MORRHEAT

WASTE OIL HEATING SOLUTIONS

Waste Oil Fired Boiler 80 | 160

Installation, operation and service instructions

120v Manual

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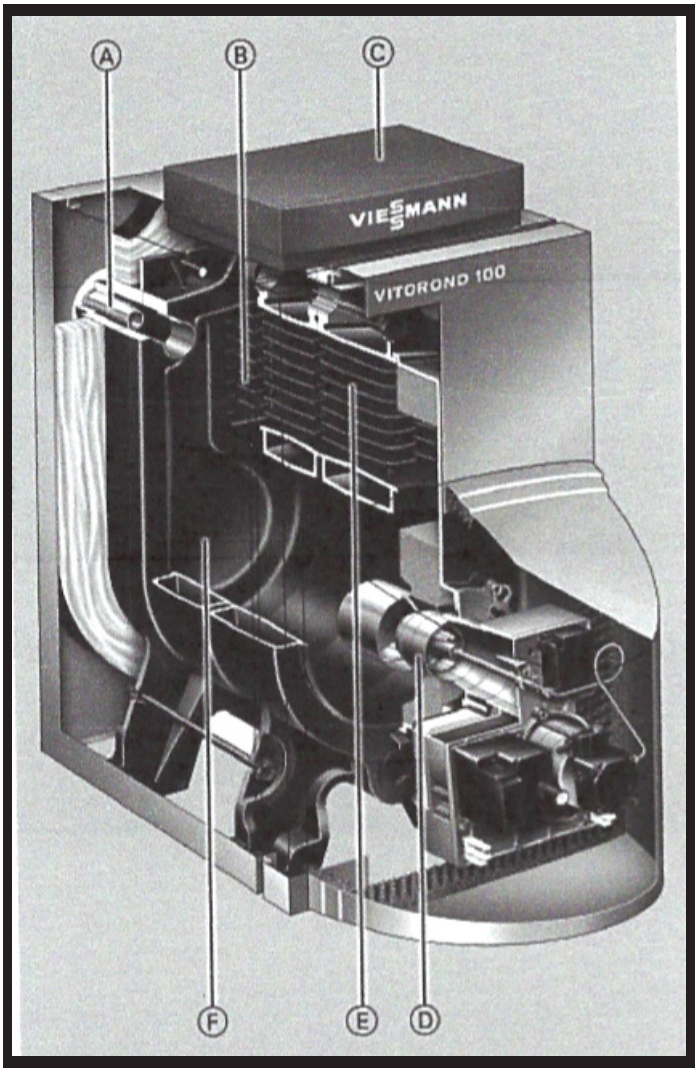
PRODUCT INFORMATION

A genuine triple-pass boiler of cast iron sectional design. The high-quality construction and innovative oil heating technology of this boiler provides a high level of operational reliability, high-efficiency operation and reduced emissions.

Benefits at a Glance:

- Get the most out of your fuel dollar! Maximum heat extraction with triple-pass design. A.F.U.E : up to 84%.
- Extremely durable cast iron heat exchanger for maximum reliability and service life.
- Integrated stainless steel combustion changer insert for clean and efficient combustion.
- Thick 3.5" insulation.
- Easy access. Full-swing left-hinged or right-hinged combustion chamber door.
- Low maintenance cost with service-friendly burner and easy-to-clean flue gas passageways.
- Spacious, wet-base water walls prevent deposits, reduce stress and increase boiler life.

CUTAWAY SECTION



A. Special return water flow control injector

B. Eutectoplex heat exchanger surface of the special homogeneous grey cast iron

C. Vitoronic 100 – indoor/outdoor digital boiler and heating system control (**not included**).

D. Oil Burner

E. Third pass

F. Combustion chamber

Stainless steel combustion chamber(**F**) insert not shown.
Boiler/burner and controls combination may not be exactly as illustrated.

Technical Data

Boiler Model No.	MHB80	MHB160
CSA Input *1 :	80,000	160,000
GPH	.5	1
CSA Output:	65,000	135,000
A.F.U.E.	--	--
%	81	84
Boiler Dimensions:	--	--
Depth (without burner)	29½in	34½in
Width	20in	20in
Height	37in	37in
Overall Dimensions (with jacket)	--	--
Total Depth (includes burner)	37½in	42½in
Total Width	22½in	22½in
Total Height (without Vitotronic)	39¾in	39¾in
Height 1	50½in	50½in
(control unit in position for operation and programming)	--	--
Height 2	59½in	59½in
(control unit in position for servicing)	--	--
Height of boiler stand	9¾in	9¾in
Weight Boiler Block	522lb	637lb
Total Weight, Boiler with Insulation, Burner and Boiler Control	608lb	725lb
Boiler Water Content	--	--
USG	16.1	19.3
(L)	61	73
Max. Operating Pressure *2	--	--
PSIG	30	30
(kPA)	207	207
Boiler Water Connections	--	--
Supply and Return	2in	2in
Saftey Supply	2in	2in
Drain Value	2in	2in
Gross Flue Gas Temperature *3	--	--
104 °F (40 °C) boiler water temp	311 °F (155 °C)	311°F (155 °C)
167 °F (75 °C) boiler water temp	356 °F (180 °C)	--
Boiler Vent Connection *4	--	--
Outer DIA in"	6	6
Required Flue Draft	--	--
"w.c	-0.02 to 0.06	-0.02 to 0.06

Technical Data Continued

*1: Combustion results are based on 11.0% to 13.5% $C0^2$ with fuel oil #2 and a hot water heating system supply temperature of 167°F (75°C), return 140°F (60°C).

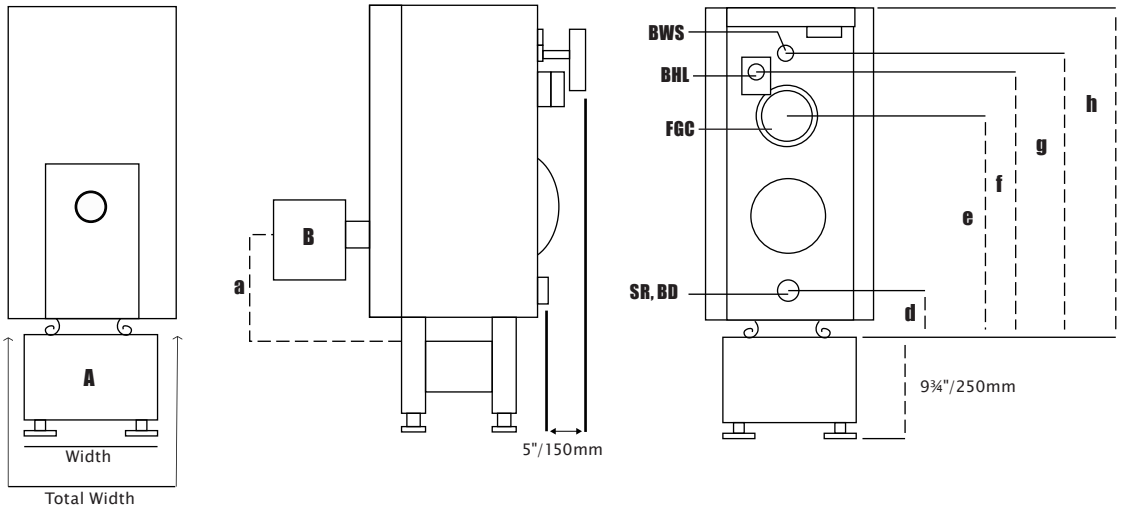
*2: Max. operating pressure is 45 psig (310 kPal) in all Canadian provinces where a CRN is not required, and in the U.S.A.

*3: Measured flue gas temperature with combustion air temperature of 68°F (20°C).

*4: The vent pipe adaptor is not supplied with boiler models VR1-40 to VR1-63.

- For information regarding direct vent applications, please refer to Direct Vent Systems installation instruction Supplement.
- For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

Vitorond 100 with Aquastat or Hydrostat



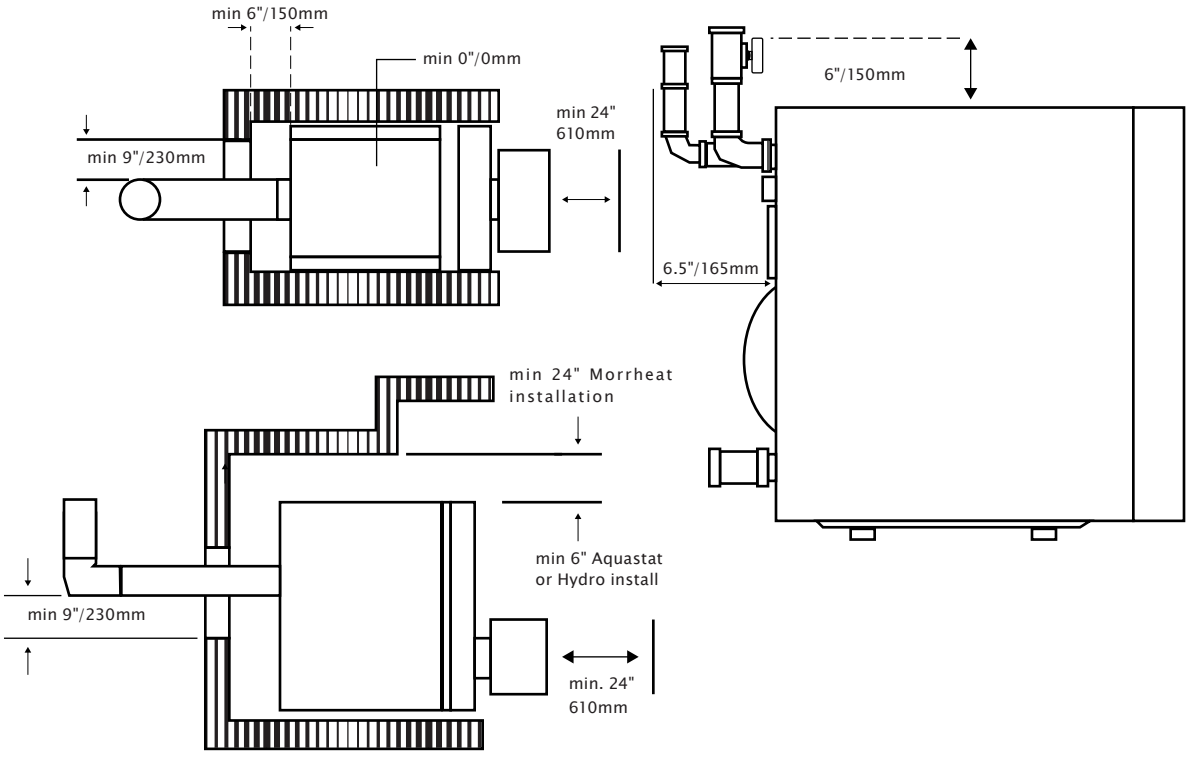
Legend

BD | Boiler Drain
BTS | Boiler Temperature Sensor
BWR | Boiler Water Return
BWS | Boiler Water Supply
FGC | Flue Gas Collar
SR | Safety Return
SS | Safety Suplly
BHL | Boiler High Limit
(with outdoor reset module)
Ⓐ Boiler Stand
Ⓑ MorrHeat Burner

Dimensions

Boiler Model	MHB80	MHB160
a.	13¾in	13¾in
b.	3in	3in
c.	9½in	9½in
d.	4¼in	4¼in
e.	27¾in	27¾in
f.	32¼in	32¼in
g.	34¾in	34¾in
h.	39¾in	39¾in
k.	6½i	6½in

Venting Clearances



Standard Installation

Boiler Model	MHB80	MHB160
Rear	--	--
in	6	6
Sides	--	--
in	0	0
Flue	--	--
in	9	9

*1 Front service clearance

*2 24" with Vitotronic control.

Burner Specifications

BURNER ASSEMBLY

Performance Ratings		
Voltage	–	120v
Cycles	–	60Hz
Total Operating Amperage (Burner Only)	Amp	8.4

PUMP ASSEMBLY

Performance Ratings		
Voltage	–	120v
Cycles	–	60Hz
Total Operating Amperage (Pump Assy Only)	Amps	2.1

SYSTEM DESIGN CONSIDERATIONS

Chimney

For proper operation of the MHB boiler, all products of combustion must be safely vented to the outdoors, while ensuring that flue gases do not cool prematurely. It is critical that the chimney system is properly designed to handle the flue gas temperatures which the MHB boiler produces.

Flue gases which cool too quickly and produce condensation lead to damages if the chimney diameter is too large and the chimney system is not well insulated. If a calculated chimney diameter lies between two values, the larger diameter should be selected.

Intermediate section

The intermediate (vertical and horizontal) section of venting between the boiler vent pipe collar and the chimney must be of the identical diameter as the vent connection of the boiler. Use the shortest possible path between the boiler and the chimney. A maximum of two elbows may be installed in the intermediate section. Avoid the use of two level 90 degree elbows. Intermediate section must be sealed pressure tight at the boiler vent pip collar and at the chimney connection. Ensure any test port for combustion values is sealed as well. The chimney connection lenght between the boiler vent pipe collar and the chimney may be installed with insulation. We recommend consulting a reputable chimney installer for advice in project-specific circumstances. Barometric damper must be used!

Note: Direct Vent exhaust system operates under a positive pressure developed by the burner. Make sure all vent connections and observation ports on the boiler are sealed airtight, by tightening screws and using high-temperature silicone sealant if necessary.

The vent components must be supplied without any alteration except for the length of the flex pipe which can be out to the desired length.

Warranty

Our warranty does not cover damages resulting for the following:

- installation or service by unqualified and not licensed personnel
- corrosion caused by flue gas condensation due to low boiler water and/or return water temperatures
- operation with contaminated fill and supplementary feed water

For detailed warranty information, please read warranty sheet supplied with the product.

Combustion air supply

The boiler must not be located in areas or rooms where chemicals containing chlorine, bromine, fluorine, or other corrosive chemicals are stored. Examples include refrigerants, bleach, paint, paint thinner, hair spray, cleaning solvents, water softener salt, etc. The combustion air must not be contaminated with the above mentioned, or other aggressive or corrosive chemicals.

Boilers should never be installed in areas where excessive dust, high humidity, or risk of frost exist. Ensure adequate ventilation and supply of fresh combustion air.

Consult MorrHeat with uncertainties in regard to a suitable boiler installation location. This boiler/burner unit needs clean fresh air for safe operation and must be installed so that there are provisions for adequate combustion and ventilation air. For oil-fired boilers, use the "Installation Code for Oil Burner Equipment CAN/CSA-B139" (Canada), or NFPA 31 (USA) and/or provisions of local codes. The sizing methods outlined in the above codes should be used when installing a round duct to supply combustion air from the outside. Observe local jurisdictional requirements.

System Layout

The boiler water temperature limit can be increased by altering the adjustable high limit to increase the supply water temperature. To minimize piping losses of the system, however, we recommend that the radiation and domestic hot water production in the system be designed for 158 degree boiler supply water temperature (new systems).

Water Quality

Treatment for boiler feed water should be considered in areas of known problems, such as where a high mineral content and hardness exist. In areas where freezing might occur, and antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer. Do not use automotive silicate base anitfreeze/water mixturemay require a backflow preventer within the automatic water feed and influence components such an diaphragm expansion tanks radiation, etc. A 40% antifreeze content will provide freeze-up protection to -10° ℉ (23° ℃).

Do not user antifreeze other than specifically made for hot water heating systems. The system also may contain components which might be negatively affected by antifreeze. Advise system operator/ultimate owner that the system is filled with a glycol mix. The heating contractor must provide an MSDS (Material Safety Data Sheet) for the antifreeze used to the system operator/ultimate owner.

Oxygen Diffustion Barrier Under Tubing

The boiler warranty does not cover leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. Such systems must have the non-oxygen diffusion barrier tubing separated form the boiler with a heat exchanger. Viessmann recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

Low Water Cut-Off

A low water cut-off may be required by local codes. If boiler is installed above the radiation level, a low water cut-off device of approved type must be installed in all instances. An approved type low water cut-off device must be provided by the, heating contractor. Do no install an isolation valve. between the boiler and the low water cut-off. Hydrostat control model3250 PLUS is equipped with low water cut-off.

Fow Rates

The relationship between boiler flow rate and temperature rise is according to the formula:

Boiler output (Btu/h) = 500 x flow (USGPM) x Rise (°F)

The following chart lists typical flow rates for the Vitorond boiler:

Boiler Model	MHB80	MHB160
20°F USGM	17.2	21.5
30°F USGM	11.5	14.3

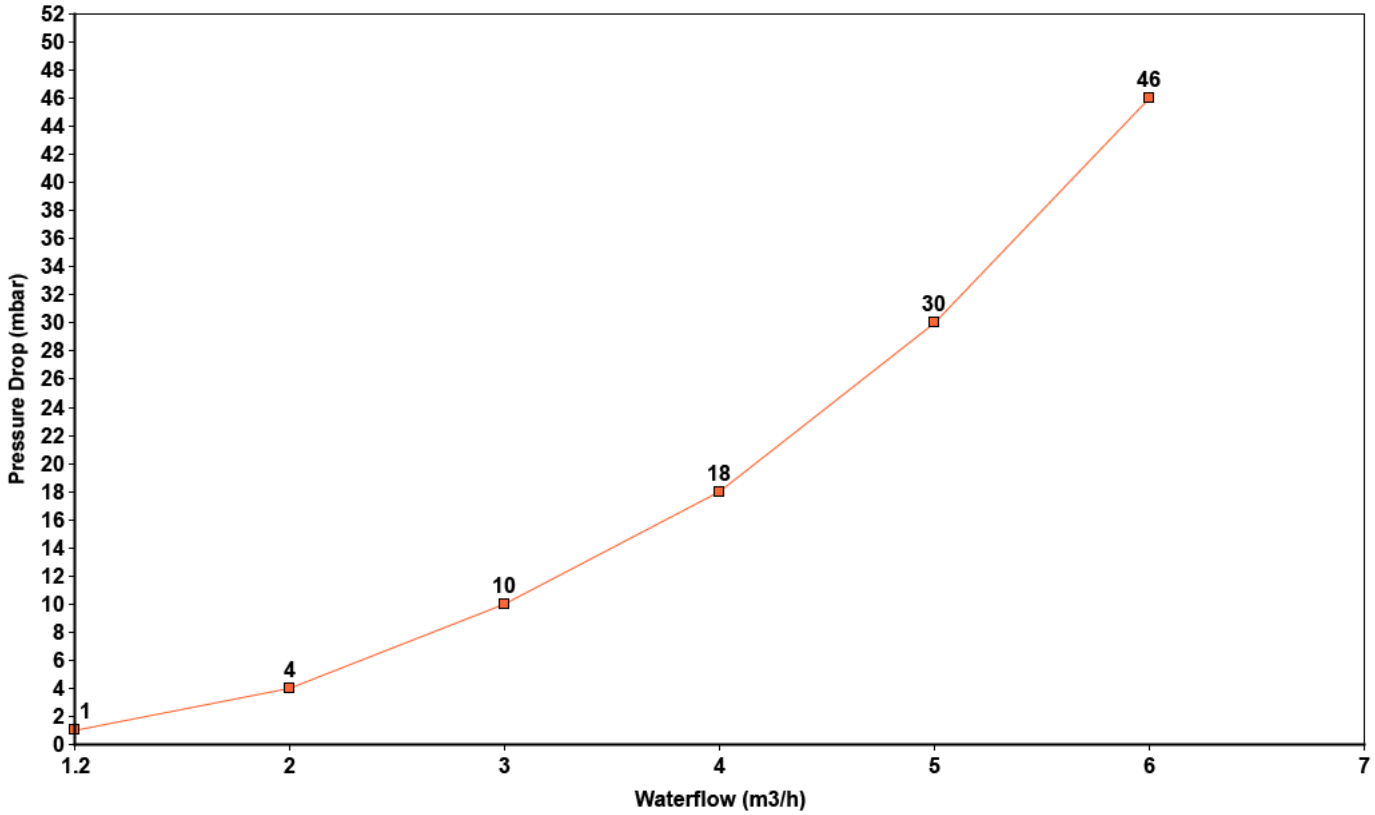
General

The schematics on the following pages are to be seen as guidelines only. They futher do not display all system varieties, safety devices, or concepts possible.

Clearances

A minimum of 2" circumferentail 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 reducated to 0".

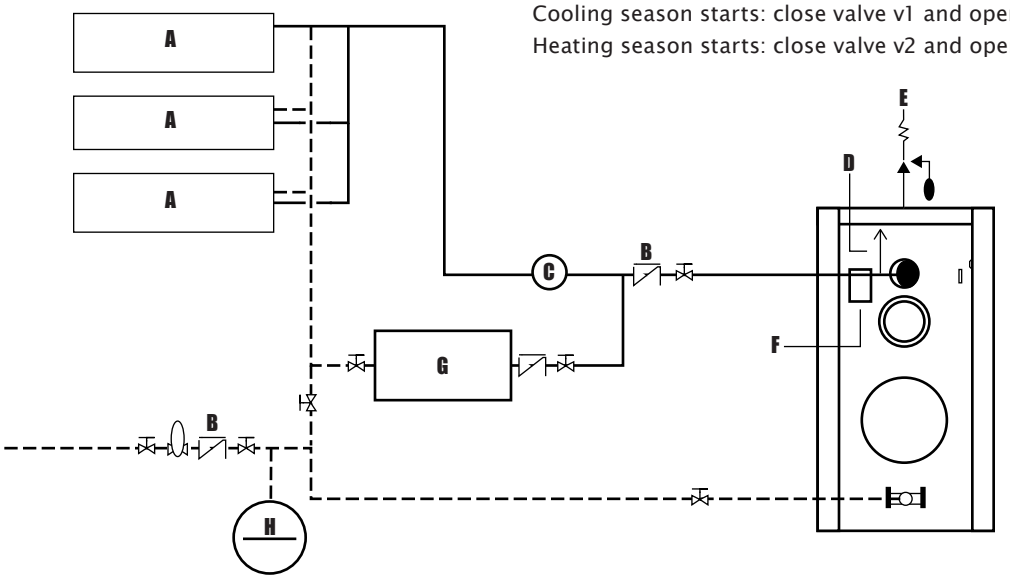
Waterside Flow



Installation Examples - Hydrostat

Boiler In A Heating/Cooling Application

Cooling season starts: close valve v1 and open valve v2
Heating season starts: close valve v2 and open valve v1



Legend

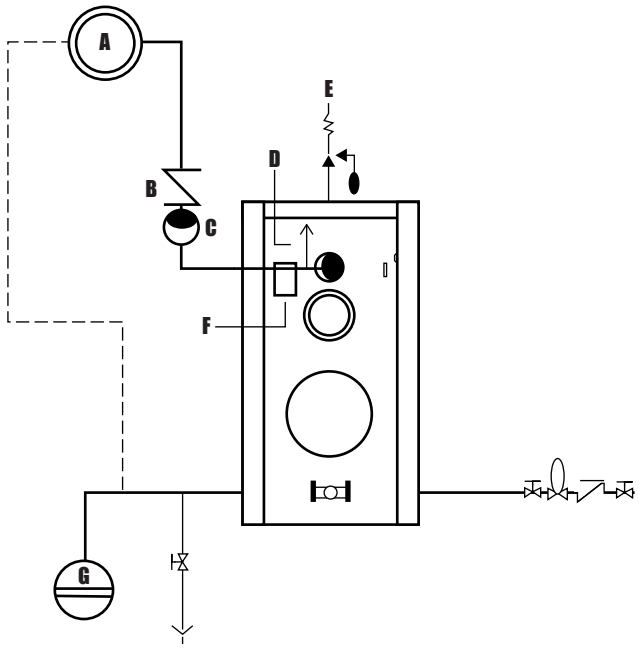
Ⓐ Heating/Cooling unit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent
Ⓔ Pressure relief valve
Ⓕ Hydrostat 3250-Plus
(with low water cut-off)
Ⓖ Water chiller
Ⓗ Expansion tank

IMPORTANT

We strongly suggets that the valves be labelled "v1"and "v2"

Description

Hydrostat model 3250-Plus is equipped with a low water cut-off feature in combination with 'electro well' sensor well. The function can be set to operate in automatic (default) or manual reset manual reset mode. Do not disable this function it may be required by local codes.



Quick Reference

℃	℉
-40	-40
-35	-31
-25	-13
-20	-4
-18	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
00	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+88
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

Parts List

Parts

01 Hydrostat control, Model 3250-Plus
02 Electro well, extended ¾" NPT
03 Hex busing, 1½" x ¾"
04 Temperature and pressure gage
05 Reduction tee, 2" x 5"
06 Nipple, 2" x 5"
07 Reduction tee, 2" x ¾" x 2"
08 90° Street elbow, ¾"
09 Nipple, ¾" x 3½"
10 Pressure relief valve, 30 psig
11 Reduction relief valve, 30 psig
12 Sediment faucet
13 Vent pipe adaptor, 6"
14 Burner cable 85" (4-wire)
15 Cable clamp