MIDSTATES
REFRIGERATION
SUPPLY

Modular Refrigeration Systems

Transcritical CO_2 (R744) Refrigeration Systems

midstatesrefrigsupply.com

219-325-0414

About Mid States Refrigeration Supply

With over 30 years of experience in the refrigeration industry, Mid States Refrigeration Supply has built a reputation for reliability, expertise, and exceptional customer service.

As a trusted partner to contractors, technicians, and businesses across the region, we offer an extensive inventory of industrial refrigeration and HVAC supplies, parts, and equipment to keep your operations running smoothly. Our knowledgeable team brings decades of hands-on industry experience to every interaction, ensuring you get the right products and solutions — when you need them most.

At Mid States Refrigeration Supply, we're more than a supplier; we're a partner you can count on.

Built for Industry.
Engineered to Perform.

Transcritical CO_2 (R744) Refrigeration Systems

Mid-States Refrigeration Supply (MRS) has partnered with Budzar to provide high-efficiency modular refrigeration systems utilizing R744 (CO_2) engineered for cold storage, food processing, and industrial refrigeration facilities.

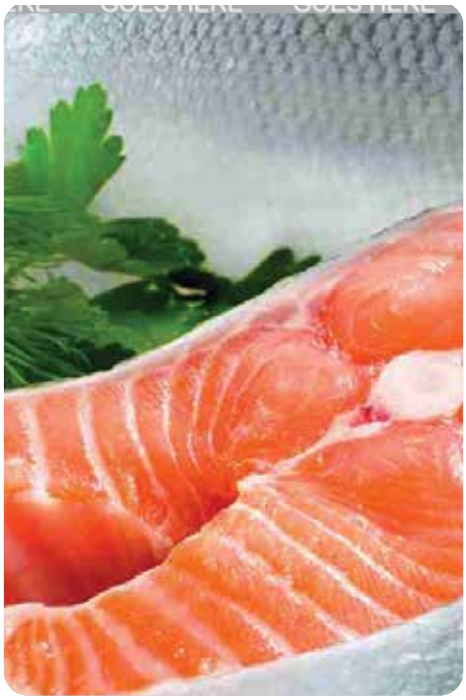
These systems integrate transcritical CO_2 booster technology, reciprocating compressors, adiabatic gas cooling, stainless steel refrigerant piping, and PLC-based automation to deliver dependable refrigeration performance across freezer and cooler applications.

The MRS modular system platform provides a complete packaged refrigeration plant designed for outdoor installation, reducing field installation time while ensuring consistent factory-tested performance.

BUDZAR
INDUSTRIES, LLC.

Why CO_2 Refrigeration

CO_2 (R744) is one of the fastest growing refrigerants in industrial refrigeration due to its strong thermodynamic performance and environmental sustainability



01

Environmental Advantages

- Global Warming Potential (GWP): 1
- Zero Ozone Depletion Potential
- Long-term Regulatory Compliance
- Natural Refrigerant Technology

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Performance Advantages

- Excellent efficiency in low temperature refrigeration
- High heat transfer performance
- Reduced refrigerant charge
- Ideal for cold storage and food processing

Modular Refrigeration Platform

MRS modular refrigeration systems integrate major refrigeration components into a factory-assembled skid package.

Integrated System Components

- Low temperature booster compressors
- Medium temperature compressors
- Flash tank and pressure regulation
- Adiabatic gas cooler
- Oil management system
- PLC automation platform
- Stainless steel refrigerant piping
- Refrigerant safety systems

This modular design reduces installation time and improves system reliability.

System Design Conditions

Refrigerant: R744 (CO_2)

Maximum Operating Pressure:

1181 PSIG

Evaporation Temperatures

Freezer Systems: -20°F SST
Cooler Systems: +20°F SST

Ambient Operating Range
-20°F to 95°F

Evaporators typically utilize DX coils with electric defrost supplied by the evaporator manufacturer.

Industrial Construction

Each refrigeration module is engineered for reliable operation in demanding industrial environments.

Structural Design

- Heavy-duty carbon steel structural frame
- Integrated gas cooler support structure
- Insulated embossed aluminum enclosure panels
- Industrial epoxy protective coating

Equipment Enclosure

- Service access door
- Interior lighting
- Equipment heaters and ventilation
- Refrigerant leak detection system

Features

Stainless Steel Refrigerant Piping

MRS CO_2 refrigeration systems utilize fully welded stainless steel refrigerant piping throughout the refrigeration circuit.

Piping Design

- Stainless steel piping rated for CO_2 pressures up to 1181 PSIG
- Precision welded joints
- Industrial vibration-isolated pipe supports

Advantages

- Superior corrosion resistance
- Long service life
- Reduced refrigerant leak potential
- Ideal for high-pressure CO_2 refrigeration systems

All piping is factory assembled and pressure tested prior to shipment.

CO_2 Booster Compressor System

The refrigeration system utilizes a two-stage CO_2 booster architecture designed to efficiently serve freezer and cooler loads.

Low Temperature Compressor Group

- Subcritical booster compressors
- Semi-hermetic reciprocating compressors
- Oil separator and oil management system
- Suction accumulator

Medium Temperature Compressor Group

- Transcritical reciprocating compressors
- Flash tank pressure regulation
- Oil management system

Capacity Control

- Variable Frequency Drive (VFD)
- Compressor staging
- Compressor unloading
- Hot gas bypass modulation

This control strategy allows the system to operate efficiently across varying refrigeration loads.

Adiabatic Gas Cooler Technology

MRS CO_2 refrigeration systems utilize a high-efficiency adiabatic gas cooler.

Gas Cooler Construction

- Aluminum fin / stainless steel tube heat exchanger
- EC propeller fan motors
- Integrated adiabatic water assist system

Operating Characteristics

- Adiabatic assist activates at approximately 84°F ambient temperature
- Maximum water consumption approximately 13 GPM
- Electronic high pressure control valve

Adiabatic cooling significantly improves system efficiency during high ambient conditions.

Advanced Evaporator Controls

MRS refrigeration systems provide fully integrated evaporator control and management through the PLC control platform.

EC Fan Motor Control

Evaporator fans utilize electronically commutated (EC) motors.

Features

- Variable fan speed control
- Reduced electrical consumption
- Lower heat load in refrigerated rooms
- Quiet and efficient operation

Defrost Control Options

Electric Defrost

- Common for cooler evaporators
- Simple and reliable operation

Hot Gas Defrost

- Rapid defrost cycles for freezer evaporators
- Reduced electrical energy consumption

Demand Defrost

- Defrost initiated only when frost accumulation occurs
- Improved system efficiency

Integrated Evaporator Management

The PLC control platform coordinates evaporator operation with the refrigeration plant.

Control functions include:

- EC fan speed modulation
- Defrost scheduling and sequencing
- Coil temperature monitoring
- Suction pressure optimization
- System alarm management

Electrical System

- 460V / 3 Phase / 60Hz power supply
- 115V control voltage
- NEMA 4 electrical enclosures
- Through-door disconnect switches
- Motor protection and safety controls
- Evaporator fan contactors
- Emergency stop and alarm beacon

PLC Control Platform

Each refrigeration system includes a modern industrial automation platform.

Control System

- Allen-Bradley CompactLogix PLC
- Ethernet/IP communications
- Allen-Bradley PanelView Plus HMI

System Monitoring

Operators can monitor:

- Suction pressure and temperature
- Refrigerant superheat
- Compressor discharge pressure
- Liquid refrigerant temperature and subcooling
- Compressor runtime and system alarms

Specifications

Model	Capacity (Tons)	Evap. Temp (SST) (°F)	Comp LT/MT	Comp. Power (Total BHP	Heat of Rejection (kBTU/h)	Adiabatic Cooler Fans Qty/Type	Cond. Fan Power (Total HP)
LTA-60T(-20F)-R744-DX	60	-20	1 / 1	195	1170	3, V-Coil	13
LTA-90T(-20F)-R744-DX	90	-20	2 / 2	296	1761	6, V-Coil	19
LTA-120T(-20F)-R744-DX	120	-20	2 / 2	391	2339	6, V-Coil	19
LTA-180T(-20F)-R744-DX	180	-20	3 / 3	586	3509	8, V-Coil	35
LTA-240T(-20F)-R744-DX	240	-20	4 / 4	781	4679	12, V-Coil	38
LTA-60T(20F)-R744-DX	60	+20	0 / 2	127	1059	3, V-Coil	10
LTA-90T(20F)-R744-DX	90	+20	0 / 2	191	1605	5, V-Coil	16
LTA-120T(20F)-R744-DX	120	+20	0 / 2	265	2140	5, V-Coil	22
LTA-180T(20F)-R744-DX	180	+20	0 / 3	397	3210	8, V-Coil	25
LTA-240T(20F)-R744-DX	240	+20	0 / 4	529	4280	10, V-Coil	32
LTA-60T(-20F)/60T(20F)-R744-DX	60 / 60	-20 / +20	2 / 3	325	2191	6, V-Coil	19
LTA-90T(-20F)/90T(20F)-R744-DX	90 / 90	-20 / +20	2 / 4	483	3257	8, V-Coil	35
LTA-120T(-20F)/60T(20F)-R744-DX	120 / 60	-20 / +20	2 / 4	514	3343	8, V-Coil	35

Model	Evap. Fan (Est. Only) Contractors	Total FLA (Amps)	Condenser Skid Size L x W xH (ft)	Compressor. Rack Skid	Overall Skid Size L x W xH (ft)	COP
LTA-60T(-20F)-R744-DX	6	344	15 x 5 x 6	10 x 7.5 x 9	18 x 8 x 17	1.36
LTA-90T(-20F)-R744-DX	9	554	27 x 5 x 6	14 x 7.5 x 9	30 x 8 x 17	1.35
LTA-120T(-20F)-R744-DX	12	676	27 x 5 x 6	14 x 7.5 x 9	30 x 8 x 17	1.38
LTA-180T(-20F)-R744-DX	18	1023	20 x 8.5 x 9.5	21 x 7.5 x 9	25 x 10 x 20	1.37
LTA-240T(-20F)-R744-DX	24	1351	29 x 8.5 x 9.5	28 x 7.5 x 9	34 x 10 x 20	1.381
LTA-60T(20F)-R744-DX	6	213	15 x 5 x 6	10 x 7.5 x 9	18 x 8 x 17	2.074
LTA-90T(20F)-R744-DX	9	342	15 x 5 x 6	10 x 7.5 x 9	18 x 8 x 17	2.05
LTA-120T(20F)-R744-DX	12	463	23 x 5 x 6	10 x 7.5 x 9	25 x 8 x 17	1.97
LTA-180T(20F)-R744-DX	18	685	35 x 5 x 6	14 x 7.5 x 9	40 x 8 x 17	2.017
LTA-240T(20F)-R744-DX	24	909	24 x 8.5 x 9.5	14 x 7.5 x 9	29 x 10 x 20	2.02
LTA-60T(-20F)/60T(20F)-R744-DX	12	656	27 x 5 x 6	14 x 7.5 x 9	30 x 8 x 17	1.64
LTA-90T(-20F)/90T(20F)-R744-DX	18	923	20 x 8.5 x 9.5	21 x 7.5 x 9	25 x 10 x 20	1.64
LTA-120T(-20F)/60T(20F)-R744-DX	18	1008	20 x 8.5 x 9.5	21 x 7.5 x 9	25 x 10 x 20	1.55

Optional Heat Recovery

Optional heat recovery systems allow compressor waste heat to be utilized for facility heating.

Typical performance:

- 65 GPM glycol circulation
- 40% propylene glycol mixture
- 300,000 BTU/hr heating capacity

Manufacturing & Delivery

Engineering drawings issued: **4–6 weeks after order**
Equipment shipment: **30–32 weeks after drawing approval**
Manufactured in Willoughby, Ohio USA.

MID-STATES REFRIGERATION SUPPLY
Industrial Refrigeration Systems & Natural Refrigerant Solutions

Providing engineered refrigeration systems:

- Cold Storage Facilities
- Food Processing Plants
- Blast Freezer Operations
- Distribution Warehouses
- Industrial Refrigeration Plants

“Providing our customers with the highest quality of industrial refrigeration equipment in the market”

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