

## OIL-FIRED DUCT FURNACE

### HDO(I) SERIES OIL INDOOR OR OUTDOOR INSTALLATION



## ***SPECIFICATION MANUAL***

## TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	<b>2</b>
1. DESCRIPTION.....	3
2. APPLICATIONS.....	3
3. SELECTION CRITERIA .....	4
4. INSTALLATION GUIDELINES .....	5
5. SELECTION TABLE.....	6
6. DIMENSIONS .....	7
7. PRESSURE DROP THROUGH HEAT EXCHANGER .....	9
8. REMOTE CONTROL PANEL OPTION .....	11
9. FEATURES.....	12
10. TYPICAL SPECIFICATIONS .....	13

## 1. DESCRIPTION

The HDO(I) indirect oil-fired duct furnace manufactured by **BOUSQUET** are sturdy and of industrial quality. They are certified for both indoor and outdoor installation and designed to serve as a heating element in ventilation systems. They operate with a minimum thermal efficiency of 80% and use oil #1 or #2 as fuel. The capacities available range from 400 to 5000 MBH (from 117 to 1464 kW) and from 5291 to 66138 SCFM (from 2497 to 31213 l/s) of air at temperature rise of 70°F to 120°F (39°C to 67°C), which enables flexibility of use for multiple applications.

The multiple pass heat exchanger comprises a primary drum and secondary tubes made of 316 grade stainless steel requiring no thermal treatment to prevent the cracking of welded joints. In addition, 300 series stainless steel is known for its great resistance to corrosion and high temperatures, which increases the service life of the unit. The heat exchanger is equipped with access panels for the inspection and cleaning of the tubes. It is installed as to enable the thermal expansion that occurs during the heating cycles of the unit. The forced draft and oil burner offers optimal heat transfer on all the surfaces of the heat exchanger while maintaining optimal combustion efficiency through the entire range of capacity.

The support frame of the unit is sturdy and consists of welded steel channels. The sides and top are of 2-inch thick double wall construction, with panels made of 18 gauge G90 galvanized steel with double folded edges for structural rigidity and the liner is made of 22 gauge G90 galvanized steel. The unit cabinet is insulated with 2-inch thick high temperature insulation with a density of 1.02lb/ft<sup>3</sup>. For outdoor installation, a weatherproof cabinet is provided to enclose the burner, piping, controls and electrical components. The external surfaces of the device can be processed (optional) with a primer based on epoxy anticorrosive and finishing is ensured by using a high performance enamel alkyd resin grade. All HDO(I) duct furnace are cETLus approved and are certified according to standards CSA B140.0, CSA B140.4 and UL 727 latest revision.

## 2. APPLICATIONS

- Fresh air compensation:
  - Apartment building corridors;
  - Schools;
  - Hospitals;
  - Industries.
- Industrial and commercial warm air heating systems;
- Ventilation / make-up air systems;
- Industrial processes.

### **3. SELECTION CRITERIA**

#### **1. Capacity**

- Airflow (CFM);
- The blower must have the capacity to provide the required CFM to compensate for the total pressure drop of the system (heat exchanger and system air friction);
- Air temperature rise;
- Final air temperature.

#### **2. Type of installation**

- Indoor;
- Outdoor.

#### **3. Control location**

- On the left-hand or right-hand side of the heater (when facing the airflow).

#### **4. Airflow configuration**

- Horizontal air flow (standard);
- Vertical air flow (downward or upward).

#### **5. Temperature control**

- Electronic controller with integral temperature sensor;
- Electronic controller for a 0-10 VDC or 4-20 mA external signal.

#### **6. Remote controls (optional)**

- Basic or Deluxe control panel;
- Room thermostat.

#### **7. Other options**

- Low limit temperature sensor;
- Lighting;
- Power outlets;
- Switches;
- Main power disconnect.

## 4. INSTALLATION GUIDELINES

The installer of a duct furnace such as the HDO(I) must follow certain rules in order to comply with the codes governing oil equipment. Here are some recommendations:

- The blower must be installed upstream of the duct heater so that it is submitted to positive air pressure;
- The final air temperature should be controlled by a duct thermostat located downstream of the duct heater;
- Allow for sufficient clearance around the unit to enable its installation and maintenance.

For indoor installation:

- The chimney must satisfy the following requirements:
  - Have double walls;
  - Be certified for positive pressure units (type **PS**);
  - Be **cULus** certified.
- Ensure that there is enough air for the combustion in the room where the duct heater is installed (refer to code in effect);
- Ensure that the combustion air is clean and free of dust or corrosive material that could reduce the service life of the unit.

For chimney and breaching dimensions, consult the manufacturer.

For any other information related to the installation of the HDO(I) duct furnace, refer to the installation and service manual pertaining to these units.

## 5. SELECTION TABLE

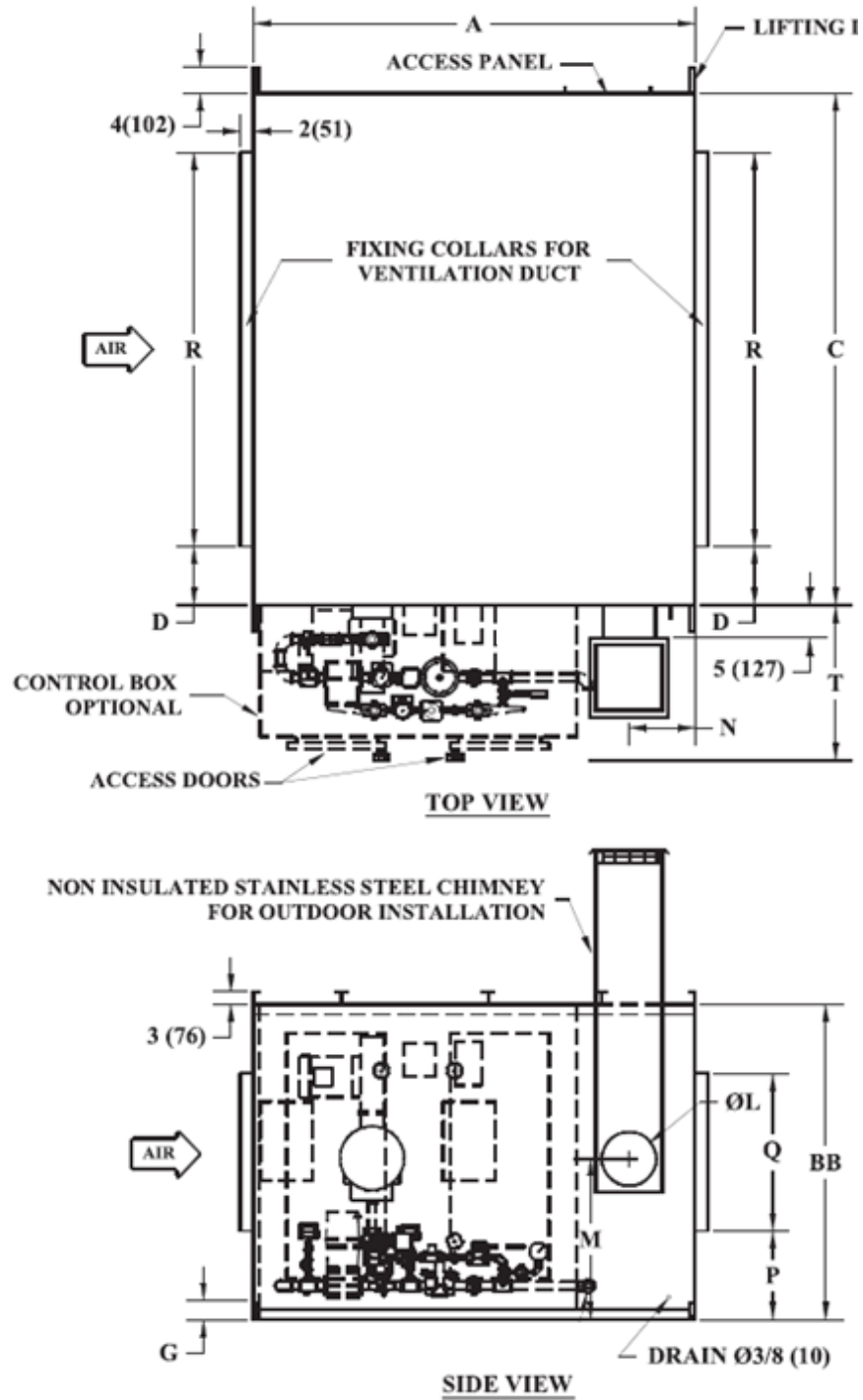
Using the selection table below, choose the HDO(I) duct furnace according to the required airflow and net heating capacity.

Model HDO(I)	Burner capacity		Net capacity		Airflow *			
	MBTU/H	kW	MBTU/H	kW	PCM		L/s	
40	500	146	400	117	3086	5291	1457	2497
50	625	183	500	146	3858	6614	1821	3121
55	688	201	550	161	4244	7275	2003	3433
65	813	238	650	190	5015	8598	2367	4058
75	938	275	750	220	5787	9921	2731	4682
85	1063	311	850	249	6556	11243	3095	5306
100	1250	366	1000	293	7716	13228	3642	6243
125	1563	458	1250	366	9645	16534	4552	7803
150	1875	549	1500	439	11574	19841	5462	9364
175	2188	641	1750	512	13503	23148	6373	10925
200	2500	732	2000	586	15432	26455	7283	12485
250	3125	915	2500	732	19290	33069	9104	15607
300	3750	1098	3000	878	23148	39683	10925	18728
350	4375	1281	3500	1025	27006	46296	12745	21849
400	5000	1464	4000	1171	30864	52910	14566	24971
500	6250	1830	5000	1464	38580	66138	18202	31213

**\*Notes :**

For a temperature rise of 70 °F to 120 °F (39 °C to 67 °C).  
 For smaller or larger amounts of CFM, consult the manufacturer.

## 6. DIMENSIONS



( ) : Dimensions in mm

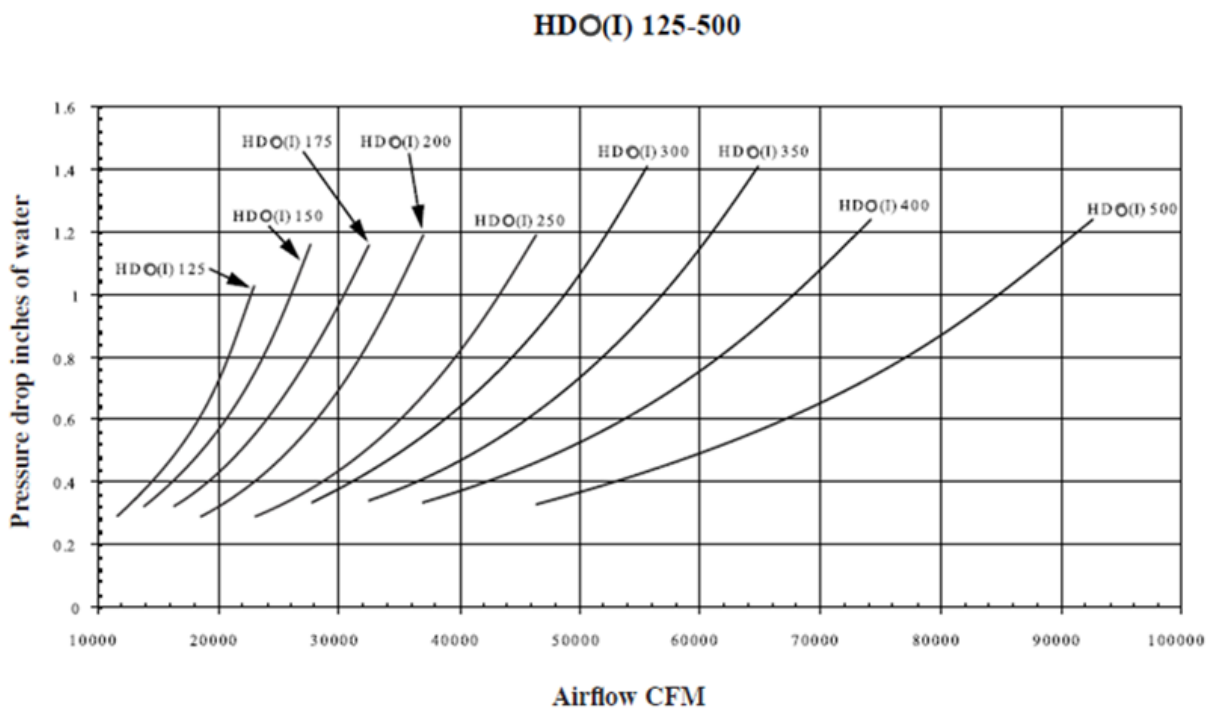
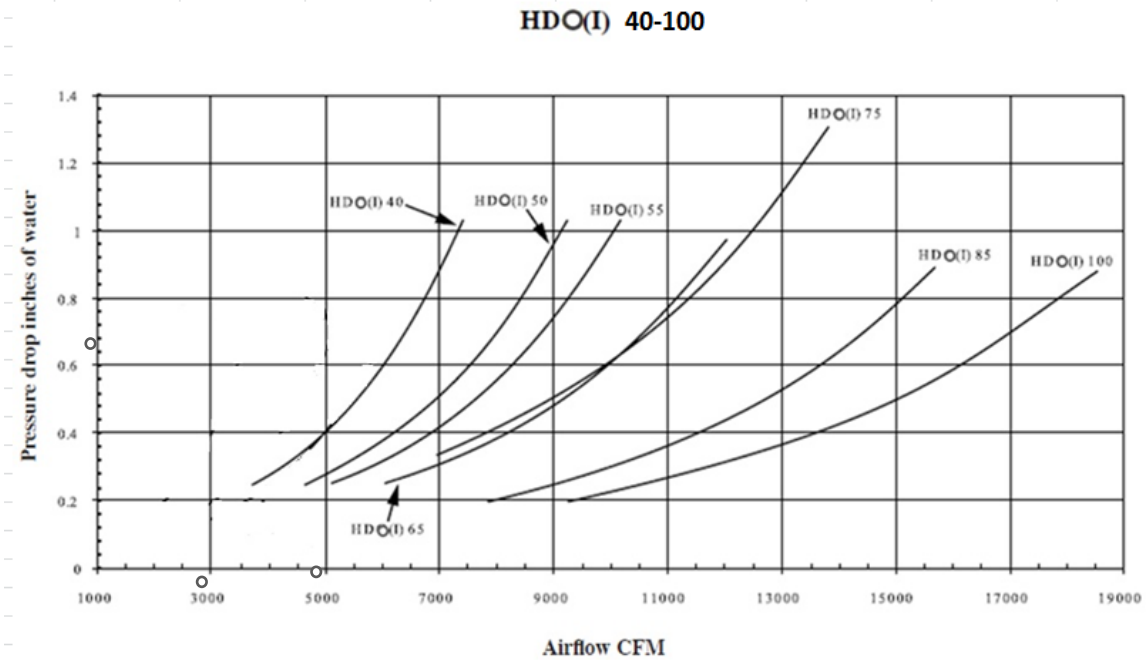
Note: The controls shown are on the left-hand side of the unit (controls on the right-hand side not shown).

Dim.	HDO(I) 40-50-55		HDO(I) 65-75		HDO(I) 85		HDO(I) 100		HDO(I) 125-150-175	
	In	mm	In	mm	In	mm	In	mm	In	mm
A	58	1473	58	1473	67	1702	67	1702	74	1880
BB	41	1041	41	1041	48	1219	48	1219	62	1575
C	54	1372	74	1880	78	1981	78	1981	98	2489
D	5	127	7	178	9	229	9	229	8.5	216
G	3	76	3	76	3	76	3	76	4	102
L	6	152	8	203	8	203	8	203	8	203
M	21	533	21	533	24.5	622	24.5	622	32	813
N	10.8	274	9.7	246	10	254	10	254	9.6	244
P	12	305	12	305	12.5	318	12.5	318	20	508
Q	18	457	18	457	24	610	24	610	24	610
R	44	1118	60	1524	60	1524	60	1524	81	2057
T	34	864	34	864	32	813	32	813	32	813
Poids Lb (kg)	1823 (827)		2282 (1035)		2875 (1304)		2875 (1304)		4122 (1870)	

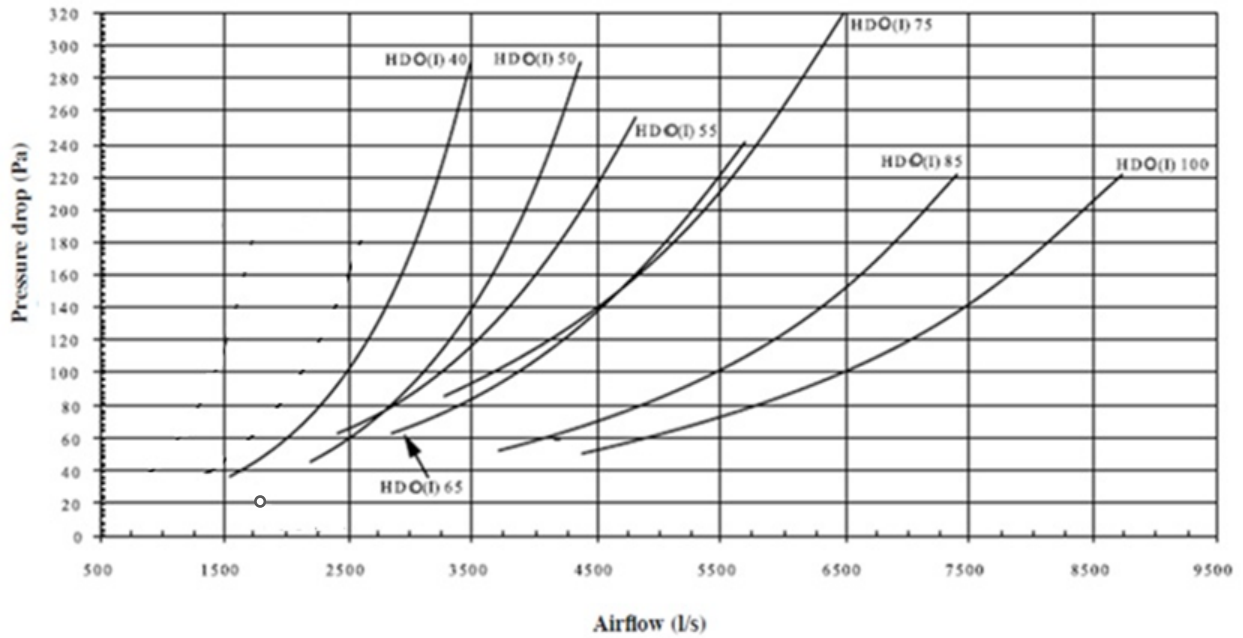
Dim.	HDO(I) 200-250		HDO(I) 300-350		HDO(I) 400		HDO(I) 500	
	In	mm	In	mm	In	mm	In	mm
A	77	1956	106	2692	106	2692	106	2692
BB	74	1880	77	1956	83	2108	89	2261
C	108	2743	150	3810	150	3810	150	3810
D	6	152	9	229	9	229	9	229
G	4	102	5	127	5	127	5	127
L	10	254	10	254	12	305	12	305
M	38	965	40	1016	43	1092	46	1168
N	10.9	277	12.1	307	11.1	282	11.1	282
P	26	660	28	711	31	787	34	864
Q	24	610	24	610	24	610	24	610
R	96	2438	132	3353	132	3353	132	3353
T	36	914	36	914	39	991	39	991
Poids Lb (kg)	4827 (2189)		7203 (3267)		7295 (3309)		7743 (3512)	



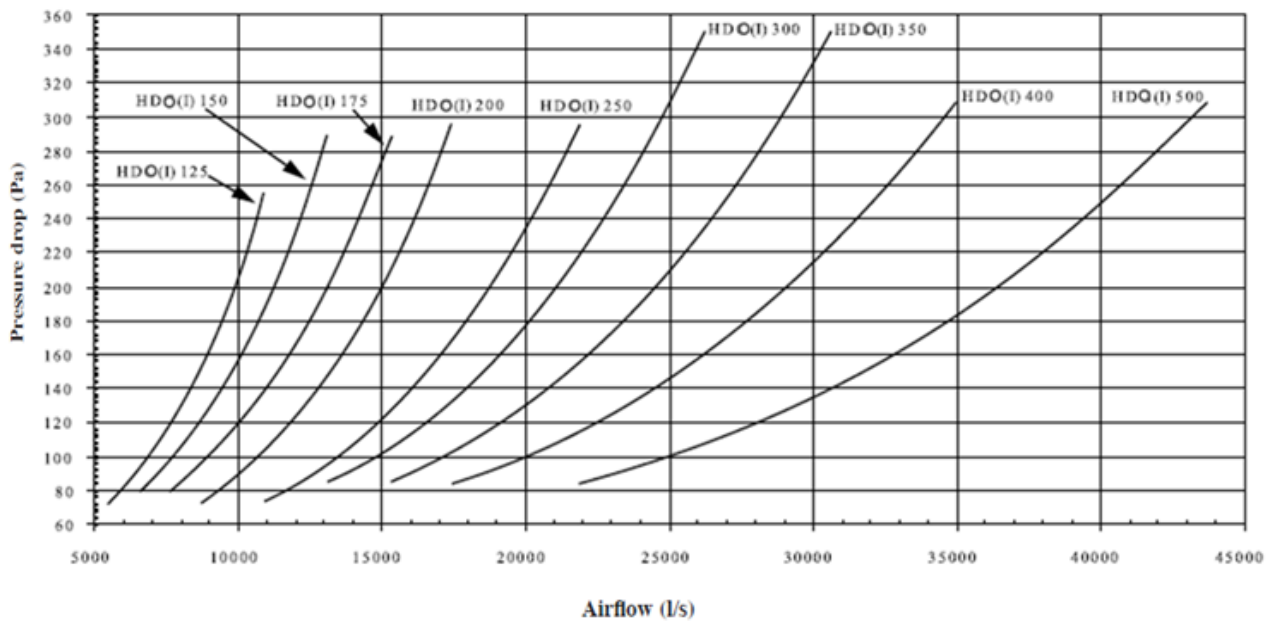
## 7. PRESSURE DROP THROUGH HEAT EXCHANGER



### HDO(I) 40-100



### HDO(I) 125-500



## 8. REMOTE CONTROL PANEL OPTION



### Base remote panel :

#### Standard equipment :

- Stop/fan/burner Switch;
- Fan operation light;
- Burner operation light;
- Connecting terminal block.

#### Optional equipment :

- Temperature selector (separately).



### Deluxe remote panel :

#### Standard equipment :

- Stop/start fan switch;
- Stop/start burner switch;
- Fan operation light;
- Burner operation light;
- Flame failure light;
- Connecting terminal block.

#### Optional equipment:

- Discharge air low limit light;
- Clogged filter light;
- Purge cycling completed light;
- Temperature selector;
- Key lock.

**Note :** For any other option or feature, contact the manufacturer.

## 9. FEATURES

### STANDARD FEATURES :

- cETLus listed;
- Oil #1 or #2;
- Single stage burner;
- Heat exchanger with 316 grade stainless steel drum and tubes;
- Main power supply (575 volts/3 phases/60 cycles);
- Connecting terminal block;
- All the electric and mechanical components required for the proper operation of the unit;
- Pre-purge period;
- All safety controls;
- Galvanized 18 awg outer panels and galvanized 22 awg inner panels;
- 2-inch thick (51 mm) high temperature insulation with a 1.02lb/ft<sup>3</sup> density;
- Lifting lugs on both sides of the unit for easy handling and installation;
- Access panel to the exchanger tubes (for cleaning purposes);
- Supply air temperature controller.

### OPTIONAL FEATURES :

- Two stages or modulating burner;
- Electric power supply (208, 460 volts/3 phases/60 cycles);
- Partial or complete stainless steel construction;
- Main power supply disconnect with or without fuses;
- Controls and wiring required to interface with a centralized building automation system;
- Modulation controller with 0-10 VDC or 4-20 mA signal from a central building automation system;
- Room thermostat;
- 120-volt electrical outlet;
- Exchanger for vertical air flow.

**Note :** Refer to manufacturer for other options.

## 10. TYPICAL SPECIFICATIONS

### GENERAL

Supply and install a Bousquet Technologies Inc model HDO(I)\_\_\_\_\_ indirect oil-fired duct furnace for indoor or outdoor installation. The manufacturer must be accredited by the CWB to certify that he complies with standard CSA W47.1 regarding all types of welds including those on a stainless steel heat exchanger.

### PERFORMANCE

The duct furnace will have the capacity to heat \_\_\_\_\_ CFM of standard air from \_\_\_\_\_°F to \_\_\_\_\_°F, for a net heat output of \_\_\_\_\_ MBH at a minimum combustion efficiency of 80%. The fuel used will be oil at an inlet pressure of \_\_\_\_\_ psig. The air pressure drop shall not exceed \_\_\_\_\_ inches of water.

### UNIT CONSTRUCTION

The support frame will be made of structural steel. The walls and roof will be of 2-inch thick double wall construction with a 2-inch thick high temperature insulation with a density of 1.02lb/ft<sup>3</sup>. The outer wall are made with galvanized 18 awg steel with double folded edges for structural rigidity and the inner wall made of 22 awg galvanized steel. A PVC gasket will be installed between each panel and also a urethane sealant to prevent from humidity. For outdoor applications, all the controls and piping will be installed inside a weatherproof cabinet with a full-sized access door for easy maintenance.

### HEAT EXCHANGER

The multiple pass heat exchanger will consist of a primary drum and secondary tubes, entirely made of 316 grade stainless steel requiring no thermal treatment to prevent the cracking of welded joints and providing great resistance to corrosion and high temperatures, for longer service life of the unit. The heat exchanger will be equipped with access panels for tube inspection and cleaning. 400 series stainless steel, aluminized steel or carbon steel heat exchangers are not acceptable.

### BURNER AND OIL PIPING

The burner will be of a forced draft type, factory-installed on the exchanger with all piping and control wiring required for the proper operation of the unit.

### **BURNER CONTROL MODE**

- G1 : A temperature sensor with adjustable set point is installed in the air discharge to maintain the desired final temperature.
- G2 : A temperature sensor with adjustable set point is installed in the air discharge to maintain the desired final temperature. Upon a demand for heating from the room thermostat, the burner modulates to satisfy the heating needs of the room.
- Other

### **REMOTE CONTROL PANEL (option)**

A remote control panel will be supplied by the manufacturer to turn the unit on or off from a remote location. It will be equipped with a blower/burner on-off switch and indicating lights.

### **CERTIFICATION**

All HDO(I) duct furnace must be cETLus approved and certified according to standards CSA B140.0, CSA B140.4 and UL 727.

### **OPTIONS**

The duct furnace will be equipped with the following options:  
(List other required options.)