

**DOCKETED**

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## **Heat Recovery**

California industries used over 760 million cu.ft. of natural gas last year. The commercial sector consumed over 248 million and our electricity producing power plants almost 630 million cu.ft. How much of this combusted energy was vented into the atmosphere as hot exhaust? And California is trying to Reduce Global Warming?

California is big into food and beverage processing, and this industry requires a lot of steam and hot water for their process requirements. We also have petro chemical and pharmaceutical and other large industries that require steam to be generated.

California also has a lot of large commercial buildings that include universities and hospitals and hotels that use steam or hot water for building space heating for to heat the domestic water or even the swimming pools.

The power plants generate steam for only 1 purpose, to turn turbines to generate electricity. All of the above locations that combust natural gas have chimneys, and going up all those chimneys is recoverable heat energy.

The Sidel Condensing Flue Gas Heat Recovery Unit was developed nearly 40 years ago to recover that waste heat energy. The heat energy is transferred into water to be used in the building or facility, or at a nearby location.

The temperature of the exhaust has to be measured at each location as different appliances have different efficiency ratings at different firing rates. The goal has to be to determine the best method of utilizing the recovered heat energy. Ideally the temperature can be reduced to well below the temperature of condensing. There will be days when the exhaust temperature leaving the chimney will be lower than the outside air temperature.

For every 1 million Btu's of heat energy that is recovered from the combusted natural gas exhaust and the recovered heat energy is utilized, 117 lbs of CO<sub>2</sub> will not be put into the atmosphere. This will help California to meet one of it's other goals, Reduced CO<sub>2</sub> Emissions.

California is out of it's drought situation right now, but in every 1 million Btu's of combusted natural gas are 5 gallons of recoverable distilled water. It's better to collect this water, rather than let it go over the mountains in a jet stream.

At those facilities where the exhaust is quite a bit hotter, this exhaust should be put through a waste heat boiler where steam can be generated to produce electricity for the facility or be added into the grid. The remaining heat can then be delivered to the Sidel Condensing Economizer where the remaining heat in the exhaust can there be recovered and then be utilized.

The residential market has condensing boilers and water heater. These appliances if installed properly can have operating efficiencies of over 95%. With the addition of a Sidel SRU Flue Gas Condenser it is possible to also attain those high efficiency numbers.

With the very lo cost of natural gas today, obtaining an ROI based upon reduced utility bills is

difficult. If the State of California could offer tax incentives based on the amount of Btu's not put into the atmosphere and also number of pounds or tons of CO2 not put into the atmosphere we believe could make these Waste Heat Recovery ~ Reduced CO2 Emission projects worth while for the utility customer or building owner.

What natural gas is not wasted today, will be there to be used another day.

The water created during the Condensing Heat Recovery process can be utilized by some industries for plant wash down or for lawn and flower bed irrigation, or injected into the ground to replenish ground water resources.

Have you ever seen combusted natural gas irrigate the lawns and flower beds?

I look forward to working with the California Energy Commission on this important environmental issue.

Have A Fantastic Day!

Sid Abma

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[www.SidelSystems.com](http://www.SidelSystems.com)

*Additional submitted attachment is included below.*

THE ENERGY SAVING COMPANY

[sidelsystems.com](http://sidelsystems.com)

## Sidel SRU Series

# Flue Gas Condensing Economizers for Natural Gas Boilers

 **IDE L**  
**SYSTEMS U.S.A. INC.**



## SRU SERIES ECONOMIZERS

**“Do You Want To Save Money, Increase Profits, Reduce Your ‘Carbon Footprint,’ And Help Conserve The World’s #1 Natural Resource?”**

At Sidel Systems, we know that governments, corporations and organizations of every size want to identify efficient ways to cut costs and improve the bottom line. As a company focused on harnessing energy, we also understand the importance of reducing CO<sub>2</sub> emissions and conserving water, as well as the many economic, public relations, and environmental benefits from minimizing our carbon footprint. We created the SRU Series Flue Gas Condenser to meet all of these challenges, while supplying the best possible return on investment for our clients. You can count on ultimate value, with the most efficient, trouble-free Flue Gas Condenser system available anywhere – guaranteed – at an honest, fair price.

- The Sidel SRU flue gas condensers have been in operation for almost 30 years.
- This natural gas / LPG energy saving equipment has no moving parts to wear out.
- It requires little or no electricity to operate.
- It requires little or no maintenance.
- It is self cleaning on the flue gas side.
- Sidel Systems is pleased to state that in all these years of operation, no unit has required shop repairs due to equipment failure.

### **Condensing flue gas heat recovery systems**

have been used around the world for more than 30 years. In most applications, savings of 8% to 18% are realized. This is significant considering the high cost of natural gas.

The Sidel SRU series waste heat recovery units are built in North America in accordance with ASME (American Society of Mechanical Engineers) codes. Our systems can be installed with any natural gas or LPG fired power burner boiler or heating unit. We retrofit to work with your equipment, saving money and time.

Our systems retrofit to your existing boiler and furnace equipment, which saves you money while boosting energy efficiency.

At larger new commercial construction, the installation of a Sidel SRU unit will transform a traditional boiler into one that operates as efficiently as a condensing boiler with over 90% energy efficiency.

## SIDEL SYSTEMS, INC.

### **What We Do**

Sidel Systems proudly manufactures the full line of SRU Series Flue Gas Waste Heat Recovery Units. We help companies and government agencies save money on energy bills while reducing CO<sub>2</sub> emissions and creating usable water as a byproduct of operating our equipment. We retrofit to your systems to reduce costs.

- Increased natural gas energy efficiency = Reduced utility bills = Profit.
- Increased natural gas energy efficiency = Reduced global warming.
- Increased natural gas energy efficiency = Reduced CO<sub>2</sub> emissions.
- Increased natural gas energy efficiency = Water conservation

### **Save Money**

By significantly increasing the efficiency of natural gas appliances, we help our clients lower their electrical energy consumption and water costs. Money that was literally “going up the chimney” goes back on your bottom line as new-found profit.

### **Reduce CO<sub>2</sub> Emissions**

By reducing the quantity of flue exhaust released from your chimney, CO<sub>2</sub> emissions are reduced. This not only helps the environment, but improves the public perception of your company or organization. As the “green revolution” gains momentum throughout the world, our products help you promote your efforts as an authentic, environmentally-friendly organization.

### **“We Are The Energy Efficiency Experts”**

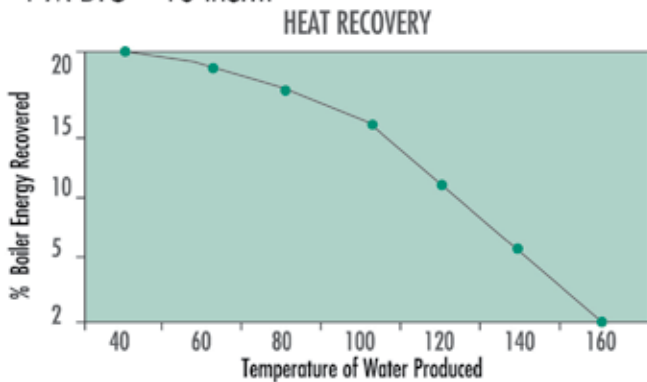
Our clients were saving money and helping the environment long before “going green” was trendy. Back in 1978, we specialized in the design and installation of hot water heating systems for the commercial greenhouse industry. Greenhouse structures have a very high heat loss factor, so it’s extremely important to achieve maximum fuel efficiency. Building on our success within that industry we have become true experts in energy efficiency. Today, Sidel Systems products are among the most energy efficient, cost effective flue gas waste heat recovery units in the world. Guaranteed!

## WHY SEND YOUR \$\$\$ MONEY UP THE CHIMNEY?

### POTENTIAL SAVINGS TO YOU

For a typical 250 HP natural gas fired boiler operating with an exhaust gas temperature of 410°F and 15% excess combustion air, the efficiency is approximately 80%. The fuel input is approximately 10.5 million BTU/hr, and 20% of the fuel's total energy is going up the chimney. By incorporating a SRU waste heat recovery system to produce 100°F water, about **15% of the fuel's original energy can be recovered**. If the boiler operates for an equivalent of 6,000 full load hours per year, and natural gas costs \$.70 per therm, the annual savings realized from a SRU waste heat recovery system will be:  $10.5\text{M BTU/hr} \times 15\% \times 6,000 \text{ hrs/yr} \times \$7.00/\text{M BTU}^* = \$66,150$

\*1 M BTU = 10 therm



### APPLICATIONS

Food Processing	Prisons
Hospitals and Health Centers	Breweries
Schools and Universities	Hotels
Government Buildings	Wineries
Commercial Laundries	Swimming pools
Pulp & Paper	Textile Plants
Natural Gas Power Plants	District Heating Plants

#### **The question to ask is: Why is this boiler here?**

Is steam from this boiler used to heat domestic or process water? Is it a hot water boiler used for space heating? Let's use the heat from the exhaust gasses to preheat this water.

### SRU CAPACITY

Standard SRU sizes are available for heating appliances with inputs as small as 2 million BTU/hr. to capacities of 350,000 lbs/hr. and larger using multiple SRU recovery units. All units are constructed in accordance with the ASME codes.

## WATER FOR THE LAWNS AND FLOWERBEDS

### CONDENSATE

Did you know that if you own a natural gas boiler or heating appliance, usable water is escaping out of your chimney? In fact, approximately 8% of flue gas is water. It's literally like taking a faucet and leaving it on all day, but on a much larger scale. Not only are you wasting a precious natural resource every hour of every day, but you're also losing money.

Sidel Systems can help you conserve water while saving money at the same time. Our SRU Heat Recovery Condensers capture most of the energy potential exhausted in your flue gases and turn it into usable heat. During this heat recovery process, as the waste HOT exhaust gases are being cooled to below the dewpoint temperature, water is being created, and is collected at the base section. Every gallon collected is a gallon you do not have to purchase. This not only conserves the public water supply, but it also saves you money.

*So while our SRU units are increasing your energy efficiency and saving you money, they're also conserving water and making your organization "greener." Your customers will love you for that.*

There are several beneficial uses for this reclaimed water. It can be used as boiler feedwater, or be added to the plant washdown water, or to the evaporative coolers. It can be treated and applied to almost any application, and if there is no other place to utilize this water, how about collecting it into a large plastic container underground and using this water to irrigate lawns and flower beds?

**Have you ever seen combusted natural gas irrigate the lawns and flower beds?**

*Investing in a Sidel SRU Heat Recovery System is a great way to save money and help the environment, but- it's also great for increasing customer loyalty and expanding your customer base.*

When you conserve energy, reduce CO<sub>2</sub> emissions, and conserve water, you become a hero to all the people who care about protecting our environment for future generations, including your customers! They really will appreciate your efforts to make the world a better place, and they will reward you for it – with continued loyalty and by telling their business associates to do business with you.



On the roof

**SIDEL SRU  
STANDARD CONCEPT**



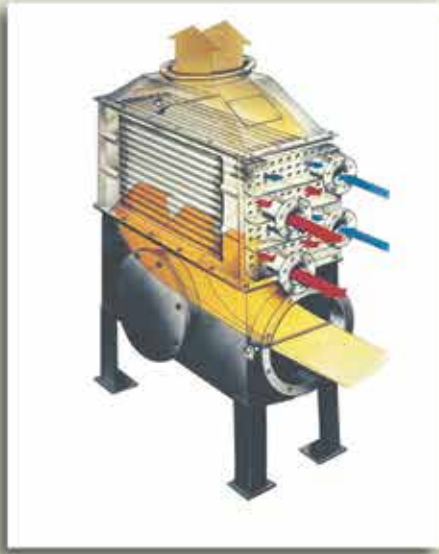
Off the floor



2 X 350 hp



**SIDEL SRU  
COMBI CONCEPT**



600 hp C.B. on the floor



# Sidel Therm and CO<sub>2</sub> Counter



In order to quantify the amount of heat recovered, Sidel Systems, in conjunction with Helman Automation, has created the Sidel Therm and CO<sub>2</sub> Counter. This is an industrial PLC capable of continuously storing data which shows how much energy is saved by the SRU Flue Gas Condenser. The Therm and CO<sub>2</sub> Counter control unit has two major components: the HMI (human machine interface), and the PLC (programmable logic units).

The HMI displays all the important information, is the gateway to change parameters, and can communicate collected data to other terminals via the internet.

One of the greatest advantages of the system is its capability to be adapted to the monitoring needs of the customer. The system can be programmed to perform all the automation control, data acquisition, and data storage.

The Sidel Therm and CO<sub>2</sub> Counter works in a similar way to any utility meter, with the exception of an additional audible buzzer which sounds in response to any hazard that may occur.

The display screen shows the amount of energy recovered as well as other vital information such as the temperature at several critical points, water flow, and

chimney valve position. It also monitors any other information required to protect the SRU from damage. Any data that registers out of normal range will set off an alarm.

The HMI used in the Sidel Therm and CO<sub>2</sub> Counter has all the latest technology, such as: a high resolution touchscreen, Ethernet, USB and serial port connections. This allows the data collected to be displayed on any computer in the company.

The HMI can be customized to display in either Metric units or British units and also can be programmed for multi-languages.

This feature is very useful to see graphically how the changes of each parameter affect the heat recovery process.

## How the Sidel Therm and CO<sub>2</sub> Counter works

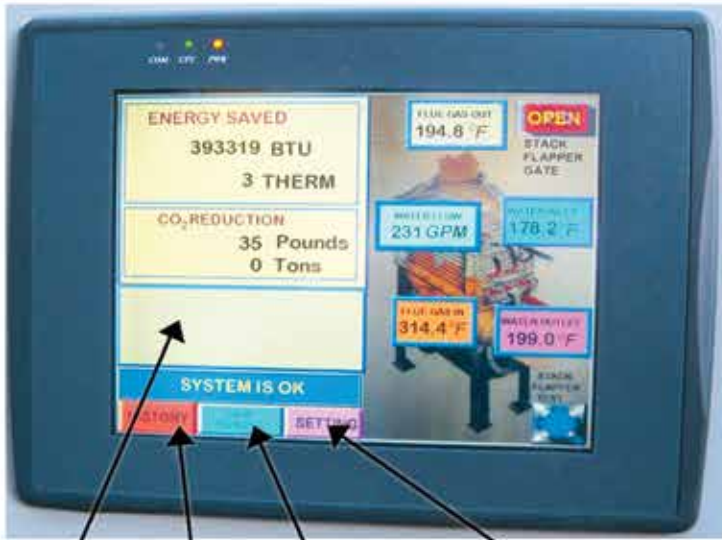
From 4 sensors that are inserted into the pipes connected to the Sidel SRU Flue Gas Heat Recovery Unit, the Therm and CO<sub>2</sub> Counter takes the temperature of:

- Water flowing into the SRU unit.
- Water flowing out of the SRU unit.
- Flue gas entering the SRU unit.
- Flue gas exiting the SRU unit.

From the water flow sensor inserted into the water intake pipe, the PLC receives the rate of water flowing through the SRU in gallons per minute (GPM). This data is received by the PLC in 5 second intervals and is displayed on the screen.

The PLC calculates the Delta T in BTU's and the flow rate in GPM and displays the resulting calculation as BTU's saved every 5 seconds. From these figures it is possible to see, in real time, exactly how the SRU is performing. This information is also saved as history in the PLC memory and can be displayed on the History Screen.

## DATA TRENDING



Alarm Screen      History Button      Data Trending Button      System Settings

By using the touch screen, the operator can open and close the chimney valve, control the alarm function set the system, and navigate between the displays. The displayed calculations also can be sent over the internet or intranet to be displayed on any computer within the company.

This gives the Sidel SRU a unique advantage in providing real time cost savings analysis that can be used by managers to prove that their company is acting responsibly by reducing greenhouse gas emissions and using their energy as efficiently as possible.

## HISTORY

Time	Date	Win (F)	W out (F)	Air in (F)	Air out (F)	GPM	BTU/h
17:53	15/12/08	117.7	133.1	291.2	169.2	162	1016
10:58	15/12/08	157.5	181.9	276.5	161.5	120	1064
09:58	15/12/08	156.2	179.5	271.5	161.0	111	969
08:58	15/12/08	155.2	156.7	190.8	94.8	81	273
07:58	15/12/08	112.0	97.1	83.0	58.1	19	0
06:58	15/12/08	80.9	56.0	51.0	53.8	0	0
05:58	15/12/08	80.2	57.5	50.4	52.3	0	0
04:58	15/12/08	80.2	57.7	50.3	51.1	0	0
03:58	15/12/08	80.3	58.0	50.6	50.7	0	0
02:58	15/12/08	81.6	58.8	51.7	50.4	0	0
01:58	15/12/08	83.8	60.2	53.6	52.0	0	0
00:58	15/12/08	80.3	59.8	52.9	52.5	1	1

## OUR CLIENTS

We are honored to have helped the following companies and organizations, in the last few years, meet their energy efficiency goals, and we are proud to call them our clients and friends...

- Gem State Potato Processing, Heyburn, ID
- District of Columbia Regional Housing Authority
- Best Glove, Fayette, Alabama
- C. Rakers and Sons, Linchfield, Missouri
- Del Monte Foods, Laurence, KS
- TRI C Colleges, Cleveland, OH
- Mission Linen Supply, Chico, California
- Mission Linen Supply, Salinas, California
- Mission Linen Supply, Oceanside, California
- Mission Linen Supply, Santa Maria, California
- Michigan State University, Houghton, MI
- Ritz Carlton Hotel, Montreal, QB
- Darigold, Inc., Jerome, Idaho
- Darigold, Inc., Boise, Idaho
- Steam Engineering, Vancouver, Washington
- Dryden Regional Health Center, Dryden, Ontario
- S.D. State Penitentiary, Sioux Falls, SD
- Carderock Naval Research Laboratory, Carderock, MD
- Harris Ranch Meats, Selma, California
- E&J Gallo Winery, Fresno, California
- Holman Boiler, Houston, Texas
- AKZO Nobel, Houston, Texas
- Kraft Foods, Ingleside, Ontario, Canada
- Pacific foods, Portland, Oregon
- Georgia Gulf Chemicals, Aberdeen, MS

We would love to explore with you how you can become our next satisfied client.

**Our Iron-Clad Guarantee: "You Will Be 100% Satisfied With The Money Saved, CO<sub>2</sub> Emissions Reduced, Water Conserved, And Exceptional Service, Or We'll Buy Your Unit Back From You - Period."**  
- Sid Abma

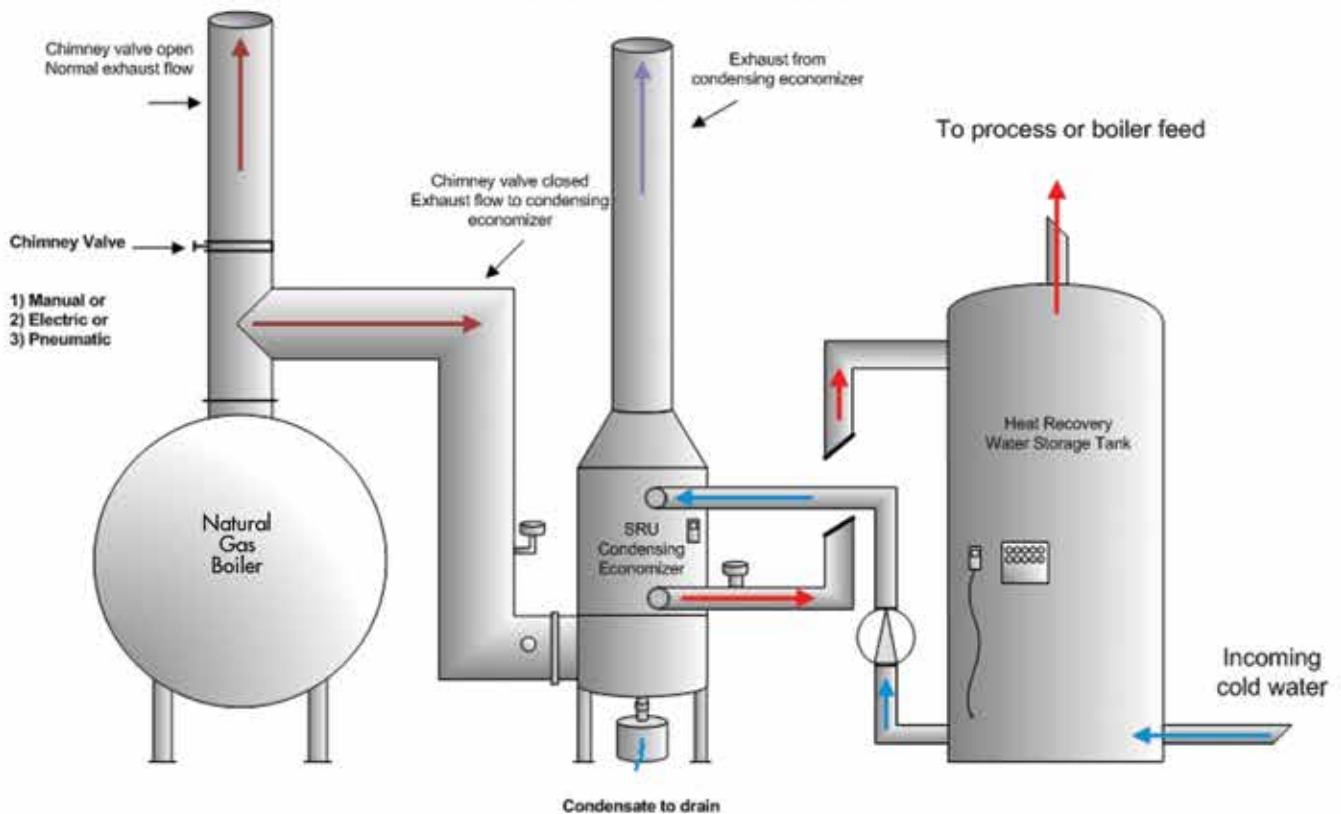
Flue gas recovery systems are being used around the world.

## BENEFITS

- Increased system efficiency (typically to 90-95%)
- Fuel savings (typically 10-15%)
- Short payback
- Easy installation, low maintenance
- Reduced CO<sub>2</sub> and other noxious gas emissions
- Reduced stack noise emission
- Operates over a broad range of equipment conditions
- Computer-aided design (to ensure optimum sizing)
- Computer-aided investment analysis
- 7- year limited guarantee

[sidelsystems.com](http://sidelsystems.com)

### Sidel Systems SRU Flue Gas Condensing Economizer Potential Installation Option



**SIDEL**  
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