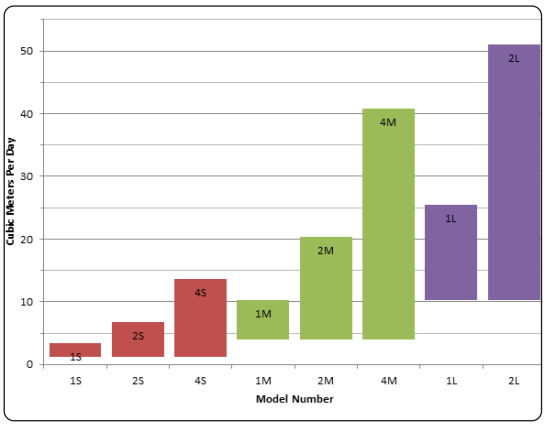
Catalytic Methane Abatement System



Methane escaping into the atmosphere is a significant greenhouse gas source throughout North America. Regulations and environmental concerns are requiring the capture and elimination of these gases.

The Patented ETTER Catalytic Methane Abatement System (CMAS), is provided for Methane Abatement, addressing what is commonly found at wellheads on oil and gas wells.

These methane emissions occur as a result of the loss of integrity between casing strings and are called surface casing vent flows in some jurisdictions. Methane that has built up in the annuli between casing strings can be captured, and processed through an array of Catalytic Oxidizers, which will convert the Methane to environmentally friendlier CO2 and water vapor. The System can also be used to oxidize methane emitted as solution gas from oil production and emissions from natural gas pneumatic controls.

The System operates at low gas supply pressure, and once operational, can operate indefinitely without any on-site electrical power. The design is scalable, in order to address the specific available Methane flow rates of each well or drilling site.

The CMAS are available with 3 sizes, in single, double, and 4-pack configurations. The Oxidizers are FM approved for Class I, Division I installations, and the housing are provided as complete "Plug-and-Play" assemblies. All of the necessary gas valving and control equipment is pre-assembled. The electric preheat cable is provided.

The Catalytic Oxidizers use a platinum based catalyst that, once initially heated, processes the methane in a flameless conversion to CO2 and water vapor. Startup requires power from either a land based power connection, or a portable generator. The housing is designed to eliminate the effects of rain and snow, while reducing the effects of wind. The units are designed for outdoor installation.

U.S. Patent #10,150,081
Canadian Patent Pending

FM APPROVED

MODEL NUMBER	CMAS-1S		CMAS-2S		CMAS-4S	
Heaters:	6x24, Class I Div I Rated		6x24, Class I Div I Rated		6x24, Class I Div I Rated	
Qty Heaters:	1		2		4	
Max Output:	5,000 BTU/Hr.	3.4 m^3/Day	10,000 BTU/Hr.	6.8 m^3/Day	20,000 BTU/Hr.	13.6 m^3/Day
Min BTU's:	2,000 BTU/Hr.	1.4 m^3/Day	4,000 BTU/Hr.	2.8 m^3/Day	8,000 BTU/Hr.	5.6 m^3/Day
Fuel Type:	Natural Gas		Natural Gas		Natural Gas	
Min Gas Pressure:	7" WC	17 mbar	7" WC	17 mbar	7" WC	17 mbar
Max Gas Pressure:	14"WC	35 mbar	14"WC	35 mbar	14"WC	35 mbar
Startup Voltage:	12VDC, 120/240VAC - 1Ph - 60Hz		12VDC, 120/240VAC - 1Ph - 60Hz		12VDC, 120/240VAC - 1Ph - 60Hz	
Startup Wattage:	240 W		240 W per Heater		240 W per Heater	
Startup Type	Manual BASO Valve		Manual BASO Valve		Manual BASO Valve	
Startup Temp. Minimum	-20F	-30C	-20F	-30C	-20F	-30C
Installation	To be installed above snow line, and reduce wind as much as possible		To be installed above snow line, and reduce wind as much as possible		To be installed above snow line, and reduce wind as much as possible	

MODEL NUMBER	CMAS-1M		CMAS-2M		CMAS-4M	
Heaters:	18x24, Class I Div I Rated		18x24, Class I Div I Rated		18x24, Class I Div I Rated	
Qty Heaters:	1		2		4	
Max Output:	15,000 BTU/Hr.	10.2 m^3/Day	30,000 BTU/Hr.	20.4 m^3/Day	60,000 BTU/Hr.	40.8 m^3/Day
Min BTU's:	6,000 BTU/Hr.	4.1 m^3/Day	12,000 BTU/Hr.	8.2 m^3/Day	24,000 BTU/Hr.	16.3 m^3/Day
Fuel Type:	Natural Gas		Natural Gas		Natural Gas	
Min Gas Pressure:	7" WC	17 mbar	7" WC	17 mbar	7" WC	17 mbar
Max Gas Pressure:	14"WC	35 mbar	14"WC	35 mbar	14"WC	35 mbar
Startup Voltage:	120/240/480VAC - 1Ph - 60Hz		120/240/480VAC - 1Ph - 60Hz		120/240/480VAC - 1Ph - 60Hz	
Startup Wattage:	500 W		500 W per Heater		500 W per Heater	
Startup Type	Manual BASO Valve		Manual BASO Valve		Manual BASO Valve	
Startup Temp. Minimum	-20F	-30C	-20F	-30C	-20F	-30C
Installation	To be installed above snow line, and reduce wind as much as possible		To be installed above snow line, and reduce wind as much as possible		To be installed above snow line, and reduce wind as much as possible	

MODEL NUMBER	CMAS-1L		CMAS-2L	
Heaters:	18x60, Class I Div I Rated		18x60, Class I Div I Rated	
Qty Heaters:	1		2	
Max Output:	37,500 BTU/Hr.	25.5 m^3/Day	75,000 BTU/Hr.	51.0 m^3/Day
Min BTU's:	15,000 BTU/Hr.	10.2 m^3/Day	30,000 BTU/Hr.	20.4 m^3/Day
Fuel Type:	Natural Gas		Natural Gas	
Min Gas Pressure:	7" WC	17 mbar	7" WC	17 mbar
Max Gas Pressure:	14"WC	35 mbar	14"WC	35 mbar
Startup Voltage:	120/240/480VAC - 1Ph - 60Hz		120/240/480VAC - 1Ph - 60Hz	
Startup Wattage:	2500 W		2500 W per Heater	
Startup Type	Manual BASO Valve		Manual BASO Valve	
Startup Temp. Minimum	-20F	-30C	-20F	-30C
Installation	To be installed above snow line, and reduce wind as much as possible		To be installed above snow line, and reduce wind as much as possible	

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