

# Installation Instructions

for use by heating contractor

**VIESSMANN®**

Vitocrossal 300 CU3A

Models 26, 35, 45, 57, 94, 125, 160, 199

Floor mounted, gas-fired condensing boiler with MatriX gas burner and Lambda Pro control

For operation with natural gas and liquid propane gas

Heating input 19 to 199 MBH

5.6 to 58 kW



## VITOCROSSAL 300



*Product may not be exactly as shown*

### IMPORTANT

**Read and save these instructions for future reference.**

## Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

### ■ Product documentation

Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

► *For a listing of applicable literature, please see section entitled "Important Regulatory and Installation Requirements".*



### ■ Warranty

Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.



### ■ Licensed professional heating contractor

The installation, adjustment, service and maintenance of this equipment must be performed by a licensed professional heating contractor.

► *Please see section entitled "Important Regulatory and Installation Requirements".*



### ■ Contaminated air

Air contaminated by chemicals can cause by-products in the combustion process, which are poisonous to inhabitants and destructive to Viessmann equipment.

► *For a listing of chemicals which cannot be stored in or near the boiler room, please see subsection entitled "Mechanical room" in the "Installation Instructions".*



### ■ Advice to owner

Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service annually before the heating season begins.



## WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow the Viessmann maintenance schedule of the boiler contained in this manual.

### Operating and Service Documentation

It is recommended that all product documentation such as parts lists, operating and service instructions be handed over to the system user for storage. Documentation is to be stored near boiler in a readily accessible location for reference by service personnel.

### ■ Carbon monoxide

Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas.

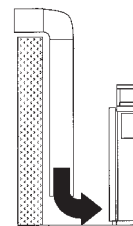
► *For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see subsection entitled "Mechanical room" and "Venting requirements" in the "Venting System Installation Instructions".*



### ■ Fresh air

This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

► *For information pertaining to the fresh air requirements of this product, please see subsection entitled "Mechanical room" in the "Installation Instructions".*



### ■ Equipment venting

Never operate boiler without an installed venting system. An improper venting system can cause carbon monoxide poisoning.

► *For information pertaining to venting and chimney requirements, please see section entitled "Venting Connection". All products of combustion must be safely vented to the outdoors.*



## WARNING

This boiler requires fresh air for safe operation and must be installed with provisions for adequate combustion and ventilation air (in accordance with local codes and regulations of authorities having jurisdiction).

Do not operate this boiler in areas with contaminated combustion air. High levels of contaminants such as dust, lint or chemicals can be found at construction sites, home renovations, in garages, workshops, in dry cleaning/laundry facilities, near swimming pools and in manufacturing facilities.

Contaminated combustion air will damage the boiler and may lead to substantial property damage, severe personal injury and/or loss of life. Ensure boiler/burner is inspected and serviced by a qualified heating contractor at least once a year in accordance with the Service Instructions of the boiler.

## Safety, Installation and Warranty Requirements

### Fiberglass wool and ceramic fiber materials

#### **WARNING**

Inhaling of fiberglass wool and/or ceramic fiber materials is a possible cancer hazard. These materials can also cause respiratory, skin and eye irritation.

The state of California has listed the airborne fibers of these materials as a possible cancer hazard through inhalation. When handling these materials, special care must be applied.

Suppliers of ceramic fiber products recommend the following first aid measures:

- *Respiratory tract (nose and throat) irritation:*  
If respiratory tract irritation develops, move the person to a dust free location.
- *Eye irritation:* If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.
- *Skin irritation:* If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.
- *Gastrointestinal irritation:* If gastrointestinal tract irritation develops, move the person to a dust free environment.

Suppliers of fiberglass wool products recommend the following precautions be taken when handling these materials:

- Avoid breathing fiberglass dust and contact with skin and eyes.
- Use NIOSH approved dust/mist respirator.
- Wear long-sleeved, loose fitting clothing, gloves and eye protection.
- Wash work clothes separately from other clothing. Rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out and spraying may generate airborne fiber concentration requiring additional protection.


#### First aid measures

- If eye contact occurs, flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- If skin contact occurs, wash affected areas gently with soap and warm water after handling.

#### **WARNING**

Appliance materials of construction, products of combustion and the fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, aldehydes and/or other toxic or harmful substances which can cause serious injury or loss of life and which are known to the State of California to cause cancer, birth defects and other reproductive harm. Always use proper safety clothing, respirators and equipment when servicing or working nearby the appliance.

## About these Installation Instructions

 Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

#### **WARNING**

Indicates an imminently hazardous situation which, if not avoided, could result in loss of life, serious injury or substantial product/property damage.

#### **CAUTION**

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

#### **IMPORTANT**

► Warnings draw your attention to the presence of potential hazards or important product information.

► Cautions draw your attention to the presence of potential hazards or important product information.

► Helpful hints for installation, operation or maintenance which pertain to the product.

► This symbol indicates that additional, pertinent information is to be found.

► This symbol indicates that other instructions must be referenced.



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## Important Regulatory and Installation Requirements

### Codes

The installation of this unit shall be in accordance with local codes or, in the absence of local codes, use CAN/CSA-B149.1 or .2 Installation Codes for Gas Burning Appliances for Canada. For U.S. installations use the National Fuel Gas Code ANSI Z223.1. Always use latest editions of codes.

In Canada all electrical wiring is to be done in accordance with the latest edition of CSA C22.1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70. The heating contractor must also comply with both the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, and the Installation Code for Hydronic Heating Systems, CSA B214-01, where required by the authority having jurisdiction.

### Instructing the system user

The installer of the system is responsible to ensure the system operator/ultimate owner is made familiar with the system functioning, its activation, and its shut-down.

### Initial start-up

Initial start-up must be performed by a qualified heating contractor. Proper completion of the Maintenance Record by the heating contractor is also required.

### Working on the equipment

The installation, adjustment, service, and maintenance of this boiler must be done by a licensed professional heating contractor who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burners, or control.

Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Close main gas supply valve. Take precautions in all instances to avoid accidental activation of power during service work.

### Carbon Monoxide Detectors

The installer must verify that at least one carbon monoxide alarm has been installed within a residential living space or home following the alarm manufacturer's instructions and applicable codes before putting the appliance into operation.

The following topics must be covered:

Proper system operation sequence.

Explain the equipment.

Demonstrate an emergency shut-down, what to do and what not.

Explain that there is no substitute for proper maintenance to help ensure safe operation.

The Maintenance Record is located in the Service Instructions

Please carefully read this manual prior to attempting start-up, maintenance or service. Any warranty is null and void if these instructions are not followed.

For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

We offer frequent installation and service seminars to familiarize our partners with our products. Please inquire.

### Technical literature

Literature for the Vitocrossal 300 CU3A boiler:

- Technical Data Manual
- Installation Instructions
- Service Instructions
- Operating Instructions and User's Information Manual
- Instructions of other Viessmann products utilized and installed
- Installation codes mentioned in this manual

The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. These include low water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.

Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.

This product comes with several safety instruction labels attached.

Do not remove!

Contact Viessmann immediately if replacement labels are required.

**Important Regulatory and Installation Requirements** *(continued)*

CSD-1 Field Testing of High Limit Switches for Vitocrossal 300 CU3A boilers – where required by law.

VISSMANN IS NOT RESPONSIBLE FOR ANY DAMAGES THAT THE FOLLOWING TEST PROCEDURE MAY RESULT IN BY OVERHEATING THE SYSTEM.

The fixed high limit, when tripped, produces a fault that will require manual reset of the boiler control.

Fixed High Limit fault simulation:

- Run the boiler to high fire via relays test.
- Throttle the boiler valve to a point where the burner will run with as little flow as possible.
- When the burner shuts down on the electronic limit, close the ball valve to stop the flow.
- The boiler temperature should continue a steady increase to trip the fixed high limit.
- Once the fixed high limit is tripped, slowly open the boiler valve to safely cool the boiler down.



## Applicability



### CAUTION

The boiler serial number must be provided when ordering replacement parts.

### IMPORTANT

When ordering replacement parts, provide either the 16-digit boiler serial number (on the bar code label) located underneath boiler front enclosure panel. Refer to page 21 for instructions on how to remove front enclosure panel.

Model No. CU3A 26, 94

Serial No. 7553000□□□□□□□□

Model No. CU3A 35, 125

Serial No. 7553001□□□□□□□□

Model No. CU3A 45, 160

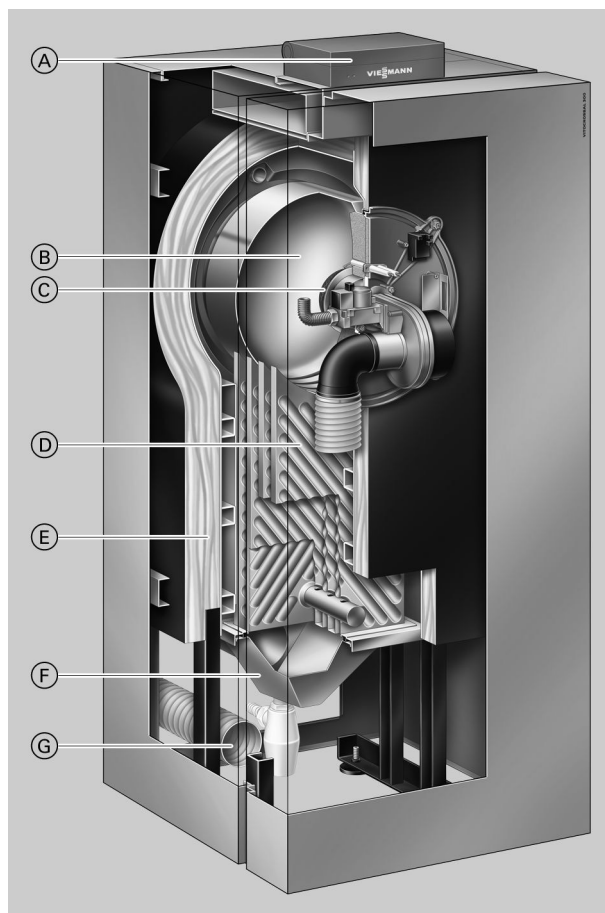
Serial No. 7553002□□□□□□□□

Model No. CU3A 57, 199

Serial No. 7553003□□□□□□□□

#### Legend

- (A) Digital Vitotronic boiler control unit
- (B) Water-cooled stainless steel combustion chamber
- (C) Modulating MatriX gas burner – for extremely clean combustion
- (D) Stainless steel Inox-Crossal heat exchanger
- (E) Highly effective thermal insulation
- (F) Flue gas collector with condensate drain pipe
- (G) Combustion air intake for direct vent (two-pipe) systems



## Product Information

Natural gas and liquid propane gas-fired condensing heating boiler for weather-responsive operation in closed loop, forced circulation hot water heating systems for space heating and domestic hot water (DHW) production.

The Vitocrossal CU3A boiler comes factory set for operation with natural gas. For a fuel conversion to liquid propane gas no conversion kit is required.

Boiler model must be selected based on an accurate heat loss calculation of the building. Ensure boiler model is compatible with connected radiation.

Vitocrossal CU3A boilers are factory-tested and calibrated. Further gas valve adjustments are not typically required during field start-up.



Follow the Vitocrossal CU3A Venting System Installation Instructions to vent this boiler.



For conversion to LPG refer to the Service Instructions.



## Mechanical Room

During the early stages of designing a new home, we recommend that proper consideration be given to constructing a separate mechanical room dedicated to the gas- or oil-fired heating equipment and domestic hot water storage tank(s).

The boiler must be located in a heated indoor area, near a floor drain, and as close as possible to a wall. Whenever possible, install the boiler near an outside wall so that it is easy to duct the venting system to the boiler.

Ensure that the boiler location does not interfere with the proper circulation of combustion and ventilation air of other fuel burning equipment within the mechanical room (if applicable).

The maximum room temperature of the mechanical room where the boiler is located must not exceed 104°F (40°C).

### Installation area conditions



#### WARNING

**Incorrect ambient conditions can lead to damage to the heating system and put safe operation at risk.**

- Ensure ambient temperatures are higher than 32°F (0°C) and lower than 104°F (40°C).
- Prevent the air from becoming contaminated by halogenated hydrocarbons (e.g. as contained in paint solvents or cleaning fluids) and excessive dust (e.g. through grinding or polishing work). Combustion air for the heating process, and ventilation of the boiler room must be free of corrosive contaminants. To that end, any boiler must be installed in an area that has no chemical exposure. The list to the right indicates the main, currently known sources.
- Avoid continuously high levels of humidity (e.g. through frequent drying of laundry).
- Never close existing ventilation openings.



#### WARNING

**If you notice fire coming from the appliance, call the fire department immediately! Do not attempt to extinguish the fire unless qualified to do so.**

### IMPORTANT

The service life of the boiler's exposed metallic surfaces, such as the casing and fan housing, is directly influenced by proximity to damp and salty marine environments. In such areas, higher concentration levels of chlorides from sea spray, coupled with relative humidity, can lead to degradation of the exposed metallic surfaces mentioned above. Therefore, it is imperative that boilers installed in such environments not be installed using direct vent systems which draw outdoor air for combustion. Such boilers must be installed using room air dependent vent systems; i.e. using room air for combustion. The indoor air will have a much lower relative humidity and, hence, potential corrosion will be minimized.

### Sources of combustion and ventilation air contaminants

#### Areas likely to contain contaminants:

- New building construction
- Swimming pools
- Remodelling areas, hobby rooms
- Garages with workshops
- Furniture refinishing areas
- Dry cleaning/laundry areas and establishments
- Auto body shops
- Refrigeration repair shops
- Metal fabrication plants
- Plastic manufacturing plants
- Photo processing plants
- Beauty salons

#### Products containing contaminants:

- Chlorine-type bleaches, detergents and cleaning solvents found in household laundry rooms
- Paint and varnish removers
- Hydrochloric acid, muriatic acid
- Chlorine-based swimming pool chemicals
- Spray cans containing chlorofluorocarbons
- Chlorinated waxes and cleaners
- Cements and glues
- Refrigerant leaks
- Calcium chloride used for thawing
- Sodium chloride used for water softening salt
- Permanent wave solutions
- Adhesives used to fasten building products and other similar items
- Antistatic fabric softeners used in clothes dryers




#### WARNING

**Fire causes a risk of burns and explosion!**

- Shut down the boiler
- Close fuel shut-off valves
- Use a tested fire extinguisher, class ABC.

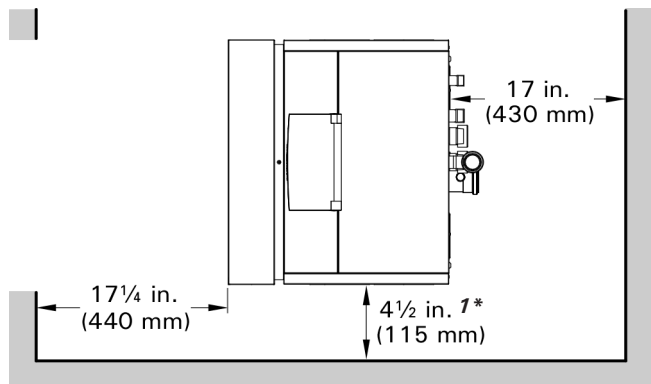
Before Set-up

Before placing boiler in its installation location, ensure all necessary accessories are installed.

**CAUTION**


The boiler must be installed in such a way that gas ignition system components are protected from water (spraying, splashing, etc.) during boiler operation and service.

Minimum Clearances



**Recommended minimum service clearances**  
For typical Vitocrossal CU3A series boiler installations, Viessmann recommends installing the boiler with the service clearances shown in the illustration.

**Note:** The Vitocrossal 300 CU3A series boiler conforms to the zero inches vent clearance to combustibles testing requirements dictated by the boiler Harmonized Standard ANSI Z21.13. CSA/4.9 (latest edition) and therefore is listed for zero clearance to combustibles when vented with a single-wall UL/ULC certified special venting system. The zero inches vent clearance to combustibles for the Vitocrossal 300 CU3A boiler supercedes the clearance to combustibles listing that appears on the special venting system label. The back or side clearance shall be increased if piping installation is required.



See the Vitocrossal 300 CU3A Venting System Installation Instructions for details.

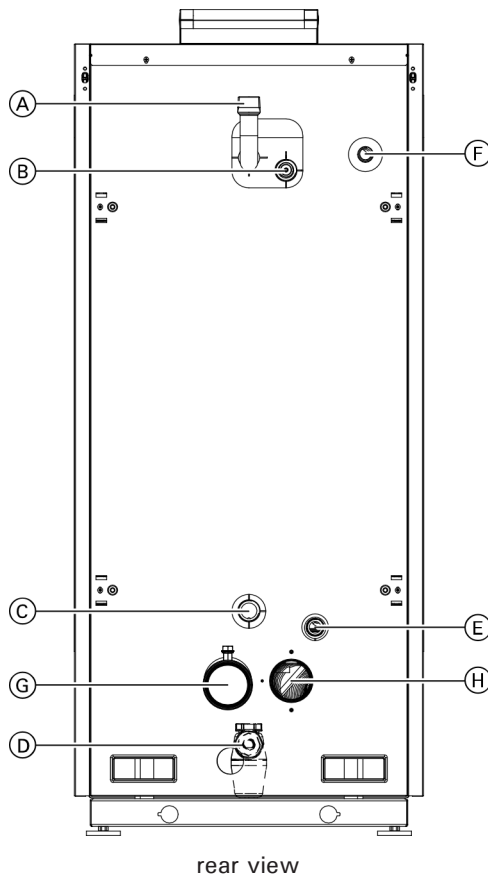
Minimum clearances to combustibles

Boiler model CU3A	26, 94	35, 125	45, 160	57, 199
Top	0	0	0	0
Sides (left and right)	0	0	0	0
Vent pipe	0	0	0	0
Front (alcove or closet)	0	0	0	0
Rear	0	0	0	0
Floor	combustible	combustible	combustible	combustible

The Vitocrossal CU3A series boilers are approved for closet and alcove installation with the clearances to combustibles listed.

- \*1** Clearance between boilers may be reduced to zero in multi-boiler installations.
- Note:** The burner, boiler control, condensate trap, venting and heat exchanger are still fully accessible from the front and rear of the boiler.

## Connections



### Legend

- Ⓐ Safety connection  
(pressure relief valve and air vent valve) 1 1/4 in. NPT
- Ⓑ Boiler supply 1 1/4 in. NPT
- Ⓒ Boiler return 1 1/4 in. NPT
- Ⓓ Condensate drain Ø 3/4 in. (19 mm) barbed fitting
- Ⓔ Safety return and drain (diaphragm expansion vessel)  
1 in. NPT
- Ⓕ Gas connection 3/4 in. NPT
- Ⓖ Boiler flue termination
- Ⓗ Combustion air intake

**Note:** The Vitocrossal is only suitable for fully pumped hot water heating systems. Never install 4-way mixing valves, overflow valves or other flow/return bypass devices. Never connect a heating return to the safety return.

### CAUTION

To prevent equipment damage, install all pipework free of load and torque stresses.

### Connecting power

The Vitocrossal 300 CU3A boiler has external accessories connection modules installed behind the front cover, which requires a 120VAC power supply from a wall receptacle. Refer to the wiring diagram (see page 57).

### Connecting heating system

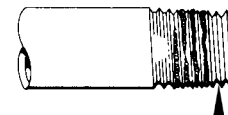
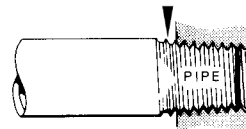
Flush heating system thoroughly prior to connecting boiler

### Proper piping practice

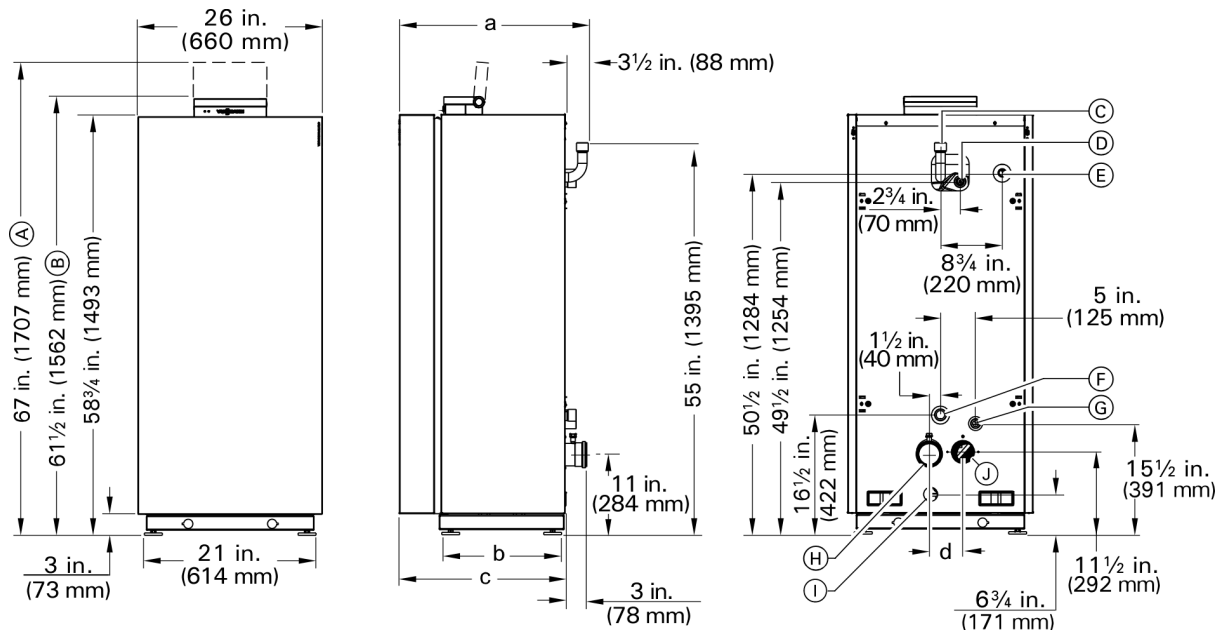
Support piping by proper suspension method. Piping must not rest on or be supported by boiler. Use moderate amount of dope.

Use an approved pipe sealant or teflon tape when connecting the following installation fittings.

### 2 imperfect threads



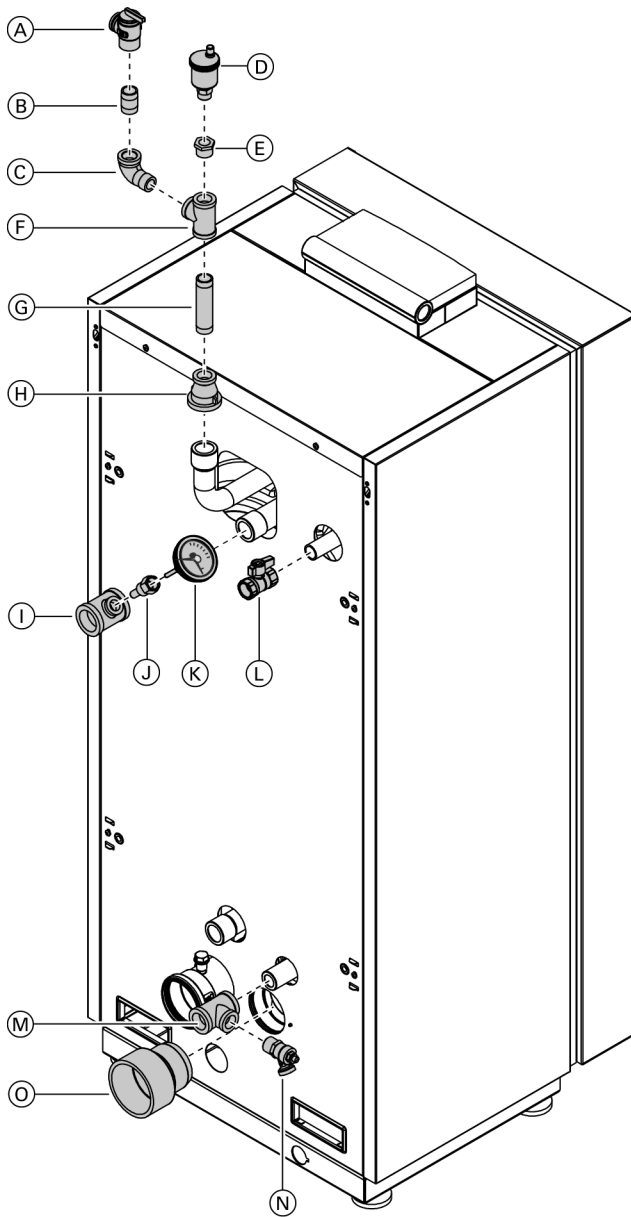
Leave 2 threads bare

**Connections** *(continued)***Dimensions****Legend**

- Ⓐ Overall boiler height (boiler control open)
- Ⓑ Overall boiler height (boiler control closed)
- Ⓒ Safety header connection
- Ⓓ Boiler supply
- Ⓔ Gas connection
- Ⓕ Boiler return
- Ⓖ Boiler drain
- Ⓗ Vent connection
- Ⓘ Condensate drain connection
- Ⓙ Combustion air connection

Model 26, 35, 94, 125			Model 45, 57, 160, 199		
a	in. (mm)	27 (684)	a	in. (mm)	31 1/2 (801)
b	in. (mm)	17 (430)	b	in. (mm)	21 1/2 (545)
c	in. (mm)	23 1/2 (595)	c	in. (mm)	28 (712)
d	in. (mm)	4 3/4 (120)	d	in. (mm)	5 1/2 (140)

**Note:** All height dimensions of the boiler have a tolerance of +.6 in. (+ 15 mm) due to the factory installed adjustable feet.

**Connections** *(continued)***Installation fittings****Safety header**

- Ⓐ Pressure relief valve  $\frac{3}{4}$  in., 30 psig
- Ⓑ Nipple  $\frac{3}{4}$  in. x  $1\frac{1}{2}$  in.
- Ⓒ Street elbow  $\frac{3}{4}$  in.
- Ⓓ Air vent
- Ⓔ Bushing  $\frac{3}{4}$  in. to  $\frac{3}{8}$  in.
- Ⓕ Tee,  $\frac{3}{4}$  in.
- Ⓖ Nipple  $\frac{3}{4}$  in. x  $3\frac{1}{2}$  in.
- Ⓗ Reducing coupling  $1\frac{1}{4}$  in. x  $\frac{3}{4}$  in.

**Supply fitting\*1**

- Ⓘ Reducing tee  $1\frac{1}{4}$  in. x  $1\frac{1}{4}$  in. x  $\frac{1}{2}$  in.
- Ⓙ Thermowell
- Ⓚ Temperature and pressure gauge

**Gas fitting**

- Ⓛ Gas ball valve  $\frac{3}{4}$  in.

**Drain fitting**

- Ⓜ Reducing tee 1 in. x 1 in. x  $\frac{3}{4}$  in.
- Ⓝ Sediment faucet  $\frac{3}{4}$  in.

**Venting**

- Ⓞ CPVC vent adaptor 80 mm to 3 in.  
(used with CPVC/ABS air intake pipe connections)

\*1 Install anywhere in supply piping near boiler

**Connections** *(continued)***Siting and levelling the boiler****IMPORTANT**

**Damage to the flue gas connection can lead to flue gas escaping. Never lift or move the boiler by the flue gas connection.**

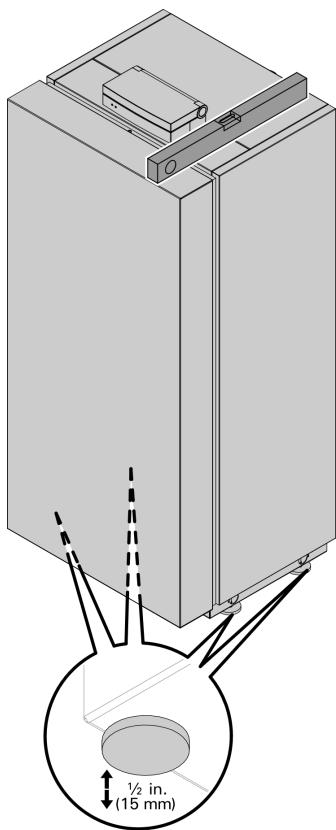
**Note:** The adjustable feet are supplied preinstalled.

1. Level the boiler horizontally using the adjustable feet.

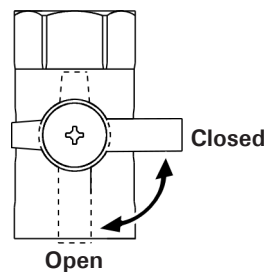
**Note:** Special foundations are not required.

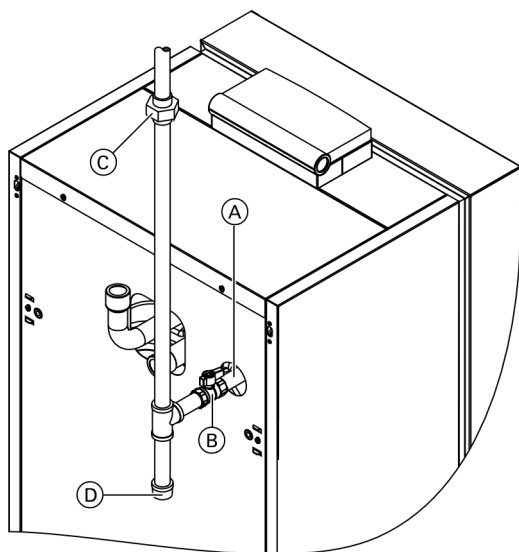


It is essential to use appropriate lifting devices certified of lifting a minimum 400 lbs. (180 kg).

**Gas shut-off valve connection**

1. Make gas connections in accordance with codes CAN/CSA B149.1 and .2 or National Fuel Gas Code ANSI Z223.1/NFPA 54, as well as local codes.
2. Connect gas shutoff valve to the boiler gas connection.
3. Once connected close gas shutoff valve on boiler.

**Manual gas shutoff**

**Connections** *(continued)***Legend**

- (A) Gas connection  $\varnothing$   $\frac{3}{4}$  in. (NPT)
- (B) Accessible manual gas shutoff valve (supplied)
- (C) Ground joint union
- (D) Drip leg

**Gas connection and piping**

1. Refer to current CAN/CSA B149.1 and .2 or National Fuel Gas Code ANSI Z223.1/NFPA 54, as well as local codes for gas piping requirements and sizing. Pipe size to the boiler must be determined based on:
  - pipe length
  - number of fittings
  - type of gas
  - maximum input requirements of all gas appliances in the residence.

**IMPORTANT**

**Design piping layout in such a way that piping does not interfere with serviceable components.**

2. Before connecting boiler to gas line, install ground joint union, capped drip leg and a manual equipment shutoff valve as shown. Valves must be listed by a nationally recognized testing agency. Make boiler gas connection as shown.
3. Perform gas piping pressure test as described in the following subsection.

**IMPORTANT**

**Max. gas supply pressure: 14 "w.c.**

4. Identify shutoff valves as such with a tab and familiarize operator / ultimate owner of boiler with these valves.



See Vitocrossal 300, CU3A Service Instructions for applicable system coding changes.

**WARNING**

The gas supply piping must be leak tested before placing the boiler in operation.

**CAUTION**

Ensure that gas piping is large enough for all appliances in the residence. No noticeable gas pressure drop in the gas line must occur when any unit (or combination of units) lights or runs.

**Gas piping pressure test**

When performing the gas piping pressure test, ensure the following requirements are met.

**WARNING**

Never check for gas leaks with an open flame.

**WARNING**

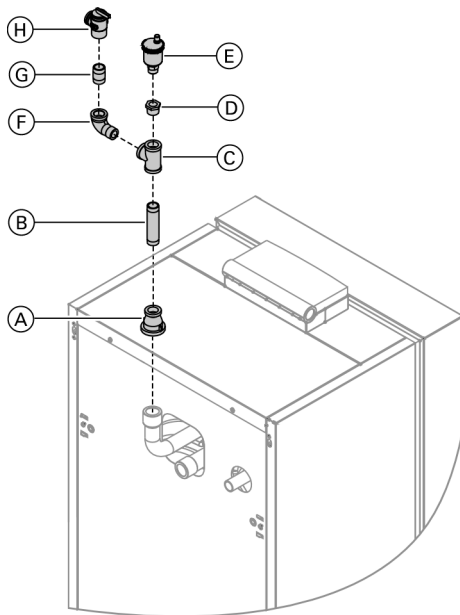
Exposing boiler gas pressure regulator and gas valve to extreme pressures renders warranty null and void.

**IMPORTANT**

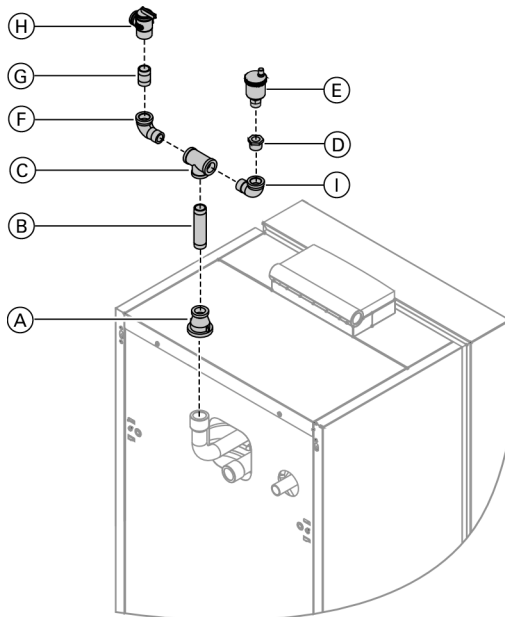
$\frac{1}{2}$  psig = 14 "w.c.

1. Isolate the boiler from the gas supply piping system using the individual manual shutoff valve during pressure tests equal to or less than  $\frac{1}{2}$  psig (14 "w.c.)
2. The boiler and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of  $\frac{1}{2}$  psig (14 "w.c.)
3. Perform leak test.  
Use approved liquid spray solution for bubble test. Ensure that no liquid is sprayed on any electrical components, wires or connectors. Do not allow leak detection fluid to contact gas valve regulator or regulator vent opening.
4. Correct any and all deficiencies.
5. Remove air from gas line.



**Connections** *(continued)*

Standard safety header configuration



Optional safety header configuration

**Legend**

- (A) Reducing coupling, 1 1/4 in. x 3/4 in.
- (B) Long nipple, 3/4 in. x 4 in.
- (C) Tee, 3/4 in.
- (D) Bushing, 3/4 in. x 3/8 in.
- (E) Air vent
- (F) Street elbow, 3/4 in.
- (G) Short nipple, 3/4 in. x 1 1/2 in.
- (H) Pressure relief valve, 3/4 in. 30 psig
- (I) Street elbow, 3/4 in. (field supplied)

**Installing boiler safety devices**

1. Apply sufficient amount of pipe sealant to both ends of all pipe fittings (B), (D), (F) and (G) and install onto coupling (A) and tees (C).
2. Install pressure relief valve (H) and air vent (E) and tighten.
3. Install discharge pipe on pressure relief valve in such a way that...
  - the end of the pipe is not threaded.
  - the pressure relief discharge pipe extends to a floor drain and ends approximately 6 in. (150 mm) above the drain.
 Ensure that...
  - there is no shutoff valve installed in the discharge pipe.
  - discharge pipe diameter is not reduced.
  - discharge is not piped to outdoors.

**IMPORTANT**

Install the (approved) factory supplied pressure relief valve.

Removal of air from the system must occur via use of air vent(s) in the system supply. To ensure the boiler can be purged of all air, ensure supply/return water lines do not contain restrictive piping where air could be trapped.

**! WARNING**

Do not install an isolation valve between boiler and pressure relief valve.

The discharge pipe for the pressure relief valve must be oriented to prevent scalding of attendants.

Pipe pressure relief valve discharge pipe close to floor drain. Never pipe discharge pipe to the outdoors.

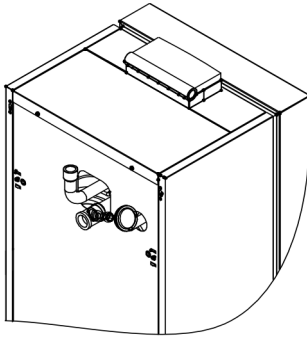
Minimum connection diameters:

Pressure relief valve..... 3/4 in.

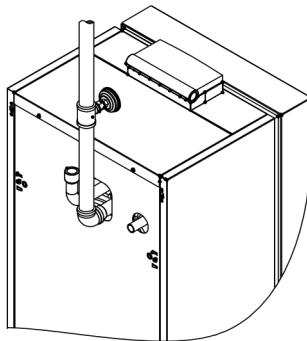
Discharge pipe..... 3/4 in.

Piping to precharged expansion tank..(field supplied)

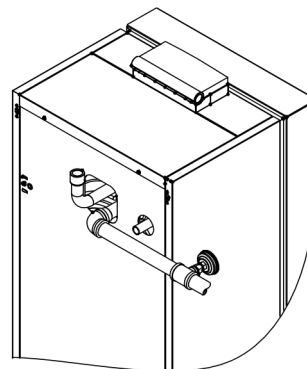
# Connections *(continued)*



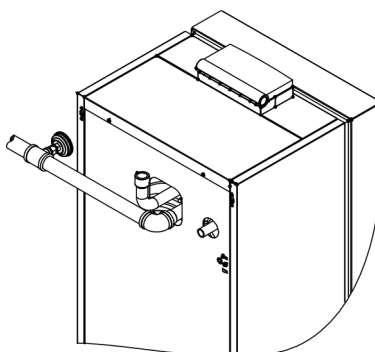
Typical connection with supplied;  
 - reducing tee 1 1/4 in. x 1 1/4 in. x 1/2 in.  
 - thermal well  
 - tridicator (temp and pressure gauge)  
 All other piping is field supplied.



Vertical connection with supplied;  
 - reducing tee 1 1/4 in. x 1 1/4 in. x 1/2 in.  
 - thermal well  
 - tridicator (temp and pressure gauge)  
 All other piping is field supplied.



Horizontal (left) connection with supplied;  
 - reducing tee 1 1/4 in. x 1 1/4 in. x 1/2 in.  
 - thermal well  
 - tridicator (temp and pressure gauge)  
 All other piping is field supplied.



Horizontal (right) connection with supplied;  
 - reducing tee 1 1/4 in. x 1 1/4 in. x 1/2 in.  
 - thermal well  
 - tridicator (temp and pressure gauge)  
 All other piping is field supplied.

## Heating water connections

1. Thoroughly flush heating system (particularly before connecting the boiler to an existing system).
2. Connect boiler to the heating system.



## WARNING

Exposing the boiler to pressures and temperatures in excess of those listed will result in damages, and will render warranty null and void.

Min. operating pressure..... 1 bar (14 psig)

Max. allowable working pressure (MAWP)..2 bar (30 psig)

## IMPORTANT

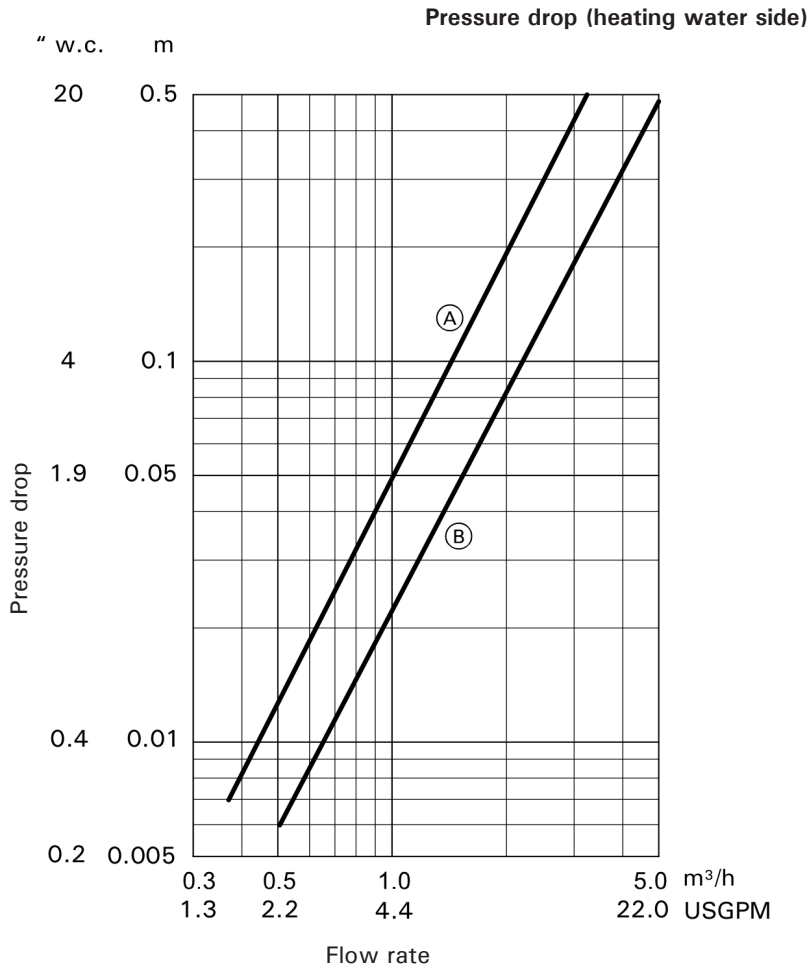
Apply sufficient amount of thread sealant when making the connections.



## CAUTION

To prevent equipment damage, install all pipework free of load and torque stresses.

Connections (continued)



Legend

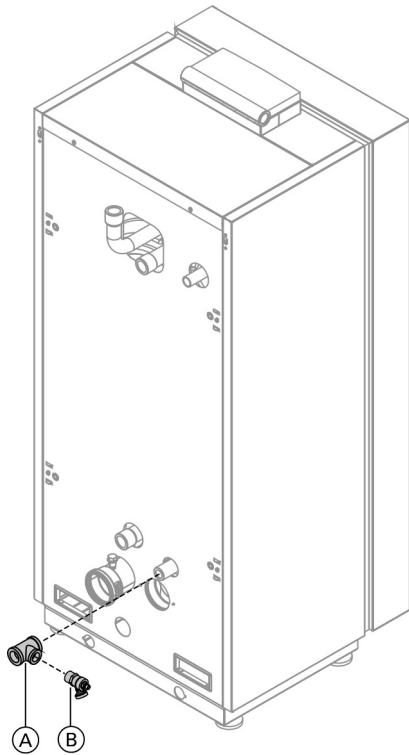
- Ⓐ Boiler models CU3A 26, 35, 94, 125
- Ⓑ Boiler models CU3A 45, 57, 160, 199

The Vitocrossal 300 is only suitable for fully pumped hot water heating systems.

Boiler models CU3A	ΔT = 20°F (10 K)	ΔT = 30°F (15 K)	ΔT = 40°F (20 K)
	Flow rate USGPM (m³/h)	Flow rate USGPM (m³/h)	Flow rate USGPM (m³/h)
26, 94	9.9 (2.2)	6.6 (1.5)	4.9 (1.1)
35, 125	13.3 (3.0)	8.9 (2.0)	6.6 (1.5)
45, 160	17.0 (3.9)	11.4 (2.6)	8.5 (2.0)
57, 199	22.7 (5.2)	15.0 (3.4)	11.4 (2.6)

**Note:** This boiler does not require a flow switch.

**Connections** *(continued)*



**Legend**

- (A) Reducing tee, 1 in. x 1 in. x 3/4 in.
- (B) Sediment faucet, 3/4 in.

**Installing drain valve**

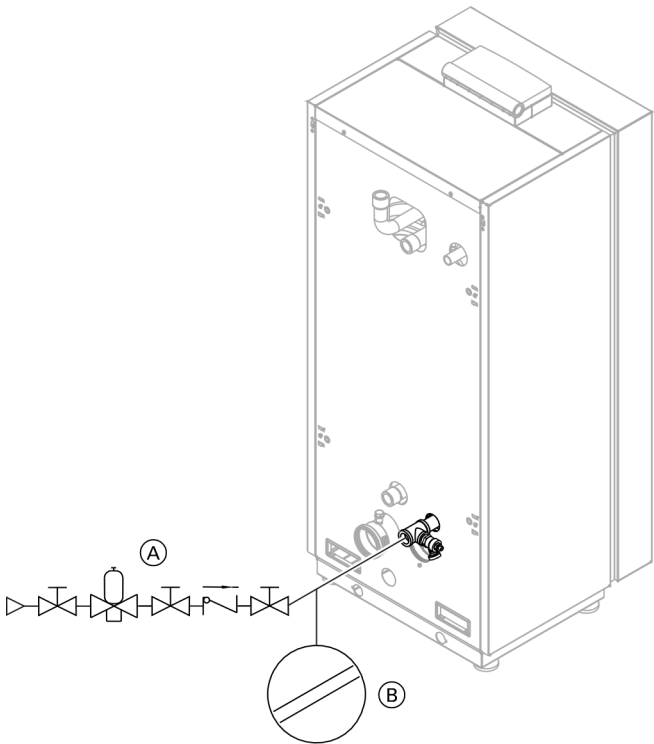
**CAUTION**

To prevent equipment damage, install all pipework free of load and torque stresses.

Install drain valve assembly as shown in the diagram.

**IMPORTANT**

Apply sufficient amount of thread sealant when making the connections.

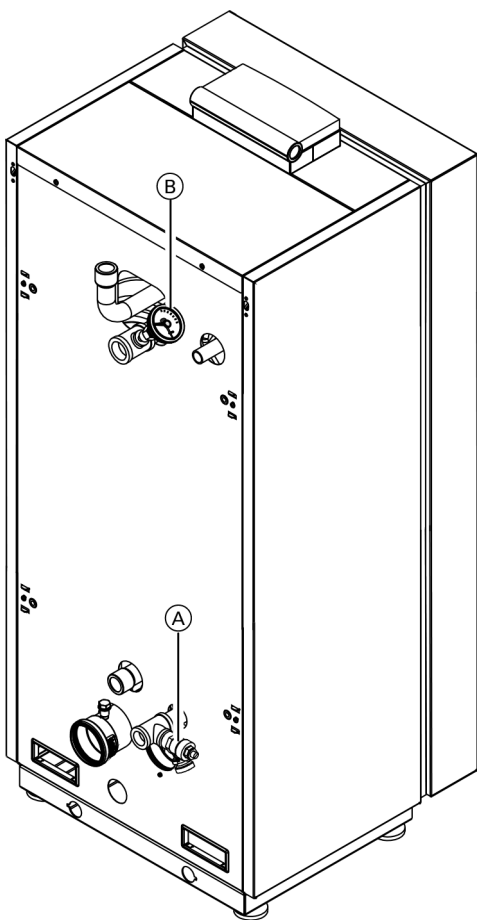


**Installing boiler fill / expansion tank**

**Legend**

- (A) Automatic fill
- (B) Precharged expansion tank

## Filling the Heating System



### CAUTION

Unsuitable fill water increases the level of deposits and corrosion, and may lead to damage to the equipment.

- Thoroughly flush the entire heating system prior to filling with water.
- Only use water of potable quality.
- The water will have to be softened if it is harder than 8.77 grains / 150 ppm total dissolved solids.
- Inhibitors or antifreeze additives suitable for heating systems may be added manually.

1. Check the pre-charge pressure of the diaphragm expansion vessel when the system is still cold.

**Note:** If the pre-charge pressure of the diaphragm expansion vessel is lower than the static pressure of the system, top up with nitrogen until the precharge pressure 1.5 to 3 psi (0.1 to 0.2 bar) is higher than the static system pressure. The static pressure corresponds to the static head.

2. Close the gas shutoff valve.

3. Open any installed shutoff valves.

4. Fill the heating system with water and vent it, until the fill pressure 1.5 to 3 psi (0.1 to 0.2 bar) is higher than the pre-charge pressure of the diaphragm expansion vessel using the boiler drain/fill valve (A).

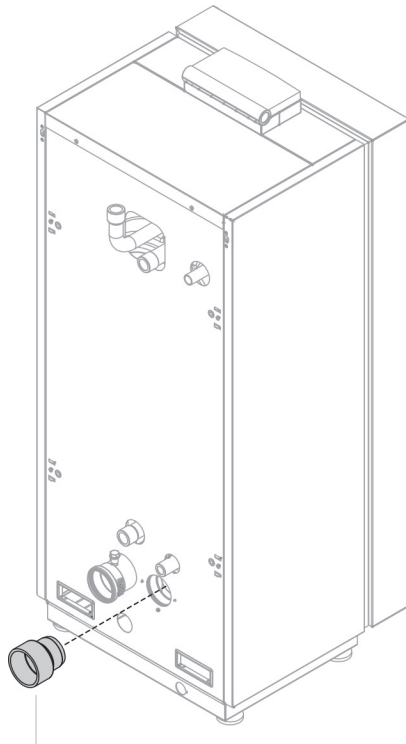
Max. operating pressure:.....30 psi (2 bar)

Min. operating pressure:.....14 psi (1 bar)

Pressure relief valve:.....30 psi (2 bar)

5. Mark the set pressure at temperature and pressure gauge (B).
6. Record the fill volume, water hardness and pH value.
7. Return the shutoff valves to their operating position.
8. Close boiler drain/fill valve (A).

## Combustion Air Connection



CPVC adaptor  
80 mm to 3 in.



Refer to the CU3A venting Installation Instructions for venting configurations and limitations.



### CAUTION

To prevent equipment damage, install all pipework free of load and torque stresses.

We recommend fitting an on-site support immediately downstream of the boiler flue connection. Connect the flue outlet to the flue pipe via the shortest possible run, with a slight rise (min. 3°). Avoid sharp bends.



See venting Installation Instructions.

Flue gas connection:

CU3A 26, 35, 94, 125: Ø 3 in. (80 mm)

CU3A 45, 57, 160, 199: Ø 4 in. (110 mm)

Combustion air connection:

CU3A 26, 35, 94, 125: Ø 3 in. (80 mm)

CU3A 45, 57, 160, 199: Ø 3 in. (80 mm)

### IMPORTANT

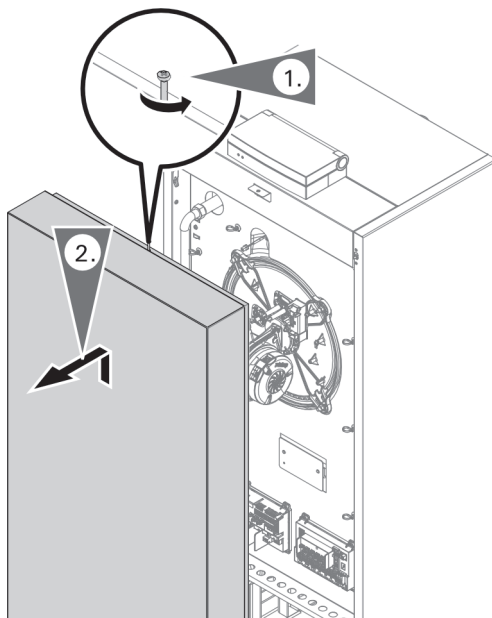
The boiler flue gas collector vent is not designed to support the weight of the venting system.



### WARNING

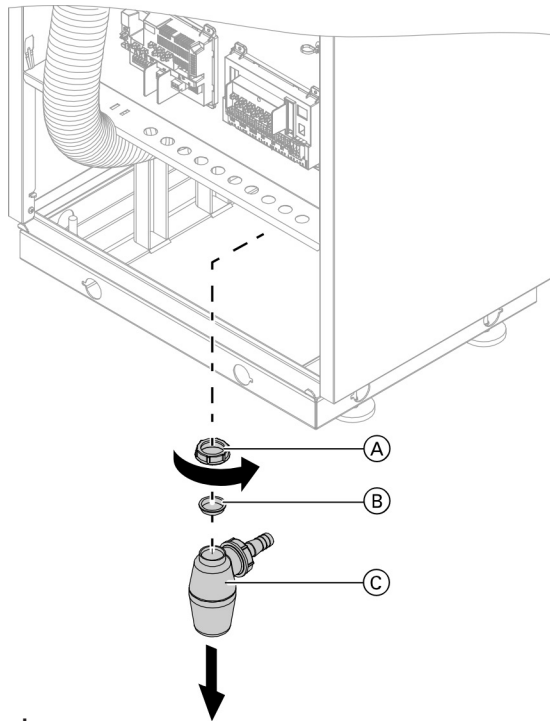
Combustion and exhaust vent pipes must not come loose. Secure the pipes using venting manufacturer's anchoring/mounting accessories for both combustion and exhaust pipes.

## Removing the Front Panel



1. Remove the retaining screw and set aside.
2. Remove boiler front panel by pulling out and lifting up off the locking tabs.

## Condensate Siphon

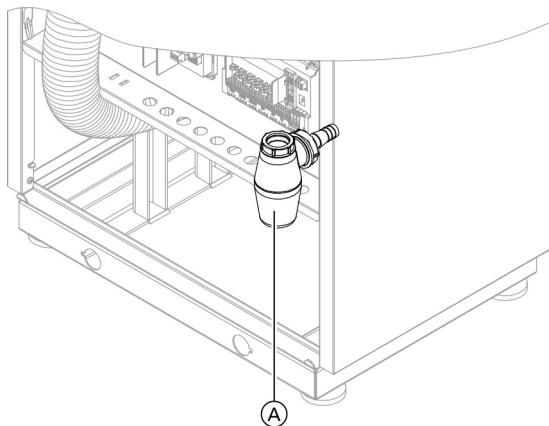


### Legend

- (A) Retaining nut
- (B) Gasket
- (C) Siphon

1. Remove the condensate siphon from the boiler.
2. Fill the siphon with water and reinstall onto the boiler.

## Condensate Connection



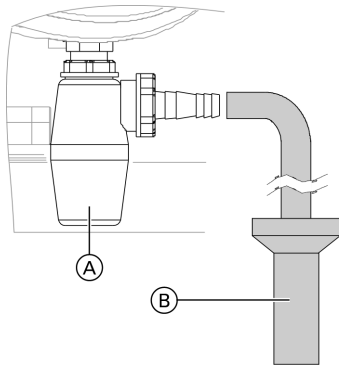
### Legend

- (A) Condensate drain (must be able to be inspected)

The Vitocrossal 300 CU3A boiler comes with a built-in condensate trap. An external trap is not required when connecting the field drain to the P-trap. Discharge tubing (field supplied) must be  $\frac{3}{4}$  in. diameter. Use CPVC, PVC or other material approved by code listed below.

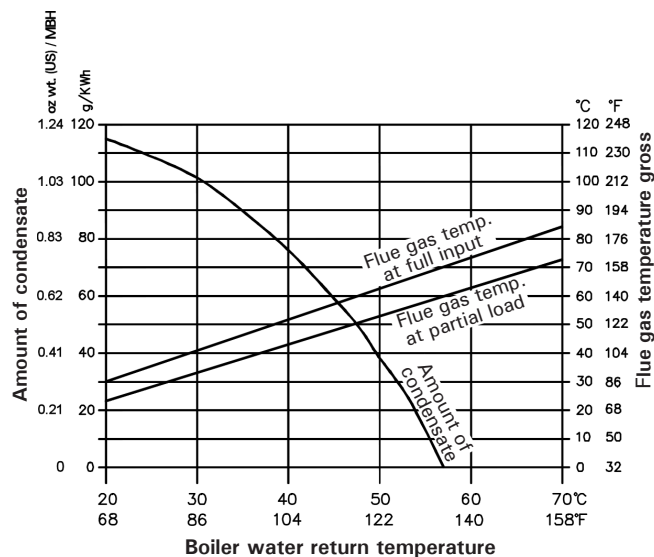
The drain pipe and fittings must conform to ANSI standards and ASTM D1785 or D2846. CPVC or PVC cement and primer must conform to ASTM D2564 or F493. In Canada use CSA or ULC listed schedule 40 CPVC or PVC drain pipe, fittings and cement.



**Condensate Connection** *(continued)***Legend**

- (A) Condensate drain (must be able to be inspected)  
 (B) Open or vented field supplied drainage system

**Note:** If the boiler is installed even with the ground, install a condensing drain above the ground max. 2 in. (50 mm).



**Note:** The 'amount of condensate' and the 'flue gas temperature gross' graphs are independent of each other.

1. Install the condensate drain pipe with a suitable gradient.
2. Discharge condensate from the boiler into the drain system, either directly or (if required) via a neutralization unit (accessory).

**IMPORTANT**

Do not connect the drain pipe from any other appliance, such as a water softener backwash pipe, to the Vitocrossal 300 CU3A condensate drain pipe.

**IMPORTANT**

Pipe ventilation must take place between the siphon trap and the neutralization unit (if applicable).

**IMPORTANT**

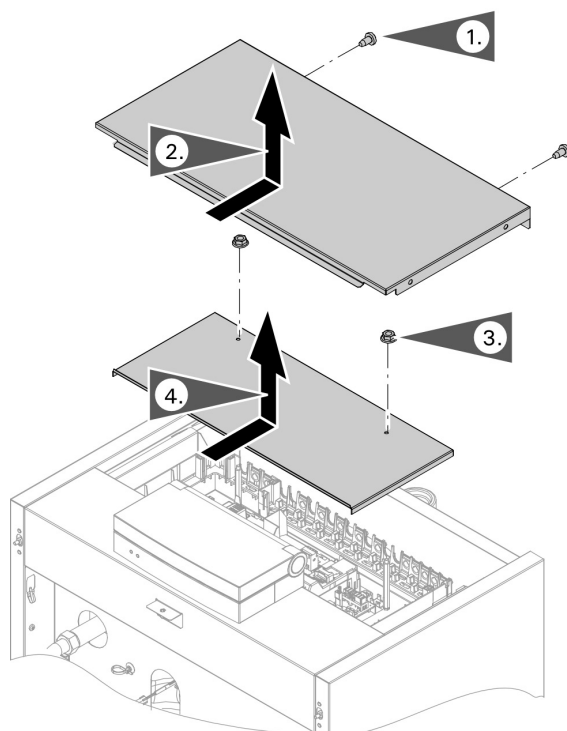
Always connect the siphon to prevent flue gas from escaping into the space.

Connection (external):  $\varnothing \frac{3}{4}$  in. (19 mm) barb fitting

The amount of condensate to be expected during the operation of the boiler and can be read from the chart.

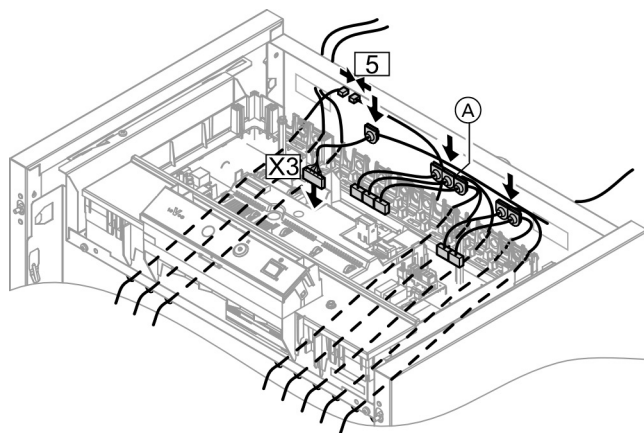
If the condensate outlet of the Vitocrossal 300 CU3A boiler is lower than the drain, a condensate pump must be installed. Select a pump which is approved for condensing boiler applications. To avoid condensate spillage, select a pump with an overflow switch. The drain connection must terminate into an open or vented drain as close to the boiler as possible to prevent siphoning of the boiler drain.

## Accessing the Control Electrical Connections Box



1. Remove the screws from the top panel and set aside.
2. Slide the top panel to the rear of the boiler and lift up.
3. Remove the retaining nuts from the control connection cover and set aside.
4. Slide the control connection cover to the rear of the boiler and lift up.

## External Cables Connections



### Legend

(A) Strain relief

### Low voltage plugs

- [1] Outdoor temperature sensor
- [2] Low loss header temperature sensor
- [5] Tank temperature sensor (in the control unit pack)
- [145] KM BUS subscriber (accessory)
  - Vitotrol 200A or 300A remote control
  - Extension kit for one heating circuit with mixing valve
  - Solar control module, type SM1

### Routing the connecting cables

**Note:** Connecting cables will be damaged if they touch hot components. When routing and securing power cables on site, ensure that the maximum permissible temperatures for these cables are not exceeded.

### Connecting External Cables



For information on accessory connection, observe the separate installation instructions provided with the accessories.

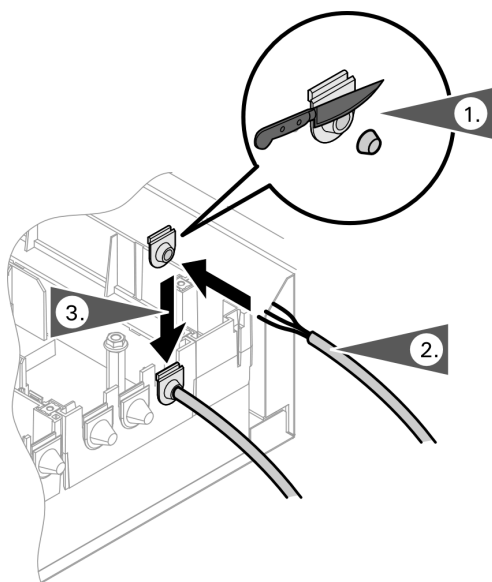
### 120V ~ plugs

- [20] Heating circuit pump  
Rated voltage: .....120V ~  
Rated current: .....max. 2A ~
- [21] Circulation pump for tank heating  
Rated voltage: .....120V ~  
Rated current: .....max. 2A ~
- [28] DHW circulation pump  
Rated voltage: .....120V ~  
Rated current: .....max. 2A ~
- [40] Power supply



### WARNING

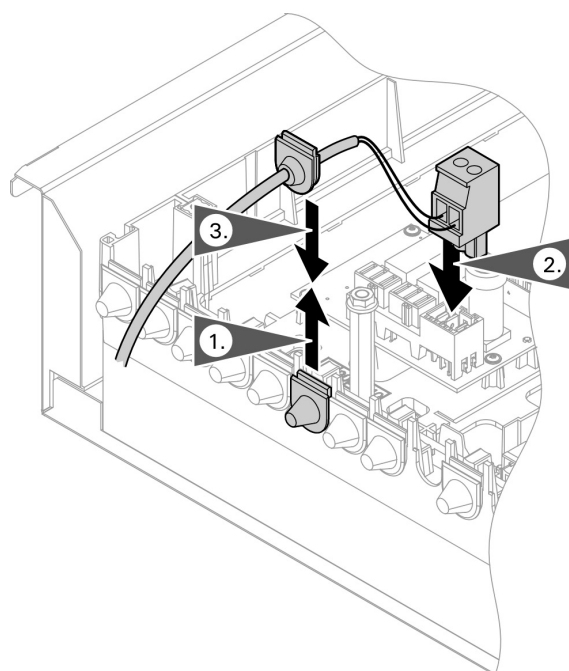
Incorrect core allocation can cause severe injury and can damage the appliance. Never interchange cores "L" and "N".

**External Cables Connection** *(continued)***Applying strain relief**

On-site cables

1. Cut the tip from the rubber cable restraint.
2. Feed the cable through the rubber cable restraint.
3. Install the cable restraint with cable into the connection housing.

Strip up to 4 in. (100 mm) of insulation from the cables.

**Cables with moulded strain relief**

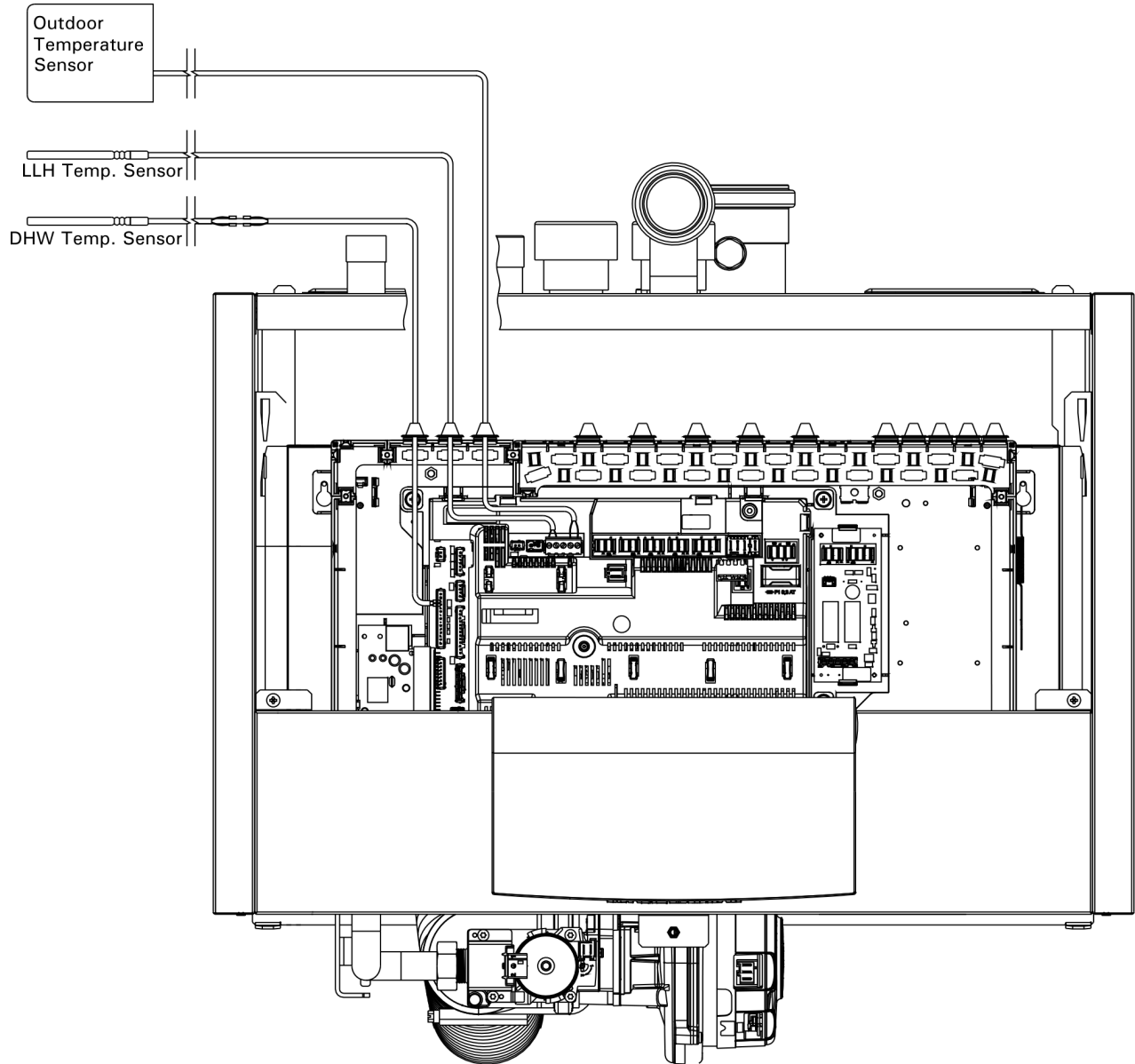
1. Remove the rubber strain relief from the connection housing and discard.
2. Install the plug into the counter plug on the control board.
3. Install the cable's strain relief into the vacant mount of the connection housing.

## Temperature Sensors Overview

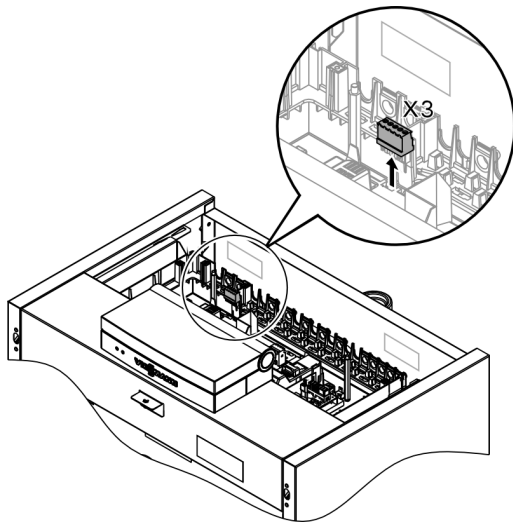
### Control base - External sensor connections

**Note:** See wiring diagram on page 57 for connection to the external accessory connection box.

Route cables through the openings provided at the top left or top right of the rear boiler panel.

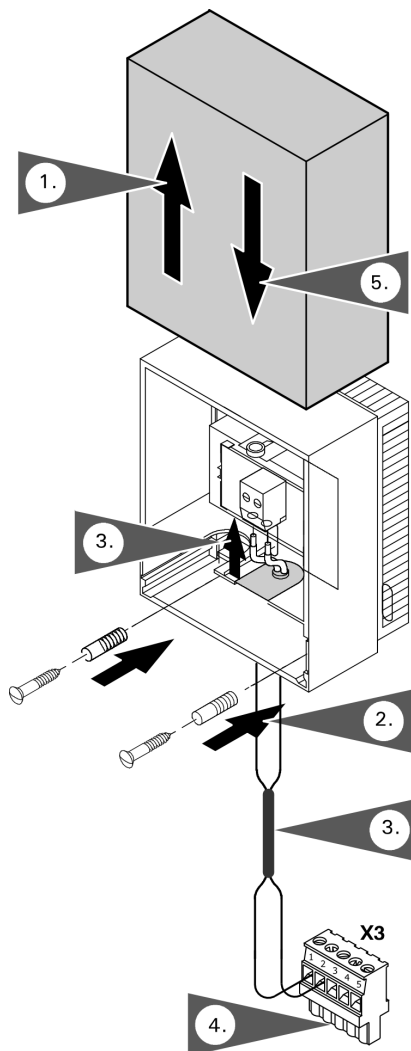


## Accessing the X3 Plug



1. Remove the X3 plug from the control board. Attach sensors and reinsert the X3 plug. Refer to the following sensor information.
2. Reinstall the control cover.

## Connecting the Outdoor Temperature Sensor



1. Remove cover of outdoor temperature sensor.
2. Mount wall-mount base (cable entry must point downward).

### IMPORTANT

The outdoor temperature sensor should be mounted 6.6 to 8.2 ft. (2 to 2.5 m) above ground level on the north or northwest wall of the building. In case of a multi-storey building, mount outdoor temperature sensor in the upper half of the second floor.

Ensure that sensor is not located above windows, doors and air vents, or immediately underneath a balcony or gutter.

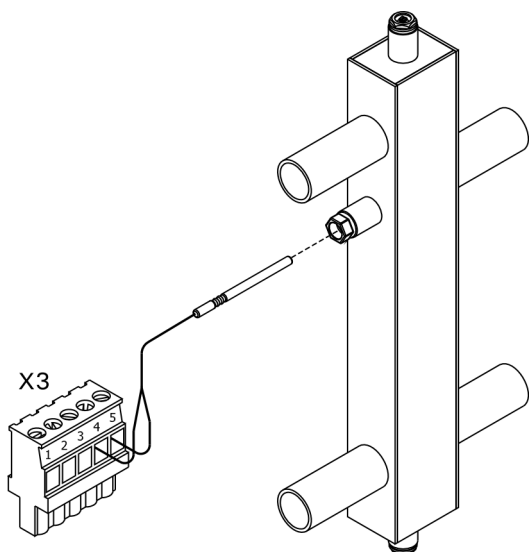
The outdoor temperature sensor must not be covered by plaster. If mounting on an unplastered wall, make allowances for thickness of plaster or remove sensor before plastering wall.

3. Route cable from the boiler control board to the outdoor sensor. Connect cable to sensor terminals (wires are interchangeable).  
Cable specifications:  
2-wire cable, max. cable length 115 ft. (35 m) with a wire size of min. AWG 16 copper.
4. Connect the outdoor temperature sensor to terminals X 3.1/X3.2 on the boiler control board (wires are interchangeable).

### IMPORTANT

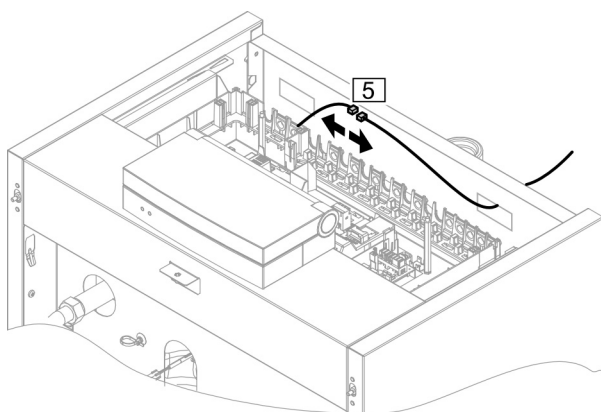
Cable to the outdoor sensor must not be laid near line voltage wiring (120/240V).

## Connecting the Low-loss Header Sensor



1. Connect the low-loss header sensor (if used) to terminals X3.4/X3.5 on the boiler control board.
2. Route the sensor to the low loss header and install into the sensor well.

## Connecting the DHW Sensor



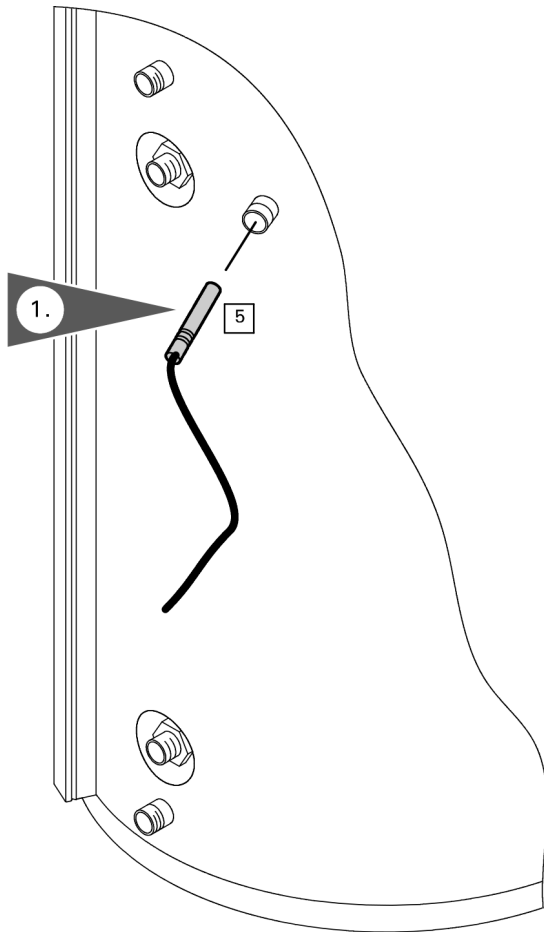
### Connecting DHW sensor

1. Attach the DHW sensor to the quick connect plugs provided from the boiler control board.



Install DHW tank temperature sensor as described in the Vitocell Installation Instructions supplied with the DHW storage tank.

## Connecting the DHW Sensor *(continued)*



### DHW storage tank information

The DHW water tank sensor [5] is required when using a stand-alone DHW storage tank with the Vitocrossal 300 CU3A heating boiler. It comprises the sensor only required for the connection of a stand-alone tank. All other required piping connections are field supplied.



See Vitocrossal 300 CU3A Service Instructions for applicable system coding information.

### IMPORTANT

Apply sufficient amount of thread sealant (supplied) when making the connections.

### Making the DHW connections

1. With a Vitocell 100 and 300 series tanks locate the DHW temperature sensor well and install the DHW temperature sensor [5] using the installation instructions provided with the DHW storage tanks.

### IMPORTANT

Follow the Installation Instructions supplied with the Viessmann DHW storage tank when mounting and securing DHW tank temperature sensor [5].

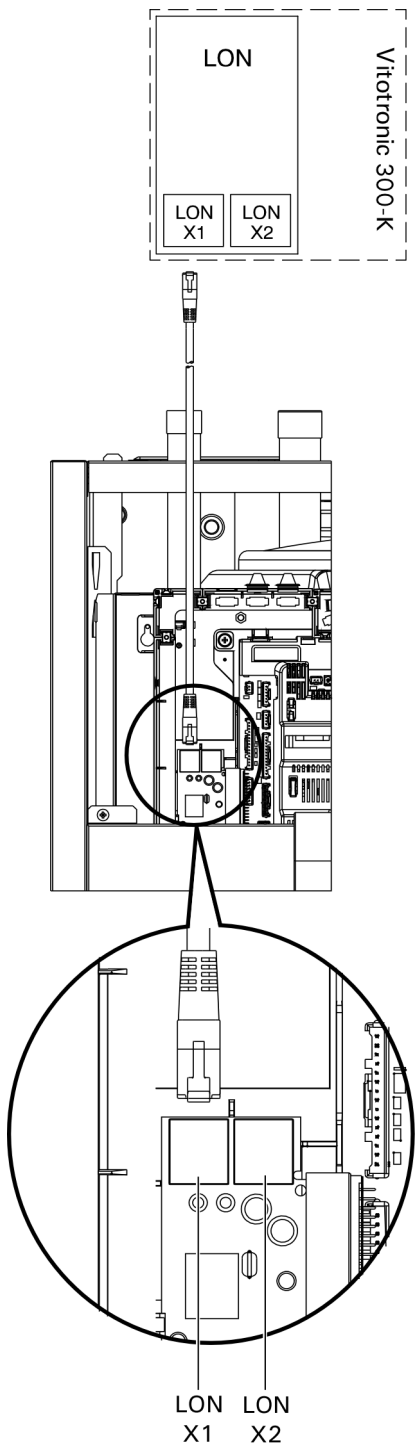


### WARNING

If a DHW storage tank other than a Viessmann Vitocell 100 or 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.



Installing the LON Communication Module



**Boiler LON communication module**

The boiler comes with a LON communication module pre-installed.

**Connecting the LON module cable**



Refer to the Vitocrossal 300 CU3A Service Instructions for details on LON connections.



See the Vitotronic 200-H HK1B Installation Instructions.

# Connections

## Legend

- (A) Integrate EA1 module
- (B) Power/Pump connection interface

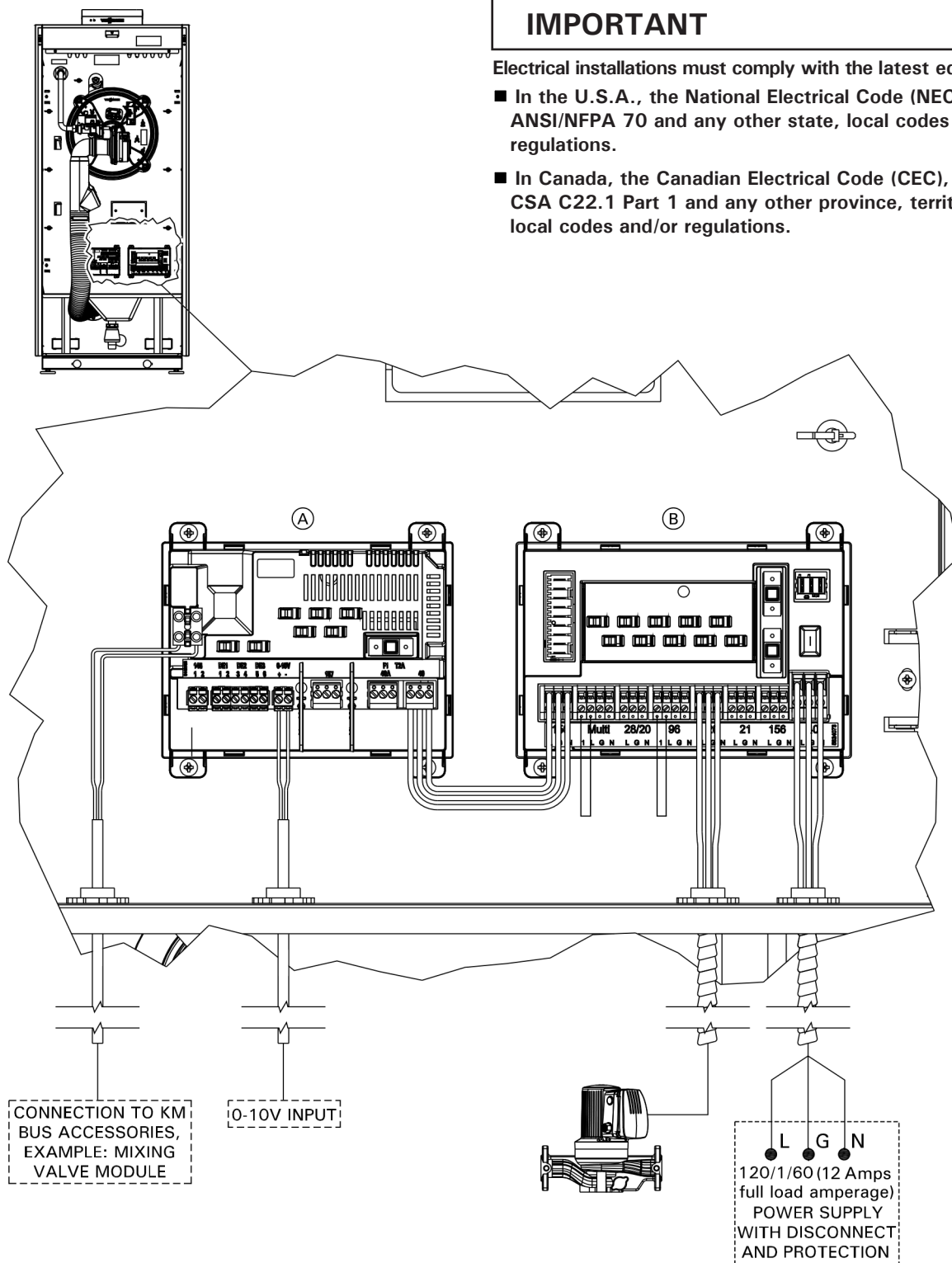
## External accessory connection overview

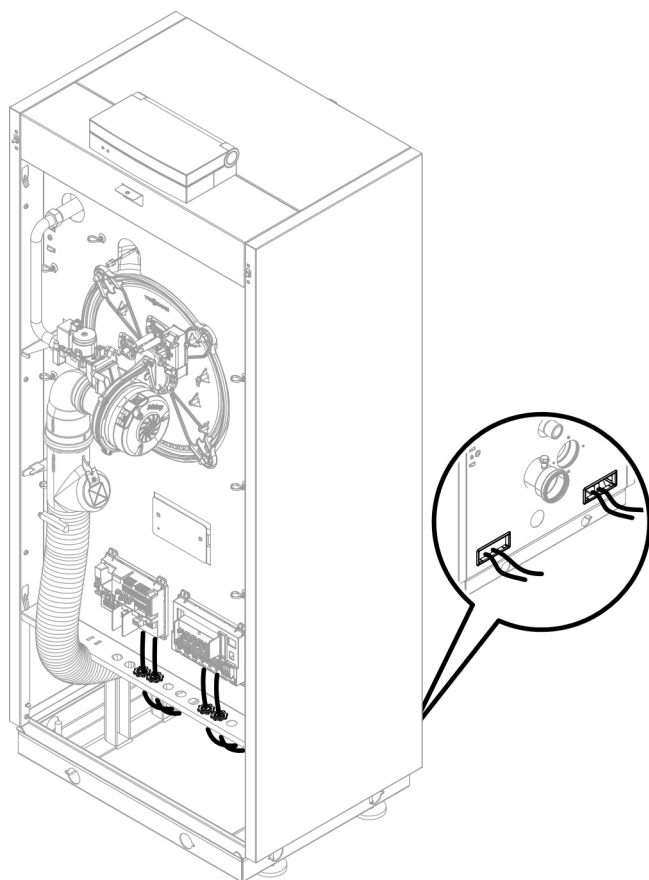
**Note:** See wiring diagram on page 57 for connection to the control base.

## IMPORTANT

Electrical installations must comply with the latest edition of:

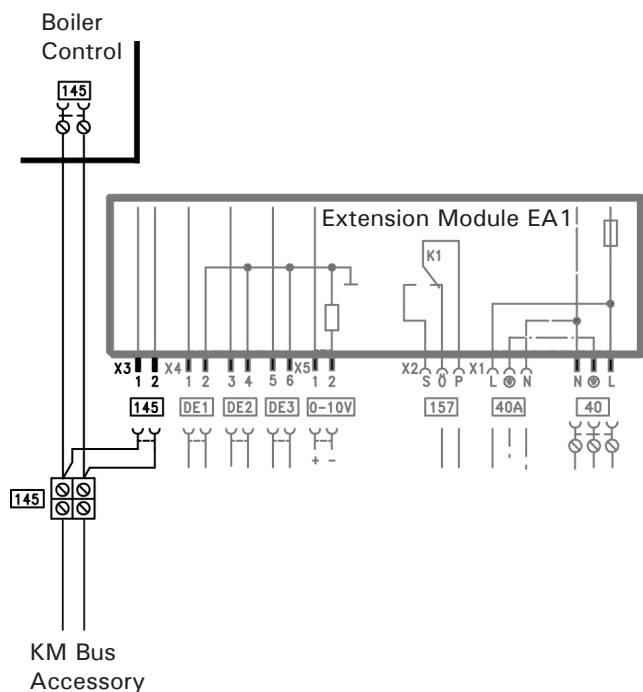
- In the U.S.A., the National Electrical Code (NEC), ANSI/NFPA 70 and any other state, local codes and/or regulations.
- In Canada, the Canadian Electrical Code (CEC), CSA C22.1 Part 1 and any other province, territory, local codes and/or regulations.



**Connections** *(continued)***Routing power/pump accessory cables**

Route cables from the accessory connection modules underneath through the boiler frame and out the openings in the back of the jacketing.

**Note:** Connecting cables will be damaged if they touch hot components. When routing and securing power cables on site, ensure that the maximum permissible temperatures for these cables are not exceeded.

**Accessory kit for zone circuits or heating circuit with mixing valve connections**

The mixing valve controller kit can only be used with wall-mounted gas-fired hot water heating boilers and a weather-responsive control (it can be used as an alternative for a Vitotronic control HK1B).

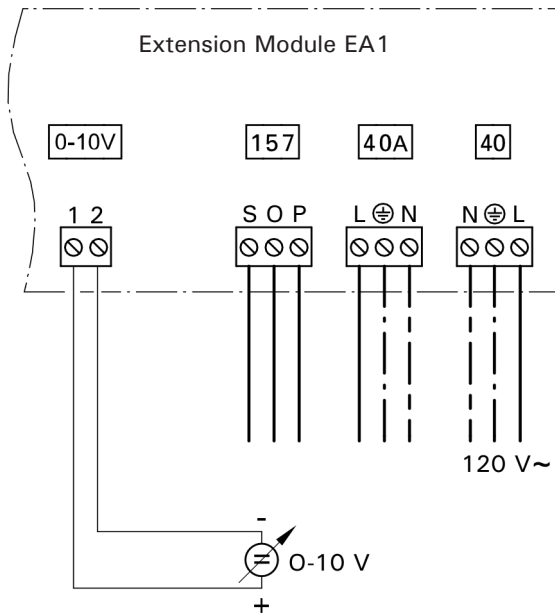


For details on coding and connection to the control, refer to the Vitocrossal 300 CU3A Service Instructions.



For details on installation, refer to the accessory kit Installation Instructions.

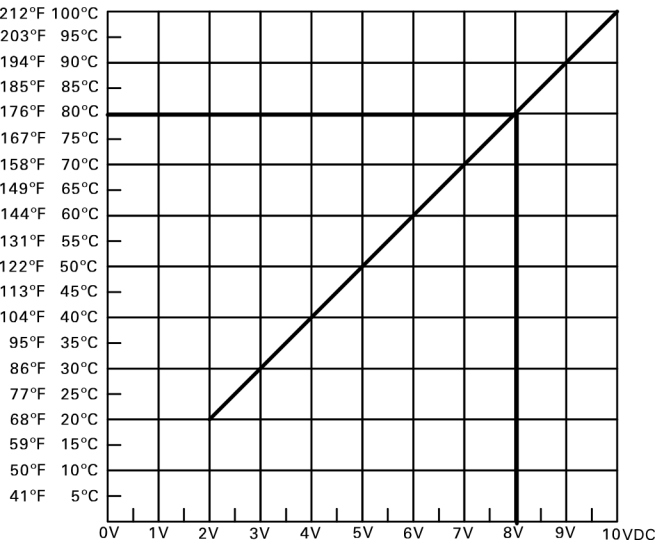
**Connections** *(continued)*



**Connecting to extension module EA1**

1. Connect the external 0-10V signal to plug 0-10V located in the extension module EA1.
2. Ensure correct polarity.
3. See chart for maximum possible boiler water temperature and required signal.

Example: Voltage to temperature setpoint  
8VDC = 176°F (80°C)



**Connections** *(continued)***Connecting a 24 VAC Thermostat**

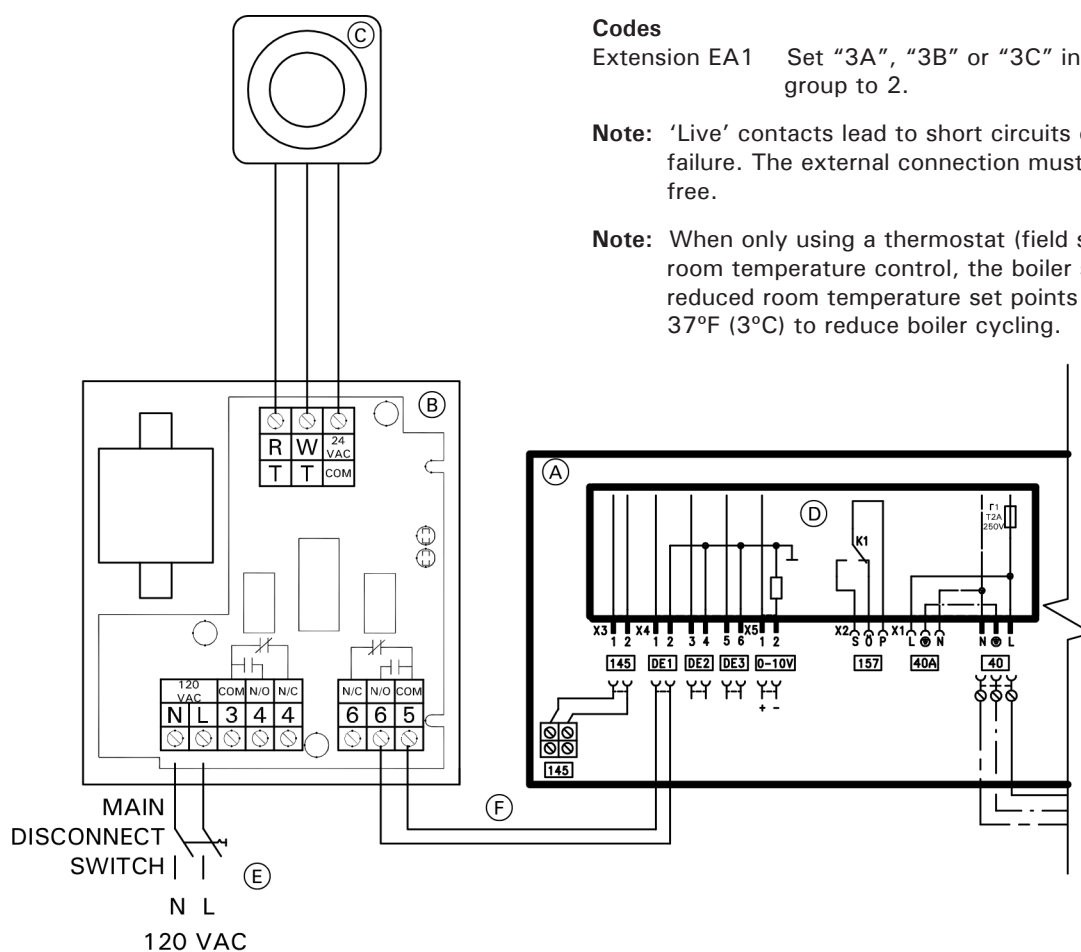
1. Connect normally open dry contact of the switching relay ('T-T' contact) to terminal DE1, DE2 or DE3 of the EA1 module located in the boiler electrical junction box.
2. Connect switching relay to thermostat and power supply as per manufacturers instructions. When the thermostat contact is closed, burner operation is load-dependent. The supply water is heated to the value set in the coding address "9b" in the "General" group of the boiler. The supply water temperature is limited by this set value and the electronic supply temperature maximum limit.

**Codes**

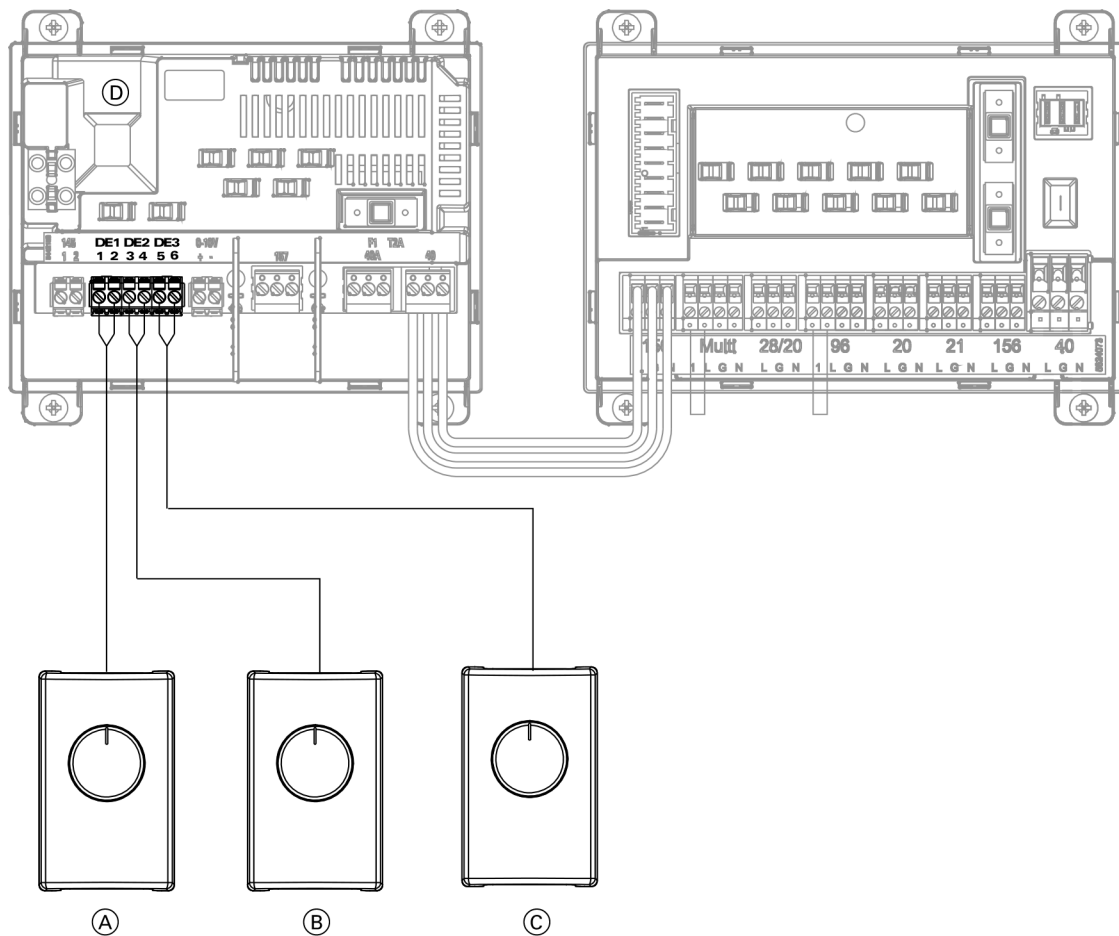
Extension EA1 Set "3A", "3B" or "3C" in the "General" group to 2.

**Note:** 'Live' contacts lead to short circuits or phase failure. The external connection must be potential-free.

**Note:** When only using a thermostat (field supplied) for room temperature control, the boiler standard and reduced room temperature set points may be set to 37°F (3°C) to reduce boiler cycling.

**Legend**

- (A) Boiler electrical junction box
- (B) Switch relay (ie Taco SR501, Honeywell RA889A-1001, field supplied)
- (C) 24VAC room thermostat (field supplied)
- (D) Internal EA1 module
- (E) 120VAC power supply for switching relay (refer to manufacturers instructions)
- (F) Dry contact connection from switching relay (to boiler 'T-T')

**Connections** *(continued)***Legend**

- Ⓐ Room thermostat (dry contact) zone circuit 1
- Ⓑ Room thermostat (dry contact) zone circuit 2
- Ⓒ Room thermostat (dry contact) zone circuit 3
- Ⓓ EA1 module (integrated into the boiler)

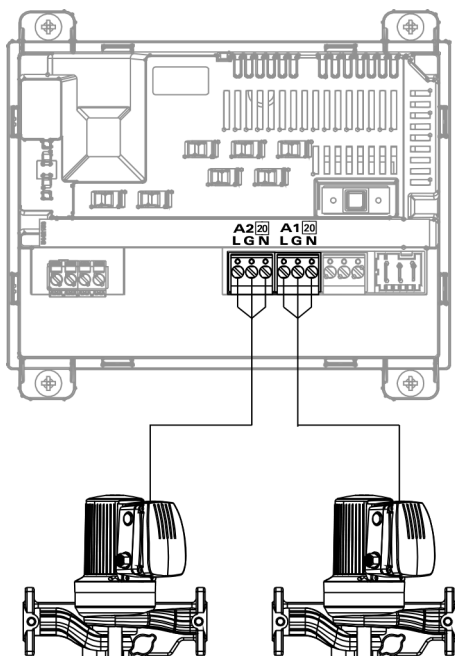
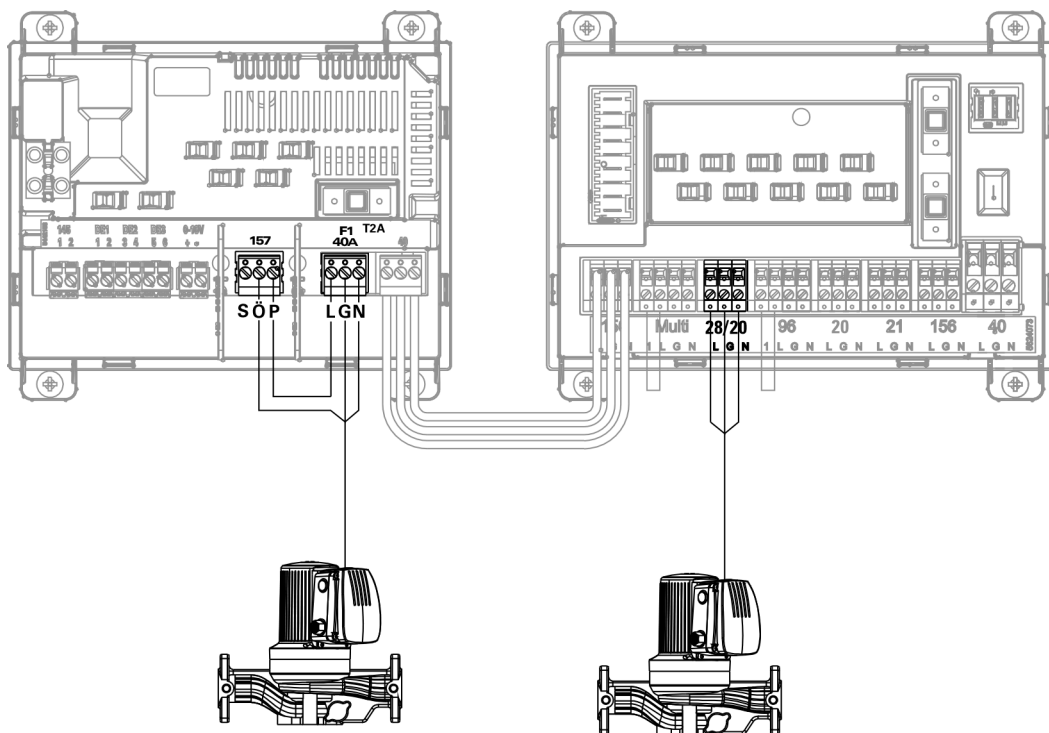
**Connections** *(continued)***Connection to boiler**

Pump output assignment is done using the start-up wizard.

A maximum of 2 zone circuit pumps can be connected to the boiler additional pumps will require the use of an AM1 extension module.



Refer to the AM1 extension module Installation Instructions for additional details.

**Connection at AM1 (accessory)**

Pump output assignment is done using the start-up wizard.



Refer to the boiler Service Instructions for start-up instructions.



**Connections** *(continued)***Function**

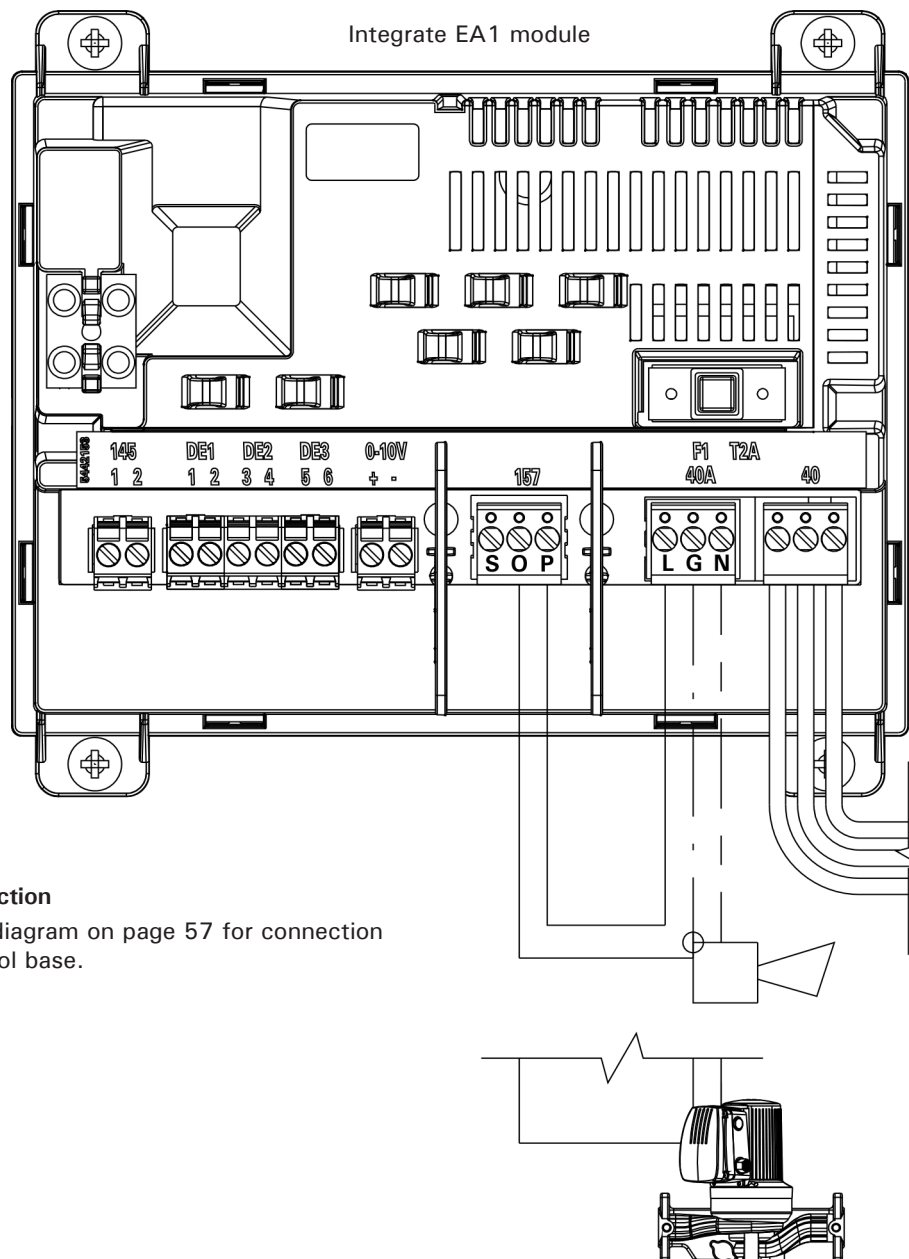
The **157** output is a programmable function output and may be coded for only one of the following functions;

- alarm output
- DHW recirculation pump
- field pump
- zone circuit pump



Refer to the Vitocrossal 300 CU3A Service Instructions for applicable coding.

**Note:** Maximum output 2 FLA

**Legend**

**157** output connection

**Note:** See wiring diagram on page 57 for connection to the control base.

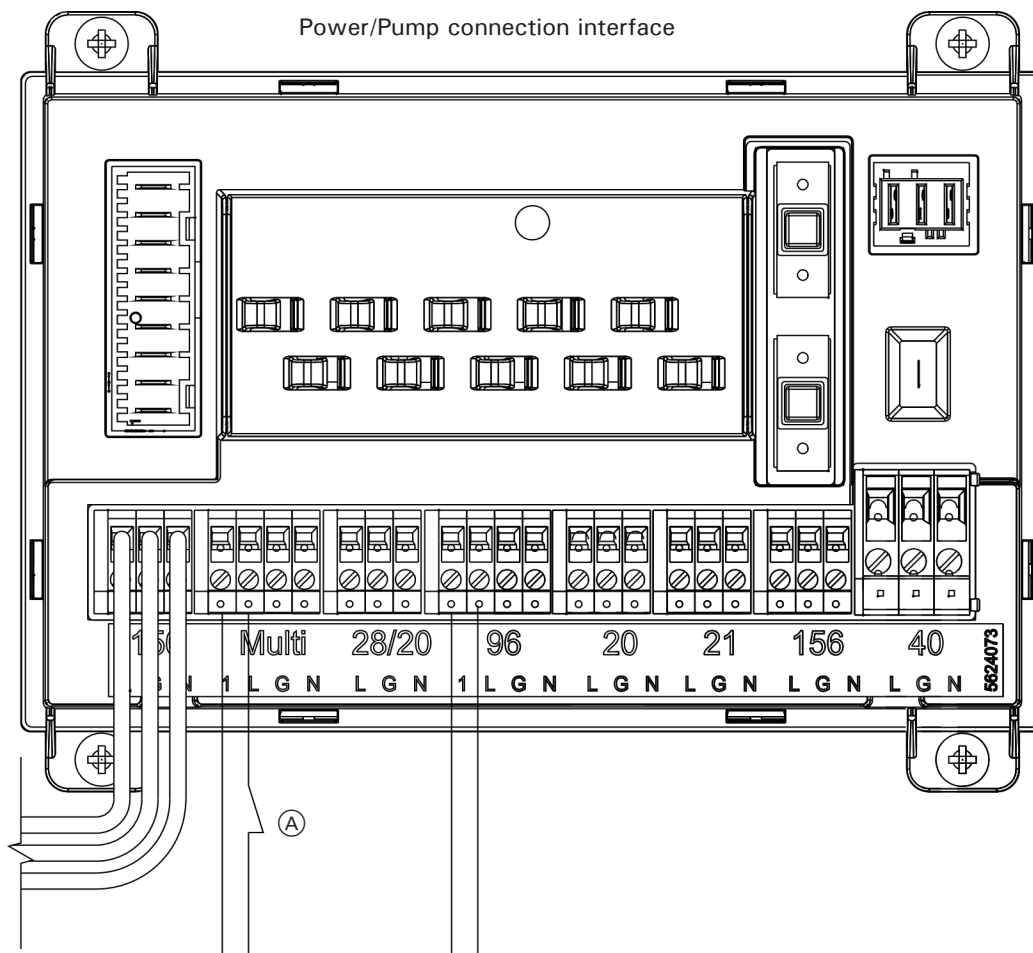
**Connections** *(continued)***Multi connection**

Normally closed safety connection (A).

Remove jumper (not shown) to install a field supplied normally closed relay.

**IMPORTANT**

The relay must be rated for 120VAC 5 FLA

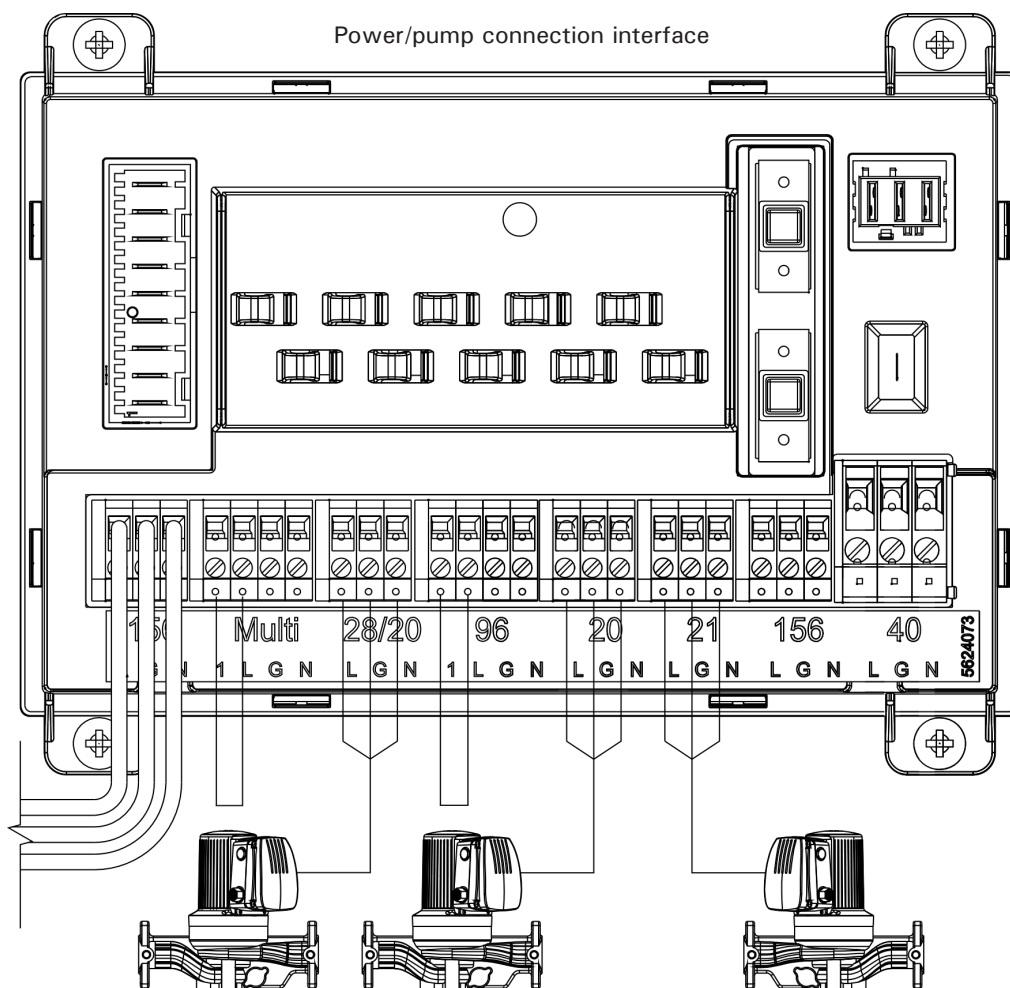
**Legend****Multi connection**

**Note:** See wiring diagram on page 53 for connection to the control base.

**Connections** *(continued)***Pump connection**

**Note:** See wiring diagram on page 57 for connection to the control base.

**Note:** Maximum pump draws 2 FLA each. All 120VAC outputs must not exceed 6 FLA.

**Legend**

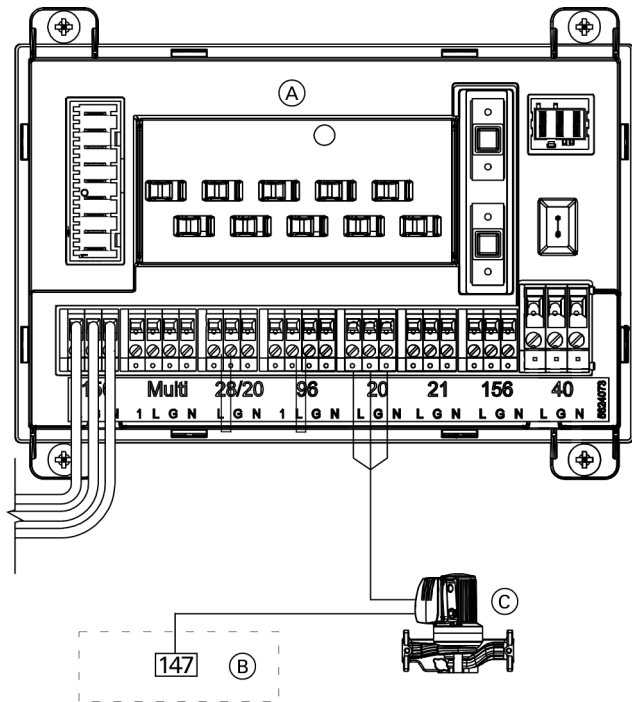
- 20 Boiler pump/heating circuit A1 pump / zone circuit pump
- 21 DHW pump
- 28/20 DHW recirculation pump (see service manual)

Connections *(continued)*

Pump modulation connection (0-10VDC)

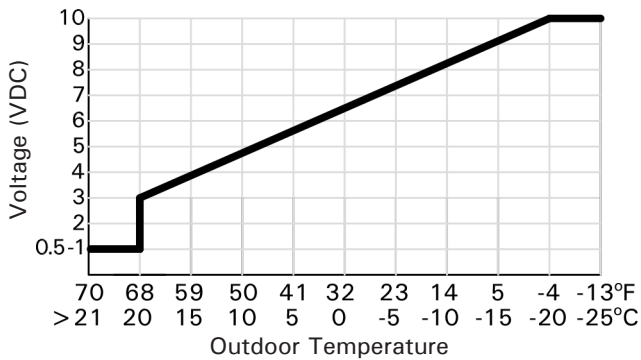
Pump modulation signal can only be applied to output 20 when used as heating circuit pump A1.

**Note:** See wiring diagram on page 57 for connection to the control base.



Legend

- (A) Power/pump connection interface
- (B) CU3A Boiler Control
- (C) Variable speed pump with 0-10VDC input signal for pump modulation



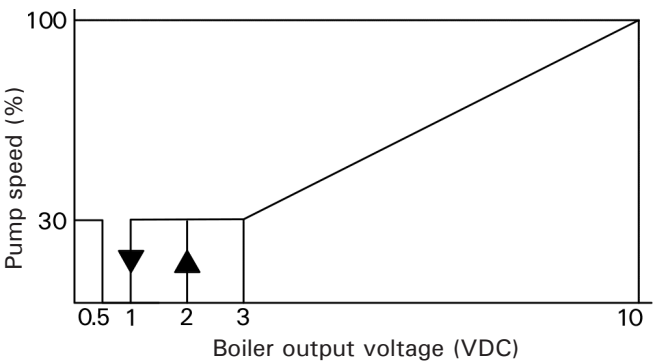
The chart is based on coding address E6 adjusted to 100.

**Note:** Minimum pump modulation rate 30% (3VDC).

Relevant Coding Address	
A3	Heating circuit pump logic based on outdoor temp.
A5	Heating circuit pump logic based on outdoor temperature relevant to room temperature setpoint
B5	Heating circuit pump logic based on outdoor temperature relevant to room temperature setpoint using room temperature feedback
E5	Heating circuit A1 pump modulation signal activation - allowing access to coding addresses E6 thru E9 make required adjustments to addresses E6 thru E9 and return coding address E5 to 0, Leaving coding address E5 set to 1 will generate the C7 fault
E6	Set pump maximum speed up to 100%
E7	Set pump min. speed (min. pump speed is 30%)
E8	Force pump to operate at minimum pump speed (address E9) during reduced heating mode operation
E9	Min. pump speed during reduced heating operation

Setting of address A3, A5, and B5 will determine shut off point for pump based on outdoor temperature and/or room temperature set point.

Pump speed control based on the Wilo-Stratos PARA.

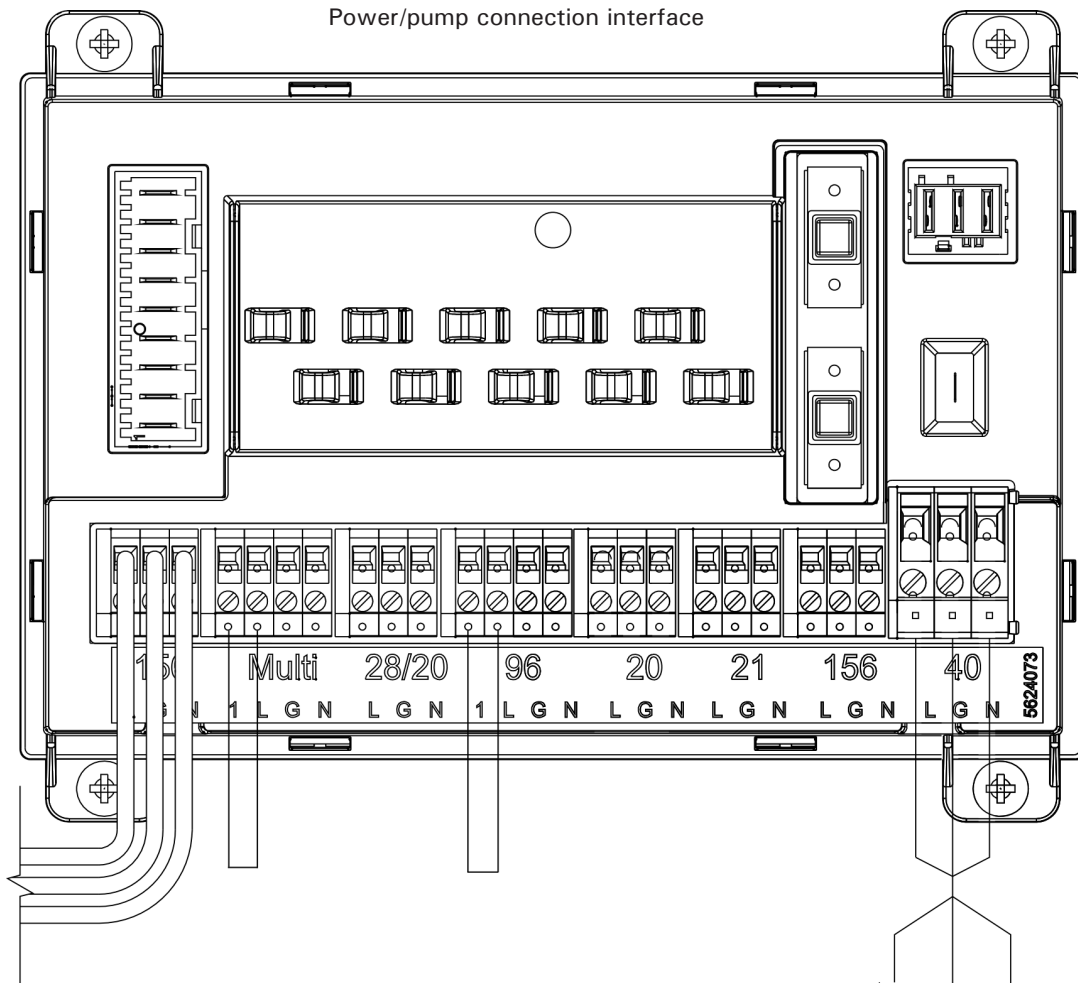


Voltage level	Description	Pump speed
0V to 0.5V	Cable break detected pump runs on lowest speed	30%
0.5V to 1V	Pump standby	0%
1V to 3V	Pump runs at lowest speed	30%
2V to 3V	Pump runs at Lowest speed (pump startup)	30%
3V to 10V	Linear speed presetting between lowest and highest speed	30%-100%

# Connections *(continued)*

## Boiler power supply connection

**Note:** See wiring diagram on page 57 for connection to the control base.



## IMPORTANT

Electrical installations must comply with the latest edition of:

- In the U.S.A., the National Electrical Code (NEC), ANSI/NFPA 70 and any other state, local codes and/or regulations.
- In Canada, the Canadian Electrical Code (CEC), CSA C22.1 Part 1 and any other province, territory, local codes and/or regulations.



## WARNING

Incorrectly executed electrical installations can lead to injuries from electrical current and result in appliance damage.

DISCONNECT AND PROTECTION

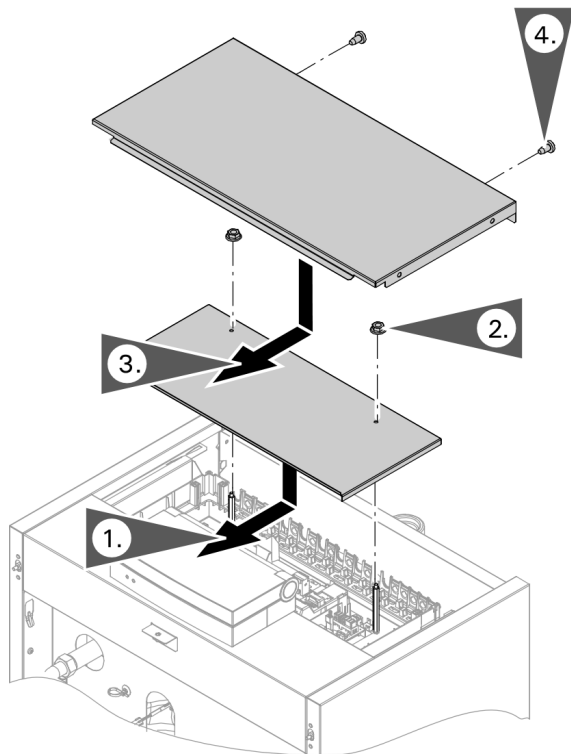


## WARNING

If system components are not grounded, serious injury from electric current can result if an electrical fault occurs.

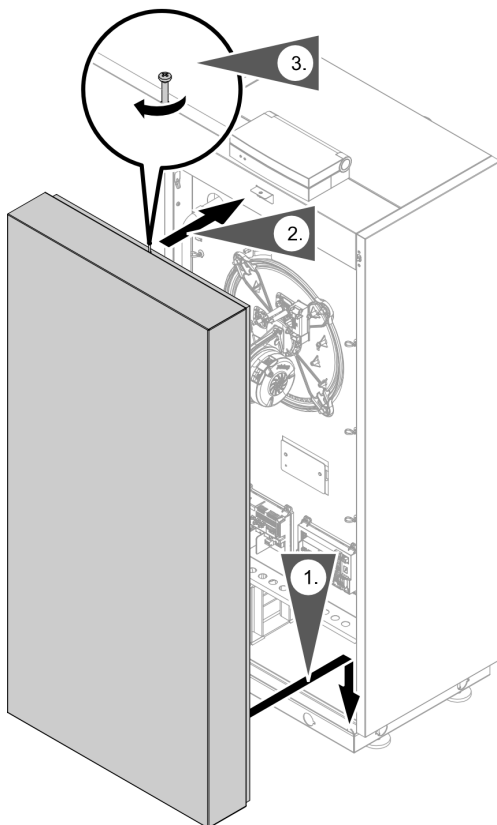
Connect the appliance and pipework to the equipotential bonding of the building in question.

## Fitting the Top Panels



1. Place the control cover on the control connection housing and slide into place.
2. Install previously removed nuts onto the threaded studs.
3. Place the top jacket panel on the top of the boiler and slide in place.
4. Fasten the panel with the previously removed retaining screws.

## Fitting the Front Panel



1. Place the front cover onto the locating pegs.
2. Push the top of the panel in place.
3. Secure in place with the retaining screw.

## General

The schematics on the following pages are to be seen as guidelines only. They further do not display all system varieties, safety devices, or concepts possible. Specific system layouts may be further discussed with the local Viessmann sales representative office.

### Clearances

A minimum of 2 in. (51 mm) circumferential clearance from non-insulated hot water pipes to combustible construction must be maintained. In cases where the pipes are insulated with pipe insulation of appropriate and sufficient thickness and insulation values, the above clearance may be reduced to 0 in. (refer to local gas codes).



### CAUTION

For underfloor heating applications, an additional immersion or strap-on aquastat must be installed in the low temperature underfloor loop (downstream of the mixing valve) to de-energize the pump and/or boiler to prevent overheating. High water temperatures can damage concrete slabs.

### IMPORTANT

The examples on the following pages depict possible piping layouts of the Vitocrossal 300 CU3A boiler equipped with Viessmann System Technology. For boiler and tank combinations, please install only feasible combinations listed in the Viessmann Price List.

Please note that the following examples are simplified conceptual drawings only!  
Piping and necessary componentry must be field verified.  
A low water cut-off (LWCO) must be installed where required by local codes.  
Proper installation and functionality in the field is the responsibility of the heating contractor.



### WARNING

If a DHW storage tank other than a Viessmann Vitocell 100 or 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with the original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.

### IMPORTANT

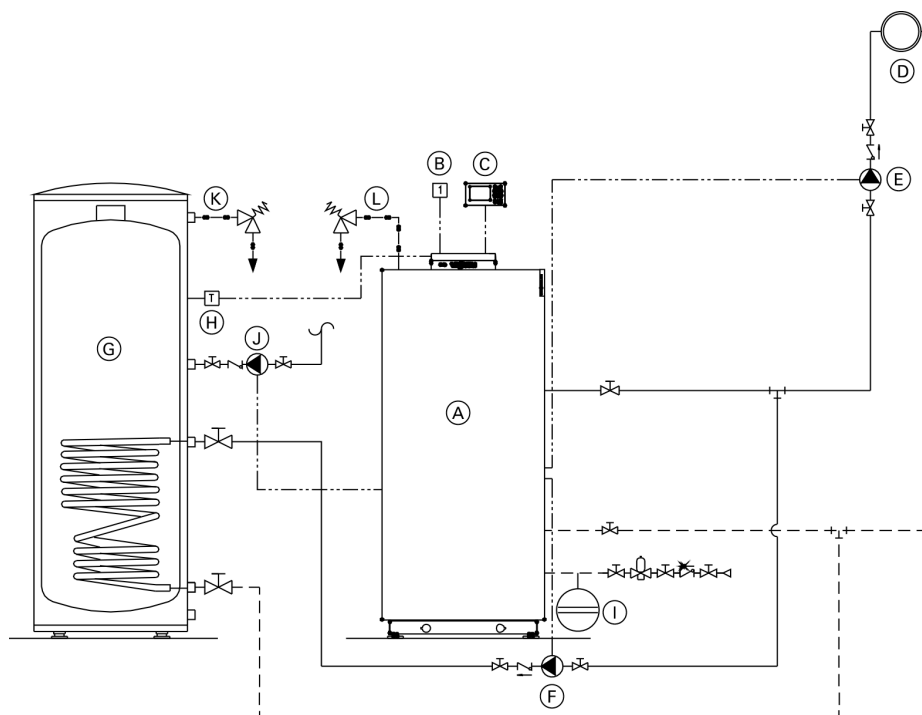
DHW supply and return piping between boiler DHW connections and the Viessmann DHW tank connections, shall be a minimum of 1 ¼ in. pipe size. This will ensure the residual head of the field supplied pump is fully utilized to overcome the resistance of the DHW heat exchanger coil and to provide sufficient water flow to the boiler heat exchanger.

In non-Viessmann DHW tank applications, perform, in addition to the above, accurate calculations for DHW tank coil pressure drop versus boiler pump (field supplied) residual head to ensure sufficient water flow to the boiler heat exchanger. Failure to heed the above instructions may cause boiler short-cycling and inadequate DHW supply.

**Note:** In the following piping layout examples all pumps are field supplied.

# System Layout 1

Vitocrossal 300 CU3A with a direct-connected heating circuit



## Legend

- (A) Vitocrossal 300 CU3A boiler with Vitotronic 200, KW6B outdoor reset control
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Heating circuit
- (E) Heating circuit pump [20]
- (F) DHW pump [21]
- (G) DHW storage tank
- (H) DHW tank temperature sensor [5]
- (I) Expansion tank
- (J) DHW recirculation pump [28/20] \*
- (K) Temperature and pressure relief valve
- (L) Pressure relief valve
- \* Function based on coding of address 53

## Installation of ...

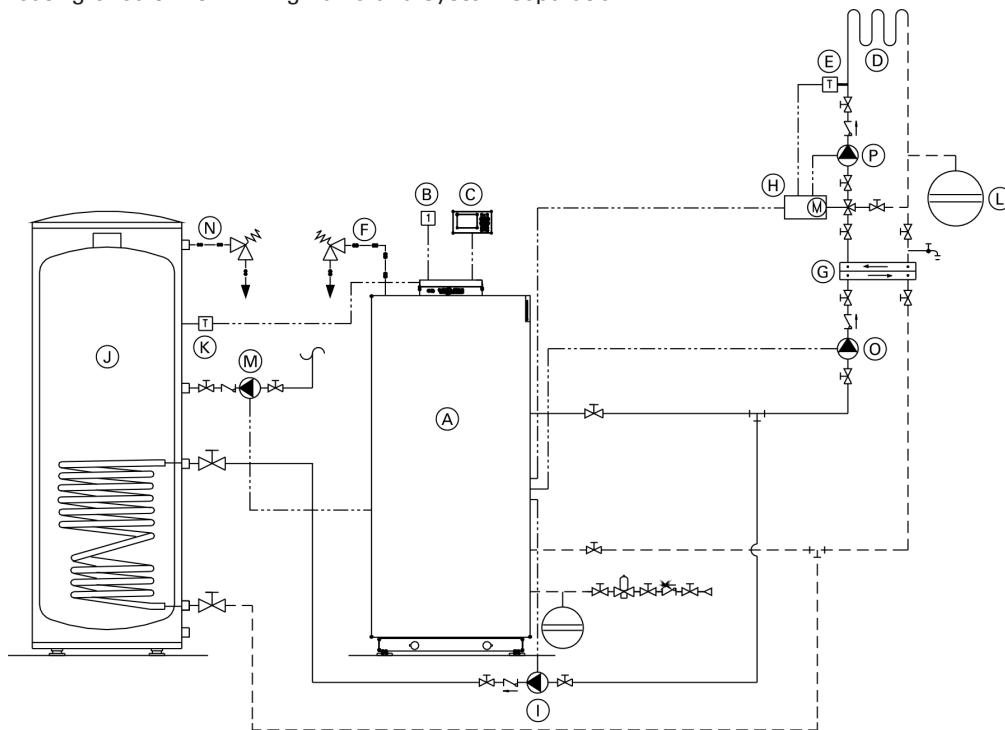
- radiator heating circuit (high-temp. circuit)
- DHW production



## System Layout 2

Vitocrossal 300 CU3A with...

- DHW storage tank
- one heating circuit with mixing valve and system separation



### Legend

- (A) Vitocrossal 300 CU3A boiler with Vitotronic 200, KW6B outdoor reset control
- (B) Outdoor temperature [1]
- (C) Vitotrol remote (optional)
- (D) Underfloor heating circuit
- (E) Mixing valve temperature sensor [2]
- (F) Pressure relief valve
- (G) Plate heat exchanger for system separation
- (H) Accessory kit for heating circuit with mixing valve
- (I) DHW circulating pump [21]
- (J) DHW storage tank
- (K) DHW tank temperature sensor [5]
- (L) Expansion tank
- (M) DHW recirculation pump [28/20] \*
- (N) Temperature and pressure relief valve
- (O) Heating circuit pump [20]
- (P) Heating circuit pump

\* Function based on coding of address 53

Installation of ...

- underfloor heating circuit with 3-way mixing valve and system separation (low-temp. circuit)
- DHW production

### IMPORTANT

**System separation is required of underfloor heating systems employing non-oxygen diffusion barrier tubing. All components on the secondary side of the heat exchanger must be made of corrosion-resistant materials.**

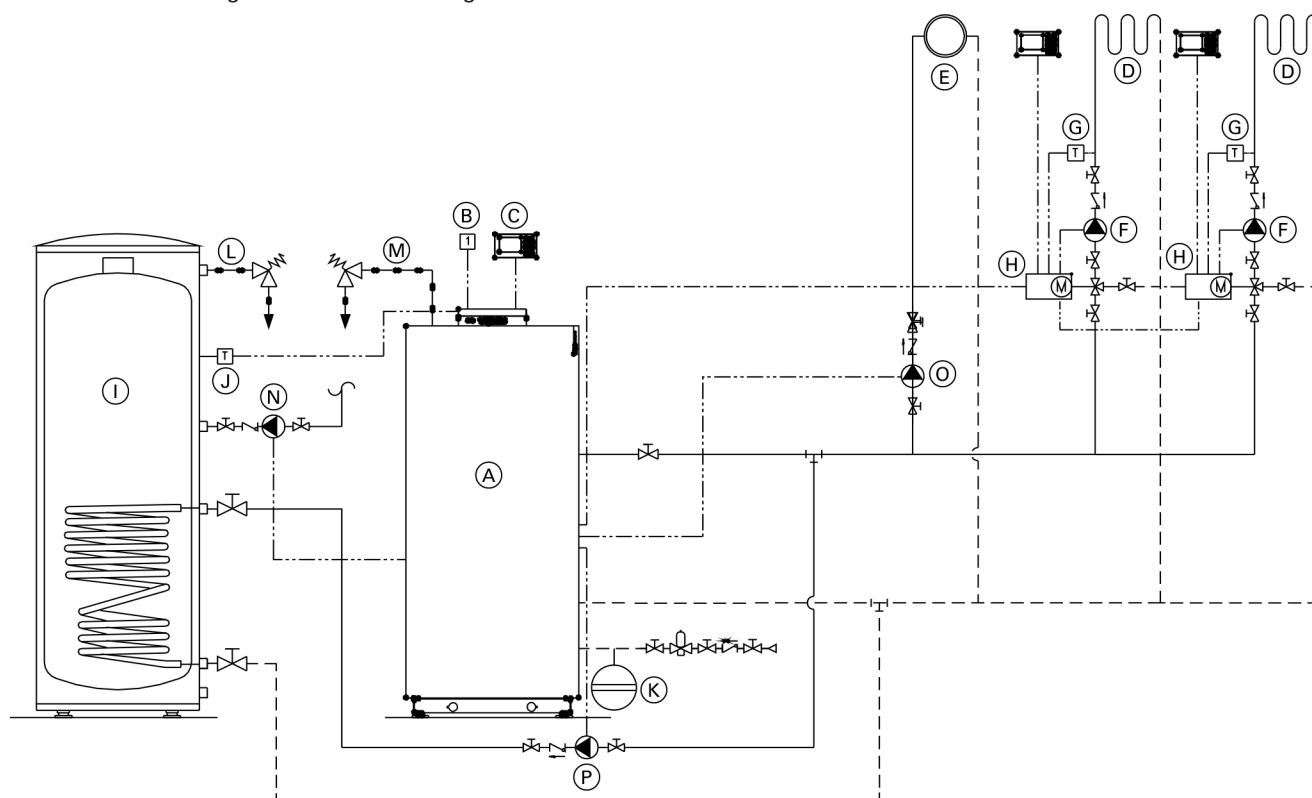
### IMPORTANT

**Sizing of field-supplied pump (P) is critical for proper boiler operation in this system layout. See page 18 for the supply head pressure drop of the boiler. An undersized pump may cause short-cycling and/or improper operation of the boiler.**

# System Layout 3

Vitocrossal 300 CU3A with...

- DHW storage tank
- one direct-connected heating circuit
- two heating circuit with a mixing valve



## Legend

- (A) Vitocrossal 300 CU3A boiler with Vitotronic 200, KW6B outdoor reset control
  - (B) Outdoor temperature sensor [1]
  - (C) Vitotrol remote (optional)
  - (D) Under floor heating circuit
  - (E) Radiator heating circuit
  - (F) Heating circuit pump
  - (G) Mixing valve temperature sensor [2]
  - (H) Accessory kit for heating circuit with mixing valve
  - (I) Domestic hot water storage tank
  - (J) DHW tank temperature sensor [5]
  - (K) Expansion tank
  - (L) Temperature and pressure relief valve
  - (M) Pressure relief valve
  - (N) DHW recirculation pump [28/20] \*
  - (O) Boiler pump [20]
  - (P) DHW circulating pump [21]
- \* Function based on coding of address 53

Installation of different heating circuits...

- radiator heating circuit (high-temp. circuit)
- under floor heating circuit with 3-way mixing valve (low-temp. circuit)
- DHW production

The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with mixing valve.

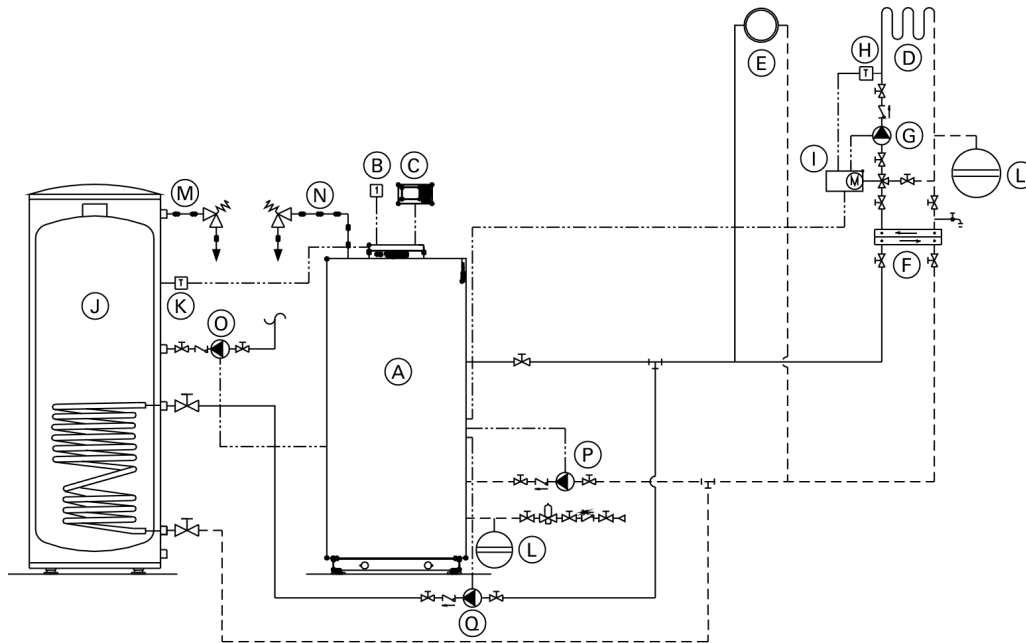
## IMPORTANT

**System separation is required of underfloor heating systems employing non-oxygen diffusion barrier tubing. All components on the secondary side of the heat exchanger must be made of corrosion-resistant materials.**

## System Layout 4

Vitocrossal 300 CU3A with...

- direct-connected heating circuit
- one heating circuit with system separation



### Legend

- (A) Vitocrossal 300 CU3A boiler with Vitotronic 200, KW6B outdoor reset control
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Under floor heating circuit
- (E) Radiator heating circuit
- (F) Plate heat exchanger for system separation
- (G) Heating circuit pump
- (H) Mixing valve temperature sensor [2]
- (I) Accessory kit for heating circuit with mixing valve
- (J) DHW storage tank
- (K) DHW tank temperature sensor [5]
- (L) Expansion tanks
- (M) Temperature and pressure relief valve
- (N) Pressure relief valve
- (O) DHW recirculation pump [28/20] \*
- (P) Boiler pump [20]
- (Q) DHW circulating pump [21]

\* Function based on coding of address 53

### Installation of different heating circuits...

- radiator heating circuit (high-temp. circuit)
- under floor heating circuit with 3-way mixing valve (low-temp. circuit)
- DHW production

The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with mixing valve (I). The boiler pump [20] supplies the radiator heating circuit and the plate heat exchanger for system separation.

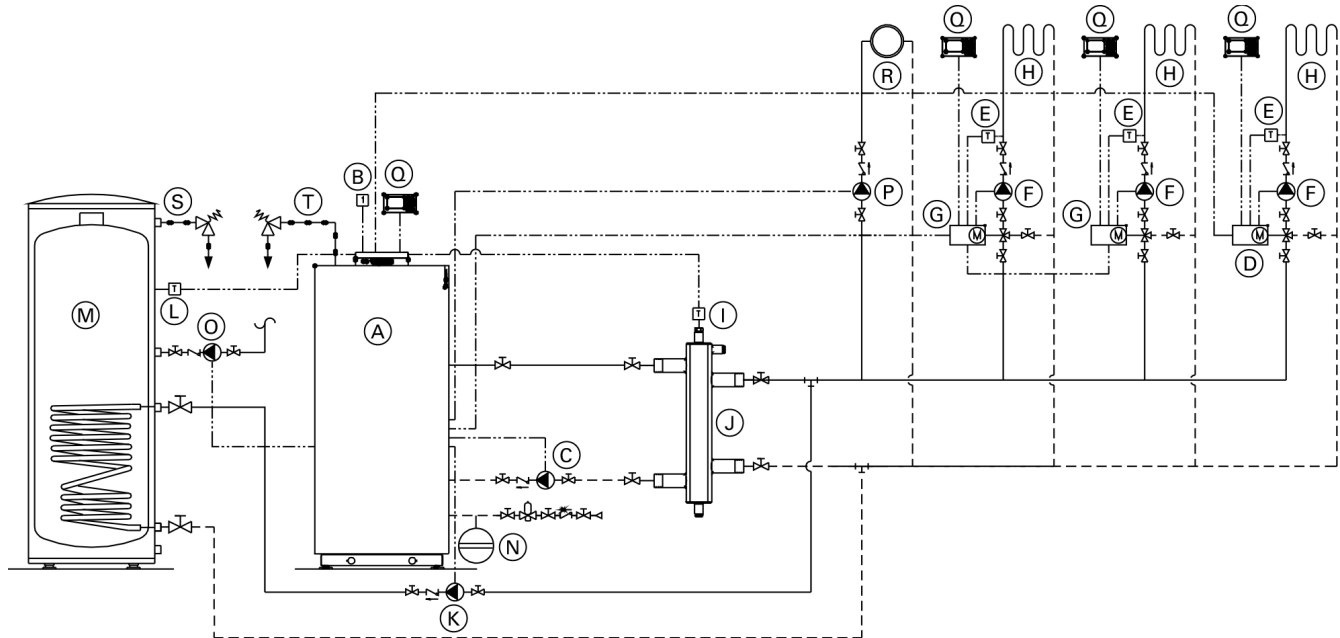
### IMPORTANT

The pressure drop (secondary circuit) of the plate heat exchanger (F) must be less/equal to the pressure drop of the 3-way mixing valve. This must be taken into account when sizing the plate heat exchanger.

# System Layout 5

Vitocrossal 300 CU3A with...

- DHW storage tank
- low-loss header
- multiple heating circuits with mixing valves
- one heating circuit without mixing valve



When designing a system as illustrated above, please contact your local Viessmann Sales Representative for assistance.

## Legend

- (A) Vitocrossal 300 CU3A boiler with Vitotronic 200, KW6B outdoor reset control
- (B) Outdoor temperature 1
- (C) Boiler pump 20
- (D) Vitotronic 200-H, HK1B \*1
- (E) Mixing valve temperature sensor 2
- (F) Heating circuit pumps
- (G) Accessory kit for heating circuit with mixing valve
- (H) Heating circuits with mixing valves
- (I) Viessmann temperature sensor for low-loss header 2
- (J) Low-loss header (if required)
- (K) DHW circulating pump 21
- (L) DHW tank temperature sensor 5
- (M) DHW storage tank
- (N) Expansion tank
- (O) DHW recirculation pump 28
- (P) Heating circuit pump 28/20 \*
- (Q) Vitotrol remote (optional)
- (R) Radiator heating circuit
- (S) Temperature and pressure relief valve
- (T) Pressure relief valve

\* Function based on coding of address 53

\*1 Contact your local Sales Representative for details.

Vitotronic 200-H, HK1B mixing valve control with LON communication module can be used instead of the accessory kit and Vitocontrol.

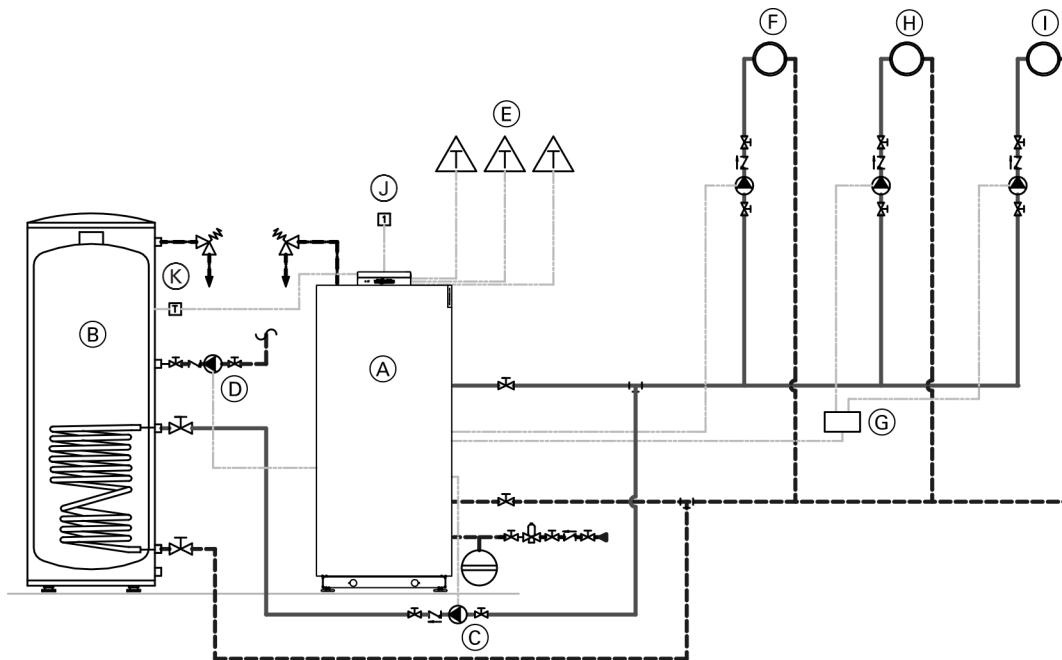
## IMPORTANT

Please note location of expansion tank (N).

## System Layout 6

Vitocrossal 300 CU3A with...

- DHW storage tank
- three zone circuits



### Legend

- (A) Vitocrossal 300 CU3A boilers
- (B) DHW storage tank
- (C) DHW pump [output 21]
- (D) DHW recirculation pump [output 28/20]
- (E) Thermostat zone circuits 1, 2, 3 (dry contact)
- (F) Zone circuit 1 [output 157]
- (G) AM1 extension module (accessory)
- (H) Zone circuit 2 [output A1 - AM1 extension module]
- (I) Zone circuit 3 [output A2 - AM1 extension module]
- (J) Low-loss header (if required)
- (K) DHW circulating pump

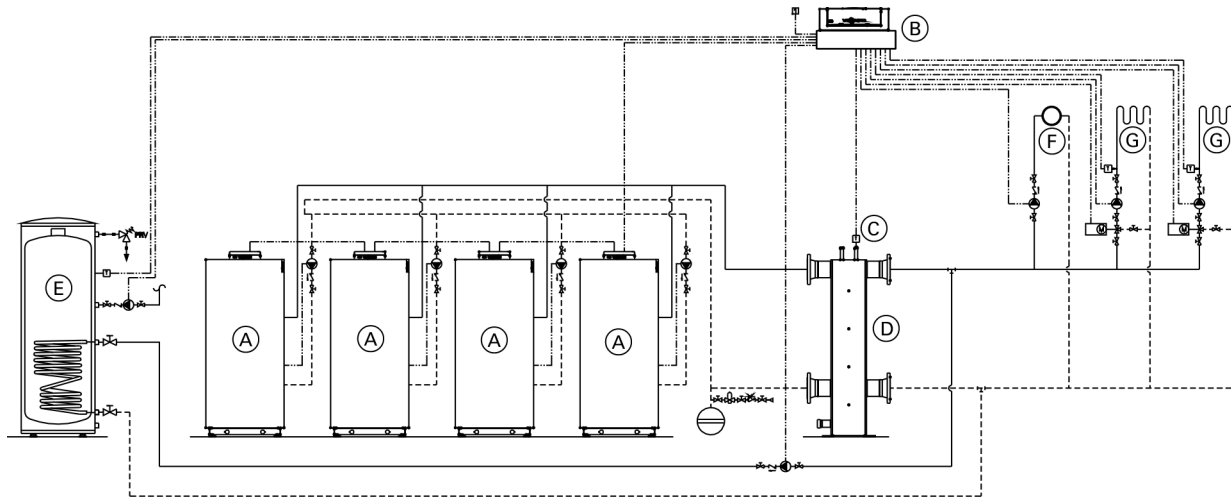
Installation of different heating circuits...

- DHW production
- 3 zone circuits

## System Layout 7

Multiple (up to eight) Vitocrossal 300 CU3A with...

- multiple heating circuits with mixing valves
- low-loss header



### Legend

- Ⓐ Vitocrossal 300 CU3A boiler
- Ⓑ Vitotronic 300K, MW2C
- Ⓒ Low-loss header/common supply temperature sensor
- Ⓓ Low-loss header
- Ⓔ DHW storage tank
- Ⓕ High temperature heating circuit
- Ⓖ Low temperature heating circuit

When designing a multiple Vitocrossal 300 CU3A system as shown above, please reference applicable multiple Vitocrossal 300 CU3A technical documentation, and contact your local Viessmann Sales Representative for further assistance.

This installation example depicts a possible piping layout for multiple Vitocrossal 300 CU3A boilers equipped with Viessmann System Technology. Please note that this example is based on a simplified conceptual drawing only! Piping and necessary componentry must be field verified. A low water cut-off (LWCO) must be installed where required by local codes.

Proper installation and functionality in the field is the responsibility of the heating contractor.



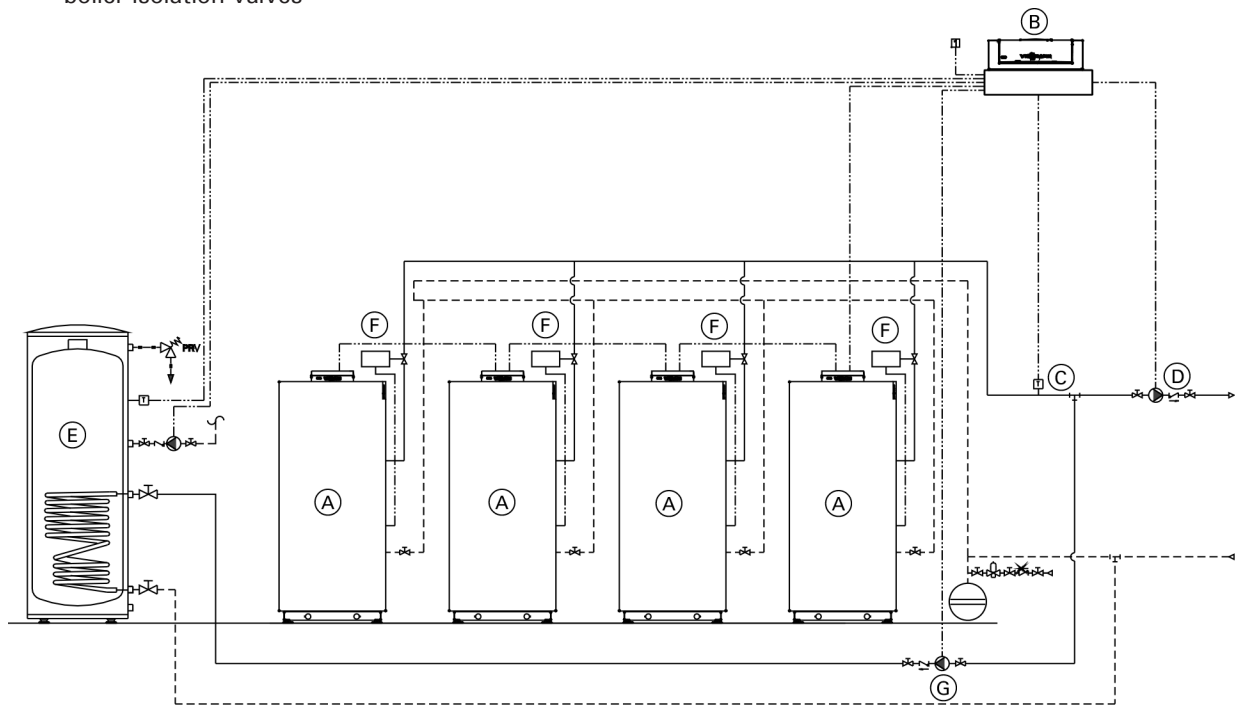
### WARNING

If a DHW storage tank other than a Viessmann Vitocell 100 or 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with the original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.

## System Layout 8

Multiple (up to eight) Vitocrossal 300 CU3A with...

- system pump
- boiler isolation valves



### Legend

- (A) Vitocrossal 300 CU3A boiler
- (B) Vitotronic 300K, MW2C
- (C) Common supply temperature sensor
- (D) System pump
- (E) DHW storage tank
- (F) Boiler isolation valve (power open spring return)
- (G) DHW pump

When designing a multiple Vitocrossal 300 CU3A system as shown above, please reference applicable multiple Vitocrossal 300 CU3A technical documentation, and contact your local Viessmann Sales Representative for further assistance.

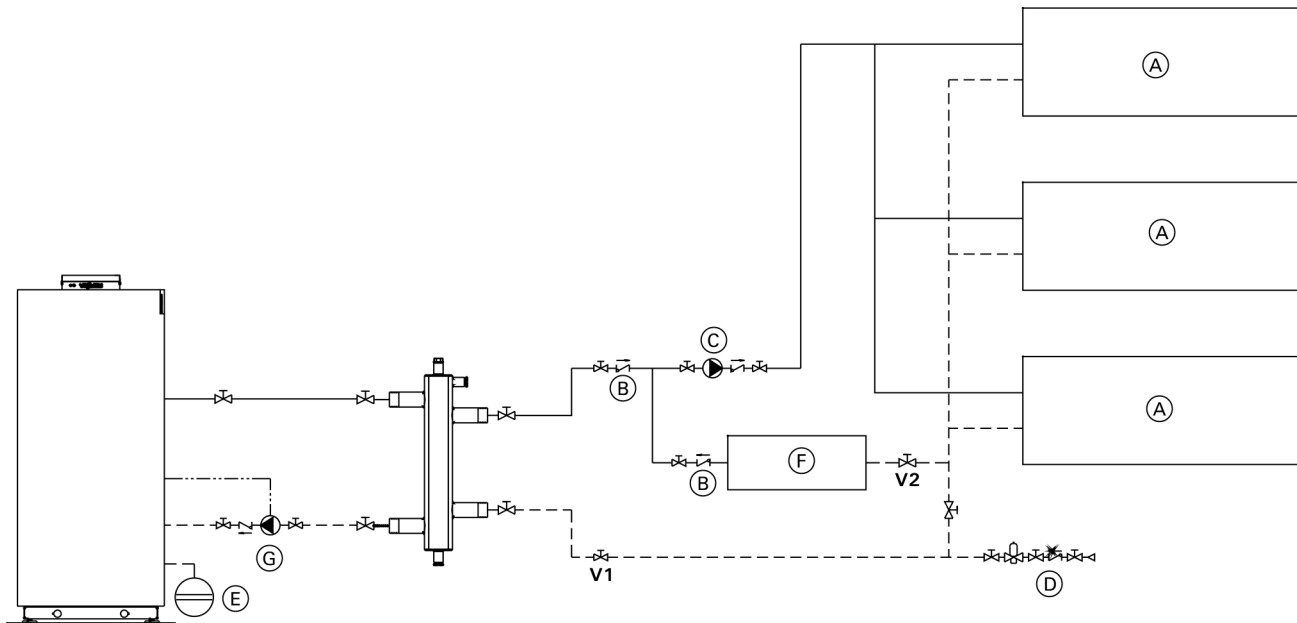
This installation example depicts a possible piping layout for multiple Vitocrossal 300 CU3A boilers equipped with Viessmann System Technology. Please note that this example is based on a simplified conceptual drawing only! Piping and necessary componentry must be field verified. A low water cut-off (LWCO) must be installed where required by local codes.

Proper installation and functionality in the field is the responsibility of the heating contractor.

### WARNING

If a DHW storage tank other than a Viessmann Vitocell 100 or 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with the original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.

## Boiler in Heating/Cooling



### Legend

- Ⓐ Heating/Cooling unit
- Ⓑ Spring-loaded flow check valve
- Ⓒ Circulation pump
- Ⓓ Automatic feed valve
- Ⓔ Expansion tank
- Ⓕ Water chiller
- Ⓖ Boiler circuit pump (field supplied)

### Boiler in heating/cooling application

The boiler, when used in connection with a refrigeration system, must be installed ensuring the chilled medium is piped in parallel to the boiler with appropriate valves to prevent the chilled medium from entering the boiler. See illustration on the left.

The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

Check installation instructions of the chiller manufacturer carefully for additional requirements.

Cooling season starts:

Close valve "v1" and open valve "v2".

Heating season starts:

Close valve "v2" and open valve "v1".

### IMPORTANT

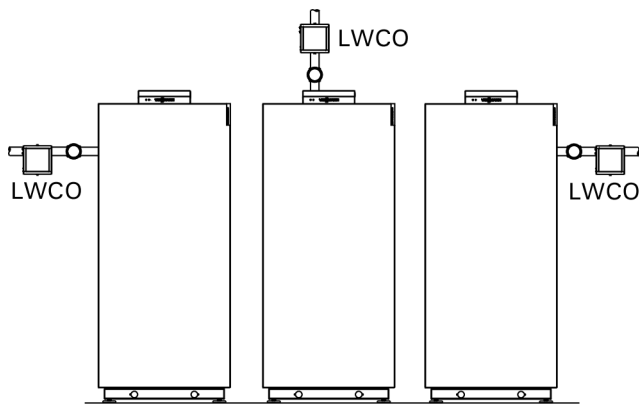
Viessmann strongly suggests that the valves illustrated be labelled "v1" and "v2".

### IMPORTANT

In the illustration, the circulating pump must be operated from a separate on/off switch, not from the pump aquastat on the boiler control.



## Boiler with Low Water Cut-off



### Boiler with low water cut-off (remote-mounted, field supplied)

A low water cut-off may be required by local codes. Do not install an isolation valve between boiler and low water cut-off.



Follow the installation instructions of the low water cut-off from the manufacturer.

For low water cut-off wiring information specific to your application, refer to applicable wiring diagram (see page 57).

## Venting Connection



### WARNING

Failure to ensure that all flue gases have been safely vented to the outdoors can cause property damage, severe personal injury, or loss of life. Flue gases may contain deadly carbon monoxide.



### CAUTION

Under certain climatic conditions some building materials may be affected by flue products expelled in close proximity to unprotected surfaces. Sealing or shielding of the exposed surfaces with a corrosion resistant material (e.g. aluminum sheeting) may be required to prevent staining or deterioration. The protective material should be attached and sealed (if necessary) to the building before attaching the vent termination. It is strongly recommended to install the vent termination on the leeward side of the building.



Vitocrossal 300 CU3A Installation Instructions  
Venting System

## Technical Data

CU3A Boiler Model No.		26, 94	35, 125	45, 160	57, 199
Natural Gas / Liquid Propane Gas CSA input	MBH	19-94	25-125	43-160	43-199
	(kW)	(5.6-27.5)	(7.3-36.6)	(12.6-47)	(12.6-58)
CSA output / DOE heating capacity* 1	MBH	17.7-87	23.3-116	40-149	40-185
	(kW)	(5.2-25.5)	(6.8-34)	(11.7-43.7)	(11.7-54.2)
Net AHRI Rating	MBH	76	101	129	161
	(kW)	(22)	(30)	(38)	(47)
Heat exchanger surface area	ft. <sup>2</sup>	16.7	20.7	34.1	34.1
	(m <sup>2</sup> )	(1.5)	(1.9)	(3.2)	(3.2)
Min. gas supply pressure					
Natural gas	"w.c.	4	4	4	4
Liquid propane gas	"w.c.	10	10	10	10
Max. gas supply pressure *3					
Natural gas	"w.c.	14	14	14	14
Liquid propane gas	"w.c.	14	14	14	14
A.F.U.E.	%	95	95	95	95
Weight	lbs	269	275	352	352
	(kg)	(122)	(125)	(160)	(160)
Boiler water content	USG	13.5	13.0	18.8	18.8
	(L)	(51)	(49)	(71)	(71)
Max. operating pressure at 210°F (99°C)	psig	30	30	30	30
	(bar)	(2)	(2)	(2)	(2)
Boiler water temperature					
- Adjustable high limit (AHL) range space heating (steady state)	°F	68-194	68-194	68-194	68-194
	(°C)	(20-90)	(20-90)	(20-90)	(20-90)
DHW production	°F	194	194	194	194
	(°C)	(90)	(90)	(90)	(90)
- Fixed high limit (FHL)	°F	210	210	210	210
	(°C)	(99)	(99)	(99)	(99)
Boiler connections					
Boiler heating supply and return	NPTM	1¼ in.	1¼ in.	1¼ in.	1¼ in.
Pressure relief valve	NPTF	¾ in.	¾ in.	¾ in.	¾ in.
Boiler drain	NPTM	1 in.	1 in.	1 in.	1 in.
Gas valve connection	NPTF	¾ in.	¾ in.	¾ in.	¾ in.

\*1 Output based on 140°F (60°C), 120°F (49°C) system supply/return temperature.

\*2 Net AHRI rating based on piping and pick-up allowance of 1.15.

\*3 If the gas supply pressure exceeds the maximum gas supply pressure value, a separate gas pressure regulator must be installed upstream of the heating system.

**Note:** For high altitude installation at 10,000 ft. the input for model Vitocrossal 300 CU3A will have an altitude de-rating of 18%.

**Technical Data** *(continued)*

CU3A Boiler Model No.		26, 94	35, 125	45, 160	57, 199
<b>Dimensions</b>					
Overall depth	inches	27	27	31½	31½
	(mm)	684	684	801	801
Overall width	inches	26	26	26	26
	(mm)	660	660	660	660
Overall height (with control interface open)	inches	67	67	67	67
	(mm)	1707	1707	1707	1707
Overall height	inches	61.5	61.5	61.5	61.5
	(mm)	1562	1562	1562	1562
<b>Flue gas *4</b>					
Temperature (at boiler return temperature of 86°F (30°C))					
- at rated full load	°F (°C)	113 (45)	113 (45)	113 (45)	113 (45)
- at rated partial load	°F (°C)	90 (32)	90 (32)	90 (32)	90 (32)
Temperature (at boiler return temperature of 140°F (60°C))	°F (°C)	167 (75)	167 (75)	167 (75)	167 (75)
<b>Max. condensate flow rate *5</b> for NG and LPG TS/TR = 104/86°F (40/30°C)					
	USG/h	0.9	1.2	1.6	2.1
	(L/h)	3.43	4.62	5.95	7.92
<b>Condensate connection</b>					
hose nozzle Ø in.					
		¾	¾	¾	¾
<b>Boiler flue gas connection *6</b>					
Ø in. (mm)					
		3 (80)	3 (80)	4 (110)	4 (110)
<b>Combustion air supply connection</b>					
outer Ø in. (mm)					
		3 (80)	3 (80)	3 (80)	3 (80)
<b>Sound Rating (A scale)</b>					
- at maximum input	dB	48	55	53	58
	dB	32	33	33	33
Standby losses *7	BTU/hr	1128	1000	1120	995
	W/hr	330	292	328	291

\*4 Measured flue gas temperature with a combustion air temperature of 68°F (20°C).

\*5 Based on maximum input rate.

\*6 For side wall vent installations (coaxial system):

Do not exceed max. equivalent length specified in the Installation Instructions of the Vitocrossal 300 CU3A Venting System.

Do not attempt to common-vent Vitocrossal 300 CU3A with any other appliance.

Side wall co-axial vent installation must include Viessmann protective screen!

For details refer to the Installation Instructions for the Vitocrossal 300 CU3A Venting System.

\*7 Standby losses measured from the boiler temperature sensor well based on a boiler water temperature of 158°F (70°C) and a room temperature of 68°F (20°C).

For information regarding other Viessmann System Technology componentry, please reference documentation of respective product.

## Electrical Connections

### Power supply connection of accessories

The power supply connection of accessories can be made directly at the control. The connection is activated and deactivated with the system on/off switch.

The Vitotronic 200-H, HK1B mixing valve control, the mixing valve accessory kit and the Solartrol control require a separate 120VAC power supply from the wall receptacle.

Closing the control unit casing and inserting (continued) Insert programming unit (packed separately) into the control unit support.

**Note:** The programming unit can also be used in a wall mounting base (accessory) near the boiler

Cabling required for:

- outdoor temperature sensor
- Vitotronic 200-H, HK1B mixing valve control
- accessory kit for heating circuit with mixing valve
- remote switching of operating mode
- remote disable
- alarm output
- wall-mount base
- circulating pump
- zone circuit thermostats

### IMPORTANT

When running and securing connecting cables on site, ensure that the maximum permissible temperatures of the cables are not exceeded.

### IMPORTANT

Cables in the vicinity of the control unit must not be secured to the control unit bracket.

### Connection of accessories

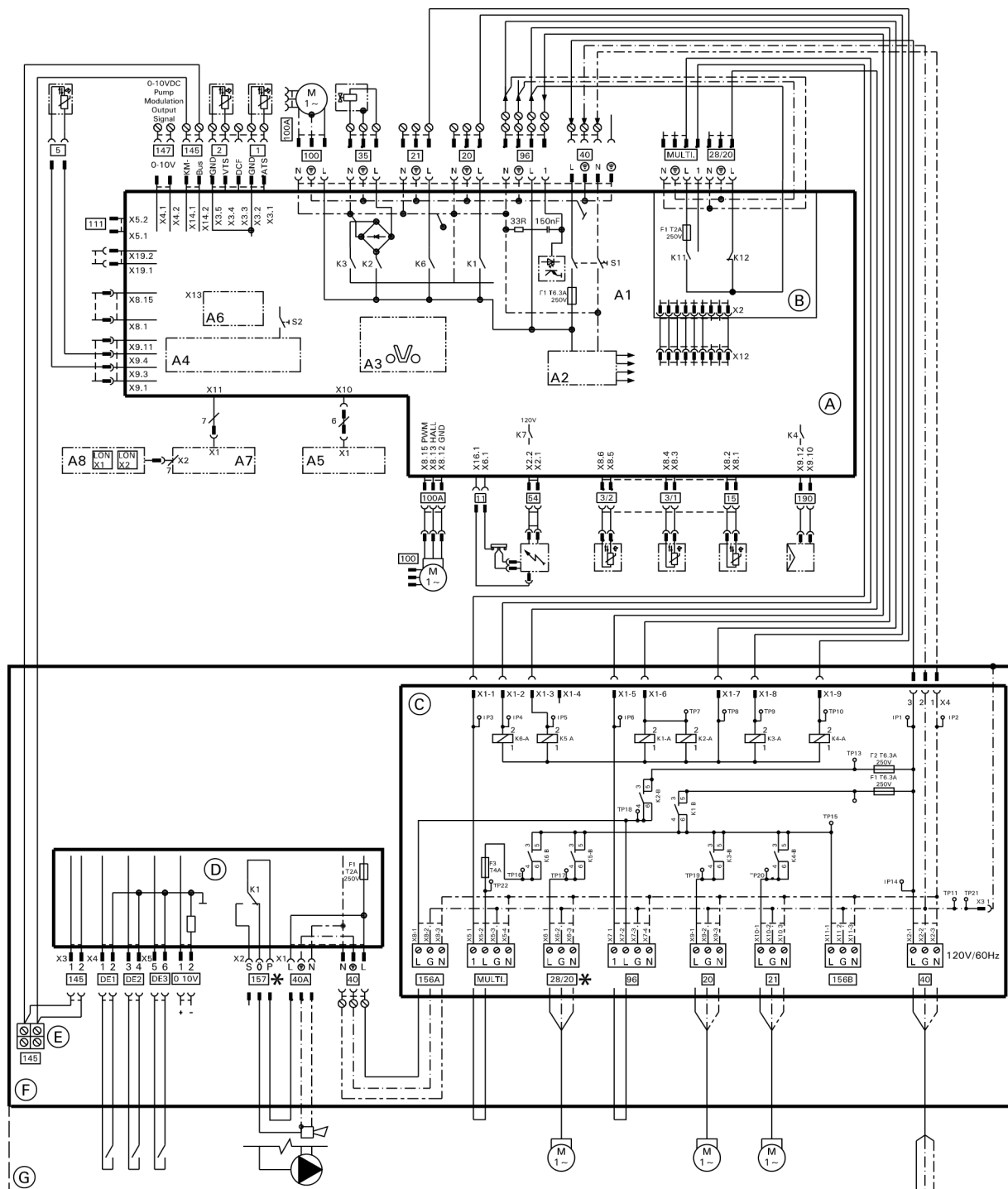


For details regarding other installation steps required, please reference the Installation Instructions supplied with the respective accessory part.

**Note:** Only one accessory part or one switch contact can be connected to the contacts of a plug at a time.



For information for commissioning and adjustment on boiler and boiler control unit, refer to the Service Instructions.

**Electrical Connections** *(continued)***WARNING**

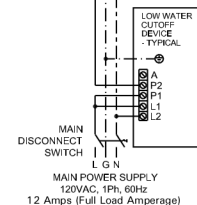
**DISCONNECT POWER BEFORE  
SERVICING BOILER.**

If any of the original wires as  
supplied with the appliance must  
be replaced, it must be replaced  
with the exact equivalent.

**CAUTION**

Label all wires prior to disconnection  
when servicing controls. Wiring errors  
can cause improper and dangerous  
operation. Verify proper operation  
after servicing.

\* Only one function/connection may  
be assigned to each connection.



**Electrical Connections** *(continued)***Legend**

1	Outdoor Temperature Sensor
2	Supply Temperature Sensor/Low Loss Header
3/1	Boiler Temperature Sensor #1
3/2	Boiler Temperature Sensor #2
5	DHW Temperature Sensor
11	Ionization Electrode
15	Flue Gas temperature Sensor
20	Boiler Pump
21	DHW Pump
28/20	Programmable Pump Output / zone circuit pump output*
35	Gas Valve
40	Power Supply
40A	Accessory Power Output
54	Ignition Transformer
96	Powered Accessory Connection
100	Fan Motor
100A	Fan Motor Control
111	Not Used
145	KM BUS
147	Pump Modulation Output 0-10VDC
Multi	Powered Accessory Connection
156A	Switched Output F2
156B	Switched Output F1
DE1	Digital Input 1 (Dry Contact)
DE2	Digital Input 2 (Dry Contact)
DE3	Digital Input 3 (Dry Contact)
0-10V	0-10VDC Input
157	Fault Alarm/DHW Recirculation Pump / zone circuit pump output*
190	Gas Modulation Coil

\* See wiring diagram

- Ⓐ Boiler Control
- Ⓑ External Accessory Connection Board
- Ⓒ Power/Pump Connection Interface
- Ⓓ Integrate EA1 Module
- Ⓔ KM-BUS for External Devices
- Ⓕ Electrical Junction Box
- Ⓖ Field Wiring Connections
- A1 Main Board
- A2 Internal Power Supply Unit
- A3 Optolink
- A4 Burner Control Unit
- A5 Programming Unit
- A6 Coding Card
- A7 Connection Adaptor
- A8 LON Communication Module
- S1 ON/OFF Switch
- S2 Reset Button
- X.. Electrical Interface

**IMPORTANT**

Electrical installations must comply with the latest edition of:

- In the U.S.A., the National Electrical Code (NEC), ANSI/NFPA 70 and any other state, local codes and/or regulations.
- In Canada, the Canadian Electrical Code (CEC), CSA C22.1 Part 1 and any other province, territory, local codes and/or regulations.

## Lighting and Operating Instructions

### FOR YOUR SAFETY READ BEFORE OPERATING

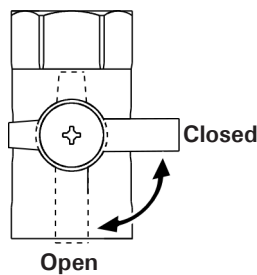
**W A R N I N G:** If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.  
**WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliance.
  - Do not touch any electric switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

### OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set thermostat or other operating control to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Close main gas shut-off valve.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
7. Open main gas shut-off valve.
8. Turn on all electric power to the appliance.
9. Set thermostat or other operating control to desired setting.
10. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

Manual gas shutoff



### TO TURN OFF GAS TO APPLIANCE

1. Set thermostat or other operating control to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Close main gas shut-off valve.

