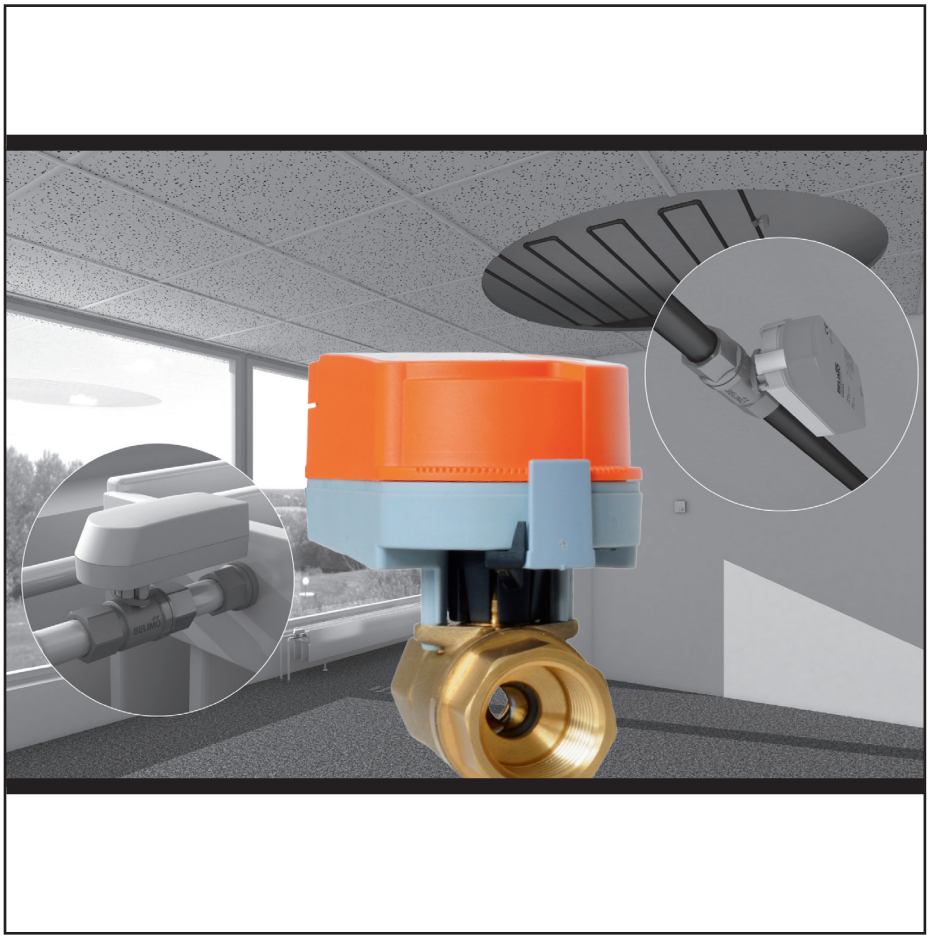

# 2-way zone valve QCV™ / ZoneTight™

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## Introduction

The valve-actuator combination QCV™ (= Quick Compact Valve) is a ZoneTight™ Room & Zone Solution. The QCV, comprised of the C215Q rotary valve and the CQ.. actuators, has impressive properties:
– very compact and space-saving
– lightning-fast manually adjustable flow rates ($k_v$ 0.25 to 4.5) at the actuator CQ..
– no energy loss thanks to air bubble tightness of the rotary valve C215Q
– rotary valve protected against soiling and *force-fit* thanks to friction-locked valve-actuator connection
– snap-on connection (without tools)

## Type key

QCV™ (= Quick Compact Valve) for Room & Zone Solutions

| Valve | Actuator |
|---|---|
| **C2 15 Q** **Valve with rapid connection to the actuator**<br>C2 = compact, 2-way, internal thread<br>15 = DN 15<br>Q = tool-free snap-on connection | **CQ xxx A - zzz - T** **Actuator with rapid connection to the valve**<br>CQ = compact, low torque<br>xxx = 24 V or 230 V<br>A = New Generation<br>zzz = SZ or MPL<br>T = Version with terminal connection |

**Valve/actuator combination (ID No.)**

**C215Q/xxx-T**

C2 = compact, 2-way, internal thread
15 = DN 15
Q = tool-free snap-on connection
/ = enclosed
xxx = 24V, 230V, SZ, MPL
T = Version with terminal connection

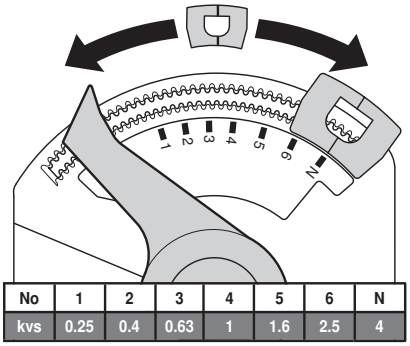
## Product features

**Adjustable angle of rotation**

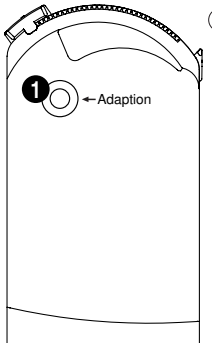
The rotary actuator can be changed in 2.5° increments with the use of a clip. This is used to set the $k_v$ value (maximum flow of the valve).

**$k_v$ setting**

Remove end stop clip and place at desired position (without end stop clip $k_{vs}$ = 4.5 m³/h).




| No | 1 | 2 | 3 | 4 | 5 | 6 | N |
|---|---|---|---|---|---|---|---|
| kvs | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 |




① Push-button
Press button: Triggers angle of rotation adaptation followed by standard mode

**Adaption**

When the supply voltage is switched on for the first time, i.e. at the time of commissioning, the CQ24A-SZ(-T) and CQ24A-MPL(-T) actuators with modulating control carry out an adaption.

| No. | 1 | 2 | 3 | 4 | 5 | 6 | N 2) | 1) |
|---|---|---|---|---|---|---|---|---|
| $k_v$ | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 4.5 |

1) without end stop clip
2) Factory setting

## Product features

**Operating range**

The ball valve is known to have an operating range in its direction of opening of 15°..90° as a result of its design, which means that the air tight range with the ball valve is at 15°. A hysteresis of 4° also obtains as a result of the design, which means that the ball valve is not air bubble tight in the direction of closing until it reaches 11°.
At the smallest $k_v$ value that can be set (0.25), the angle of rotation of the ball valve is still 30°. This means that the actuator adapts to the angle 0 ... 30° ($k_v$ = 0.25), 15° of which is in the air tight range, meaning 50% at this flow value setting. The actuator has the range 0.5 ... 10 V (for 0 ... 90°). This means the operating range of the valve is between 5.5 and 10 V. The running time of the actuator is 90 s / 90°, i.e. this results in a running time of 30 s for the 30° when $k_v$ is 0.25.
The operating ranges of the valves with the respective kv values are:

| Modulating control actuators | | | | | |
|---|---|---|---|---|---|
| **Position No. CQ..actuator** | **Setting $k_v$ value** [$m^3/h$] | **Completely open position at** [°] | **Combination operating range in the direction of opening** [V] | **Effective running time** [s] | **Number of control steps** |
| 1 | 0.25 | 30 | 5.5 ... 10 | 30 | 60 |
| 2 | 0.4 | 36 | 4.5 ... 10 | 36 | 73 |
| 3 | 0.63 | 43 | 4.0 ... 10 | 43 | 80 |
| 4 | 1 | 51 | 3.5 ... 10 | 51 | 86 |
| 5 | 1.6 | 61 | 3.0 ... 10 | 61 | 93 |
| 6 | 2.5 | 71 | 2.5 ... 10 | 71 | 100 |
| N | 4 | 80 | 2.0 ... 10 | 80 | 107 |
| 1) | 4.5 | 90 | 1.6 ... 10 | 90 | 112 |

1) without end stop clip

Calculation of actuator control steps:
– Operating range (e.g. 5.5 ... 10 V) 10 V – 5.5 V = 4.5 V
– Response sensitivity: 75 mV = 0.075 V
– Actuator control steps: 4.5 V / 0.075 V = 60 steps

Opening limit angle (tight – not tight): approx. 15° in the direction of opening
Hysteresis combination: 3.5 ... 4°
Closing limit angle (not tight – tight): approx. 11° in closing direction
Running time of actuators: 90 s / 90°

Recommendation for the smallest $k_v$ values (0.25 ... 0.63):
– The QCV should not be used with a P controller (persistent control deviation)
– The QCV should be used only in a closed control loop with PI or PID control
– In case of doubt, use the QCV only as an open-close unit

## Selection table

| | |
|---|---|
| Permissible working pressure $p_s$ | 1000 kPa |
| Max. differential pressure $\Delta p_{max}$ | 230 kPa |
| Internal thread | ISO 7-1 |
| Medium temperature | 6 ... 80 °C |

| Valve type | Valve design | Valve-characteristic curve | DN | $k_v$ | Actuator | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Position No. CQ..actuator | CQ24A-SZ(-T) | CQ24A(-T) | CQ230A(-T) | CQ24A-MPL(-T) |
| C215Q |  |   | 15 | 0.25 | 1 | | | | |
| | | | | 0.4 | 2 | | | | |
| | | | | 0.63 | 3 | | | | |
| | | | | 1 | 4 | | | | |
| | | | | 1.6 | 5 | | | | |
| | | | | 2.5 | 6 | | | | |
| | | | | 4 | N | | | | |
| | | | | 4.5 | [1] | | | | |

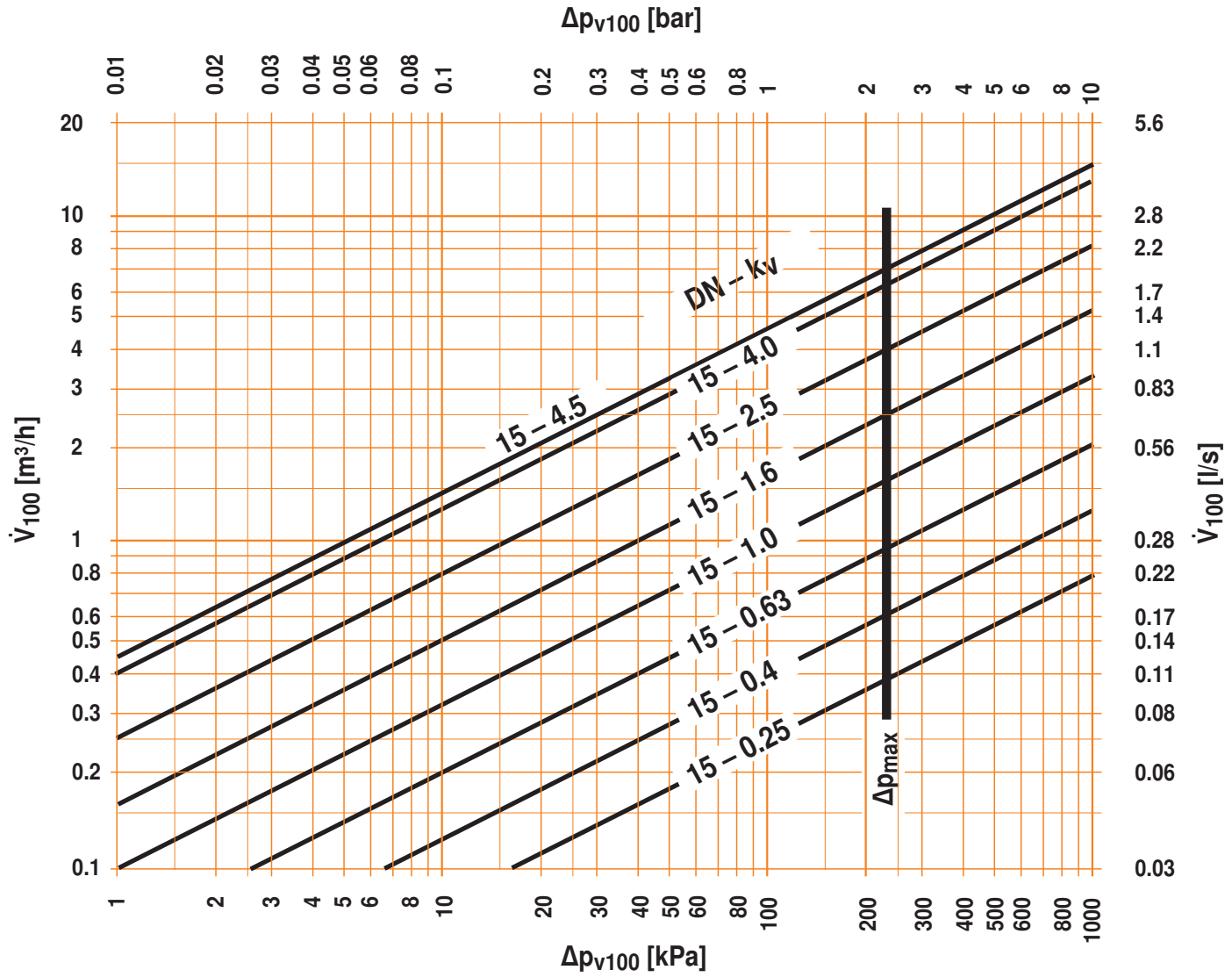
[1] without end stop clip

## Calculation diagram for 2-way zone valve C215Q

**Application** These characterised control valves are used in closed cold and hot water systems for modulating water-side control of air treatment and heating plants.

**Media** Cold and hot water, water with glycol up to max. 50% vol.

**Media temperatures** 6 ... 80 °C




**Δpmax**
Maximum permitted differential pressure for long service life across control path A – AB, with reference to the whole opening range.

**Δpv100**
Differential pressure for ball valve opened up to $k_v$ value setting

**V̇100**
Nominal flow rate with Δpv100

**Formula $k_v$**

$$k_v = \frac{\dot{V}_{100}}{\sqrt{\frac{\Delta p_{v100}}{100}}}$$

| | |
|---|---|
| $k_v$ | [m³/h] |
| $\dot{V}_{100}$ | [m³/h] |
| $\Delta p_{v100}$ | [kPa] |

## Notes for project planning

# All-inclusive.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