

# TECHNI-BRIEFS

PRODUCT APPLICATION: SEALED MOTOR VALVE

## Controlling Flow in Refrigeration Systems

**C**ontrol valves are devices with movable, variable, and controlled internal elements for modulating fluid and/or vapor flow in a refrigeration system. The valve controls flow in response to a signal (digital or analog) from a basic or sophisticated control system.

Proper application of control valves requires a combination of engineering knowledge, broad experience, and sensitivity to the aspects of the art involved. It is not always simple and doesn't always follow a formula, book or rules. Sometimes control valve applications fall victim to being a casual afterthought to the system design. Good control valve application requires a broad knowledge of control valve types, design details and operating characteristics. Beyond that, the application engineer requires a good understanding of the aspects of control dynamics, thermodynamics, hydraulics, fluid dynamics, liquid/vapor physical properties, metallurgy, codes and standards, and seals and gaskets. Finally, for those really tough service applications, the control valve application engineer will require a good dose of ingenuity and imagination for a solution.

Control valves are the final control element. It does little good to specify and purchase the most sophisticated and capable controllers if the control valve is given little thought and viewed as

just a simple piece of hardware. Dave

Harrolds, "Back to Basics," Control Engineering, (March 1997).

Additionally, if our system operators are not trained properly to understand and service the controllers and control valves, then we are limited in our application opportunities and unable to apply the latest technology necessary to reap the economic benefits of energy savings and efficient automated operation.

### Direct Acting HANSEN Sealed Motorized Valve (4-20mA Analog Control)

When Mr. Charles Hansen (Hansen Technologies' Founder) showed the Sealed Motor Valve for the first time (IAR 1999), my initial thought was, "This valve could potentially replace every control valve in the refrigeration system". Originally, the sealed motor valve was designed for on-off operation only --- the valve would simply open or close at a slow rate of speed. However, with customer input, engineering refinements and 4-20mA control innovations, the modulating Hansen Sealed Motor valve has become the control valve of choice for the system engineer and operator.

Liquid refrigerant make-up, evaporator pressure regulation, hot gas feed, defrost relief, condenser discharge pressure control, liquid injection oil cooling, etc..... The **HANSEN SEALED MOTOR VALVE** has proven to be a control valve for numerous system applications.

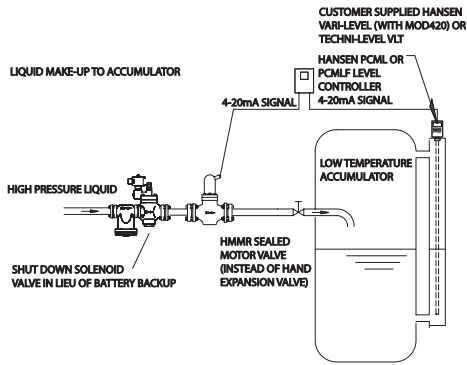


The DIRECT ACTING sealed motorized valve is unique because the main valve seat is directly actuated by a motor unlike pilot operated valves where pressure differential is required to open the valve. The sealed motorized valve requires no pressure drop to operate. The valve is ideal for applications where stem leakage is intolerable. The valve is slow opening and closing which minimizes the potential for velocity shock or "water hammer effect" sometimes experienced with quick opening and closing solenoid valves. Additionally, the modulating effect of the valve allows the controller to "dial in" the load or "mass flow required" and allow the valve to react at a pace that minimizes system imbalances.

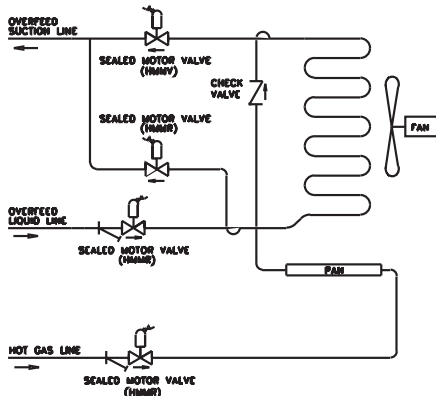
*Continued on reverse*

## Controlling Flow in Refrigeration Systems...cont'd

For LIQUID MAKE-UP APPLICATIONS, the valve acts as an automatic expansion valve.



In the HOT GAS line, the valve can be used as a soft gas and main hot gas supply by time sequence.



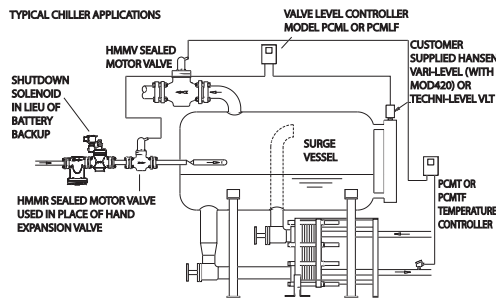
Automatic modulation is the key to a smooth operating system that reduces compressor loading and unloading, pump cavitation and "water hammer effect".

### Use Your Imagination

The direct acting Hansen motorized valve has many applications beyond high pressure liquid make-up. As previously discussed, current applications include high pressure liquid make-up, intermediate to low pressure vessel liquid make-up, back pressure regulators for evaporators, ice makers and flooded chillers, liquid injection oil cooling and hot gas feed to evaporators. There are many potential applications once the control logic / input can be realized. A true analog controlled / direct operated modulating valve will automate our systems to run safely and efficiently.

- Don Chason, Regional Sales Manager  
email at [dchason@hantech.com](mailto:dchason@hantech.com)

In the SUCTION LINE, the valve can act as a back pressure regulator for evaporators and water / glycol chillers.



### PLEASE NOTE:

The drawings in this article are for illustration purposes only and should not be used for actual engineering or installation. Not to scale.

## EVENTS

### JULY 2004

07/06 - 07/09 HVAC&R  
Singapore

### SEPTEMBER 2004

09/22 - 09/24 AHR Expo  
Monterrey, Mexico

### OCTOBER 2004

10/13 - 10/15 IKK  
Nuremberg, Germany  
10/25 - 10/30 RETA  
Reno, NV

### NOVEMBER 2004

11/20 - 11/22 Expo Pesca  
Lima, Peru

11/24 - 11/27 SuperMarket  
Kiev, Ukraine

## TRAINING

Hansen offers a free two day seminar focusing on industrial refrigeration valves and technical equipment. It offers an excellent opportunity to review the Hansen product line and discover practical solutions, answers to operational questions, service and maintenance issues.

Contact Hansen today to register for an upcoming date:

**November 8-9, 2004**

Please register early to secure your space — seating is limited. Submit Registration Form, available at [www.hantech.com](http://www.hantech.com), via email to [training@hantech.com](mailto:training@hantech.com) or via fax to 630-372-1572.

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