Efficient in Every Way

Belimo ZoneTight™ Zone Valves

TECHNICAL DOCUMENTATION

BELIMO

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Tech.Doc - 04.2025 – Subject to technical modifications

Designed for maximum efficiency in tight spaces, Belimo's ZoneTight valve offering sets new design and performance standards for both pressure dependent and pressure independent zoning applications.

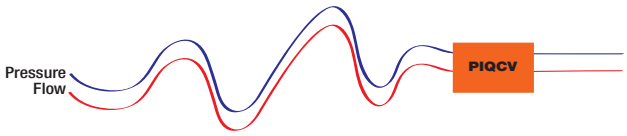
ZoneTight Zone Valve (QCV)

The ultra-compact QCV leads the way in Belimo's new generation of room and zone solutions. Equipped with a space-saving 2-way or 3-way ball valve and an electronic rotary actuator, the QCV has an installation height of just 4.33 inches (110 mm), available NPT or Sweat, and offers a number of benefits over conventional pressure dependent control valves, including:

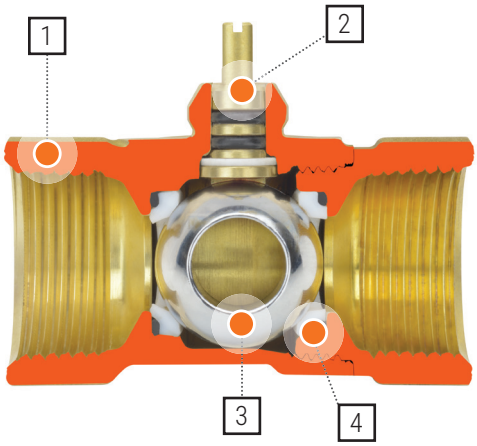
- Belimo ball valve design with zero leakage eliminates energy loss.
- Self-cleaning ball valve technology provides superior clog resistance.
- Low power consumption up to 95% less than conventional zone valves.
- Field adjustable Cv value to meet your design requirements.

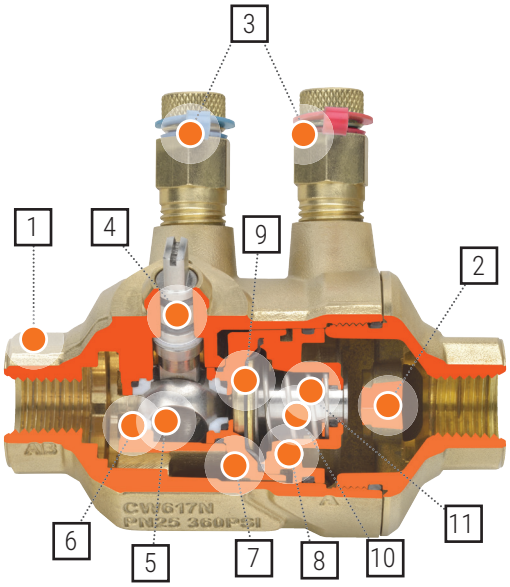
ZoneTight Pressure Independent Zone Valve (PIQCV)

The PIQCV offers all the advantages of a Pressure Independent Characterized Control Valve (PICCV) but in an ultra compact configuration. The PIQCV combines a differential pressure regulator with a 2-way control valve to supply a specific flow for each degree of ball opening regardless of system pressure fluctuations. The valve performs the function of a balancing valve and control valve in one unit.



- Smallest pressure independent characterized ball valve in the market.
- Actuator runs at 0.3 W saving energy and transformer power.
- Flow is adjustable at the actuator and always perfectly balanced.
- Permits PIV installation in tight spaces.





ZoneTight Zone Valve

Valve body		Control valve (QCV)	
1	Body NPT or Sweat	2	Stem
		3	Ball with profile
		4	Seat

ZoneTight Pressure Independent Zone Valve

Valve body		Control valve (PIQCV)		Regulator	
1	Body	4	Stem	7	Regulator Cap
2	End Cap	5	Ball with profile	8	Regulator Body
3	PT Ports	6	Seat	9	Diaphragm
				10	Regulator Shaft
				11	Regulator Spring

Compact Design
When faced with limited available mounting space, the Belimo ZoneTight valve's super-compact design helps maximize workable space and complements OEM valve compartment optimization.

Ball Valve Technology
Unlike short stroke globe valves with plug and seat design, the self-cleaning ball helps minimize energy losses caused by clogging (0% A to AB leakage) and eliminates seat leakage. The intuitive configuration also allows for bi-directional flow (QCV) unlike traditional paddle style zone valves. In addition, equal percentage flow characteristic provides superior part load coil performance.

Actuator with Patented Brushless DC Motor
The brushless DC motor's power consumption when running is a mere 0.3W, 0.15W when holding, saving energy and transformer power. In addition to significantly reducing energy costs, this helps eliminate failures due to stalled motors and prolongs actuator life. It also allows for more units to be powered by a single transformer.

Snap Fit
The QCV and PIQCV easily connects to the actuator allowing operators and technicians to install valves quickly, easily, and without the use of tools. This helps simplify commissioning and reduces labor costs.

Field Adjustable Max Cv/Flow
QCVs and PIQCVs can be quickly and easily field adjusted to ensure that necessary design requirements are met and reduces inventory.

Stem Extension for Insulation
Unlike conventional zone valve actuators, which are normally covered by pipe insulation, the stem extension on QCVs and PIQCVs allows for easy actuator removal without damaging the surrounding insulation, helping simplify operation and maintenance activities.

Z2	050	Q	S	-J	+CQB	24	-SR	-L	
Valve Type Z2 = 2-way Z3 = 3-way ZoneTight Chrome Plated Brass Ball and Brass Stem	**Valve Size** 050 = ½" 075 = ¾" 100 = 1"	Quick Connect	**Connection Type** Blank = NPT S = Sweat PF = Press Fit	**Cv*** **2-way** F J K **3-way**** E H J	**Actuator Type** **Non Fail-Safe** CQB CQX **Electronic Fail-Safe** CQKB CQKX	**Power Supply** 24 = AC/DC 24 V UP = AC 100...240 V	**Control** Blank = On/Off -3 = On/Off, Floating Point -SR = Modulating 2...10 V Standard 0.5...10 V Custom***	**Direction of Rotation** -L = Open (2 V) -R = Close (2 V) -LL = Normally Open, Fail Open -RR = Normally Close, Fail Close -LR = Normally Open, Fail Close -RL = Normally Close, Fail Open	-S = Built-in Auxiliary Switch

"X" models are customizable. Refer to page 6 for factory set clip position options.

*For C_V rating, see chart on next page.
**On/off only.
*** Configurable on "X" models.

Ordering Example

1 Choose the valve actuator combination.

Z2050QS-J+CQB24-SR **-L**

2 Choose set-up required

Tagging or Setting (if needed)

3 Does order require tagging?

4 Does order require clip setting?

Set-Up

Modulating Non Fail-Safe Models
L = Normally Open
R = Normally Closed

Fail-Safe Models
LL = Normally Open/Fail Open
LR = Normally Open/Fail Closed

RL = Normally Closed/Fail Open
RR = Normally Closed/Fail Closed

Refers to valve ports from inlet to outlet, per flow arrow.

Tagging:
Valves may be tagged per customer specification.

Example:
AHU-1
FCU-2

Part number for tagging: 99981-00101

Clip Setting:
Valves may be set per customer specification. (All clip settings excluding "N" [default by factory] and "No Clip" have a list price adder)

Example:
Clip Position 1
No Clip

Part number for setting: CQX, CQKX

5 Complete Ordering Example: Z2050QS-J+CQB24-SR-L

Belimo ZoneTight Zone Valves

QCV Product Range

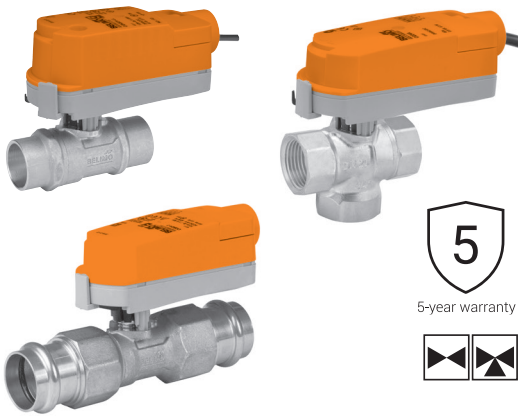
		Valve Nominal Size		Type		Suitable Actuators	
	C_V	Inches	DN [mm]	2-way	3-way	Non Fail-Safe	Fail-Safe
NPT	1.4*	½	15	Z2050Q-F		CQB Series	CQKB Series
	5.9*	½	15	Z2050Q-J			
	9.8*	¾	20	Z2075Q-K			
	8.2*	1	25	Z2100Q-K			
	1	½	15		Z3050Q-E		
	2.7	½	15		Z3050Q-H		
	4.6	¾	20		Z3075Q-J		
	4.4	1	25		Z3100Q-J		
Sweat	1.4*	½	15	Z2050QS-F			
	5.9*	½	15	Z2050QS-J			
	9.8*	¾	20	Z2075QS-K			
	8.2*	1	25	Z2100QS-K			
	1	½	15		Z3050QS-E		
	2.7	½	15		Z3050QS-H		
	4.6	¾	20		Z3075QS-J		
	4.4	1	25		Z3100QS-J		
Press Fit	1.4*	½	15	Z2050QPF-F			
	5.9*	½	15	Z2050QPF-J			
	9.8*	¾	20	Z2075QPF-K			
	8.2*	1	25	Z2100QPF-K			
	1	½	15		Z3050QPF-E		
	2.7	½	15		Z3050QPF-H		
	4.6	¾	20		Z3075QPF-J		
	4.4	1	25		Z3100QPF-J		

*Maximum flow. Max value can be field adjusted, see actuator instructions.
Order "X" model Actuators for Factory Clip Setting, see Instruction Manual for details.

CLIP POSITION FOR FLOW ADJUSTMENT (GPM)

											No Clip
	1	2	3-	3	4	4+	5	5+	6	N	No end stop
Z2050Q(S)(PF)-F (½")	0.1	N/A	0.2	N/A	N/A	0.4	N/A	0.6	0.8	1.2	1.4
Z2050Q(S)(PF)-J (½")	0.5	0.7	N/A	1.2	1.7	N/A	2.4	N/A	3.4	4.8	5.9
Z2075Q(S)(PF)-K (¾")	0.5	1.0	N/A	1.5	2.3	N/A	3.3	N/A	4.6	6.6	9.8
Z2100Q(S)(PF)-K (1")	0.5	0.9	N/A	1.5	2.2	N/A	3.1	N/A	4.3	6	8.2

Teflon® is a registered trademark of DuPont™
**Configurable on "X" models
***If temperature exceeds 212°F [100°C] operating range due to a boiler control failure the valve will safely contain the hot water but manufacturer's product warranty becomes invalid.



MODE OF OPERATION

The ZoneTight Zone Valve (QCV) is operated by a rotary actuator. The actuators are controlled by a standard voltage for on/off control, a modulating signal, or floating point control system which moves the ball of the valve to the position dictated by the control system.

PRODUCT FEATURES

The equal percentage characteristic of the flow is ensured by the design of the ball. This characteristic provides linear heating or cooling output from the coil improving energy efficiency and comfort.

ACTUATOR SPECIFICATIONS

Control type	
Blank	on/off
-3	on/off, floating point
-SR	modulating 2...10 V standard 0.5...10 V custom**
Manual override	use actuator to turn valve stem
Electrical connection	3 ft. [1 m] cable with ½" conduit fitting, screw terminals
Power consumption	
CQ..	0.3 W running, 0.2 W holding
CQK..	2.5 W running, 0.5 W holding
CQ..UP	1.0 W running, 0.7 W holding
CQK..UP	3.0 W running, 0.5 W holding
Power supply	AC/DC 24 V or AC 100...240 V
Power consumption	
CQ..	0.6 VA
CQK..	5 VA
CQ..UP	2 VA
CQK..UP	7 VA

VALVE SPECIFICATIONS

Fluid	chilled or hot water, up to 60% glycol max
Flow characteristic	equal percentage (2-way), linear (3-way)
Controllable flow range	75° (2-way), 90° (3-way)
Sizes	½", ¾", 1"
End fitting	NPT female, sweat, press fit
Materials	
Body	forged brass
Ball	chrome plated brass
Stem	brass
Seats	Teflon® PTFE
O-rings	EPDM (lubricated)
Fluid temp range	36...212°F [2...100°C]***
Fluid temp limit	250°F [120°C]***
Max. allowable operating temp.	212°F [100°C]***
Body pressure rating	360 psi (NPT, sweat), 250 psi (press fit)
Close-off pressure	75 psid (2-way), 40 psid (3-way)
Max. differential pressure (ΔP)	40 psid
Leakage	0%

Z2	050	QPT		-B	+CQB	24	-SR	-R	
Valve Type Z2 = 2-way	**Valve Size** 050 = ½" 075 = ¾"	Quick Connect Pressure Independent PT Port	Blank = NPT PF = Press Fit	**Flow Rate** B = 0.9 GPM D = 2.0 GPM F = 4.3 GPM G = 9.0 GPM	**Actuator Type** Non Fail-Safe CQB CQX Fail-Safe CQKB CQKX	**Power Supply** 24 = AC/DC 24 V UP = AC 110...240 V	**Control** -3 = On/Off, Floating Point -SR = Modulating 2...10 V Standard 0.5...10 V Custom*	**Direction of Rotation** -L = Open (2 V) -R = Close (2 V) -LL = Normally Open, Fail Open -RR = Normally Close, Fail Close -LR = Normally Open, Fail Close -RL = Normally Close, Fail Open	-S = Built-in Aux. Switch

"X" models are customizable. Refer to page 8 for factory set clip position options.

*Configurable on "X" models

Ordering Example

1 Choose the valve actuator combination.
Z2050QPT-B+CQB24-SR **-R**

2 Choose set-up required.

Set-Up

Modulating Non Fail-Safe Models
L = Normally Open
R = Normally Closed

Fail-Safe Models
LL = Normally Open/Fail Open
LR = Normally Open/Fail Closed

RL = Normally Closed/Fail Open
RR = Normally Closed/Fail Closed

Refers to valve ports from inlet to outlet, per flow arrow.

Tagging or Setting (if needed)

3 Does order require tagging?

Tagging:
Valves may be tagged per customer specification.

Example:
AHU-1
FCU-2

Part number for tagging: 99981-00101

4 Does order require clip setting?

Clip Setting:
Valves may be set per customer specification. (All clip settings excluding "N" [default by factory] and "No Clip" have a list price adder)

Example:
Clip Position 1
No Clip

Part number for setting: CQX, CQKX

5 Complete Ordering Example: Z2050QPT-B+CQB24-SR-R

Belimo ZoneTight Zone Valves

PIQCV Product Range

	Valve Nominal Size			Type	Suitable Actuators	
	GPM	Inches	DN [mm]	2-way with PT ports	Non Fail-Safe	Fail-Safe
NPT	0.9*	½	15	Z2050QPT-B	CQ Series	CQK Series
NPT	2.0*	½	15	Z2050QPT-D		
NPT	4.3*	½	15	Z2050QPT-F		
NPT	9.0*	¾	20	Z2075QPT-G		
Press Fit	0.9*	½	15	Z2050QPTPF-B		
Press Fit	2.0*	½	15	Z2050QPTPF-D		
Press Fit	4.3*	½	15	Z2050QPTPF-F		
Press Fit	9.0*	¾	20	Z2075QPTPF-G		

*Maximum flow value can be field adjusted, see actuator instructions.
Order "X" model actuators for Factory Clip Setting, see instruction manual for details.

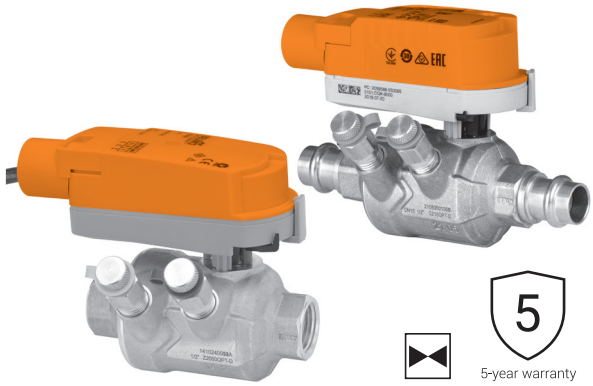
CLIP POSITION FOR FLOW ADJUSTMENT (GPM)

	1	1+	2-	2	2+	3-	3	3+	4-	4
Z2050QPT(PF)-B (½")	N/A	N/A	0.1	N/A	N/A	N/A	N/A	0.2	N/A	N/A
Z2050QPT(PF)-D (½")	0.2	N/A	N/A	0.3	N/A	N/A	0.4	0.5	N/A	0.6
Z2050QPT(PF)-F (½")	N/A	N/A	N/A	0.6	N/A	0.7	0.8	0.9	1.0	1.3
Z2075QPT(PF)-G (¾")	N/A	N/A	1.6	1.8	2.1	2.4	2.7	3.0	3.3	3.7
Actuator Runtime	30 s	33 s	35 s	37 s	39 s	41 s	43 s	45 s	47 s	49 s

	4+	5-	5	5+	6-	6	6+	N-	N	No Clip
Z2050QPT(PF)-B (½")	0.3	N/A	0.4	N/A	0.5	N/A	0.6	0.7	0.8	0.9
Z2050QPT(PF)-D (½")	0.7	0.8	0.9	1.0	1.2	1.3	1.5	1.6	1.8	2.0
Z2050QPT(PF)-F (½")	1.5	1.7	1.9	2.2	2.5	2.8	3.1	3.3	3.6	4.3
Z2075QPT(PF)-G (¾")	4.0	4.4	4.9	5.3	5.8	6.3	6.7	7.2	7.7	9.0
Actuator Runtime	51 s	53 s	55 s	58 s	60 s	62 s	64 s	66 s	68 s	75 s

**Configurable on "X" models

***If temperature exceeds 212°F [100°C] operating range due to a boiler control failure the valve will safely contain the hot water but manufacturer's product warranty becomes invalid.



5-year warranty

MODE OF OPERATION

The ZoneTight Pressure Independent Zone Valve (PIQCV) is a two-way valve which combines the functionality of a control valve and a pressure regulating valve, creating one precise product which is unaffected by pressure variations in a system.

PRODUCT FEATURES

Provides constant flow regardless of pressure variations in the system. Simplified valve sizing and selection, no Cv calculations required.

ACTUATOR SPECIFICATIONS

Control type	
Blank	on/off
-3	on/off, floating point
-SR	modulating, 2...10 V standard 0.5...10 V custom**
Manual override	use actuator to turn valve stem
Electrical connection	3 ft. [1 m] cable with ½" conduit fitting, screw terminals
Power consumption	
CQ..	0.3 W running, 0.2 W holding
CQK..	2.5 W running, 0.5 W holding
CQ..UP	1.0 W running, 0.7 W holding
CQK..UP	3.0 W running, 0.5 W holding
Power supply	AC/DC 24 V (AC 110...240 V, UP)
Power consumption	
CQ..	0.6 VA
CQK..	5 VA
CQ..UP	2 VA
CQK..UP	7 VA

VALVE SPECIFICATIONS

Fluid	chilled or hot water, up to 60% glycol max
Flow characteristic	equal percentage
Controllable flow range	75°
Sizes	½", ¾"
End fitting	NPT female, press fit
Materials	
Body	forged brass
Ball	stainless steel
Stem	stainless steel
Seats	Teflon® PTFE
O-rings	EPDM
Spring	stainless steel
Fluid temp range	36...212°F [2...100°C]***
Fluid temp limit	250°F [120°C]***
Max. allowable operating temperature	212°F [100°C]
PT ports	2
Body pressure rating	360 psi (NPT), 250 psi (press fit)
Close-off pressure	200 psid
Differential pressure (ΔP) range	5...50 psid
Leakage	0%
Flow control tolerance	±5%

SET-UP- Specify Upon Ordering

2-WAY VALVES

NON FAIL-SAFE Stays in Last Position	**CQB(X)UP-3**	**On/Off:** Power to brown wire (pin 2) will drive valve CW (closed). Power to brown wire (pin 2) and white wire (pin 3) will drive valve CCW (open). **Floating:** Power to brown wire (pin 2) will drive valve CW (closed). Power to white wire (pin 3) will drive valve CCW (open).	
	CQB(X)24-3	**On/Off:** Power to red wire (pin 2) will drive valve CW (closed). Power to red wire (pin 2) and white wire (pin 3) will drive valve CCW (open). **Floating:** Power to red wire (pin 2) will drive valve CW (closed). Power to white wire (pin 3) will drive valve CCW (open).	
	CQB(X)24-SR	**CQB24-SR-R:** Normally closed, valve will open as voltage increases	CQB24-SR-L: Normally open, valve will close as voltage increases
ELECTRONIC FAIL-SAFE	**CQKB(X)24** **CQKB(X)24-S** **CQKB(X)UP**	**CQKB24-LL, CQKB24-S-LL, CQKBUP-LL:** Normally open CCW, valve will drive closed when energized. **Fail-Safe Action:** Actuator will fail open CCW upon power loss.	**CQKB24-RR, CQKB24-S-RR, CQKBUP-RR:** Normally closed CW, valve will drive open when energized. **Fail-Safe Action:** Actuator will fail closed CW upon power loss.
	CQKB(X)24-SR	**CQKB24-SR-RL:** Normally closed CW, valve will open as voltage increases. **Fail-Safe Action:** Will fail open upon power loss.	**CQKB24-SR-RR:** Normally closed CW, valve will open as voltage increases. **Fail-Safe Action:** Will fail closed upon power loss.
		CQKB24-SR-LL: Normally open CCW, valve will close as voltage increases. **Fail-Safe Action:** Will fail open upon power loss.	**CQKB24-SR-LR:** Normally open CCW, valve will close as voltage increases. **Fail-Safe Action:** Will fail closed upon power loss.

*PIQCV are 2-way only.

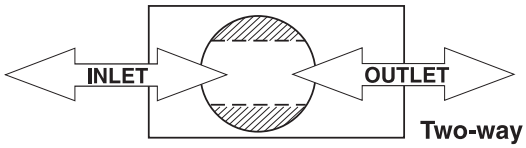
			VALVE TYPE	
ZoneTight Valve Accessories		**Valves**	**Z2 (2-WAY)**	**Z3 (3-WAY)**
	**ZCQB-FL** Flow setter	PIQCV	•	
		QCV	•	
	**ZCQ-E** QCV or PIQCV valve stem extension. Designed for chilled/ hot water service 36...190°F [2...88°C] media temperature	PIQCV	•	
		QCV	•	•
FLOW ORIFICE				
	**FO15010** ½" Flow orifice for 1.0 GPM	PIQCV	•	
		QCV	•	
	FO15025 ½" Flow orifice for 2.5 GPM	PIQCV	•	
		QCV	•	
	FO15055 ½" Flow orifice for 5.5 GPM	PIQCV	•	
		QCV	•	
	FO20100 ¾" Flow orifice for 10.0 GPM	QCV	•	
		PIQCV	•	
	FO25210 1" Flow orifice for 21.0 GPM	QCV	•	
		PIQCV	•	
Architectural Cover				
	**ZCQB-W** Housing cover for CQ actuators (white)	PIQCV	•	
		QCV	•	•

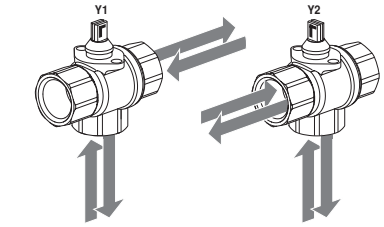
QCV Flow Pattern

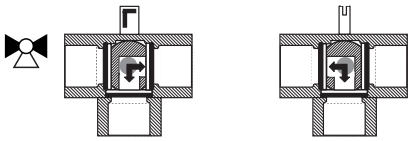
QCV 2-way valves can be piped with flow entering and exiting either port.

For on/off control of coil flow the QCV 3-way valve is piped with supply entering the bottom part.

For a QCV 3-way switching application, pipe hot and cold supply water to either side ports and the appropriate seasonal supply water will exit the bottom port for regulation by another 2-way valve; typically installed in the return pipe.

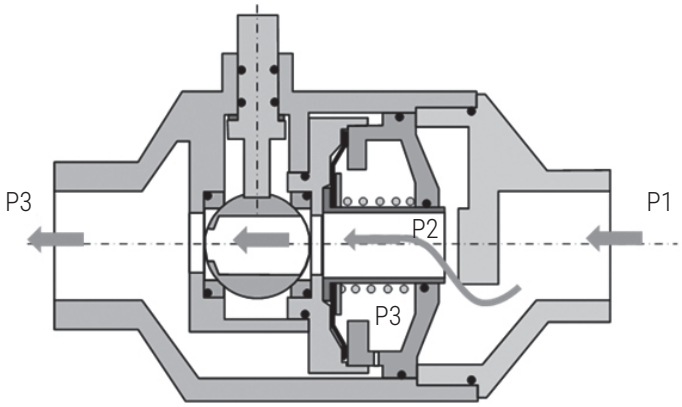






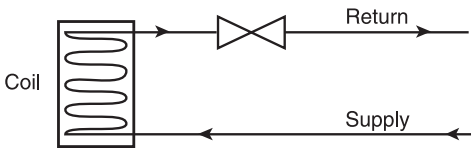
PIQCV Flow Pattern

The PIQCV consists of a differential pressure regulator and a control valve. The control valve is throttled to match the flow command of the control signal. The differential pressure regulator holds the pressure drop across the ball of the valve. As system pressure changes, the differential pressure regulator moves in response to keep the flow stable. Pressure (P1) at the inlet PIQCV is high and pressure (P3) at the outlet is low. The differential pressure between (P1) and (P3) must be between 5-50 to achieve pressure independent flow. When differential pressure increases the regulator opening is decreased. When differential pressure decreases the regulator opening is increased. This allows for the constant pressure differential across the ball of the valve.

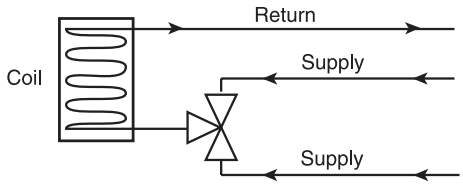


QCV Typical Piping

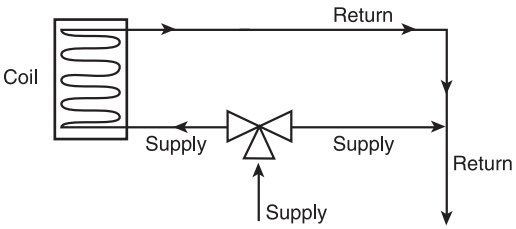
2-way Valve Piping Diagram



3-way Switching Valve Piping Diagram

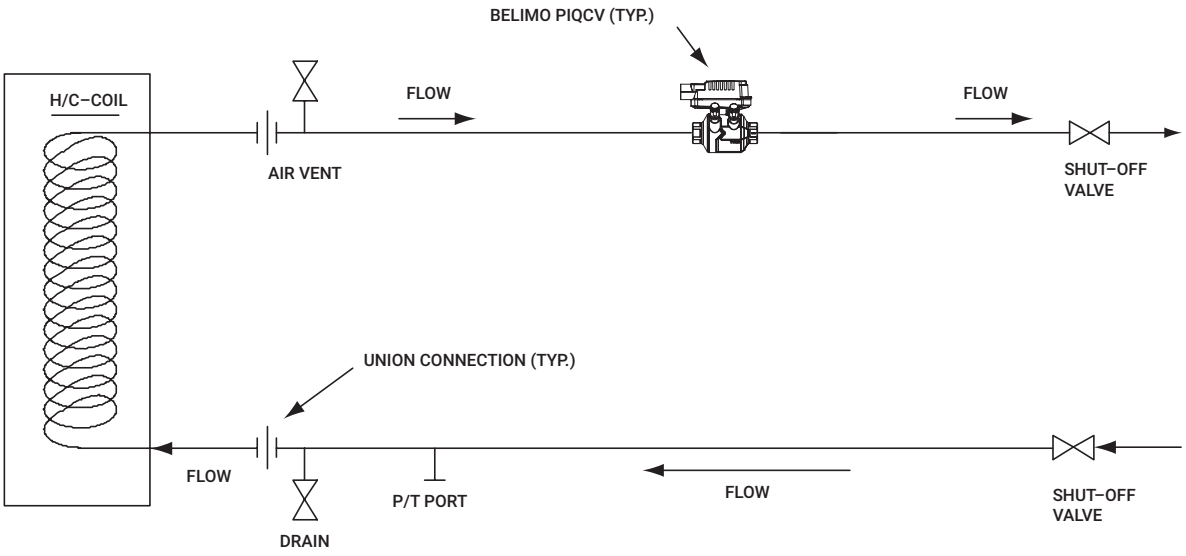


3-way Diverting Valve Piping Diagram



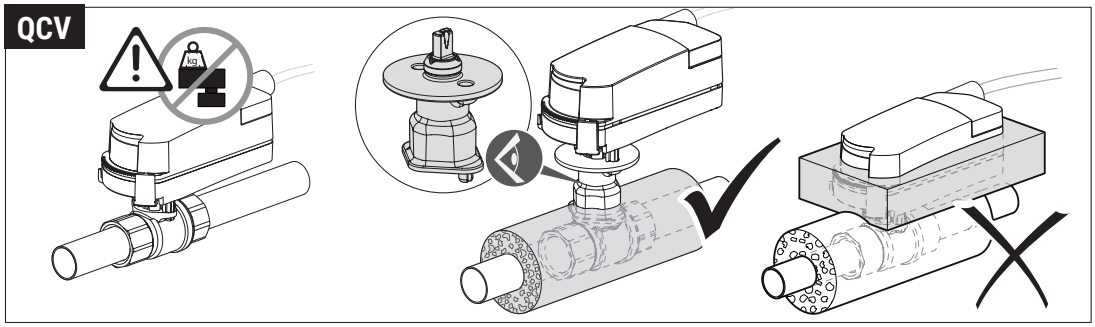
PIQCV Typical Piping

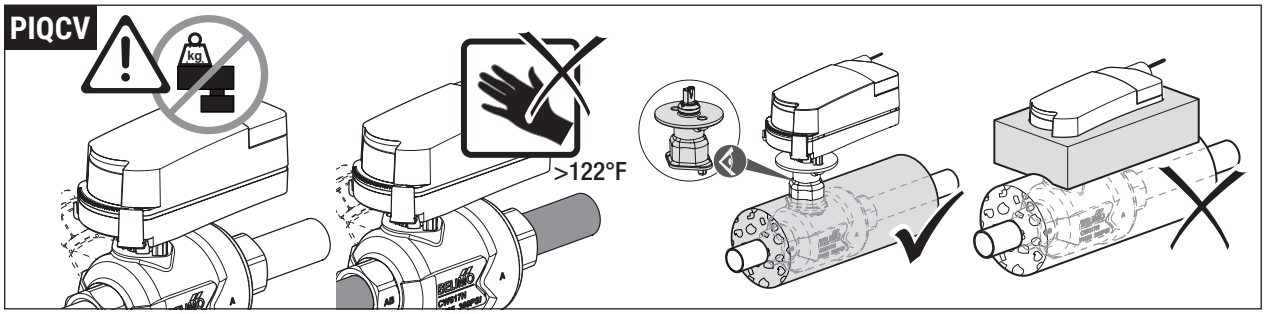
PIQCV is recommended to be installed on the return side of the coil. This diagram is for typical applications only. Consult engineering specification and drawings for particular circumstances. PT ports are recommended on the supply side of the heat transfer device to allow for coil pressure/temperature measurements and calculation of flow. Refer to PIQCV technical documentation for flow verification and commissioning procedures.



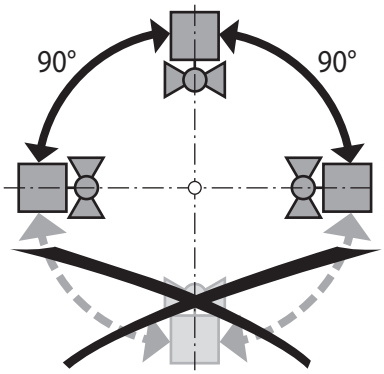
Insulation and Orientation

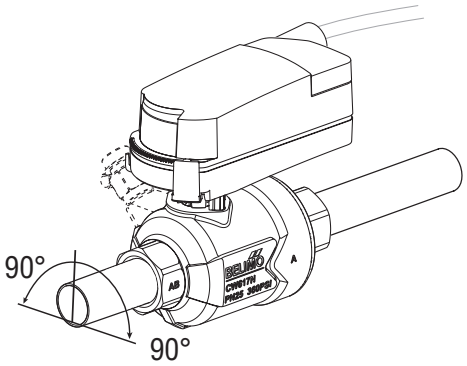
Insulation should wrap the pipe and valve body but not the actuator. For chilled water applications use the stem extension kit accessory to raise the actuator above the valve body to provide space for insulation.

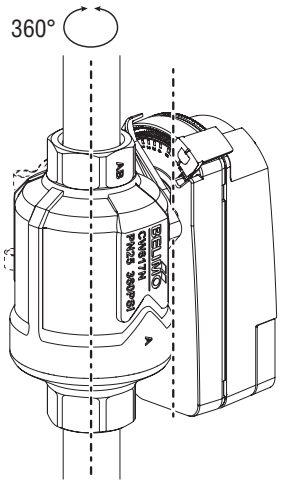




PIQCV's should be installed with flow in the direction of the arrow on the valve body. If installed backwards, there could be damage to either the diaphragm or the regulator. The valve assembly can be installed in a vertical or horizontal arrangement as long as the actuator is positioned to avoid water from dripping on the actuator.





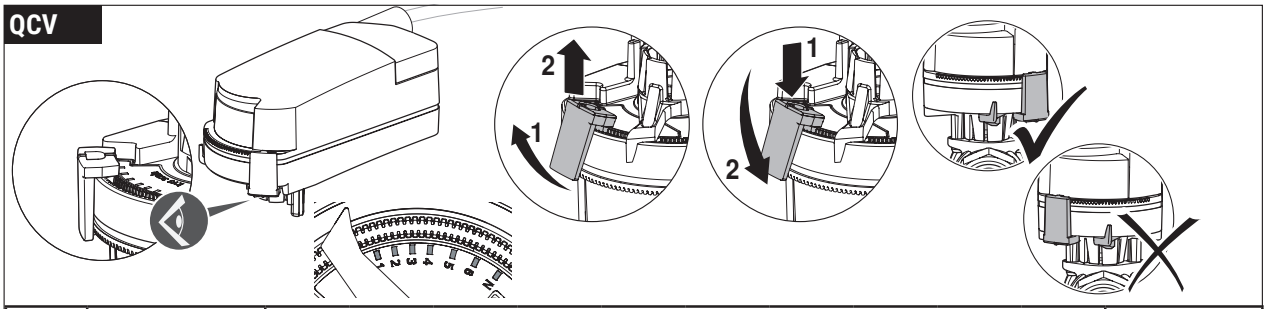


Field-Set Flow Capacity Adjustment

Align the clip to the notch scale found on the underside of the actuator to the corresponding flow in the table below. For 3-point floating control signals adjust the controller runtime parameter to match the runtime of the of the final clip position. For analog DC 2...10 V control signals see adaption instructions.

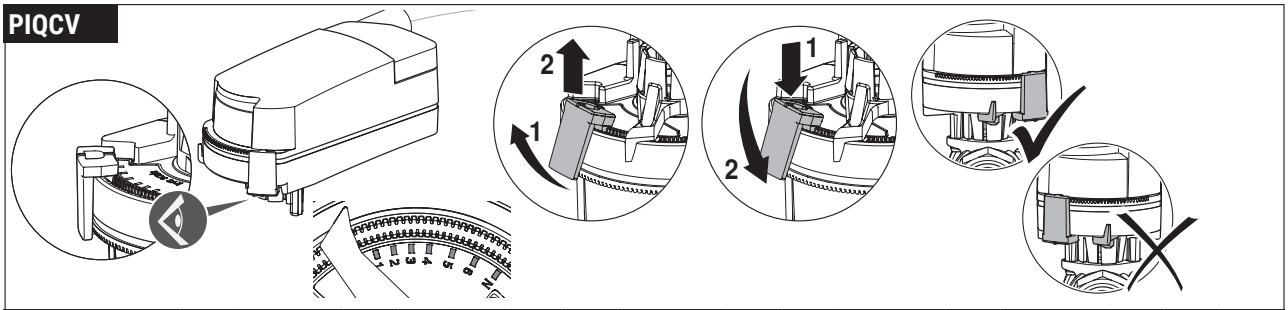
For incremental notch settings refer to the flow graphs on page 25 or visit www.belimo.com and put in your flow requirements to determine your notch position.

QCV



Size	Valve Model	V'max End Stop Positions										V'nom
		1	2	3-	3	4	4+	5	5+	6	N	No end stop
1/2"	Z2050Q(S)(PF)-F	0.1		0.2			0.4		0.6	0.8	1.2	1.4
1/2"	Z2050Q(S)(PF)-J	0.5	0.7		1.2	1.7		2.4		3.4	4.8	5.9
3/4"	Z2075Q(S)(PF)-K	0.5	1.0		1.5	2.3		3.3		4.6	6.6	9.8
1"	Z2100Q(S)(PF)-K	0.5	0.9		1.5	2.2		3.1		4.3	6	8.2
Runtime (seconds)		30	37	41	43	49	51	55	58	62	68	75

PIQCV



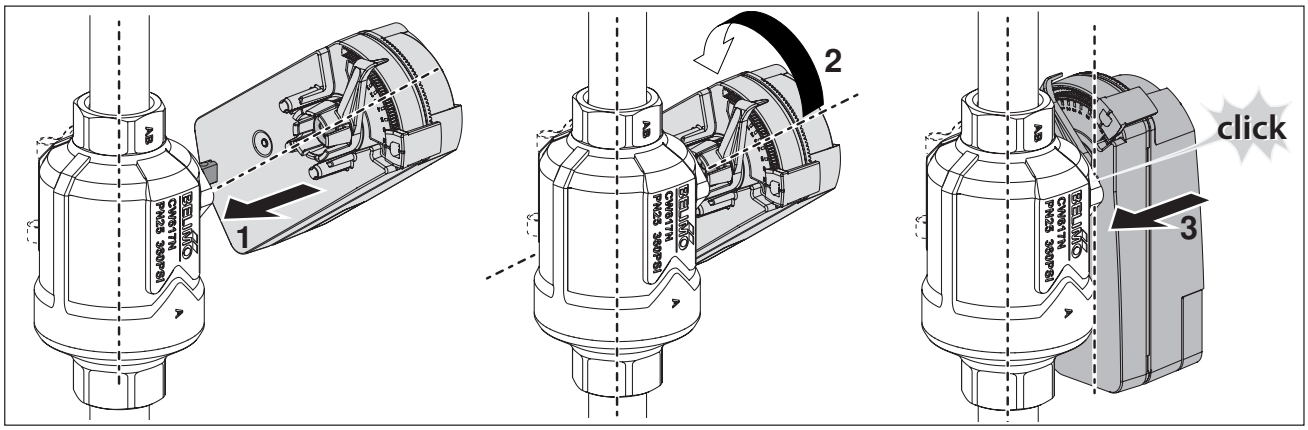
Valve Model 1/2"	Clip Position for Flow Adjustment (GPM)																			
	1	1+	2-	2	2+	3-	3	3+	4-	4	4+	5-	5	5+	6-	6	6+	N-	N	No Clip
Z2050QPT(PF)-B			0.1					0.2			0.3		0.4		0.5		0.6	0.7	0.8	0.9
Z2050QPT(PF)-D	0.2			0.3			0.4	0.5		0.6	0.7	0.8	0.9	1.0	1.2	1.3	1.5	1.6	1.8	2.0
Z2050QPT(PF)-F				0.6		0.7	0.8	0.9	1.0	1.3	1.5	1.7	1.9	2.2	2.5	2.8	3.1	3.3	3.6	4.3
Valve Model 3/4"																				
Z2075QPT(PF)-G			1.6	1.8	2.1	2.4	2.7	3.0	3.3	3.7	4.0	4.4	4.9	5.3	5.8	6.3	6.7	7.2	7.7	9.0
Runtime	30	33	35	37	39	41	43	45	47	49	51	53	55	58	60	62	64	66	68	75

NPT Installation

ZoneTight valves are provided with ASME NPT female pipe treads for connection to threaded pipe.

Actuator Attachment

Attach the actuator to the valve body. Align the actuator guide pins to the valve bonnet openings and press down until a click is heard. To remove the actuator, grasp it with your hand and pull it away from the valve body.



Adaption for Proportional Actuators

For actuators with analog 2-10 VDC signal, after flow capacity adjustment has been field-set by moving the clip to a desired position, execute the adaption routine to scale the signal across the available travel. The actuator will travel first in one direction and stall, then will travel in the opposite direction and stall. Then it will travel to the commanded position of the control signal. When the actuator is powered for the first time the adaption routine will execute automatically. Execute the adaption function any time the clip position is changed. The adaption routine does not change the actuator speed, which is 75 seconds over 90 degree rotation.

For actuators with On/Off or Floating Control input there is no adaption function or button.

Proportional Actuators: CQB24-SR, CQB24-SR-L, CQB24-SR-R, CQKB24-SR, CQKB24-SR-LL, CQKB24-SR-RR, CQKB24-SR-LR, CQKB24-SR-RL

On/Off, Floating Point Actuators: CQB24-3, CQBUP-3

On/Off Actuators: CQKB24, CQKB24-S, CQKBUP

Proportional Actuator

On/Off, Floating Point Actuator

Operation

The ZoneTight Zone Valves (QCV, PIQCV) are operated by rotary actuators. The actuators are controlled by a standard voltage for on/off control, proportional signal, or 3-point control system which move the ball of the valve to the position dictated by the control system.

Non-Spring Return CQ.., CQ..UP
Fail-Safe Actuators CQK.., CQK..UP

Actuator Specifications	
Power supply	24V (AC 110...230 V, UP series)
Manual override	use actuator or slotted screwdriver to turn valve stem
Power consumption	
CQ...	0.3 W running, 0.2 W holding
CQK...	2.5 W running, 0.5 W holding
CQ..UP	1.0 W running, 0.7 W holding
CQK..UP	3.0 W running, 0.5 W holding
Transformer sizing	
CQ...	0.6 VA
CQK..	5 VA
CQ..UP	2 VA
CQK..UP	7 VA
Electrical connection	3 ft., 18 GA, plenum rated cable ½" conduit connector
Overload protection	
Non-Spring Return	electronic throughout 0° to 90° rotation
Fail-Safe	electronic throughout full stroke
Operation range Y	on/off
Angle of Rotation	90°, adjustable with mechanical stop
Position Indication	pointer
Running Time (Motor)	75 seconds
Running Time (Fail-Safe)	60 seconds
Humidity	5...95% RH non-condensing
Ambient Temperature Range	35...104°F [1.7...40°C]
Storage Temperature Range	-40...+176°F [-40...+80°C]
Housing	NEMA 2, IP40, UL enclosure type 2
Housing Material	UL94-5VA
Agency Listings†	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC and 2006/95/EC
Noise Level (Motor)	<35 dB (A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	
Non-Spring Return	0.44 lb [0.2 kg]
Fail-Safe	3.6 lb [1.6 kg]
Quality standard	ISO 9001
Agency listings	UL 60730-1/2-14, 2-18, CE according to 2004/108/EC and 2006/95/EC

Problem	Field Observations	Possible Solution
Actuator will not move.	Actuators wires are connected.	Verify the power supply and control signal are wired and operating correctly. Remove the actuator from the valve body and use the actuator or a slotted screwdriver to move the valve stem to verify free rotation.
Actuator does not modulate with the control signal as expected.	Valve throttles to a different position than expected.	For 3-point floating signals the actuator runtime is relative to the travel set by the clip. The controller runtime parameter may need to be adjusted to match the runtime of the actuator.
Valve is yielding flow but cannot be commanded to the full flow setting	Valve is partially open but will not move to a full open position with a full signal command.	For analog actuators the adaption function may have previously occurred to a lesser angle of rotation than now exits. Press the adaption button and the actuator will re-scale to the full travel set by the clip position.
Full flow is lower than expected.	Clip may be in the wrong position.	The clip may need to be adjusted to a greater angle of rotation to allow more flow, or removed to obtain maximum flow capacity. Refer to the flow commissioning instructions (page 18) for adjustment and verification procedures.
Desired flow cannot be reached.	Valve is wide open.	Increase the pump differential pressure to resolve low flow problems.
Flow measurements are not stable.	Air may be in the system.	Remove air from the system to solve the problem.

Wiring Diagrams

INSTALLATION NOTES

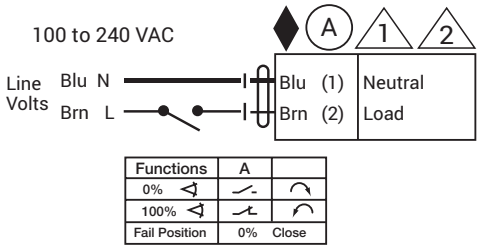
- (A) Actuators with appliance cables are numbered.
- (1) Provide overload protection and disconnect as required.
- (2) Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- (3) Actuators may also be powered by 24 VDC.
- (18) Actuators with plenum rated cable do not have numbers on wires; use color codes instead.
- (100) One built-in auxiliary switch (1x SPST), for end position indication, interlock control, fan startup, etc.

APPLICATION NOTES

- ◆ Meets cULus requirements without the need of an electrical ground connection

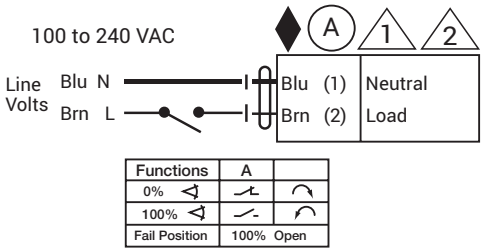
⚠ WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



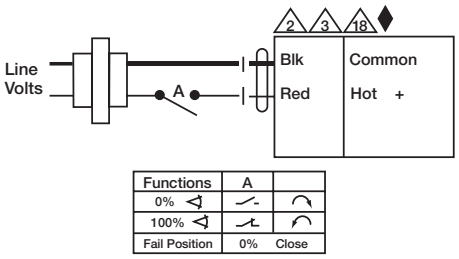
Functions	A	
0%		
100%		
Fail Position	0%	Close

On/Off, CQKBUP-RR



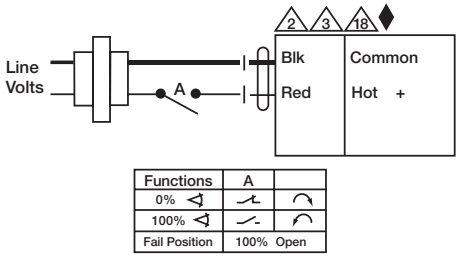
Functions	A	
0%		
100%		
Fail Position	100%	Open

On/Off, CQKBUP-LL



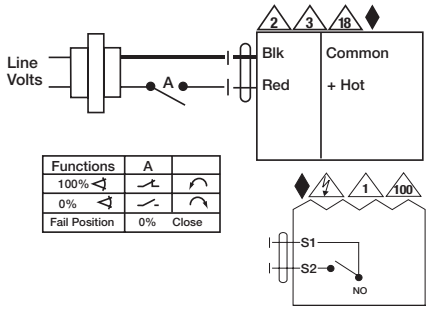
Functions	A	
0%		
100%		
Fail Position	0%	Close

On/Off, CQKB24-RR



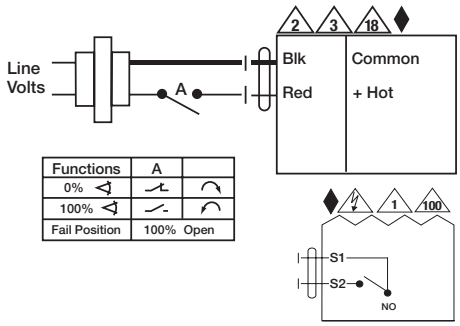
Functions	A	
0%		
100%		
Fail Position	100%	Open

On/Off, CQKB24-LL



Functions	A	
100%		
0%		
Fail Position	0%	Close

On/Off, CQKB24-S-RR



Functions	A	
0%		
100%		
Fail Position	100%	Open

On/Off, CQKB24-S-LL

Wiring Diagrams

INSTALLATION NOTES

2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

3 Actuators may also be powered by 24 VDC.

5 Only connect common to neg. (-) leg of control circuits.

7 A 500 Ω (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

18 Actuators with plenum rated cable do not have numbers on wires; use color codes instead.

APPLICATION NOTES

Meets cULus requirements without the need of an electrical ground connection

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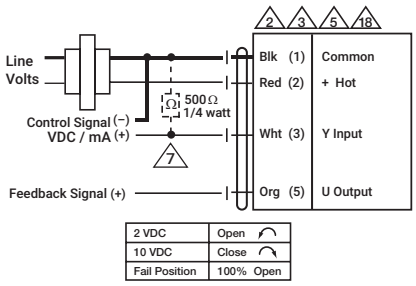
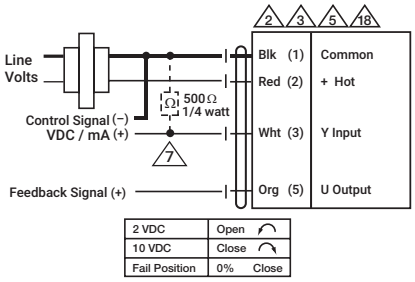
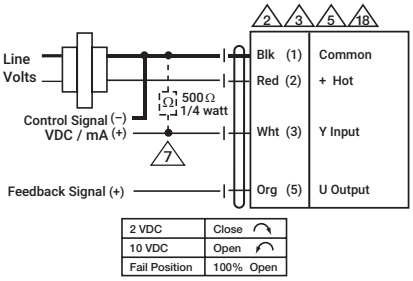


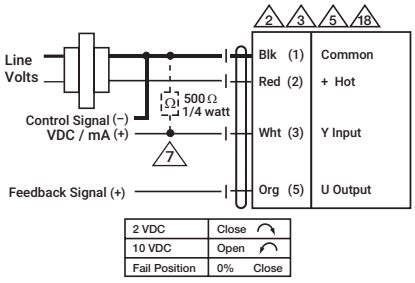
Proportional, CQKB24-SR-LL



Proportional, CQKB24-SR-LR



Proportional, CQKB24-SR-RL



Proportional, CQKB24-SR-RR

Wiring Diagrams

INSTALLATION NOTES

△2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

△3 Actuators may also be powered by 24 VDC.

△5 Only connect common to neg. (-) leg of control circuits.

△7 A 500 Ω (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

△18 Actuators with plenum rated cable do not have numbers on wires; use color codes instead.

APPLICATION NOTES

◆ Meets cULus requirements without the need of an electrical ground connection

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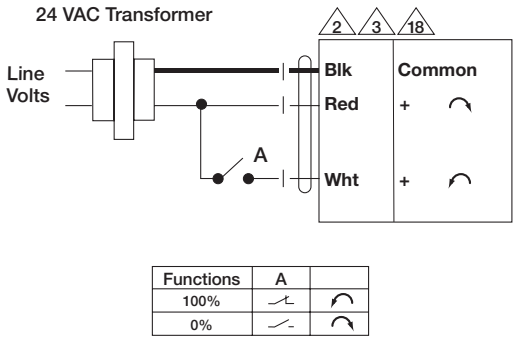
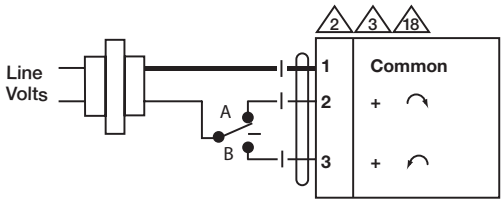


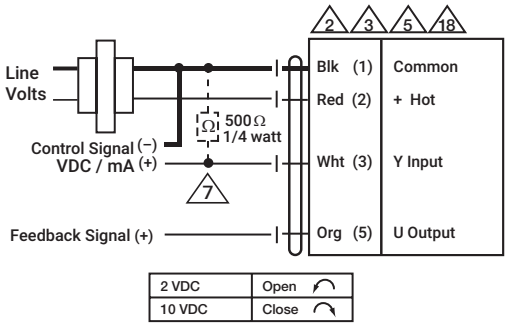
Functions	A	
100%		
0%		

On/Off, CQB24-3



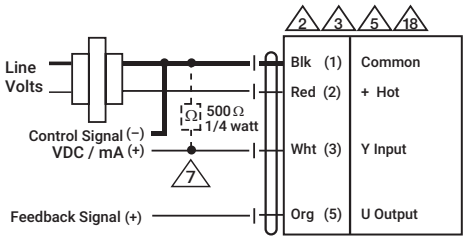
Functions	A	B	
0%			
100%			

Floating Point, CQB24-3



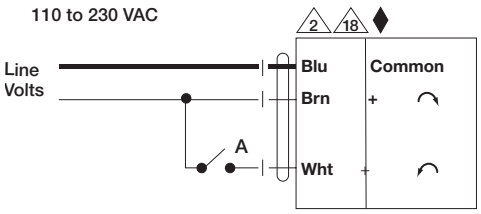
2 VDC	Open
10 VDC	Close

Proportional, CQB24-SR-L



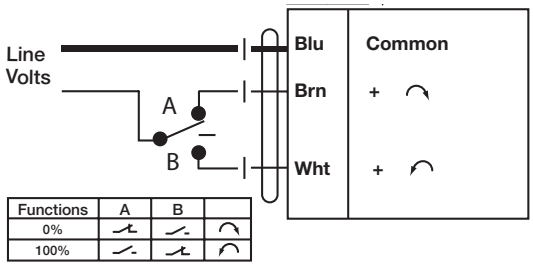
2 VDC	Close
10 VDC	Open

Proportional, CQB24-SR-R



Functions	A	
100%		
0%		

On/Off, CQBUP-3



Functions	A	B	
0%			
100%			

Floating Point, CQBUP-3

PIQCV Flow Verification and Commissioning Overview without Flow Orifice Device

After the actuator travel limit clip has been correctly located to position 1-N (or removed) to match the maximum flow setting of the coil, the following procedures detail the flow verification and commissioning procedures for Pressure Independent Valves Quick Compact Valves (PIQCV). These procedures are not mandatory to ensure proper operation of PIQCV. PIQCVs are very different from pressure dependent control valves (standard control valves). Pressure variations in the system do not affect flow through the PIQCV. Additional flow regulating devices (e.g. circuit setters and automatic flow limiting devices) should not be used in conjunction with PIQCVs. This makes the Testing and Balancing (TAB) or commissioning process much different from standard control valves. PIQCVs offer numerous maximum design flow values in each valve body size. It is important to note that the valve will travel to 90 degrees only when there is no end stop.

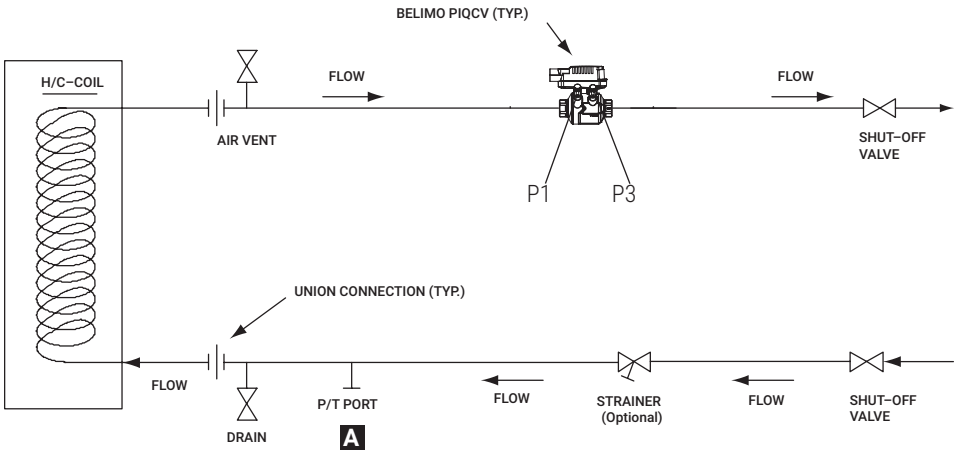
External P/T ports allow for independent verification of proper PIQCV operation. Additionally, these ports allow for future comprehensive troubleshooting and diagnosis. For proper and accurate flow verification of the mechanical PIQCV, it is essential that the mechanical contractor install P/T port A.

- P/T port A (P1) are used for measuring pressure differential across the coil (used to measure water ΔP to equate to flow) or to measure water ΔT across the coil.
- P/T port P1 and P3 are used to measure ΔP across the PIQCV assembly. PIQCVs must have 5 – 50 psid (11.5 ft. – 115 ft. H2O) differential pressure within this range. Do not manually remove the actuator travel limit clip to fully open the valve to check for design flow or pressure. Valve shall be commanded to design flow position via analog or BMS (Building Management System) signal. The required operating differential pressure range is necessary to insure pressure independent operation of the PIQCV

Note: The flow setter (ZCQB-FL) can be used to adjust the flow if the BMS is not available during the commissioning process.

Mechanical PIQCV Pre-flow Verification Checklist

- Verify that system is purged of air and filled to proper pressure.
- Verify that each PIQCV has the required operating differential pressure range across P/T ports P1 and P3 as shown in fig. A.
- Verify proper pump operation per manufacturer's specifications.
- Verify proper supply water temperature is available and is at design temperature.
- Proper air filter maintenance has been completed.
- Fan belts are in proper working order.
- Heat transfer devices (coils) are clean.
- Strainers are clean.
- All manual shutoff valves are open.
- All bypass valves are closed.
- No automatic or manual balancing valves exist. If they do exist, they must be set fully open and locked to not interfere with the pressure independency function of the PIQCV.



Procedures without Flow Orifice Device

Procedure #1 (System Verification) – Total System Flow Method

Verification for PIQCV Cooling/Heating

1. Verify that the system is in proper working order. Depending on the valves used, check the items listed for PIQCV Pre-Flow Verification Checklists.
2. If diversity factor = 100%, command open all PIQCV's via the BMS system. Systems with less than 100% diversity need to have a number of valves closed to match design diversity.
3. Ensure that pumps are either manually commanded to sufficient speed to provide proper differential pressure across all valves OR if pumps are under DDC pressure control ensure ΔP setpoint is sufficient to provide the above conditions.

- Verify total system flow in main return line is at system design flow rate using one of the following methods: Orifice, Venturi, Electronic flow meter, System-level Flow Device

1. Decrease the pump speed (or decrease ΔP setpoint if under control) until a measureable flow decrease occurs.
2. Increase pump speed (or increase ΔP setpoint if under control) slowly until design flow is reestablished. Make note of the resulting ΔP. This will be the maximum system ΔP operating setpoint.

Note: If total flow does not match design flow then troubleshooting must be done to determine cause. This may involve verifying flows at the terminal level.

Procedure #2 (Terminal Level Verification) – Air Delta T Method

Verification for PIQCV Cooling/Heating

1. Verify that the system is in proper working order. Depending on the valves used, check the items listed for PIQCV Pre-Flow Verification Checklists.
2. Ensure that water is at design temperature.
3. Ensure that terminal airflow is at design airflow rate (cfm).
4. Command open the PIQCV via analog or BMS control signal to maximum design flow position. (Do not manually open the PIQCV beyond the actuator travel limit clip position).
5. Reference approved engineering document containing design air temperature drop/rise for design conditions.
6. Measure coil inlet air temperature and coil discharge air temperature.
7. Difference between coil inlet air reading (EAT) and coil discharge air reading (LAT) should equal to or exceed design air delta T as shown on the contract documents.

Procedure #3 (Terminal Level Verification) – Water Delta Method

Verification for PIQCV Cooling/Heating

1. Verify that the system is in proper working order. Depending on the valves used, check the items listed for PIQCV Pre-Flow Verification Checklists. Ensure that water is at design temperature.
2. Ensure that terminal airflow is at design flow rate (cfm) or water coil airflow is unencumbered.
3. Command open the PIQCV via analog or BMS control signal to maximum design flow position. (Do not manually open the PIQCV beyond the actuator travel limit clip position.)
4. Reference approved engineering document containing design water temperature drop/rise for design conditions.
5. Measure water temperature differential of coil by using P/T ports A and B (or A and P1) as referenced in Fig. A.
6. Measured temperature differential should be equal to designed water temperature differential (EWT, LWT) as shown on the contract documents.

Procedure #4 (Terminal Level Verification) – Coil ΔP (Delta P) Method

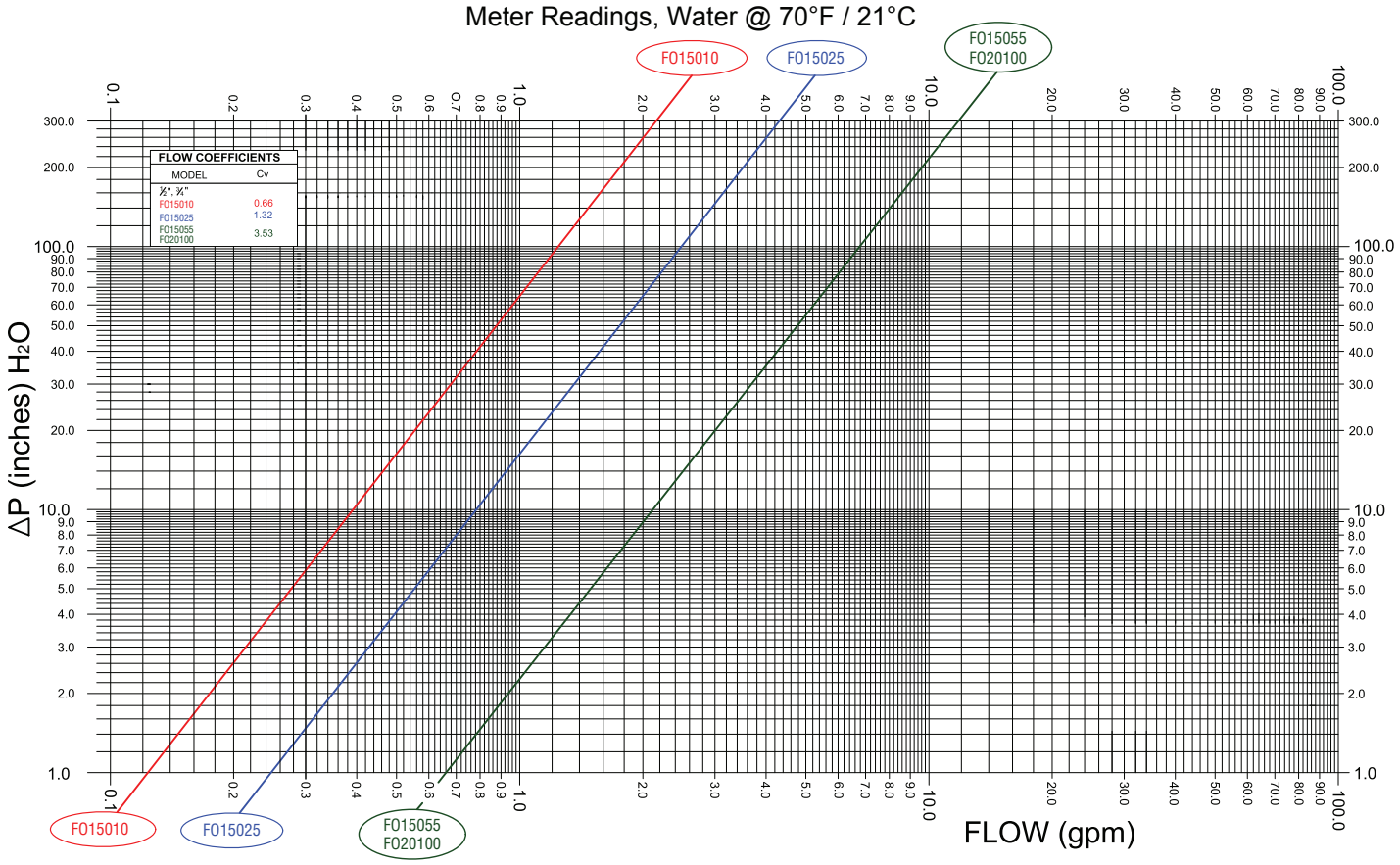
Verification for PIQCV Cooling/Heating

1. Verify that the system is in proper working order. Depending on the valves used, check the items listed for PIQCV Pre-Flow Verification Checklists.
2. Command open the PIQCV via analog or BMS control signal to maximum design flow position. (Do not manually open the PIQCV beyond the actuator travel limit clip position.)
3. Ensure ΔP across valve assembly between P/T ports B and C (or P1 and P3) as shown above in Fig. A is within manufacturer's operating parameters.
4. Reference approved engineering document containing design coil water pressure drop (usually expressed in ft. of water) for design flow conditions. This value will be for the heating/cooling coil associated with corresponding PIQCV.
5. Measure coil ΔP by using P/T ports A and B (or A and P1) as referenced in Fig. A.
6. Formula to calculate flow is: Actual GPM = Design GPM x $\sqrt{(\text{Measured Coil } \Delta P/\text{Design Coil } \Delta P)}$

Note: Measured Coil ΔP and Design Coil ΔP must be expressed in the same engineering units (feet of water, inches of water, psi, etc.).

Flow Verification with Flow Orifice Device

- Belimo flow orifice device has two pressure ports for field ΔP measurement with a manometer gauge.
- Connect manometer high pressure line to flow orifice red PT port; connect low pressure line to green PT port. Follow gauge instructions to verify connections.
- Take ΔP reading in inches of water (w.c.) and transpose to the Flow Orifice line of the Flow Chart. From that point follow the corresponding chart line to the flow scale and determine the actual flow.
- Refer to field-set procedure section on page 14 to adjust flow capacity to meet project requirements.



For Exact GPM or ΔP
GPM = $\sqrt{DP}$ x (Cv / 5.3)
Δ P = (GPM x 5.3 / Cv)²

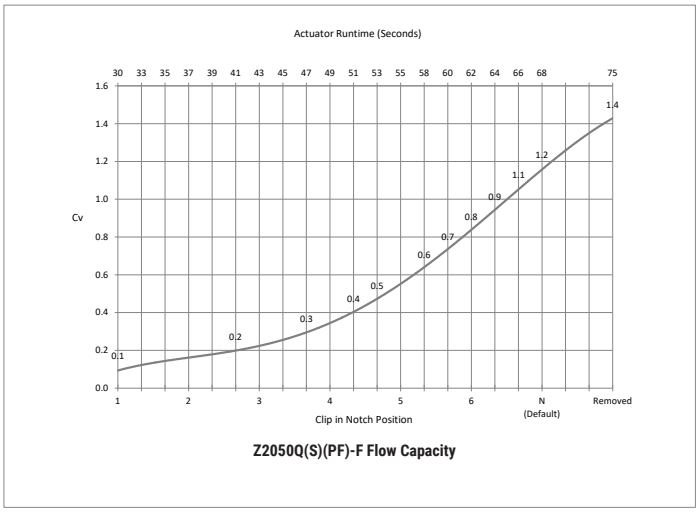
Temperature Correction Factor:
155°F / 68°C = 1.01 x GPM
205°F / 96°C = 1.02 x GPM

How to Determine Flow:
1. Enter the chart with the ΔP (differential pressure) reading.
2. Go horizontally across to the size of the valve.
3. Go vertically up or down to read the GPM (flow).

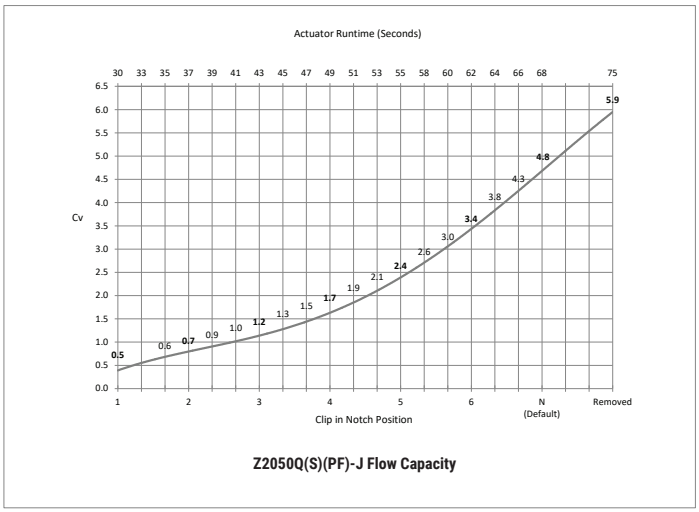
Valve Flow Charts

Two notch positions exist between numbered notches for field-set clip positioning to obtain maximum flow capacity. Refer to charts and set the clip as needed.

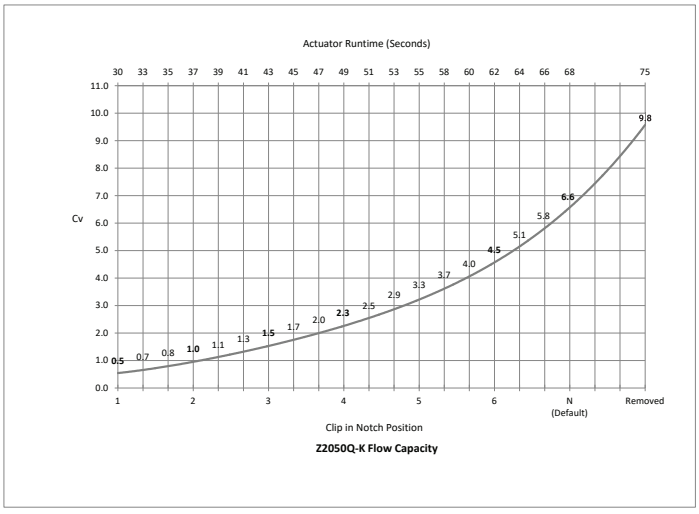
QCV Flow Curves



Z2050Q(S)(PF)-F Flow Capacity

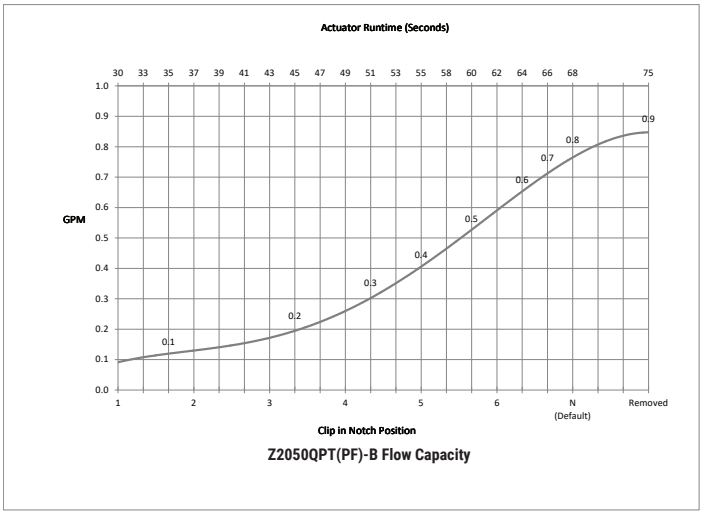


Z2050Q(S)(PF)-J Flow Capacity

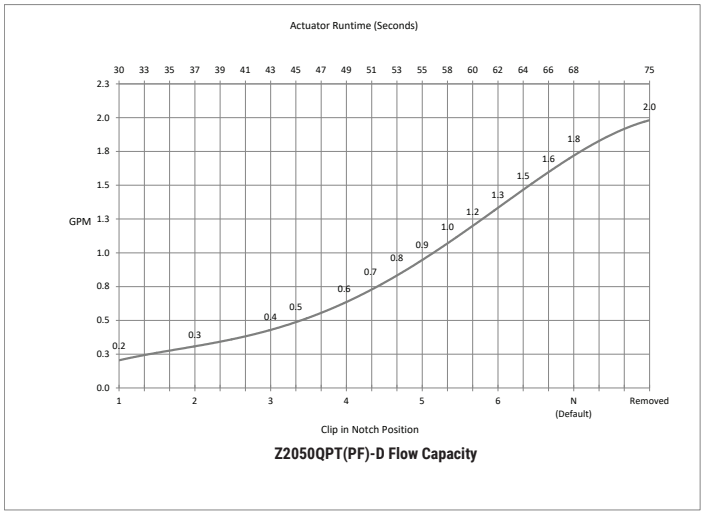


Z2050Q-K Flow Capacity

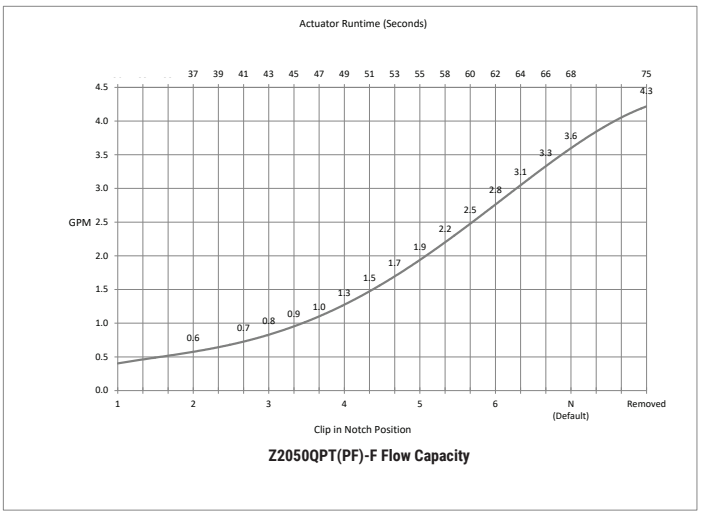
PIQCV Flow Curves



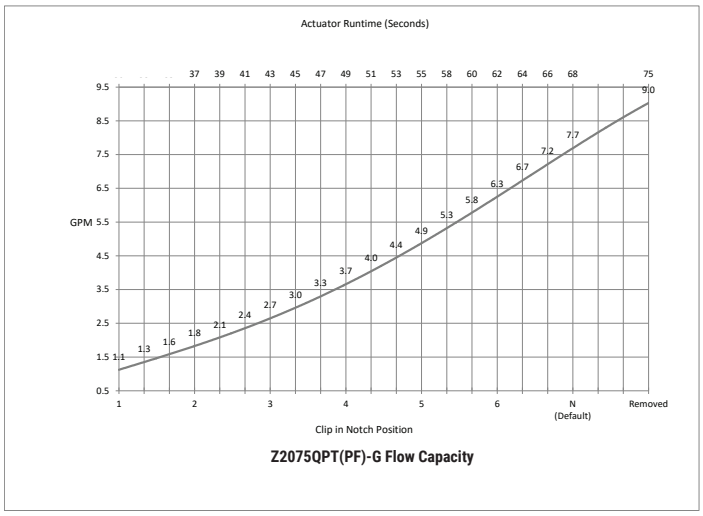
Z2050QPT(PF)-B Flow Capacity



Z2050QPT(PF)-D Flow Capacity



Z2050QPT(PF)-F Flow Capacity



Z2075QPT(PF)-G Flow Capacity

1. Scope

These General Terms and Conditions are applicable to the purchase and sale of BELIMO Aircontrols USA, Inc., (hereinafter "BELIMO") products and services by the Client. As used herein, Client refers to the individual or entity that purchases BELIMO products or services directly from BELIMO. If the Client requests a delivery or service abroad, the contract will be concluded with the local BELIMO company in that country or with a BELIMO company named by BELIMO in the order confirmation. In such case, the General Terms and Conditions of the BELIMO company appointed in the order confirmation will be applicable. In case our delivery includes software and accompanying documentation, the terms of the license agreement are applicable in addition to these General Terms and Conditions. However, in case of any conflict between the two documents, the license agreement shall prevail.

Client's order of any BELIMO product, or BELIMO providing any service to Client, is expressly conditioned on Client's acceptance of these General Terms and Conditions, and the parties agree that Client's order of any BELIMO product, or BELIMO's performing of any service to Client, constitutes Client's acceptance of these General Terms and Conditions. No additional or different terms or conditions delivered to BELIMO from Client apply. BELIMO deems such additional or different terms or conditions material alterations to these General Terms and Conditions, and BELIMO hereby notifies Client of its objection to and rejection of such additional or different terms or conditions.

2. Conclusion of the contract

The contract is deemed to be concluded upon receipt of an order confirmation by the Client or, upon absence of such confirmation, upon the segregation of the ordered products by BELIMO. All catalogs, brochures and publications on the Internet are considered to be an offer from BELIMO to Client, which acceptance is expressly limited to these General Terms and Conditions.
Modifications or additions to these General Terms and Conditions or to the contract are not valid without written approval by BELIMO. Orders that deviate from the specifications published by BELIMO or contain additions or modifications made by the Client will only be effective if they have been expressly approved by BELIMO with a written order confirmation.

3. Cancellation of the contract

Orders of products according to catalog (standard products) may be cancelled by the Client until the segregation of the ordered products by BELIMO provided that BELIMO has received the statement of cancellation prior to the time of segregation.
Orders of customers' products (special designs etc.) may be cancelled only up to 4 hours after receipt of the order by BELIMO. In that case, a service charge of 10% of the net order amount will be invoiced to the Client. In case of customized products or configured actuators, a service charge of 20% of the net order amount will be invoiced to the Client.

4. Prices

If not expressly specified otherwise, all price information is net, excluding VAT.
The standard packaging of the ordered products is included in the net price. All other costs, such as for transport, insurance, taxes, customs duties as well as export, import or other necessary approvals will be invoiced as additional charges. The net price does not include any additional services performed by BELIMO, such as installation, commissioning and compilation of diagrams etc.
BELIMO reserves the right to change prices at any time until the conclusion of the contract.

5. Delivery conditions

All times, dates and delivery deadlines are considered non-binding, unless their binding nature has been expressly agreed in writing. Binding delivery deadlines and dates that have been agreed upon in writing are met when the product is made available in the distributing warehouse before the corresponding dates have passed. If BELIMO has a delay in delivery, it is assumed that the Client continues to demand the delivery. Compensation for late delivery or for replacement is excluded.
If not otherwise indicated on the order confirmation, delivery of the Goods shall be made in accordance with Incoterms® 2020 DAP Goods recipient (DAP = Delivered At Place, delivery address ship-to-party)
BELIMO reserves the right not to deliver the ordered products if they are unavailable; in this case, BELIMO will promptly notify the Client of the non-availability and, if necessary, reimburse any payment already made.

6. Payment conditions

BELIMO invoices must be paid in full within 30 days after the date of invoice. If the Client is in delay, BELIMO reserves the right to withhold further deliveries.
The Client is not entitled to offset outstanding accounts from BELIMO with any counterclaims.

7. Application, installation and use of BELIMO products

BELIMO products are intended for professional use only. BELIMO products may only be installed and replaced by skilled qualified personnel.
BELIMO products must be used in accordance with the specifications of the respective currently valid data and assembly sheet. The use of Belimo Cloud Services is subject to the "Terms of Use for Belimo Cloud Services" as amended from time to time (https://www.belimo.com/mam/corporate-communications/privacy/BELIMO-Cloud-Terms-of-use_EN.pdf).

8. Specifications

Except as provided in section 13, the non-technical specifications or technical specifications that are not part of the data sheets as provided for a particular product at the time of order, published by BELIMO in text or picture form (e.g. illustrations or drawings) in catalogs, brochures, websites, data and assembly sheets or other publications are only to be regarded as a guideline. The specific characteristics of the delivered products can deviate from that of images or samples in respect to material, color or shape. BELIMO reserves the right to change the communicated product specifications or to deliver corresponding products from third-party suppliers in place of the ordered products.

9. Reservation of title

The title of supplied products remains with BELIMO until the Client has fully paid all invoices.

10. Passing of risk

Benefit and risk with regard to the products purchased pass to the Client in accordance with agreed Incoterms® 2020.

11. Redemption of products

BELIMO may, upon prior agreement, redeem products according to catalog (standard products) provided that these products are still contained in the product range, virgin, i.e. not older that max. 6 months, unused, and originally packed at the time of return. BELIMO does not have any duty of redemption. Redemption of customers' products (special designs, Designed to Order, configured actuators), Openline-products or products that have been procured on Client's specific demand is excluded.
The return of products according to catalog shall be made enclosing a copy of the invoice and stating the reason for the return, free of all charges to BELIMO Aircontrols USA, Inc, 33 Turner Road, attn. Returns Dept., Danbury, CT 06810 for the east coast of USA and to BELIMO Aircontrols USA Inc, 1049 Fortunato Loop, attn. Returns Dept., Sparks, NV, 89436-8310 for the west coast of USA.

From the credit as agreed with the Client, a service charge of at least 20% of the net catalog price will be deducted. A payment of the credit in cash is excluded. It can only be credited against future orders.

12. Duty of examination/Acceptance

The Client shall examine all products for defects within 5 working days of receipt. Any defects are to be reported to BELIMO within 5 working days of receipt in writing; the product will otherwise be deemed to be accepted. Hidden defects must be reported in writing within 5 working days after they are discovered.

13. Warranty

With its warranty, BELIMO guarantees during the warranty period in accordance with this section 13, that the delivered products meet the technical specifications that are explicitly listed on the corresponding data sheets as at the time of order.

However, the applicable warranty for a Belimo product is null and void in the event of damage resulting from or partly caused by the Client or by third parties acting within the scope of responsibility of the Client when:

a) Products are used in areas that are not specified in the data and assembly sheets, especially in aircraft and any other airborne means of transport;
b) Products are used contrary to applicable laws, official regulations or the instructions of BELIMO (especially regarding installation, commissioning, operating regulations and information on the data and assembly sheets);
c) Products are used under special conditions, especially under the continuous influence of aggressive chemicals, gases or liquids or outside of the permissible operating parameters or conditions for use;
d) Products are assembled, handled or installed incorrectly or without due care or not according to the respective authoritative state-of-the-art or are not used or installed by skilled qualified personnel;
e) Products are modified or repaired without prior written approval of BELIMO;
f) Products become worn out as a result of inappropriate or unintended use or excessive stress;
g) Products are stored inappropriately; or
h) The Client or third parties are responsible for damage.
i) Belimo also provides no warranty for normal wear and tear, including all types of corrosion, operational or environmental wear and tear and the like, as long as this is not due to defects in materials or workmanship.

For Openline-products further limitations of liability according to the applicable framework agreement, concluded between BELIMO and the Client, will apply.

The Client is liable for actions or omissions of auxiliary personnel as if these were his own actions.

The warranty period is five years from the date of manufacture for BELIMO products. The warranty period is two years from the date of delivery for Openline-products. The warranty period for products that have not been manufactured by BELIMO (trade products) can be derived from the order confirmation. Trade products are specified as such, either by the name and/or by the logo of the manufacturer. The warranty period for trade products is generally one year from the date of delivery, in exceptional cases two years from the date of delivery.

The warranty period starts at the time of manufacture or delivery of the product, respectively, without requiring acceptance from or testing by the Client. The Client is obliged to immediately initiate all suitable measures to minimize damage. If a timely report has been made in accordance with Section 12 above, BELIMO has the sole and absolute discretion to replace, repair or refund by store credit or otherwise the net purchase price of a defective product. In case of repair or replacement, Belimo is obliged to either replace defective products with products that are equal or equivalent, or to have them repaired either by BELIMO or by third parties at BELIMO's expense. Client shall have no right to a preference or selection between a repair, replacement or refund, whether through store credit or otherwise, of a defective product.

The replacement of a defective product does not restart the warranty period for that product. BELIMO can require the Client to replace particular defective products or parts of products in a system to prevent damage, whereby reasonable Client expenditures in this context that are approved in advance in writing by BELIMO will be reimbursed by BELIMO.

WARRANTY DISCLAIMER: EXCEPT FOR THE WARRANTY SET FORTH IN THIS SECTION, BELIMO MAKES NO CONDITION OR WARRANTY, AND DISCLAIMS ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY (A) CONDITION OR IMPLIED WARRANTY OF MERCHANTABILITY; (B) CONDITION OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; C) CONDITION OR WARRANTY OF TITLE; OR (D) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.

14. Indemnification

CLIENT AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS BELIMO, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, REPRESENTATIVES, ASSIGNS, AFFILIATES, PARENT, AND SUCCESSORS ("BELIMO INDEMNIFIED PARTIES") FROM AND AGAINST ALL CAUSES OF ACTION, COMPLAINTS, CLAIMS, DEMANDS, JUDGMENTS, SUITS, LOSSES, LIABILITIES, LIENS, DAMAGES, FINES, PENALTIES, ASSESSMENTS, COSTS, ATTORNEYS FEES, AND EXPENSES THAT ARISE OUT OF, RELATE TO, OR ARE CONNECTED WITH ANY THIRD-PARTY CLAIM, SUIT, ACTION, OR PROCEEDING, RELATING TO (I) CLIENT'S ADVERTISING, MARKETING, PURCHASE, SALE, OR USE OF BELIMO PRODUCTS AND SERVICES, (II) CLIENT'S ACTUAL OR ALLEGED BREACH OF ANY REPRESENTATION, WARRANTY, COVENANT, OR OBLIGATION UNDER THESE GENERAL TERMS AND CONDITIONS, AND (III) BELIMO OR THE BELIMO INDEMNIFIED PARTIES' NEGLIGENCE. AT ITS OPTION, BELIMO WILL HAVE THE RIGHT TO CONTROL THE DEFENSE OF ANY LEGAL PROCEEDING, AND CLIENT SHALL NOT ENTER INTO ANY SETTLEMENT WITHOUT THE PRIOR WRITTEN CONSENT OF BELIMO OR THE BELIMO INDEMNIFIED PARTIES, WHICH SHALL NOT BE REASONABLY WITHELD.

15. LIMITATION OF LIABILITY

IN NO EVENT SHALL BELIMO AND THE BELIMO INDEMNIFIED PARTIES, HAVE ANY LIABILITY TO CLIENT OR ANY THIRD PARTY FOR ANY (I) LOST PROFITS, LOST REVENUE, DIMINUTION IN VALUE, COSTS OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, OR (II) ANY DAMAGES WHATSOVER (INCLUDING BUT NOT LIMITED TO CONSEQUENTIAL AND PUNITIVE DAMAGES) RESULTING FROM THE PERFORMANCE OF A PRODUCT, A TEMPORARY OR PERMANENT LOSS OF USE OF A PRODUCT, OR ARISING OUT OF ANY SERVICE PROVIDED TO CLIENT OR A THIRD PARTY, HOWEVER CAUSED UNDER ANY THEORY OF LIABILITY, AND WHETHER BASED IN CONTRACT, TORT (INCLUDING BELIMO OR THE BELIMO INDEMNIFIED PARTIES' NEGLIGENCE), STATUTE, OR OTHERWISE. BELIMO'S MAXIMUM AGGREGATE LIABILITY UNDER, ARISING FROM, OR IN CONNECTION WITH THE SALE OF ITS PRODUCTS AND PROVIDING SERVICES TO CLIENT SHALL BE LIMITED TO THE AMOUNT PAID BY CLIENT FOR THE PRODUCT OR SERVICE DEEMED RESPONSIBLE FOR THE LOSS OR DAMAGE.

THE FOREGOING LIMITATION SHALL APPLY EVEN IF BELIMO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND NOTWITHSTANDING THE FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY STATED HEREIN.

16. Force majeure

Neither BELIMO nor the Client shall have any liability to the other party for damages of any kind that result from the failure or delay in the performance of its obligations under these General Terms and Conditions, if such failure or delay is due to obstacles that are beyond either party's reasonable control irrespective of whether these occur at BELIMO, the Client or a third party.

Such obstacles are, for example, epidemics, pandemics, mobilization, war, revolts, severe interruptions of operations, accidents, labor disputes, delayed or faulty delivery of the required raw materials, semi-finished or finished goods, non-availability of important work pieces, magisterial injunctions or omissions, embargos, export or import restrictions, acts of God or any other circumstances which are, to a large extent, beyond the control of BELIMO or the Client. In such cases, both parties shall, without delay, undertake all effective measures which can be expected of them to prevent damage, or if damage occurs, to minimize the degree of this damage as far as possible.
However, in no event shall payment of any money due to BELIMO be excused or delayed by reason of the foregoing.

17. Resale
If the product is resold, the Client must impose at least the same limitations of warranty restrictions upon the buyer.

18. Privacy policy
BELIMO places great value on the implementation of lawful data processing to protect your personal data. BELIMO is obliged to process your personal data in accordance with current legislation. We are dependent on the services of third parties for the provision of our services. These third parties will only process your data in connection with the services agreed with BELIMO, will ensure the same level of data protection as BELIMO, and will not pass on your data to other third parties without your agreement. When processing your data and transfer-ring your data to third parties, BELIMO will ensure that an appropriate level of data protec-tion is guaranteed and that appropriate organizational and technical measures are implemented to protect your data. More detailed information on our data protection guidelines is available from the following Internet address: www.belimo.com/privacy.

19. Modifications
BELIMO reserves the right to modify these General Terms and Conditions at any time.

20. Severability clause
The provisions of these General Terms and Conditions are severable, and if any provision is found to be illegal, invalid, or unenforceable, the validity of the remaining provisions shall not be affected, and the illegal, invalid, or unenforceable provisions shall be replaced by such valid provisions that reflect the purpose and intent of these General Terms and Conditions.

21. Applicable law and jurisdiction
Any matter or dispute (whether in contract, tort, or statute) based upon, arising out of, or relating to these General Terms and Conditions or BELIMO products, shall be governed by the laws of the State of Delaware, including its laws regarding the statute of limitations, without regard to the State of Delaware's conflicts of law principles. BELIMO and Client agree to submit to the exclusive jurisdiction of the federal and state courts located in the State of Connecticut with respect to any dispute arising from the subject matter hereof.

WAIVER OF JURY TRIAL: BELIMO AND CLIENT HEREBY WAIVE ALL RIGHTS TO A JURY TRIAL IN CONNECTION WITH ANY ACTION, PROCEEDING, OR CLAIM RELATING TO THESE GENERAL TERMS AND CONDITIONS OR BELIMO PRODUCTS. All causes of action arising out of or connected to the sales of Products under these General Terms and Conditions shall be resolved individually, with no right by Client to participate in a representative capacity, or as a member of any class action.

The UN Convention on the International Sale of Goods of 11 April 1980 (CISG) shall not apply to Client's purchase of BELIMO products.

22. Waiver
The failure of either party to enforce at any time any of the provisions of these General Terms and Conditions, or the failure to require, at any time, performance by the other party of any of the provisions of these General Terms and Conditions, will in no way be construed to be a present or future waiver of such provisions, nor in any way affect the validity of either party to enforce each and every such provision thereafter.

23. Intellectual Property
All intellectual property, included but not limited to, inventions, patents, copyrights, trade secrets, know-how, test results, tooling, jigs and fixtures, or other industrial property, associated with, discovered in, or used in or for, the manufacturing of the Products shall be identified herein as "Property." All Property owned by BELIMO prior to selling products or providing services to Client shall remain owned by BELIMO and nor rights, title or interest to such shall pass or be assigned to the Client at the time of the sale and/or delivery and any Property and intellectual property rights created by BELIMO or contributed by Client in connection with the customization or the sale of products and performing services for Client shall remain owned by BELIMO and the Client hereby as-signs any and all rights, title or interest to such to BELIMO, including a waiver of moral rights if applicable, and shall not be considered a work for hire.

24. Entire Agreement
These General Terms and Conditions, including the applicable BELIMO documents referenced herein, plus any accompanying BELIMO docu-mentation relevant to Client's order for BELIMO products or BELIMO providing services to Client, constitutes the entire agreement between the parties with respect to the BELIMO products ordered by Client, or services provided by BELIMO. These General Terms and Conditions and applicable BELIMO documents supersede all of the parties prior and contemporaneous agreements, understandings, negotiations, inducements, representations, or conditions, whether oral or written, whether express or implied, with respect to the purchase and sale of BELIMO products and services.

25. California Proposition 65 ⚠
WARNING: Some Belimo Products can expose you to chemicals which are known to the State of California to cause cancer, birth defects, or other reproductive harm. Please refer to the Product specific Technical Data sheet at www.belimo.com for details. For more information see www.p65warnings.ca.gov

Tech.Doc - 04.2025 – Subject to technical modifications