



**XSTREAM<sup>®</sup> Valve System With A.R.M.E.D.<sup>®</sup> Technology**  
**Service & Installation Instructions**  
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• **WHY should I install the XSTREAM<sup>®</sup> Valve System?**

- XDX<sup>®</sup> is more efficient, saving on power consumption.
- Use of XDX<sup>®</sup> system decreases defrost cycles.
- XDX<sup>®</sup> maintains more consistent product temperatures, increasing shelf life of products.
- XDX<sup>®</sup> helps maintain higher humidity levels in the case or the box.
- Total system capacity is increased when using XDX<sup>®</sup>.

• **WHAT is the XSTREAM<sup>®</sup> Valve System?**

The XSTREAM<sup>®</sup> valve is a multi-functional valve that changes the characteristics of the refrigerant flow pattern through the evaporator. This valve can be installed close to the evaporator, adjacent to the rack, or inside the condensing unit on any direct expansion cooling system and needs to be installed in conjunction with the other required system components to allow for the desired system performance.

• **WHAT are the components of the XSTREAM<sup>®</sup> Valve System?**

The component list consists of the XSTREAM<sup>®</sup> valve, a Thermostatic Expansion valve, an Evaporator Inlet Line (EIL), an Adjustable Refrigerant Metering Evaporator Device, and a Solenoid Valve. The XSTREAM<sup>®</sup> valve can be a part of a kit which includes the XDX<sup>®</sup> valve and an Adjustable Refrigerant Metering Evaporator Device (A.R.M.E.D.<sup>®</sup>).

1. XSTREAM<sup>®</sup> valve- An epoxy coated static refrigerant valve which, by design, changes the consistency of the refrigerant flow into the evaporator.
2. Thermostatic Expansion Valve- Regulates and controls the feed of refrigerant through the system.
3. Evaporator Inlet Line- A predetermined length and size of copper line used to achieve a desired pressure drop.
4. Adjustable Refrigerant Metering Evaporator Device (A.R.M.E.D.<sup>®</sup>) - Regulates flow, creates pressure drop, and corrects the inaccuracy of the TXV.
5. Solenoid Valve- A liquid line mounted electrically operated valve which stops the flow of refrigerant through the system.

• **HOW do I install the XSTREAM<sup>®</sup> Valve System?**

**Solenoid**

Install into the liquid line, prior to any thermostatic expansion valve, a system or circuit solenoid valve sized for the proper capacity. This solenoid should be wired into a system or circuit thermostat device and utilized for pump-down operation during off-cycle or defrost times. The solenoid valve may be located anywhere along the liquid line, down stream from the receiver.

**Thermostatic Expansion Valve**

Down stream of the solenoid valve, install the XDX<sup>®</sup> recommended externally equalized thermostatic expansion valve into the liquid line. When used with A.R.M.E.D.<sup>®</sup>, this should be sized using a 1.5 multiplier based on the evaporator capacity.



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### Adjustable Refrigerant Metering Evaporator Device (A.R.M.E.D.®)

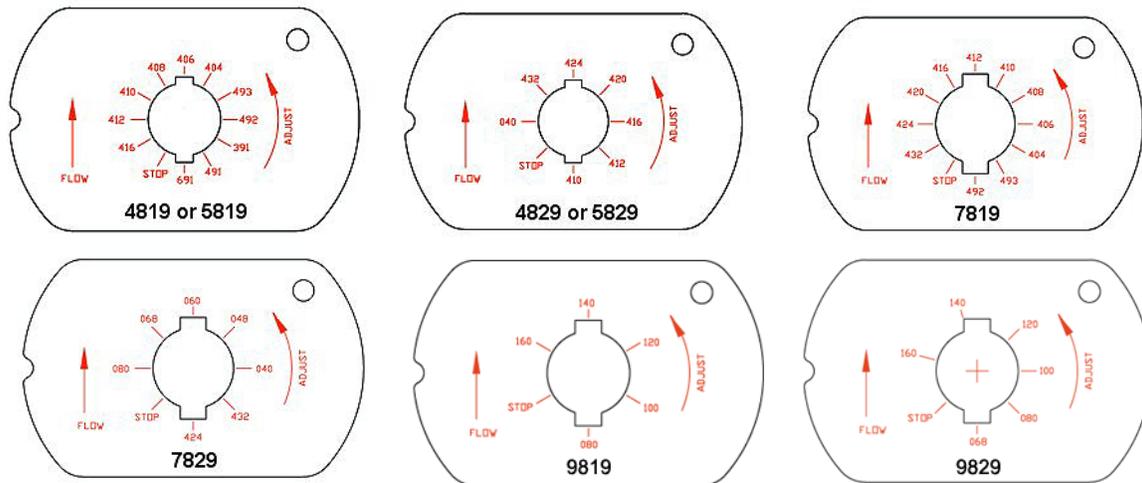
The A.R.M.E.D.® is used to regulate flow through pressure drop and is designed with multiple settings for fine-tuning your system. A.R.M.E.D.® should be installed between the XDX® valve and the expansion valve.

Remove or drill out completely any distributor nozzle or orifice that may be installed in the existing distributor. Within four inches of the outlet of the thermostatic expansion valve, install the A.R.M.E.D.® component with the threaded side as the inlet. The directional arrow on the side of each device and the “inlet” sticker will confirm that it is installed in the proper direction. *\*Tightening of the A.R.M.E.D.® cap is necessary to eliminate refrigerant leakage.*

*\*\*The “stop” position is not intended for use as a permanent system shut-off valve.*

### A.R.M.E.D.® Adjustments

The A.R.M.E.D.® currently comes in connection sizes ½, 5/8, 7/8, and 1-1/8 OD copper with multiple respective nozzle openings. When installing, allow top access for adjustments. Make all necessary adjustments in a counter-clockwise direction. Evacuation of the system is most efficient when the A.R.M.E.D.® adjustment indicator is set perpendicular to the inlet pipe. Confirm that you have the appropriate nozzle and adjust this valve to the proper manufacturer recommended setting, as referenced by the following diagram:



After setting the evaporator superheat to the lowest possible setting, A.R.M.E.D.® can be used for fine-tuning the evaporator performance.

*\*Monitor the evaporator coil refrigerant temperature inlet after one pass through the coil. At the same time, monitor the evaporator coil refrigerant temperature outlet at the expansion valve bulb location. Determine the total evaporator coil refrigerant temperature difference.*

Ideally this difference would be two to four degrees Fahrenheit. If necessary, adjust A.R.M.E.D.® to achieve a closer evaporator coil temperature difference from inlet to outlet. Typical XDX® operation should demonstrate a colder evaporator outlet temperature as compared to the evaporator inlet temperature. Adjustments should only require minor changes from the XDX® recommended setting, usually only one position up or down. This adjustment should reflect good refrigerant feed at the inlet to the evaporator coil.

*\*To achieve a more accurate refrigerant quality reference, utilize the pressure port at the evaporator coil inlet and relate this to the actual inlet temperature.*

*\*\*Evaporator Superheat will need to be reconfirmed and possibly readjusted after these changes are made.*

XSTREAM® Valve

PHONE 847.398.0250 ♦ 800.XDX.0250 ♦ FAX 847.398.1365 ♦ 800.XDX.9656

3176 NORTH KENNICOTT AVENUE ♦ ARLINGTON HEIGHTS, ILLINOIS 60004

WWW.XDXUSA.COM



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Within four inches from the outlet of the A.R.M.E.D.<sup>®</sup> device, pipe directly into port “B” of the XSTREAM<sup>®</sup> valve assembly (using reducing couplings as necessary). Make sure to support all copper lines connected to the XDX<sup>®</sup> valve to eliminate any stress on the fittings or solder joints.

*\* If outside the evaporator housing, insulate all components between the thermostatic expansion valve and the XSTREAM<sup>®</sup> valve. Insulation with a wall dimension of at least ¾ of an inch in thickness should be used.*

### Evaporator Inlet Line (EIL)

From the outlet of the XSTREAM<sup>®</sup> valve, Port “A”, pipe about eighteen inches of copper directly into the inlet of the distributor. Use the same OD size copper as the distributor inlet. This is the Evaporator Inlet Line (EIL). Contact XDX<sup>®</sup> for lengths that vary from this recommended dimension. Use only soft copper and no pre-bent elbows. No linear deduction is necessary for bent elbows using soft copper. Use reducing couplings, as necessary, to connect to the XSTREAM<sup>®</sup> valve, the distributor assembly, or the evaporator inlet.

*\*If outside of the evaporator housing, insulate from the outlet of the XDX valve to the inlet of the evaporator. Insulation with a wall dimension of at least ¾ of an inch in thickness should be used.*

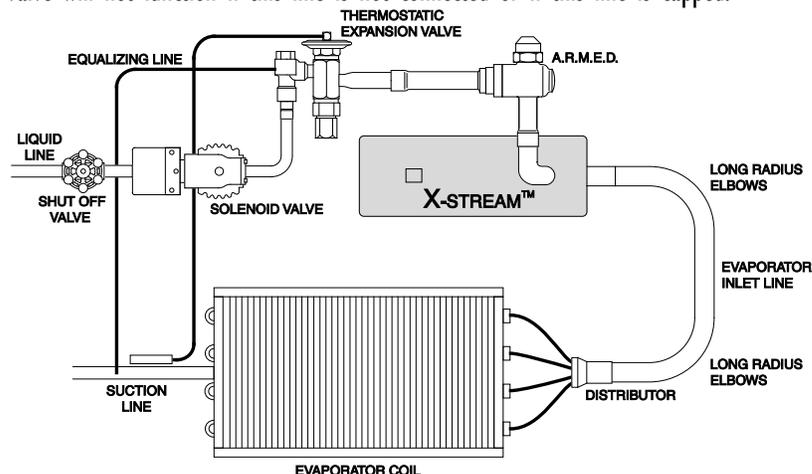
### TXV Power Head

Attach the thermostatic expansion valve bulb on a horizontal section of suction line at the outlet of the evaporator, or on the adjacent suction line if the XSTREAM<sup>®</sup> valve is mounted at a different location in the system. The bulb should be mounted at either the 4 or 8 o'clock position on the side of the horizontal line. Never mount the bulb near or after any oil trap. Confirm that there is good contact between the bulb and the suction line and use two straps to secure it in place. Check to make sure that the proper power head is being used:

- |                |                          |                    |
|----------------|--------------------------|--------------------|
| ▪ Medium Temp- | 10 degree SST and higher | “C” charge         |
| ▪ Low Temp-    | Below 10 degree SST      | “Z” or “ZP” charge |

### Equalizing Line

At the outlet of the evaporator, immediately down stream of the bulb, install the thermostatic expansion valve external equalizing line to the suction line. If the XSTREAM<sup>®</sup> valve is mounted at a different location in the system, install equalizing line on the adjacent suction line. The thermostatic expansion valve will not function if this line is not connected or if this line is capped.



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### HOW do I adjust the XSTREAM® Valve System?

The XSTREAM® valve system is fine tuned by gradually adjusting the superheat of the thermostatic expansion valve using the pressure-temperature method (the temperature difference method of checking superheat is not recommended or endorsed by XDX®) Target evaporator superheat is between two and three degrees, without compromising the compressor superheat requirements.

-If system is close coupled to the condensing unit and suction line run from the outlet of the evaporator to the compressor is less than 10 feet, a minimum compressor superheat of 10 degrees Fahrenheit is required.

-If system has a remote condensing unit and suction line run from the outlet of the evaporator to the compressor is greater than 10 feet, a minimum compressor superheat of 15 degrees Fahrenheit is required.

### Checking correct "Superheat"-

1. Determine the temperature of the suction line at the bulb location.
2. Determine the pressure of the suction line at the bulb location or the evaporator outlet. (Achieve this by either measuring the pressure at that location directly or by measuring the pressure at the compressor suction valve and adding the determined pressure drop back to the evaporator.)
3. Convert the pressure determined in step 2 to the saturated evaporator temperature by using a pressure-temperature chart for the appropriate refrigerant.
4. The difference of the temperatures in step 1 and 3 is the superheat.

*\* The temperature difference method of checking superheat, while acceptable to some manufacturers, is not recommended or endorsed by XDX®, although it can be used as a method for checking evaporator coil performance.*

The reduction of superheat is accomplished by turning the expansion valve adjusting stem in a counter-clockwise direction. The increase of superheat is accomplished by turning the expansion valve adjusting stem in a clockwise direction. After adjustment, allow at least thirty minutes for stabilization of flow. A maximum of one turn of the expansion valve should be adjusted at a time to closely observe any change and to prevent over-shooting the desired setting.

*Some system factors that can affect the necessary thermostatic expansion valve adjustment are:*

- *Compressor and evaporator balance*
  - *Capacity of system condenser*
  - *System installation with multiple evaporators*
  - *Expansion valve bulb location*
  - *Head pressure variance due to extreme ambient change*
- **HOW should I adjust the defrost periods and what can I expect?**

Due to the increased capacity of the evaporator coil, the defrost cycles will, in most cases, be able to be reduced from their conventional settings. The best way to accomplish this is by a gradual reduction of defrost frequencies. Initially, leave the defrost cycles as they were conventionally and allow for stabilization of the system after start-up. Monitor operation before the first couple of defrost cycles and visually note if there is a need for that specific defrost period. Then gradually eliminate defrost cycles until the need to defrost is satisfied by the least number of defrost cycles in a twenty-four hour period.

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Normally this will be twenty-five to fifty percent of the defrost time that is usually necessary in the conventional operation. Note that the reduction of defrost cycles is based on many system and surrounding factors, so that there can be no guarantee as to specific defrost reduction or the quantity of defrost cycles necessary.

- **WHAT are some of the precautions?**

1. Confirmation of the proper refrigerant level is mandatory prior to making any adjustments.
2. Always mount the XSTREAM® valve in a vertical position with “arrow” up.
3. If Xstream valve is mounted outside the evaporator housing, ensure valve is installed in such a manner that allows regular cleanings. Make sure valve is not flush against a wall or hidden behind the evaporator.
4. Wrap all system components, with a wet rag, when soldering to protect the XSTREAM® valve body or A.R.M.E.D.® from damage. Excessive heat will void the manufacturer’s warranty.
5. Mount the XSTREAM® valve, around the bottom, with at least two straps or secure to a firm base at the time of installation.
6. Acid in the system needs to be controlled, as acid and contaminants can cause damage to internal seals.
7. Contaminants, moisture, and oil can commonly cause irregularity or failure of any thermostatic expansion valve. Erratic system feed is often related to the performance of the thermostatic expansion valve.
8. Due to the benefit of increased refrigerant flow and improved oil return, monitoring oil level is necessary.
9. Suction filter pressure drop should be monitored to confirm that it never exceeds 2 PSI.
10. Evacuate the entire system using the triple evacuation method.
11. For optimal operation, the XSTREAM® valve should be positioned at the same height or higher than the evaporator(s) in that same system.
12. Never open the thermostatic expansion valve without monitoring for proper superheat.
13. Due to system parameters, actual performance may vary.

- **WHAT can you tell me about piping and soldering?**

The XSTREAM® valve system may be installed using any of the commonly acceptable solders. Always disassemble individual components as necessary, direct the flame away from the system components, and wrap a wet rag around them to eliminate excessive heat build-up when soldering. Follow good soldering practices including cleaning copper connections thoroughly, removing burrs from any pieces of cut copper, and purging copper lines with nitrogen during brazing.

Use ACR grade copper tubing and keep it dry and clean. Use only long radius elbows. Install all components in accordance with local and national codes and in conformance with good refrigeration practice for proper system operation.

The suction line must be sized for a high enough refrigerant velocity to assure proper oil return and with a low enough pressure drop to prevent system capacity decrease. The recommended suction line pressure drop should not exceed 2 PSI. Suction line risers should have an oil trap at the bottom and at ten-foot intervals up the riser. Risers should never exceed the horizontal run in diameter.



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Liquid lines must be sized in accordance with system capacity requirements. Over or under sizing the liquid line can result in excessive flash gas or greater than necessary refrigerant charge. Liquid sub-cooling will affect system performance and should be addressed at the time of the XSTREAM® valve installation.

• **WHAT do I do when these problems occurs?**

**Problem**

*Refrigerant will not feed through the XSTREAM® Valve*

**Possible Causes or Remedy**

Moisture in system  
 Low refrigerant charge  
 Bad power head on TX valve  
 Low side restriction  
 Undersized TX valve  
 Improper superheat setting

*Erratic or "hunting" Thermostatic Expansion Valve*

Oversized TX valve  
 Poor TX valve bulb location  
 Improper superheat setting  
 Low refrigerant charge  
 Too much liquid sub-cooling

*Continued excessive frost buildup on the evaporator coil*

Too few defrost cycles  
 Unit not cycling properly  
 Thermostat setting too low  
 Defective defrost timer

*Excessive buildup of frost onto the suction line and compressor service valve*

Improper superheat setting  
 Confirm compressor superheat

*Case or Box temperatures too high*

Thermostat set too high  
 Low refrigerant charge  
 Improper superheat setting  
 Iced evaporator

• **WHAT should I do if something is damaged in shipment?**

Notify your local carrier office immediately and request inspection. Record model and serial number then contact XDX® shipping department for assistance or replacement of damaged merchandise.

• **WHAT can I expect for warranty claims?**

XDX® warrants, to its direct purchasers that all products manufactured by XDX® shall be free of all defects, in material or workmanship, under normal use and service for a period of one (1) year from the date of purchase.

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