

- **Temperature Control Units**

Water & Oil
30° - 500°F

- **Portable Chillers**

Air & Water-Cooled
20° - 80°F

- **Central Chillers**

Air & Water-Cooled
Packages & Modules
20° - 70°F

- **Pump Tank Stations**

Chilled or Tower Water
200 - 3600 gallons

- **Cooling Tower Cells**

45 - 540 tons

- **Fluid Coolers**

Hybrid
Dry

- **Filters**

- **Heat Exchangers**

- **Heat Recovery Units**

WARRANTY

- **1 Year:**
Covering parts and labor

- **2nd Year:**
FREE preventative
maintenance visit

MAXIMUM SERIES

- Air & Water-Cooled
- ¼ to 40 Tons
- 20°F to 80°F
- Using Non-Ozone Depleting Refrigerants

Since 1977 Advantage has been applying, designing and servicing the best chillers available.



10 ton water-cooled model



10 ton air-cooled model



2 ton water-cooled model



1 ton air-cooled model

APPLICATIONS

Maximum Series portable chillers can be used on a variety of process applications that require 20°F to 80°F chilled water.



Molds & Dies



Nozzles, Barrels & Tools



Heat Exchangers



Troughs & Tanks



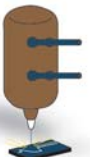
Rolls



Radiators
and Air Coils



Jacketed Vessels
and Mixers



Lasers



AIR-COOLED : 1/4 - 30 TONS

WATER-COOLED : 2 - 40 TONS

Advantage Maximum air-cooled and water-cooled chillers are designed for processes requiring liquid temperatures from 20°F to 80°F.

Air-Cooled and Water-Cooled units can be installed and operated easily needing only a source of electrical power, coolant fluid and a process load to be cooled and controlled. Water-cooled units require a secondary condensing water source. All Maximum Series portable liquid chillers are delivered fully charged, tested and ready to run right out of the box. Temperature control is achieved by using a "tailor made" microprocessor

control instrument designed and manufactured exclusively for the Advantage chiller. The control instrument maintains precise temperature control while protecting the system components. All gauges and control instrument information is conveniently located permitting instant diagnosis of performance.



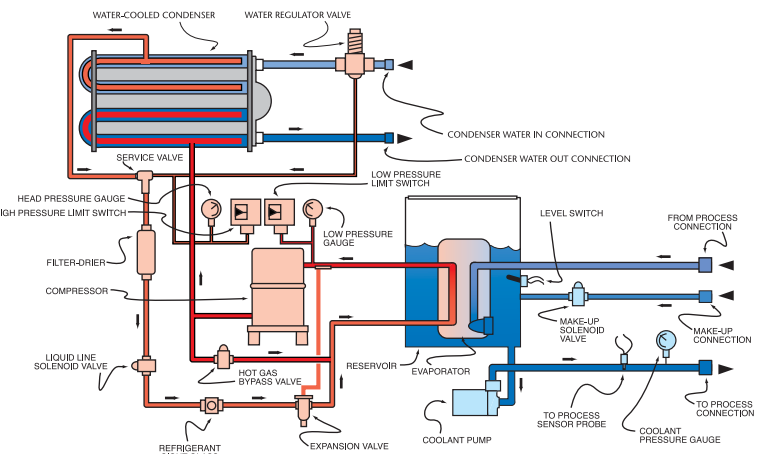
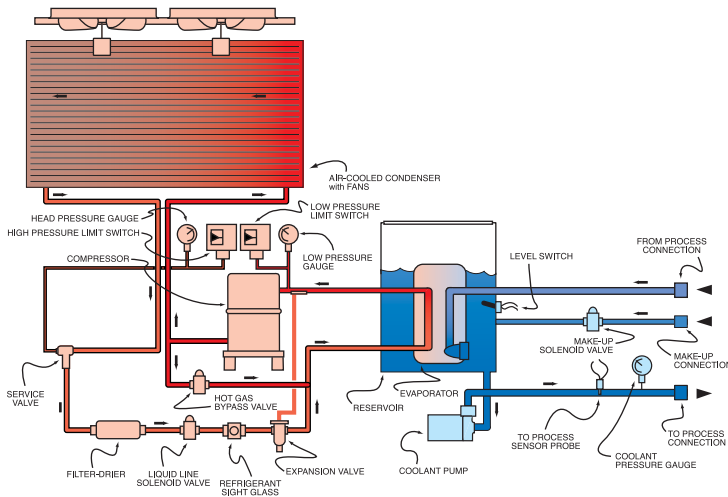
AIR-COOLED

Air-Cooled chillers utilize plant ambient air to extract heat from the refrigeration circuit. Fan or blowers move the plant air across generously sized finned condenser coils to permit full rated capacity at design conditions.



WATER-COOLED

Water-Cooled chillers utilize a secondary plant water source such as cooling tower or city water to extract heat from the refrigeration circuit. These units operate independently of plant ambient air temperature to provide full rated capacity even during the hottest weather. And, water-cooled chillers won't add extra heat to your building.



Schematic is typical of 5 to 40 ton models. See standard features list for details. Hot gas bypass valve is excluded on units with Digital Scroll compressor.

COMPONENTS



HIGHLY EFFICIENT EVAPORATORS...
High efficiency stainless steel brazed plate evaporators are used in 2 - 40 ton models. Copper tube-in-tube evaporators are used in 1/4 to 1-1/2 ton models. Non-ferrous construction prevents rusting.

HIGH PERFORMANCE COOLANT PUMPS...

Brass positive displacement pumps are used in 1/4 - 1-1/2 ton models. Centrifugal pumps are used in 2 - 40 ton models. All pumps are selected to provide turbulent flow to promote efficient heat transfer.



AIR-COOLED CONDENSER...

Finned tube condensers are used in all models. Propeller fans are standard in 1/4 - 20 ton models. Centrifugal blowers that allow air ducting are standard in 25 - 30 ton models and optional in 5 - 20 ton models.

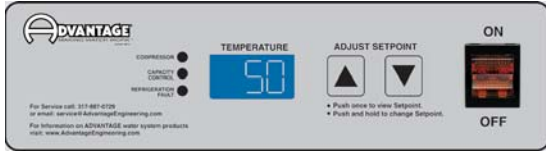
CONTROL INSTRUMENTS

MAXIMUM portable chillers are supplied with tailor made microprocessor control instruments that control and monitor all aspects of the chiller operation to assure accurate control and dependable operation. The controls are designed to support the specific and unique requirements of process cooling in an industrial environment.

All **ADVANTAGE** tailor made microprocessor control instruments include a **4 year warranty**. After the warranty period we'll repair your board for an economical fee should it require repair.

For chillers from 1/4 to 1-1/2 tons

The standard chiller control for 1/4 to 1-1/2 ton Maximum chillers provides basic temperature and machine status monitoring.



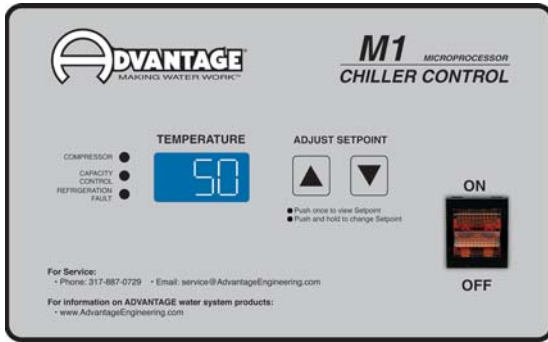
FEATURES:

- Accurate control
- Large & Bright LED temperature display
- Digital Setpoint selection with soft touch keys

- Illuminated Chiller On / Off switch
- Compressor On light
- Basic chiller diagnostics with Refrigeration Fault light
- Capacity control light

For chillers from 2 to 40 tons ... models designated as "M1".

The standard chiller control for 2 to 40 ton Maximum chillers equipped with hot gas bypass capacity control, providing basic temperature and machine status monitoring.



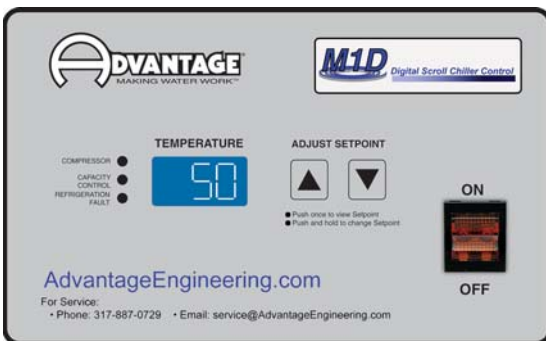
FEATURES

- Accurate control
- Large & Bright LED temperature display
- Digital Setpoint selection with soft touch keys
- Illuminated Chiller On / Off switch

- Compressor On light
- Basic chiller diagnostics with Refrigeration Fault light
- Capacity control light

For Chillers with Digital Scroll Compressors ... models designated as "M1D". 5, 10 and 15 tons models.

The "M1D" Control is provided on chillers using the Copeland Scroll Digital™ compressor.



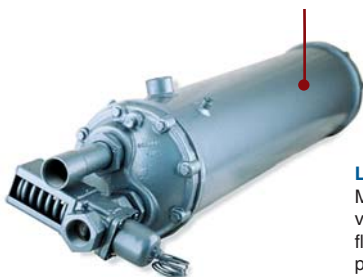
FEATURES

- Accurate control
- Large & Bright LED temperature display
- Digital Setpoint selection with soft touch keys
- Illuminated Chiller On / Off switch
- Compressor On light

- Basic chiller diagnostics with Refrigeration Fault light
- Capacity control light
- Custom control software included to operate digital capacity control feature
- Provides energy efficient capacity modulation from 20 - 100%.

Sales@SouthwestThermal.com | p. 888-226-8522 f. 805-484-0049 | www.SouthwestThermal.com

WATER-COOLED CONDENSER... Shell and tube condensers with water regulator valves are used in 15 - 40 ton water-cooled models. 1 - 10 ton models use tube-in-tube condensers.



LIFETIME WATER RESERVOIR... All Maximum chillers include a non-rusting vented water reservoir sized to support the flow rate of the chillers. The reservoir helps provide a stable water temperature under varying load conditions.



RUGGED COMPRESSORS... Reliable scroll, digital scroll and reciprocating compressors provide long life and energy efficient operation.



REFRIGERANT COMPONENTS...

All refrigerant components used in Advantage Maximum chillers are selected for historic reliability and performance. Components include high & low pressure limit switches, freestat, expansion valve, relief valve, filter dryer and sight glass/moisture indicator.

STANDARD FEATURES

Standard unit features listed. Customized models may include other or different features.

CONSTRUCTION:

- 1/4 to 2 ton Air-Cooled Models & 1 to 3 ton Water-Cooled Models
 - Stainless steel frame and enclosure panels
- 3 to 30 ton Air-Cooled models & 5 to 40 ton Water-Cooled models
 - Powder coated steel upright frame member
 - Galvanized steel cross frame members
 - Powder coated lift-off enclosure panels
 - Lift-off molded front panel
- All Models:
 - Casters for portability

REFRIGERANT CIRCUIT:

- Compressors:
 - Hermetic reciprocating in 1/4 to 1 1/2 ton models
 - Hermetic scroll in 2 to 40 ton models
- Air-Cooled Condensers
 - Finned tube
 - Fan generated air flow in 1/4 to 20 ton models
 - Blower generated air flow in 25 to 30 ton models
- Water-Cooled Condensers
 - Tube in tube in 1 to 10 ton models
 - Shell and tube in 15 to 40 ton models
 - Water regulating valve in all models
- Refrigerant sight glass with moisture indicator
- Thermostatic expansion valve
- Microprocessor controlled 50% hot gas by-pass capacity control system in 2, 3, 4, 7.5, 20, 25, 30 & 40 ton models
- Microprocessor controlled 20-100% energy saving capacity modulation with Digital Scroll compressor on 5, 10 & 15 ton standard models.
- Evaporators
 - Copper tube-in-tube in 1/4 to 1 1/2 ton models
 - Stainless Steel Brazed Plate in 2 - 40 ton models

- Filter-drier
- Liquid line solenoid valve

PRESSURE GAUGES: (2-40 ton models)

- Refrigerant high pressure
- Refrigerant low pressure
- Coolant pressure gauge

COOLANT CIRCUIT:

- Coolant pump
 - Brass positive displacement pump in 1/4 to 1-1/2 ton models
 - High flow stainless steel centrifugal pump in 2 to 30 tons models (up to 5 HP)
 - High flow cast iron centrifugal pump on the 40 ton model (above 5 HP)
- Large capacity insulated non-ferrous reservoir
- Reservoir level sight tube
- Automatic water make-up system in 5 to 40 ton models
- Standard NPT process fittings

LIMIT DEVICES:

- High refrigerant pressure
- Low refrigerant pressure
- Refrigerant pressure relief valve
- Process pump motor overload
- Instrument control circuit fuse

ELECTRICAL:

- Process pump motor starter
- Compressor motor
- Fused transformer
- Power entry terminal block
- 5 kA RMS SSCR

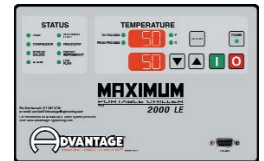
WARRANTY:

- 1 Year covering parts and labor
- Free preventative maintenance check in the 2nd year
- 4 Years on the control instrument

OPTIONS

CONTROL INSTRUMENT:

- Accurate
- LED displays
- Digital Setpoint selection
- Power On light
- Machine status and diagnostic lights
- Soft touch keys for Setpoint selection and chiller On / Off control
- RS-485 with SPI communications protocol port
- Additional functions provided for display and alarm capability
- Not compatible with digital scroll compressors



REFRIGERANT CIRCUIT:

- Centrifugal blower generated air flow for air-cooled condensers (5 to 20 tons)
- Low temperature models to 0°F LFT
- Tandem scroll compressors

COOLANT CIRCUIT:

- Overhead piping kit - prevents tank overflow when overhead piping is used
- No tank for gravity return applications
- Low flow bypass circuit - manual or automatic
- Process line shut-off valves
- Larger process pump

ALARMS:

- Audible alarm
- Visual / audible alarm beacon

WARRANTIES:

- Extended compressor warranty

ELECTRICAL:

- Branch circuit fusing
- UL rated electrical enclosures

OTHER PRODUCTS



We have over 40 standard models that cover 1/4 to 40 tons of cooling capacity. If one of these standard models does not match your application requirements, then we can design a model that will. Our Engineering Department is staffed with experienced machine designers to provide you with a refined machine built to your exact specifications.



SPECIFICATIONS

Maximum Air-Cooled Portable Chillers .25 - 30 Tons

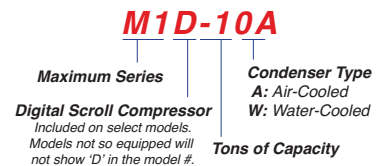
MODEL	M1 / M1D ¹	.25A	.33A	.5A	.75A	1A	1.5A	2A	3A	4A	5A	7.5A	10A	15AF	15AB	20AF	20AB	25A	30A
CAPACITY @ 50°F LWT	Tons ²	.29	.39	.50	.75	1	1.5	2	2.9	4	4.9	7.2	9.8	14.5	14.5	18.5	18.5	23.1	30
	KW ²	1	1.36	1.75	2.53	3.5	4.73	7.0	10.8	14.0	17.2	25.3	34.4	50.9	50.9	65.0	65.0	81.0	105.3
COMPRESSOR	HP	.25	.33	.50	.75	1	1.5	2	3	4	5	7½	10	15	15	20	20	25	30
	Type ³	R	R	R	R	R	R	SC	SC	SC	DSC	SC	DSC	DSC	DSC	SC	SC	SC	SC
REFRIGERANT		134A	134A	134A	134A	134A	134A	410A	410A	410A	410A	410A	410A	410A	410A	410A	410A	410A	410A
PROCESS PUMP	HP	⅓	⅓	⅓	⅓	½	½	¾	¾	¾	2	2	2	3	3	3	3	5	5
	GPM	.7	.9	1.2	1.8	2.4	3.6	4.8	7.2	9.6	12	18	24	36	36	48	48	60	72
	PSI	60	60	60	60	60	60	32	30	30	52	50	48	55	55	50	50	59	57
	Type ⁴	P	P	P	P	P	P	C	C	C	C	C	C	C	C	C	C	C	C
	Construction ⁵	B	B	B	B	B	B	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
CONNECTION	Process (to/from)	½	½	½	½	½	½	¾	1	1¼	1¼	1¼	1¼	2	2	2	2	2	2
SIZES	Make-Up	--	--	--	--	--	--	--	--	--	½	½	½	½	½	½	½	½	½
AIR-COOLED	Type ⁶	F	F	F	F	F	F	F	F	F	F	F	F	F	B	F	B	B	B
CONDENSER	CFM x 1000	.25	.33	.45	.65	.71	1.1	2	3	5	5	10	10	15	15	20	20	20	30
	S.P. ⁷	--	--	--	--	--	--	--	--	--	--	--	--	--	1.35	--	1.35	1.35	1.35
	Ambient ⁸	90	90	90	90	90	90	95	95	95	95	95	95	95	95	95	95	95	95
FULL LOAD ⁹	115/1/60	13	15	17	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMPERAGE	230/1/60	--	--	9	11	15	20	--	--	--	--	--	--	--	--	--	--	--	--
	230 volt	--	--	--	--	--	--	17	20	24	34	48	56	86.6	87	92	103	148	184
	460 volt	--	--	--	--	--	--	8.5	10	12	17	24	28	43.3	44	46	51.5	74	92
	575 volt	--	--	--	--	--	--	--	7.5	9	14 ¹²	19	23	35	31	37	42	60	74
	TANK CAPACITY	Holding	4	4	4	4	4	4	7½	7½	25	25	25	25	65	65	65	65	65
(gallons)	Tank Lid ¹⁰	S	S	S	S	S	S	O	O	S	S	S	S	S	S	S	S	S	
	Auto Make Up ¹⁰	O	O	O	O	O	O	O	O	S	S	S	S	S	S	S	S	S	
DIMENSIONS	Height	33	33	33	33	37	37	30	43	60	60	60	60	65	96	66	96	96	
	Width	18	18	18	18	19	19	37	34	34	34	34	34	58	58	59	58	58	
	Depth	24	24	24	24	25	25	24	40	40	40	56	56	64	70	58	70	70	
WEIGHTS (pounds)	Shipping ¹¹	220	220	220	265	345	350	415	600	800	800	1,100	1,100	1,600	2,300	2,000	2,600	3,200	

Notes

- M1 = units with fixed displacement scroll compressors. M1D = models with digital scroll compressors.
- Tons or Kilowatts capacity at 12,000 Btu/hr/ton @ 50°F LWT, 95°F ambient and 115°F condensing. Operating at temperatures below 50°F will reduce chiller capacity. The minimum recommended operating temperature when no glycol is used is 48°F.
- R = hermetic reciprocating. SC = hermetic scroll. DSC = Copeland Digital Scroll™.
- P = positive displacement. C = centrifugal.
- B = brass. SS = stainless steel. C = cast iron.
- F = fan. B = blower.
- Static pressure in inches of water.
- Design ambient conditions. Loss of capacity and/or difficulty operating will occur at higher ambient.
- Full load amps are higher than run load amps and must be used for sizing disconnects and supply wiring.
- S = standard. O = optional.
- Approximate unit weight crated for shipment.
- 575 volt, 5 ton digital compressors are not available. A fixed displacement compressor is included.

Since product innovation and improvement is our constant goal, all features and specifications are subject to change without notice or liability. Selection of certain optional features may change listed specifications.

Model Designator for Maximum Portable Chillers



SPECIFICATIONS

Maximum Water-Cooled Portable Chillers 5 - 40 Tons

MODEL	M1 / M1D	1W	2W	3W	5W	7.5W	10W	15W	20W	25W	30W	40W
CAPACITY @ 50°F LWT	Tons ²	1	2	3	5.0	7.6	10	15	20	25	30	40
	KW ²	3.5	7.0	10.5	17.1	26.7	34.1	52.6	70.2	87.7	105.3	140.4
COMPRESSOR	HP	1	2	3	5	7½	10	15	20	25	30	20 ⁽²⁾
	Type ³	R	SC	SC	DSC	SC	DSC	DSC	SC	SC	SC	SC
REFRIGERANT		134A	410A	410A	410A	410A	410A	410A	R410A	R410A	R410A	R410A
PROCESS PUMP	HP	½	¾	¾	2	2	2	3	3	5	5	7½
	GPM	2.4	4.8	7.2	12	19	26	36	48	60	72	92
	PSI	60	32	30	52	48	47	55	50	59	57	61
	Type ⁴	P	C	C	C	C	C	C	C	C	C	C
	Construction ⁵	B	SS	SS	SS	SS	SS	SS	SS	SS	SS	C
CONNECTION SIZES	Process (to/from)	½	¾	¾	1¼	1¼	1¼	2	2	2	2	2½
WATER-COOLED CONDENSER REQUIREMENTS (GPM)	Condenser	½	½	¾	¾	¾	1	1¼	1¼	1½	1½	2½
	Make-Up	--	--	--	½	½	½	½	½	½	½	½
	From City ⁶	1.5	3	4.5	8	14	16	23	32	39	45	60
FULL LOAD ⁸ AMPERAGE	From Tower ⁷	3	6	9	15	28	32	45	63	78	90	120
TANK CAPACITY (gallons)	115/1/60	22	--	--	--	--	--	--	--	--	--	--
	230/1/60	11	--	--	--	--	--	--	--	--	--	--
	230 volt	--	16	18	30	40	48	68.4	78	106	134	178
	460 volt	--	8	9	15	20	24	34.2	39	53	67	89
	575 volt	--	7	8	12 ¹¹	16	20	27.5	32	43	54	72
DIMENSIONS (inches)	Holding	4	7½	7½	25	25	25	65	65	65	65	65
	Tank Lid ⁹	S	O	O	S	S	S	S	S	S	S	S
	Auto Make Up ⁹	O	O	O	S	S	S	S	S	S	S	S
WEIGHTS (pounds)	Height	33	30	30	40	40	40	57	57	57	57	57
	Width	18	37	37	34	34	34	34	34	34	34	34
	Depth	24	24	24	45	45	56	80	80	80	80	80
	Shipping ¹⁰	270	445	470	655	740	760	1,500	1,900	2,100	2,200	2,500

Notes

- M1 = units with fixed displacement scroll compressors. M1D = models with digital scroll compressors.
- Tons or Kilowatts capacity at 12,000 Btu/hr/ton @ 50°F LWT, 85°F condensing water and 105°F condensing. Operating at temperatures below 50°F will reduce chiller capacity. The minimum recommended operating temperature when no glycol is used is 48°F.
- R = hermetic reciprocating. SC = hermetic scroll. DSC = Copeland Scroll Digital™.
- P = positive displacement. C = centrifugal.
- B = brass. SS = stainless steel. C = cast iron.
- City water requirements in gallons per minute (GPM) based on 60°F water supply at 20 PSI differential with a clean condenser.
- Tower water requirements gallons per minute (GPM) based on 85°F water supply at 20 PSI differential with a clean condenser.
- Full load amps are higher than run load amps and must be used for sizing disconnects and supply wiring.
- S = standard. O = optional.
- Approximate unit weight crated for shipment.
- 575 volt, 5 ton digital compressors are not available. A fixed displacement compressor is included.

Since product innovation and improvement is our constant goal, all features and specifications are subject to change without notice or liability. Selection of certain optional features may change listed specifications.

Model Designator for Maximum Portable Chillers

M1D-10A

<p style="text-align: center;">Maximum Series Digital Scroll Compressor <small>Included on select models. Models not so equipped will not show 'D' in the model #.</small></p>	<p style="text-align: center;">Condenser Type A: Air-Cooled W: Water-Cooled Tons of Capacity</p>
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- **Temperature Control Units**
Water & Oil
30° - 500°F

- **Portable Chillers**
Air & Water-Cooled
20° - 70°F

- **Central Chillers**
Air & Water-Cooled
Packages & Modules
20° - 70°F

- **Pump Tank Stations**
Chilled or Tower Water
200 - 3600 gallons

- **Cooling Tower Cells**
45 - 540 tons

- **Filters**

- **Heat Exchangers**

WARRANTY

- **1 Year:**
Covering parts and labor

- **2nd Year:**
FREE preventative
maintenance visit

MAXIMUM SERIES with Digital Scroll Technology

- 5, 10 & 15 Ton Models
- Air & Water-Cooled
- 20°F to 80°F Fluid Temperatures
- R410A Non Ozone Depleting Refrigerant
- Energy Efficient Control
from 20-100% Capacity



M1D-10W shown



M1D-10A shown



Copeland Scroll Digital™ compressors offer energy efficient control from 20 - 100% capacity.



Advantage M1D Digital Scroll Chiller Control



HOW IT WORKS

The Copeland Scroll Digital™ compressor controlled by Advantage's M1D advanced microprocessor control instrument uses a simple and effective method to modulate chiller capacity from 20 - 100 %, giving unparalleled energy efficient performance in the modulation field.

The scroll compressor uses a simple concept first patented in 1905 and has been deployed in industrial process chillers and air conditioning systems for many years. Scroll compressors provide a very smooth compression process and have fewer moving parts compared with traditional reciprocating compressors.

The Copeland Scroll Digital™ compressor improves on the basic scroll design by having axial and radial compliance, which allows the fixed scroll to move in both the axial and radial directions by very small amounts. This ensures that the fixed and orbiting scrolls are always loaded together with the optimal force, thereby maximizing efficiency.

Compliance helps to protect the compressor from damage by debris or liquid. A compressor is designed to only compress gas. Having debris and/or liquid in the compression cycle will damage the compressor. Compliance (the ability of the scrolls to separate axially and radially) allows unexpected debris or liquid to be safely discharged.

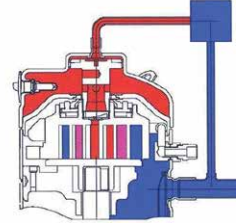
The Copeland Scroll Digital™ compressor uses axial compliance as its basic principle, but takes it further by controlling the separation of the scrolls.

The Advantage M1D microprocessor control instrument controls the axial separation of the scrolls by using a solenoid valve and a bypass connection between the discharge chamber and the intake gas. The scrolls are designed so that the upper scroll can separate from the bottom scroll by 1 mm vertically.

The Copeland Scroll Digital™ operates in two stages - the loaded state, when the solenoid valve is normally closed and unloaded

Copeland Scroll Digital™ Technology

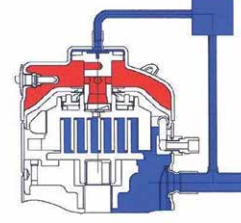
Solenoid Valve Closed



Loaded

Scroll engaged
full compression

Solenoid Valve Open



Unloaded

Scroll separated
no compression

state, when the solenoid valve is open. During the loaded state, the compressor operates like a standard Scroll and delivers full capacity and mass flow. During the unloaded state, there is no capacity and no mass flow through the compressor.

By controlling the amount of time that the compressor is in the loaded and unloaded state, the Advantage M1D control instrument can effectively and efficiently modulate the chiller capacity from 20 to 100% while maintaining temperature stability.

Since there is no compression when the compressor is in the 'unloaded state' far less energy is consumed. Testing shows that compressor energy is reduced by approximately 8% when running at 75% capacity, 12% when running at 50% capacity and 18% when running at 25% capacity as compared to traditional portable chillers that use hot gas bypass for capacity modulation.

Additionally, compressor starts and stops are reduced providing longer compressor life while providing stable cooling fluid temperatures.

SPECIFICATIONS

MODEL	CAPACITY ¹ TONS	STYLE	PUMP			TANK CAPACITY	DIMENSIONS (H x W x D)	FLA ²	AVAILABLE VOLTAGES
			HP	FLOW	PRESSURE				
M1D-5A	5	Air-Cooled	2	12 gpm	52 psi	25 gallons	60" x 34" x 45"	16.5	230 / 460
M1D-5W	5	Water-Cooled	2	12 gpm	52 psi	25 gallons	60" x 34" x 45"	16.5	230 / 460
M1D-10A	10	Air-Cooled	2	24 gpm	48 psi	25 gallons	60" x 34" x 56"	28	230 / 460 / 575
M1D-10W	10	Water-Cooled	2	24 gpm	48 psi	25 gallons	40" x 32" x 40"	24	230 / 460 / 575
M1D-15A	14.5	Air-Cooled	3	36 gpm	55 psi	65 gallons	57" x 34" x 80"	38	230 / 460 / 575
M1D-15W	15	Water-Cooled	3	36 gpm	55 psi	65 gallons	66" x 59" x 58"	34	230 / 460 / 575

Notes:

1. Tons capacity at 50°F LWT and 95°F ambient (air-cooled models), 85°F condensing water (water-cooled models).
2. 3A, 3W, 5A & 5W available 230/460/3/60 only. 10A & 10W available 230/460/575/3/60. 460/3/60 amps shown.

