

VIESMANN

climate of innovation

Vitocrossal 300, CU3A - Introduction

Vitocrossal 300, CU3A

Floor standing, high mass, gas-fired condensing boiler



Vitocrossal 300, CU3A

Features:

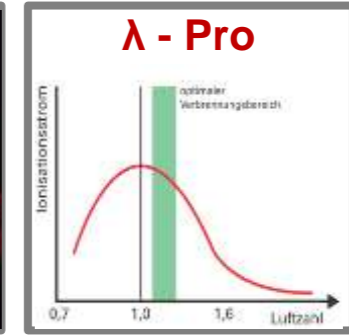
- Floor standing gas-fired condensing boiler
- High water volume / high mass construction
- Low friction loss in heat exchanger
- High temperature operation with maximum supply Temperature: 90°C (194°F)
- Fuel saving, highly efficient operation
- 95% AFUE
- Fast and easy to install, simple to service
- Compact space saving design
- Modern appearance



Vitocrossal 300, CU3A

Features:

- InoX-Crossal stainless steel heat exchanger
- Self cleaning action in heat exchanger
- Sediment / sludge settlement area in bottom of heat exchanger
- MatriX-Dome radiant burner (in NG or LP)
- 5:1 Turndown
- Low NOx emissions < 20 ppm
- Lambda Pro Combustion technology
- High altitude operation up to 10,000 FASL



Vitocrossal 300, CU3A

Features:

- Vitotronic 200 KW6B with familiar black interface for easy programming and set up
- Comes internet ready for:
 - Vitocom 100 LAN1 module and Vitotrol App
 - Vitogate 300
- Shipped fully assembled
- Full line of Viessmann System Technology accessories available:
 - DHW storage tanks
 - Mixing valve and actuators



Vitocrossal 300, CU3A

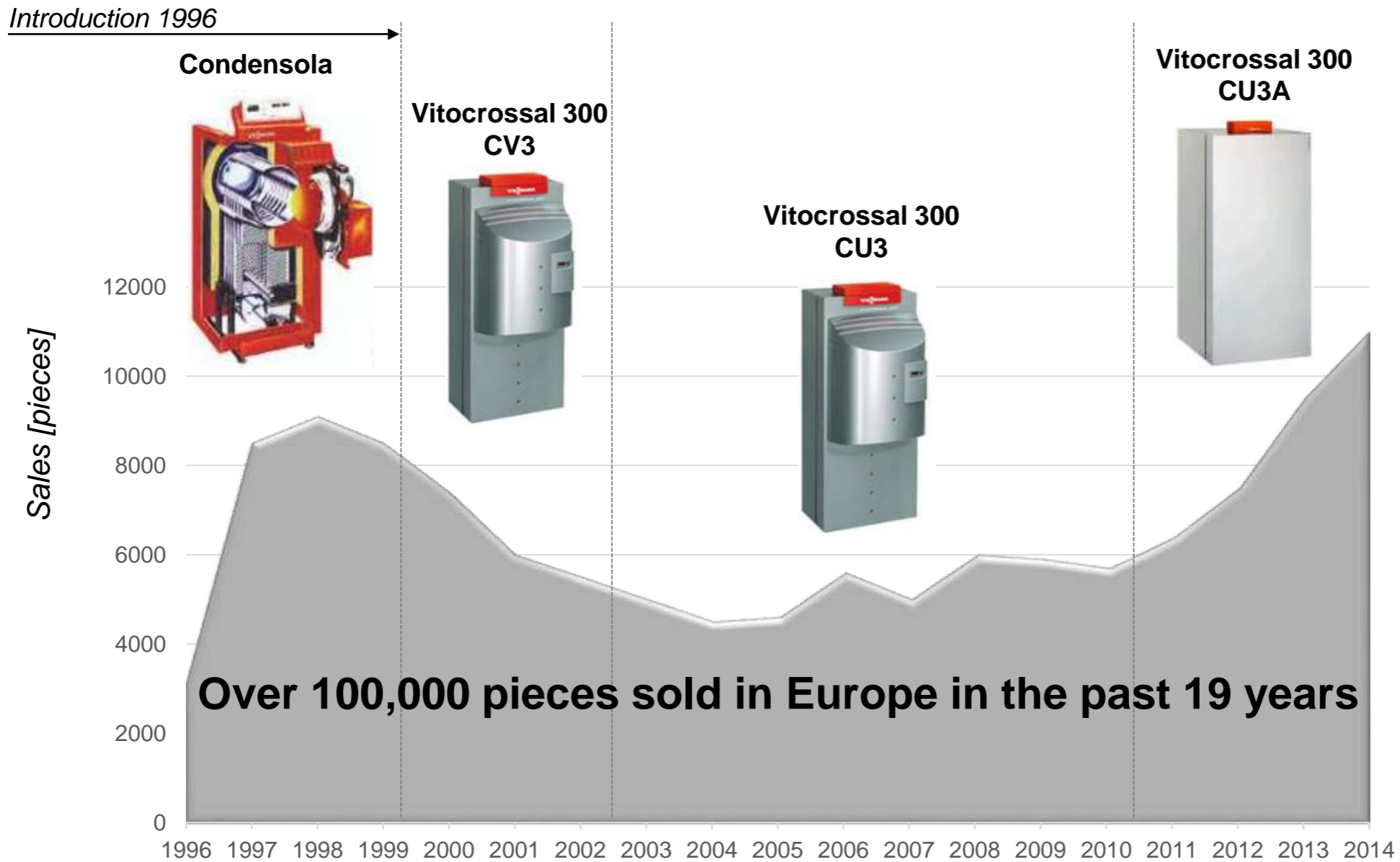
Benefits:

- Reliable long service life
- Lowest possible fuel consumption
- Suitable for a wide range of applications
- Ideal suited for high temperature retrofits of cast iron and fin tube baseboard systems
- Perfect for multi-zone systems with micro-loads
- Reduced boiler cycling reduces wear and tear on boiler HX and burner components
- No need for boiler pump, mass tanks, primary secondary piping
- Easy to service and maintain



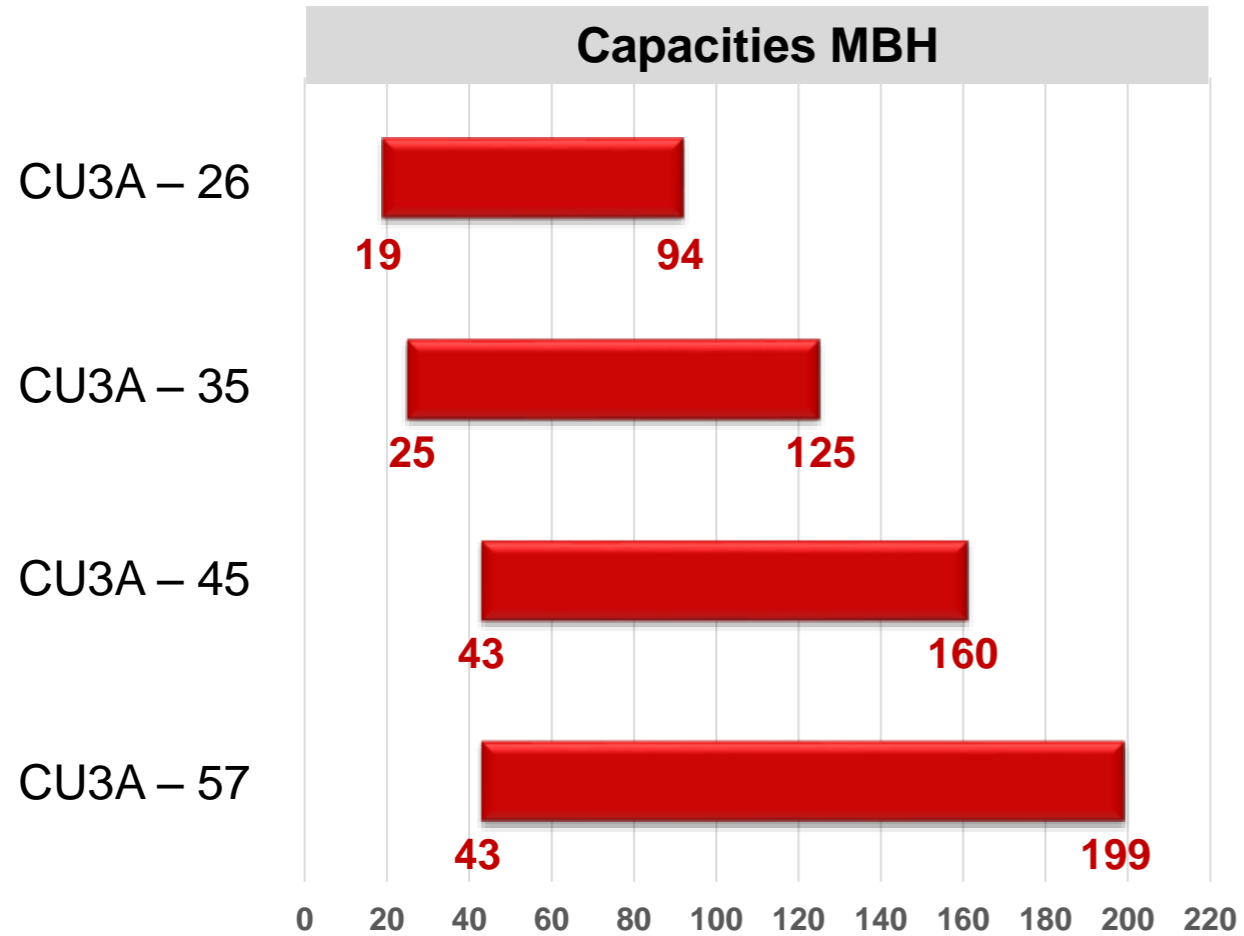
Vitocrossal 300, CU3A

Proven, trusted, reliable design



Vitocrossal 300, CU3A

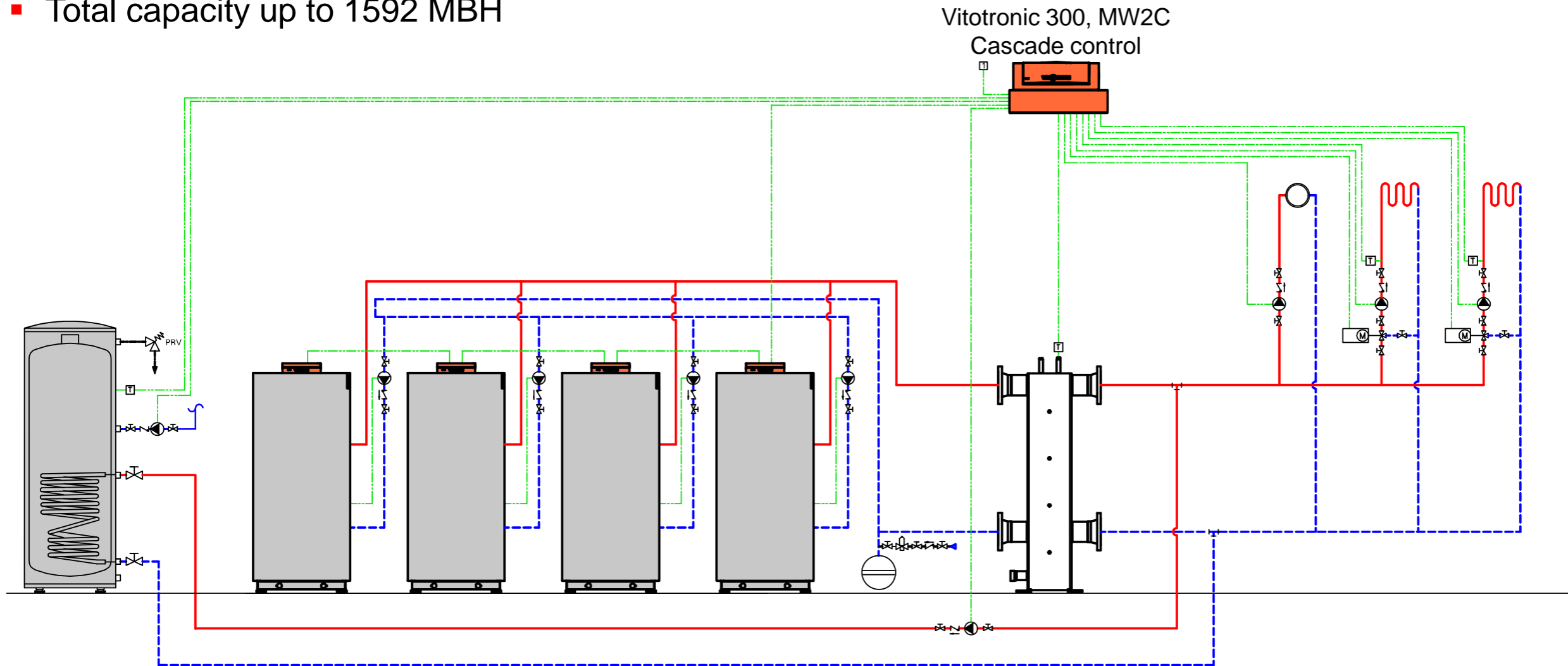
Four sizes available



Vitocrossal 300, CU3A

Multi-Boiler Cascade up to 8 boilers

- Vitotronic 300K MW2C cascade control
- For systems up to 8 boilers via LON
- Total capacity up to 1592 MBH



Vitocrossal 300, CU3A

True floor standing boiler with **high mass, large water content**



- Why is mass and water volume important?
- How does it impact boiler operation?

Vitocrossal 300, CU3A

A Viessmann history of high mass, large water content boilers



Atola-RN 385
385 MBH
12 gal water volume
827 lbs



Vitola 200, VBC-63
300 MBH
59 gal water volume
941 lbs



Vitocrossal 200, CM2-620
2245 MBH
131 gal water volume
1929 lbs



Vitocrossal 300, CT3-89
3341 MBH
222 gal water volume
3344 lbs

Vitocrossal 300, CU3A

True floor standing boiler with **high mass, large water content**

BOILER WATER CONTENT

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Large water volume = Longer burner run time = Fewer burner on/off cycles =

- Higher seasonal fuel efficiency
- Less wear and tear on boiler and components
- Lower NO_x and CO emissions



The benefits of high mass and large water volume are not new to Viessmann.

We have been preaching the merits for years!

Vitola presentation from 2000

Vitocrossal 300, CU3A

True floor standing boiler with **high mass, large water content**



- Boiler weight: **269 – 352 lbs**
- Boiler water content: **13.9 – 18.7 gallons**
- Boiler heat exchanger surface area: **16.7 – 31.4 ft²**
- Boiler pressure loss only: **0.6 – 1.6 ft. of head***
- Sediment settlement area: At lowest point of heat exchanger
- Vitocrossal 300 CT3 and 200 CM2 design philosophy

* At design flow rate with 20° deltaT

Vitocrossal 300, CU3A

Benefits of high mass, high water volume

- Low thermal BTU loading; less stress on the boiler
- Dramatically reduced burner short cycling
- Excessive turndown rates *not required* to control cycling
- Better design for mismatched and micro-load systems
- No minimum flow rates
- No dedicated boiler pump required
- No low loss header or primary / secondary piping required
- No high head system pumps required
- Boiler not sensitive to sediment collection
- Durability, reliability, value that's build to last



Vitocrossal 300, CU3A

Boiler comparison

Vitocrossal 300



Weight:

269 – 352 lbs

Water content:

13.9 – 18.7 gals

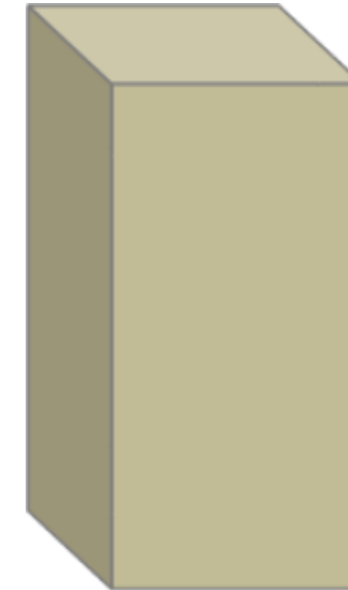
Pressure loss @ 20°F TD:

0.6 – 1.6 ft. of hd.

Vitocrossal 300, CU3A compared:

- More mass
- More water content
- Longer burner run times
- Less thermal loading on HX
- Low pressure drop in HX
- Simpler installation
- Better durability

Typical Low Mass Boiler



Typical Values:

Weight

100 – 150 lbs

Water content:

0.5 – 2.0 gals

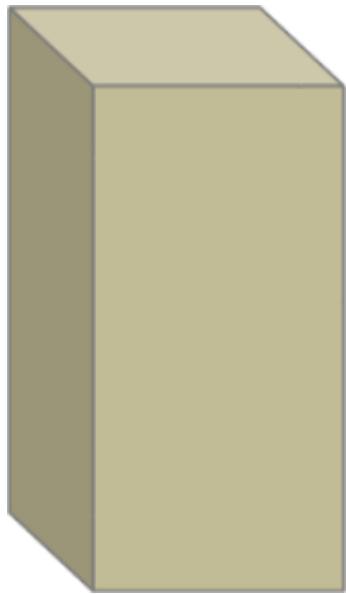
Pressure loss @ 20°F TD:

20 – 30 ft. of hd.

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Multi-load boiler piping comparison

Typical Low Mass Boiler

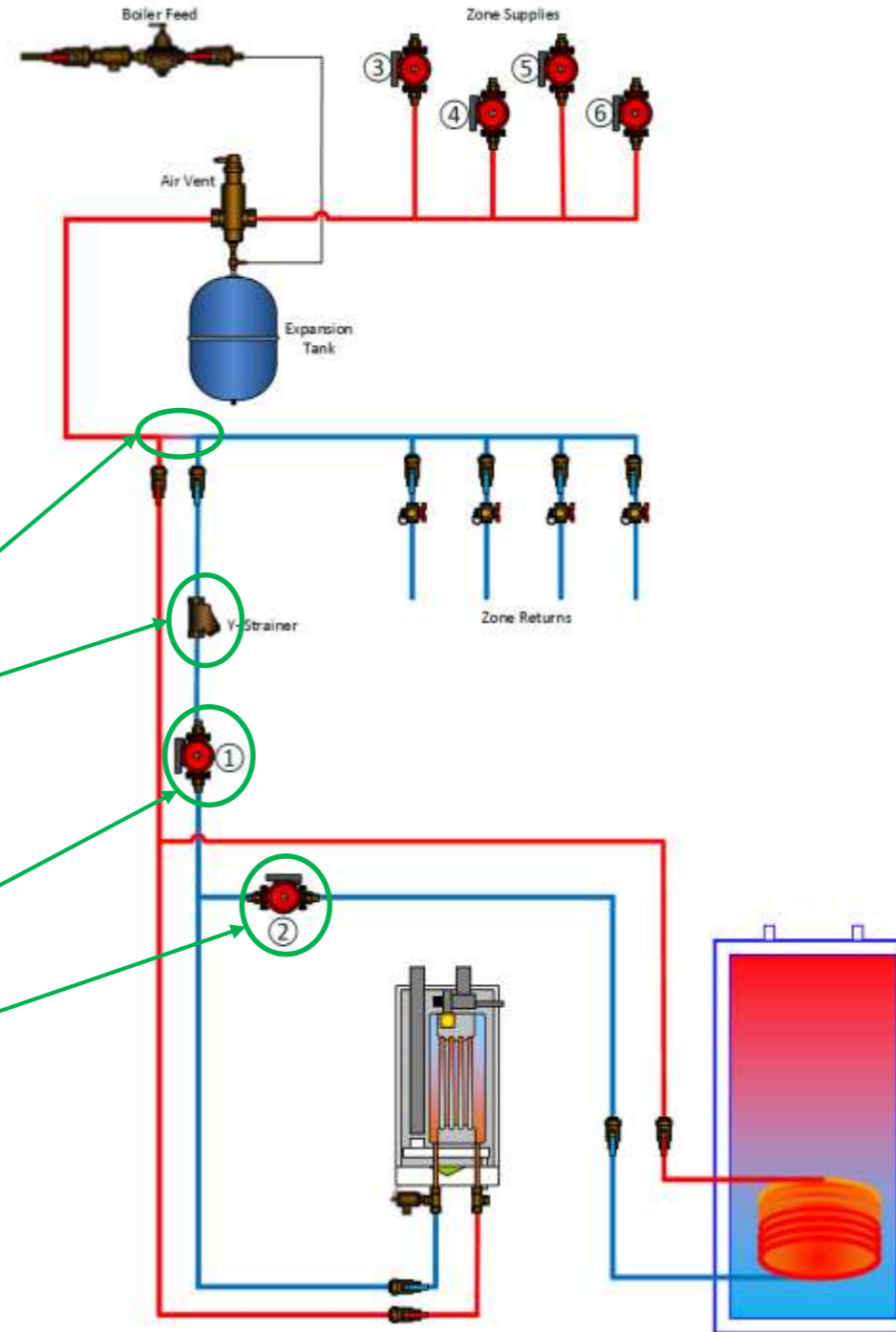


Primary-secondary or
Low Loss Header

Y-Strainer

High head boiler pump

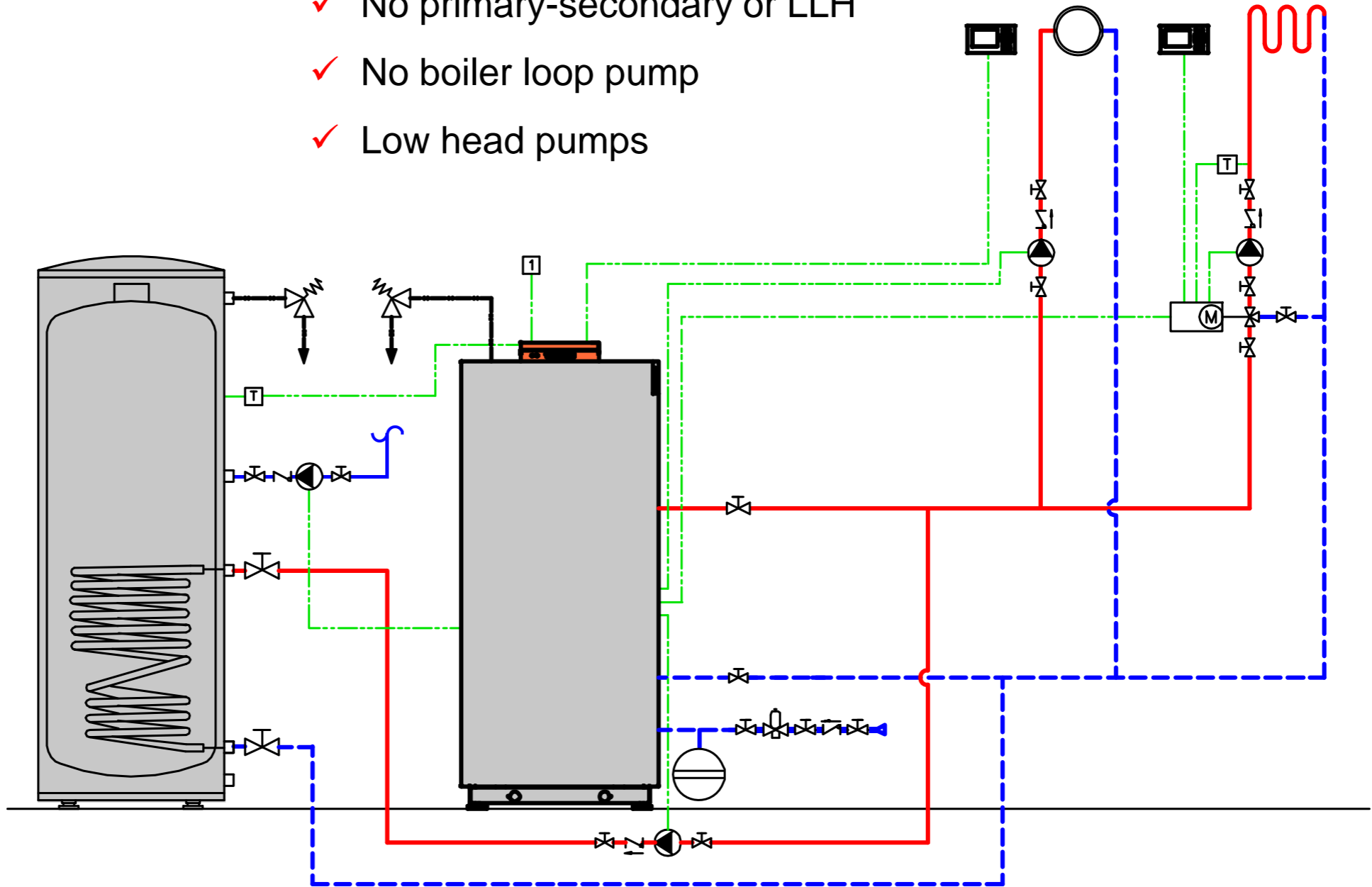
High head DHW pump



Vitocrossal 300, CU3A

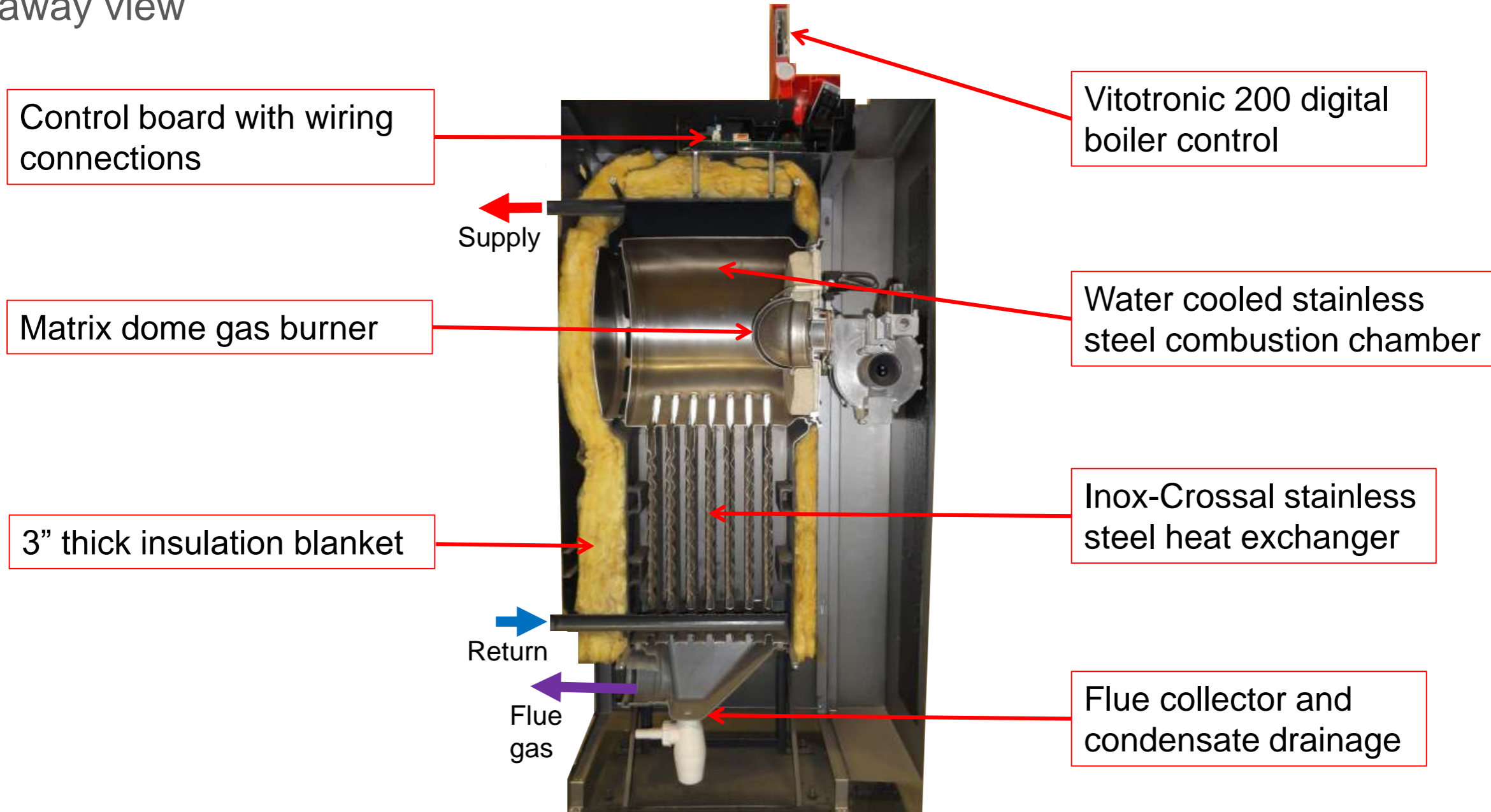
Boiler piping comparison

- ✓ No primary-secondary or LLH
- ✓ No boiler loop pump
- ✓ Low head pumps



Vitocrossal 300, CU3A

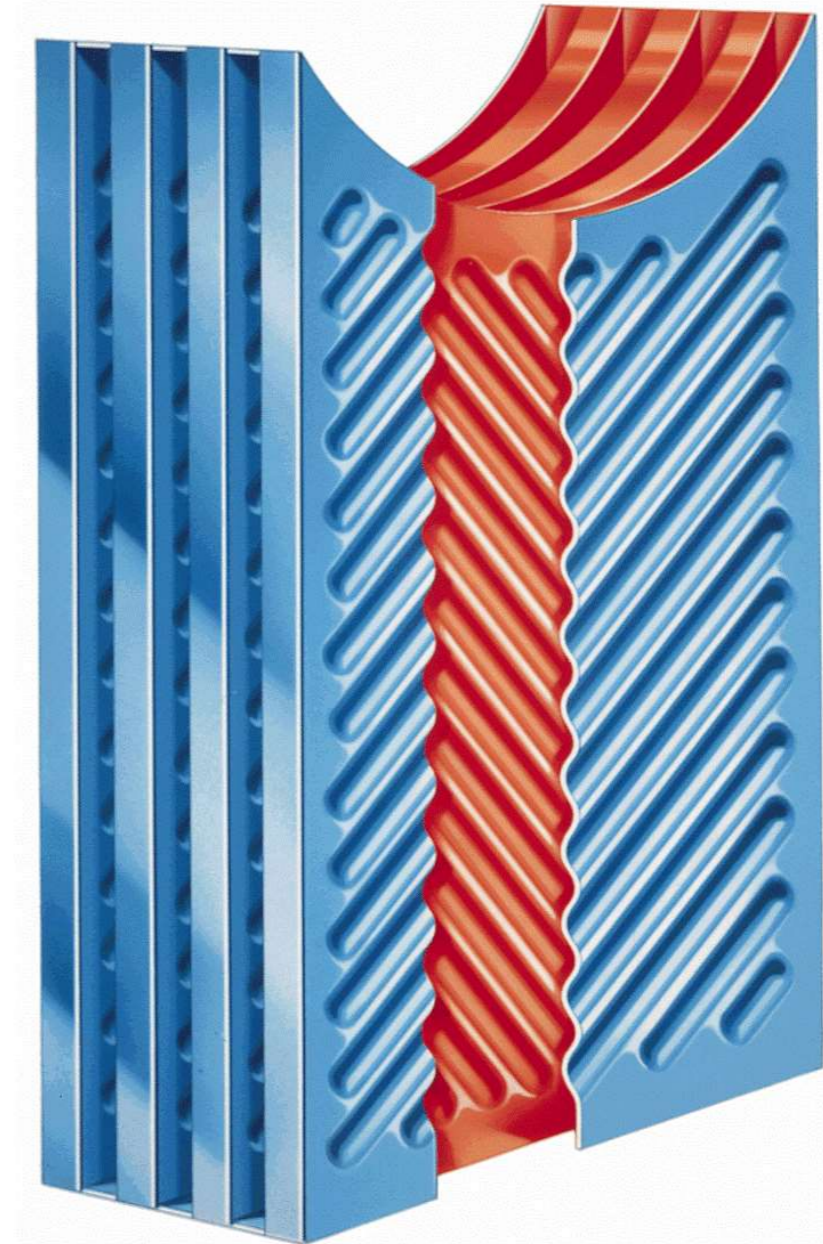
Cutaway view



Vitocrossal 300, CU3A

Inox-Crossal heat exchanger

- High grade 316Ti stainless steel construction
- Developed and manufactured by Viessmann in Germany
- Time tested reliability for over 25 years



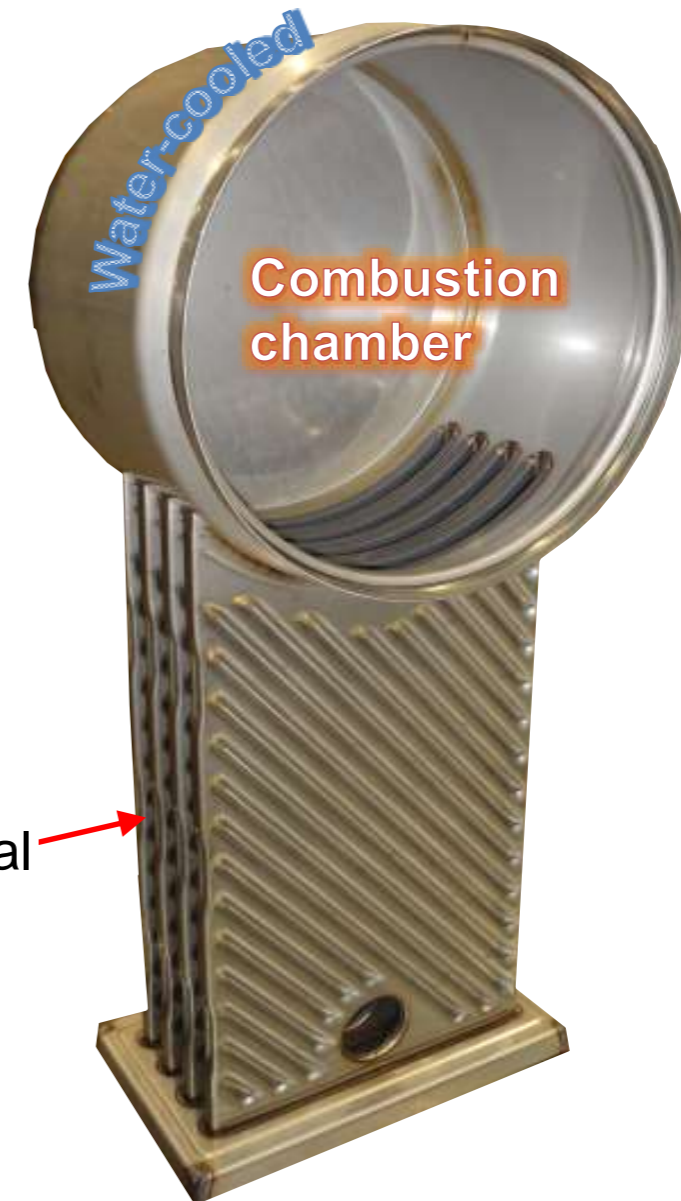
Vitocrossal 300, CU3A

Inox-Crossal heat exchanger

- Water cooled combustion chamber
- Large heat transfer surface area
- Each heat exchanger pocket ~30 Mbtu
- Low thermal loading reduces stress
- Accessible, easy to clean surfaces
- Extremely low pressure loss



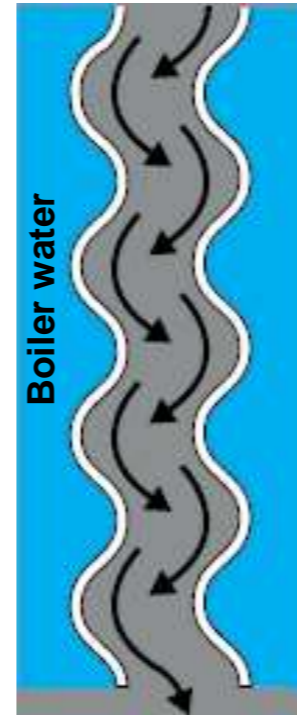
Inox-Crossal
pockets



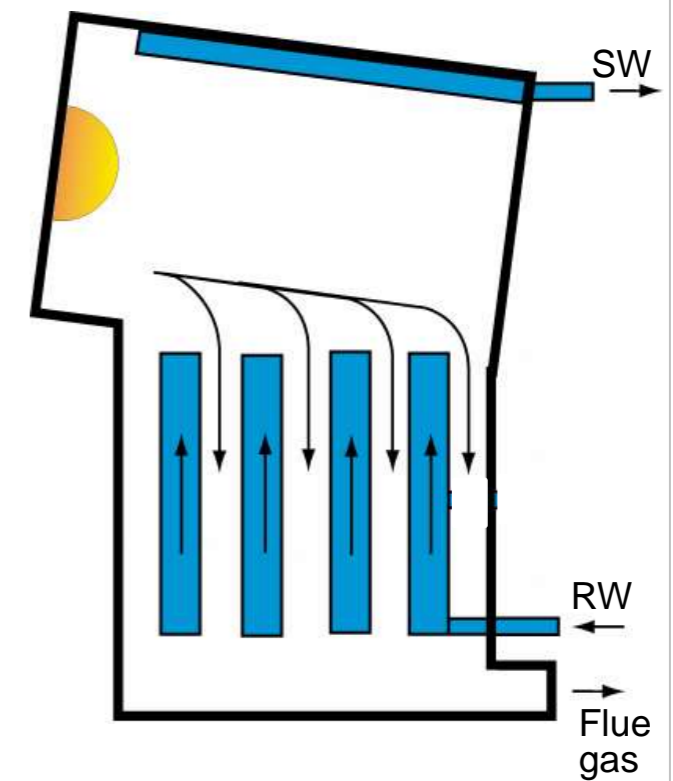
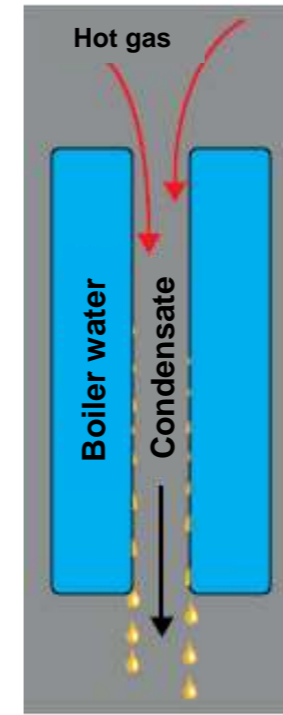
Vitocrossal 300, CU3A

Inox-Crossal heat exchanger

- Intensive contact of hot gas with heat exchange surface is ensured by turbulent flow of flue gas and mutually inclined indentations
- Parallel flow of flue gas and condensate (no accumulation of concentration)
- Condensation occurs on the inside of pocket
- Sensible and latent heat extracted
- Self cleaning action through smooth heat exchanger surface



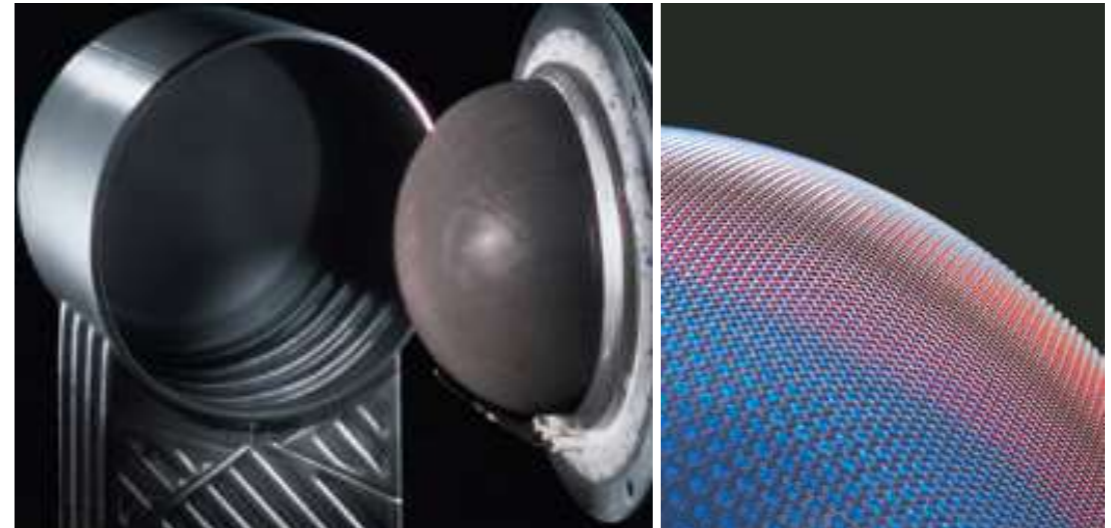
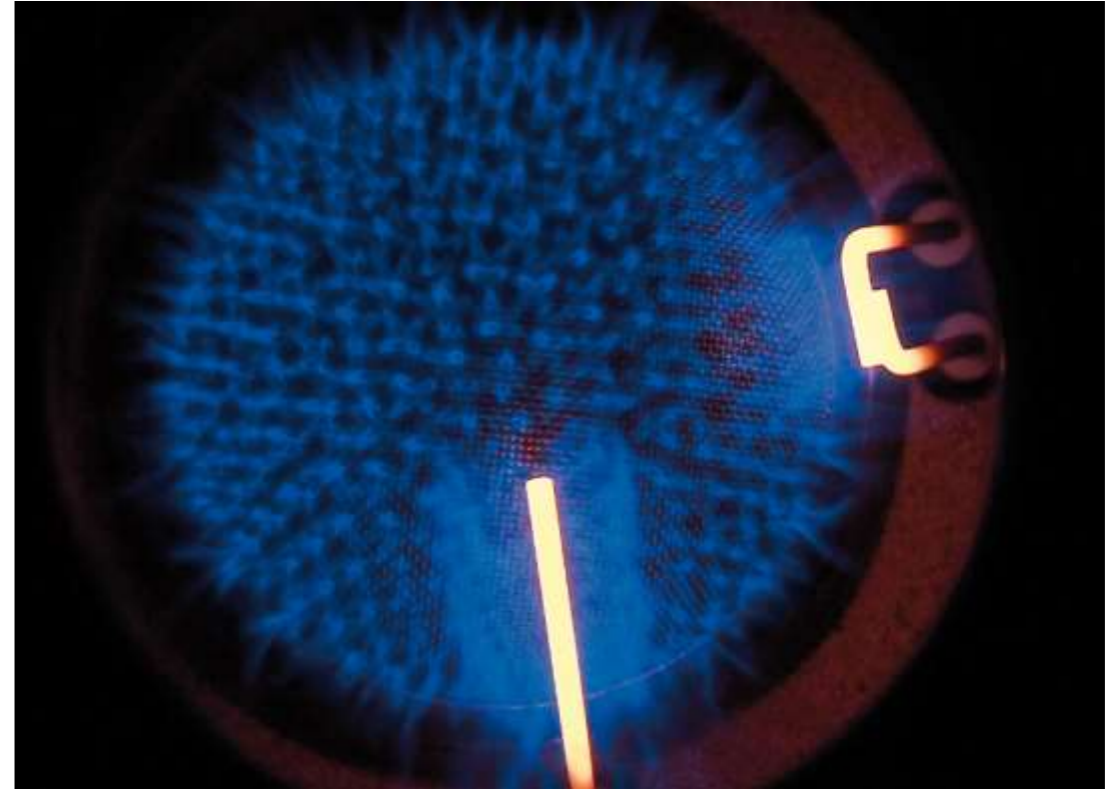
Flue gas



Vitocrossal 300, CU3A

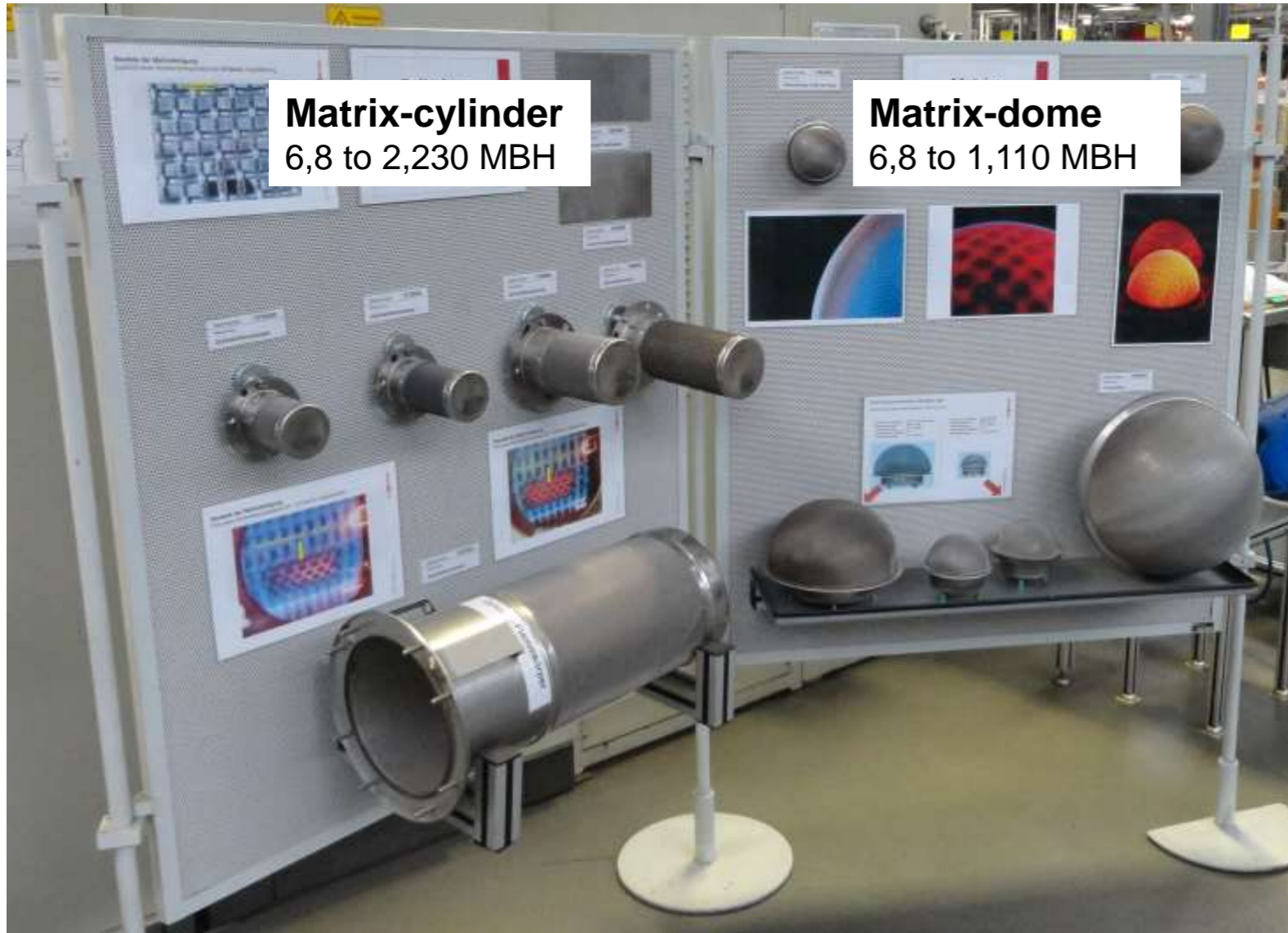
MatriX dome burner

- Developed and manufactured by Viessmann
- Matrix dome screen made of stainless steel
- Radiant burner technology
- Lambda Pro Control: Electronic combustion control system
- Factory calibrated



Vitocrossal 300, CU3A

MatriX dome and cylinder burner



Production Pland Viessmann Allendorf

Developed and manufactured by Viessmann and used for floorstanding and wallhung boilers for over 15 years

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MatriX dome burner

- Fully modulating burner
- Up to 5:1 turndown
- Suitable for a wide heat load range (from glow to blue flame)
- Natural gas or LP gas
- Low NOx (< 20 ppm)
- Lambda Pro Technology

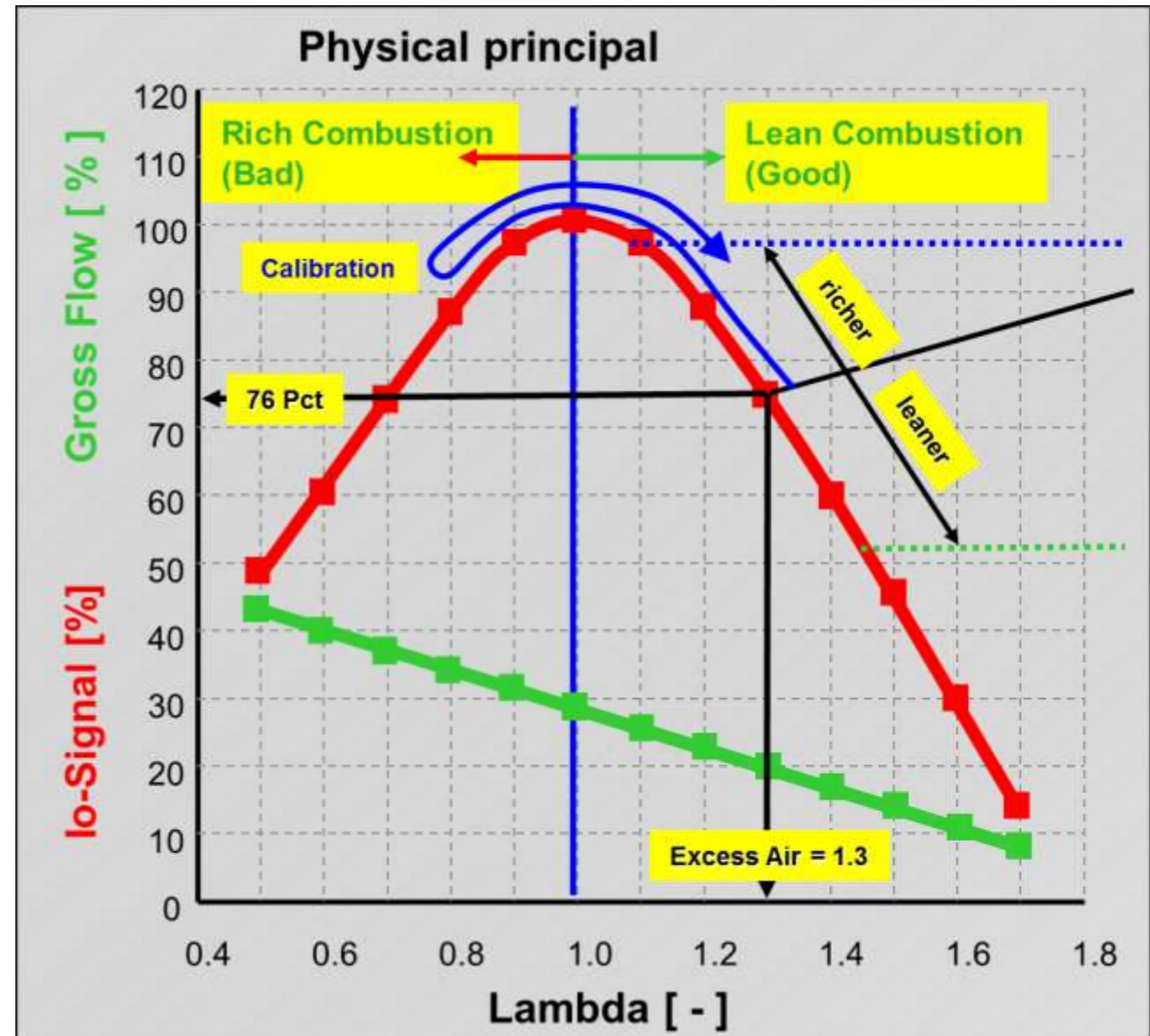


Vitocrossal 300, CU3A

MatriX dome burner

Lambda Pro Technology

- Self calibrating boiler and combustion management
- Ensures optimum combustion and constant high efficiency at all times
- Automatic adjustment to varying gas quality
- Easily adjusts to NG or LP



Vitocrossal 300, CU3A

MatriX dome burner

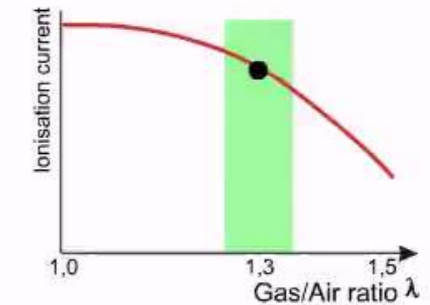
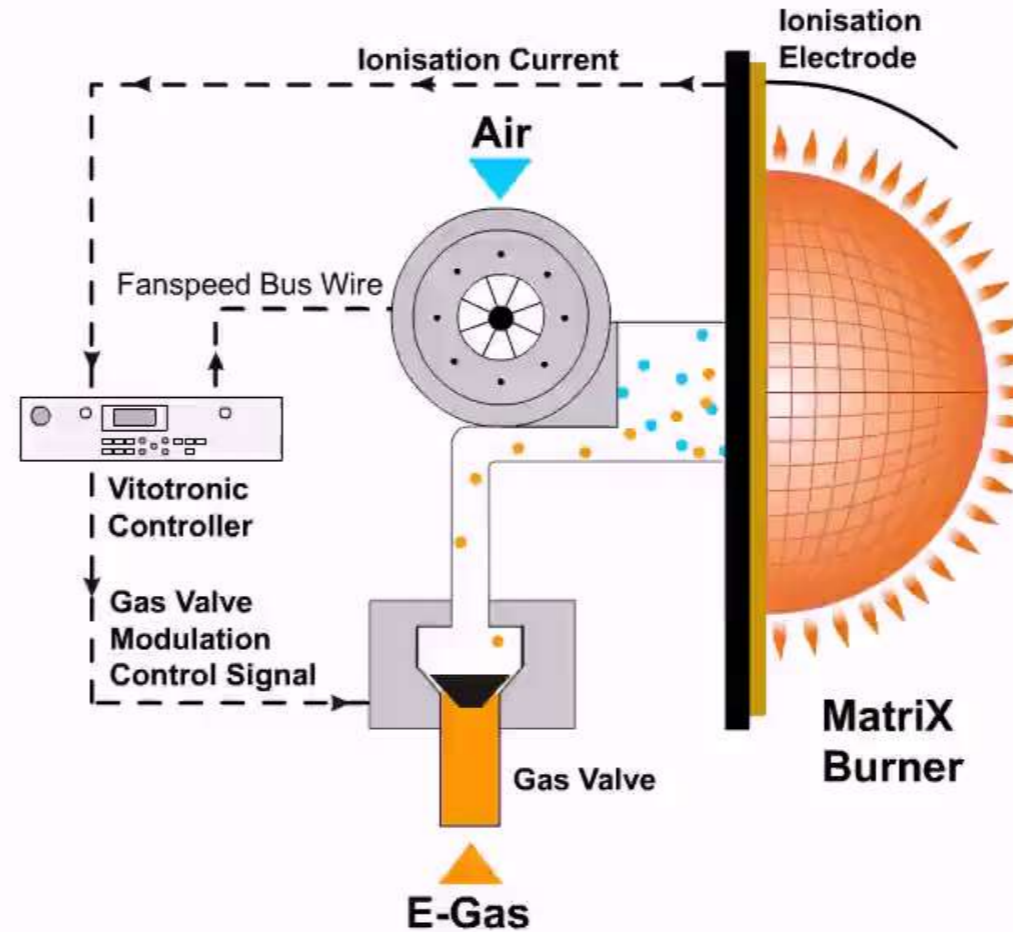
Lambda Pro – How it works:

- Controls gas and air independently of each other
- Based on flame quality (ionization current)
- Simple commissioning with no field adjustments required

Lambda Pro Control

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1. Situation Natural Gas type E

- The MatriX burner is working at its optimum Gas/Air ratio

(Gas/Air ratio 1,3).

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Benefits of Lambda Pro Control



Automatic adjustment to the gas quality

Always optimum combustion

Benefits for Gas industry

- More flexible gas quality possible
- LNG, Shale gas, Biogas, ...

Benefits for Installer

- Simpler, more reliable commissioning
- easy adjustment for natural-gas or LPG

Benefits for Enduser

- Constant high efficiency, safety and comfort
- low susceptibility to interference

Combustion control is the answer to future developments of gas quality

Vitocrossal 300, CU3A

Multiple venting options

- Venting made easy with multiple vent material options
- Separate flue gas and combustion air openings on boiler
- Approved materials:
 - Coaxial PPs
 - Rigid PPs
 - Flexible PPs
 - CPVC
 - Stainless Steel
- Maximum equivalent lengths up to 198 ft.
- No common venting option at this time



Pipe in pipe
■ Coaxial PPs



Single wall pipe:
■ PPs Rigid
■ PPs Flexible
■ CPVC
■ Stainless steel

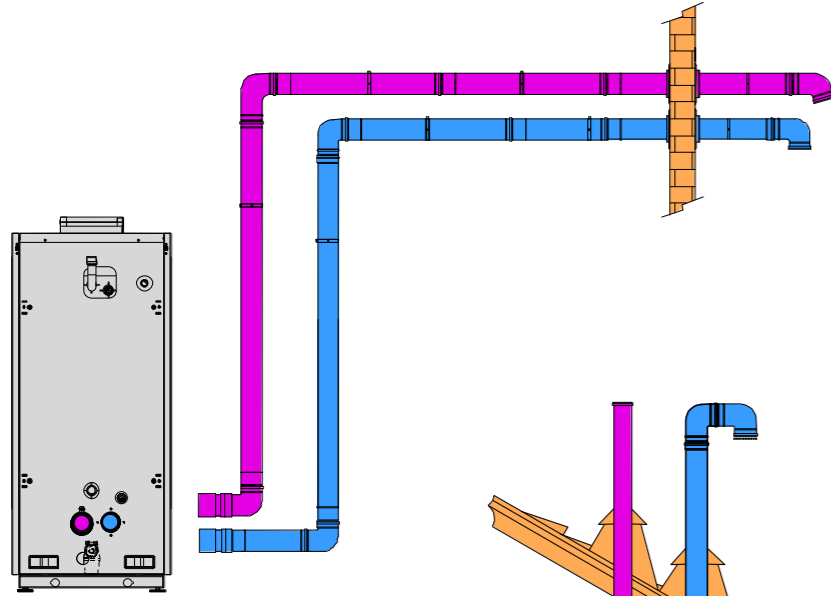


Gas Vent Type BH Class 11B 90°C cUL E System 636

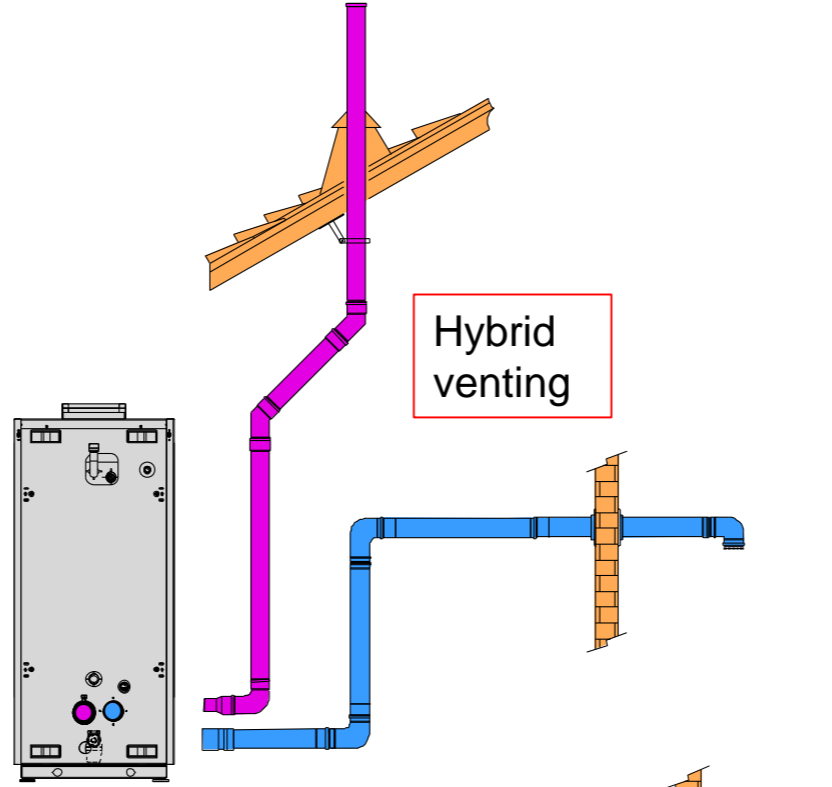
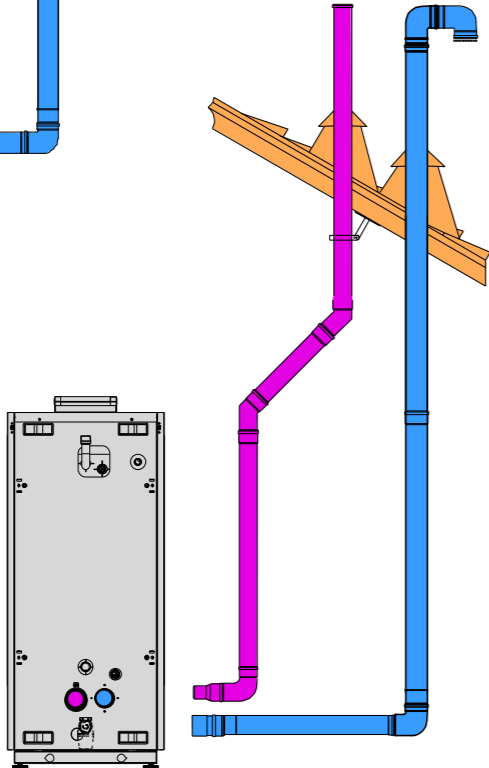
or System 636 Gas Vent Type BH Class 11B 90°C IPEX
IPEX x" (mm) CPVC Intertek Warnock Hersey ULC 636

Vitocrossal 300, CU3A

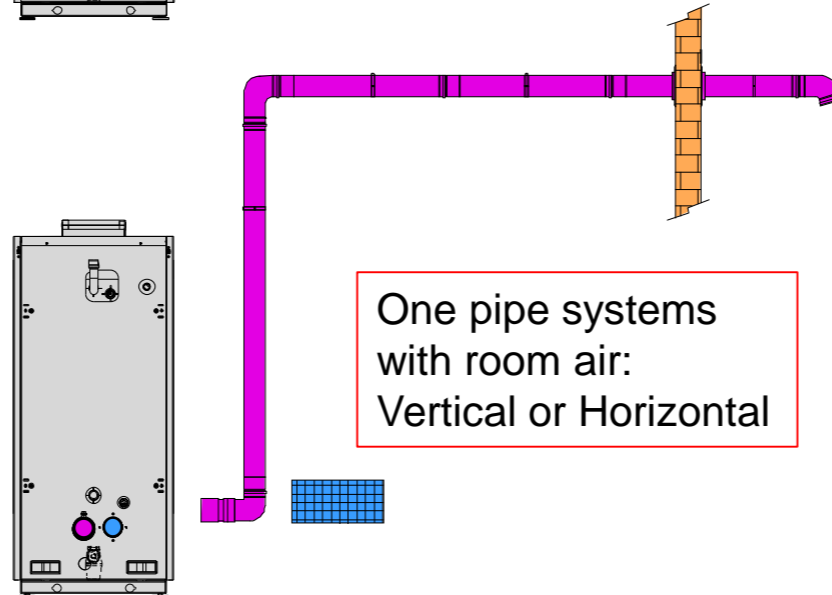
Multiple venting options



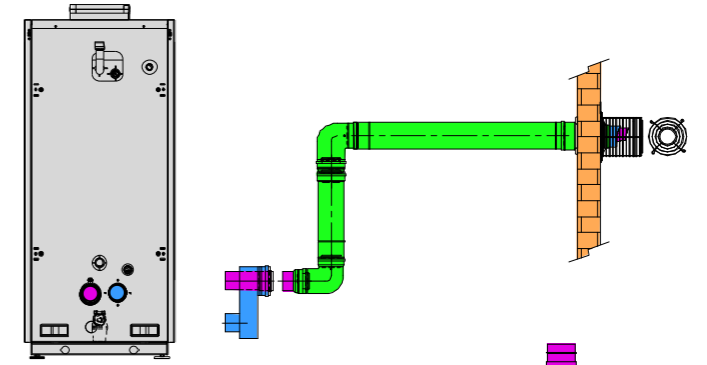
Two pipe systems:
Vertical or
Horizontal



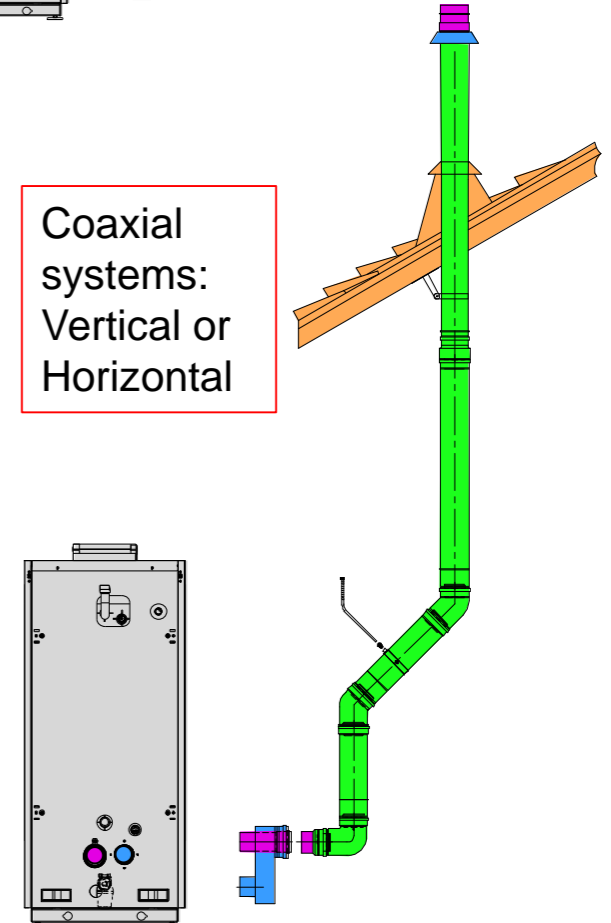
Hybrid
venting



One pipe systems
with room air:
Vertical or Horizontal



Coaxial
systems:
Vertical or
Horizontal



Vitocrossal 300, CU3A

Integrated Vitotronic 200, KW6B control

- Multi-function outdoor reset boiler and system control
- Multi-temperature space heating and DHW production
- Clear text display and graphic support
- 1 high temperature heating circuit
- 2 low temperature heating circuit
- Integrated digital clock with daily and weekly program
- Domestic hot water priority function
- Integrated LON module
- 0-10 V output for variable speed pump



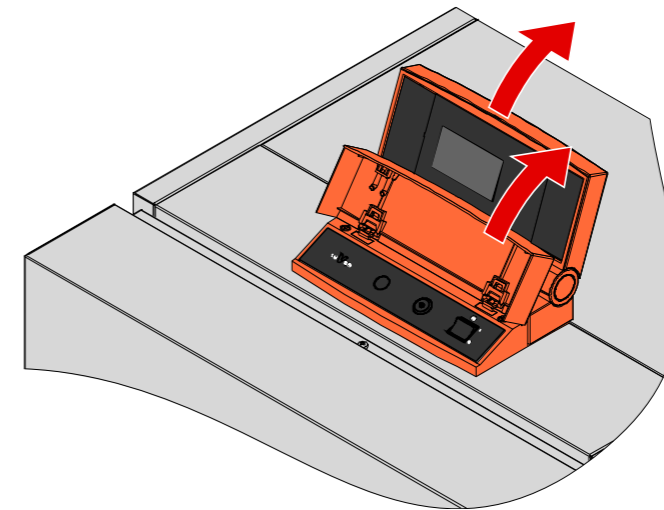
Same accessories as the Vitodens 200

- Vitotronic 300 MW2C - Cascade control
- Vitogate 300 – BMS Gateway
- Vitocom 100 LAN1 – Internet communication

Vitocrossal 300, CU3A

Integrated Vitotronic control

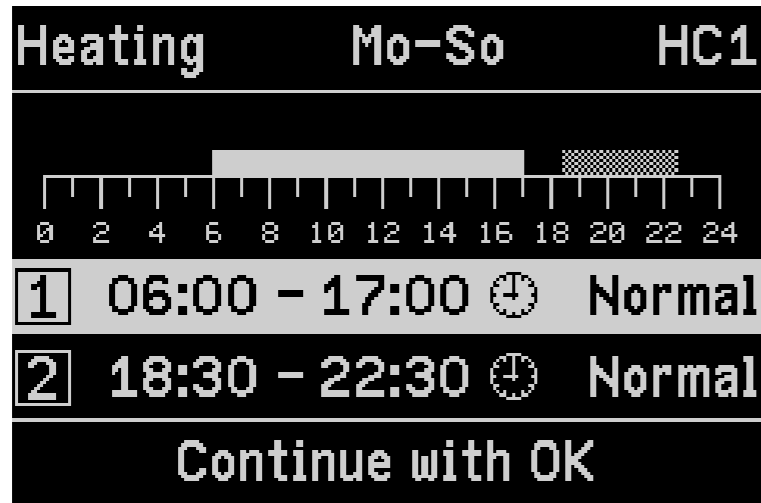
- Bright white text on black background for easy to read information.
- Easier to use with more intuitive programming functions, graphically displayed information & more features.



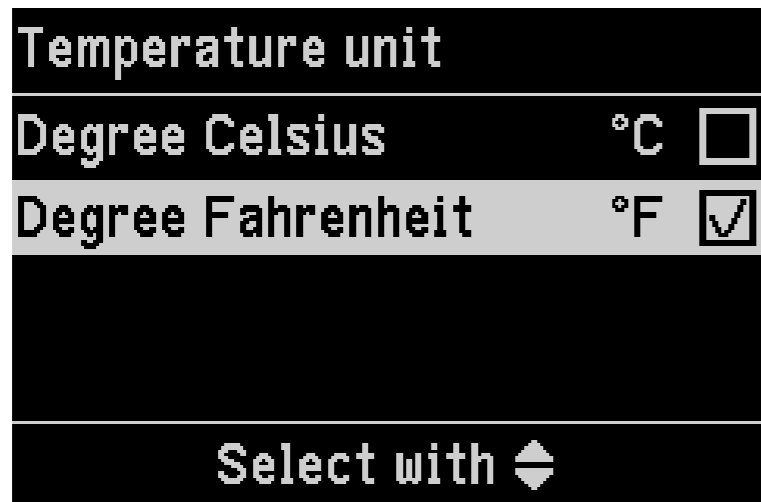
Vitocrossal 300, CU3A

Integrated Vitotronic control

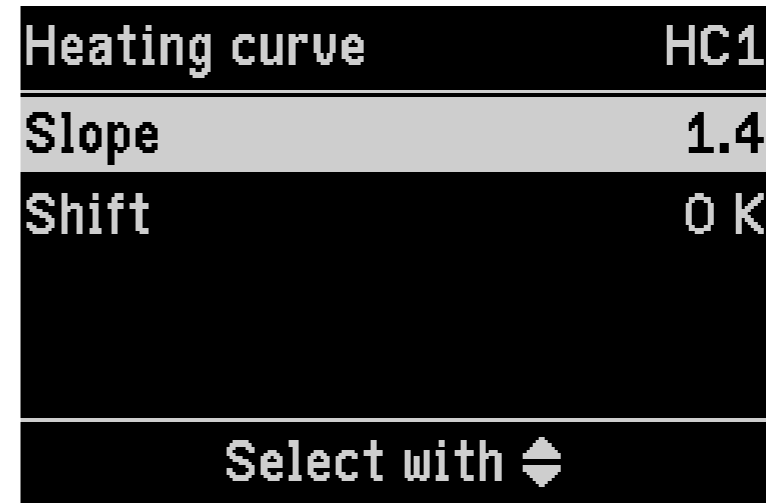
- Easy to navigate with plain text and graphics



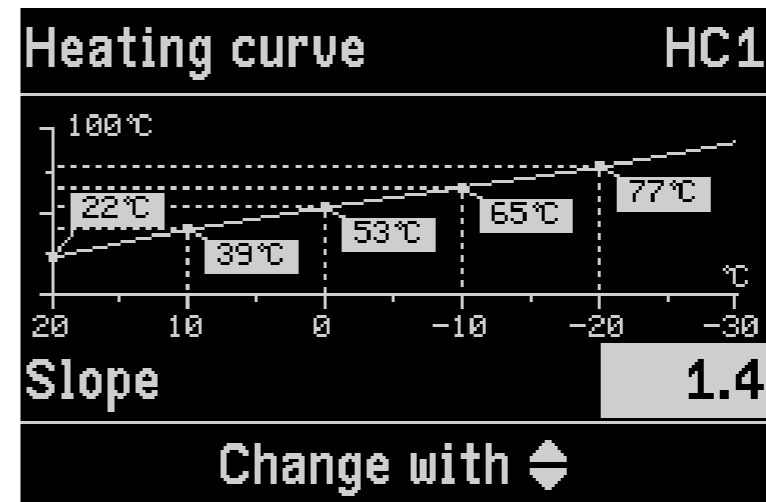
Setback
timers



Change units

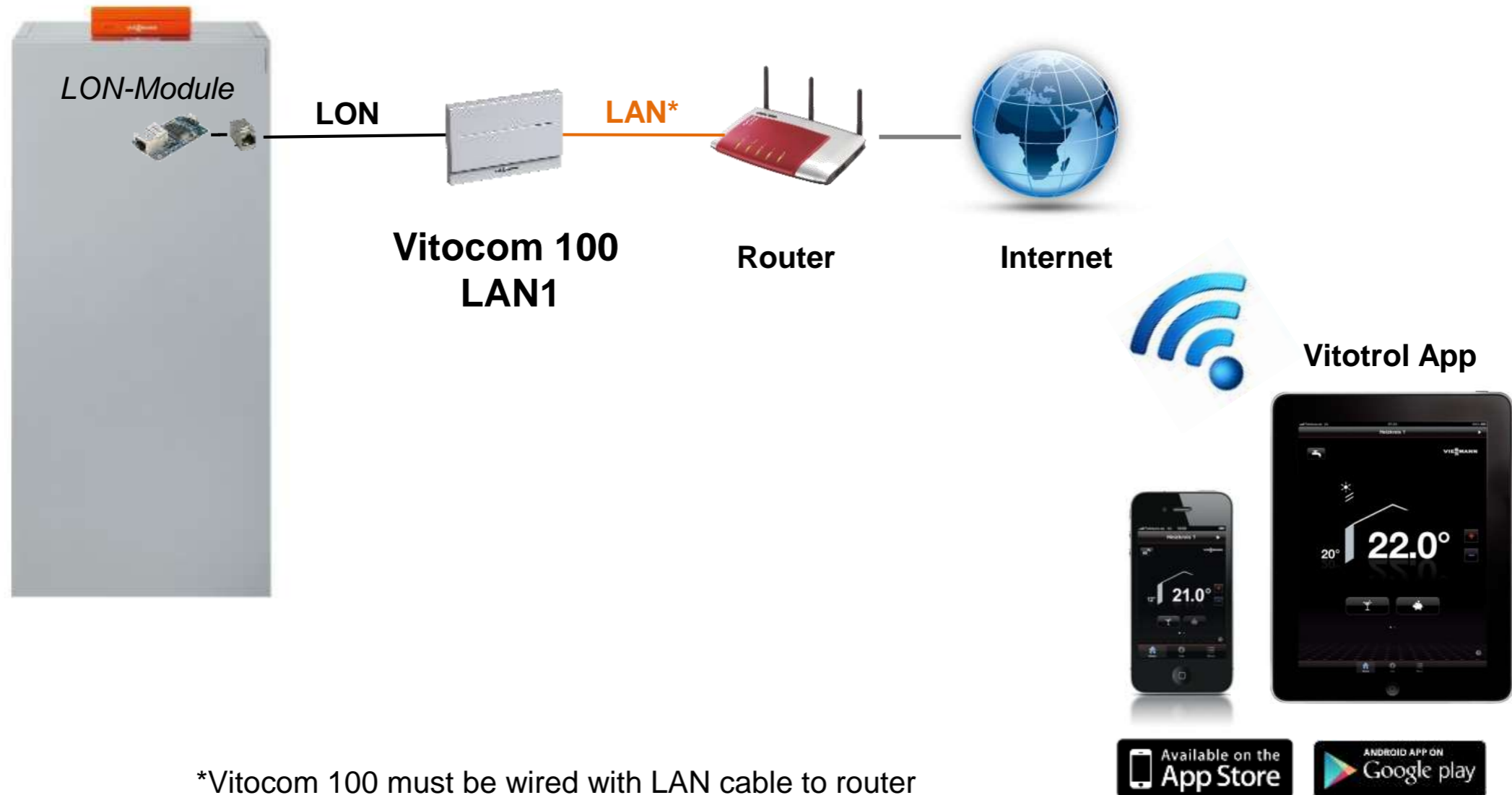


Heating curve
adjustment



Vitocrossal 300, CU3A

Internet ready with integrated LON module



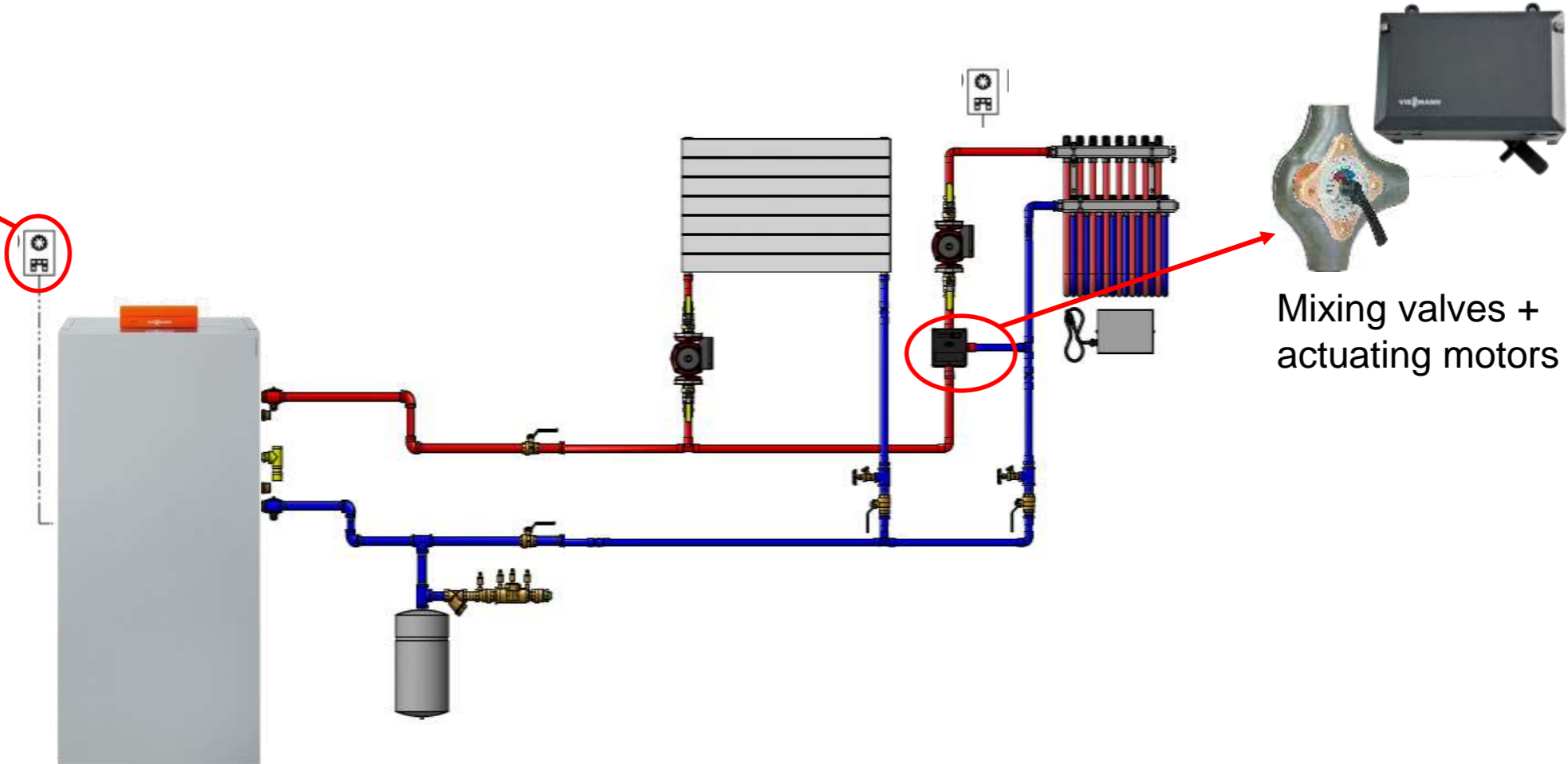
*Vitocom 100 must be wired with LAN cable to router

Vitocrossal 300, CU3A

Integrated Vitotronic control – Accessory options



Vitotrol 200/300
Communication
Thermostat



Mixing valves +
actuating motors

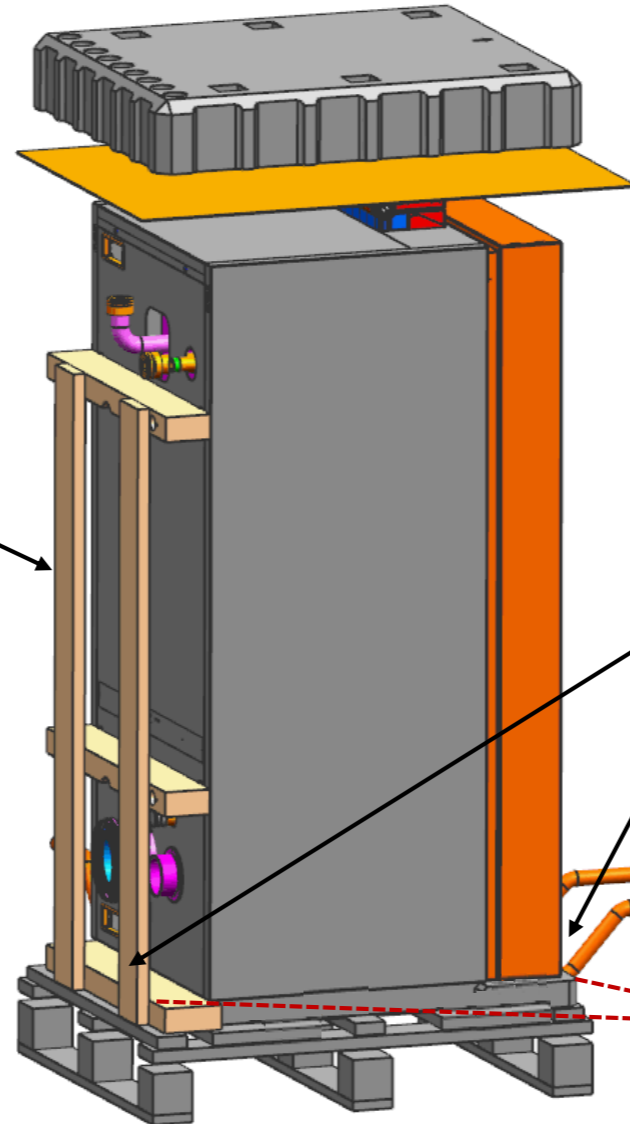
Vitocrossal 300, CU3A

Transportation and handling



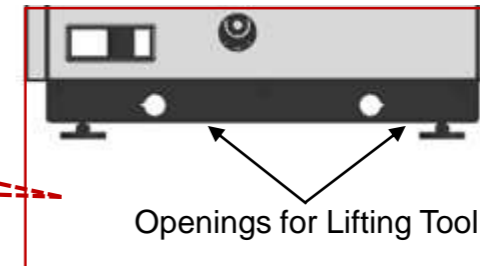
Back skid

- Easy transport with hand truck



Lifting Tool

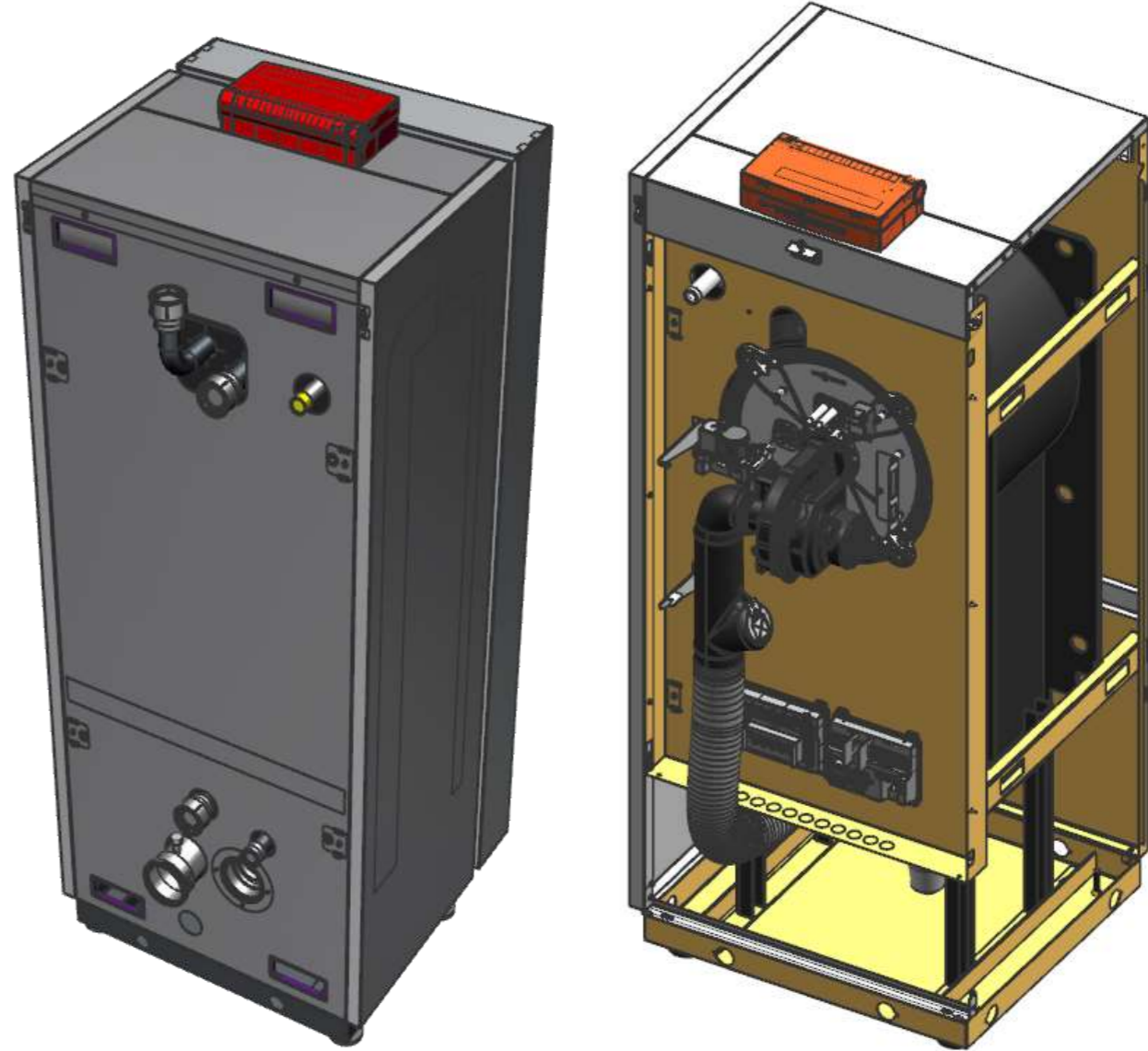
- Easy lifting from pallet and transport
- Usable from front and rear



Vitocrossal 300, CU3A

Ease of installation

- Shipped fully assembled
- No need to remove side or back panels for installation
- No wall mounting required
- All pipe connections at the rear
- Two pipe venting standard
- Air intake pre-piped to the burner
- Electrical panel located at the top for easy access

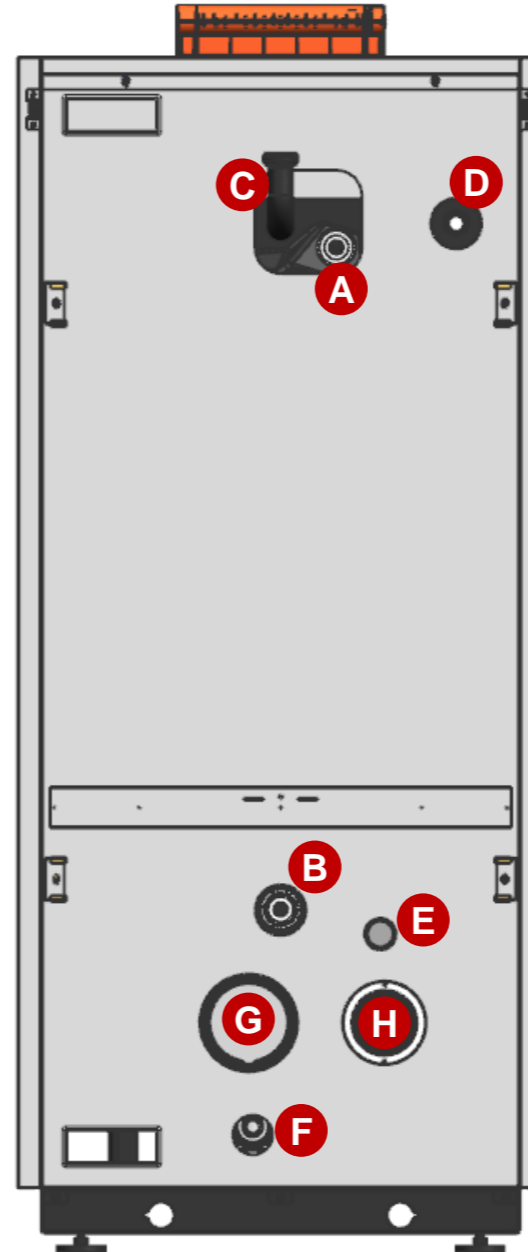


Vitocrossal 300, CU3A

Connections

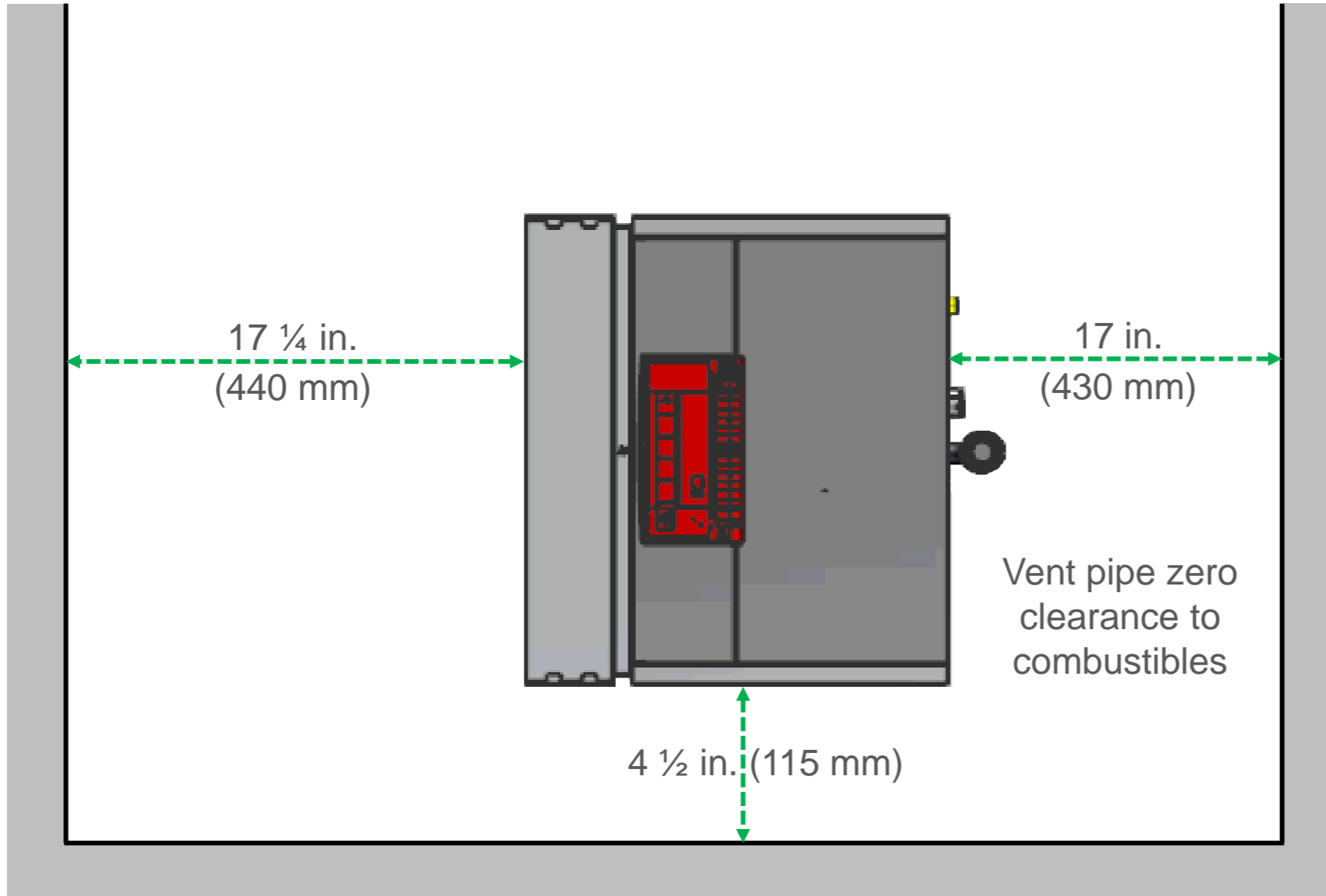
Legend:

- A** Boiler supply – 1 ¼" NPTM
- B** Boiler return – 1 ¼" NPTM
- C** Safety header connection
- D** Gas connection – ¾" NPTF
- E** Boiler drain – ¾"
- F** Condensate drain connection – ¾" hose
- G** Vent connection - 3" or 4"
- H** Combustion air connection – 3"



Vitocrossal 300, CU3A

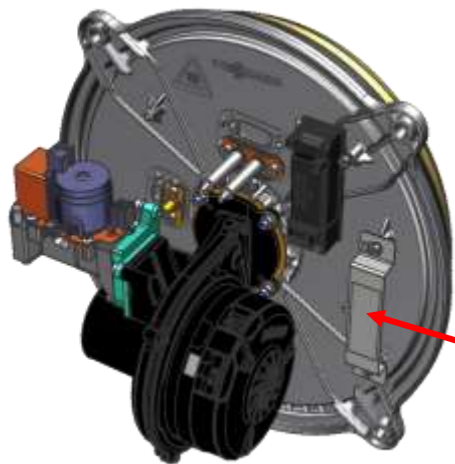
Recommended minimum service clearances



Vitocrossal 300, CU3A

Accessible components for easy service

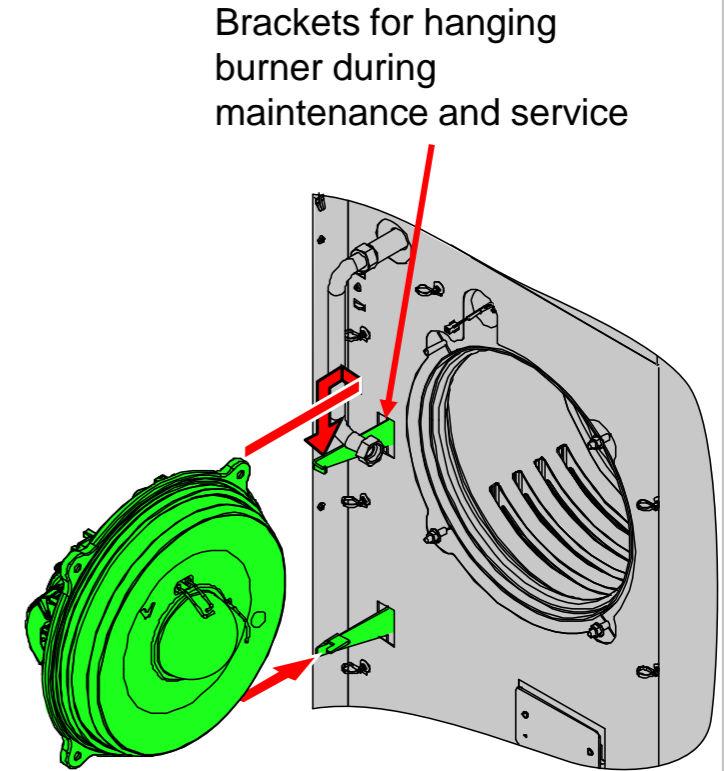
- All serviceable components are accessible from the front
- All major components are easily removed with push-fit system
- Burner easily removed and placed for service
- Boiler heat exchanger easily accessible for cleaning



Handle on door to lift burner during service



Burner assembly easy to remove

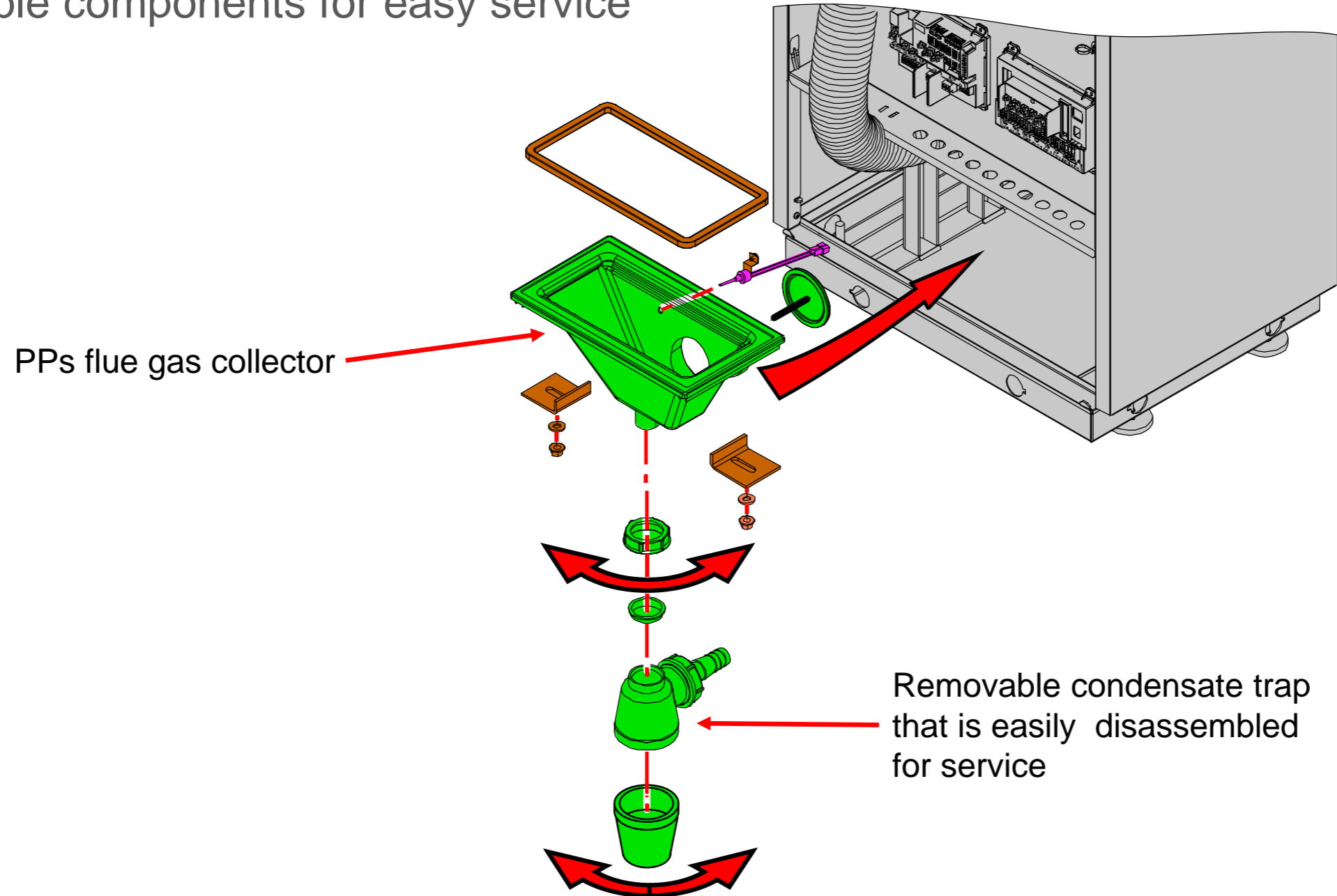


Brackets for hanging burner during maintenance and service

Easy service is the basis of design.

Vitocrossal 300, CU3A

Accessible components for easy service



Vitocrossal 300, CU3A

Where is the opportunity?

Anywhere a non-condensing or condensing boiler could be used:

- Residential or small commercial applications
 - Boiler retrofits
 - New construction
 - Low temperature applications...Radiant floor heating, snowmelting
 - High temperature applications...Radiators, fancoils
 - Volume DHW heating
 - Multi-load, Multi-temperature hydronic systems
 - Multi-zone systems with micro loads

Vitocrossal 300, CU3A

Where is the opportunity?

Boiler Retrofits:

- Atmospheric boiler replacements
- Cast-iron boiler replacements
- Old Viessmann boiler replacements
- High temperature baseboard systems
- Cast iron radiator systems
- Old homes with converted gravity systems
- Old churches, municipal buildings, etc

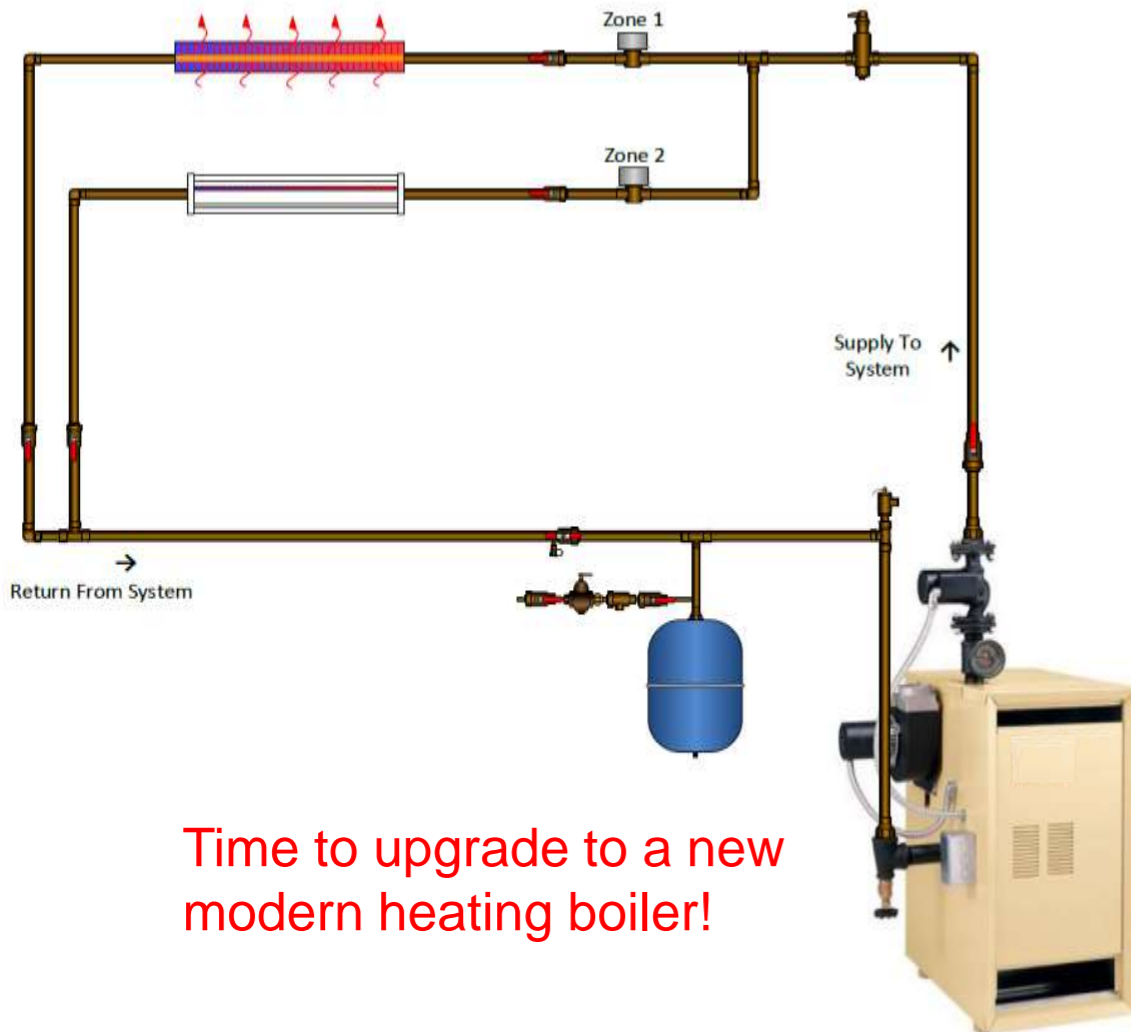
New Installations:

- Radiant floor heating
- Snow melting
- Multi-zone systems with micro-loads
- Mismatched systems with *low* heating load / *high* DHW loads
 - Low energy homes
 - Mild climate areas
 - Laundromats
 - Car/truck wash

Vitocrossal 300, CU3A

Target Application – Boiler retrofit

High temperature baseboard system with cast iron boiler



Time to upgrade to a new modern heating boiler!

Pro's of cast iron boiler

- Economical first cost
- Simple piping and wiring
- Chimney or sidewall vent
- Suitable for low basements
- High temperature output capability (up to 200°F)
- High mass boiler design not sensitive to low flow rates



Con's

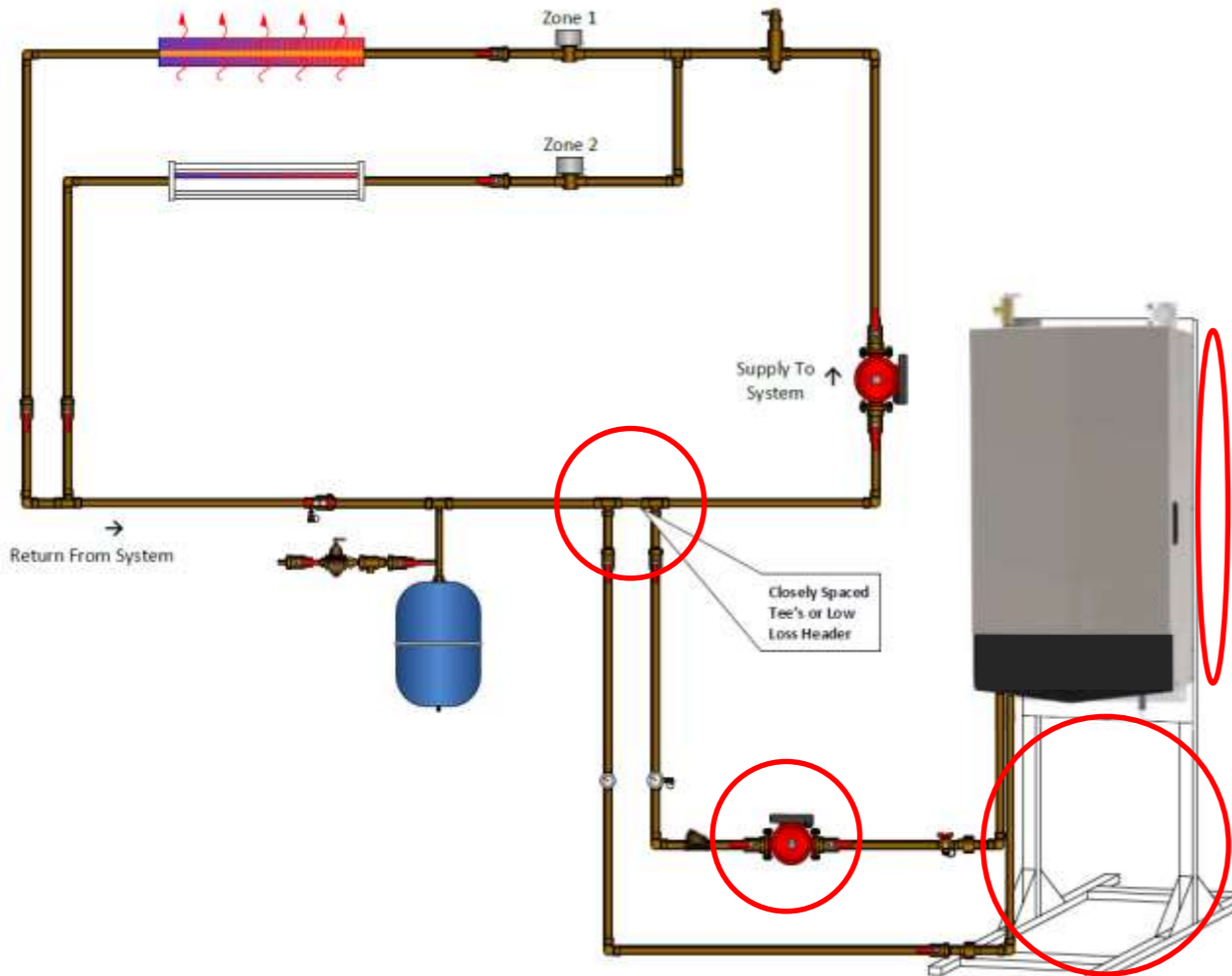
- High energy costs
- Low appliance seasonal efficiency, typically ~80%
- Typically single set point with no outdoor reset
- No advanced control capabilities
- Burner does not modulate
- Boiler cannot be operated in condensing mode
→ Return water temp limit 130 deg. F
- Must use SS for sidewall venting
- Not sealed combustion
- Carbon monoxide (CO) outflow possible



Vitocrossal 300, CU3A

Target Application – Solution 1:

Retrofit with wall mounted low-mass condensing boiler



Pro's of low-mass condensing boiler

- Condensing with low return water temperatures resulting in efficiencies up to 95%AFUE
- Lower fuel costs
- Modulating burner
- Advanced control functions (e.g. Integrated DHW priority)
- Multiple heat circuit set point temperatures
- Multiple venting options
- Sealed combustion, no CO outflow possible



Con's

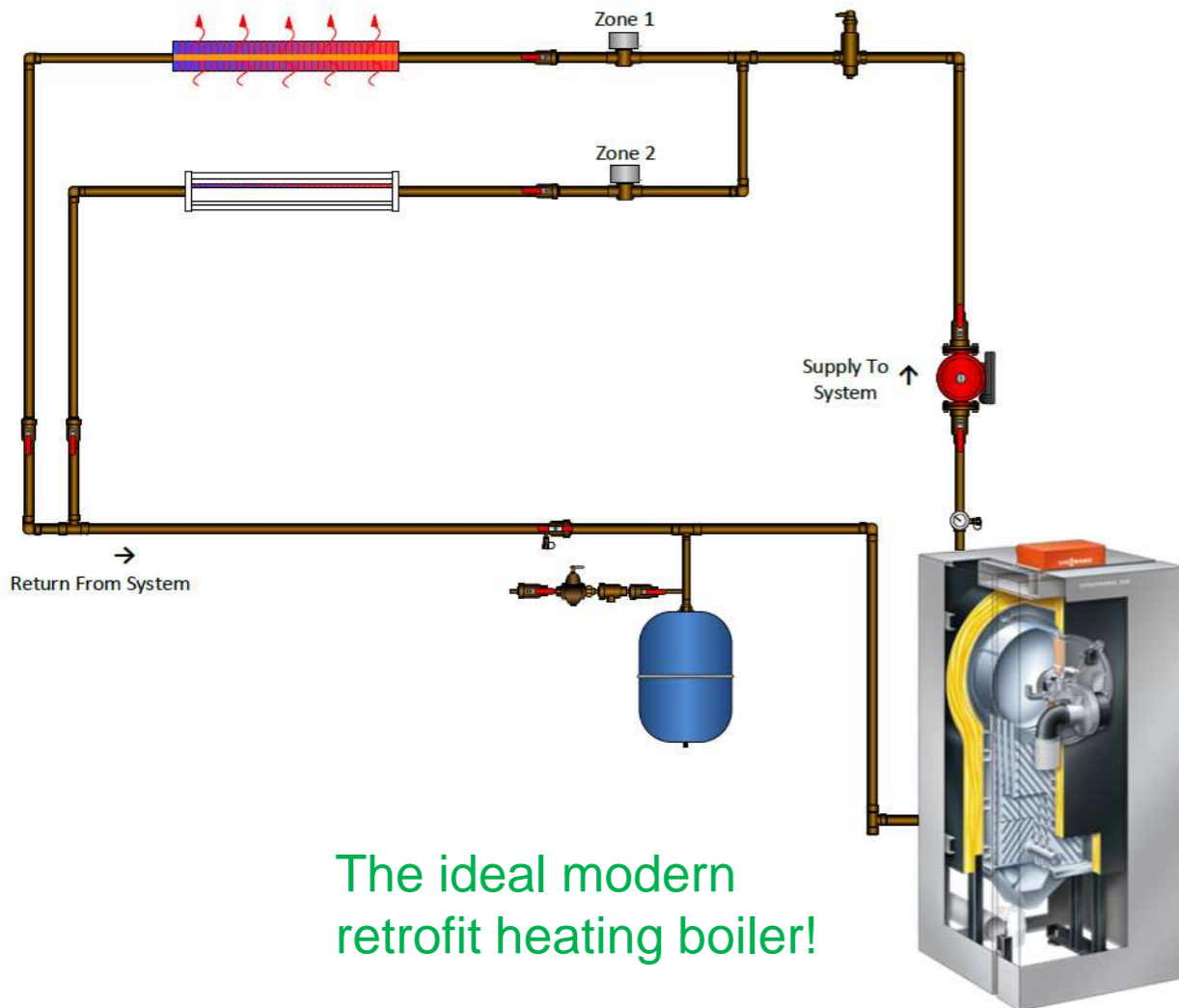
- Difficult to install in low basements
- Requires boiler stand to floor mount
- Sensitive to flow rates:
 - Requires low loss header or primary-secondary piping
 - Requires additional boiler loop pump
 - Boiler can short-cycle with micro-loads
- Additional components, installation time and cost
- High pressure loss in exchanger requires bigger pump
- Higher electrical consumption
- Sensitive to sediment from old system piping
- Limited in output temperature (Vitodens167°F)



Vitocrossal 300, CU3A

Target Application – Solution 2:

CU3A - Floor Standing High Mass Condensing Boiler



The ideal modern
retrofit heating boiler!

Pro's of high-mass CU3A boiler

- Condensing with low return water temperatures resulting in efficiencies up to 95%AFUE
- Lower fuel costs
- Modulating burner
- Advanced control functions (e.g. Integrated DHW priority)
- Multiple heat circuit set point temperatures
- High temperature up to 90°C (194 °F)
- High mass high water volume design
- Low pressure loss thru heat exchanger
- No primary-secondary piping, LLH or boiler pump required
- Directly connect to existing piping and pump
- Lower electrical consumption
- No wall mounting or stand required
- Vent height ideal for low basements
- Multiple venting options
- Sealed combustion, no CO outflow possible
- Service friendly

Considerations

- Larger and heavier than wall mount boiler



Vitocrossal 300, CU3A

Target Application: Ideal for retrofits in low basements



Vitocrossal 300, CU3A

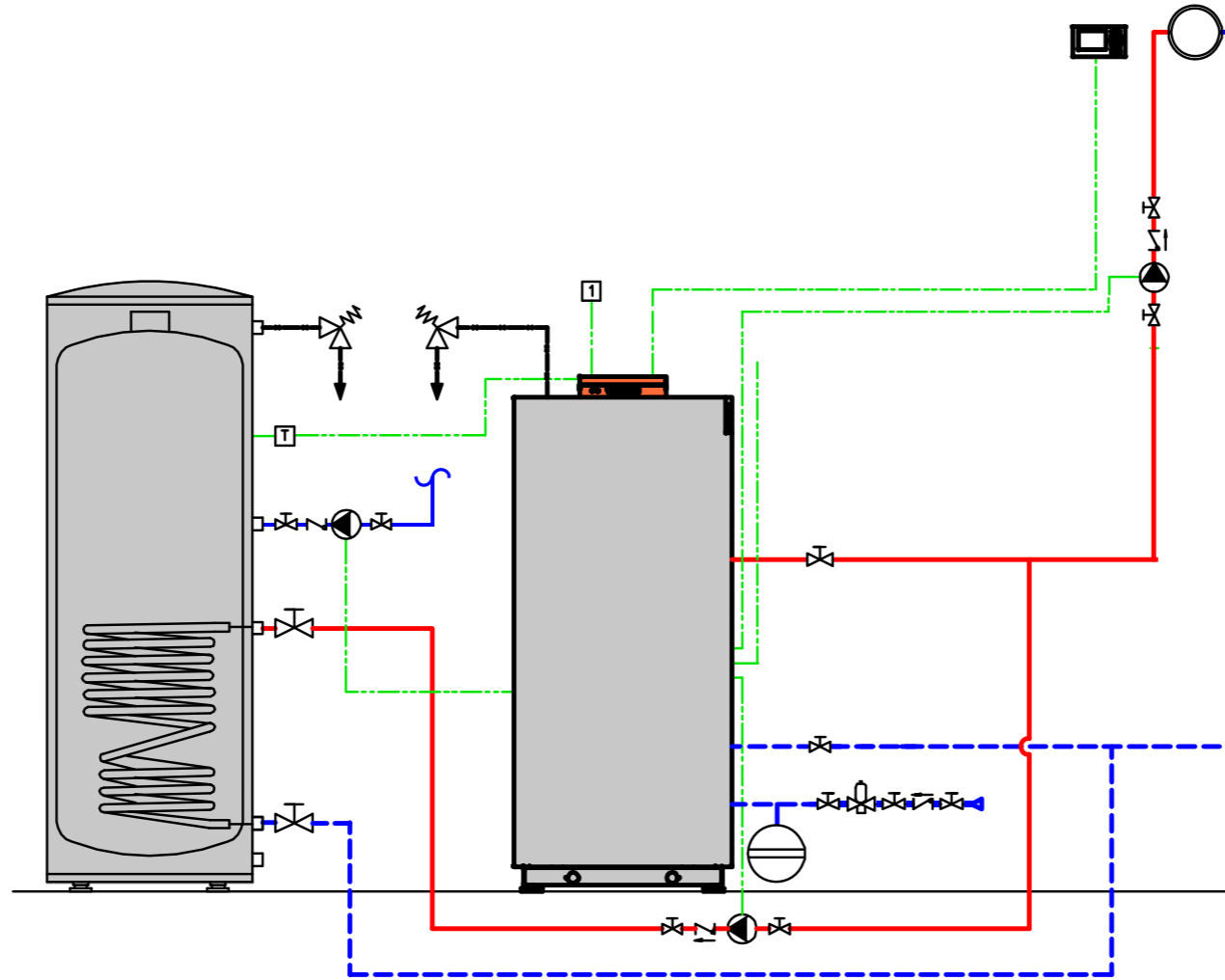
Target Application: Low heating load, Large DHW load



Low heating load



Large DHW load



Pro's of high-mass CU3A

- High boiler temperature up to 90°C (194 °F) allows for very high volume DHW production and recovery
- High mass high water volume boiler design minimizes boiler cycling during heating demand
- Advanced control functions (e.g. Integrated DHW priority)

Vitocrossal 300, CU3A

Everything you need in a heating boiler

- Suitable for a wide range of applications
- Highly efficient condensing operation for dramatic fuel savings
- Durable, reliable and long service life with stainless steel construction and high mass design
- High temperature capability
- Space saving compact design
- Nearly silent operation
- Fast and simple to install and program
- Easy to service and maintain



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Vitocrossal 300, CU3A Product Overview