

SM Series

Brass & Lead Free Brass Ball Valves with Compact Electric Actuators



The SM series motorized brass ball valves are ideal for HVAC and industrial on/off and modulating applications. The quarter turn ball valve features a unique direct mount system that allows for extremely quick and easy actuator mounting allowing for easy removal or replacement of the on/off or modulating compact electric actuator. Lead free brass valves are only available with on/off actuators.

When used with a modulating actuator, there are various flow optimizers (ball port inserts) that can be selected to achieve a precise flow control range.

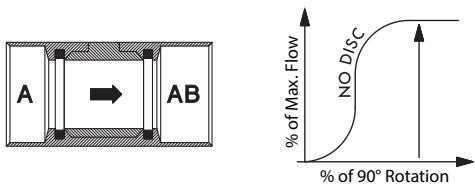
FEATURES

- Simple, 1 clip-pin actuator mounting system offers outstanding stability and eliminates the cost, weight, and installation time required by other valve/actuator mounting systems that require brackets and multiple fasteners
- Pre-wired with a cable lead eliminates the need for opening the actuator and wiring in the field
- Manual override for emergency operation requires no special tools. Use a screwdriver to switch to manual operation and use a wrench to rotate the position indicator (on/off actuators only.) All valves can be manually operated with a large screwdriver if the actuator is removed
- Two internal limit switches (0° and 90°) to indicate fully open and fully closed position (on/off and 0-10vDC modulating only)
- 100% testing to ensure quality of all valve assemblies
- Visual position indicator (on/off actuators only)
- One size actuator fits all valve sizes which simplifies and reduces inventory
- Rugged gearbox construction for extended service life

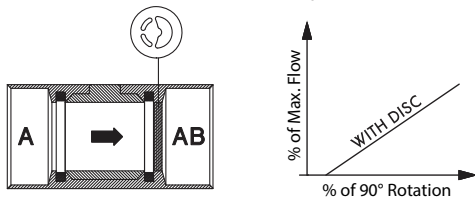
MODULATING BALL VALVES

The addition of a parabolic disc to the full port ball valve converts the valve from a standard on/off ball valve to a more precise flow control valve. The disc, or "flow optimizing trim" makes the percentage of maximum flow increase evenly with direct relation to the percentage of the 90° rotation.

Full Port Ball Valve WITHOUT Flow Optimizer



Full Port Ball Valve WITH Flow Optimizer



SPECIFICATIONS

Duty Cycle: 50%

Rotation: 90°

Limit Switch: 2 SPDT dry contact switches (on/off and 0-10vDC actuators only)

Heater: Available as special order - consult factory

Electrical Connection: 24" cable

Speed (On/Off):

4 sec. Nominal to 10 sec. Max. for 90° rotation (varies with valve size and line pressure)

Speed (Modulating):

35 seconds for 90° rotation

SM SERIES MODEL NUMBERING

Model Number **XSMNXXXX**

NPT Size: _____

C = 1/2"
D = 3/4"
E = 1"
F = 1 1/4"
G = 1 1/2"
H = 2"

Connection Type: _____

N = FNPT

Valve Body Material: _____

omit = Nickel Plated Brass
LF = Lead Free Brass*
*only available for On/Off

Electric Actuator Type: _____

CE = On/Off
CEKEP = Modulating

Electric Actuator Voltage: _____

On/Off type

B = 24vDC
E = 24vAC
F = 12vDC

Modulating

010 = 24vAC/DC w/ 0-10vDC
420 = 24vAC/DC w/ 4-20mA

Flow Optimizing Trim: _____

for modulating only - various trims are available for each size. see chart on page 4 for options

TEMPERATURE RANGE

Valve:

-4°F to 266°F (-20°C to 130°C)

Actuator:

-4°F to 158°F (-20°C to 70°C)

PRESSURE RATINGS

Body: 600 psi (41.36 bar) non-shock cold working pressure

Close-off: 360 PSI (24.82 bar) non-shock cold working pressure

Max. ΔP: 50 psi (3.45 bar) for typical applications

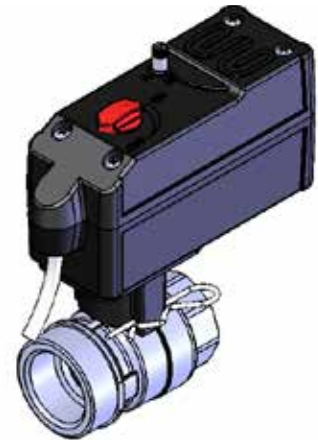
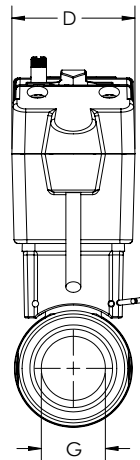
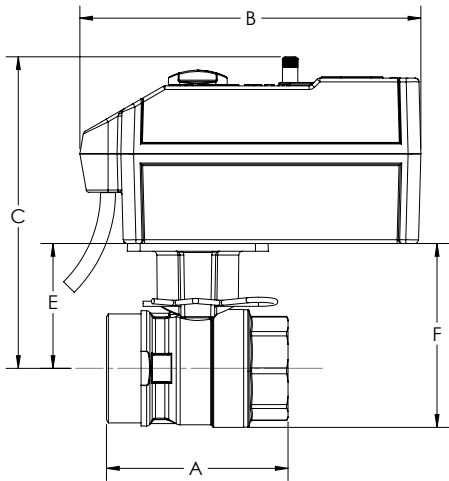
MATERIALS

Body: Ni Plated or Lead Free Brass

Seats & Seals: PTFE

SMNCE & SMNLFCE Series

Nickel Plated Brass and Lead Free Brass 2-way ball valves with compact on/off electric actuator
(Threaded end connection, 2-piece body, actuators are sized for 50 PSI pressure differential)



DIMENSIONS, WEIGHTS & SPECIFICATIONS

Size	A	B	C	D	E	F	G	Actuator	Wt. (lbs.)	Model No.
1/2"	2.169	5.24	4.48	1.89	1.38	2.25	0.591	CE◇	2	CSMN*CE◇
3/4"	2.30	5.24	4.63	1.89	1.76	2.50	0.787	CE◇	2.2	DSMN*CE◇
1"	2.79	5.24	4.78	1.89	1.92	2.82	0.984	CE◇	2.7	ESMN*CE◇
1-1/4"	3.22	5.24	4.98	1.89	2.11	3.25	1.260	CE◇	3.1	FSMN*CE◇
1-1/2"	3.54	5.24	4.98	1.89	2.11	3.25	1.240	CE◇	4.5	GSMN*CE◇
2"	4.11	5.24	5.27	1.89	2.40	3.78	1.550	CE◇	6.7	HSMN*CE◇

* = valve body material: omit = Nickel Plated Brass, **LF** = Lead Free Brass

◇ = voltage: **B** = 24vDC, **E** = 24vAC, **F** = 12vDC

VALVE FEATURES

- Full port (except 1 1/2" and 2"), 90°, 2-way, on/off ball valve
- Nickel plated brass or lead free brass body
- Quick-mount stem for use with quick-mount actuators

VALVE SPECIFICATIONS

Temperature Range: -4°F to 266°F (-20°C to 130°C)

Pressure Ratings:

Body: 600 psi (41.36 bar) non-shock cold working pressure

Close-off: 360 PSI (24.82 bar) non-shock cold working pressure

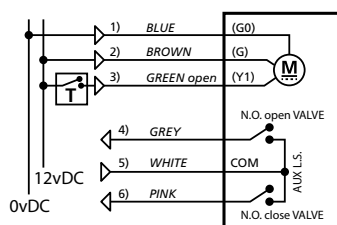
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ELECTRIC ACTUATOR FEATURES

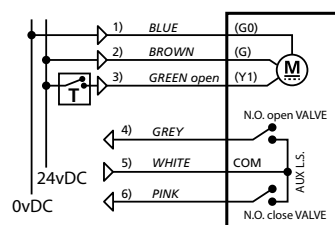
- 24vDC, 24vAC, or 12vDC operation voltage
- IP54 (protection from dust and splashing water) (IP65 available as special order)
- Limit Switch: two isolated end of travel
- Quick-mount for use with valves with Quick-mount stems
- Temperature range: -4°F to 158°F (-20°C to 70°C)
- Amp Draw:
 - 12vDC = 10 Watts
 - 24vDC = 20 Watts
 - 24vAC = 20 Watts
- UL and CSA approved, CE marked

WIRING DIAGRAMS

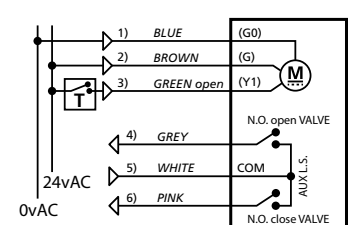
12vDC



24vDC

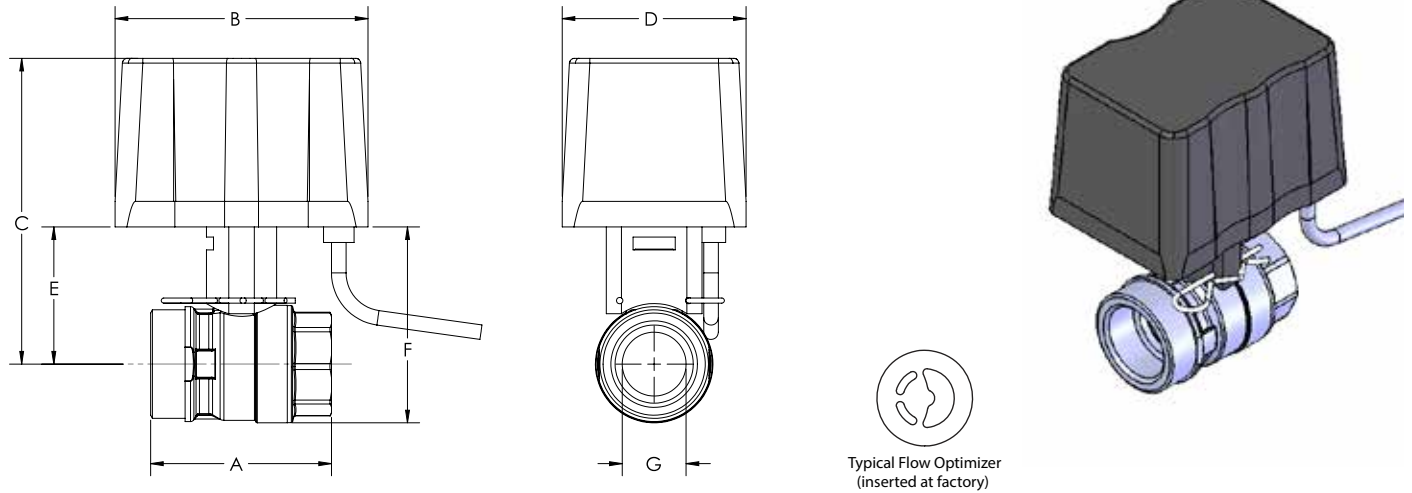


24vAC



SMNCEKEP Series

Nickel Plated Brass 2-way ball valve with modulating compact electric actuator
(Threaded end connection, 2-piece body, actuators are sized for 50 PSI pressure differential)



DIMENSIONS, WEIGHTS & SPECIFICATIONS

Size	A	B	C	D	E	F	G	Actuator	Wt. (lbs.)	Cv Flow Optimizers Available	Model No.
1/2"	2.16	3.90	4.43	2.84	1.81	2.44	0.591	CEKEP*	2.1	0.46, 0.73, 1.16, 2.2, 3.47, 5.43, 19.7	CSMNCEKEP*◇
3/4"	2.30	3.90	4.58	2.84	1.96	2.70	0.787	CEKEP*	2.4	4.62, 7.75, 47.4	DSMNCEKEP*◇
1"	2.79	3.90	4.73	2.84	2.11	3.02	0.984	CEKEP*	2.8	7.28, 10.40, 18.50, 80.93	ESMNCEKEP*◇
1-1/4"	3.22	3.90	4.93	2.84	2.31	3.44	1.260	CEKEP*	3.2	18.50, 139.9	FSMNCEKEP*◇
1-1/2"	3.54	3.90	4.93	2.84	2.31	3.44	1.240	CEKEP*	4.6	13.87, 23.59, 54.11, 231.24	GSMNCEKEP*◇
2"	4.11	3.90	5.22	2.84	2.60	3.98	1.550	CEKEP*	7.1	35.84, 46.25, 231.24	HSMNCEKEP*◇

* = modulating actuator output: **420** = 4-20mA, **010** = 0-10vDC ◇ = Cv of Flow Optimizer (see Cv chart on page 4)

VALVE FEATURES

- Full port (up to 1 1/4"), 90°, 2-way, flow control ball valve
- Various flow optimizing trim discs available for each size
- Nickel plated brass body
- Quick-mount stem for use with quick-mount actuators

VALVE SPECIFICATIONS

Temperature Range: -4°F to 266°F (-20°C to 130°C)

Pressure Ratings:

Body: 600 psi (41.36 bar) non-shock cold working pressure

Close-off: 360 PSI (24.82 bar) non-shock cold working pressure

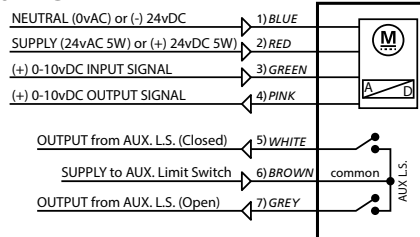
Max. ΔP: 50 psi (3.45 bar) for typical applications

MODULATING ELECTRIC ACTUATOR FEATURES

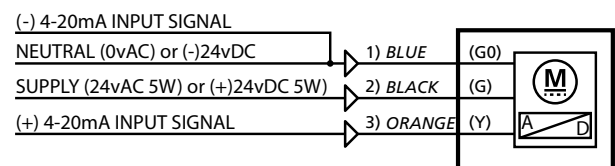
- 24 VAC/VDC with 4-20mA or 0-10vDC output
- IP54 (protection from dust and splashing water)
- Limit Switch: two isolated end of travel
- Quick-mount for use with valves with Quick-mount stems
- Temperature range: -4°F to 176°F (-20°C to 80°C)
- Amp Draw: 10 Watts
- UL and CSA approved, CE marked

WIRING DIAGRAMS

0-10vDC



4-20mA



SMNCEKEP Modulating Ball Valves

FLOW OPTIMIZING TRIM OPTIONS AND Cv VALUES

This chart shows the flow rates that can be achieved with a pressure drop of 1psi

Size	Model Code	Ball rotation in degrees - Cv (gpm with 1 psi ΔP)								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
1/2"	-0.6	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6
	-0.8	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8
	-1.2	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2
	-2.3	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.1	2.3
	-3.5	0.4	0.8	1.2	1.5	1.9	2.3	2.7	3.1	3.5
	-5.8	0.6	1.3	1.9	2.6	3.2	3.9	4.5	5.1	5.8
	(none)	Full Port - Valve without an optimizing trim disc... No Data Available.								
3/4"	-5.4	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4
	-8.1	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1
	(none)	Full Port - Valve without an optimizing trim disc... No Data Available.								
1"	-8.1	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1
	-12.7	1.4	2.8	4.2	5.6	7.1	8.5	9.9	11.3	12.7
	-18.5	2.1	4.1	6.2	8.2	10.3	12.3	14.4	16.4	18.5
	(none)	Full Port - Valve without an optimizing trim disc... No Data Available.								
1 1/4"	-18.5	2.1	4.1	6.2	8.2	10.3	12.3	14.4	16.4	18.5
	(none)	Full Port - Valve without an optimizing trim disc... No Data Available.								
1 1/2"	-13.9	1.5	3.1	4.6	6.2	7.7	9.2	10.8	12.3	13.9
	-23.6	2.6	5.2	7.9	10.5	13.1	15.7	18.3	21.0	23.6
	-54.3	6.0	12.1	18.1	24.1	30.2	36.2	42.2	48.3	54.3
	(none)	Standard Port - Valve without an optimizing trim disc... No Data Available.								
2"	-40.5	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
	-54.3	6.0	12.1	18.1	24.1	30.2	36.2	42.2	48.3	54.3
	(none)	Standard Port - Valve without an optimizing trim disc... No Data Available.								

HOW TO CALCULATE A Cv

C_v = Flow Coefficient **Q** = Flow Rate **ΔP** = Pressure Drop **G** = Specific Gravity of Media

$$C_v = Q \sqrt{\frac{G}{\Delta P}}$$

$$Q = C_v \sqrt{\frac{\Delta P}{G}}$$

$$\Delta P = G \left(\frac{Q}{C_v} \right)^2$$

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CERTIFICATIONS

- CSA Std C22.2 No. 0-10 - General Requirements - Canadian Electrical Code, Part II
- CSA Std C22.2 No.139-13 - Electrically Operated Valves
- UL429 Edition 7 - Electrically Operated Valves
- CSA Std C22.2 No. 24-93 - Temperature Indicating and Regulating Equipment
- UL Std 873 (12th Edition, 2007) - Temperature Indicating and Regulating Equipment

And for valve

- ANSI Z21.15-1997 CGA 9.1-M977
- ANSI Z2115-2001 CGA 9.1a-20013-88
- CR91-002

(Note) These standards are only related to gas modulating and not shut off.