



The Emerson Electronic Valves and Controls Solution

One valve series for all applications



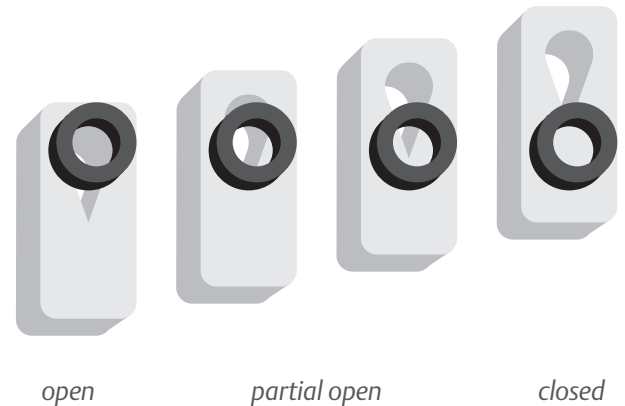
Save energy in industrial cooling and air conditioning processes

Improving efficiency while reducing energy consumption is key in today's air conditioning and refrigeration systems. Often systems are designed and optimized to operate at full load conditions or with fixed condensing pressures, and at these conditions both conventional and electronic control valves operate efficiently. However, under a partial load condition or varying condensing pressure (e.g. due to low ambient temperature) the condensing pressure decreases. Under these conditions, conventional thermal expansion valves tend to oscillate, resulting in poor system performance and/or decreased life. Systems with electronic control valves can operate at partial load in the same precise and stable way as under full load, and therefore can better exploit the potential to save energy due to low condensing pressure.

Emerson electrical control valves

Emerson electrical control valves EX4, EX5, EX6, EX7 and EX8 are optimized for the control of liquid or gaseous mass flow in refrigeration systems. The stepper motor, which produces a precise valve opening, is energized directly from the electrical power and therefore operates independent from differential pressure ensuring stable operation at low condensing pressures.

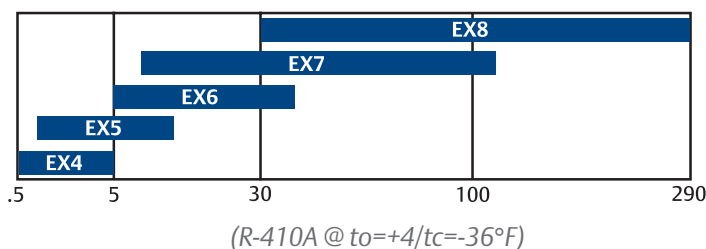
The valve seat and slider are made of solid ceramic for long life, low operating force, low internal leak rate and to eliminate corrosion. The positive shut off function and fast response time eliminate the need for an additional solenoid valve. The special shape of the valve slide provides for proper flow through the valve and a highly linear capacity characteristic between 10% and 100% of maximum capacity.



Control valves EX4 ... EX8 for capacities from .5 to 290 tons. (R-410A @ $t_o=+4/t_c=-36^{\circ}\text{F}$)



Electrical control valve capacity range



Electrical control valve applications

The refrigeration circuit in the figure on the back page demonstrates how the same type of control valve can be used for different tasks: expansion valve for superheat control, suction pressure control for capacity modulation, liquid injection for desuperheating of compressor, condensing pressure control for head pressure control and hot gas bypass control to compensate excess compressor capacity and to ensure evaporating pressure does not go below a setpoint.

The same valve can be used for all conventional refrigerants (R-22, R-23, R-32, R-124, R-134a, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R450A, R-507, R-513A, R-744 subcritical, R-1234ze).



EXD-SH2

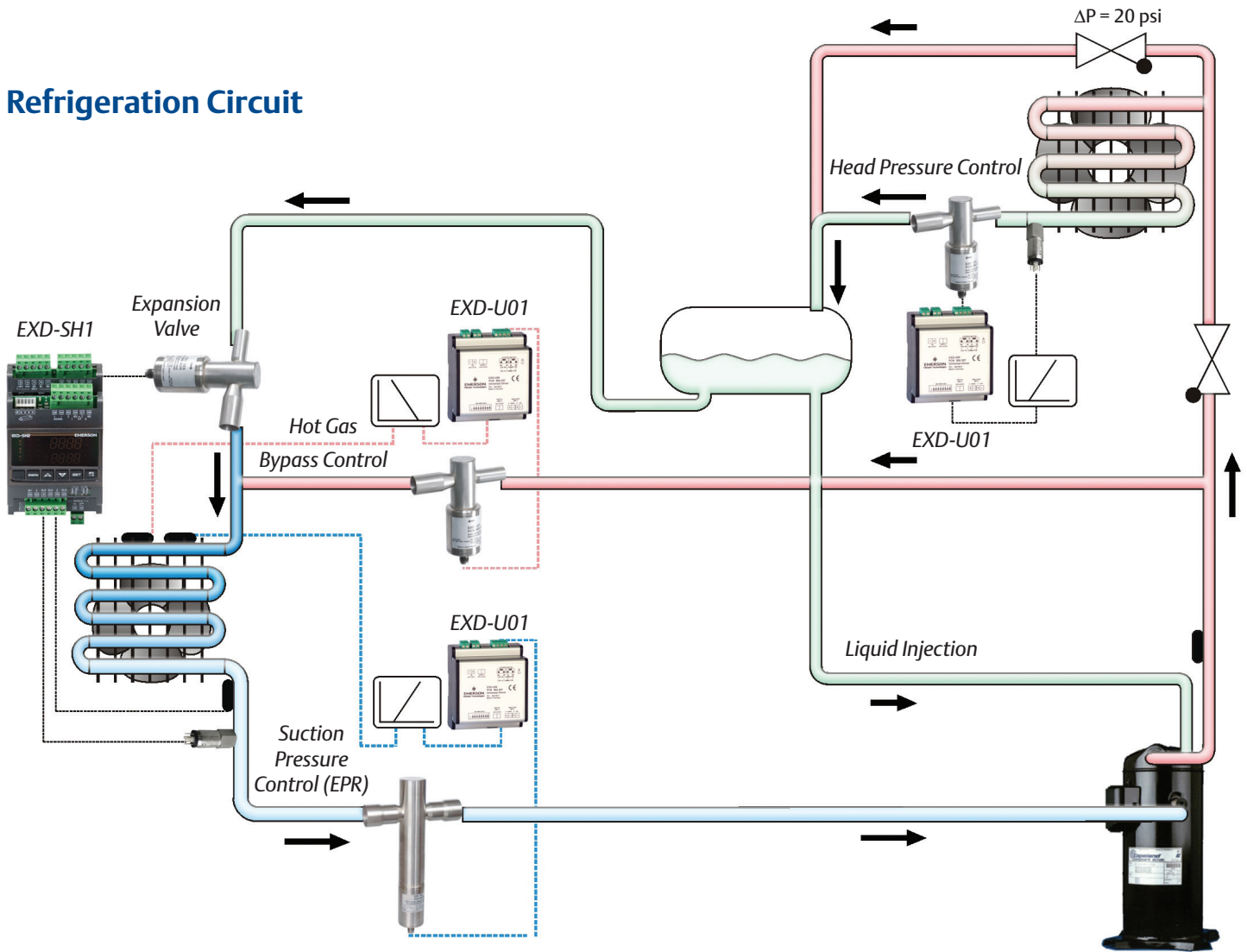
Emerson electronic valve controllers

Emerson valve controllers are optimized for the requirements of refrigeration and air-conditioning. They perform all control tasks, which have been performed by conventional valves in the past, such as superheat control or capacity control. The EXD-SH1 and EXD-SH2 are designed for precise control of the superheat or temperature in conjunction with EX4–EX8 Series valves. The EXD-SH2 can control two valves in independent refrigerant circuits. These controllers are also available in kits which include all components for installation excluding valves. A complete system consisting of control valve, superheat controller,

DESCRIPTION	MODEL NUMBER	ITEM NUMBER
EX 4 valve 3/8" x 5/8" ODF	EX4-I21 800615	097719
EX 5 valve 5/8" x 7/8" ODF	EX5-U21 800618	097720
EX 6 valve 7/8 x 1-1/8" ODF	EX6-I21 800620	097721
EX 7 valve 1-1/8" x 1-3/8" ODF	EX7-I21 800624	097722
EX 8 valve 1-5/8" x 1-5/8" ODF	EX8-I21 800631	097723
Superheat and/or temperature controller for 1 valve	EXD-SH1 807855	097175
Superheat and/or temperature controller for 2 valves	EXD-SH2 807856	097176
Superheat and/or temperature controller kit for 1 valve (kit includes 1 each EXD-SH1, EXV-M60, PT5N-18M, PT4-M60, TP1-NP6, EXD-M03, 90-T40F3). Valve not included.	EXD-SH1K	EXD-SH1K
Superheat and/or temperature controller kit for 2 valves (kit includes 1 each EXD-SH2, EXD-M03, 90-T50F3 and two of each PT4-M60, EXV-M60, TP1-NP6, PT5N-18M). Valve not included.	EXD-SH2K	EXD-SH2K
Universal driver	EXD-U01 808052	097795
Cable for supply voltage, 3 meter	EXD-M03 807865	097177
Valve Cable, 6 meter	EXV-M60 804665	097741
Pressure transmitter able to operate in a vacuum	PT5N-07M 805350	805350
Pressure transmitter including R-410A	PT5N-18M 805351	805351
Pressure transmitter including R-744	PT5N-30M 805352	805352
Plug & cable assy for pressure transmitter, 6 meter	PT4-M60 804805	097717
Temperature sensor std cable, 6 meter	TP1-NP6 804490	804490
Temperature sensor - ultra low temperature	ECN-Z60	807826
Transformer for 1 circuit	90-T40F3	90-T40F3
Transformer for 2 circuits	90-T50F3	90-T50F3

and temperature and pressure sensor, controls the superheat exactly to the setpoint, independent from condensing pressure. The MOP (Maximum Operating Pressure) function protects the compressor from dangerous overload conditions. The positive shut-off function eliminates the use of an additional solenoid valve. The controllers can easily be adjusted for all listed refrigerants and valve types. The universal stepper motor control driver, EXD-U01 is used for suction pressure regulation, hot gas bypass, head pressure control and other commercial refrigeration and air conditioning applications.

Refrigeration Circuit



Heat Pump Applications

For heatpumps with reversing refrigerant flow, bi-directional versions of the **EX4**, **EX5**, **EX6**, **EX7** are available to control flow in both directions.

DESCRIPTION	MODEL NUMBER	ITEM NUMBER
EX4 Bi-directional valve 3/8" x 5/8" ODF	EX4-U31 800617	097756
EX 5 Bi-directional valve 5/8" x 7/8" ODF	EX5-U31 800619	097729
EX 6 Bi-directional valve 7/8 x 1-1/8" ODF	EX6-I31 800622	097757
EX 7 Bi-directional valve 1-1/8" x 1-3/8" ODF	EX7-U31 800626	097758

