KSR INSTALLATION INSTRUCTIONS
KNOCK-DOWN PROCEDURE

1. Verify Curb Installation ........................................................................................................2
2. Required Installation Tools .................................................................................................2
3. Unpacking the KSR .................................................................................................................3
4. Attach KSR Bottom Rail to Curb ..........................................................................................5
5. Attach KSR Upper Rail ...........................................................................................................6
6. Install Cross Bracing (if supplied) .......................................................................................7
7. Attach Wind/Seismic Restraints ...........................................................................................7
8. Install Flex Connector Supports (if supplied) .......................................................................8
9. Install Weather Seals ............................................................................................................10
10. Installation of Air Handling Unit .........................................................................................12
11. Trouble Shooting Section ...................................................................................................13
12. Appendix ............................................................................................................................14
1. **Verify Curb Installation**

A. Assemble the roof curb (by others) according to the manufacturer’s instructions.

B. The top of the roof curb must be square and level within +/- ¼”.

C. Curb sides must be square and level within +/- ¼”.

D. Corner to corner, diagonal measurement must be equal within +/- ¼”.

**IMPORTANT!** Do not use the gaskets which may be furnished by the equipment manufacturer for the top of the curb, or which may be attached to the bottom of the equipment. **Failure to remove or using manufacturer’s gasket material may result in deformation of the upper isolation rail!**

---

2. **Required Installation Tools**

- 5/16”x1” Lag screws *(By others)*
- Drill & Drill Bits
- C-clamp vise grips
- C-clamp
- Industrial scissors
- Tape Measure
- 1/4” 3/8” 9/16” Socket & Open End Wrenches
- Caulk gun
3. **Unpacking the KSR**

A. Remove shipping straps and cardboard from KSR rails.
B. Use packing list and any figures below to verify all parts are present.

**NOTE:** Promptly report any shipping damage to the carrier and report any missing parts to the vendor.

**TYPICAL PACKING LIST**

Rail assembly: 1 per side marked A, B, C, D

Top Rail Corner Bracket (x4)  
# 53.135-01

Top Rail Corner Cover (x4)  
# 53.135-04

Seismic leaf restraint (see submittal for quantity)  
1" deflection rail # 53.135-16  
2: deflection rail # 53.135-20

Restraint backing plate # 31.300-02

Vertical Restraint Strap (see submittal for quantity) # 24.085-03

Restraint Hardware (qty per restraint)

Cross Brace (cut to length) # 54.009-01  
Bracket (2 per cross brace) # 35.056-01  
*(If required)*

Cross Brace Hardware (per cross brace)  
*(If required)*
Flex connector support  # 54.009-01
Bracket (x2 each support)  # 35.054-01
(If required)

Self-Drilling Screws

Neoprene weather seal (a large KSR may have multiple rolls)  # 24.085-01

Adhesive double sided tape  # 63.010-16

Foam weather seal  # 24.025-02

Caulk  # 57-040-01

Trouble shooting kit
1" Deflection # 11-22.008-01 or # 11-22.008-03
2" Deflection # 11-22.008-02 or # 11-22.008-04
(Each kit contains 5 - 8 spring coils for additional capacity of ~300# or ~900#; see Section 13)

Cover Straps (5 ft long)  # 53.125-04

Splice channel & backing plate (if required)
4. **Attach KSR Bottom Rail to Curb**

   A. Rail “B” is marked on the submittal drawing (condenser end, return end, etc.).
   B. Match this end to the correct end of the roof curb.

   **NOTE:** *The bottom rail containing the pre-located springs must be installed as shown on the submittal to ensure proper loading and optimum performance.*

   C. Remove the top rail from all rail assemblies at this time. Discard wood blocking from bottom rail, this is used to protect restraint ends during shipping (see figure 4.1).
   D. Apply two (2) beads of caulk to the top of the roof curb (see figure 4.1).
   E. Lay bottom rails on top of roof curb make certain the corners are tight and caulk each junction (see figure 4.2).
   F. Lag the bottom extrusion to the curb using 5/16” dia x 1” long (min) lag screws (not provided). Install lag screw on 36” centers with a minimum of two (2) screws per side (see figure 4.3).

   **Note:** If wood nailer is attached to top of steel curb, additional attachment is required at each restraint point (see figure 4.4).
5. **Attach KSR Upper Rail**

A. Verify spring locations with the shipping documentation and submittal drawings.
B. Set top rails onto the spring coils (see figure 5.1).
C. If curb is over 21 feet long, the top rail will need to be spliced, see Appendix A, page 14.
D. Verify that the springs are sitting flat against the underside of the top rail.
E. Remove the four (4) top rail corner brackets and the sixteen (16) ¼” dia. x 1” long self-drilling screws from the shipping carton.
F. Attach a corner bracket to the top rails at each corner with four (4) ¼” screws through the pre-located holes in the bracket (see figure 5.2 and 5.3).
1) It may be necessary to hold the rails and bracket with clamps (see figure 5.3).
G. Caulk the full seam of the corner bracket and top rail (see figure 5.2).

![Figure 5.1](image_url1)

![Figure 5.2](image_url2)

![Figure 5.3](image_url3)
6. **Install Cross Bracing (if supplied)**

A. If cross bracing is required for this installation, it will be shown on the submittal drawing.

B. Remove the cross brace channel, a steel wall stud with two (2) holes at each end.

C. Determine the best location for cross bracing. It should be as close to the center of the span as possible while still clearing all ductwork. If more than one cross brace is required, they should be spaced evenly in the rails.

D. Attach cross brace bracket to the ends of each cross brace using 3/8” hardware (provided). Do not tighten bolts at this time.

**NOTE:** Before drilling top rail, verify that the cross brace will not interfere with ductwork. In addition, verify that the vertical dimension between the top of the cross brace and the top of the top rail is greater than the distance the equipment may protrude down between the top rails. Failure to do this may result in interference between the equipment and the isolation rails.

E. Drill top rail to match mounting holes on cross brace bracket.

F. Attach cross bracing to top rail using four (4) 3/8” bolts (provided) per end (see figures 6.1 and 6.2).

G. Verify alignment of isolation rail to curb and then **tighten all bolts.**

7. **Attach Wind/Seismic Restraint**

A. The restraints have been located and attached to the top rail by the factory. These will correspond to the locations shown on the submittal data sheet. The bottom of the restraint is to be attached to the curb.

B. Remove the curb attachment hardware from the shipping carton: 3/8” x 2.25” long hex head bolts, 3/8” nuts and washers, and back up plates.
C. To attach the restraint to the curb, drill 7/16” diameter holes through roof curb, in line with holes on bottom of restraint leaf. Note: If wood nailer is attached to top of steel curb, additional attachment is required at each restraint point (see figure 4.4).

D. Bolt bottom of restraint leaf to curb using back-up plate and 3/8” hardware. The bolt may be trimmed flush with the nut or turned around if there is interference. Tighten the bolts to 15 ft-lbs. If a rubber vertical restraint is present, use the holes that line up best with the leaf restraint holes.

**NOTE:** There should be a minimum of four (4) wind/seismic restraint leaves per unit. These components are also used to hold the isolation rail system stationary during equipment installation. Their omission can result in isolation rail instability. Larger units or those in higher seismic or high wind zones will have additional leaf and/or rubber vertical restraints.

---

**Figure 7.2**

**Figure 7.3**

**Figure 7.4**
8. **Install Flex Connector Supports (if supplied)**

A. If flex connector supports have been specified for this installation they will be shown on the submittal drawing. Canvas flex connectors are by others.

B. Attach end brackets to flex connector support channels with #8 TEK screws (provided).

C. Hang flex connector supports either on the perimeter channel or to mating flex connector supports.

D. Note the relative heights of the perimeter support area and the lips around the supply and return ducts. Adjust the height of the flex connector supports to match these and form a positive seal (note: the maximum standard adjustment is 2” below flush).

E. If a noise package is required, see Appendix B, page 14.

![Image 8.1](image1.png)

**Figure 8.1**

F. Canvas flex connectors, provided by others, are to be attached between the installed flex connector supports and to the duct from the building, see figure 8.2.

![Image 8.2](image2.png)

**Figure 8.2**
9. **Install Weather Seals**

A. Remove the roll of neoprene weather seal material from shipping container. **DO NOT CUT WEATHER SEAL AT THIS TIME.**

B. Start at one corner of the isolation rail system and slide the rounded edge of the weather seal into the 1/4" diameter groove in the upper rail (see figure 9.1 & 9.2).

C. Pull the weather seal to the midpoint of this top rail as shown in figure 9.3.

D. Insert the other end of the weather seal into the opposite groove of the same corner, and gently pull all the way through this rail until all the slack is taken up.

E. Repeat this process at the other corners. Gently pull the weather seal around the perimeter until it meets the other end (see figure 9.3). Make sure weather seal is tight around the corners.

![Figure 9.1](image1.png)

![Figure 9.2](image2.png)

![Figure 9.3](image3.png)
F. Cut to length allowing for a 3" overlap. Trim rounded top (see figure 9.4).
G. Bond weather seal with adhesive tape (see figure 9.4).
H. Attach foam weather seal to top outside edge of upper rails as shown in figure 9.1.

**IMPORTANT:** Neoprene weather seal must be cleaned with a solvent, such as alcohol, which will not leave an oily film, or adhesive tape will not stick. Do not use paint thinners or turpentine.

I. Caulk corner at weather seal and corner bracket, see figure 9.5.

J. See section 10.E for attaching bottom of weather seal to curb using provided cover straps and #8 TEK screws after equipment is set.
10. Installation of Air Handling Unit

A. Visually inspect the assembly for springs that may be tilted due to misalignments between the top rail and the bottom rail. Realign the spring as required so the springs remain in an upright position.

B. Check to be certain there is no factory applied gasket material on the underside of the equipment where contact will be made with the top rail of the KSR. **IMPORTANT: FAILURE TO REMOVE MANUFACTURER’S GASKET MATERIAL VOIDS KSR WARRANTY.**

C. Position the air-handing unit onto the top of the KSR. **WARNING: THE AIR HANDLER MUST BE LOWERED SLOWLY AND KEPT LEVEL SO IT ENGAGES THE TOP RAILS EVENLY OR DAMAGE TO THE KSR MAY RESULT. THE AIR HANDLER MUST BE INSTALLED AS ONE UNIT AND NOT IN SECTIONS. DO NOT ATTEMPT TO DRAG THE AIR HANDLER ACROSS THE KSR DURING INSTALLATION, OR DAMAGE TO THE KSR WILL RESULT.**

D. Verify the KSR is floating freely on the springs. This can be done by rocking the air handler. If the air handler does not rock, check to be sure there is no interference between the top rail and the bottom rail. See figure (right) for a measurable approximate deflected rail dimension. If solid springs are present, or if the KSR is not sitting level, remove the KSR Trouble Shooting Kit from the shipping carton and follow the trouble shooting instructions on the last page of these instructions.

E. Arrange the neoprene weather seal with some slack between the top rail and the bottom rail and secure in place with the 5 feet long aluminum cover straps (#53.125-04) and #8 TEK (#88.070-04) screws as shown in figure (right). The cover straps are not cut to length, but can be bent to fit around corners. To cut or bend the cover strap, first notch with a hammer and cold chisel, then bend strap to shape (or bend back and forth to break off).

F. Ensure the weather seal is watertight.

G. Lag the air handler to the KSR per the manufacturer’s instructions, or if a wind or seismic analysis has been performed, in accordance with that analysis.

H. Disconnect the rigging cables and dismiss the crane. **WARNING: IF THE CRANE IS DISMISSED BEFORE THE ABOVE INSPECTIONS AND LEAK TESTING ARE COMPLETED, THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY COST TO REPAIR OR MODIFY THE KSR, INCLUDING LABOR, MATERIALS, OR CRANE RENTAL.**

---

**NOTE: IN THE EVENT THE INSTALLATION OF THE KSR IS NOT COMPLETED IN ACCORDANCE WITH THESE INSTRUCTIONS, THE MANUFACTURER WILL NOT ACCEPT ANY RESPONSIBILITY FOR MALFUNCTION OF THE KSR OR DAMAGE TO THE KSR OR ANY ASSOCIATED EQUIPMENT OR STRUCTURE RESULTING FROM THE INSTALLATION.**
11. Trouble Shooting Section

**Overloaded springs** are springs that have less than 1/16" average air gap between the coils after loading. **Under loaded springs** are springs that measure more than 2-1/4" top to bottom after loading.

**What to do if improperly loaded springs are found on the installation.**

1. Recheck the tagging (Rail A, B, C, and D) on the rails against the submittal drawing. Is the assembly sequence correct? Check the equipment orientation label (Condenser End, Return End, etc.).
2. If the unit has an overhanging condenser with a support rail, check the installation drawing to ensure proper alignment.
3. If multiple units are being installed, check to see that the tag numbers on all (4) rails agree and are consistent with the unit being supported (is RTU-1 on the isolation rail meant for RTU-1).
4. Make sure all ductwork and piping have flex connectors between the unit and the roof structure.
5. If unit leveling is required: A trouble shooting kit is shipped with each KSR for this purpose. The springs should be installed within 18” of a corner when they are required. Low and high corners should be identified while the KSR springs support the unit weight (see figure 11.1). The unit should then be lifted slightly and additional springs should be located in the low corners and twisted into the grooves on the lower rail assembly (see figure 11.2). The unit can then be lowered into place again. Should further leveling be required, remove springs from the high corners and relocate them to the low corners (do not allow the gap between springs to exceed 24”). Repeat the process as necessary. Caution should be used not to install too many springs, as the entire system may become unstable if it sits too high.

**Trouble Shooting Coils by Kit**

**1” Deflection**

P/N 11-22.008-01 ~310 lbs.
(2) 1”-30 lb. Blue
(2) 1”-65 lb. Green
(1) 1”-120 lb. Gray

P/N 11-22.008-03 ~925 lbs.
(2) 1”-30 lb. Blue
(2) 1”-65 lb. Green
(1) 1”-120 lb. Gray
(3) 1”-205 lb. Brown

**2” Deflection**

P/N 11-22.008-02 ~300 lbs.
(2) 2”-30 lb. Gray
(2) 2”-60 lb. Blue
(1) 2”-120 lb. Green

P/N 11-22.008-04 ~915 lbs.
(2) 2”-30 lb. Gray
(2) 2”-60 lb. Blue
(1) 2”-120 lb. Green
(3) 2”-205 lb. Black
12. APPENDIX

A. Splice Plate Installation (if required)

1. Line up the two top rail ends as shown in figure A-1.
2. Place the aluminum backing plate on the outside of the top rail, as shown in figure A-1. Hold in place using two (2) #8 x ¾” TEK screws. Drill four (4), 7/16” holes using the backing plate as a template.
3. Place the splice channel on the inside of the rail, lining up with the four (4) lower bolt holes. Then use the 3/8” bolts, nuts, and washers supplied to fasten the four (4) pieces together (see figure A-2).

B. Installation of Optional Noise Control Package

1. Install any optional noise control package prior to the setting of the equipment on the isolation rail. 2 x 4 studs, sheet rock and deck insulation by others (see figure B-1).