

SHOP DRAWING TRANSMITTAL

The Park Danforth

Portland ME

Project No.: 13-059-00

Division: 23 52 16

Transmit To:

Mark Donovan
PC Construction
131 Presumpscot Street
Portland ME 04103

Submission No.: 43

Version: A

CM Reference No.: 23 52 16-001

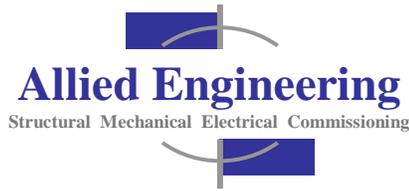
Copies:

Ron Norton	Construction Management Consultin
Andrew Pires	PC Construction
Kemp Carey	PC Construction

Submittal No.	Qty.	Description
43 - 1	1	Condensing Boilers

Comments:

Note: Refer to attached submittals for review comments and requirements.



SHOP DRAWING REVIEW COVER SHEET

Project Name, Project #: Park Danforth : 14018

Date Received: 12/9/15

Date Due: 12/23/15

AEI Shop Drawing #: 06

Contractor Shop Drawing #: 235216-001

AEI Project Manager: Ian MacDonald

Contractor: PC Construction

Item Description: Condensing Boiler

Spec. Section Number(s): 235216

email : Date Returned 12-14-2015

\\AEFile\cad\Projects\2014\14018 ~ Park Danforth\40 Construction\Shops\Electronic Submittals from contractor\06 Condensing Boiler\06 Condensing Boiler Review Letter.doc

CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR QUANTITIES; DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE JOB SITE; INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESS FOR TECHNIQUES OF CONSTRUCTION; COORDINATION OF THE WORK OF ALL TRADES; AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER. THIS REVIEW DOES NOT MODIFY CONTRACTOR'S DUTY TO COMPLY WITH THE CONTRACT DOCUMENTS.

___ REVIEWED
 REVIEWED W/NOTES, *No Resubmission* Required
___ REVIEWED W/NOTES, *Resubmission Required*
___ NOT ACCEPTABLE

NOTES: [See notes herein.](#)

Reviewed by: Allied Engineering, Inc.

Reviewer: Susan Hathaway



Garret Bertolini
 131 Presumpscot St
 Portland, ME 04103
 T: 207.874.2323
 F: 207.874.2727
 E: gbertolini@pcconstruction.com

Project No. 14776
The Park Danforth Expansion & Renovations
 789 Stevens Ave
 Portland, ME 04103

CONSTRUCTION

Submittal 23 52 16-001
Review Cycle 1

Title	Condensing Boilers: Product Data		
Type	Product Data		
Sent Date	08-Dec-2015	Spec Section	230000
Due Date	22-Dec-2015	Spec Sub-Section	235216

Sent To For Review

Scott Timmons
 Lavallee Brensinger Architects

Responsible Subcontractor / Vendor

Michael Leighton
 Titan Mechanical, Inc.

Item Being Submitted

Condensing Boilers: Product Data

Submittal Contains Product Data for the Following:

- Boilers
- Boiler Controls
- DHW Tanks
- Boiler System Accessories

Contractor's Review Stamp

I hereby certify that I have examined the enclosed submittal(s) and have determined and verified all field measurements, construction criteria, materials, catalog numbers, and similar data, coordinated the submittal(s) with other submissions and the work of other trades and contractors and, to the best of my knowledge and belief, the enclosed submittal(s) is/are in full compliance with the Contract requirements, except as noted above.

Architect's Review Stamp

Signature	Date
	12/08/2015

Name
 Andrew Pires
 PC Construction Company

This approval does not release subcontractor / vendor from the contractual responsibilities.



Titan Mechanical, Inc. *Design Build Engineering · Mechanical Contracting · Service*

232 Riverside Industrial Parkway · Portland, ME 04103 · Ph 207.878.5223 · Fax 207.878.5235

P.O. Box 103 · Newport, ME 04953 · Ph 207.368.2503 · Fax 207.368.2395

SUBMITTAL S - 1

Project Name: Park Danforth

Project Location: Portland, Maine

Project Number: 15 - 785

General Contractor: P C Construction Company

Sub-Contractor: Titan Mechanical Inc.

Submittal Supplied By: Portland Winnelson

Item: Viessmann Boiler

Specification Section: 23 52 16 / 2.1 / A.1. [Also spec section 223500](#)

Reviewed By: Michael Leighton

Date: 11 / 27 / 15

Initials: M J L

_____ This Submittal contains variations from Contract Documents

 X _____ This Submittal does not contain variations from Contract Documents

Product Submittal



Project:

Location:

Index:

▶ Boilers and Burners

Vitocrossal 200, CM2-311 Gas-fired Condensing Boiler (Qty. of 3)

▶ Boiler Controls

Vitotronic 300, GW6B-Digital-Boiler-Control (Qty. of 3)

▶ DHW Tanks

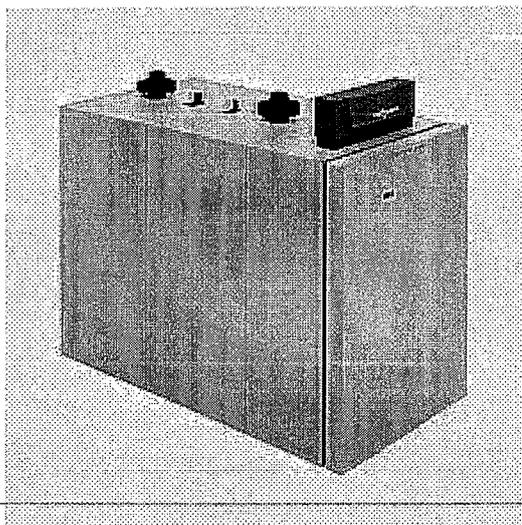
Vitocell 300-V, EVI-300 Stainless Steel DHW Tank (Qty. of 2)

▶ System Accessories

Neutralization System, Model N-70 (Qty. of 3)

Vitogate 300 BACNet/ModBUS Gateway (Qty. of 1)

Boiler Data



VITOCROSSAL 200

CM2 Series

Full product manuals:

-  Technical Data Manual
-  Installation Instructions
-  Operating Instructions
-  Service Instructions
-  Common Venting System Manual

1.0 Technical Data for CM2-311

Input *1	1112 MBH	326 kW
Minimum input *1	222 MBH	65 kW
Output *2	1078 MBH	316 kW
Net AHRI rating	937 MBH	275 kW
Combustion efficiency *2	95 %	
Thermal efficiency *2	97 %	

Overall dimensions

Overall length (e)	73 inches	1852 mm
Overall width (c) including insulation	36½ inches	930 mm
Overall height (a) including control unit *3	66 inches	1676 mm

Concrete boiler base

Length	40 inches	1005 mm
Width	31 inches	800 mm
Thickness	4 inches	100 mm

Weight

Boiler body	564 lbs	256 kg
Complete with burner, control & thermal insulation	792 lbs	359 kg

Boiler water content	74 USG	279 L
Heat exchanger surface water cooled	114.1 sq. ft.	10.6 sq. m
Max. operating temperature	190 °F	88 °C
Max. operating pressure	75 psig	517 kpa

Boiler connections

Boiler supply (BS) and return (BR) ANSI flanges	2½ inches	65 mm
Safety supply	1¼ inches	32 mm
Boiler drain	1 inch	
Condensate drain	¾ inch	

Vent pipe

Internal diameter	8 inches	201 mm
-------------------	----------	--------

Flue gas values

Temperature (at a return temperature of 86°F / 30°C)		
– At rated input	130 °F	54 °C
– At partial load	95 °F	35 °C
Temperature (at a return temperature of 140°F / 60°C)		
– At rated input	167 °F	75 °C

Mass flow rate of flue gas

– At rated input	994 lbs/h	451 kg/h
– At partial load	331 lbs/h	150 kg/h

Pressure at boiler flue outlet at rated input	0.28 " w.c.	70 Pa
---	-------------	-------

Notes:

- *1 For high altitude installations (5,000 to 10,000 ft.), the input will have an altitude de-ration of 15% for 5,000 ft. and 18% for 10,000 ft.
- *2 Tested to AHRI, BTS-2000 Testing Standard Method to Determine Efficiency of Commercial Heating Boilers.
- *3 Add 1½ in. (40 mm) when using seismic mounts (optional accessory).

1.1 Technical Data for Cylinder Burner for CM2-311

Burner version	Modulating
Voltage	120 V
Frequency	60 Hz

Power consumption

– At maximum input	368 Watts
– At minimum input	67 Watts

Dimensions

Length	17¾ inches	450 mm
Total length	23½ inches	595 mm
Length with burner hood	20 inches	510 mm
Width	21¾ inches	550 mm
Height	19 inches	480 mm

Weight

Burner with combination valve & burner hood	78 lbs	35.5 kg
---	--------	---------

Minimum gas supply pressure

Natural gas	4 " w.c.	996 Pa
Liquid propane gas	10 " w.c.	2491 Pa

Maximum gas supply pressure

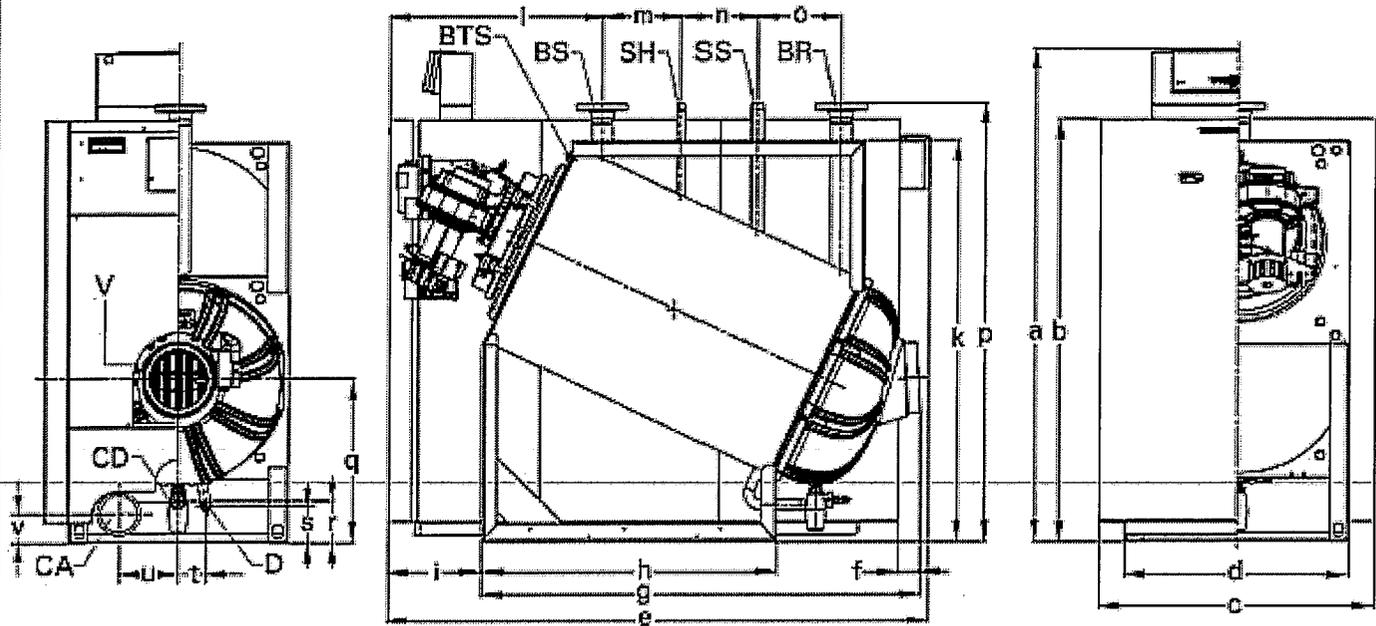
Natural gas	14 " w.c.	3487 Pa
Liquid propane gas	14 " w.c.	3487 Pa

Gas connection	1¼ inch NPT
-----------------------	-------------

verify boilers are set up for natural gas

1.2 Dimensional Drawings

Boiler Rear, Side and Front Views



Dimensions

a	66"	1676 mm
b	56½"	1438 mm
c	36½"	930 mm
d	30"	760 mm
e	73"	1852 mm
f (flue pipe projection at the back)	3"	75 mm
g	59"	1500 mm
h (foot length)	39½"	1005 mm
i (distance from front face of cover to front supporting foot)	12¾"	323 mm
k	53¾"	1365 mm
l (distance from front face of cover to centre of boiler supply connection)	28¾"	729 mm
m	10¾"	275 mm
n	10"	255 mm
o	11¼"	284 mm
p	58¾"	1493 mm
q	22"	558 mm
r	5½"	142 mm
s	5"	126 mm
t	4"	100 mm
u	8"	207 mm
v	4"	100 mm

Legend

BR	Boiler return
BS	Boiler supply
BTS	Boiler water temperature sensor
CA	Combustion air pipe connection
CD	Condensate drain
D	Drain
SH	Female connection ½ in. for pressure gage
SS	Safety supply; pressure relief valve, air vent, low water cut-off
V	Vent pipe connection

1.3 Minimum Clearances

Clearances to Combustibles	
Top	0" / 0 mm
Sides	0" / 0 mm
Flue	As per vent manufacturer's specifications
Front	0" / 0 mm
Floor	Combustible

Recommended Minimum Service Clearances

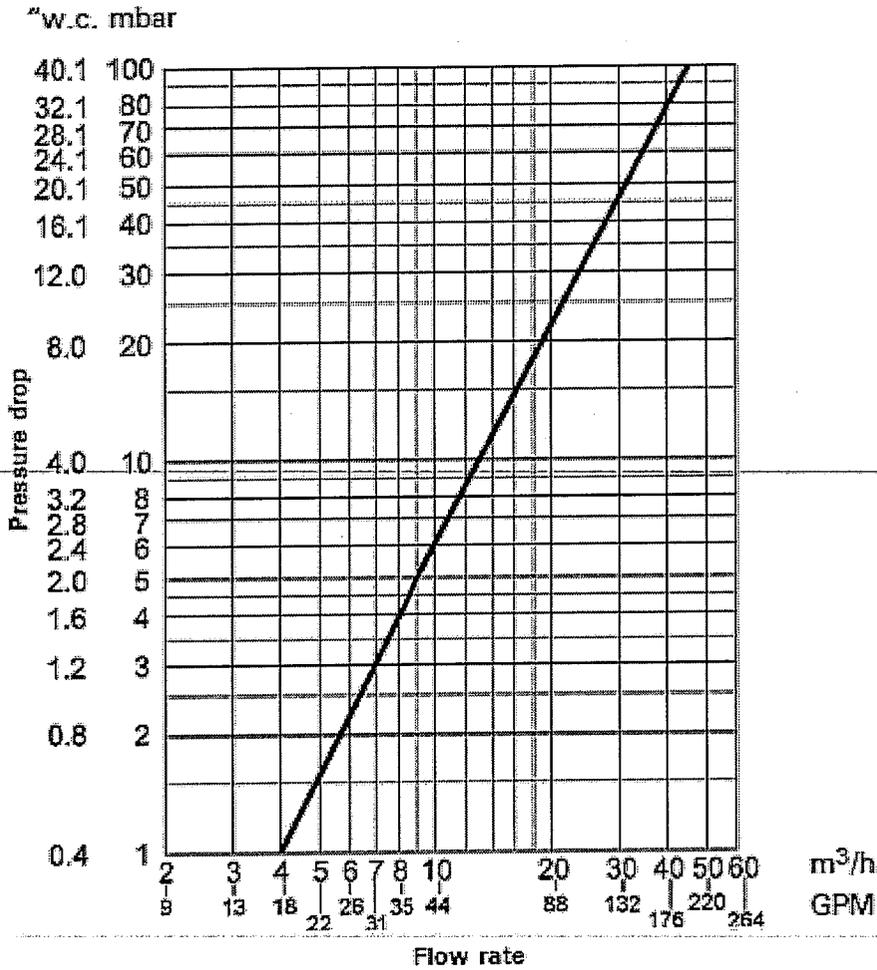
Dimensions		
a	*1	20" 500 mm
b	*2	30" 760 mm
c		20" 500 mm
d		20" 500 mm
e		24" 600 mm
f		22" 550 mm
g		15½" 395 mm

*1 Clearance may be reduced to zero in multi-boiler installations, provided the side panel removal is not required.
Note: The burner, boiler control, condensate trap, venting and heat exchanger are still fully accessible from the front and rear of the boiler.
 *2 Clearance for vent pipe installation.

Legend
 (A) Boiler
 (B) Burner

1.4 Waterside Flow

Pressure Drop (Primary Circuit)

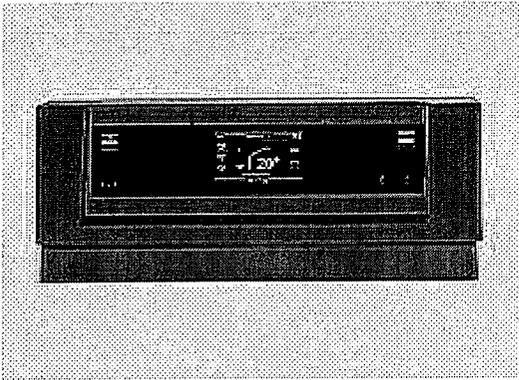


Recommended Flow Rates for CM2-311

20° F Δt	106 GPM
40° F Δt	53 GPM
11° C Δt	24.07 cubic m/h
22° C Δt	12.04 cubic m/h

Δt = temperature difference

Control Data



VITOTRONIC 300

GW6B Series

Full product manuals:

-  Installation and Service Instructions
-  Operating Instructions
-  Wiring Diagram

1.0 Product Description

Weather-compensated boiler and heating circuit control unit for use with Vitocrossal 200 boilers in single or multi-boiler systems (cascadable up to 8 boilers).

1.1 Technical Data

Rated voltage	120 V~
Rated frequency	60 Hz
Rated current	12 A~
Power consumption	10 W
Safety category	I

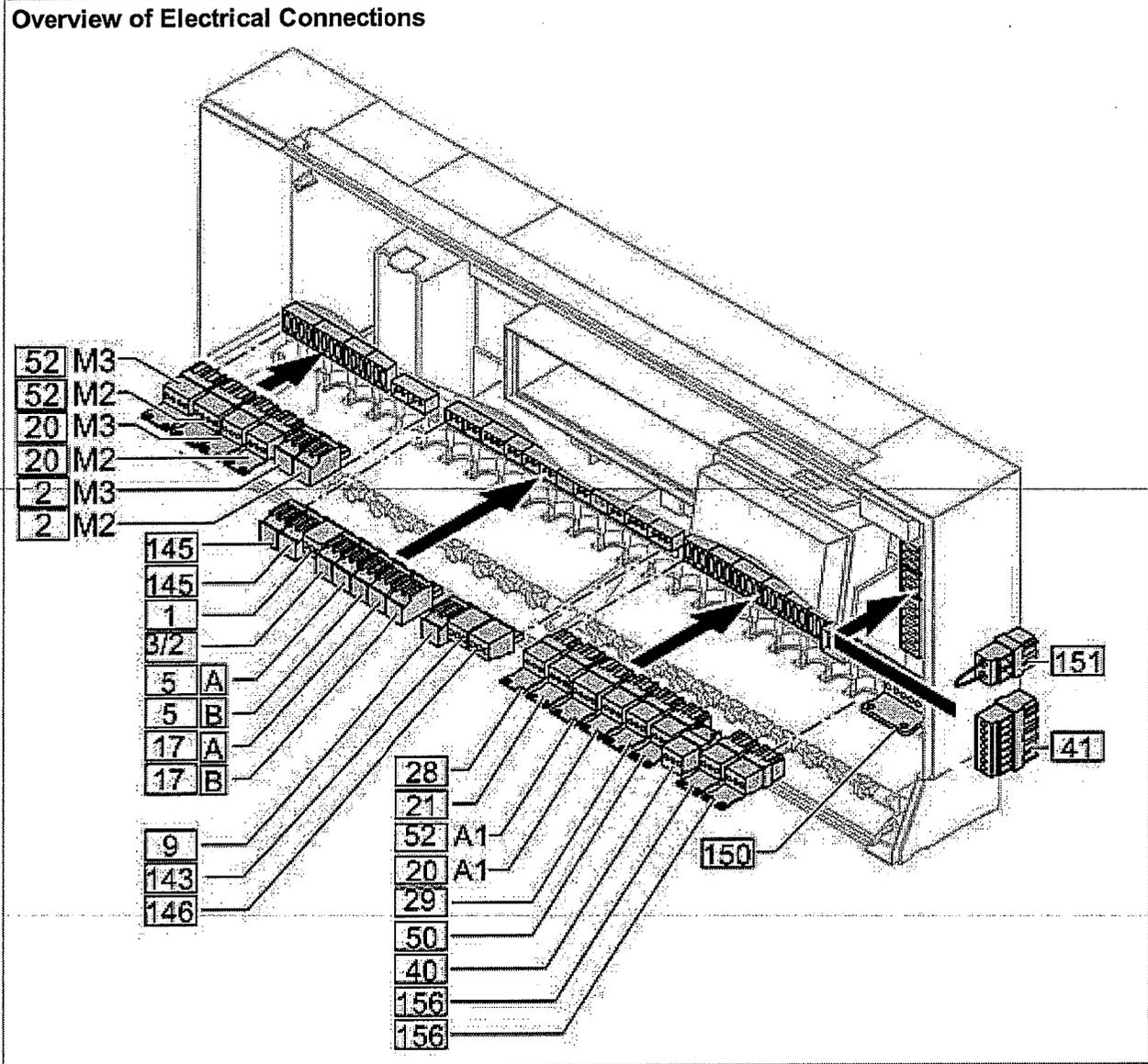
Permissible ambient temperature

– During operation	32 to 104°F
Installation in living spaces or boiler rooms (standard ambient conditions)	0 to +40°C
– During storage and transport	-4 to 149°F -20 to +65°C

Rated relay output breaking capacity

Plug	Component	Rated breaking capacity	Multi boiler system		
			Single boiler system Single boiler control unit	Cascade control unit	Lag boiler control unit
[20]A1	Heating circuit pump for heating circuit A1	2A, 120V~	–	X	–
	Primary pump, primary store system [Primary pump, tank loading system]		X	X	–
[21]	Circulation pump for tank heating (accessory)	2A, 120V~	X	X	–
[28]	DHW recirculation pump	2A, 120V~	X	X	–
[29]	Boiler circuit pump or Distribution pump	2A, 120V~	–	X	X
[50]	Central fault message	2A, 120V~	X	X	X
[52]A1	Motorized isolation valve	0.1A, 120V~	–	X	X
	Motor, 3-way mixing valve, tank loading system		X	X	–
Total		Max. 6A, 120V~			

1.2 Control Diagrams



Connections on the low voltage PCB

Plug	Component	Multi boiler system		
		Single boiler system Single boiler control unit	Cascade control unit	Lag boiler control unit
[1]	Outdoor temperature sensor	X	X	-
[3]/[2]	Common supply temperature sensor	-	X	-
[5][A]	DHW tank temperature sensor	X	X	-
[5][B]	DHW tank temperature sensor (bottom) in a tank loading system	X	X	-
[17][A]	Return temperature sensor T1	X	X	X
[17][B]	Temperature sensor tank loading system	X	X	-
[143].1/[143].2	External operating program changeover	X	-	-
	External "mixing valve open"	X	-	-
	External blocking boiler	-	-	X
[143].2/[143].3	External blocking boiler	X	-	-
	Start the boiler externally as the last one in the boiler sequence	-	-	X
	External "mixing valve close"	X	-	-

[145]	KM BUS participant (accessory), e.g. EA1 extension	X	X	X
[146].2/[146].3	External demand via switching contact	X	X	-
LON	LON communication module for data exchange between control units, Vitocom and Vitogate	X	X	X

PCB connections 120V~

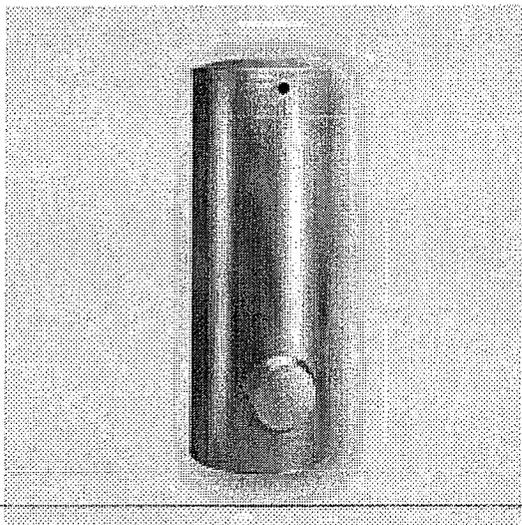
Plug	Component	Multi boiler system		
		Single boiler system Single boiler control unit	Cascade control unit	Lag boiler control unit
[20]A1	Heating circuit pump for heating circuit A1 (high temp.)	-	X	-
	Primary pump, primary store system	X	X	-
[21]	DHW pump	X	X	-
[28]	DHW recirculation pump	X	X	-
[29]	Boiler pump or system pump	-	X	X
[40]	Power supply	X	X	X
[41]	Burner	X	X	X
[50]	Central fault message	X	X	X
[52]A1	Motorized isolation valve	-	X	X
	Motor, 3-way mixing valve, tank loading system	X	X	-
[150]	External safety equipment	X	X	X
	Provisional burner operation	X	X	X
[156]	Power supply for accessories	X	X	X

Connections on extension for heating circuit with mixing valve HC2/M2, HC3/M3

Plug	Component	Multi boiler system		
		Single boiler system Single boiler control unit	Cascade control unit	Lag boiler control unit
[2] M2/M3	Supply temperature sensor	X	X	-
[20] M2/M3	Heating circuit pump	X	X	-
[52] M2/M3	Mixing valve motor	X	X	-

Submittal information is not complete enough to verify all control features specified are included, see spec section 235216 for complete features and options

Domestic Hot Water Storage Tank Data



VITOCCELL 300-V

EVI Series

Full product manuals:

-  Technical Data Manual
-  Installation Instructions
-  Operating Instructions
-  Service Instructions

1.0 Product Description

Vertical indirect-fired domestic hot water storage tank of high-grade (SA 240-316 Ti) stainless steel. For domestic hot water heating applications which utilize hot water heating boilers.

Suitable for heating systems with:

- max. working pressure on **heat exchanger side** up to **220 psig** at 392°F / 200°C
- max. working pressure on **DHW water side** of up to **150 psig** at 210°F / 99°C

119 USG, 2 req'd

1.1 Technical Data for EVI 79USG / 300L

Storage capacity	79 USG	300 ltr
Recovery rate ^{*1} with a DHW temperature increase from 50 to 140°F (10 to 60°C) and a heating water supply temperature of...		
194°F / 90°C	280 MBH 6.2 GPM	82 kW 1410 ltr/h
176°F / 80°C	201 MBH 4.5 GPM	59 kW 1014 ltr/h
158°F / 70°C	140 MBH 3.1 GPM	41 kW 705 ltr/h
Supply flow rate for the recovery rates stated	22.0 GPM	5.0 cubic m/h
Standby losses ^{*2}	6.8 MBH/24h	
Domestic hot water draw rate Storage tank contents heated to 140°F / 60°C, boiler not reheating		
DHW draw rate	4.0 GPM	15 ltr/min
DHW draw, water with t = 140°F / 60°C (constant)	72 USG	272 ltr
Percentage tank volume	91 %	
Heat-up time ^{*3} with heating water supply temperature of...		
194°F / 90°C	15.5 minutes	
176°F / 80°C	21.5 minutes	
158°F / 70°C	32.5 minutes	

Overall dimensions with insulation *4

Overall width	25 inches	633 mm
Overall depth	27 $\frac{3}{4}$ inches	704 mm
Overall height	70 inches	1779 mm
Tilt height	71 $\frac{3}{4}$ inches	1821 mm
Weight of tank with insulation	220 lbs	100 kg

Heating water content (heat exchanger pipe coil)	2.91 USG	11 ltr
Heat exchanger surface area	16 sq. ft	1.5 sq. m

see schedule on
P2.1B for pipe
connection sizes

Connections (diameter)

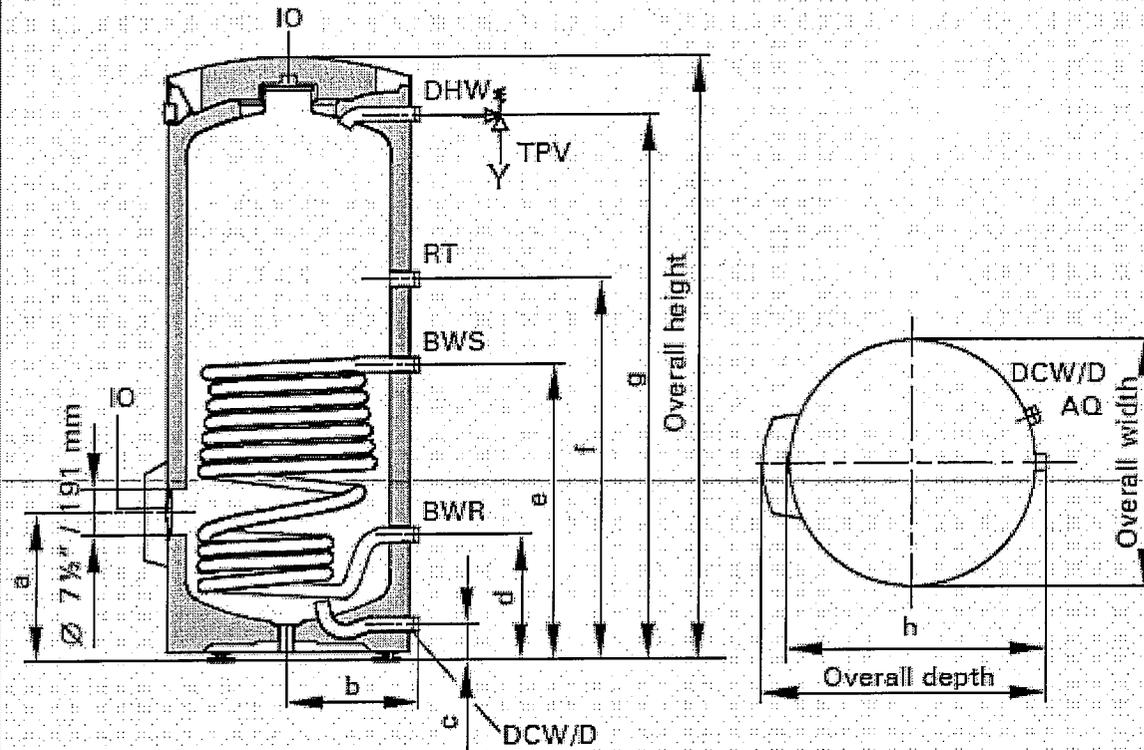
Heating water supply/return	1 inch	Male thread
Domestic cold/hot water	1 inch	Male thread
Temperature and pressure relief valve	1 inch	Male thread
Recirculation	1 inch	Male thread

Notes:

- *1 When planning for the recovery rate as stated or calculated, allow for the corresponding circulation pump. The stated recovery rate is only achieved when the rated output of the boiler is equal to or greater than that stated under "Recovery rate".
- *2 Measured values are based on a room temperature of 68°F / 20°C and a domestic hot water temperature of 149°F / 65°C and can vary by ±5%.
- *3 The stated heating times are achieved when the maximum recovery rate of the domestic hot water tank is made available at the respective supply temperature and with a domestic hot water rise from 50 to 140°F / 10 to 60°C.
- *4 For other dimensions, see dimensional drawings below.

1.2 Dimensional Drawings

DHW Tank Side and Top Views



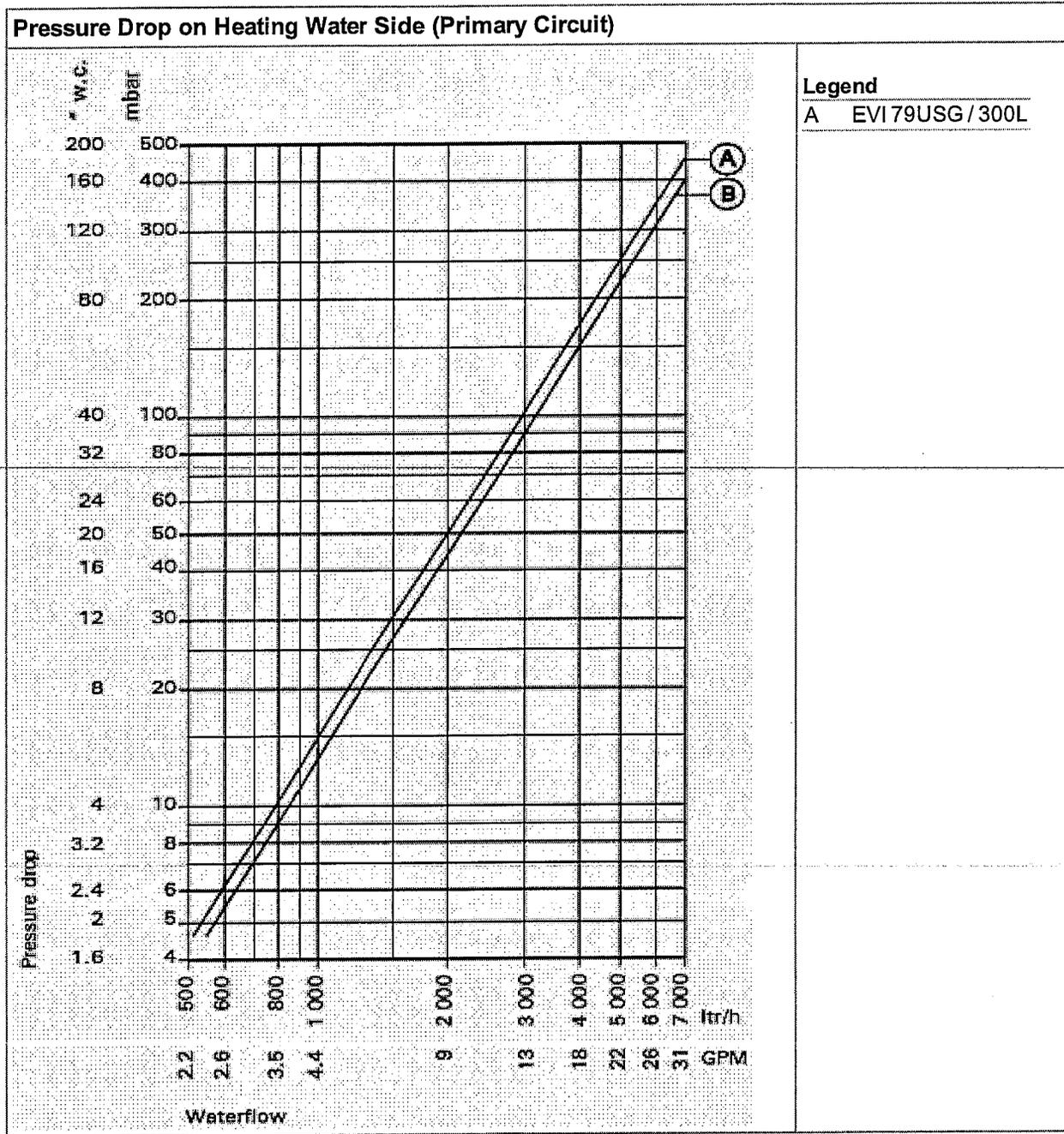
Dimensions

a	14½"	357 mm
b	13½"	343 mm
c	3½"	87 mm
d	11¼"	301 mm
e	29½"	751 mm
f	37½"	951 mm
g	64½"	1640 mm
h	26¼"	665 mm

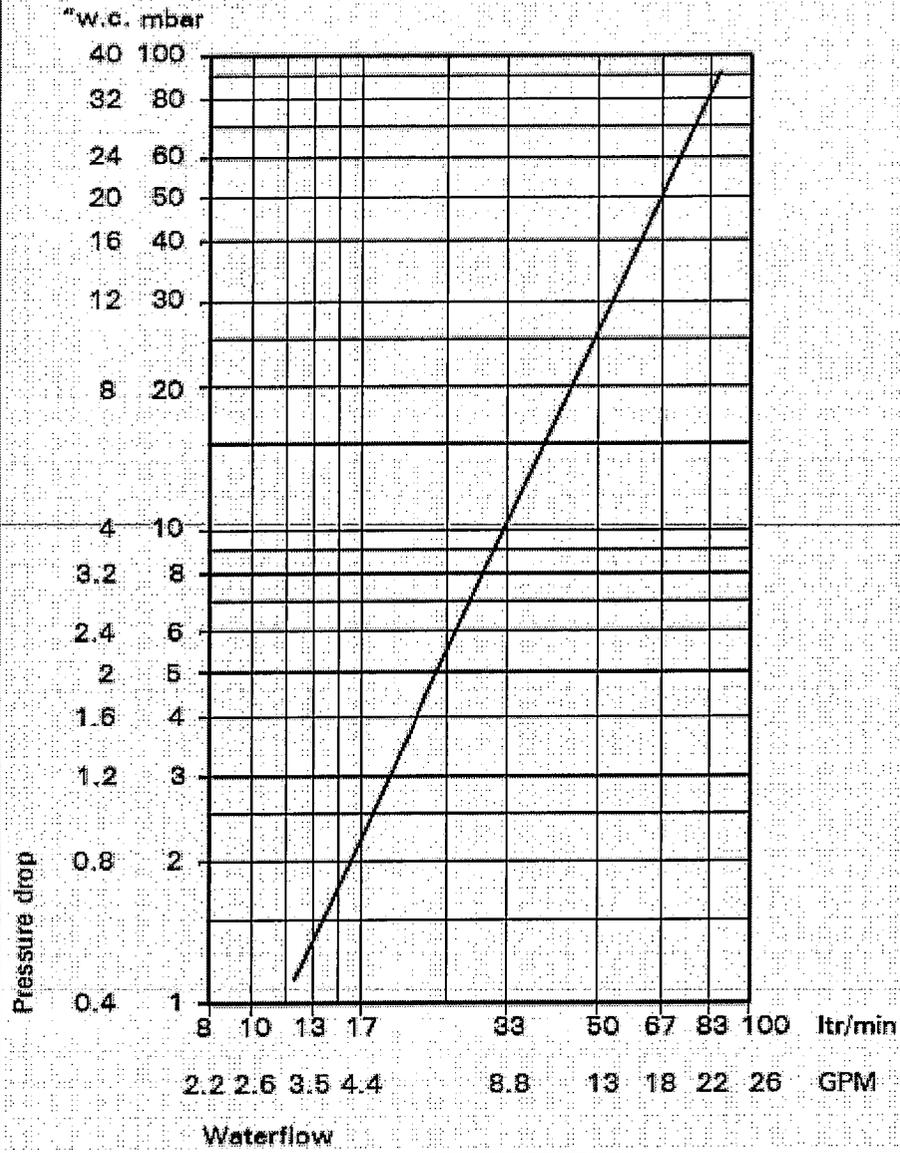
Legend

AQ	Aquastat well
BWR	Boiler water return
BWS	Boiler water supply
D	Drain
DCW	Domestic cold water
DHW	Domestic hot water
IO	Inspection and clean-out opening
RT	Recirculation tapping
TPV	Temperature and pressure relief valve

1.3 Pressure Drop

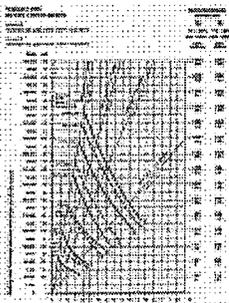


Pressure Drop on Domestic Hot Water Side (Secondary Circuit)



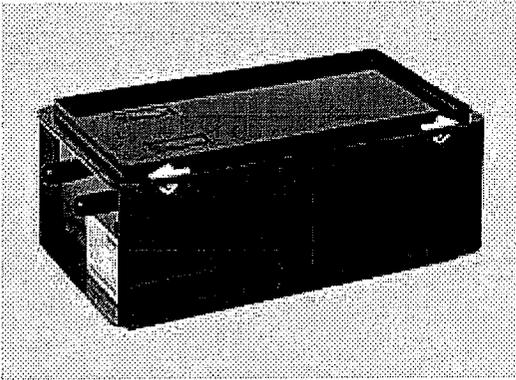
1.4 Sizing Charts

Continuous Flow Capacity Chart



[View full-sized PDF chart](#)

System Accessories Data



Neutralization System

Grünbeck GENO®-Neutra V N-70

Full product manuals:



Installation and Service Instructions

1.0 Product Description

Refillable-neutralization-unit-with-granular-pellets-designed-to-neutralize-aggressive-condensate produced by gas-fired condensing boilers. The neutralized condensate released by the unit will be non-corrosive, with a safe pH value of above 6.5.

1.1 Technical Data

Max. neutralizing output	18.5 GPH	70 L/h
Neutralizing granulate	GENO- Neutralit Hz	
Neutralizing granulate fill volume	17.6 lbs	8 kg
Service life	12 months	

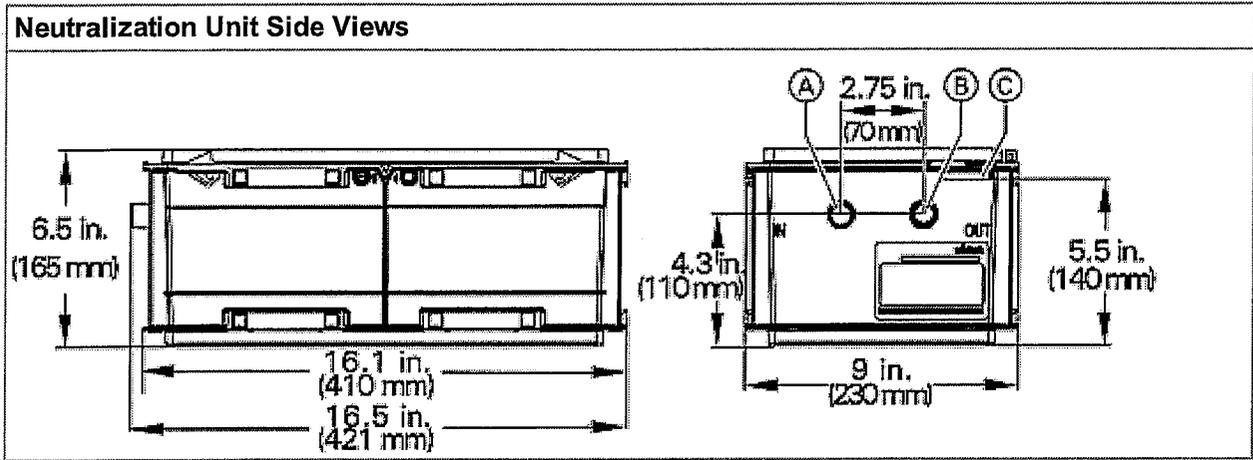
Neutralizable condensate amount

– With standard condensate to DVGW-VP-114, pH 3	207 cubic ft.	63 cubic m
– This corresponds to full boiler utilisation hours	900 bVH	
– With standard condensate with min. pH 3.2	344.5 cubic ft.	105 cubic m
– This corresponds to full boiler utilisation hours	1500 bVH	

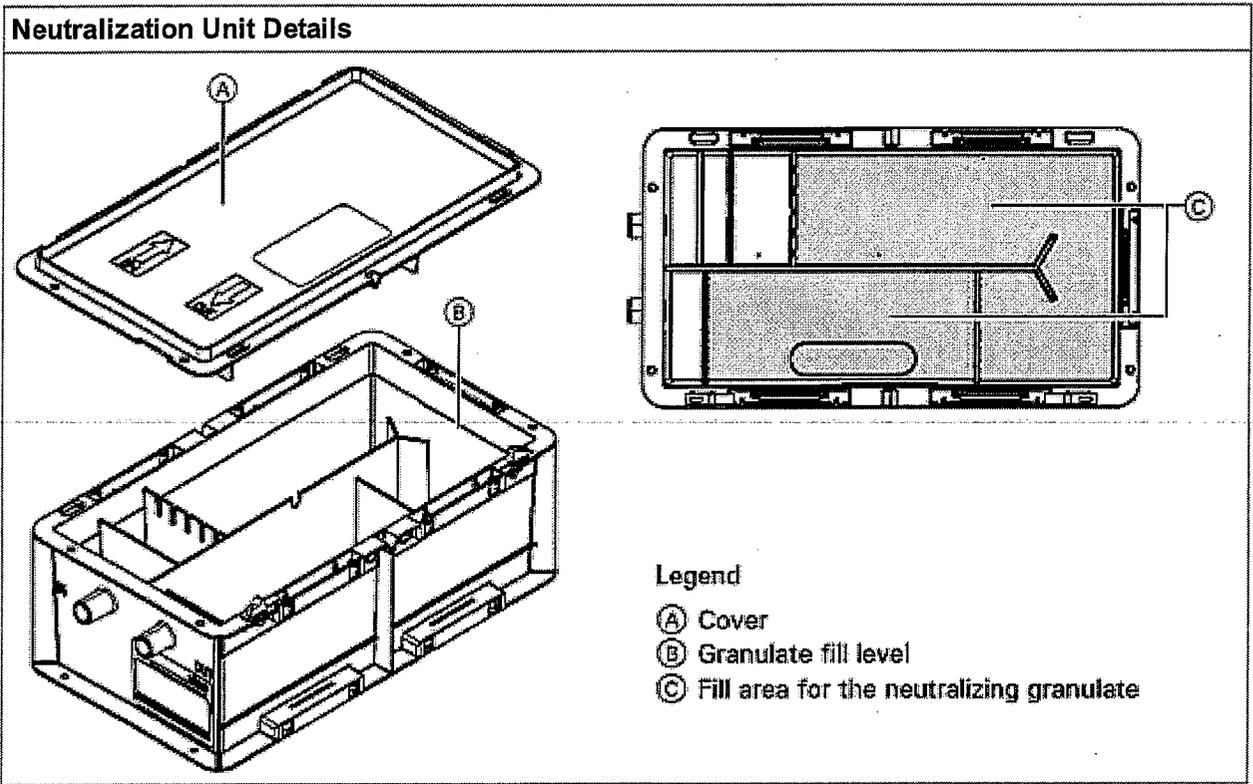
Weight

In the delivered condition	26.5 lbs	12 kg
In operation (filled) approx.	33 lbs	15 kg

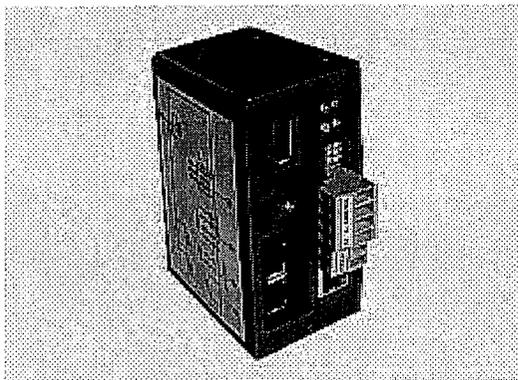
1.2 Dimensional Drawings



1.3 Diagrams



System Accessories Data



Vitogate 300 BN/MB

For Integration of Viessmann Systems to BMS/BAS

Full product manuals:



Installation and Service Instructions



Online Help

1.0 Product Description

Vitogate 300 is a gateway designed to integrate Vitotronic controls which utilize the LON communication protocol, with Building Management Systems utilizing BACnet or ModBUS communication protocols.

Comes in one of the 2 following configurations:

- Mounted in a CSA housing, with 6.5 ft (2m) cord and 120V plug.
- Vitogate 300 Module and Power Supply Unit for DIN Rail mounting

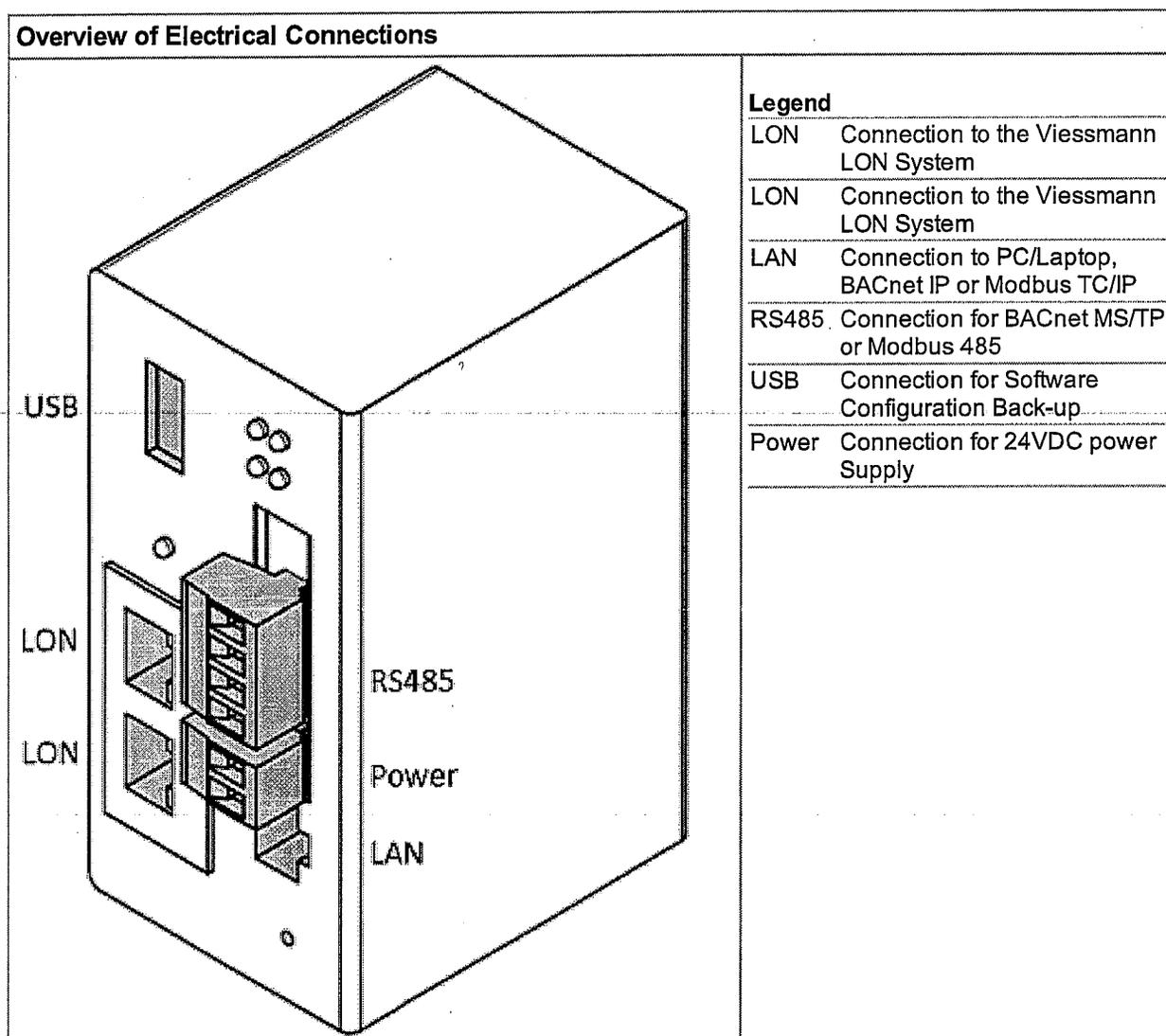
1.1 Technical Data for Vitogate 300, Type BN/MB

Mains voltage	12 to 24V AC/DC
Power consumption	Max. 320 mA
Rated output	Max. 3.85 W
Frequency range	47 to 63 Hz
Permissible ambient temperature	
– During operation	32 to 113°F (0 to 45°C)
– During storage and transport	14 to 149°F (-10 to 65°C)
Permissible humidity	
– During operation	20 to 80% relative humidity, non-condensing
– During storage and transport	10 to 85% relative humidity, non-condensing
Dimensions (height x width x depth)	4 x 2 x 2.75 in. (100 x 48 x 70 mm)
Installation	DIN rail (TS35 Top Hat Rail 35 x 15 mm or 35 x 7.5 mm)
Power supply unit	STEP-PS 1AC/24DC 0.75/FL.

1.2 Technical Data for Power Supply Unit

Rated voltage	100 to 240V~
Rated frequency	45 to 65 Hz
Output voltage	24VDC \pm 1%
Output current max.	1.4A
Permissible ambient temperature	
– During operation >131°F (>55°C) line loss	-13 to 158°F (-25 to 70°C)
– During storage and transport	-40 to 185°F (-40 to 85°C)
Max. humidity	95% relative humidity at 77°F (25°C), non-condensing
Dimensions (height x width x depth)	6 x 1.4 x 1.7 in. (150 x 36 x 43 mm)
Installation	DIN rail (TS35 Top Hat Rail 35 x 15 mm or 35 x 7.5 mm)

1.3 Connection Diagrams



Technical information subject to change without notice. Viessmann reserves the right to correct errors in graphics, files, text and technical data. Some product may not be exactly as illustrated.

© Viessmann Manufacturing Company Inc. All rights reserved.

Viessmann is a trademark of Viessmann Werke GmbH & Co. KG, and is registered with the U.S. Patent and Trademark Office. For further copyright, trademark and disclaimer information, please visit: www.viessmann.ca/en/copyright.html