

PIPING PACKAGES

For Chilled and Hot Water Fan Coil Units,
Blower Coil Units, and AHUs

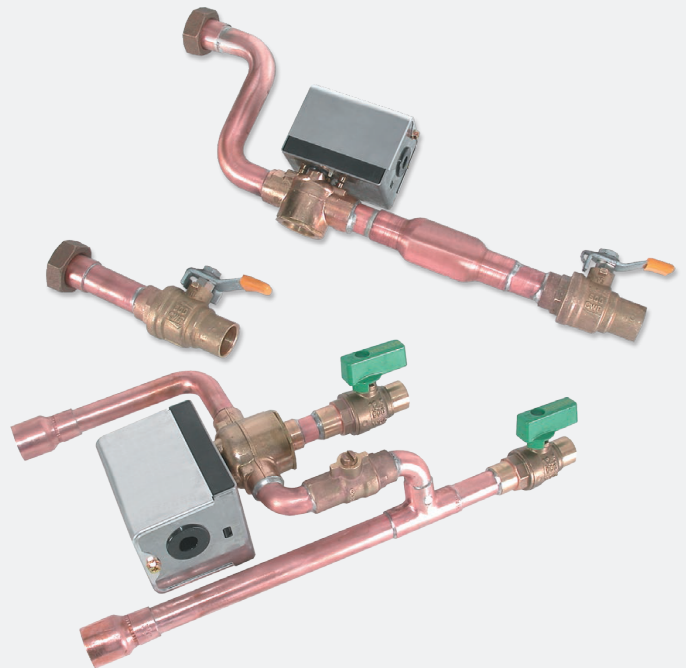


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GENERAL NOTES

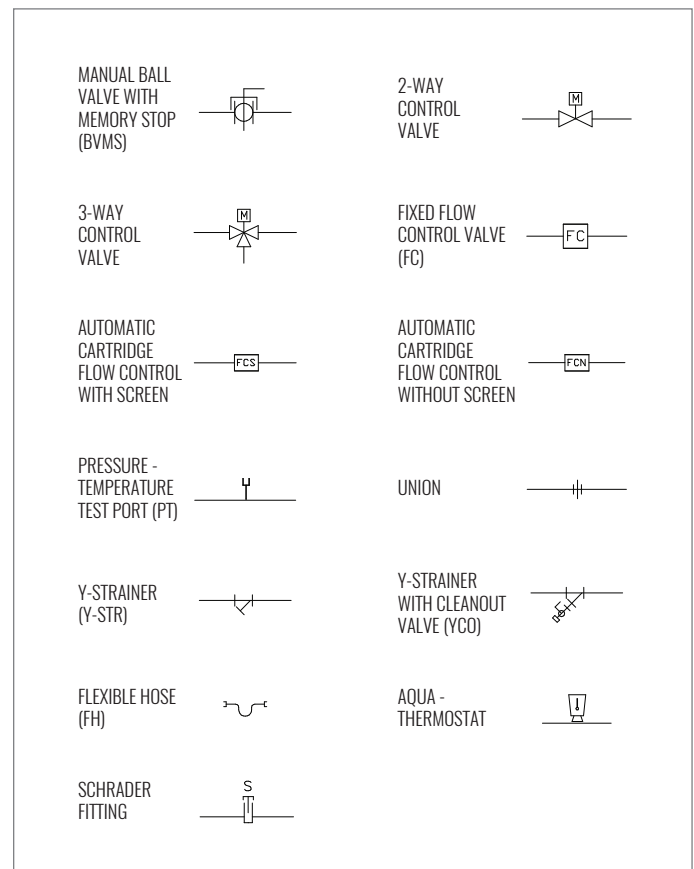
1. All the packages and components described in this brochure are optional, extra cost features. Consult your Krueger sales representative for details. Not all components are available on all unit models. See valve package code charts.
2. All standard valve packages and piping components described in this catalog are for chilled and hot water applications. They may also be used with ethylene and propylene glycol solutions up to 50% concentration.
3. KHF, KHG, and KVF fan coil unit packages are factory assembled and shipped loose for field installation and wiring; factory mounting is optional for some units. All KVP fan coil unit packages are factory assembled, installed, and wired.
4. KHF, KHG, and KVF unit valve packages are designed to mount directly onto the coil connections.
5. Control valve actuators are removable, and may be serviced or replaced without removal of the valve body.
6. Control valves are piped normally closed to the coil. For hot water coils, control valves are available normally open.
7. All ball isolation valves are furnished with an adjustable memory stop feature and may be used as a balancing valve.
8. When ordered, unions are installed at the water coil on all fan coil units except KVP. Unions must be ordered on both coils of 4-pipe units. Unions are not available separately.
9. All KVP units include two flexible stainless steel braided hoses and ball isolation valves per coil. This hose/valve combination provides a "union" type connection to allow coil removal.
10. Pressure/temperature (P/T) ports are located to monitor the pressure and temperature across the coil.
11. Component performance ratings such as Cv, maximum close-off pressure, operating temperature and pressure, are shown in Component Specifications.
12. Valve and component performance ratings shown are maximum values. Appearance and actual ratings may vary with individual vendor and component size.
13. 2-Pipe "change-over" units using a 2-way control valve and factory thermostat must be ordered with a 1/4" "bleed" line to assure proper changeover thermostat (aquastat) operation. The 1/4" "bleed" line is optional on 2-pipe "changeover" units with field provided thermostats.
14. Some piping packages may extend beyond the unit drain pan and/or factory auxiliary drip pan. Requirements for field furnished and installed valve package and piping insulation must be determined by others on an individual application basis.

The valve package piping and component details shown in this catalog are for standard valves and components. The suitability of all valve packages and components must be determined by others based on individual application requirements. Krueger assumes no responsibility for selection and/or application of valve packages and components.

Modulating cooling valve control can increase part load space relative humidity. Krueger does not encourage or endorse modulating valve control for fan coil cooling systems, and is not liable for high humidity problems that may result. Modulating heating valve control may result in low leaving air temperatures while the valve reduces flow and as setpoint is approached.

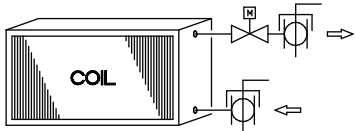
Contact the factory for any requirements not shown in this catalog.

CONTROL DEVICE LEGEND



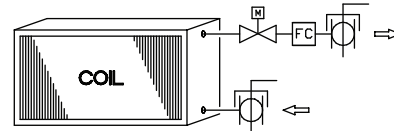
CODE DESCRIPTIONS | KHG/KHG/KVF FAN COILS

2-WAY PIPING PACKAGE										
PACKAGE CODE	COMPONENTS		VALVE SIZE			UNIONS			P/T PORTS	1/4" BLEED LINE
	BVMS	FC	1/2"	3/4"	1" *	1/2"	3/4"	1" *		
24	x		x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	x	x



CODE 24

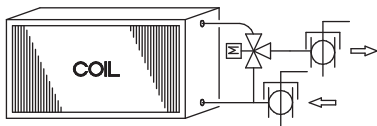
2-Way Control Valve and Ball Valves with Memory Stop



CODE 25

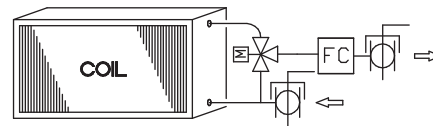
2-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control

3-WAY PIPING PACKAGE									
PACKAGE CODE	COMPONENTS		VALVE SIZE			UNIONS			P/T PORTS
	BVMS	FC	1/2"	3/4"	1" *	1/2"	3/4"	1" *	
36	x		x	x	x	x	x	x	x
37	x	x	x	x	x	x	x	x	x



CODE 36

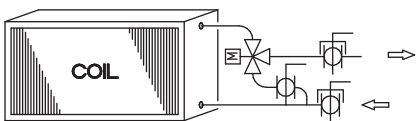
3-Way Control Valve and Ball Valves With Memory Stop



CODE 37

3-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control

3-WAY PACKAGE WITH BALANCE BYPASS VALVE									
PACKAGE CODE	COMPONENTS		VALVE SIZE			UNIONS			P/T PORTS
	BVMS	FC	1/2"	3/4"	1" *	1/2"	3/4"	1" *	
50	x		x	x	x	x	x	x	x



CODE 50

3-Way Control Valve, Ball Valve in Bypass, and Ball Valves With Memory Stop

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments > 4.0 to 9.0 GPM in 1.0 GPM Increments
3/4"	3.0 - 12.0 GPM	= 3.0 to 4.0 GPM in 0.5 GPM Increments > 4.0 to 12.0 GPM in 1.0 GPM Increments
1"	5.0 - 20.0 GPM	= 5.0 to 10 GPM in 1.0 GPM Increments > 10.0 to 20 GPM in 2.0 GPM Increments

CONTROL DEVICE LEGEND

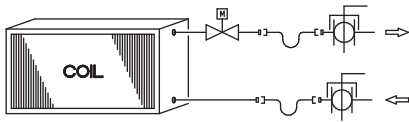
- BVMS:** Manual Ball Valves with Memory Stop, 600 PSIG
- FC:** Fixed Flow Control, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 400 PSIG
- Union:** 125 PSIG (contact factory for 600 PSIG)
- Control Valve:** 450 PSIG

NOTES

- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
- 1/4" bleed line is required on 2-pipe cool and heat auto changeover systems with factory provided thermostats; optional for thermostats by others.
- * 1" piping packages available on KHG only.

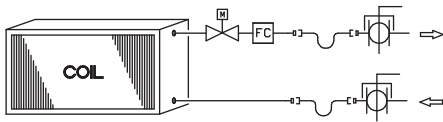
CODE DESCRIPTIONS | KVP FAN COILS

PACKAGE CODE	COMPONENTS				VALVE SIZE	Y-CO	P/T PORTS	1/4" BLEED LINE
	FC	Y-STR	FCN	FCS	1/2"			
32					X		X	X
34	X				X		X	X
60		X			X	X	X	X
61	X	X			X	X	X	X



CODE 32
2-Way Control Valve Only

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments



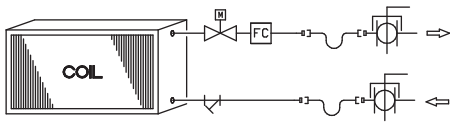
CODE 34
2-Way Control Valve and Fixed Flow Control

CONTROL DEVICE LEGEND

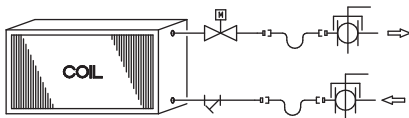
- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control w/ PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 400 PSIG
- Control Valve:** 450 PSIG

NOTES

- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
- 1/4" bleed line is required on 2-pipe cool and heat auto changeover systems with factory provided thermostats; optional for thermostats by others.



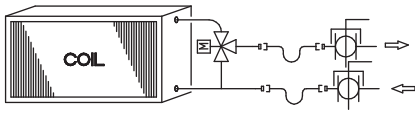
CODE 61
2-Way Control Valve, Fixed Flow Control, and Y Strainer



CODE 60
2-Way Control Valve and Y Strainer

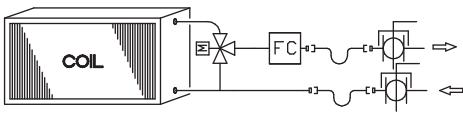
CODE DESCRIPTIONS | KVP FAN COILS

3-WAY PIPING PACKAGES							
PACKAGE CODE	COMPONENTS				VALVE SIZE	Y-CO	P/T PORTS
	FC	Y-STR	FCN	FCS	1/2"		
43					X		X
44	X				X		X
46		X			X	X	X
47	X	X			X	X	X



CODE 43
3-Way Control Valve Only

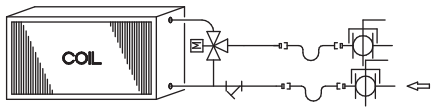
AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments



CODE 44
3-Way Control Valve and Fixed Flow Control

CONTROL DEVICE LEGEND

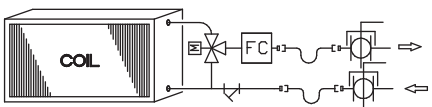
- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control w/ PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 400 PSIG
- Control Valve:** 450 PSIG



CODE 46
3-Way Control Valve and Y Strainer

NOTES

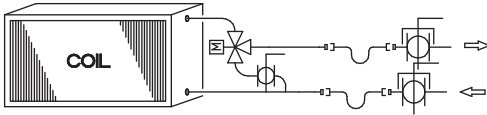
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.



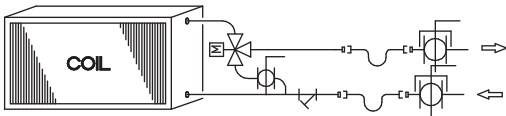
CODE 47
3-Way Control Valve, Fixed Flow Control and Y Strainer

CODE DESCRIPTIONS | KVP FAN COILS

3-WAY PIPING PACKAGES WITH BALANCE BYPASS VALVE								
PACKAGE CODE	COMPONENTS					VALVE SIZE	Y-CO	P/T PORTS
	FC	AFS	Y-STR	FCN	FCS	1/2"		
56						x		x
57			x			x	x	x



CODE 56
3-Way Control Valve and Balance Valve in Bypass



CODE 57
3-Way Control Valve, Balance Valve in Bypass and Y Strainer

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments

CONTROL DEVICE LEGEND

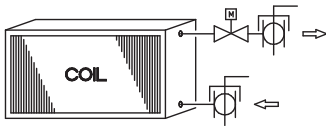
- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 400 PSIG
- Control Valve:** 450 PSIG

NOTES

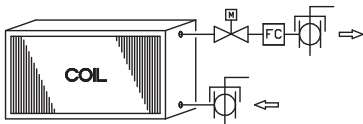
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

CODE DESCRIPTIONS | KBHD/KBHV DIRECT DRIVE BLOWER COILS

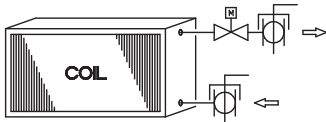
3-WAY PIPING PACKAGES																	
PACKAGE CODE	COMPONENTS				VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
24	x				x	x	x	x	x	x	x	x	x	x			
25	x	x			x	x	x	x	x	x	x	x	x	x	x		
26	x		x		x	x				x	x				x	x	
29	x			x				x	x				x	x			



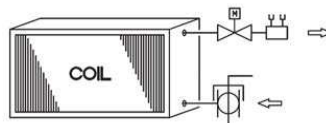
CODE 24
2-Way Control Valve and Ball Valves with Memory Stop



CODE 25
2-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control



CODE 26
2-Way PIC Valve and Ball Valves with Memory Stop



CODE 29
2-Way Control Valve, Ball Valve with Memory Stop, and Adjustable Flow Setter

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

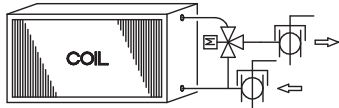
- FC:** Fixed Flow Control, 600 PSIG
- PICV:** Pressure Independent Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

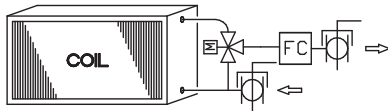
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
- Code 29 is a special. Please contact Application Engineering for more info.

CODE DESCRIPTIONS | KBHD/KBHV DIRECT DRIVE BLOWER COILS

3-WAY PIPING PACKAGES															
PACKAGE CODE	COMPONENTS		VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
36	x														
37	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x



CODE 36
3-Way Control Valve and Ball Valves With Memory Stop



CODE 37
3-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

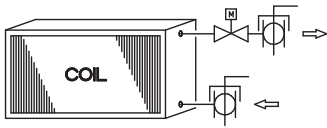
- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- ECN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

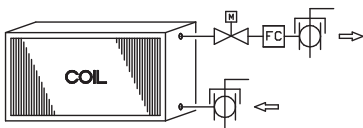
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

CODE DESCRIPTIONS | KVGH HIGH PERFORMANCE BLOWER COILS

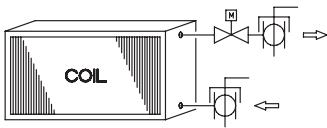
2-WAY PIPING PACKAGES																	
PACKAGE CODE	COMPONENTS				VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
24	x				x	x	x	x	x	x	x	x	x	x			
25	x	x			x	x	x	x	x	x	x	x	x	x	x		
26	x		x		x	x				x	x				x	x	
29	x			x				x	x				x	x			



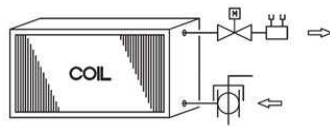
CODE 24
2-Way Control Valve and Ball Valves with Memory Stop



CODE 25
2-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control



CODE 26
2-Way PIC Valve and Ball Valves with Memory Stop



CODE 29
2-Way Control Valve, Ball Valve with Memory Stop, and Adjustable Flow Setter

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

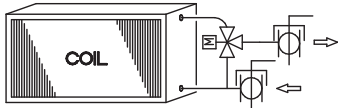
- FC:** Fixed Flow Control, 600 PSIG
- PICV:** Pressure Independent Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

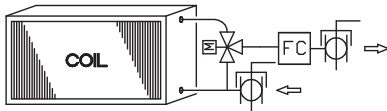
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
- Code 29 is a special. Please contact Application Engineering for more info.

CODE DESCRIPTIONS | KVGH HIGH PERFORMANCE BLOWER COILS

3-WAY PIPING PACKAGES															
PACKAGE CODE	COMPONENTS		VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
36	x														
37	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x



CODE 36
3-Way Control Valve and Ball Valves with Memory Stop



CODE 37
3-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

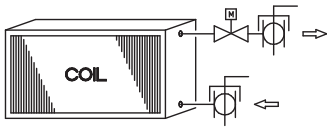
- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- ECN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

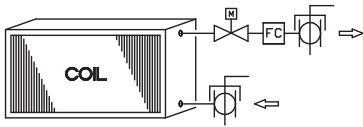
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

CODE DESCRIPTIONS | KSL/KSB REDUCED FOOTPRINT BLOWER COILS

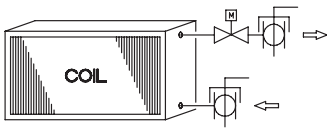
2-WAY PIPING PACKAGES																	
PACKAGE CODE	COMPONENTS				VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
24	x				x	x	x	x	x	x	x	x	x	x			
25	x	x			x	x	x	x	x	x	x	x	x	x	x		
26	x		x		x	x				x	x				x	x	
29	x			x				x	x				x	x			



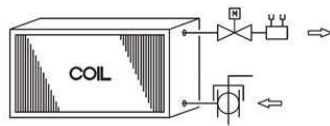
CODE 24
2-Way Control Valve and Ball Valves with Memory Stop



CODE 25
2-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control



CODE 26
2-Way PIC Valve and Ball Valves with Memory Stop



CODE 29
2-Way Control Valve, Ball Valve with Memory Stop, and Adjustable Flow Setter

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

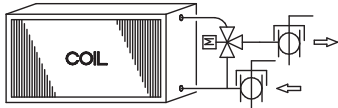
- FC:** Fixed Flow Control, 600 PSIG
- PICV:** Pressure Independent Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

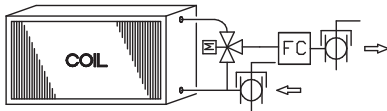
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
- Code 29 is a special. Please contact Application Engineering for more info.

CODE DESCRIPTIONS | KSL/KSB REDUCED FOOTPRINT BLOWER COILS

3-WAY PIPING PACKAGES															
PACKAGE CODE	COMPONENTS		VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
36	x														
37	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x



CODE 36
3-Way Control Valve and Ball Valves with Memory Stop



CODE 37
3-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

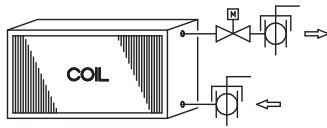
- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- ECN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

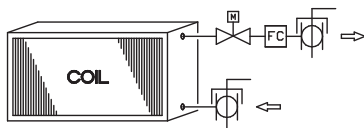
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

CODE DESCRIPTIONS | KBM MODULAR INDOOR AIR HANDLER

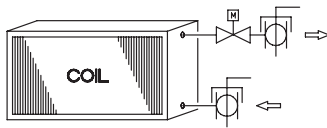
2-WAY PIPING PACKAGES																	
PACKAGE CODE	COMPONENTS				VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
24	x				x	x	x	x	x	x	x	x	x	x			
25	x	x			x	x	x	x	x	x	x	x	x	x	x		
26	x		x		x	x				x	x				x	x	
29	x			x				x	x				x	x			



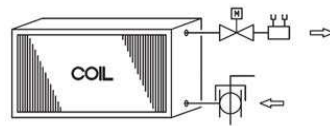
CODE 24
2-Way Control Valve and Ball Valves with Memory Stop



CODE 25
2-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control



CODE 26
2-Way PIC Valve and Ball Valves with Memory Stop



CODE 29
2-Way Control Valve, Ball Valve with Memory Stop, and Adjustable Flow Setter

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

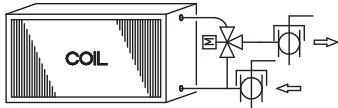
- FC:** Fixed Flow Control, 600 PSIG
- PICV:** Pressure Independent Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- FCN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

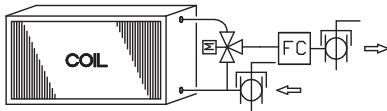
- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
- Code 29 is a special. Please contact Application Engineering for more info.

CODE DESCRIPTIONS | KBM MODULAR INDOOR AIR HANDLER

3-WAY PIPING PACKAGES															
PACKAGE CODE	COMPONENTS		VALVE SIZE					UNIONS					P/T PORTS	Y-STR	1/4" BLEED LINE
	BVMS	FC	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"			
36	x														
37	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x



CODE 36
3-Way Control Valve and Ball Valves with Memory Stop



CODE 37
3-Way Control Valve, Ball Valves with Memory Stop, and Fixed Flow Control

AUTOMATIC FIXED FLOW CONTROLS (FC, FCN, FCS) GPM RANGES AND AVAILABLE INCREMENTS		
PIPING PACKAGE DIAMETER	GPM RANGE	INDIVIDUAL COIL GPM REQUIREMENTS (MUST BE SPECIFIED AT TIME OF ORDER)
1/2"	0.5 - 8.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 8.0 GPM in 1.0 GPM Increments
3/4"	4.0 to 15.0 GPM	4.0 to 15.0 GPM in 1.0 GPM Increments
1"	11.0 to 22.0 GPM	11.0 to 22.0 GPM in 1.0 GPM Increments
1-1/4"	18.0 to 29.0 GPM	18.0 to 29.0 GPM in 1.0 GPM Increments
1-1/2"	26.0 to 45.0 GPM	26.0 to 45.0 GPM in 1.0 GPM Increments

Note: 1-1/4" and 1-1/2" piping packages include unions with integrated P/T ports.

CONTROL DEVICE LEGEND

- FC:** Fixed Flow Control, 600 PSIG
- Y-STR:** Y-Strainer, 600 PSIG
- ECN:** Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
- FCS:** Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
- Y-CO:** Y-Strainer Cleanout, 600 PSIG
- P/T Port:** Pressure/Temperature Test Port, 450 PSIG
- Control Valve:** 450 PSIG

NOTES

- All drawings subject to change without prior notice.
- Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

GUIDE SPECIFICATIONS

Provide a standard factory assembled valve piping package to consist of a 2 or 3 way, on/off, motorized electric control valve and two ball isolation valves. Control valves are piped normally closed to the coil. Maximum entering water temperature on the control valve is 200°F, and maximum close-off pressure is 40 PSIG (1/2"), 20 PSIG (3/4"), 17 PSIG (1"), 50 PSIG (1¼"), 50 PSIG (1½"). Maximum operating pressure shall be 450 PSIG.

Option: Provide 24V floating point modulating control valve (fail-in-place) in lieu of standard 2-position control valve with factory assembled or kit valve piping package.

Option: Provide 0-10V proportional control valve (fail-in-place) in lieu of standard 2-position control valve with factory assembled or kit valve piping package.

Option: Provide normally open control valve for hot water coils.

Option: Provide high pressure close-off actuators for 2-way control valves. Maximum close-off pressure is 125 PSIG for 1/2" and 3/4".

Option: Provide a fixed flow control device for each piping package.

Option: Provide a pressure independent control valve (PICV) for each piping package.

Option: Provide unions and/or pressure-temperature ports for each piping package.

Option: Valve packages shipped factory installed on fan coil.

KHF, KHG, and KVF: Piping package shall be completely factory assembled, including interconnecting pipe, and shipped separate from the unit for field installation on the coil, so as to minimize the risk of freight damage.

Model KVP: Piping package shall be completely factory assembled, tested, mounted to coil, and include stainless steel braided hoses.

SPECIFICATIONS

MANUAL BALL VALVE W/MEMORY STOP (BVMS)

An adjustable stop position lever to limit travel of the ON/OFF handle. This allows the ball valve to be closed, and returned to the balance setting position without re-testing the system. 1/2" size shown.

<u>Nominal Size:</u>	1/2"	3/4"	1"
<u>Body Material:</u>	Brass	Brass	Brass
<u>Ball:</u>	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated
<u>Seats:</u>	Teflon	Teflon	Teflon
<u>Stem Seal:</u>	(2) Viton O-Rings	Teflon	Teflon
<u>Connection:</u>	Sweat	Sweat	Sweat
<u>Pressure Rating, (psig):</u>	600	600	600
<u>Temp. Rating, °F:</u>	325	325	325
<u>Cv:</u>	17	32	27



FLEXIBLE HOSE KITS, 18" (FH)

<u>Materials:</u>	EPDM inner lined, KeFLar® reinforced hose with stainless steel outer covering
<u>Flow Rates:</u>	0.5 to 12.0 GPM, based on application
<u>Pressure Temp. Rating:</u>	375 PSIG @ 250°F (450 PSIG test pressure)
<u>Min Burst Pressure:</u>	1500 PSI
<u>Flame Spread:</u>	Not greater than 25 per UL 723
<u>Smoke Development:</u>	Not greater than 50 per UL 723
<u>Ball Valve with Memory Stop:</u>	Full port brass
• Ball:	Stainless steel
• Seats:	Teflon
• Stem Seal:	(2) Viton O-Rings
• Pressure Rating:	600 PSIG WOG
• Temperature Rating:	325°F
• Cv:	20



NOTE: Available in 1/2" size only.

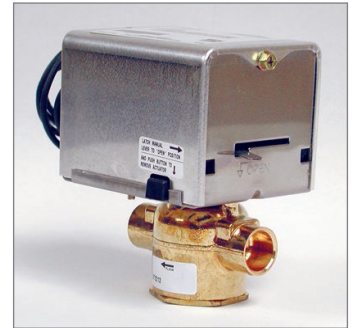
SPECIFICATIONS

TYPICAL 2-WAY, 2-POSITION PADDLE STYLE VALVE

Applicable for KVF*/KVL* Series only.

A 2-position water control valve driven open with spring return upon a call for heating or cooling to maintain space temperature. In open position, water can flow through the unit's water coil to heat or cool the space depending on supply water temperature. In closed position, water cannot flow through the water coil. Control valves are piped normally closed to the coil as standard. Valve actuators are low voltage (24VAC).

Nominal Size:	1/2" 2-Way	3/4" 2-Way	1" 2-Way
Body Material:	Brass	Brass	Brass
Connection:	Sweat	Sweat	Sweat
Pressure Rating (psig):	450	450	450
Temp. Rating, °F:	200	200	200
Cv:	2.5	5.0	8.0
Max Close-off Pressure, Std. (psig):	40	20	17
High Close-off:	50	25	20
Power Consumption:	7 VA	7 VA	7 VA



TYPICAL 3-WAY, 2-POSITION PADDLE STYLE VALVE

Applicable for KVF*/KVL* Series only.

A 2-position water control valve driven open with spring return (bypass) upon a call for heating or cooling to maintain space temperature. Energized, the bypass port is blocked, and water can flow through the unit's water coil to heat or cool the space depending on the supply water temperature. De-energized, water cannot flow through the water coil but is forced to flow through the bypass port, bypassing the coil. Control valves are piped normally closed to the coil as standard (in full bypass). Valve actuators are low voltage (24VAC).

Nominal Size:	1/2" 3-Way	3/4" 3-Way	1" 3-Way
Body Material:	Brass	Brass	Brass
Connection:	Sweat	Sweat	Sweat
Pressure Rating (psig):	450	450	450
Temperature Rating, °F:	200	200	200
Cv:	3.0	5.0	8.0
Max Close-off Pressure (psig):	N/A	N/A	N/A
Power Consumption:	7 VA	7 VA	7 VA



SPECIFICATIONS

TYPICAL 2-WAY, 2-POSITION MOTORIZED BALL VALVE

A 2-position water control motorized ball valve driven open with a capacitor upon a call for heating or cooling to maintain space temperature. In open position, water can flow through the unit's water coil to heat or cool the space depending on supply water temperature. In closed position, water cannot flow through the water coil. Control valves are piped normally closed to the coil as standard. Valve actuators are low voltage (24VAC).

<u>Nominal Size:</u>	1/2" 2-Way	3/4" 2-Way	1" 2-Way
<u>Body Material:</u>	Forged Brass	Forged Brass	Forged Brass
<u>Connection:</u>	Sweat	Sweat	Sweat
<u>Pressure Rating (psig):</u>	450	450	450
<u>Temperature Rating, °F:</u>	240	240	240
<u>Cv:</u>	4.9	10.3	8.9
<u>Max Close-off Pressure, Operating (psig):</u>	125	125	125
<u>Power Consumption, Power On:</u>	2 VA	2 VA	2 VA
<u>Power Consumption, Charging:</u>	12 VA	12 VA	12 VA



TYPICAL 3-WAY, 2-POSITION MOTORIZED BALL VALVE

A 2-position water control motorized ball valve driven open with a capacitor (bypass) upon a call for heating or cooling to maintain space temperature. Energized, the bypass port is blocked, and water can flow through the unit's water coil to heat or cool the space depending on the supply water temperature. De-energized, water cannot flow through the water coil but is forced to flow through the bypass port, bypassing the coil. Control valves are piped normally closed to the coil as standard (in full bypass). Valve actuators are low voltage (24VAC).

<u>Nominal Size:</u>	1/2" 3-Way	3/4" 3-Way	1" 3-Way
<u>Body Material:</u>	Forged Brass	Forged Brass	Forged Brass
<u>Connection:</u>	Sweat	Sweat	Sweat
<u>Pressure Rating (psig):</u>	450	450	450
<u>Temperature Rating, °F:</u>	240	240	240
<u>Cv:</u>	1.5	3.3	3.0
<u>Max Close-off Pressure, Operating (psig):</u>	125	125	125
<u>Power Consumption, Power On:</u>	2 VA	2 VA	2 VA
<u>Power Consumption, Charging:</u>	12 VA	12 VA	12 VA



SPECIFICATIONS

TYPICAL 2-WAY MODULATING CONTROL VALVE

A 24V floating point, fail-in-place (non-spring return) modulating water control valve, driven open or closed upon a call for heating or cooling to maintain space temperature. In the open position, water can flow through the unit's water coil to heat or cool the space depending on supply water temperature. In the closed position, water cannot flow through the water coil. Factory furnished 2-way valve packages are piped normally closed to the water coil. The floating point control valve is compatible with any 24VAC three-wire signal when three minute time-out logic resides in the thermostat or system controller.

<u>Nominal Size:</u>	1/2" 2-Way	3/4" 2-Way	1" 2-Way
<u>Body Material:</u>	Brass	Brass	Brass
<u>Connection:</u>	NPT	NPT	NPT
<u>Pressure Rating (psig):</u>	450	450	450
<u>Temperature Rating, °F:</u>	200	200	200
<u>Cv:</u>	1.9	4.7	7.4
<u>Max Close-off Pressure, Operating (psig):</u>	200	200	200
<u>Power Consumption:</u>	3VA	3VA	3VA

NOTE: Contact factory for 24V floating, spring return applications.



TYPICAL 3-WAY MODULATING CONTROL VALVE

A 24V floating point, fail-in-place (non-spring return) modulating water control valve, driven open or closed (bypass) upon a call for heating or cooling to maintain space temperature. In the "open" position, the bypass port is closed and water is directed through the unit's water coil to heat or cool the space depending on supply water temperature. In the "closed" position, the service (water coil) port is closed and water is directed through the bypass port. Factory furnished 3-way valve packages are piped as "mixing" valves. The floating point control valve is compatible with any 24VAC three-wire signal when three minute time-out logic resides in the thermostat or system controller.

<u>Nominal Size:</u>	1/2" 3-Way	3/4" 3-Way	1" 3-Way
<u>Body Material:</u>	Brass	Brass	Brass
<u>Connection:</u>	NPT	NPT	NPT
<u>Pressure Rating (psig):</u>	450	450	450
<u>Temperature Rating, °F:</u>	200	200	200
<u>Cv:</u>	1.9	4.7	7.4
<u>Max Close-off Pressure, Operating (psig):</u>	200	200	200
<u>Power Consumption:</u>	3VA	3VA	3VA

NOTE: Contact factory for 24V floating, spring return applications.



SPECIFICATIONS

TYPICAL 2-WAY UNIVERSAL CONTROL VALVE

A 24V floating point, fail-in-place (non-spring return) on/off, floating, or proportional water control valve, driven open or closed upon a call for heating or cooling to maintain space temperature. In the open position, water can flow through the unit's water coil to heat or cool the space depending on supply water temperature. In the closed position, water cannot flow through the water coil. Factory furnished 2-way valve packages are piped normally closed to the water coil. The floating point control valve is compatible with any 24VAC three-wire signal when three minute time-out logic resides in the thermostat or system controller.

<u>Nominal Size:</u>	1 1/4" 2-Way	1 1/2" 2-Way
<u>Body Material:</u>	Brass	Brass
<u>Connection:</u>	NPT	NPT
<u>Pressure Rating (psig):</u>	450	450
<u>Temperature Rating, °F:</u>	200	200
<u>Cv:</u>	11.7	18.7
<u>Maximum Close-off Pressure</u>		
<u>Operating Mode (PSI):</u>	200	200
<u>Power Consumption:</u>	3VA	3VA

NOTE: Contact factory for 24V floating, spring return applications.



NOTE: Photos are for representation purposes only. Vendors and models subject to change without notice.

TYPICAL 3-WAY UNIVERSAL CONTROL VALVE

A 24V floating point, fail-in-place (non-spring return) on/off, floating, or proportional water control valve, driven open or closed (bypass) upon a call for heating or cooling to maintain space temperature. In the "open" position, the bypass port is closed and water is directed through the unit's water coil to heat or cool the space depending on supply water temperature. In the "closed" position, the service (water coil) port is closed and water is directed through the bypass port. Factory furnished 3-way valve packages are piped as "mixing" valves. The floating point control valve is compatible with any 24VAC three-wire signal when three minute time-out logic resides in the thermostat or system controller.

<u>Nominal Size:</u>	1 1/4" 3-Way	1 1/2" 3-Way
<u>Body Material:</u>	Brass	Brass
<u>Connection:</u>	NPT	NPT
<u>Pressure Rating (psig):</u>	450	450
<u>Temperature Rating, °F:</u>	200	200
<u>Cv:</u>	11.7	18.7
<u>Maximum Close-off Pressure</u>		
<u>Operating Mode (PSI):</u>	200	200
<u>Power Consumption:</u>	3VA	3VA

NOTE: Contact factory for 24V floating, spring return applications.



NOTE: Photos are for representation purposes only. Vendors and models subject to change without notice.

ADJUSTABLE FLOW SETTER (AFS)

A control device designed to allow maximum water flow through the unit coil in the open (0%) position, and as little as 10% of flow through the unit coil in the closed (90%) position.

<u>Nominal Size:</u>	1 1/4" and 1 1/2"
<u>Body Material:</u>	Forged Brass
<u>Connection:</u>	Sweat
<u>Pressure Rating (psig):</u>	450
<u>Temp. Rating, °F:</u>	250
<u>Cv:</u>	Variable



NOTE: Photos are for representation purposes only. Vendors and models subject to change without notice.

SPECIFICATIONS

PRESSURE INDEPENDENT CONTROL VALVE (PICV)

PICV is a combination of three main components; a pressure regulator, a regulating valve, and a control valve. The pressure regulator adjusts the system for pressure fluctuation, while the regulating valve sets the maximum flow. The control valve modulates between the minimum and maximum flow in response to the configured flow rate.

Nominal Sizes:	1/2" and 3/4"
Body Material:	Forged Brass
Connection:	NPT
Seals:	EPDM O-Rings
Pressure Rating (psig):	360
Temp. Rating, °F:	250
PSIG Range:	3 - 87

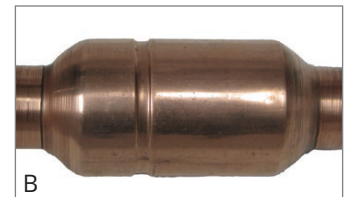


NOTE: Photos are for representation purposes only. Vendors and models subject to change without notice.

AUTOMATIC FIXED FLOW CONTROL (FC)

A pressure compensated automatic fixed flow control device designed to limit the flow GPM through the unit coil. Desired GPM must be specified when ordering. Device A shown is typical for controlling flow up to 8.0 GPM, and features a changeable flow cartridge. Device B is typical for flows above 8.0 GPM.

Nominal Size (A):	1/2" and 3/4"
Nominal Size (B):	3/4" and 1"
Body Material:	Copper
Connection:	Sweat
Pressure Rating (psig) (A):	600
Pressure Rating (psig) (B):	522
Temperature Rating, °F:	225
Cv:	Variable with Inlet Pressure

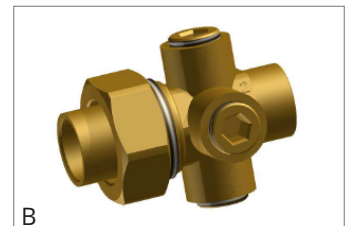


UNIONS

A fitting used to provide a mechanical connection between the coil and valve package that can be connected, disconnected, and re-connected without the need to cut tubing or unsolder a joint. Unions (Figure A) are installed at the coil on KPF, KHG, and KVF fan coil units. Unions are not available on KVP fan coil units For convenience, 1/4" and 1/2" unions include an integrated P/T port (Figure B).

Nominal Size:	1/2", 3/4", and 1"
Body Material:	Bronze/Copper
Connection:	Sweat
Pressure Rating (psig):	500
Temperature Rating, °F:	200

NOTE: *Contact factory for unions rated at 600 PSIG and 325°F.



SPECIFICATIONS

Y-STRAINER (Y-STR)

Designed to allow water to flow through a built in screen to filter debris or contaminants from the water system. With the water system isolated, the plug can be removed from the blowdown leg of the strainer and the captured debris removed from the screen. After the plug is replaced, the system can be put back in operation and the strainer will continue to filter the unit's water.

<u>Nominal Size:</u>	1/2", 3/4", 1", 1 1/4", 1 1/2"
<u>Body Material:</u>	Forged Brass
<u>Connection:</u>	Sweat
<u>Pressure Rating (psig):</u>	600
<u>Temperature Rating, °F:</u>	325
<u>Screen:</u>	20 Mesh Stainless Steel



BLOW DOWN VALVE (Y-CO)

A standard ball valve installed on the strainer blowdown leg to allow flushing the strainer screen without removing the plug in the blowdown leg. This valve has a standard 1/2" garden hose connection to allow fluid to be piped to a container or remote location during cleaning. Not available separately.

<u>Nominal Size:</u>	1/4"
<u>Body Material:</u>	Bronze
<u>Connection:</u>	MPT
<u>Pressure Rating (psig):</u>	600
<u>Temperature Rating, °F:</u>	200



OPTIONAL PRESSURE/TEMPERATURE TEST PORT LOCATIONS (P/T)

Designed to allow testing of water pressure, differential pressure or water temperature without interrupting the waterside operation of the fan coil unit. Sensor probes (1/8") are not included.

<u>Nominal Size:</u>	1/4"
<u>Body Material:</u>	Brass
<u>Connection:</u>	MPT
<u>Pressure Rating (psig):</u>	400
<u>Temperature Rating, °F:</u>	250



OPTIONAL PRESSURE/TEMPERATURE TEST PORT LOCATIONS (P/T)

The SEN-700-1 digital duct temperature sensor measures indoor air temperature in the return air duct. If used indoors as a remote temperature sensor, the sensor will read room temperature and send the information to the thermostat. If used as a duct temperature sensor, this sensor may be used to provide duct temperature information (which is not used to control heating or cooling).

<u>Operating Range:</u>	-40° to 127°F
<u>Agency Approval:</u>	UL listed, CSA Approved



SPECIFICATIONS

AQUA THERMOSTAT

The aqua thermostat, also called an automatic seasonal changeover switch or aquastat, is a switch designed to change a room thermostat from heating to cooling and back, based on the temperature of the water supplied to a 2-pipe unit to be used for both heating and cooling. The switch is shipped loose and is mounted in the field on the water tubing using the integral clip or spring.

<u>Nominal Size:</u>	1/2", 3/4" and 1"
<u>Switch Action:</u>	SPDT
<u>Switch on Temperature Rise:</u>	85°F (± 6°F)
<u>Switch on Temperature Fall:</u>	70°F (± 6°F)
<u>Current Rating:</u>	120VAC = 5.8 FLA/34.8 LRA (Inductive), 10.0 Amps (Resistive)
<u>208/240VAC =</u>	2.9 FLA/17.4 LRA (Inductive), 2.0 Amps (Resistive)
<u>277VAC =</u>	3.6 FLA/21.6 LRA (Inductive), 1.0 Amp (Resistive)
<u>Agency Approval:</u>	UL Listed, CSA Approved

NOTE: Ratings may vary with vendor and size.



COPPER TUBE DATA

COPPER TUBE DIMENSIONAL AND PHYSICAL DATA											
NOMINAL DIAMETER (IN.)	WALL THICKNESS (T, IN.)	DIAMETER		SURFACE AREA		CROSS SECTION		WEIGHT			
		OUTSIDE (D, IN.)	INSIDE (D, IN.)	OUTSIDE (FT², FT)	INSIDE (FT², FT)	METAL AREA (IN²)	FLOW AREA (IN²)	TUBE (LB/FT)	WATER (LB/FT)	1/2" INS. (LB/FT)	3/4" INS. (LB/FT)
TYPE K (COLOR CODE: GREEN)											
3/4	0.065	0.875	0.745	0.229	0.195	0.165	0.436	0.641	0.189	0.04	0.06
1	0.065	1.125	0.995	0.295	0.260	0.216	0.778	0.839	0.336	0.05	0.07
1 1/4	0.065	1.375	1.245	0.360	0.326	0.268	1.217	1.037	0.527	0.06	0.09
1 1/2	0.072	1.625	1.481	0.425	0.388	0.351	1.723	1.361	0.745	0.07	0.11
2	0.083	2.125	1.959	0.556	0.513	0.532	3.014	2.063	1.304	0.09	0.14
2 1/2	0.095	2.625	2.435	0.687	0.637	0.755	4.657	2.926	2.015	0.11	0.17
3	0.109	3.125	2.907	0.818	0.761	1.033	6.637	4.002	2.872	0.14	0.20
TYPE L (COLOR CODE: BLUE)											
3/4	0.045	0.875	0.785	0.229	0.206	0.117	0.484	0.455	0.209	0.04	0.06
1	0.050	1.125	1.025	0.295	0.268	0.169	0.825	0.654	0.357	0.05	0.07
1 1/4	0.055	1.375	1.265	0.360	0.331	0.228	1.257	0.884	0.544	0.06	0.09
1 1/2	0.060	1.625	1.505	0.425	0.394	0.295	1.779	1.143	0.770	0.07	0.11
2	0.070	2.125	1.985	0.556	0.520	0.452	3.095	1.751	1.339	0.09	0.14
2 1/2	0.080	2.625	2.465	0.687	0.645	0.640	4.772	2.479	2.065	0.11	0.17
3	0.090	3.125	2.945	0.818	0.771	0.858	6.812	3.325	2.947	0.14	0.20
TYPE M (COLOR CODE: RED)											
3/4	0.032	0.875	0.811	0.229	0.212	0.085	0.517	0.328	0.224	0.04	0.06
1	0.035	1.125	1.055	0.295	0.276	0.120	0.874	0.464	0.378	0.05	0.07
1 1/4	0.042	1.375	1.291	0.360	0.388	0.176	1.309	0.682	0.566	0.06	0.09
1 1/2	0.049	1.625	1.527	0.425	0.400	0.243	1.831	0.940	0.792	0.07	0.11
2	0.058	2.125	2.009	0.556	0.526	0.377	3.170	1.459	1.372	0.09	0.14
2 1/2	0.065	2.625	2.495	0.687	0.653	0.523	4.889	2.026	2.116	0.11	0.17
3	0.072	3.125	2.981	0.818	0.780	0.691	6.979	2.676	3.020	0.14	0.20

SOURCE: CDA Copper Development Association - The Copper Tube Handbook

SOLDERED AND BRAZED JOINT RATED WORKING PRESSURE				
ALLOY USED FOR JOINTS	WATER AND NONCORROSIVE LIQUIDS AND GASES ^a			
	SERVICE TEMP. (°F)	NOMINAL TUBE SIZE (TYPES K, L, M)		
		3/4" TO 1"	1 1/4" TO 2"	2 1/2" TO 3"
50-50 TIN-LEAD ^b SOLDER (ASTM B32 GR 50A)	100	200	175	150
	150	150	125	100
	200	100	90	75
	250	85	75	50
95-5 TIN-ANTIMONY ^c SOLDER (ASTM B32 GR 50TA)	100	500	400	300
	150	400	350	275
	200	300	250	200
	250	200	175	150
BRAZING ALLOYS MELT TEMPERATURE >= 1000° F	100 to 200	REFERENCE 'D'	REFERENCE 'D'	REFERENCE 'D'
	250	300	270	170
	350	270	190	150

NOTES:

- Tin-lead solder shall not be used in Krueger products.
- Tin-Antimony solder is used on Krueger valve packages and "packed" or "gasketed" parts.
- Brazing alloy is used for all Krueger coils, risers and piping runs.

SOURCE: CDA Copper Development Association - The Copper Tube Handbook

- Solder joints shall not be used for:
 - Flammable or toxic gases or liquids
 - Gas, vapor or compressed air in tubing over 4 inch, unless maximum pressure is limited to 20 psig.
- Lead based solders must not be used on potable water systems
- Tin-Antimony solder is allowed for potable water supplies in some jurisdictions.
- Rated pressure for up to 200°F applies to the tube being joined – see pipe internal pressure chart.

COPPER TUBE DATA

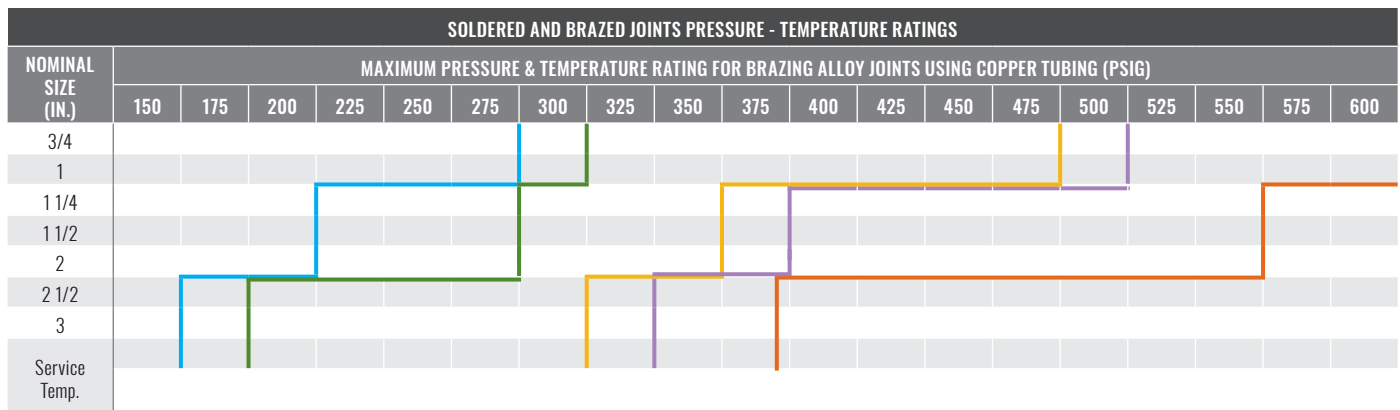
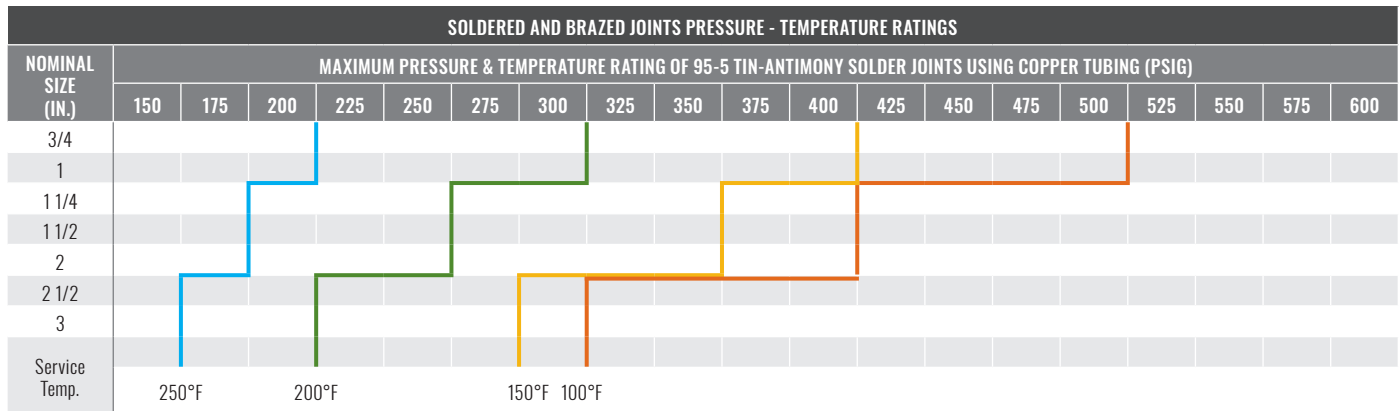
COPPER TUBE RATED INTERNAL WORKING PRESSURE (PSIG)								
NOMINAL SIZE (IN.)	ANNEALED (SOFT)				DRAWN (HARD)			
	S = 6000 PSI 100° F	S = 5100 PSI 150° F	S = 4800 PSI 200° F	S = 4800 PSI 250° F	S = 9000 PSI 100° F	S = 9000 PSI 150° F	S = 9000 PSI 200° F	S = 9000 PSI 250° F
TYPE K (COLOR CODE: GREEN)								
3/4	852	724	682	682	1278	1278	1278	1278
1	655	557	524	524	982	982	982	982
1 1/4	532	452	425	425	797	797	797	797
1 1/2	494	420	396	396	742	742	742	742
2	435	370	348	348	652	652	652	652
2 1/2	398	338	319	319	597	597	597	597
3	385	328	308	308	578	578	578	578
TYPE L (COLOR CODE: BLUE)								
3/4	582	495	466	466	873	873	873	873
1	494	420	395	395	741	741	741	741
1 1/4	439	373	351	351	658	658	658	658
1 1/2	408	347	327	327	613	613	613	613
2	364	309	291	291	545	545	545	545
2 1/2	336	285	269	269	504	504	504	504
3	317	270	254	254	476	476	476	476
TYPE M (COLOR CODE: RED)								
3/4	407	346	326	326	611	611	611	611
1	337	286	270	270	506	506	506	506
1 1/4	338	285	270	270	507	507	507	507
1 1/2	331	282	265	265	497	497	497	497
2	299	254	239	239	448	448	448	448
2 1/2	274	233	219	219	411	411	411	411
3	253	215	203	203	380	380	380	380

SOURCE: CDA Copper Development Association - The Copper Tube Handbook

NOTES:

- Table values based on the maximum allowable stress in tension (psi) for the indicated service temperature (° F).
- When brazing or soldering is used to join drawn (hard) tubing, the corresponding annealed rating shall be used.
- Type M annealed temper is not readily available. Annealed values indicated for use when heating or forming drawn tube.

COPPER TUBE DATA



NOTES:

- Pressure ratings based on ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- Tubing pressure ratings may exceed those shown if joints are not present and tubing is not annealed. See Copper Tube Internal Pressure Ratings Chart for those cases.

COPPER TUBE DATA

PIPING SYSTEM COMPONENT MAXIMUM WORKING PRESSURE (PSIG)																				
SYSTEM WORKING PRESSURE (PSIG)	WATER COIL			BALL VALVES	MOTORIZED CONTROL VALVES ^A						FLOW CONTROL		1/4" SCHRAEDER VALVE	PRESSURE / TEMP. TEST PORT	FLEXIBLE HOSE KIT	Y-STRAINER		UNIONS ^G		
	COIL	AIR VENT			2 POSITION			MODULATING ^B			AUTOMATIC					BODY	CLEAN-OUT			
		MANUAL	AUTO		1/2"	3/4"	1"	1/2"	3/4"	1"	FIXED	CARTRIDGE ^C								
100	250 @ 200°F, 15 PSIG Steam	400 @ 200°F	150 @ 240°F	600 @ 200°F	40	20	17	50	35	35	522 @ 225°F	230 @ 250°F	400 @ 250°F	400 @ 250°F	375 @ 250°F	400 @ 150°F	400 @ 200°F	125 @ 200°F		
200					300 @ 200°F	300 @ 200°F	300 @ 200°F	300 @ 200°F	300 @ 200°F	300 @ 200°F										
300																				
400																				
500																				
600																				

NOTES:

- a. All valves use sweat connections. 2 position valves are N.C. spring return; modulating valves are floating point non-spring return fail in place.
- b. Valve close off pressure is rated at powered operating mode.
- c. Cartridge type flow control devices utilize a replaceable flow compensation cartridge to adjust desired flow rate.
- d. Pressure ratings will be reduced as temperatures exceed those shown above.
- e. Maximum allowable system pressure is limited to the components selected with the lowest working pressure.
- f. Krueger assumes no responsibility for misapplication and selection of piping components.
- g. Contact factory for unions rated at 600 PSIG and 325°F.

XX = Valve close off pressure

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