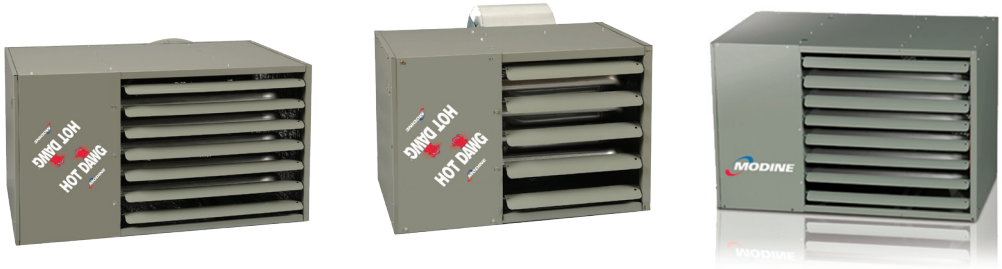
MODINE

GAS-FIRED UNIT HEATERS
RESIDENTIAL, COMMERCIAL & INDUSTRIAL

POWER VENTED
HD, HDB, PDP, BDP, PTP



SEPARATED COMBUSTION
HDS, HDC, PTS, BTS

HIGH-EFFICIENCY SEPARATED COMBUSTION
PTC, BTC

6-107.15 • JULY, 2016

GAS-FIRED, POWER-EXHAUSTED, PROPELLER

• 82% Thermal Efficiency • Horizontal or Vertical Venting • Field Convertible to Propane • 100% Shut-Off with Continuous Retry • Commercial or Residential Applications

MODEL HD

MODEL PDP

MODEL PTP

For applications requiring a low profile unit, Modine offers the Hot Dawg® unit heater. The Hot Dawg® may be installed in residential or commercial applications just one inch below the ceiling. The superior quality matched with the following features makes the Hot Dawg® unit heater an easy choice for a variety of applications:

- 82% thermal efficiency for fuel savings.
- Uses natural or propane gas (field convertible from natural to propane gas).
- Certified for residential, commercial and industrial use.
- Lightweight, easily installs 1" from ceiling with only two angle brackets (standard on 30-75, accessory for 100-125).
- Install quickly and easily with knockouts for quick access to gas and electricity.
- The standard power exhauster allows the unit to be vented vertically or horizontally and is designed to use the smallest diameter vent pipe possible.
- Permanently-lubricated motor for trouble-free dependability.
- Full 10-year warranty on heat exchanger.
- Available in both propeller fan and centrifugal blower configurations.

The PDP propeller, power vented gas-fired unit heater is a product that is inexpensive to install, easy to use, and offers excellent in-service economy. The PDP model series expands on the size range of the HD model series providing product that is certified for commercial and industrial applications in sizes from 150 through 400MBH.

For blower model data, see page 6.

Table 2.1 - Propeller Unit Model HD and PDP General Performance Data

	Model HD Sizes						Model PDP Sizes						
	30	45	60	75	100	125	150	175	200	250	300	350	400
Btu/Hr Input ①	30,000	45,000	60,000	75,000	100,000	125,000	150,000	175,000	200,000	250,000	300,000	350,000	400,000
Btu/Hr Ouput ①	24,600	36,900	49,200	31,500	82,000	102,500	123,000	143,500	164,000	205,000	246,000	287,000	328,000
Entering Airflow (CFM) @ 70°F	505	720	990	1160	1490	1980	2180	2550	2870	3700	4460	4870	5440
Air Temp. Rise (°F)	44	46	45	48	50	47	51	51	52	50	50	53	54
Max. Mounting Height (Ft.) ②	10	10	12	14	12	16	16	17	15	19	21	20	19
Heat Throw (Ft.) @ Max Mtg Ht ②	25	27	36	38	42	56	55	59	51	67	74	70	69

The PTP features a stainless steel tubular heat exchanger as STANDARD on all units with a 10-year heat exchanger warranty, providing customers with a peace of mind. Users of the PTP will also benefit from a low profile design that allows quick and easy installations.

Table 2.2 - Propeller Unit Model PTP General Performance Data

	Model PTP Sizes						
	150	175	200	250	300	350	400
Btu/Hr Input ①	150,000	175,000	200,000	250,000	300,000	350,000	400,000
Btu/Hr Ouput ①	123,000	143,500	164,000	205,000	246,000	287,000	328,000
Entering Airflow (CFM) @ 70°F	2140	2725	2870	3995	4545	5280	5995
Air Temp. Rise (°F)	53	48	52	47	50	50	51
Max. Mounting Height (Ft.) ②	15	14	15	18	19	18	21
Heat Throw (Ft.) (@ Max Mtg Ht)	51	50	53	62	69	65	74

① Ratings shown are for elevations up to 2,000 Ft. For elevations above 2,000 feet, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level. (In Canada see rating plate.) Reduction of ratings requires use of a high altitude kit.

② Data taken at 55°F air temperature rise. At 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods. For units equipped with deflector hoods.

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DO NOT LOCATE ANY GAS-FIRED UNIT IN AREAS WITH CHLORINATED, HALOGENATED, OR ACIDIC VAPORS IN ATMOSPHERE.

Request Catalog 6-189 For Complete Technical Information and Specifications.

GAS-FIRED, SEPARATED COMBUSTION, PROPELLER

• 100% Outside Air for Combustion • Sealed Compartment Protects Combination Gas Control, Ignition Control, Manifold and Burner • Horizontal or Vertical Concentric Venting • 82% Thermal Efficiency • Direct Spark Ignition • 100% Shut-Off with Continuous Retry • Certified for Commercial or Residential Applications

MODEL HDS

MODEL PTS

The separated combustion models HDS and PTS draw 100% of their combustion air from outside to ensure that the unit will always have plenty of fresh, clean air to breathe. This fresh-air supply reduces common concerns about maintenance, performance, and durability in dusty, dirty, or humid applications. In addition, by drawing the combustion air from the outside, the overall heating efficiency is increased. In short, the separated combustion units give you the added advantages of:

- 82% thermal efficiency for fuel savings.
- A sealed compartment protects the combination gas valve, ignition control, manifold, and burner from the environment.
- External gas connections.
- Uses natural or propane gas (field convertible from natural to propane gas).
- Certified for residential (30-125MBH), commercial and industrial use (30-400MBH).
- Lightweight, easily installs 1" from ceiling with only two angle brackets (standard on 30-75, accessory for 100-125).
- Install quickly and easily with knockouts for quick access to gas and electricity.
- Standard power exhaust simplifies side-wall or roof venting with small-diameter vent pipe.
- Horizontal or vertical two-pipe or concentric venting options.
- Permanently-lubricated motor for trouble-free dependability.
- Full 10-year warranty on heat exchanger.
- Available in both propeller fan and centrifugal blower configurations.

For blower model data, see page 6.

Table 3.1 - Propeller Unit Model HDS and PTS General Performance Data

	Model HDS Sizes						Model PTS Sizes						
	30	45	60	75	100	125	150	175	200	250	300	350	400
Btu/Hr Input ①	30,000	45,000	60,000	75,000	100,000	125,000	150,000	175,000	200,000	250,000	300,000	350,000	400,000
Btu/Hr Ouput ①	24,600	36,900	49,200	61,500	82,000	102,500	123,000	143,500	164,000	205,000	246,000	287,000	328,000
Entering Airflow (CFM) @ 70°F	505	720	990	1160	1490	1980	2140	2725	2870	3995	4545	5280	5995
Air Temp. Rise (°F)	44	46	45	48	50	47	53	48	52	47	50	50	51
Max. Mounting Height (Ft.) ②	10	10	12	14	12	16	15	14	15	18	19	18	21
Heat Throw (Ft.) @ Max Mtg Ht ②	25	27	36	38	42	56	51	50	53	62	69	65	74

① Ratings shown are for elevations up to 2,000 Ft. For elevations above 2,000 feet, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level. (In Canada see rating plate.) Reduction of ratings requires use of a high altitude kit.

② Data taken at 55°F air temperature rise. At 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods. For units equipped with deflector hoods.

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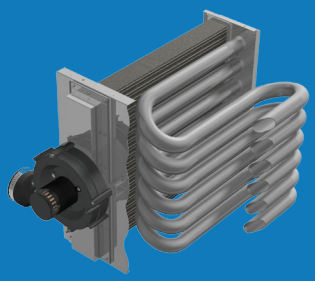
DO NOT LOCATE ANY GAS-FIRED UNIT IN AREAS WITH CHLORINATED, HALOGENATED, OR ACIDIC VAPORS IN ATMOSPHERE.

Request Catalog 6-175 For Complete Technical Information and Specifications.

GAS-FIRED, SEPARATED COMBUSTION, HIGH-EFFICIENCY CONDENSING

• 100% Outside Air for Combustion • Sealed Compartment Protects Combination Gas Control, Ignition Control, Manifold and Burner • Conservicore® Secondary Heat Exchanger • Horizontal or Vertical Concentric Venting • 93% Thermal Efficiency • Direct Spark Ignition • 100% Shut-Off with Continuous Retry

MODEL PTC



MODINE CONSERVICORE® HEAT EXCHANGER

Effinity 93®
with Conservicore Technology®

At 93% thermal efficiency for all model sizes, Modine's Effinity[93®] condensing unit heater features the highest efficiency available in North America for commercial and industrial, as well as residentially certified (sizes 110 and smaller) gas-fired unit heaters. This industry leading efficiency is a result of the coupling of our Conservicore® secondary heat exchanger technology with our robust tubular primary heat exchanger design. The Conservicore® technology features a secondary recuperative heat exchanger fabricated from AL29-4C® stainless steel. This material is superior to other lower grades of stainless steel and aluminum, resulting in outstanding ability to withstand the corrosive environment of condensing gas fired equipment.

Available in ten model sizes with input ranges from 55,000 to 310,000 Btu/Hr, Modine offers application flexibility unmatched in the industry. The separated combustion units draw combustion air from outside to ensure that the unit will always have plenty of fresh, clean air for combustion while increasing the overall heating efficiency. Venting material to be used is PVC, an extremely cost effective vent system.

- 93% thermal efficiency for fuel savings.
- Conservicore® secondary heat exchanger made of AL29-4C® stainless steel.
- A sealed compartment protects the combination gas valve, ignition control, manifold, and burner from the environment.
- External gas connections.
- Uses natural or propane gas (field convertible from natural to propane gas).
- Certified for residential (55-110MBH), commercial, and industrial use.
- Standard Contractor Convenience Package with diagnostic LEDs, disconnect switch, and condensate pump outlet.
- Standard power exhaust simplifies side-wall or roof venting with small-diameter pipe.
- Horizontal or vertical two-pipe or concentric venting options.
- Permanently lubricated motor for trouble-free dependability.
- Full 10-year warranty on both heat exchangers.

For blower model data, see page 6.

Table 4.1 - Propeller Unit Heater Model PTC General Performance Data

	PTC Model Sizes									
	55	**65**	**85 ③**	**110 ③**	**135**	**156**	**180**	**215**	**260**	**310**
Btu/Hr Input ①	55,000	65,000	85,000	110,000	135,000	155,000	180,000	215,000	260,000	310,000
Btu/Hr Output ①	51,150	60,450	79,050	102,300	125,550	144,150	167,400	199,950	241,800	288,300
Condensate Production (Gal/Hr)	0.3	0.4	0.5	0.7	1.0	1.1	1.3	1.6	1.9	2.3
Entering Airflow (CFM) @ 70°F ②	1097	1141	1650	1750	2160	2600	3020	3865	4585	5400
Air Temp Rise (°F)	43	49	44	54	54	51	51	48	49	49
Max. Mounting Height (Ft.) ②	12	12	13	13	14	18	15	17	20	19
Heat Throw (Ft.) @ Max. Mtg. Ht.	43	43	48	46	51	62	53	60	70	67

① Ratings shown are for elevations up to 2,000 Ft. For elevations above 2,000 feet, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level. (In Canada see rating plate.) Reduction of ratings requires use of a high altitude kit.

② Data taken at 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods.

③ Also certified for residential installations.

® AL29-4C is a Registered Trademark of Allegheny Ludlum Corporation.

® Effinity[93®], Conservicore®, and any combination of these names either together or with other words is trademarked by Modine Manufacturing Co.

Heaters are designed for use in heating applications with ambient temperatures between 40°F and 80°F. Heaters should not be used in applications where the heated space temperature is below 40°F. The combination of low space and combustion air temperatures may result in condensate freezing in the secondary heat exchanger and/or condensate drain.

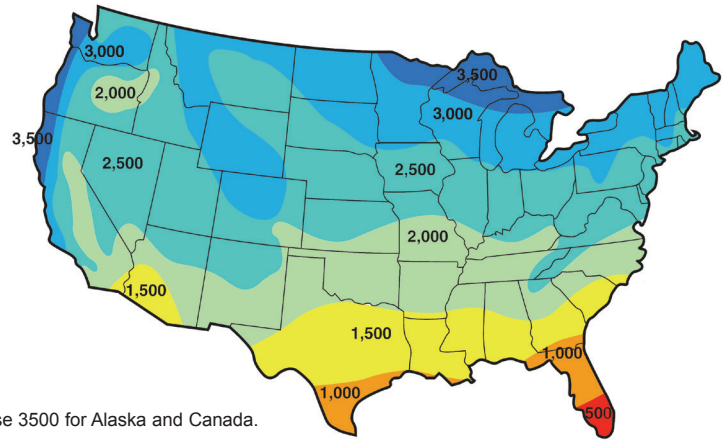
DO NOT LOCATE ANY GAS-FIRED UNIT IN AREAS WITH CHLORINATED, HALOGENATED, OR ACIDIC VAPORS IN ATMOSPHERE.

Request Catalog 6-170 For Complete Technical Information and Specifications.

Effinity 93®
with Conservicore Technology®

93% Efficient

Figure 5.1 - U.S. Average Heat Load Hours Map



Use 3500 for Alaska and Canada.

Table 5.1 - Estimated Annual Fuel Cost Savings Using the Effinity[93®] Condensing Unit Heater

		Estimated Annual Savings Against Other Equipment ① ②			
		Gravity Vented		Power Vented	
Design Heat Load (Btu/Hr):		120,000	280,000	120,000	280,000
Annual Heat Load Hours (refer to Figure 5.1)	500	$306	$713	$136	$318
	1000	$611	$1,427	$273	$637
	1500	$917	$2,140	$409	$955
	2000	$1,223	$2,853	$546	$1,274
	2500	$1,529	$3,567	$682	$1,592
	3000	$1,834	$4,280	$819	$1,911
	3500	$2,140	$4,993	$955	$2,229

① Based on a natural gas rate of $1.10/Therm. Actual realized savings can vary significantly based on a number of changing factors including, but not limited to, fuel prices, climate, building use or construction, etc.

② Compares 93% efficient against 65% seasonal efficient gravity vented and 78% seasonal efficient power vented.

Table 5.2 - Effinity[93®] PTC260 (260,000 BTU/hr) vs. Comparable Power-Vented Unit Heater ①

Uses Less Natural Gas for Fewer CO_2 Emissions			
City	Annual Gas Savings	Equivalent Urban Trees Planted	Pounds of CO_2 Saved
Chicago, IL	$914	154 trees	13,261
Las Vegas, NV	$325	58 trees	4,945
Minneapolis, MN	$903	187 trees	16,099
Nashville, TN	$555	88 trees	7,350
Oklahoma City, OK	$656	96 trees	8,278
Philadelphia, PA	$916	118 trees	10,131
Portland, OR	$671	109 trees	9,328

① Savings are realized by comparing the Effinity[93®] BTU/hr output to a 78% seasonally efficient power-vented heater. Savings were determined by applying appropriate degree days at 65 degrees indoor design temperature under full year, 24/7 operation to each state's 2012 average price/therm of gas.

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Request Catalog 6-170 For Complete Technical Information and Specifications.

GAS-FIRED, BLOWER MODELS

MODEL HDB

MODEL BDP

MODEL BTS

MODEL BTC

Blower unit heaters are designed for both heating and ventilating. All Modine gas-fired unit heater types can be equipped with blowers, including our Hot Dawg® low-profile residential garage heaters and the Effinity 93®. In fact, the Effinity 93® is the only high efficiency gas-fired unit heater in North America with this option available.

These units can be used in a variety of ways:

- Ducting air in from adjacent spaces for ventilation.
- Protecting units from corrosive spaces by mounting them remotely and ducting in warm air.
- Where quietness is important, blower fans are lower-noise and can be ducted, unlike propeller units.
- Deflector hoods can be used in areas with higher mounting heights.

Table 6.1 - Power-Exhausted Blower Unit Model HDB and BDP General Performance Data

	Model HDB Sizes				Model BDP Sizes						
	60	75	100	125	150	175	200	250	300	350	400
Btu/Hr Input ①	60,000	75,000	100,000	125,000	150,000	175,000	200,000	250,000	300,000	350,000	400,000
Btu/Hr Ouput ①	49,200	61,500	82,000	102,500	123,000	143,500	164,000	205,000	246,000	287,000	328,000
Entering Airflow Range (CFM)	635-1111	794-1389	1140-2116	1235-2058	1587-2778	1852-3241	2116-3704	2646-4630	3175-5556	3704-6481	4233-6584
Outlet Velocity (FPM)	437-726	546-908	443-781	488-773	869	892	773	966	1026	1037	1008
Air Temp. Rise (°F)	40-70	40-70	35-65	45-75	40-70	40-70	40-70	40-70	40-70	40-70	40-70
Max. Mounting Height (Ft.) ②	7-13	7-16	8-19	8-17	14	15	13	16	18	19	19
Heat Throw (Ft.) @ Max Mtg Ht ②	20-45	24-57	27-68	27-59	49	52	47	58	64	67	68

Table 6.2 - Separated Combustion Blower Unit Model HDC and BTS General Performance Data

	Model HDC Sizes				Model BTS Sizes						
	60	75	100	125	150	175	200	250	300	350	400
Btu/Hr Input ①	60,000	75,000	100,000	125,000	150,000	175,000	200,000	250,000	300,000	350,000	400,000
Btu/Hr Ouput ①	49,200	61,500	82,000	102,500	123,000	143,500	164,000	205,000	246,000	287,000	328,000
Entering Airflow Range (CFM)	635-1111	794-1389	1140-2116	1235-2058	1587-2778	1852-3241	2116-3704	2646-4630	3175-5556	3704-6481	4233-7407
Air Temp. Rise (°F)	40-70	40-70	35-65	45-75	40-70	40-70	40-70	40-70	40-70	40-70	40-70
Max. Mounting Height (Ft.) ②	7-13	7-16	8-19	8-17	9-21	8-18	9-21	10-22	11-26	11-26	13-29
Heat Throw (Ft.) @ Max Mtg Ht ②	20-45	24-57	27-68	27-59	33-75	28-65	32-74	34-78	40-94	39-90	44-102

Table 6.3 - Separated Combusion, High-Efficiency Condensing Blower Unit Heater Model BTC General Performance Data

	Model BTC Sizes		
	215	260	310
Btu/Hr Input ①	215,000	260,000	310,000
Btu/Hr Output ①	199,950	241,800	288,300
Condensate Production (Gal./Hr.)	1.6	1.9	2.3
Entering Airflow Range (CFM)	2645-4628	3198-5597	3813-6674
Air Temp. Rise (°F)	40-70	40-70	40-70
Max. Mounting Height (Ft.) ③	9-22	11-26	11-26
Heat Throw (Ft.) @ Max. Mtg Ht	33-77	40-94	39-91

① Ratings shown are for elevations up to 2,000 Ft. For elevations above 2,000 feet, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level. (In Canada see rating plate.) Reduction of ratings requires use of a high altitude kit.

② Data taken at 55°F air temperature rise. At 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods.

③ Data taken at 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods.

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Request Catalog 6-189 (HDB, BDP), 6-175 (BTS) and 6-170 (BTC)
For Complete Technical Information and Specifications.

Table 7.1 - Standard Features and Factory Options

	Feature	Model					Model				Model	
		HD	HDB	PDP	BDP	PTP	HDS	HDC	PTS	BTS	PTC	BTC
Cabinet and Air Mover	Aluminized steel cabinet (gauge indicated)	22 ga.	22 ga.	20 ga.	20 ga.	20 ga.	22 ga.	22 ga.	20 ga.	20 ga.	20 ga.	20 ga.
	Low profile casing design	•	•				•	•				
	Baked-on polyester powder paint for durability and corrosion resistence	•	•	•	•	•	•	•	•	•	•	•
	Adjustable air-deflector blades	•	•	•	•	•	•	•	•	•	•	•
	Fans engineered for quiet operation	•	•	•	•	•	•	•	•	•	•	•
	Totally enclosed fan/blower motors (model sizes 100 and above)	•	•	•	•	•	•	•	•	•	•	•
	Fingerproof fan guard (standard on sizes 125 and below)	•	•	Opt		•	•	•	Opt		Opt	
	Two L-shaped mounting brackets (standard on 30-75, optional on 85-125)	•	•				•	•			•	
	Adjustable mounting brackets for level hanging			•	•							
	Hinged tool-less bottom pan entry			•	•							
	Adjustable motor sheaves, certified to 0.7" W.C. external static pressure				•					•		•
Heat Exchanger and Burner	82% minimum thermal efficiency	•	•	•	•	•	•	•	•	•	•	•
	93% minimum thermal efficiency										•	•
	Aluminized steel heat exchanger (409 stainless steel optional)	•	•	•	•	SS Std	•	•	•	•	•	•
	Tubular heat exchanger	•	•			•	•	•	•	•	•	•
	In-shot burner on each heat exchanger tube for reliable performance, ease of serviceability, and low sound level on flame ignition/extinction	•	•			•	•	•	•	•	•	•
	Aluminized steel burner (409 stainless steel optional)			•	•							
	Modine Conservicore® Technology on secondary recuperative heat exchanger with AL29-4C® stainless steel material as standard										•	•
Controls	CSA or ETL certification for commericial and industrial use in the US and Canada	•	•	•	•	•	•	•	•	•	•	•
	CSA or ETL certification for residential use in the US and Canada	•	•				•	•			55-110	
	Factory-installed power exhauster	•	•	•	•	•	•	•	•	•	•	•
	Controls for natural gas (propane optional)	•	•	•	•	•	•	•	•	•	•	•
	Single stage gas controls (two stage optional except for PTC/BTC)	•	•	•	•	•	•	•	•	•	•	•
	Supply air high limit safety controls	•	•	•	•	•	•	•	•	•	•	•
	Differential pressure switch for proof of venting	•	•	•	•	•	•	•	•	•	•	•
	Flue gas high limit safety controls										•	•
	Flame roll-out safety switch	•	•				•	•			55-110	
	Direct spark ignition with continuous retry control system	•	•			•	•	•	•	•	•	•
	Intermittent pilot ignition with continuous retry control system			•	•							
	Control terminal board and low voltage terminal connections	•	•	•	•	•	•	•	•	•	•	•
	Gas control step down transformer with 24V gas controls	•	•	•	•	•	•	•	•	•	•	•
	Fan delay timer	•	•	•	•	•	•	•	•	•	•	•
	Condensate drain overflow switch										•	•
	Contractor convenience package featuring a condensate pump convenience outlet, unit on/off switch, heater function status indicator lights, and external terminals for thermostat wiring										•	•

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Products from Modine are designed to provide indoor air-comfort and ventilation solutions for residential, commercial, institutional and industrial applications. Whatever your heating, ventilating and air conditioning requirements, Modine has the product to satisfy your needs, including:

HVAC

- Unit Heaters:
  - Gas
  - Hydronic
  - Electric
  - Oil
- Ceiling Cassettes
- Duct Furnaces
- Hydronic Cabinet Unit Heaters, Fin Tube, Convectors
- Infrared Heaters
- Make-up Air Systems
- Unit Ventilators

Ventilation

- Packaged Rooftop Ventilation

School Products

- Vertical Packaged Classroom HVAC:
  - DX Cooling/Heat Pump
  - Water/Ground Source Heat Pump
  - Horizontal/Vertical Unit Ventilators

Geothermal

- Water-to-Water
- Water-to-Air
- Combination

Specific catalogs are available for each product. Catalogs 75-136 and 75-137 provide details on all Modine HVAC equipment.

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