

Bid Specifications

SmartRack® In-Row Precision Cooling – DX Split

Models: SRCOOLDXRW12, SRCOOLDXRW25

Standard Features

- EC fans
- Inverter-driven compressor
- Side and/or front air discharge
- Color touchscreen user interface
- Air filtration
- R-410A refrigerant
- Outdoor air-cooled condenser
- Electronic expansion valve
- Top/bottom piping and electrical connections
- Onboard logic controller
- High sensible cooling coil
- Condensate pan with pump
- Maintenance mode
- Grouping (multi-unit) capability
- MODBUS TCP/IP
- SNMP Network Management Card (WEBCARDLXMINI)

Accessories

- Long piping kit - **SRCOOLLONGPKIT** - for linear piping distances >100 ft. (30 m)
- Low temperature kit - **SRCOOLDXRWLTKIT** - for outdoor temperatures <-4°F (-20°C)



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A. PERFORMANCE

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|--|----------------------------|----------------------------|
| Working conditions | | |
| Rated cooling capacity (see Section CC for additional detail) | 12.8 kW (43 kBTU) | 25.8 kW (88 kBTU) |
| Rated indoor return air temperature and RH 24%.* | 98.6°F (37°C) | 98.6°F (37°C) |
| Rated outdoor temperature | 95°F (35°C) | 95°F (35°C) |
| Energy Efficiency Rating (EER) W/W | 3.8 | 3.9 |
| Approx minimum cooling capacity (continuous) | 4 kW | 8 kW |
| Maximum cooling capacity** | 13.2 kw (45 kBTU) | 27.3 kw (93.2 kBTU) |
| Maximum outdoor operating temperature | up to 113°F (45°C) | up to 113°F (45°C) |
| Minimum outdoor operating temperature without low temp kit installed | down to -4°F (-20°C) | down to -4°F (-20°C) |
| Minimum outdoor operating temperature with low temp kit (SRCOOLDXRWLTKIT) installed | down to -40°F (-40°C) | down to -40°F (-40°C) |
| Acceptable humidity operating range (indoor) | 5 to 80% RH | 5 to 80% RH |
| Maximum operational altitude (see chart in Section DD for altitude correction factors) | up to 13,000 ft. (4,000 m) | up to 13,000 ft. (4,000 m) |

* For maximum cooling capacity and RH operating scenarios, see chart in Section CC.

** With indoor return air temperature of 104°F (40°C) and 20% RH (see Section CC for additional detail).

B. COMPLIANCE APPROVALS

1. ANSI/UL 60335-1 and ANSI/UL 60335-2-40
2. CAN/CSA-C22.2 No. 60335-2-40-2017
3. FCC/ICES Compliant; CLASS A; 47 CFR FCC PART 15 SUBPART B; ICES-003 Issue 7
4. NOM
5. RoHS

C. CABINET (IN-RW)

1. 300 mm wide for maximum cooling capacity with minimal floorspace consumption
2. Horizontal airflow pass-thru: no raised floor required
3. Matching cabinet depth and height with standard IT rack
4. Rigid formed steel cabinet
5. Removable side panels both left and right for easy servicing
6. Front and rear doors for easy servicing
7. Color code RAL 9005

D. INVERTER AND COMPRESSOR

1. Modulates compressor speed between 30~100%
 - a. SRCOOLDXRW12: 60~180 Hz
 - b. SRCOOLDXRW25: 90~270 Hz
2. Conserves energy by operating the compressor at partial load
3. Fault indicator on the inverter for easy troubleshooting
4. Soft start (in-rush current less than full load) to downsize breaker size
5. Rotary compressor for energy efficient and reliable operation

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|-------------------|-----------------|-----------------|
| Compressor | | |
| Type | Rotary | Rotary |
| Drive | Inverter-driven | Inverter-driven |
| Modulation | Variable speed | Variable speed |
| Speed | 60~180 Hz | 90~270 Hz |
| Operating range | 30~100% | 30~100% |
| Fault indicator | Yes | Yes |

E. EVAPORATOR FANS

1. Qty 3 fans (SRCOOLDXRW12), Qty. 6 fans (SRCOOLDXRW25)
2. EC (variable speed), adjusts automatically according to heat load to meet the user-specified setpoint
3. Airflow
 - a. SRCOOLDXRW12: 1233 CFM @ 2543 RPM (default max); 0~1475 CFM (absolute max)
 - b. SRCOOLDXRW25: 2400 CFM @ 2753 RPM (default max); 0~2950 CFM (absolute max)
4. Centrifugal type, quieter than axial
 - a. Sound rating at 10 ft. (3 m) at rated conditions = 68dBA
5. Fan array extends entire height of cooling cabinet for uniform cold air top to bottom
6. Horizontal airflow through the cabinet negates the need for a raised floor
7. All fans operate in unison (matching RPM)
8. Finger protection guards
9. Built-in redundancy – if one fan fails, the others will continue operating and even compensate for missing fan
10. Fan power each: 69W/SRCOOLDXRW12 and 84W/SRCOOLDXRW25
11. Fan size: 225 mm

F. CONDENSER

1. Remote condenser rejects all heat to the outdoors, no building HVAC or commercial cooling system required
2. Properly sized, comes standard with each In-Row (indoor) cooler
3. Powered via In-Row (indoor), no separate power source required
4. Vertical mount condenser for space savings (SRCOOLDXRW12)
5. Horizontal (legs included) or vertical mount condenser for space savings (SRCOOLDXRW25)
6. Up to 200 ft. (61 m) equivalent distance between condenser and In-Row
7. Up to 65 ft. (20 m) vertical elevation (condenser above In-Row)
8. Down to -16 ft. (-5 m) vertical elevation (condenser below In-Row)
9. Galvanized aluminum chassis for anti-rust/anti-corrosion
10. Optional long piping kit (SRCOOLLONGPKIT) for linear equiv distance >100 ft. (30 m), prevents liquid refrigerant floodback; powered from In-Row (indoor) unit
11. Total heat rejection rate of condenser captures both the cooling capacity as well as the compressor heat:
 - a. SRCOOLDXRW12: 18kW
 - b. SRCOOLDXRW25: 38kW

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|--|--------------|--------------|
| Condenser | | |
| Maximum total heat rejection (condenser) | 18 kW | 38 kW |
| Discharge fitting size | 5/8 in. | 7/8 in. |
| Liquid-line fitting size | 1/2 in. | 5/8 in. |

G. CONDENSER FAN

1. Qty. 2 fans (SRCOOLDXRW12) and qty. 1 fan (SRCOOLDXRW25)
2. AC type fans, no belts
3. Variable speed for consistent condensing temperature and pressure
4. Airflow
 - a. SRCOOLDXRW12: 4984 CFM @ 1700 RPM
 - b. SRCOOLDXRW25: 7908 CFM @ 700 RPM
5. Sound rating at 10 ft. (3 m): <74dBA
6. Finger guard

H. TEMPERATURE AND HUMIDITY SENSORS

1. Rear temperature and humidity sensor for return air measurement
2. Front temperature sensor for supply air measurement
3. Used for cooling mode to control both fan and compressor speeds independently
4. Cooling mode can switch between return air and supply air control methods
5. User can specify the target supply/return air temperature
6. Humidity sensor controls dehumidification mode: if humidity becomes too high, the system will remove moisture from the air
7. User can specify the target humidity level

I. REFRIGERANT

1. Sight glass (included)
 - a. Assists in checking refrigerant quality and charge level
2. Nominal charge:
 - a. SRCOOLDXRW12: 12.1 lb. (5.0 kg)
 - b. SRCOOLDXRW25: 17.4 lb. (8.0 kg)
 - c. Actual charge depends on application (see installation manual)
3. R410A refrigerant
 - a. Ozone depletion potential: 0
 - b. Global warming potential: 2088 (i.e. 2088 times more than CO²)
 - c. ASHRAE standard: 34 Safety Rating: A1 (best)
 - d. Environmentally friendly, non-ozone depleting
 - e. Industry standard
4. The product shall not require any water to operate
5. Refrigerant Piping
 - a. Downward pitch at least 1 in. per 10 ft./ (10 mm per 1 m)
 - b. Minimum exposure temperature: 32°F (0°C)

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|--------------------------------------|---|---------------|
| Refrigerant Piping | | |
| Refrigerant | R-410A | R-410A |
| Discharge fitting size | 5/8 in. | 5/8 in. |
| Liquid line fitting size | 1/2 in. | 5/8 in. |
| Discharge horizontal piping diameter | Varies -- see installation manual | |
| Discharge vertical piping diameter | Varies -- see installation manual | |
| Liquid line piping diameter | Varies -- see installation manual | |
| Copper pipe type | ACR Type L - hard drawn preferred | |
| S-trap (vertical discharge piping) | Every 20 ft. (6 m) (combined) | |
| Maximum condenser elevation | 65 ft. (20 m) above In-Row | |
| Minimum condenser elevation | -16 ft. (-5 m) below In-Row | |
| Maximum equivalent piping distance | Up to 200 ft. (60 m) | |
| Connection location (indoor) | Top or bottom | Top or bottom |
| Protection | Grommets | Grommets |
| Discharge piping downward pitch | At least 1 in. per 10 ft. (10 mm per 1 m) | |
| Sight glass | Included | Included |
| Filter drier | Included | Included |
| Oil separator | Included | Included |

J. DIRECTIONAL AIRFLOW

1. Optional side air discharge panels
 - a. Directs air either left or right (or both) along the fronts of adjacent racks
 - b. Comes as standard feature
2. Front airblock
 - a. Blocks air from discharging out the front and instead redirects it to the sides
 - b. Comes as a standard feature
3. Flush or staggered row alignment
 - a. In-Row can be positioned either flush with adjacent cabinets (front only discharge) or protruded (side air discharge)

K. STABILIZERS

1. Casters
 - a. Qty. 4 all four corners
 - b. Full swivel for each
 - c. Allows cabinet to be maneuvered from room to room and into position without the need for special lifting equipment
2. Leveling feet
 - a. Qty. 4 adjustable leveling feet all four corners
 - b. Stabilizes cabinet into place
3. Baying brackets
 - a. Included with package
 - b. Supports both flush and protruded/staggered installation

L. EXPANSION VALVE AND FILTER DRIER

1. Electronic Expansion Valve (EEV)
 - a. Comes standard with electronic type, for better stability and control over thermal type
 - b. Increased cooling precision
 - c. Improved energy efficiency
 - d. Improved turndown ratio (improves minimum capacity)
2. Filter drier
 - a. Included in refrigeration circuit to catch particulates and remove moisture inside the piping

M. PIPING AND ELECTRICAL CONNECTIONS

1. Top or bottom entry: piping/electrical can be routed from top or bottom into the In-Row cooler; no modifications required
2. Designated ports both top and bottom with grommets to protect against vibration
3. Strain relief provided for electrical terminal connections

N. POWER INPUT

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|--------------------------------------|-------------------------------------|-------------------------------------|
| Power input (In-Row cooler) | | |
| Rated Input Power, Indoor Unit | 208V, 3ph, 60 Hz | 208V, 3ph, 60 Hz |
| Voltage input range | 200-240V | 200-240V |
| Voltage input tolerance | ±10% | ±10% |
| Frequency range | 48-62 Hz | 48-62 Hz |
| Connection type | Hardwired | Hardwired |
| MCA (Minimum Current Ampacity) | 19A | 33A |
| MOP (Maximum Overcurrent Protection) | 25A | 50A |
| In-rush current | Soft-start | Soft-start |
| Strain Relief | Included | Included |
| Power input (condenser) | | |
| Input Power from Indoor Cooling Unit | 208V, 1ph, 60 Hz | 208V, 3ph, 60 Hz |
| Voltage input range | 200-240V | 200-240V |
| Voltage input tolerance | ±10% | ±10% |
| Frequency range | 48-62 Hz | 48-62 Hz |
| Connection type | Hardwired from In-Row (Indoor Unit) | Hardwired from In-Row (Indoor Unit) |
| Signal wire (from In-Row) | 20 AWG | 20 AWG |
| FLA | 2.9A | 3.2A |

O. MAINTENANCE MODE

1. Instantly switches the In-Row unit into max-cooling mode to help exhaust the hot aisle of hot air while technicians are working
2. No password required; no hassle of getting permissions to access the settings menu
3. Automatic timeout: after 30 minutes (or as specified by the owner) system returns to normal operation
4. Allowing/disabling this feature can be managed in the settings menu

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|-------------------------------|---------------|---------------|
| Maintenance Mode | | |
| Maintenance Mode (MM) | Included | Included |
| MM default run time (timeout) | 30 min. | 30 min. |
| MM fan speed | 100% | 100% |
| MM password | Not required | Not required |
| MM disable | Settings menu | Settings menu |

P. ALARMS

1. Return air humidity sensor failure
2. Return air temperature high
3. Return air temperature low
4. Return air temperature sensor failure
5. Suction pressure low
6. Suction pressure sensor failure
7. Suction temperature sensor failure
8. Supply air temperature high
9. Supply air temperature low
10. Supply air temperature sensor failure
11. High water level (condensate overflow prevention)
12. Display communications lost
13. Compressor maintenance needed
14. Discharge pressure high
15. Discharge pressure sensor failure
16. Filter maintenance needed
17. High pressure / high discharge switch fault
18. Indoor fan maintenance needed
19. Liquid-pipe temperature sensor failure
20. Return air humidity high
21. Return air humidity low

Q. COMMUNICATION

1. MODBUS TCP/IP
 - a. MODBUS register map provided
2. SNMP Network Management Card included (WEBCARDLXMINI)
3. Monitor and manage all essential functions remotely

R. GROUPING

1. Group (link) multiple In-Row coolers together for:
 - a. Rotation
 - b. Redundancy
2. Inter-compatibility between SRCOOLDXRW12 and SRCOOLDXRW25
3. Rotation
 - a. Balance runtimes among all In-Row units in a group to ensure even wear and tear
4. Redundancy
 - a. Set up a fallback In-Row unit; should a given In-Row unit fail, its back up will resume automatically

S. COOLING COIL

1. Full length coil: extends from top to bottom, providing maximum face area for maximum cooling capacity
2. Face area $\geq 700 \text{ in.}^2$ (4516 cm^2)
3. Copper tube diameter 3/8 in.
4. Vertical fin to allow condensate to drain downward naturally to the drain pan
5. 3 rows deep: to provide maximum cooling capacity without increasing static pressure and without producing excess latent cooling
6. Counterflow design: for maximum cold air temperature delta
7. Draw-thru design: allows fans to pull air evenly across coil rather than forcing air past that can lead to leaks and inefficiency
8. Condensate drain pan affixed directly below the cooling coil to accumulate condensate

T. DEHUMIDIFICATION MODE

1. Automatically removes excess moisture from the air
2. User-specified humidity setpoint
3. Can be enabled or disabled by the user
4. Rejects condensate via condensate pump

U. CONDENSATE PUMP

1. Standard feature
2. Activated by primary water sensor
3. Protection against dry running
4. Overflow alarm: secondary drain pan sensor detects if condensate pump has failed or if there is a clog in the drain system

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|-------------------------------------|---|--------------|
| Condensate management system | | |
| Connection size | 1/4 in. | |
| Drain tube length | 13 ft. (4 m) | |
| Max flow | 2.4 gal/h (9 L/h) | |
| Maximum lift | 26.5 ft. (8 m) | |
| Maximum distance | 150 ft. (45 m) | |
| Downward pitch | At least 1 in. per 10 ft. (10 mm per 1 m) | |
| Minimum exposure temperature | >32°F (0°C) | |
| Dehumidification mode | Included | |
| Dehumidification setting | User specified | |

V. USER INTERFACE

1. 7 in. color touchscreen high resolution interface
2. Allows user and service personnel to adjust settings mentioned throughout this document
 - a. User supply air temp setting range: 64~99°F (18~37°C)
3. Features home screen with status indicators
4. Features 3 password protected service levels: 1) User, 2) Service, and 3) Factory settings
5. Features temperature and pressure graphing/plotting screen for easy visual tracking of system performance and behavior
6. Features dedicated alarm list and log
7. Features a read-only, real-time data parameter screen
8. Firmware upgradeable in field

W. CONTROLLER

1. Supports all commands locally and remotely
2. Governs the speed of the compressor and fans
3. Utilizes the return air temperature and humidity sensor, supply air temperature sensor, along with other sensors, to control system behavior
4. Firmware upgradeable in field

X. FILTERS

1. Qty. 2, extending full height of cabinet
2. Efficiency rating: G4
3. Replaceable and easy to service from the rear of the cabinet
4. Size/Dimensions: 33 x 8.5 in. (84 x 22 cm)

Y. LOW TEMPERATURE KIT (SRCOOLDXRWLTKIT, OPTIONAL)

1. Optional accessory
2. Comes with all necessary components preassembled, includes a heater mounted to the receiver tank
3. Powered from In-Row (indoor unit)
4. Necessary for outdoor ambient temperature ranging from -4°F (-20°C) to -40°F (-40°C)

Z. PROTECTION METHODS

1. Oil separator
 - a. Ensures proper oil return to the compressor for maximum reliability
2. Tip-N-Tell
 - a. Determines whether the product has been potentially damaged by tracking the angle of the package
 - b. Indicator is visible on the outside package
3. ISTA testing
 - a. ISTA-1B tested: shock, vibration, and drop

AA. SPARE PARTS

1. Full range of spare parts to allow full servicing in the field

BB. DOCUMENTATION

1. Content:
 - a. Installation Guide (shipped with product)
 - b. Owner's Manual (shipped with product)
 - c. Submittal Drawing (website)
 - d. Service Manual (for certified technicians)
 - e. Bid Specifications (website)
2. Translations for manuals:
 - a. English
 - b. Spanish
 - c. French

CC. PERFORMANCE DATA

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|--|-------------------|-------------------|
| Performance data | Sensible / Total | Sensible / Total |
| 104°F/40°C DB, 20% RH, 71.6°F/22°C WB | 13.2 kW / 13.2 kW | 27.3 kW / 27.3 kW |
| 98.6°F/37°C DB, 24% RH, 70.34°F/21.3°C WB | 12.8 kW / 12.8 kW | 25.8 kW / 25.8 kW |
| 95°F/35°C DB, 26% RH, 68.9°F/20.5°C WB | 12.6 kW / 12.6 kW | 25.1 kW / 25.2 kW |
| 89.6°F/32°C DB, 29% RH, 66.56°F/19.2°C WB | 11.8 kW / 11.8 kW | 23.4 kW / 24.2 kW |
| 86°F/30°C DB, 34% RH, 65.84°F/18.8°C WB | 10.9 kW / 11.7 kW | 21.6 kW / 23.9 kW |
| 82.4°F/28°C DB, 45% RH, 67.1°F/19.5°C WB | 9.4 kW / 11.9 kW | 18.4 kW / 24.3 kW |
| 82.4°F/28°C DB, 38% RH, 64.58°F/18.1°C WB | 10.2 kW / 11.4 kW | 20.0 kW / 23.3 kW |
| 77°F/25°C DB, 40% RH, 61.16°F/16.2°C WB | 9.6 kW / 10.7 kW | 18.9 kW / 21.8 kW |
| 77°F/25°C DB, 50% RH, 62.6°F/17°C WB | 8.5 kW / 11 kW | 16.7 kW / 22.4 kW |
| 77°F/25°C DB, 45% RH, 62.78°F/17.1°C WB | 9.1 kW / 11 kW | 17.9 kW / 22.4 kW |
| 71.6°F/22°C DB, 55% RH, 59.72°F/15.4°C WB | 7.8 kW / 10.7 kW | 15.5 kW / 21.7 kW |

^^ to convert to BTU, multiple kW by 3,412

DD. COOLING AT ALTITUDE

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|---|--------------|--------------|
| Altitude: cooling capacity correction factors | | |
| 0 ft. (0 m) | 1.00 | 1.00 |
| 3280 ft. (1000 m) | 0.94 | 0.94 |
| 6560 ft. (2000 m) | 0.88 | 0.88 |
| 9840 ft. (3000 m) | 0.82 | 0.82 |
| 13120 ft. (4000 m) | 0.76 | 0.76 |

EE. SOUND PROFILE

| | SRCOOLDXRW12 | SRCOOLDXRW25 |
|--|--------------|--------------|
| Indoor Sound Profile in dBA @ rated airflow @ a distance of 10 ft. (3m) | | |
| 63 Hz | 33 | 30 |
| 125 Hz | 43 | 40 |
| 250 Hz | 50 | 50 |
| 500 Hz | 56 | 55 |
| 1000 Hz | 61 | 61 |
| 2000 Hz | 64 | 64 |
| 4000 Hz | 59 | 61 |
| 8000 Hz | 56 | 60 |
| Sum | 67 | 68 |

FF. OPERATION

Cooling modes:

- Cooling (either supply or return temperature control)
- Dehumidification (if enabled, automatically engages when necessary during cooling mode)
- Maintenance (up to 30 minutes of max cooling)
- Standby

Settings:

- Temperature setting
- Humidity
- Fan speed
- Alarm and temperature thresholds
- Restart delay
- Front/rear temperature control mode
- Maintenance mode duration
- Group rotation

Alarms:

- Display communications lost
- Compressor maintenance needed
- Discharge pressure high
- Discharge pressure sensor failure
- Filter maintenance needed
- High pressure / high discharge switch fault
- Indoor fan maintenance needed
- Liquid-pipe temperature sensor failure
- Return air humidity high
- Return air humidity low
- Return air humidity sensor failure
- Return air temperature high
- Return air temperature low
- Return air temperature sensor failure
- Suction pressure low
- Suction pressure sensor failure
- Suction temperature sensor failure
- Supply air temperature high
- Supply air temperature low
- Supply air temperature sensor failure
- High water level (condensate overflow prevention)

Data items:

- High pressure
- Low pressure
- Condensing temperature
- Liquid temperature
- Subcooling temperature
- Compressor speed
- Indoor fan speed
- Return temperature
- Supply temperature
- Evaporator temperature
- Suction temperature
- Superheat temperature
- Electronic expansion valve position
- Outdoor fan speed
- Return humidity

Graphic (user interface):

- Supply temperature
- Return temperature
- Humidity
- Low (suction) pressure
- High (discharge) pressure

