terminal 7 to energize 2CON and 4CON and power the heating elements.
         a. Initial condition is OFF 45 seconds.
         b. Heat condition ON 2 seconds (heat light ON).

NOTE: Refer to "SCHEMATIC TSP1569C" under "SCHEMATIC DIAGRAMS".

B. Control cycles output at time intervals of 30 seconds OFF, then 2 seconds ON (heat light ON).

4. Shortening temperature reaches 135°F.

A. Melt cycle is automatically over-ridden.

NOTE: The Fry/Melt switch should remain in the "Melt" position.

B. Control uses thermistor input to cycle the output at terminal 7.

5. Shortening reaches set point temperature.

A. Control removes output from pin 7.

1) 2CON and 4CON are de-energized and power is removed from the heating elements.

2) Heat light goes out.

6. Control cycles the output at terminal 7, on the vat temperature.

Computer Control, Full Vat

Refer to schematic diagram's TSP1571C for "Fryer Controls" operation and TSP1587 "Kleenscreen Filtering system" operation.

FRY CYCLE - LIQUID FRYING OIL

NOTE: If using solid shortening, the computer control should be programmed to use the MELT CYCLE. In the MELT CYCLE, the computer will "cycle" the heaters ON/OFF in short intervals to gradually heat and liquify the shortening until it reaches a temperature of 135°F.The computer then resumes normal operation as described under FRY CYCLE.

1. Conditions.

A. Fryer connected to correct supply voltage (separate connections are required for each section of the battery).

1) 208, 240 or 480VAC - power for heating elements.

2) 208 or 240VAC models - Step down transformer(s) provide power for the fryer controls, basket lift(s) if installed, and the Kleenscreen filtering controls.

3) 480VAC models - A separate 120VAC connection is used along with step down transformer(s) to provide power for the fryer controls, basket lift(s) if installed, and the Kleenscreen filtering controls.

4) All models require a separate 120VAC connection for the pump motor.

B. 24VAC transformer 2T energized.

1) Power to pins 3, 4, 5, 6, 11, and 17 (control system main input) on computer main harness.

2) 24 VAC ground to pins 9, 12, and 13 (control system main input GND).

NOTE: Pin 12 on the main harness is used to indicate to the computer the type of fryer (full or split vat) the computer is installed in. If the fryer is a full vat, pin 12 is tied to 24 VAC ground. If the fryer is a split vat, pin 12 is tied to 24 VAC.

C. Fryer properly grounded.

D. Internal fryer circuit breakers ON.

NOTE: 208 and 240VAC models at 21 and 24 KW only.

E. Power switch to the fryer section controls in the OFF position.

F. Tilt switch contacts CLOSED (N.O. - held CLOSED with heating elements down).

G. Second high limit thermostat CLOSED.

H. Frying oil at the proper level in vat and below 300°F.

I. Computer control is setup properly and ready to use.

2. Press power ON switch.

A. 12VAC transformer 1T energized.

1) Computer power supply board PS-1 is energized and a (+) 12VDC signal is sent to pin 23 on the computer main harness.

B. Computer control powers ON, initializes and performs a diagnostic self check.

NOTE: If the control passes self check, then the outputs are energized and operation sequence continues. If control does <u>not</u> pass self test then CALL SERVICE or MICRO FAIL will display. Refer to "COMPUTER CONTROL BOARD DIAGNOSTICS" under "SERVICE PROCEDURES AND ADJUSTMENTS".

1) R1 control relay, 1CON and 3CON will energize.

a. R1 relay energized, NO contacts CLOSE and supply power to pin 1 on computer main harness.

NOTE: Pins 1 and 2 on the main harness are used to monitor the power switch "status" of the vat(s). Pin 1 is the power status input on a full vat or right side split vat and pin 2 is the input for the left side split vat only. These inputs tell the computer which vat(s) are turned ON or OFF.

3. Computer control evaluates input from thermistor at pins 3 and 4 (full vat or right side split vat).

NOTE: Pins 1 and 2 (left side split vat only) on temperature probe harness.

A. Computer control evaluates the input from thermistor then activates the 24VAC output from pin 15 and power is applied to R2 control relay.

1) R2 control relay is energized and the N.O. contacts CLOSE.

a. 2CON and 4CON are energized and heating elements are powered.

NOTE: Pin 15 and 16 on the main computer harness are the heat outputs. Pin15 is the full vat or right side split vat output and pin 16 is the left side output on a split vat only.

4. Oil temperature reaches set temperature.

A. Computer turns OFF heat output and control relay R2 de-energizes.

B. 2CON and 4CON are de-energized and power is removed from heating elements.

5. Computer cycles heat output on oil temperature until power switch is turned OFF, heating elements are raised or a high limit condition occurs.

NOTE: Steps 5A and 5B discuss OPEN high limits. For additional information on computer control error messages, refer to "COMPUTER CONTROL BOARD DIAGNOSTICS" under "SERVICE PROCEDURES AND ADJUSTMENTS".

A. If the oil reaches 410°F ±5, the display will indicate “HI TEMP” as an alarm to the operator only.

B. If the second high limit (435°F ±15) OPENS or the tilt switch operates, the control relay R1 and contactors 1 thru 4 are de-energized.

1) Power is removed form the heating elements and heating stops.

2) R1 contacts OPEN and remove power from pin 1 (full vat or right side split vat). The display will indicate “OFF”.

NOTE: If the second high limit trips for the left side split vat only, R3 and contactors 3 and 4 are de-energized. Power is removed form the left side vat heating elements only and heating stops. R3 contacts OPEN and remove power from pin 2 (left side split vat only). The display will indicate “OFF” for the left side vat.

NOTE: The filter valve handle and the discard valve handle are connected to a mechanical valve and switch assembly to route the flow of oil filtering system and supply power to the pump motor.

Kleenscreen Filtering System

For Solid State Control, refer to schematic diagram TSP1567C for both the "Fryer Controls" operation and the "Kleenscreen Filtering system" operation.

For Computer Control, refer to schematic diagrams TSP1571C for the "Fryer Controls" operation and TSP1587C for the "Kleenscreen Filtering system" operation.

1. Conditions

A. Fryer connected to correct supply voltage (separate connections are required for each section of the battery).

B. Fryer properly grounded.

C. Power switch to fryer section controls turned OFF.

D. Frying oil below 300°F.

E. Filter drawer assembly installed properly.

F. Filter power switch turned OFF.

G. Filter valve handle (red) retracted.

1) Filter valve switch N.O. contacts OPEN.

H. Discard valve handle (white) retracted.

1) Discard valve switch N.O. contacts OPEN.

2. Set temperature control between 300°F (minimum) and 350°F (maximum).

NOTE: Oil should not be filtered outside of this temperature range. At lower temperatures the oil is thicker which may increase filtering time and place a greater load on the pump. At higher oil temperatures, oil seal life is deceased.

3. Turn the power switch ON, to the fryer section to be filtered.

A. Allow oil to cycle at set temperature for approximately 10 minutes.

NOTE: If using solid shortening, once it has melted, stir the oil to eliminate any sold shortening in cold zone of the vat. Refer to "MELT CYCLE - SOLID SHORTENING".

4. Turn the power switch OFF, to the fryer section to be filtered.
5. Open the manual drain valve to the fryer section in need of filtering and drain the liquid oil/shortening into filter tank.

NOTE: If using solid shortening, allow hot shortening to stand in filter tank for approximately 6 minutes prior to filtering.

6. Turn filter power switch ON.
   A. Switch pilot light comes ON.
7. Extend Filter valve handle of the same fryer section.
   A. Filter valve switch N.O. contacts CLOSE.
      1) Filter relay coil is energized and the N.O. contacts CLOSE.
         a. Power supplied to pump motor.
   B. Pump motor circulates oil through filter until power is removed.
8. When the oil filtering process is completed, close the manual drain valve to the fryer and allow the vat to refill.

NOTE: No electrical switching occurs by closing the manual drain valve unless the optional drain valve switch is installed.

9. When all filtered oil is returned to the fryer, retract the filter valve handle.
   A. Filter valve switch N.O. contacts OPEN.
      1) Filter relay coil is de-energized and the N.O. contacts OPEN.
         a. Power is removed from pump motor.
10. Turn filter power switch OFF.

NOTE: If using solid shortening, when all filtered oil is returned to the vat and filter power switch is OFF, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete.

Discard of used oil

1. Conditions
   A. Same as outlined in steps 1 thru 4 under “KLEENSCREEN FILTERING SYSTEM”.
2. Open the manual drain valve to the fryer section in need of oil discarding and drain the oil into the filter.
3. Attach oil drain hose the male quick connect fitting on the fryer.
4. Turn filter power switch ON.
   A. Switch pilot light comes ON.
5. Place drain hose discharge end into a used oil holding tank.
6. Extend discard handle.
   A. Discard valve switch N.O. contacts CLOSE.
      1) Filter relay coil is energized and the N.O. contacts CLOSE.
         a. Power supplied to pump motor.
   B. Oil begins flowing through drain hose into holding tank until power is removed.
7. When all used oil is emptied from the fryer, retract the discard valve handle.
   A. Discard valve switch N.O. contacts OPEN.
      1) Filter relay coil is de-energized and the N.O. contacts OPEN.
         a. Power is removed from pump motor.
8. Close the manual drain valve to the fryer.

NOTE: No electrical switching occurs by closing the manual drain valve unless the optional drain valve switch is installed.

9. Turn filter power switch OFF.

NOTE: If using solid shortening, when all filtered oil is returned to the vat and filter power switch is OFF, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete.

COMPONENT FUNCTION

NOTE: For components not listed here, refer to the ER series service manual listed on the front cover and under "INFORMATION SOURCES" in the "GENERAL" section.

Filter Power Switch . . . . . Supplies 120VAC to pump motor when filter relay is energized.

Filter Relay . . . . . Supplies 120VAC to pump motor through filter relay contacts (N.O.) when 24VAC coil is energized. Filter power switch must be ON and the filter valve switch or discard valve switch must be CLOSED (valve handle extended).

Transformer 2T . . . . . Supplies 24VAC to the oil filter control circuit and fryer power switch. Transformer is energized when supply power is connected to fryer.

Transformer 1T . . . . . Supplies 12VAC to the computer power supply board. Transformer is energized when fryer power switch is turned ON. Computer control models only.

Pump Motor . . . . . Operates the "pump" to circulate oil through the filtering system.

Filter Valve Switch . . . . . Energizes the filter relay coil to supply power to the pump motor through filter relay contacts (N.O.) when switch is CLOSED (valve handle extended). When oil filtering is complete, close the manual drain valve to the fryer and allow the vat to refill. Retract the filter handle when all filtered oil is returned.

Discard Valve Switch . . . . . Energizes the filter relay coil to supply power to the pump motor through filter relay contacts (N.O.) when switch is CLOSED (valve handle extended). This allows the oil to be discarded through the discard hose into a separate container. When filter tank is empty, retract the handle to return the discard switch to normal operating position.

Fryer Power Switch . . . . . Energizes relay coil R1 and supplies power to fryer control circuit through relay R1-1 contacts (N.O.). The switch positions are: momentary ON, momentary OFF with a center NEUTRAL (starting) position. Solid state controls only.

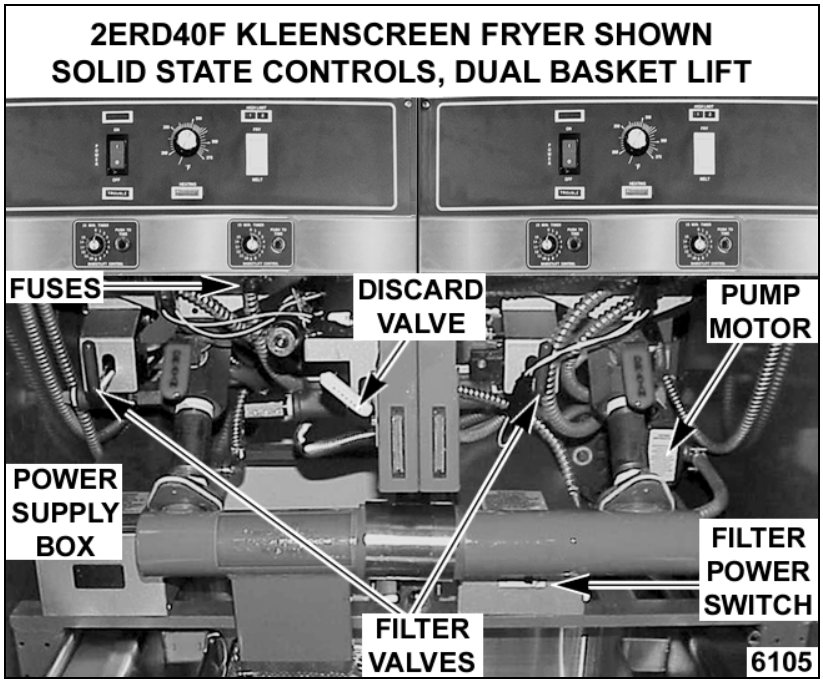
Circuit 1 on the switch is the normally CLOSED (N.C.) side. Press power OFF to momentarily OPEN switch contacts and turn the fryer OFF.

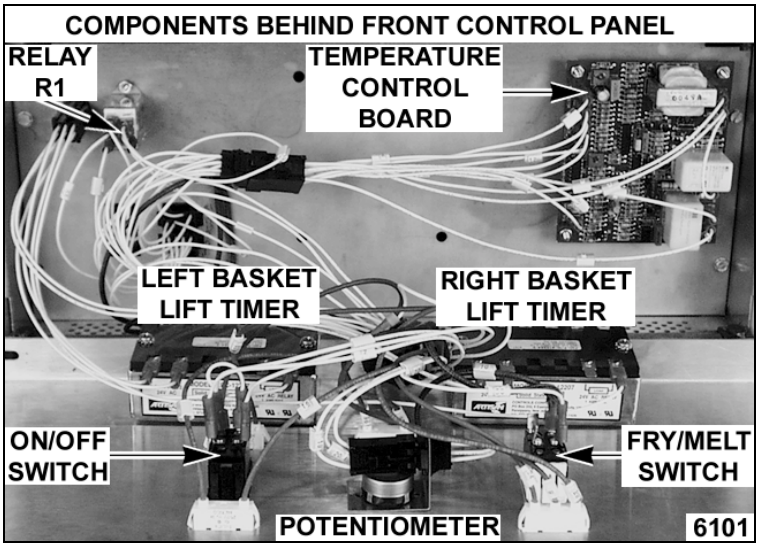
Circuit 2 on the switch is the normally OPEN (N.O.) side. Press power ON to momentarily CLOSE switch contacts and turn the fryer ON.

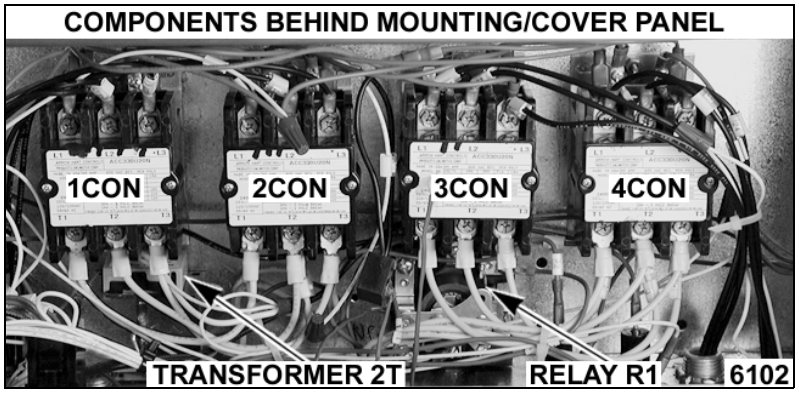
Relay R1 . . . . . Supplies power to fryer control circuit and basket lift circuit (if installed) through relay R1-1 contacts (N.O.) when 24VAC coil is energized. The relay remains energized through R1-2 contacts (N.C.) and fryer power switch contacts until power switch is turned OFF. Full vat and split vat fryers, solid state controls only.

Relay R2 . . . . . Supplies power to fryer control circuit and basket lift circuit (if installed) through relay R2-1 contacts (N.O.) when 24VAC coil is energized. The relay remains energized through R2-2 contacts (N.C.) and fryer power switch contacts until power switch is turned OFF. Split vat fryers with solid state controls only.

COMPONENT LOCATION

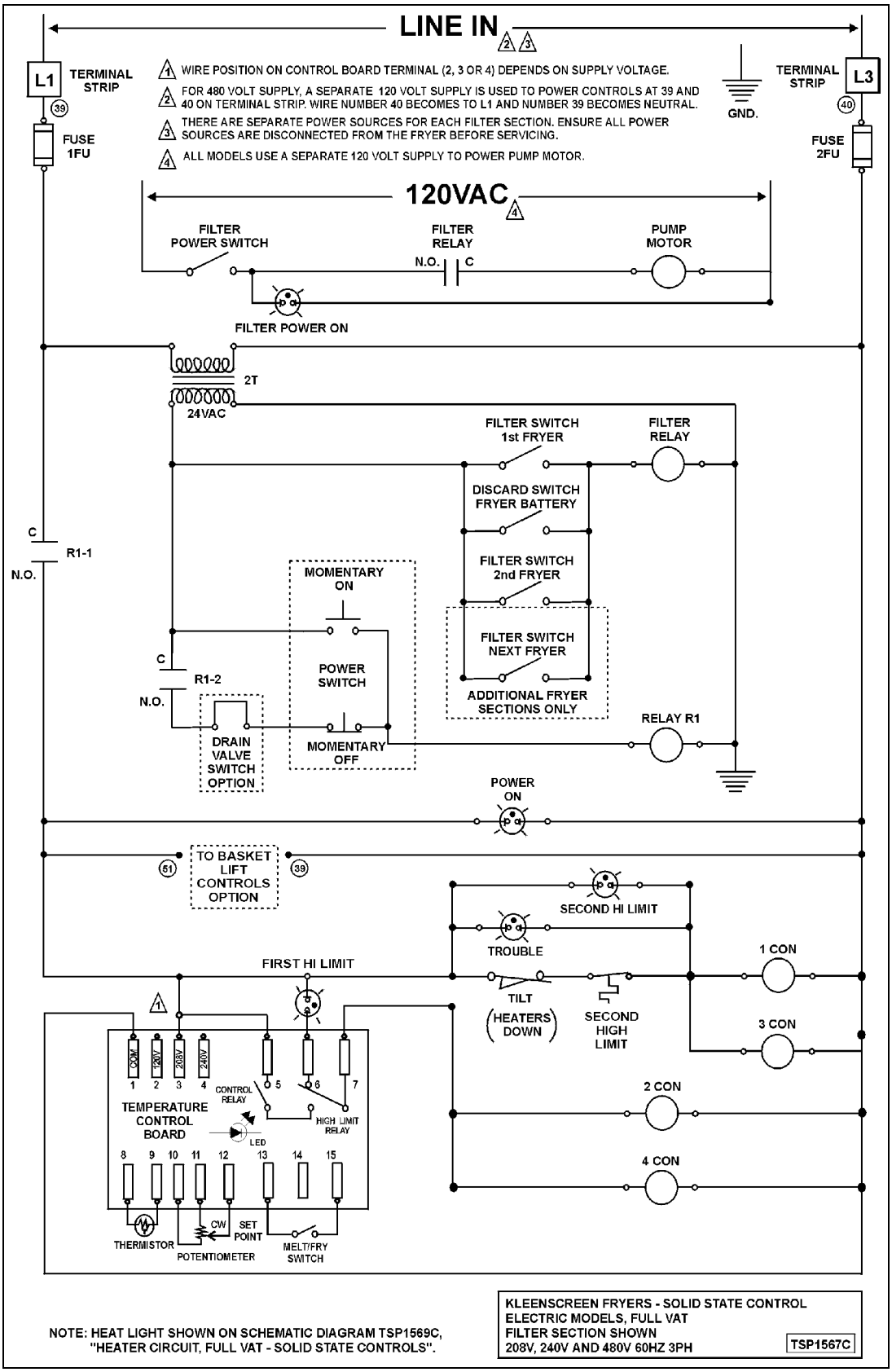




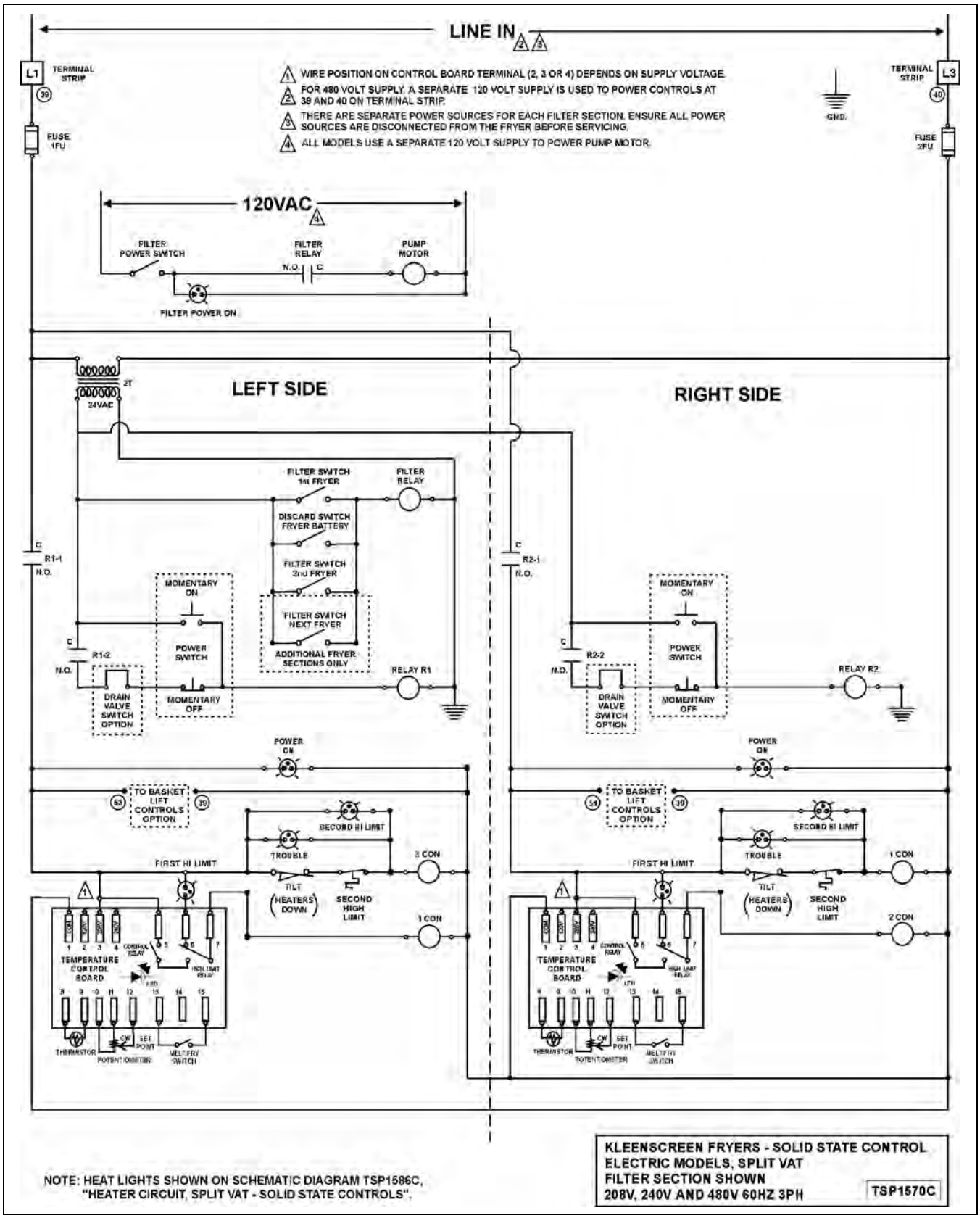


SCHEMATIC DIAGRAMS

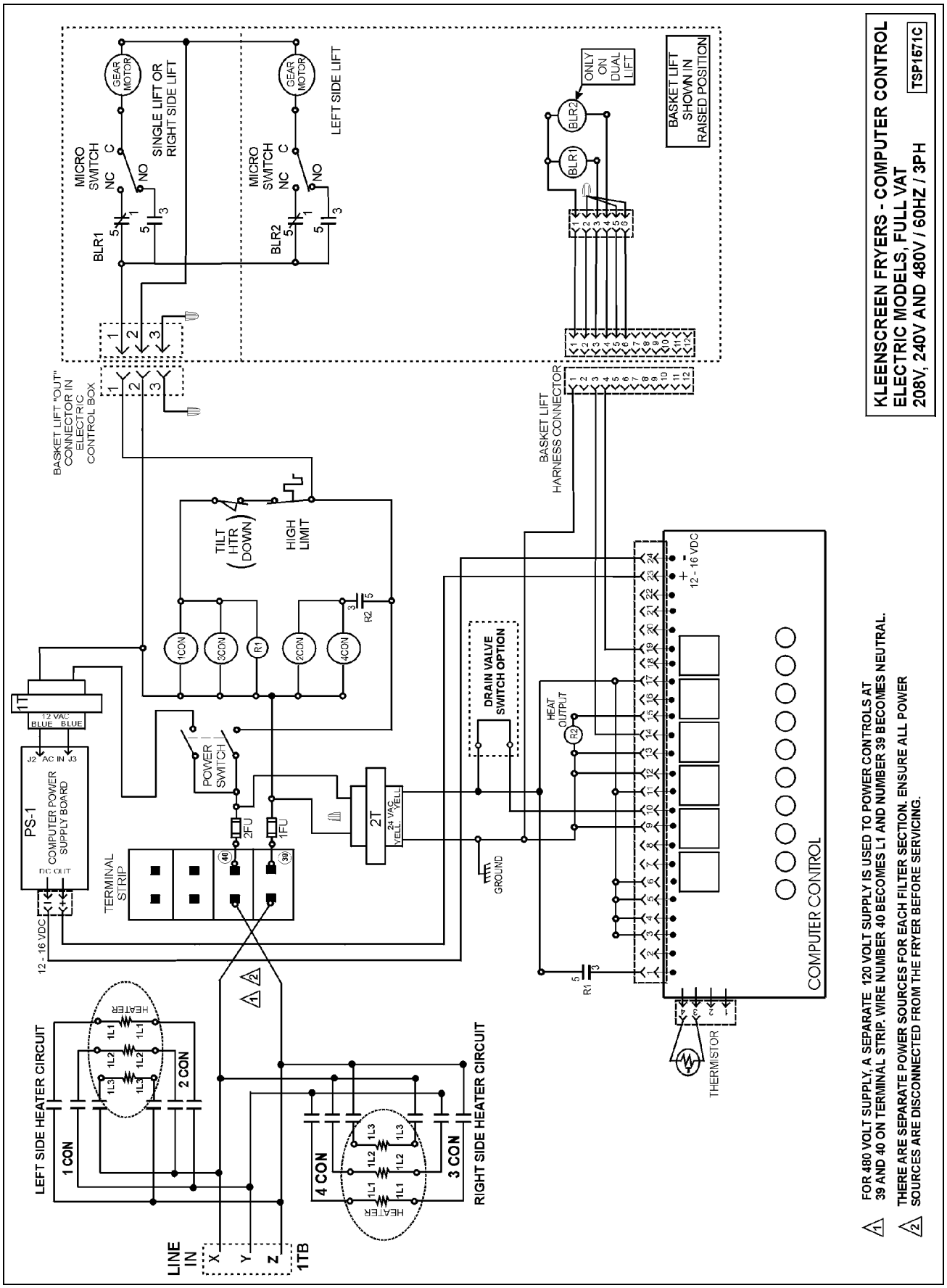
Solid State Control and Kleenscreen Filter, Full Vat



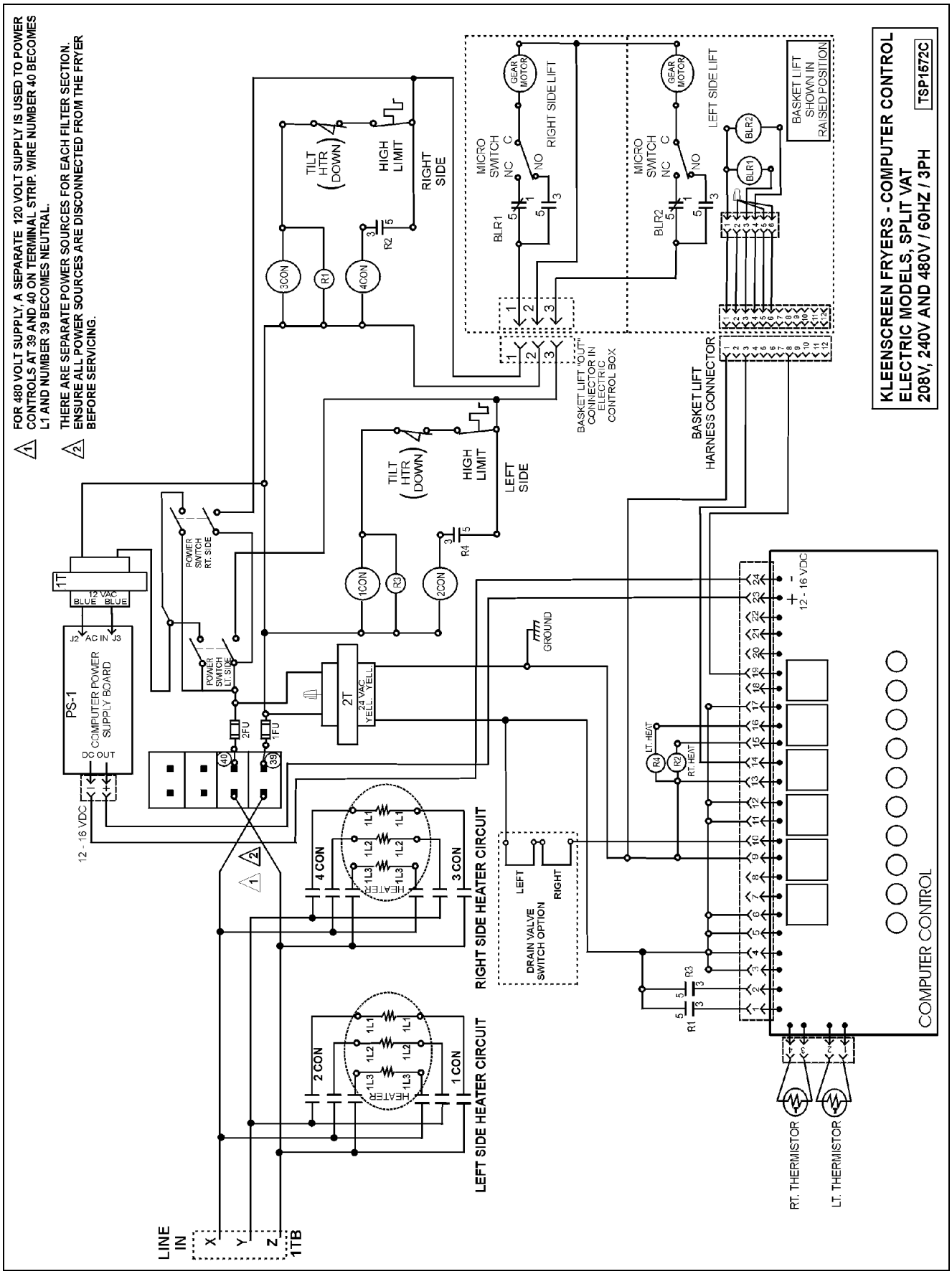
Solid State Control and Kleenscreen Filter, Split Vat



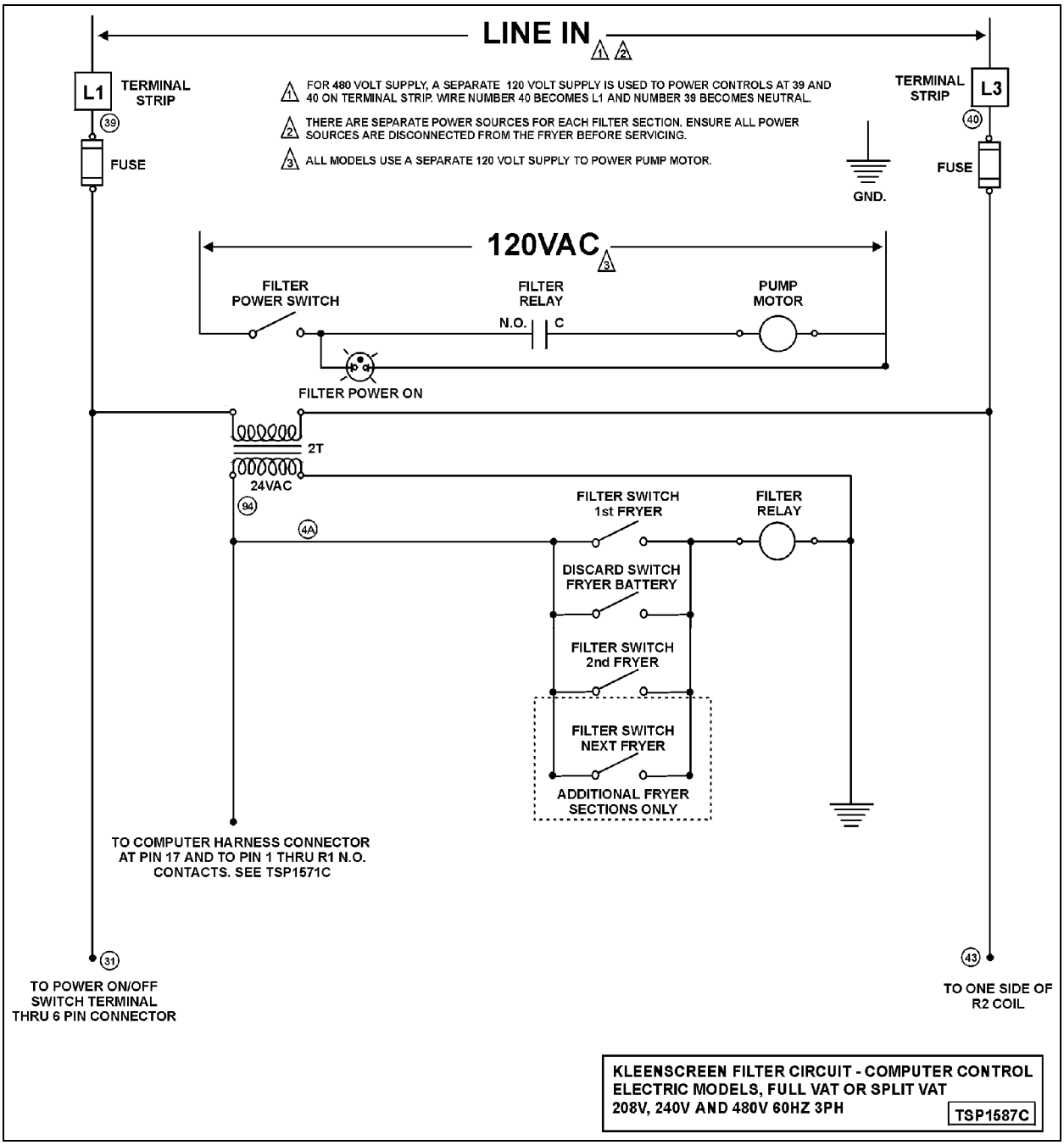
Computer Control, Full Vat



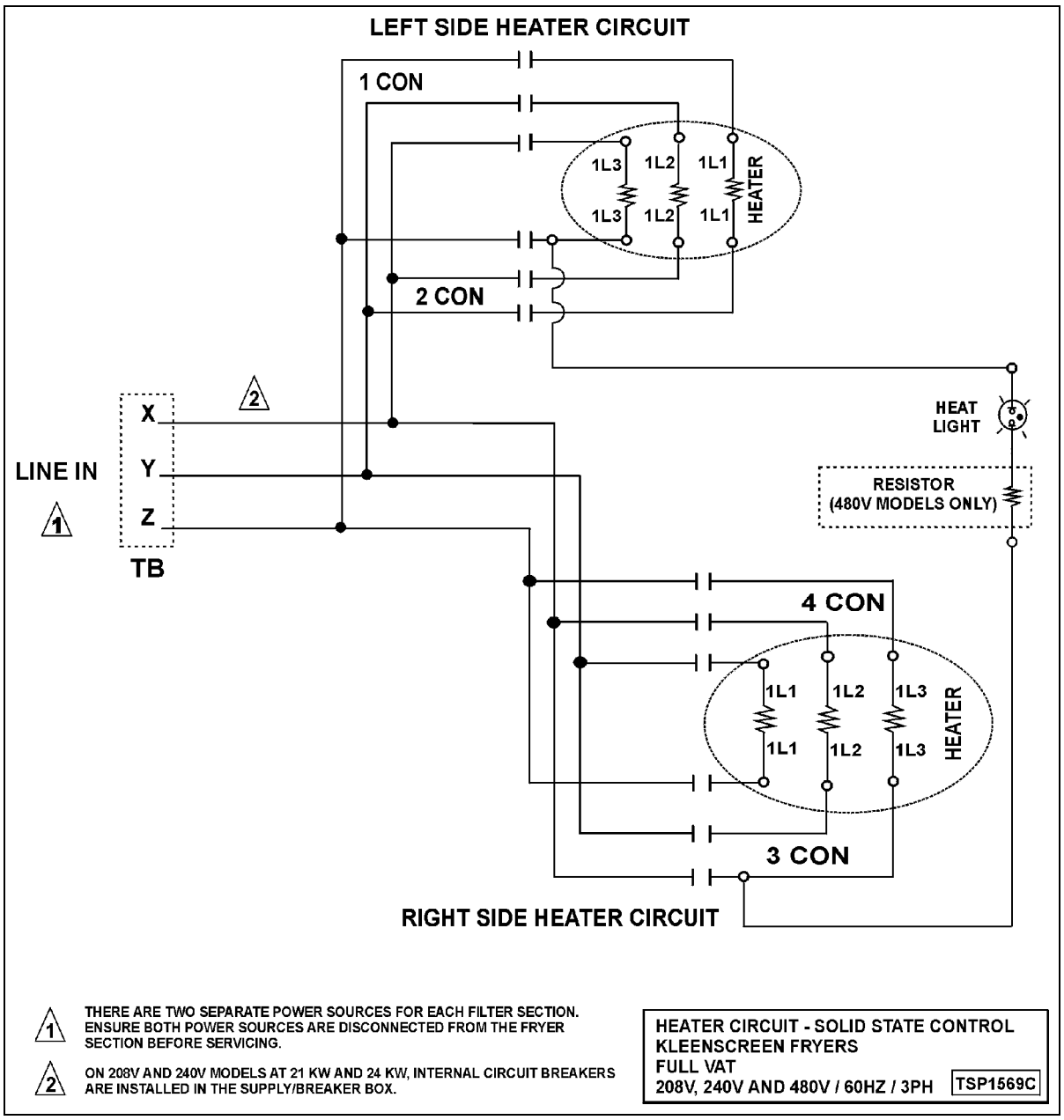
Computer Control, Split Vat



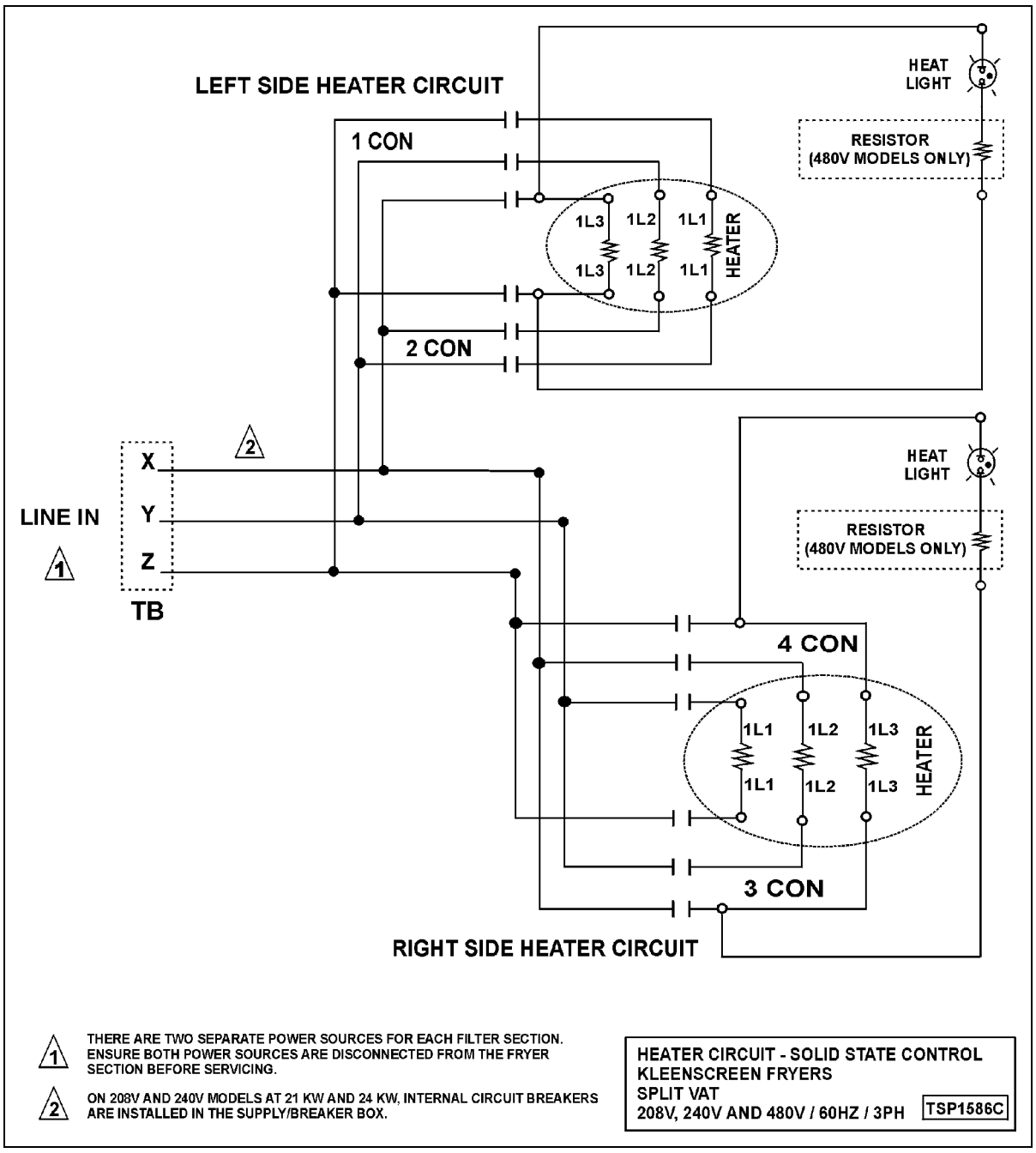
Kleenscreen Filtering System, Computer Control



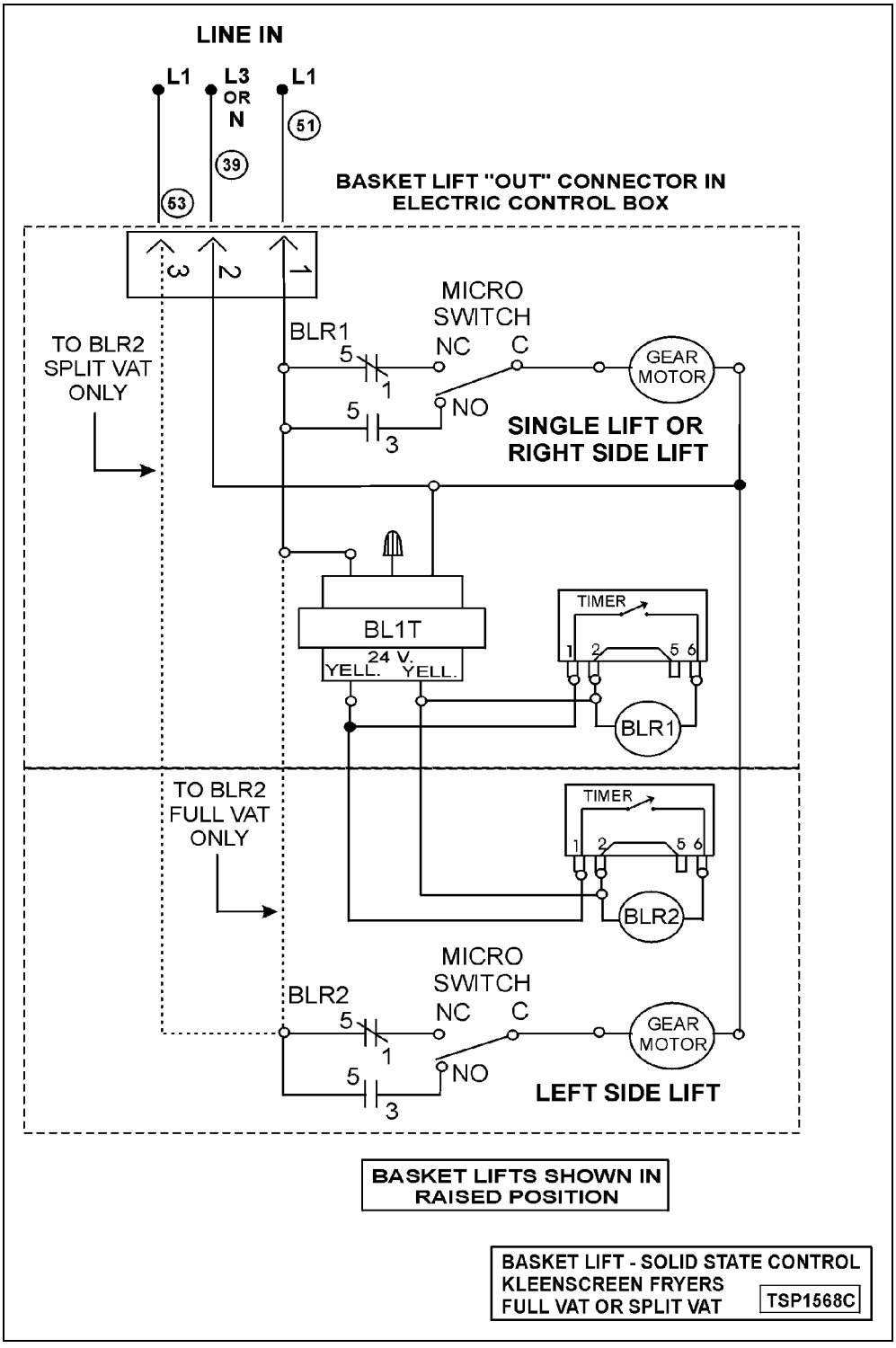
Heater Circuit, Solid State Controls, Full Vat



Heater Circuit, Solid State Controls, Split Vat

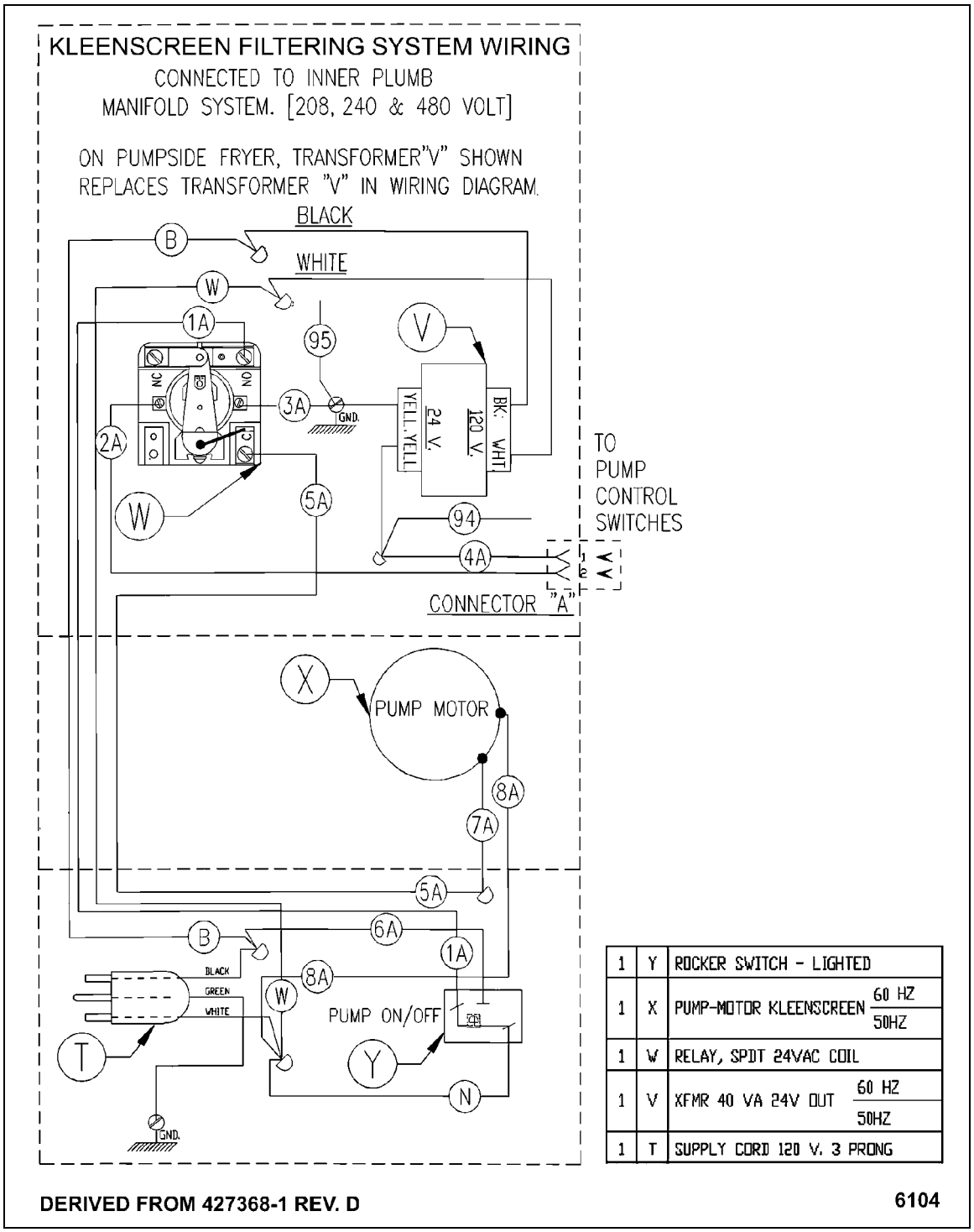


Basket Lift Circuit, Solid State Controls



WIRING DIAGRAMS

Kleenscreen Filtering System



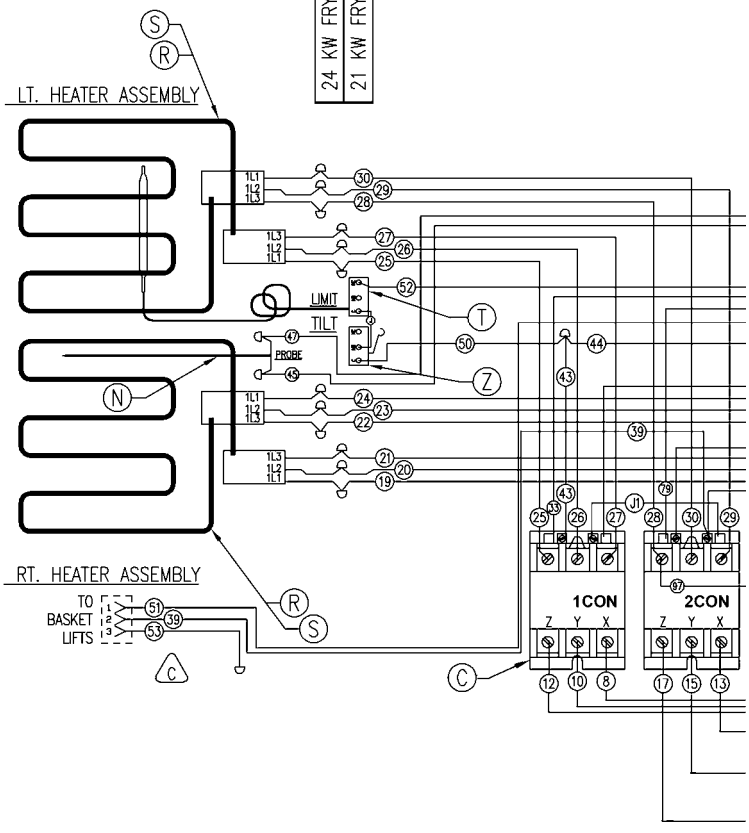
1	Y	ROCKER SWITCH - LIGHTED
1	X	PUMP-MOTOR KLEENSCREEN 60 HZ / 50HZ
1	W	RELAY, SPDT 24VAC COIL
1	V	XFMR 40 VA 24V OUT 60 HZ / 50HZ
1	T	SUPPLY CORD 120 V. 3 PRONG

Wiring Diagram Index

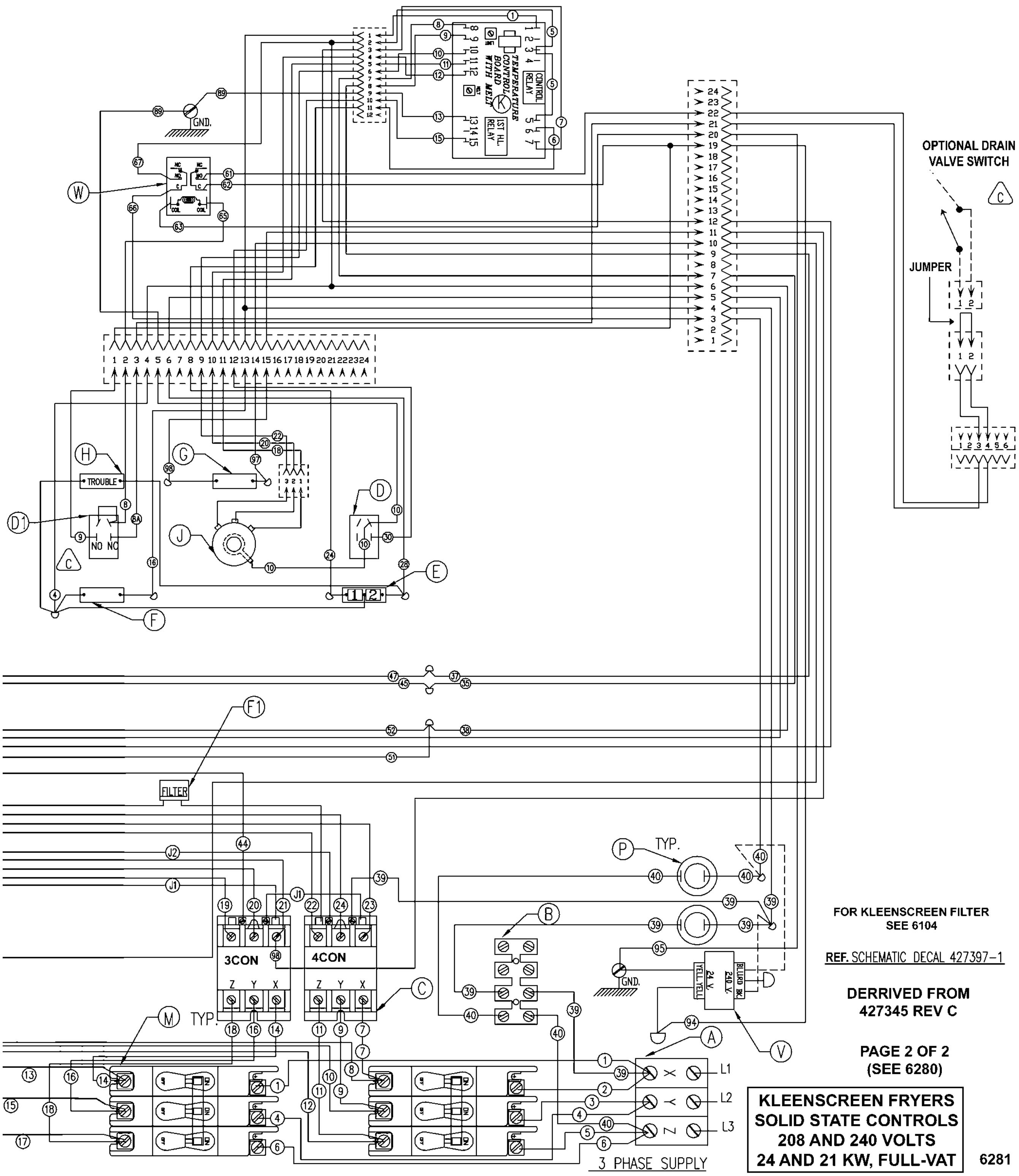
208–240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X–Y	X–Z	Y–Z
24	8	8	8
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
21	51	51	51

24 KW FRYER REQ.	21 KW FRYER REQ.	IT.	DESCRIPTION	FIN.
1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	Z	SWITCH, LIMIT TILT	-
1	1	W	RELAY DPDT 24V COIL	-
1	1	V	TRANSFORMER, 40 VA 24V.	240V.SYS 120V.SYS
1	1	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 12KW	208 V. 240 V.
-	2	R	ELEMENT, FIREBAR 10.5KW	208 V. 240 V.
2	2	P	FUSE & HOLDER	HOLDER FUSE
1	1	N	THERMISTOR PROBE	-
2	2	M	CIRCUIT BREAKER 50A 3 POLE	-
1	1	K	TEMPERATURE CONTROL BOARD	-
1	1	J	POTENTIOMETER ASSEMBLY	-
1	1	H	LIGHT, INDICATOR 'TROUBLE'	-
1	1	G	LIGHT, INDICATOR AMBER **(HEAT)**	-
1	1	F	LIGHT, INDICATOR RED **(POWER)**	-
1	1	E	LIGHT, INDICATOR (1 2) **(HIGH LIMIT)**	-
1	1	D1	SWITCH, ROCKER DPDT MOM ON/OFF	-
1	1	D	SWITCH, ROCKER DPST **(FRY/MELT)**	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-



PAGE 1 OF 2
(SEE 6281) **6280**



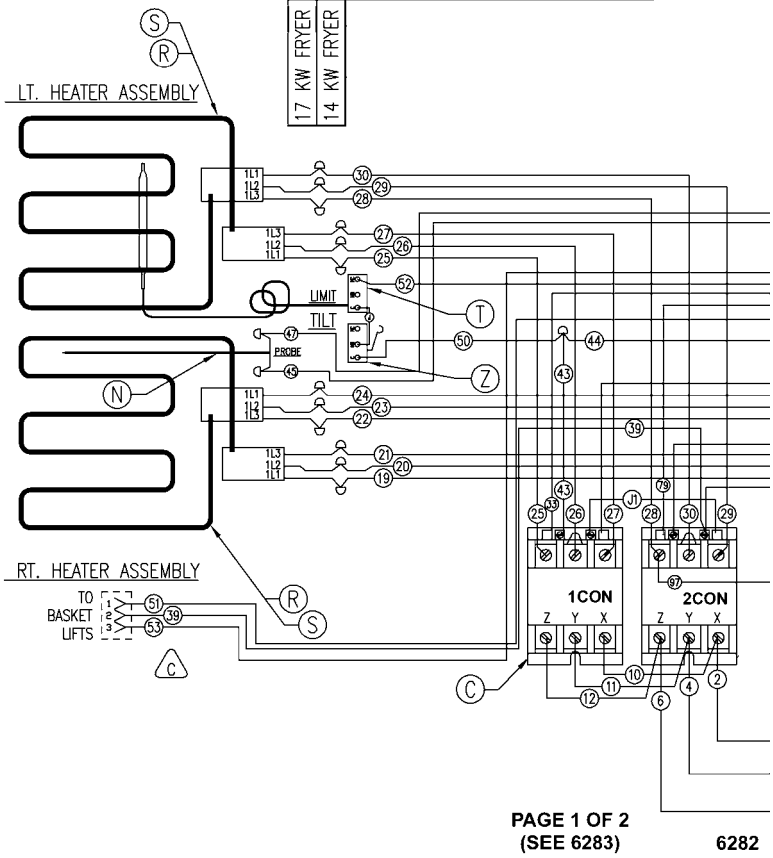
KLEENSCREEN FRYERS
SOLID STATE CONTROLS
208 AND 240 VOLTS
24 AND 21 KW, FULL-VAT

6281

208–240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X–Y	X–Z	Y–Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34

17 KW FRYER	14 KW FRYER	IT.	DESCRIPTION	FIN.
1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	Z	SWITCH, LIMIT TILT	-
1	1	W	RELAY DPDT 24V COIL	-
1	1	V	TRANSFORMER, 40 VA 24V.	240V.SYS
				120V.SYS
1	1	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 8.5KW	208 V.
				240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V.
				240 V.
2	2	P	FUSE & HOLDER	HOLDER
				FUSE
1	1	N	THERMISTOR PROBE	-
1	1	K	TEMPERATURE CONTROL BOARD	-
1	1	J	POTENTIOMETER ASSEMBLY	-
1	1	H	LIGHT, INDICATOR 'TROUBLE'	-
1	1	G	LIGHT, INDICATOR AMBER **(HEAT)**	-
1	1	F	LIGHT, INDICATOR RED **(POWER)**	-
1	1	E	LIGHT, INDICATOR [1 2] **(HIGH LIMIT)**	-
1	1	D1	SWITCH, ROCKER DPDT MOM ON/OFF	-
1	1	D	SWITCH, ROCKER DPST **(FRY/MELT)**	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-



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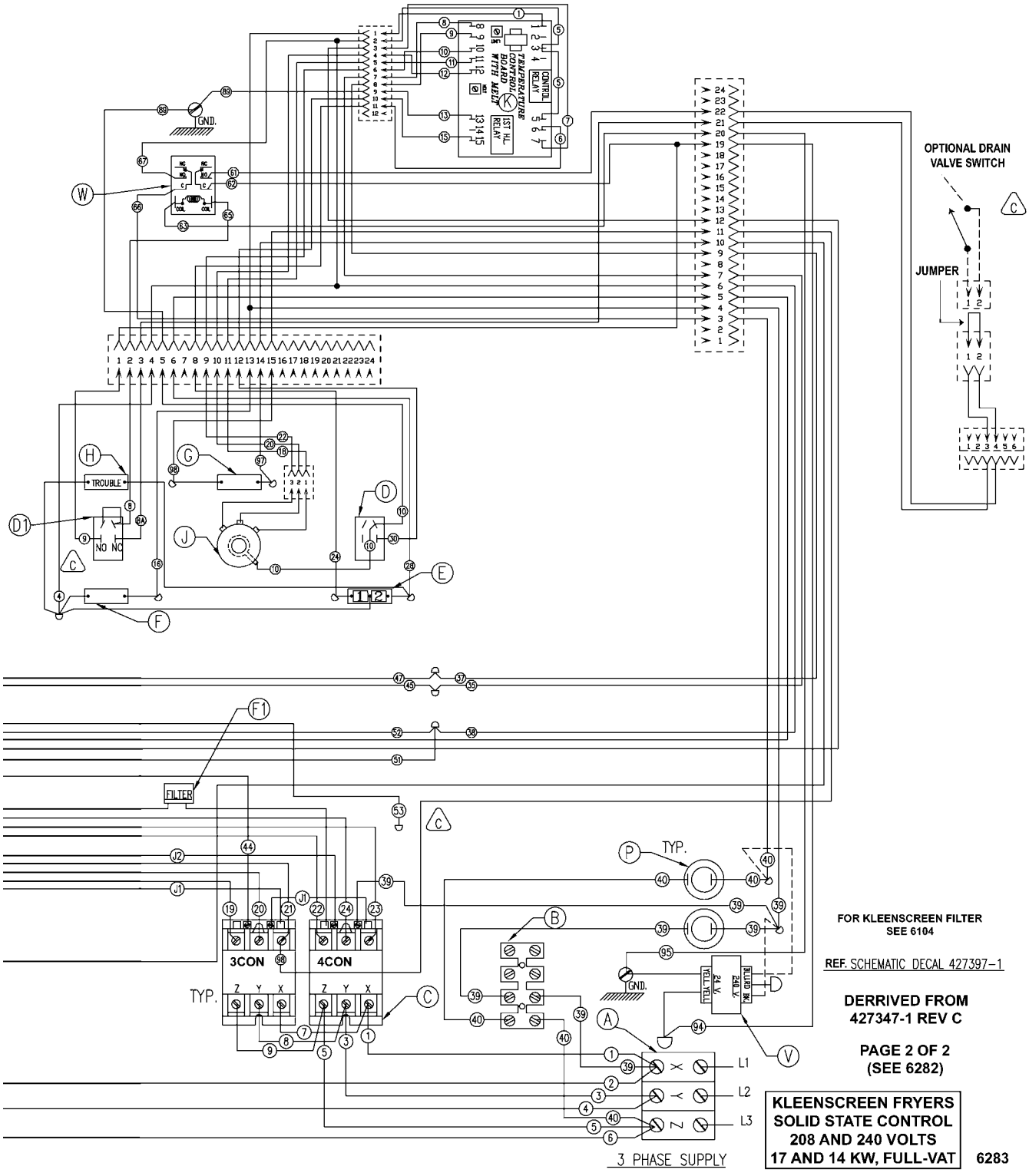
(SEE 6283)

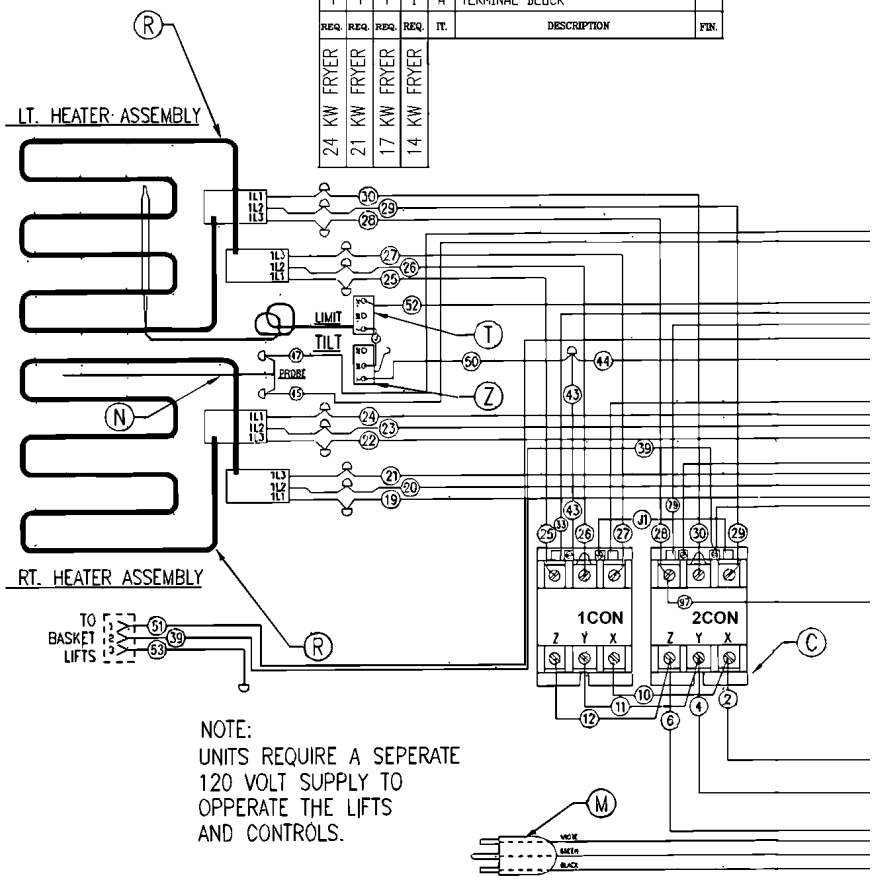
6282


OPTIONAL DRAIN VALVE SWITCH
JUMPER
TROUBLE
3CON
4CON
TYP.
FILTER
GND.
3 PHASE SUPPLY
L1
L2
L3
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427397-1
DERRIVED FROM 427347-1 REV C
PAGE 2 OF 2 (SEE 6282)
KLEENSCREEN FRYERS
SOLID STATE CONTROL
208 AND 240 VOLTS
17 AND 14 KW, FULL-VAT
6283

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
21	25	25	25
17	20	20	20
14	17	17	17

24 KW FRYER	21 KW FRYER	17 KW FRYER	14 KW FRYER	IT.	DESCRIPTION	FIN.
1	1	1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	1	1	Z	SWITCH, LIMIT TILT	-
1	1	1	1	W	RELAY DPDT 24V COIL	-
1	1	1	1	V	TRANSFORMER, 40VA 24V.	-
1	1	1	1	T	2ED HIGH LIMIT 435 F	-
2	-	-	-	R4	ELEMENT, FIREBAR 480V. 12 KW.	-
-	2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
1	1	1	1	N	THERMISTOR PROBE	-
1	1	1	1	M	CORD, SUPPLY	-
1	1	1	1	L	RESISTOR, 300K 1/4W	-
1	1	1	1	K	TEMPERATURE CONTROL BOARD	-
1	1	1	1	J	POTENTIOMETER ASSEMBLY	-
1	1	1	1	H	LIGHT, INDICATOR 'TROUBLE'	-
1	1	1	1	G	LIGHT, INDICATOR AMBER **(HEAT)**	-
1	1	1	1	F	LIGHT, INDICATOR RED **(POWER)**	-
1	1	1	1	E	LIGHT, INDICATOR [1 2] **(HIGH LIMIT)**	-
1	1	1	1	D1	SWITCH, ROCKER DPDT MOM ON/OFF	-
2	2	2	2	D	SWITCH, ROCKER DPST **(FRY/MELT)**	-
4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	1	A	TERMINAL BLOCK	-



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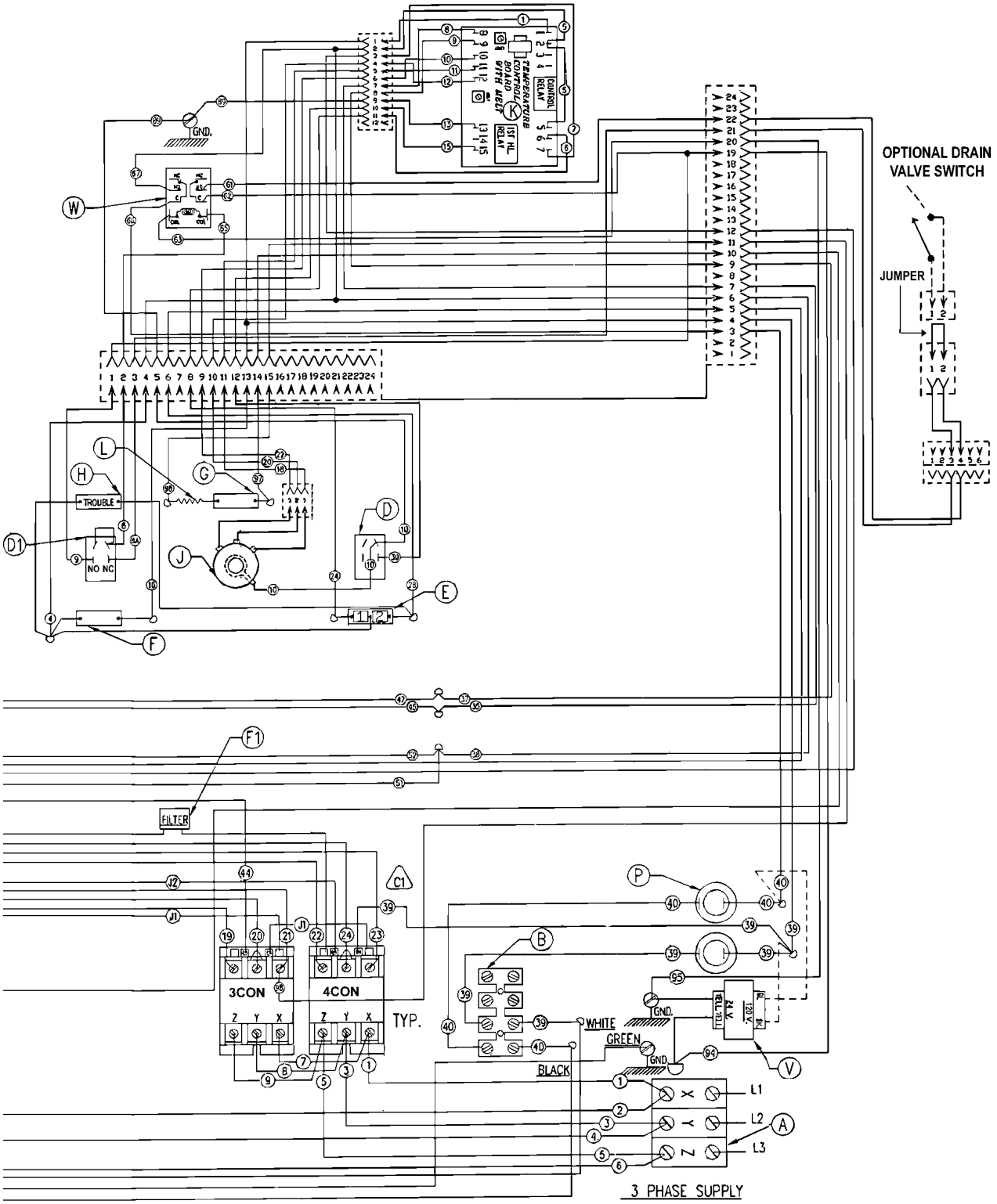
(SEE 6285)

6284



FOR KLEENSCREEN FILTER SEE 6104.

REF. SCHEMATIC DECAL 427399-2

DERIVED FROM 427351 REV. C

KLEENSCREEN FRYERS
SOLID STATE CONTROLS
480 VOLTS ONLY
24, 21, 17 AND 14 KW, FULL-VAT

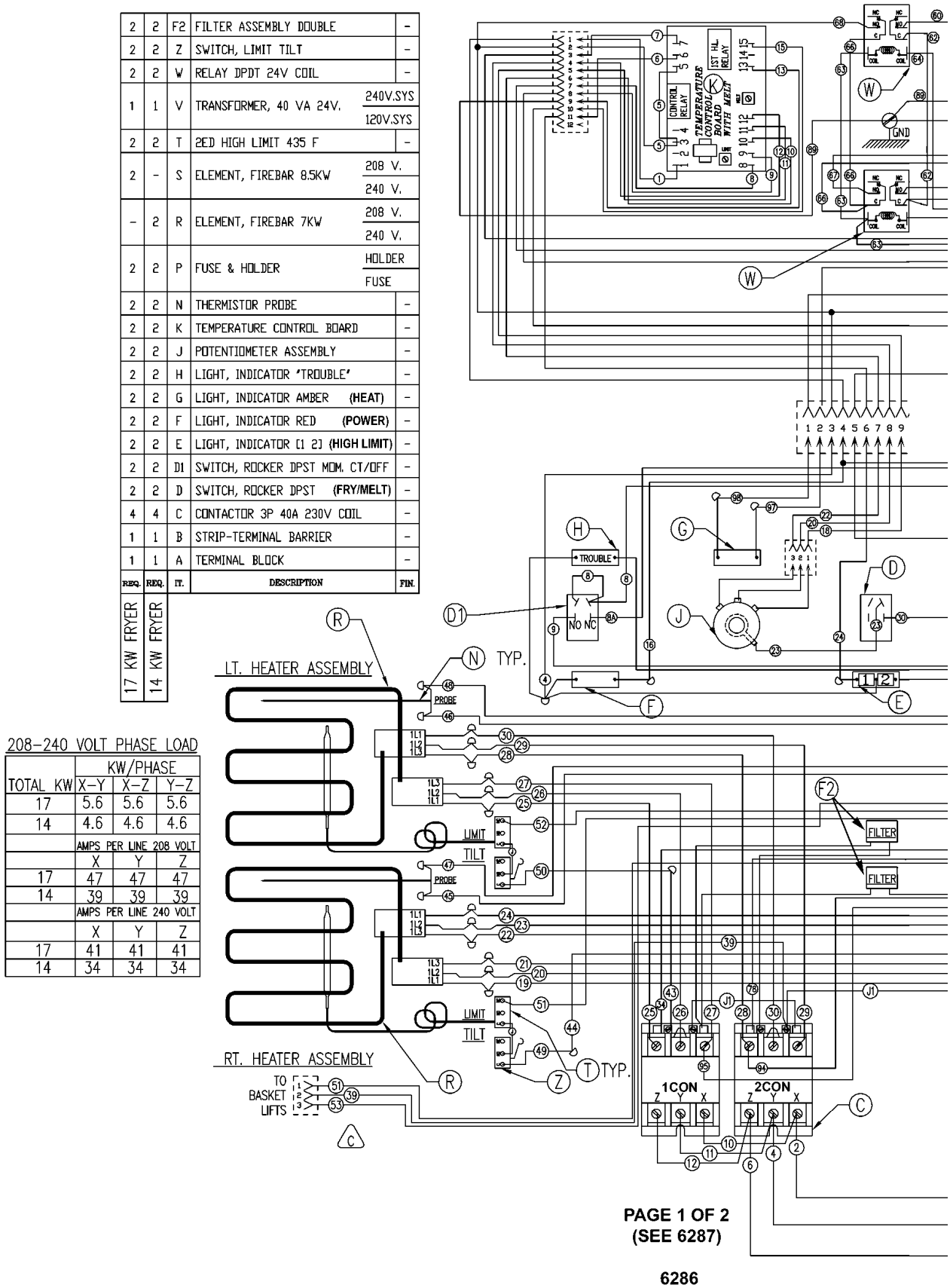
PAGE 2 OF 2
(SEE 6284)

6285

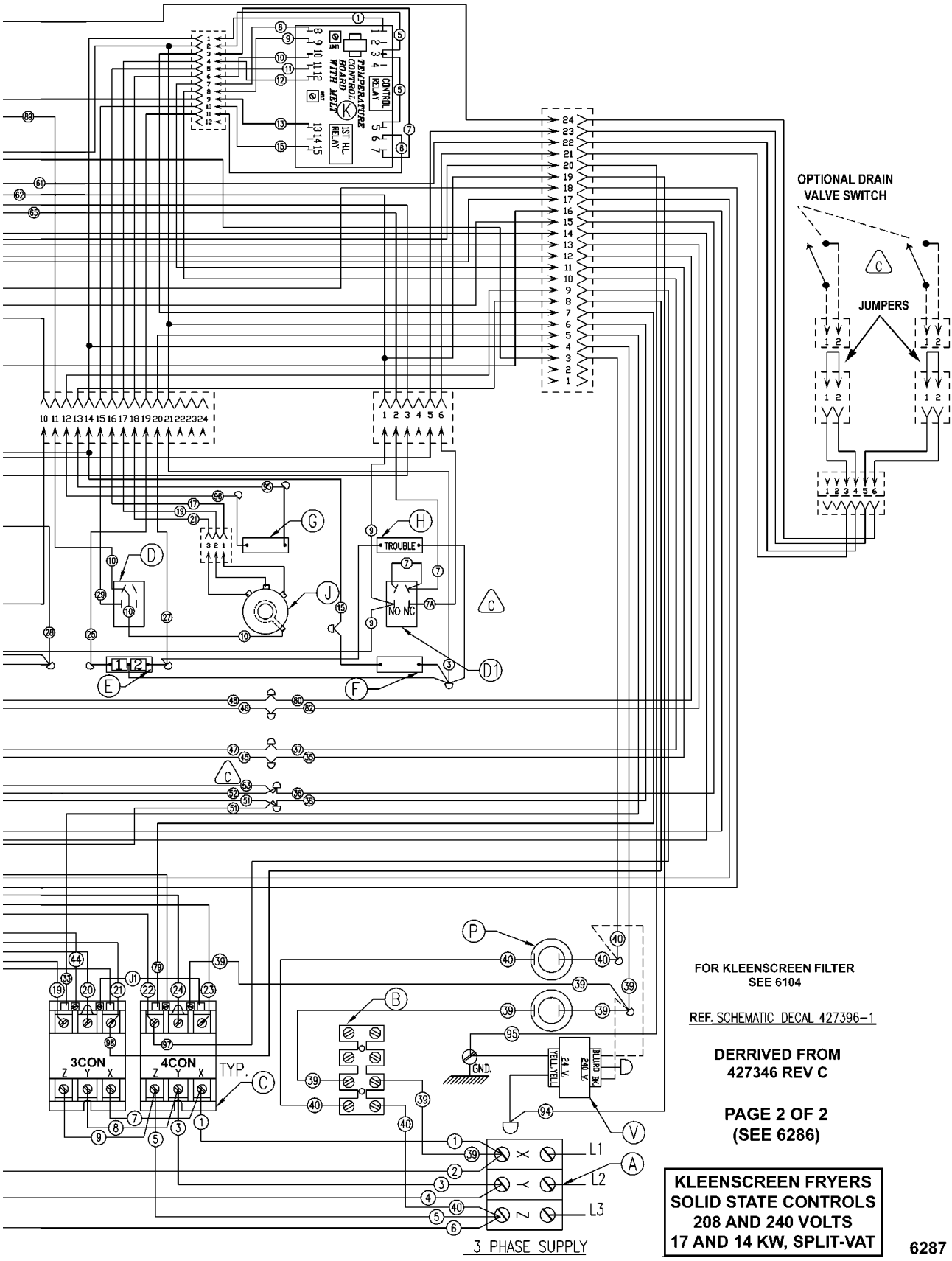
17 KW FRYER REQ.	14 KW FRYER REQ.	IT.	DESCRIPTION	FIN.
2	2	F2	FILTER ASSEMBLY DOUBLE	-
2	2	Z	SWITCH, LIMIT TILT	-
2	2	W	RELAY DPDT 24V COIL	-
1	1	V	TRANSFORMER, 40 VA 24V.	240V.SYS 120V.SYS
2	2	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 8.5KW	208 V. 240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V. 240 V.
2	2	P	FUSE & HOLDER	HOLDER FUSE
2	2	N	THERMISTOR PROBE	-
2	2	K	TEMPERATURE CONTROL BOARD	-
2	2	J	POTENTIOMETER ASSEMBLY	-
2	2	H	LIGHT, INDICATOR 'TROUBLE'	-
2	2	G	LIGHT, INDICATOR AMBER (HEAT)	-
2	2	F	LIGHT, INDICATOR RED (POWER)	-
2	2	E	LIGHT, INDICATOR [1 2] (HIGH LIMIT)	-
2	2	D1	SWITCH, ROCKER DPST MOM. CT/OFF	-
2	2	D	SWITCH, ROCKER DPST (FRY/MELT)	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-

208-240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34



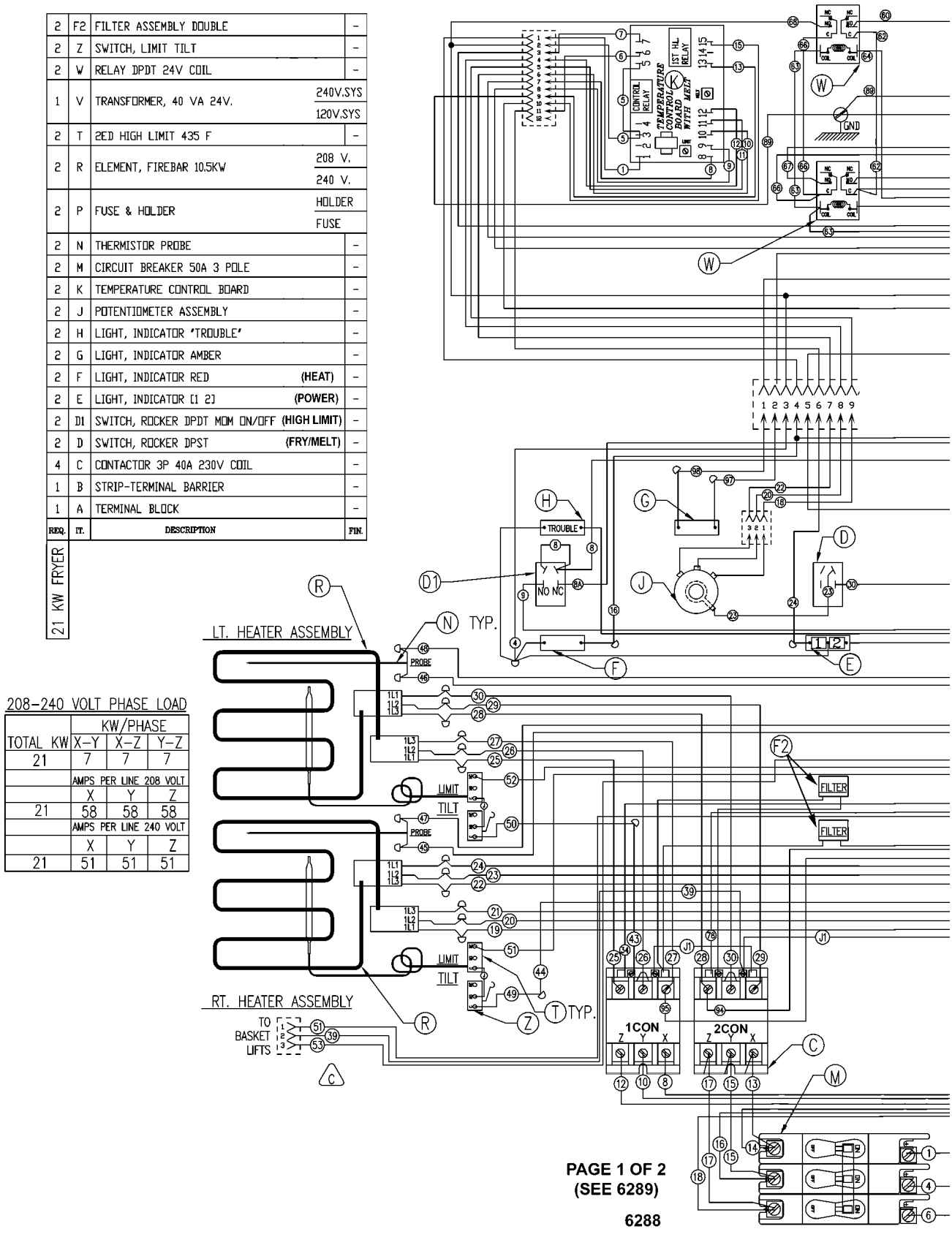
6286


OPTIONAL DRAIN VALVE SWITCH
JUMPERS
TROUBLE
3CON
4CON
TYP.
GND.
L1
L2
L3
3 PHASE SUPPLY
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427396-1
DERRIVED FROM 427346 REV C
PAGE 2 OF 2 (SEE 6286)
KLEENSCREEN FRYERS
SOLID STATE CONTROLS
208 AND 240 VOLTS
17 AND 14 KW, SPLIT-VAT
6287

REQ.	IT.	DESCRIPTION	FIN.
21 KW FRYER			
2	F2	FILTER ASSEMBLY DOUBLE	-
2	Z	SWITCH, LIMIT TILT	-
2	W	RELAY DPDT 24V COIL	-
1	V	TRANSFORMER, 40 VA 24V.	240V.SYS 120V.SYS
2	T	2ED HIGH LIMIT 435 F	-
2	R	ELEMENT, FIREBAR 10.5KW	208 V. 240 V.
2	P	FUSE & HOLDER	HOLDER FUSE
2	N	THERMISTOR PROBE	-
2	M	CIRCUIT BREAKER 50A 3 POLE	-
2	K	TEMPERATURE CONTROL BOARD	-
2	J	POTENTIOMETER ASSEMBLY	-
2	H	LIGHT, INDICATOR 'TROUBLE'	-
2	G	LIGHT, INDICATOR AMBER	-
2	F	LIGHT, INDICATOR RED (HEAT)	-
2	E	LIGHT, INDICATOR (1 2) (POWER)	-
2	D1	SWITCH, ROCKER DPDT MOM ON/OFF (HIGH LIMIT)	-
2	D	SWITCH, ROCKER DPST (FRY/MELT)	-
4	C	CONTACTOR 3P 40A 230V COIL	-
1	B	STRIP-TERMINAL BARRIER	-
1	A	TERMINAL BLOCK	-

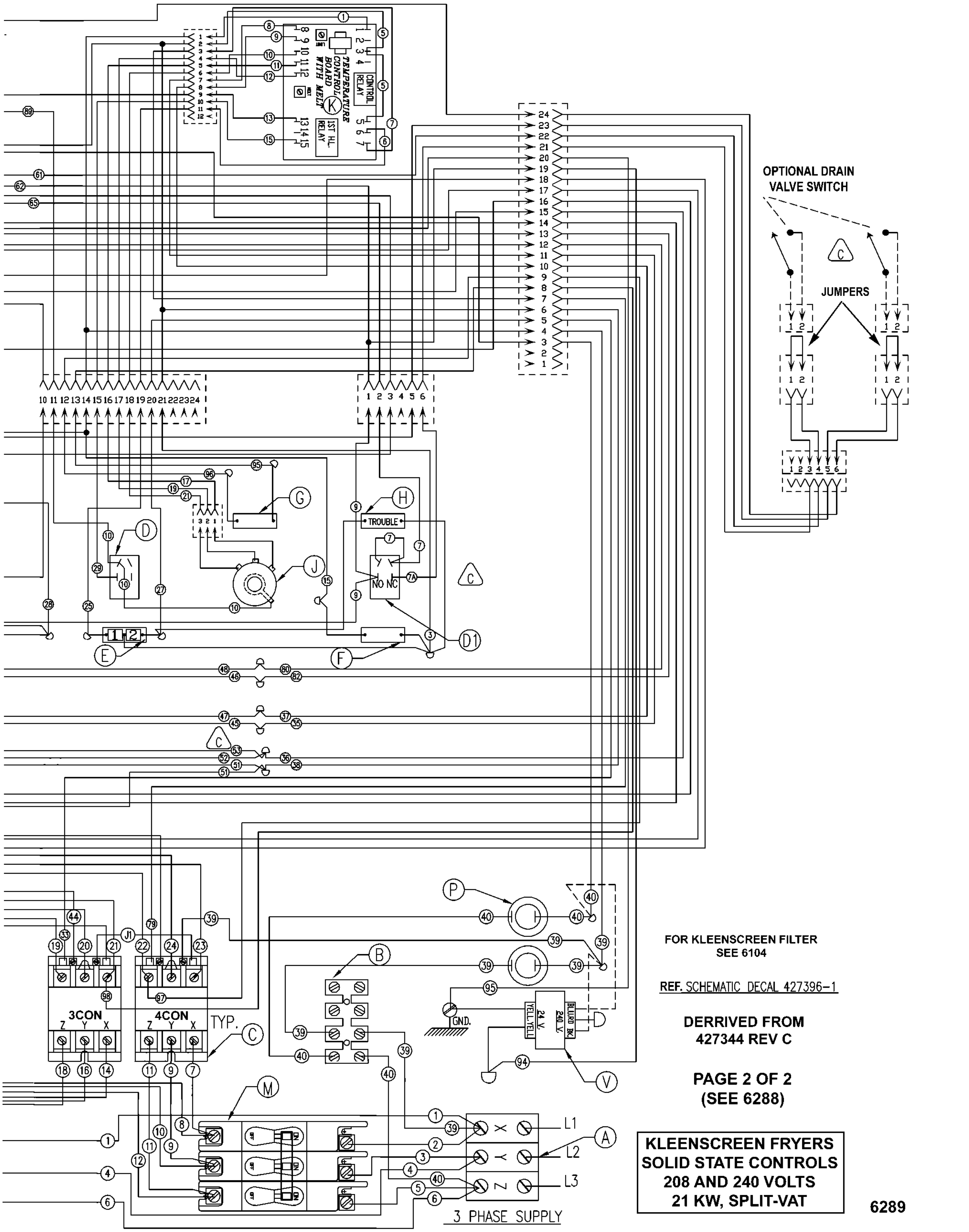
208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
21	51	51	51



PAGE 1 OF 2
(SEE 6289)

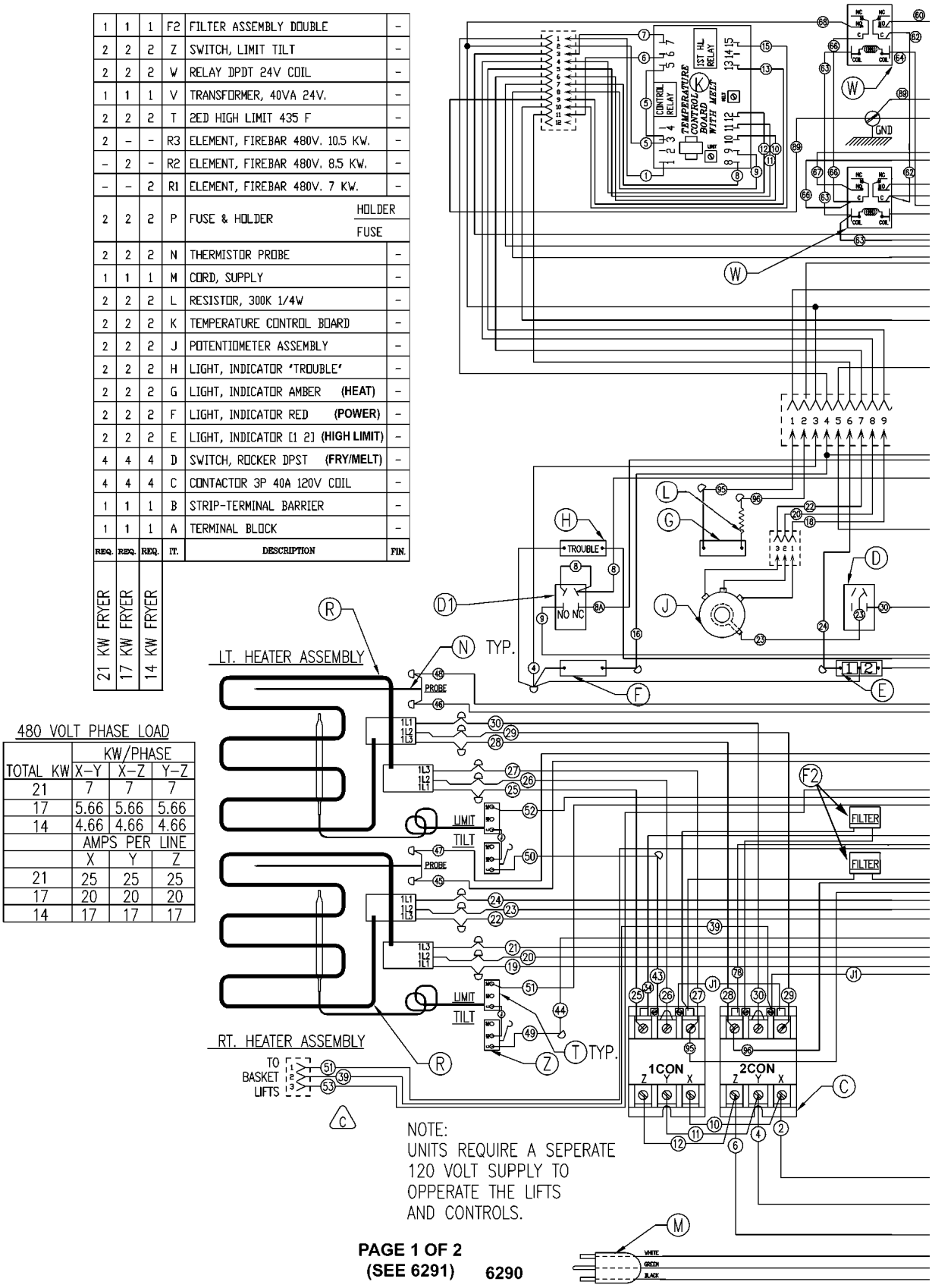
6288


OPTIONAL DRAIN VALVE SWITCH
JUMPERS
TEMPERATURE CONTROL BOARD WITH MELT
CONTROL RELAY
1ST HL. RELAY
TROUBLE
NO NC
3CON
4CON
TYP.
GND.
24 V.
240 V.
3 PHASE SUPPLY
L1
L2
L3
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427396-1
DERRIVED FROM 427344 REV C
PAGE 2 OF 2 (SEE 6288)
KLEENSCREEN FRYERS SOLID STATE CONTROLS 208 AND 240 VOLTS 21 KW, SPLIT-VAT
6289

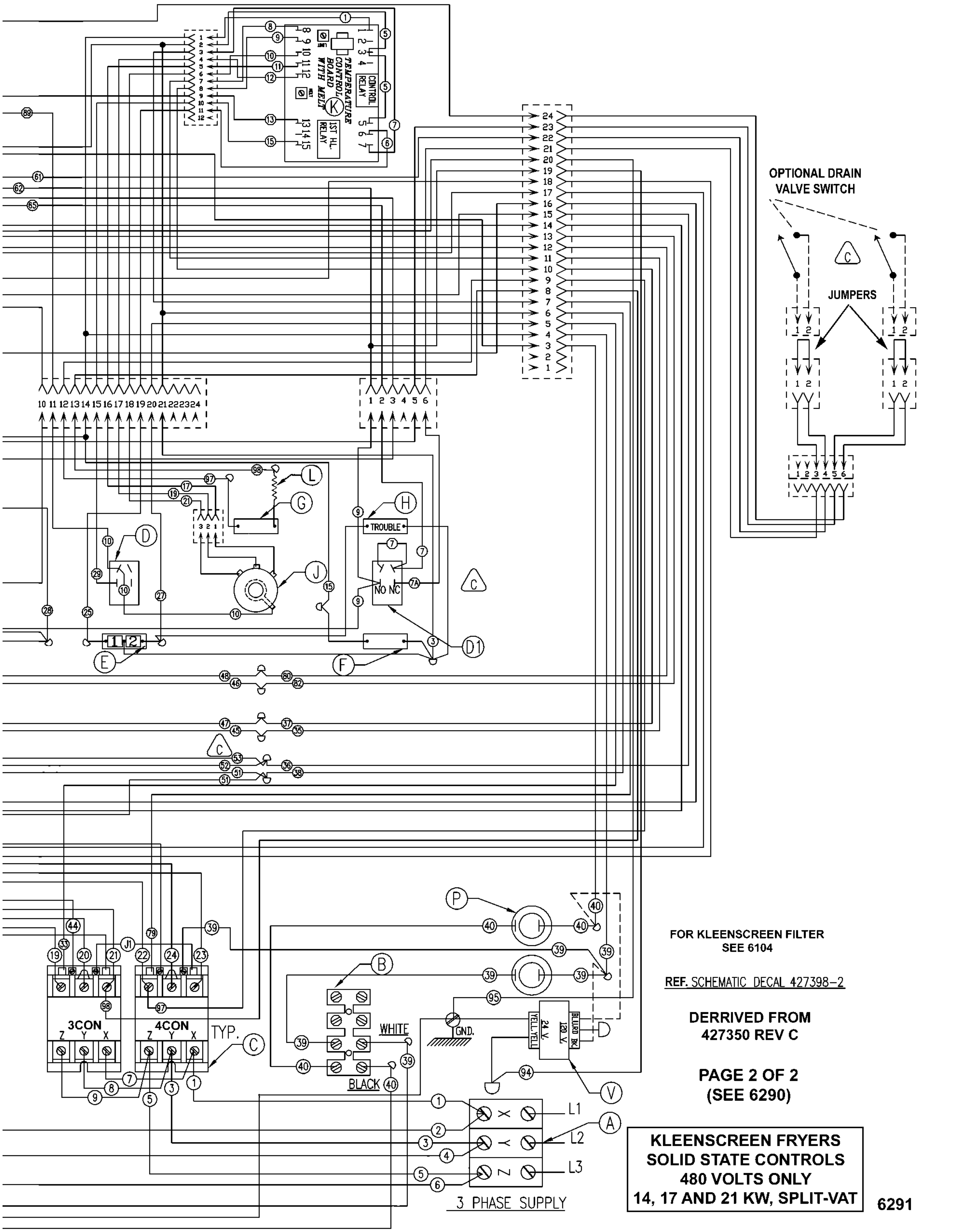
21 KW FRYER	17 KW FRYER	14 KW FRYER	IT.	DESCRIPTION	FIN.
1	1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
2	2	2	W	RELAY DPDT 24V COIL	-
1	1	1	V	TRANSFORMER, 40VA 24V.	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
2	2	2	N	THERMISTOR PROBE	-
1	1	1	M	CORD, SUPPLY	-
2	2	2	L	RESISTOR, 300K 1/4W	-
2	2	2	K	TEMPERATURE CONTROL BOARD	-
2	2	2	J	POTENTIOMETER ASSEMBLY	-
2	2	2	H	LIGHT, INDICATOR 'TROUBLE'	-
2	2	2	G	LIGHT, INDICATOR AMBER **(HEAT)**	-
2	2	2	F	LIGHT, INDICATOR RED **(POWER)**	-
2	2	2	E	LIGHT, INDICATOR [1 2] **(HIGH LIMIT)**	-
4	4	4	D	SWITCH, ROCKER DPST **(FRY/MELT)**	-
4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-

480 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
21	25	25	25
17	20	20	20
14	17	17	17



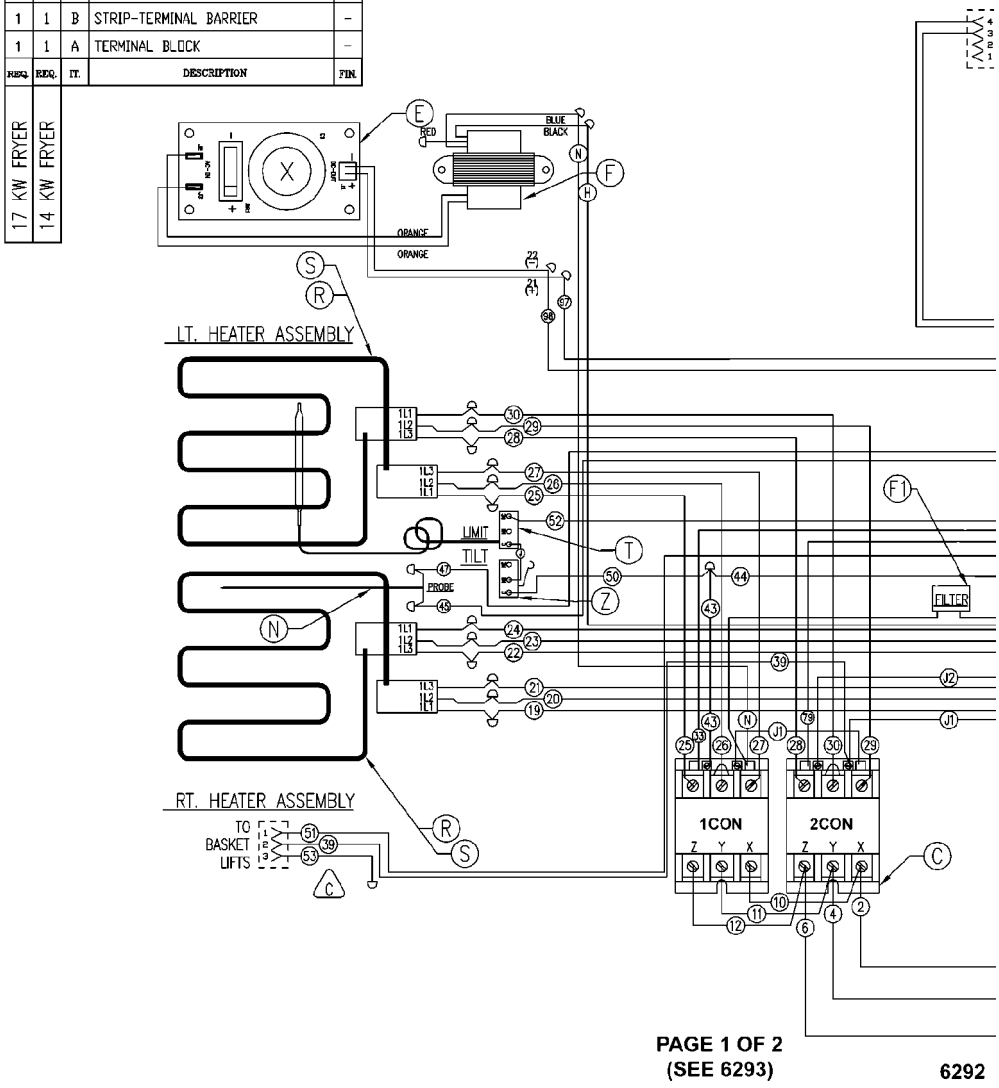
PAGE 1 OF 2
(SEE 6291) **6290**


TEMPERATURE CONTROL BOARD WITH MELT
CONTROL RELAY
1ST HL RELAY
OPTIONAL DRAIN VALVE SWITCH
JUMPERS
TROUBLE
3CON
4CON
TYP.
WHITE
BLACK
GND.
24 V.
120 V.
3 PHASE SUPPLY
L1
L2
L3
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427398-2
DERRIVED FROM 427350 REV C
PAGE 2 OF 2 (SEE 6290)
KLEENSCREEN FRYERS
SOLID STATE CONTROLS
480 VOLTS ONLY
14, 17 AND 21 KW, SPLIT-VAT
6291

17 KW FRYER REQ.	14 KW FRYER REQ.	IT.	DESCRIPTION		FIN.
1	1	F1	FILTER ASSEMBLY SINGLE		–
1	1	Z	SWITCH, LIMIT TILT		–
1	1	V	TRANSFORMER, 40 VA 24V.	240V.SYS	
				120V.SYS	
1	1	T	2ED HIGH LIMIT 435 F		–
2	–	S	ELEMENT, FIREBAR 8.5KW	208 V.	
				240 V.	
–	2	R	ELEMENT, FIREBAR 7KW	208 V.	
				240 V.	
2	2	P	FUSE & HOLDER	HOLDER	
				FUSE	
1	1	N	THERMISTOR PROBE		–
1	1	K	COMPUTER CONTROL	RED	
				BLACK	
1	1	H	RELAY DPDT 240V COIL		–
1	1	G	RELAY, DPDT 24V COIL		–
1	1	F	TRANSFORMER 240-12V		–
1	1	E	BOARD, COMPUTER POWER SUPPLY		–
1	1	D	SWITCH, ROCKER DPST		–
4	4	C	CONTACTOR 3P 40A 230V COIL		–
1	1	B	STRIP-TERMINAL BARRIER		–
1	1	A	TERMINAL BLOCK		–

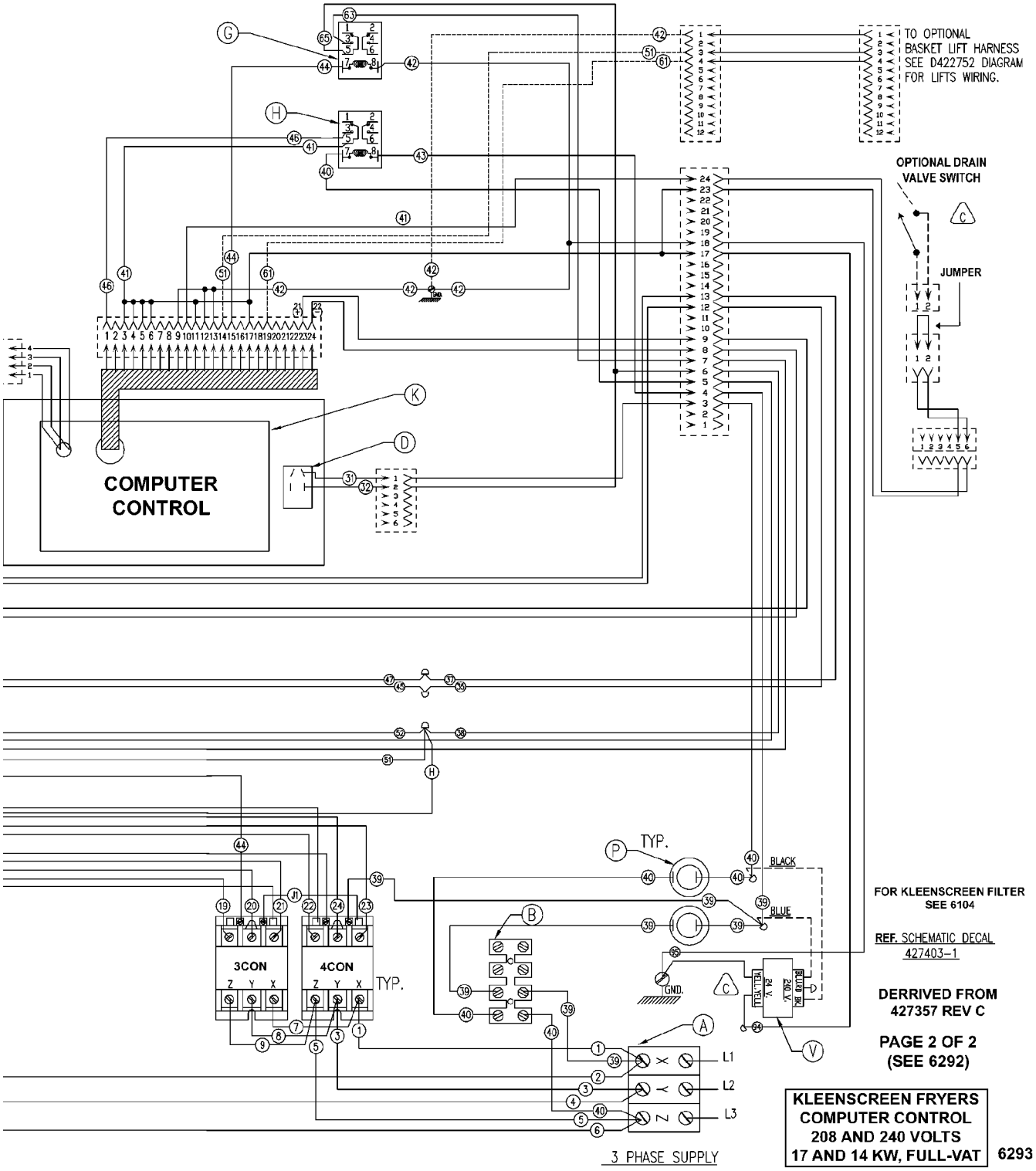
208–240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X–Y	X–Z	Y–Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34



PAGE 1 OF 2
(SEE 6293)

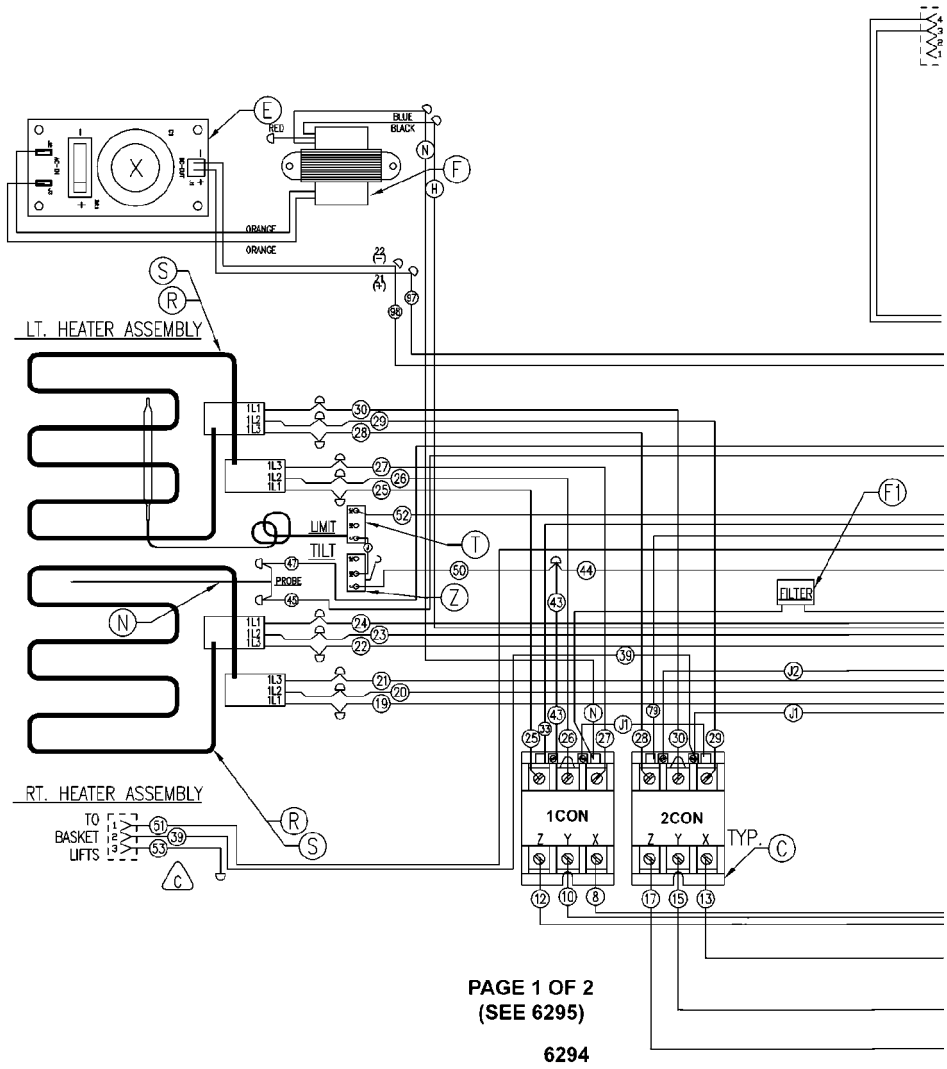
6292


TO OPTIONAL BASKET LIFT HARNESS SEE D422752 DIAGRAM FOR LIFTS WIRING.
OPTIONAL DRAIN VALVE SWITCH
JUMPER
COMPUTER CONTROL
3CON
4CON
TYP.
BLACK
BLUE
GND.
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427403-1
DERRIVED FROM 427357 REV C
PAGE 2 OF 2 (SEE 6292)
L1
L2
L3
3 PHASE SUPPLY
KLEENSCREEN FRYERS
COMPUTER CONTROL
208 AND 240 VOLTS
17 AND 14 KW, FULL-VAT
6293

24 KW FRYER REQ.	21 KW FRYER REQ.	IT.	DESCRIPTION	FIN.
1	1	V	TRANSFORMER, 40 VA 24V.	240V.SYS 120V.SYS
1	1	Z	SWITCH, LIMIT TILT	-
*1	*1	X	CORD, SUPPLY - FILTER	-
*1	*1	W	RELAY, SPDT 24V. COIL	-
1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	U	HARNESS-CABLE ASSEMBLY	-
1	1	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 12KW	208 V. 240 V.
-	2	R	ELEMENT, FIREBAR 10.5KW	208 V. 240 V.
2	2	P	FUSE & HOLDER	HOLDER FUSE
-	1	N	THERMISTOR PROBE	-
1	-	N	THERMISTOR PROBE	-
2	2	M	CIRCUIT BREAKER 50A 3 POLE	-
1	1	K	COMPUTER CONTROL	RED BLACK
1	1	H	RELAY DPDT 240V COIL	-
1	1	G	RELAY, DPDT 24V COIL	-
1	1	F	TRANSFORMER 240-12V	-
1	1	E	BOARD, COMPUTER POWER SUPPLY	-
1	1	D	SWITCH, ROCKER DPST	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-

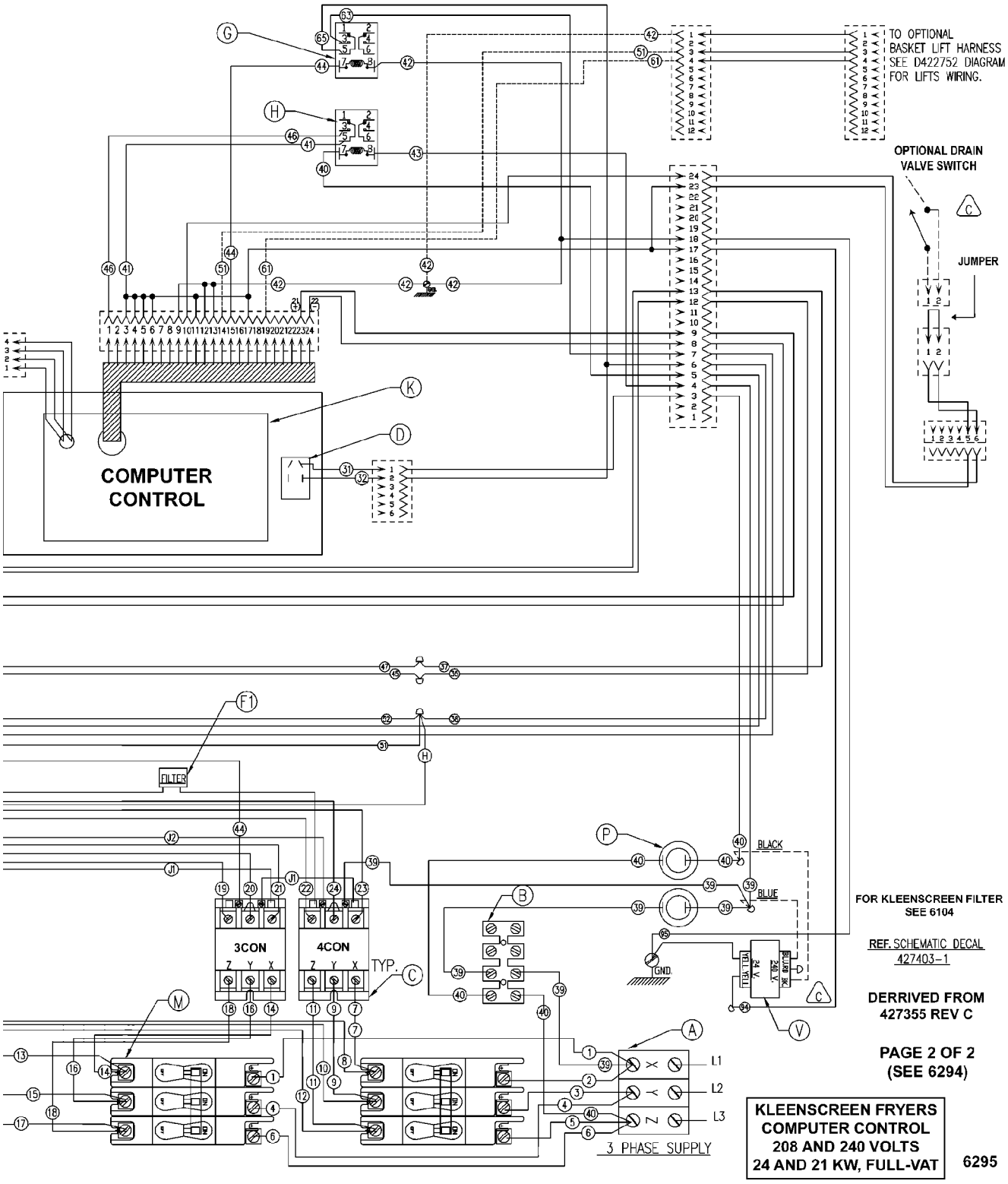
208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
21	58	58	58
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
21	51	51	51



PAGE 1 OF 2
(SEE 6295)

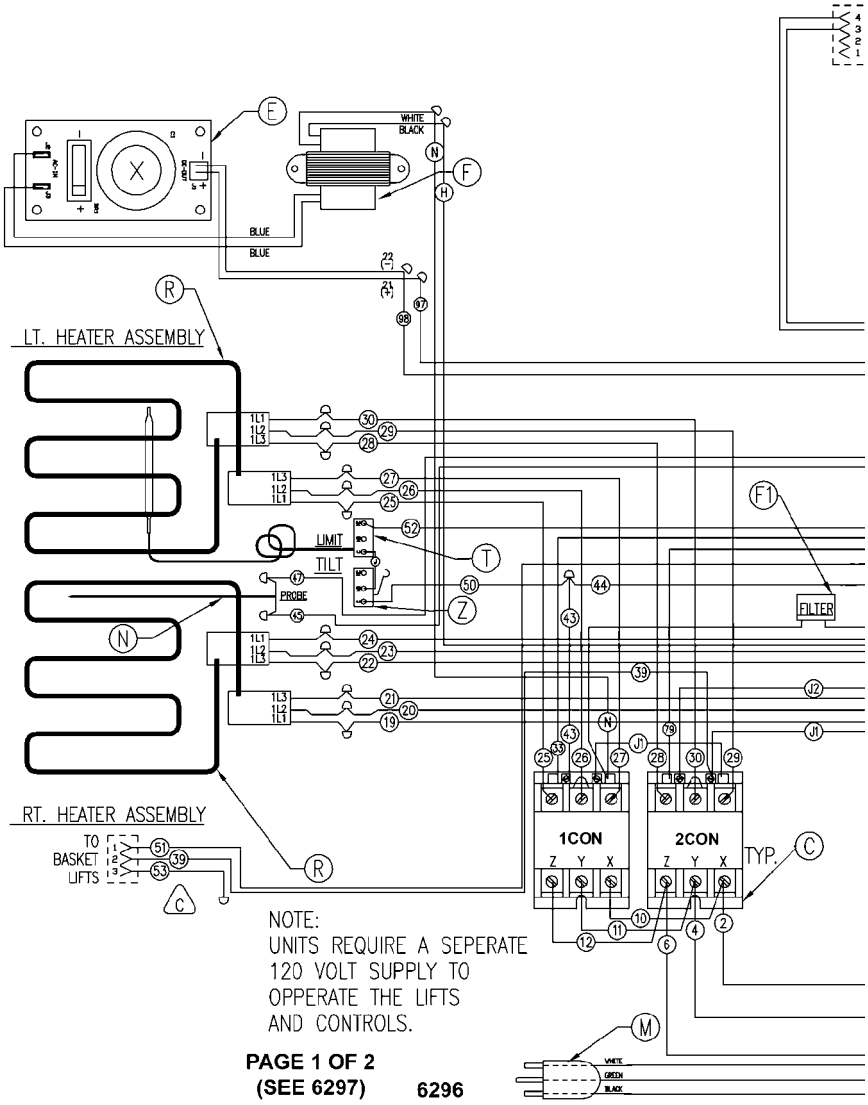
6294


TO OPTIONAL BASKET LIFT HARNESS SEE D422752 DIAGRAM FOR LIFTS WIRING.
OPTIONAL DRAIN VALVE SWITCH
JUMPER
COMPUTER CONTROL
FILTER
3CON
4CON
TYP.
BLACK
BLUE
GND.
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427403-1
DERRIVED FROM 427355 REV C
PAGE 2 OF 2 (SEE 6294)
L1
L2
L3
3 PHASE SUPPLY
KLEENSCREEN FRYERS
COMPUTER CONTROL
208 AND 240 VOLTS
24 AND 21 KW, FULL-VAT
6295

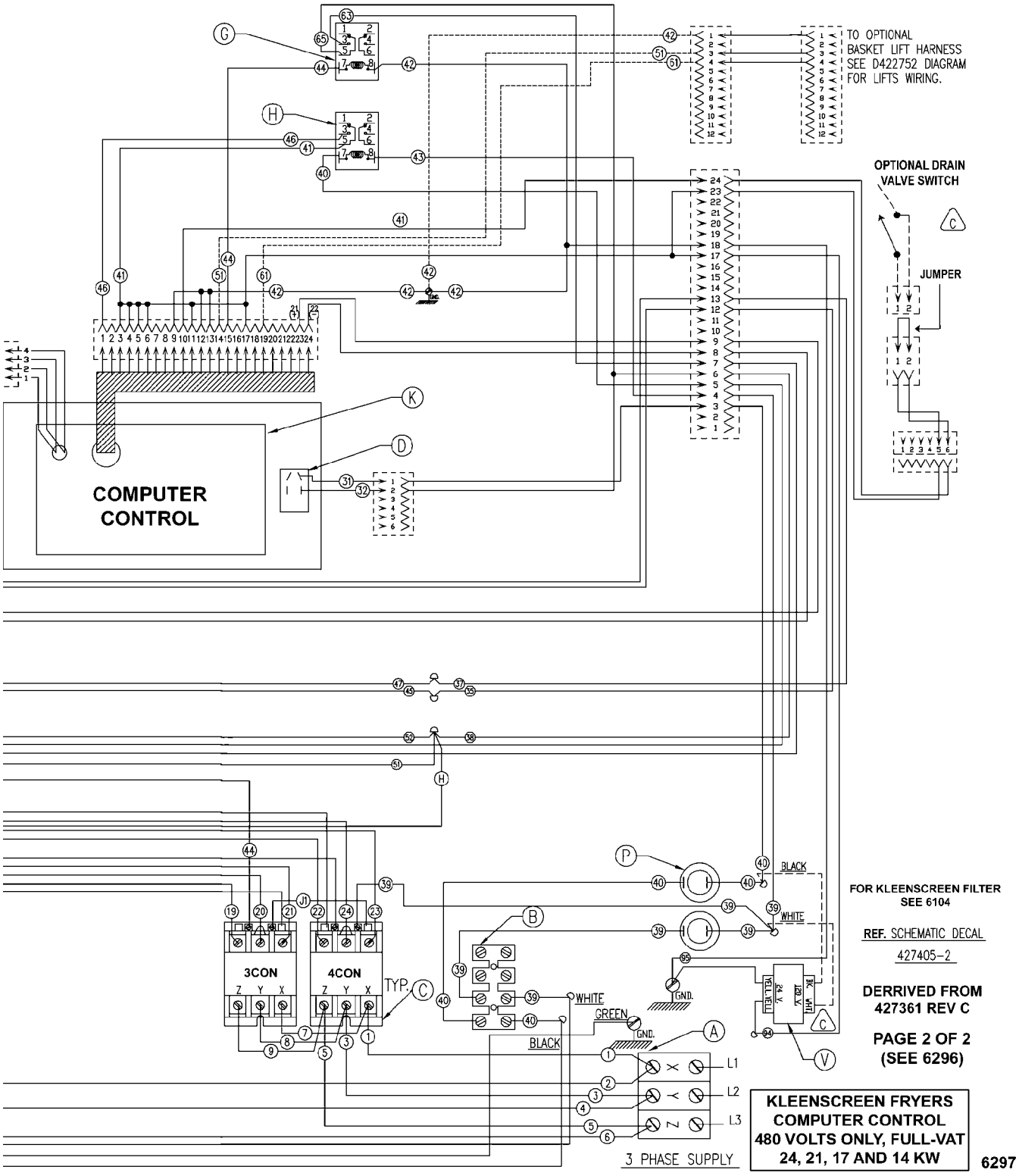
24 KW FRYER	21 KW FRYER	17 KW FRYER	14 KW FRYER	IT.	DESCRIPTION	FIN.
1	1	1	1	F1	FILTER ASSEMBLY SINGLE	-
1	1	1	1	Z	SWITCH, LIMIT TILT	-
1	1	1	1	V	TRANSFORMER, 40VA 120/24VAC	-
1	1	1	1	T	2ED HIGH LIMIT 435 F	-
2	-	-	-	R3	ELEMENT, FIREBAR 480V. 12 KW.	-
-	2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	2	P	FUSE & HOLDER	HOLDER
						FUSE
1	1	1	1	M	CORD, SUPPLY	-
1	-	-	-	N	THERMISTOR PROBE	-
-	1	1	1	N	THERMISTOR PROBE	-
1	1	1	1	K	COMPUTER CONTROL	RED
						BLACK
1	1	1	1	H	RELAY DPDT 120V COIL	-
1	1	1	1	G	RELAY, DPDT 24V COIL	-
1	1	1	1	F	TRANSFORMER 120-12V	-
1	1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
1	1	1	1	D	SWITCH, ROCKER DPST	-
4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	1	A	TERMINAL BLOCK	-

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
21	25	25	25
17	20	20	20
14	17	17	17



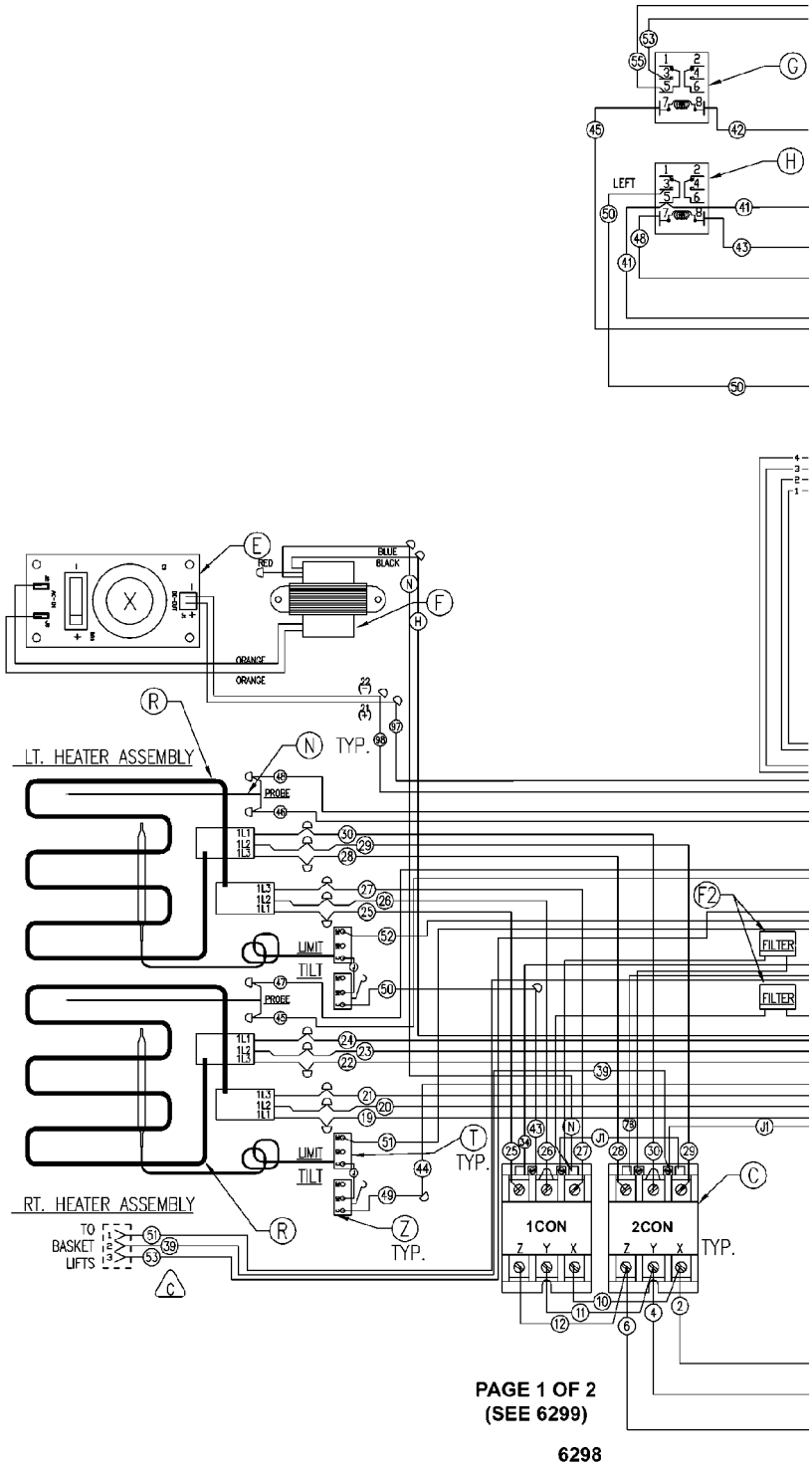
PAGE 1 OF 2
(SEE 6297) **6296**


TO OPTIONAL BASKET LIFT HARNESS SEE D422752 DIAGRAM FOR LIFTS WIRING.
OPTIONAL DRAIN VALVE SWITCH
JUMPER
COMPUTER CONTROL
3CON
4CON
TYP.
WHITE
GREEN
BLACK
GND.
L1
L2
L3
3 PHASE SUPPLY
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427405-2
DERRIVED FROM 427361 REV C
PAGE 2 OF 2 (SEE 6296)
KLEENSCREEN FRYERS COMPUTER CONTROL 480 VOLTS ONLY, FULL-VAT 24, 21, 17 AND 14 KW
6297

17 KW FRYER REQ.	14 KW FRYER REQ.	IT.	DESCRIPTION	FIN.
1	1	F2	FILTER ASSEMBLY DOUBLE	-
2	2	Z	SWITCH, LIMIT TILT	-
1	1	V	TRANSFORMER, 40 VA 24V.	240V.SYS
				120V.SYS
2	2	T	2ED HIGH LIMIT 435 F	-
2	-	S	ELEMENT, FIREBAR 8.5KW	208 V.
				240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V.
				240 V.
2	2	P	FUSE & HOLDER	HOLDER
				FUSE
2	2	N	THERMISTOR PROBE	-
1	1	K	COMPUTER CONTROL	RED
				BLACK
2	2	H	RELAY DPDT 240V COIL	-
2	2	G	RELAY, DPDT 24V COIL	-
1	1	F	TRANSFORMER 240-12V	-
1	1	E	BOARD, COMPUTER POWER SUPPLY	-
2	2	D	SWITCH, ROCKER DPST	-
4	4	C	CONTACTOR 3P 40A 230V COIL	-
1	1	B	STRIP-TERMINAL BARRIER	-
1	1	A	TERMINAL BLOCK	-

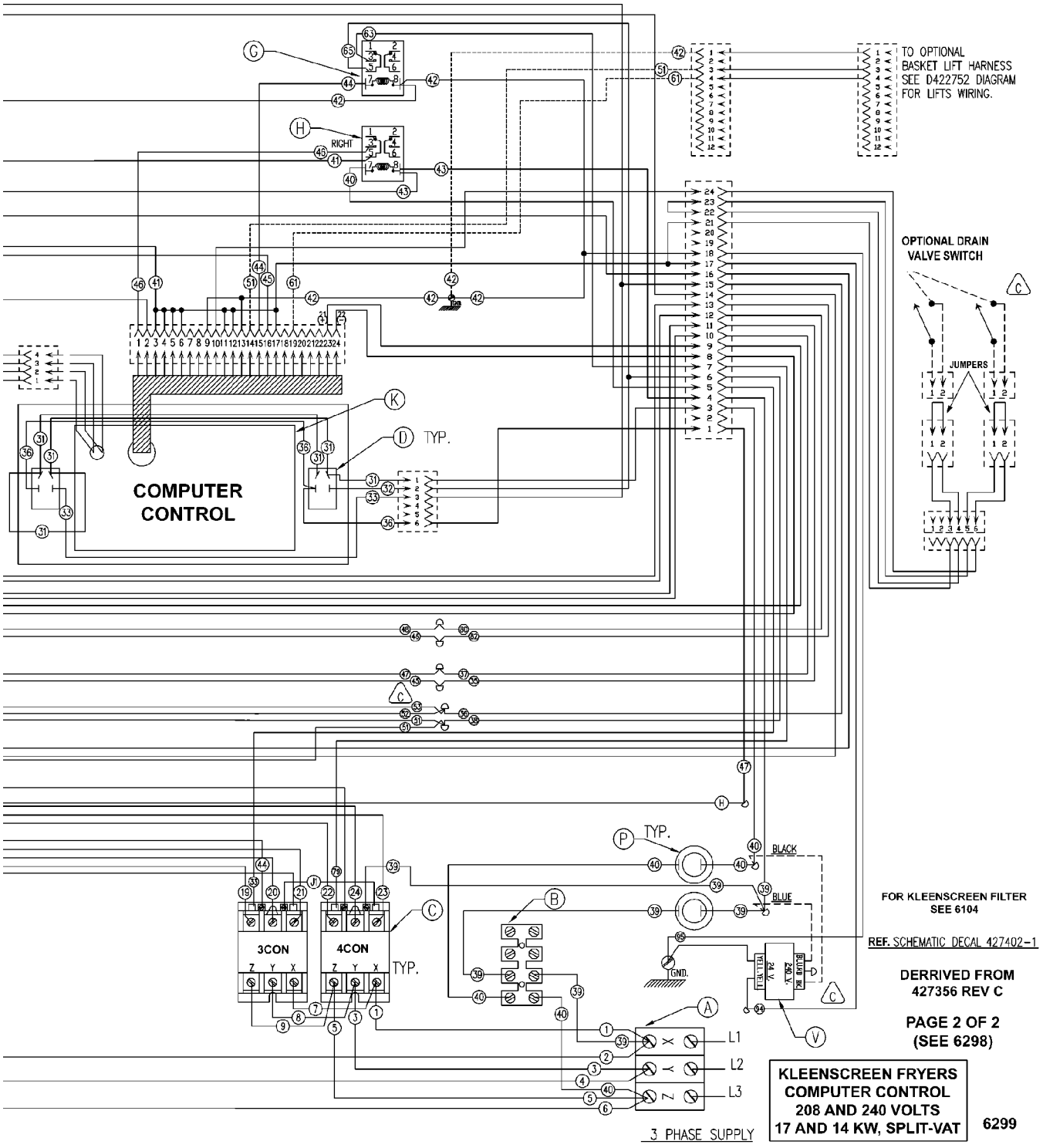
208-240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34



PAGE 1 OF 2
(SEE 6299)

6298

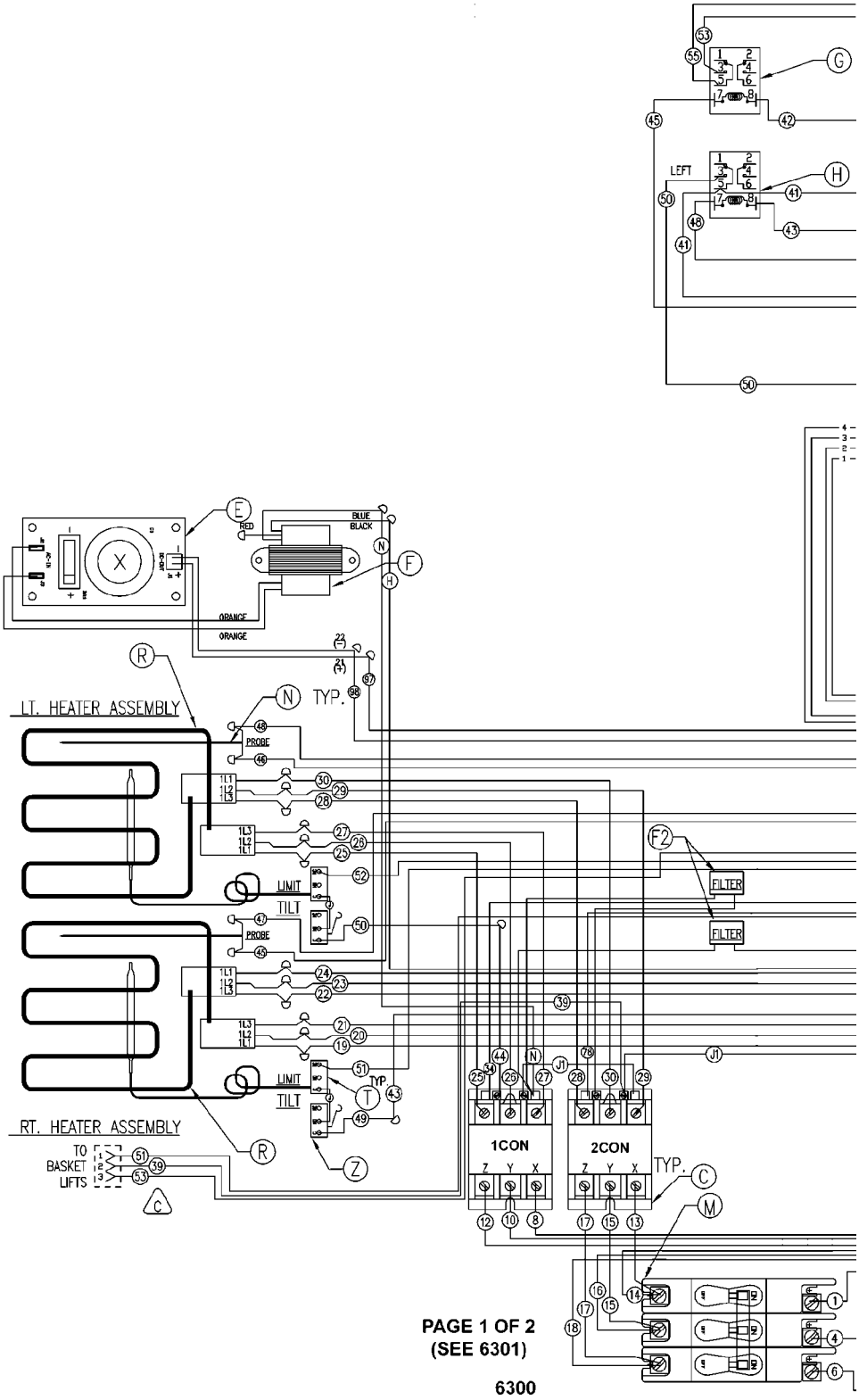

TO OPTIONAL BASKET LIFT HARNESS SEE D422752 DIAGRAM FOR LIFTS WIRING.
OPTIONAL DRAIN VALVE SWITCH
JUMPERS
RIGHT
COMPUTER CONTROL
TYP.
3CON
4CON
BLACK
BLUE
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427402-1
DERRIVED FROM 427356 REV C
PAGE 2 OF 2 (SEE 6298)
L1
L2
L3
3 PHASE SUPPLY
KLEENSCREEN FRYERS
COMPUTER CONTROL
208 AND 240 VOLTS
17 AND 14 KW, SPLIT-VAT
6299

REQ.	REQ.	IT.	DESCRIPTION	FIN.
	2	F2	FILTER ASSEMBLY DOUBLE	-
	2	Z	SWITCH, LIMIT TILT	-
	1	V	TRANSFORMER, 40 VA 24V. 240V.SYS / 120V.SYS	
	2	T	2ED HIGH LIMIT 435 F	-
	2	R	ELEMENT, FIREBAR 10.5KW 208 V. / 240 V.	
	2	P	FUSE & HOLDER HOLDER / FUSE	
	2	N	THERMISTOR PROBE	-
	2	M	CIRCUIT BREAKER 50A 3 POLE	-
	1	K	COMPUTER CONTROL RED / BLACK	
	2	H	RELAY DPDT 240V COIL	-
	2	G	RELAY, DPDT 24V COIL	-
	1	F	TRANSFORMER 240-12V	-
	1	E	BOARD, COMPUTER POWER SUPPLY	-
	2	D	SWITCH, ROCKER DPST	-
	4	C	CONTACTOR 3P 40A 230V COIL	-
	1	B	STRIP-TERMINAL BARRIER	-
	1	A	TERMINAL BLOCK	-

21 KW FRYER

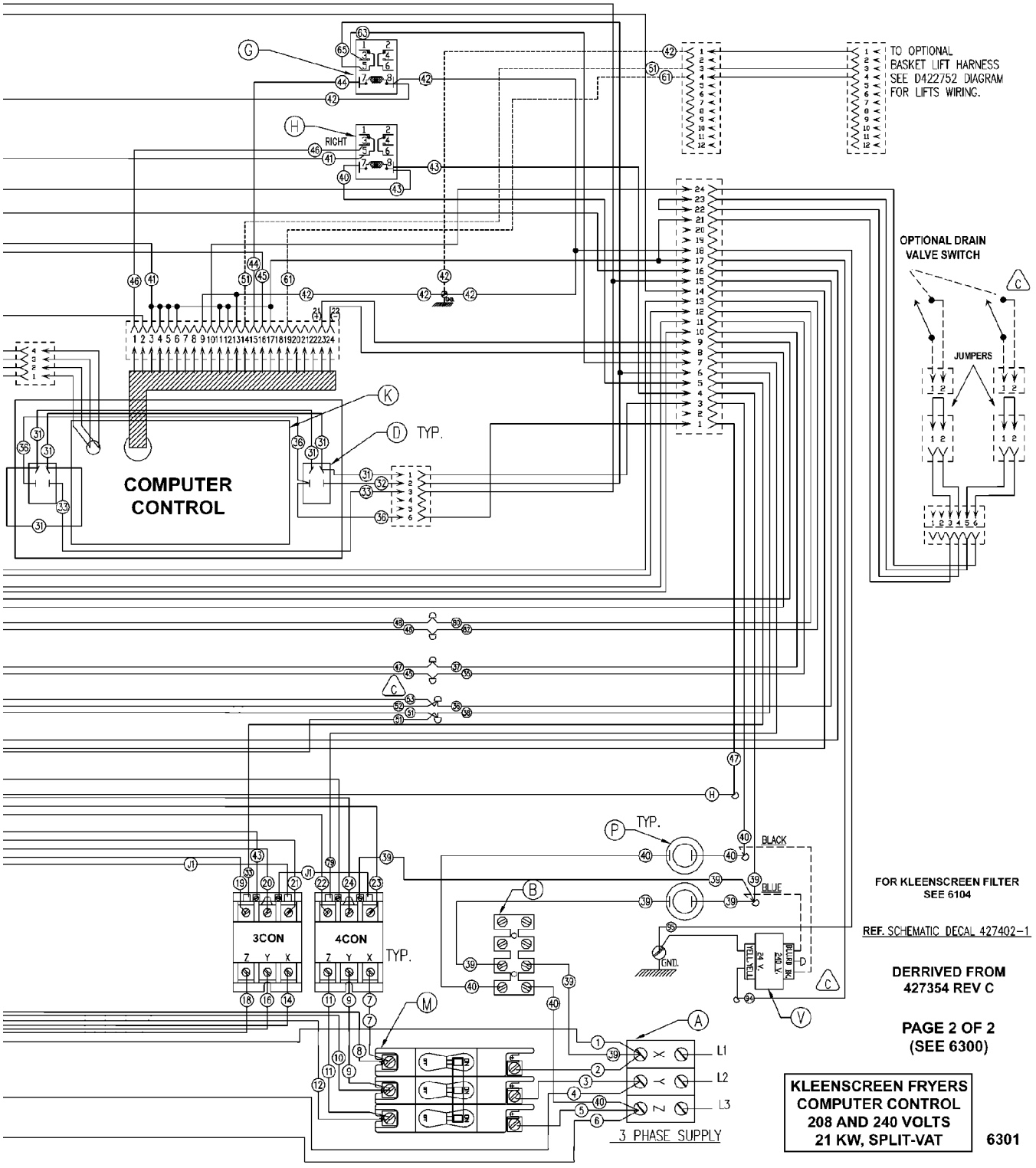
208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
21	7	7	7
	AMPS PER LINE 208 VOLT X	Y	Z
21	58	58	58
	AMPS PER LINE 240 VOLT X	Y	Z
21	51	51	51



PAGE 1 OF 2
(SEE 6301)

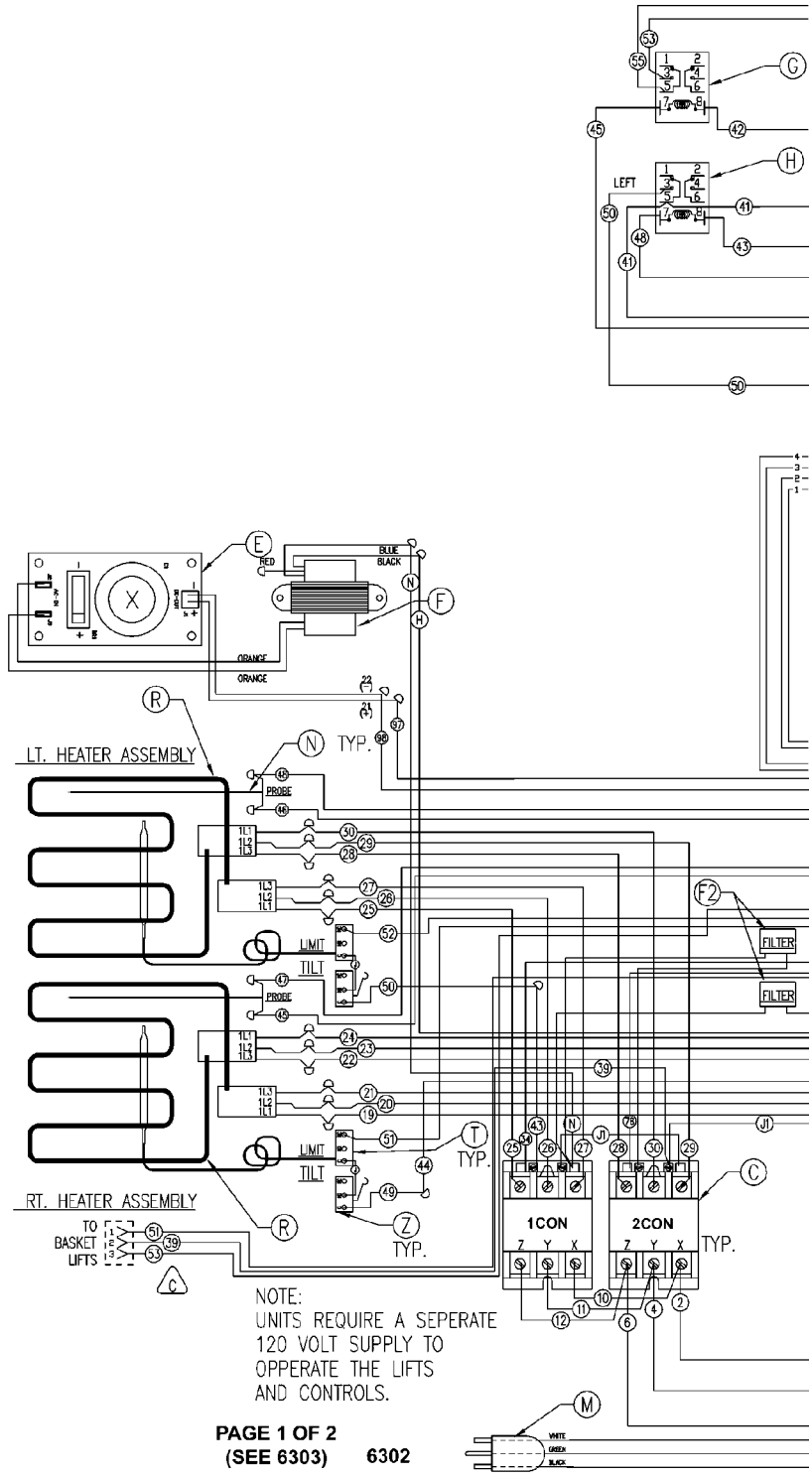
6300


TO OPTIONAL BASKET LIFT HARNESS SEE D422752 DIAGRAM FOR LIFTS WIRING.
OPTIONAL DRAIN VALVE SWITCH
JUMPERS
COMPUTER CONTROL
TYP.
RIGHT
3CON
4CON
BLACK
BLUE
GND.
L1
L2
L3
3 PHASE SUPPLY
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427402-1
DERRIVED FROM 427354 REV C
PAGE 2 OF 2 (SEE 6300)
KLEENSCREEN FRYERS
COMPUTER CONTROL
208 AND 240 VOLTS
21 KW, SPLIT-VAT
6301

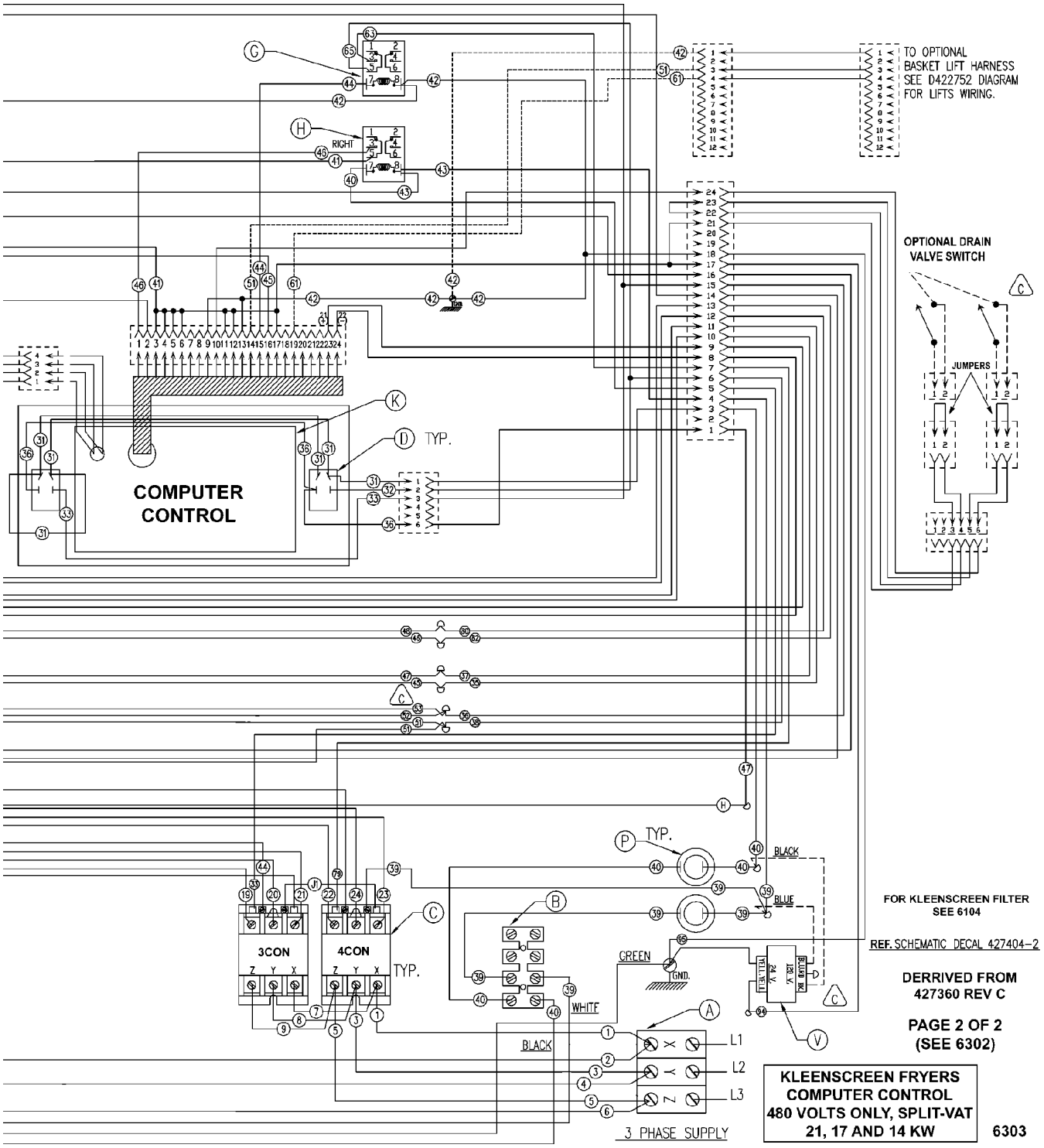
21 KW FRYER REQ.	17 KW FRYER REQ.	14 KW FRYER REQ.	CT.	DESCRIPTION	FIN.
2	2	2	F2	FILTER ASSEMBLY DOUBLE	-
2	2	2	Z	SWITCH, LIMIT TILT	-
1	1	1	V	TRANSFORMER, 40VA 120/24VAC	-
2	2	2	T	2ED HIGH LIMIT 435 F	-
2	-	-	R3	ELEMENT, FIREBAR 480V. 10.5 KW.	-
-	2	-	R2	ELEMENT, FIREBAR 480V. 8.5 KW.	-
-	-	2	R1	ELEMENT, FIREBAR 480V. 7 KW.	-
2	2	2	P	FUSE & HOLDER — HOLDER / FUSE	
1	1	1	M	CORD, SUPPLY	-
2	2	2	N	THERMISTOR PROBE	-
1	1	1	K	COMPUTER CONTROL — RED / BLACK	
2	2	2	H	RELAY DPDT 120V COIL	-
2	2	2	G	RELAY, DPDT 24V COIL	-
1	1	1	F	TRANSFORMER 120-12V	-
1	1	1	E	BOARD, COMPUTER POWER SUPPLY	-
2	2	2	D	SWITCH, ROCKER DPST	-
4	4	4	C	CONTACTOR 3P 40A 120V COIL	-
1	1	1	B	STRIP-TERMINAL BARRIER	-
1	1	1	A	TERMINAL BLOCK	-

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
21	7	7	7
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
21	25	25	25
17	20	20	20
14	17	17	17



PAGE 1 OF 2
(SEE 6303) **6302**


TO OPTIONAL BASKET LIFT HARNESS SEE D422752 DIAGRAM FOR LIFTS WIRING.
OPTIONAL DRAIN VALVE SWITCH
JUMPERS
RIGHT
COMPUTER CONTROL
TYP.
3CON
4CON
BLACK
BLUE
WHITE
GREEN
GND.
L1
L2
L3
3 PHASE SUPPLY
FOR KLEENSCREEN FILTER SEE 6104
REF. SCHEMATIC DECAL 427404-2
DERRIVED FROM 427360 REV C
PAGE 2 OF 2 (SEE 6302)
KLEENSCREEN FRYERS
COMPUTER CONTROL
480 VOLTS ONLY, SPLIT-VAT
21, 17 AND 14 KW
6303

TROUBLESHOOTING

SOLID STATE CONTROL

SYMPTOM	POSSIBLE CAUSES
Fryer does not heat.	1. Power switch OFF or inoperative. 2. Main circuit breaker(s) OFF or the fryers internal circuit breaker(s), if applicable, OFF. 3. Control circuit fuse 1FU or 2FU OPEN. 4. Transformer 2T inoperative. 5. Drain valve switch malfunction (if installed). 6. Malfunctioning heat control relay R1 (full vat or right side split vat) or R2 on left side split vat only.
Ventilator OFF, power switch ON, power light ON.	1. Ventilator hood circuit breaker OPEN. 2. Interlock wiring OPEN. 3. Power switch inoperative.
No heating light, power light ON.	1. Temperature control set too low or not calibrated. 2. Heating light inoperative. 3. Contactor(s) malfunction. 4. Control board malfunction.
No heating light, power light ON, trouble light and first and second high limit lights ON.	1. Low oil. 2. First high limit inoperative (control board). 3. Second high limit OPEN or tilt switch OPEN or tilt switch malfunction. 4. Contactor(s) malfunction. 5. Control board malfunction.
Excessive time to melt shortening (more than 45 minutes).	1. Melt cycle timing incorrect (control board). 2. Heating elements malfunctioning. 3. Supply power incorrect voltage.
Fryer shuts down on first high limit and first high limit light ON.	1. Low oil. 2. Control not calibrated. 3. Contactor(s) malfunction. 4. Control board malfunction.
Fryer shuts down on second high limit, power light ON, no first high limit light and second high limit light ON.	1. Low oil. 2. First high limit "light" inoperative. 3. Second high limit OPEN or tilt switch OPEN or tilt switch malfunction. 4. Contactor(s) malfunction. 5. Control board malfunction.
Thermostat out of calibration by more than 25°F.	1. Probe touching element. 2. Probe malfunction. 3. Control board malfunction.
Light(s) not ON when required.	1. Light inoperative. 2. Wiring problem.

COMPUTER CONTROL

NOTE: The computer control is also used in other equipment, therefore it is possible for unrelated error prompts to appear if a problem occurs in the computer main harness plug.

SYMPTOM	POSSIBLE CAUSES
Fryer does not heat.	1. Power switch OFF or inoperative. 2. Main circuit breaker(s) OFF or the fryers internal circuit breaker(s), if applicable, OFF. 3. Control circuit fuse 1FU or 2FU OPEN. 4. Drain valve switch malfunction (if installed). 5. Malfunctioning heat control relay R2 (full vat or right side split vat) or R4 on left side split vat only. 6. Contactor(s) malfunctioning. 7. Computer power supply board or transformer 1T or 2T inoperative. 8. Open pins 23 or 24 (12 VDC). 9. Open 24 VAC pin 1 (full vat or right side split vat) or pin 2 on left side split vat only. 10. Open pin 15 right heat output (full vat or right side split vat), or pin 16 left heat output on left side split vat only. 11. Computer main harness wiring problem. 12. Malfunctioning computer control.
Fryer displays "HI TEMP" alarm message.	1. Low oil. 2. Frying oil temperature above 410°F, heating elements not turning OFF. A. Malfunctioning heat control relay R2 (full vat or right side split vat) or R4 on left side split vat only. B. Contactor(s) malfunctioning. 3. Malfunctioning computer control. A. Pin 15 right heat output (full vat or right side split vat), or pin 16 left heat output on left side split vat only, not turning OFF.
Fryer heats slowly.	1. Incoming voltage incorrect. 2. Heating element(s) malfunction.
Fryer displays "CALL SERVICE"	1. Probe malfunction. 2. Failed self-check. 3. Malfunctioning computer control.
Fryer displays "IGN FAILURE"	1. Pins 3, 4, 5 or 6 not connected to 24VAC.
Fryer displays "DRAIN OPEN"	1. Drain "ball" valve left OPEN. 2. Pin 10 not connected to 24VAC. 3. Drain valve switch malfunction (if installed).
Fryer displays "OFF"	1. Second high limit OPEN or tilt switch OPEN or tilt switch malfunction.

COMPUTER CONTROL HARNESS PIN-OUTS CHART

NOTE: The terms right and left throughout the table below have the following meanings: Right equals Full vat or right side split vat; Left equals left side, split vat only.

COMPUTER CONTROL PIN-OUTS			
PIN #	**DESCRIPTION**	**PIN #**	**DESCRIPTION**
1	Right power input "status"	13 [2]	24 VAC input ground
2	Left power input "status"	14	Right basket output
3 [1]	Right input	15	Right heat output
4 [1]	Left input	16	Left heat output
5 [1]	Right input	17 [1]	24 VAC main input
6 [1]	Left input	18	no connection
7	no connection	19	Left basket output
8	no connection	20	no connection
9 [2]	ground	21	no connection
10	Drain valve switch(es) (if installed) input "status"	22	no connection
11 [1, 3]	Door switch input "status"	23	Computer power input (+) 12 VDC nominal
12 [1, 2]	Full vat or Split vat mode Input	24	Computer power input (-) 12 VDC

NOTES:
1. 24VAC - control system main input to pin 17; jumpered to pins 3, 4, 5, 6, 11 & 12 (split vat only). Input to jumpered pins must be present or computer control will not function properly.
2. 24VAC ground - control system input to pin 13; jumpered to pins 9 & 12 (full vat only). Input to jumpered pins must be present or computer control will not function properly.
3. Pin 11 - door switch no longer used on these models. Input must remain or computer will display "DOOR OPEN".

KLEENSCREEN FILTERING SYSTEM

SYMPTOM	POSSIBLE CAUSES
Oil not filtering, pump motor is ON.	1. Filter screen plugged. 2. Clog in filter system lines. **NOTE**: If using solid shortening, when all filtered oil is returned to the vat and filter power switch is OFF, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 3. Oil/Shortening below 300°F to "thick". 4. Filter valve switch malfunction. 5. Filter valve mechanical malfunction. 6. Pump is inoperative.
Oil not discarding, pump motor ON.	1. Filter screen plugged. 2. Clog in filter system lines. **NOTE**: If using solid shortening, when all filtered oil is returned to the vat and filter power switch is OFF, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 3. Oil/Shortening below 300°F to "thick". 4. Discard valve switch malfunction. 5. Discard valve mechanical malfunction. 6. Discard hose connection not fully engaged. 7. Pump is inoperative.
Pump motor is not running.	1. Filter power switch inoperative. 2. Filter/discard handle not extended. 3. Filter/discard valve switch malfunction. 4. Filter relay malfunction. 5. Pump motor inoperative.

- NOTES -

- NOTES -

CONDENSED SPARE PARTS LIST

KLEENSCREEN FILTER

PART NUMBER	DESCRIPTION	NOTES
411496-B4	Lighted Rocker Switch, Filter	
417792-1	Pump and Motor Assy, Kleenscreen filter	
411497-A3	Relay, Filter Circuit, 24v Coil	

ER SERIES ELECTRIC KLEENSCREEN FRYERS

PART NUMBER	DESCRIPTION	ERD	ERC	NOTES
411496-F7	"Tilt Limit Switch", "Filter valve switch" and "Discard valve switch".	X [1]	X [2]	
411496-B9	Rocker Switch, Momentary on/off, Center off	X		
416535-4	Relay, 24v Coil		X	
414146-2	Hi-limit Thermostat	X [1]	X [2]	
FE-023-55	Fuse, Holder	X [1]	X [2]	
FE-019-40	Fuse, 15 Amp	X [1]	X [2]	
414142-1	Temperature Probe, Thermistor	X [1]		
417876-1	Resistor, Heat Light	X [1]		
415144-12	Temperature Control Board	X [1]		
415638-G1	Potentiometer Assy.	X [1]		
411496-B1	Rocker Switch, Fry / Melt	X [1]		
411497-C3	Contactor, 3 Pole 40 Amp 120v Coil	X [1]	X [2]	
411497-C5	Contactor, 3 Pole 40 Amp 240v Coil	X [1]	X [2]	
418159-1	Cam Switch, Basket Lift	X [1]	X [2]	
418156-1	Gear Motor, Basket Lift	X [1]	X [2]	
416741-G5	Element, 208v 14kw,	X [1]	X [2]	
416741-G7	Element, 240v, 14kw	X [1]	X [2]	
416741-G9	Element, 208v 17kw,	X [1]	X [2]	
416741-G11	Element, 240v, 17kw	X [1]	X [2]	
422737-2	Temperature Probe, Thermistor		X [2]	
419574	Power Supply Board, Computer 12vac-12vdc		X [2]	
419557-7	Computer Control		X [2]	
416535-7	Relay, 240v Coil		X [2]	
419572-G2	Transformer, 240-12v		X [2]	
411500-12	Transformer, 120-24v	X [1]	X [2]	
411500-13	Transformer, 240-24v	X [1]	X [2]	

1 = COMMON TO STANDARD ERD SERIES FRYERS
2 = COMMON TO STANDARD ERC SERIES FRYERS

SERVICE MANUAL

22402

ERA / EBD ELECTRIC FRYER

See GENERAL section for a complete listing of Models and ML Numbers.

1ER50-Series
1ER85-Series
2ER50-Series
2ER85-Series
2XER50-Series
2XER85-Series
3ER50-Series
3E85-Series
3ER85-Series
4E50-Series
4ER50-Series
4E85-Series
4ER-Series

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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TABLE OF CONTENTS

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GENERAL

INTRODUCTION

This Service Manual covers specific service information related to the models listed on the front cover. ERA and EBD series electric fryers come equipped with behind-the-door solid state controls. The features and operation of the cooking controls are the same for both single floor model fryers and Kleenscreen battery fryers. All pictures and illustrations are of a 2ER50AF (17kW, 208V) unless otherwise noted.

SINGLE FLOOR MODEL FRYERS

Fryers with the Filter-Ready option installed, use the Mobile Filter. For service information related to the Mobile filter refer to F24599 MOBILE FILTERS. A GRO Frymate (dump station) can be configured in a battery with fryers 15½ inches or 21 inches in width.

Model	KILOWATT EACH FRY TANK	FRYER WIDTH (INCHES) TOTAL SYSTEM	SHORTENING CAPACITY (LBS) EACH FRY TANK
1ER50A (1E50BD)	17	15.5	50
1ER50AF (1E50BDF)	17	15.5	50
1ER85A (1E85BD)	24	21.0	85
1ER85AF (1E65BDF)	24	21.0	85
2ER50AF (2E50BDF)	17	31.0	50
2ER85AF (2E85BDF)	24	42.0	85
2XER50AF (2XE50BDF)	17	31.0	50
2XER85AF (2E85BDF)	24	42.0	85
3ER50AF (3E50BDF)	17	46.5	50
3ER85AF (3E85BDF)	24	63.0	85
4ER50AF (4E50BDF)	17	62.0	50
4ER85AF 4E85BDF)	24	84.0	85

KLEENSCREEN FILTRATION SYSTEM

The Kleenscreen filtration system is integrated into the ERA & EBD Series fryer battery. The filter is housed in a pull-out drawer assembly at the base of the fryer. The filtering components in the drawer include a stainless steel filter tank, crumb-catch basket and a dual element mesh filter screen. With the filter drawer closed, a self-seating oil return line provides the path to return the filtered shortening to the fry tank.

This system is designed to provide a thorough and easy method to filter the shortening.

Some of the benefits include:

- Self-contained system eliminating the use of external filter equipment.
- Paperless filtering system.
- Easy to clean and low maintenance.

Kleenscreen fryer batteries are available in a minimum of two and a maximum of four fryer sections. The fryer size of each section is identical.

A GRO Frymate (dump station) can also be included as one or more of the sections.

SPECIFICATIONS

MODEL	KW PER FRYER SECTION	AMPS - EACH FRYER SECTION (3 PHASE/ 60HZ)* PER LINE		
		208V	240V	480V
ALL 50 LB CAPACITY FRYERS	14	39	34	17
	17	47	41	20

MODEL	KW PER FRYER SECTION	AMPS - EACH FRYER SECTION (3 PHASE/ 60HZ)*		
		PER LINE		
		208V	240V	480V
ALL 85 LB CAPACITY FRYERS	24	67	58	29
NOTES:	* Amperage values in the table are nominal. Tolerance is +5/-10%.			

Single Floor Model Fryers

- 208VAC, 240VAC or 480VAC (3 phase, 60HZ) to power the heating elements.

Drawer Filter System

Separate electrical connections are required for **each** section of the battery.

- 208VAC, 240VAC or 480VAC (3 phase, 60HZ) to power the heating elements.
- On 208VAC and 240VAC models, a transformer provides power for the fryer controls and drawer filter system controls.
- On 480VAC models, a 120VAC connection is required for each fryer section.

TOOLS

Standard

- Standard set of hand tools.
- VOM with minimum of NFPA-70E CATIII 600V, UL/CSA/TUV listed. Sensitivity of at least 20,000 ohms per volt and the ability to measure DC micro amps. Meter leads must also be rated at CAT III 600V.
- Digital temperature tester (thermocouple type).

Special

- Electrostatic Discharge Kit.
- Burndy pin extraction tool RX2025 GE1; Newark Electronics Catalog Number 16F6666. Used for removing pin terminals on Burndy connectors.
- Clamp on type amp meter with minimum of NFPA-70E CAT III 600V,UL/CSA/TUV listed.

MODELS AND ML NUMBERS

The following table contains a complete listing of fryer models addressed by this Service Manual.

Model	ML Number
1ER50A	ML-136730
1E50BD	
1ER50AF	ML-136799
1E50BDF	
1ER85A	ML-136740
1E85BD	
1ER85AF	ML-136802
1E85BDF	
2ER50AF	ML-136741
2E50BDF	
2ER85AF	ML-136742
2E85BDF	
2XER50AF	ML-136747
2XE50BDF	
3ER50AF	ML-136743
3E50BDF	
3ER85AF	ML-136744
3E85BDF	

Model	ML Number
4ER50AF	ML-136745
4E50BDF	
4ER85AF	ML-136746
4E85BDF	

REMOVAL AND REPLACMENT OF PARTS

COVERS AND PANELS

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

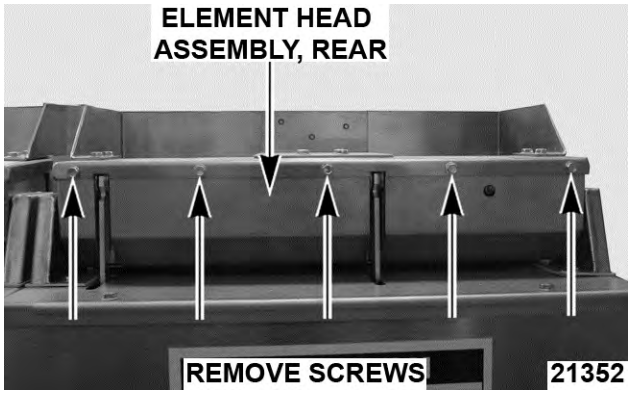
Electrical Components Access Panel

1. Remove screws at top of access panel and lower panel.

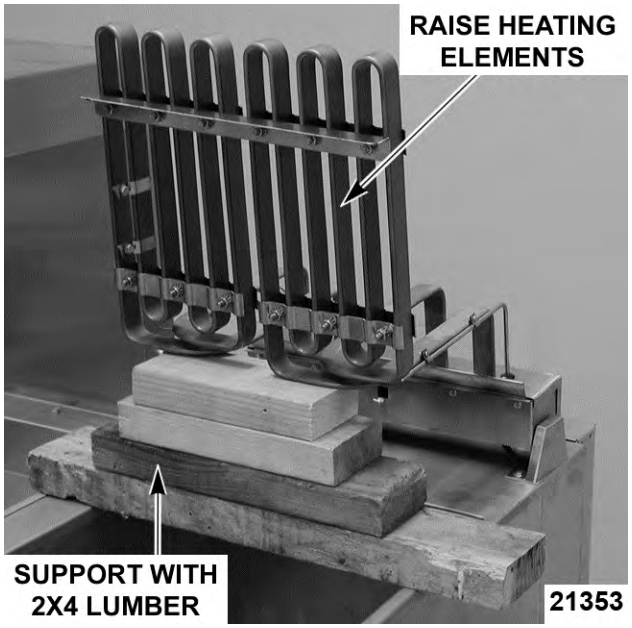
2. Lift from hinge then remove panel.
3. Reverse procedure to install.

Element Head Cover

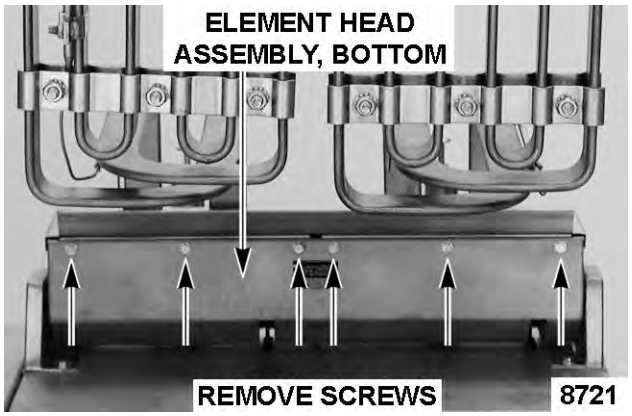
1. Drain shortening from fry tank.
2. Remove screws from rear of element head assembly.



3. Raise heating elements and place 2x4 lumber under them for support.



4. Remove screws from the bottom of element head assembly.



NOTE: Head cover will separate from element head base. Heating elements remain attached to element head cover.

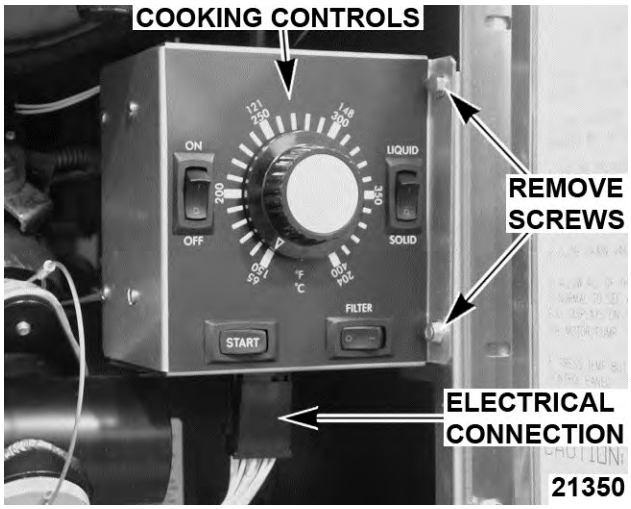
5. Grasp heating elements and remove 2x4 lumber. Lift the elements and pull toward rear of fryer.
6. Lower the heating elements and place them in fry tank.
7. Reverse procedure to install.

COOKING CONTROLS

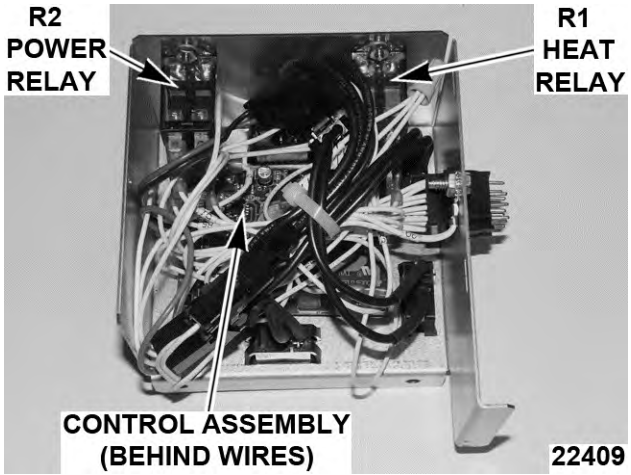
⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

NOTICE Certain components in this system are subject to damage by electrostatic discharge (ESD) during field repairs. An ESD kit is required to prevent damage. The ESD kit must be used anytime the circuit board is handled.

1. Open fryer section door(s).
2. Remove electrical connection to cooking controls.



3. Remove screws securing controls.
4. Remove cooking control cover.
5. Disconnect lead wires from the component being replaced then remove from control box.



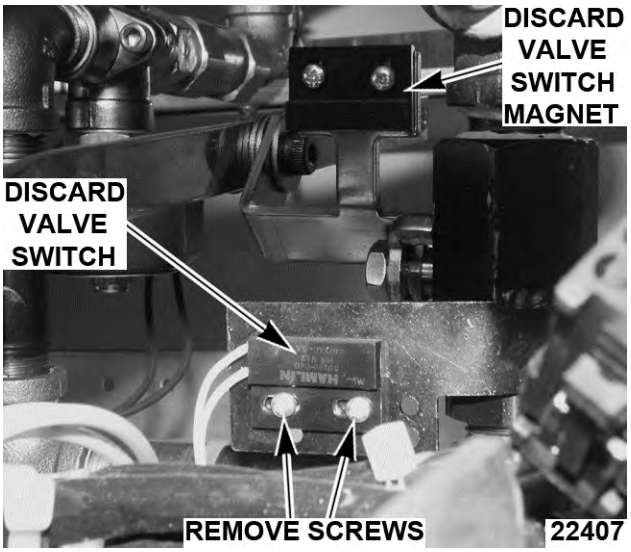
6. Reverse procedure to install and check for proper operation.

DISCARD VALVE SWITCH (KLEENSCREEN FRYERS ONLY)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

NOTE: Switches are not adjustable.

1. Open the door to the fryer section being serviced.
2. Disconnect lead wire connector.
3. Remove switch mounting screws.



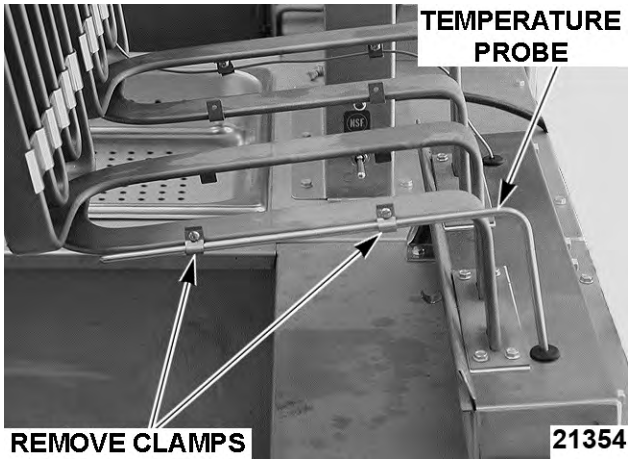
4. Remove discard valve switch.
5. Reverse procedure to install and check for proper operation.

TEMPERATURE PROBE

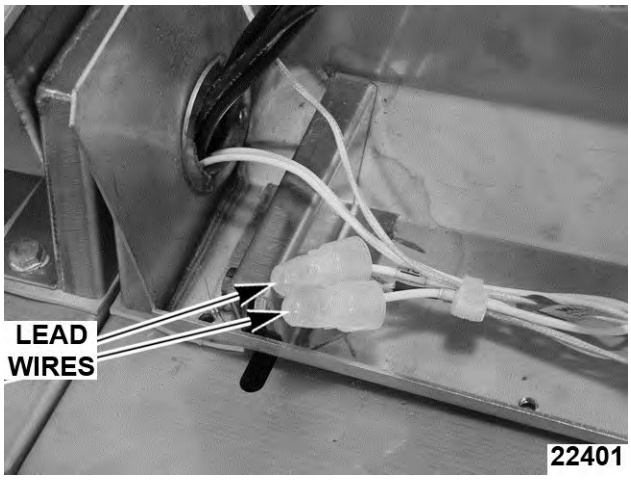
⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

CAUTION Do not sharply bend and kink, or clamp down on the capillary tube or damage may occur.

1. Raise heating elements.
2. Remove clamps from temperature probe.



3. Remove element head cover as outlined under COVERS AND PANELS.
4. Disconnect temperature probe lead wires.



5. Remove temperature probe from the element head.
6. Reverse procedure to install.

NOTE: When installing, ensure grommet remains in place when inserting temperature probe thru the grommet in the element head.

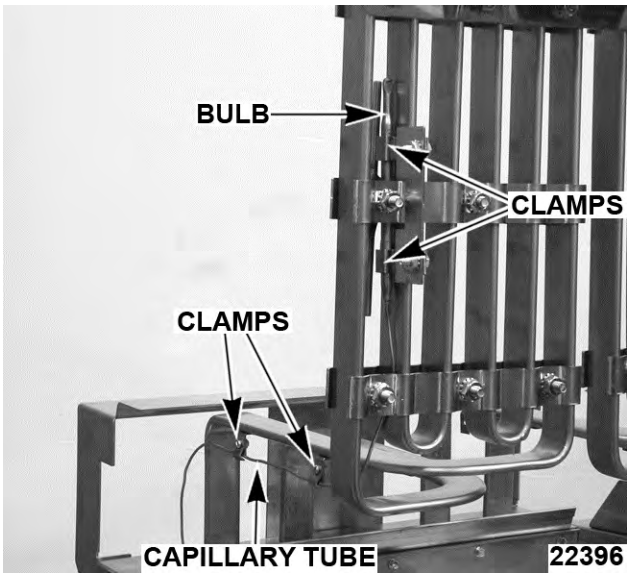
7. Check cooking control calibration as outlined in COOKING CONTROL CALIBRATION.

HIGH LIMIT THERMOSTAT

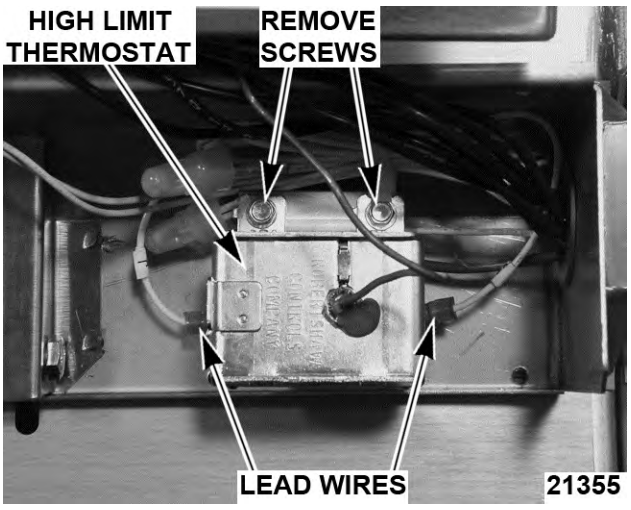
⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

CAUTION Do not sharply bend and kink, or clamp down on the capillary tube or damage may occur.

1. Raise heating elements.
2. Loosen clamps securing capillary tube and bulb to element.



3. Remove element head cover as outlined under COVERS AND PANELS.
4. Remove high limit from mounting bracket.



5. Disconnect high limit lead wires.

6. Remove grommet from the element head assembly.
7. Remove the bulb, capillary tube and high limit from the element head assembly.
8. Reverse procedure to install.
   A. Slide grommet onto capillary tube then insert grommet into the capillary tube thru hole in the element head.
   B. Move element lead wires clear of high limit when installing.

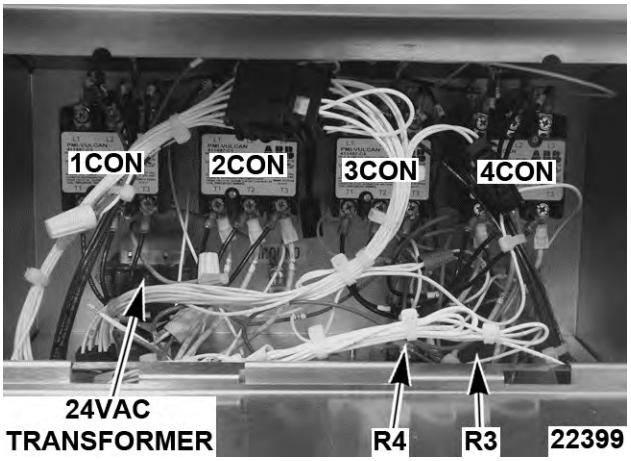
ELECTRICAL COMPONENTS

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

CAUTION Components in this system are subject to damage by electrostatic discharge. A field grounding kit is available to prevent damage. The field service kit must be used anytime the control board is handled.

1. Open electrical component access panel.

2. Disconnect lead wires then remove the component being replaced.



3. Reverse procedure to install the replacement component and check for proper operation.

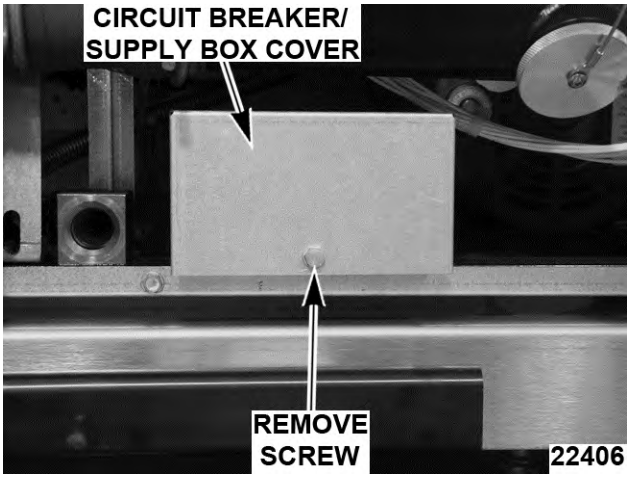
CIRCUIT BREAKER / SUPPLY BOX COMPONENTS

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

CAUTION Components in this system are subject to damage by electrostatic discharge. A field grounding kit is available to prevent damage. The field service kit must be used anytime the control board is handled.

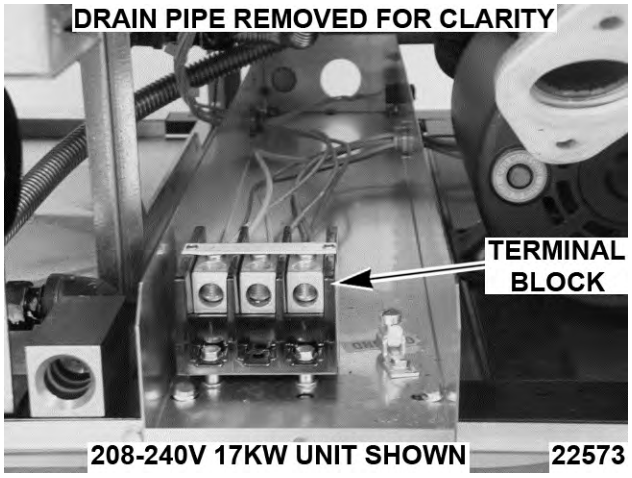
NOTE: Supply box will contain a circuit breaker on 24kW 208-240V units.

1. Remove screw and circuit breaker/ supply box cover.



2. Disconnect lead wires then remove the component being replaced.

NOTE: Supply box will contain a circuit breaker on 24kW 208-240V units.

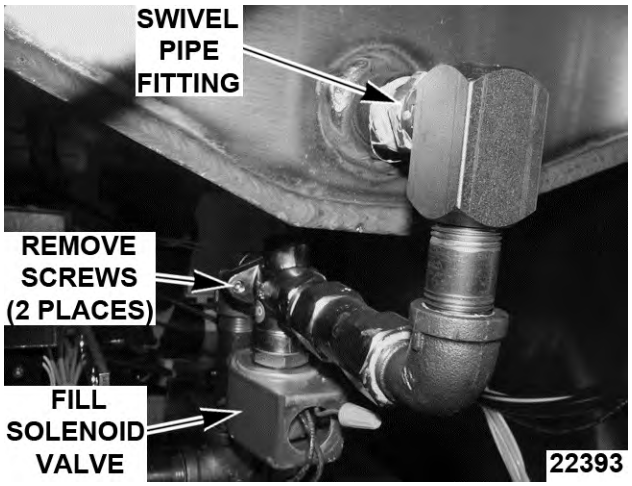


3. Reverse procedure to install the replacement component and check for proper operation.

FILL SOLENOID VALVE (KLEENSCREEN FRYERS ONLY)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

1. Disconnect swivel pipe fitting at rear of fry tank.



2. Disconnect fill solenoid valve lead wire connector from below control panel.
3. Remove screws (2) securing the solenoid valve body flange to pipe tee then remove the assembly from fryer.
4. Remove pipe fittings from solenoid valve and install on replacement valve.
5. Reverse procedure to install and check for proper operation.

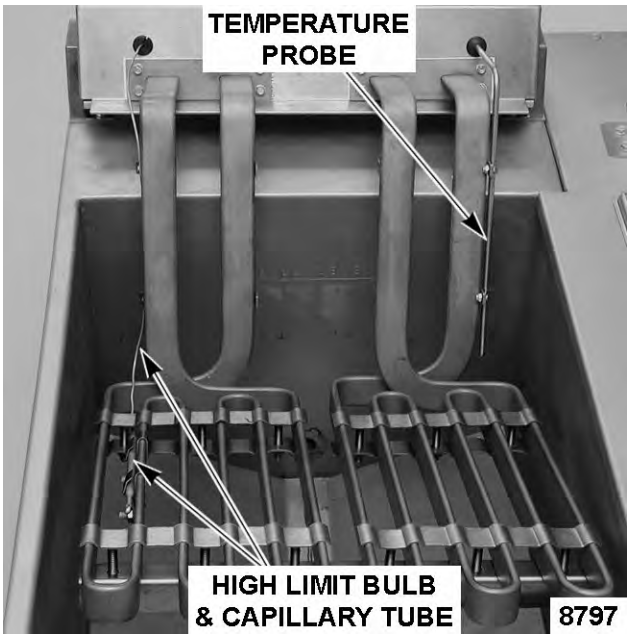
HEATING ELEMENTS

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

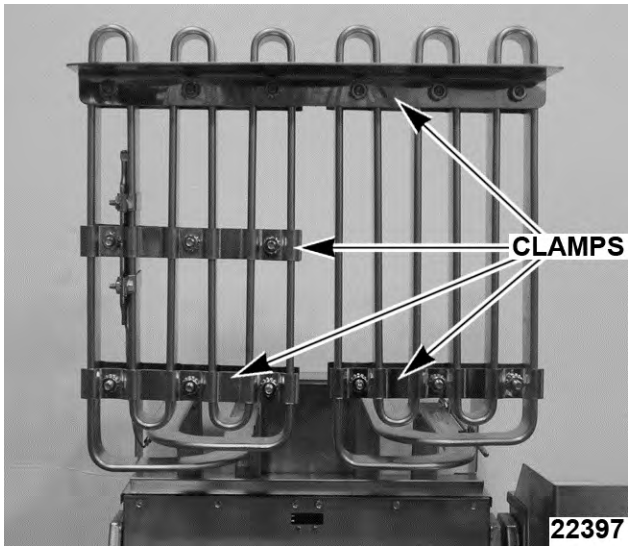
CAUTION Components in this system are subject to damage by electrostatic discharge. A field grounding kit is available to prevent damage. The field service kit must be used anytime the control board is handled.

1. Raise heating elements.
   A. If replacing left heating element, loosen high limit bulb and capillary tube clamps. Remove high limit bulb and capillary tube from clamps then position away from element.
   B. If replacing right heating element, remove temperature probe clamps and position temperature probe away from element.

NOTE: When installing high limit, route the capillary tube and center the bulb between the clamps before tightening.



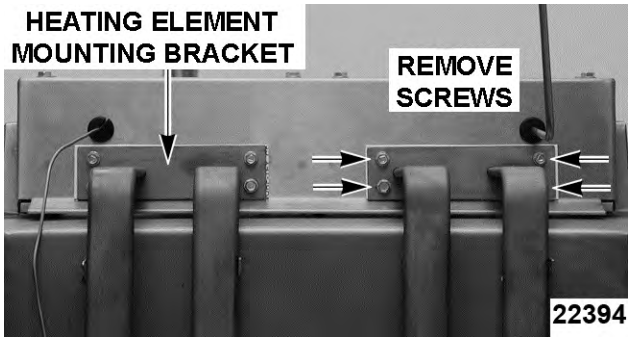
2. Remove element assembly clamps.



3. Remove element head cover as outlined under COVERS AND PANELS.
4. Disconnect heating element lead wires.

NOTE: Each heating element assembly contains three individual elements (six lead wire connections total).

5. Remove screws from heating element mounting bracket and remove heating element.



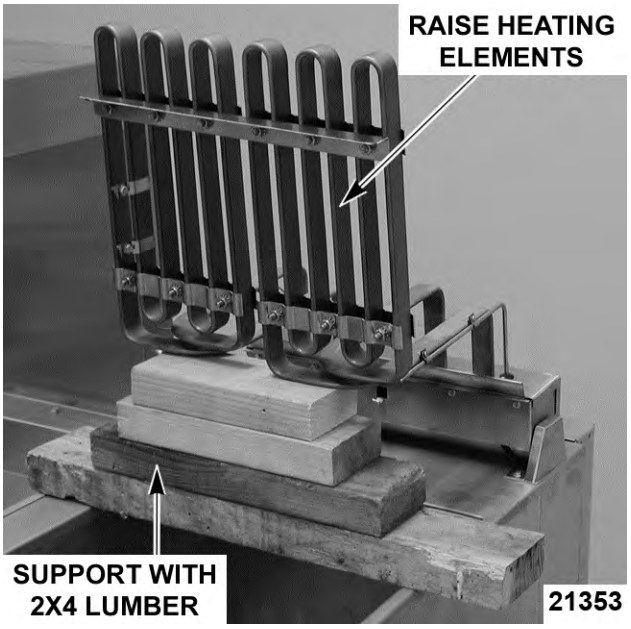
6. Reverse procedure to install.

LIFT ASSIST SPRINGS

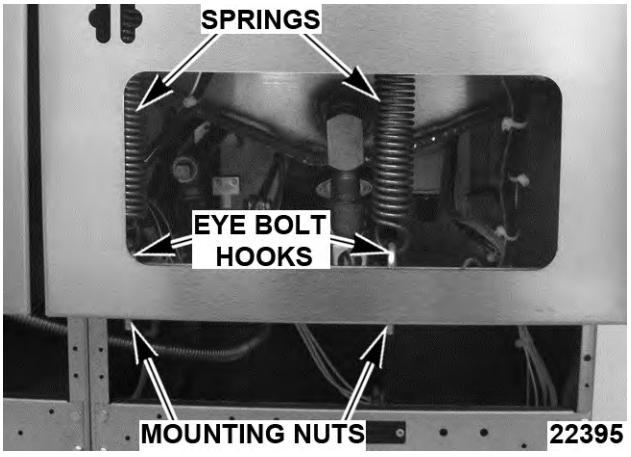
⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

NOTE: If one spring breaks, replace both springs.

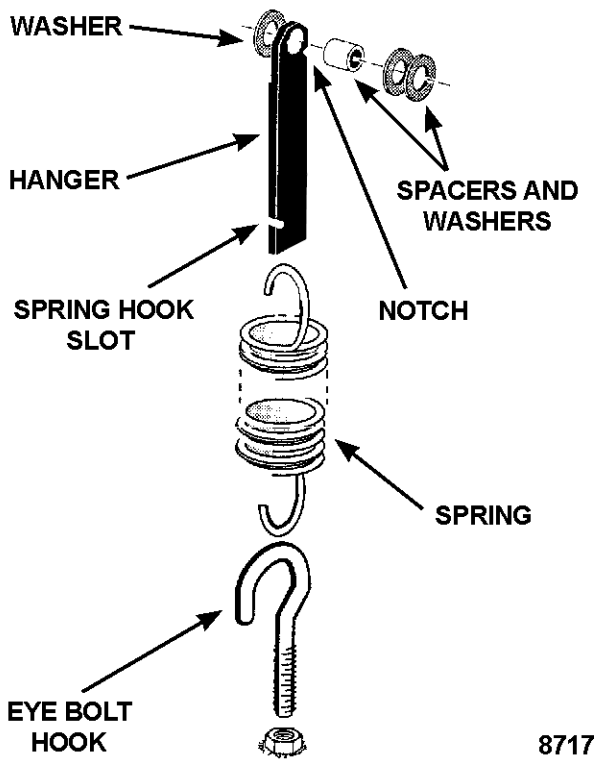
1. Raise heating elements and place 2x4 lumber under them for support. Heating elements are to remain upright.



2. Loosen all eye bolt mounting nuts to release tension on springs.



3. Remove lift assist springs from the eye bolt hooks.
4. Remove lift assist springs from the hangers.
5. To install springs:
   A. Attach spring hook to hanger thru rear door opening.
   B. Attach spring hook to eye bolt and tighten eye bolt mounting nut.



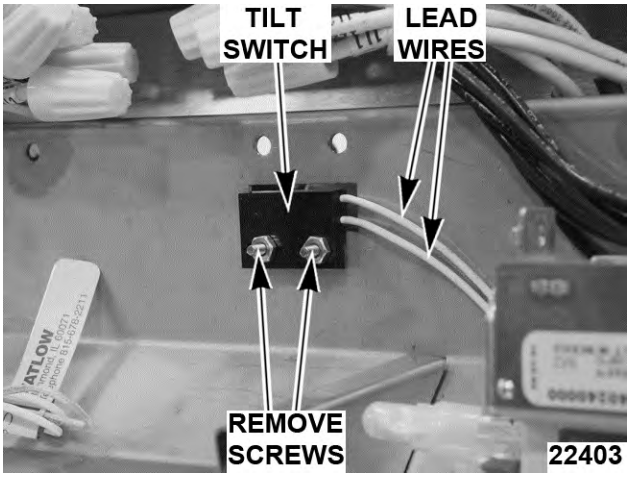
C. Remove 2x4 lumber and lower heating elements.

6. Adjust spring tension as outlined under LIFT ASSIST SPRING ADJUSTMENT.

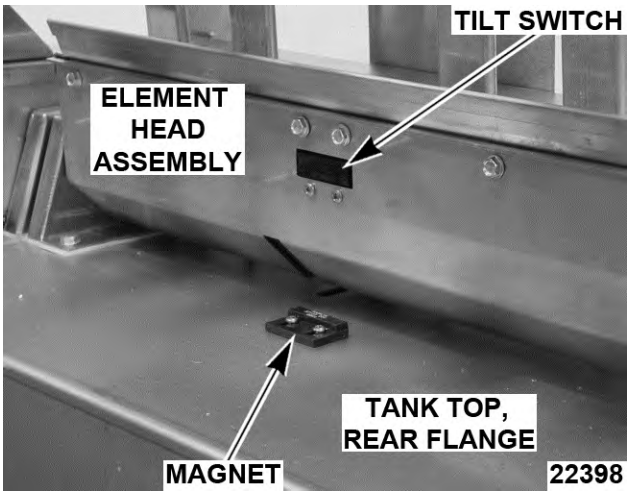
TILT SWITCH

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

1. Remove element head cover as outlined under COVERS AND PANELS.
2. Lower heating elements.
3. Disconnect lead wires from tilt switch.
4. Remove tilt switch from element head.



REAR VIEW SHOWN, ELEMENTS LOWERED



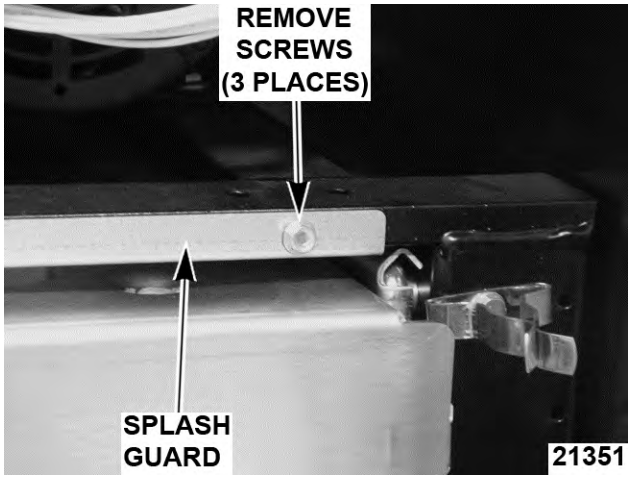
FRONT VIEW SHOWN, ELEMENTS RAISED

5. Reverse procedure to install and check for proper operation.

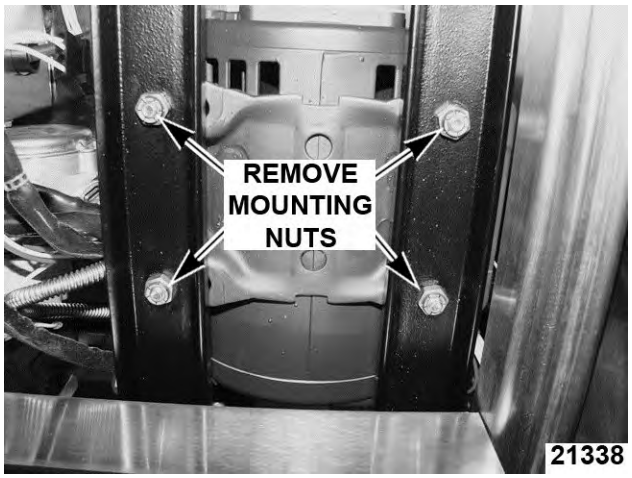
PUMP AND MOTOR (KLEENSCREEN FRYERS ONLY)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

1. Drain filter tank of shortening.
2. Open the fryer section doors above the filter tank drawer.
3. Pull filter drawer out, remove filter tank assembly and push the tank support arms back into place under the fryer.
4. Remove splash guard from base frame.



5. Disconnect pump motor lead wire connector.
6. 6. From underneath the fryer: disconnect flexible line fittings from pump.
7. Remove pump motor assembly from fryer.



8. Remove pipe fittings from the pump and install on replacement pump.
9. Reverse procedure to install and check for proper operation.

SERVICE PROCEDURES AND ADJUSTMENTS

⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout / tagout procedures, attach test equipment and reapply power to the test.

TEMPERATURE PROBE TEST

The temperature probe is an RTD (resistance temperature device) of the thermistor type. As temperature increases the resistance value decreases.

Probe Fault

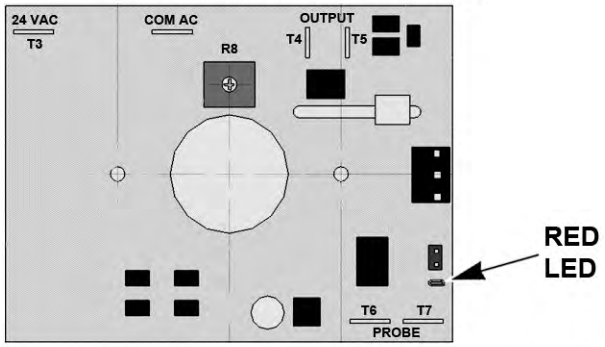
NOTE: A temperature probe fault can be caused by a lead wire break or a lead short.

If a temperature probe fault occurs:

- The red diagnostic LED on back of control assembly (inside control box cover) will flash.
- The heat demand outputs are de-activated.

This will continue until the fault clears, power is cycled or problem resolved.

COOKING CONTROL ASSEMBLY



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To Check

1. Turn power switch off.
2. Disconnect cooking control connector.

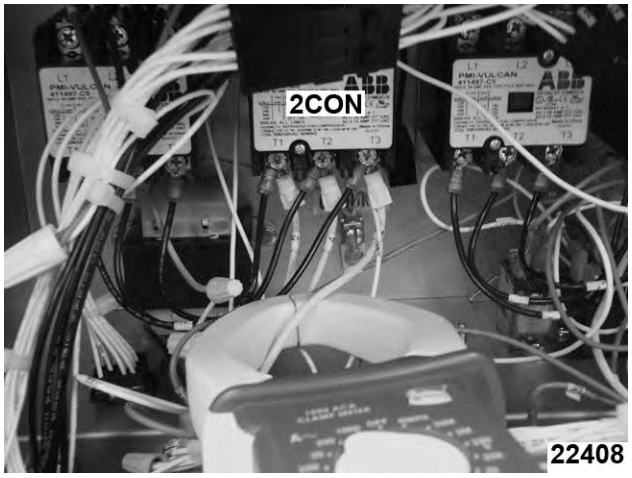
3. Test the probe using a VOM to measure resistance. Connect the meter leads to pins 4 & 5 on the male connector.
   A. If the measured resistance values are within the allowable range, the probe is functioning properly. Reverse procedure to install.
   B. If the measured resistance values are outside the allowable range, install a replacement probe and check for proper operation.

Temperature (ºF)	Resistance (Ω)
77	90K - 110K
212	5,016 - 6,130
275	1,804 - 2,204
300	1,254 - 1,534
350	646 - 790
392	391 - 478

COOKING CONTROL CALIBRATION

1. Verify condition of temperature probe as outlined under TEMPERATURE PROBE TEST.

2. Check the level of shortening in fry tank. The level must be between the MIN & MAX fill lines before proceeding.
3. Place clamp on type amp meter around any yellow lead wire of 2CON or 4CON.



4. Allow shortening to cool below 300°F.
5. Place a thermocouple in the geometric center of the fry tank one inch below the shortening surface.
6. Set the cooking control to 350°F and turn the fryer on.
7. Monitor the current as it cycles on and off.

NOTE: Stir shortening to eliminate any cold zones.

   A. Allow heat to cycle three times to stabilize shortening temperature.

   B. Record meter reading from thermocouple when the current cycles off and on for at least two complete heating cycles.

8. Calculate the average temperature by adding the temperature reading when the heat goes off to the temperature reading when the heat comes on & divide this answer by 2.

   [Temp. (Heat off) + Temp. (Heat on)] ÷ 2 = Average Temp.

   Example: 360° + 340° ÷ 2 = 350°F. The average temperature should be 350°F (± 5°F).

   A. If the average temperature reading is within tolerance, cooking control is properly calibrated.

   B. If the average temperature reading is out of tolerance, loosen set screw to remove temperature knob and adjust calibration potentiometer.

NOTE: Ensure that the shaft and knob position does not change when loosening set screw and removing temperature knob, as this could affect calibration.

   - Adjust calibration potentiometer clockwise to increase temperature.
   - Adjust calibration potentiometer counterclockwise to decrease temperature.

   C. If over 25° of adjustment is necessary, replace cooking control.

9. Repeat the average temperature calculation for up to three attempts. Allow the cooking control to cycle at least two times between adjustments before performing the calculation.
10. If calibration is unsuccessful, the cooking control may be malfunctioning and cannot be adjusted properly. Install a replacement cooking control and check calibration.

LIFT ASSIST SPRING ADJUSTMENT

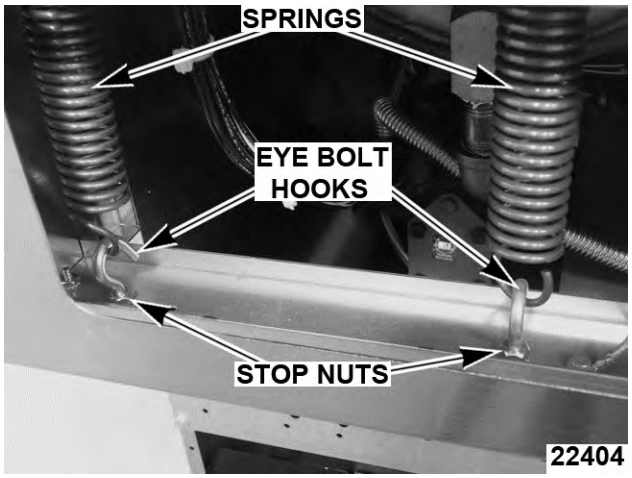
1. Turn power switch off.
2. Check spring tension:

   A. Raise heating elements to the full up position.

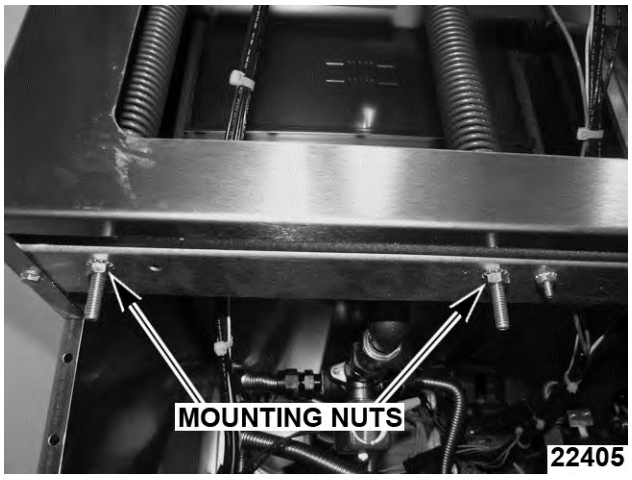
   B. Lower heating elements to the full down position. Elements should remain in place.

   C. If the elements remain in place as described, then no adjustment is necessary. If the elements do not remain in place, continue with procedure for adjustment.

3. Lower heating elements to the down position.
4. Loosen stop nut on all eye bolts.



5. Adjust eye bolt mounting nuts as necessary, but equally on all springs to achieve the best spring tension to hold elements in place.



6. Perform spring tension check.
7. Repeat spring tension adjustment if necessary.
8. Tighten stop nut on all eye bolts.

HEATING ELEMENT TEST

CAUTION Heating elements must remain submerged in shortening while performing this test or damage may occur.

1. Remove element head cover as outlined under COVERS AND PANELS.
2. Access heating element lead wire connections at wire nuts.
3. Re-connect power, turn power switch on and set cooking control to call for heat.
4. Measure voltage at heating element connections and verify against data plate voltage.
   A. If voltage is incorrect, see ALL MODELS.
   B. If voltage is correct, check current draw (amps) through the heating element lead wires. See table below for proper values.

NOTE: This method is preferred over a resistance check when a clamp on type amp meter is available.

   1) If current draw is correct then heating element is functioning properly.
   2) If current draw is not correct, turn power switch off and disconnect power to the machine.
      a. Install a replacement heating element.
      b. Proceed to last step.

   C. If unable to check current draw, a resistance check may indicate a malfunctioning element. See table for proper values.
      1) Turn power switch off and disconnect power to the machine.
      2) Remove wire nuts from heating element lead wire connections and separate lead wires.
      3) Check resistance (ohms)

5. Check for proper operation.

VOLTAGE	TOTAL KW	AMPS PER ELEMENT	OHMS PER ELEMENT
208	14	11	18.4
	17	13.5	15.5
	24	19.2	10.8
240	14	9.6	25.1
	17	11.6	20.5
	24	16.7	14.4
480	14	4.8	100.1
	17	5.8	82.3
	21	7.3	65.8
	24	8.3	57.6

NOTE:

Values in the table are nominal. Tolerance is +5/-10%.

Resistance values (ohms) are @ room temperature.

There are 3 elements per firebar, 6 elements per tank.

ELECTRICAL OPERATION

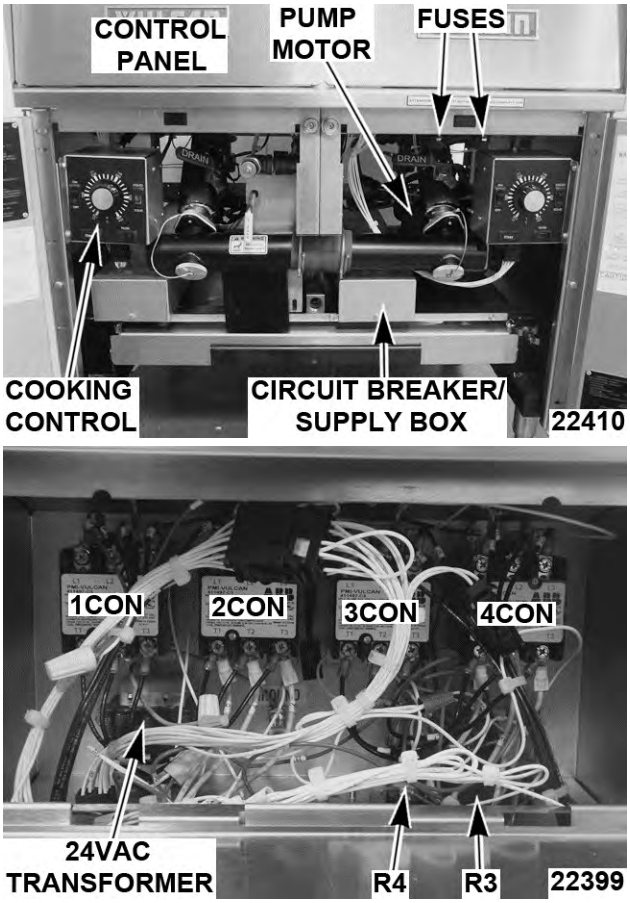
COMPONENT FUNCTION

FRYER CONTROLS	
Cooking Control	Monitors and evaluates input signals to the control: Activates heat output signal to maintain shortening temperature; and activates filter output signal to power the fill solenoid valve.
Transformer	Supplies 24VAC to the cooking control circuit. Transformer is energized when power switch is turned on.
Power Switch	Supplies power to control circuit for fryer operation and filtering.
Melt Select Switch	Controls heating circuit operation during melt cycle based on type of shortening being used (liquid/ solid).
High Limit Thermostat	Prevents the shortening from reaching temperatures over 450°F (manual reset).
Temperature Probe	Senses temperature of shortening. Converts the temperature into a resistance which is monitored by the cooking control. The probe is an RTD (resistance temperature device) of the Thermistor type. As temperature increases the resistance value decreases.
Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/ closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents heating elements from being energized with the fry tank empty.
Tilt Switch	A magnetic reed switch (N.O.) mounted underneath the element head assembly. Remove power from 1CON and 3CON to de-energize the heating elements when the elements are raised.
1CON, 3CON and 2CON, 4CON Contactors	Supplies line voltage to heating elements.
Heating Elements	Produces heat that is transferred to the shortening.
R1 Heat Relay	Supplies power to 2CON and 4CON contactor coils.
R2 Power Relay	Supplies power to cooking control.

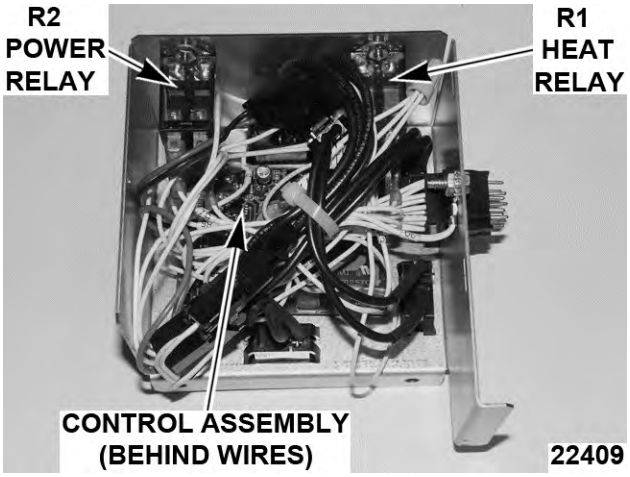
KLEENSCREEN FILTER CONTROLS	
Fill Solenoid Valve	When energized by filter switch, the solenoid valve opens to allow the flow of shortening thru filtering system.
Pump Motor	Operates pump to circulate shortening through filtering system.

KLEENSCREEN FILTER CONTROLS	
Start Switch	Supplies start heating function to the temperature control at the beginning of a cooking cycle or after the vat has been filled from the filter process.
Filter Switch	Energizes pump motor to filter the shortening when switch is closed (valve handle extended). Filter power switch must be turned on.
Discard Valve Switch	A magnetic reed switch mounted on the mechanical discard valve that closes when discard valve handle is extended to discard the shortening. Prevents R4 solenoid relay N.C. contacts from suppling power to the fill solenoid valve when filter key is pressed.
R3 Filter Relay	Supplies power to pump motor and solenoid.
R4 Solenoid Relay	Removes power to solenoid if discard valve switch is operated.

COMPONENT LOCATION



CONTROL PANEL COMPONENTS



COOKING CONTROL COMPONENTS

SEQUENCE OF OPERATION

Fryer

1. Conditions.
   - Fryer connected to correct supply voltage and is properly grounded. Separate connections are required for each section of the battery.
   - 120/24VAC transformer energized.
   - Internal fryer circuit breaker ON (24kW, 208-240V units only).
   - Power switch off.
   - Shortening at proper level in fry tank and below last set point temperature used.
   - Cooking control is setup properly and ready to use.
   - Manual drain valve closed (drain valve interlock switch N.O. is closed).
   - Tilt switch contacts closed (N.O. - held closed with heating elements lowered).
   - High limit thermostat closed.
2. Turn power switch on. Supply voltage energizes:
   - 1CON and 3CON thru high limit thermostat and tilt switch.
   - R2 power relay coil and R2 N.O. contacts close.
   - Cooking control thru DVI switch.
3. Press start momentary switch. If shortening temperature is below set point:
   A. J5 outputs 24VDC to R1 thru wire 56.
   B. R1 heat relay coil energized and R1 N.O. contacts close.
   C. 2CON and 4CON are energized and heating elements are powered.
4. Shortening reaches set temperature.
   A. Cooking control de-activates the heat demand output (24VDC) at J5.
   B. With power removed from J5, R1 is de-energized thru wire 56.
   C. 2CON and 4CON are de-energized and power is removed from heating elements.
5. Cooking control cycles heat output on shortening temperature until power switch is turned off, heating elements are raised or a high limit condition occurs.
   A. If shortening reaches 460°F
      - Tthe high limit thermostat opens
      - 1CON and 3CON are de-energized
      - Power is removed from heating elements.
   B. 1CON and 3CON remain deenergized until:
      - Shortening temperature drops below 460°F.
      - Manual reset button is pressed.
      - Start button is actuated.

Filtering System

The discard valve handle is connected to a mechanical valve and switch assembly to route the flow of shortening (electrically and mechanically) in the filtering system.

Refer to Installation & Operation manual for specific instructions on filtering.

1. Conditions
    - Fryer connected to correct supply voltage and is properly grounded.
    - Power switch to the fryer section off.
    - Shortening between 300°F and 350°F.
    - Filter drawer assembly installed properly.
    - Filter power switch off.
    - Discard valve handle (yellow) retracted.
    - Discard valve switch N.O. contacts open.
    - Mechanical discard valve closed.
2. Turn power switch on, to the fryer section to be filtered.

NOTE: Shortening should not be filtered outside of this temperature range. At lower temperatures the shortening is thicker which may increase filtering time and place a greater load on the pump. At higher shortening temperatures, the pump seal life is decreased.

3. Set cooking control between 300°F (minimum) and 350°F (maximum).

NOTE: If using solid shortening, once it has melted, stir the shortening to eliminate any solid shortening in cold zone of the fry tank.

4. Allow shortening to cycle at set temperature for approximately 10 minutes.

NOTE: If using solid shortening, allow hot shortening to stand in filter tank for approximately 6 minutes prior to filtering.

5. Open the manual drain valve to the fryer section in need of and drain the shortening into filter tank. (Heat circuit will be disabled).
6. Turn filter power switch on
    - R3 filter relay coil energized.
    - R3 N.O. contacts close.
    - Power supplied to pump motor and fill solenoid.
7. Pump motor circulates shortening through filter and solenoid to tank until power is removed.

NOTE: If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies.

8. When filtering process is completed and the tank is full, turn off filtering switch.
    - Power is removed from pump motor and solenoid closes.
9. Close the filter drawer when complete.
10. To restart the cooking process, press the start button.

Discarding Shortening

The discard valve handle is connected to a mechanical valve and switch assembly to route the flow of shortening (electrically and mechanically) out discard hose.

Refer to Installation & Operation manual for specific instructions on draining.

1. Conditions
    - Fryer connected to correct supply voltage and is properly grounded.
    - Power switch to the fryer section off.
    - Shortening between 300°F and 350°F.
    - Filter drawer assembly installed properly.
    - Filter power switch off.
    - Discard valve handle (yellow) retracted.
    - Discard valve switch N.O. contacts open.
    - Mechanical discard valve closed.
2. Turn power switch on, to the fryer section to be drained.

NOTE: Shortening should not be drained outside of this temperature range. At lower temperatures the shortening is thicker which may increase draining time and place a greater load on the pump. At higher shortening temperatures, the pump seal life is decreased.

3. Set cooking control between 300°F (minimum) and 350°F (maximum).

NOTE: If using solid shortening, once it has melted, stir the shortening to eliminate any solid shortening in cold zone of the fry tank.

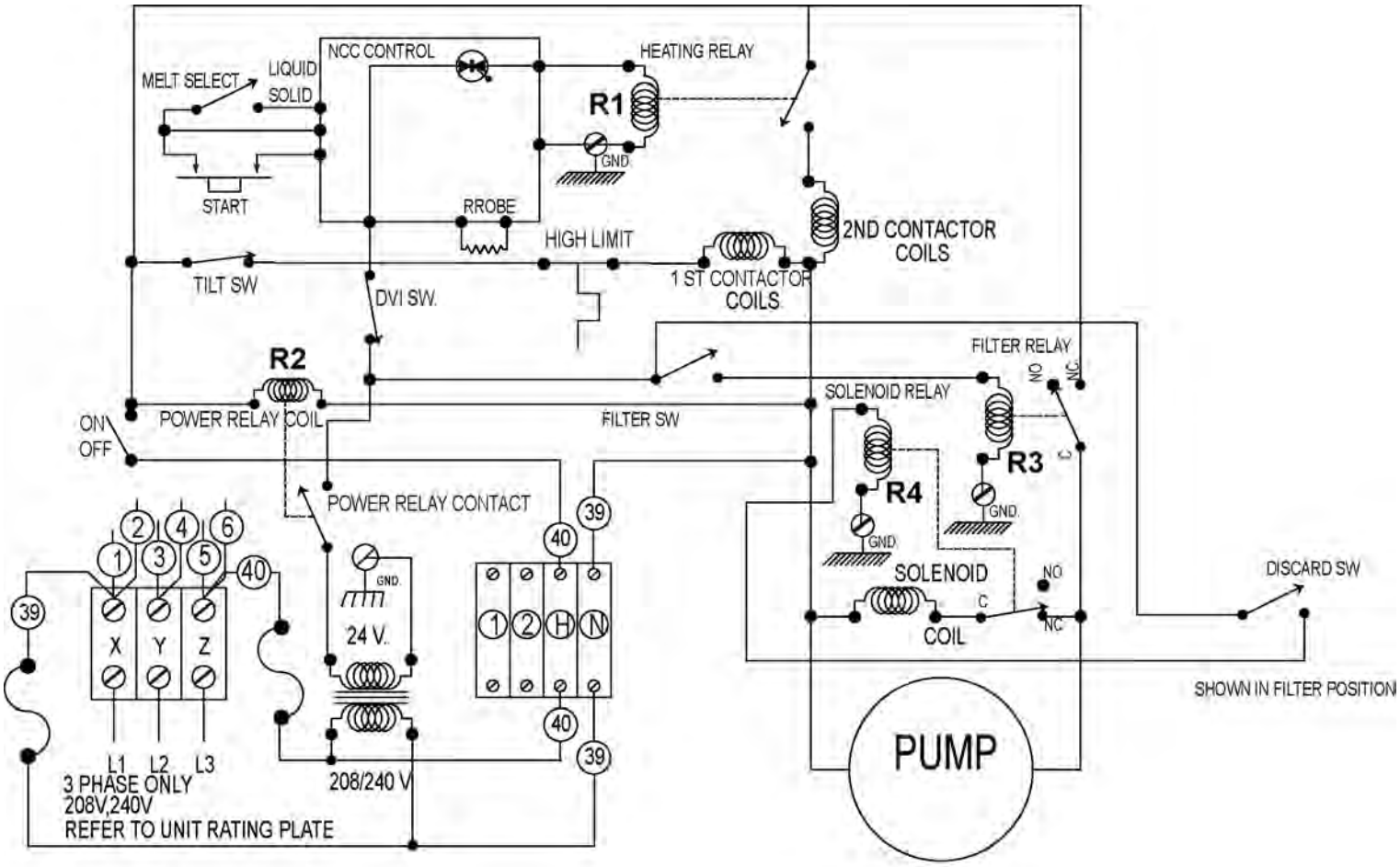
4. Allow shortening to cycle at set temperature for approximately 10 minutes.

NOTE: If using solid shortening, allow hot shortening to stand in filter tank for approximately 6 minutes prior to discarding.

5. Open the manual drain valve to the fryer section in need of discarding and drain the shortening into filter tank. (Heat circuit will be disabled.
6. Connect discard hose. Place other end of discard hose in appropriately-sized receptacle.

7. Pull out discard handle.
   - Discard switch N.O. contacts close.
   - R4 solenoid relay coil energized.
   - R4 N.C. contacts open.
8. Turn filter power switch on.
   A. R3 filter relay coil energized.
   B. R3 N.O. contacts close.
   C. Power supplied to pump motor.
9. Pump motor circulates shortening out discard hose and into receptacle. If discard receptacle is not large enough to hold entire shortening amount
   A. Turn filter switch off to stop pump motor.
   B. Empty receptacle.
   C. Resume discard operation by turning filter switch on.
10. When discard process is complete, turn off filter switch.
    - Power is removed from pump motor.
11. Push in discard handle.

SCHEMATIC DIAGRAMS



CHECK UNIT RATING PLATE FOR THIS UNIT'S KILOWATT POWER INPUT.

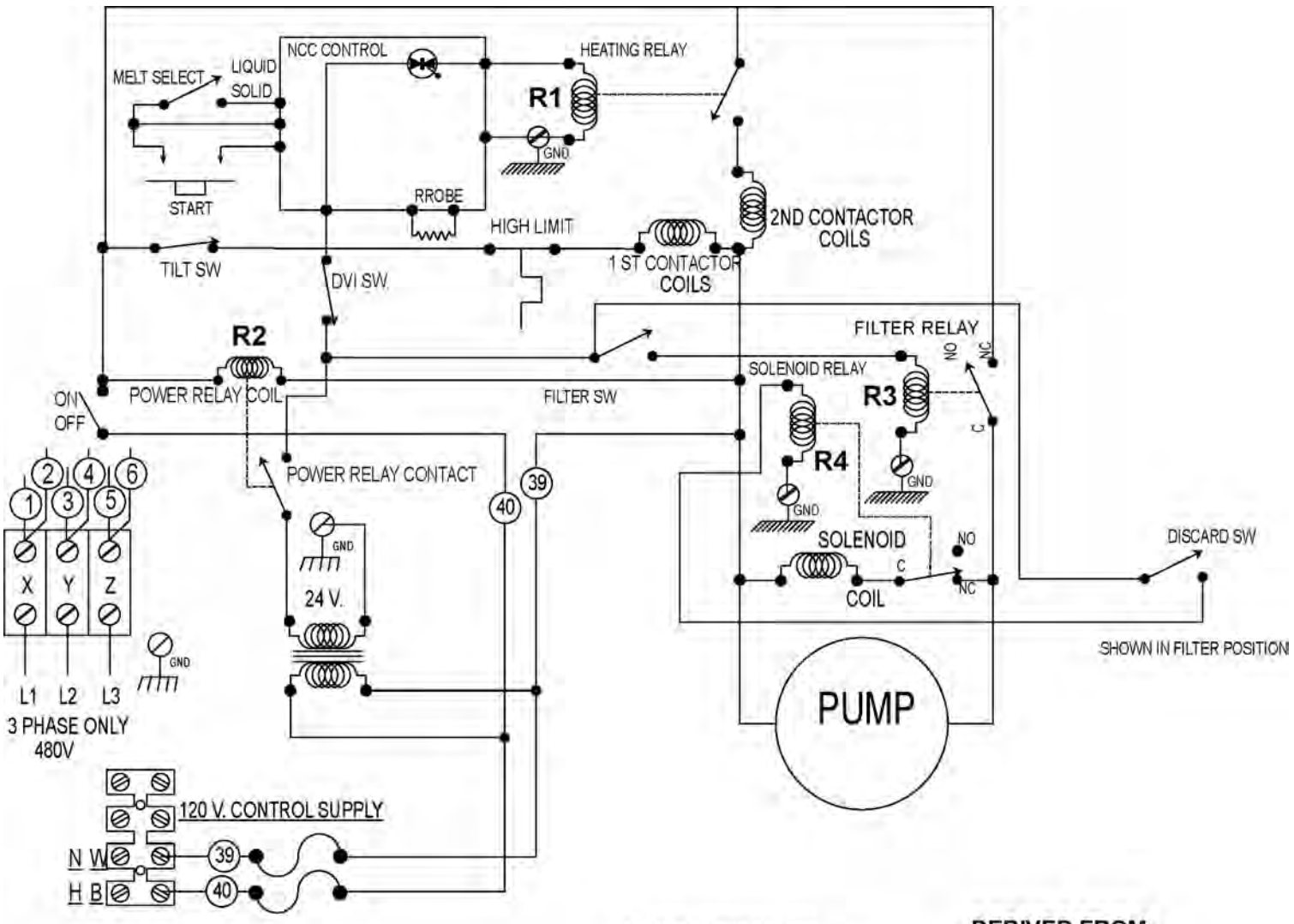
208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8.0	8.0	8.0
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
17	41	41	41
14	34	34	34

DERIVED FROM 957331-2 REV C

AI 2858

208V & 240V Fryers Shown With KleenScreen Filtration System



480 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
24	8	8	8
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE		
	X	Y	Z
24	29	29	29
17	20	20	20
14	17	17	17

DERIVED FROM 957332-2 REV C

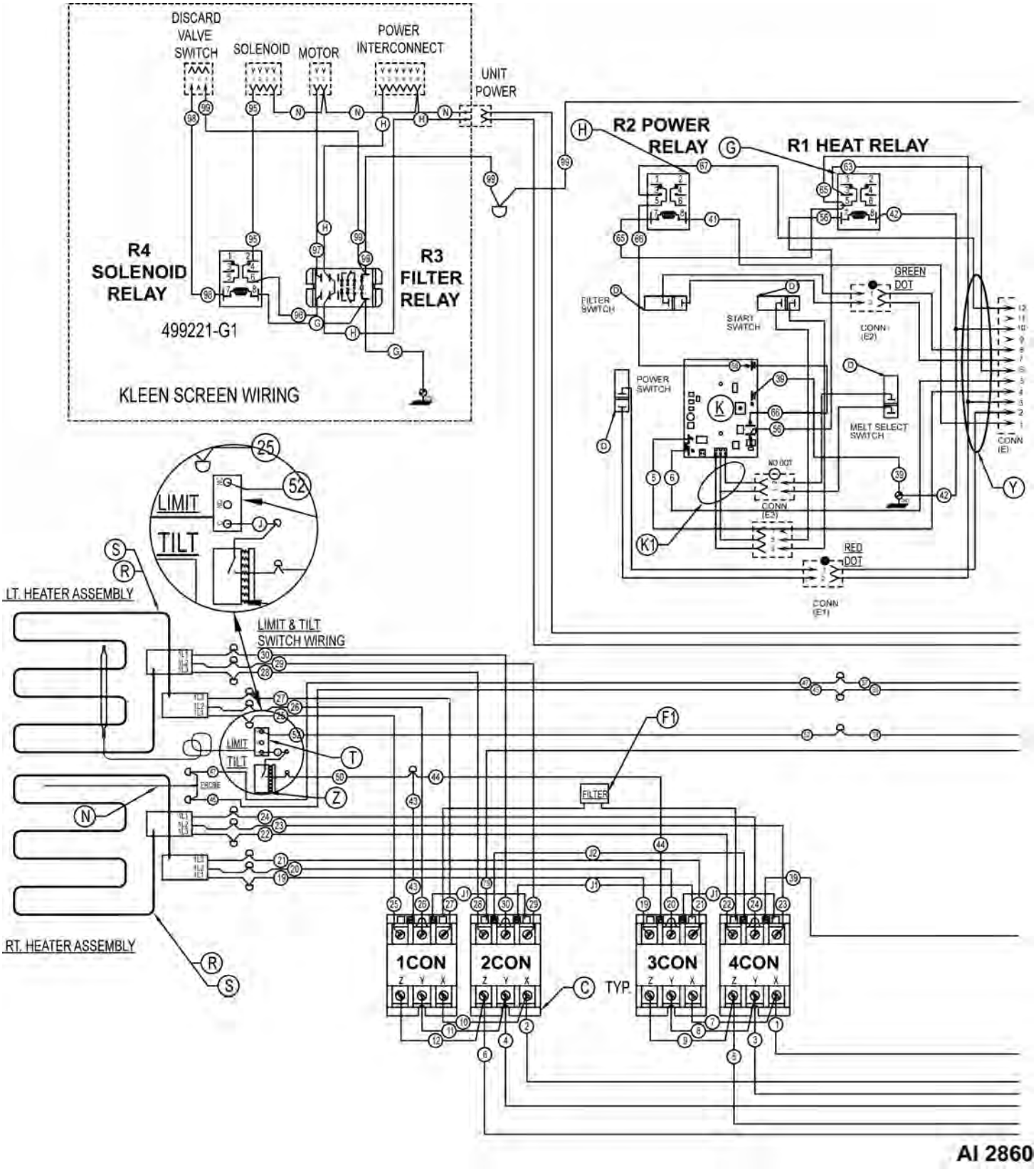
UNIT CONTAINS 2 SOURCES OF SUPPLY
ENSURE BOTH ARE OFF BEFORE SERVICING

CHECK UNIT RATING PLATE FOR THIS UNIT'S KILOWATT POWER INPUT.

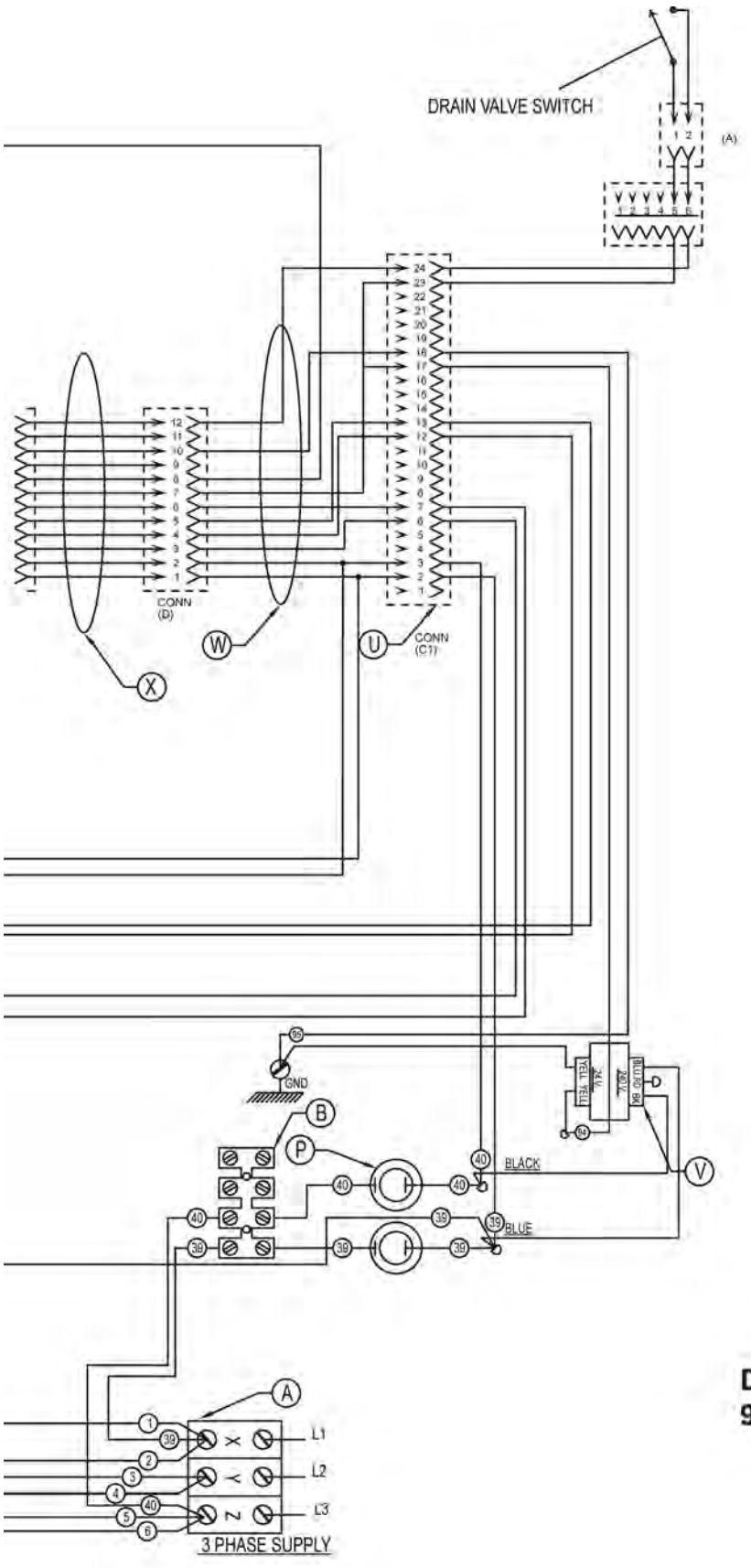
AI 2859

480V Fryers Shown With KleenScreen Filtration System

WIRING DIAGRAMS



208V & 240V (14, 17 kW) Fryers Shown With KleenScreen Filtration System (Sheet 1)



208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34

1	1	F1	FILTER ASSEMBLY SINGLE	
1	1	Z	SWITCH, LIMIT	WIRED / MAGNET
1	1	Y	HARNESS-CONTROL BOX	
1	1	X	HARNESS-POWER TO CONTROL BOX	
1	1	V	TRANSFORMER 40 VA. 240V./24V.	
1	-	W	HARNESS-POWER DISTRIBUTION	
1	1	U	HARNESS-CABLE ASSEMBLY	
1	1	T	2ED HIGH LIMIT 460 F	
2	-	S	ELEMENT, FIREBAR 6.5KW	208 V. / 240 V.
-	2	R	ELEMENT, FIREBAR 7KW	208 V. / 240 V.
2	2	P	FUSE & HOLDER	HOLDER / FUSE
1	1	N	THERMISTOR PROBE	
1	1	K1	NCC CONTROL HARNESS	
1	1	K	NCC TEMPERATURE CONTROL	
1	1	H	RELAY, DPDT 240V COIL	
1	1	G	RELAY, DPDT 24V COIL	
1	1	D1	ROCKER SWITCH ASSEMBLY- START	
2	2	D	ROCKER SWITCH ASSEMBLY	
4	4	C	CONTACTOR 3P 40A 230V COIL	
1	1	B	STRIP-TERMINAL BARRIER	
1	1	A	TERMINAL BLOCK	

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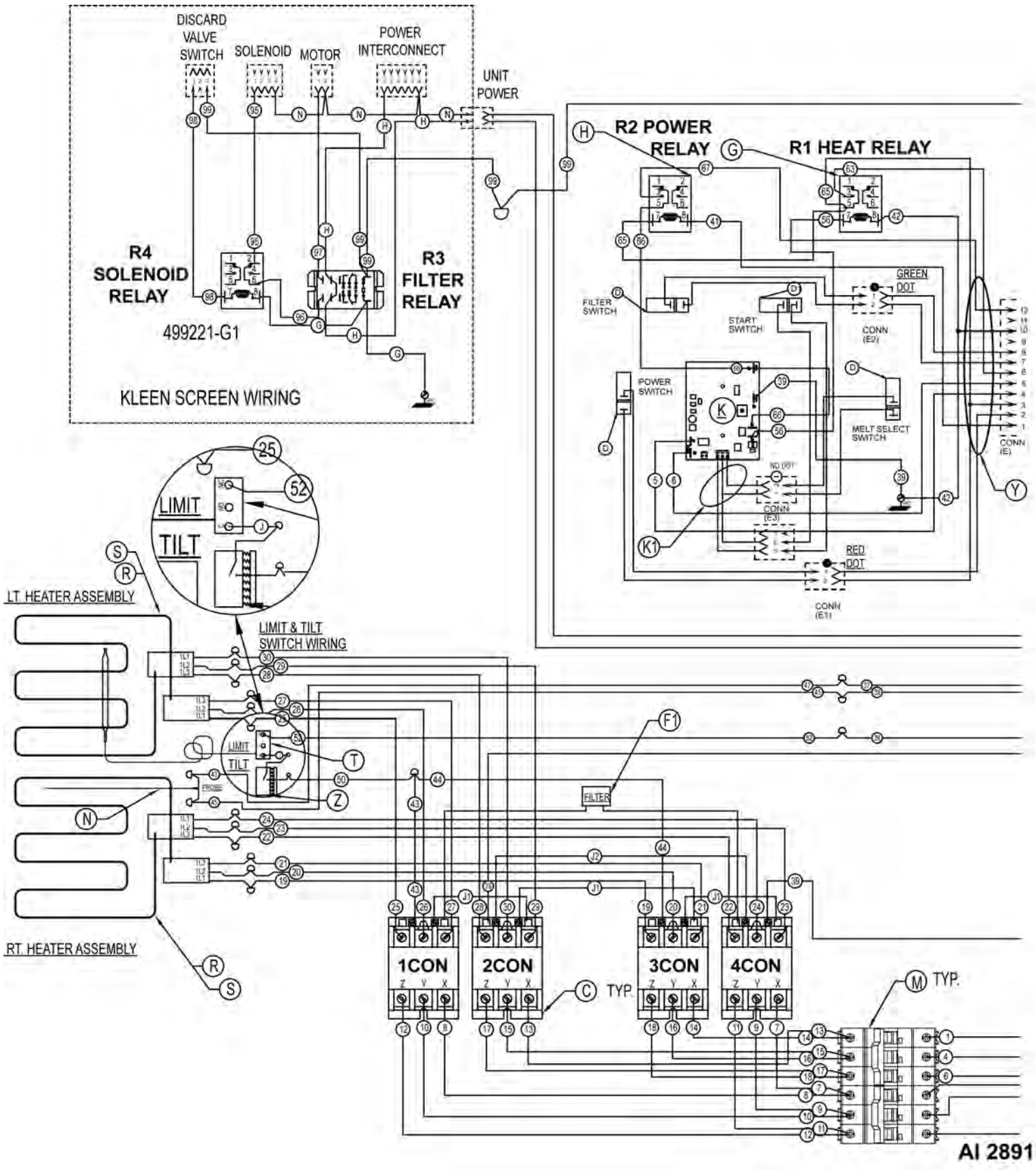
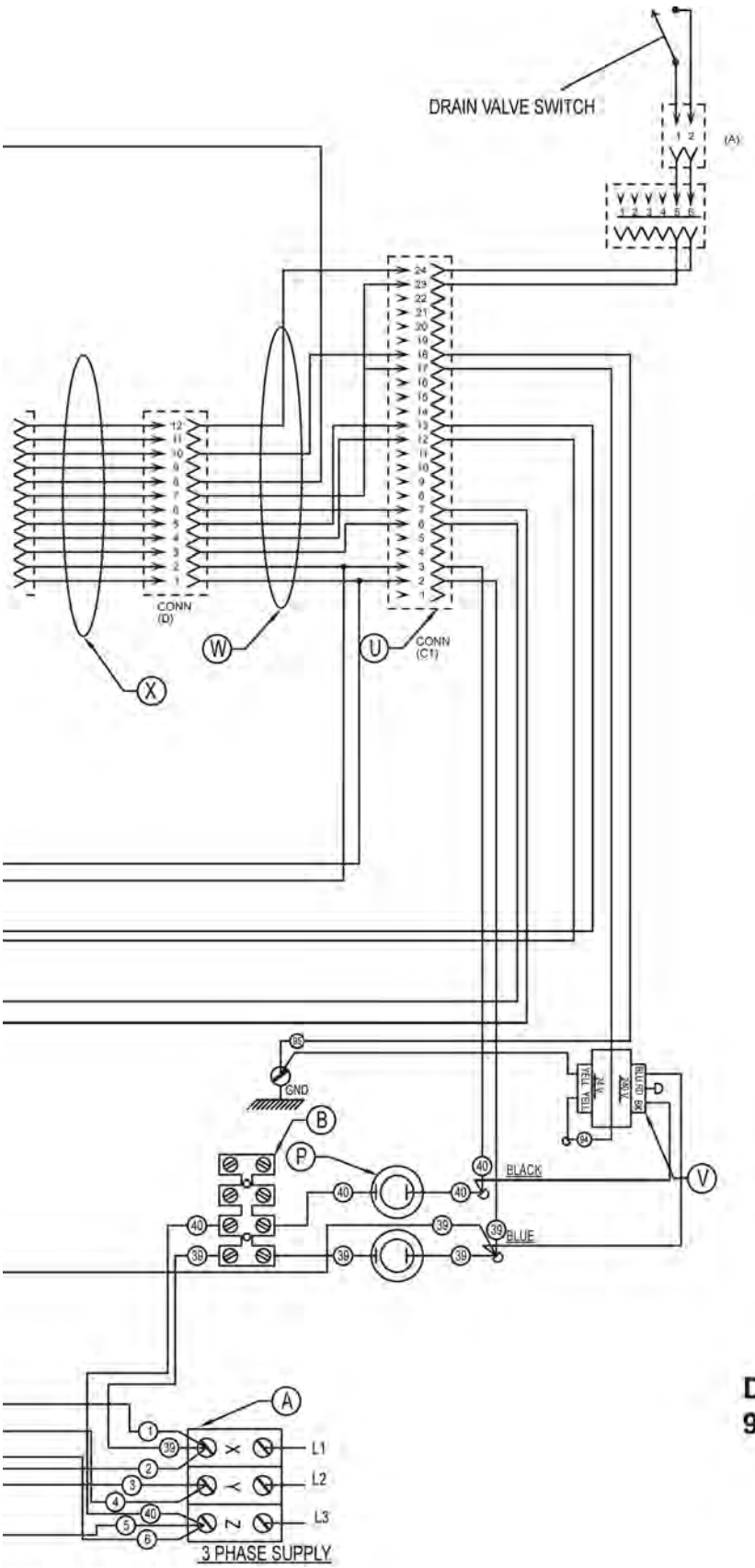
AI 2861

208V & 240V (14, 17 kW) Fryers Shown With KleenScreen Filtration System (Sheet 2)



208V & 240V (24 kW) Fryers Shown With KleenScreen Filtration System (Sheet 1)



208-240 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58

1	-	F1	FILTER ASSEMBLY SINGLE	
1	-	Z	SWITCH, LIMIT	WIRED
				MAGNET
1	-	Y	HARNESS-CONTROL BOX	
1	-	X	HARNESS-POWER TO CONTROL BOX	
1	-	W	HARNESS-POWER DISTRIBUTION	
1	-	V	TRANSFORMER, 40 VA 240V/24V.	
1	-	U	HARNESS-CABLE ASSEMBLY	
1	-	T	2ED HIGH LIMIT 460 F	
2	-	S	ELEMENT, FIREBAR 12KW	208 V.
				240 V.
2	-	P	FUSE & HOLDER	HOLDER
				FUSE
1	-	N	THERMISTOR PROBE	
2	-	M	CIRCUIT BREAKER 50A 3 POLE	
1	-	L	RELAY, TYCO T92S11 DPDT 24V COIL	
1	-	K1	NCC CONTROL HARNESS	
1	-	K	NCC TEMPERATURE CONTROL	
1	-	H	RELAY, DPDT 240V COIL	
2	-	G	RELAY, DPDT 24V COIL	
1	-	D1	ROCKER SWITCH ASSEMBLY- START	
3	-	D	ROCKER SWITCH ASSEMBLY	
4	-	C	CONTACTOR 3P 40A 230V COIL	
1	-	B	STRIP-TERMINAL BARRIER	
1	-	A	TERMINAL BLOCK	

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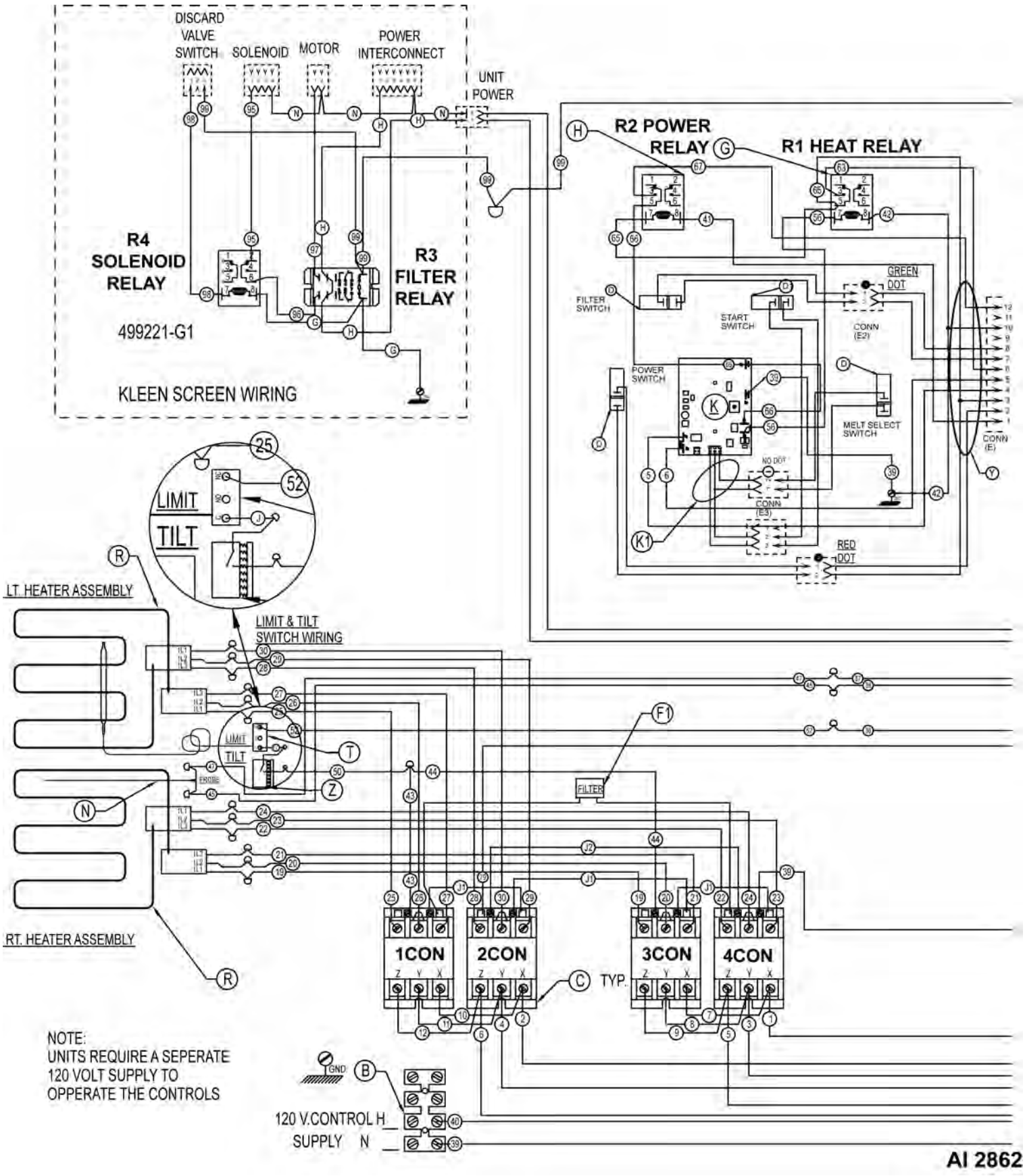
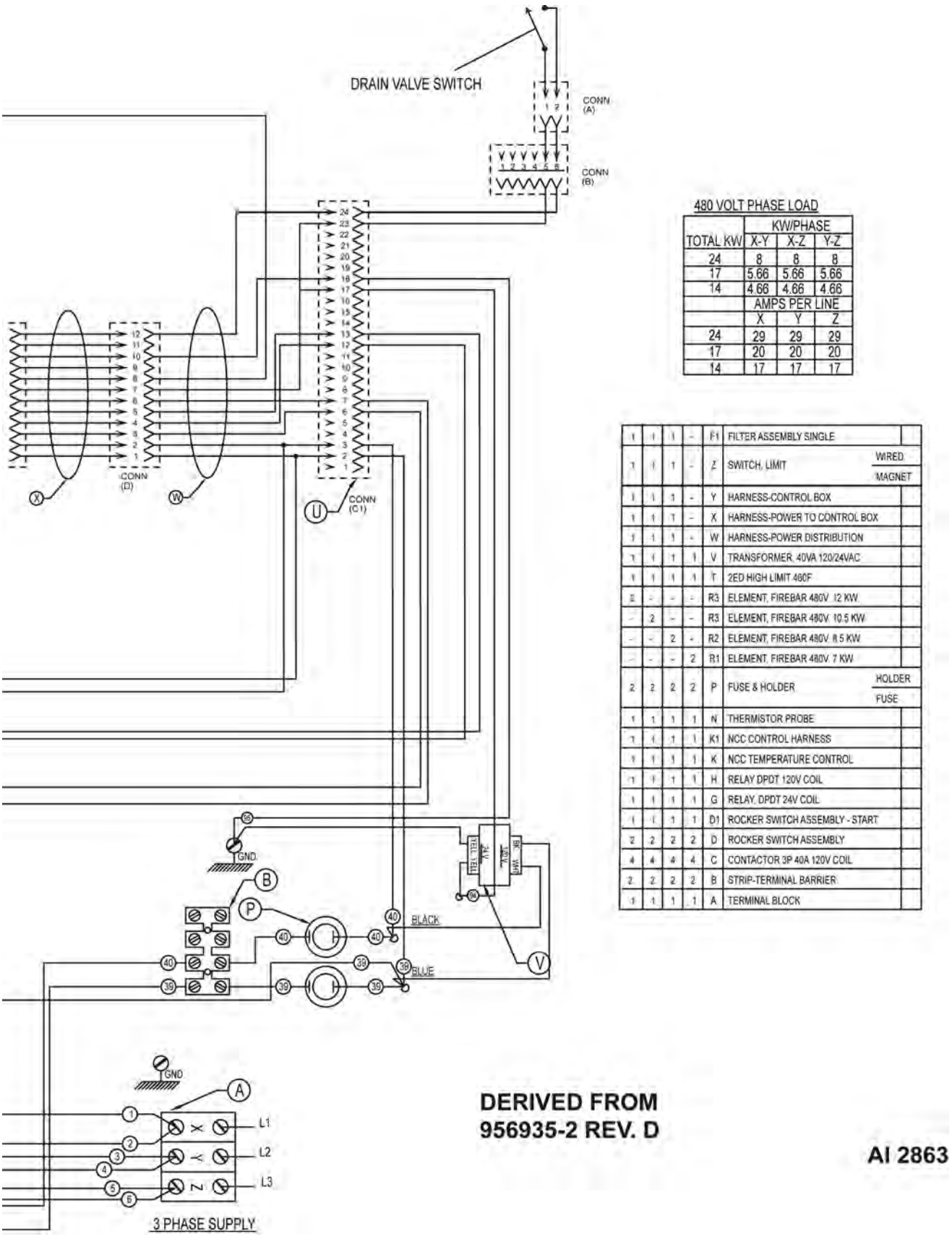
AI 2892

208V & 240V (24 kW) Fryers Shown With KleenScreen Filtration System (Sheet 2)



480V Fryers Shown With KleenScreen Filtration System (Sheet 1)

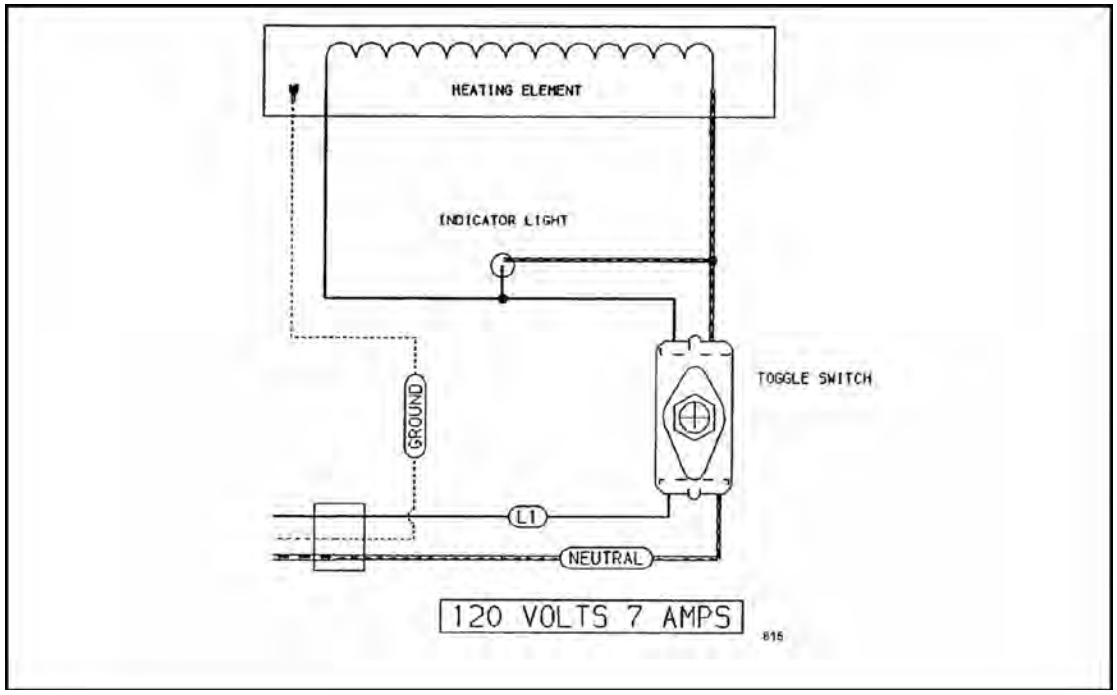


480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE X	Y	Z
24	29	29	29
17	20	20	20
14	17	17	17

1	1	1	-	F1	FILTER ASSEMBLY SINGLE	
1	1	1	-	Z	SWITCH, LIMIT	WIRED / MAGNET
1	1	1	-	Y	HARNESS-CONTROL BOX	
1	1	1	-	X	HARNESS-POWER TO CONTROL BOX	
1	1	1	-	W	HARNESS-POWER DISTRIBUTION	
1	1	1	1	V	TRANSFORMER, 40VA 120/24VAC	
1	1	1	1	T	2ED HIGH LIMIT 460F	
1	-	-	-	R3	ELEMENT, FIREBAR 480V 12 KW	
-	1	-	-	R3	ELEMENT, FIREBAR 480V 10.5 KW	
-	-	1	-	R2	ELEMENT, FIREBAR 480V 8.5 KW	
-	-	-	1	R1	ELEMENT, FIREBAR 480V 7 KW	
2	2	2	2	P	FUSE & HOLDER	HOLDER / FUSE
1	1	1	1	N	THERMISTOR PROBE	
1	1	1	1	K1	NCC CONTROL HARNESS	
1	1	1	1	K	NCC TEMPERATURE CONTROL	
1	1	1	1	H	RELAY DPDT 120V COIL	
1	1	1	1	G	RELAY, DPDT 24V COIL	
1	1	1	1	D1	ROCKER SWITCH ASSEMBLY - START	
2	2	2	2	D	ROCKER SWITCH ASSEMBLY	
4	4	4	4	C	CONTACTOR 3P 40A 120V COIL	
2	2	2	2	B	STRIP-TERMINAL BARRIER	
1	1	1	1	A	TERMINAL BLOCK	

480V Fryers Shown With KleenScreen Filtration System (Sheet 2)



Frymate (Dump Station)

TROUBLESHOOTING

ALL MODELS

SYMPTOMS	POSSIBLE CAUSES
Fryer does not heat, but voltage is present between J2 and J9.	1. Tilt switch covered with debris or malfunction (heating elements are lowered). 2. High limit thermostat open. 3. Contactor(s) malfunction. 4. Cooking control malfunction (no output from terminal J5). 5. R1 heat relay malfunction. 6. Interconnecting wiring malfunction.
Fryer does not heat, voltage notpresent between J2 and J9.	1. Check main power to unit. 2. Internal circuit breaker OFF (24kW, 208-240V units only). 3. Power switch off or malfunction. 4. Transformer inoperative. 5. R2 power relay malfunction. 6. Drain valve switch open or switch malfunction. 7. Interconnecting wiring malfunction.
Excessive time to melt solid shortening (more than 45 minutes).	1. Melt cycle timing incorrect. 2. Incorrect supply voltage. 3. Temperature probe malfunction. 4. Cooking control malfunction.
Excessive or low heat.	1. Incorrect supply voltage. 2. Temperature probe malfunction. 3. Contactor(s) malfunction. 4. R1 heat relay malfunction. 5. Heating element malfunction (low heat). 6. Cooking control malfunction.
Intermittent problems.	1. High ambient temperatures. 2. Wiring connections loose.

FRYMATE (DUMP STATION) WITH OPTIONAL HEATER

SYMPTOMS	POSSIBLE CAUSES
Fryer does not heat, but voltage is present between J2 and J9.	1. Unplugged. 2. Power switch off or inoperative. 3. Main circuit breaker off or open. 4. Malfunctioning heater assembly.

KLEENSCREEN FILTERING SYSTEM

SYMPTOMS	POSSIBLE CAUSES
Shortening not filtering, pump motor is energized.	1. Clog in filter system lines. **NOTE:** If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 2. Shortening below 300°F to thick. 3. Fill solenoid valve malfunction. 4. Interconnecting wiring malfunction. 5. Pump is inoperative.
Shortening not discarding, pump motor energized.	1. Filter screen plugged. **NOTE:** If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 2. Clog in filter system lines. 3. Shortening below 300°F to thick. 4. Discard valve switch malfunction (N.O. contacts not closing to energize R3 filter relay coil). **NOTE:** The fill solenoid valve should not be energized during discard operation so that shortening will flow thru manual discard valve only. 5. R3 fill relay malfunction (contacts remain closed). 6. Discard valve mechanical malfunction. 7. Discard hose connection not fully engaged. 8. Pump is inoperative.

SYMPTOMS	POSSIBLE CAUSES
Pump motor is not energized to circulate shortening thru filtering system.	1. Filter switch on cooking controls not turned on. 2. Pump needs reset. (Reset button located on pump.) 3. R3 filter relay malfunction. 4. Interconnecting wiring malfunction. 5. Pump motor inoperative.
Pump motor is not energized to discard shortening. 1	1. Filter switch on cooking controls not turned on. 2. Pump needs reset. (Reset button located on pump) 3. Discard handle (yellow) not extended. 4. R3 filter relay malfunction. 5. Interconnecting wiring malfunction. 6. Pump motor inoperative.

SERVICE MANUAL

ERC50 WITH DUAL BASKET LIFTS SHOWN

ER SERIES ELECTRIC FRYERS WITH TRIDELTA CONTROLS

MODEL	ML
ERD50	135541
ERD85	135543
ERC50	135545
ERC85	135547
ERD50F	135561
ERD85F	135563
ERC50F	135565
ERC85F	135567
ERO15	135548
ERO21	135549

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified. If you have attended a Vulcan Service School for this product, you may be qualified to perform all the procedures described in this manual.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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For additional information on Vulcan-Hart Company or to locate an authorized parts and service provider in your area, visit our website at www.vulcanhart.com.

A product of VULCAN-HART LOUISVILLE, KY 40201-0696

F35613 (September 2003)

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GENERAL

INTRODUCTION

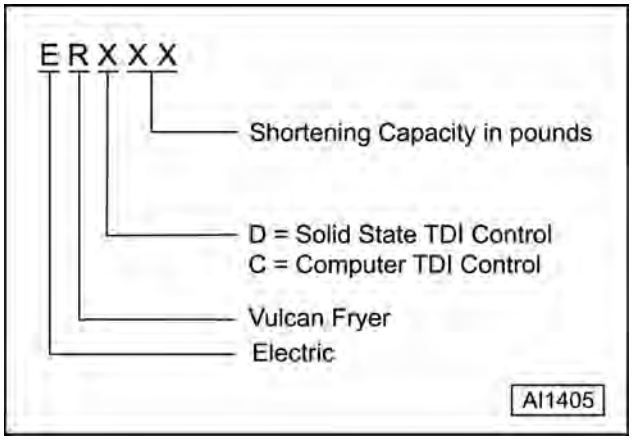
This Service Manual covers specific service information related to the models listed on the front cover. Current production model fryers are built using a solid state control and computer control from Tridelta Industries (TDI).

SINGLE FLOOR MODEL FRYERS

Fryers with the Filter-Ready option installed, use the Mobile Filter. For service information related to the Mobile filter, refer to F24599 MOBILE FILTERS.

An ERO Frymate (dump station) can be configured in a battery with fryers 15 1/2 inches or 21 inches in width.

Model Designations



Models, Features and Options

MODEL	FEATURES					OPTIONS
	FRYER WIDTH (INCHES)	SHORTENING CAPACITY (POUNDS)	FRY TANK	COOKING CONTROL	COOK TIMER (MM:SS)	AUTOMATIC BASKET LIFTS
ERD50	15 1/2	45-50	Full	Solid State	0-99:59	Single or Dual
ERD85	21	85-90	Full	Solid State	0-99:59	Single or Dual
ERC50	15 1/2	45-50	Full	Computer	0-99:59	Single or Dual
ERC85	21	85-90	Full	Computer	0-99:59	Single or Dual
ERO15 (Frymate)	15 1/2					
ERO21 (Frymate)	21					

KLEENSCREEN FILTERING SYSTEM

The Kleenscreen filtering system has been integrated into the ER Series fryer battery. The filter is housed in a pull-out drawer assembly at the base of the fryer. The filtering components in the drawer include a stainless steel filter tank, crumb-catch basket and a dual element mesh filter screen. With the filter drawer closed, a self-seating oil return line provides the path to return the filtered shortening to the fry tank.

This system is designed to provide a thorough and easy method for filtering shortening.

Some of the benefits include:

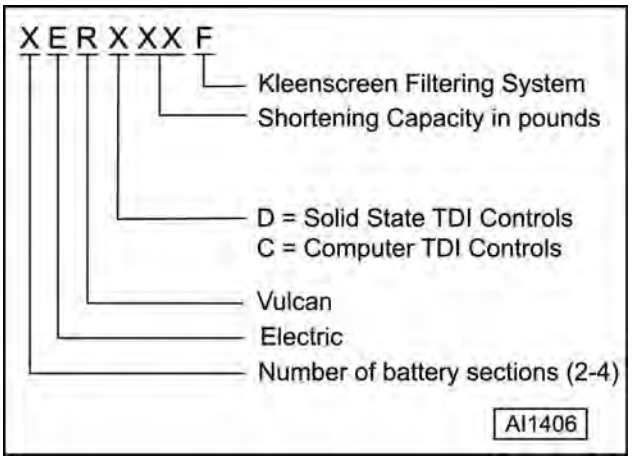
- Self-contained system eliminating the use of external filter equipment.
- Paperless filtering system.
- Easy to clean and low maintenance.

The fryer battery still utilizes many of the same components as the Vulcan ER series fryers.

Kleenscreen fryer batteries are available in a minimum of two and a maximum of four fryer sections. The fryer size of each section is identical.

An ERO Frymate (dump station) can be included as one of the sections.

Model Designations



Models, Features and Options

MODEL	FEATURES						OPTIONS
	FRYER WIDTH (INCHES)	FRYING OIL CAPACITY PER FRYER (POUNDS)	FILTER PAN CAPACITY (POUNDS)	FRY TANK	COOKING CONTROL	COOK TIMER (MM:SS)	AUTOMATIC BASKET LIFTS
2ERD50F [1]	42	45-50	130	Full	Solid State	0-99:59	Single or Dual
2ERD85F [2]	42	85-90	130	Full	Solid State	0-99:59	Single or Dual
2ERC50F [1]	31	45-50	130	Full	Computer	0-99:59	Single or Dual
2ERC85F [2]	42	85-90	130	Full	Computer	0-99:59	Single or Dual
ERO15 (Frymate)	15 1/2						
ERO21 (Frymate)	21						
NOTES:	1. For each additional fryer section, add 15 1/2 inches to the width. 2. For each additional fryer section, add 21 inches to the width.						

SPECIFICATIONS

MODEL	KW PER FRYER SECTION [2]	AMPS - EACH FRYER SECTION (3 PHASE/ 60HZ) [1]		
		PER LINE		
		208V	240V	480V
ERD50,	14	39	34	17
ERD50F	17	47	41	20
ERD85, ERD85F	24	67	58	29
ERC50,	14	39	34	17
ERC50F	17	47	41	20
ERC85, ERC85F	24	67	58	29
NOTES:	1. Amperage values in the table are nominal. Tolerance is +5/-10%. 2. 14kw is standard on all fryers except 85 lb. models which are 24kw.			

Single Floor Model Fryers

- Fryers with the Filter-Ready option installed, use a 120VAC power cord for the Mobile Filter.
- 208VAC, 240VAC or 480VAC (3 phase, 60HZ) to power the heating elements.

Kleenscreen Filtering System

Separate electrical connections are required for each section of the battery.

- 208VAC, 240VAC or 480VAC (3 phase, 60HZ) to power the heating elements.
- On 208VAC and 240VAC models, a transformer provides power for the fryer controls, basket lift(s) if installed, and Kleenscreen filtering controls.
- On 480VAC models, a 120VAC connection is required for each fryer section.
- All models require a separate 120VAC connection for the pump motor (5.0 amp draw).

TOOLS

Standard

- Standard set of hand tools.
- VOM with AC current tester.

  NOTE: Any quality VOM with a sensitivity of 20,000 ohms per volt can be used.
- Temperature tester (thermocouple type).

Special

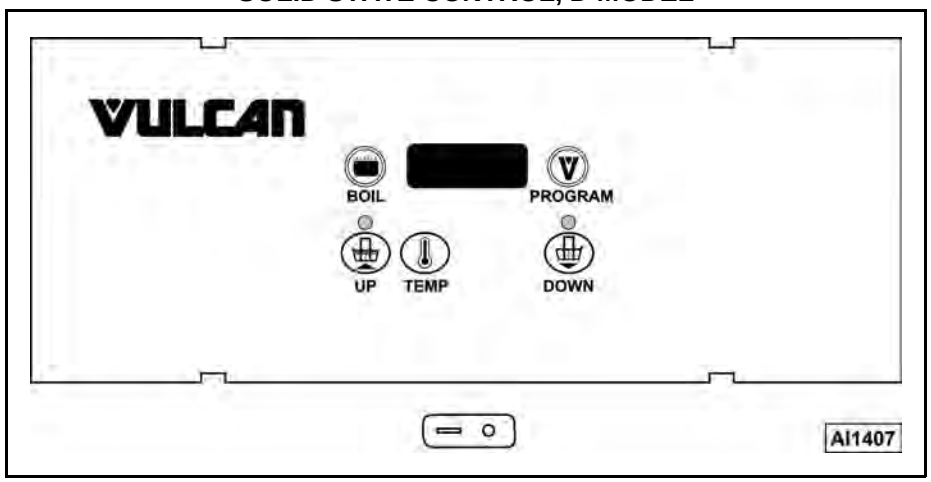
- Field service grounding kit P/N TL- 84919.
- Loctite 242 P/N 520228 or equivalent.
- Burndy pin extraction tool RX2025 GE1; Newark Electronics Catalog Number 16F6666. Used for removing pin terminals on Burndy connectors.

CONTROL PANELS

Solid State

- Five product/programming keys: Left basket (up arrow); Right basket (down arrow); Temperature; Program and Boil.
- Four digit display window that indicates fryer status, time left to cook, and actual or set point temperature. Decimal point of first character indicates heat on when lit.
- Two LED lamps that illuminate when a basket timer is being programmed or blink to when a timer is activated (left or right basket).
- Boil key for automatic or manual mode BOIL out cleaning of fry tank.

SOLID STATE CONTROL, D MODEL

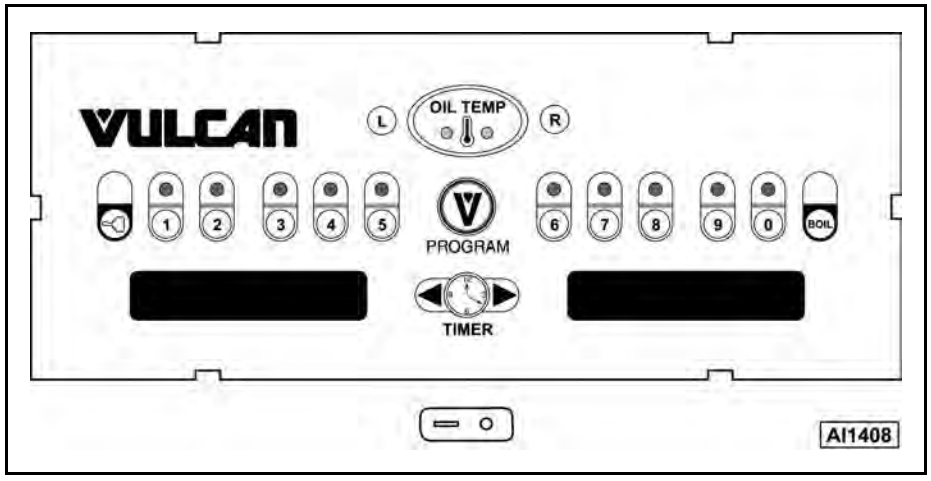


Computer

- Eighteen product/programming keys allow individual product cooking times for up to ten different products: Product/Programming keys 1 thru 0; Oil Temp to view actual temperature or set the desired product cooking temperature; L & R (Left & Right) basket selection; Toggle; Boil; and two Timer keys.

  Left & Right Arrows - used to initiate programming of time and checking stored values (left 1-5 & right 6-0).
- Left & Right displays that indicate actual or set point temperature, remaining times, operating mode, and completion of preheat period.
- Two LED lamps on the OIL TEMP key that indicate heat on and ten individual LED lamps above each of the ten product/programming keys: LED's blink when a product key is activated, solid when using a key for programming.
- Boil key for automatic or manual mode BOIL out cleaning of fry tank.

COMPUTER CONTROL, C MODEL



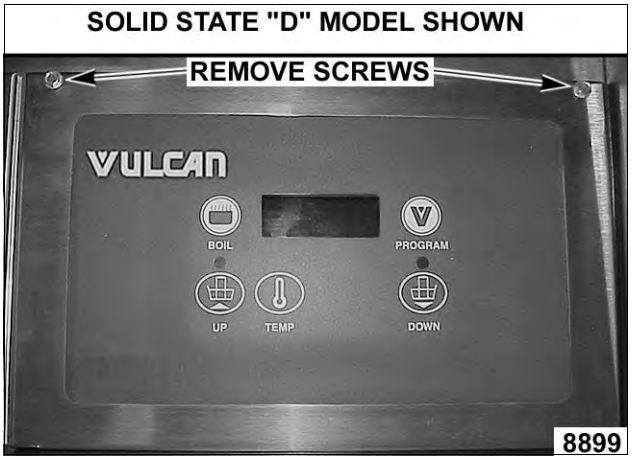
REMOVAL AND REPLACEMENT OF PARTS

COVERS AND PANELS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

Control Panel

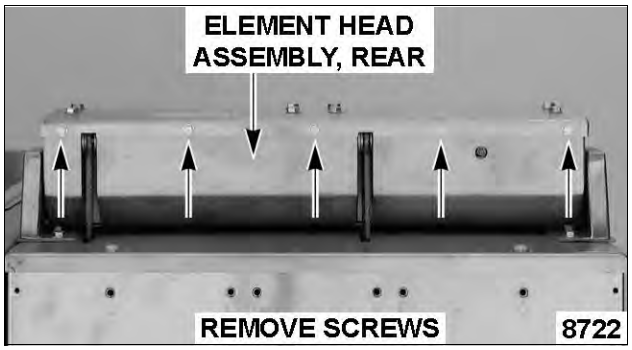
1. Remove screws at top of control panel and lower panel.



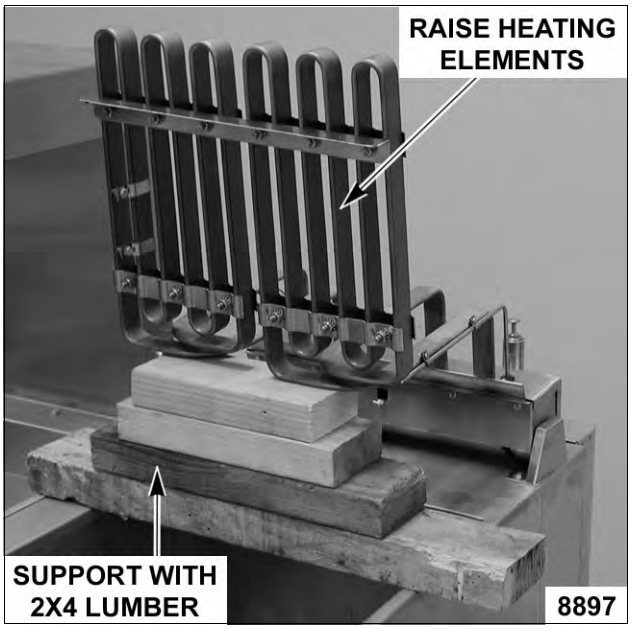
2. Disconnect wiring harness then remove control panel.
3. Reverse procedure to install.

Element Head Cover

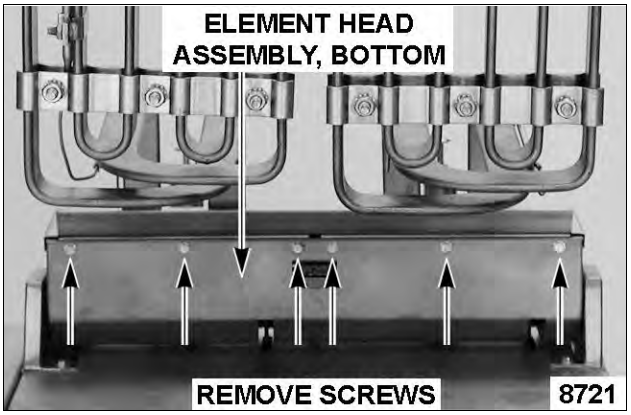
1. Remove basket hanger or lift arm(s) if basket lift option is installed.
2. Remove screws from rear of element head assembly.



3. Raise heating elements and place 2x4 lumber under them for support.



4. Remove screws from the bottom of element head assembly.



5. Grasp heating elements and remove 2x4 lumber. Lift the elements and pull toward rear of fryer. Head cover will separate from element head base.
   A. Lower the heating elements and place them in fry tank.

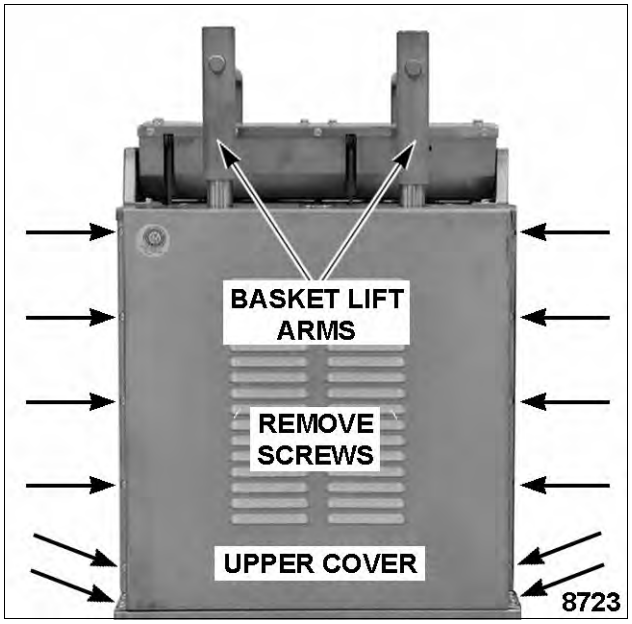
NOTE: Heating elements remain attached to element head cover.

6. Reverse procedure to install.

Basket Lift Covers

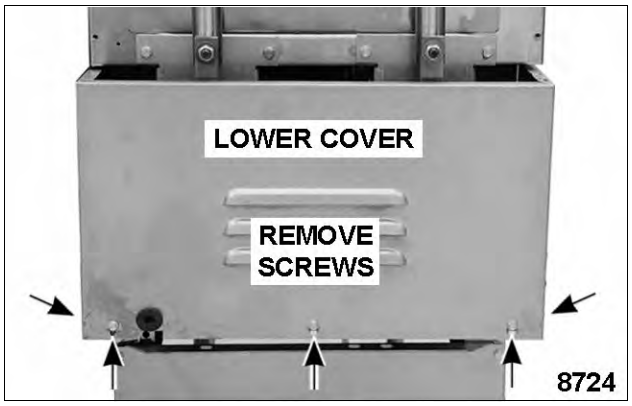
NOTE: Applies to fryers with basket lift option only.

1. Access rear of fryer.
2. Remove basket lift arms from lift tubes.
3. Remove screws securing upper cover to fryer.



A. Lift the upper cover over support rods to remove.

4. Remove screws securing lower cover to motor mounting base.



5. Reverse procedure to install.

Rear Door (Access Cover)

1. Access rear of fryer.
2. Remove basket lift covers if basket lift option is installed.
3. Remove access cover at the top.

NOTE: The cover is flanged at the top & bottom and is held in place by an interference fit. The bottom flange is formed to secure the cover to fryer.

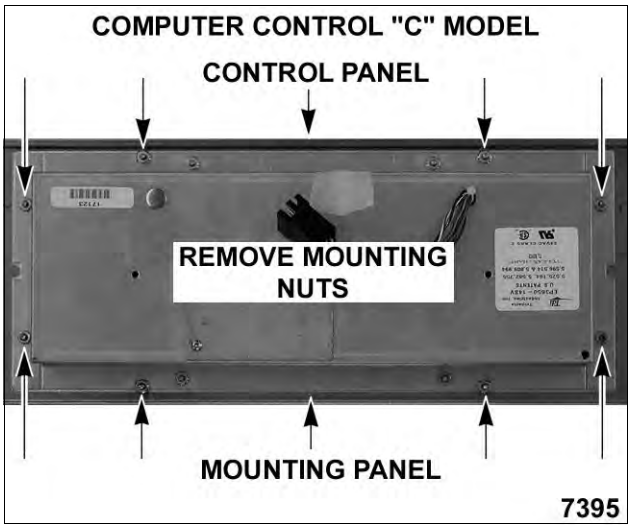
4. Reverse procedure to install.

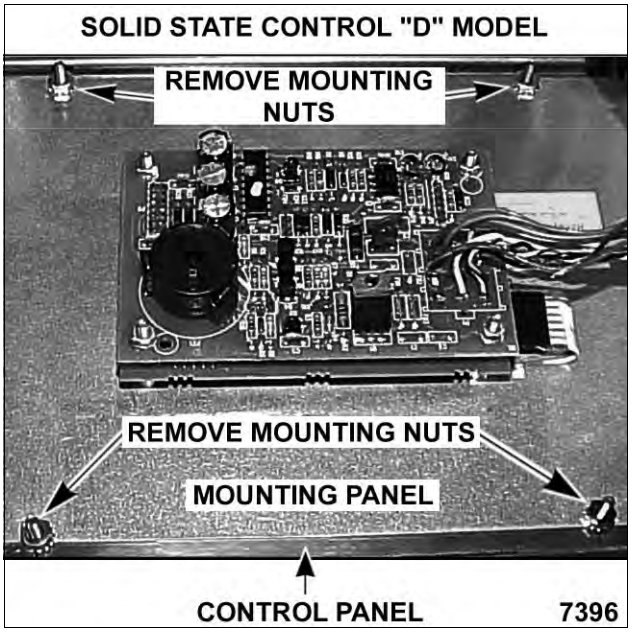
COOKING CONTROLS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

CAUTION: Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service ground kit is available to prevent damage. The field service grounding kit must be used anytime the control board is handled.

1. Remove the control panel as outlined under CONTROL PANEL.
2. Remove cooking control by removing mounting nuts securing the control and mounting panel to front control panel.





3. Lift the cooking control with mounting panel attached, off the front control panel.
4. Reverse procedure to install.
5. Re-connect power and turn power switch on.
6. Program the cooking control for the control type as outlined under SOLID STATE CONTROL or COMPUTER CONTROL in SERVICE PROCEDURES AND ADJUSTMENTS.

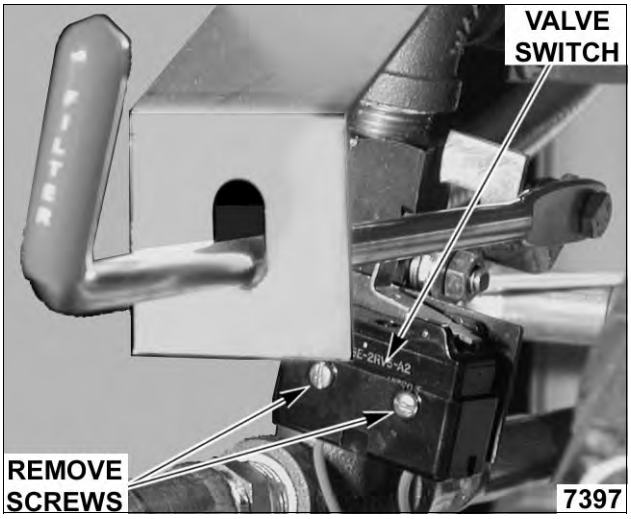
NOTE: If installing a replacement cooking control, program the control with the customers settings and products.

7. Check for proper operation.

FILTER VALVE AND DISCARD VALVE SWITCHES

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Open the door to the fryer section being serviced.
2. Disconnect lead wire connector (2 pin) to the switch.
3. Remove switch mounting screws.



4. Remove switch cover and disconnect lead wires from switch.
5. Reverse procedure to install and check for proper operation.

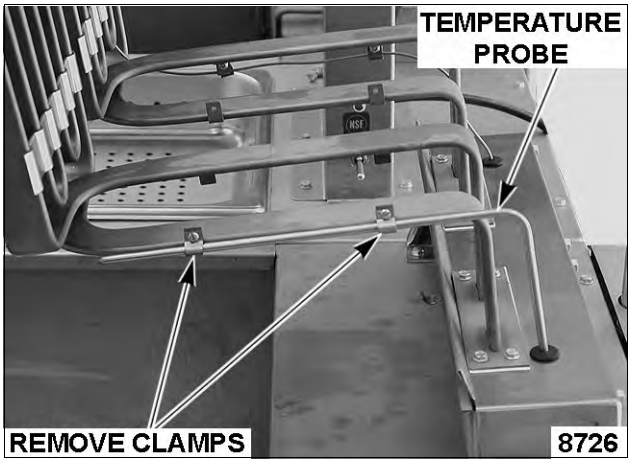
NOTE: Switches are not adjustable.

TEMPERATURE PROBE

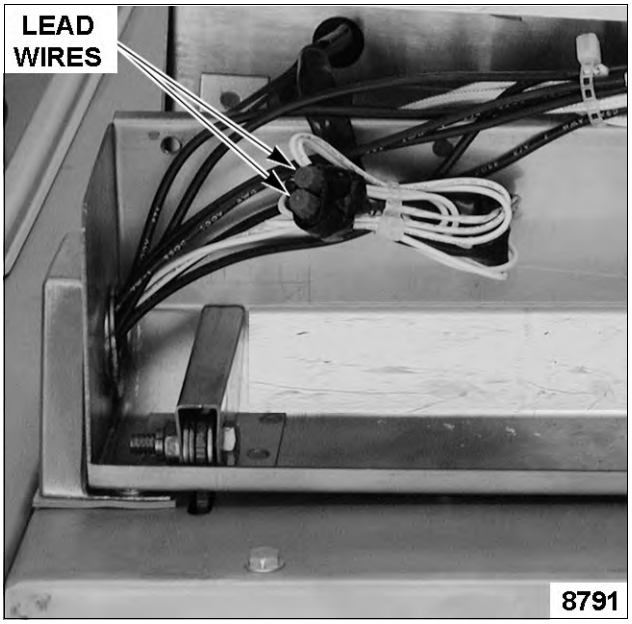
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

CAUTION: Do not sharply bend and kink the temperature probe or damage may occur.

1. Raise heating elements.
2. Remove clamps from temperature probe.



3. Remove element head cover as outlined under COVERS AND PANELS.
4. Disconnect temperature probe lead wires.



5. Remove temperature probe from the element head.
6. Reverse procedure to install.

NOTE: When installing, ensure grommet remains in place when inserting temperature probe thru the grommet in the element head.

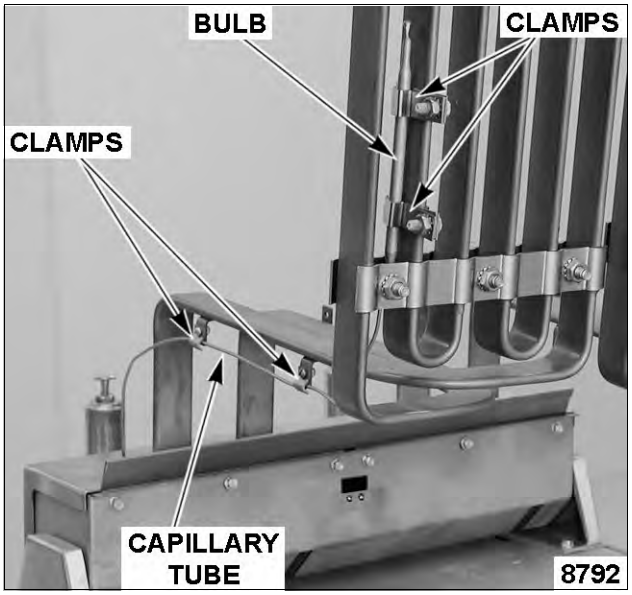
7. Check cooking control calibration as outlined in COOKING CONTROL CALIBRATION under SERVICE PROCEDURES AND ADJUSTMENTS.

HIGH LIMIT THERMOSTAT

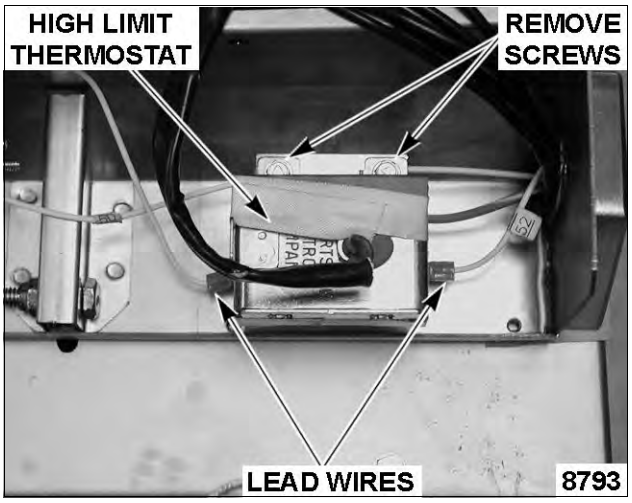
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

CAUTION: Do not sharply bend and kink the capillary tube or damage may occur.

1. Raise heating elements.
2. Loosen clamps securing capillary tube and bulb to element.



3. Remove element head cover as outlined under COVERS AND PANELS.
4. Remove high limit from mounting bracket.
5. Disconnect high limit lead wires.



6. Remove grommet from the element head assembly.
7. Remove the bulb, capillary tube and high limit from the element head assembly.

NOTE: When installing, slide grommet onto capillary tube then insert grommet into the capillary tube thru hole in the element head.

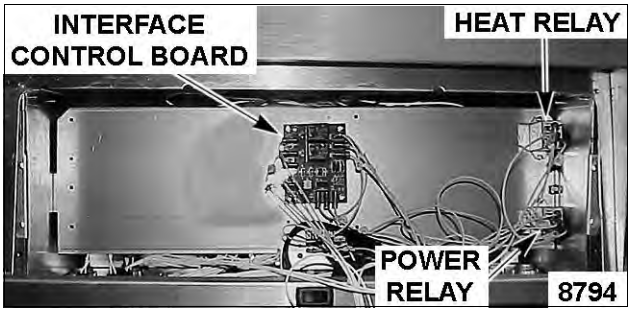
8. Reverse procedure to install.

POWER SUPPLY BOX COMPONENTS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

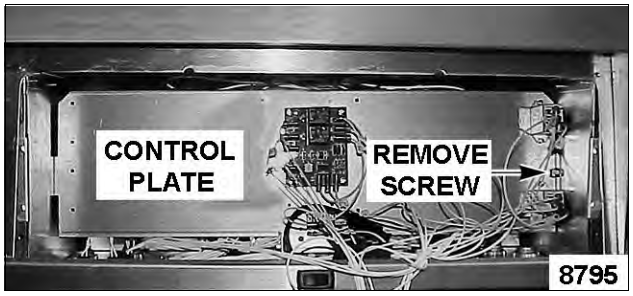
CAUTION: Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service grounding kit is available to prevent damage. The field service grounding kit must be used anytime a control board is handled.

1. Remove the control panel as outlined under CONTROL PANEL.
2. Disconnect lead wires then remove the component being replaced.



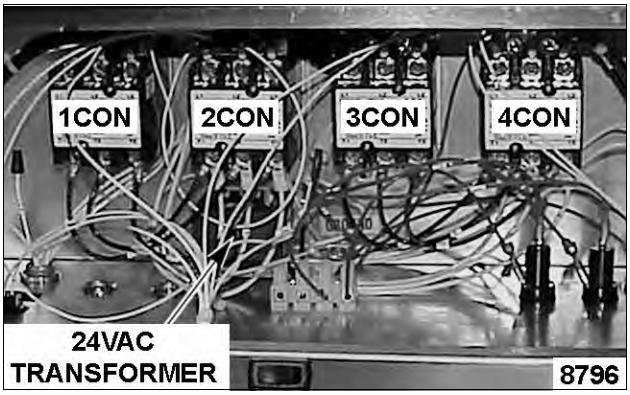
   A. If removing, contactor(s), transformer, or filter relay, continue with procedure.

3. Remove screw securing control plate to box.



   A. Grasp control plate on the right side at the top, and pull out until left side holding tab clears slot.

4. Disconnect lead wires then remove the component being replaced.



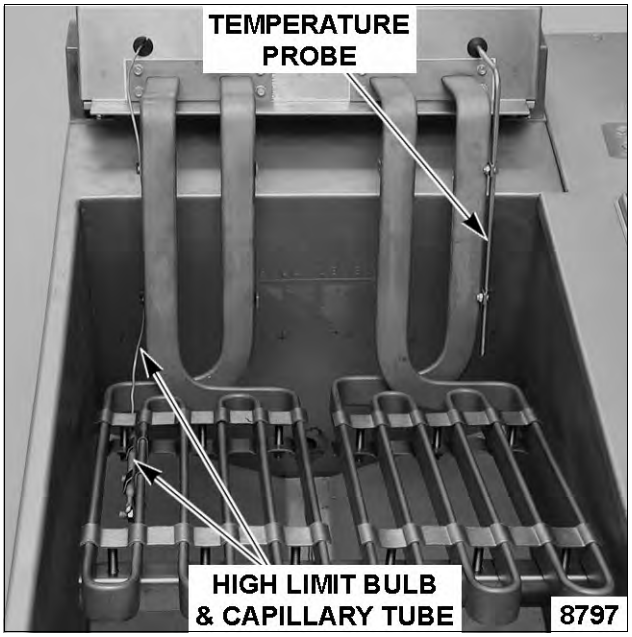
5. Reverse procedure to install the replacement component and check for proper operation.

HEATING ELEMENTS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

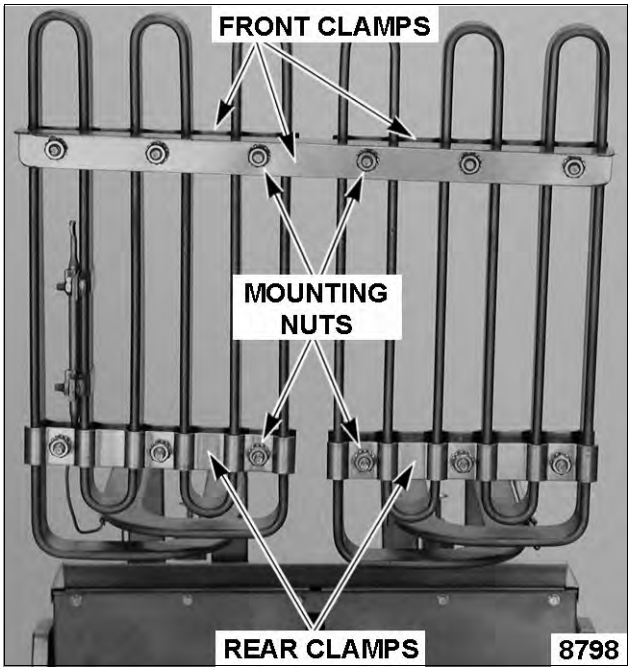
CAUTION: Do not sharply bend and kink the capillary tube or the temperature probe, or damage may occur.

1. Remove basket hanger or lift arm(s) if basket lift option is installed.
2. Raise heating elements.
   A. If replacing left heating element, loosen high limit bulb and capillary tube clamps. Remove high limit bulb and capillary tube from clamps then position away from element.
   B. If replacing right heating element, remove temperature probe clamps and position temperature probe away from element.



NOTE: When installing high limit, route the capillary tube and center the bulb between the clamps before tightening.

3. Remove element assembly clamps. Front clamps stiffen and secure both elements together. Rear clamps stiffen each individual element.

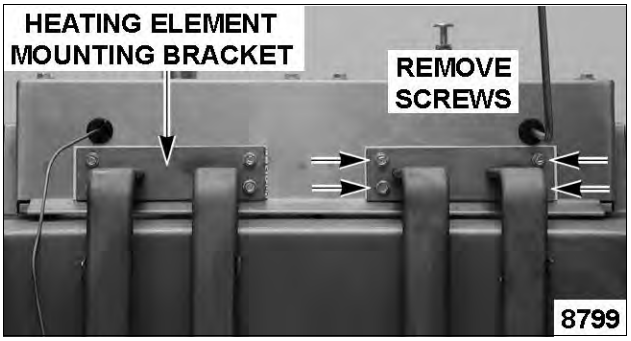


4. Remove element head cover as outlined under COVERS AND PANELS.

5. Disconnect heating element lead wires.

NOTE: Each heating element assembly contains three individual elements (six lead wire connections total).

6. Remove screws from heating element mounting bracket and remove heating element.



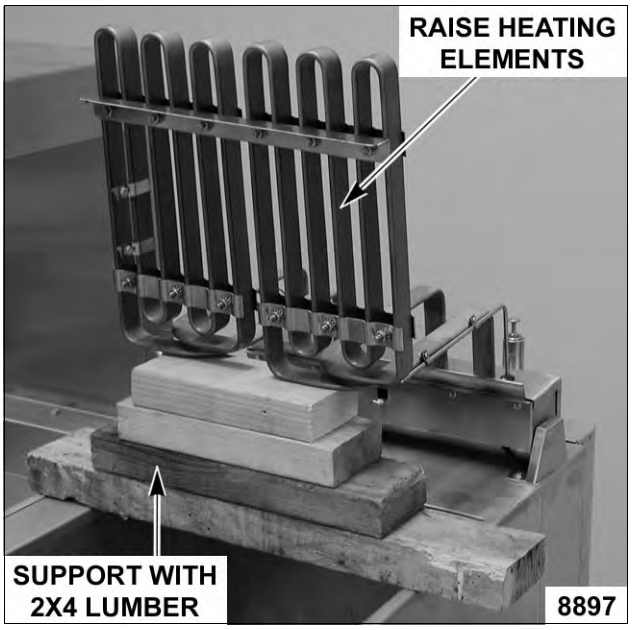
7. Reverse procedure to install.

LIFT ASSIST SPRINGS

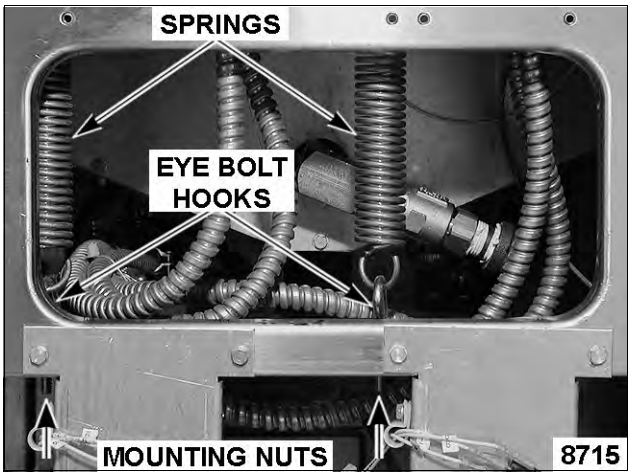
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Remove rear door (access cover) as outlined under COVERS AND PANELS.

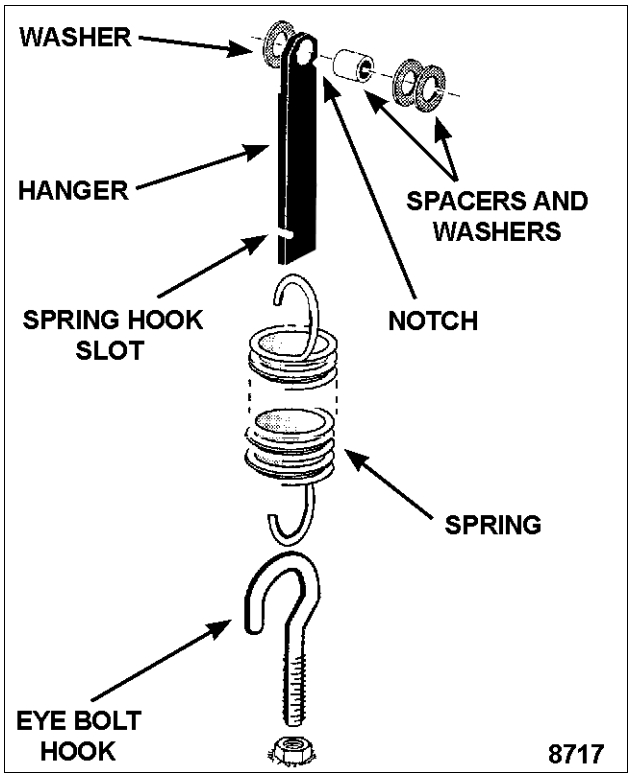
2. Raise heating elements and place 2x4 lumber under them for support. Heating elements are to remain upright.



3. Loosen all eye bolt mounting nuts to release tension on springs.



4. Remove lift assist springs from the eye bolt hooks.
5. Remove lift assist springs from the hangers.
6. To install springs:
   A. Attach spring hook to hanger thru rear door opening.
   B. Attach spring hook to eye bolt and tighten eye bolt mounting nut.

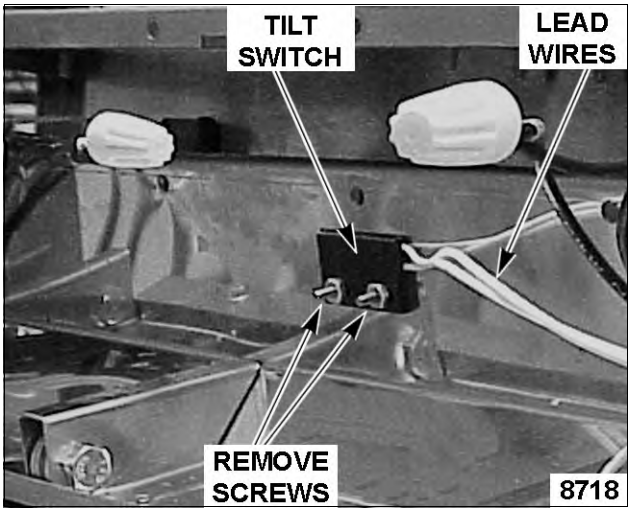


   C. Remove 2x4 lumber and lower heating elements.
7. Adjust spring tension as outlined under LIFT ASSIST SPRING ADJUSTMENT in SERVICE PROCEDURES AND ADJUSTMENTS.

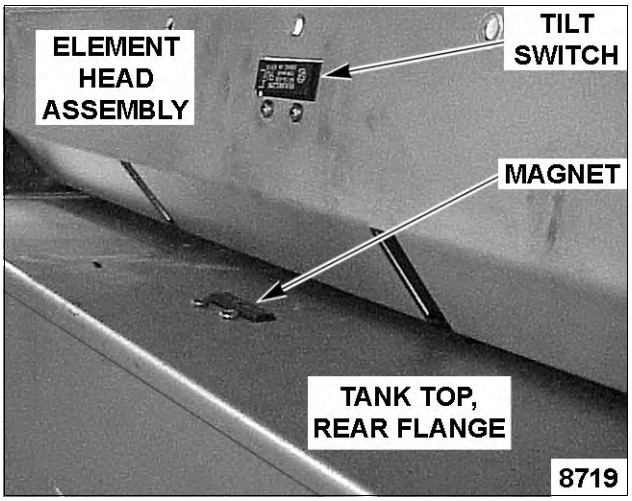
TILT SWITCH

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Remove element head cover as outlined under COVERS AND PANELS.
2. Lower heating elements.
3. Disconnect lead wires from tilt switch.
4. Remove tilt switch from element head.



REAR VIEW SHOWN, ELEMENTS LOWERED



FRONT VIEW SHOWN, ELEMENTS RAISED

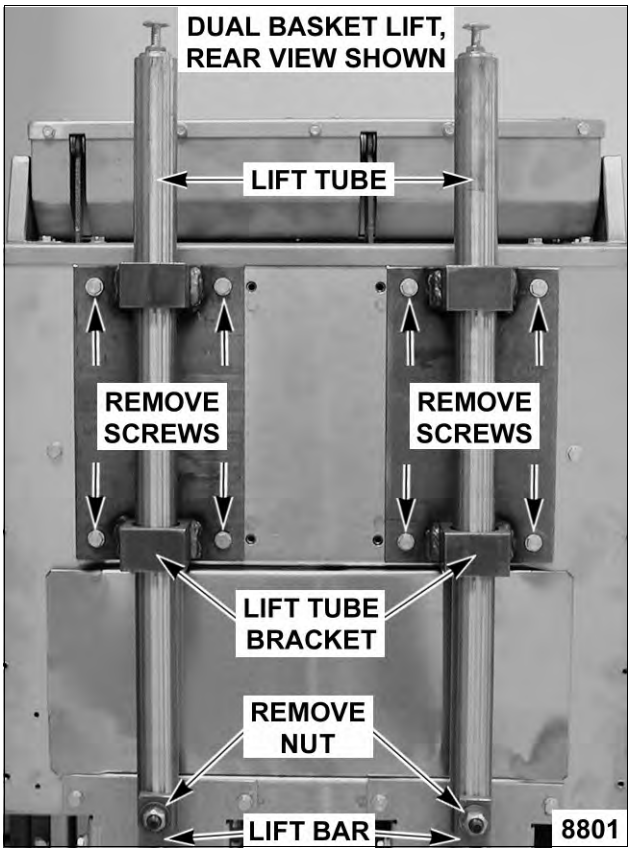
5. Reverse procedure to install and check for proper operation.

NOTE: The tilt switch and magnet are mounted in fixed locations and are not adjustable.

BASKET LIFT TUBE

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Remove basket lift covers as outlined under COVERS AND PANELS.
2. Remove nut securing lift bar to the lift tube.
3. Remove screws securing lift tube bracket to fryer then remove bracket and lift tube.

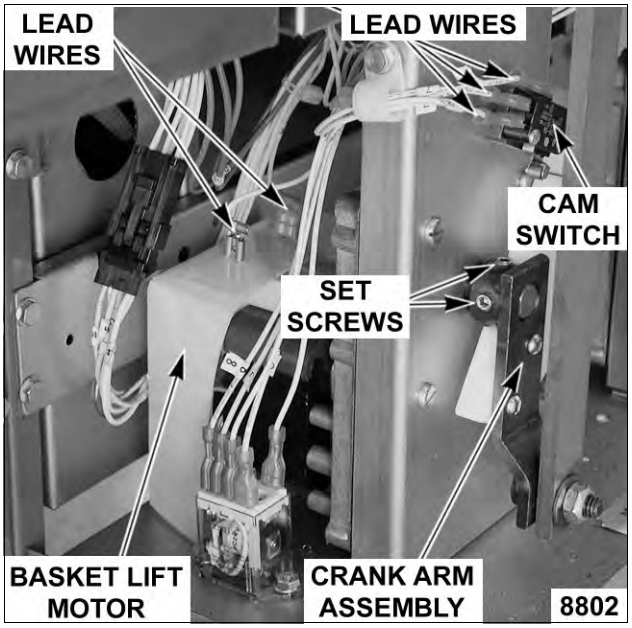


4. Reverse procedure to install.

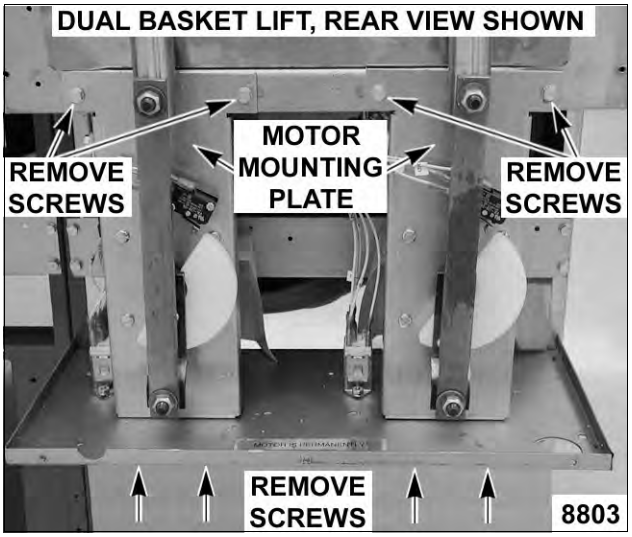
BASKET LIFT MOTOR

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Remove basket lift tube as outlined under BASKET LIFT TUBE.
2. Disconnect lead wires from cam switch and basket lift motor.
3. Loosen set screws securing crank arm assembly to the basket lift motor shaft.



4. Remove screws securing motor mounting plate to fryer then remove motor from plate.



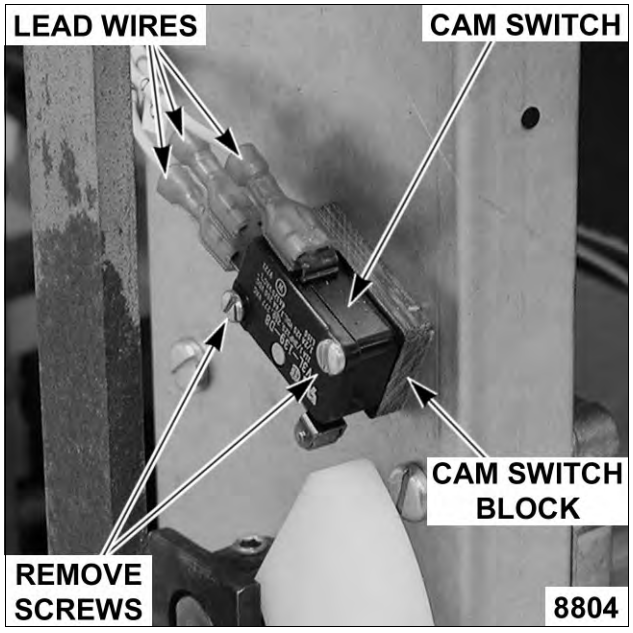
5. Reverse procedure to install and check for proper operation.

NOTE: When installing, keep all lead wires clear from moving parts.

BASKET LIFT CAM SWITCH

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Remove basket lift covers as outlined under COVERS AND PANELS.
2. Disconnect lead wires from cam switch.
3. Remove screws securing cam switch to motor mounting plate.



4. Reverse procedure to install and check for proper operation.

NOTE: When installing, place the cam switch block behind the cam switch for proper spacing.

PUMP AND MOTOR

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

1. Open both fryer cabinet doors above the filter tank drawer.
2. Pull the filter drawer out and remove splash guard/cover from tank.
   A. If filter tank is not empty, remove shortening from filter tank.
3. Remove the filter tank assembly and push the tank support arms back underneath the fryer.

NOTE: The remaining steps are written for front removal of the pump assembly. If access to the back of the fryer is available, it may be easier to remove the pump from the rear.

4. Disconnect the electrical connection to the motor.
5. Separate the swivel hose connections at the pump.

NOTE: When viewed from pump end, the right side is the intake port and the left side is the discharge port.

6. Remove motor mounting bolts.
7. Remove the motor and pump (pipe fittings attached) from the fryer.
   A. If replacing the pump and motor, remove the existing pipe assemblies and reuse.
8. Reverse procedure to install.

NOTE: Ensure the rubber vibration pad or the grommets are installed under the motor mounting plate.

SERVICE PROCEDURES AND ADJUSTMENTS

WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER AND FOLLOW LOCKOUT / TAGOUT PROCEDURES, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

TEMPERATURE PROBE TEST

The temperature probe is used for both the solid state and computer cooking controls. The probe is an RTD (resistance temperature detector) of the thermistor type. As temperature increases the resistance value decreases.

Probe Fault

If a temperature probe fault or high temperature condition occurs, a fault message will be displayed and the electronic alarm will sound continuously. The heat demand and basket lift outputs are de-activated. If a cooking cycle is in process (timer active), it will be cancelled and the key pad disabled.

This will continue until the fault clears, power is cycled or problem resolved.

Cooking Control	Display Message
SOLID STATE	An open will display Prob and a short or high temperature condition will display HI.
COMPUTER	An open will display PROBE OPEN and a short or high temperature condition will display PROBE SHORT.

To Check:

1. Turn power switch off.
2. Remove CONTROL PANEL as outlined under COVERS AND PANELS.
3. Test the probe using a VOM to measure resistance. Connect the meter probe leads to pins 3 & 4 on the female connector for the wiring harness.
   A. If the measured resistance values are within the allowable range, the probe is functioning properly. Reverse procedure to install.
   B. If the measured resistance values are outside the allowable range, install a replacement probe as outlined under TEMPERATURE PROBE in REMOVAL AND REPLACEMENT OF PARTS.
   C. Check cooking control calibration.

Temperature (ºF)	Resistance (Ω)
77	90,000 - 110,000
350	604 - 836
415 [1]	302 - 369
460 [2]	191 - 233

NOTE: 1. High temperature alarm level for the cooking controls.
2. Shorted probe equivalent temperature.

COOKING CONTROL CALIBRATION

NOTE: Verify condition of temperature probe as outlined under TEMPERATURE PROBE TEST before proceeding.

1. Check the level of shortening in fry tank. The level must be between the MIN & MAX fill lines before proceeding.
2. Allow the shortening to cool below 300°F.
3. Place a thermocouple in the geometric center of the fry tank one inch below the shortening surface.
4. Set the cooking control to 350°F and turn the fryer on.
5. Monitor the heat indicator lamp. When cooking control is calling for heat, lamp will be on. If cooking control is satisfied, lamp will be off.

   Solid State Control - Decimal point of first character indicates heat on when lit.

   Computer Control - Two LED lamps on the oil temp key that indicate heat on.

NOTE: Agitate the shortening, to eliminate any cold zones.

   A. Allow cooking control to cycle three times to stabilize shortening temperature.
   B. Record meter reading from thermocouple when the cooking control cycles off and on for at least two complete heating cycles.

6. Calculate the average temperature by adding the temperature reading when the heat lamp goes out to the temperature reading when the heat lamp comes on & divide this answer by 2.

[Temp. (Lamp off) + Temp. (lamp on)] ÷ 2 = Average Temp.

Example: 360˚ + 340˚ ÷ 2 = 350˚F.

The average temperature should be 350°F (± 5°F).

A. If the average temperature reading is within tolerance, cooking control is properly calibrated.

B. If the average temperature reading is out of tolerance, perform the following:

1) Solid State Control - Adjust the offset temperature accordingly as outlined in SOLID STATE CONTROL under SERVICE PROCEDURES and ADJUSTMENTS.

2) Computer Control - Adjust the offset temperature accordingly as outlined in COMPUTER CONTROL under SERVICE PROCEDURES and ADJUSTMENTS.

7. Repeat the average temperature calculation for up to three attempts. Allow the cooking control to cycle at least two times between adjustments before performing the calculation.

8. If calibration is unsuccessful, the cooking control may be malfunctioning and cannot be adjusted properly. Install a replacement cooking control and check calibration.

LIFT ASSIST SPRING ADJUSTMENT

1. Turn power switch off.

2. Remove lift arm(s) if basket lift option is installed.

3. Check spring tension:

A. Raise heating elements to the full up position. Elements should remain in place.

B. Lower heating elements to the full down position. Elements should remain in place.

C. If the elements remain in place as described, then no adjustment is necessary. If the elements do not remain in place, continue with procedure for adjustment.

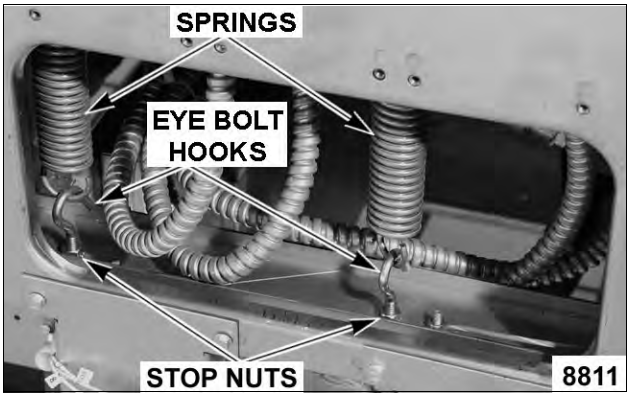
4. Remove basket lift tube(s) if basket lift option is installed as outlined under BASKET LIFT TUBE in REMOVAL AND REPLACEMENT OF PARTS.

5. Remove rear door (access cover).

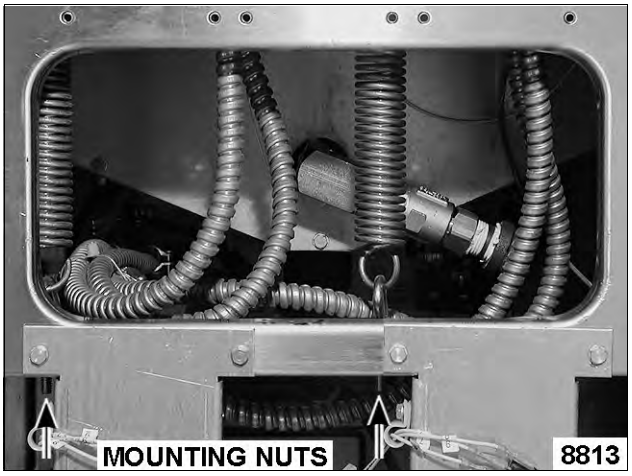
NOTE: Elements should be in the down position.

6. To adjust spring tension:

A. Loosen stop nut on all eye bolts.



B. Adjust eye bolt mounting nuts as necessary, but equally on all springs to achieve the best spring tension to hold elements in place.



C. Perform spring tension check.

D. Repeat spring tension adjustment if necessary.

E. Tighten stop nut on all eye bolts.

7. Replace rear door (access cover) and basket lift components (if installed).

BASKET LIFT ARM ADJUSTMENT

1. With shortening at room temperature, verify the level is between MIN & MAX lines in fry tank. Add shortening as needed.

NOTE: Shortening will expand when heated. Do not fill the fry tank past the MAX line.

2. Turn power switch on and set temperature to 350˚F. Allow the shortening to reach set temperature.

3. Check basket lift operation.

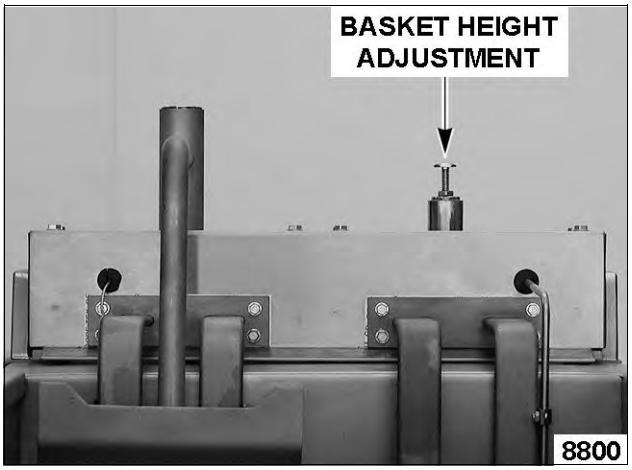
A. If necessary, adjust as outlined below.

4. When basket is in the up position, the bottom of the basket should be out of the shortening. When basket is in the down position, the bottom of the basket should clear the crumb screen and the product should be submerged.

   A. To adjust, remove basket arm from lift shaft, loosen stop nut and turn height adjustment bolt to raise or lower basket arm as required. Both baskets should be same height.

   B. Re-tighten stop nut when complete.

NOTE: If adjustment is to low, when the basket is lowered, it will disengage from basket arm.



HEATING ELEMENT TEST

VOLTAGE	TOTAL KW	AMPS PER ELEMENT	OHMS PER ELEMENT
208	14	39	18.3
	17	47	15.2
	24	67	10.7
240	14	34	24.2
	17	41	20.4
	24	58	14.2
480	14	17	97.6
	17	20	83.0
	24	29	57.4

NOTES:
1. Values in the table are nominal. Tolerance is +5/-10%.
2. Voltage values are @ 60HZ.
3. Resistance values (ohms) are @ room temperature.

1. Remove element head cover as outlined under COVERS AND PANELS in REMOVAL AND REPLACEMENT OF PARTS.

CAUTION: Heating elements must remain submerged in shortening while performing this test or damage may occur.

2. Access heating element lead wire connections at wire nuts.

3. Re-connect power, turn power switch on and set cooking control to call for heat.

4. Measure voltage at heating element connections and verify against data plate voltage.

   A. If voltage is incorrect, see ALL MODELS under TROUBLESHOOTING.

   B. If voltage is correct, check current draw (amps) through the heating element lead wires. See table for proper values.

   NOTE: This method is preferred over a resistance check when a clamp on type amp meter is available.

      1) If current draw is correct then heating element is functioning properly.

      2) If current draw is not correct, turn power switch off and disconnect power to the machine.

         a. Install a replacement heating element.

         b. Proceed to last step.

   C. If unable to check current draw, a resistance check may indicate a malfunctioning element. See table for proper values.

      1) Turn power switch off and disconnect power to the machine.

      2) Remove wire nuts from heating element lead wire connections and separate lead wires.

      3) Check resistance (ohms).

5. Check for proper operation.

SOLID STATE CONTROL

Operation

Refer to the Installation & Operations manual for specific operating instructions.

Error messages

For information on solid state control error messages, refer to SOLID STATE CONTROL under TROUBLESHOOTING.

Programming

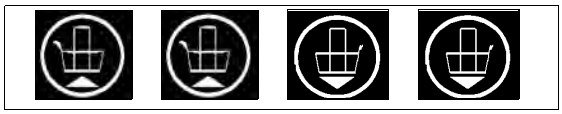
The solid state control's programming mode is used to set the controls operational parameters.

NOTE: If a product key is active (timing), programming mode can not be entered.

1. Press V key to enter programming mode.

   If the PARAMETER LOCK feature is disabled, PROGRAM MODE entry is immediate. If the PARAMETER LOCK feature is enabled LoC will be displayed.

   Use the following key sequence (password) to enter PROGRAM MODE: LEFT BASKET/UP; LEFT BASKET/UP; RIGHT BASKET/DOWN; RIGHT BASKET/DOWN.



   NOTE: If the proper key sequence is not entered within 6 seconds the control exits PROGRAM MODE.

2. Beeper chirp's on each successful keypress; If a key is not pressed within 2 minutes, the control will automatically exit programming.
3. To scroll through each of the PROGRAM ITEMS, press V and release.
4. To exit PROGRAM MODE, at any time, press V and hold for 1 second.

PROGRAM ITEM	KEY SEQUENCE	DISPLAY [5]
Left Timer	• Press Left Basket to increase or Right Basket to decrease cook time. [1]	LED above left basket is on. **15:00** time value with flashing colon (MM:SS).
Right Timer	• Press Left Basket to increase or Right Basket to decrease cook time. [1]	LED above right basket is on. **15:00** time value with flashing colon (MM:SS).
Set point Temperature	• Press Left Basket to increase or Right Basket to decrease set point temperature. [2]	**340F** or 171C current set point with flashing F or C
Calibration Offset	• Press Left Basket to increase or Right Basket to decrease offset temperature. [2, 3]	**00F** OR -00F always in ˚F
Melt Options	• Press Left Basket or Right Basket to scroll thru Melt Options.	**CY L** CY L = Liquid CY S = Solid CY 0 = No
Energy Source	• Press Left Basket or Right Basket to select the fryer's energy source, electric or gas heat.	**ELEC** or gAS
Parameter Lock	• Press Left Basket or Right Basket to select desired Parameter Lock Condition. [4]	**Uloc** or LoC selected parameter is enabled if flashing
Degrees F or C	• Press Left Basket or Right Basket to select desired Temperature Scale.	**F** or C
NOTES:	1. Time will change in one second increments, accelerating if the button is held. 2. Temperature will change in one degree increments, accelerating if the button is held. 3. Range -20 to +20, default = 0 (˚F). 4. Selecting Parameter Lock enabled will take effect on the next Program Mode entry. 5. Default value shown in bold.	

COMPUTER CONTROL

Operation

Refer to the Installation & Operations manual for specific operating instructions.

Service Programming

The computer control's service programming mode is used to perform system diagnostic tests or edit program items that affect the fryers operation.

NOTE: If a product key is active (timing), service programming can not be entered.

Error messages

For information on computer control error messages, refer to COMPUTER CONTROL under TROUBLESHOOTING.

Enter Service Mode

1. Press V key and enter password (default, 1972); Use product key numbers (1 thru 0) to enter values.
   A. SERVICE is displayed in left window & the LED's above product key's 1, 2, 4, 5, 6, 7 & 8 come on.
   B. Beeper chirp's on each successful keypress; If a key is not pressed within 2 minutes, the computer will automatically exit service programming (except in diagnostic mode).
2. To exit a PROGRAM ITEM after making a selection, press V to accept and return to service programming.
3. To exit SERVICE PROGRAMMING and return to operation mode, press V key twice.

PROGRAM ITEM	KEY SEQUENCE	LED STATUS		DISPLAY [8]	
		ON	OFF	LEFT	RIGHT
Temperature Offset	• Press 1 and enter desired offset temperature		all	OFF **00** F	DEGREES
	• Press V to accept selection				
	• Press TOGGLE to display direction of offset (positive or negative)			POSITIVE OR NEGATIVE	DEGREES
Melt Cycle On/Off Times	• Press 2 and set melt cycle on time [7]		all	MLTON:**04**	MELT ON
	• Press LEFT OR RIGHT TIMER key arrow and set melt off time			MLTOFF:**11**	MELT OFF
Diagnostic Mode	• Press 5 to enter diagnostic mode (outputs for heat, basket lift(s) and cooking timers turned off)	5, 7		DIAGNOST	DIAGNOST
	• Press 1 to toggle left basket lift output; left basket lift lowers. LED toggles on/off.	5, 7		L BASKET	L BASKET
	• Press 2 to toggle right basket lift output; right basket lift lowers. LED toggles on/off.	5, 7		R BASKET	R BASKET
	• Press 3 and hold to temporarily activate heat demand (heat on); release to de-activate heat demand (heat off). LED toggles on/off. [1]	5, 7		HEAT DEM	HEAT DEM
	• Press 5 to test drain valve interlock	5, 7			
	- If drain valve closed	5, 7		DRN ON	DRN ON
	- If drain valve open	7	5	DRN OFF	DRN OFF
	• Press 6 and hold to light all display elements	all		✳.✳.✳.✳.✳.✳'✳'✳	✳.✳.✳.✳.✳.✳'✳'✳
Temperature Ready Level	• Press 6 to view the cooking cycle lock out temperature (always °F). To edit, enter the 2-digit number desired. [2]		all	READY**40**F	

Service Programming, continued on next page

PROGRAM ITEM	KEY SEQUENCE	LED STATUS		DISPLAY [8]	
		ON	OFF	LEFT	RIGHT
More Service Programming Level	• Press 8 to enter the More Service Programming. To edit one of the selections, enter the 2-digit number desired. To exit a selection, press V to accept & return to More Service Programming.	4, 5, 6, 7, 8		MORE	SERVICE
	• Press 4 to view or edit the Shake Alarm duration: 0-98 seconds; 99 - continuous alarm until cancelled manually.			DT-DUR**13**	DURATION
	• Press 5 to view or edit the Hold Alarm duration: 0-98 seconds; 99 - continuous alarm until cancelled manually.			HD-DUR**.˙05**	DURATION
	• Press 6 to view or edit the Cooking cycle cancel delay; 0-10 seconds. [3]			CANCEL**.˙01**	DELAY
	• Press 7 to view or edit the number of basket lifts: 0 = none; 1 = one lift; 2 = two lifts. [4, 5]		all	LIFTS	**0**, 1 or 2
	• Press 8 to view or edit the fryer's Energy Source, electric or gas heat. [5, 6]		all	FRYER	**ELECTRIC** or gAS
NOTES:	1. Oil temp LED's cycle on/off with heat. 2. If the cooking temperature is below set point by this number, a cooking cycle can not be started. 3. The number of seconds to hold a product key during a cooking cycle to cancel it. 4. If zero basket lifts are selected, the idle setback option under ERC SERIES PROGRAMMING in the Installation and Operation manual is not available. 5. Exit Service Programming Mode. Cycle power switch to lock selection into memory. 6. Pressing V to accept selection returns menu to Operator Programming & not More Service Programming. Enter Service Programming Mode again, to make additional selections. 7. Default melt cycle on/off times shown for liquid shortening (default shortening type). 8. Default value shown in bold.				

Display, Led and Keypad Test

1. Press and hold the 5 key while turning power on to Initiate test. Release the 5 key during display of software revision level.
2. For each number key (1-9, & 0) pressed, the corresponding value is displayed in each character position on the left and right display.

   (i.e. 5 key shows 55555555 55555555).

NOTE: Beeper chirp's for as long as key is held.

3. For each function key pressed, the following values are displayed in each character position on the left and right display:

   - PROGRAM (V): V
   - TEMPERATURE: T
   - TOGGLE: L
   - BOIL: B
   - LEFT TIME: <
   - RIGHT TIME: >

4. Turn power off to exit test.

ELECTRICAL OPERATION

COMPONENT FUNCTION

FRYER CONTROLS

Solid State or Computer Cooking Controls (D or C Models) . . . . . . Controls fryer operation: Maintains shortening temperature, counts product cook time(s) and signals the electronic alarm at the end of a cooking cycle. If fryer is equipped with basket lift(s), controls the basket lift(s) operation.

Note: By utilizing the same wiring harness connections, the two control types are interchangeable between fryers.

Control Interface Board . . . . . Provides the output signal interface from cooking control, to regulate heating and basket lift(s) operation (if equipped). The board components consist of a heat control Triac and two single pole N.O. relays.

Transformer . . . . . . Supplies 24VAC to the cooking control circuit. If equipped with basket lift(s)or filtering system, also supplies power for those control circuits. Transformer is energized when supply voltage is connected.

Power Switch . . . . . . Supplies power to control circuit.

High Limit Thermostat . . . . . . Prevents shortening from reaching temperatures over 460°F nominal (2nd high limit; manual reset @ 445˚F or below). Serves as a backup to the cooking control's high temperature alarm setting of 415˚F (1st high limit; normal operation resumes when temperature falls below this point).

Temperature Probe . . . . . . Senses temperature of shortening. Converts the temperature into a resistance valve which is monitored by the cooking control. The probe is an RTD (resistance temperature detector) of the Thermistor type. As temperature increases the resistance value decreases.

Drain Valve Interlock Switch (DVI) . . . . . . A magnetic reed switch (N.O.) mounted on the manual drain valve. When valve is closed, supplies a drain valve position signal to the cooking control. Prevents heating elements from being energized with the fry tank empty.

Tilt Switch . . . . . . A magnetic reed switch (N.O.) mounted underneath the element head assembly. Removes power from 1CON & 3CON to de-energize the heating elements when the elements are raised.

1CON, 3CON and 2CON, 4CON Contactors . . . . . . Supplies line voltage to heating elements.

Heating Elements . . . . . . Produces heat that is transferred to the shortening.

R1 Heat Relay . . . . . . Supplies power to 2CON and 4CON contactor coils.

R2 Power Relay . . . . . . Supplies power to cooking control.

KLEENSCREEN FILTER CONTROLS

Filter Power Switch . . . . . . Supplies 120VAC to pump motor. Filter valve switch or discard valve switch must be closed (valve handle extended).

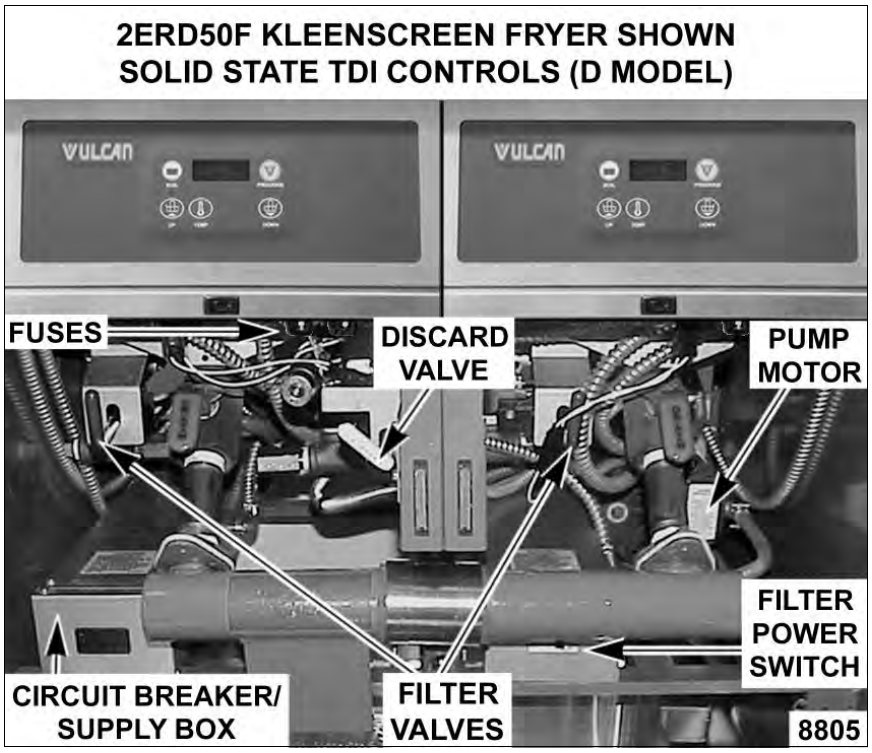
Pump Motor . . . . . . Operates pump to circulate shortening through filtering system. Thermal protector prevents motor from reaching excessive operating temperatures. If tripped, the protector can be manually reset when motor temperature is between 185˚F to 228˚F.

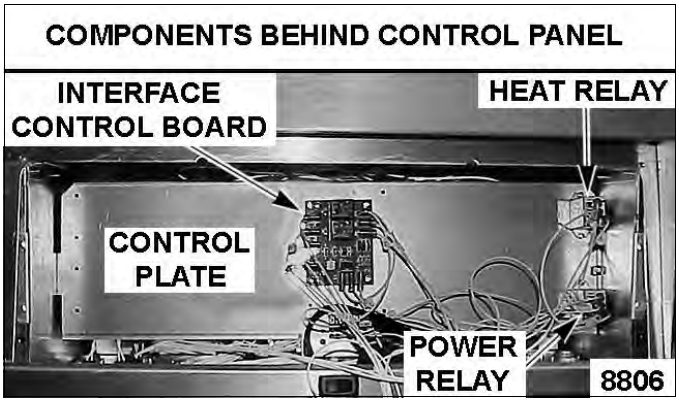
Filter Valve Switch . . . . . . Energizes pump motor to filter the shortening when switch is closed (valve handle extended). Filter power switch must be turned on.

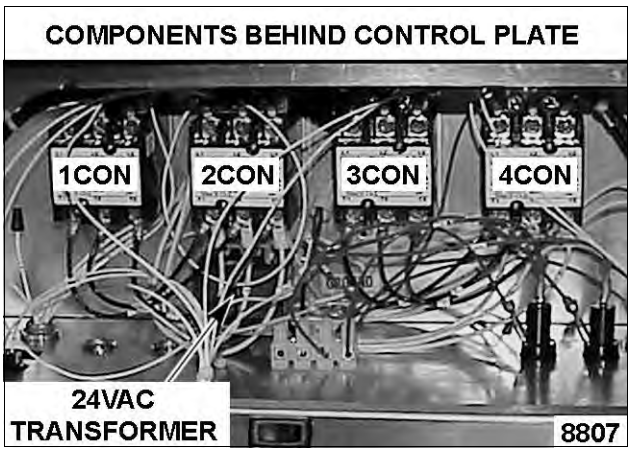
Discard Valve Switch . . . . . . Energizes pump motor to discard the shortening from filter tank when switch is closed (valve handle extended). Filter power switch must be turned on.

R3 Filter Relay . . . . . . Supplies power to pump motor.

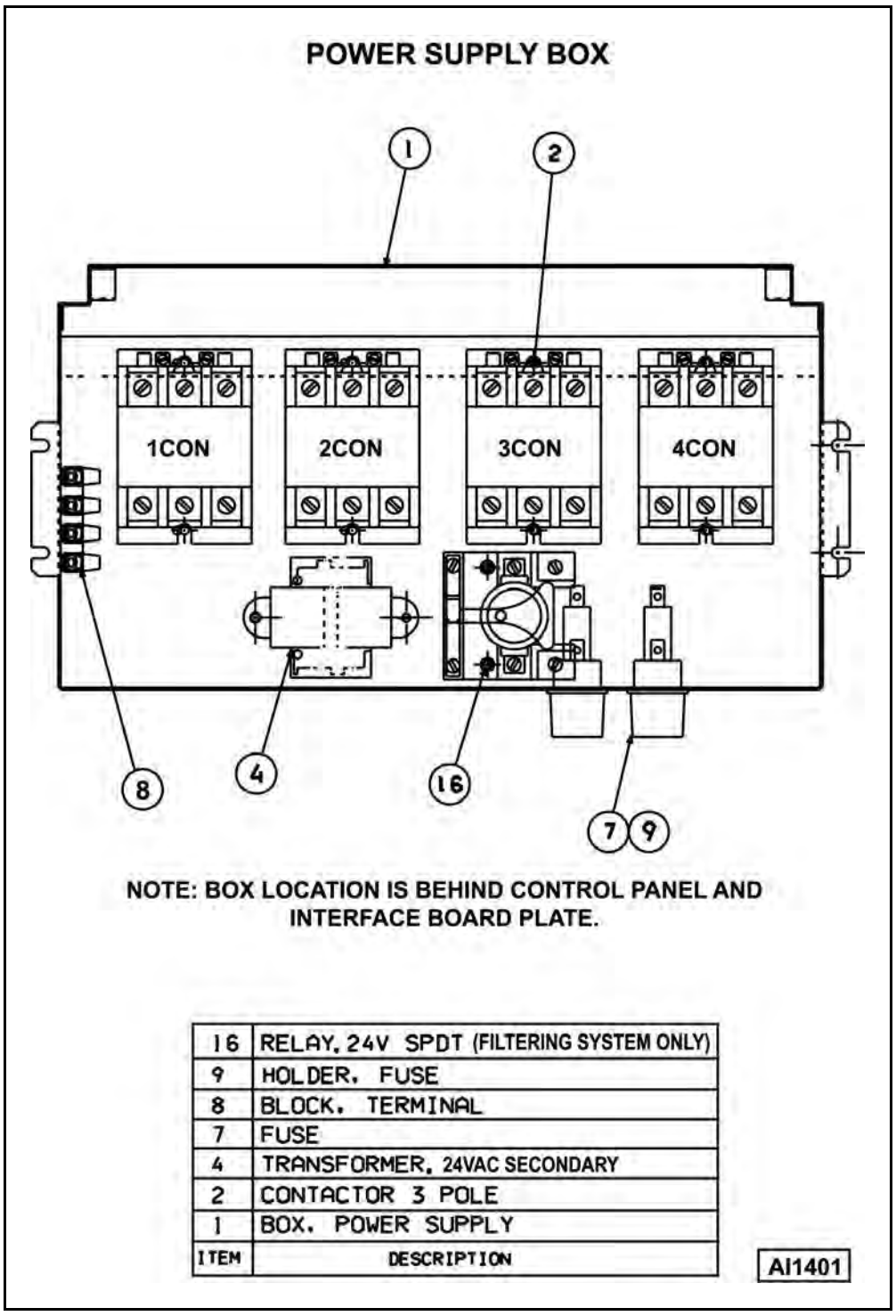
COMPONENT LOCATION







POWER SUPPLY BOX



CIRCUIT BREAKER/SUPPLY BOX

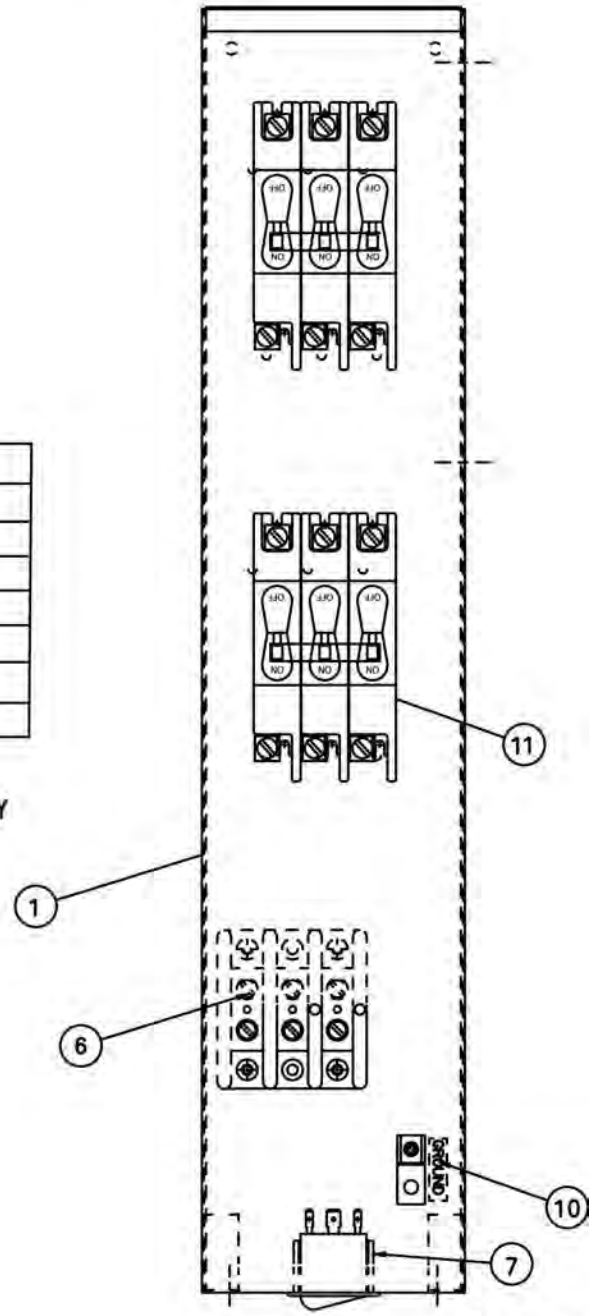
CIRCUIT BREAKER/SUPPLY BOX

ITEM	DESCRIPTION
*	GRIP, CORD **
*	CORD, POWER **
11	CIRCUIT BREAKER ***
10	LUG, GROUND
7	SWITCH, FILTER POWER **
6	BLOCK, 3 POLE TERMINAL
1	BOX, BREAKER

* REQUIRED, NOT SHOWN

** FILTERING SYSTEM & 480V FRYERS ONLY

*** 24KW FRYERS ONLY



SEQUENCE OF OPERATION

Refer to schematic diagram 8810 for Cooking Control and Filtering System operation.

Cooking Control, Solid State or Computer

FRY CYCLE - LIQUID SHORTENING

If using solid shortening, the control should be programmed to use the solid shortening MELT CYCLE . During the MELT CYCLE, the control will cycle the heat on/off in short intervals. This will gradually heat and liquify the shortening until it reaches a temperature of 135˚F. Melt cycle default times are:

- Liquid L = 4 sec on, 11 sec off (default)
- Solid S = 2 sec on, 13 sec off
- No melt 0 = 100% on.

On solid state controls only, CY (cycle) will be displayed before shortening letter designation and zero represents none (no melt).

The control then resumes normal operation as described in this sequence.

1. Conditions.
    A. Fryer connected to correct supply voltage and is properly grounded. Separate connections are required for each section of the battery.
    B. Fryer connected to a separate 120VAC source for the pump motor and transformer. Required for all filtering system fryer batteries.
        1) 120/24VAC transformer energized.
    C. Internal fryer circuit breakers ON.

    NOTE: 208 and 240VAC models at 24 KW only.

    D. Power switch off.
    E. Shortening at proper level in fry tank and below last set point temperature used.
    F. Cooking control is setup properly and ready to use.
    G. Manual drain valve closed (drain valve interlock switch N.O. is closed).
    H. Tilt switch contacts closed (N.O. - held closed with heating elements lowered).
    I. High limit thermostat closed.
2. Turn power switch on.
    A. Supply voltage energizes:
        1) 1CON and 3CON thru high limit thermostat and tilt switch.
        2) R2 power relay coil and R2-2 N.O. contacts close.
3. Cooking control powered at pin C2-1 (24VAC) and is jumpered to pin 6 (heat status). The control initializes and performs a diagnostic self check.

    NOTE: If the control passes self check, then the outputs are energized and operation sequence continues. If control does <u>not</u> pass self test, the control will display the appropriate message for the problem, disable the keypad and the electronic alarm will sound continuously. Refer to SOLID STATE or COMPUTER CONTROL under TROUBLESHOOTING.

    A. Cooking control evaluates the input from: Heat status at pin C2-6; Drain valve interlock at pin C2-5; And temperature probe at pins C2-3 and C2-4 (high & low).
    B. If the inputs to the control are valid and the shortening temperature is below set point, the heat demand output (24VDC) at pin C2-8 is then activated and power is applied to P3 (heat demand control, Triac energized) on the control interface board.
        1) Heat output (24VAC) at P6 (heat demand Triac) is activated on the control interface board. R1 heat relay coil energized and R1-2 N.O. contacts close.
            a. 2CON and 4CON are energized and heating elements are powered.
4. Shortening reaches set temperature.
    A. Cooking control de-activates the heat demand output (24VDC) at pin C2-8 and power is removed from P3 (heat demand control, Triac de-energized) on the control interface board. With power removed from P3, the heat output at P6 (heat demand Triac) is also removed.
        1) 2CON and 4CON are de-energized and power is removed from heating elements.
5. Cooking control cycles heat output on shortening temperature until power switch is turned off, heating elements are raised or a high limit condition occurs.

NOTE: Steps 5A and 5B discuss open high limits. For additional information on cooking control error messages, refer to SOLID STATE or COMPUTER CONTROL under TROUBLESHOOTING.

A. If shortening reaches 415°F or higher (1st high limit), the cooking control de-activates the heat demand and basket lift outputs, cooking timers are cancelled (if active), keypad is disabled, display indicates HI, and the electronic alarm will sound continuously.

Turn power switch off to silence the alarm. Normal operation resumes when temperature drops below 415˚F.

B. If shortening reaches 460°F, the high limit thermostat opens (2nd high limit), 1CON and 3CON are de-energized and power is removed from heating elements.

1) 1CON and 3CON remain de-energized until the shortening temperature drops below 415˚F, manual reset button is pressed and power switch is turned on.

Filtering System

The filter valve handle and the discard valve handle are connected to a mechanical valve and switch assembly to route the flow of shortening in the filtering system and supply power to the pump motor.

NOTE: The computer control contains a program feature that allows the operator to program a specific number of timed cooking cycles to complete then alert the operator to filter the shortening.

When the actual cooking count reaches the filter count setting, FILTER will flash in the right display when fryer is idle. Normal fryer operation continues without a cooking lockout. This feature can also be disabled.

Refer to Installation & Operation manual for specific instructions on filtering.

1. Conditions

A. Fryer connected to correct supply voltage and is properly grounded.

NOTE: Separate connections are required for the fryer controls and the filtering system controls.

B. Power switch to the fryer section off.

C. Shortening between 300˚F and 350˚F.

D. Filter drawer assembly installed properly.

E. Filter power switch off.

F. Filter valve handle (red) retracted.

1) Filter valve switch N.O. contacts open.

G. Discard valve handle (white) retracted.

1) Discard valve switch N.O. contacts open.

NOTE: On computer control fryer's, the control should be setup properly and ready to use.

2. Turn power switch on, to the fryer section to be filtered.

3. Set cooking control between 300˚F (minimum) and 350˚F (maximum).

NOTE: Shortening should not be filtered outside of this temperature range. At lower temperatures the shortening is thicker which may increase filtering time and place a greater load on the pump. At higher shortening temperatures, the pump seal life is decreased.

A. Allow shortening to cycle at set temperature for approximately 10 minutes.

NOTE: If using solid shortening, once it has melted, stir the shortening to eliminate any solid shortening in cold zone of the fry tank.

4. Solid State Control:

A. Turn power switch off, to the fryer section to be filtered.

B. Open the manual drain valve to the fryer section in need of filtering and drain the shortening into filter tank.

NOTE: If using solid shortening, allow hot shortening to stand in filter tank for approximately 6 minutes prior to filtering.

C. Turn filter power switch on.

1) Switch pilot light comes on.

D. Extend filter valve handle of the same fryer section.

1) Filter valve switch N.O. contacts close.

a. Power supplied to pump motor.

E. Pump motor circulates shortening through filter until power is removed.

F. When filtering process is completed, close the manual drain valve to the fryer section and allow the fry tank to refill.

G. When all filtered shortening is returned to the fryer, retract the filter valve handle.

1) Power is removed from pump motor.

H. Turn filter power switch off.

1) Switch pilot light goes out.

NOTE: If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete.

5. Computer Control:

   A. The number of cooking cycle's reach the filter count setting.

   B. The right side display indicates FILTER and will flash when the fryer is idle.

NOTE: A manual filter cycle can also be done at any time by following the procedure outlined under SOLID STATE CONTROL in steps 4B thru 4H. Display will show DRAINING TURN OFF. If desired, the filter timer can still be initiated.

   C. Open the manual drain valve to the fryer section in need of filtering and drain the shortening into filter tank.

   NOTE: If using solid shortening, allow hot shortening to stand in filter tank for approximately 6 minutes prior to filtering.

   NOTE: Drain valve interlock contacts open and the position of the drain valve is indicated to the cooking control.

   NOTE: Steps 5D thru 5G should be performed in immediate succession to start the filtering process and the filter timer.

   D. Turn filter power switch on.

      1) Switch pilot light comes on.

   E. Extend Filter valve handle of the same fryer section.

      1) Filter valve switch N.O. contacts close.

         a. Power supplied to pump motor.

   F. Pump motor circulates shortening through filter until power is removed.

   G. Press either TIME key to start filter timer countdown.

      1) FILTER and the remaining filter time are displayed.

   H. Filter time expires:

      1) FILTER DONE is displayed and the electronic alarm will sound for approximately 5 seconds. Display then changes to CLOSE DRAIN.

   I. Close the drain valve:

      1) TURN OFF is displayed.

   NOTE: Closing the drain valve before filter time expires will stop the filter timer but will not reset the filter counts. The FILTER prompt can only be reset by completing a filtering cycle or disabling the function in programming mode. Cycling the power will not reset this prompt.

   NOTE: Drain valve interlock contacts close and the position of the drain valve is indicated to the cooking control.

   J. When all filtered shortening is returned to the fryer, retract the filter valve handle.

      1) Power is removed from pump motor.

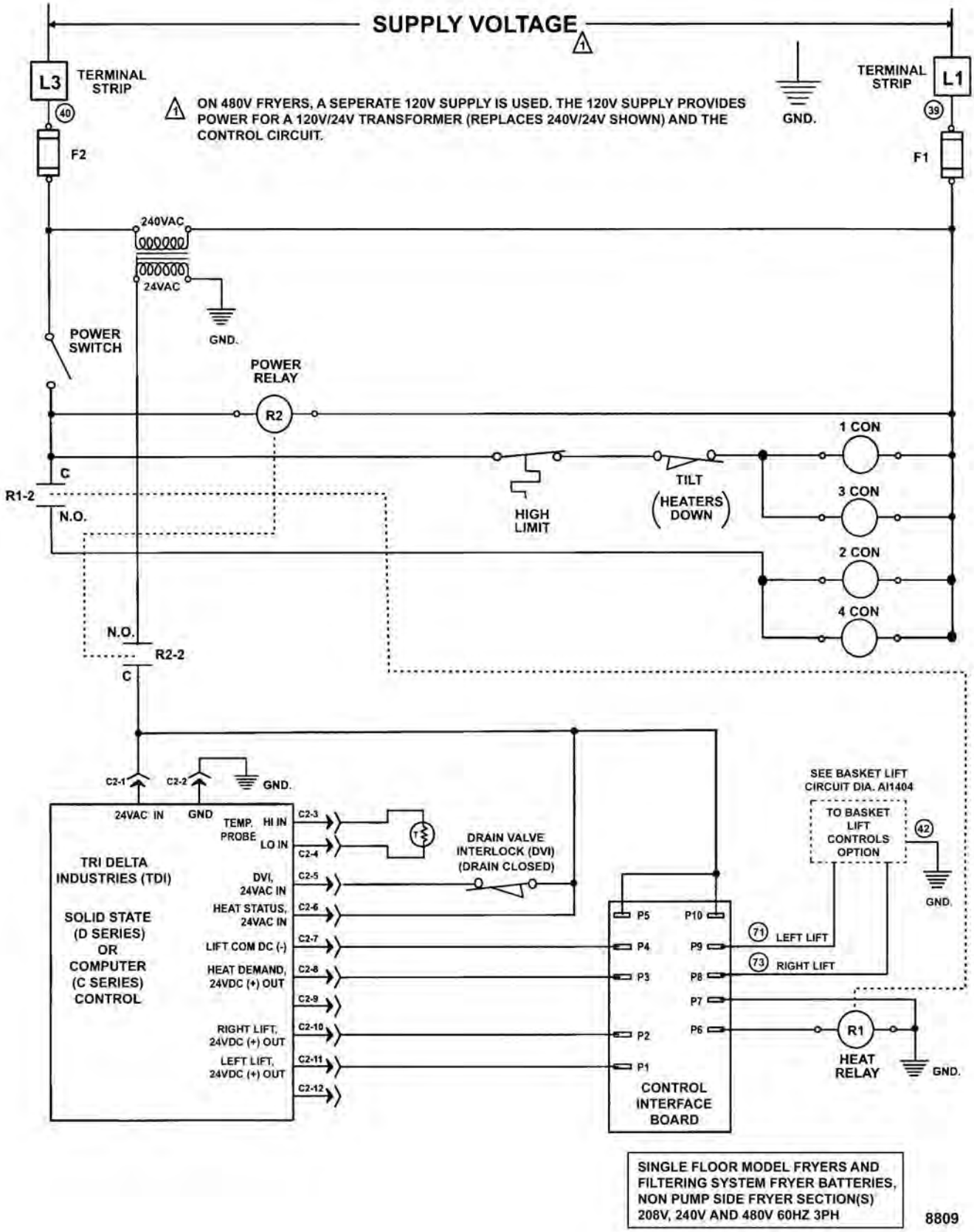
   K. Turn filter power switch off.

   NOTE: If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete.

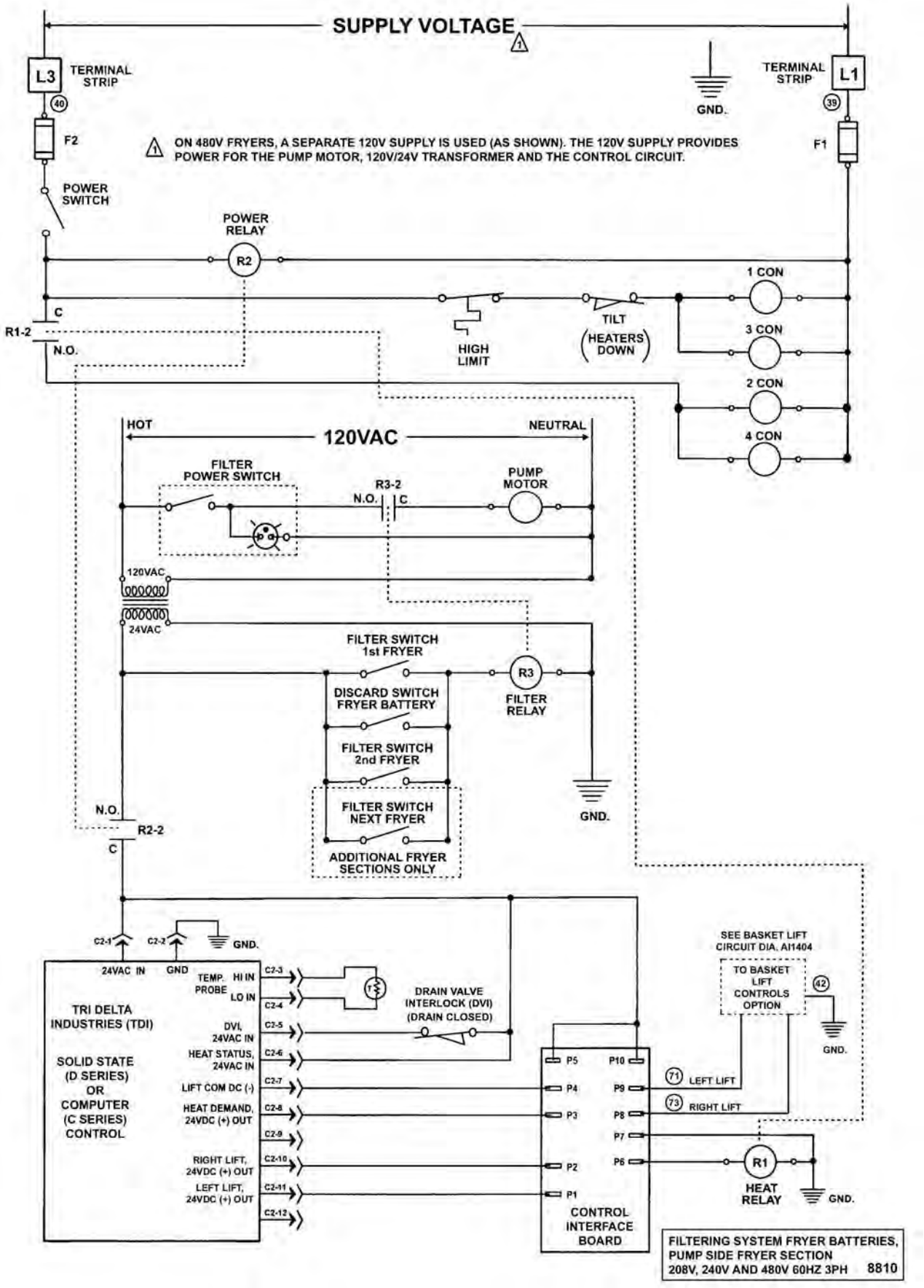
   L. Turn power switch off.

SCHEMATIC DIAGRAMS

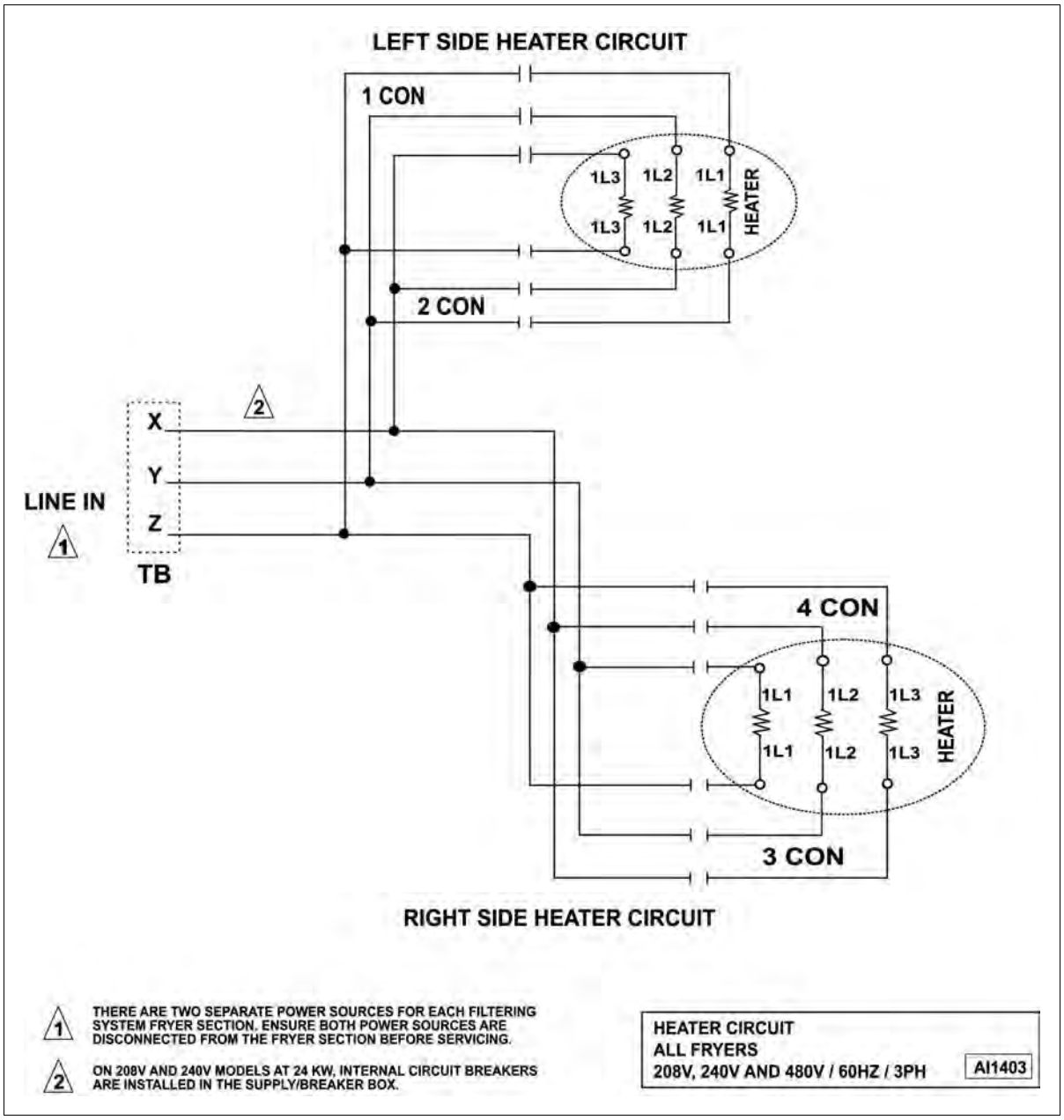
Single Floor Model Fryers & Filtering System Fryer Batteries, Non Pump Side Fryer Section(s)



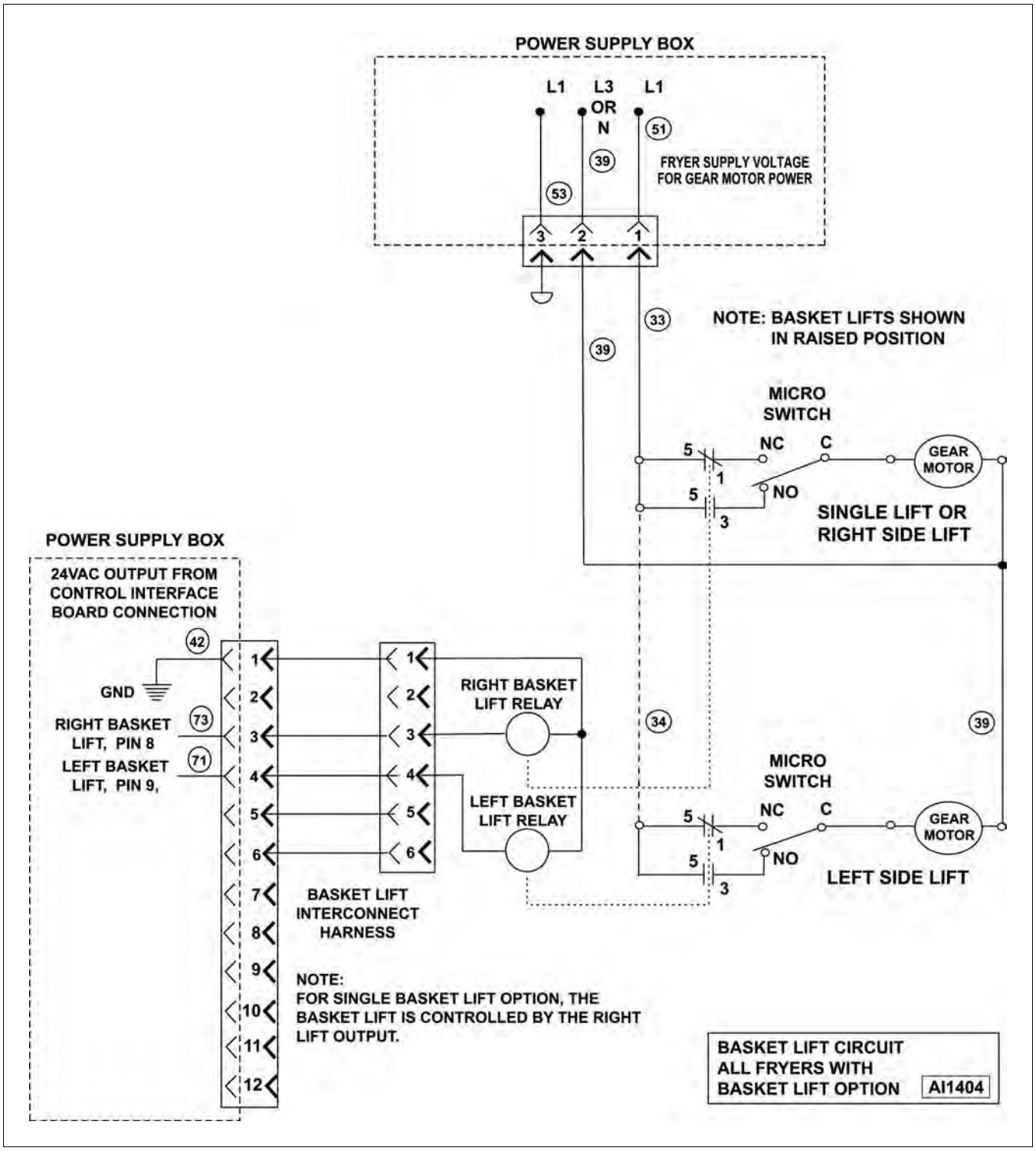
Filtering System Fryer Batteries, Pump Side Fryer Section



Heater Circuit



Basket Lift Circuit



WIRING DIAGRAMS

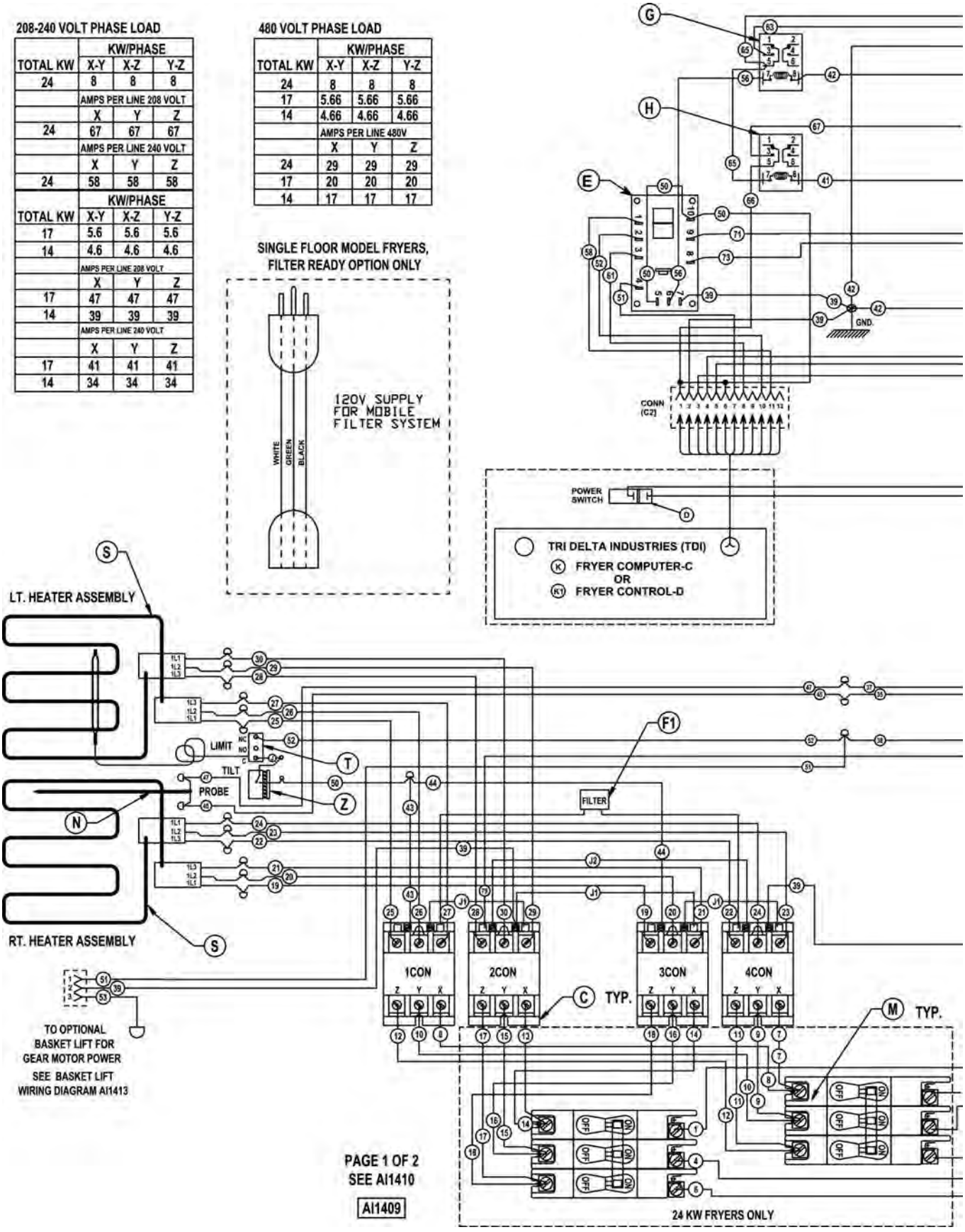
Single Floor Model Fryers & Filtering System Fryer Batteries, Non Pump Side Fryer Section(s)

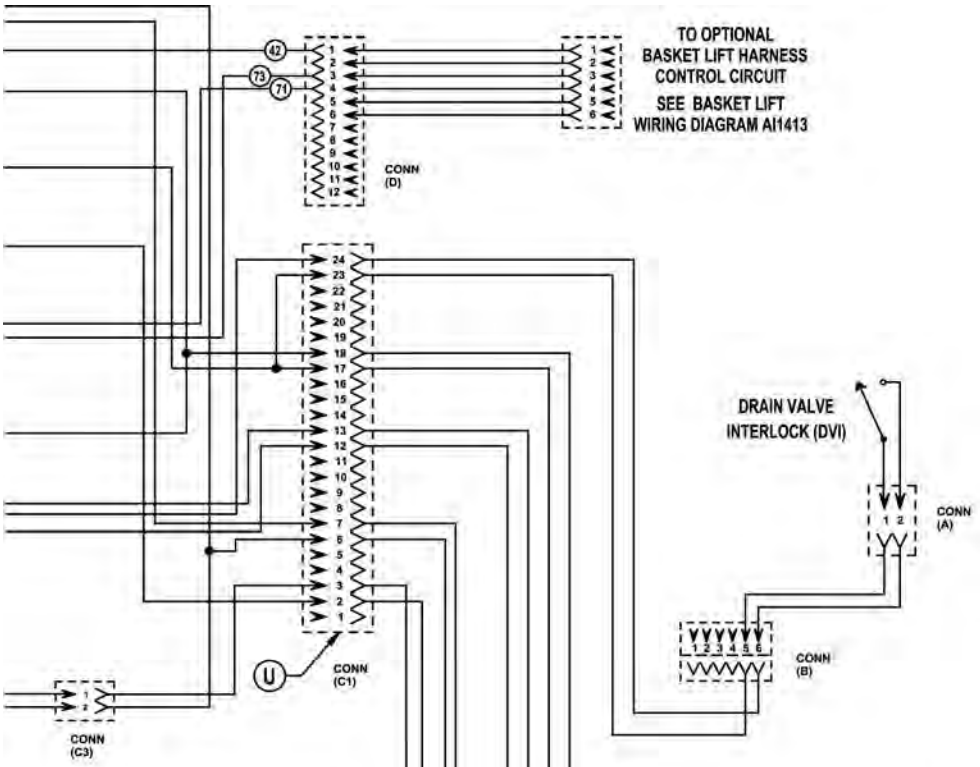
208-240 VOLT PHASE LOAD

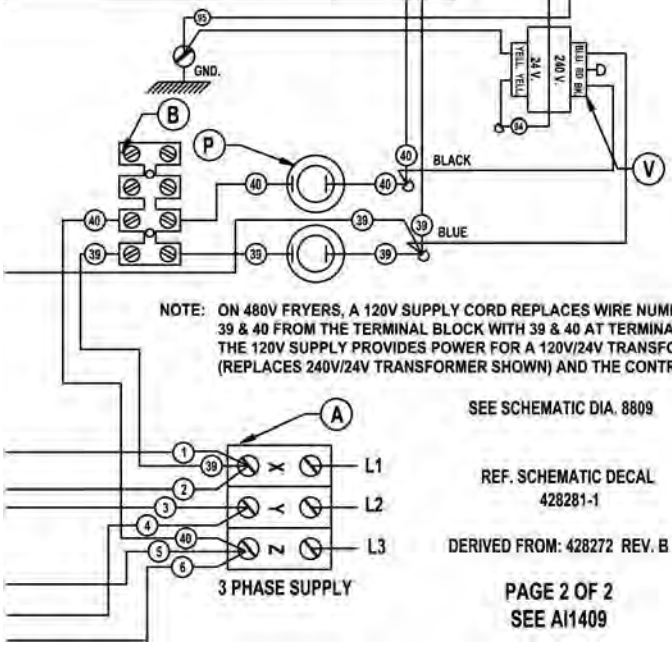
TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34

480 VOLT PHASE LOAD

TOTAL KW	KW/PHASE X-Y	X-Z	Y-Z
24	8	8	8
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE 480V		
	X	Y	Z
24	29	29	29
17	20	20	20
14	17	17	17







NOTE: ON 480V FRYERS, A 120V SUPPLY CORD REPLACES WIRE NUMBERS 39 & 40 FROM THE TERMINAL BLOCK WITH 39 & 40 AT TERMINAL STRIP. THE 120V SUPPLY PROVIDES POWER FOR A 120V/24V TRANSFORMER (REPLACES 240V/24V TRANSFORMER SHOWN) AND THE CONTROL CIRCUIT.

SEE SCHEMATIC DIA. 8809

REF. SCHEMATIC DECAL
428281-1

DERIVED FROM: 428272 REV. B

PAGE 2 OF 2
SEE AI1409

*24KW FRYERS ONLY
**480V FRYERS USE COMPONENTS WITH 120V COILS.
***480V FRYERS USE 480V ELEMENTS.

REQ.	IT.	DESCRIPTION	FIN.
1	F1	FILTER ASSEMBLY SINGLE	-
1	Z	SWITCH, LIMIT — WIRED / MAGNET	-
1	V	TRANSFORMER, 40 VA 240V/24V.	-
1	U	HARNESS-CABLE ASSEMBLY	-
1	T	2'ND HIGH LIMIT 460 F	-
2	S	ELEMENT, FIREBAR 12KW, 8.5KW OR 7KW *** — 208 V. / 240 V.	-
2	P	FUSE & HOLDER — HOLDER / FUSE	-
1	N	THERMISTOR PROBE	-
2*	M	CIRCUIT BREAKER 50A 3 POLE	-
1	K1	TDI CONTROL W/TIMER(S)	-
1	K	TDI COMPUTER	-
1	H	RELAY, DPDT 240V COIL**	-
1	G	RELAY, DPDT 24V COIL	-
1	E	CONTROL, INTERFACE TRIDELTA	-
1	D	ROCKER SWITCH ASSEMBLY	-
4	C	CONTACTOR 3P 40A 230V COIL**	-
1	B	STRIP-TERMINAL BARRIER	-
1	A	TERMINAL BLOCK	-

WIRING DIA. 208 & 240 VOLT FRYERS, TDI CONTROLS
480 VOLT FRYERS SEE NOTE.
24, 17 & 14 KW. FULL-VAT. SINGLE FLOOR MODEL FRYERS AND FILTERING SYSTEM FRYER BATTERIES, NON PUMP SIDE FRYER SECTION(S)

AI1410

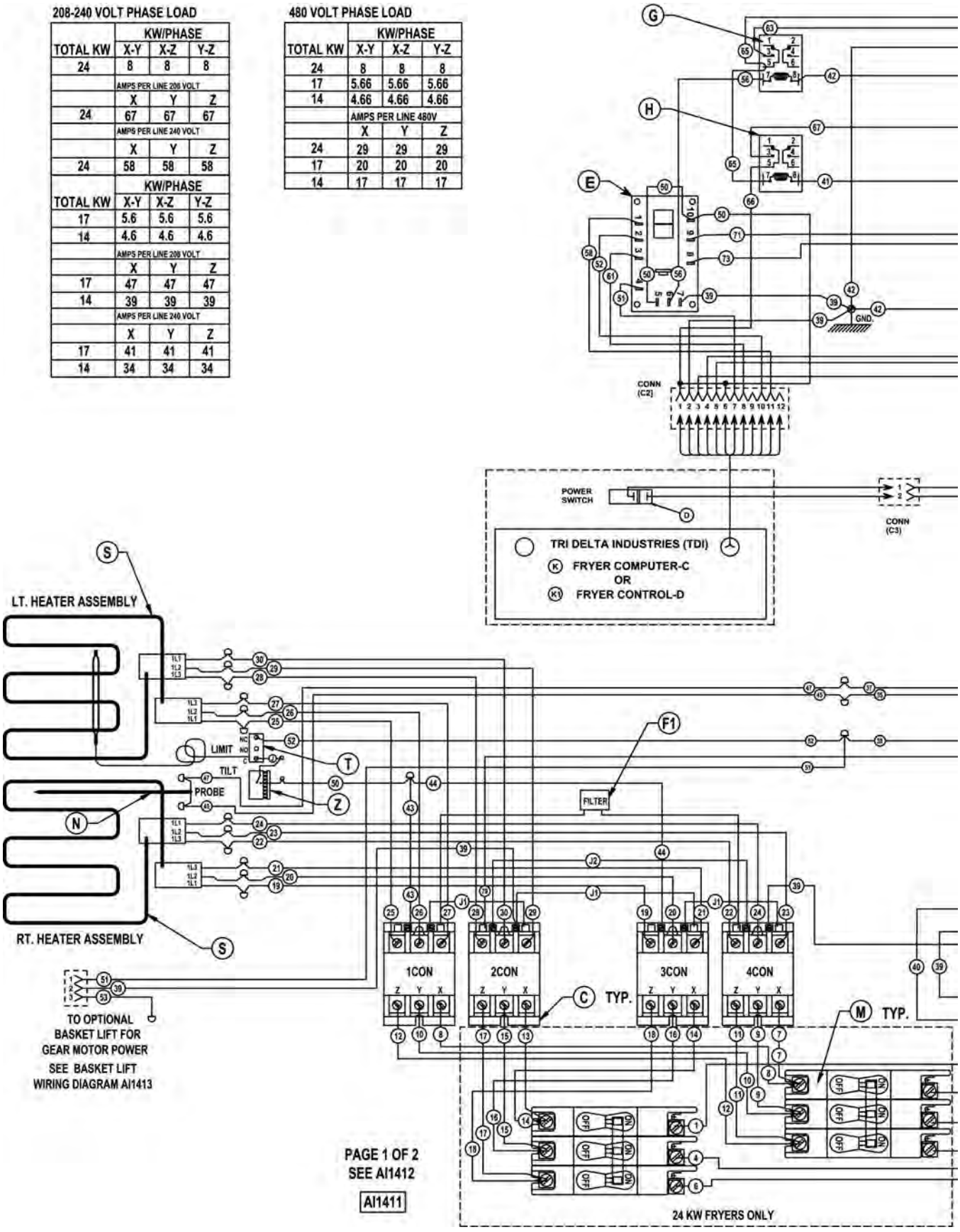
Filtering System Fryer Batteries, Pump Side Fryer Section

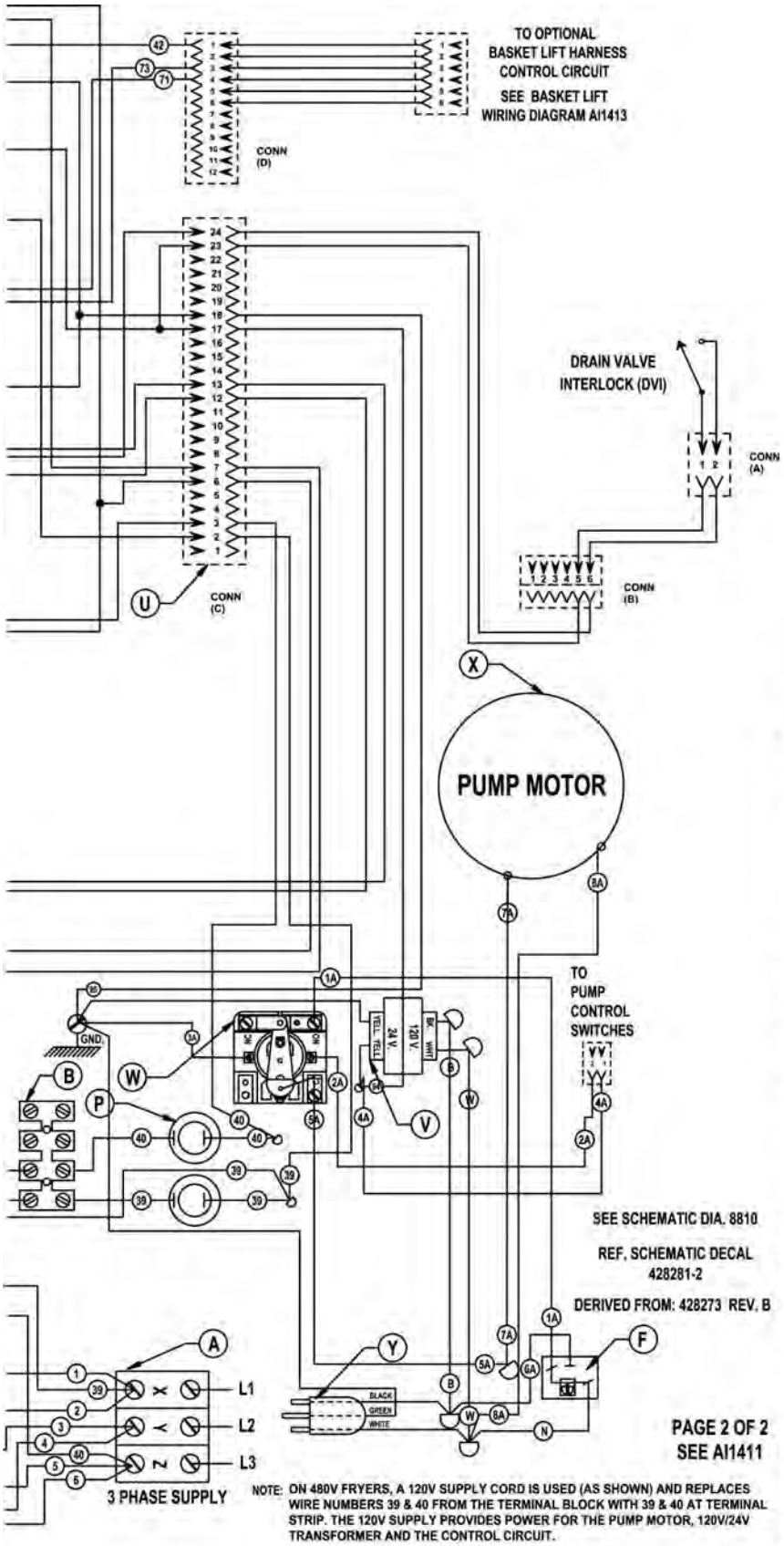
208-240 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
24	8	8	8
	AMPS PER LINE 208 VOLT		
	X	Y	Z
24	67	67	67
	AMPS PER LINE 240 VOLT		
	X	Y	Z
24	58	58	58
	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
17	5.6	5.6	5.6
14	4.6	4.6	4.6
	AMPS PER LINE 208 VOLT		
	X	Y	Z
17	47	47	47
14	39	39	39
	AMPS PER LINE 240 VOLT		
	X	Y	Z
17	41	41	41
14	34	34	34

480 VOLT PHASE LOAD

	KW/PHASE		
TOTAL KW	X-Y	X-Z	Y-Z
24	8	8	8
17	5.66	5.66	5.66
14	4.66	4.66	4.66
	AMPS PER LINE 480V		
	X	Y	Z
24	29	29	29
17	20	20	20
14	17	17	17





NOTE: ON 480V FRYERS, A 120V SUPPLY CORD IS USED (AS SHOWN) AND REPLACES WIRE NUMBERS 39 & 40 FROM THE TERMINAL BLOCK WITH 39 & 40 AT TERMINAL STRIP. THE 120V SUPPLY PROVIDES POWER FOR THE PUMP MOTOR, 120V/24V TRANSFORMER AND THE CONTROL CIRCUIT.

*24KW FRYERS ONLY

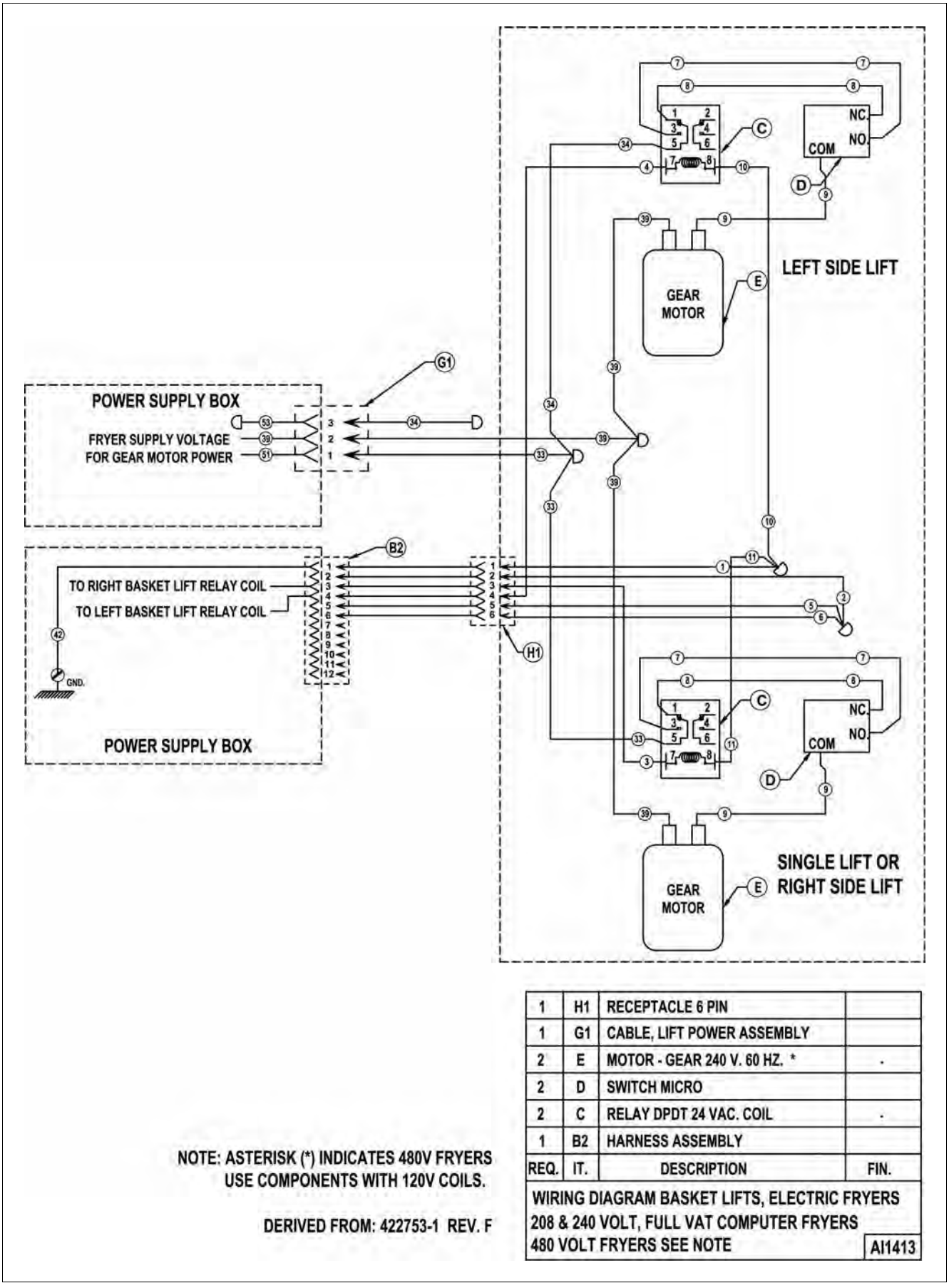
**480V FRYERS USE COMPONENTS WITH 120V COILS.

***480V FRYERS USE 480V ELEMENTS.

REQ.	IT.	DESCRIPTION	FIN.
1	F1	FILTER ASSEMBLY SINGLE	-
1	Z	SWITCH, LIMIT — WIRED / MAGNET	-
1	Y	CORD, SUPPLY - FILTER	-
1	X	PUMP-MOTER KLEENSCREEN 120V.	-
1	W	RELAY, SPDT 24V. COIL	-
1	V	TRANSFORMER,40 VA 120V./24 V.	-
1	U	HARNESS-CABLE ASSEMBLY	-
1	T	2ND HIGH LIMIT 460 F	-
2	S	ELEMENT, FIREBAR 12KW, 8.5KW OR 7KW*** — 208 V. / 240 V.	-
2	P	FUSE & HOLDER — HOLDER / FUSE	-
1	N	THERMISTOR PROBE	-
2	M	CIRCUIT BREAKER 50A 3 POLE*	-
1	K1	TDI CONTROL W/TIMER(S)	-
1	K	TDI COMPUTER	-
1	H	RELAY, DPDT 240V COIL**	-
1	G	RELAY, DPDT 24V COIL	-
1	F	ROCKER SWITCH - LIGHTED	-
1	E	CONTROL, INTERFACE TRIDELTA	-
1	D	ROCKER SWITCH ASSEMBLY	-
4	C	CONTACTOR 3P 40A 230V COIL**	-
1	B	STRIP-TERMINAL BARRIER	-
1	A	TERMINAL BLOCK	-

WIRING DIA. 208 & 240 VOLT FRYERS, TDI CONTROLS
480 VOLT FRYERS SEE NOTE.
24, 17 & 14 KW. FULL-VAT. FILTERING SYSTEM FRYER BATTERIES, PUMP SIDE FRYER SECTION — AI1412

Basket Lift



REQ.	IT.	DESCRIPTION	FIN.
1	H1	RECEPTACLE 6 PIN	
1	G1	CABLE, LIFT POWER ASSEMBLY	
2	E	MOTOR - GEAR 240 V. 60 HZ. *	-
2	D	SWITCH MICRO	
2	C	RELAY DPDT 24 VAC. COIL	-
1	B2	HARNESS ASSEMBLY	

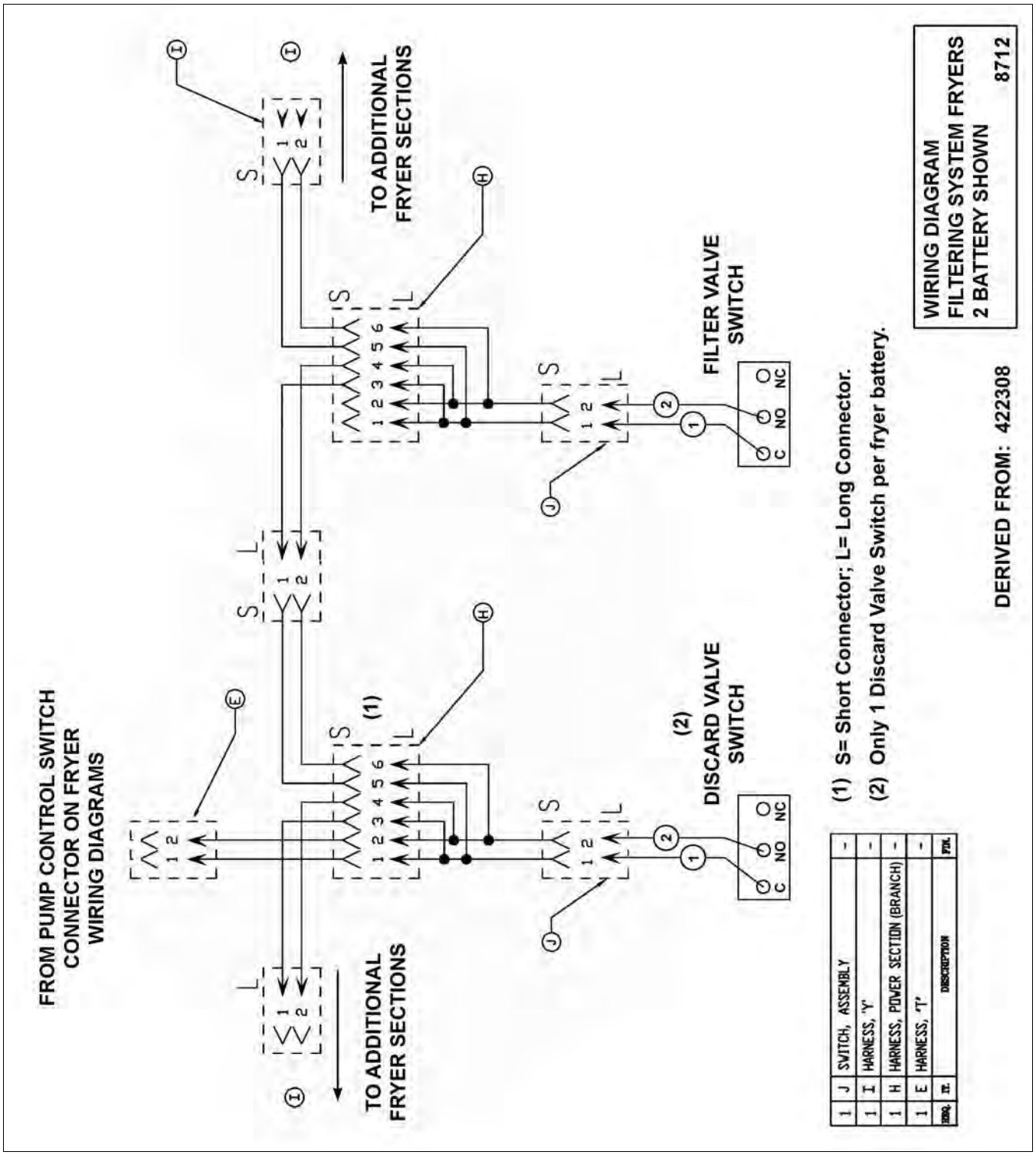
NOTE: ASTERISK (*) INDICATES 480V FRYERS USE COMPONENTS WITH 120V COILS.

DERIVED FROM: 422753-1 REV. F

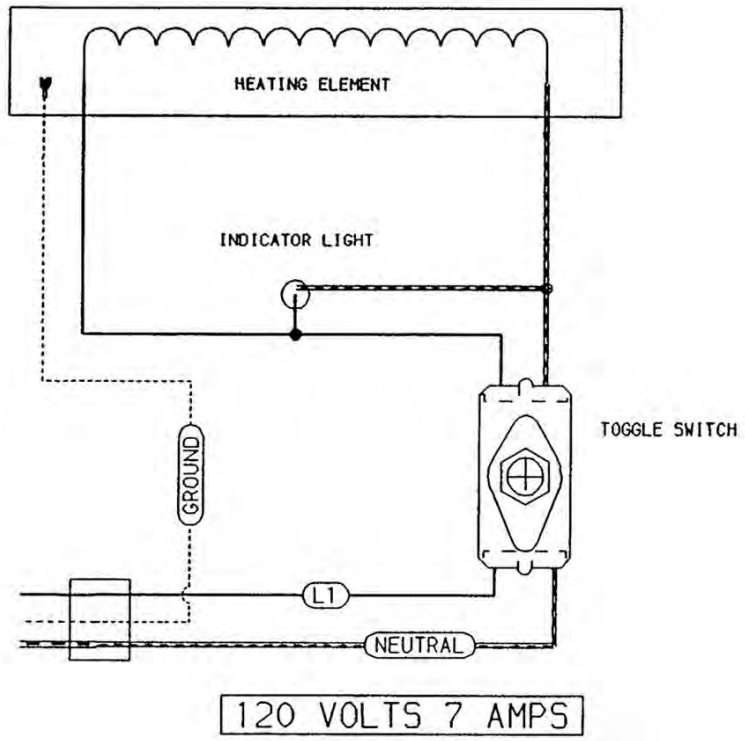
WIRING DIAGRAM BASKET LIFTS, ELECTRIC FRYERS
208 & 240 VOLT, FULL VAT COMPUTER FRYERS
480 VOLT FRYERS SEE NOTE

AI1413

Filtering System Fryers, Filter/Discard Switch Connections



Frymate (Dump Station)



815

TROUBLESHOOTING

ALL MODELS

SYMPTOMS	POSSIBLE CAUSES
Fryer does not heat; Display lit.	1. Drain valve switch open (alarm message displayed); or switch malfunction. 2. Tilt switch covered with debris or malfunction (heating elements are lowered). 3. High limit thermostat open. 4. Contactor(s) malfunction. 5. R1 heat relay malfunction. 6. Interface board malfunction (no output from terminal P6). 7. Cooking control malfunction (no output from terminal C2-8). 8. Interconnecting wiring malfunction.
No power to cooking control, fryer does not heat.	1. Power switch off or malfunction. 2. Main circuit breaker off; If fryer is 24kw, internal circuit breaker off. 3. Transformer inoperative. 4. R2 power relay malfunction. 5. Interconnecting wiring malfunction.
Excessive time to melt solid shortening (more than 45 minutes).	1. Melt cycle timing incorrect. 2. Incorrect supply voltage. 3. Temperature probe malfunction. 4. Control malfunction.
Excessive or low heat.	1. Incorrect temperature offset selected. 2. Incorrect supply voltage. 3. Temperature probe malfunction. 4. Contactor(s) malfunction. 5. R1 heat relay malfunction. 6. Heating element malfunction (low heat). 7. Control Interface board malfunction. 8. Cooking control malfunction.
Intermittent problems.	1. High ambient temperatures. 2. Wiring connections loose or contaminated.

SOLID STATE CONTROL

The following alarms take precedence over any other controller mode or function (except drain valve open).

ALARMS	DESCRIPTION
OPEN PROBE	If an open probe is detected, the heat demand (heat on) and basket lift outputs are disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display shows Prob and the electronic alarm will sound continuously. **NOTE:** A temperature of less than 40˚F is an open probe equivalent.
SHORTED PROBE	If a shorted probe is detected, the heat demand (heat on) and basket lift outputs are disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display shows HI and the electronic alarm will sound continuously. **NOTE:** A temperature of 460˚F or greater is a shorted probe equivalent.
HI TEMPERATURE	If the temperature is greater than or equal to 415˚F, the heat demand (heat on) is disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display shows HI and the electronic alarm will sound continuously. Normal fryer operation resumes when the temperature drops below the high temperature alarm level.
DRAIN VALVE INTERLOCK (DVI)	When drain valve is opened, the DVI switch contacts open, and the 24VAC input to the controller is removed. The heat demand (heat on) and basket lift outputs are disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display will alternate between drn tUrn oFF for 3 seconds each in a continuos loop. When the drain valve is closed, the DVI switch contacts close, and the 24VAC input to the controller is restored. The heat demand (heat on) and all operator buttons will remain disabled; and the display will alternate between tUrn oFF for 3 seconds each in a continuos loop until power is cycled.

COMPUTER CONTROL

The following alarms take precedence over any other controller mode or function (except drain valve open).

ALARMS	DESCRIPTION
OPEN PROBE	If an open probe is detected, the heat demand (heat on) and basket lift outputs are disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display shows PROBE OPEN and the electronic alarm will sound continuously. **NOTE**: A temperature of less than 40˚F is an open probe equivalent.
SHORTED PROBE	If a shorted probe is detected, the heat demand (heat on) and basket lift outputs are disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display shows PROBE SHORT and the electronic alarm will sound continuously. **NOTE**: A temperature of 460˚F or greater is a shorted probe equivalent.
HI TEMPERATURE	If the temperature is greater than or equal to 415˚F, the heat demand (heat on) is disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display shows HI TMP and the electronic alarm will sound continuously. Normal fryer operation resumes when the temperature drops below the high temperature alarm level.
DRAIN VALVE INTERLOCK (DVI)	When drain valve is opened, the DVI switch contacts open, and the 24VAC input to the controller is removed. The heat demand (heat on) and basket lift outputs are disabled. Any cooking in progress is cancelled and all operator buttons are disabled. The display will show DRAINING TURN OFF. If the filter prompt is active, DRAINING FILTER is displayed; if the dispose prompt is active, DRAINING DISPOSE is displayed. When the drain valve is closed, the DVI switch contacts close, and the 24VAC input to the controller is restored. The heat demand (heat on) and all operator buttons will remain disabled; and the display will show TURN OFF until power is cycled.

SOLID STATE OR COMPUTER CONTROL HARNESS PIN-OUTS

PIN NO.	INPUTS	PIN NO.	OUTPUTS [3]
C2-1	24VAC Hot	C2-8	24VDC (+) Heat Demand
C2-2	24VAC Neutral [1]	C2-9	Not used at this time [2]
C2-3	Probe High (red)	C2-10	24VDC (+) Right Basket Lift
C2-4	Probe Low (white)	C2-11	24VDC (+) Left Basket Lift
C2-5	Drain Valve Interlock (24VAC) N.O.	C2-12	No connection
C2-6	Heat Status (24VAC)	---	---
C2-7	Lift Relay DC (-) Common	---	---

NOTES: 1. Connected to ground internally. 2. Available for external buzzer output (24VDC).
3. Outputs to Control Interface Board.

CONTROL INTERFACE BOARD PIN-OUTS

PIN NO.	INPUTS	PIN NO.	OUTPUTS
P1	24VDC (+) Left Basket Lift	P6	Heat Demand, Triac (24VAC) [2]
P2	24VDC (+) Right Basket Lift	P7	System Ground
P3	24VDC (+) Heat Demand Control, Triac	P8	24VAC Right Basket Lift [3]
P4	Lift Relay DC (-) Common	P9	24VAC Left Basket Lift [3]
P5	Heat Demand, Triac (24VAC)	---	---
P10	Relay Contacts Common (24VAC) [1]	---	---

NOTES: 1. Relays connected internally. 2. To R1 heat relay coil.
3. To basket lift relay coil.

FRYMATE (DUMP STATION) WITH OPTIONAL HEATER

SYMPTOM	POSSIBLE CAUSES
No heat.	1. Unplugged. 2. Power switch off or inoperative. 3. Main circuit breaker off or open. 4. Malfunctioning heat assembly.

KLEENSCREEN FILTERING SYSTEM

SYMPTOM	POSSIBLE CAUSES
Shortening not filtering, pump motor is on.	1. Filter screen plugged. 2. Clog in filter system lines. **NOTE:** If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 3. Shortening below 300˚F (to thick). 4. Filter valve switch malfunction. 5. Filter valve mechanical malfunction. 6. Pump is inoperative.
Shortening not discarding, pump motor on.	1. Filter screen plugged. 2. Clog in filter system lines. **NOTE:** If using solid shortening, when all filtered shortening is returned to the fry tank and filter power switch is off, open the filter drawer approximately one inch. Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 3. Shortening below 300˚F (to thick). 4. Discard valve switch malfunction. 5. Discard valve mechanical malfunction. 6. Discard hose connection not fully engaged. 7. Pump is inoperative.
Pump motor is not running.	1. Filter power switch inoperative. 2. Filter/discard handle not extended. 3. Filter/discard valve switch malfunction. 4. Filter relay malfunction. 5. Pump motor limit tripped (manual re-set). 6. Pump motor inoperative.

- NOTES -

- NOTES -

- NOTES -

CONDENSED SPARE PARTS LIST

ER SERIES ELECTRIC FRYERS WITH TDI CONTROLS		
Part Number	**Description**	**Notes**
414146-2	High Limit Thermostat	
422737-1	Thermistor Probe-Temperature	
427759-1	Interface Board	
426805-G1	Reed Switch- Wired	
426801-2	Magnet-Reed Switch	
411500-13	Transformer 240/24 40 VA	
FE-023-55	Fuse Holder	
FE-019-40	Fuse 15 Amp	
411501-21	Circuit Breaker 50 Amp	
416535-7	Relay, 240v	
416535-4	Relay, 24V	
416535-6	Relay, 120v	
427755-G1	Rocker Switch	
411497-C5	Contactor 40 Amp 230v	
411497-C3	Contactor 40 Amp 120v	
421892-G1	Element 208v 12KW	
421892-G3	Element 240v 12KW	
416741-G9	Element 208v 8.5KW	
416741-G11	Element 240v 8.5KW	
416741-G5	Element 208v 7KW	
416741-G7	Element 240v 7KW	
421892-G4	Element 480v, 12KW	
416741-G12	Element 480v, 8.5KW	
416741-G8	Element 480v, 7KW	
411500-12	Transformer 120/28 40 VA	
411500-13	Transformer 208-240/28 40VA	
427757-1	Controller TDI D Series	
427758-1	Controller TDI C Series	
427820-1	Overlay, Controller TDI D Series	
426732-1	Overlay, Controller TDI C Series	
411497-A3	Relay 24v	
417792-1	Pump & Motor, Filter 120v	
411496-B4	Rocker Switch, Lighted (Filter)	
411496-F7	Micro Switch (oil return valves)	

ONLINE PARTS CATALOG

Order parts online at our Hobart Service Parts store: http://thesmartpartsestore.hobartservice.com/

VULCAN

CATALOG OF REPLACEMENT PARTS

ER SERIES FRYER

MODELS

1ER50A	ML-136730
1ER50C	ML-136498
1ER50D	ML-136496
1ER85A	ML-136740
1ER85C	ML-136499
1ER85D	ML-136497
1ER50AF	ML-136799
2ER50AF	ML-136741
3ER50AF	ML-136743
4ER50AF	ML-136745
1ER50CF	ML-136798
2ER50CF	ML-136598
3ER50CF	ML-136608
4ER50CF	ML-136615
1ER50DF	ML-136797
2ER50DF	ML-136596
3ER50DF	ML-136606
4ER50DF	ML-136614
1ER85AF	ML-136802
2ER85AF	ML-136742
1ER85CF	ML-136801
2ER85CF	ML-136599
1ER85DF	ML-136800
2ER85DF	ML-136597

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BALTIMORE, MD 21222

F-43220 Rev C. (April 2020)

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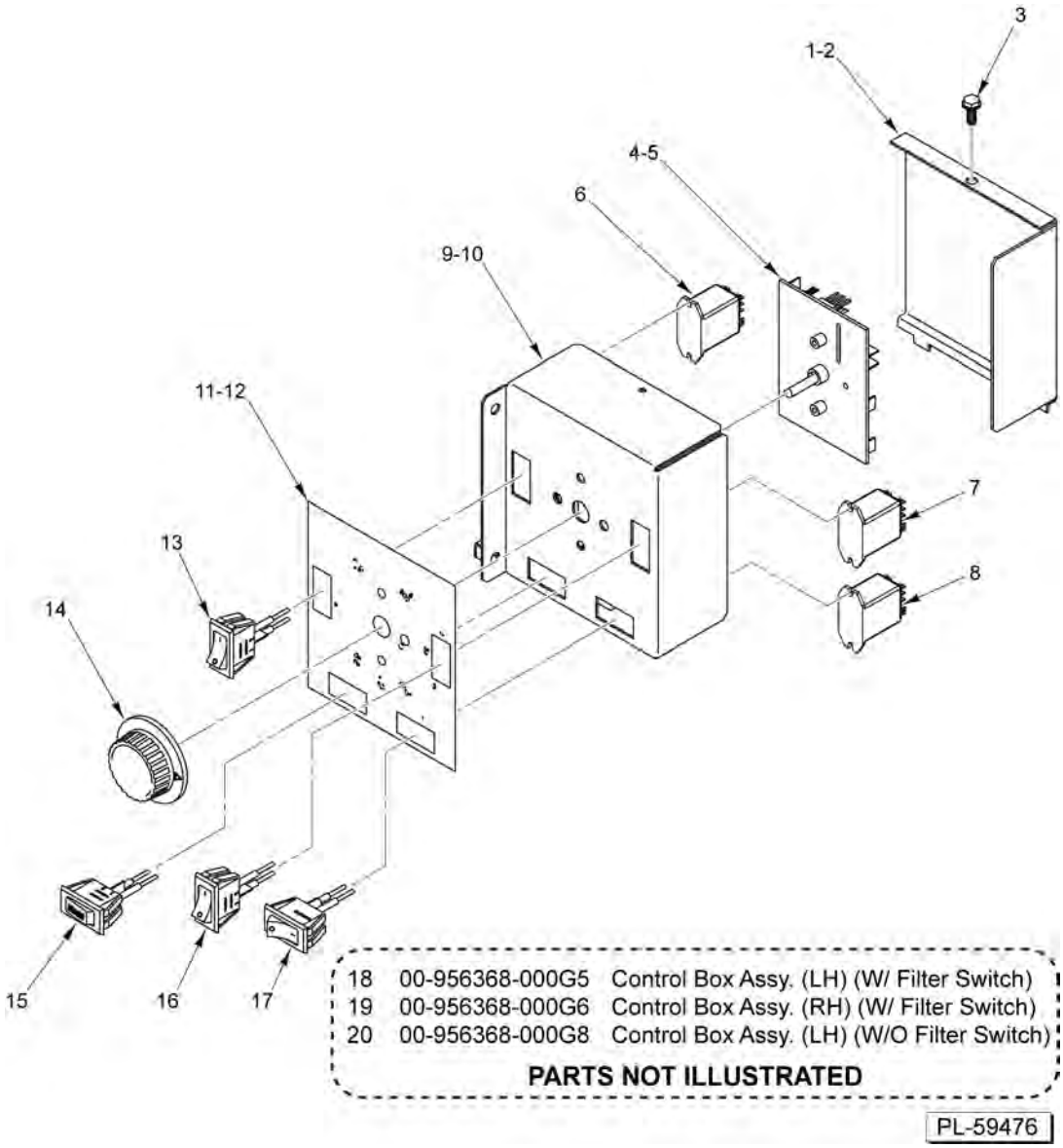
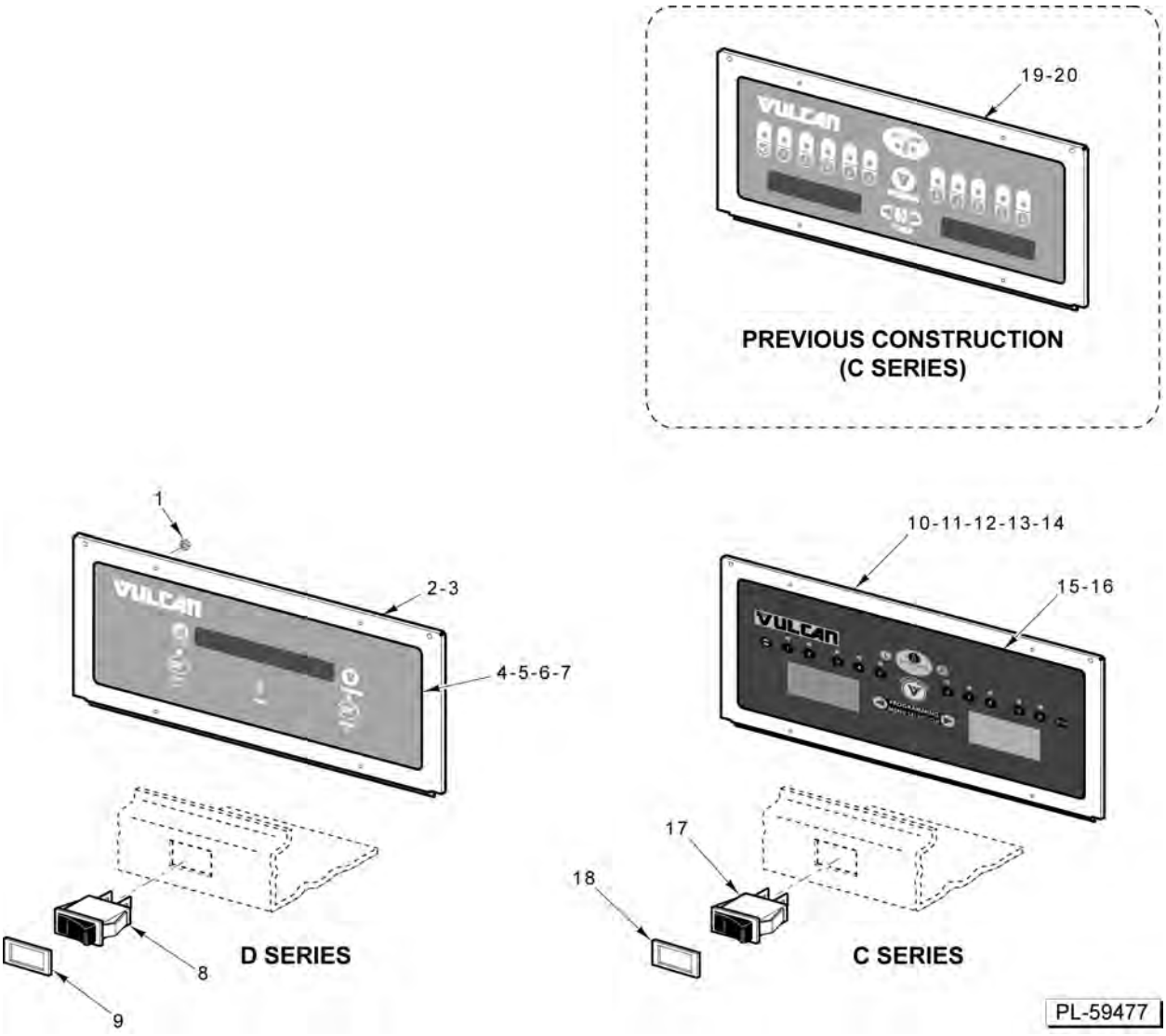


CONTROL BOX ASSEMBLY
(BEHIND DOOR)

CONTROL BOX ASSEMBLY
(BEHIND DOOR)

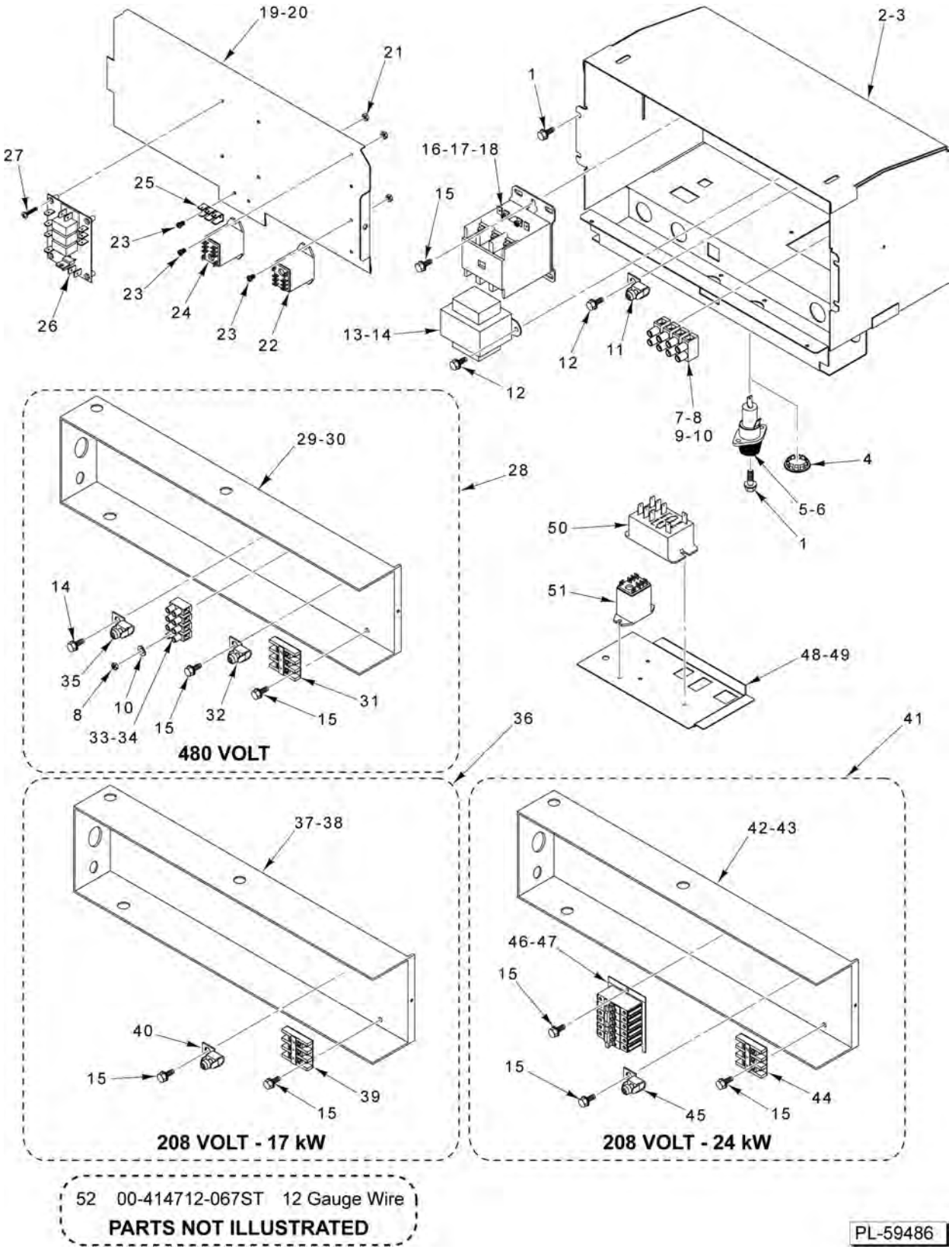
ILLUS. PL-59476	PART NO.	NAME OF PART	AMT.
1	00-957822-00002	Cover - Control Box (LH)	1
2	00-957822-00003	Cover - Control Box (RH)	1
3	SD-032-07	Self-Tapping Screw 10-24 x 1/2 Hex Washer Hd., Type TT	1
4	00-956926-000G4	Control Assy. - Behind Door With Led	1
5	00-956926-000G2	Control Assy. - Behind Door No Led	1
6	00-416535-00006	Relay (Power) (Built Before 1/1/2010)	1
7	00-416535-00007	Relay (Power) (Built Before 1/1/2010)	1
8	00-416535-00004	Relay (Heating) S.P.D.T. 24 V. Coil	1
9	00-499716-00003	Plate - Control Mounting (LH)	1
10	00-499716-00004	Plate - Control Mounting (RH)	1
11	00-956827-00002	Overlay	1
12	00-428906-00001	Overlay - Power	1
13	00-427755-000G1	Rocker Switch Assy. S.P.S.T. (ON/OFF)	1
14	00-411242-00001	Knob	1
15	00-427755-000G2	Rocker Switch Assy. (Start)	1
16	00-427755-000G1	Rocker Switch Assy. S.P.S.T	1
17	00-427755-000G1	Rocker Switch Assy. S.P.S.T. (FILTER) (AF Series)	1
18	00-956368-000G5	Control Box Assy. (LH) (W/ Filter Switch) (Incls. Items 1, 3, 4, 8, 9, & 11 thru 17)	1
19	00-956368-000G6	Control Box Assy. (RH) (W/ Filter Switch) (Incls. Items 2, 3, 4, 8, & 10 thru 17)	1
20	00-956368-000G8	Control Box Assy. (LH) (W/O Filter Switch) (Incls. Items 1, 3, 4, 8, 9, & 11 thru 16)	1



CONTROL PANEL (NCC)

CONTROL PANEL (NCC)

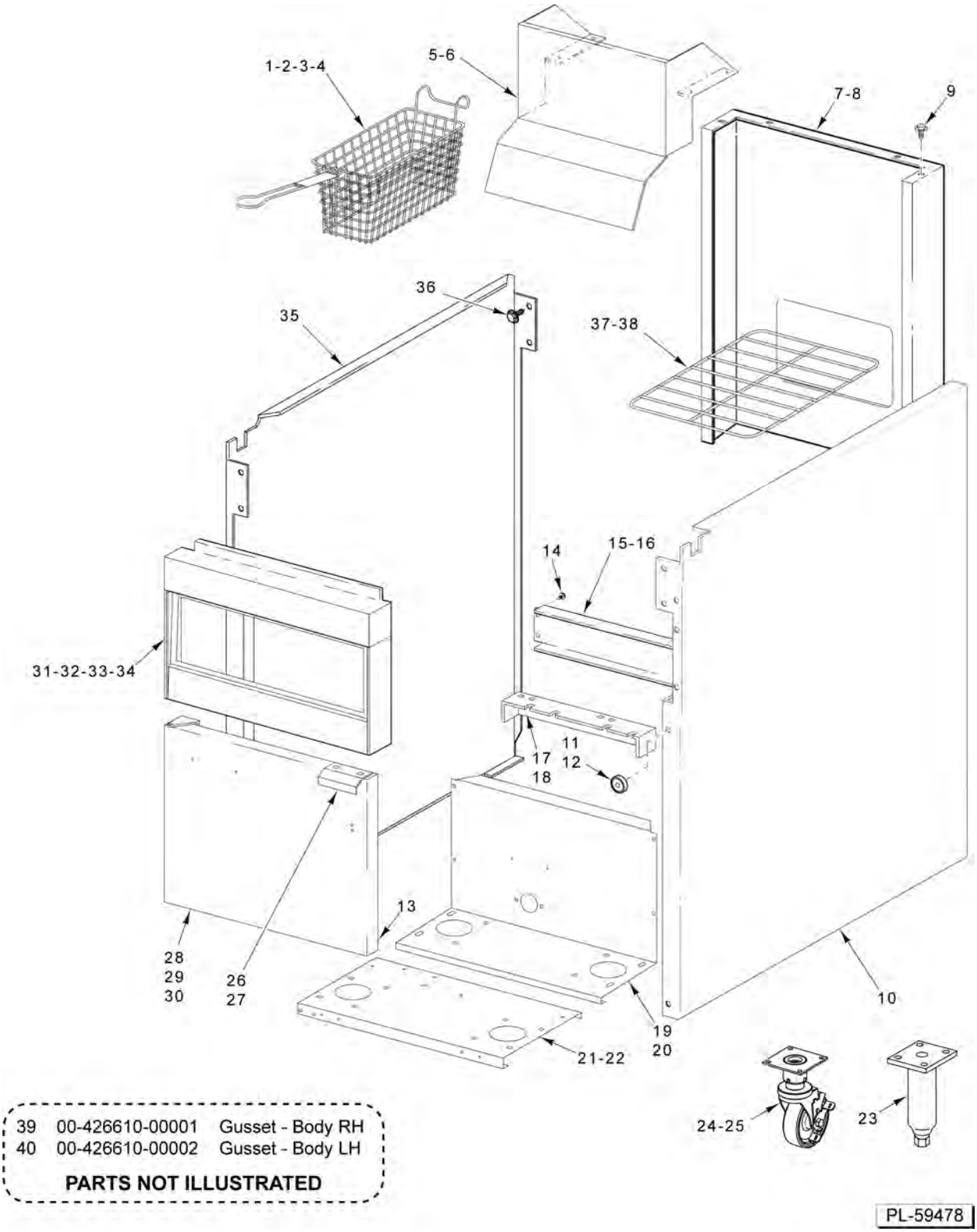
ILLUS. PL-59477	PART NO.	NAME OF PART	AMT.
1	NS-046-89	Nut Assy. 6-32 Hex	4
2	00-426815-000G1	Plate Assy. - Mounting (50 Series)	1
3	00-426815-000G2	Plate Assy. - Mounting (85 Series)	1
4	00-497745-00003	Overlay - Vulcan (Boil) (Button)	1
5	00-497745-00001	Overlay - Vulcan (Filter) (Button)	1
6	00-913086-00003	Control Assy. - Solid State (Boil Button) (Incls. Item 4)	1
7	00-913086-00004	Control Assy. - Solid State (Filter Button) (Incls. Item 5)	1
8	00-427755-000G1	Rocker Switch Assy. Power	1
9	00-428906-00001	Overlay - Power	1
10	00-913086-00002	Computer Cooking Assy. (Filter Button) (Incls. 15)	1
11	00-913086-00001	Computer Cooking Assy. (Boil Button) (Incls. 16)	1
12	00-426815-000G1	Plate Assy. - Mounting (50 Series)	1
13	00-426815-000G2	Plate Assy. - Mounting (85 Series)	1
14	NS-046-89	Nut Assy. 6-32 Hex	4
15	00-958620-00001	Overlay - Vulcan (Filter Button) Control Panel	1
16	00-958620-00002	Overlay - Vulcan (Boil Button) Control Panel	1
17	00-427755-000G1	Rocker Switch Assy	1
18	00-428906-00001	Overlay - Power	1
19	00-426732-00001	Overlay - Control Panel (Filter Button)	1
20	00-497422-00001	Overlay - Control Panel (Boil)	1



POWER SUPPLY BOX

POWER SUPPLY BOX

ILLUS. PL-59486	PART NO.	NAME OF PART	AMT.
1	SD-036-80	Self-Tapping Screw 8-32 x 3/8 Hex Washer Hd., Type TT	AR
2	00-497095-00002	Box - Power Supply (85 Series)	1
3	00-497095-00001	Box - Power Supply (50 Series)	1
4	PB-002-26	Plug - Button (Slave Power Box)	2
5	FE-019-40	Fuse (15 Amp., 600 V.)	2
6	FE-023-55	Holder - Fuse (15 Amp., 300 V.)	2
7	00-414208-00002	Barrier - Terminal	1
8	NS-009-07	Nut 6-32 Hex	4
9	SC-119-90	Mach. Screw 6-32 x 1 Slotted Pan Hd	2
10	WL-004-40	Lockwasher 10 Helical	4
11	00-417856-00001	Lug - Grounding (With Set Screw)	1
12	SD-032-07	Self-Tapping Screw 10-24 x 1/2 Hex Washer Hd., Type TT	3
13	00-411500-00012	Transformer (120 VAC, 24 V., 40 VA) (480 V.)	1
14	00-411500-00013	Transformer (200-240 VAC, 28 V., 20 VA) (208/240 V.)	1
15	SD-036-96	Self-Tapping Screw 8-18 x 3/4 Hex Hd., Type AB	AR
16	00-945037-00050	Contactor - 50 Amp. DEF (208/240 V.) (ER50)	AR
17	00-945037-00063	Contactor - 63 Amp. DEF (208/240 V.) (ER85)	AR
18	00-411497-000C6	Contactor (3-Pole) (50 Amp., 120 V.) (480 V.)	AR
19	00-497096-00001	Plate - Temperature Board (50 Series)	1
20	00-497096-00002	Plate - Temperature Board (85 Series)	1
21	NS-047-32	Lock Nut 4-40	AR
22	00-416535-00007	Switch - Relay (240 V.) (Built Before 1/1/10)	1
23	SC-060-23	Mach. Screw 4-40 x 1/4 Slotted Rd. Hd	AR
24	00-416535-00004	Relay - Filter - Fill Valve S.P.D.T. 24 V. Coil	1
25	00-419317	Terminal - Stationary	1
26	00-427759-00001	Control - Interface	1
27	SD-024-40	Self-Tapping Screw 6-32 x 5/8 Phil. Pan Hd., Type TT	4
28	00-497266-000G4	Box - Power Supply (480 V.) (Incls. Items 8, 10, 14, 15, & 29 thru 35)	1
29	00-428270-00003	Box - Breaker	1
30	00-428271-00005	Lid - Breaker Box Small	1
31	00-410472-00008	Block - Terminal (3-Pole)	1
32	00-417856-00001	Lug - Grounding (With Set Screw)	1
33	00-414208-00002	Barrier - Terminal	1
34	SC-119-90	Mach. Screw 6-32 x 1 Slotted Pan Hd	2
35	00-417856-00001	Lug - Grounding (With Set Screw)	1
36	00-497266-000G1	Box - Power Supply (208 V., 17 kW) (50 Series) (Incls. Items 15, & 37 thru 40)	1
37	00-428270-00003	Box - Breaker	1
38	00-428271-00005	Lid - Breaker Box Small	1
39	00-410472-00008	Block - Terminal (3-Pole)	1
40	00-417856-00001	Lug - Grounding (With Set Screw)	1
41	00-497266-000G2	Box - Power Supply (208 V.) (24 kW) (85 Series) (Incls. Items 15, & 42 thru 47)	1
42	00-428270-00002	Box - Breaker	1
43	00-428271-00004	Lid Breaker Box With Breakers	1
44	00-410472-00008	Block - Terminal (3-Pole)	1
45	00-417856-00001	Lug - Grounding (With Set Screw)	1
46	00-976601-00001	Breaker - Circuit (3-Pole) (ER85 208 V.)	2
47	00-497361-00002	Bracket - Breaker (ER85 208 V.)	1
48	00-499219-000G1	Plate - Control Mounting (Incls. Items 49 thru 51)	1
49	00-499219-00001	Plate - Control Mount	1
50	00-428864-00001	Relay (Filter - Pump)	1
51	00-416535-00004	Relay - Filter - Fill Valve S.P.D.T. 24 V. Coil	1
52	00-414712-067ST	12 Gauge Wire 67 In. (Contactor to Element)	AR



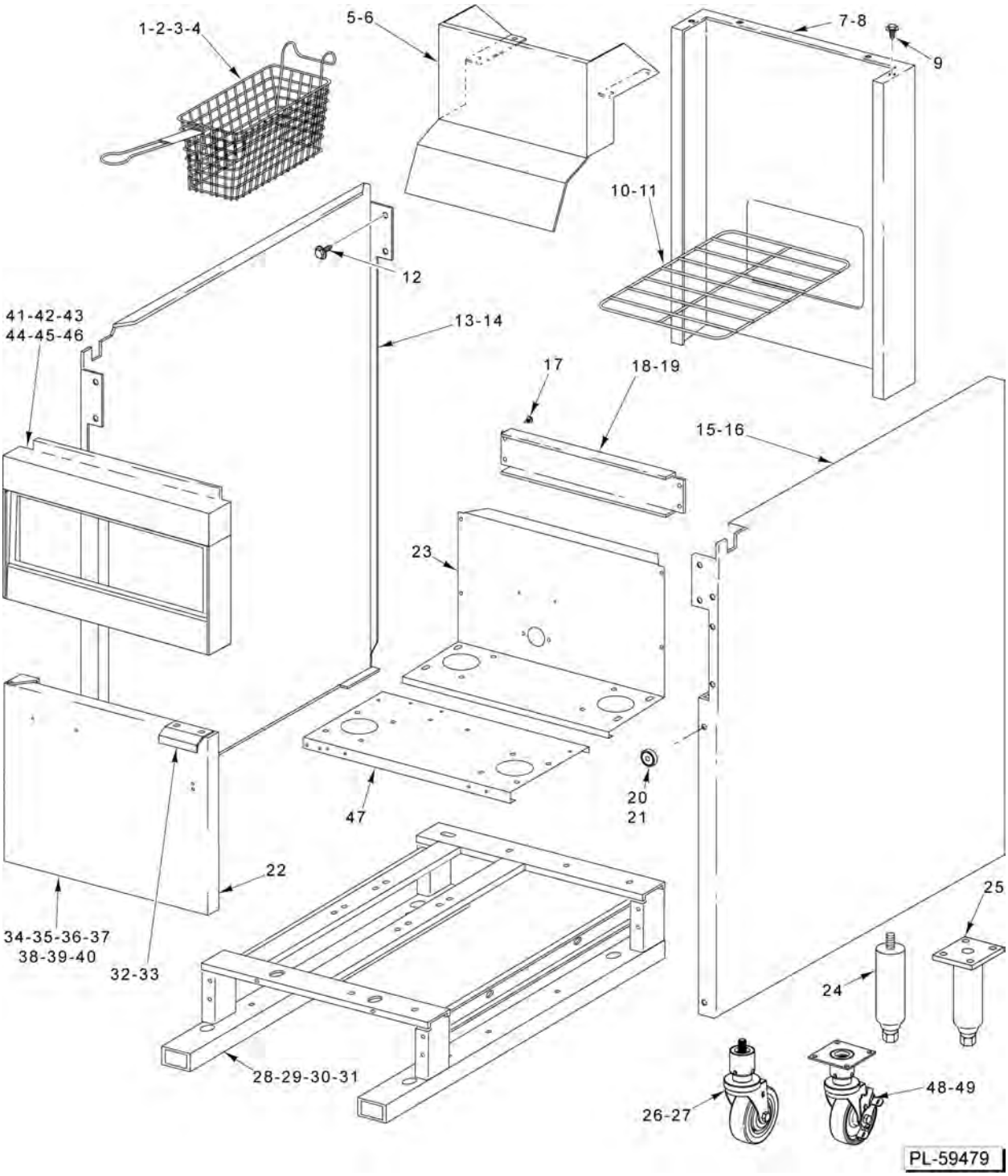
39	00-426610-00001	Gusset - Body RH
40	00-426610-00002	Gusset - Body LH

PARTS NOT ILLUSTRATED

BODY UNIT
(WITHOUT FILTER)

BODY UNIT
(WITHOUT FILTER)

ILLUS. PL-59478	PART NO.	NAME OF PART	AMT.
1	00-499223-00001	Basket - Twin (50 Series)	AR
2	00-499223-00004	Basket - Twin (85 Series)	AR
3	00-499223-00011	Basket - Single (85 Series)	AR
4	00-499223-00009	Basket Single (50 Series)	AR
5	00-421912-000G1	Hanger - Single Basket (85 Series)	1
6	00-421911-000G1	Hanger - Basket (50 Series)	1
7	00-422020-000G4	Flue Wrap (SST) (85 Series)	1
8	00-422021-00002	Flue Wrap (SST) (50 Series)	1
9	SD-036-96	Self-Tapping Screw 8-18 x 3/4 Hex Hd., Type AB	2
10	00-419777-00004	Body - Side (SST)	1
11	RS-033-04	Rivet - Pop	1
12	00-497296-000G1	Magnet Assy	1
13	00-420769-00001	Bumper - Rubber	1
14	SD-032-07	Self-Tapping Screw 10-24 x 1/2 Hex Washer Hd., Type TT	10
15	00-417014-00001	Bracket - Rear Support (50 Series)	1
16	00-418320-00001	Bracket - Rear Support (85 Series)	1
17	00-427825-00001	Bracket - Power Supply - Rear	1
18	00-427824-00001	Bracket - Power Supply - Front	1
19	00-416950-00001	Body - Bottom (Rear) (50 Series)	1
20	00-419652	Body - Bottom (Rear) (85 Series)	1
21	00-427886-00001	Body - Bottom (Front) (50 Series)	1
22	00-428152-00001	Body - Bottom (Front) (85 Series)	1
23	00-413112-00012	Leg - Plate Mount (6 In.) (SST)	4
24	00-421893-00001	Caster - Plate Mount (With Brake)	2
25	00-421893-00002	Caster - Plate Mount (Without Brake)	2
26	00-419653	Handle	1
27	RS-033-02	Rivet - Pop	2
28	00-428023-000G2	Hinge Assy	1
29	00-499487-000G3	Door Assy. (LH) (SST) (50 Series)	1
30	00-499487-000G7	Door Assy. (LH) (SST) (85 Series)	1
31	00-426806-000G1	Frame - Front Assy. (50 Series)	1
32	00-426806-000G4	Frame - Front Assy. (85 Series)	1
33	00-426814-00004	Plate - Control (1ER50A)	1
34	00-426814-00005	Plate - Control (1ER85A)	1
35	00-419777-00003	Body - Side (SST)	1
36	SD-036-03	Self-Tapping Screw 8-18 x 3/8 Hex Washer Hd., Type AB	8
37	00-427883-00002	Screen - Basket Support (50 Series)	1
38	00-427883-00004	Screen - Basket Support (85 Series)	1
39	00-426610-00001	Gusset - Body RH	1
40	00-426610-00002	Gusset - Body LH	1



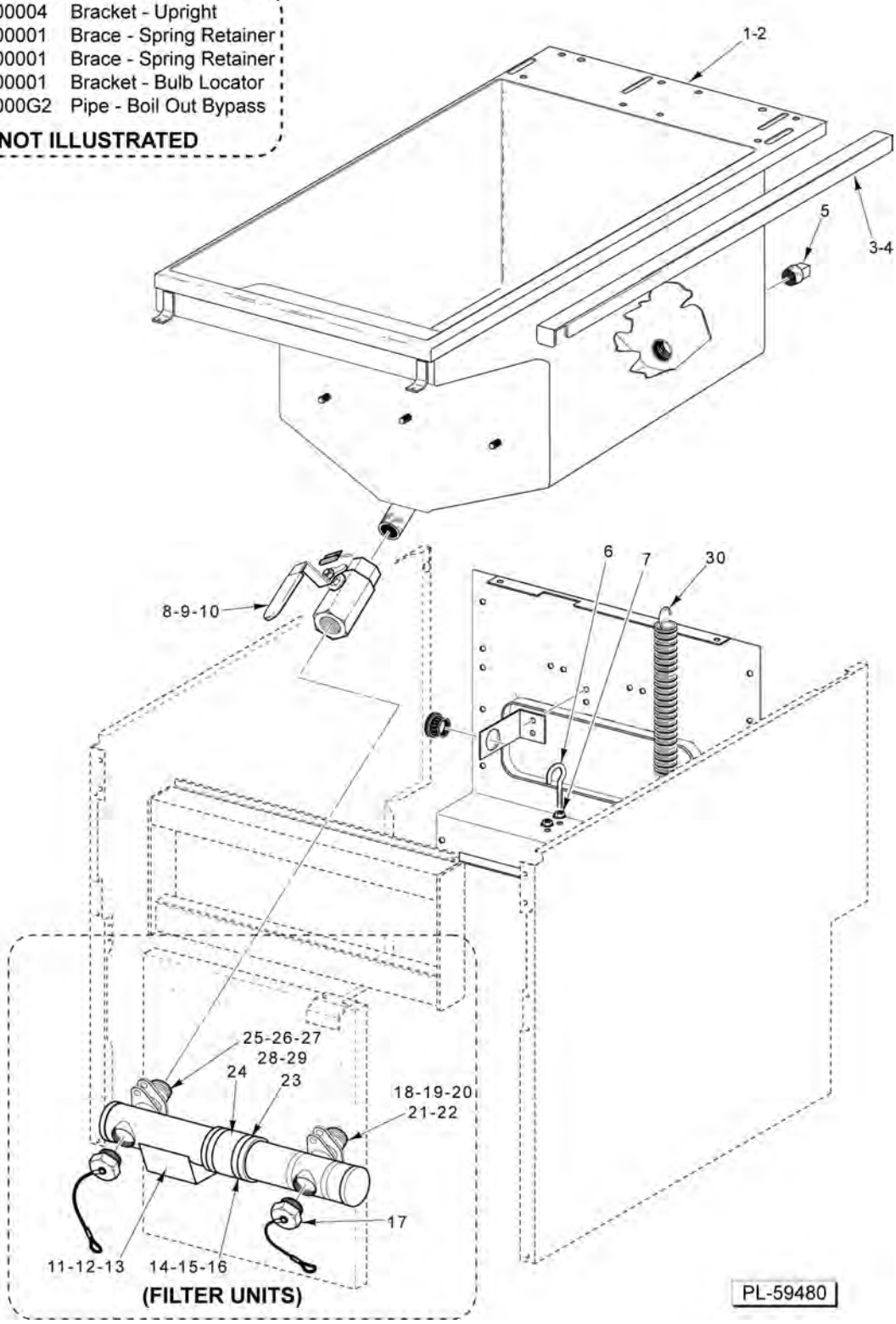
BODY UNIT
(WITH FILTER)

BODY UNIT
(WITH FILTER)

ILLUS. PL-59479	PART NO.	NAME OF PART	AMT.
1	00-499223-00001	Basket - Twin (50 Series)	AR
2	00-499223-00004	Basket - Twin (85 Series)	AR
3	00-499223-00011	Basket - Single (85 Series)	AR
4	00-499223-00009	Basket - Single (50 Series)	AR
5	00-421912-000G1	Hanger - Single Basket (85 Series)	1
6	00-421911-000G1	Hanger - Basket (50 Series)	1
7	00-422020-000G4	Flue Wrap (SST) (85 Series)	1
8	00-422021-00002	Flue Wrap (SST) (50 Series)	1
9	SD-036-96	Self-Tapping Screw 8-18 x 3/4 Hex Hd., Type AB	2
10	00-427883-00002	Screen - Basket Support (50 Series)	1
11	00-427883-00004	Screen - Basket Support (85 Series)	1
12	SD-036-03	Self-Tapping Screw 8-18 x 3/8 Hex Washer Hd., Type AB	8
13	00-420596-00003	Body - Side (SST) (LH) (3ER50 & 4ER50 Series)	1
14	00-419777-00003	Body - Side (SST) (LH) (85 Series, 1ER50, & 2ER50 Series)	1
15	00-420596-00004	Body - Side (SST) (RH) (4ER50 Series)	1
16	00-419777-00004	Body - Side (SST) (RH) (85 Series, 1ER50, 2ER50, & 3ER50 Series)	1
17	SD-032-07	Self-Tapping Screw 10-24 x 1/2 Hex Washer Hd., Type TT	10
18	00-417014-00001	Bracket - Rear Support (50 Series)	1
19	00-418320-00001	Bracket - Rear Support (85 Series)	1
20	RS-033-04	Rivet - Pop	1
21	00-497296-000G1	Magnet Assy	1
22	00-420769-00001	Bumper - Rubber	1
23	00-416950-00001	Body - Bottom (Rear) (3ER50 & 4ER50 Series)	1
24	00-413112-00007	Leg - Screw-in Mount (6-1/4 In.) (SST)	4
25	00-413112-00012	Leg - Plate Mount (6 In.)	2
26	00-959832-00001	Caster - Screw-In Mount (With Brake)	2
27	00-959832-00002	Caster - Screw-In Mount (Without Brake)	2
28	00-427275-000G1	Body - Bottom Frame (2ER50, 3ER50, & 4ER50 Series)	1
29	00-427373-000G1	Body - Bottom Frame (2ER85 Series)	1
30	00-956906-000G2	Body - Bottom Frame (50 Series)	1
31	00-956906-000G4	Body - Bottom Frame (85 Series)	1
32	00-419653	Handle	1
33	RS-033-02	Rivet - Pop	2
34	00-499487-000G1	Door Assy. (LH) (SST) (3ER50 & 4ER50 Series)	1
35	00-499487-000G2	Door Assy. (RH) (RH) (SST) (4ER50 Series)	1
36	00-499487-000G3	Door Assy. (LH) (With Hinge) (SST) (50 Series)	1
37	00-499487-000G4	Door Assy. (RH) (With Hinge) (SST) (2ER50, 3ER50, & 4ER50 Series)	1
38	00-499487-000G7	Door Assy. (LH) (With Hinge) (SST) (85 Series)	1
39	00-499487-000G8	Door Assy. (RH) (With Hinge) (SST) (2ER85 Series)	1
40	00-428023-000G2	Hinge Assy. - Door LH (3ER50 & 4ER50 Series)	1
41	00-426806-000G1	Frame - Front Assy. (1ER50 Series)	1
42	00-426806-000G2	Frame - Front Assy. (2ER50 Series)	1
43	00-426806-000G3	Frame - Front Assy. (3ER50 Series)	1
44	00-426806-000G4	Frame - Front Assy. (1ER85 Series)	1
45	00-426806-000G5	Frame - Front Assy. (2ER85 Series)	1
46	00-426806-000G7	Frame - Front Assy. (4ER50 Series)	1
47	00-427886-00001	Body - Bottom (Front) (3ER50 & 4ER50 Series)	1
48	00-421893-00001	Caster - Plate Mount (With Brake)	2
49	00-421893-00002	Caster - Plate Mount (Without Brake)	2

31	00-420588-00004	Bracket - Upright
32	00-422376-00001	Brace - Spring Retainer
33	00-422377-00001	Brace - Spring Retainer
34	00-956636-00001	Bracket - Bulb Locator
35	00-497572-000G2	Pipe - Boil Out Bypass

PARTS NOT ILLUSTRATED



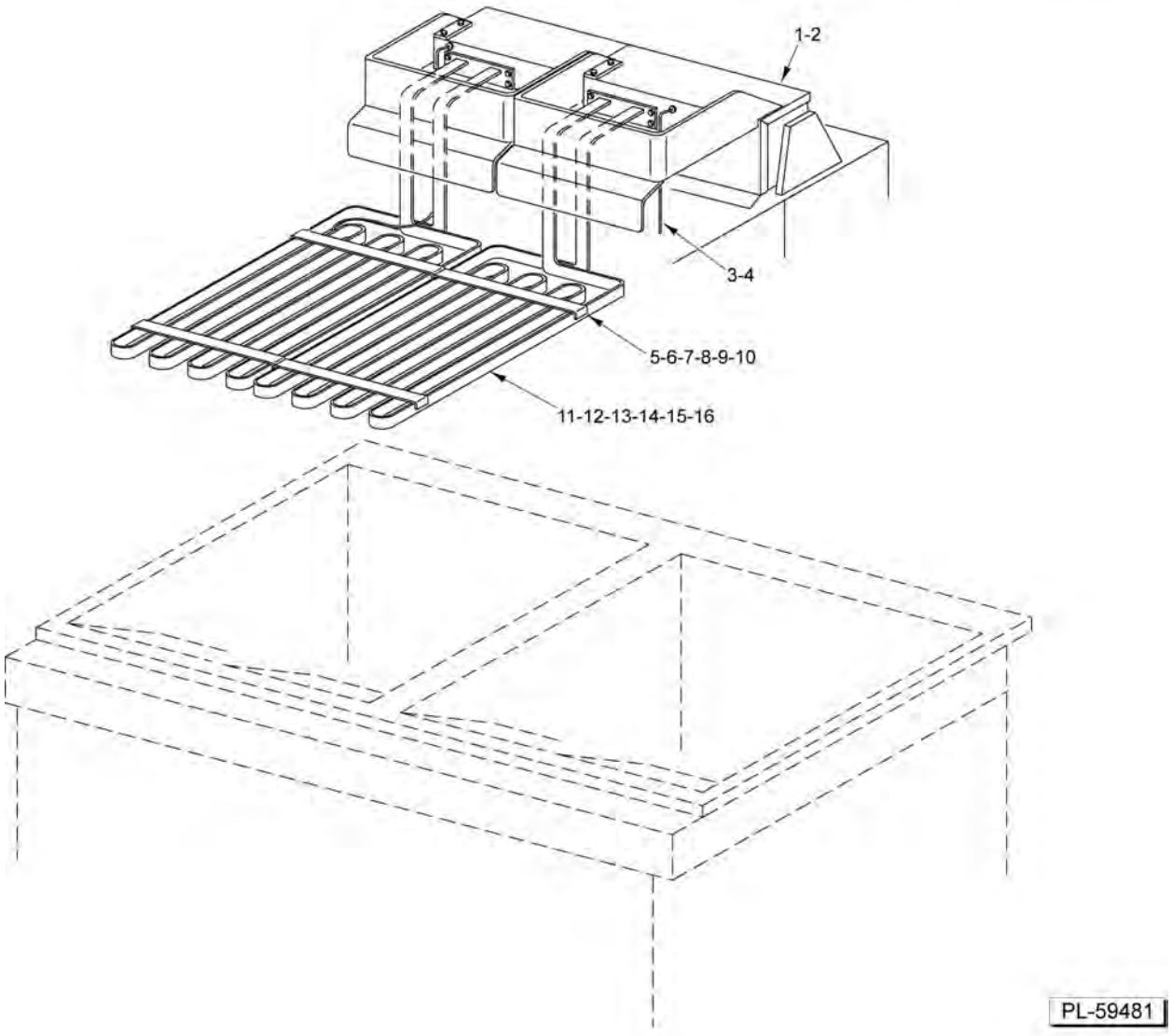
TANK AND DRAIN

TANK AND DRAIN

ILLUS. PL-59480	PART NO.	NAME OF PART	AMT.
1	00-421844-000G3	Tank Assy. (50 Series)	1
2	00-421842-000G3	Tank Assy. (85 Series)	1
3	00-410863-00002	Strip - Grease (50 Series)	1
4	00-410863-00007	Channel - Grease (85 Series)	1
5	FP-028-14	Pipe - Plug 1/2 Sq. Hd	AR
6	00-402570-00003	Eye Bolt	AR
7	NS-047-69	Lock Nut 6-32 Hex	AR
8	00-913111	Valve Assy. (Incls. Items 9 & 10)	1
9	00-426805-000G1	Switch Assy	1
10	00-426801-00002	Magnet - Switch Element Head	1
11	00-497567-000G4	Pipe - LH Drain With Spout (2ER85 Series)	1
12	00-497567-000G9	Pipe - Drain (LH) With Spout (2ER50 Series)	1
13	00-497569-000G3	Pipe - Drain (Center) With Spout (4ER50 Series)	1
14	00-497566-000G1	Pipe - Drain (End) (50 Series)	1
15	00-497566-000G4	Pipe - Drain (End) (85 Series)	1
16	00-497568-000G1	Pipe - Drain (Center) (4ER50 Series)	1
17	00-497571-000G1	Plug - Drain	2
18	00-420726-00001	Flange - Pipe 1-1/4 In	1
19	00-420553-00002	Gasket - Silicone	1
20	FP-036-32	Pipe 1-1/4 x 2 TBE	1
21	FP-036-33	Pipe 1-1/4 x 2 1/2 TBE	1
22	SC-036-13	Cap Screw 1/4-20 x 3/4 Hex Hd	2
23	00-497409-00001	Clamp - Drain Tube	AR
24	00-419351-00001	Hose - Connect	AR
25	00-420553-00002	Gasket - Silicone	1
26	00-420726-00001	Flange - Pipe 1-1/4 In	1
27	FP-036-32	Pipe 1-1/4 x 2 TBE	1
28	FP-059-54	Pipe 1-1/4 x 4 Pipe 1-1/4 x 2 1/2 TBE	1
29	SC-036-13	Cap Screw 1/4-20 x 3/4 Hex Hd	2
30	00-406363-00001	Spring - Door (Long)	AR
31	00-420588-00004	Bracket - Upright	1
32	00-422376-00001	Brace - Spring Retainer (50 Series)	1
33	00-422377-00001	Brace - Spring Retainer (85 Series)	1
34	00-956636-00001	Bracket - Bulb Locator	1
35	00-497572-000G2	Pipe - Boil Out Bypass	1

17	00-414146-00002	Thermostat Hi-Limit
18	00-426801-00001	Switch - Wired
19	00-426801-00002	Magnet - Switch Element Head
20	00-422380-00001	Clamp - Rear Lower Element
21	00-414178-000G3	Clamp - Top Element Assy. With Guard
22	00-422381-000G2	Clamp - Top Element Assy. With Guard
23	00-422414-00001	Clamp - Front Lower Element
24	00-427764-00001	Clamp - Front Lower Element
25	00-414305-00001	Gasket - Wire Chase
26	00-416736-00001	Gasket - Element Flange

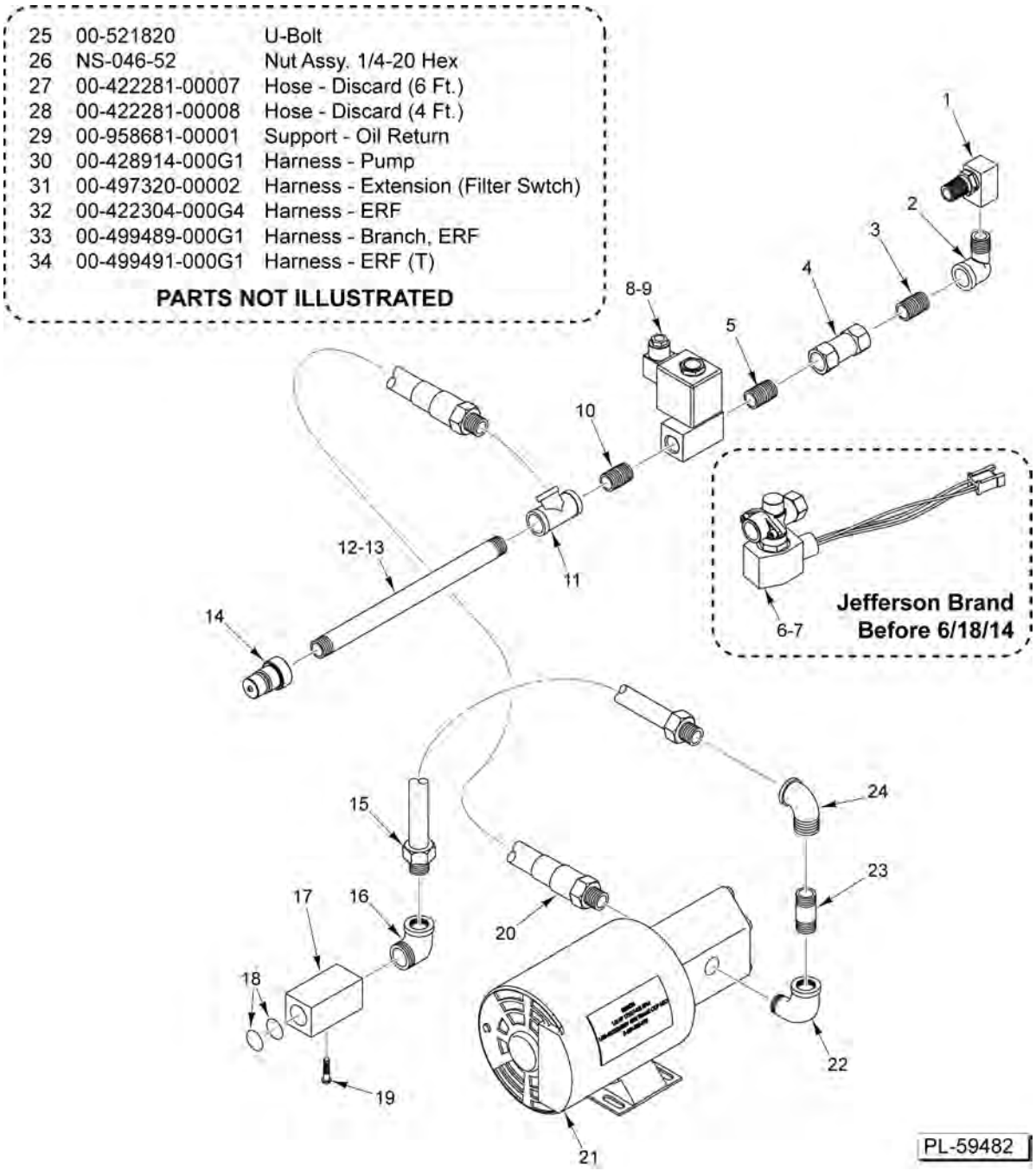
PARTS NOT ILLUSTRATED



HEATING ELEMENT ASSEMBLY

HEATING ELEMENT ASSEMBLY

ILLUS. PL-59481	PART NO.	NAME OF PART	AMT.
1	00-421829-000G1	Element Head Assy. (85 Series)	1
2	00-422322-000G1	Element Head Assy. (50 Series)	1
3	00-422737-00001	Probe - Thermistor (85 Series)	1
4	00-422737-00002	Probe - Thermistor (50 Series)	1
5	00-416782-00001	Bracket - Hi-Limit	AR
6	00-416782-00002	Bracket - Hi-Limit	1
7	00-414177-00001	Clamp - Bottom Element (50 Series)	2
8	00-422380-00001	Clamp - Bottom Element (85 Series)	1
9	00-422381-000G1	Clamp - Top Element Assy. (85 Series)	4
10	00-414178-000G2	Clamp - Top Element Assy. (50 Series)	4
11	00-416741-000G9	Element Assy. (208 V., 8500 W) (50 Series)	2
12	00-416741-00G12	Element Assy. (480 V., 8500 W) (50 Series)	2
13	00-416741-00G11	Element Assy. (240 V., 8500 W) (50 Series)	2
14	00-421892-000G1	Element Assy. (208 V., 12000 W) (85 Series)	2
15	00-421892-000G4	Element Assy. (480 V., 12000 W) (85 Series)	2
16	00-421892-000G3	Element Assy. (240 V., 12000 W) (85 Series)	2
17	00-414146-00002	Thermostat Hi-Limit	1
18	00-426801-00001	Switch - Wired	1
19	00-426801-00002	Magnet - Switch Element Head	1
20	00-422380-00001	Clamp - Rear Lower Element (85 Series)	1
21	00-414178-000G3	Clamp - Top Element Assy. With Guard (50 Series)	1
22	00-422381-000G2	Clamp - Top Element Assy. With Guard (85 Series)	1
23	00-422414-00001	Clamp - Front Lower Element (85 Series)	1
24	00-427764-00001	Clamp - Front Lower Element (50 Series)	1
25	00-414305-00001	Gasket - Wire Chase	1
26	00-416736-00001	Gasket - Element Flange	4



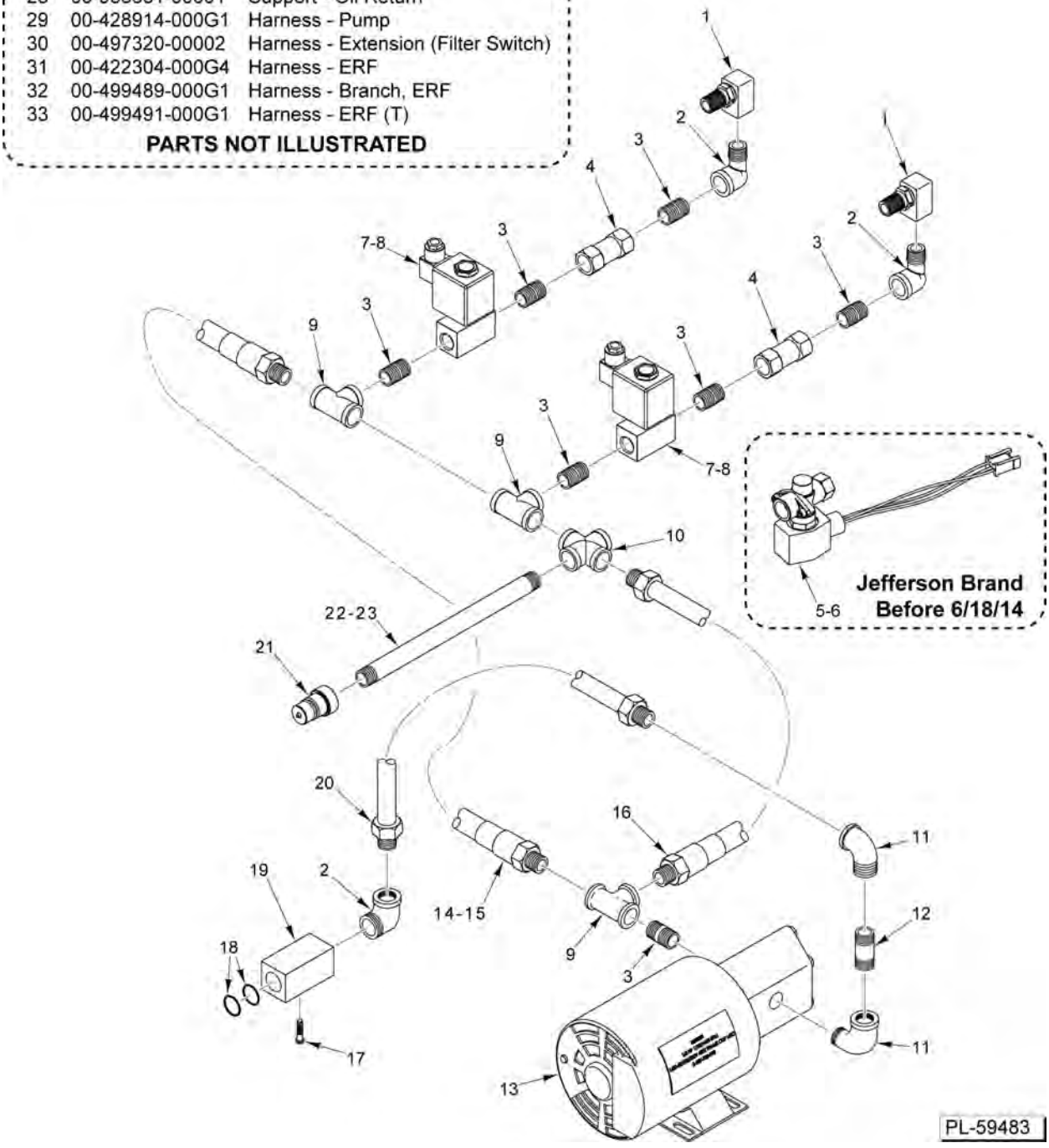
OIL RETURN
(STAND ALONE WITH FILTER)

OIL RETURN
(STAND ALONE WITH FILTER)

ILLUS. PL-59482	PART NO.	NAME OF PART	AMT.
1	00-419251-00001	Fitting - 90 Deg. Swivel	1
2	FP-013-17	Elbow - Street 1/2 x 90 Deg	1
3	FP-035-91	Pipe 1/2 x 1-1/8 TBE	1
4	00-418786-00001	Valve - Check	AR
5	FP-035-91	Pipe 1/2 x 1-1/8 TBE	1
6	00-428691-00002	Valve - Solenoid (120 V.) (Before 6/18/14)	AR
7	00-428691-00003	Valve - Solenoid (208 V.) (Before 6/18/14)	AR
8	00-959909-00001	Valve - Solenoid (120 V.) (Starting 6/18/14)	AR
9	00-959909-00002	Valve - Solenoid (208 V.) (Starting 6/18/14)	AR
10	FP-035-91	Pipe 1/2 x 1-1/8 TBE	1
11	FP-019-25	Tee 1/2 x 1/2 x 1/2	1
12	FP-085-79	Pipe 1/2 x 14-1/4 TBE	1
13	FP-090-79	Pipe 1/2 x 19 TBE	1
14	00-418781-00001	Quick Disconnect	1
15	00-426602-00002	Tube - Flex (29 In.)	1
16	FP-013-17	Elbow - Street 1/2 x 90 Deg	1
17	00-426567-00003	Receptacle - Oil Suction	1
18	00-426567-00002	O-Ring (Viton)	2
19	SC-114-01	Mach. Screw 10-32 x 3/8 Hex Washer Hd	2
20	00-426602-00001	Tube - Flex (12 In.)	1
21	00-417792-00008	Pump Motor Assy. (115/230 V., 60 Hz.) (8 G.P.M.)	1
22	FP-077-68	Elbow 1/2 x 90 Deg	1
23	FP-035-95	Pipe 1/2 x 2 TBE	1
24	FP-077-68	Elbow 1/2 x 90 Deg	1
25	00-521820	U-Bolt	1
26	NS-046-52	Nut Assy. 1/4-20 Hex	2
27	00-422281-00007	Hose - Discard (6 Ft.)	AR
28	00-422281-00008	Hose - Discard (4 Ft.)	AR
29	00-958681-00001	Support - Oil Return	1
30	00-428914-000G1	Harness - Pump	1
31	00-497320-00002	Harness - Extension (Filter Switch)	1
32	00-422304-000G4	Harness - ERF	1
33	00-499489-000G1	Harness - Branch, ERF	1
34	00-499491-000G1	Harness - ERF (T)	1

24	00-521820	U-Bolt
25	NS-046-52	Nut Assy. 1/4-20 Hex
26	00-422281-00007	Hose - Discard (6 Ft.)
27	00-422281-00008	Hose - Discard (4 Ft.)
28	00-958681-00001	Support - Oil Return
29	00-428914-000G1	Harness - Pump
30	00-497320-00002	Harness - Extension (Filter Switch)
31	00-422304-000G4	Harness - ERF
32	00-499489-000G1	Harness - Branch, ERF
33	00-499491-000G1	Harness - ERF (T)

PARTS NOT ILLUSTRATED



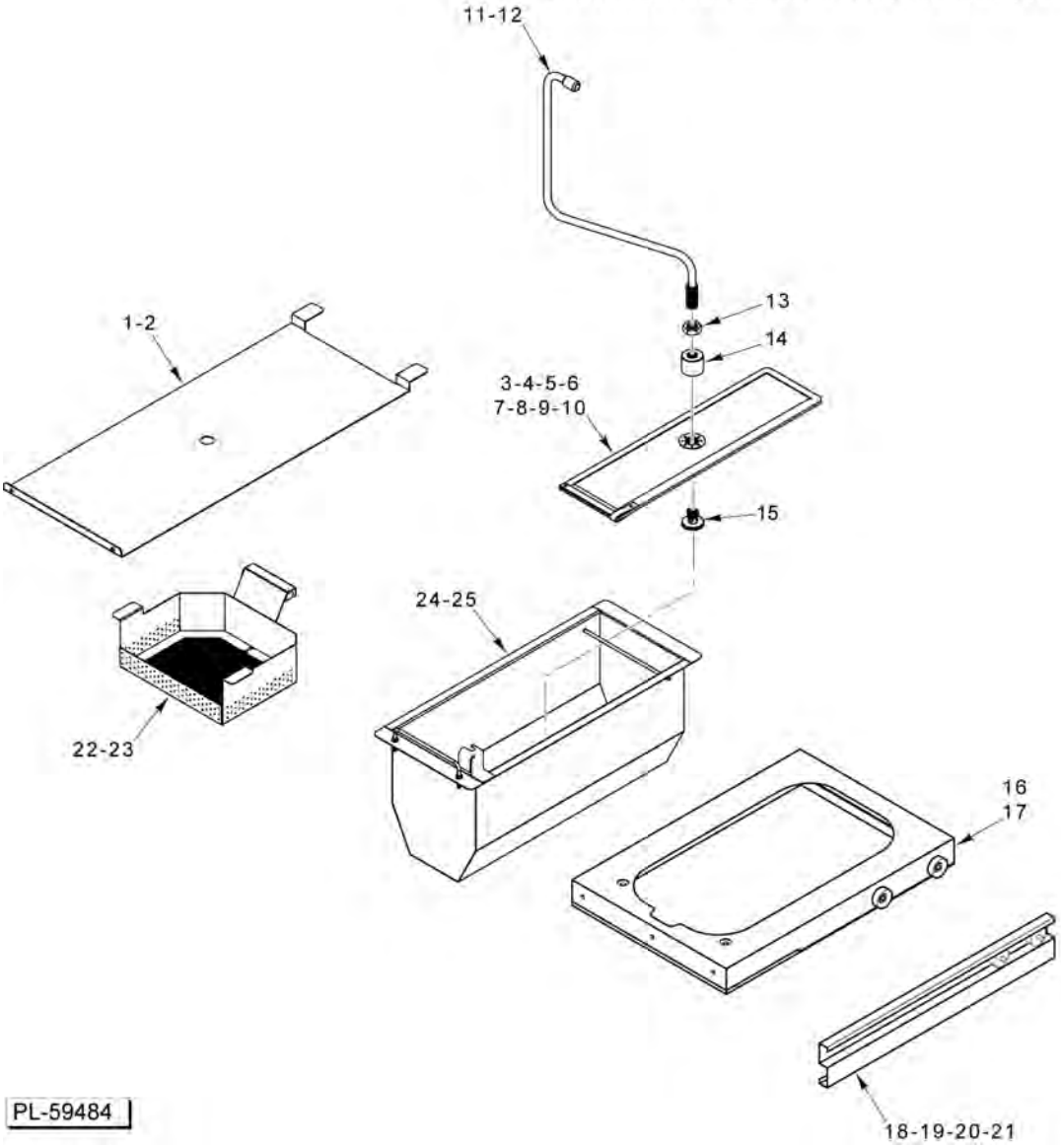
OIL RETURN
(BATTERY WITH FILTER)

OIL RETURN
(BATTERY WITH FILTER)

ILLUS. PL-59483	PART NO.	NAME OF PART	AMT.
1	00-419251-00001	Fitting - 90 Deg. Swivel	2
2	FP-013-17	Elbow - Street 1/2 x 90 Deg	3
3	FP-035-91	Pipe 1/2 x 1-1/8 TBE	7
4	00-418786-00001	Valve - Check	AR
5	00-428691-00002	Valve - Solenoid (120 V.) (Before 6/18/14)	AR
6	00-428691-00003	Valve - Solenoid (208 V.) (Before 6/18/14)	AR
7	00-959909-00001	Valve - Solenoid (120 V.) (Starting 6/18/14)	AR
8	00-959909-00002	Valve - Solenoid (208 V.) (Starting 6/18/14)	AR
9	FP-019-25	Tee 1/2 x 1/2 x 1/2	3
10	FP-034-01	Pipe - Cross 1/2 NPT	1
11	FP-077-68	Elbow 1/2 x 90 Deg	2
12	FP-035-95	Pipe 1/2 x 2 TBE	1
13	00-417792-00008	Pump Motor Assy. (115/230 V., 60 Hz.) (8 G.P.M.)	1
14	00-426602-00001	Tube - Flex (12 In.)	1
15	00-426602-00004	Tube - Flex (19 In.)	1
16	00-426602-00001	Tube - Flex (12 In.)	1
17	SC-114-01	Mach. Screw 10-32 x 3/8 Hex Washer Hd	2
18	00-426567-00002	O-Ring (Viton)	2
19	00-426567-00003	Receptacle - Oil Suction	1
20	00-426602-00002	Tube - Flex (29 In.)	1
21	00-418781-00001	Quick Disconnect	1
22	FP-085-79	Pipe 1/2 x 14-1/4 TBE	1
23	FP-090-79	Pipe 1/2 x 19 TBE	1
24	00-521820	U-Bolt	1
25	NS-046-52	Nut Assy. 1/4-20 Hex	2
26	00-422281-00007	Hose - Discard (6 Ft.)	AR
27	00-422281-00008	Hose - Discard (4 Ft.)	AR
28	00-958681-00001	Support - Oil Return	1
29	00-428914-000G1	Harness - Pump	1
30	00-497320-00002	Harness - Extension (Filter Switch)	1
31	00-422304-000G4	Harness - ERF	1
32	00-499489-000G1	Harness - Branch, ERF	1
33	00-499491-000G1	Harness - ERF (T)	1

26	00-499486-00001	Clip - Drain Pipe
27	00-413927-00001	Grommet - Rubber
28	00-499085-00005	Insert - Fabric Envelope (3-3/4 x 22 In.)
29	00-499085-00006	Insert - Fabric Envelope (9-1/4 x 22 In.)

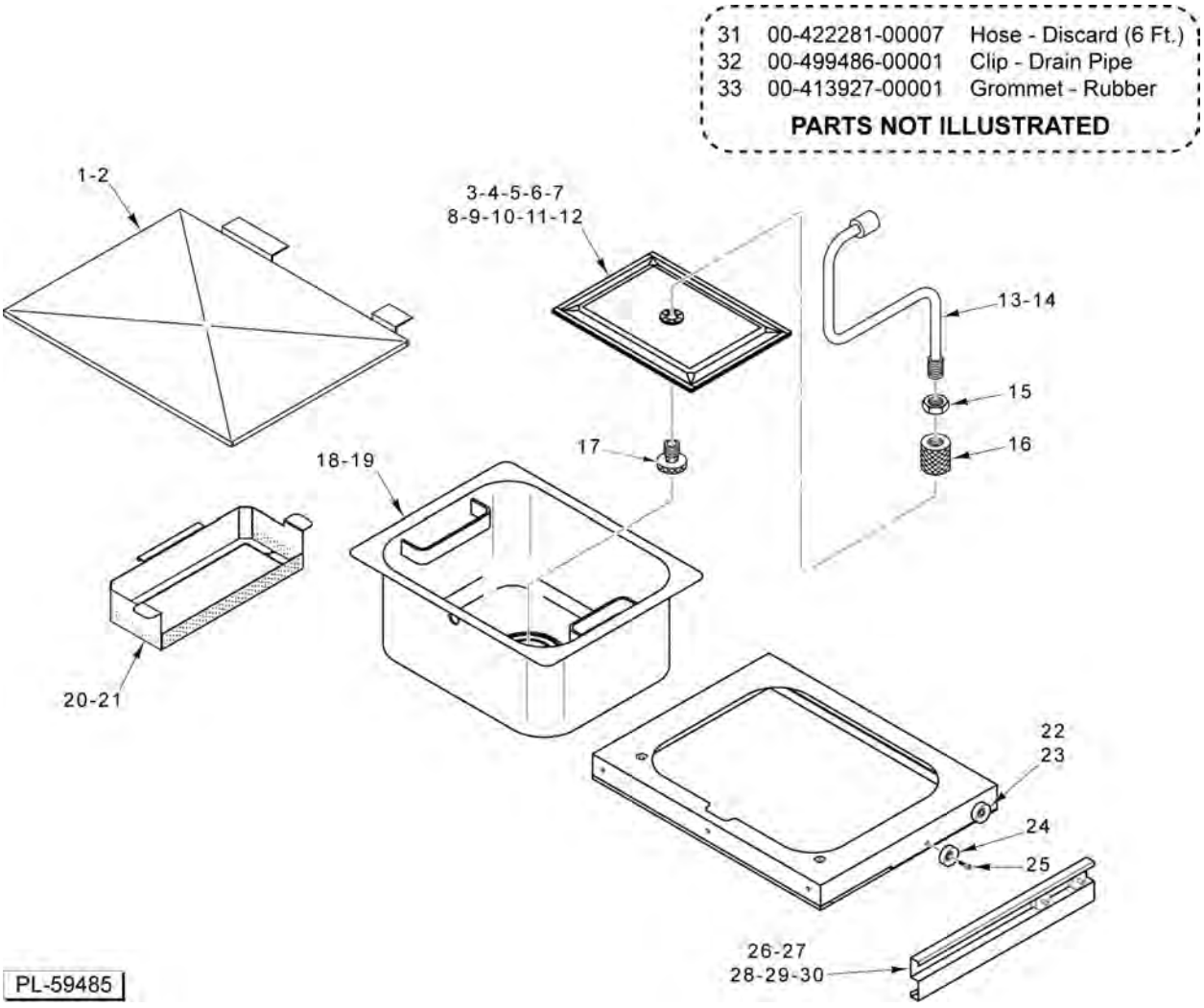
PARTS NOT ILLUSTRATED



FILTER ASSEMBLY
(STAND ALONE WITH FILTER)

FILTER ASSEMBLY
(STAND ALONE WITH FILTER)

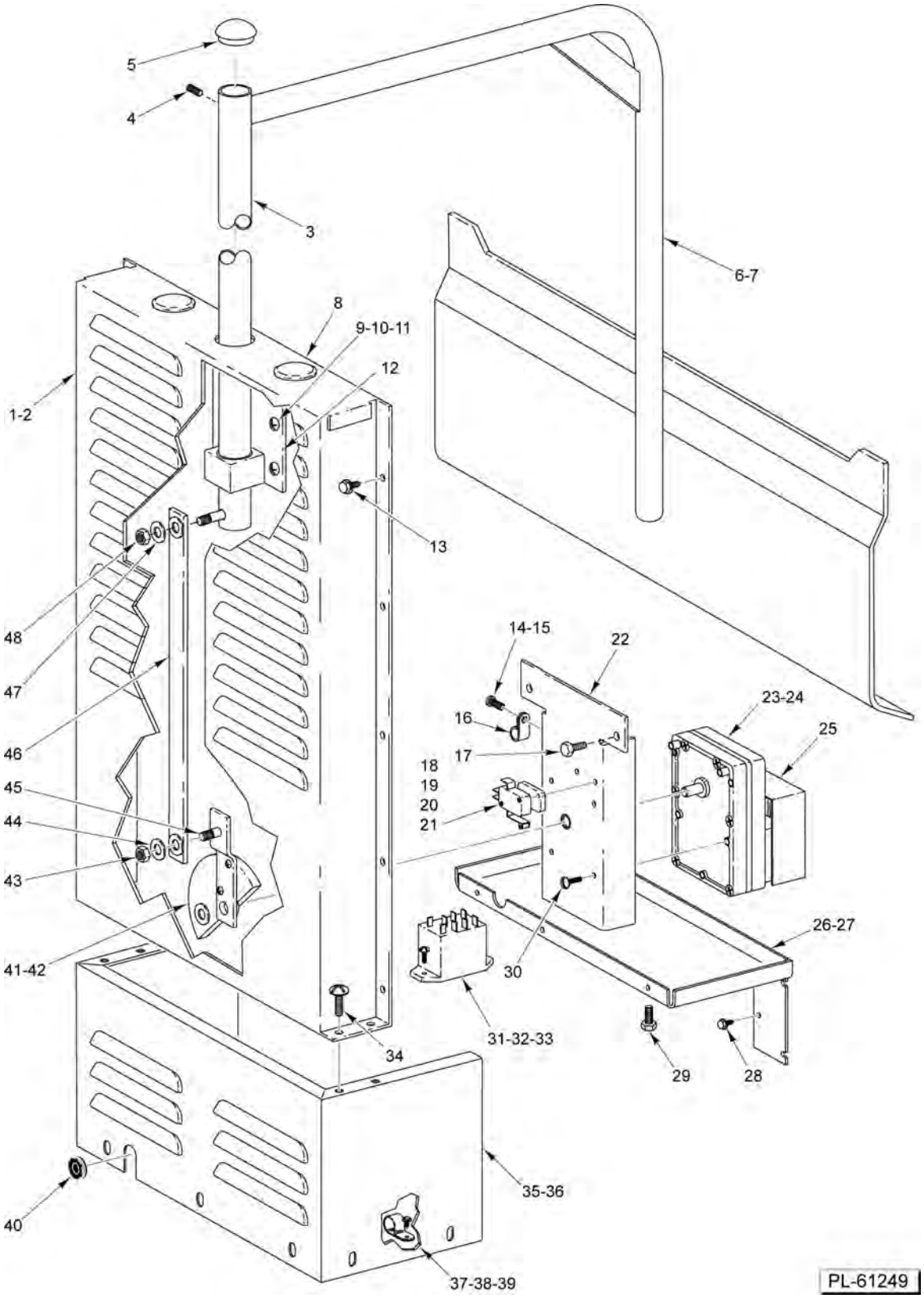
ILLUS. PL-59484	PART NO.	NAME OF PART	AMT.
1	00-956904-00001	Splash Guard (11 x 22 In.) (50 Series)	1
2	00-956904-00002	Splash Guard (16-1/2 x 22 In.) (85 Series)	1
3	00-499087-00002	Screen - Fine Mesh Filter (Metal) (22 x 5 In.) (50 Series)	1
4	00-499087-00004	Screen - Fine Mesh Filter (Metal) (22 x 10-1/2 In.) (85 Series)	1
5	00-499085-00003	Insert - Filter Screen (2-1/4 x 19 In.) (50 Series)	1
6	00-499085-00007	Insert - Filter Screen (7-3/4 x 19 In.) (85 Series)	1
7	00-499086-000G4	Filter - Envelope (6 Pack) (Fabric) (50 Series)	1
8	00-499086-000G7	Filter - Envelope (6 Pack) (Fabric) (85 Series)	1
9	00-499089-00002	Clip - Filter, Envelope (5 In. Lg.) (50 Series)	1
10	00-499089-00003	Clip - Filter, Envelope (10-1/2 In. Lg.) (85 Series)	1
11	00-956901-000G9	Tube, "S" Suction (50 Series)	1
12	00-956901-00G13	Tube - Suction (85 Series)	1
13	NS-017-49	Jam Nut 3/4-16 Hex	1
14	00-499083-00002	Coupling - Suction	1
15	00-499084-00002	Knob - Port Suction	1
16	00-956907-000G3	Top - Counter Assy. (50 Series)	1
17	00-956907-000G4	Top - Counter Assy. (85 Series)	1
18	00-958026-000G5	Guide - Cabinet (RH) (27-1/2 In.)	1
19	00-958026-000G6	Guide - Cabinet (LH) (27-1/2 In.)	1
20	00-958026-00008	Roller (RH) (27-1/2 In.)	1
21	00-958026-00011	Roller (LH) (27-1/2 In.)	1
22	00-426606-000G5	Basket - Scrap (50 Series)	1
23	00-426606-000G7	Basket - Scrap (85 Series)	1
24	00-958000-00G15	Pan Assy. - Filter (50 Series)	1
25	00-958000-00G16	Pan Assy. - Filter (85 Series)	1
26	00-499486-00001	Clip - Drain Pipe	1
27	00-413927-00001	Grommet - Rubber	1
28	00-499085-00005	Insert - Fabric Envelope (3-3/4 x 22 In.) (50 Series)	1
29	00-499085-00006	Insert - Fabric Envelope (9-1/4 x 22 In.) (85 Series)	1



FILTER ASSEMBLY
(BATTERY WITH FILTER)

FILTER ASSEMBLY
(BATTERY WITH FILTER)

ILLUS. PL-59485	PART NO.	NAME OF PART	AMT.
1	00-428518-00001	Splash Guard (50 Series)	1
2	00-428519-00001	Splash Guard (85 Series)	1
3	00-499087-00002	Screen - Fine Mesh Filter (Metal) (22 x 5 In.) (50 Series)	1
4	00-499087-00004	Screen - Fine Mesh Filter (Metal) (22 x 10-1/2 In.) (85 Series)	1
5	00-499085-00003	Insert - Filter Screen (2-1/4 x 19 In.) (50 Series)	1
6	00-499085-00007	Insert - Filter Screen (7-3/4 x 19 In.) (85 Series)	1
7	00-499085-00005	Insert - Fabric Envelope (3-3/4 x 22 In.) (50 Series)	1
8	00-499085-00004	Insert - Filter Screen (10-1/2 x 13-1/2 In.) (85 Series)	1
9	00-499089-00002	Clip - Filter, Envelope (5 In. Lg.) (50 Series)	1
10	00-499089-00003	Clip - Filter, Envelope (10-1/2 In. Lg.) (85 Series)	1
11	00-499086-000G4	Filter - Envelope (6 Pack) (50 Series)	1
12	00-499086-000G7	Filter - Envelope (6 Pack) (85 Series)	1
13	00-499081-000G9	Tube - Suction (50 Series)	1
14	00-499081-00G13	Tube - Suction (85 Series)	1
15	NS-017-49	Jam Nut 3/4-16 Hex	1
16	00-499083-00002	Coupling - Suction	1
17	00-499084-00002	Knob - Port Suction	1
18	00-497374-000G1	Vessel Assy. (50 Series)	1
19	00-497374-000G2	Vessel Assy. (85 Series)	1
20	00-426606-000G4	Basket - Scrap (50 Series)	1
21	00-426606-000G6	Basket - Scrap (85 Series)	1
22	00-428180-000G4	Drawer Assy. (Incls. Items 18, 19, & 20) (50 Series)	1
23	00-428180-000G5	Drawer Assy. (Incls. Items 18, 19, & 20) (85 Series)	1
24	00-426600-00002	Bearing - Roller	2
25	00-426600-00003	Screw 1/4-20	2
26	00-426600-000G1	Roller Guide Assy.	1
27	00-958026-000G5	Guide - Cabinet (RH) (27-1/2 In.)	1
28	00-958026-000G6	Guide - Cabinet (LH) (27-1/2 In.)	1
29	00-958026-00008	Roller (RH) (27-1/2 In.)	1
30	00-958026-00011	Roller (LH) (27-1/2 In.)	1
31	00-422281-00007	Hose - Discard (6 Ft.)	1
32	00-499486-00001	Clip - Drain Pipe	1
33	00-413927-00001	Grommet - Rubber	1



BASKETLIFT COMPONENTS

BASKETLIFT COMPONENTS

ILLUS. PL-61249	PART NO.	NAME OF PART	AMT.
1	00-422018-00001	Wrap - Top (85 Series)	1
2	00-422017-00001	Wrap - Top (50 Series)	1
3	00-418503-00002	Tube	1
4	SC-088-40	Set Screw 5/16-24 x 1/4 Hex Hdls., Cup Pt.	1
5	PB-004-04	Plug Button (1-1/4)	1
6	00-956914-000G6	Lift Assy. (Single) (85 Series)	1
7	00-956914-000G7	Arm - Basket Assy. (Single) (50 Series)	1
8	PB-004-04	Plug Button (1-1/4)	2
9	SD-032-07	Self-Tapping Screw 10-24 x 1/2 Hex Washer Hd., Type TT	2
10	WS-004-33	Washer	6
11	NS-047-73	Lock Nut 5/16-18 Hex	6
12	00-422247-000G1	Bearing Support Assy	1
13	SD-036-03	Self-Tapping Screw 8-18 x 3/8 Hex Washer Hd., Type AB	10
14	SC-109-10	Mach. Screw 6-32 x 3/8 Slotted Pan Hd. (SST)	1
15	NS-009-07	Nut 6-32 Hex	1
16	00-078752-00012	Clamp - Cable	1
17	SC-037-80	Cap Screw 10-24 x 1/2 Hex Hd	8
18	NS-009-02	Nut 4-40 Hex	2
19	SC-112-90	Mach. Screw 4-40 x 1 Slotted Pan Hd	2
20	00-411496-000F3	Microswitch	1
21	00-418159-00001	Block - Cam Switch	1
22	00-418123-000G1	Plate - Motor	1
23	00-418156-00001	Gear - Motor (115 V., 60 Hz.)	1
24	00-418156-00003	Gear - Motor (208 V., 50/60 Hz.)	1
25	00-418517-00001	Shroud - Motor	1
26	00-418484-00001	Base - Motor Mounting (50 Series)	1
27	00-418513-00001	Base - Motor Mounting (85 Series)	1
28	SD-032-07	Self-Tapping Screw 10-24 x 1/2 Hex Washer Hd., Type TT	2
29	SC-037-80	Cap Screw 10-24 x 1/2 Hex Hd	2
30	SC-018-47	Mach. Screw 10-32 x 3/4 Slotted Pan Hd	4
31	00-416535-00004	Switch - Relay S.P.D.T. 24 V	1
32	SC-109-10	Mach. Screw 6-32 x 3/8 Slotted Pan Hd. (SST)	3
33	NS-009-07	Nut 6-32 Hex	3
34	SD-036-03	Self-Tapping Screw 8-18 x 3/8 Hex Washer Hd., Type AB	4
35	00-418480-00001	Wrap - Bottom (50 Series)	1
36	00-418510-00001	Wrap - Bottom (85 Series)	1
37	00-078752-00012	Clamp - Cable	1
38	SC-109-10	Mach. Screw 6-32 x 3/8 Slotted Pan Hd. (SST)	1
39	NS-009-07	Nut 6-32 Hex	1
40	00-418482-00001	Grommet	1
41	00-418475-000G1	Crank - Arm Assy	1
42	SC-055-02	Set Screw 1/4-20 x 1/4 Hdls., Cup Pt. (SST)	2
43	NS-047-73	Lock Nut 5/16-18 Hex	1
44	WS-004-33	Washer	1
45	SD-015-41	Self-Tapping Screw 8-32 x 1/2 Phil. Pan Hd., Type TT	2
46	00-418477-000G1	Coupler Assy	1
47	WS-004-33	Washer	1
48	NS-047-73	Lock Nut 5/16-18 Hex	1