Application Brochure

Smart Steam Control 289

Application	Page

tekmar is not responsible for failures due to connectivity issues, power outages, or improper installation.

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A **WATTS** *Brand*

One-Pipe Steam System, One Boiler

Application A289-1   *Mechanical*

Description

A one-pipe steam heating system with one boiler is operated to provide central heating using outdoor reset.

Features:

- Central heating using outdoor reset reduces energy consumption up to 30% compared to operating with a continuous call for heat.
- Programmable schedule to reduce energy consumption during unoccupied time periods.
- Automatic warm weather shut down based upon outdoor air temperature.
- Remote access from the Internet through the Watts® OnSite web or mobile applications.

Essential System Settings:

Condensate Sensor = On

Auxiliary Sensor = Off

Pressure Sensor = Off
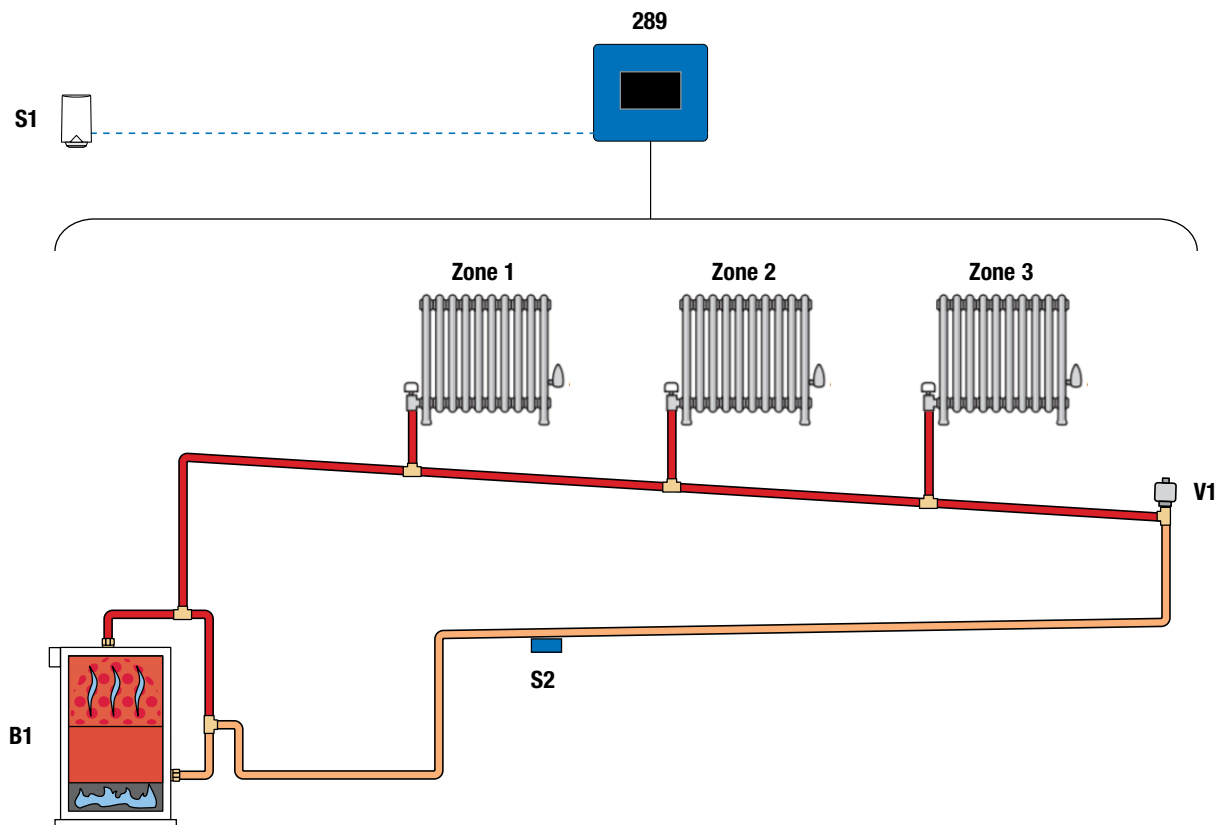
Outdoor Sensor = Control

Legend

B1 = Steam Boiler

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071

V1 = Main Steam Vent

Concept Drawing: This is only a concept drawing, not an engineered drawing. It is not intended to describe a complete system, nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed, including additional equipment, isolation relays (for loads greater than the control's specified output ratings), and any safety devices which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

Legend

B1 = Steam Boiler

E1 = Ethernet (Optional)

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071

S1 **S2** **E1**

Ref In Gnd
Pressure Sens | Outdoor Sensor | Cond Sensor | Aux Sensor | DHW + Call −
1 2 3 | 4 5 | 6 7 | 8 9 | 10 11

⚠ Class 2 Circuits

10/100
Ethernet
12

FCC ID: 2AHQR-11500A
Contains FCC ID:
2AC7Z-ESP32WROOM32E
QOQMGM12P0

Contains IC ID:
21098-ESPWROOM32E
5123A-MGM12P0
CAN ICES-3 (A)/NMB-3(A)

Input Power:
115 V (ac) ±10%, 60 Hz, 4 W
Relays:
230 V (ac), 5 A, 1/3 hp
Calls:
24 V (ac) or Short
Operating Temperature:
32°F to 122°F (0°C to 50°C)

Wi-Fi: 802.11b/g/n, 2.4GHz

Use Copper Conductors Only

⚠ **DANGER**

To Reduce the Risk of Electric
Shock - Do not connect to a
circuit operating at more than
150 volts to ground.
Pour réduire les risques
d'électrocution choc - ne pas
raccorder à un circuit
fonctionnant à plus de 150 V à
la terre.

For product literature:
Pour la documentation
du produit:
tekmarControls.com

tektra 1150-02
Designed and assembled
in Canada

H2065A

tekmar® **Smart Steam Control 289**
A WATTS Brand

13 14 15 16 17 18 19 20
Boiler 1 | Boiler 2 | Comb | Power
Enable | Enable | Air Relay | L N

L
N
G

G

T T

B1

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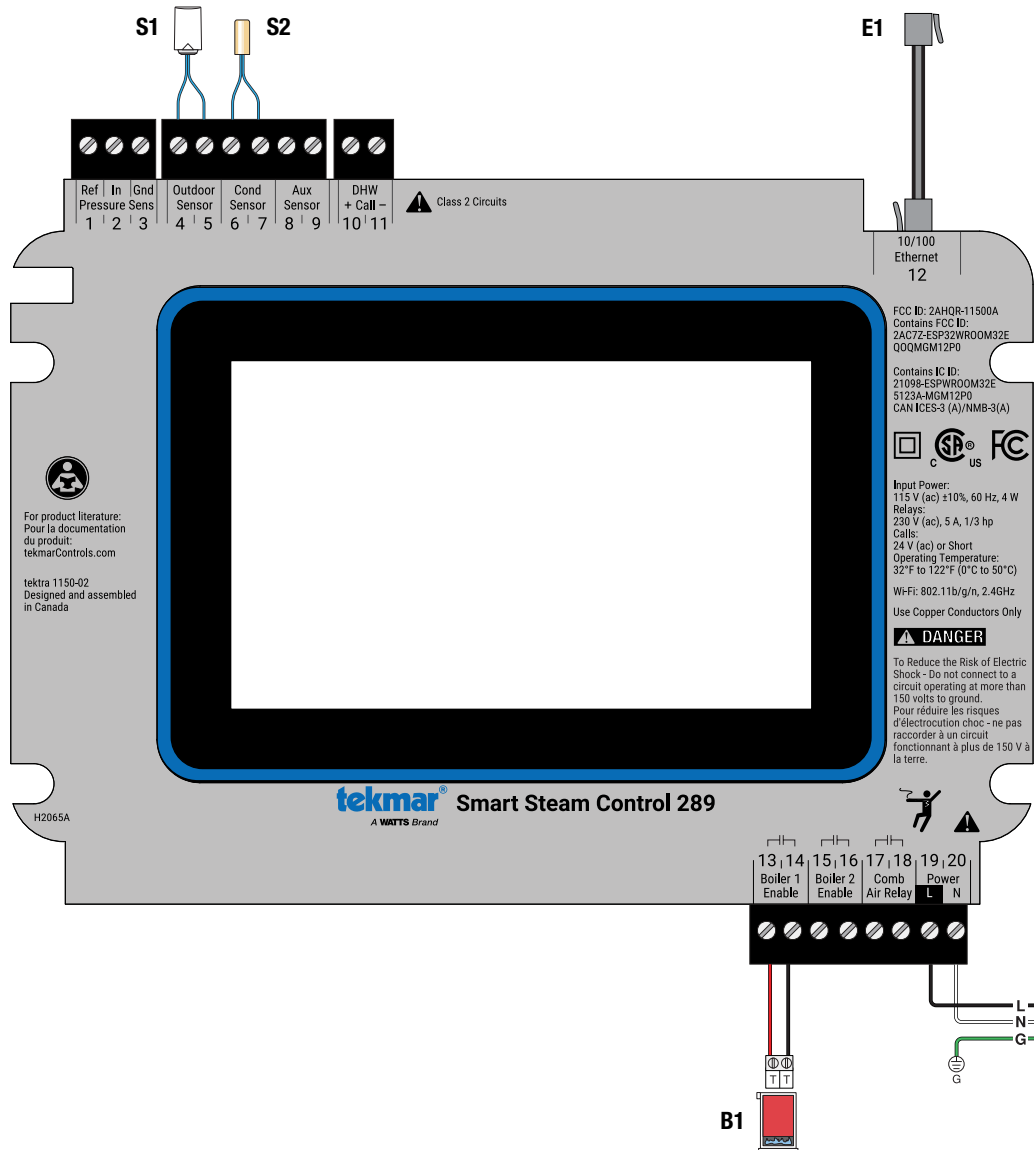
Application A289-2 *Mechanical*

Description

A two-pipe steam heating system with one boiler is operated to provide central heating using outdoor reset. The combustion air damper is opened before the boiler is fired.

Features:

- Central heating using outdoor reset reduces energy consumption up to 30% compared to operating with a continuous call for heat.
- Programmable schedule to reduce energy consumption during unoccupied time periods.
- Automatic warm weather shut down based upon outdoor air temperature.
- Remote access from the Internet through the Watts® OnSite web or mobile applications.

Essential System Settings:

Condensate Sensor = On

Auxiliary Sensor = Off

Pressure Sensor = Off

Outdoor Sensor = Control
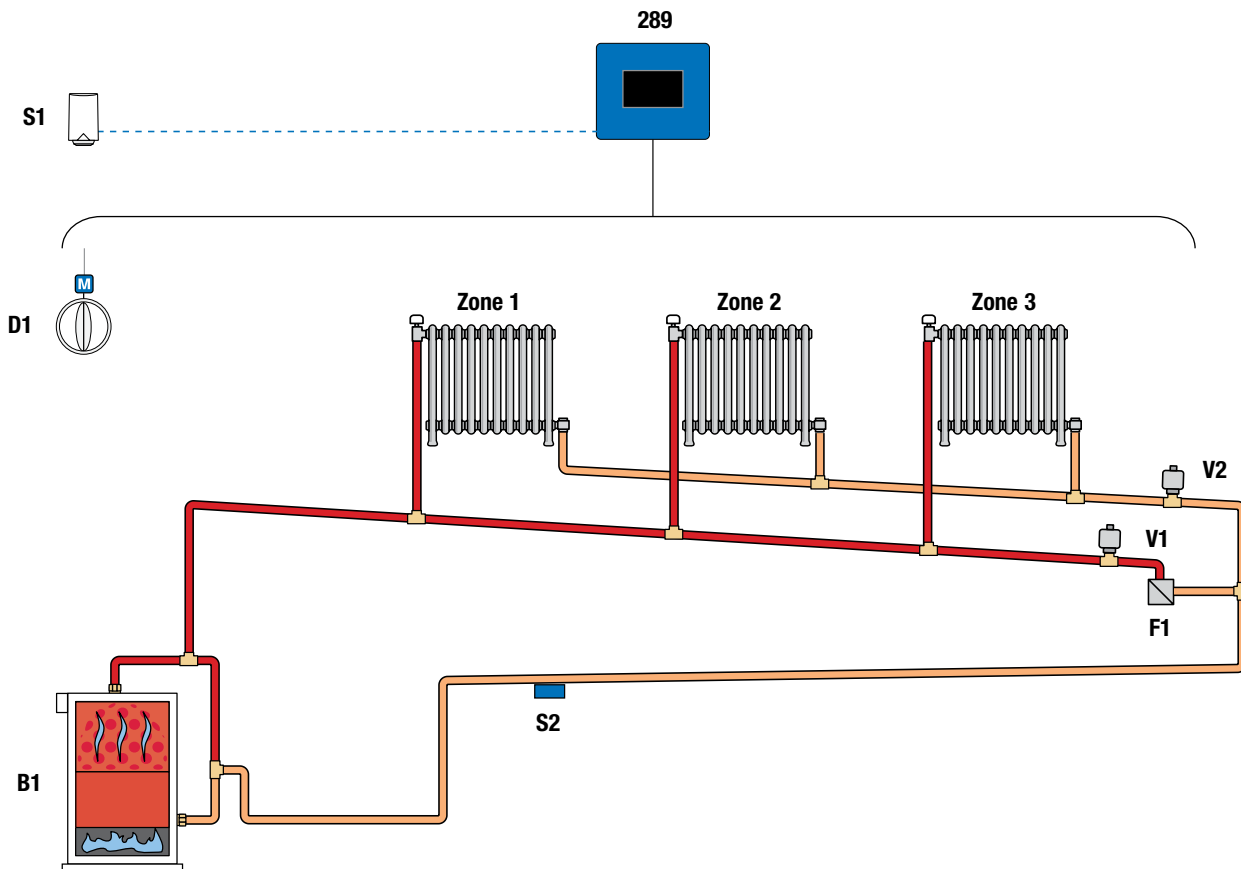
Legend

B1 = Steam Boiler

D1 = Combustion Air Damper

F1 = Float and Thermostatic Trap

S1 = Outdoor Sensor 070
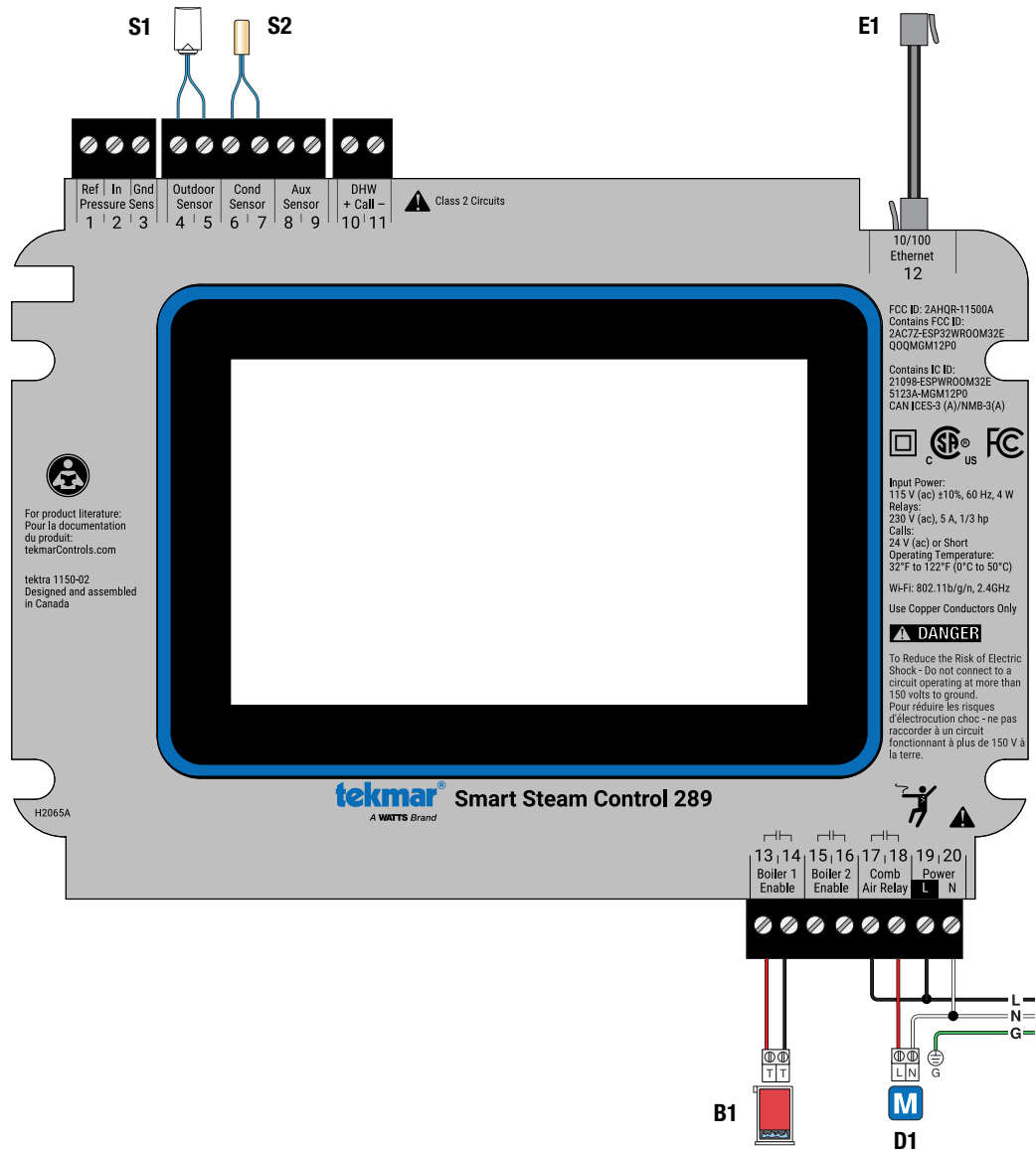
S2 = Condensate Return Sensor 071

V1, V2 = Main Steam Vent

Concept Drawing: This is only a concept drawing, not an engineered drawing. It is not intended to describe a complete system, nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed, including additional equipment, isolation relays (for loads greater than the control's specified output ratings), and any safety devices which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

Legend

B1 = Steam Boiler

D1 = Combustion Air Damper

E1 = Ethernet (Optional)

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071

S1 **S2** **E1**

Ref	In	Gnd	Outdoor	Cond	Aux	DHW	
Pressure Sens			Sensor	Sensor	Sensor	+ Call –	⚠ Class 2 Circuits
1	2	3	4	5	6	7	8	9	10	11

10/100
Ethernet
12

FCC ID: 2AHQR-11500A
Contains FCC ID:
2AC7Z-ESP32WROOM32E
Q0QMGM12P0

Contains IC ID:
21098-ESPWROOM32E
5123A-MGM12P0
CAN ICES-3 (A)/NMB-3(A)

Input Power:
115 V (ac) ±10%, 60 Hz, 4 W
Relays:
230 V (ac), 5 A, 1/3 hp
Calls:
24 V (ac) or Short
Operating Temperature:
32°F to 122°F (0°C to 50°C)

Wi-Fi: 802.11b/g/n, 2.4GHz

Use Copper Conductors Only

⚠ **DANGER**

To Reduce the Risk of Electric
Shock - Do not connect to a
circuit operating at more than
150 volts to ground.
Pour réduire les risques
d'électrocution choc - ne pas
raccorder à un circuit
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tektra 1150-02
Designed and assembled
in Canada

H2065A

tekmar® Smart Steam Control 289
A WATTS Brand

13	14	15	16	17	18	19	20
Boiler 1		Boiler 2		Comb		Power	
Enable		Enable		Air Relay		L	N

L
N
G

T T

B1

L N G

M

D1

One-Pipe Steam System, One Boiler with Tankless Coil

Application A289-3 — *Mechanical*

Description

A one-pipe steam heating system with one boiler is operated to provide central heating using outdoor reset. The control operates the boiler to heat a domestic hot water tankless coil and opens the combustion air damper before the boiler fires.

Features:

- Central heating using outdoor reset reduces energy consumption up to 30% compared to operating with a continuous call for heat.
- Programmable schedule to reduce energy consumption during unoccupied time periods.
- Automatic warm weather shut down based upon outdoor air temperature.
- Domestic hot water tankless coil heated on a programmable schedule.
- Remote access from the Internet through the Watts® OnSite web or mobile applications.

Essential System Settings:

Condensate Sensor = On

Auxiliary Sensor = Indoor

Pressure Sensor = Off

Outdoor Sensor = Control
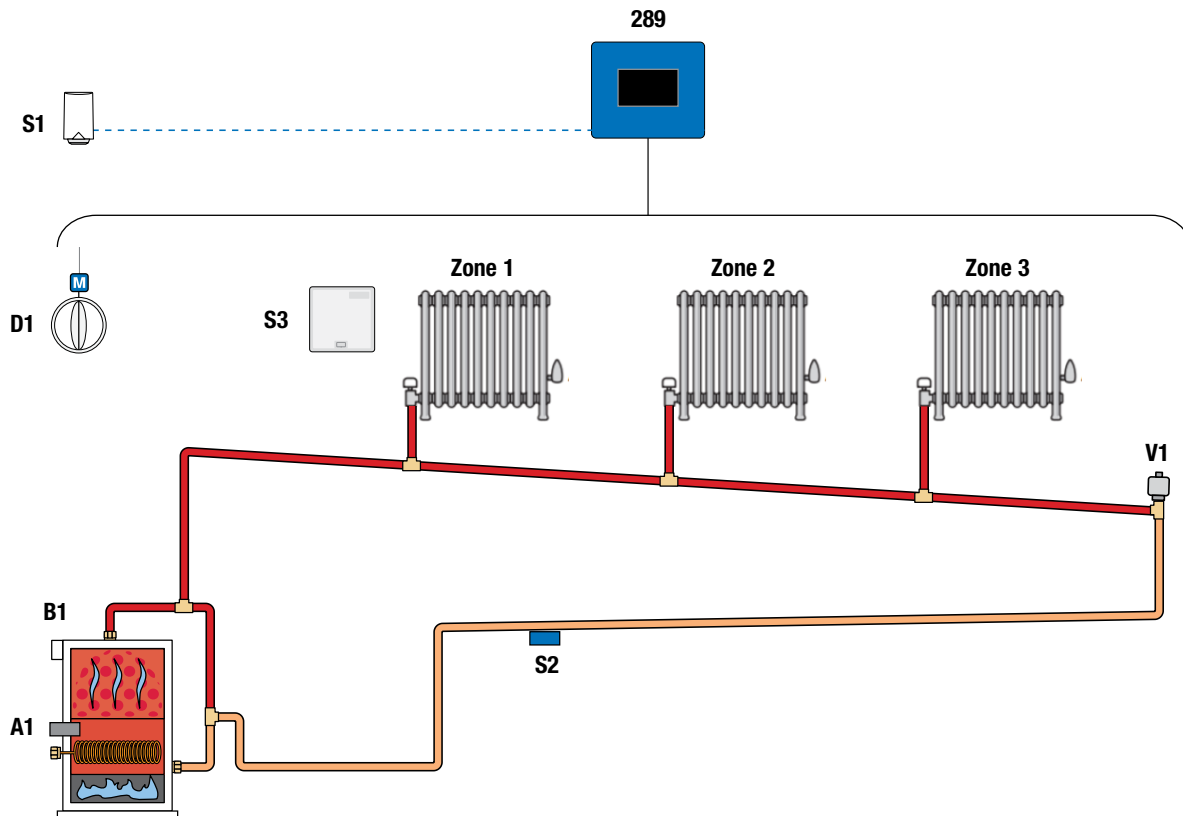
Legend

A1 = Domestic Hot Water Aquastat

B1 = Steam Boiler

D1 = Combustion Air Damper

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071

S3 = Indoor Sensor 076, 077 or 084

V1 = Main Steam Vent

Concept Drawing: This is only a concept drawing, not an engineered drawing. It is not intended to describe a complete system, nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed, including additional equipment, isolation relays (for loads greater than the control's specified output ratings), and any safety devices which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

Legend

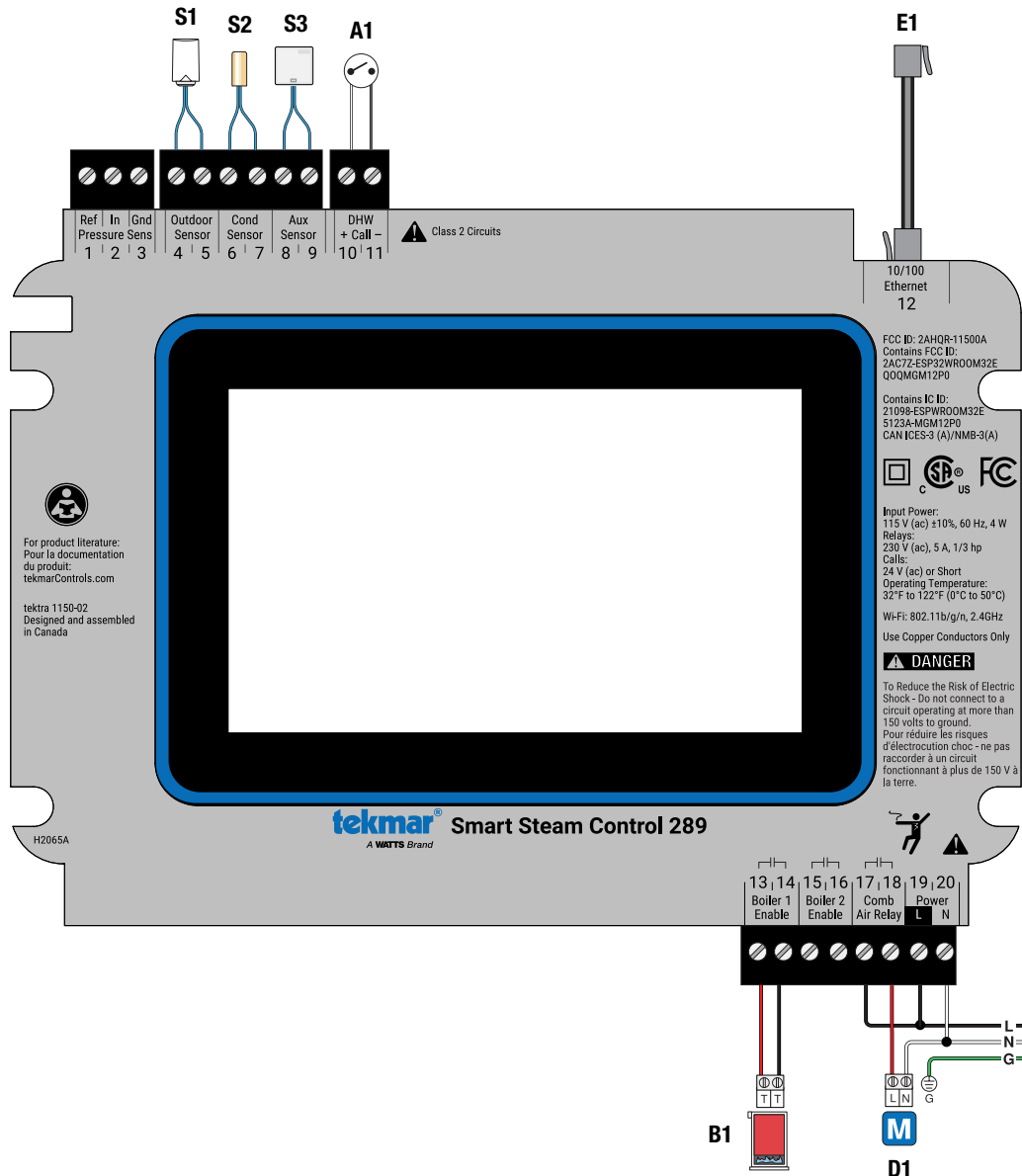A1 = Domestic Hot Water Aquastat

B1 = Steam Boiler

D1 = Combustion Air Damper

E1 = Ethernet (Optional)

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071

S3 = Indoor Sensor 076, 077 or 084

Concept Drawing: This is only a concept drawing, not an engineered drawing. It is not intended to describe a complete system, nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed, including additional equipment, isolation relays (for loads greater than the control's specified output ratings), and any safety devices which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

One-Pipe Steam System, Two Boilers

Application A289-4   *Mechanical*

Description

A one-pipe steam heating system with two boilers is operated to provide central heating using outdoor reset. The control stages the two boilers based upon the steam pressure setpoint and differential, provides boiler run time rotation to balance the running hours and opens the combustion air damper before the lead boiler fires.

Features:

- Central heating using outdoor reset reduces energy consumption up to 30% compared to operating with a continuous call for heat.
- Programmable schedule to reduce energy consumption during unoccupied time periods.
- Automatic warm weather shut down based upon outdoor air temperature.
- Equal runtime rotation on the boilers
- Remote access from the Internet through the Watts® OnSite web or mobile applications.

Essential System Settings:

Condensate Sensor = On

Auxiliary Sensor = Off

Pressure Sensor = On

Outdoor Sensor = Control
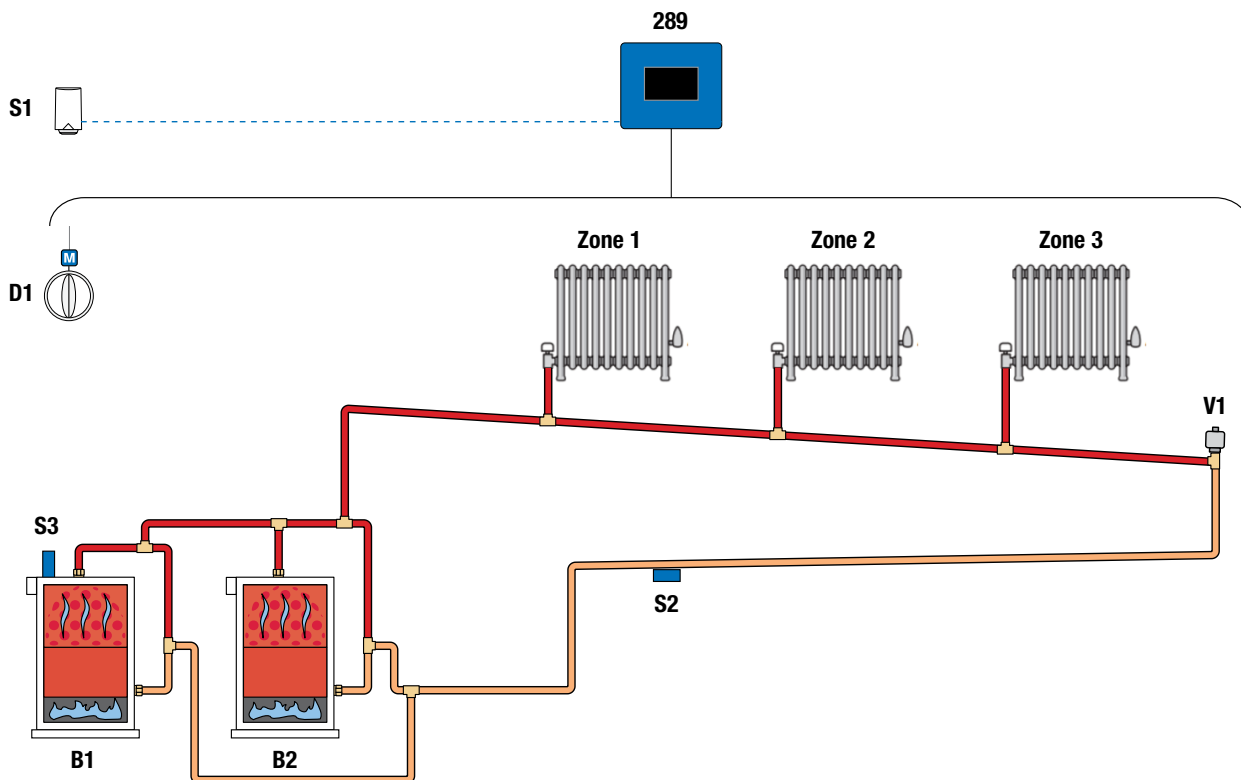
Legend

B1, B2 = Steam Boilers

D1 = Combustion Air Damper

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071
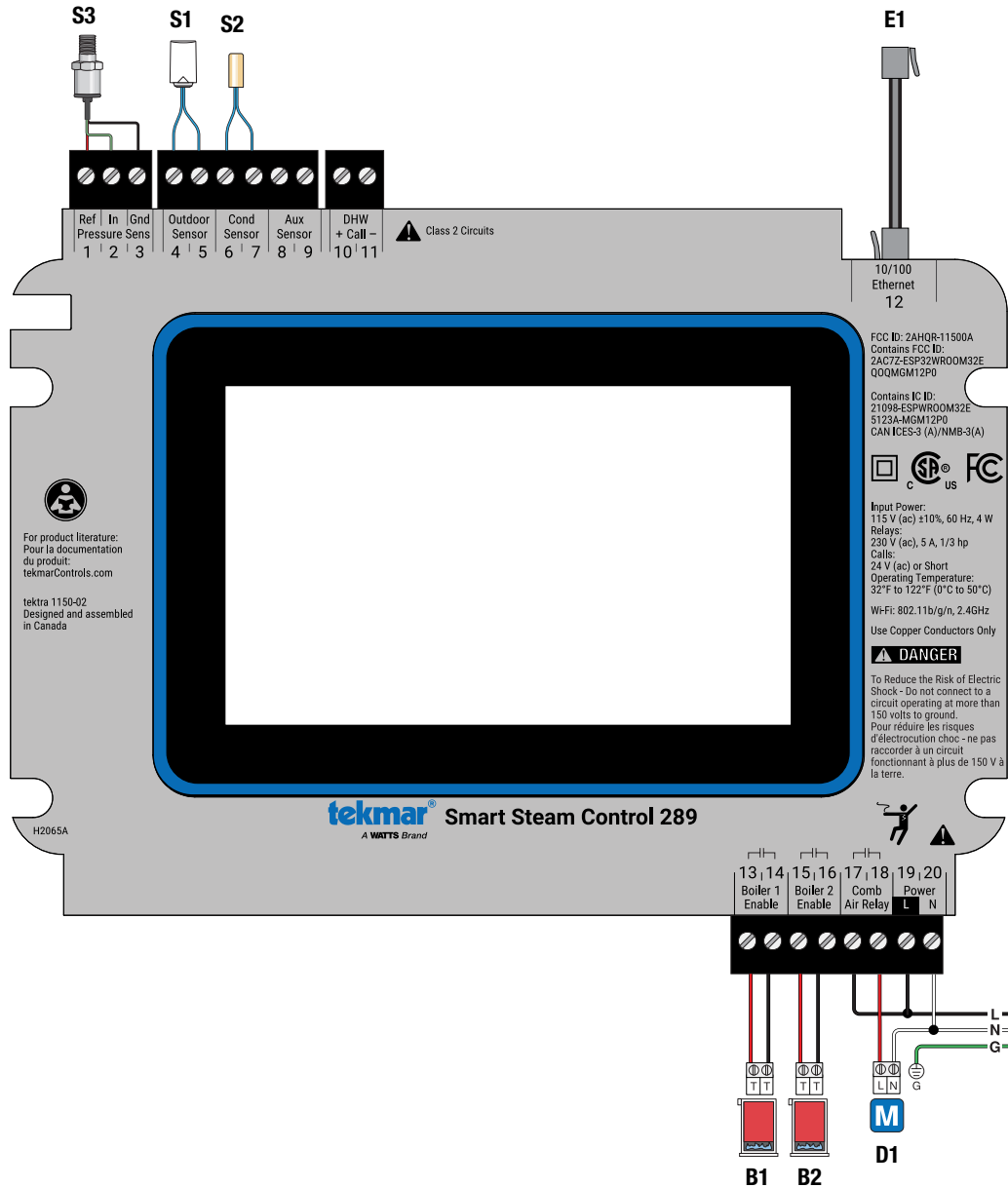
S3 = Pressure Sensor 089

V1 = Main Steam Vent

Concept Drawing: This is only a concept drawing, not an engineered drawing. It is not intended to describe a complete system, nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed, including additional equipment, isolation relays (for loads greater than the control's specified output ratings), and any safety devices which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

Legend

B1, B2 = Steam Boilers

D1 = Combustion Air Damper

E1 = Ethernet (Optional)

P1 = Pressure Sensor 089

S1 = Outdoor Sensor 070

S2 = Condensate Return Sensor 071

S3 = Pressure Sensor 089

Concept Drawing: This is only a concept drawing, not an engineered drawing. It is not intended to describe a complete system, nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed, including additional equipment, isolation relays (for loads greater than the control's specified output ratings), and any safety devices which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

Specifications

The following are the specifications for the Smart Steam Control 289

- The control shall be able to operate up to two steam boilers or on-off steam valves.
- The control shall use an outdoor reset algorithm to determine the steam heating system on time during a heating cycle.
- The control shall have the ability to measure and display the current outdoor and condensate return temperatures.
- The control shall have the option to measure and display either the indoor air temperature or the boiler flue temperature.
- The control shall have the option to measure the steam pressure.
- The control shall continually monitor the temperature and pressure sensors and provide an error message upon a control or sensor failure.
- The control shall stage the lag boiler through the steam pressure setpoint and differential.
- The control shall turn on the steam heating system once the measured outdoor temperature exceeds the control's adjustable warm weather shut down setting.
- The control shall have an adjustable steam established setting that is based upon the condensate return temperature.
- The control shall have an adjustable cool down differential setting that is based upon the condensate return temperature.
- The control shall record and display the running hours of the steam boilers.
- The control shall record and display the number of cycles of the steam boilers.
- The control shall have a time clock that includes a four-hour backup in the event of a power loss.
- The control shall have a seven-day, four-event programmable schedule stored in non-volatile memory.
- The control shall have temperature settings that follow a programmable schedule.
- The control shall have an early start feature to quickly recover when switching from the setback temperature to the regular operating temperature.
- The control shall have an input to turn on a steam boiler to heat a domestic hot water tankless coil.
- The control shall have an output to open a combustion air damper.
- The control shall have manual override options to test boiler and combustion air damper operation, suspend boiler operation, and operate the system with a maximum heat output.
- The control shall have an optional passcode to prevent unauthorized access to the home screen and settings.
- The control shall have the option to connect to the Internet using Ethernet or Wi-Fi.
- The control shall have the ability to automatically set the time and date from the Internet.
- The control shall have the ability to retrieve the local outdoor air temperature through the Internet.
- The control shall have the ability to be remotely monitored and adjust settings through a web and/or mobile application.
- The control shall have the ability to send notifications through email, text, or mobile app push notification in the event of a sensor fault or alert condition.

Notes