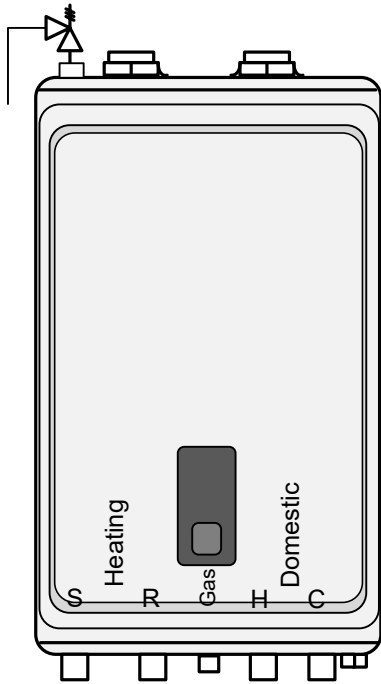
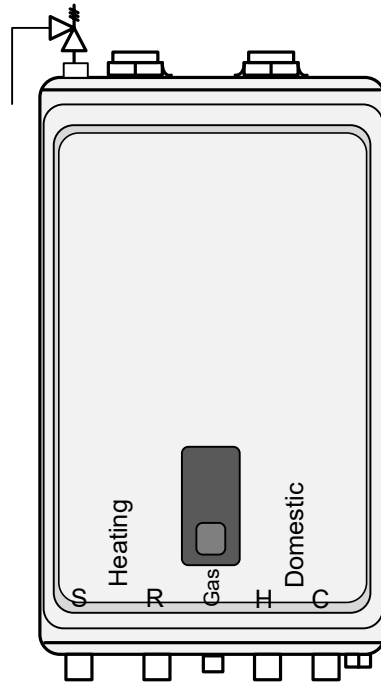


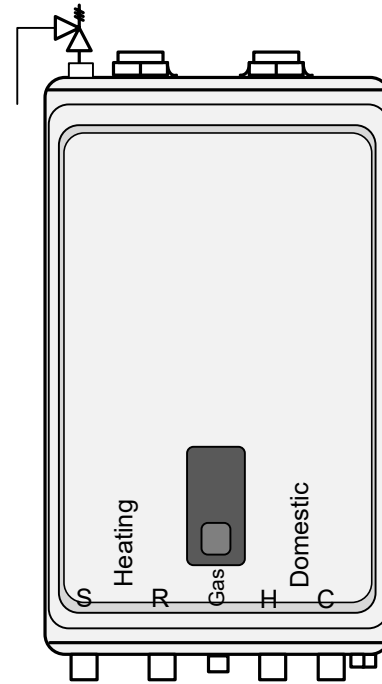
# NCB-E Series Application Drawings



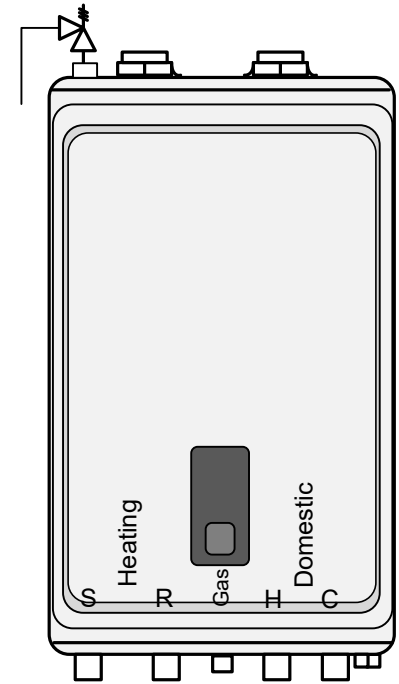
NCB-240E  
ASME



NCB-210E  
ASME



NCB-180E  
ASME



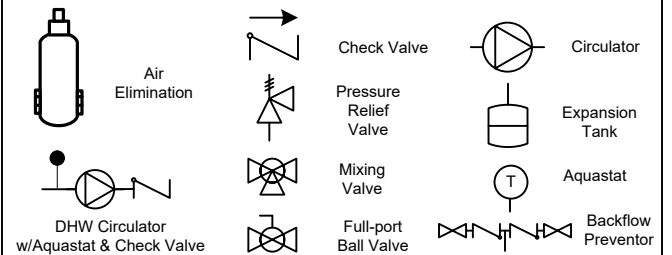
NCB-150E  
ASME



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## Guide Only

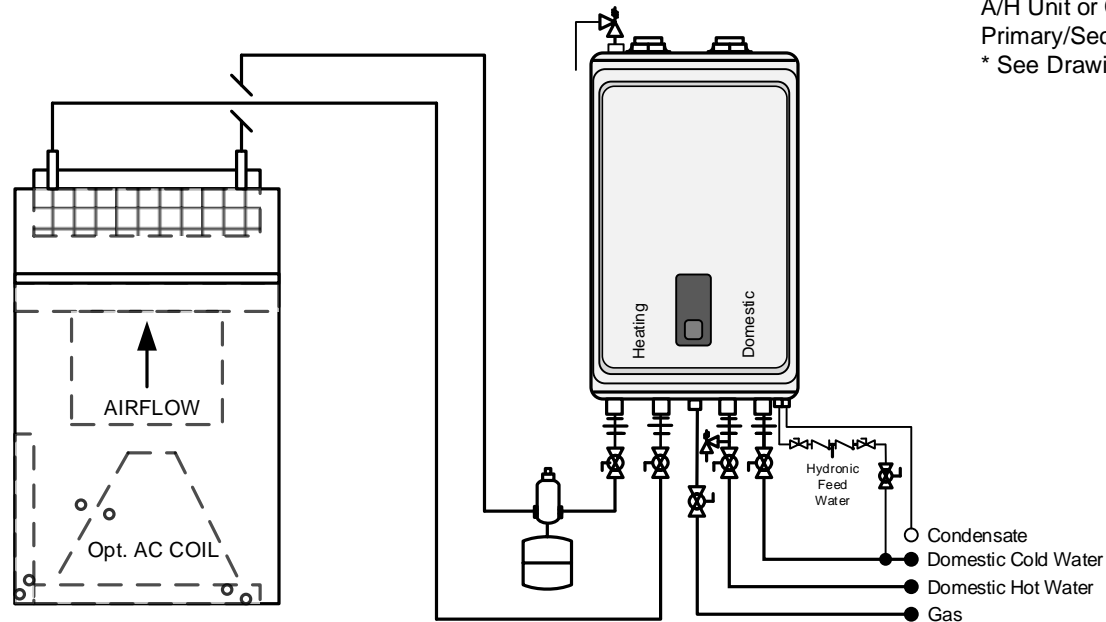
These drawing are intended as a guide only and not as a replacement for professionally engineered project drawings. These concept system drawings do not imply compliance with local building codes. Actual installations may vary depending on installation location & parameters and it must be done in accordance with all local building codes. Verify with local building officials before commencement of system installations.



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**Installation Notes:**

1. 100' Total Maximum Boiler-Side Piping Connection Length Allowed. (NCB-E Circulator-Sp 3, High)
  2. Boiler-Side Pipe Length Exceeding 100' Total or a 50MBTUH Coil Output or More Requires Primary/Secondary Piping Configuration with Separate System Circulator.
  3. Air Handlers with Internal or External Circulator Requires Crossover Pipe at A/H Unit or CH Unit to Complete Primary/Secondary Configuration\*.
- \* See Drawing NCB-E-AHU-P-BF01



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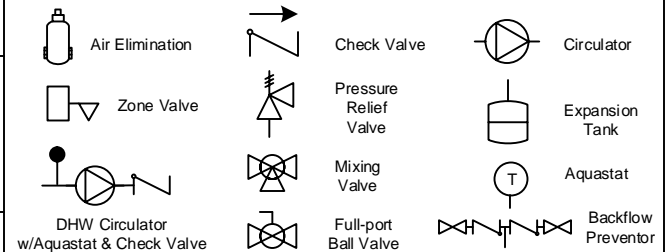
**NCB-E Series Combi-Boiler**

**Navien NCB-E Combi Boiler Application  
with Air Handler - Direct Connection**

Drawn By: B.F.

NCB-E-AHU-BF01

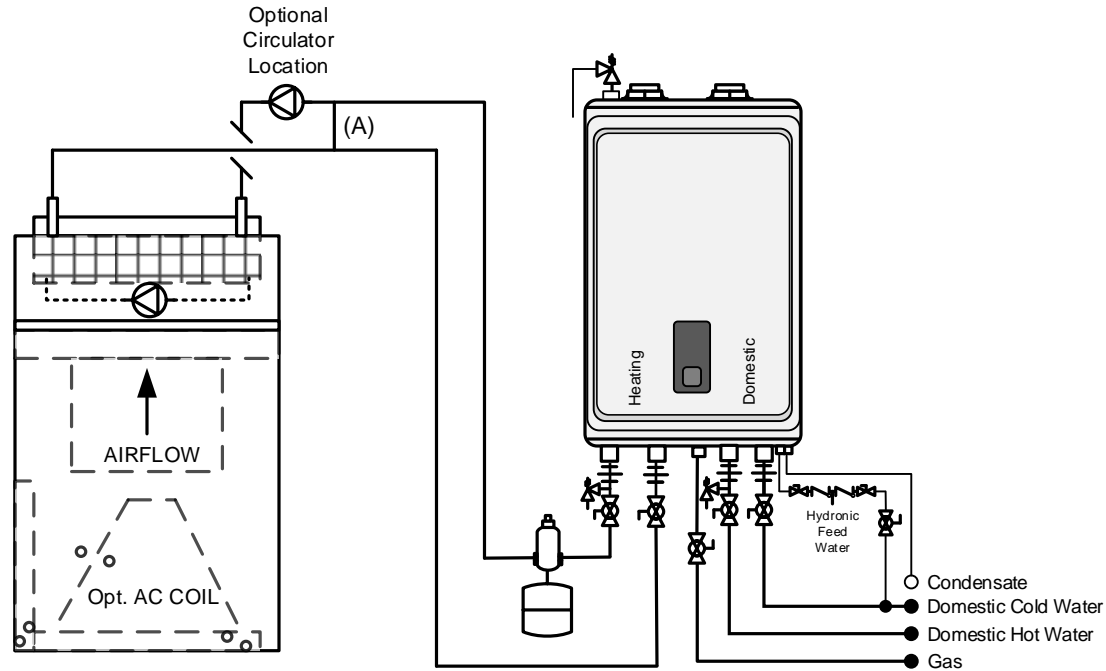
February 9, 2016



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**Installation Notes:**

1. 200' Total Maximum Boiler-Side Piping Connection Length Allowed. (NCB-E Circulator-Sp 3, High)
2. Boiler-Side Pipe Length Exceeding 200' Total or a 50MBTUH Coil Output or More Requires Primary/Secondary Piping Configuration (A) with A/H connection the tertiary secondary.



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**NCB-E Series Combi-Boiler**

Navien NCB-E Combi-Boiler Application  
Air Handler with Internal/External Pump

Drawn By: B.F.

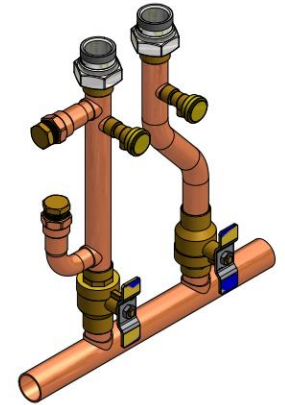
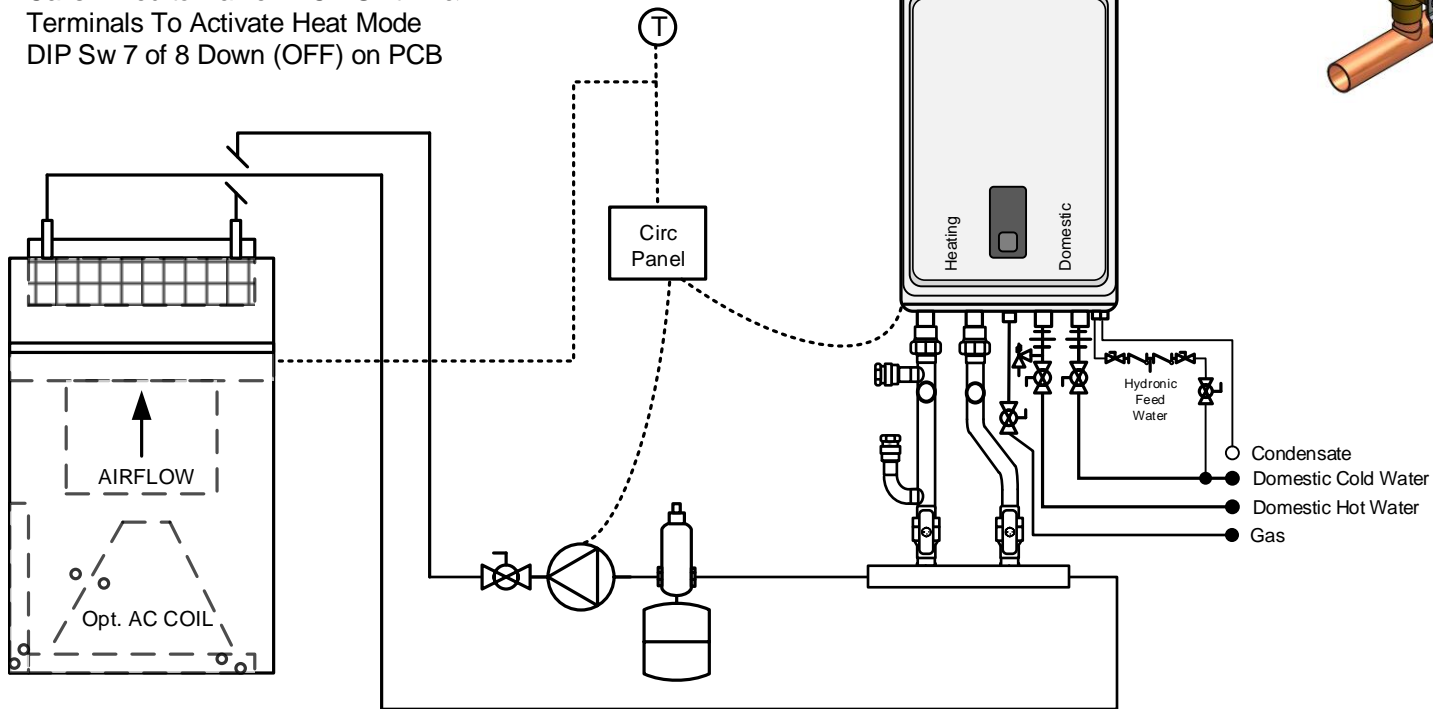
NCB-E-AHU-P-BF01

February 9, 2016

	Air Elimination		Check Valve		Circulator
	Zone Valve		Pressure Relief Valve		Expansion Tank
	DHW Circulator w/Aquastat & Check Valve		Mixing Valve		Aquastat
			Full-port Ball Valve		Backflow Preventor

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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien NCB Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



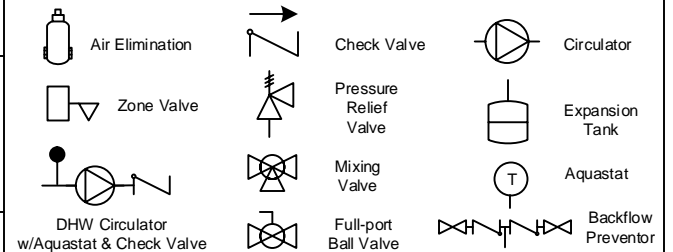
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NCB-E Series Combi-Boiler  
 Navien NCB-E Combi Boiler  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001  
 Single System Circulator with AHU Shown

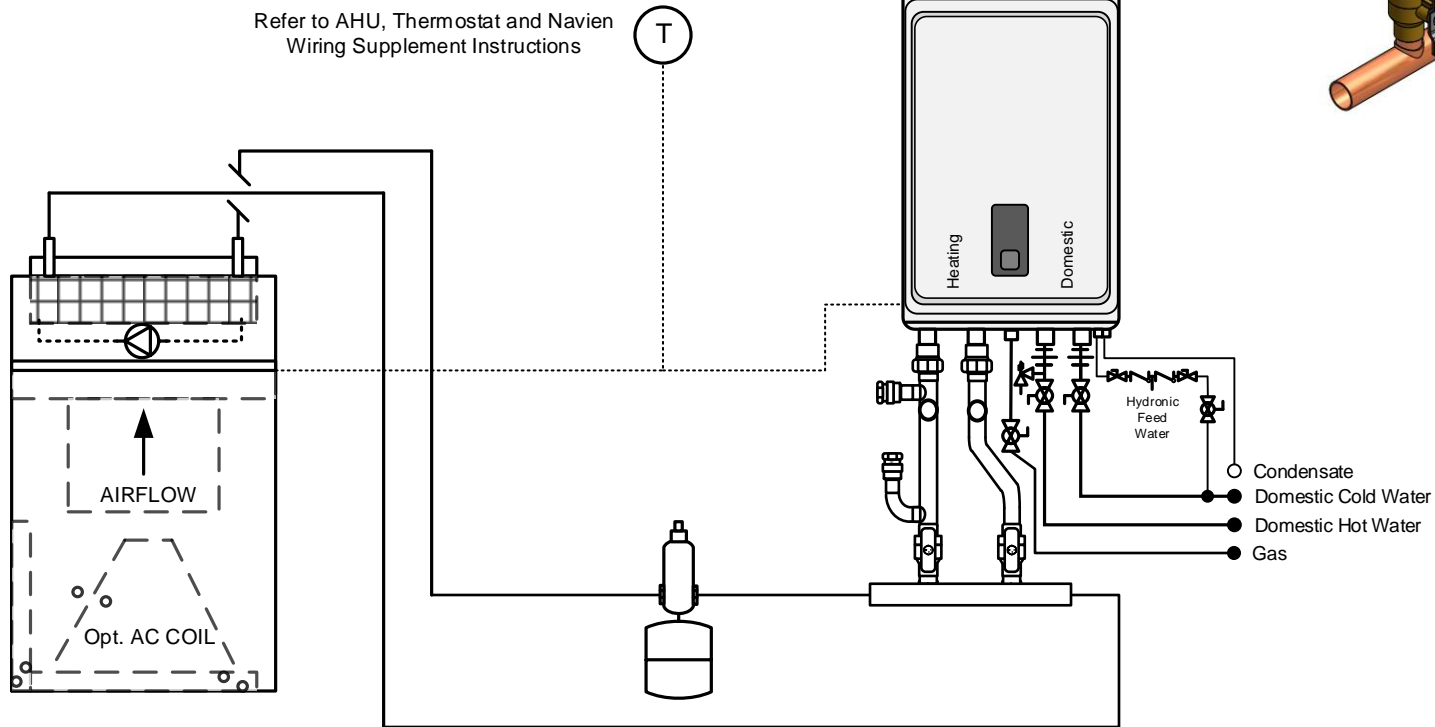
Drawn By: B.F.

NCB-E-NCBQuik4-BF01

February 9, 2016



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### NCB-E Series Combi-Boiler

Navien NCB-E Combi Boiler- AHU Int. Circulator  
With NCB Quik-Install Manifold Kit  
Part # GFFM-MCOZUS-001

Drawn By: B.F.

NCB-E-NCBQuik4-IC-BF01

February 9, 2016



Air Elimination



Zone Valve



DHW Circulator  
w/Aquastat & Check Valve



Check Valve



Pressure  
Relief  
Valve



Mixing  
Valve



Full-port  
Ball Valve



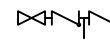
Circulator



Expansion  
Tank

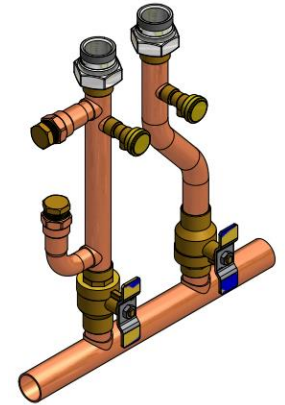


Aquastat

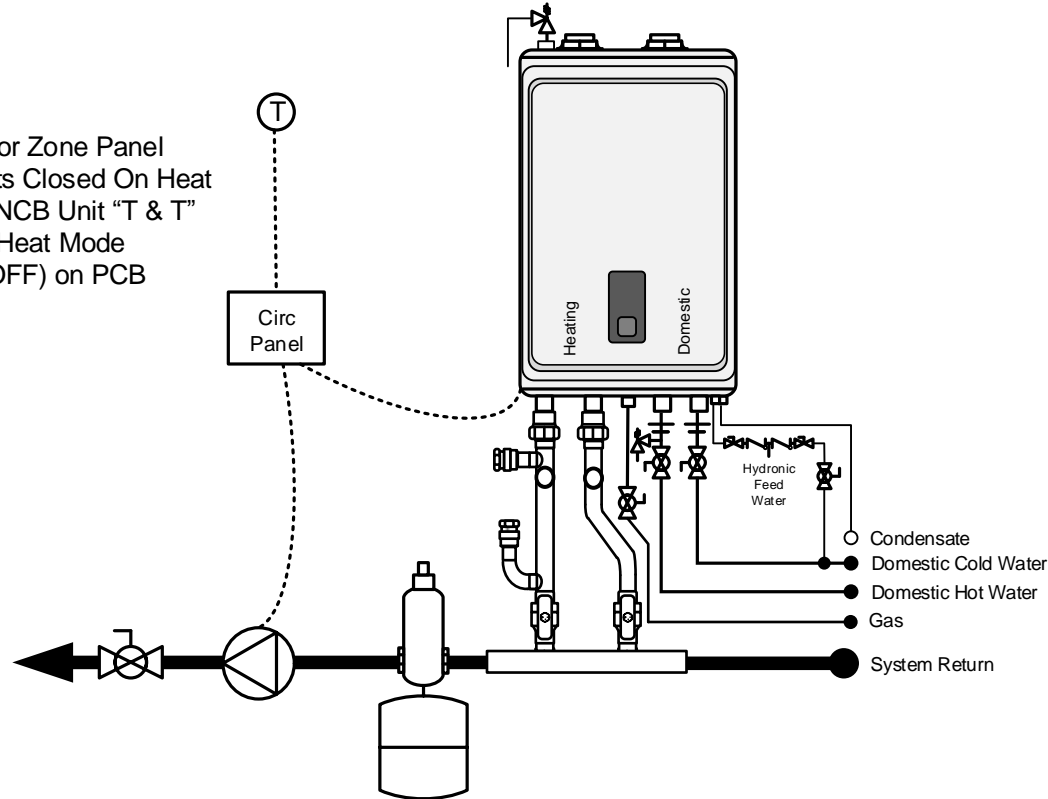


Backflow  
Preventor

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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien NCB Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



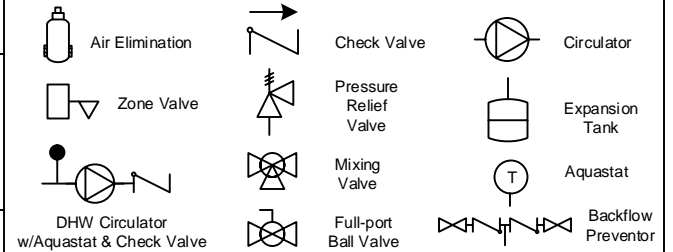
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NCB-E Series Combi-Boiler  
 Navien NCB-E Combi Boiler  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001  
 Single System Circulator Shown

Drawn By: B.F.

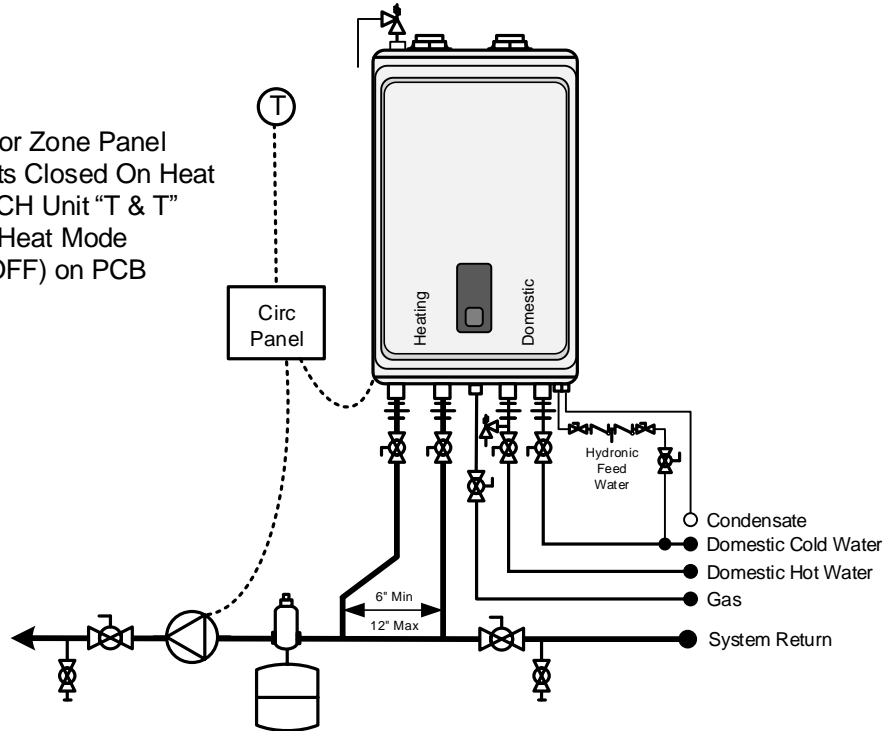
NCB-E-NCBQuik1-BF01

February 9, 2016



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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien CH Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



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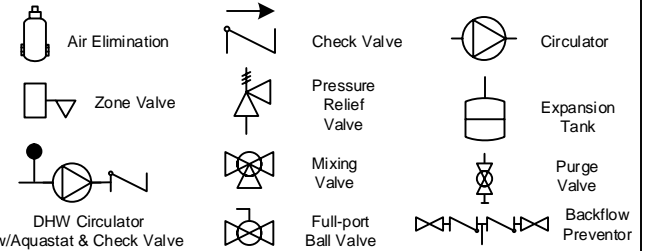
### NCB-E Series Combi-Boiler

### Navien NCB-E Combi-Boiler Application Single Circulator Zone Application

Drawn By: B.F.

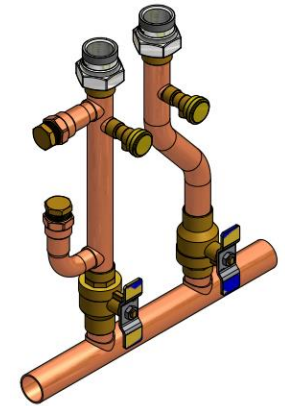
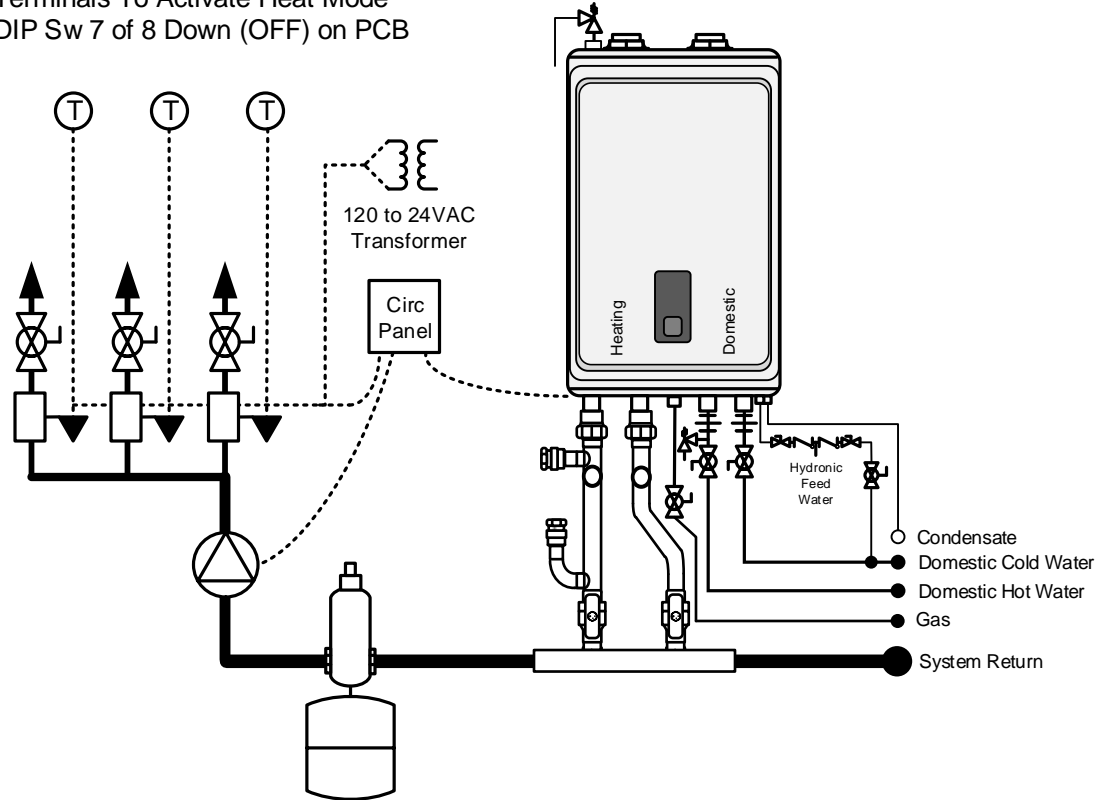
NCB-E-1P-BF01

February 9, 2016



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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien NCB Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



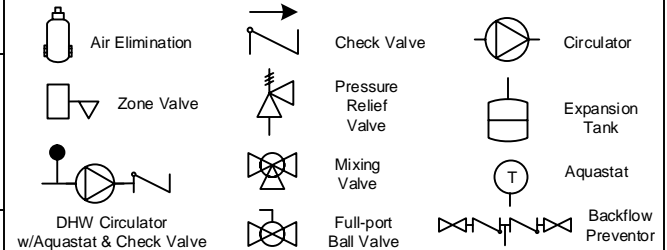
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NCB-E Series Combi-Boiler  
 Navien NCB-E Combi Boiler  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001  
 Multiple System Zone Valves Shown

Drawn By: B.F.

NCB-E-NCBQuik3-BF01

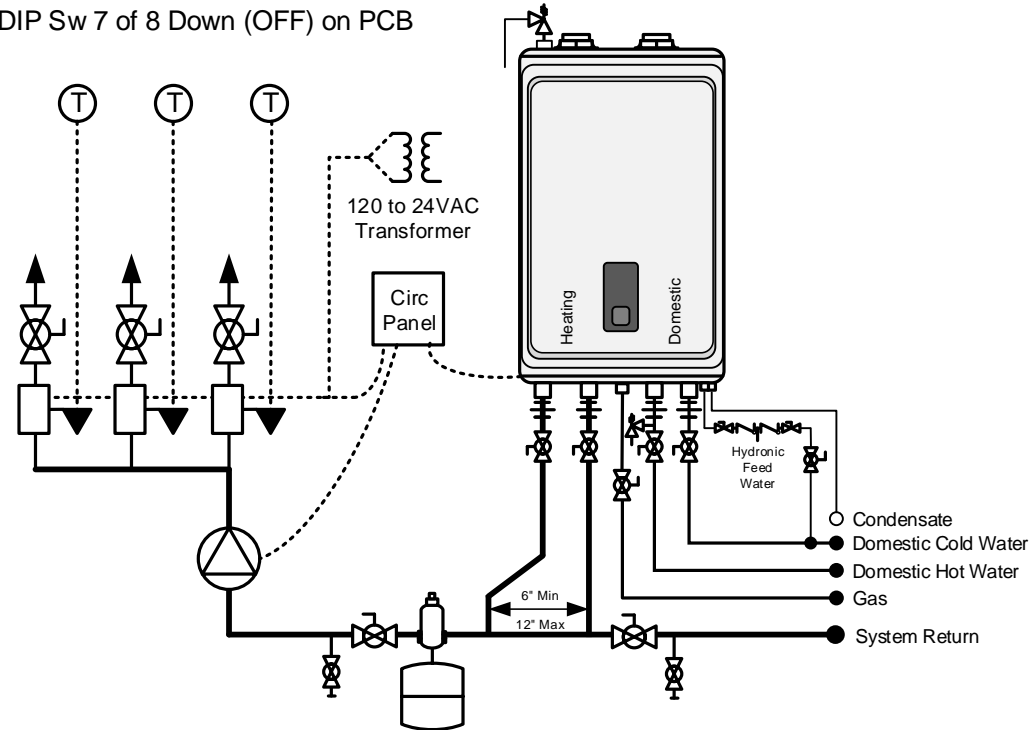
February 9, 2016





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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien CH Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



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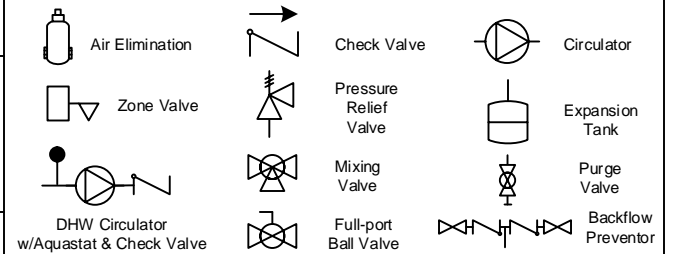
NCB-E Series Combi-Boiler

Navien NCB-E Combi-Boiler Application  
 Single Circulator with Multiple Zone Valves Shown

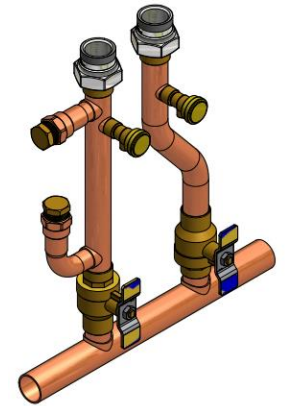
Drawn By: B.F.

NCB-E-3P-BF01

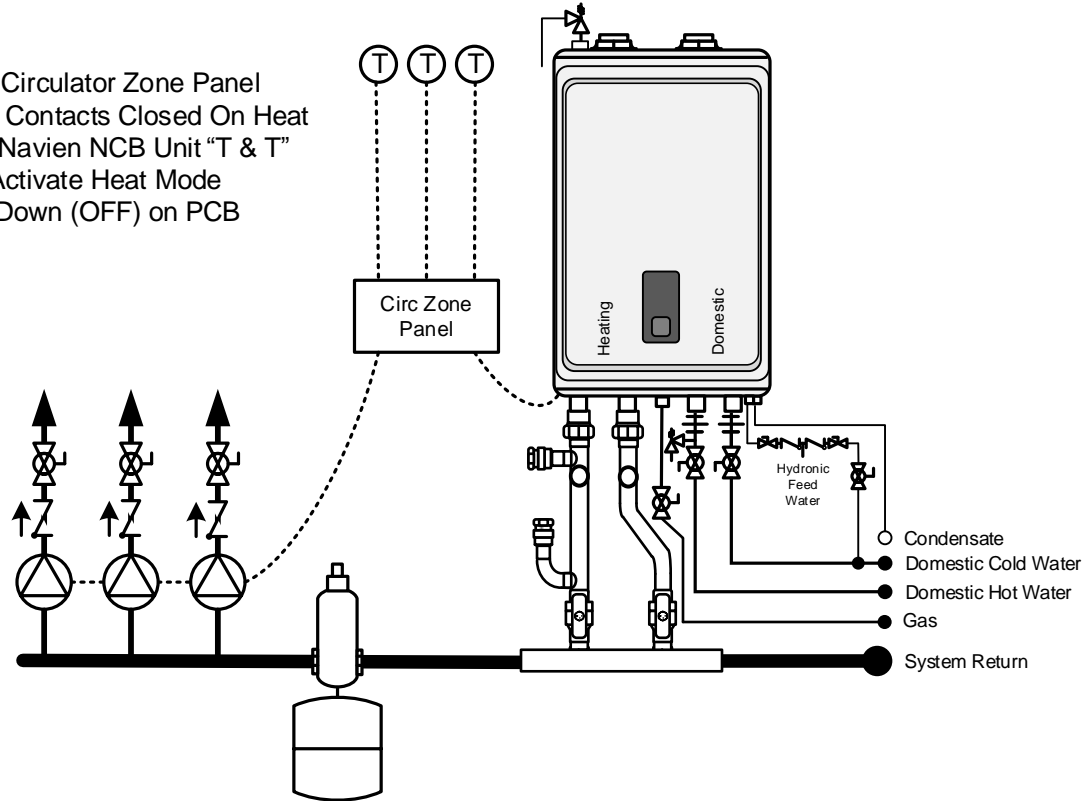
February 9, 2016



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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien NCB Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



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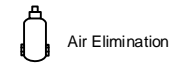
NCB-E Series Combi-Boiler

Navien NCB-E Combi Boiler  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001  
 Multiple System Circulators Shown

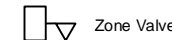
Drawn By: B.F.

NCB-E-NCBQuik2-BF01

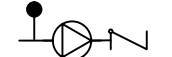
February 9, 2016



Air Elimination



Zone Valve



DHW Circulator  
 w/Aquastat & Check Valve



Check Valve



Pressure  
 Relief  
 Valve



Mixing  
 Valve



Full-port  
 Ball Valve



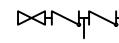
Circulator



Expansion  
 Tank



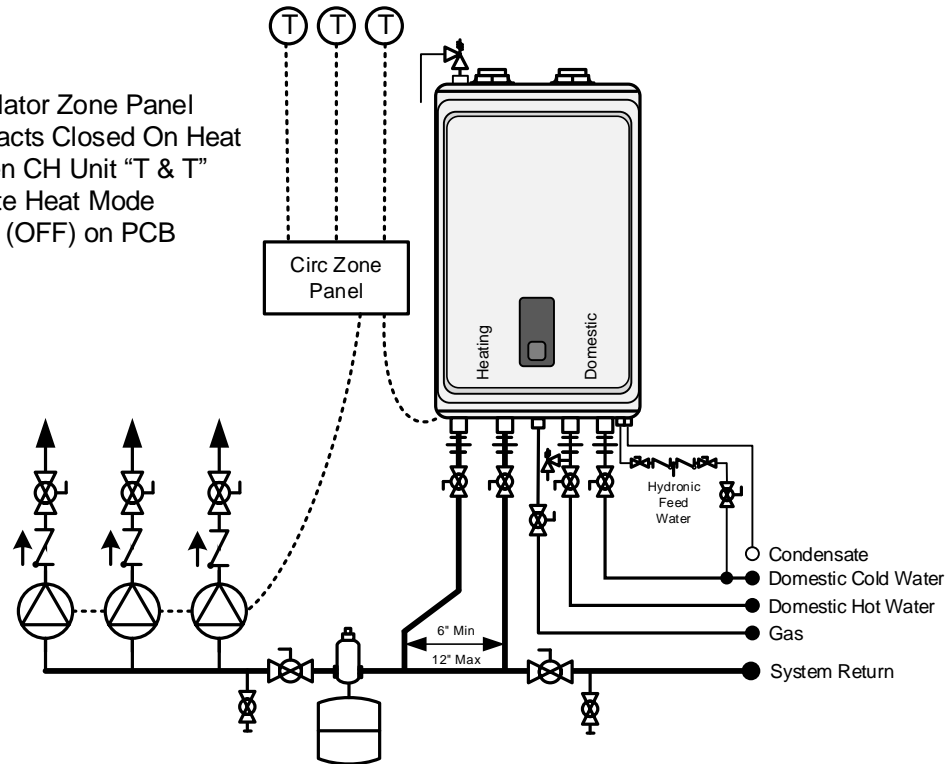
Aquastat



Backflow  
 Preventor

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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat  
 Calls Wired to Navien CH Unit "T & T"  
 Terminals To Activate Heat Mode  
 DIP Sw 7 of 8 Down (OFF) on PCB



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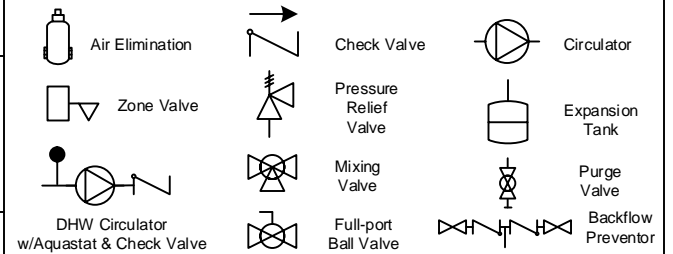
NCB-E Series Combi-Boiler

Navien NCB-E Combi-Boiler Application  
 Multiple Zone Circulators Shown

Drawn By: B.F.

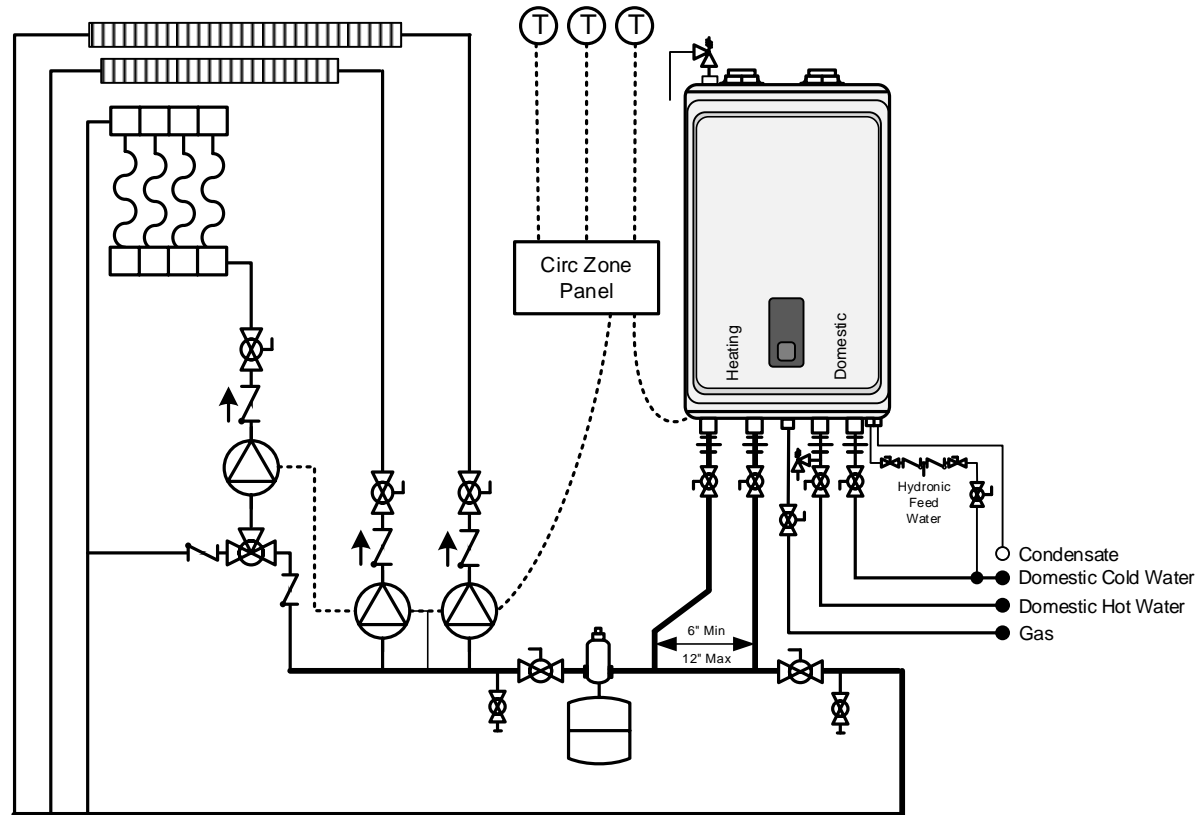
NCB-E-3P-BF01

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Field Supplied Circulator Zone Panel Shall have Dry Contacts Closed On Heat Calls Wired to Navien CH Unit "T & T" Terminals To Activate Heat Mode DIP Sw 7 of 8 Down (OFF) on PCB



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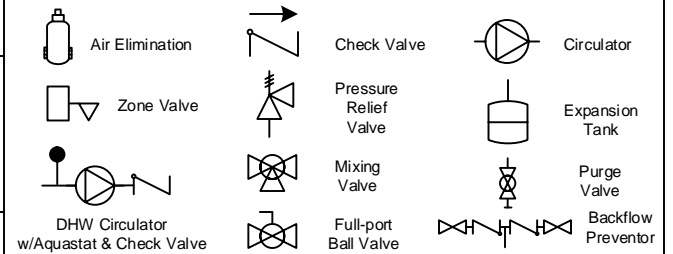
NCB-E Series Combi-Boiler

Navien NCB-E Combi-Boiler Application  
Multiple Zone Circulators  
Low Temperature Zone Shown

Drawn By: B.F.

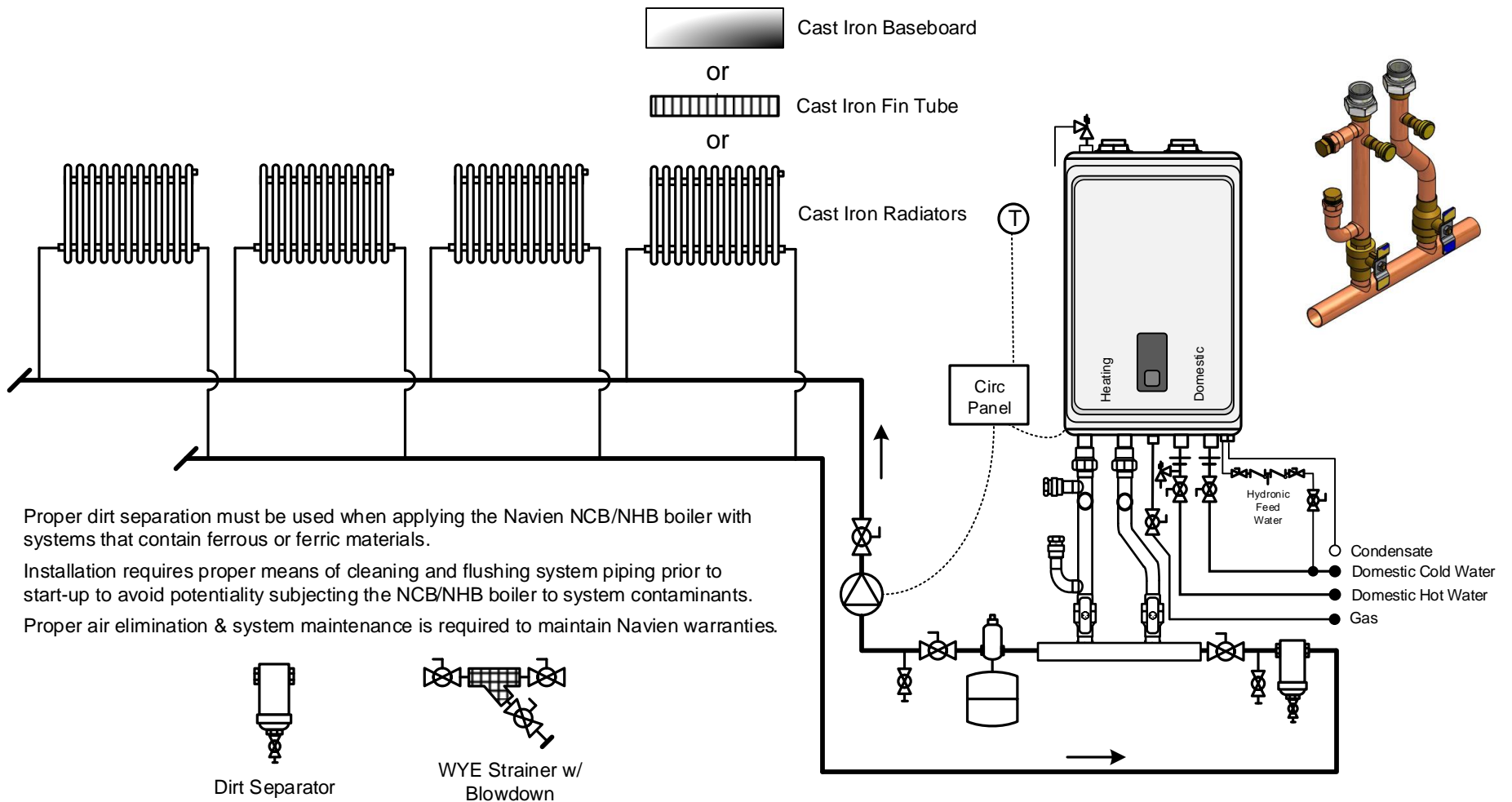
NCB-E-3P-1LT-BF01

February 9, 2016



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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat Calls Wired to Navien CH Unit  
 "T & T" Terminals To Activate Heat Mode DIP Sw 7 of 8 Down (OFF) on PCB



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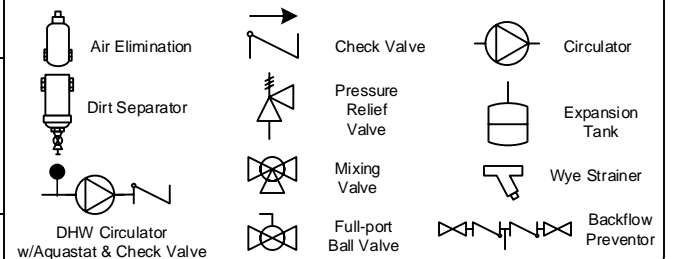
NCB-E Series Combi-Boiler

Navien NCB-E Combi-Boiler Application  
 Two-Pipe Direct Return  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001

Drawn By: B.F.




NCB-E-CI-2PDR-BF01

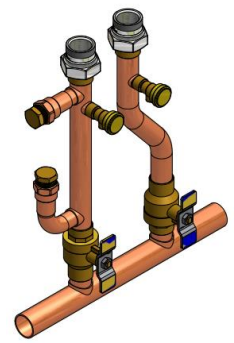
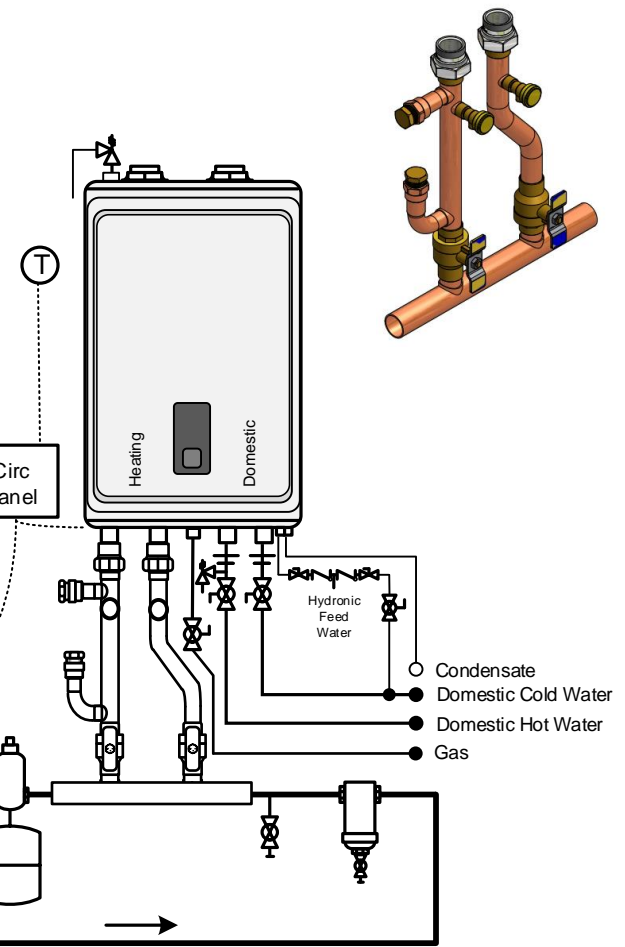
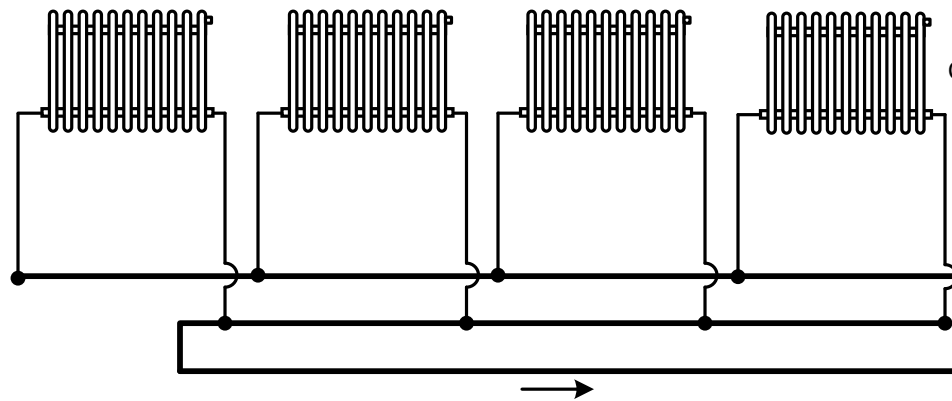
February 9, 2016



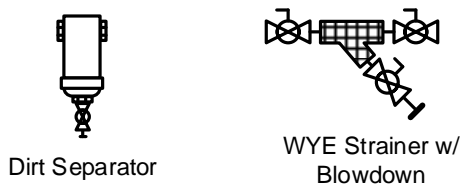
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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat Calls Wired to Navien CH Unit  
 "T & T" Terminals To Activate Heat Mode DIP Sw 7 of 8 Down (OFF) on PCB

 Cast Iron Baseboard  
 or  
 Cast Iron Fin Tube  
 or  
 Cast Iron Radiators



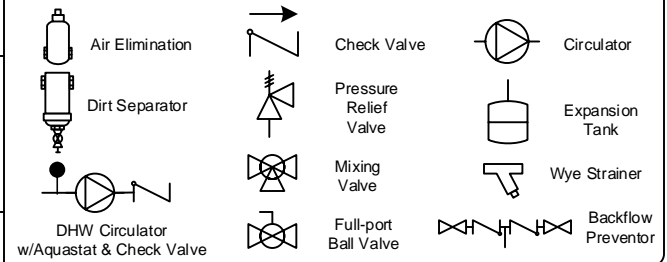
Proper dirt separation must be used when applying the Navien NCB/NHB boiler with systems that contain ferrous or ferric materials. Installation requires proper means of cleaning and flushing system piping prior to start-up to avoid potentiality subjecting the NCB/NHB boiler to system contaminants. Proper air elimination & system maintenance is required to maintain Navien warranties.



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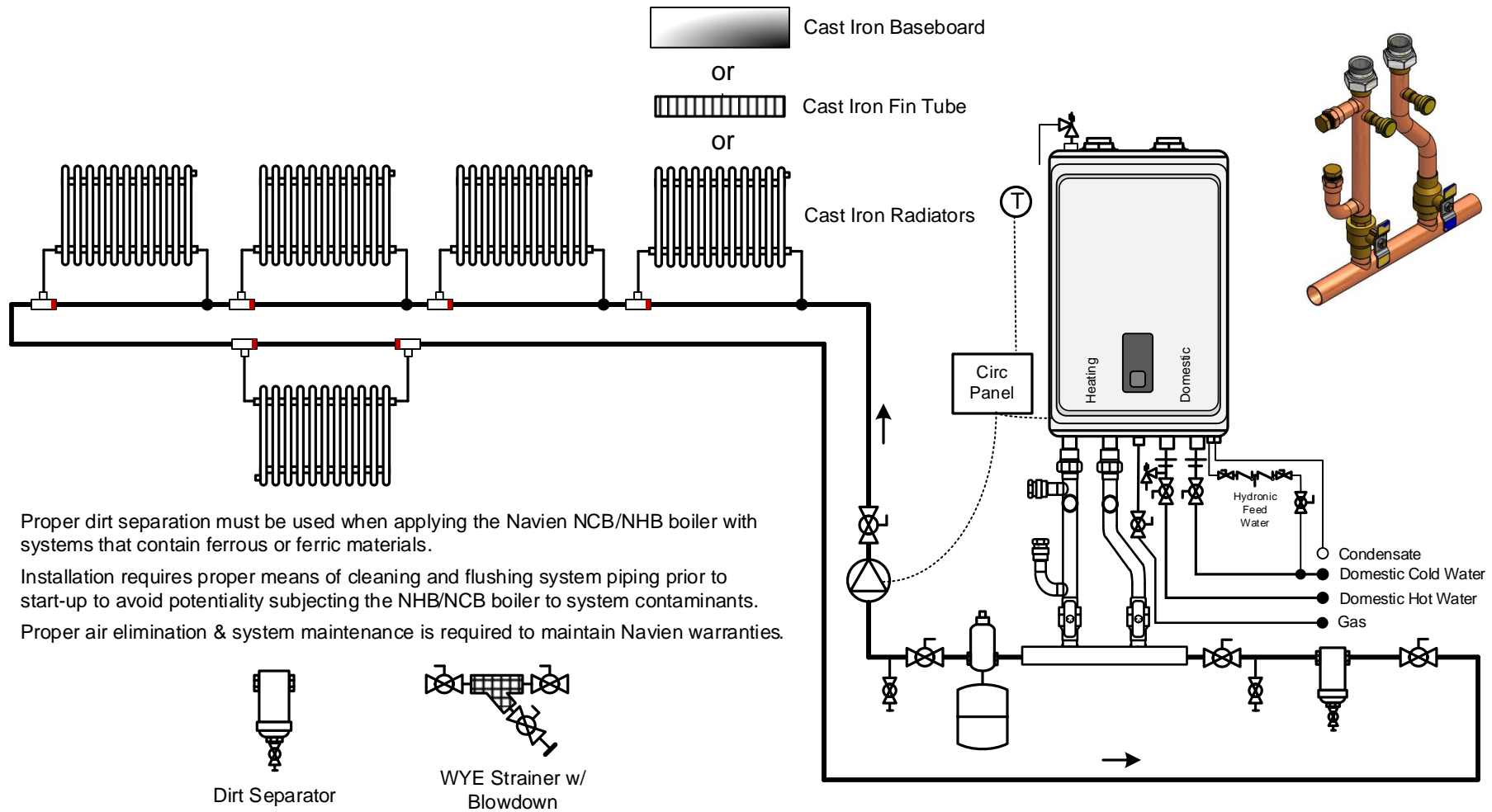
NCB-E Series Combi-Boiler  
 Navien NCB-E Combi-Boiler Application  
 Two-Pipe Reverse Return  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001

Drawn By: B.F.    NCB-E-CI-2P-RR-BF01    February 9, 2016



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Field Supplied Circulator Zone Panel  
 Shall have Dry Contacts Closed On Heat Calls Wired to Navien CH Unit  
 "T & T" Terminals To Activate Heat Mode DIP Sw 7 of 8 Down (OFF) on PCB



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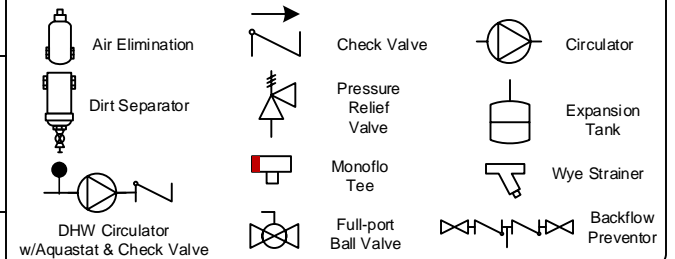
NCB-E Series Combi-Boiler

Navien NCB-E Combi-Boiler Application  
 One-Pipe (Monoflo) Distribution System  
 With NCB Quik-Install Manifold Kit  
 Part # GFFM-MCOZUS-001

Drawn By: BF

NCB-E-CI-PM-MONO-BF01

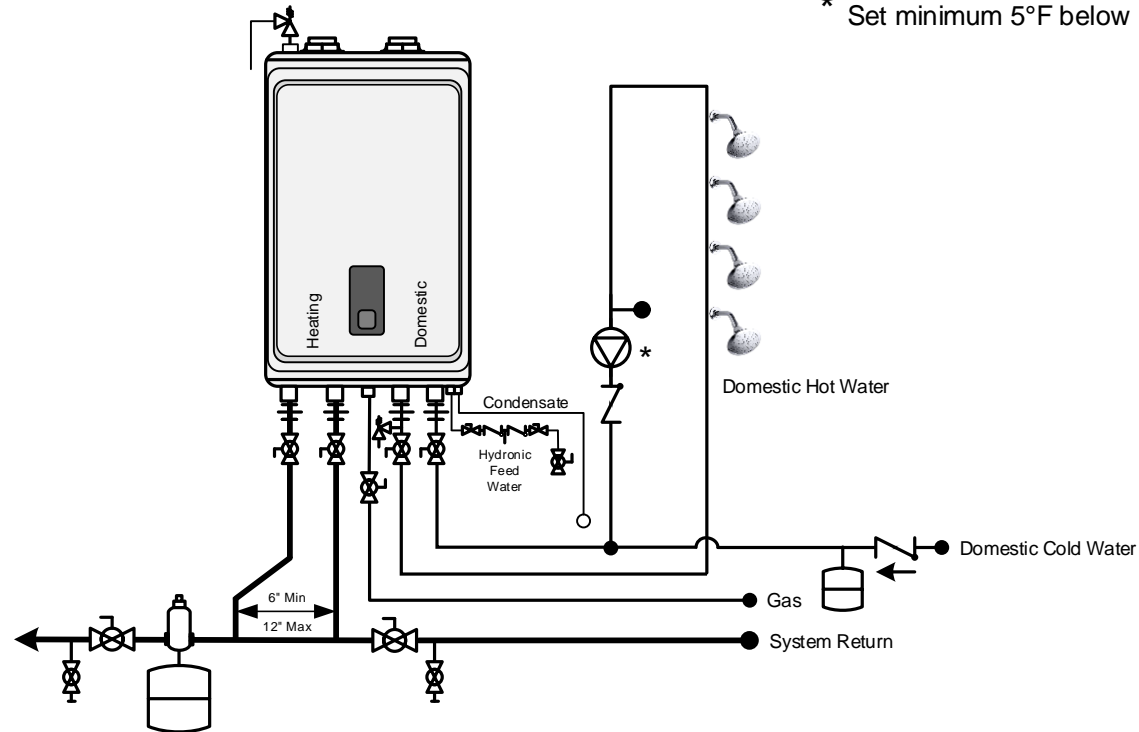
February 9, 2016



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DHW Circulator Requirements:

1. S.S. or Bronze Body & Impeller
  - \* DHW Side 2.5 PSI Pressure drop @ 2 GPM
2. > 0.5 GPM to Activate Burner
3. Maximum 2 GPM
4. Programmable Timer
5. Selectable Aquastat
  - \* Set minimum 5°F below NCB DHW Setpoint



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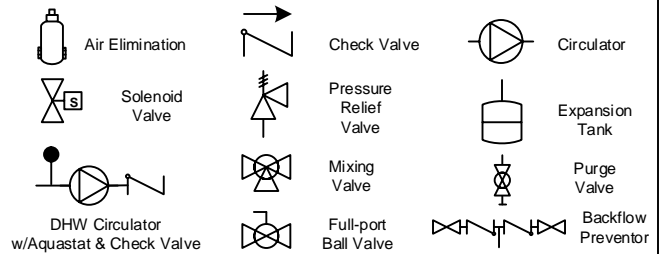
NCB-E Series Combi-Boiler

Navien NCB-E Combi-Boiler Application  
DHW Recirculation Shown

Drawn By: B.F.

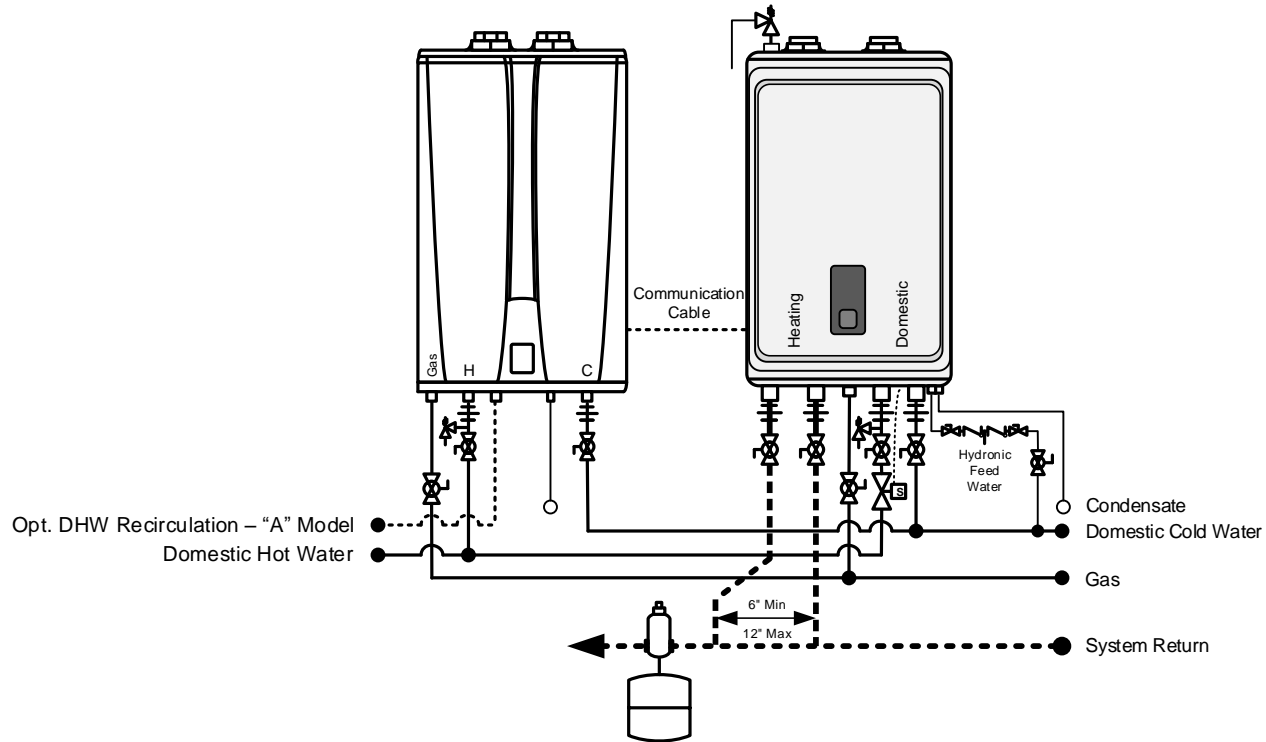
NCB-E-DHWR-BF01

February 9, 2016





This drawing is intended only as a guide and not as a replacement for professionally engineered project drawings. This concept system drawing does not imply compliance with local building codes. Actual installation may vary depending on installation location & parameters and it must be done in accordance to all local building codes. Verify with local building officials before commencement of system installation.



**KD Navien**

20 Goodyear  
Irvine, CA 92618  
800-519-8794  
www.navien.com

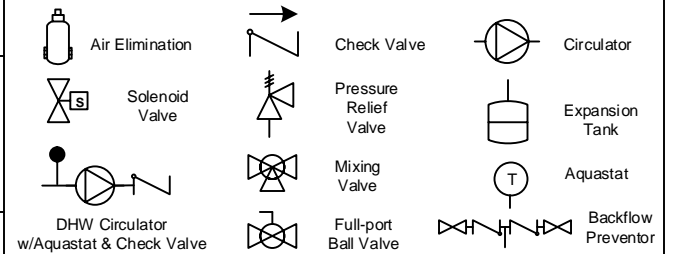
NCB-E Series Combi-Boiler & NPE (A/S) Series Tankless

Navien NCB-E Combi-Boiler Application  
With NPE-A or S Tankless Water Heater

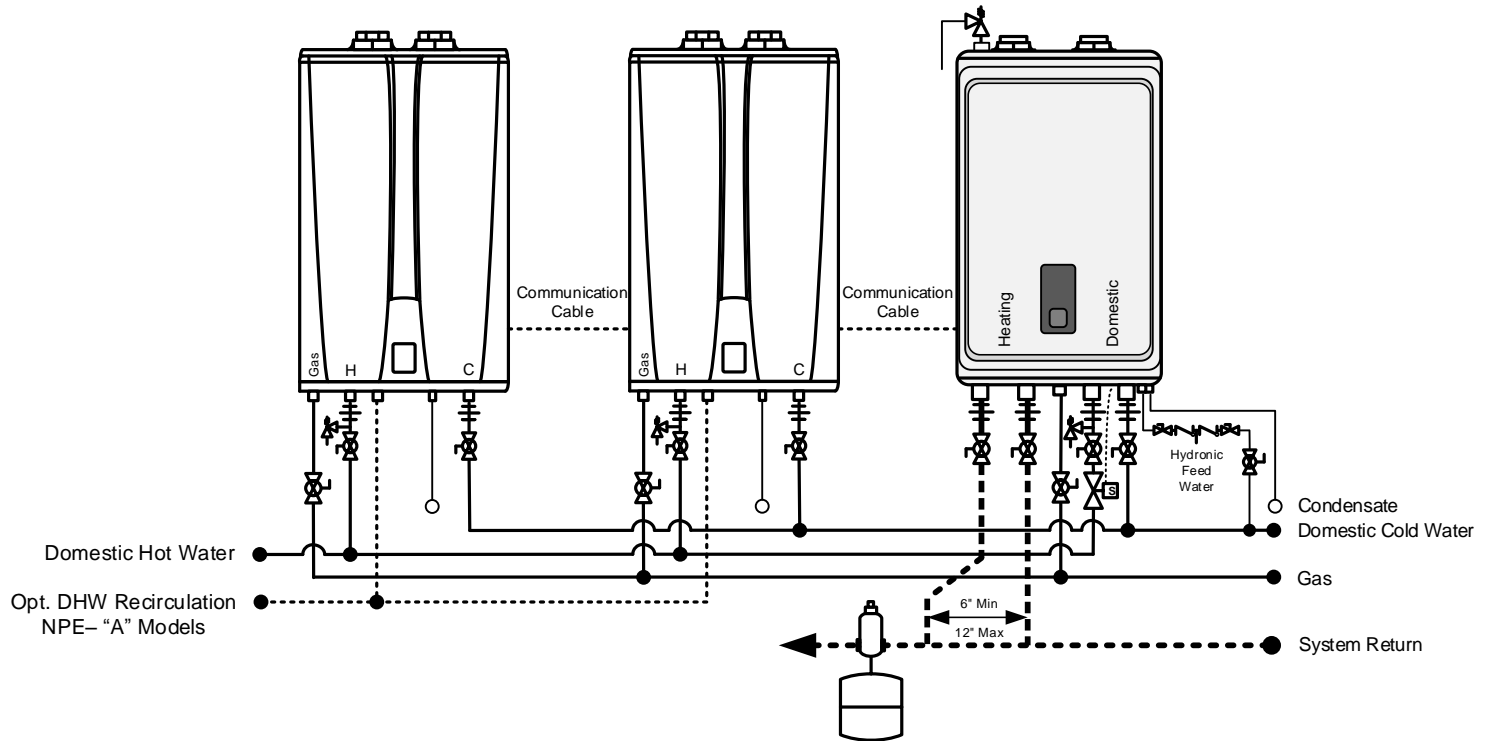
Drawn By: B.F.

NCB-E-NPE-BF01

February 9, 2016



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NCB-E Series Combi-Boiler & NPE (A/S) Series Tankless

Navien NCB-E Combi-Boiler Application  
With Two NPE-A or S Tankless Water Heater

Drawn By: B.F.

NCB-E-2NPE-BF01

February 9, 2016



Air Eliminator



Solenoid Valve



DHW Circulator  
w/Aquastat & Check Valve



Check Valve



Pressure  
Relief  
Valve



Mixing  
Valve



Full-port  
Ball Valve



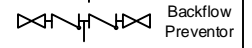
Circulator



Expansion  
Tank

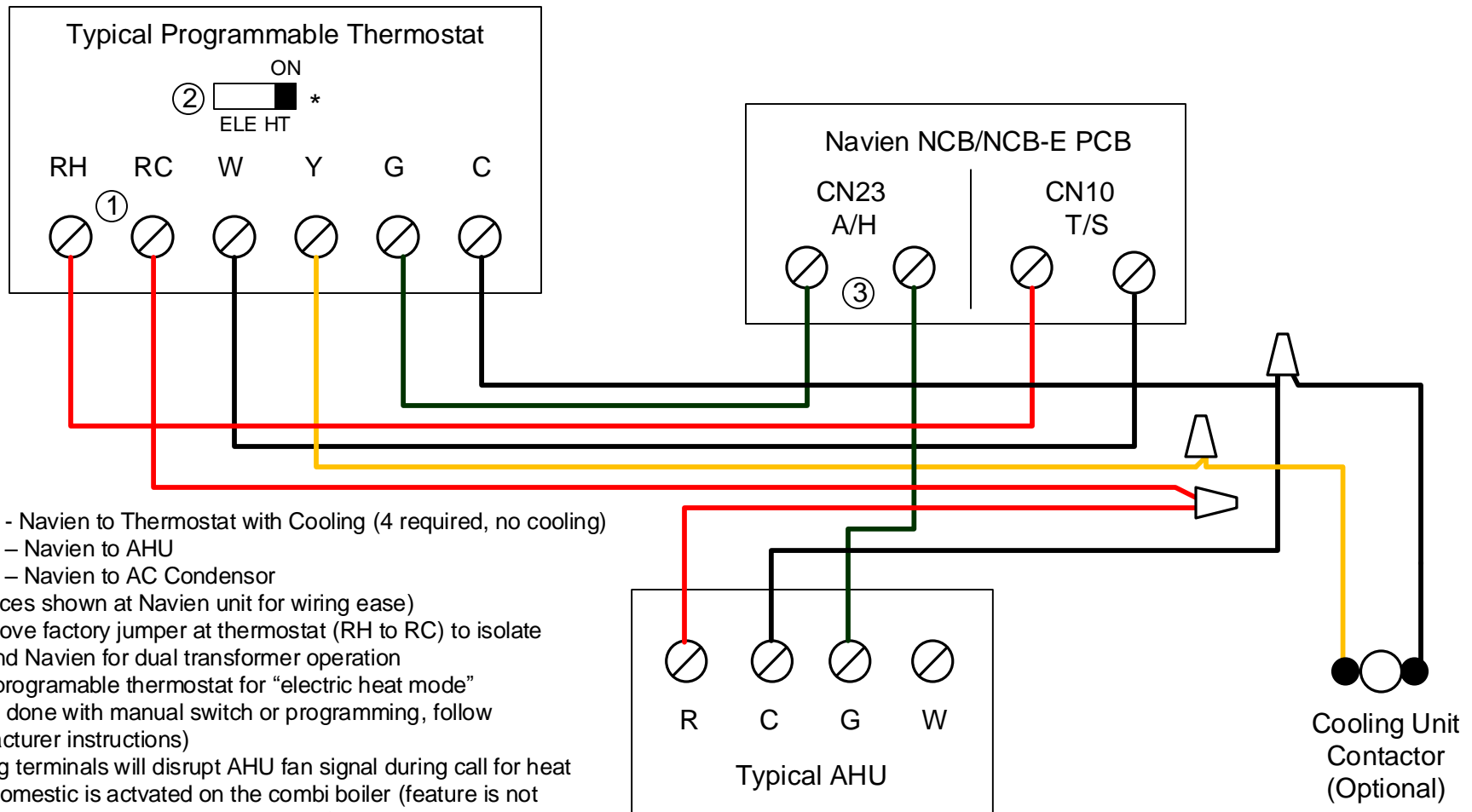


Aquastat



Backflow  
Preventor

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**Notes:**

- 6 wires - Navien to Thermostat with Cooling (4 required, no cooling)
- 3 wires - Navien to AHU
- 2 wires - Navien to AC Condensor
- (All splices shown at Navien unit for wiring ease)
- 1. Remove factory jumper at thermostat (RH to RC) to isolate AHU and Navien for dual transformer operation
- 2. Set programmable thermostat for "electric heat mode" (This is done with manual switch or programming, follow manufacturer instructions)
- 3. Using terminals will disrupt AHU fan signal during call for heat when domestic is activated on the combi boiler (feature is not required to be used, direct connecting "G" to AHU).
- \* This closes RC to G (AHU fan) & RH to W (boiler heat call).



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**NCB/NCB-E Series Combi Boiler**

**Navien NCB/NCB-E Combi Series  
Air Handler Unit Wire Diagram Example  
(Thermostat is Control Center)**

Drawn By: B.F.

NCB/NCB-E-Wire-BF

February 9, 2016

