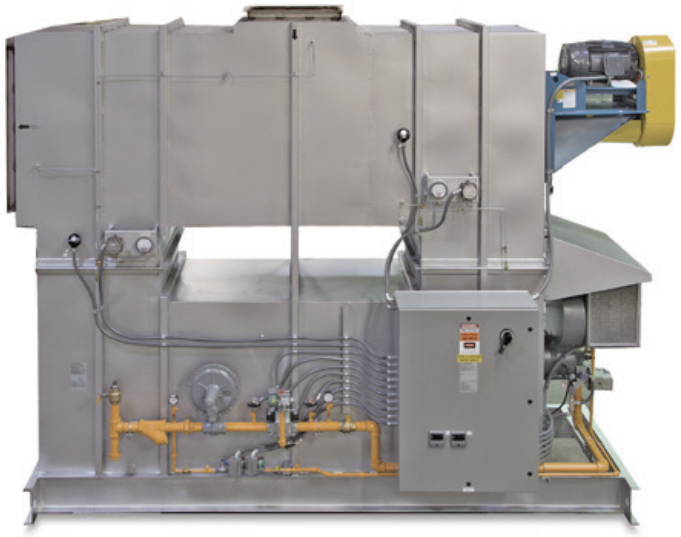
PRODUCT SHEET

Munters VariMax® IFRG

Indirect-fired recirculating gas heaters

Features

- Minimum of 87% thermal system efficiency
- Complete gas train and controls
- All-welded plate/tubular heat exchanger
- Provides a constant temperature at variable airflows



Innovative solutions for process applications

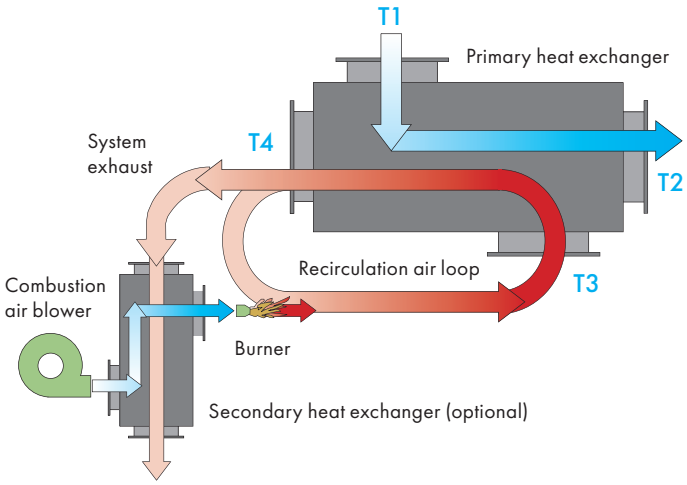
Indirect-Fired Recirculating Gas Heater

When process applications require clean, heated air, Munters has the solution. The ultrahigh efficiency VariMax indirect heater provides heated, contaminant-free process air while reducing operating costs. Most indirect heaters lose 30-50% of the heat energy through the exhaust stack. The VariMax heater can transfer 87%+ of the heat energy to process. This energy savings results in a short payback with savings year after year. VariMax's rugged, heavy-duty construction ensures a reliable, long-lasting heat source for years to come.

System Performance

The VariMax indirect heater achieves extremely high efficiency levels by recirculating a hot airstream through a semi-closed loop from T3 to T4 (refer to illustration). Traditional systems lose a tremendous amount of energy as the exhaust gases leave the heat exchanger after only one pass. The VariMax heater takes advantage of this energy by keeping it in the system. The only significant energy loss is through a small amount of exhaust air bled from the recirculation loop to offset the incoming combustion airflow. The process air is heated to the desired set point as it passes through the primary heat exchanger from T1 to T2.

To further increase efficiency, as high as 95%, an optional second heat exchanger can be added to capture the energy from the exhaust air and use that energy to preheat the incoming combustion air.



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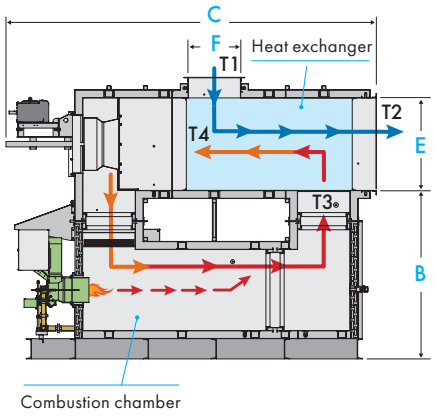
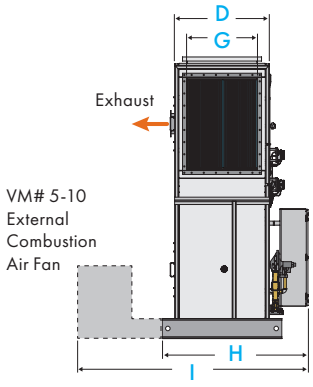
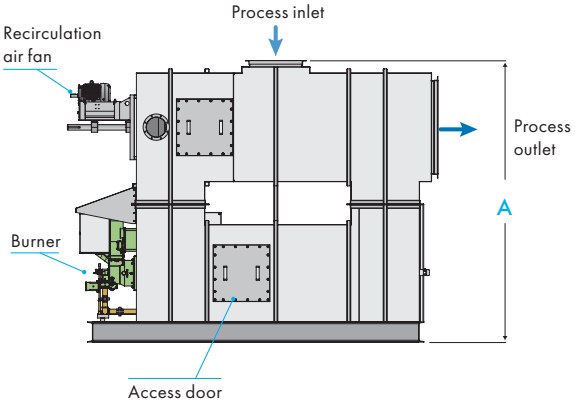
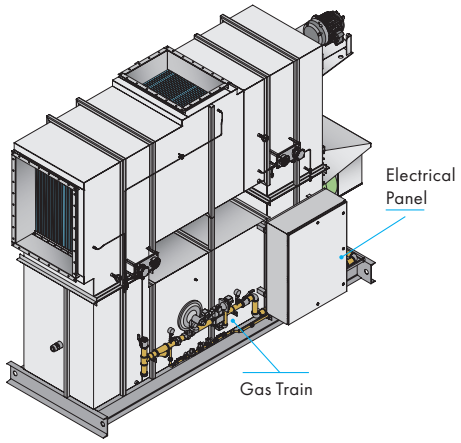
Dimensions and technical specifications









	VM Dimensions (in inches)										Approx. Weight	Process Air Flows in SCFM	Max. Design Temp Rise	Max. NET Output	Min. System Eff.	# Lift Points
Model	A	B	C	D	E	F	G	H	I	T1/T2 Flange Size	lbs	Minimum/ Maximum	°F	MMBH	%	
VM-1	120	76	171	43	34	20	28	72	NA	2 x 2 x ¼	10,000	3,500/4,475	400	1.93	87	4
VM-2	120	76	173	45	34	20	34	74	NA	2 x 2 x ¼	10,850	4,475/7,000	400	3.02	87	4
VM-3	134	78	185	45	46	26	35	76	NA	2 x 2 x ¼	12,800	7,000/9,150	400	3.95	88	4
VM-4	134	78	185	50	46	26	42	79	NA	2 x 2 x ¼	14,800	9,150/11,400	400	4.92	88	4
VM-5	140	82	201	68	46	26	60	97	131	3 x 3 x ¼	19,850	11,400/20,000	400	8.64	90	4
VM-6	140	74	210	88	46	26	80	117	157	3 x 3 x ¼	25,650	20,000/28,000	400	12.09	90	4
VM-7	142	84	210	96	46	26	88	125	165	3 x 3 x ¼	27,300	28,000/31,000	400	13.39	90	4
VM-8	142	84	216	108	46	26	100	137	176	3 x 3 x 3/8	31,600	31,000/38,000	400	16.41	90	4
VM-9	154	82	232	104	58	33	96	133	175	4 x 4 x ¼	38,350	38,000/45,000	400	19.44	90	6
VM-10	156	84	248	110	58	33	102	139	184	4 x 4 x 3/8	44,350	45,000/53,000	400	22.89	90	6

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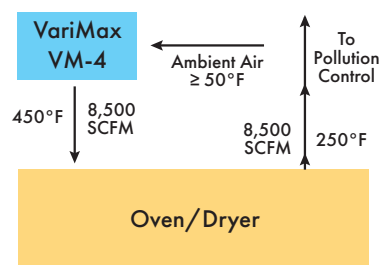
Standard IFRG options

- Process air fan for complete system packaging
- Variable speed drives for process air fans
- Fresh air filters and racks for process air quality control
- Fresh air dampers and rain hoods
- Heat exchanger face and bypass section for large volume control

Custom IFRG options

- Options listed above
- Factory wired process controller
- UL-508A labeled electric panels
- Air conditioned electric panels
- Wiring in rigid conduit
- Integral expansion joints
- Custom layouts to meet footprint requirements
- Manufactured to meet USDA 3A guidelines
- Optional Low-Nox Burner (less than 10ppm emission)
- SMARTLINK system to provide precision air/fuel ratio control
- High precision actuator to provide +/- 1°F control
- Dual fuel burners capable of using #2 fuel oil
- Custom gas trains and controls
- Combustion air preheater to maximize efficiency and fuel savings
- Customization for temperature rises up to 1,000°F (T2-T1)
- Customization for discharge temperatures (T2) up to 1,200°F

Application example



100% O/A oven system provides large temperature rise to a high volume of outside air

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Sample specifications

Heat exchanger section

Air-to-air heat exchanger shall transfer energy from recirculation airstream to an airstream that is to be heated indirectly. Capacity of heat exchanger, pressure drop, and extent of temperature rise shall be as scheduled. The heat exchanger module(s) shall be of industrial quality with minimum 0.031" 304 stainless-steel heat-transfer surface with truncated conical dimples to maintain plate separation and enhance heat transfer. The heat-transfer surface (matrix) shall be die-formed with continuous-seam welds to prevent gas leakage to adjacent airstream.

Prior to shipment, each module shall receive a pressure test and prove no more than 0.01% leakage at operating pressure. Inner casing is constructed of the same material as the heat transfer matrix. It is welded to the matrix at certain peripheral locations to assure air-tight seal.

Airflow through the heat exchanger shall be in a counterflow pattern to ensure maximum performance. Flanges for duct attachment shall be minimum 2" x 2" x 1/4" structural-steel with punched bolt holes for easy hookup. Heat exchanger module shall be sandblasted and painted.

Motor and drive

Belt drives shall have a minimum service factor of 1.5. OSHA type belt guard shall be provided. Motors shall be TEFC high-efficiency type. Motor electrical connections are to be factory pre-wired to the unit control panel. Motor shall be mounted on adjustable sliding-type base.

Combustion chamber

Unit shall be provided with a firing chamber to allow mixture of combustion gas with recirculation gas. Chamber will be provided with a minimum 4" of thermal insulation, a minimum of 12ga 304 stainless steel inner casing and a minimum 11ga carbon-steel outer casing. Access panel shall be provided for inspection and/or cleaning of components. A sight glass shall be provided to allow viewing of the combustion chamber.

Base frame

All-welded carbon steel base frame with integral lifting lugs, minimum 6 x 8.2# structural channel sandblasted and painted.

Fan section

The recirculation fan shall be centrifugal type, heavy duty, SWSI. Fans shall have backward-inclined wheels. Fan wheels shall be statically and dynamically balanced before installation in the fan. Balance readings shall be taken by electronic type equipment in the axial, vertical, and horizontal directions on each of the bearings. Bearings shall be heavy-duty, self-aligning pillow block type. Bearing selection is based on L-10 minimum life of 40,000 hours or average life of 200,000 hours.

Gas burner

Unit shall be provided with a factory-installed burner that will maintain recirculation gas temperature as required for scheduled capacity. Burner shall include a combustion-air blower, stainless-steel sleeve, gas train with pilot, and spark igniter. All safeties required for unit operation shall be included in compliance with XL Gap 4.2.0 (formerly IRI/GE GAP) & NFPA 86-2011 standards. Customer to provide 0-10V or 4-20mA for temperature control. Gas heat shall modulate to maintain supply air temperature as required.

Electrical controls

Control panel(s) shall be provided with hinged access doors and an approved locking device. Full operating and maintenance instructions shall accompany each unit. The control systems shall include the following components required for automatic operation:

Wiring for the standard unit requires a power connection to the main disconnect, a firing rate signal, burner on/off, and system enable signals. All factory-supplied components are fully wired and tested prior to shipment, and all major electrical components are UL listed. All electrical wiring shall be enclosed in liquid-tight conduit. All wiring shall be in accordance with NEC guidelines and practices.

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