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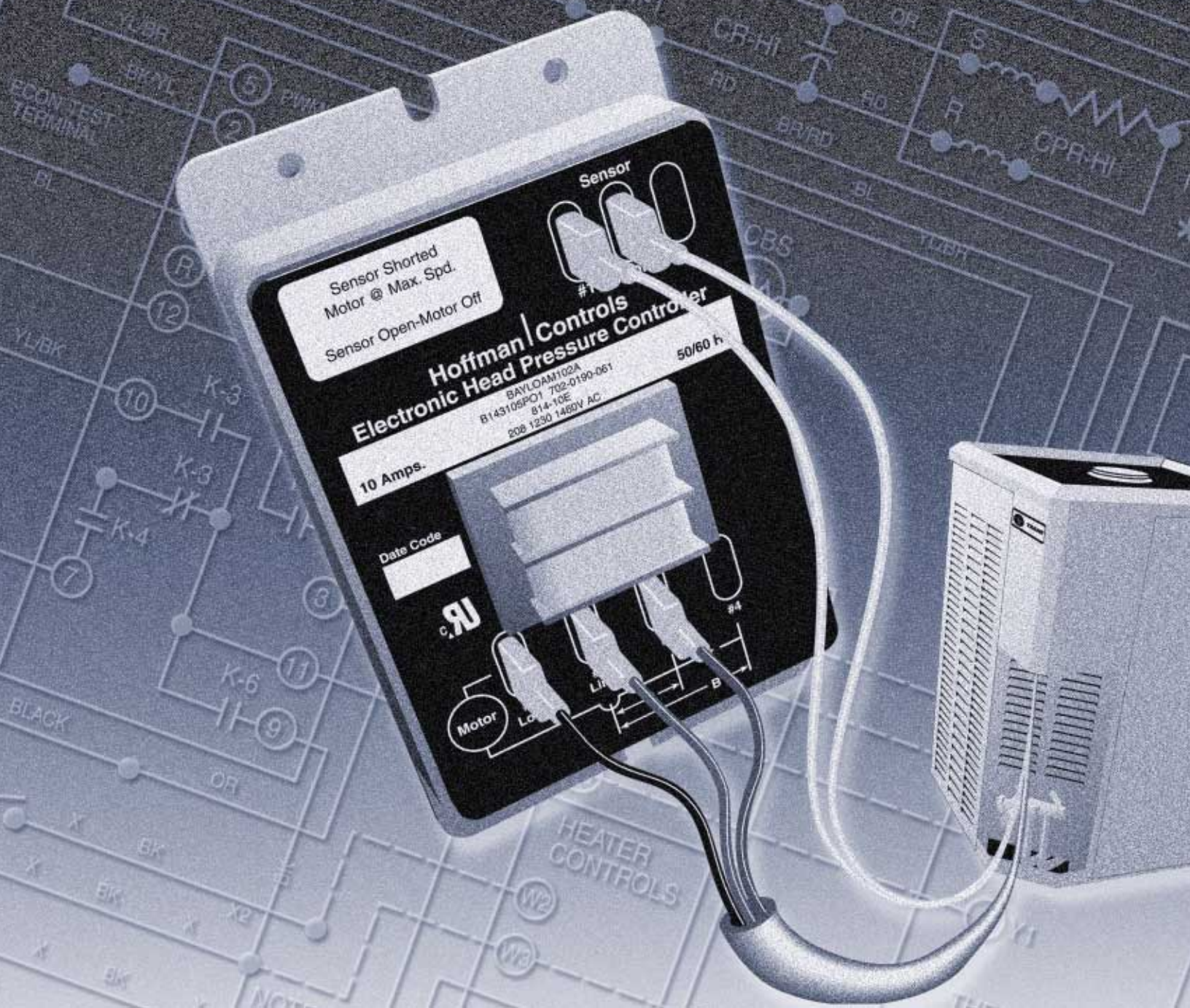
PACE Journal

Product and Applications for Consulting Engineers

Low Ambient Temperature Cooling Operations



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Introduction

Low Ambient Applications

Many applications with high internal gains such as computer rooms, electrical switch gear rooms, elevator equipment rooms, etc. require mechanical cooling during low ambient conditions. Trane Split System units are manufactured to operate in cooling mode at ambient temperatures as low as 55°F. For applications when mechanical cooling is required below 55°F, field modifications shall be performed.

This manual covers our recommended specifications to handle low ambient applications. To use this manual, first of all, identify the lowest outdoor temperature which shall surround the condensing unit, then proceed to either Table A (Cooling) or Table B (Heat Pumps). In the event when BAYLOAM102A Controller is specified, then proceed to Table C thru Table G depending on condensing unit family.

Caution

Both condensing unit and low ambient controller carry UL approval independently. Due to electrical field modifications, when applying controller, some systems as a whole will **NOT** carry UL approval.

All phases of this installation must comply with the **National, State** and **Local** Codes. In the absence of local codes, the installation must conform with **National Electrical Code**.

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Table "A" – Cooling

	Ambient Temperature In Cooling Mode Operation									
	55°F	40°F ②		30°F ②		0°F ①②③④				
	AS MANUFACTURED	AY28X079 EVAPORATOR DEFROST CONTROL	TXV (BLEED) OR FCCV	AY28X079 EVAPORATOR DEFROST CONTROL	TXV (BLEED TYPE)	TXV (NON-BLEED TYPE)	SOLENOID VALVE	BAYLOAM102A CONTROLLER	OTHER FIELD MOD. SEE TABLE	
XB 1000 (TTB)	✔	✔	✔	✔	✔	✔	✔	✔	C	
XE 1000 (TTR)	✔	✔	✔	✔	✔	✔	✔	✔	D	
XE 1100 (TTN)	✔	✔	✔	✔	✔	NOT APPROVED				
XE 1200 (TTP) 1Ø	✔	✔	✔	✔	✔	✔	✔	✔	E	
XE 1200 (TTP) 3Ø	✔	✔	✔	✔	✔	✔	✔	✔	E	
XL 1200 (TTX)	✔	✔	✔	✔	✔	NOT APPROVED				
XL 1400 (TTY)	✔	✔	✔	✔	✔					
XL 1800 (TTZ) ⑤	✔	✔	✔	✔	✔					
TTA (3Ø)	✔	✔	✔	✔	✔	✔	✔	✔	F	
RTY	✔	✔⑥	✔⑥	✔	✔⑥	NOT APPROVED				

Notes:

1. Solenoid Valve, use Direct Acting Valves. (Closes on compressor off cycle)
2. Wind Shield is required in high wind areas. See wind shield this journal.
3. On condensing unit utilizing BAYLOAM102A Controller, use Ferrite Inductor provided with controller for electrical noise control.
4. Systems subject to Low Ambient Operation shall **NOT** have indoor airflows below 370 CFM/Ton.
5. TTZ units only approved for application with variable speed indoor units.
6. RTY units approved for application with matching RWE Air Handlers and RXC Coils.

Thermal Expansion Valve For Cooling Units (TXV)		
Unit Tonage	**Bleed Type Valve**	**Non-Bleed Type Valve**
1 – 1½	TAYTXVA0B5C	TAYTXVA0B3C
2 – 2½	TAYTXVA0C5C	TAYTXVA0C3C
3 – 3½	TAYTXVA0E5C	TAYTXVA0E3C
4	TAYTXVA0G5C	TAYTXVA0G3C
5 – 6	TAYTXVA0H5C	TAYTXVA0H3C
TTZ 3 Ton⑤	N/A	TAYTXVH0D3C
TTZ 4 – 5 Ton⑤	N/A	TAYTXVH0G3C

Note: TXV's are Brazed Type Connections.

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Table "B" – Heat Pumps

	Ambient Temperature In Cooling Mode Operation									
	55°F	40°F ②		30°F ②			0°F ①②③④			
	AS MANUFACTURED	AY28X084 EVAPORATOR DEFROST CONTROL	TXV (BLEED) OR FCCV	AY28X084 EVAPORATOR DEFROST CONTROL	TXV (NON-BLEED TYPE)	HARD START KIT	TXV (NON-BLEED TYPE)	SOLENOID VALVE	BAYLOAM102A CONTROLLER	OTHER FIELD MOD. SEE TABLE
XE 1000 (TWR)	✔	✔	✔	✔	✔	✔	NOT APPROVED			
XE 1100 (TWN)	✔	✔	✔	✔	✔					
XE 1200 (TWP) 1Ø	✔	✔	✔	✔	✔					
XE 1200 (TWP) 3Ø	✔	✔	✔	✔	✔					
XL 1200 (TWX)	✔	✔	✔	✔	✔					
XL 1400 (TWY)	✔	✔	✔	✔	✔					
XL 1800 (TWZ)⑤	✔	✔	✔	✔	✔					
TWA (3Ø)	✔	✔	✔	✔	✔		✔	✔	✔	G
RWY	✔	✔⑥	✔⑥	✔	✔⑥		NOT APPROVED			

Notes:

1. Solenoid Valve use only Two-Directional Valves, Direct Acting Valve. (Closes on compressor off cycle)
2. Wind Shield is required in high wind areas. See wind shield this journal.
3. On condensing unit utilizing BAYLOAM102A Controller, use Ferrite Inductor provided with controller for electrical noise control.
4. Systems subject to Low Ambient Operation shall **NOT** have airflows below 370 CFM/Ton.
5. TWZ units only approved for application with variable speed indoor units.
6. RWY units approved for application with matching RWE Air Handlers and RXC Coils.

Thermal Expansion Valve For Heat Pump Units (TXV)	
Unit Tonage	**Non-Bleed Type Valve**
1 – 1½	TAYTXVH0B3C
2 – 2½	TAYTXVH0C3C
3 – 3½	TAYTXVH0E3C
4	TAYTXVH0G3C
5 – 6	TAYTXVH0H3C
TTZ 3 Ton	TAYTXVH0D3C
TTZ 4 – 5 Ton	TAYTXVH0G3C

Note: TXV's are Brazed Type Connections.

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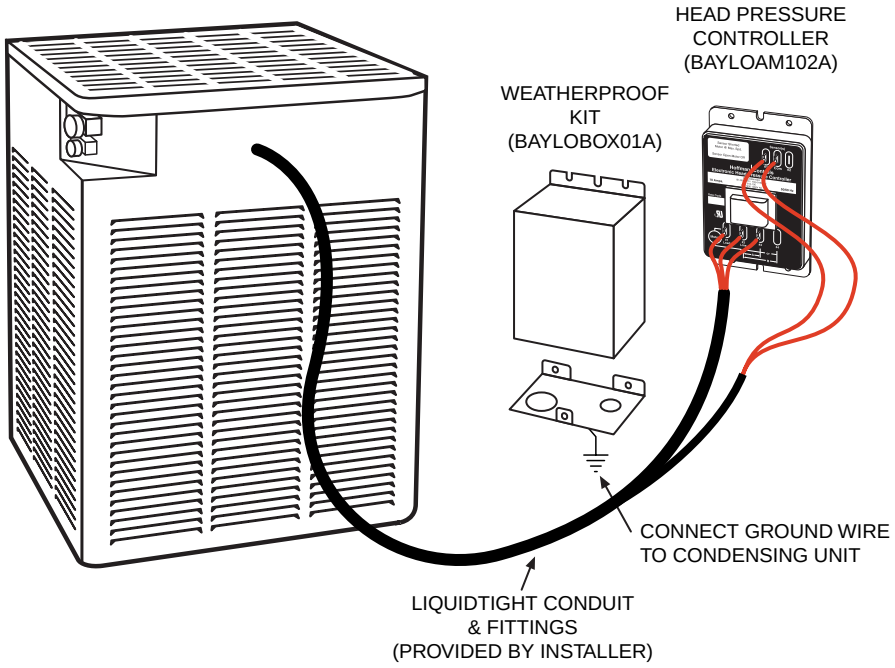
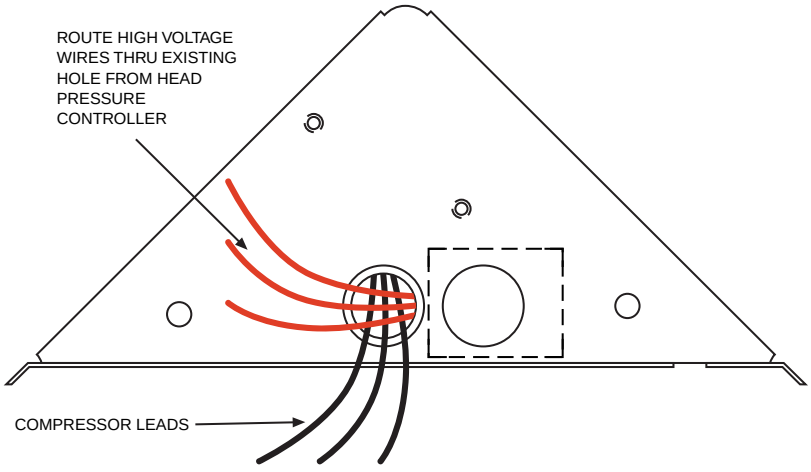
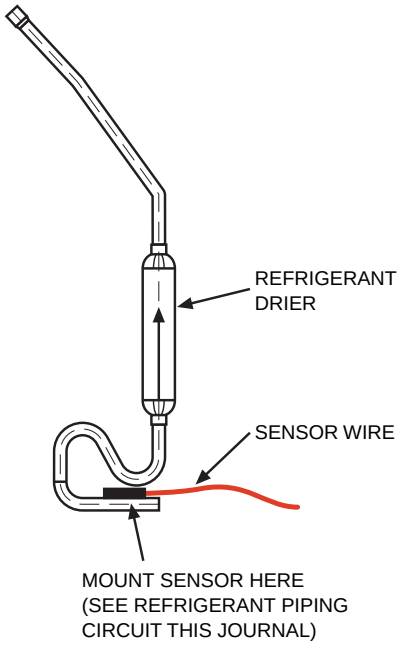
XB1000 – TTB012-024







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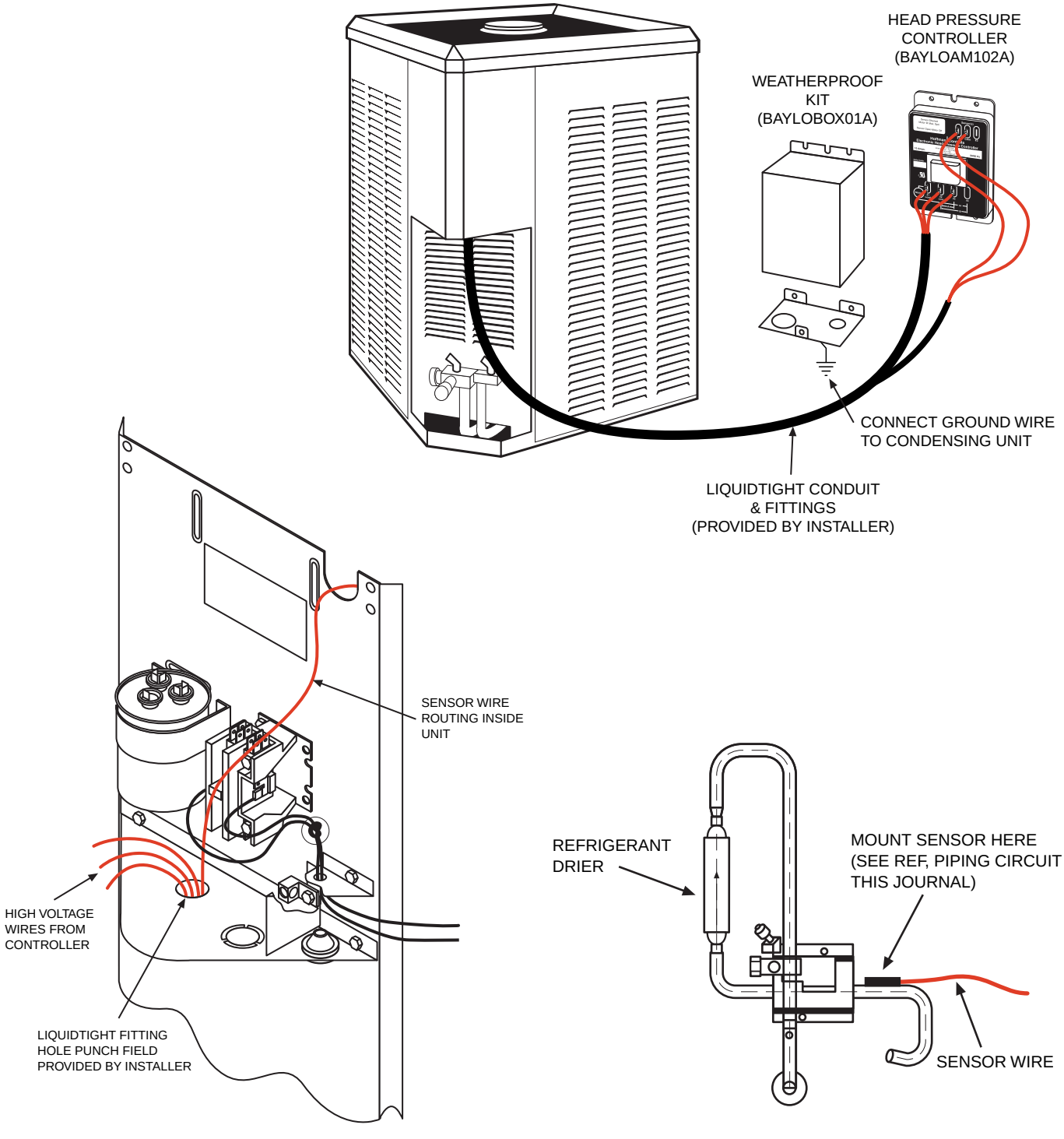

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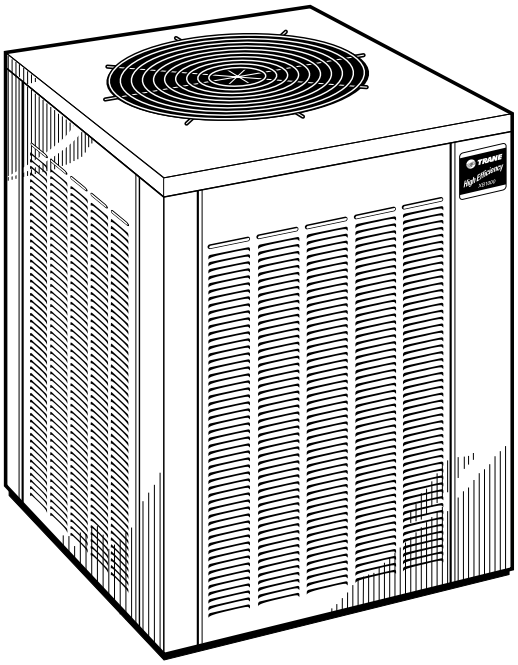
XB1000 – TTB060



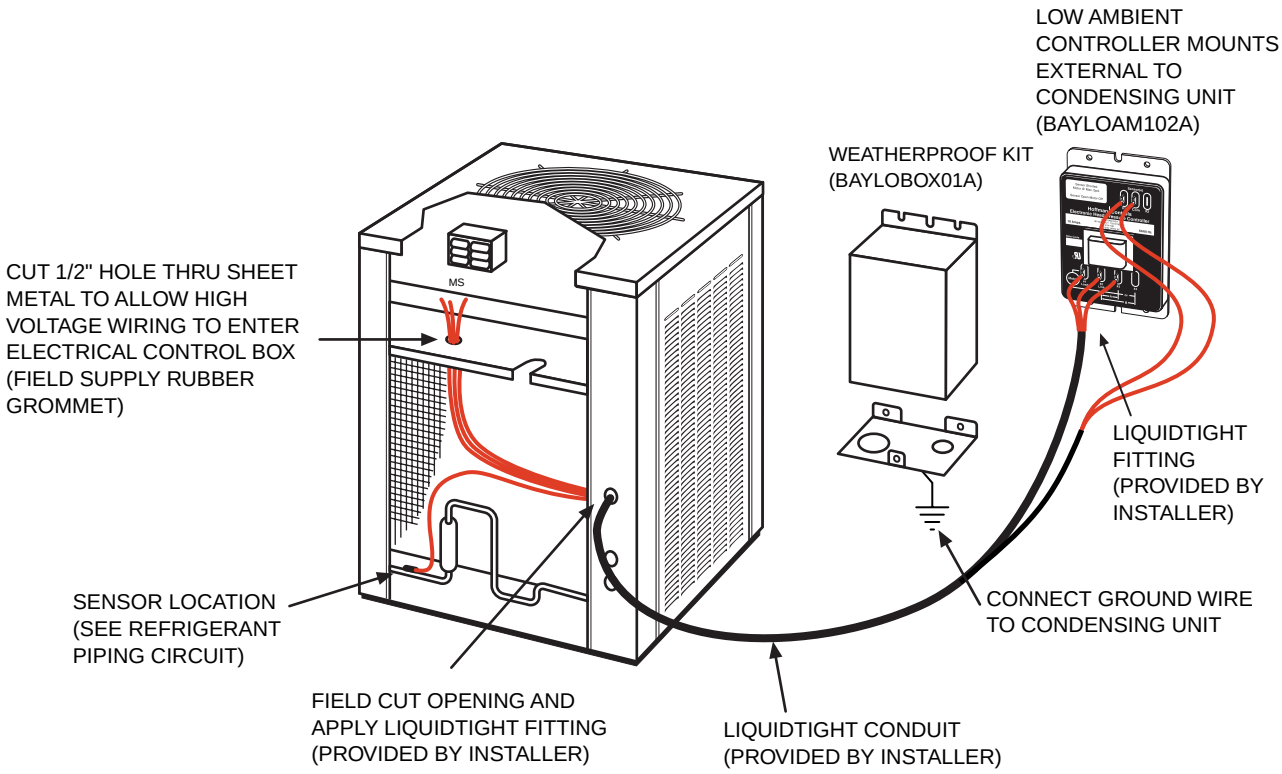


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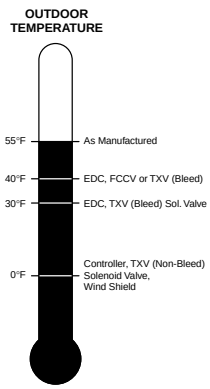
Table "C" – XB1000 (TTB's)

	Field Modification Required When Using Controller																								
	CONTROLLER		CONDENSER MOTOR						FAN			CAPACITOR			SUMP HEATER			GRILLE	RELAY		HARD START KIT		
	BAYLOAM102A①	BAYLOBOX01A②	BAYMOTR301B	BAYMOTR301A	BAYMOTR302B	BAYMOTR404A	BAYMOTR306B	BAYMOTR100A	FAN1355	FAN1403	FAN1433	CPT0076	CPT0120	CPT0255	BAYCCHT003A	BAYCCHT200A	BAYCCHT201A	GRL0808	BAY24X042③	HONEYWELL R8222B1158④	BAY41X228	BAYKSKT250A	BAYKSKT252A
TTB012C100A	✔	✔		PENDING APPROVAL											✔						✔		
TTB018C100A	✔	✔		PENDING APPROVAL											✔						✔		
TTB024C100A	✔	✔		PENDING APPROVAL											✔						✔		
TTB030C100A	✔	✔						✔					✔		✔			✔				✔	
TTB036C100A	✔	✔						✔					✔		✔			✔				✔	
TTB042D100A	✔	✔						✔					✔			✔		✔					✔
TTB048D100A	✔	✔						✔					✔			✔		✔					✔
TTB060D100A	✔	✔					✔										✔						✔

① Mount controller external to condensing unit.
② Weatherproof Kit.
③ BAY24X042 not approved for 460 volt applications.
④ For 460 volt applications use Minneapolis Honeywell R8222B1158 or equivalent.



Notes:

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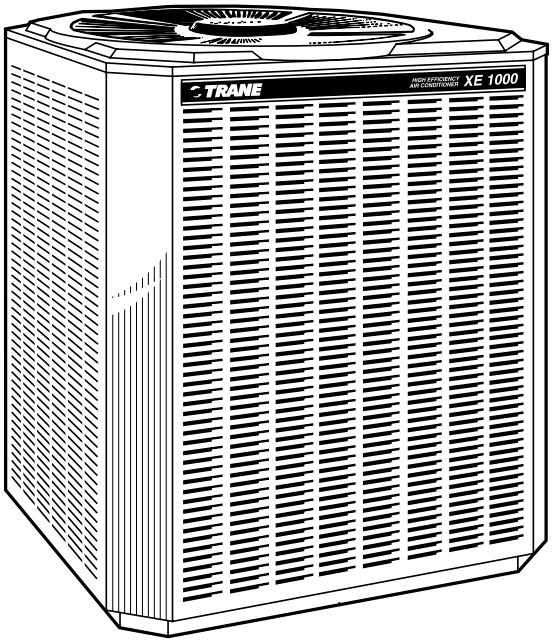
XE1000



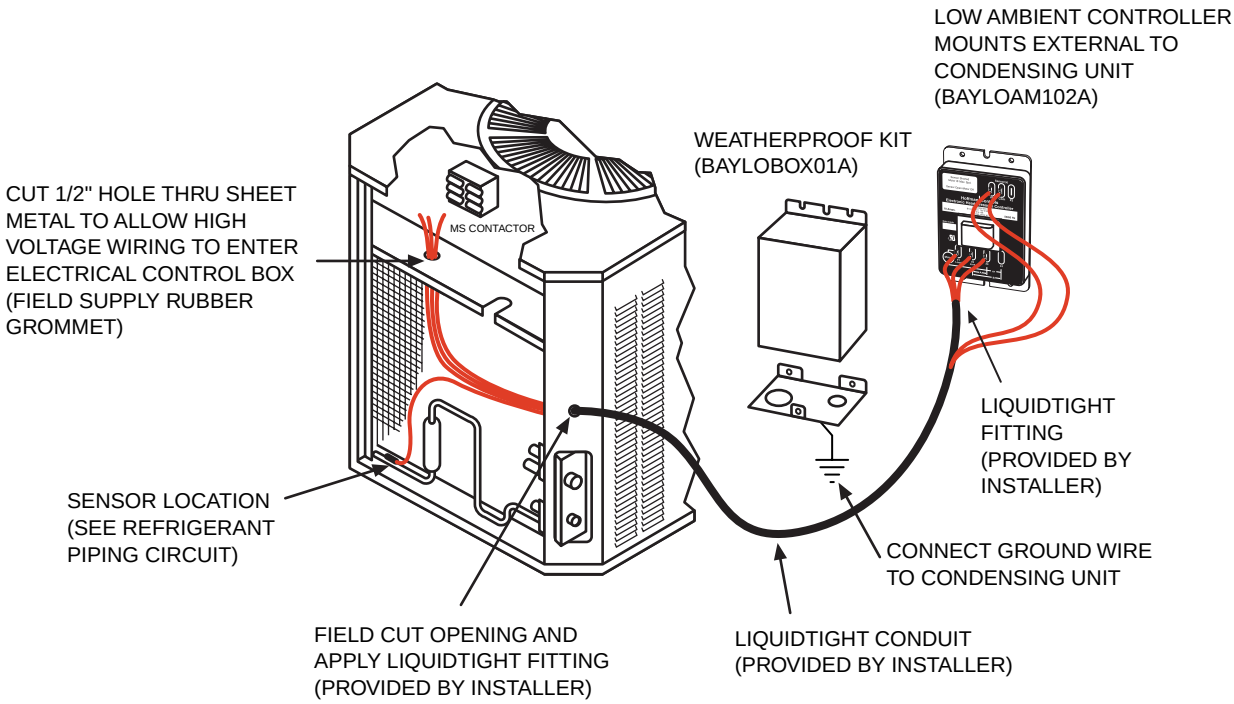
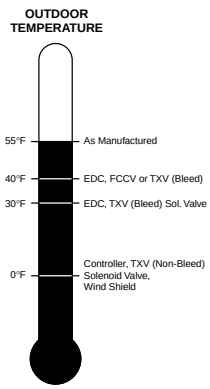


Table "D" – XE1000 (TTR's)

	Field Modification Required When Using Controller																							
	CONTROLLER		CONDENSER MOTOR						FAN			CAPACITOR			SUMP HEATER			GRILLE	RELAY		HARD START KIT		
	BAYLOAM102A①	BAYLOBOX01A②	BAYMOTR301B	BAYMOTR301A	BAYMOTR302B	BAYMOTR404A	BAYMOTR306B	BAYMOTR100A	FAN1355	FAN1403	FAN1433	CPT0076	CPT0120	CPT0255	BAYCCHT003A	BAYCCHT200A	BAYCCHT201A	GRL0808	BAY24X042③	HONEYWELL R8222B1158④	BAY41X228	BAYKSKT250A	BAYKSKT252A
TTR018D100A	✔	✔	✔						✔						✔							✔	
TTR025C100A	✔	✔	✔						✔						✔							✔	
TTR030C100A	✔	✔			✔										✔							✔	
TTR036D100A	✔	✔			✔											✔							✔
TTR042D100A	✔	✔			✔												✔						✔
TTR042D100B	✔	✔			✔											✔							✔
TTR048D100A	✔	✔			✔											✔							✔
TTR060D100A	✔	✔					✔										✔						✔

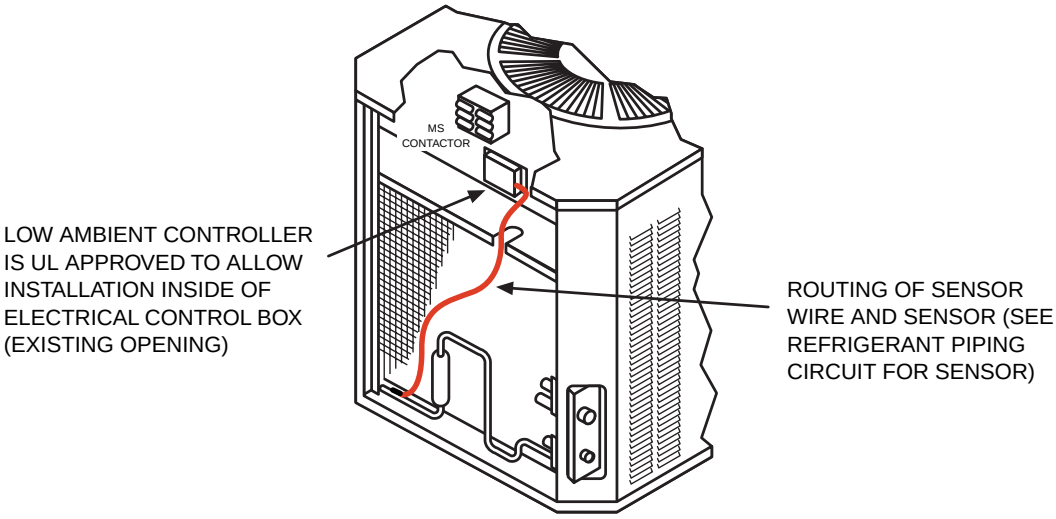
① Mount controller external to condensing unit.
② Weatherproof Kit.
③ BAY24X042 not approved for 460 volt applications.
④ For 460 volt applications use Minneapolis Honeywell R8222B1158 or equivalent.



Notes:

XE1200

Three Phase Units



Single Phase Units

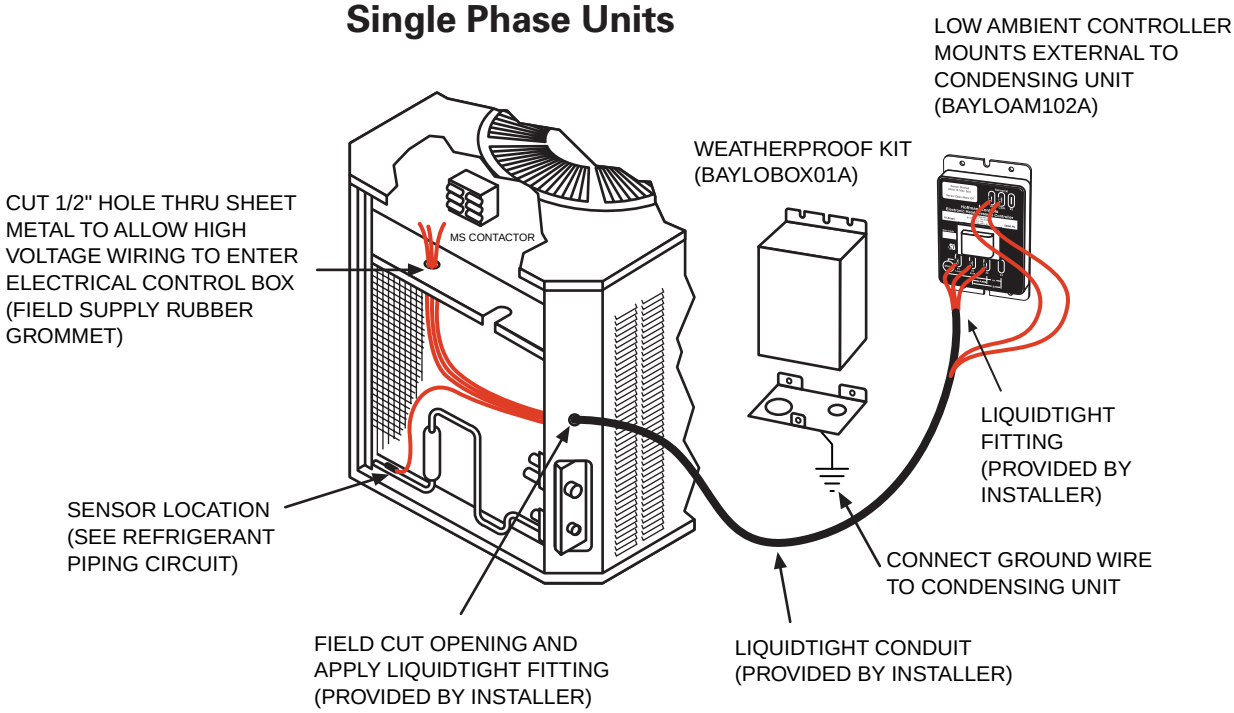
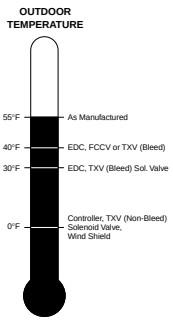


Table “E” – XE1200 (TTP’s)

	Field Modification Required When Using Controller																						
	CONTROLLER		CONDENSER MOTOR						FAN			CAPACITOR			SUMP HEATER			GRILLE	RELAY		HARD START KIT		
	BAYLOAM102A①	BAYLOBOX01A②	BAYMOTR301B	BAYMOTR301A	BAYMOTR302B	BAYMOTR404A	BAYMOTR306B	BAYMOTR100A	FAN1355	FAN1403	FAN1433	CPT0076	CPT0120	CPT0255	BAYCCHT003A	BAYCCHT200A	BAYCCHT201A	GRL0808	BAY24X042④	HONEYWELL R8222B1158⑤	BAY41X228	BAYKSKT250A	BAYKSKT252A
TTP018C100A	NOT APPROVED																						
TTP024C100A																							
TTP030D100A	✔	✔					✔									✔							✔
TTP036D100A	✔	✔					✔									✔							✔
TTP042C100A	✔	✔					✔																
TTP048D100A	✔	✔					✔										✔						✔
TTP060D100A	✔	✔					✔																✔
TTP060E100A	✔	✔					✔																✔
TTP030D300A	✔	③																					
TTP036D300A	✔	③																					
TTP042C300A	✔	③																					
TTP048D300A	✔	③																					
TTP060D300A	✔	③																					
TTP060E300A	✔	③																					
TTP030D400A	✔	③																					
TTP036D400A	✔	③																					
TTP042C400A	✔	③																					
TTP048D400A	✔	③																					
TTP060D400A	✔	③																					
TTP060E400A	✔	③																					

① Mount controller external to condensing unit.
② Weatherproof Kit.
③ Controller UL approved to be mounted in unit control box.
④ BAY24X042 not approved for 460 volt applications.
⑤ For 460 volt applications use Minneapolis Honeywell R8222B1158 or equivalent.



Notes:

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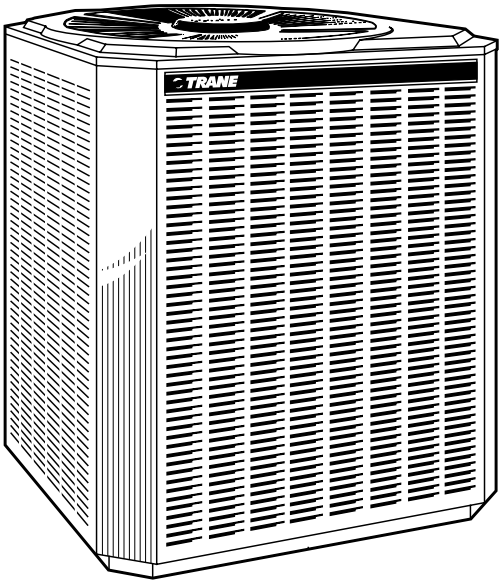
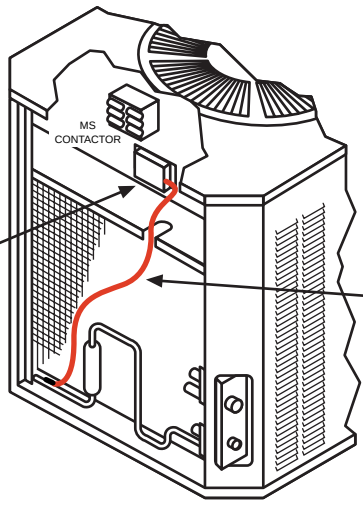




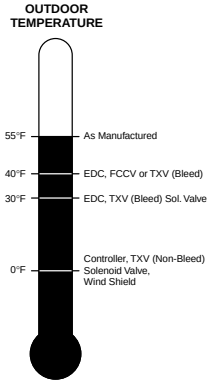
LOW AMBIENT CONTROLLER IS UL APPROVED TO ALLOW INSTALLATION INSIDE OF ELECTRICAL CONTROL BOX (EXISTING OPENING)

ROUTING OF SENSOR WIRE AND SENSOR (SEE REFRIGERANT PIPING CIRCUIT FOR SENSOR)

Table “F” – TTA’s

	Field Modification Required When Using Controller																		
	CONTROLLER		CONDENSER MOTOR						FAN			CAPACITOR			SUMP HEATER	GRILLE		RELAY
	BAYLOAM102A①	BAYLOBOX01A	BAYMOTR301B	BAYMOTR301A	BAYMOTR302B	BAYMOTR404A	BAYMOTR306B	BAYMOTR307A	FAN1355	FAN1403	FAN1433	CPT0076	CPT0120	CPT0255	BAYCCHT003	GRL0533	GRL0808	BAY24X042
TTA030C300A	✔																	
TTA036D300A	✔																	
TTA042D300A	✔																	
TTA042D300B	✔																	
TTA048D300A	✔																	
TTA060D300A	✔																	
TTA072D300A	✔																	
TTA030C400A	✔																	
TTA036D400A	✔																	
TTA042D400A	✔																	
TTA042D400B	✔																	
TTA048D400A	✔																	
TTA060D400A	✔																	
TTA072D400A	✔																	

① This family has UL approvals to mount controller inside of weatherproof electrical control box.



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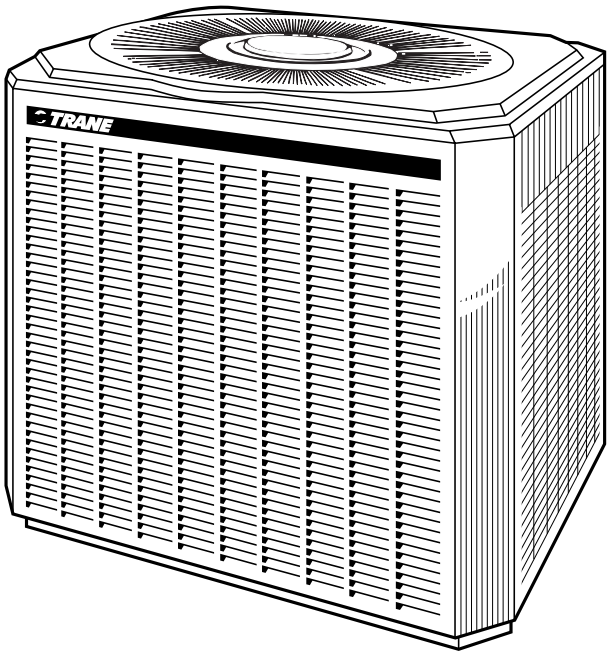
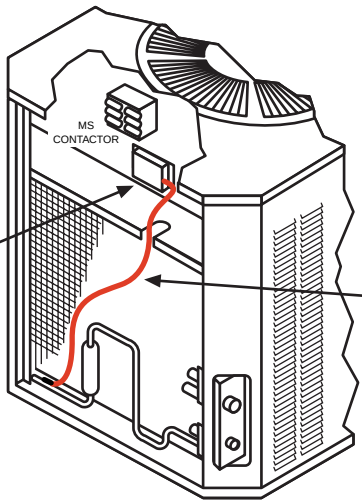




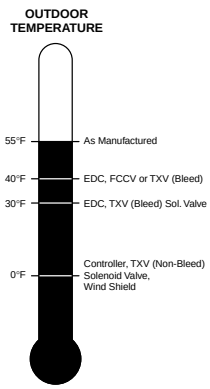
LOW AMBIENT CONTROLLER IS UL APPROVED TO ALLOW INSTALLATION INSIDE OF ELECTRICAL CONTROL BOX (EXISTING OPENING)

ROUTING OF SENSOR WIRE AND SENSOR (SEE REFRIGERANT PIPING CIRCUIT FOR SENSOR)

Table “G” – 3 Phase (Heat Pump)

	Field Modification Required When Using Controller																			
	CONTROLLER		CONDENSER MOTOR						FAN			CAPACITOR			SUMP HEATER	GRILLE		RELAY	
	BAYLOAM102A①	BAYLOBOX01A	BAYMOTR301B	BAYMOTR301A	BAYMOTR302B	BAYMOTR404A	BAYMOTR306B	BAYMOTR307A	FAN1355	FAN1403	FAN1433	CPT0076	CPT0120	CPT0255	BAYCCHT003	GRL0533	GRL0808	BAY24X042③	HONEYWELL R8222B1158④
TWA030C300A	✔				✔						✔							✔	
TWA036D300A	✔				✔						✔							✔	
TWA042C300A	✔																	✔	
TWA048D300A	✔																	✔	
TWA060D300A	✔																	✔	
TWA072C300A	✔																	✔	
TWA030C400A	✔																		✔
TWA036D400A	✔																		✔
TWA042C400A	✔																		✔
TWA048D400A	✔																		✔
TWA060D400A	✔																		✔
TWA072C400A	✔																		✔

① These condensing units have UL approval to mount controller inside of weatherproof electrical control box.
② When applying solenoid valves to heat pumps, specify two-directional direct acting valve.
③ BAY24X042 not approved for 460 volt applications.
④ For 460 volt applications use Minneapolis Honeywell R8222B1158 or equivalent.



Notes:

Head Pressure Controller

This device is a dual voltage electronic head pressure control which varies the RPM of the condenser fan motor. As the controller senses liquid line temperatures of 80°F and below (due to low ambient temperatures), modulation of condenser fan begins. Modulation stage continues until liquid line temperature reaches 50°F, at which time controller will terminate power to condenser fan. As liquid line temperature rises to 53°F the condenser motor restarts at full speed (to assure proper motor start-up), then modulates to the appropriate RPM. See Page 20 for better understanding.

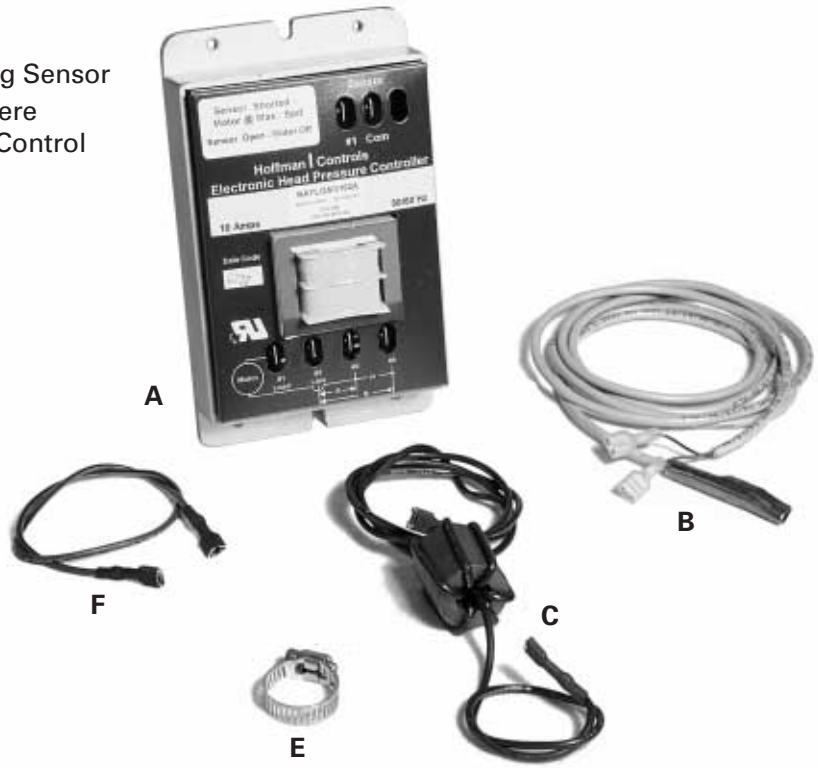
Electronic Head Pressure Controller, BAYLOAM102A

Controller Specifications

AC Voltage	—	208 – 230/460
Voltage Minimum / Maximum	—	–10% / +10%
Internal Transformer	—	Yes
Sensor Input	—	Single (SEN0237)
Phase	—	Single
Frequency	—	50 / 60 Hz
Transformer Power	—	4 VA
Operating Ambient	—	–30°F to 160°F
Sensor (Thermistor)	—	10K @ 77°F N.T.C.
Liquid Line Temperature Control Range	—	80°F to 50°F
Requires Weatherproof Box	—	Yes
Dimensions (L x W x H)	—	5.56 x 3.32 x 1.75
Calibration	—	Factory Set (No Field Calibration Required)
Manufacturer	—	Hoffman

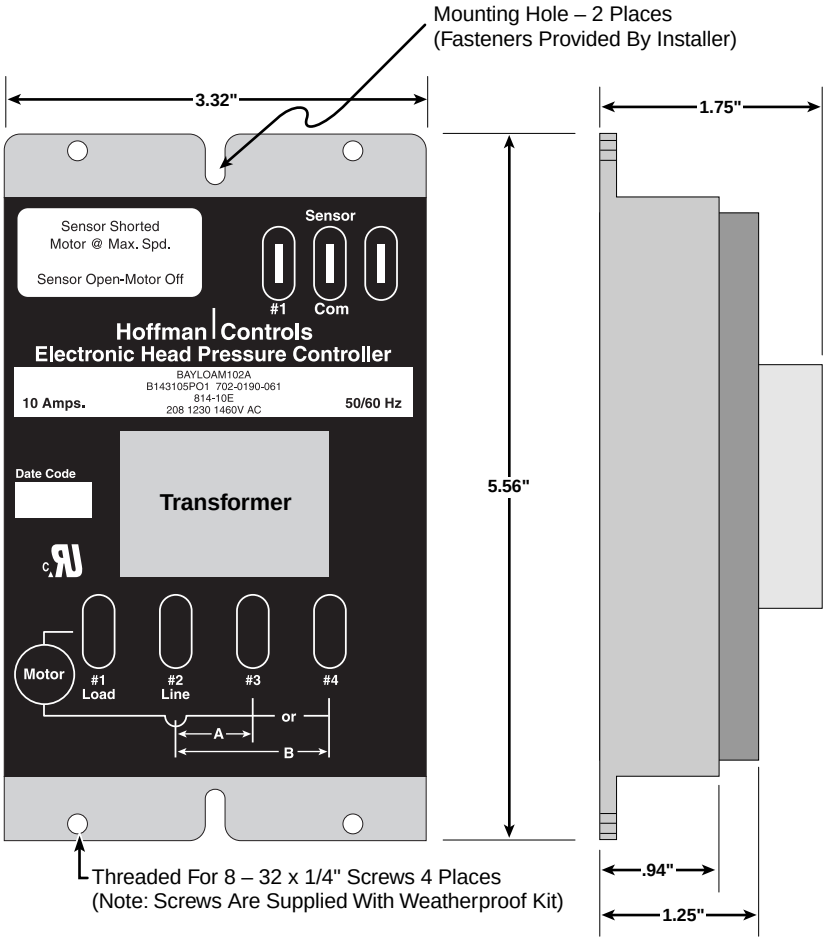
Items Inside of BAYLOAM102A Controller Kit:

A. Electronic Head Pressure Control
B. Sensor with 5 feet of 18 ga. wire
C. Choke (Ferrite Inductor)
D. Mounting Screws
E. Connecting Clamp for Mounting Sensor
F. Red Wire (Use with 3Ø unit where controller mounts in Electrical Control Box only)



Note: Weatherproof Kit is NOT Included With BAYLOAM102A.

Controller Dimensions

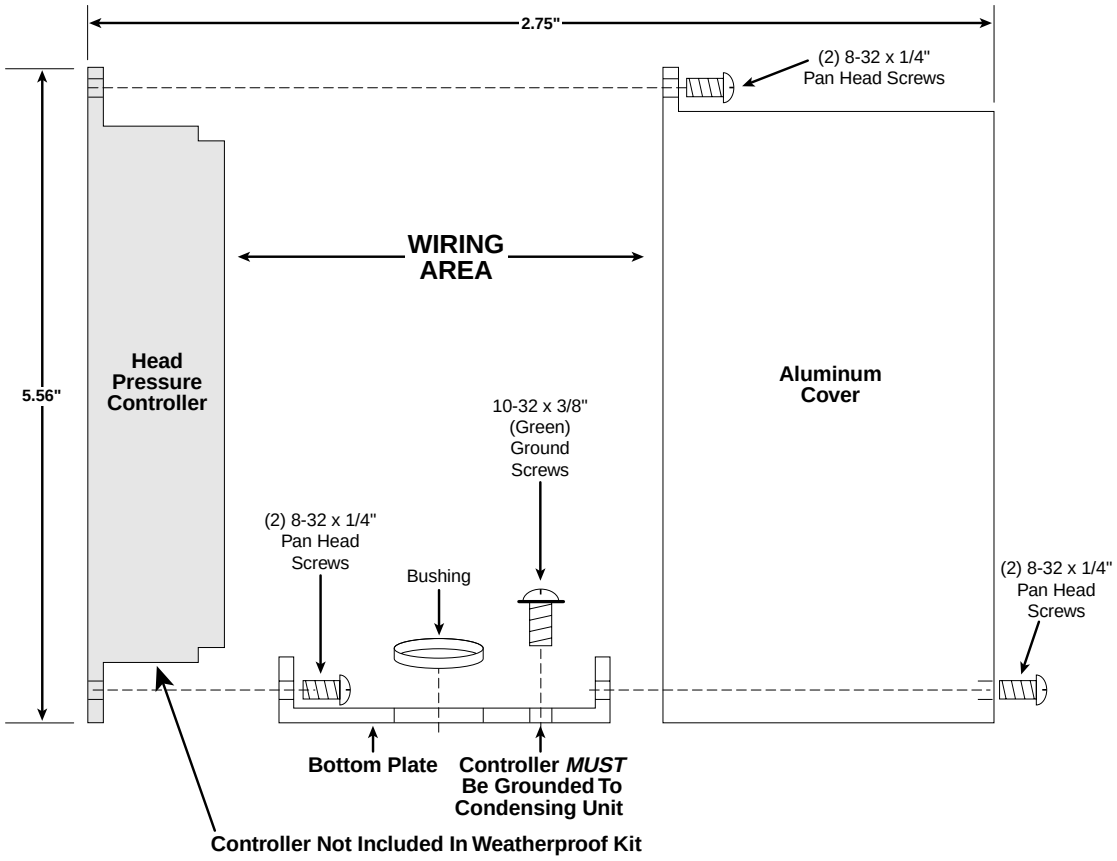


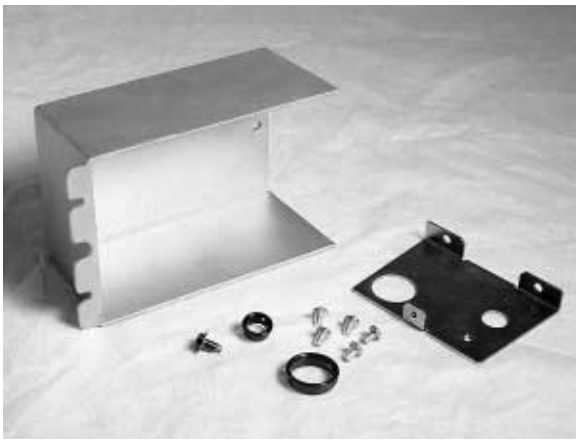
Electronic Head Pressure Controller
BAYLOAM102A

Weatherproof Kit

BAYLOBOX01A

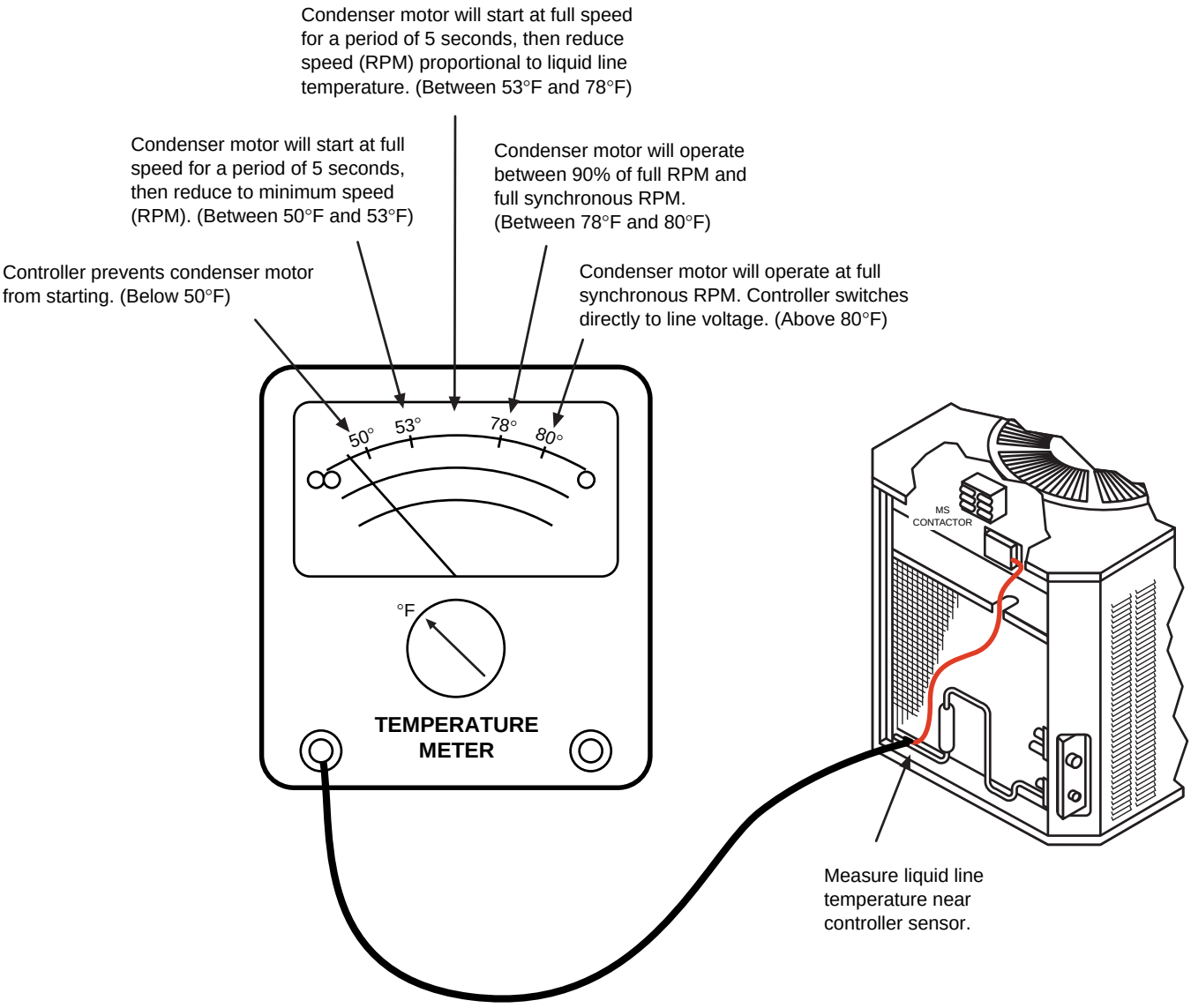
Weatherproof Kit is used in applications when head pressure controller is exposed to weather conditions. It provides electrical protection, along with sun rays and rain protection.





Sequence Of Operation

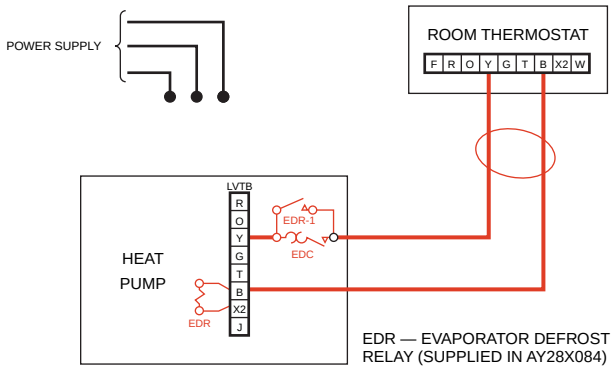
Under Low Ambient Conditions, the controller (BAYLOAM102A) allows variable condenser fan motor operation as liquid line temperature varies.



Evaporator Defrost Control, EDC

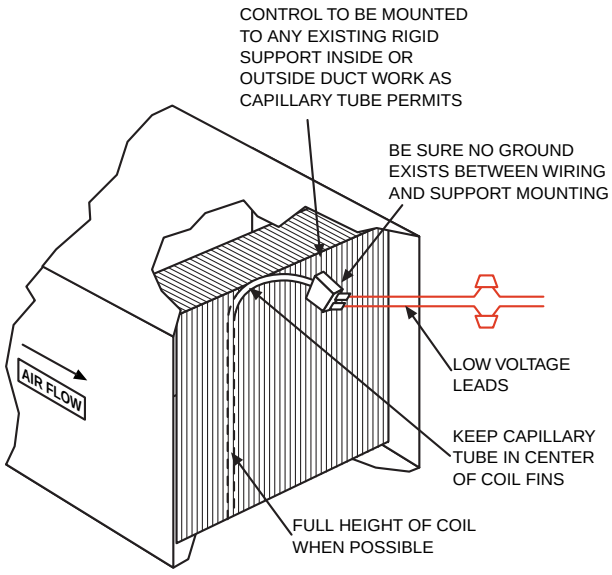
Evaporator Defrost Control is installed on the indoor coil. Its function is to terminate compressor operation in the event of frost detection on the indoor coil. As can be seen through the control diagram (below), EDC opens the compressor circuit. EDC is factory set at 32°F. (AY28X079 Cooling, AY28X084 Heat Pump.)

FIELD WIRING FOR HEAT PUMP WITH AY28X084 (EDC)



NOTES:

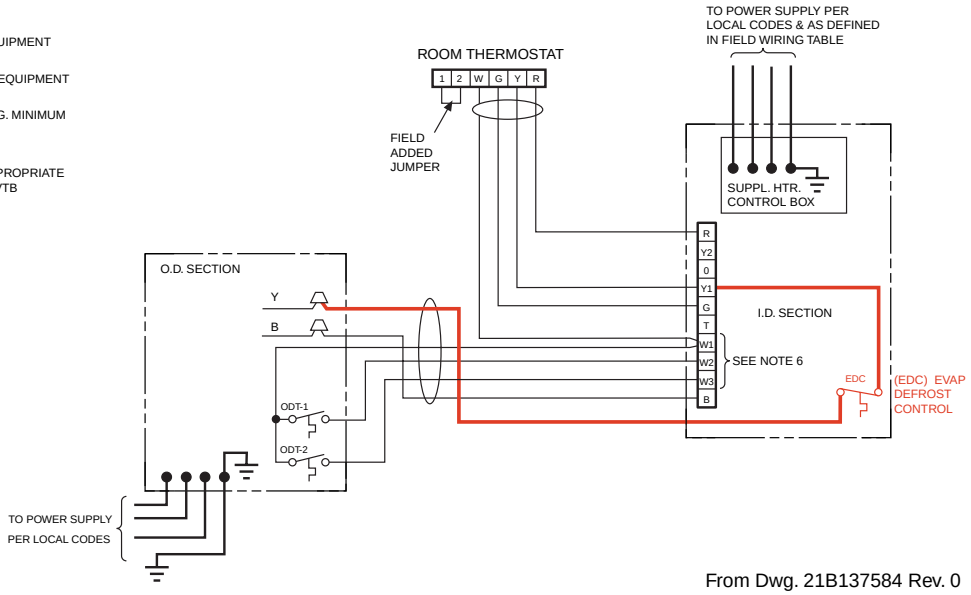
1. SIZE OF POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
2. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
3. LOW VOLTAGE WIRING TO BE NO. 18 A.W.G. MINIMUM CONDUCTOR.



FIELD WIRING DIAGRAM FOR SPLIT COOLING WITH AY28X079 (EDC)

NOTES:

1. POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
2. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
3. LOW VOLTAGE WIRING TO BE NO. 18 A.W.G. MINIMUM CONDUCTOR.
4. USE COPPER CONDUCTORS ONLY.
5. IF ODT IS NOT USED, THEN CONNECT APPROPRIATE JUMPERS FROM W1 TO W2 AND W3 ON LVTB



From Dwg. 21B137584 Rev. 0

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Replacement Condenser Fan Motor Specifications

When applying electronic Head Pressure Controller some condensing units require a motor change-out. Below are specifications of replacement motors. Note: Capacitor is not supplied with BAYMOTR100A.

	BAYMOTR301BB	BAYMOTR302BB	BAYMOTR306BB	BAYMOTR100A
Trane Part Number	MOT4123	MOT5317	MOT3419	MOT6627
Motor Frame Number	5KCP39CGL002S	5KCP39FGL227AS	5KCP39KFH957S	5KCP39HGL645S
Horsepower / RPM	1/8 / 1650	1/4 / 1075	1/4 / 825	1/5 / 1080
Voltage / Phase	200-230 / 1Ø	200-230 / 1Ø	200-230 / 1Ø	200/230 / 1Ø
Capacitor (MFD / Volts)	4 /370	7.5 / 370	12.5 / 370	7.5 / 370
Capacitor Supplied With Motor	YES	YES	YES	NO①

① Trane part number CPT0120.

Capacitor

Condenser Motor

Replacement Condenser Fan Blade

	FAN BLADE SPECIFICATIONS			
Trane Part Number	FAN 1355	FAN 1433	FAN 1403	FAN 1358
Number of Blades	3	3	3	3
Material	Aluminum	Aluminum	Aluminum	Aluminum
Blade Dia.	14 Inches	18 Inches	26 Inches	22 Inches
Pitch	26°	34°	20°	31°
Bore Size	1/2	1/2	1/2	1/2
Rotation Direction	CCW	CCW	CCW	CCW

FAN1355

Condenser Fan Blades

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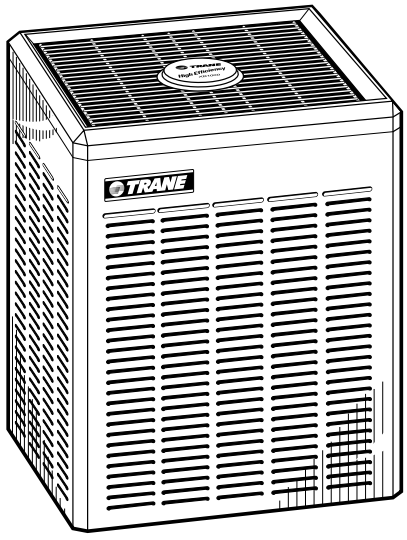
Replacement Condensing Unit Grille

The following units require grille change out when installing BAYMOTR100A:

- TTB030C100A
- TTB036C100A
- TTB042D100A
- TTB048D100A



Relay Required on Heat Pumps

Double Pole, Double Throw

Applications which specify 230 volt heat pump systems in conjunction with low ambient controls require a relay BAY24X042 to be installed. This relay will detect the system operating in heating mode and electrically remove the low ambient controller from the circuit. Resulting Low Ambient Operation will be in cooling mode only. See Heat Pump Wiring Diagram (this journal)①.

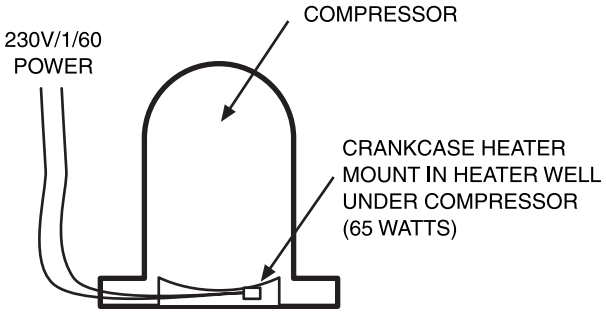
① This relay is not approved on 460 volt applications. Use Minneapolis-Honeywell Relay R8222B1158 or equivalent with applications requiring 460 volts.

Crankcase Heater

BAYCCHT003AA

Condensing unit operating in cooling mode during Low Ambient Conditions and required Electronic Head Pressure Controller, **MUST** have crankcase heater installed. This well type heater shall be installed in compressor, see diagram below.

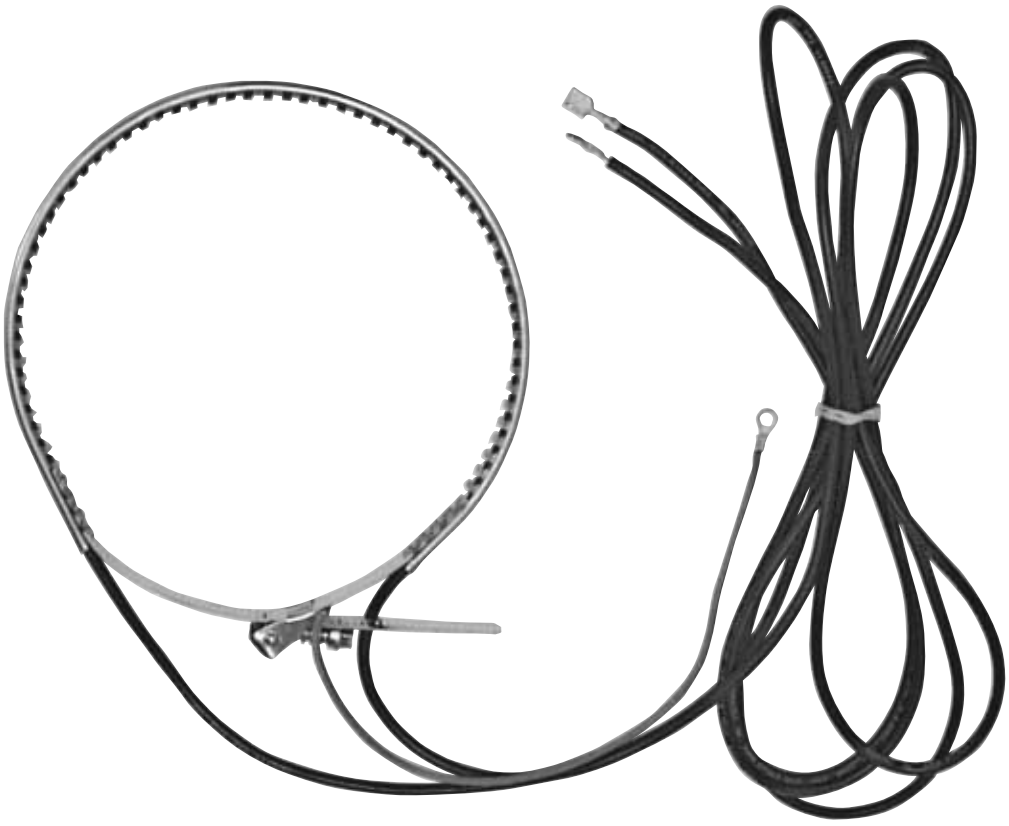
Trane Crankcase Heater



Crankcase Heater

BAYCCHT200/201A

Condensing unit operating in cooling mode during Low Ambient Conditions and required Electronic Head Pressure Controller, **MUST** have crankcase heater installed. This belly band type heater shall be installed on compressor.



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Ferrite Inductor

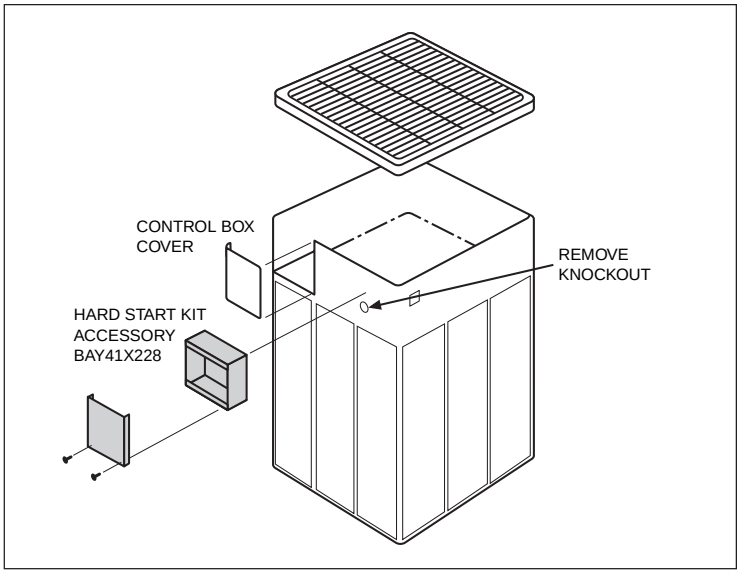
The Ferrite conductor is used to reduce conducted electrical noise. This may be seen as electrical noise that can cause other components to receive false signals or cause the controller itself to have erratic operation. This will also help reduce cross talk to other controllers causing them to function at inappropriate times.

Hard Start Kit

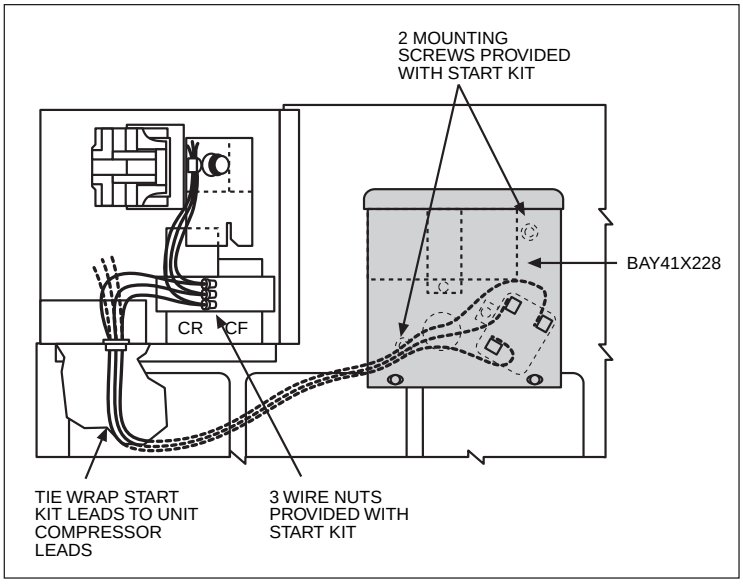
BAY41X228

Accessory For:

TTB012C100A
TTB018C100A1
TTB024C100A1



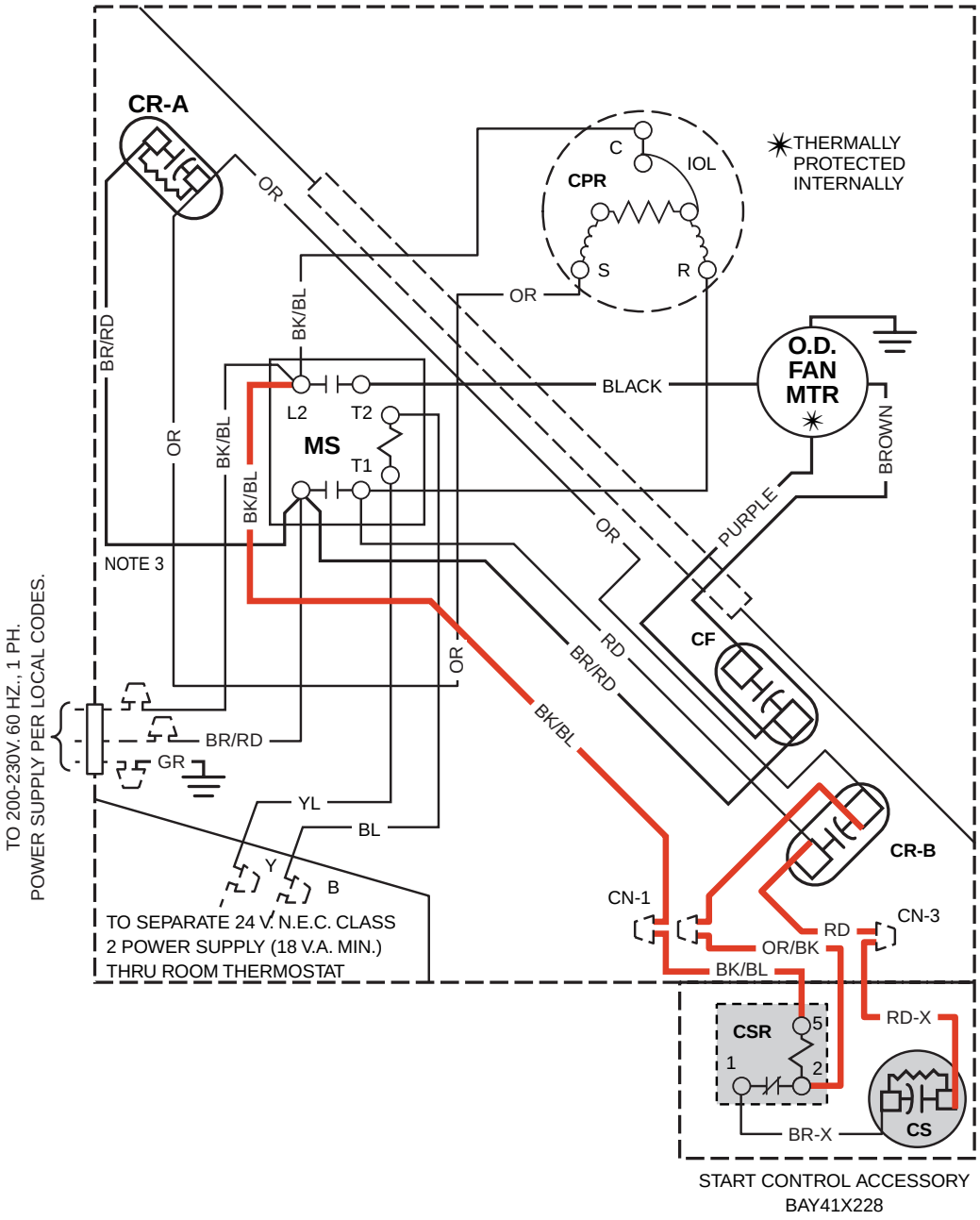
Mount Start Kit external to Condensing Unit Cabinet.



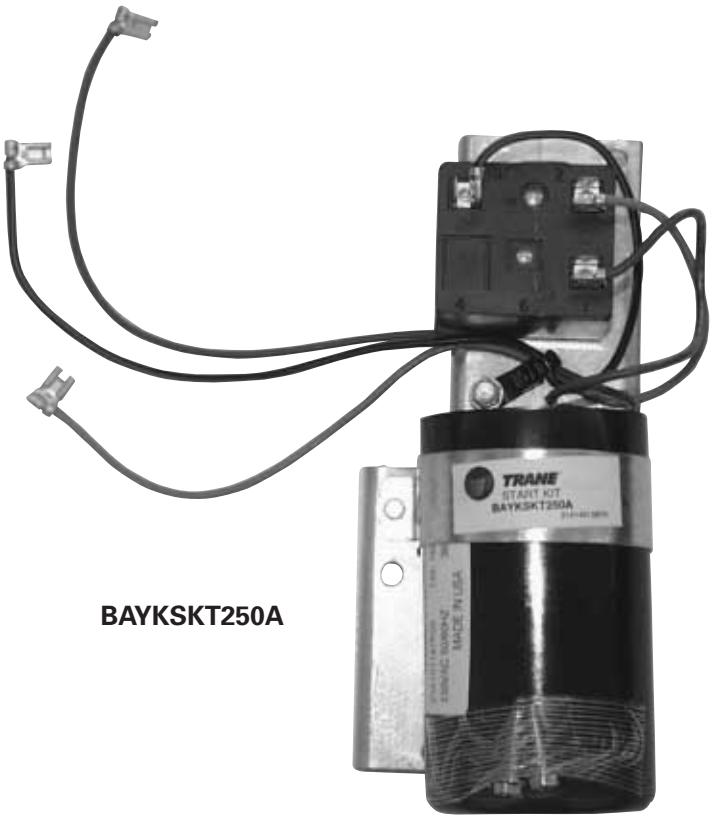
Route control wires from Hard Start Kit to Electrical Control Box.

Hard Start Kit Wiring Diagram

BAY41X228 (continued)



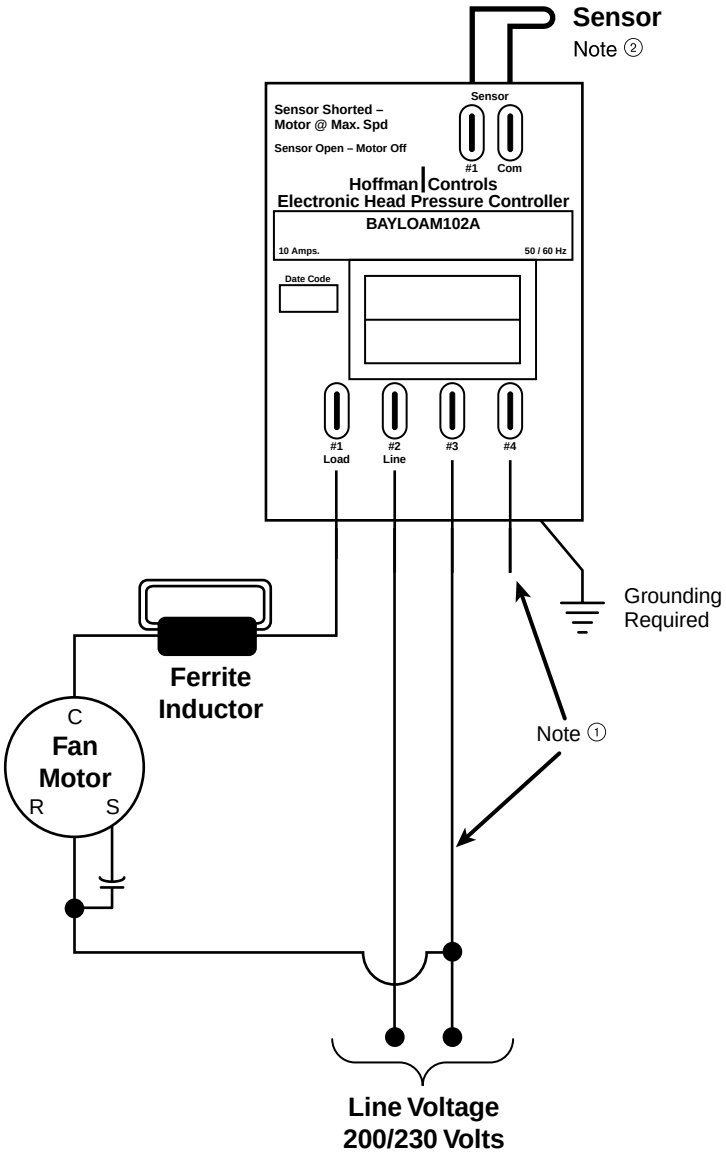
Hard Start Kit



BAYKSKT250A

BAYKSKT252A

General Wiring Diagram

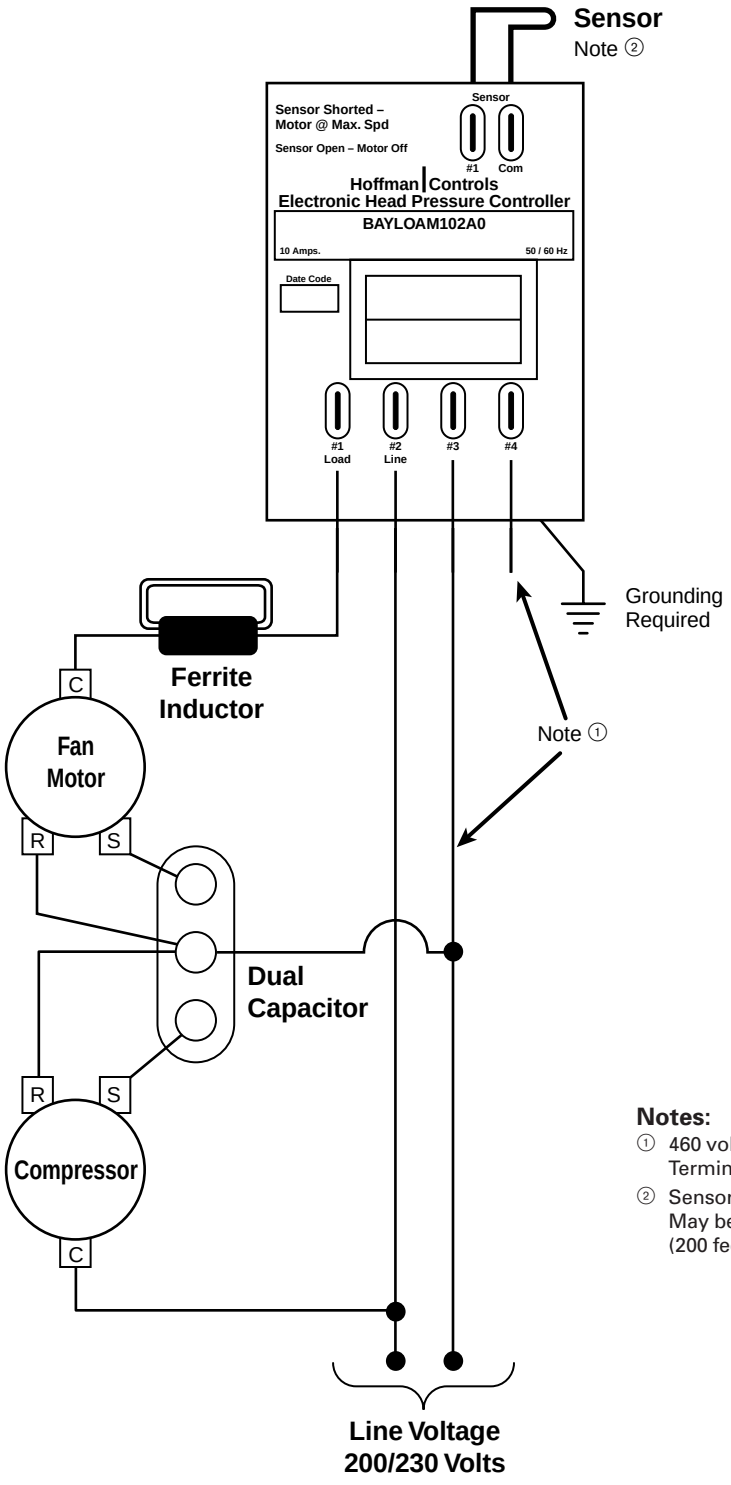


Notes:

① 460 volt application move wire from Terminal 3 to Terminal 4.

② Sensor contains 5 feet #18 ga. wire supplied with BAYLOAM102A0 Controller. May be extended by contractor (200 feet maximum, #18 ga.)

General Dual Capacitor Wiring Diagram



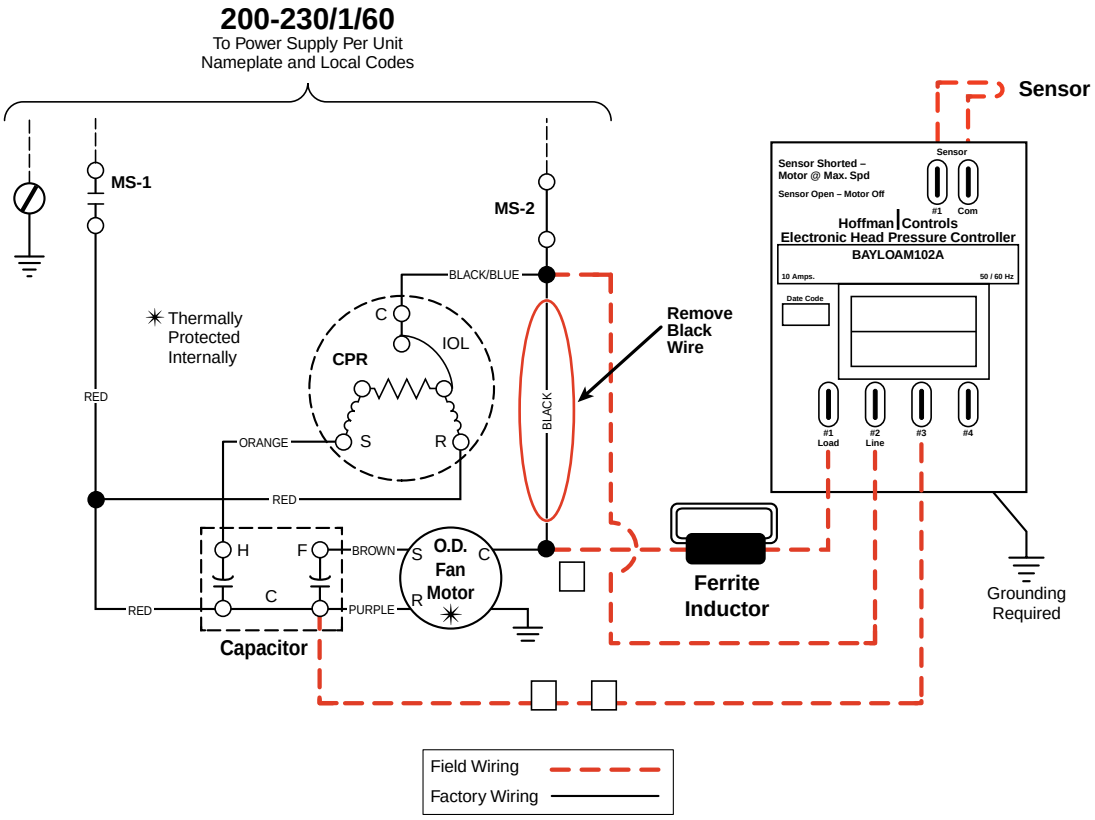
Notes:

① 460 volt application move from Terminal 3 to Terminal 4.

② Sensor contains 5 feet #18 ga. wire. May be extended by contractor (200 feet maximum, #18 ga.)

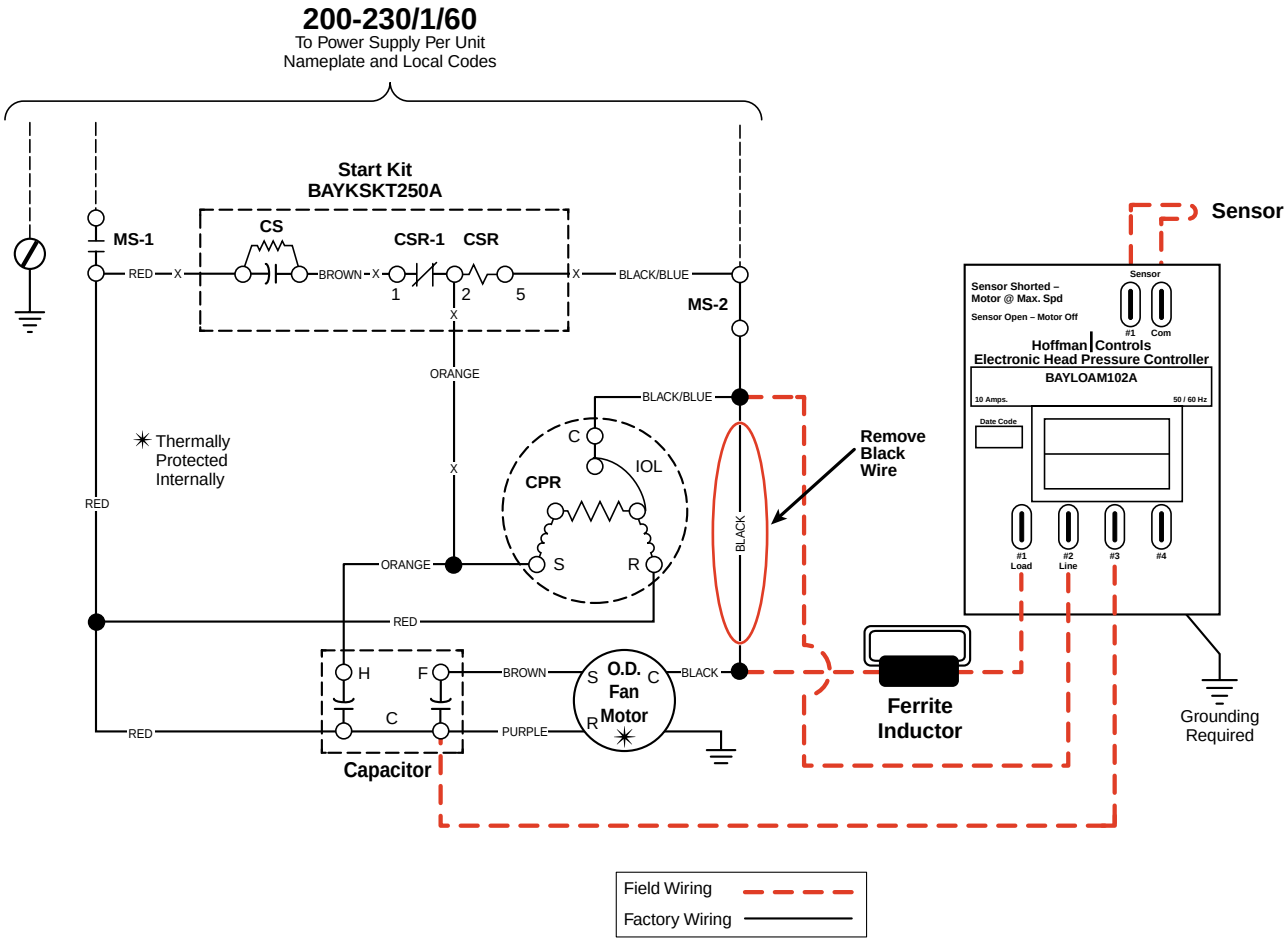
Wiring Diagram

TTB012C100A1
TTB018C100A1
TTB024C100A1



Wiring Diagram

TTB030C100A
TTB036C100A



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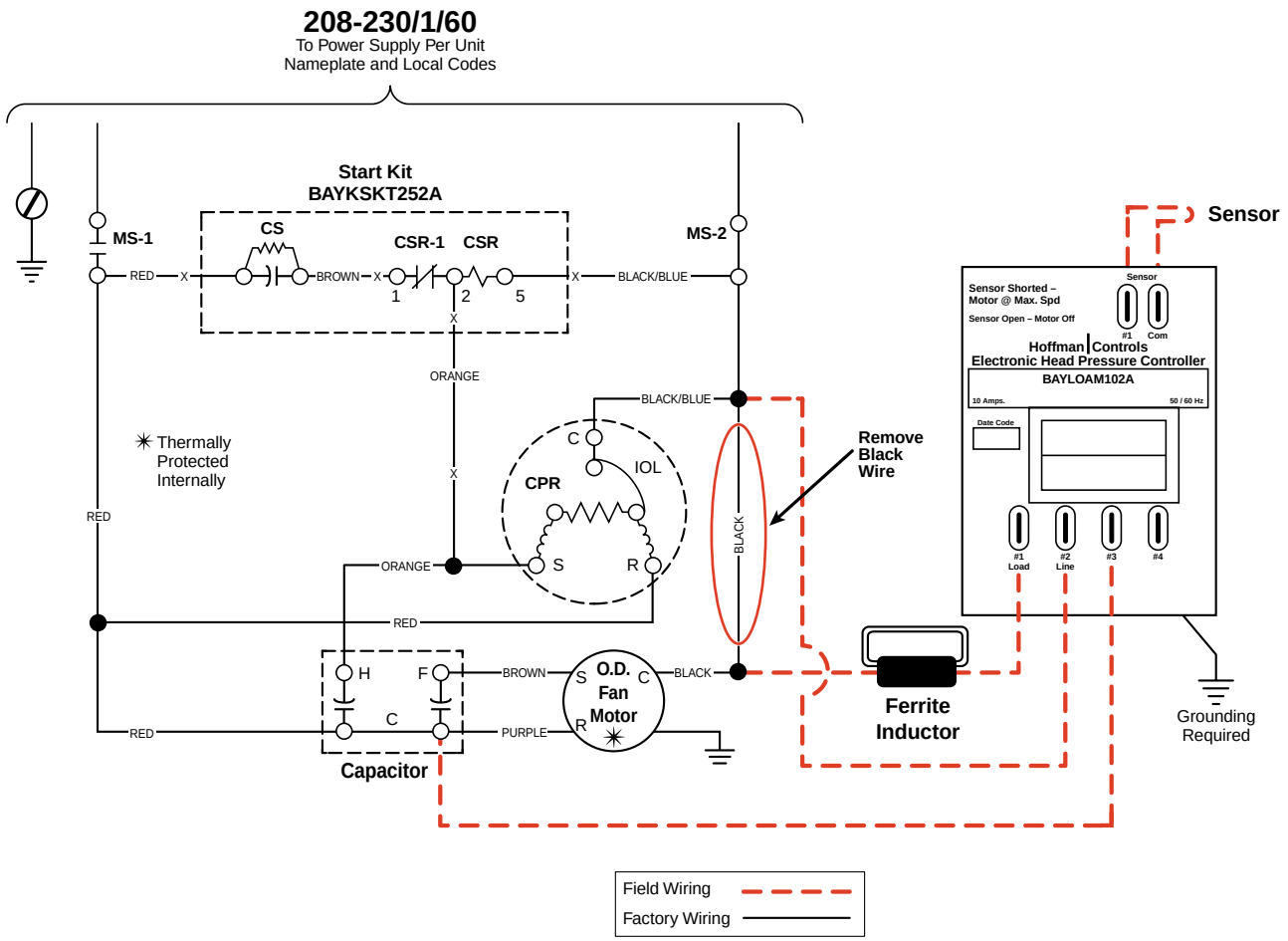
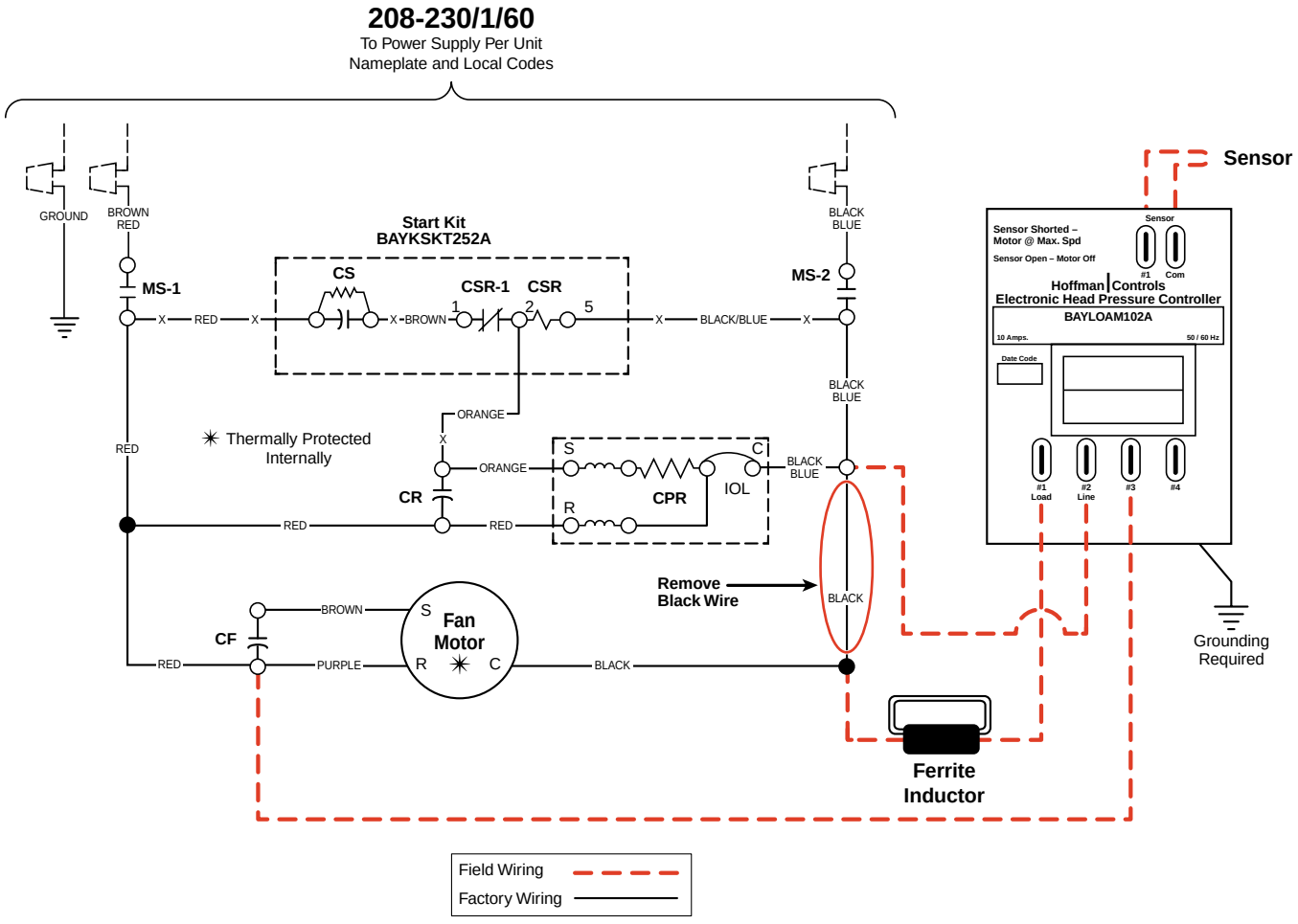
Wiring Diagram

TTB042D100A
TTB048D100A



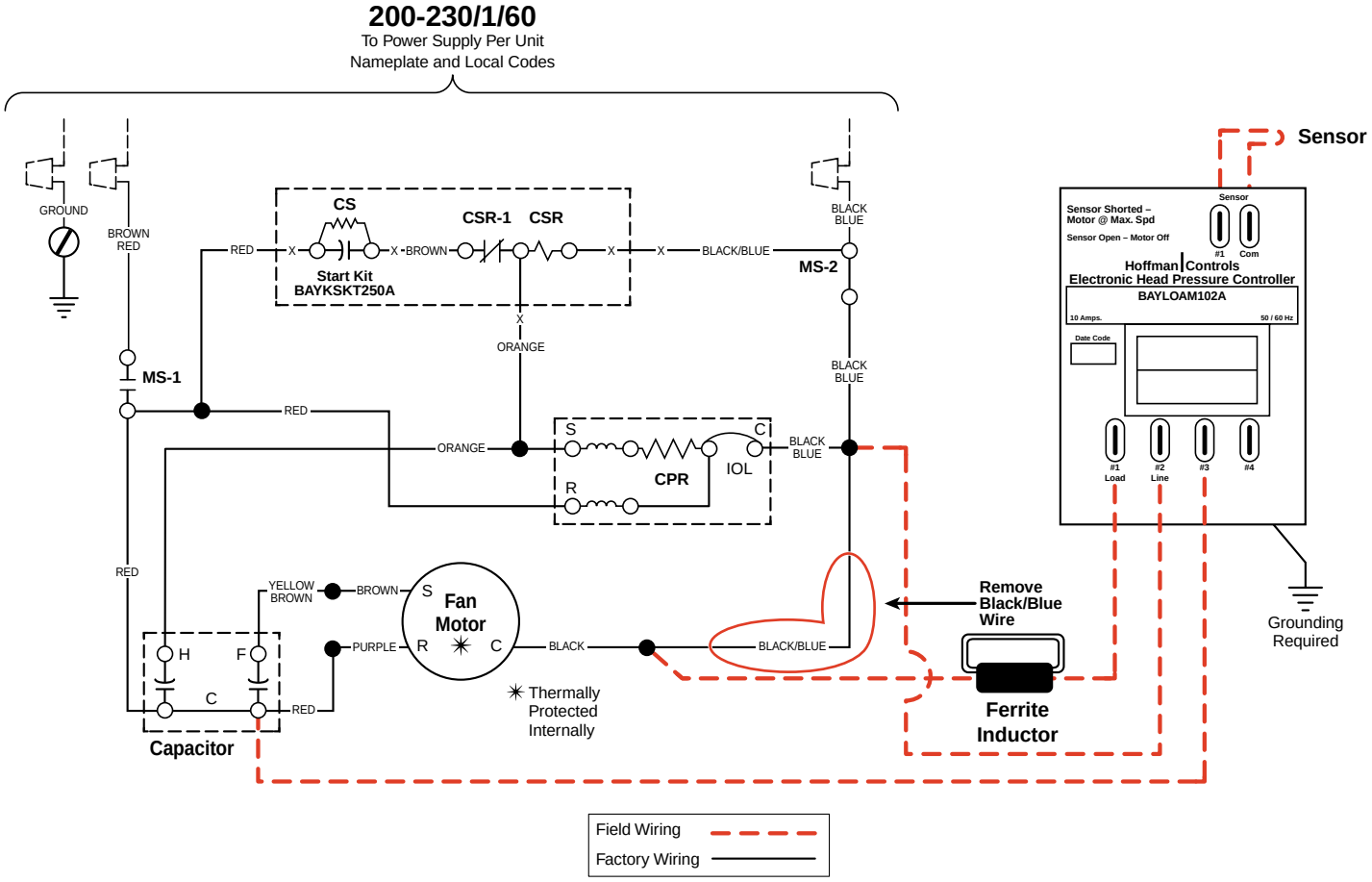
Wiring Diagram

TTB060D100A



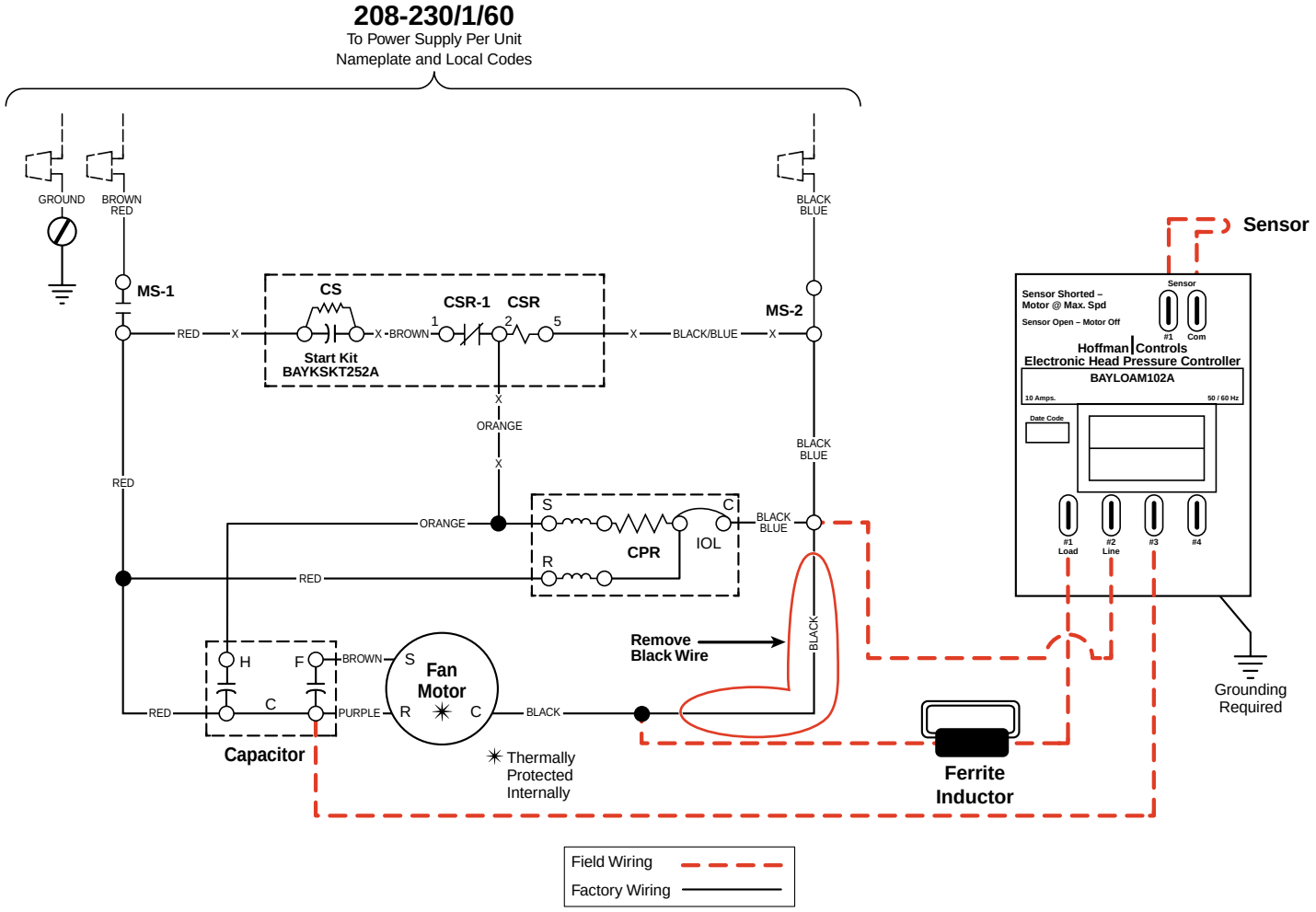
Wiring Diagram

TTR018D100A
TTR025C100A
TTR030C100A



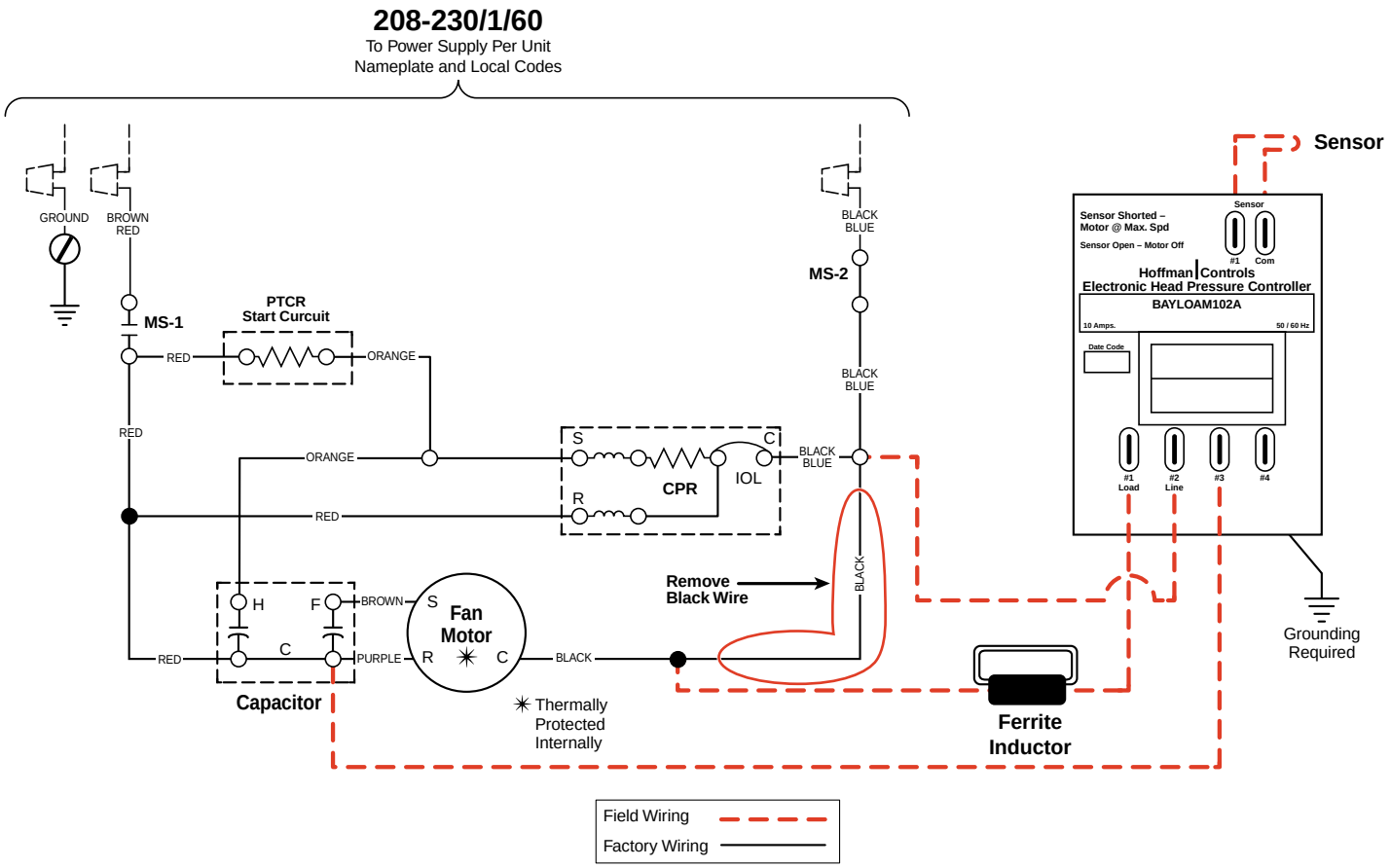
Wiring Diagram

TTR036D100A
TTR042D100A
TTR042D100B



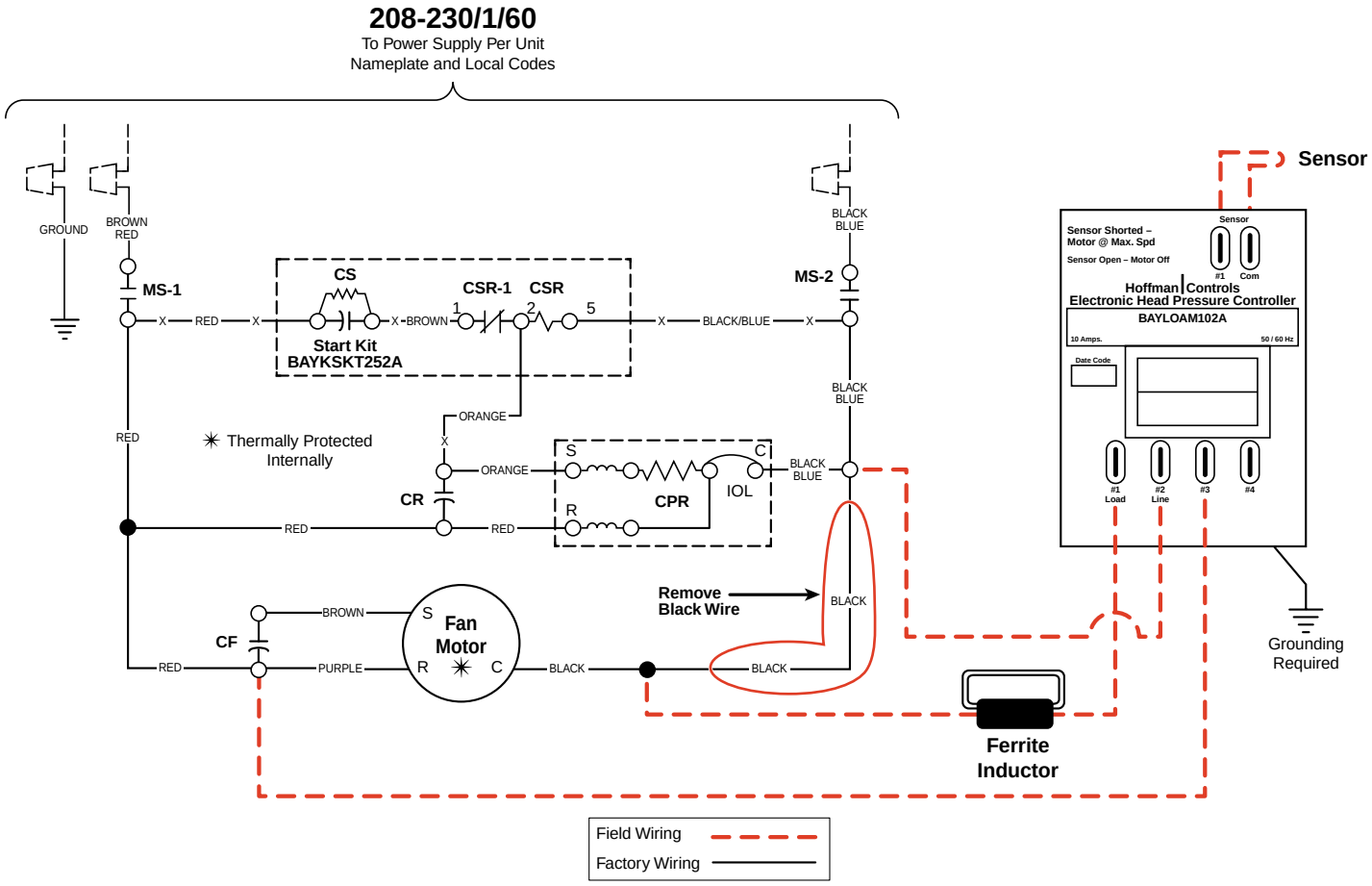
Wiring Diagram

TTR048D100A



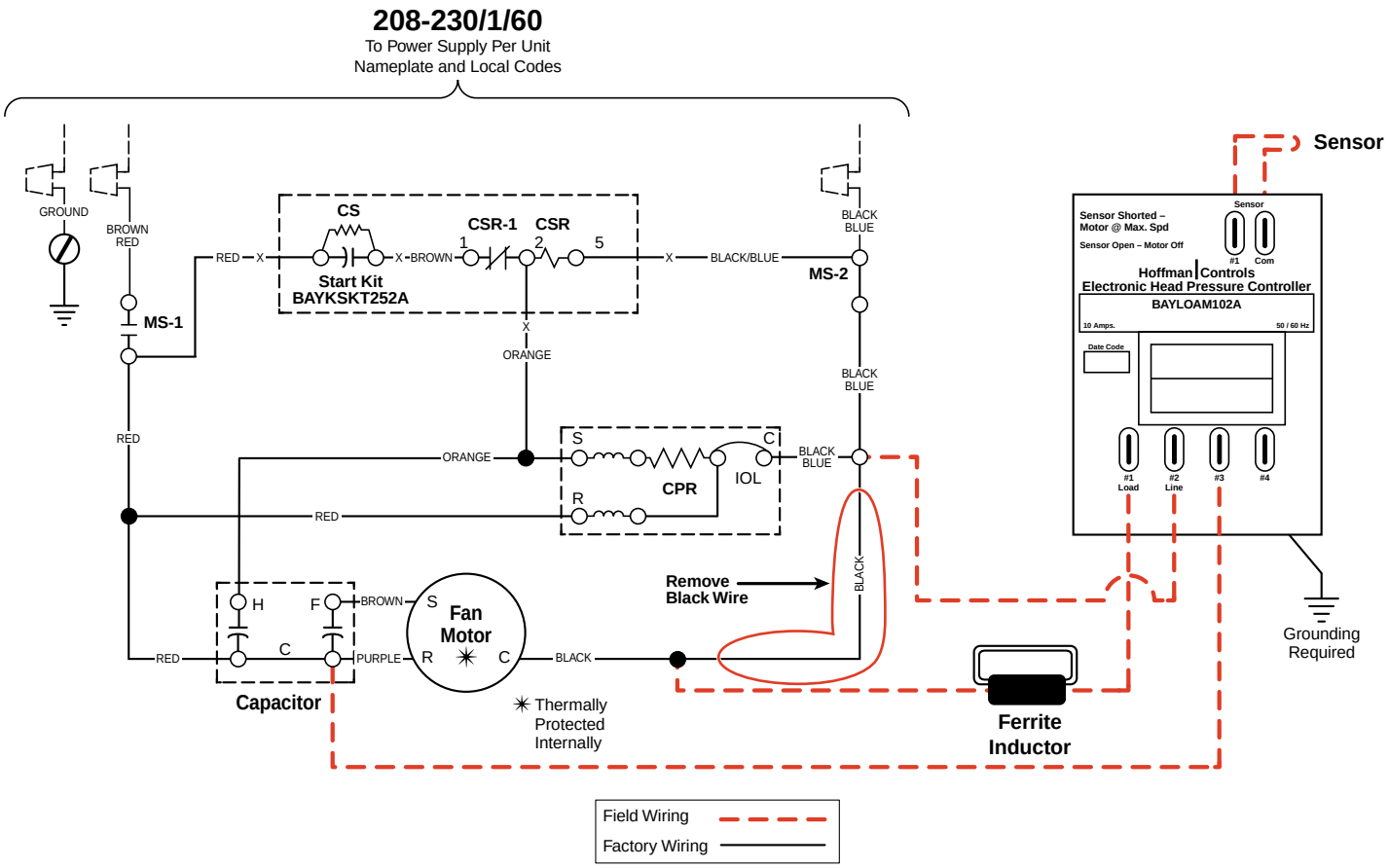
Wiring Diagram

TTR060D100A



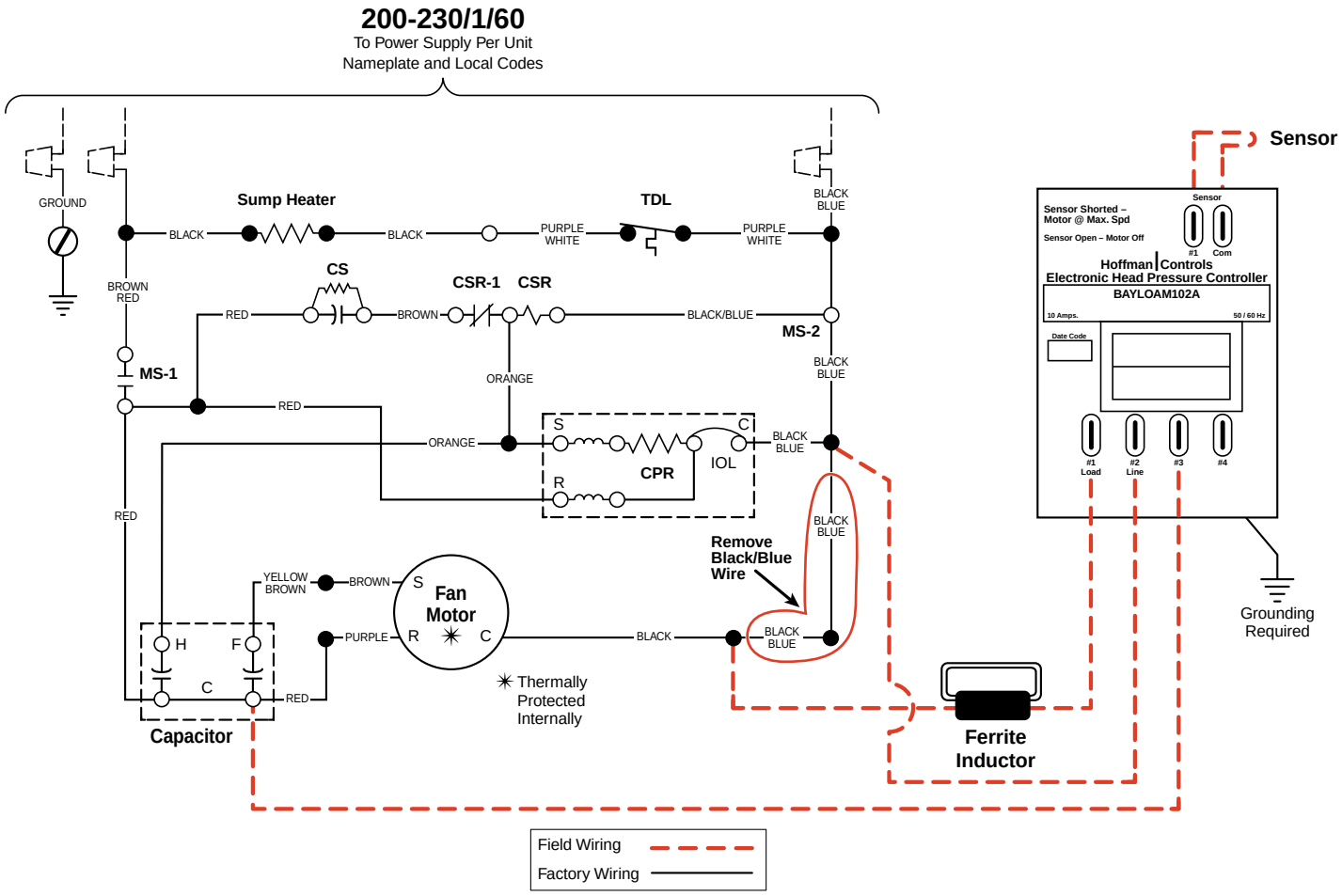
Wiring Diagram

TTP030D100A
TTP036D100A
TTP048D100A



Wiring Diagram

TTP042C100A



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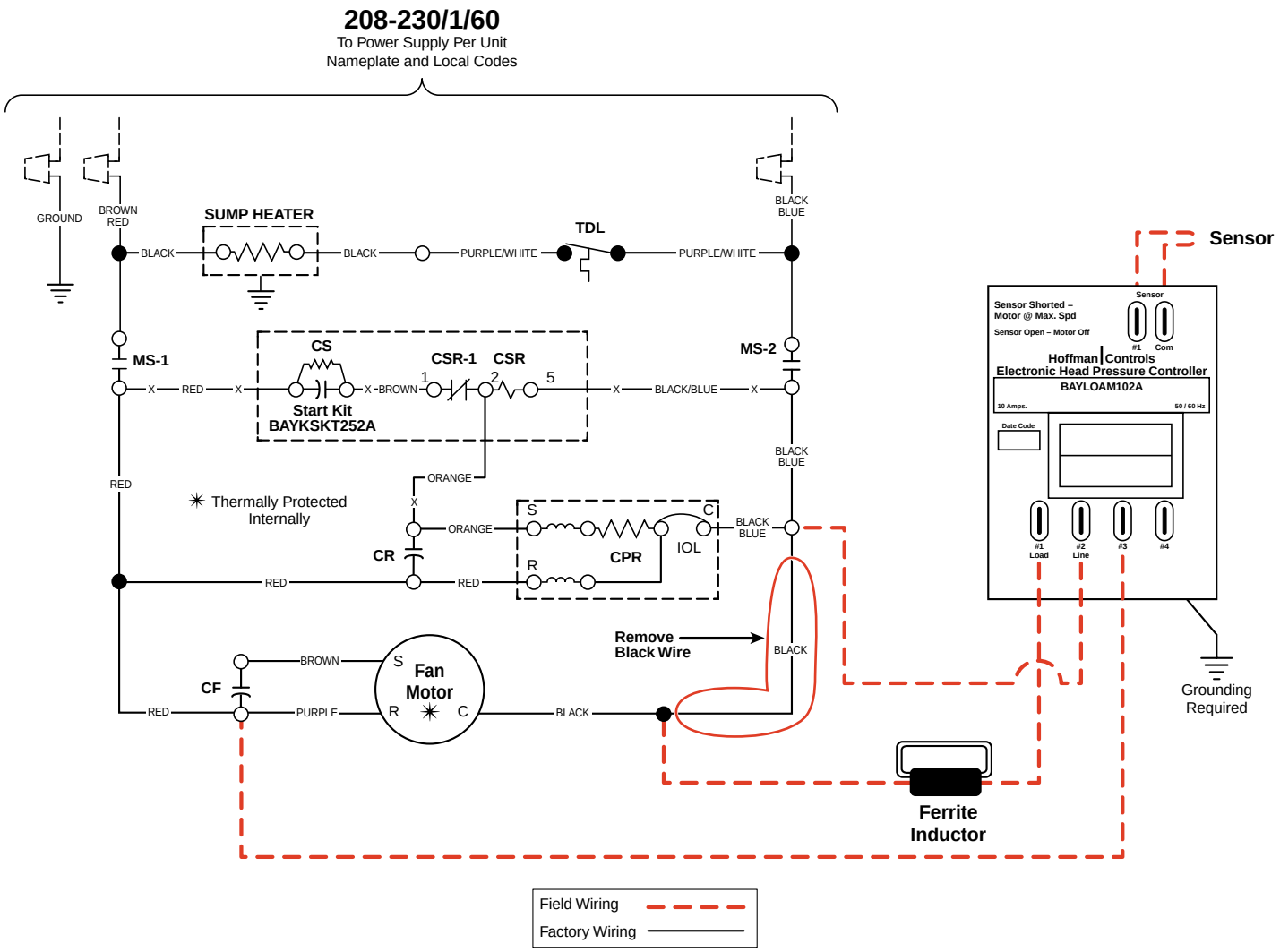
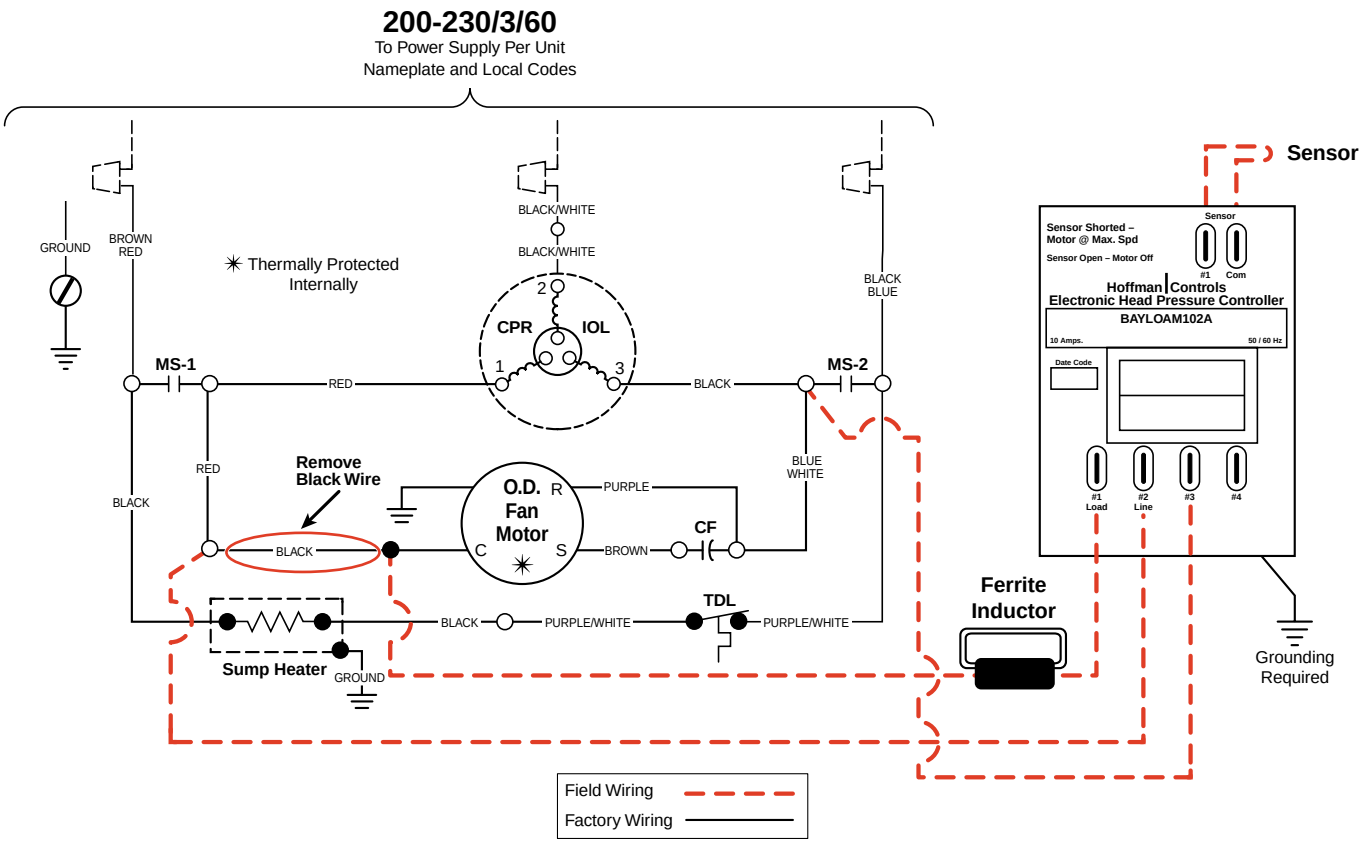
Wiring Diagram

TTP060D100A
TTP060E100A



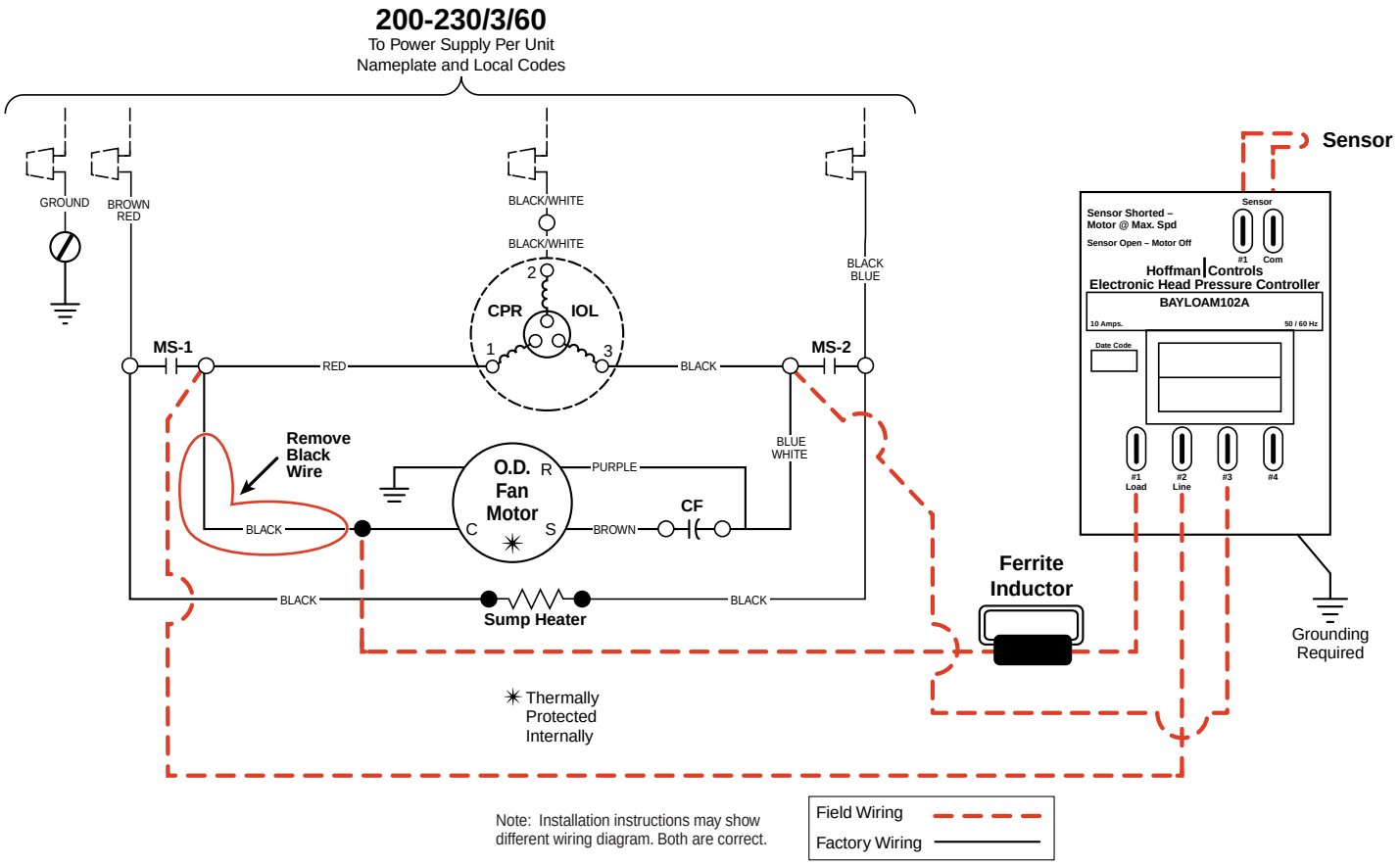
Wiring Diagram

TTP030D300A
TTP036D300A
TTP048D300A
TTP060D300A
TTP060E300A



Wiring Diagram

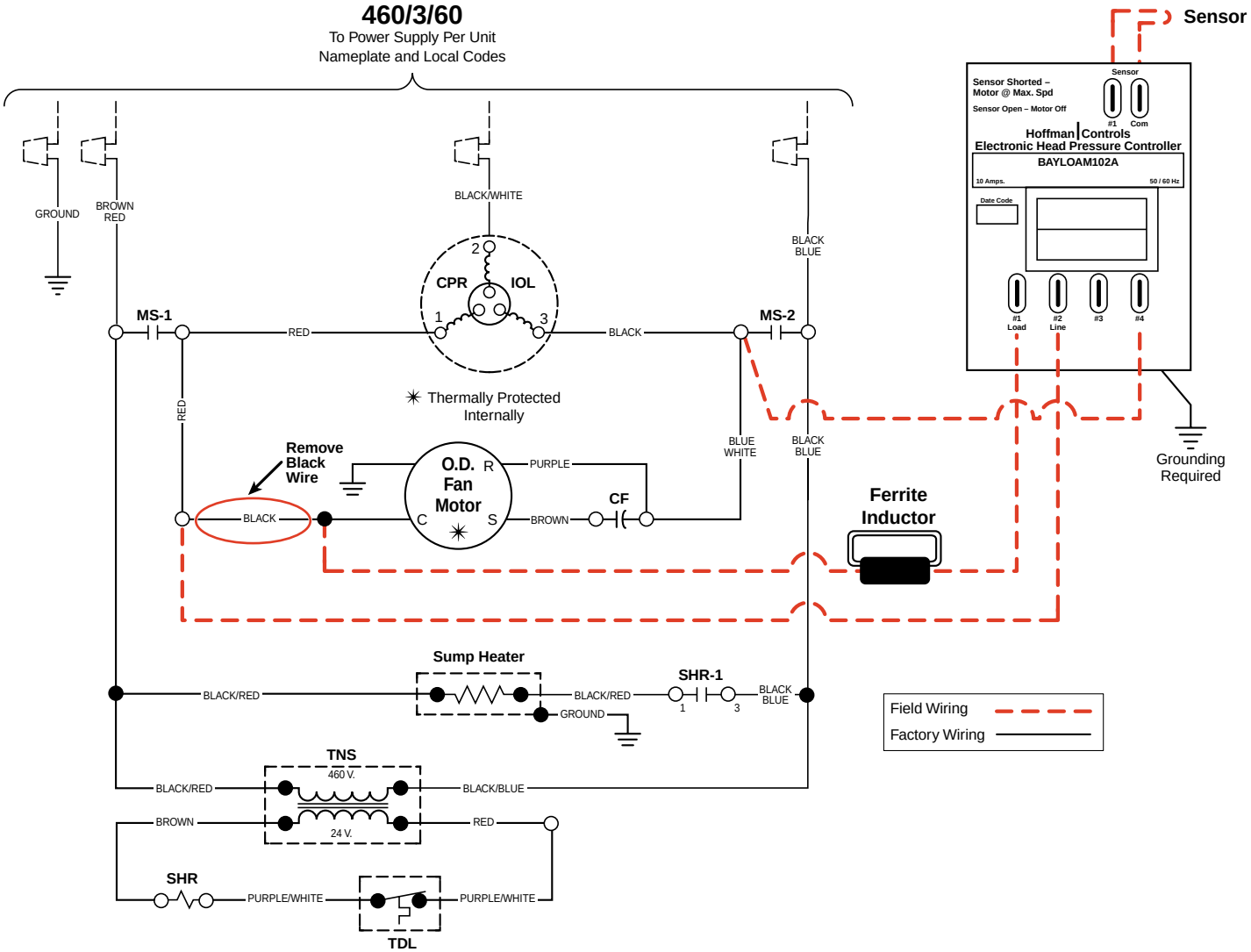
TTP042C300A



Note: Installation instructions may show different wiring diagram. Both are correct.

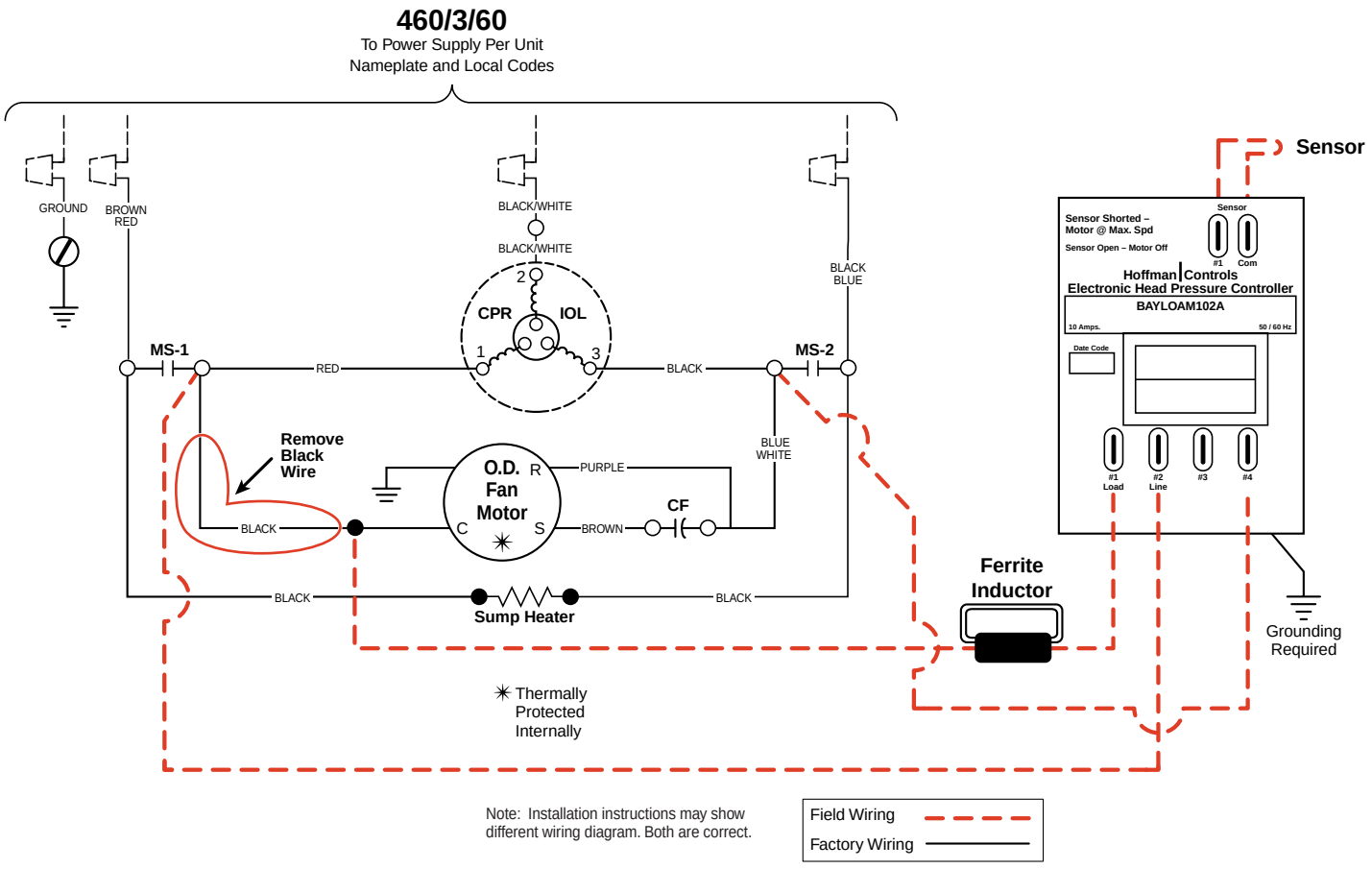
Wiring Diagram

TTP030D400A
TTP036D400A
TTP048D400A
TTP060D400A
TTP060E400A



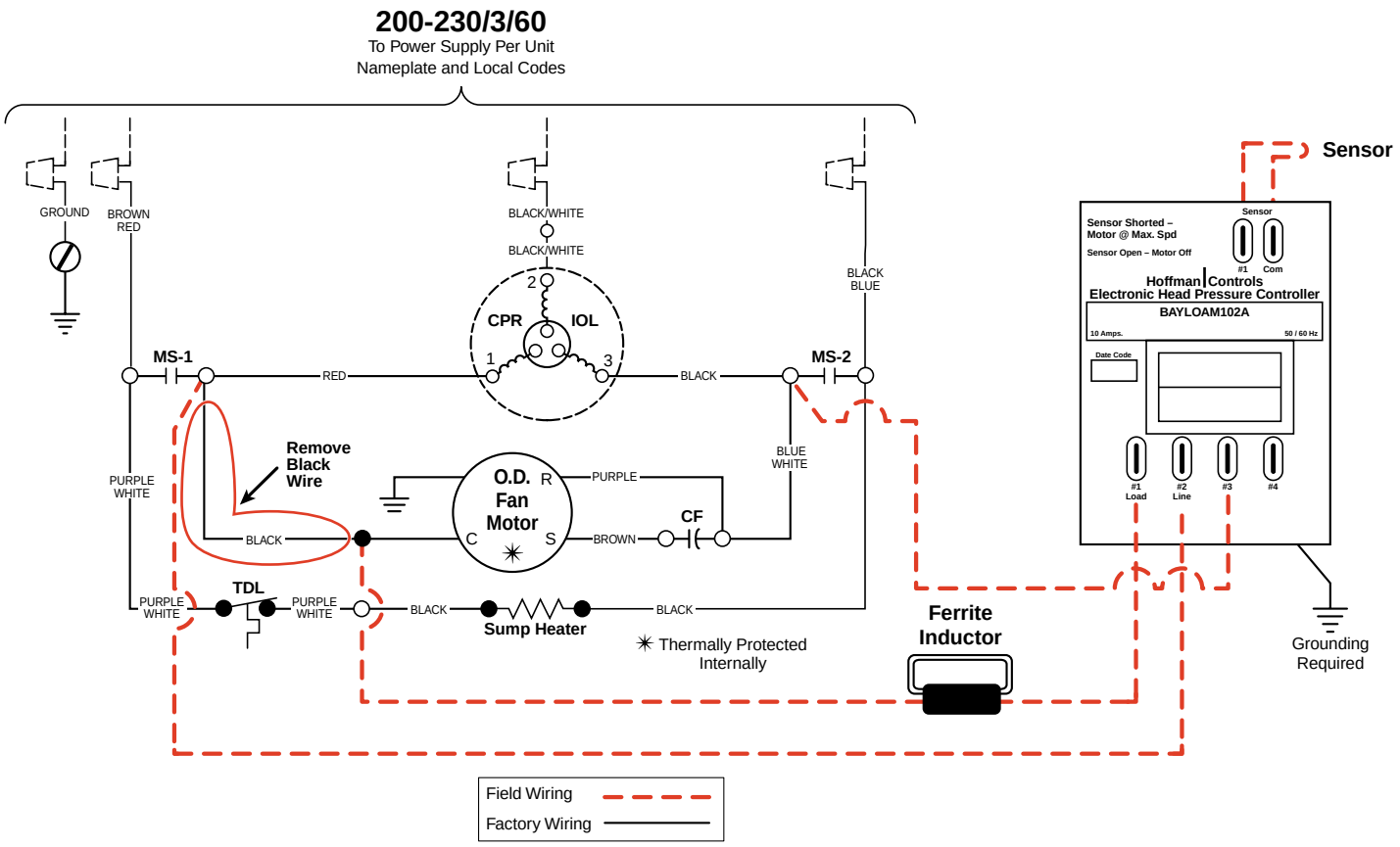
Wiring Diagram

TTP042C400A



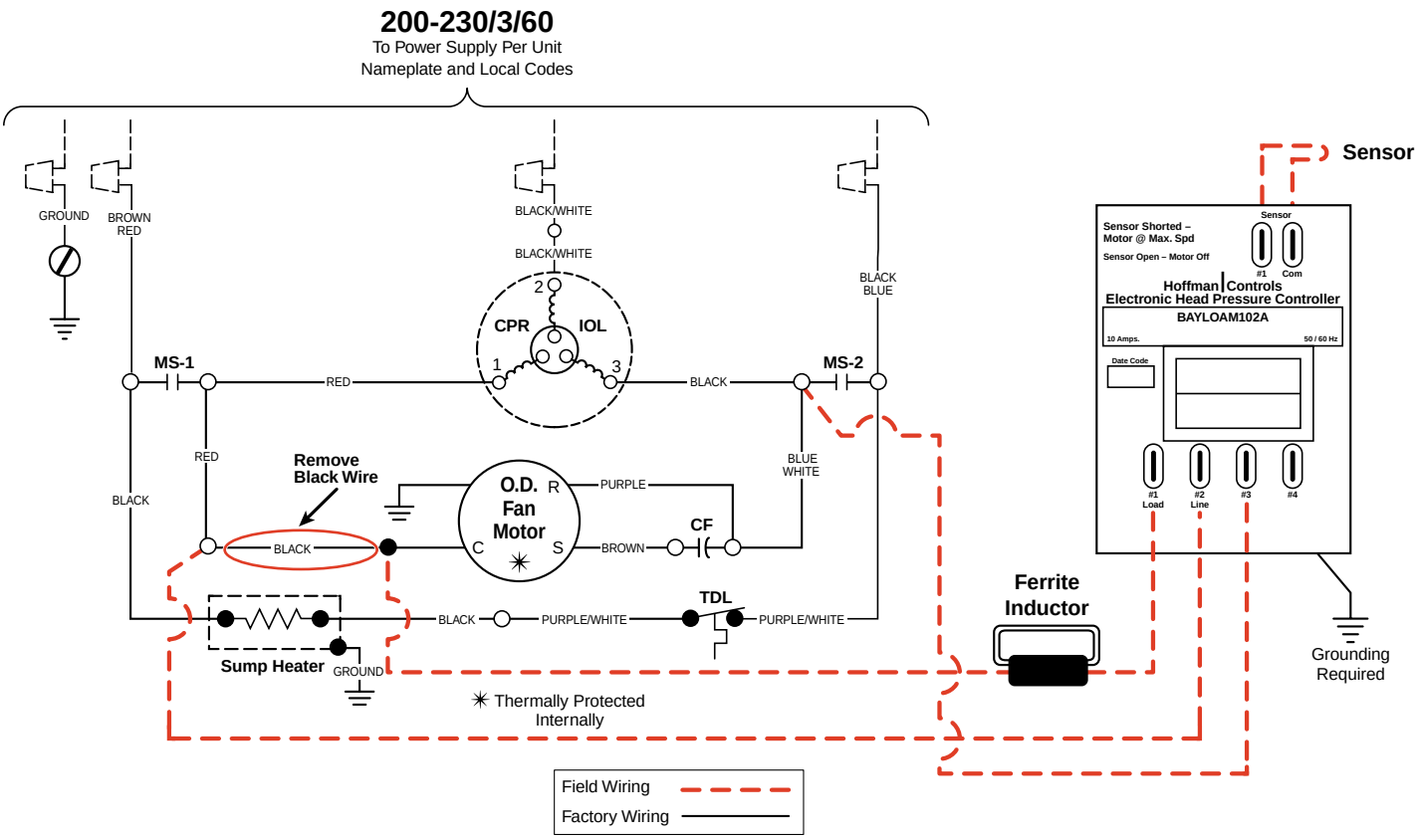
Wiring Diagram

TTA030C300A



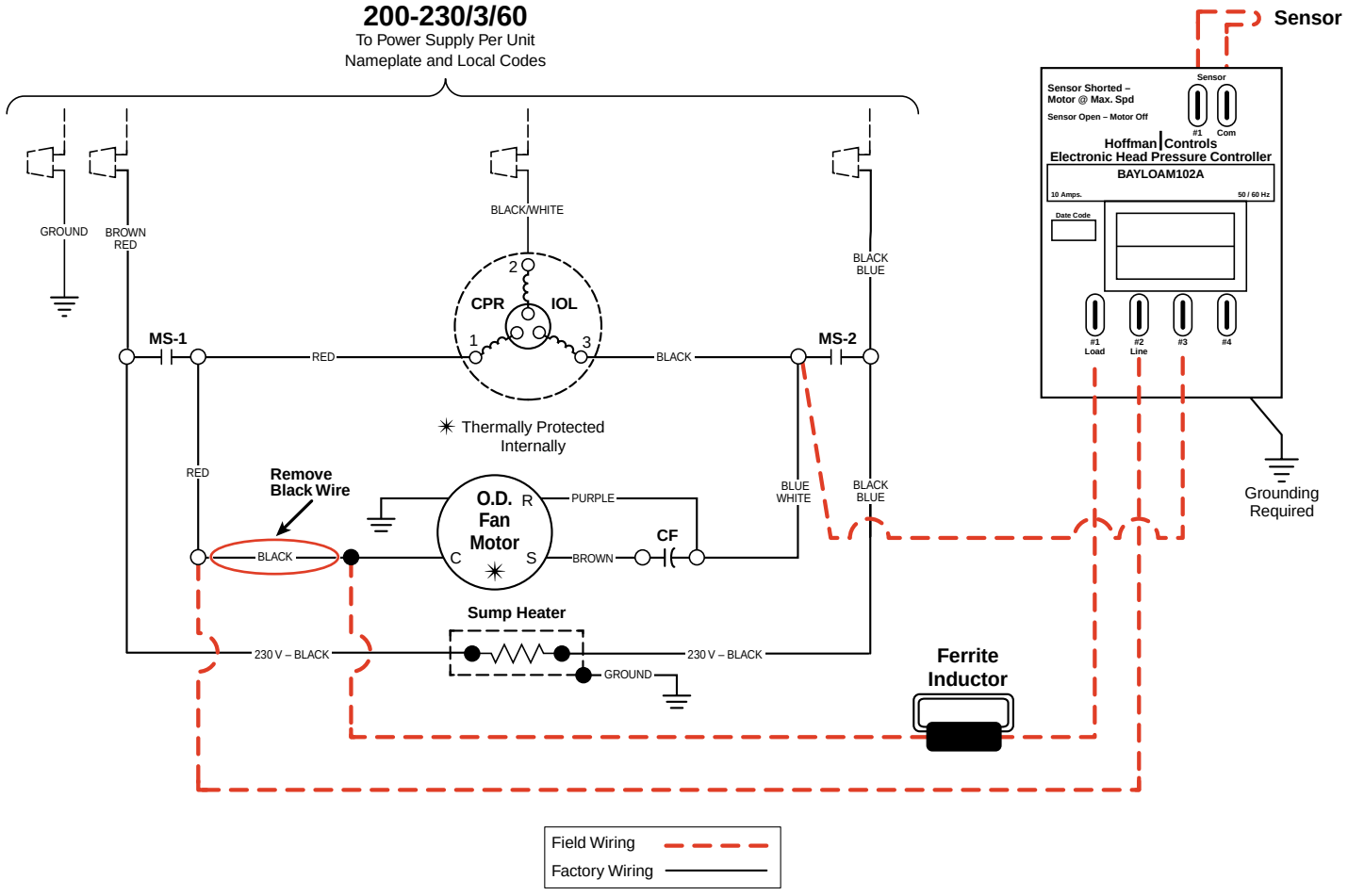
Wiring Diagram

TTA036D300A
TTA042D300A
TTA048D300A
TTA060D300A



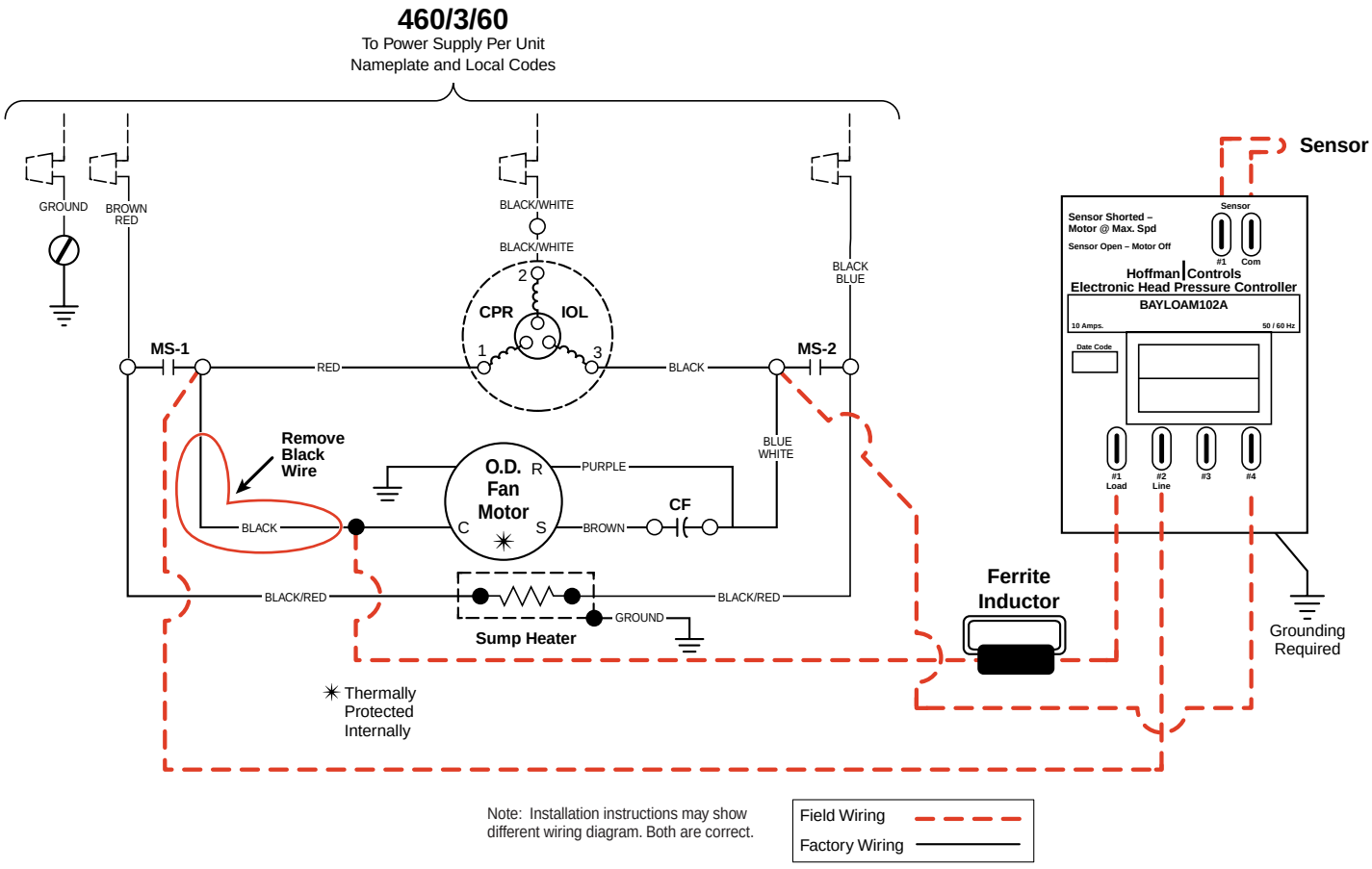
Wiring Diagram

TTA072D300A



Wiring Diagram

TTA030C400A



Note: Installation instructions may show different wiring diagram. Both are correct.

Field Wiring

Factory Wiring

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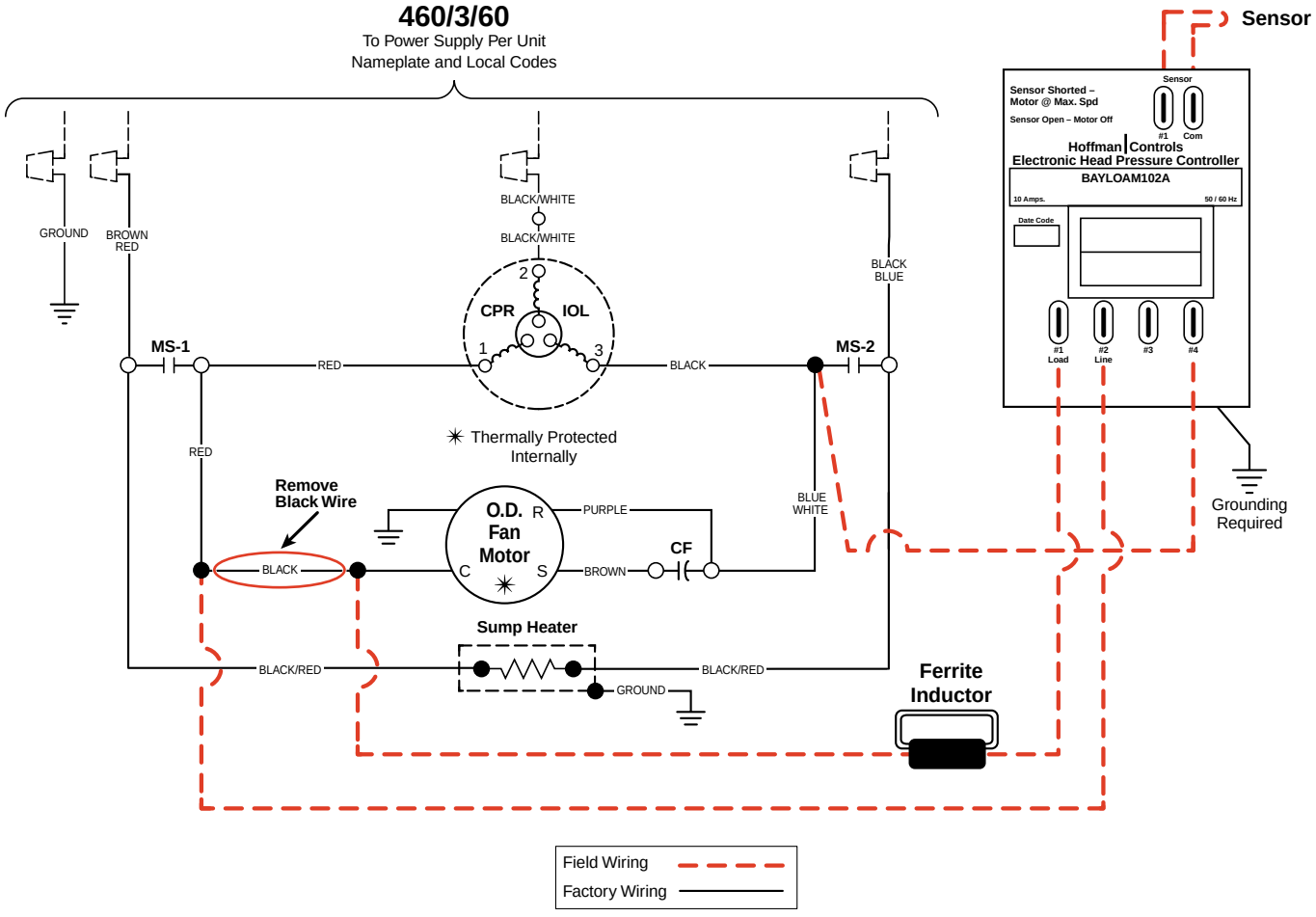
Wiring Diagram

TTA036D400A
TTA042D400A
TTA048D400A
TTA060D400A



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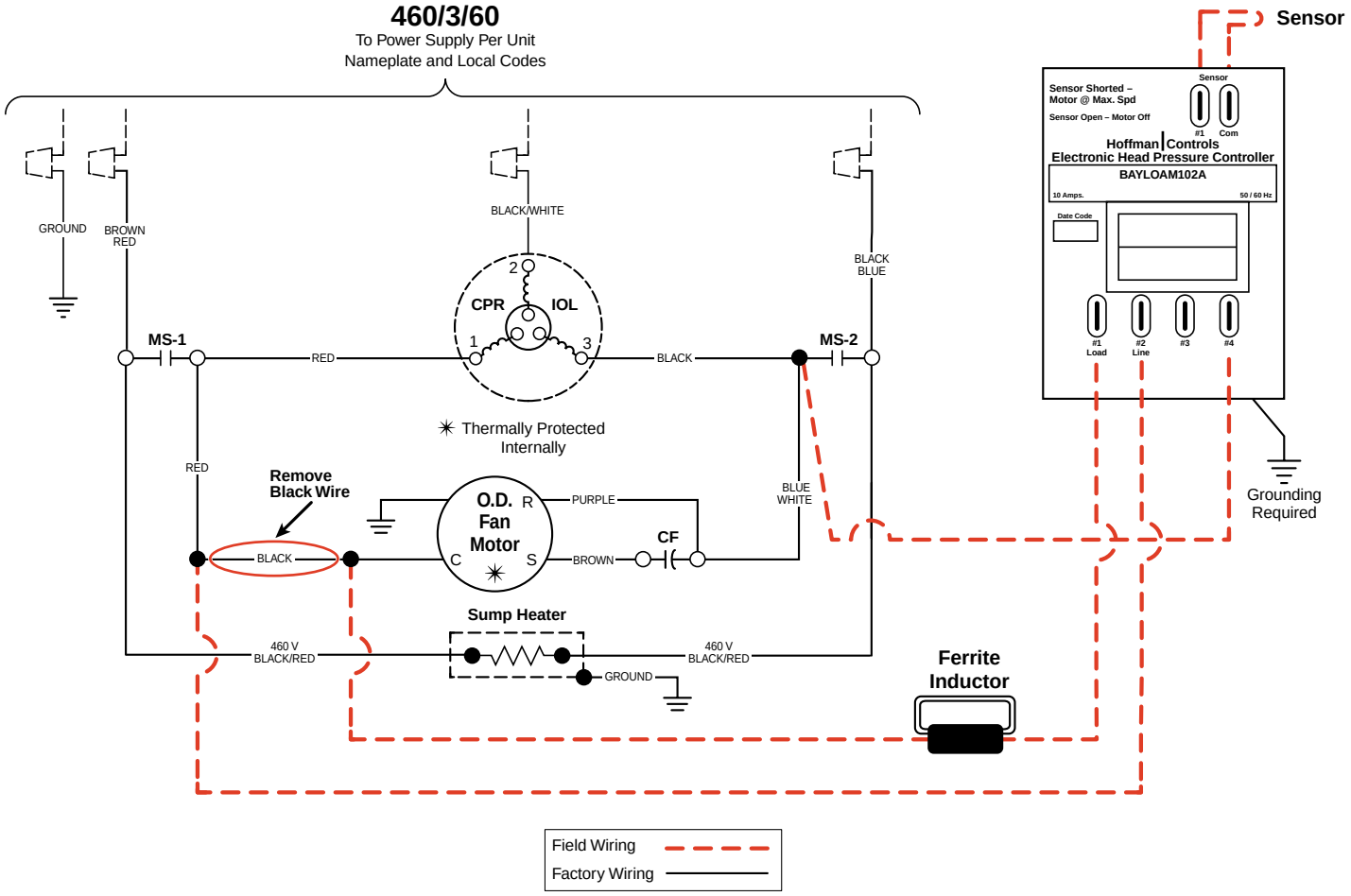
Wiring Diagram

TTA072D400A



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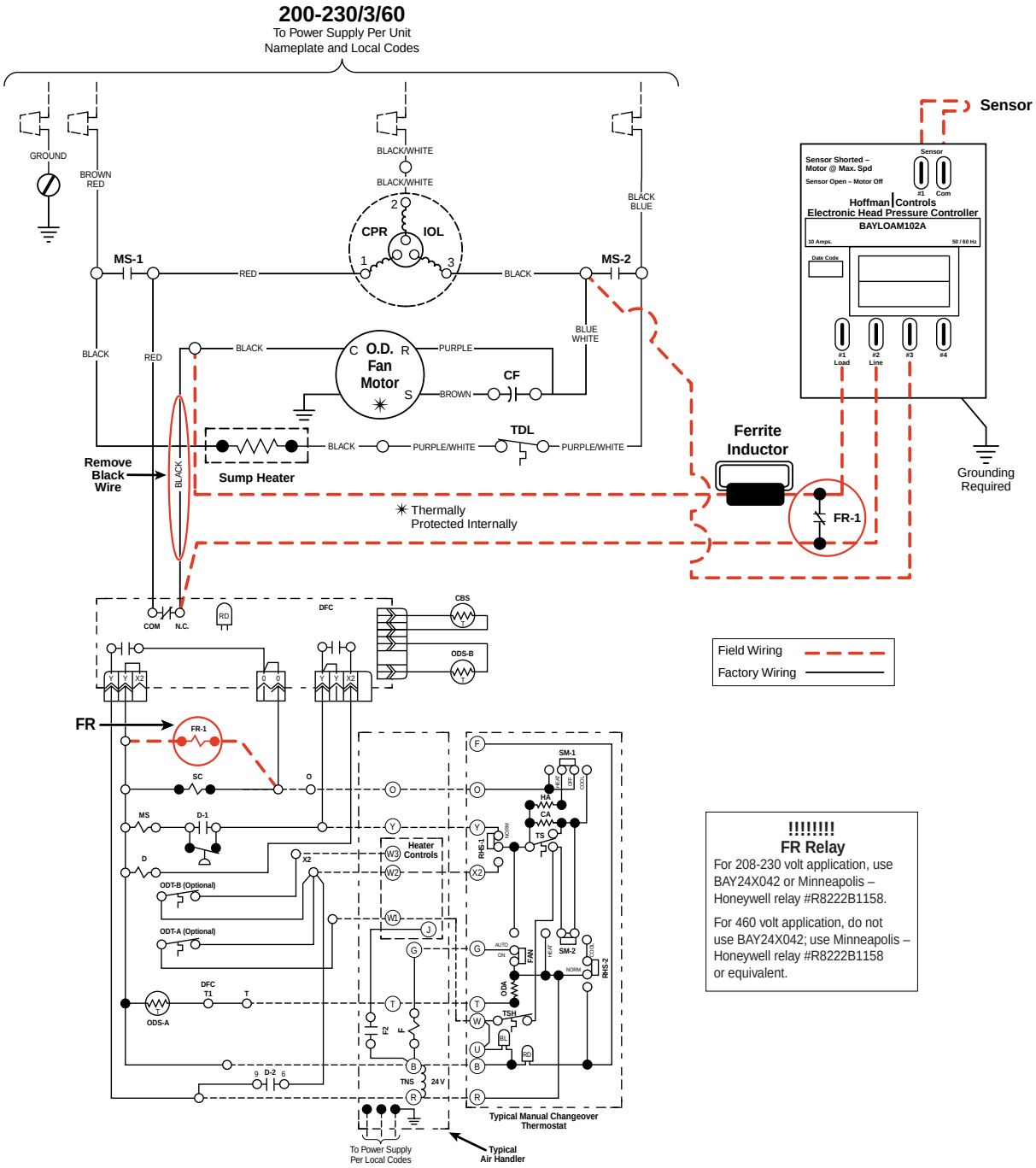
Wiring Diagram

TWA030C300A
TWA042C300A
TWA072C300A



!!!!!!!!
FR Relay

For 208-230 volt application, use BAY24X042 or Minneapolis – Honeywell relay #R8222B1158.

For 460 volt application, do not use BAY24X042; use Minneapolis – Honeywell relay #R8222B1158 or equivalent.

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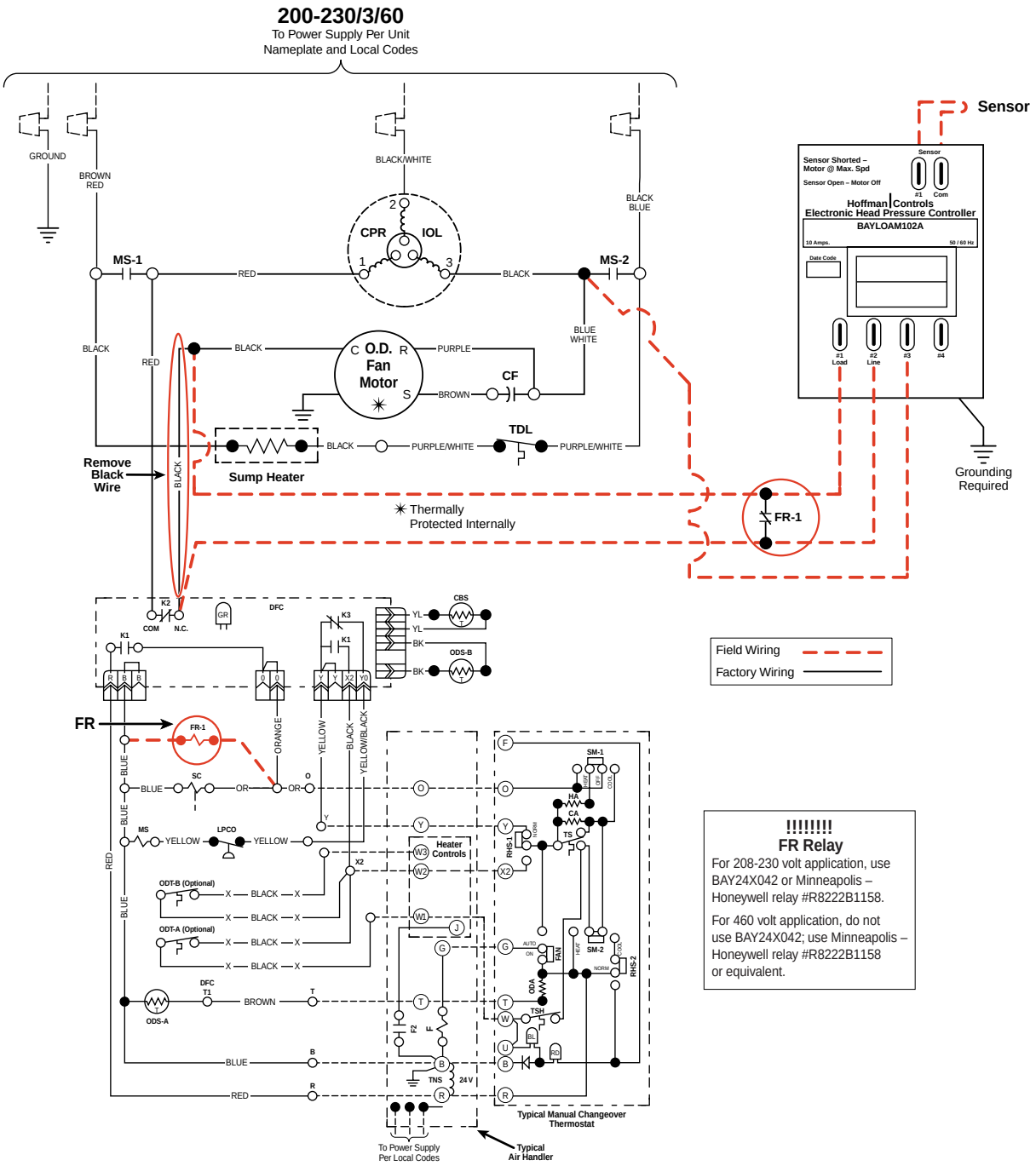
Wiring Diagram

TWA036D300A



!!!!!!!!

FR Relay

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For 460 volt application, do not use BAY24X042; use Minneapolis – Honeywell relay #R8222B1158 or equivalent.

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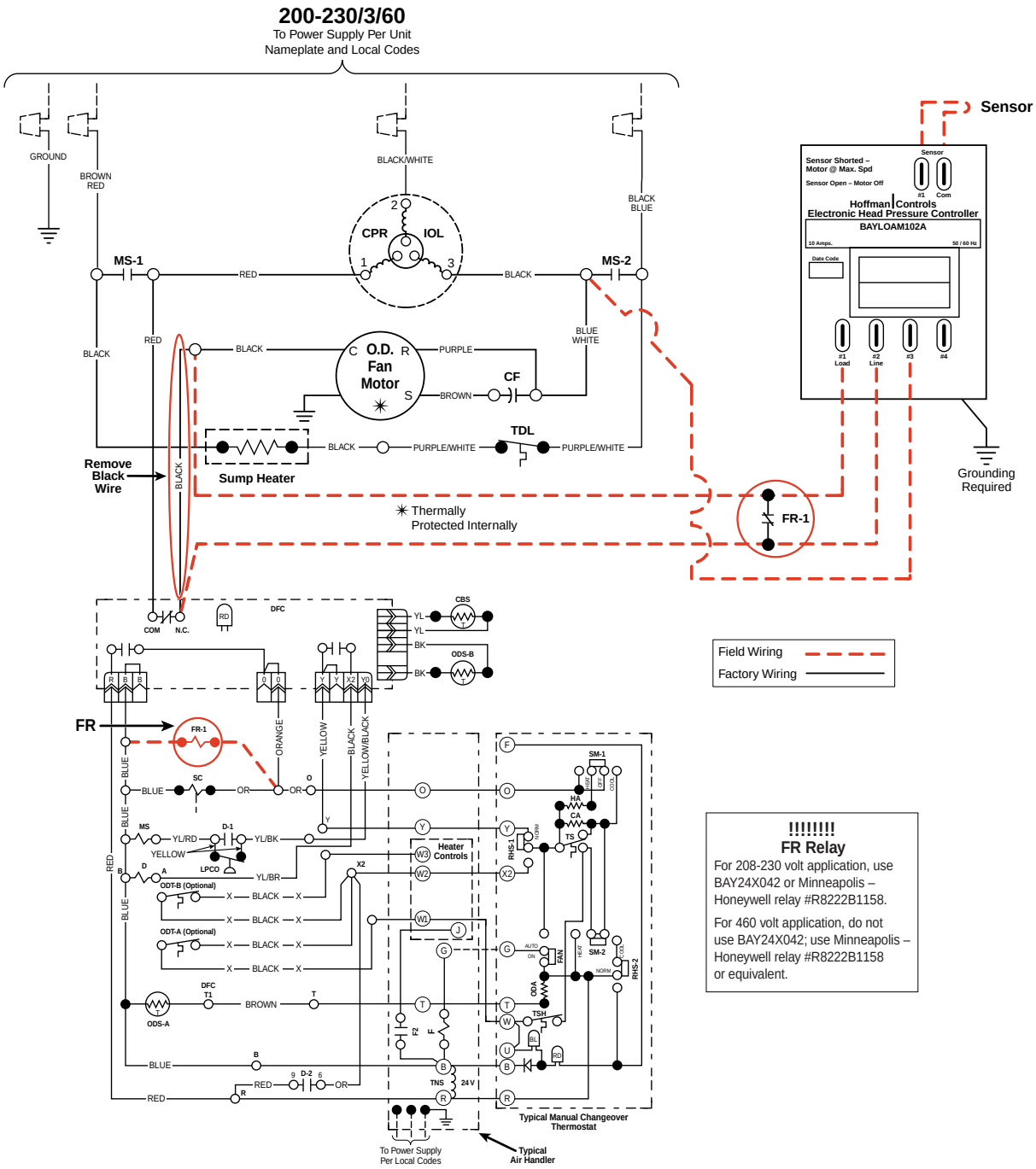
Wiring Diagram

TWA048D300A
TWA060D300A



!!!!!!!!
FR Relay

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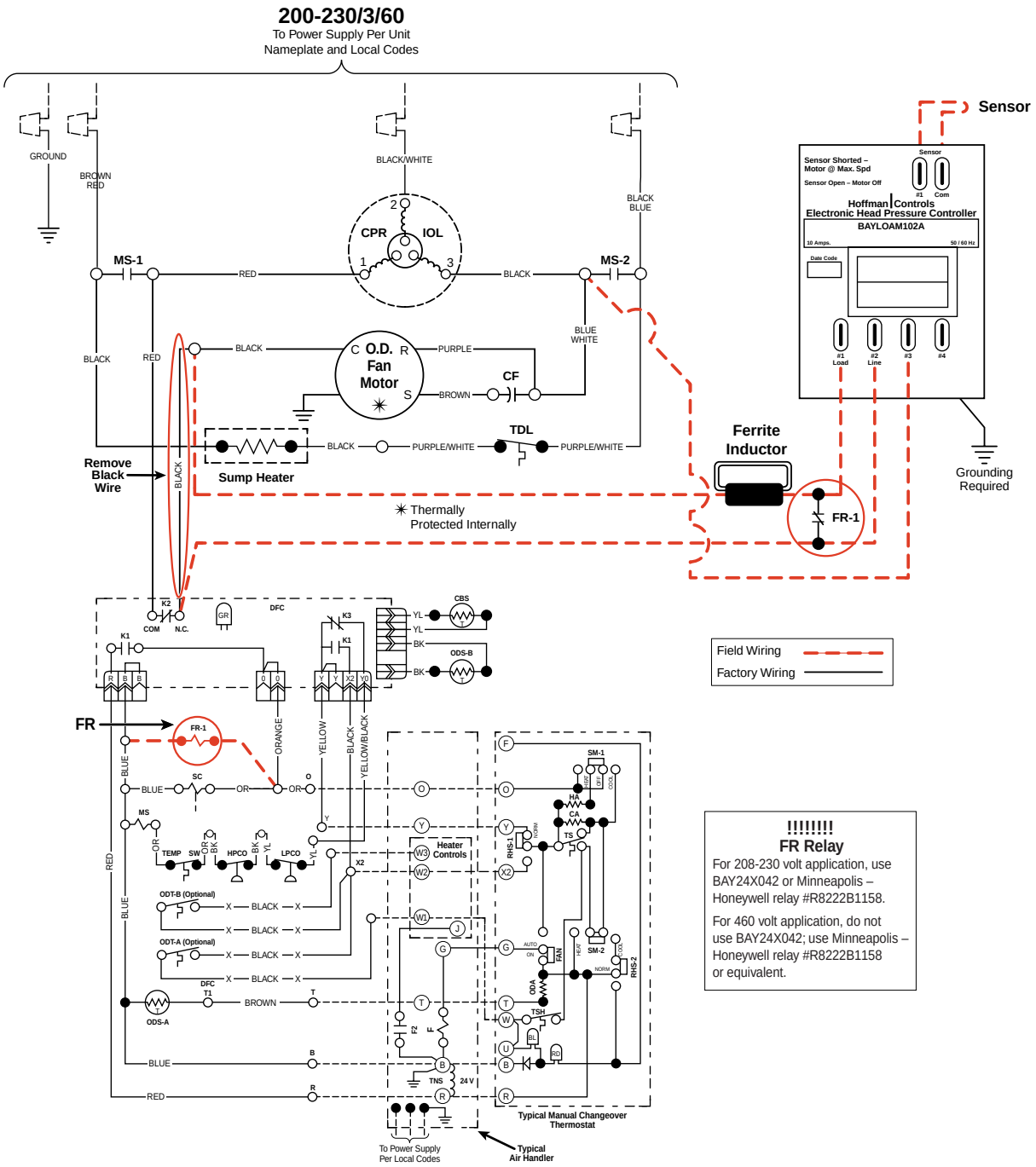
Wiring Diagram

TWA060D300A1



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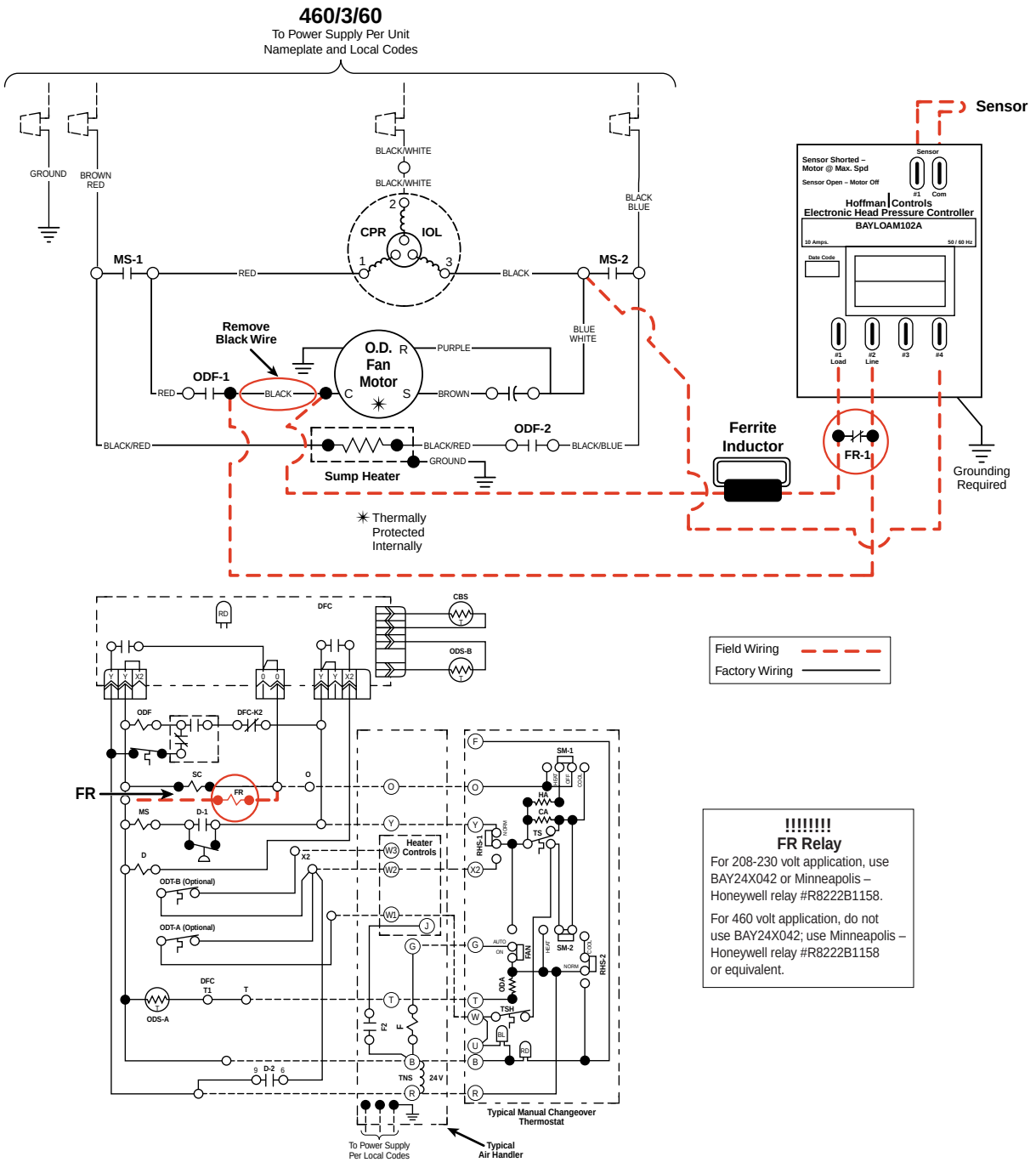
Wiring Diagram

TWA030C400A
TWA042C400A
TWA072C400A



!!!!!!!!
FR Relay

For 208-230 volt application, use BAY24X042 or Minneapolis – Honeywell relay #R8222B1158.

For 460 volt application, do not use BAY24X042; use Minneapolis – Honeywell relay #R8222B1158 or equivalent.

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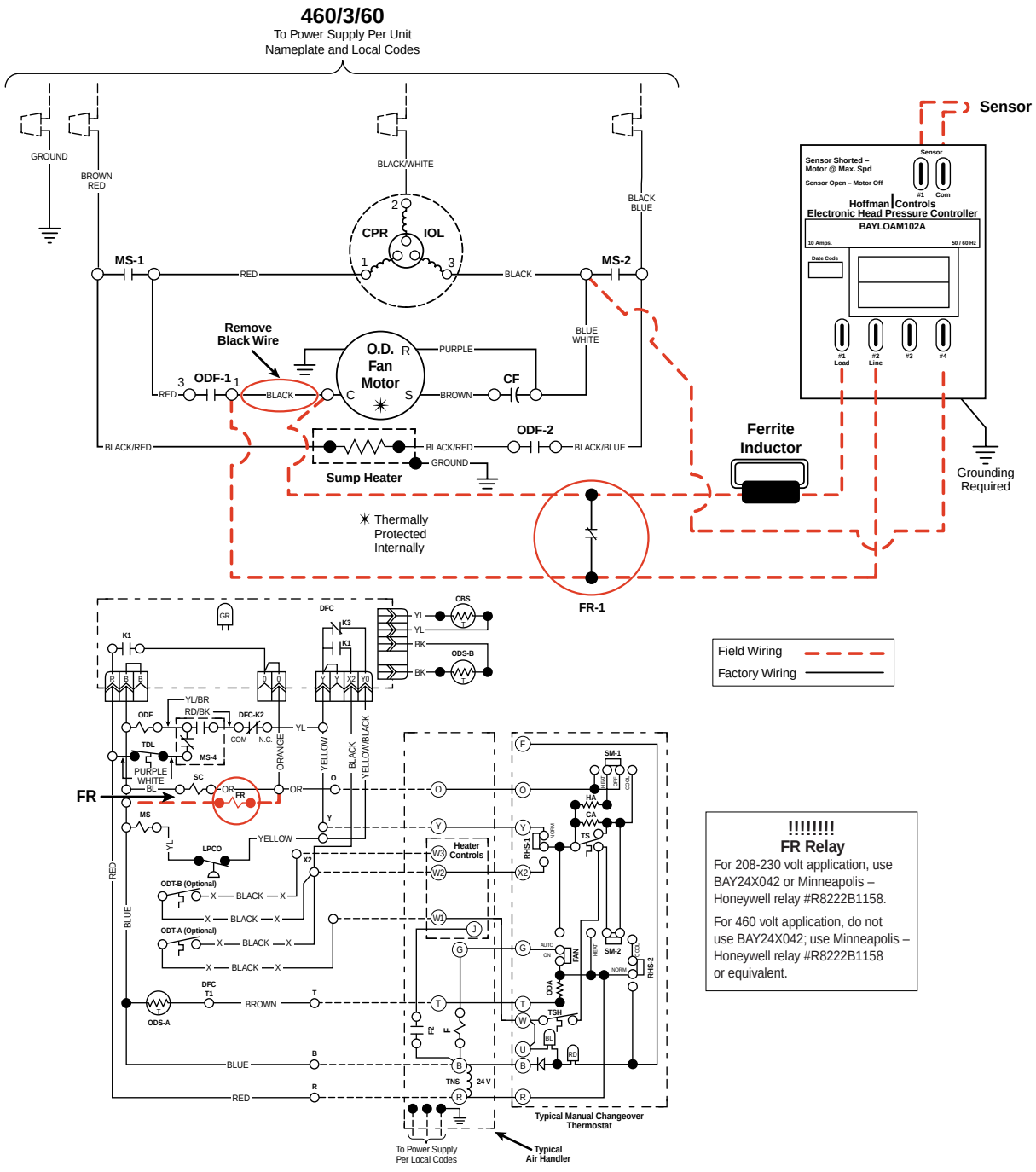
Wiring Diagram

TWA036D400A



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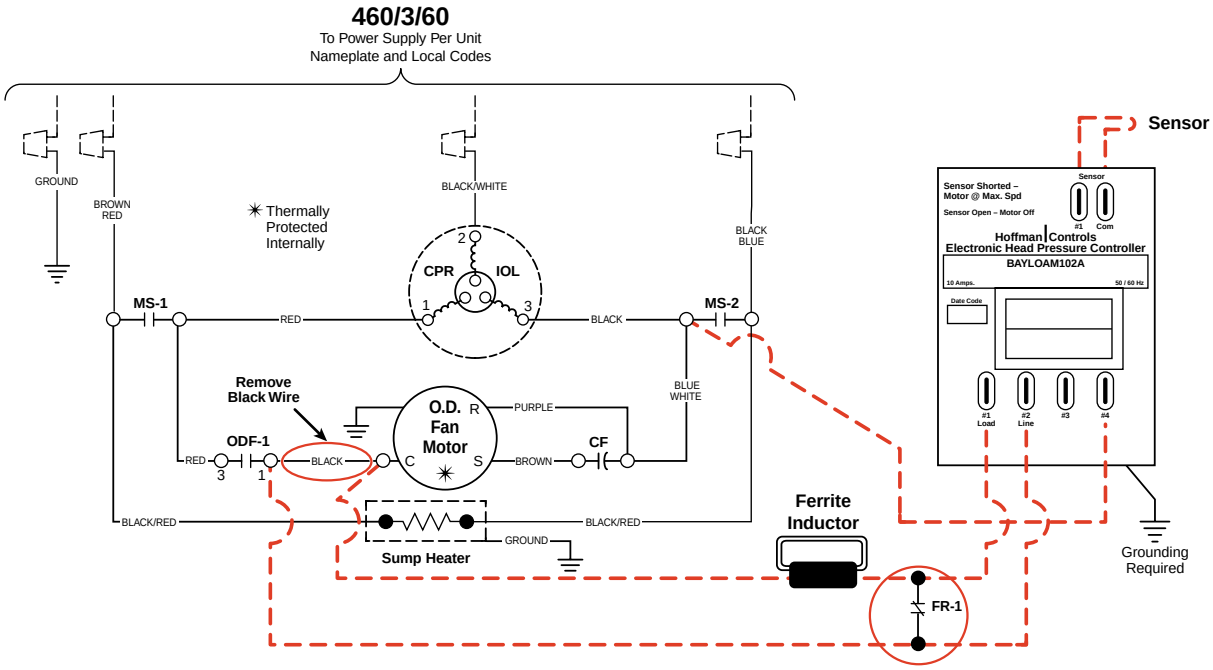
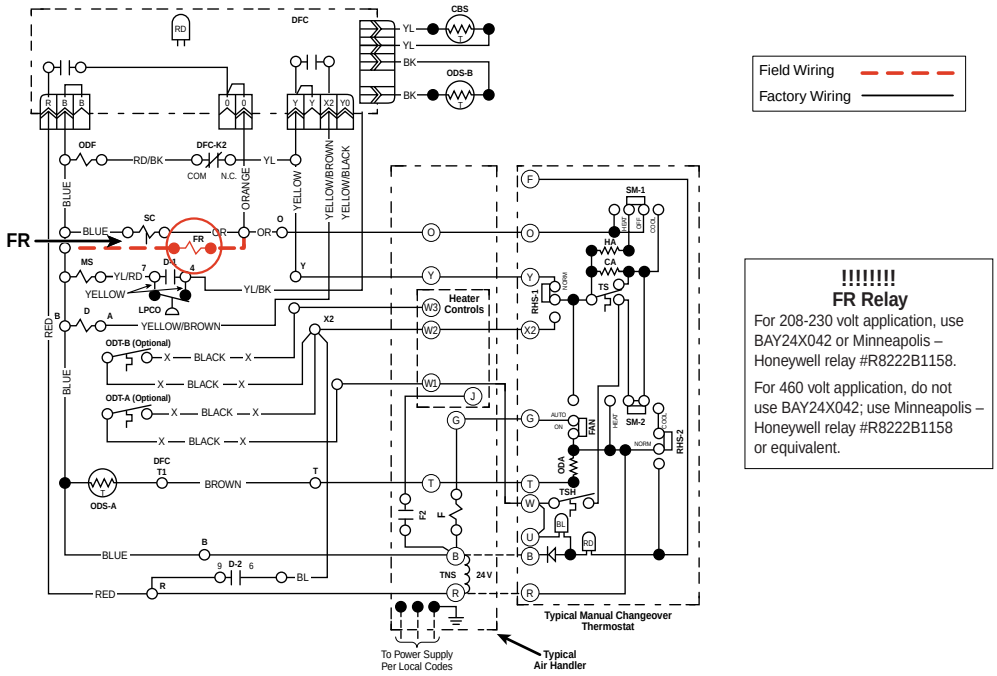
Wiring Diagram

TWA048D400A0
TWA060D400A0





Field Wiring
Factory Wiring

!!!!!!!!
FR Relay

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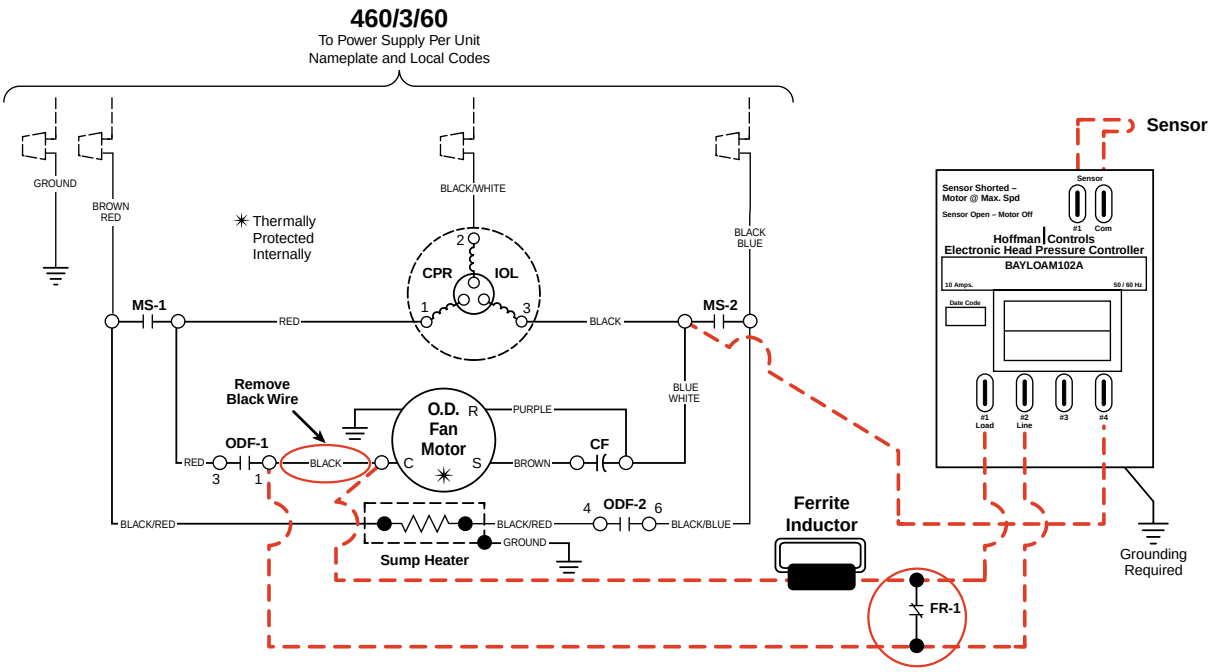
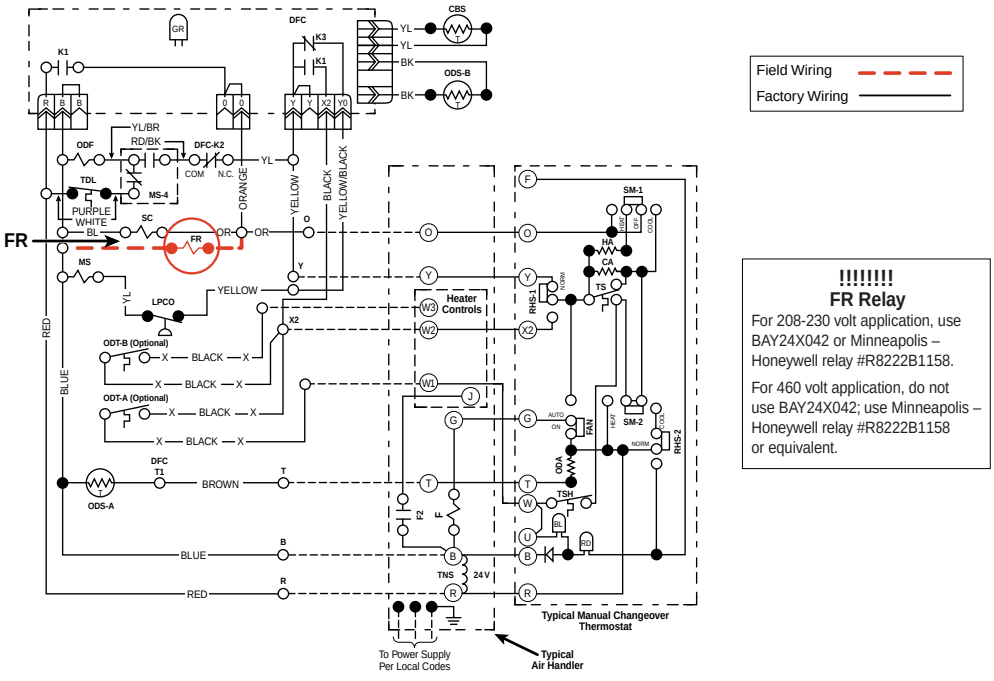
Wiring Diagram

TWA048D400A1





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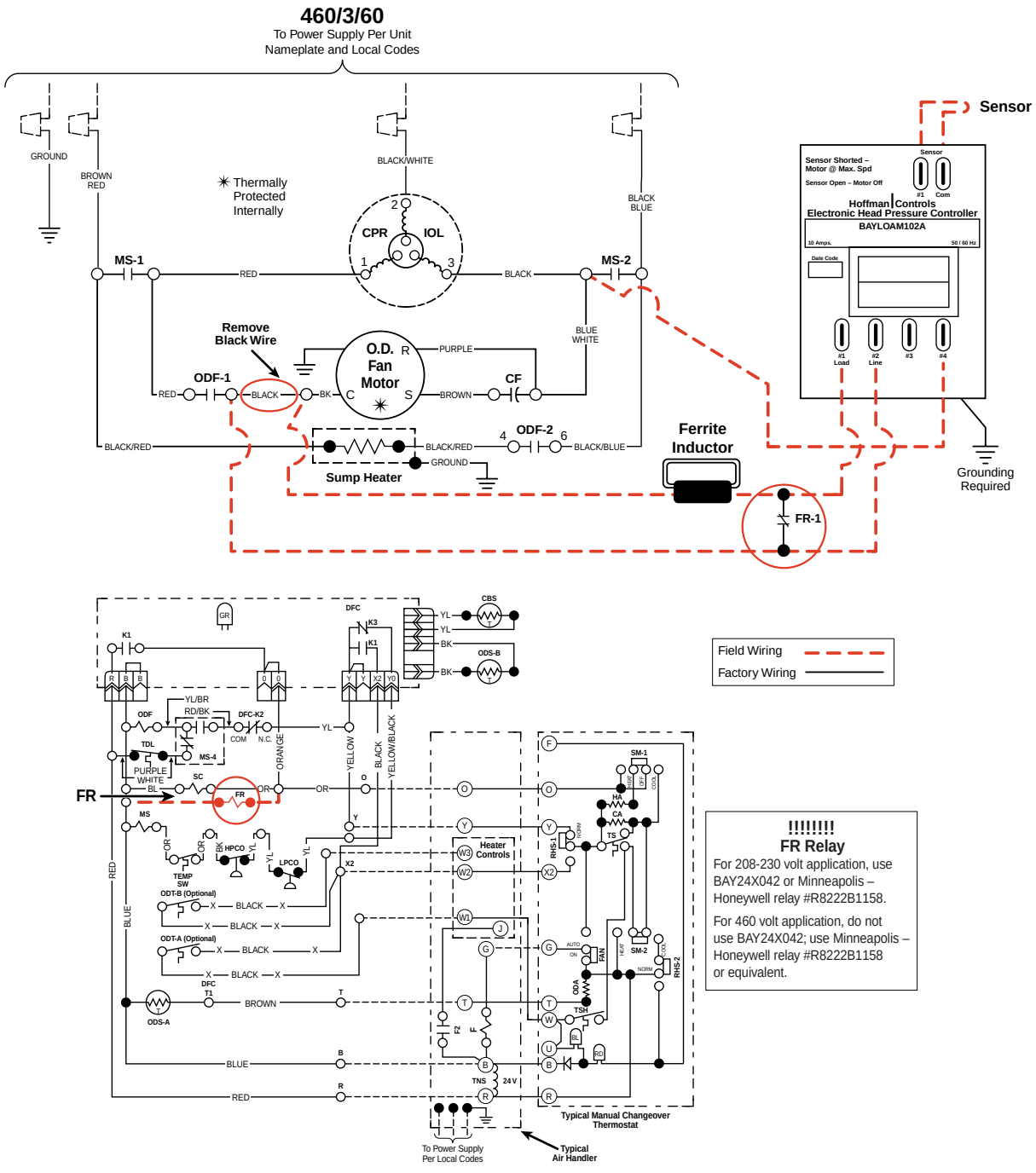
Wiring Diagram

TWA060D400A1



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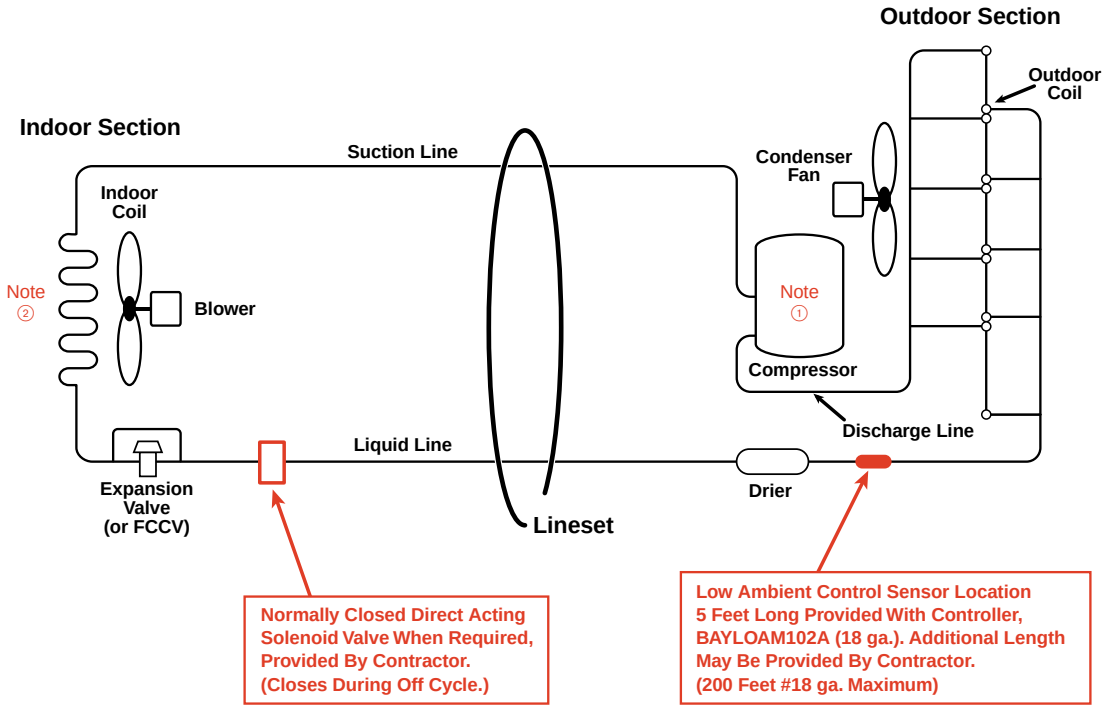
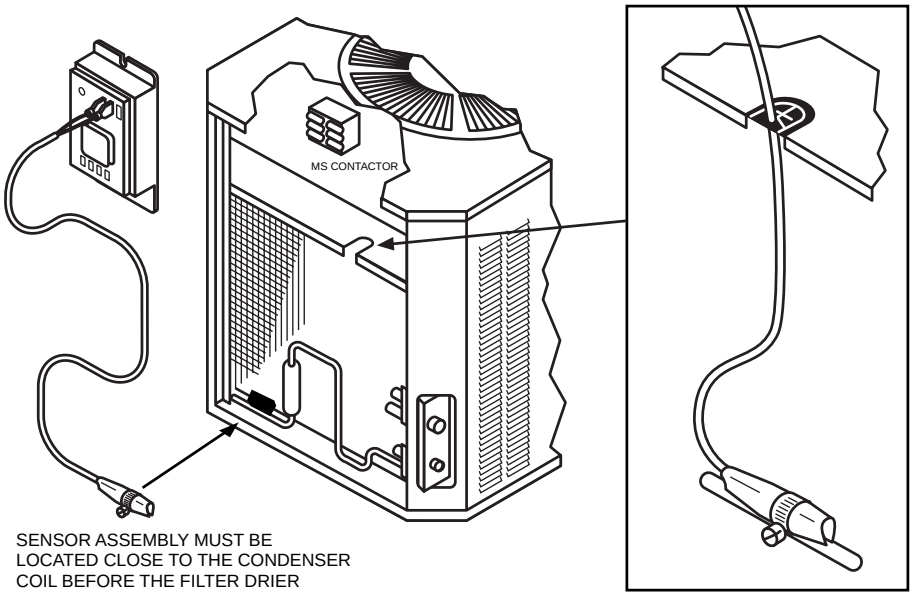
Refrigerant Piping Circuit – Cooling



Notes:

① Compressor Sump Heat Required.

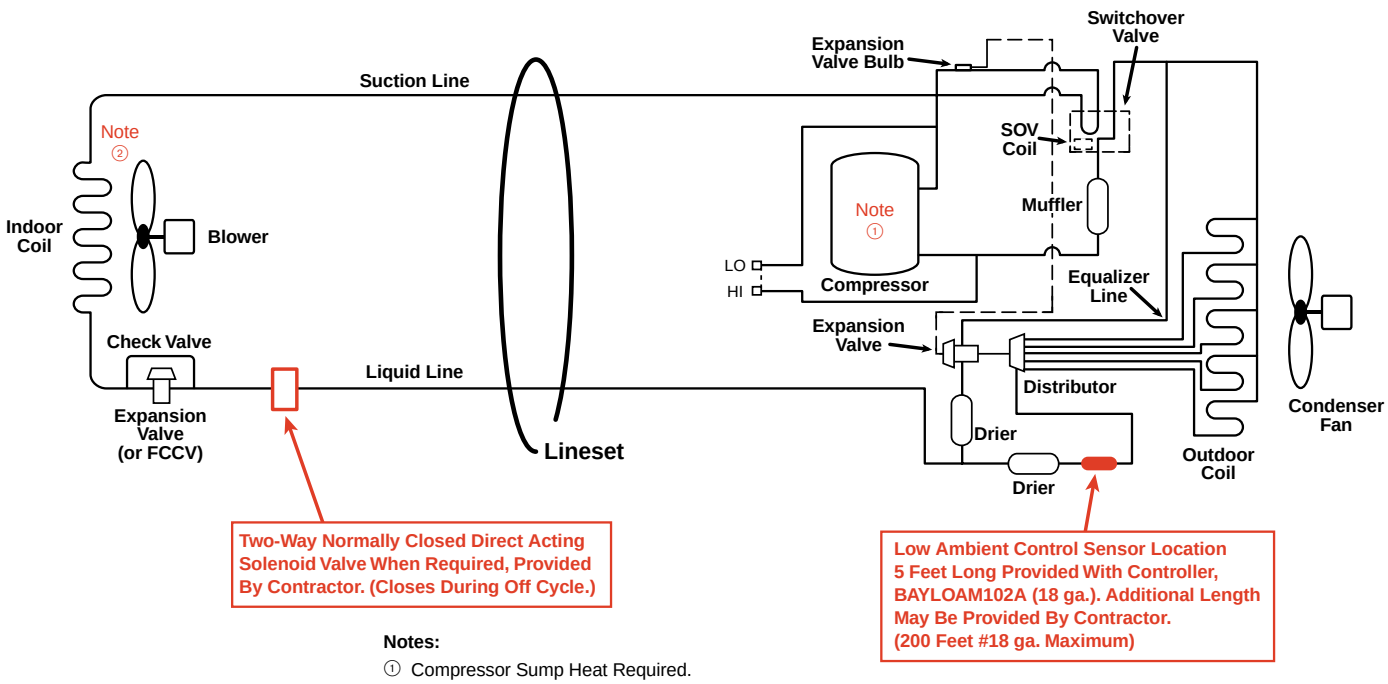
② Evaporator Defrost Control (EDC) When Required.



SENSOR ASSEMBLY MUST BE LOCATED CLOSE TO THE CONDENSER COIL BEFORE THE FILTER DRIER

FLAT METAL PORTION OF SENSOR MUST BE IN FIRM CONTACT WITH REFRIGERANT TUBE AS SHOWN TO INSURE PROPER HEAT TRANSFER

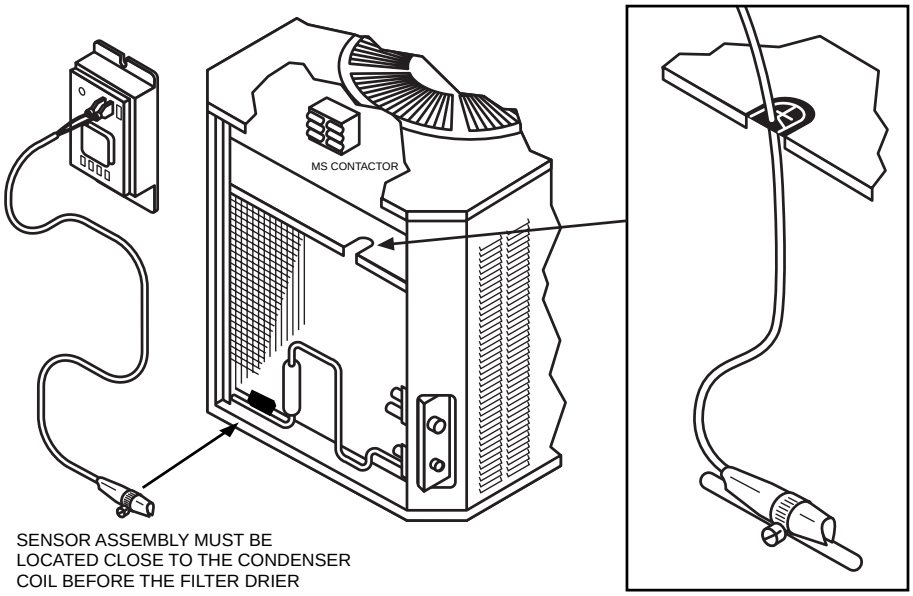
Refrigerant Piping Circuit – Heat Pump



Notes:

① Compressor Sump Heat Required.

② Evaporator Defrost Control (EDC) When Required.



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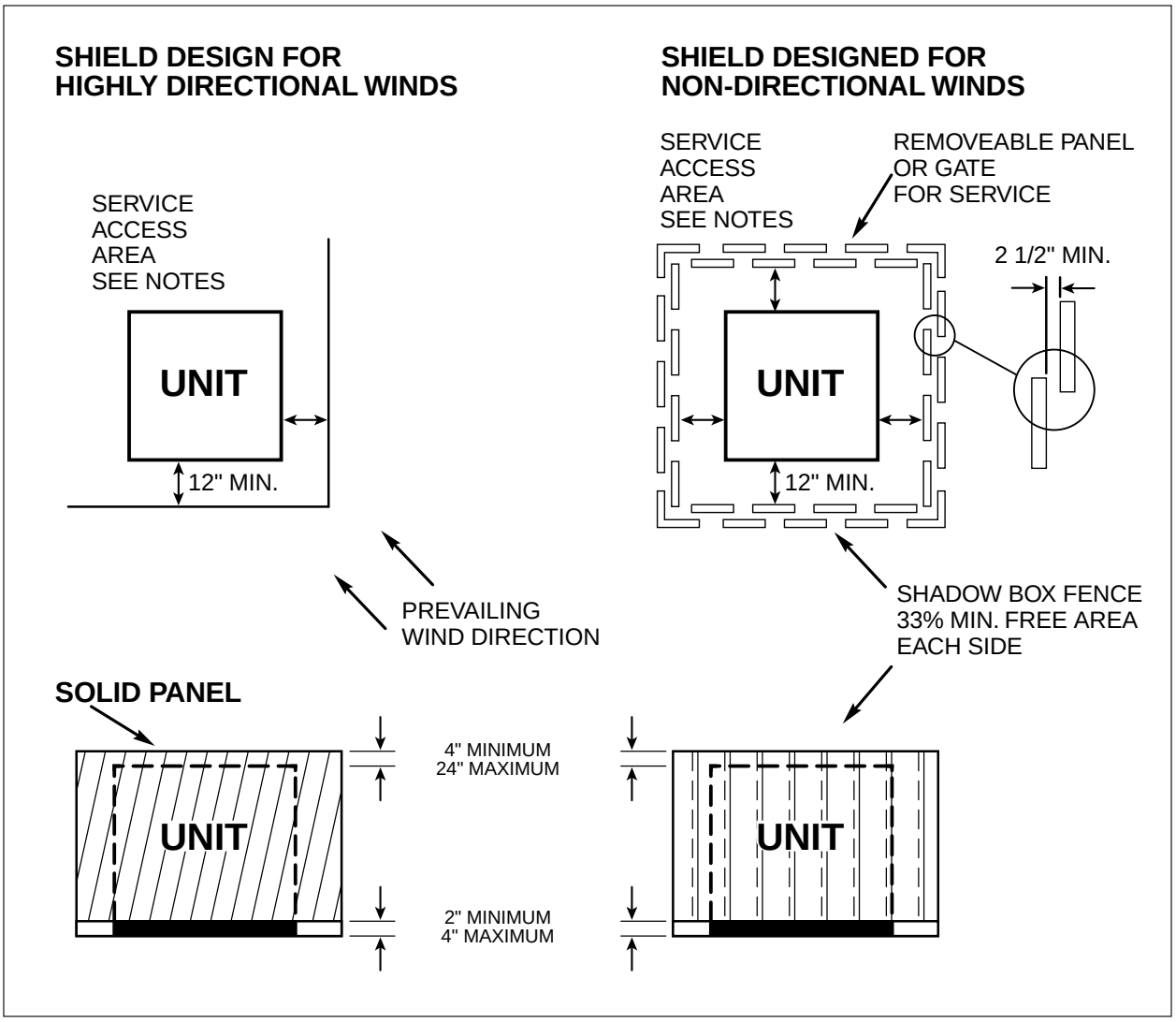
Wind Shields

Wind Shields are required to block prevailing winds across condenser coil. In applications where cooling operation is required to 0°F, wind shields are a **Must**. Use the following guidelines for your application



Notes:

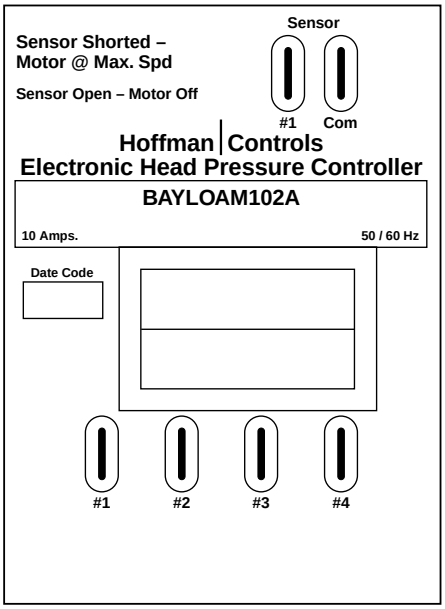
- Service access working clearance (3 feet) for electrical and refrigerant components must meet NEC Article 110-16 requirements and local codes.

Troubleshooting Procedures

Check Basic Operation by removing the sensor connection from the control. This will cause the control to drive the motor to the lowest speed, then off. Then jumper across the sensor terminals, the motor will come on at full speed.

Check Modulation Operation by placing the sensor in ice water. The motor will drop in speed, then shut off in approximately 10 seconds. Remove the sensor and warm between thumb and finger, the motor will come on and operate.

Resistance of sensor between 9K and 20K will reduce running speed. The larger the ohm reading, the slower the motor will run, above 20K, the motor will shut off.



Troubleshooting

Motor Off:

Verify line voltage (208/230 volts) between terminals 2 and 3 on control or for 460 volts systems between terminals 2 and 4 (460 volts). If voltage is present, remove the sensor leads and jumper the sensor terminals. If the motor runs, measure the liquid line temperature. If the liquid line temperature is above 48°F, replace the sensor. If the motor still will not run, disconnect the power and jumper between terminals 1 and 2 on the controller (leave other wiring in place). Repower the system and the motor should run. If it runs, replace the controller.

Motor Won't Modulate:

Check Modulation Operation.

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Notes

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Unitary Products Group
6200 Troup Highway
Tyler TX 75707-9010
http://www.trane.com

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