

GPY+ Associates Engineering Inc.

MECHANICAL SHOP DRAWINGS

PROJECT: York Region Administrative
Centre – Interior Fit-up
Package 'D'

17250 Yonge Street,
Newmarket, Ontario
L3R 0T5

Reviewed ☐ Reviewed as Modified ☒
Not Reviewed ☐ Revise and Resubmit ☐

This review is for conformance with the general design intent only and does not change the intent of the Contract Documents. Responsibility for errors or omissions in the shop drawings, details, co-ordination and dimensioning remains solely with the Contractor.

GPY+ Associates Engineering Inc.

Name: Sherwin Reyes

Date: January 24, 2025

PROJECT NO.: GPY-9920

Shop Drawing No.: M-7
Product: Control Valves
Supplier: Regulvar

Comments:

1. Fan coil unit 'FC-2.13': Revise control valve to a 3-way valve for continuous water flow to the system. A CCN will be issued for this revision.
2. Please include control valves for existing FCU on 3rd Floor Electrical Room on the Valve Schedule.
3. We recommend the shop drawings to be reviewed by electrical consultant for their comments.



SUBMITTAL

TO: GPY + Associates Engineering Inc. – ATTN: Sherwin Reyes
PROJECT: York Region, Administration Building Package D Renovations
ADDRESS: 17250 Yonge Street, Newmarket, ON
INCLUDED: Mechanical Shop Drawing – Control Valves
SPEC DIV: 25 00 00

From: Trisect Construction Corporation
7-4020A Sladeview Crescent
Mississauga, ON L5L 6B1
Tom Butkovic / Ivan Lulic / Jay Cowie

The shop drawings included below have been:

- ☒ REVIEWED
- ☐ REVIEWED AS NOTED
- ☐ RESUBMIT
- ☐ REJECTED

Review of this submission is for compliance with the general intent of the contract. This review does not relieve the Sub-Contractor, Trade Contractor, Supplier or Manufacturer of the responsibility of meeting all requirements of the contract documents. Any deviation from the contract documents initiated by the Sub-Contractor, Trade Contractor, Supplier or Manufacturer shall be at his sole risk and responsibility. QUANTITIES AND DETAIL DIMENSIONS ARE THE SUBCONTRACTORS OR SUPPLIERS' RESPONSIBILITY. VERIFY THE DATA WITH FIELD DIMENSIONS AND CONDITIONS.

Per: Tom Butkovic Final review to be received by: G. Bruce Stratton Architects	Dated: December 19/2024
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54 Audia Court, Unit 2
Concord, ON L4K 3N5
(905)-738-1400

Submittal 24-277-007

PROJECT NAME	PROJECT ADDRESS	DATE SUBMITTED
YORK REGION VARIOUS PROJECTS 24-277	17250 Young Street Newmarket, ON	Dec 16, 2024

TO	FROM
Tom Butkovic	PAUL LEDDY
COMPANY	COMPANY
TRISECT CONSTRUCTION	Consult Mechanical Inc.
EMAIL	EMAIL
tbutkovic@trisectionconstruction.com	paul.l@consultmechanical.com
ADDRESS	ADDRESS
4020A SLADEVIEW cRESCENT, UNIT 7 MISSISSAUGA, ON L5L 6B1 JOB: 1300 INSLINGTON SUITE 103	54 Audia Court, Unit 2 Concord, ON L4K 3N5

Title

BAS Control Valves

Description

1 Package control Valves as per Drawings and Specifications

Package Items

SPEC	SUBSECTION	ITEM	TYPE
25 00 00	25 00 00	Drawings	Shop Drawings



YRAB PHASE D RENOVATION

CHC H

CRV VR RV

RC

2011-

RM

GPY & ASSOCIATES ENGINEERING INC.

6 - 9 C UR DRV
MRHM, R RC
9 7-1

C

CONSULT MECHANICAL INC.

2 - , UD C UR
CCRD, R R
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SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
FC-1.1	FC-1.1-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.2	FC-1.2-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.3	FC-1.3-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.4	FC-1.4-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.5	FC-1.5-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.6	FC-1.6-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.7	FC-1.7-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.8	FC-1.8-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.9	FC-1.9-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.10	FC-1.10-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.11	FC-1.11-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.12	FC-1.12-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.13	FC-1.13-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.14	FC-1.14-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.15	FC-1.15-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.16	FC-1.16-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.17	FC-1.17-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.18	FC-1.18-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.19	FC-1.19-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.20	FC-1.20-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.21	FC-1.21-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.22	FC-1.22-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.23	FC-1.23-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.24	FC-1.24-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.25	FC-1.25-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
FC-1.26	FC-1.26-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.27	FC-1.27-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.28	FC-1.28-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.29	FC-1.29-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.30	FC-1.30-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.31	FC-1.31-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.32	FC-1.32-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.33	FC-1.33-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.34	FC-1.34-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.35	FC-1.35-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.36	FC-1.36-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.37	FC-1.37-CV	COOLING	1	1	2.20	1.34	B311	3 WAY / CCV		X	1/2	-	1.9	NO CLIP	TR24-SR	MODULATING	N/A	200	B311+TR24-SR
FC-1.38	FC-1.38-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.39	FC-1.39-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-1.40	FC-1.40-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-1.41	FC-1.41-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.1	FC-2.1-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.2	FC-2.2-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.3	FC-2.3-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.4	FC-2.4-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.5	FC-2.5-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.6	FC-2.6-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.7	FC-2.7-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.8	FC-2.8-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.9	FC-2.9-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.10	FC-2.10-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.11	FC-2.11-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R

V00V00 0000 3-WAY VALVE

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
FC-2.12	FC-2.12-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.13	FC-2.13-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.14	FC-2.14-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.15	FC-2.15-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.16	FC-2.16-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.17	FC-2.17-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.18	FC-2.18-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.19	FC-2.19-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.20	FC-2.20-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.21	FC-2.21-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.22	FC-2.22-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.23	FC-2.23-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-2.24	FC-2.24-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-2.25	FC-2.25-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.4	FC-3.4-CV	COOLING	1	1	2.80	2.17	B311	3 WAY / CCV		X	1/2	-	1.9	NO CLIP	TR24-SR	MODULATING	N/A	200	B311+TR24-SR
FC-3.5	FC-3.5-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.6	FC-3.6-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.7	FC-3.7-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.8	FC-3.8-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.9	FC-3.9-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.10	FC-3.10-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.11	FC-3.11-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.12	FC-3.12-CV	COOLING	1	1	2.20	3.36	B310	3 WAY / CCV		X	1/2	-	1.2	NO CLIP	TR24-SR	MODULATING	N/A	200	B310+TR24-SR
FC-3.19	FC-3.19-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.20	FC-3.20-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.21	FC-3.21-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-3.22	FC-3.22-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
FC-3.23	FC-3.23-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-3.24	FC-3.24-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.1	FC-4.1-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.2	FC-4.2-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.3	FC-4.3-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.4	FC-4.4-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.5	FC-4.5-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.6	FC-4.6-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.7	FC-4.7-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.8	FC-4.8-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.9	FC-4.9-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.10	FC-4.10-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.11	FC-4.11-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.12	FC-4.12-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.13	FC-4.13-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.14	FC-4.14-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.15	FC-4.15-CV	COOLING	1	1	2.80	2.17	B311	3 WAY / CCV		X	1/2	-	1.9	NO CLIP	TR24-SR	MODULATING	N/A	200	B311+TR24-SR
FC-4.16	FC-4.16-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.17	FC-4.17-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.18	FC-4.18-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.19	FC-4.19-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.20	FC-4.20-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.21	FC-4.21-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.22	FC-4.22-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.23	FC-4.23-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.24	FC-4.24-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.25	FC-4.25-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
FC-4.26	FC-4.26-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.27	FC-4.27-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.28	FC-4.28-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.29	FC-4.29-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.30	FC-4.30-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.31	FC-4.31-CV	COOLING	1	1	2.80	1.96	Z2050Q-J	2 WAY / QCV		X	1/2	2.0	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.32	FC-4.32-CV	COOLING	1	1	2.80	2.17	B311	3 WAY / CCV		X	1/2	-	1.9	NO CLIP	TR24-SR	MODULATING	N/A	200	B311+TR24-SR
FC-4.33	FC-4.33-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.34	FC-4.34-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.35	FC-4.35-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.36	FC-4.36-CV	COOLING	1	1	1.30	2.09	Z2050Q-F	2 WAY / QCV		X	1/2	0.9	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-R
FC-4.37	FC-4.37-CV	COOLING	1	1	2.20	2.15	Z2050Q-J	2 WAY / QCV		X	1/2	1.5	-	NO CLIP	CQB24-SR-R	MODULATING	N/A	75	Z2050Q-J+CQB24-SR-R
FC-4.1	FC-4.1-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.2	FC-4.2-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.3	FC-4.3-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.4	FC-4.4-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.5	FC-4.5-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.6	FC-4.6-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.7	FC-4.7-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.8	FC-4.8-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.9	FC-4.9-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.10	FC-4.10-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.11	FC-4.11-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.12	FC-4.12-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.13	FC-4.13-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.14	FC-4.14-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.15	FC-4.15-HV	HEATING	1	1	1.40	3.06	B309	3 WAY / CCV	X		1/2	-	0.8	NO CLIP	TR24-SR	MODULATING	N/A	200	B309+TR24-SR

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
FC-4.16	FC-4.16-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.17	FC-4.17-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.18	FC-4.18-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.19	FC-4.19-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.20	FC-4.20-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.21	FC-4.21-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.22	FC-4.22-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.23	FC-4.23-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.24	FC-4.24-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.25	FC-4.25-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.26	FC-4.26-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.27	FC-4.27-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.28	FC-4.28-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.29	FC-4.29-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.30	FC-4.30-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.31	FC-4.31-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.32	FC-4.32-HV	HEATING	1	1	1.40	3.06	B309	3 WAY / CCV	X		1/2	-	0.8	NO CLIP	TR24-SR	MODULATING	N/A	200	B309+TR24-SR
FC-4.33	FC-4.33-HV	HEATING	1	1	1.40	1.96	Z2050Q-F	2 WAY / QCV	X		1/2	1.0	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.34	FC-4.34-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.35	FC-4.35-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.36	FC-4.36-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
FC-4.37	FC-4.37-HV	HEATING	1	1	1.10	1.89	Z2050Q-F	2 WAY / QCV	X		1/2	0.8	-	NO CLIP	CQB24-SR-L	MODULATING	N/A	75	Z2050Q-F+CQB24-SR-L
WF-2-A1.1	WF-2-A1.1-HV	HEATING	1	1	2.70	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	2.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B1.1	WF-2-B1.1-HV	HEATING	1	1	2.30	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	2.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B1.2	WF-2-B1.2-HV	HEATING	1	1	1.75	0.95	Z2050Q-J	2 WAY / QCV	X		1/2	1.8	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B1.3	WF-1-B1.3-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B1.4	WF-1-B1.4-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
WF-1-B1.5	WF-1-B1.5-HV	HEATING	1	1	3.50	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.5	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B1.6	WF-1-B1.6-HV	HEATING	1	1	3.50	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.5	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B1.7	WF-1-B1.7-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B1.8	WF-1-B1.8-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-C1.1	WF-2-C1.1-HV	HEATING	1	1	1.27	0.95	Z2050Q-F	2 WAY / QCV	X		1/2	1.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-F+CQKB24-SR-LL
WF-2-A2.1	WF-2-A2.1-HV	HEATING	1	1	1.27	0.95	Z2050Q-F	2 WAY / QCV	X		1/2	1.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-F+CQKB24-SR-LL
WF-2-B2.1	WF-2-B2.1-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B2.2	WF-1-B2.2-HV	HEATING	1	1	2.40	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	2.4	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.3	WF-2-B2.3-HV	HEATING	1	1	1.27	0.95	Z2050Q-F	2 WAY / QCV	X		1/2	1.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-F+CQKB24-SR-LL
WF-2-B2.4	WF-2-B2.4-HV	HEATING	1	1	2.22	1.02	Z2050Q-J	2 WAY / QCV	X		1/2	2.2	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B2.5	WF-1-B2.5-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B2.6	WF-1-B2.6-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.7	WF-2-B2.7-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.8	WF-2-B2.8-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.9	WF-2-B2.9-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.10	WF-2-B2.10-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.11	WF-2-B2.11-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B2.12	WF-2-B2.12-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-C2.1	WF-2-C2.1-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-D3.1	WF-1-D3.1-HV	HEATING	1	1	2.40	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	2.4	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-B3.1	WF-1-B3.1-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B3.2	WF-2-B3.2-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B3.3	WF-2-B3.3-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B3.4	WF-2-B3.4-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B3.5	WF-2-B3.5-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-B3.6	WF-2-B3.6-HV	HEATING	1	1	2.22	1.02	Z2050Q-J	2 WAY / QCV	X		1/2	2.2	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-C3.1	WF-2-C3.1-HV	HEATING	1	1	3.17	0.98	Z2050Q-J	2 WAY / QCV	X		1/2	3.2	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL

SYSTEM	VALVE														ACTUATOR				ASSEMBLY
	TAG	APPLICATION	QTY	LINE SIZE (In.)	FLOW (GPM)	WPD (PSIG)	MODEL	TYPE	N.O.	N.C.	SIZE (In.)	PROGRAMMED CV	CV	CLIP POSITION	MODEL	TYPE	SPRING RETURN	CLOSE-OFF (PSIG)	
WF-2-E4.1	WF-2-E4.1-HV	HEATING	1	1	1.27	0.95	Z2050Q-F	2 WAY / QCV	X		1/2	1.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-F+CQKB24-SR-LL
WF-1-F4.1	WF-1-F4.1-HV	HEATING	1	1	2.40	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	2.4	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-F4.2	WF-1-F4.2-HV	HEATING	1	1	2.40	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	2.4	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-F4.3	WF-1-F4.3-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-F4.4	WF-1-F4.4-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-F4.5	WF-1-F4.5-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-F4.6	WF-1-F4.6-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-F4.7	WF-1-F4.7-HV	HEATING	1	1	3.00	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.0	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-2-F4.8	WF-2-F4.8-HV	HEATING	1	1	1.27	0.95	Z2050Q-F	2 WAY / QCV	X		1/2	1.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-F+CQKB24-SR-LL
WF-2-G4.1	WF-2-G4.1-HV	HEATING	1	1	1.27	0.95	Z2050Q-F	2 WAY / QCV	X		1/2	1.3	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-F+CQKB24-SR-LL
WF-2-G4.2	WF-2-G4.2-HV	HEATING	1	1	1.75	1.06	Z2050Q-J	2 WAY / QCV	X		1/2	1.7	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL
WF-1-G4.3	WF-1-G4.3-HV	HEATING	1	1	3.50	1.00	Z2050Q-J	2 WAY / QCV	X		1/2	3.5	-	NO CLIP	CQKB24-SR-LL	MODULATING	YES	75	Z2050Q-J+CQKB24-SR-LL

- For closed cold and warm water systems
- For switching functions and 2-point controls on the water side of air-handling units and heating systems
- Snap-assembly of the actuator



5-year warranty



Type overview

Type	DN
Z2050Q-J	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	36...212°F [2...100°C]
	Body Pressure Rating	360 psi
	Close-off pressure Δps	75 psi
	Differential pressure Δpmax	40kPa
	Flow characteristic	equal percentage
	Angle of rotation note	Operating range 15...90°
	Installation position	upright to horizontal (in relation to the stem)
	Servicing	maintenance-free
	Flow Pattern	2-way
	Leakage rate	0%
	Controllable flow range	75°
	Cv	5.9
Materials	Valve body	forged brass
	Stem	brass
	Stem seal	EPDM O-ring
	Seat	PTFE, O-Ring EPDM
	Seat	PTFE
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	chrome plated brass
Suitable actuators	Non-Spring	CQB
	Electrical fail-safe	CQKB(X)

Safety notes



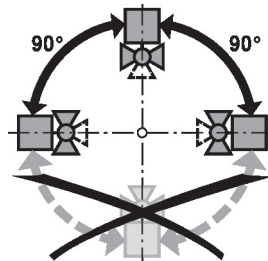
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov
- If temperature exceeds 212°F operating range due to a boiler control failure the valve will safely contain the hot water but manufacturers product warranty becomes invalid. Valve and actuator replacement is at the expense of others.

Product features

- Application** The QCV zone valves are suited for large commercial buildings where higher close-off and the ability to change flow is desired. Common applications include unit ventilators, fan coil units, VAV reheat coils, fin tube casing, radiant panels and duct coils. The valve fits in space restricted areas and can be assembled without the use of tools.
- Mode of operation** The ball valve is adjusted by a rotary actuator. The rotary actuator is controlled by an on/off signal or by a commercially available modulating or floating point control system and moves the ball of the ball valve – the throttling device – to the position preset by the control signal. Open the ball valve is carried out counterclockwise and close it clockwise.
- Simple direct mounting** Tool-free snap assembly.
The actuator can be plugged on the valve by hand (Caution! Just vertical movements). Pins must match the holes on the flange.
The mounting orientation in relation to the valve can be selected in 180° increments. (Possible two times)

Installation notes

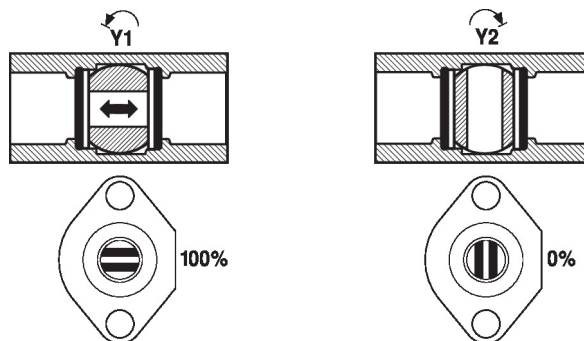
- Recommended installation positions** The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.



- Water quality requirements** Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of a suitable strainer is recommended.

- Servicing** Ball valves and rotary actuators are maintenance-free.
Before any service work on the control element is carried out, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level).
The system must not be returned to service until the ball valve and the rotary actuator have been correctly reassembled in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.

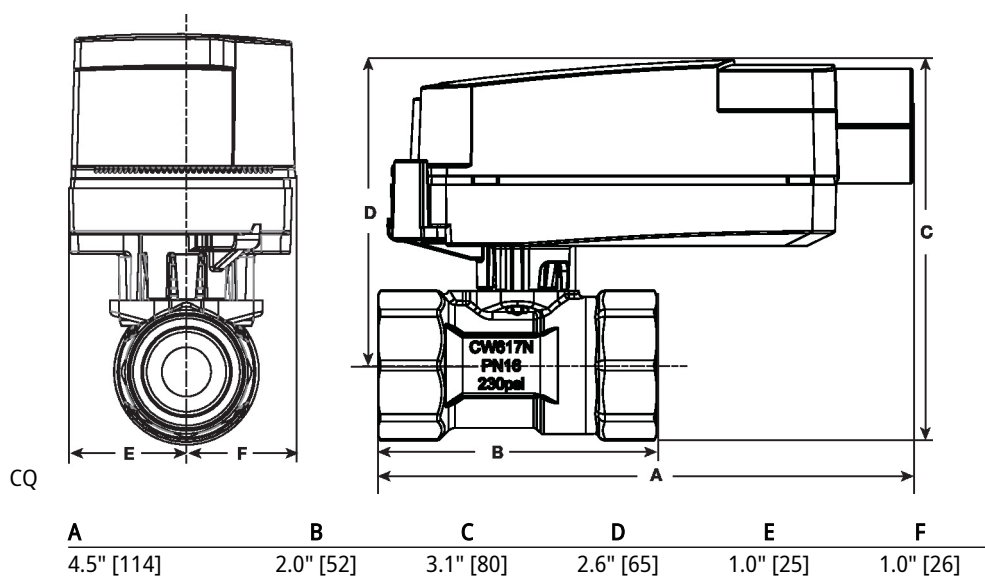
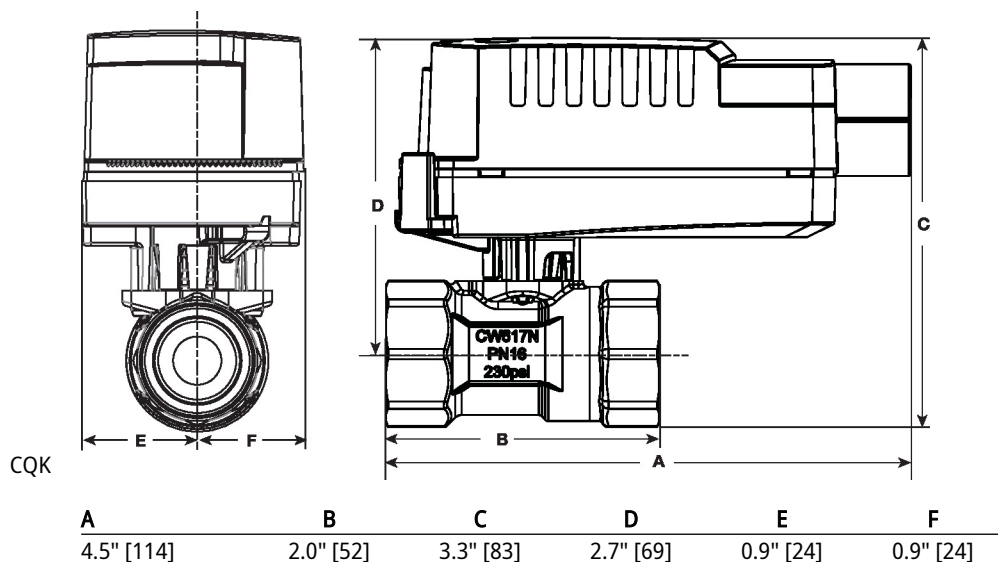
- Flow direction** Direction of flow in both directions possible.



Flow setting The angle of rotation of the actuator can be changed by a clip in 2.5° increments. This is used to set the kvs value (maximum flow rate of the valve).
Remove end stop clip and place at desired position.
After every change of the flow setting by means of end stop clip, an adaptation must be triggered on the modulating actuators.

Dimensions

Type	DN	Weight
Z2050Q-J	15	0.22 lb [0.10 kg]



- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V



5-year warranty



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.3 W
	Power consumption in rest position	0.3 W
	Transformer sizing	1 VA
	Electrical Connection	18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic throughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	2...40°C
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
	Weight	
	Weight	0.55 lb [0.20 kg]
Materials	Housing material	
	Housing material	UL94-5VA

Product features

- Application** Non-Fail Safe proportional ZoneTight actuator.
- Valve selection should be done in accordance with the flow parameters and system specifications.
- The actuator is mounted directly to the valve without the need for tools or additional linkage.
- The actuator operates in response to a 2...10 V or 4...20 mA control signal.

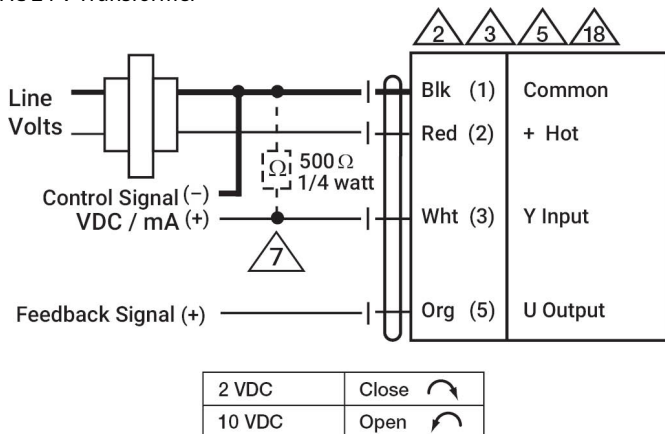
Electrical installation

✂ INSTALLATION NOTES

- 2** Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3** Actuators may also be powered by DC 24 V.
- 5** Only connect common to negative (-) leg of control circuits.
- 7** A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 18** Actuators with plenum cable do not have numbers; use color codes instead.
- Meets cULus requirements without the need of an electrical ground connection.
- 1** **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.

Wiring diagrams

AC 24 V Transformer



- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V



5-year warranty



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	2.5 W
	Power consumption in rest position	0.5 W
	Transformer sizing	5 VA
	Electrical Connection	22 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic throughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Bridging time (PF)	2 s
	Pre-charging time	5...20 s
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Running time fail-safe	<60 s
	Noise level, motor	35 dB(A)
	Noise level, fail-safe	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	35...104°F [2...40°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
	Weight	
	Weight	0.55 lb [0.20 kg]
Materials	Housing material	
	Housing material	UL94-5VA

Product features

Application Electrical fail-safe proportional ZoneTight actuator.

Valve selection should be done in accordance with the flow parameters and system specifications. The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operates in response to a 2...10 V or 4...20mA control signal.

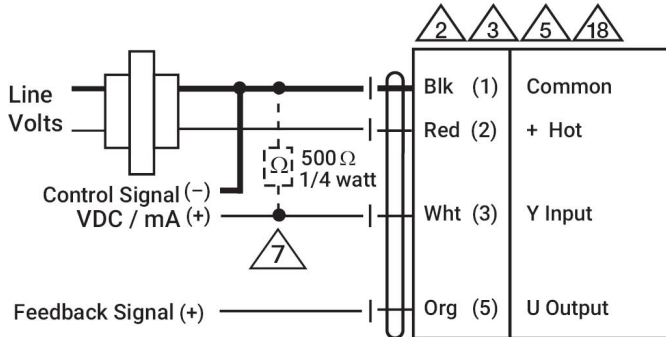
Electrical installation

⚠️ INSTALLATION NOTES

- Ⓐ Actuators with appliance cables are numbered.
- Ⓐ Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- Ⓐ Actuators may also be powered by DC 24 V.
- Ⓐ Only connect common to negative (-) leg of control circuits.
- Ⓐ A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- Ⓐ Actuators with plenum cable do not have numbers; use color codes instead.
- ⬢ Meets cULus requirements without the need of an electrical ground connection.
- ⚠️ **Warning! Live electrical components!**
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Wiring diagrams

AC 24 V Transformer



2 VDC	Open	↺
10 VDC	Close	↻
Fail Position	100% Open	

ZoneTight™, 2-way, Internal thread

- For closed cold and warm water systems
- For switching functions and 2-point controls on the water side of air-handling units and heating systems
- Snap-assembly of the actuator



5-year warranty

Type overview

Type	DN
Z2050Q-F	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	36...212°F [2...100°C]
	Body Pressure Rating	360 psi
	Close-off pressure Δp_s	75 psi
	Differential pressure Δp_{max}	40psi
	Flow characteristic	equal percentage
	Leakage rate	0%
	Angle of rotation note	Operating range 15...90°
	Pipe connection	Internal thread NPT (female)
	Installation orientation	upright to horizontal (in relation to the stem)
	Servicing	maintenance-free
	Flow Pattern	2-way
	Controllable flow range	75°
	Cv	1.4
Materials	Valve body	forged brass
	Stem	brass
	Stem seal	EPDM O-ring
	Seat	PTFE, O-Ring EPDM
	O-ring	EPDM (lubricated)
	Ball	chrome plated brass
Suitable actuators	Non Fail-Safe	CQB(X)
	Electrical fail-safe	CQKB(X)

Safety notes



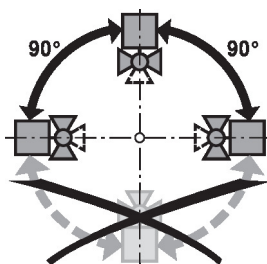
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov
- If temperature exceeds 212°F operating range due to a boiler control failure the valve will safely contain the hot water but manufacturers product warranty becomes invalid. Valve and actuator replacement is at the expense of others.

Product features

- Application** The QCV zone valves are suited for large commercial buildings where higher close-off and the ability to change flow is desired. Common applications include unit ventilators, fan coil units, VAV reheat coils, fin tube casing, radiant panels and duct coils. The valve fits in space restricted areas and can be assembled without the use of tools.
- Operating mode** The ball valve is adjusted by a rotary actuator. The rotary actuator is controlled by an on/off signal or by a commercially available modulating or floating point control system and moves the ball of the ball valve – the throttling device – to the position preset by the control signal. Open the ball valve is carried out counterclockwise and close it clockwise.
- Simple direct mounting** Tool-free snap assembly.
The actuator can be plugged on the valve by hand (Caution! Just vertical movements). Pins must match the holes on the flange.
The mounting orientation in relation to the valve can be selected in 180° increments. (Possible two times)

Installation notes

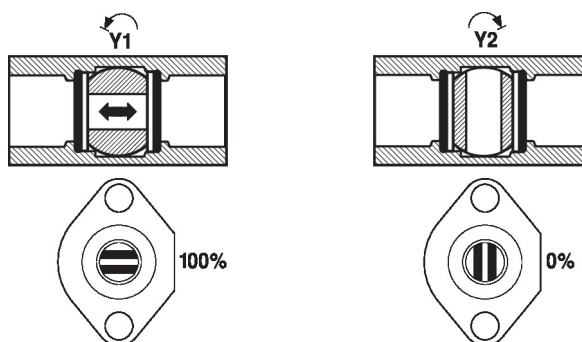
- Permissible installation orientation** The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.



- Water quality requirements** Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of a suitable strainer is recommended.

- Servicing** Ball valves and rotary actuators are maintenance-free.
Before any service work on the control element is carried out, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level).
The system must not be returned to service until the ball valve and the rotary actuator have been correctly reassembled in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.

- Flow direction** Direction of flow in both directions possible.

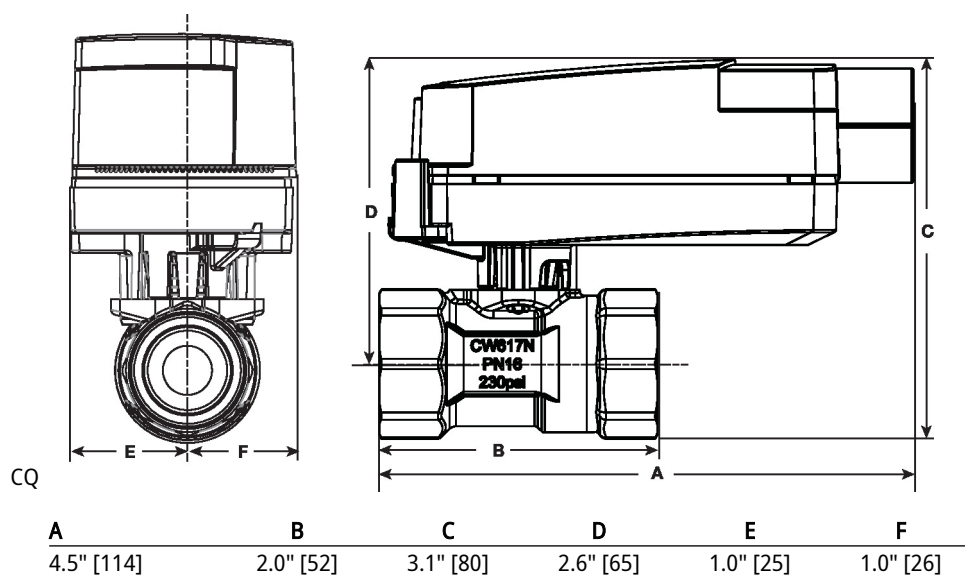
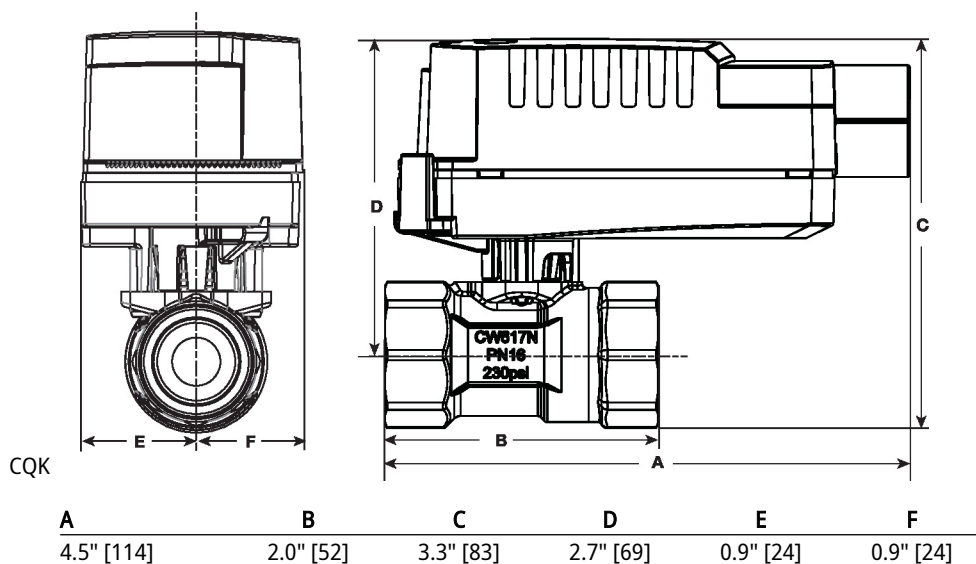


Installation notes

Flow setting The angle of rotation of the actuator can be changed by a clip in 2.5° increments. This is used to set the kvs value (maximum flow rate of the valve).
Remove end stop clip and place at desired position.
After every change of the flow setting by means of end stop clip, an adaptation must be triggered on the modulating actuators.

Dimensions

Type	DN	Weight
Z2050Q-F	15	0.15 lb [0.070 kg]



Modulating, Non fail-safe, 24 V

- Nominal voltage AC/DC 24 V
- Control Modulating 2...10 V



5-year warranty



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.3 W
	Power consumption in rest position	0.3 W
	Transformer sizing	1 VA
	Electrical Connection	22 GA plenum cable, 3 ft [1 m], with 1/2" NPT conduit connector
	Overload Protection	electronic throughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	35...104°F [2...40°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	0.55 lb [0.25 kg]
Materials	Housing material	UL94-5VA

Technical data

Product features

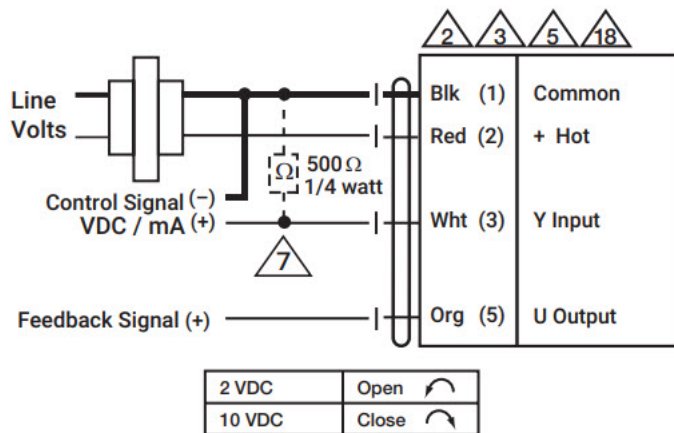
- Application** Non-Fail Safe proportional ZoneTight actuator.
- Valve selection should be in accordance with flow parameters and system specifications.
- The actuator is mounted directly to the valve without the need for tools or additional linkage.
- The actuator operated in response to a 2...10 V, 0.5...10 V, or 4...20 mA control signal.

Electrical installation

✂ INSTALLATION NOTES

-  **2** Actuators may be connected in parallel. Power consumption and input impedance must be observed.
-  **3** Actuators may also be powered by DC 24 V.
-  **5** Only connect common to negative (-) leg of control circuits.
-  **7** A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
-  **18** Actuators with plenum cable do not have numbers; use color codes instead.
-  **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.

Wiring diagrams



- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V



5-year warranty



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.3 W
	Power consumption in rest position	0.3 W
	Transformer sizing	1 VA
	Electrical Connection	18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic throughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	2...40°C
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
	Weight	0.55 lb [0.20 kg]
	Materials	UL94-5VA

Product features

- Application** Non-Fail Safe proportional ZoneTight actuator.
- Valve selection should be done in accordance with the flow parameters and system specifications.
- The actuator is mounted directly to the valve without the need for tools or additional linkage.
- The actuator operates in response to a 2...10 V or 4...20 mA control signal.

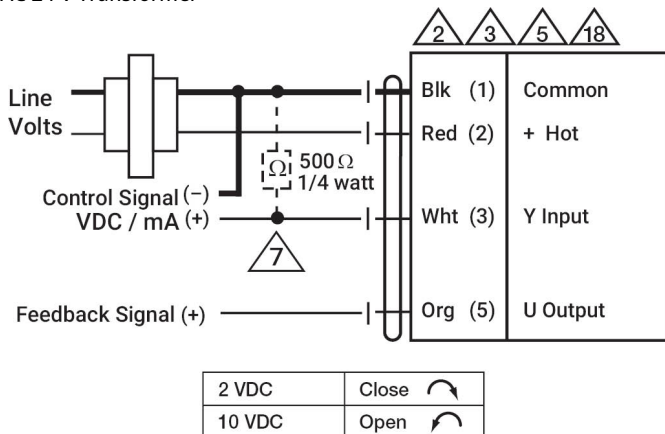
Electrical installation

✂ INSTALLATION NOTES

- 2** Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3** Actuators may also be powered by DC 24 V.
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Wiring diagrams

AC 24 V Transformer



- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V



5-year warranty



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	2.5 W
	Power consumption in rest position	0.5 W
	Transformer sizing	5 VA
	Electrical Connection	22 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic throughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Bridging time (PF)	2 s
	Pre-charging time	5...20 s
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Running time fail-safe	<60 s
	Noise level, motor	35 dB(A)
	Noise level, fail-safe	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	35...104°F [2...40°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
	Weight	0.55 lb [0.20 kg]
	Housing material	UL94-5VA

Product features

Application Electrical fail-safe proportional ZoneTight actuator.

Valve selection should be done in accordance with the flow parameters and system specifications. The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operates in response to a 2...10 V or 4...20mA control signal.

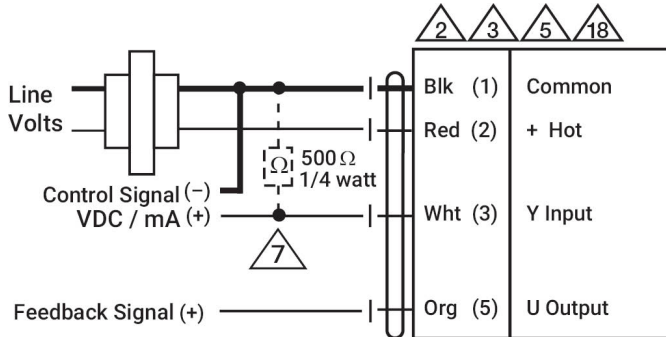
Electrical installation

⚠️ INSTALLATION NOTES

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Wiring diagrams

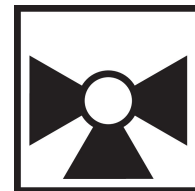
AC 24 V Transformer



2 VDC	Open	↺
10 VDC	Close	↻
Fail Position	100% Open	



5-year warranty



Type overview

Type	DN
B309	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow	A-port: as stated in chart B-port: 70% of A – AB Cv
	Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
	Servicing	maintenance-free
	Flow Pattern	3-way Mixing/Diverting
	Leakage rate	0% for A – AB, <2.0% for B – AB
	Controllable flow range	75°
	Cv	0.8
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR LRB(X) NRB(X) N4
	Spring	TFB(X) LF

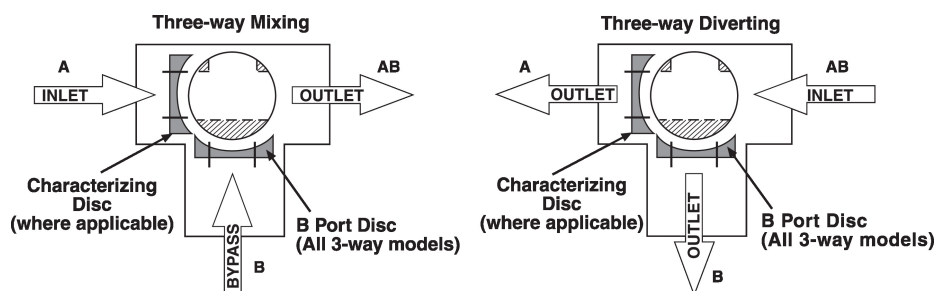
Safety notes



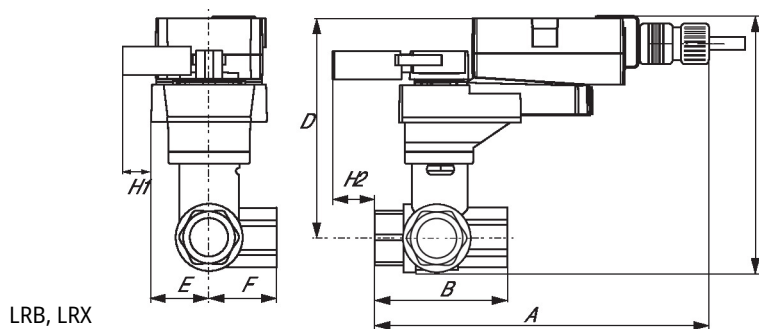
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

Product features

Application This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

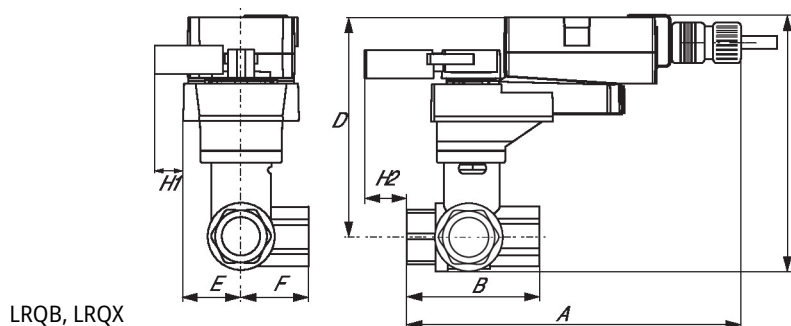
Flow/Mounting details

Dimensions

Type	DN	Weight
B309	15	0.66 lb [0.30 kg]



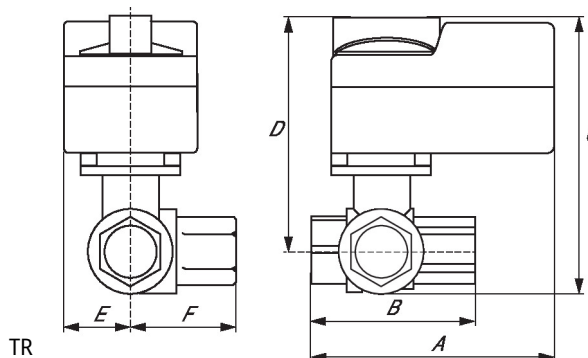
LRB, LRX

A	B	C	D	E	F	H1	H2
8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



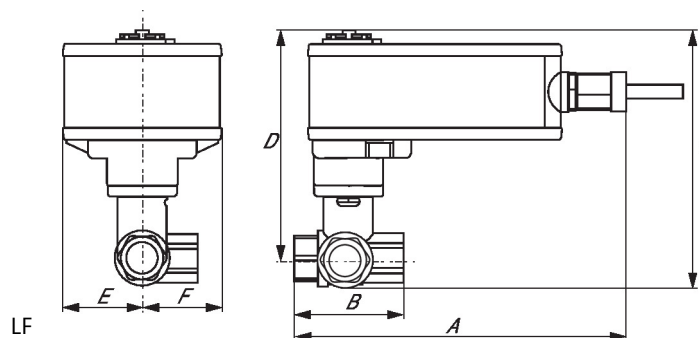
LRQB, LRQX

A	B	C	D	E	F	H1	H2
8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]

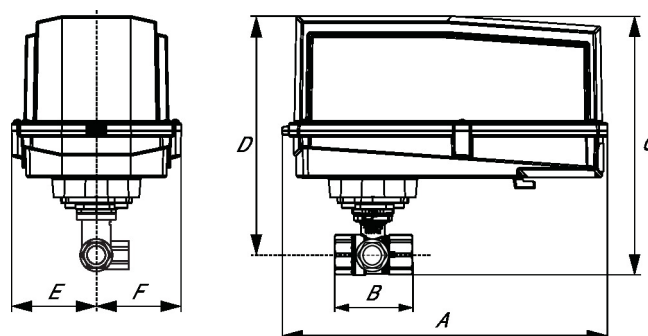


TR

A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

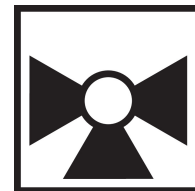


ARB N4, ARX N4

A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]



5-year warranty



Type overview

Type	DN
B310	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow	A-port: as stated in chart B-port: 70% of A – AB Cv
	Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
	Servicing	maintenance-free
	Flow Pattern	3-way Mixing/Diverting
	Leakage rate	0% for A – AB, <2.0% for B – AB
	Controllable flow range	75°
	Cv	1.2
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR
		LRB(X)
		NRB(X) N4
	Spring	TFB(X)
		LF

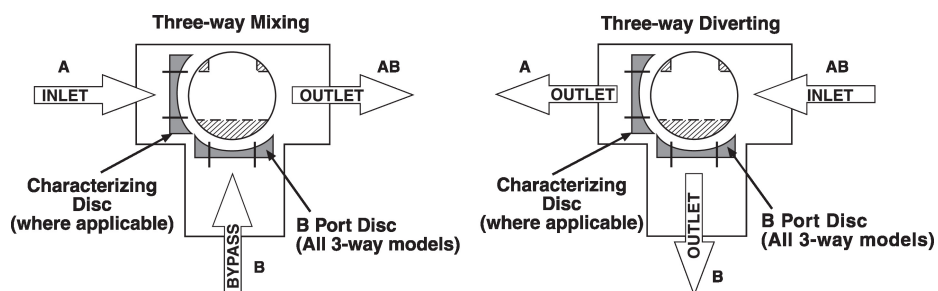
Safety notes



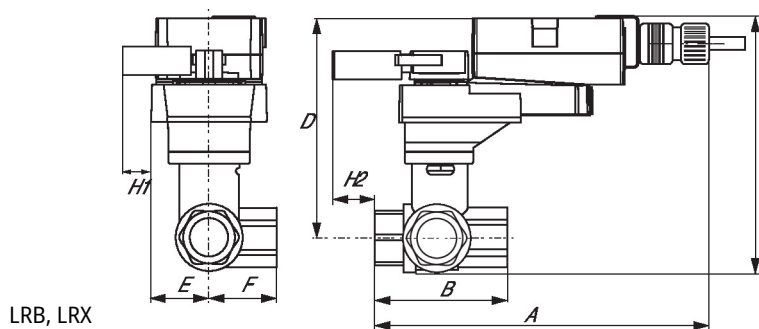
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

Product features

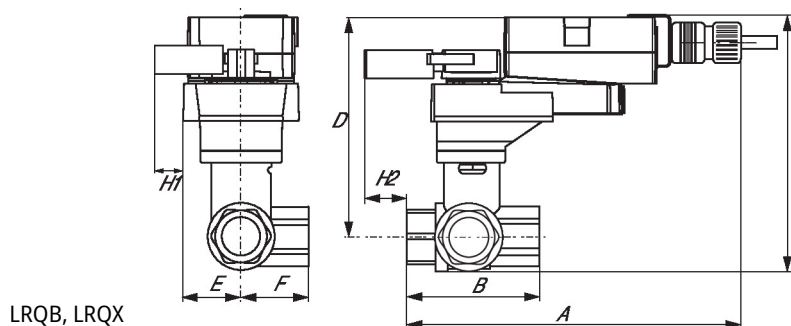
Application This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

Flow/Mounting details

Dimensions

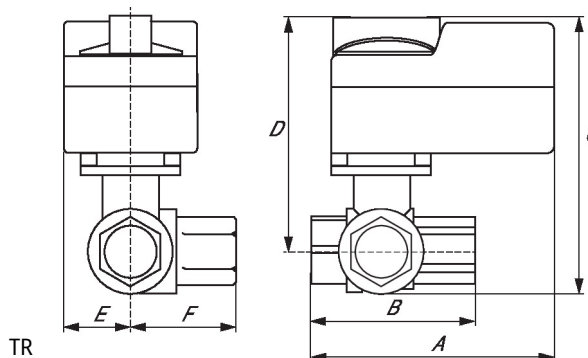
Type	DN	Weight
B310	15	0.66 lb [0.30 kg]



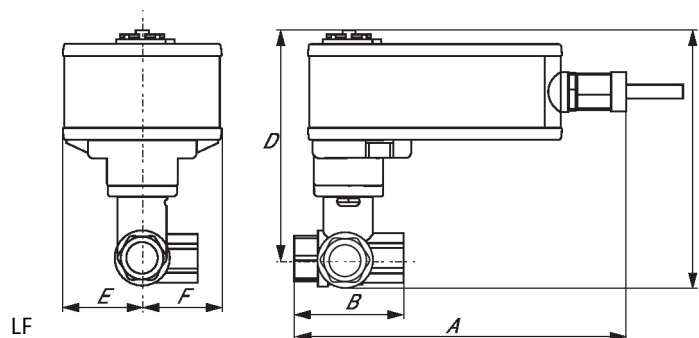
A	B	C	D	E	F	H1	H2
8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



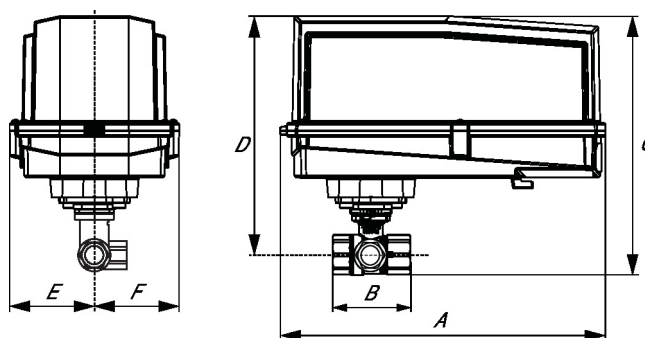
A	B	C	D	E	F	H1	H2
8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]



A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

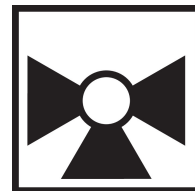


ARB N4, ARX N4

A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]



5-year warranty



Type overview

Type	DN
B311	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow	A-port: as stated in chart B-port: 70% of A – AB Cv
	Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
	Servicing	maintenance-free
	Flow Pattern	3-way Mixing/Diverting
	Leakage rate	0% for A – AB, <2.0% for B – AB
	Controllable flow range	75°
	Cv	1.9
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR LRB(X) NRB(X) N4
		TFB(X) LF

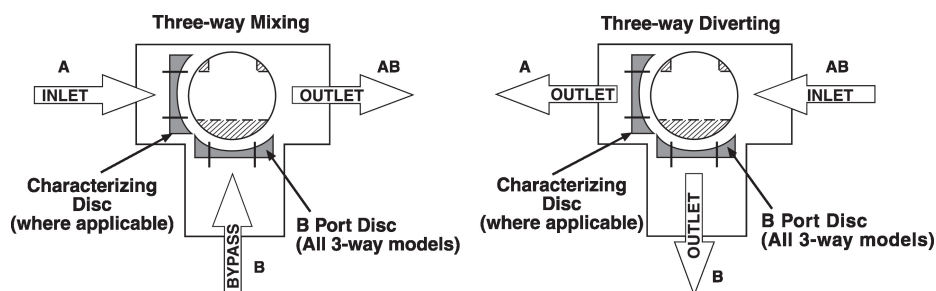
Safety notes



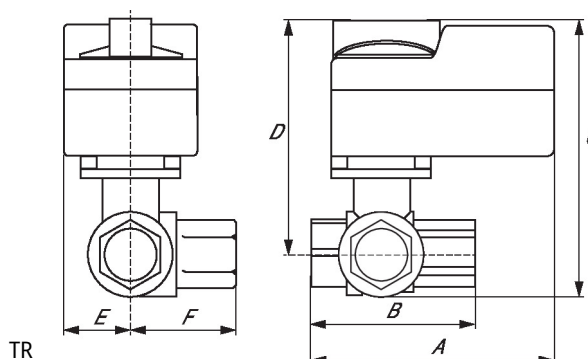
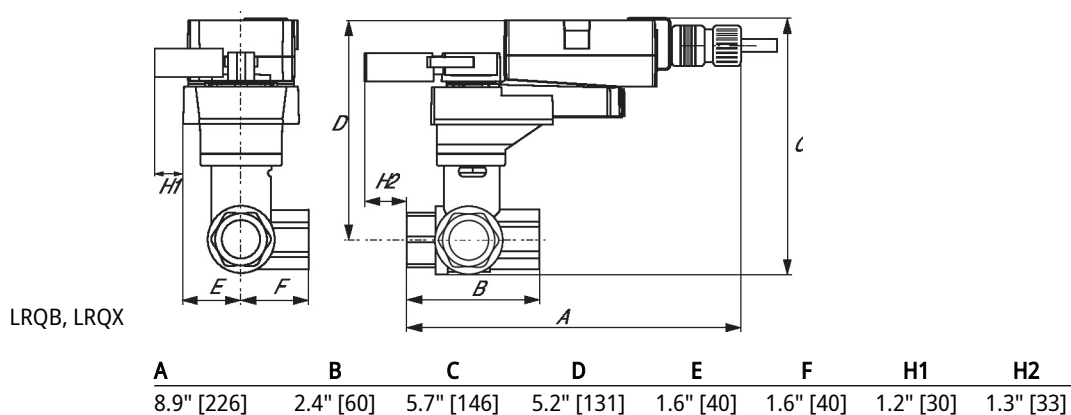
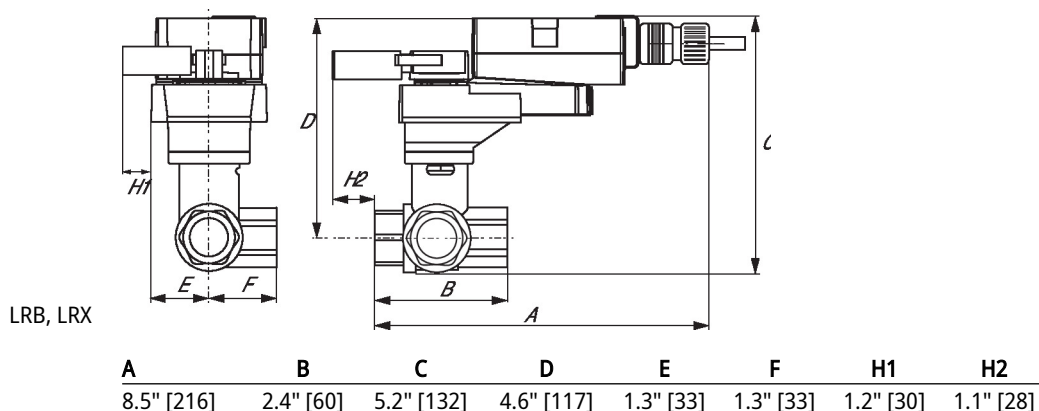
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

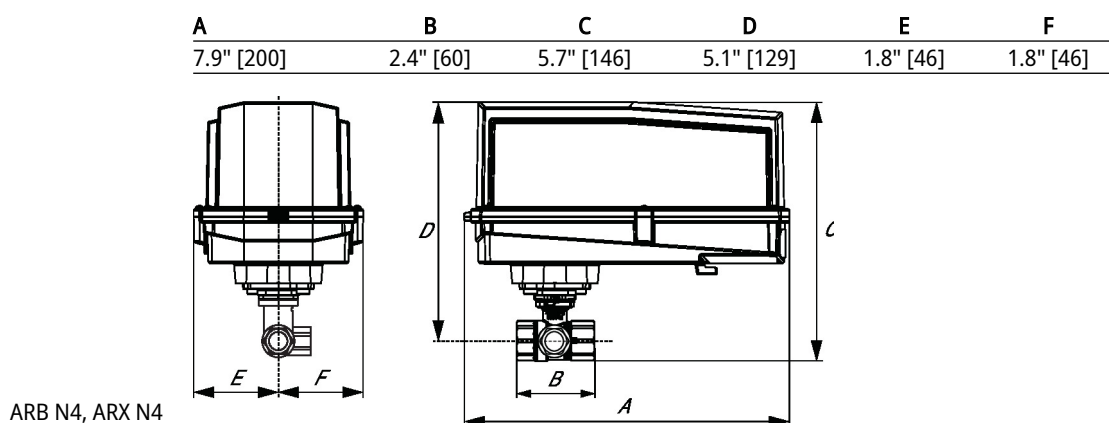
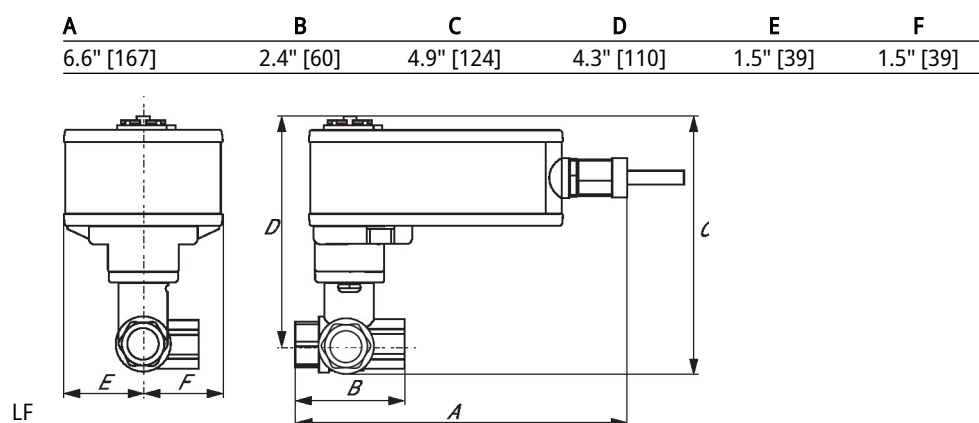
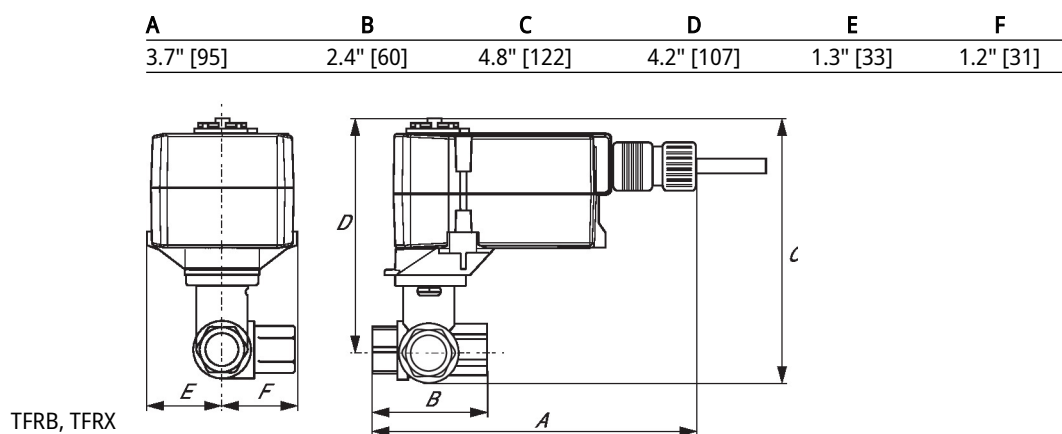
Product features

Application This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

Flow/Mounting details

Dimensions

Type	DN	Weight
B311	15	0.66 lb [0.30 kg]





A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]

Rotary actuator for ball valves

- Torque motor 2 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V


Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.5 W
	Power consumption for wire sizing	1 VA
	Connection supply / control	Cable 1 m, 3 x 0.75 mm ²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	2 Nm
	Operating range Y	2...10 V
	Input Impedance	100 kΩ
	Manual override	with hand crank
	Running time motor	90 s / 90°
	Sound power level, motor	35 dB(A)
	Position indication	Mechanical
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Degree of protection IEC/EN	IP40
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-7...50 °C
	Storage temperature	-40...80 °C
	Ambient humidity	Max. 95% r.H., non-condensing
Weight	Servicing	maintenance-free
	Weight	1.1 kg

Safety notes



- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.

Product features

Mode of operation	The actuator is connected with a standard modulating signal of 0...10 V and drives to the position defined by the positioning signal.
Simple direct mounting	Simple direct mounting on the ball valve with only one screw. The mounting orientation in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).
High functional reliability	The actuator is overload protected and automatically stops when the end stop is reached. The actuator switches off for seven seconds in the case of blocking, then attempts to restart. If the blocked condition persists, the actuator attempts to restart once every two minutes a total of 15 times and subsequently only once every two hours.
Combination valve/actuator	Refer to the valve documentation for suitable valves, their permitted fluid temperatures and closing pressures.

Electrical installation

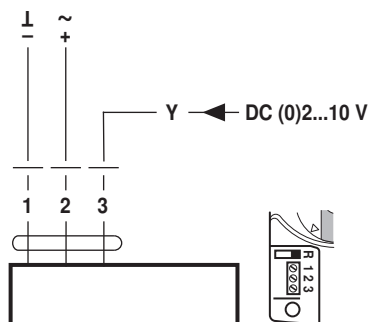


Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

AC/DC 24 V, modulating



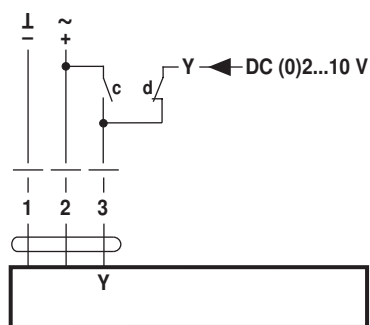
Cable colours:

- 1 = black
- 2 = red
- 3 = white

Direction of rotation R (standard)
when switch set to right position

Electrical installation

AC/DC 24 V, modulating, override control



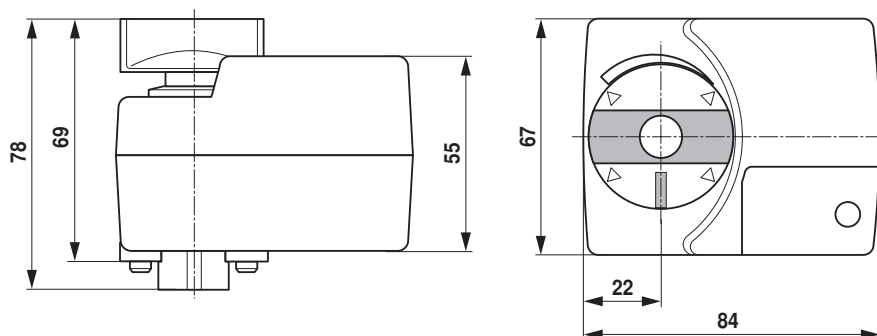
c	d	Y1 / Y2	
		Y1 	A - AB = 100%
		Y2 	A - AB = 0%
		DC (0)2...10 V	

Cable colours:

1 = black
2 = red
3 = white

Dimensions [mm]

Dimensional drawings



Further documentation

- The complete product range for water applications
- Data sheets for ball valves
- Installation instructions for actuators and/or ball valves
- General notes for project planning