

Indirect Fired Heaters



*How to heat
gases and oils
for large installations
with indirect
flame technology*



GASCAT

Introduction

Indirect fired water heaters are typically used to raise the temperature of fluids such as natural gas and oil.

Without heaters, gas freezing (because of Joule-Thomson effect) can occur, while it is passing through the pressure reduction installation, damaging valves and instrumentation, or even causing gas supply interruption.

In oil installations, heaters are used for causing the decrease in oil viscosity, facilitating its pumping.

General Description

Gascat indirect fired heater is basically a vessel containing water at atmospheric pressure. Immersed are the firetube (red in figure) and the coil (green in figure).

The firetube is the heat source, because the burner inside heats its walls.

The water is then the heat transfer medium, heating the coil walls, separating them from the firetube walls.

That's why these are called "indirect heaters", and the process gas is heated with safety while passing through the coil.

Because of that, Gascat heaters are able to operate in classified areas.

From time to time the supervisory system makes operator aware of the necessity of water refilling caused by its evaporation.

Concept and Technology

Gascat, specialist in natural gas pressure regulation, flow metering and filtering, designed the most efficient indirect gas heater by means of the state-of-the-art computer program.

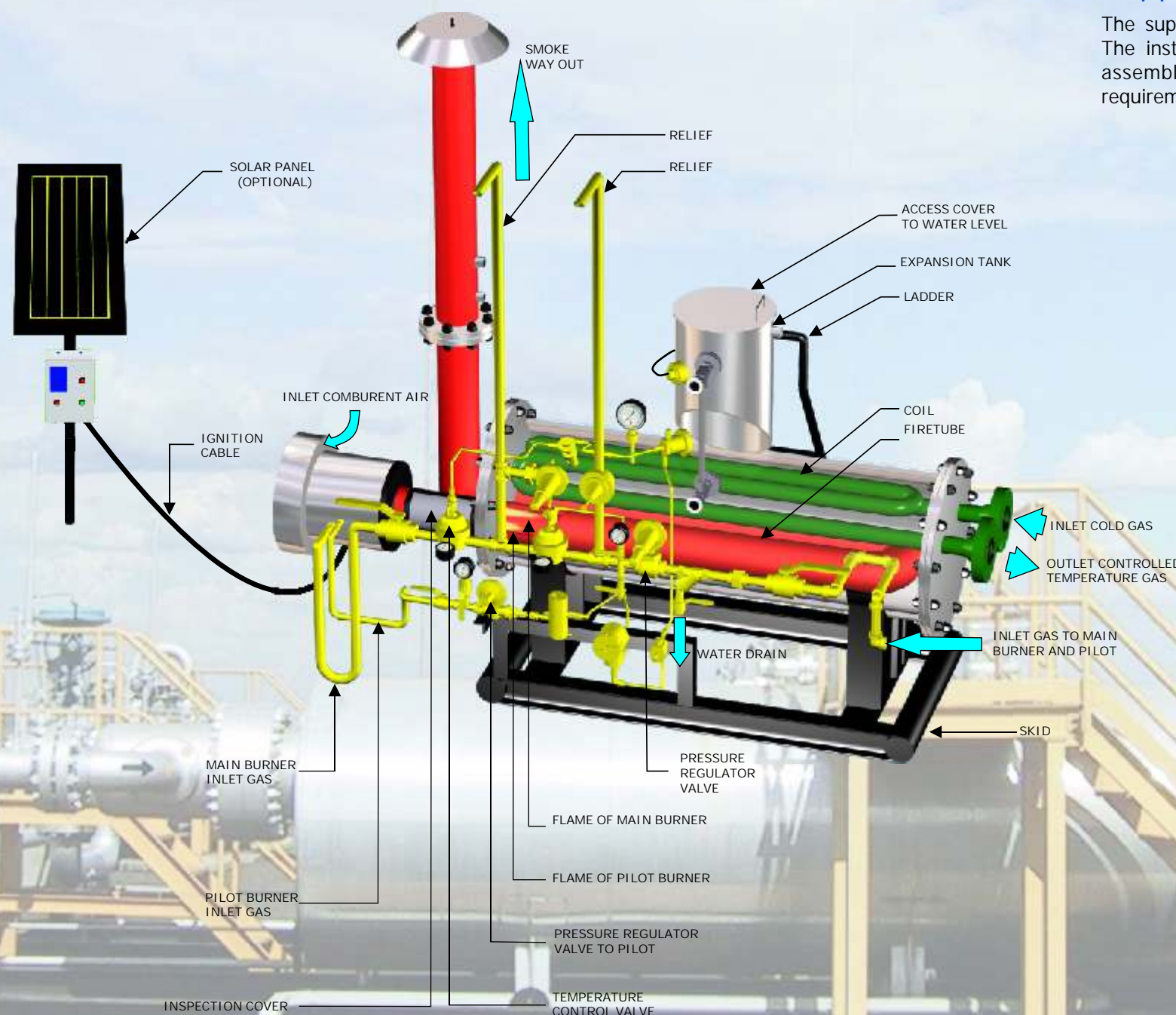
The optimized fluid flow analysis determined the more efficient relative position between coil and firetube (see figure).

A thermal efficiency from 95 to 99% was reached at coil and at the entire heater, more than 80%.

Supply

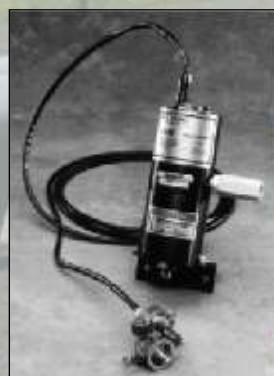
The supply and safe transportation are made by means of skids.

The instrumentation can be supplied separately or as an entire assembly for turn-key purposes, according to customer requirements.



Series components of a Gascat Heater
• Tank with basic components
• Main and pilot burners, automatically operated, with air/fuel gas ratio manual adjustment
• Pilot-guard for pilot flame acknowledgement
• Integrated flame-arrester
• Flame sight glass
• Shell with thermal insulation
• All necessary instrumentation for functioning the system (according to customer needs)

Optional Components
• Electrical ignitor for the pilot burner
• Control system powered by solar energy panel



Detail of the pilot guard



Detail of the pilot ignitor

Dimensioning

The heater nominal capacity is calculated by the formula:

$$C = 0,375 \times Q \times T$$

(for natural gas)

where

C = absorbed capacity (kcal/h)

Q = maximum gas flow rate (m³/h)

T = increase in gas temperature between heater outlet and inlet (°C)

To select a heater, enter the side table with C divided by 0,8.

It is also required:

- Operation pressure and temperature (min. and max.)
- Design pressure and temperature (min. and max.)
- Operation conditions (real flow rate through the entire installation and real flow rate through the heater)
- Natural gas molar composition

Quality Control

Gascat heaters project, construction and test procedures comply with up-to-date construction norms.

They are manufactured, mounted and tested at factory.

The control system and all the instruments are tested before shipping.

Advantages of GASCAT Heaters

The pilot and main burner ignition are self-controlled by heater instrumentation, such as temperature controllers, water level and pressure switches, whose set-points are selected at factory.

The snap acting pilot operates from the same pneumatic signal line that supplies the fuel control valve.

Also, the user can adjust the burners orifices, providing more or less oxygen to the flame.

Then no external energy supply is required, so Gascat heaters can operate in remote areas, without human interference.

Only electrical energy for valve control is required. It is usually provided by solar panels (automatic ignition system or via PLC).

Heater Capacity (kcal/h) (BTU/h)		Diameter Ø D (mm)	Size L (mm)	Diameter Ø D (pol.)	Size L (pés-pol.)
12.600	50.000	324	914	12-3/4"	3'
25.200	100.000	508	1.524	20"	5'
45.000	178.000	610	1.830	24"	6'
63.000	250.000	610	2.286	24"	7'-6"
126.000	500.000	762	3.048	30"	10'
151.200	600.000	914	3.048	36"	10'
189.000	750.000	914	3.658	36"	12'
252.000	1.000.000	1.067	4.572	42"	15'
315.000	1.250.000	1.219	4.572	48"	15'
378.000	1.500.000	1.219	5.334	48"	17' - 6"
441.000	1.750.000	1.524	5.334	60"	17' - 6"
504.000	2.000.000	1.524	5.334	60"	17' - 6"
630.000	2.500.000	1.524	6.096	60"	20'
756.000	3.000.000	1.524	6.858	60"	22' - 6"
882.000	3.500.000	1.829	6.858	72"	22' - 6"
1.008.000	4.000.000	1.829	7.620	72"	25'
1.134.000	4.500.000	1.829	8.535	72"	28'
1.260.000	5.000.000	2.134	9.144	84"	30'
1.512.000	6.000.000	2.134	9.144	84"	30'
1.764.000	7.000.000	2.438	9.144	96"	30'
2.016.000	8.000.000	2.438	9.144	96"	30'
2.520.000	10.000.000	2.438	9.144	96"	30'

GASCAT Technology

Leader in supplying natural gas equipments for 21 years, Gascat also offers:

- Service Assistance
- Training center

GASCAT Series Products

- Pressure regulators
- Relief valves
- Shut-off valves
- Gas-station filters
- Natural gas stations (City-gates)
- Other equipments for gas industry



Plant/Head Office:

Rodovia SP 73, nº 1141 - Bairro Pimenta

Indaiatuba - SP - CEP 13.347-390

Tel: 55 (19) 3936-9300 - Fax: 55 (19) 3935-6009

<http://www.gascat.com.br>

e-mail: vendas@gascat.com.br