

ENGINEERING GUIDE

Piping Packages for Fan Coil, Blower Coil & VAV Systems

Chilled & Hot Water Applications



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General Notes

1. All the packages and components described in this brochure are optional, additional cost features. Consult your Enviro-Tec sales representative for details. Not all components are available on all unit models. See valve package code charts and GPM tables.
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. 1/2", 3/4", and 1" VAV piping packages, as well as HL, HP, VF, and VL fan coil unit packages, are factory assembled and shipped loose for field installation and wiring. Factory mounting is optional for some units. All VH fan coil unit packages are factory assembled, installed, and wired.
4. 1¼" and 1½" piping packages ship loose as individual components, and field-assembly is required.
5. Enviro-Tec is not responsible for determining coil connection locations for unassembled 1¼" and 1½" piping packages, or for all 1/2", 3/4", 1" piping packages not ordered on a new equipment CO# (customer order number).
6. HL, HP, VF and VL unit valve packages are designed to mount directly onto the coil connections.
7. Control valve actuators are removable, and may be serviced or replaced without removal of the valve body.
8. Control valves are piped normally closed to the coil. For hot water coils, control valves are available normally open.
9. All ball isolation valves are furnished with an adjustable memory stop feature and may be used as a balancing valve.
10. When ordered, unions are installed at the water coil, and are available on VAV products, and all Fan Coil Units except VH. Unions must be ordered on both coils of 4-pipe units. Unions are not available separately.
11. All VH 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.
12. Pressure/temperature (P/T) ports are located to monitor the pressure and temperature across the coil.
13. Component performance ratings such as Cv, maximum close-off pressure, operating temperature and pressure are shown in the Component Specifications section.
14. Valve and component performance ratings shown are maximum values. Appearance and actual ratings may vary with individual vendor and component size.
15. 2-Pipe changeover 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.
16. Valves must be secured or supported to avoid damage to coil header and/or distributor tubes. All valves, pipes, and components must be sufficiently supported to ensure structural integrity and proper operation of the unit.
17. 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.

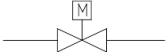
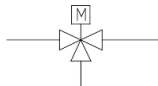
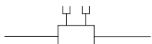
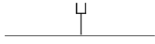
The valve package piping and component details shown in this catalog are for standard valves and components. The suitability of all valve packages and components must be determined by others based on individual application requirements. Enviro-Tec assumes no responsibility for selection and/or application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

Modulating cooling valve control can increase part load space relative humidity. Enviro-Tec 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.

Note: Individual coil GPM requirements must be specified at time of order

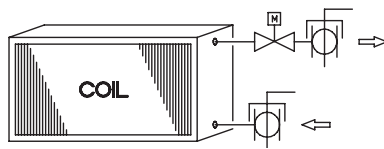
**All data herein is subject to change without notice. Some drawings are not shown in this catalog.
Contact your Enviro-Tec sales representative for unit-specific valve package drawings.**

Control Device Legend

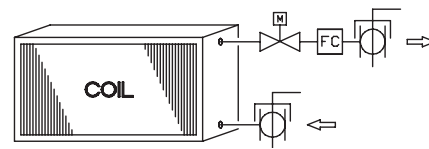
MANUAL BALL VALVE WITH MEMORY STOP (BVMS) 	2-WAY CONTROL VALVE 	3-WAY CONTROL VALVE 
FIXED FLOW CONTROL VALVE (FC) 	AUTOMATIC CARTRIDGE FLOW CONTROL WITHOUT SCREEN 	AUTOMATIC CARTRIDGE FLOW CONTROL WITH SCREEN 
ADJUSTABLE FLOW CIRCUIT SETTER (AFS) 	BYPASS BALANCE VALVE (BPV) 	PRESSURE-TEMPERATURE TEST PORT (PT) 
Y-STRAINER (Y-STR) 	Y-STRAINER W/CLEANOUT VALVE (YCO) 	UNION 
FLEXIBLE HOSE (FH) 	AQUA-THERMOSTAT 	SCHRADER FITTING 

Code Descriptions: CRB/CRQ VAV Terminal Units

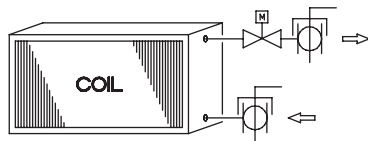
2-WAY PIPING PACKAGES							
Package Code	Components			Valve Size	Unions	P/T Ports	Y-CO
	BVMS	FC	PICV	1/2"	1/2"		
24	•			•	•	•	•
25	•	•					
26	•		•				



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

LEGEND, COMPONENT PRESSURE RATINGS

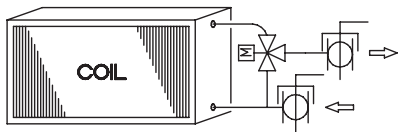
BVMS:	Manual Ball Valves w/Memory Stop, 600 PSIG
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
P/T Port:	Pressure/Temperature Test Port, 400 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
Union:	125 PSIG (contact factory for 600 PSIG)
Control Valve:	450 PSIG

NOTES:

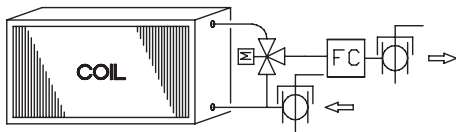
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

Code Descriptions: CRB/CRQ VAV Terminal Units

3-WAY PIPING PACKAGES						
Package Code	Components		Valve Size	Unions	P/T Ports	Y-CO
	BVMS	FC	1/2"	1/2"		
36	•		•	•	•	•
37	•	•				



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

LEGEND, COMPONENT PRESSURE RATINGS
BVMS: Manual Ball Valves w/Memory Stop, 600 PSIG
FC: Fixed Flow Control, 600 PSIG
P/T Port: Pressure/Temperature Test Port, 400 PSIG
Y-CO: Y-Strainer Cleanout, 600 PSIG
Union: 125 PSIG (contact factory for 600 PSIG)
Control Valve: 450 PSIG

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

CRB/CRQ VAV Terminal Unit Piping Package GPM Ranges and Increments

Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

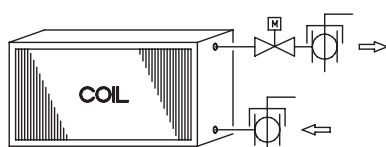
Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments

Pressure independent control valves (PICV) are available in the following GPM flow ratings:

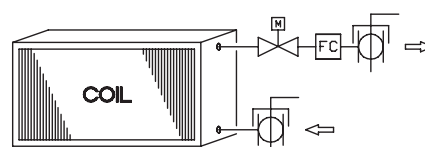
Available Piping Package GPM Ranges for PICV		
Piping Package Diameter	GPM Range	NOTES
1/2"	2.0 or 7.5 GPM Max	Individual Coil PICV Requirements Must Be Specified At Time Of Order

Code Descriptions: CRC VAV Terminal Unit

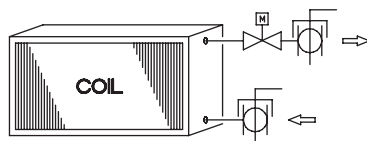
2-WAY PIPING PACKAGES							
Package Code	Components			Valve Size	Unions	P/T Ports	Y-CO
	BVMS	FC	PICV	1/2"	1/2"		
24	•			•	•	•	•
25	•	•					
26	•		•				



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

LEGEND, COMPONENT PRESSURE RATINGS

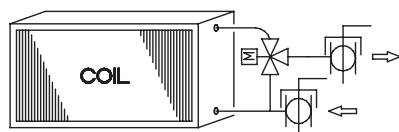
BVMS:	Manual Ball Valves w/Memory Stop, 600 PSIG
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
P/T Port:	Pressure/Temperature Test Port, 400 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
Union:	125 PSIG (contact factory for 600 PSIG)
Control Valve:	450 PSIG

NOTES:

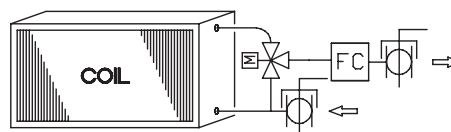
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

Code Descriptions: CRC VAV Terminal Units

3-WAY PIPING PACKAGES						
Package Code	Components		Valve Size	Unions	P/T Ports	Y-CO
	BVMS	FC	1/2"	1/2"		
36	•		•	•	•	•
37	•	•				

**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

LEGEND, COMPONENT PRESSURE RATINGS

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

NOTES:

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

CRC VAV Terminal Unit Piping Package GPM Ranges and Increments

Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

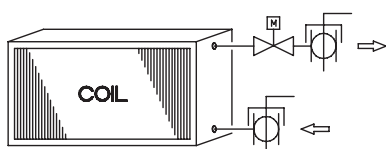
Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments

Pressure independent control valves (PICV) are available in the following GPM flow ratings:

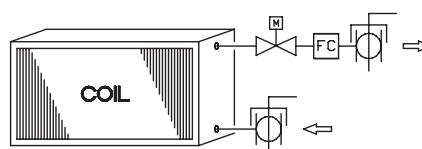
Available Piping Package GPM Ranges for PICV		
Piping Package Diameter	GPM Range	NOTES
1/2"	2.0 or 7.5 GPM Max	Individual Coil PICV Requirements Must Be Specified At Time Of Order

Code Descriptions: SDR/SDL VAV Terminal Units

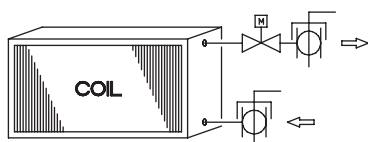
2-WAY PIPING PACKAGES							
Package Code	Components			Valve Size	Unions	P/T Ports	Y-CO
	BVMS	FC	PICV	1/2"	1/2"		
24	•			•	•	•	•
25	•	•					
26	•		•				



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

LEGEND, COMPONENT PRESSURE RATINGS

BVMS:	Manual Ball Valves w/Memory Stop, 600 PSIG
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
P/T Port:	Pressure/Temperature Test Port, 400 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
Union:	125 PSIG (contact factory for 600 PSIG)
Control Valve:	450 PSIG

NOTES:

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

SDR/SDL VAV Terminal Unit Piping Package

GPM Ranges and Increments

Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

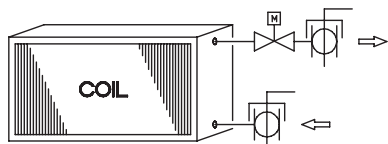
Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 5.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 5.0 GPM in 1.0 GPM Increments

Pressure independent control valves (PICV) are available in the following GPM flow ratings:

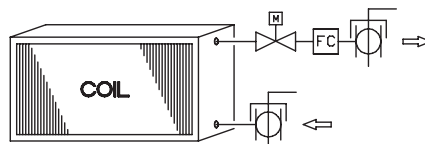
Available Piping Package GPM Ranges for PICV		
Piping Package Diameter	GPM Range	NOTES
1/2"	2.0 or 7.5 GPM Max	Individual Coil PICV Requirements Must Be Specified At Time Of Order

Code Descriptions: HL, HP, VF, VL Series Fan Coil Units

2-WAY PIPING PACKAGES											
Package Code	Components		Valve Size			Unions			P/T Ports	1/4" Bleed Line	Y-STR
	BVMS	FC	1/2"	3/4"	1"	1/2"	3/4"	1"			
24	•		•	•	•	•	•	•	•	•	•
25	•	•									

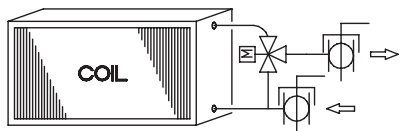


Code 24
2-Way Control Valve and Ball
Valves With Memory Stop

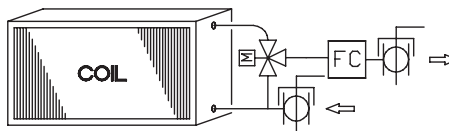


Code 25
2-Way Control Valve, Ball Valves with
Memory Stop, and Fixed Flow Control

3-WAY PIPING PACKAGES										
Package Code	Components		Valve Size			Unions			P/T Ports	Y-STR
	BVMS	FC	1/2"	3/4"	1"	1/2"	3/4"	1"		
36	•		•	•	•	•	•	•	•	•
37	•	•								



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

LEGEND, COMPONENT PRESSURE RATINGS

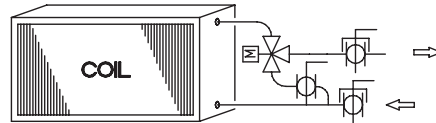
BVMS:	Manual Ball Valves w/Memory Stop, 600 PSIG
FC:	Fixed Flow Control, 600 PSIG
P/T Port:	Pressure/Temperature Test Port, 400 PSIG
Union:	125 PSIG (contact factory for 600 PSIG)
Control Valve:	450 PSIG

NOTES:

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

Code Descriptions: HL, HP, VF, VL Series Fan Coil Units

3-WAY PACKAGE WITH BALL VALVE IN BYPASS										
Package Code	Components		Valve Size			Unions			P/T Ports	Y-STR
	BVMS	FC	1/2"	3/4"	1"	1/2"	3/4"	1"		
50	•		•	•	•	•	•	•	•	•



Code 50

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

LEGEND, COMPONENT PRESSURE RATINGS

BVMS: Manual Ball Valves w/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:

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

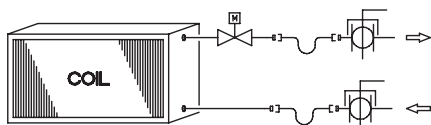
HL, HP, VF, VL Series Piping Package GPM Ranges and Increments

Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

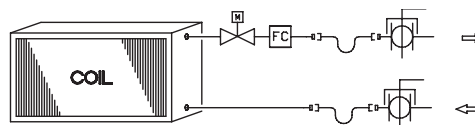
Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments
3/4"	3.0 to 12.0 GPM	= 3.0 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 12.0 GPM in 1.0 GPM Increments
1"	5.0 to 20.0 GPM	= 5.0 to 10 GPM in 1.0 GPM Increments
		> 10.0 to 20 GPM in 2.0 GPM Increments

Code Descriptions: VH Series Fan Coil Units

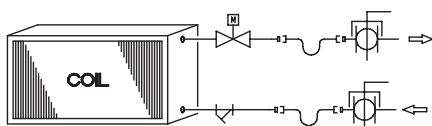
2-WAY PIPING PACKAGES						
Package Code	Components		Valve Size	Y-CO	P/T Ports	1/4" Bleed Line
	FC	Y-STR	1/2"			
32			•		•	•
34	•		•		•	
60		•	•	•	•	
61	•	•	•	•	•	



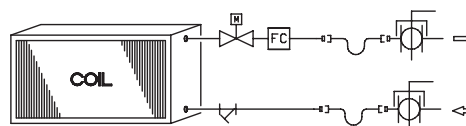
Code 32
2-Way Control Valve Only



Code 34
2-Way Control Valve and Fixed Flow Control



Code 60
2-Way Control Valve and Y-Strainer



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

LEGEND, COMPONENT PRESSURE RATINGS

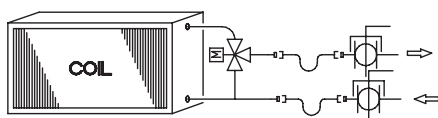
FC:	Fixed Flow Control, 600 PSIG
Y-STR:	Y Strainer, 600 PSIG
FCN:	Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
FCS:	Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
P/T Port:	Pressure/Temperature Test Port, 400 PSIG
Control Valve: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

NOTES:

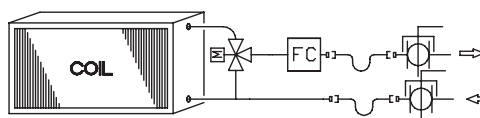
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
3. 1/4" bleed line is required on 2-pipe cool and heat auto changeover systems with factory provided thermostats; optional for thermostats by others.

Code Descriptions: VH Series Fan Coil Units

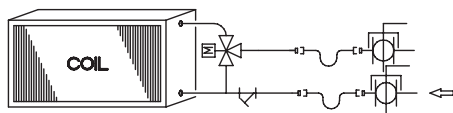
3-WAY PIPING PACKAGES					
Package Code	Components		Valve Size	Y-CO	P/T Ports
	FC	Y-STR	1/2"		
43			•		•
44	•		•		•
46		•	•	•	•
47	•	•	•	•	•



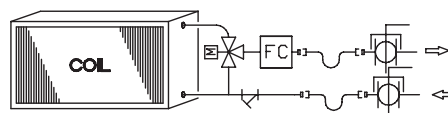
Code 43
3-Way Control Valve Only



Code 44
3-Way Control Valve and Fixed Flow Control



Code 46
3-Way Control Valve and Y-Strainer



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

LEGEND, COMPONENT PRESSURE RATINGS

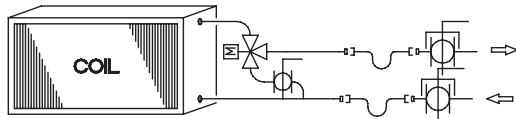
FC:	Fixed Flow Control, 600 PSIG
Y-STR:	Y Strainer, 600 PSIG
FCN:	Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
FCS:	Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
P/T Port:	Pressure/Temperature Test Port, 450 PSIG
Control Valve: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

NOTES:

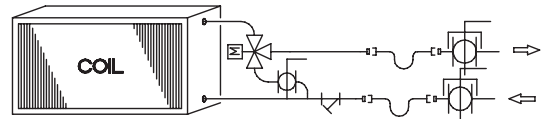
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.

Code Descriptions: VH Series Fan Coil Units

3-WAY PIPING PACKAGES WITH BALL VALVE IN BYPASS							
Package Code	Components				Valve Size	Y-CO	P/T Ports
	FC	Y-STR	FCN	FCS	1/2"		
56					•		•
57		•			•	•	•



Code 56
3-Way Control Valve and
Ball Valve in Bypass



Code 57
3-Way Control Valve,
Ball Valve in Bypass and Y-Strainer

LEGEND, COMPONENT PRESSURE RATINGS

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:

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

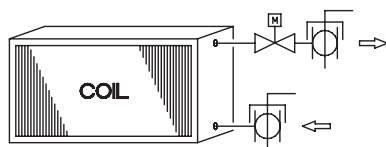
VH Series Fan Coil Unit Piping Package GPM Ranges and Increments

Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

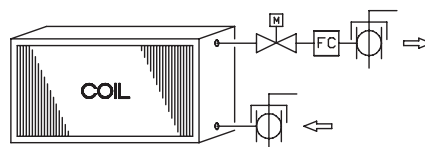
Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 9.0 GPM	= 0.5 to 4.0 GPM in 0.5 GPM Increments
		> 4.0 to 9.0 GPM in 1.0 GPM Increments

Code Descriptions: HDD/VDD Direct Drive Blower Coil Units

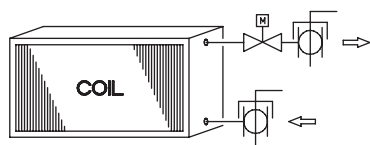
Package Code	Components				Valve Size					Unions					P/T Ports	Y-STR	1/4" Bleed Line
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1 1/4"	1 1/2"	1/2"	3/4"	1"	1 1/4"	1 1/2"			
24	•				•	•	•	•	•	•	•	•	•	•	•	•	•
25	•	•			•	•	•	•	•	•	•	•	•	•			
26	•		•		•	•				•	•						
29	•			•				•	•				•	•			



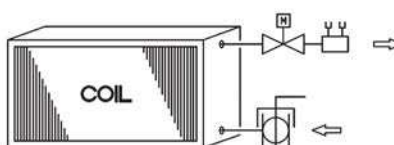
Code 24
2-Way Control Valve and Ball
Valves With Memory Stop



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

LEGEND, COMPONENT PRESSURE RATINGS

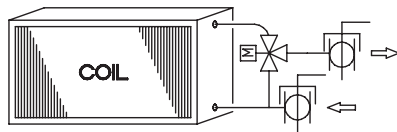
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
Y-STR:	Y Strainer, 600 PSIG
FCN:	Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
FCS:	Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
P/T Port:	Pressure/Temperature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

NOTES:

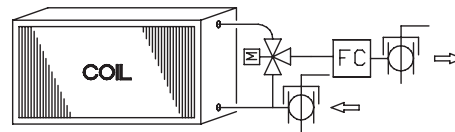
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
3. Code 29 is SQ Only. Please contact Applications Engineering for more info.

Code Descriptions: HDD/VDD Direct Drive Blower Coil Units

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	•		•	•	•	•	•	•	•	•	•	•	•	•	•
37	•	•													

**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

LEGEND, COMPONENT PRESSURE RATINGS

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, 450 PSIG
Control Valve:	450 PSIG

NOTES:

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

HDD/VDD Direct Drive Blower Coil Unit Piping Package GPM Ranges and Increments

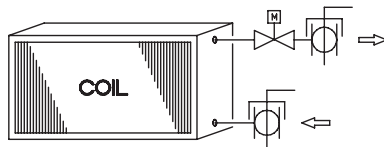
Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 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

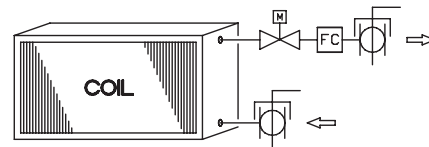
Note: 1 1/4" and 1 1/2" piping packages include unions with integrated P/T ports

Code Descriptions: CDV High Performance Fan Coil Unit

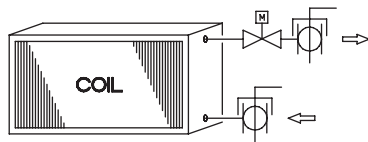
2-WAY PIPING PACKAGES																	
Package Code	Components				Valve Size					Unions					P/T Ports	Y-STR	1/4" Bleed Line
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1 1/4"	1 1/2"	1/2"	3/4"	1"	1 1/4"	1 1/2"			
24	•				•	•	•	•	•	•	•	•	•	•	•	•	•
25	•	•															
26	•		•		•	•				•	•						
29	•			•				•	•				•	•			



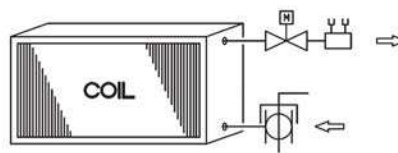
Code 24
2-Way Control Valve and Ball Valves With Memory Stop



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

LEGEND, COMPONENT PRESSURE RATINGS

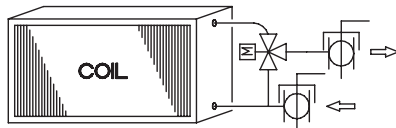
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
Y-STR:	Y Strainer, 600 PSIG
FCN:	Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
FCS:	Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
P/T Port:	Pressure/Temperature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

NOTES:

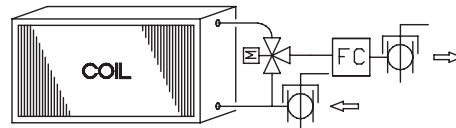
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
3. Code 29 is SQ Only. Please contact Applications Engineering for more info.

Code Descriptions: CDV High Performance Fan Coil Unit

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	•		•	•	•	•	•	•	•	•	•	•	•	•	•
37	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



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

LEGEND, COMPONENT PRESSURE RATINGS

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, 450 PSIG
Control Valve:	450 PSIG

NOTES:

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

CDV High Performance Fan Coil Unit Piping Package GPM Ranges and Increments

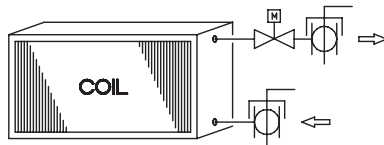
Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 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

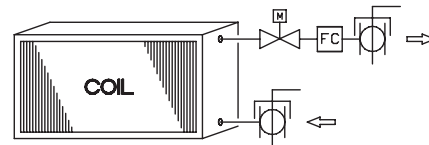
Note: 1 1/4" and 1 1/2" piping packages include unions with integrated P/T ports

Code Descriptions: VB/VR Reduced Footprint Blower Coils

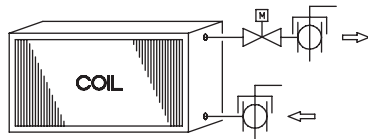
2-WAY PIPING PACKAGES																	
Package	Components				Valve Size					Unions					P/T Ports	Y-STR	1/4" Bleed Line
Code	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1 1/4"	1 1/2"	1/2"	3/4"	1"	1 1/4"	1 1/2"			
24	•				•	•	•	•	•	•	•	•	•	•	•	•	•
25	•	•															
26	•		•		•	•				•	•						
29	•			•				•	•				•	•			



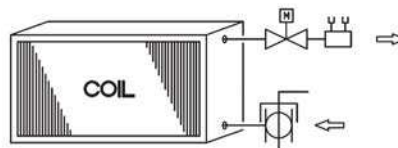
Code 24
2-Way Control Valve and Ball
Valves With Memory Stop



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

LEGEND, COMPONENT PRESSURE RATINGS

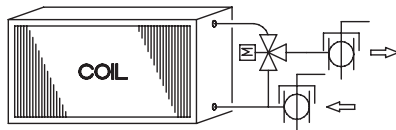
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
Y-STR:	Y Strainer, 600 PSIG
FCN:	Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
FCS:	Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
P/T Port:	Pressure/Temperature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

NOTES:

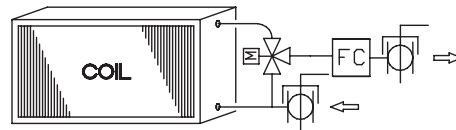
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
3. Code 29 is SQ Only. Please contact Applications Engineering for more info.

Code Descriptions: VB/VR Reduced Footprint Blower Coil

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	•		•	•	•	•	•	•	•	•	•	•	•	•	•
37	•	•													

**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

LEGEND, COMPONENT PRESSURE RATINGS

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, 450 PSIG
Control Valve:	450 PSIG

NOTES:

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

VB/VR Reduced Footprint Blower Coil Piping Package GPM Ranges and Increments

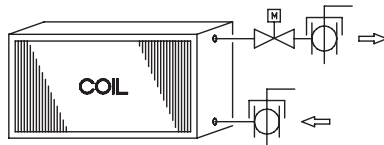
Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 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

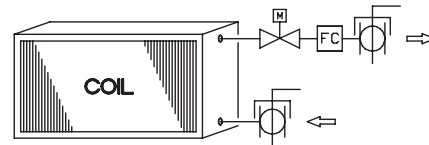
Note: 1 1/4" and 1 1/2" piping packages include unions with integrated P/T ports

Code Descriptions: MQL Modular Indoor Air Handler

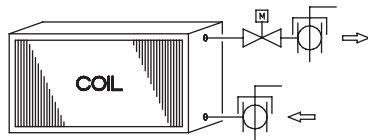
2-WAY PIPING PACKAGES																	
Package Code	Components				Valve Size					Unions					P/T Ports	Y-STR	1/4" Bleed Line
	BVMS	FC	PICV	AFS	1/2"	3/4"	1"	1 1/4"	1 1/2"	1/2"	3/4"	1"	1 1/4"	1 1/2"			
24	•				•	•	•	•	•	•	•	•	•	•	•	•	•
25	•	•															
26	•		•														
29	•			•													



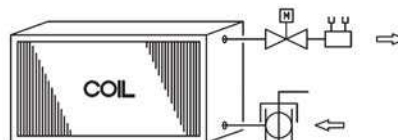
Code 24
2-Way Control Valve and Ball Valves With Memory Stop



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

LEGEND, COMPONENT PRESSURE RATINGS

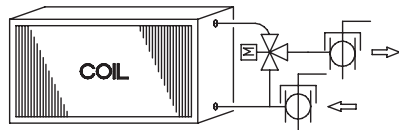
FC:	Fixed Flow Control, 600 PSIG
PICV:	Pressure Independent Control, 600 PSIG
Y-STR:	Y Strainer, 600 PSIG
FCN:	Fixed Cartridge Flow Control w/ PT Ports and No Screen, 230 PSIG
FCS:	Fixed Cartridge Flow Control with PT Ports and Screen, 230 PSIG
Y-CO:	Y-Strainer Cleanout, 600 PSIG
P/T Port:	Pressure/Temperature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

NOTES:

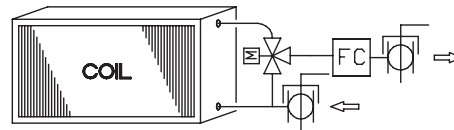
1. All drawings subject to change without prior notice.
2. Diagrams show component position in relation to fluid flow. Actual valve package configuration varies with unit type, hand connection, and pipe size.
3. Code 29 is SQ Only. Please contact Applications Engineering for more info.

Code Descriptions: MQL 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	•		•	•	•	•	•	•	•	•	•	•	•	•	•
37	•	•													

**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

LEGEND, COMPONENT PRESSURE RATINGS

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, 450 PSIG
Control Valve:	450 PSIG

NOTES:

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

MQL Modular Indoor Air Handler Piping Package GPM Ranges and Increments

Automatic fixed flow controls (FC, FCN, FCS) are available in the following GPM flow ratings:

Piping Package GPM Ranges and Available Increments		
Piping Package Diameter	GPM Range	NOTE: Individual Coil GPM Requirements Must Be Specified At Time of Order
1/2"	0.5 to 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

Piping Package 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.

FCU Products - HL, HP, VF and VL: 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 VH: Piping package shall be completely factory assembled, tested, mounted to coil, and include stainless steel braided flex hoses.

Component Specifications

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



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.

Nominal Size:	1/2"	3/4"	1"
Body Material:	Brass	Brass	Brass
Ball:	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated
Seats:	Teflon	Teflon	Teflon
Stem Seal:	(2) Viton O-Rings	Teflon	Teflon
Connection:	Sweat	Sweat	Sweat
Pressure Rating (psig):	600	600	600
Temp. Rating, °F:	325	325	325
Cv:	17	40	27



Flexible Hose Kits, 18" (FH)

Materials:	EPDM inner lined, Kevlar® reinforced hose with stainless steel outer covering
Flow Rates: application	0.5 to 12.0 GPM, based on
Pressure Temp. Rating (450 PSIG test pressure)	375 PSIG @ 250°F
Minimum Burst Pressure:	1500 PSI
Flame Spread:	Not greater than 25 per UL 723
Smoke Development:	Not greater than 50 per UL 723
Ball Valve w/Memory Stop:	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

Available in 1/2" size only.



2-Way, 2-Position Paddle Style Valve (VF/VL Series Only)

A 2-position water control paddle style 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 can be line or low (24VAC) voltage.

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
Temperature Rating, °F:	200	200	200
Cv:	2.5	5.0	8.0
Maximum Close-off Pressure, Std. (PSI):	40	20	17
High Close-off:	50	25	20
Power Consumption:	7VA	7VA	7VA

Component Specifications

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

3-Way, 2-Position Paddle Style Valve (VF/VL Series Only)

A 2-position water control paddle style 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 can be line or low (24VAC) voltage.

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
Maximum Close-off Pressure			
Pressure (PSI):	N/A	N/A	N/A
Power Consumption:	7VA	7VA	7VA



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).

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



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).

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



Component Specifications

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
Temp. Rating, °F:	225
Cv:	Variable With Inlet Pressure



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.

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

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.

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

Contact factory for 24V floating, spring return applications.

Component Specifications

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



Typical 2-Way Proportional Control Valve

A 24V floating point, fail-in-place (non-spring return) 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.

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

Contact factory for 24V floating, spring return applications.



Typical 3-Way Proportional Control Valve

A 24V floating point, fail-in-place (non-spring return) 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.

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

Contact factory for 24V floating, spring return applications.

Component Specifications

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



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.

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

Contact factory for 24V floating, spring return applications.



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.

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

Contact factory for 24V floating, spring return applications.



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.

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

Component Specifications

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

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.

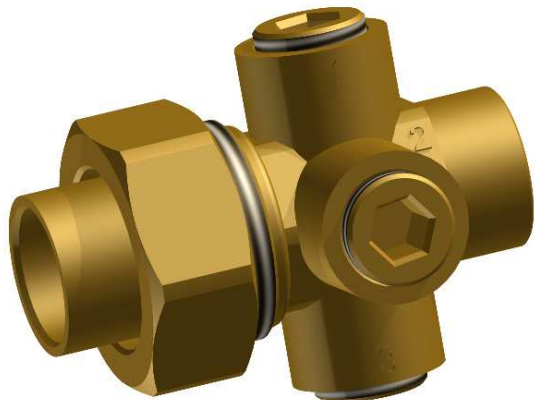
Nominal Sizes:	1/2" and 3/4"
Body Material:	Forged brass
Connection:	NPT
Seals:	EPDM O-Rings
Pressure Rating (psig):	360
Temp. Rating, °F:	250
PSIG Range:	3 - 87



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 are installed at the coil on HL, HP and VF fan coil units. Unions are not available on FS fan coil units. For convenience, 1 1/4" and 1 1/2" unions include an integrated P/T port (pictured).

Nominal Size:	1/2", 3/4", 1, 1 1/4", 1 1/2"
Body Material:	Bronze/Copper
Connection:	Sweat
Pressure Rating (psig):	225
Temp. Rating, °F:	200



Component Specifications

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



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.

Nominal Sizes:	1/2", 3/4", 1", 1 1/4", 1 1/2"
Body Material:	Forged Brass
Connection:	Sweat
Pressure Rating (psig):	600
Temp. Rating, °F:	325
Screen:	20 Mesh Stainless Steel



Cleanout Valve for Y-Strainer (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.

Nominal Size:	1/4"
Body Material:	Bronze
Connection:	MPT
Pressure Rating (psig):	600
Temp. Rating, °F:	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.

Nominal Size:	1/4"
Body Material:	Brass
Connection:	MPT
Pressure Rating (psig):	400
Temp. Rating, °F:	250

Component Specifications

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



Digital Duct Temperature Sensor

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).

Operating Range: -40° to 127° F
Agency Approval: UL Listed, CSA Approved



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.

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

Ratings may vary with vendor and size.

Controllers and Controller Accessories



ZEC500 and ZEC510 VAV DDC Controls

The ZEC500 and ZEC510 Controllers are part of the SMART equipment family. The VAV Zone controllers run a pre-engineered HVAC zoning sequence and provide the inputs and outputs required for this application.

- ZEC500: DDC Non-communicating
- ZEC510: DDC BACnet® communication

The Mobile Access Portal (MAP) Gateway tool can be used to field-adjust the ZEC Controller and change the heat application type of the ZEC Controller.



MAP Gateway Configuration Tool

The Mobile Access Portal (MAP) Gateway is a pocket-sized web server that provides a wireless mobile user interface to the ZEC500 and ZEC510 Controllers. The MAP Gateway may be used as a portable device (carried from site to site, as needed by field personnel) or it may be permanently mounted on-site.

Offering many-to-one, multi-client connectivity, the MAP Gateway provides access to any SMART Equipment device that is on a connected BACnet® MS/TP field bus. The MAP Gateway solution is conveniently sized and has a built-in wireless access point. The MAP Gateway provides an intuitive, browser-based user interface to access advanced features like alarms and point configuration.

Thermostats and Wall Sensors



TEC3000 Color Series Thermostat

TEC3000 Color Series Thermostat Controllers are wireless, stand-alone, and field-selectable BACnet® MS/TP or N2 networked devices that provide on-/off, floating, and proportional control of the following:

- Local Hydronic Reheat Valves
- Pressure-Dependent Variable Air Volume (VAV) Equipment With or Without Local Reheat
- Two-Pipe or Four-Pipe Fan Coils
- Dehumidification
- Other Zoning Equipment Using an On/Off or Floating Control Input

A bright 4.2" high-definition backlit capacitive touchscreen display provides responsive feedback and improved readability of text and icons. The home screen is configurable to Modern and Classic, and Light and Dark themes. Available in high-gloss white finish. An integrated USB port is provided to cut installation time through rapid configuration cloning.



FCP-NA-710L and FCP-PA-701L Thermostats

FCP Non-Programmable and Programmable Fan Coil or PTAC Thermostats are non-connected Fan Coil Unit (FCU) and Package Terminal Air Conditioning (PTAC) thermostats. The FCP-NA-701L is non-programmable, and the FCP-PA-701L is programmable up to seven days. FCP thermostats are compatible with:

- Two or Four-Pipe Fan Coils
- Conventional PTAC
- Heat Pump PTAC With or Without Auxiliary Heat

The FCP thermostats feature an LCD display with white LED backlight. The FCP-PA-701L thermostat includes a lithium coin cell battery to provide battery backup. Available in white finish.

Thermostats and Wall Sensors



NS-8000 Series Network Sensors

NS Series Network Sensors function directly with ZEC500 DDC Non-Communicating and ZEC510 DDC BACnet® Controllers.

The NS Series Network Sensors monitor zone temperature, relative humidity, carbon dioxide (CO2), motion, and local temperature setpoint adjustments. The sensor transmits this data to a controller on the Sensor/Actuator (SA) bus.

Select models within the NS Series Network Sensor line include a touch display to view zone temperature, RH, CO2, and adjust the zone temperature setpoint fan speed.

These models have the capability to set the default display to temperature, RH, or temperature setpoint. On display models, the user can also choose between degrees Fahrenheit (F) and degrees Celsius (C).

To prevent tampering with the sensor, display models also include a screen lockout feature. Pictured from top to bottom: NSB8BTN041-0, NSB8BTN141-0, NSB8BTN141-0.

Copper Tube Data

Copper Tube Dimensional & 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	0.64	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	0.94	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 Temperature (°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	Note d	Note d	Note d
	250	300	270	170
	350	270	190	150

Source: Based on ASME Standard B31.9 - *Building Services Piping*

Notes:

- ^a 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.
- ^b Lead based solders must not be used on potable water systems
- ^c Tin-Antimony solder is allowed for potable water supplies in some jurisdictions.
- ^d Rated pressure for up to 200°F applies to the tube being joined – see pipe internal pressure chart.
- Tin-Lead solder shall not be used in Enviro-Tec products.
- Tin-Antimony solder is used on Enviro-Tec valve packages and “packed” or “gasketed” parts.
- Brazing alloy is used for all Enviro-Tec coils, risers and piping runs.

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 (green color code)								
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 (blue color code)								
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 (red color code)								
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:

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

Copper Tube Data

Soldered and Brazed Joints Pressure - Temperature Ratings

Maximum Pressure & Temperature Rating of 95-5 Tin-Antimony Solder Joints Using Copper Tubing (PSIG)

Nominal Size (in)	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600
3/4																			
1																			
1 1/4																			
1 1/2																			
2																			
2 1/2																			
3																			
Service Temp.	250°F 200°F 150°F 100°F																		

Maximum Pressure & Temperature Rating for Brazing Alloy Joints Using Copper Tubing (PSIG)

Nominal Size (in)	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600
3/4																			
1																			
1 1/4																			
1 1/2																			
2																			
2 1/2																			
3																			
Service Temp.	350°F 250°F 200°F 150°F 100°F																		

Notes:

1. Pressure Ratings Based on *ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings*.
2. 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.

Notes

