

Carbon Steel Body, Hardened Chrome Plated, Stainless Steel Ball and Stem





Type overview			
Туре			DN
B61200VB-1905			300
Technical data			
	Functional data	Valve size [mm]	12" [300]
		Fluid	chilled or hot water, up to 60% glycol, steam
		Fluid Temp Range (water)	-22380°F [-30193°C]
		Fluid Temp Range (steam)	-22365°F [-30185°C]
		Body Pressure Rating	ANSI Class 150
		Close-off pressure Δps	250 psi
		Flow characteristic	equal percentage
		Servicing	repack/rebuild kits available
		Rangeability Sv	300:1
		Maximum differential pressure (water)	150 psi
		Max Differential Pressure (Steam)	100 psi
		Close-Off Pressure (Steam)	150 psi
		Flow Pattern	2-way
		Leakage rate	ANSI Class IV
		Controllable flow range	75°
		Cv	1905
		Maximum Inlet Pressure (Steam)	150 psi
	Materials	Valve body	WCC grade carbon steel
		Body finish	matt black body finish
		Stem	stainless steel
		Stem seal	PTFE V-ring
		Seat	PTFE
		Pipe connection	125/150 lb flanged, ASME/ANSI b16.1/b16.5
		Ball	stainless steel

### **Product features**

### **Application**

Non-Spring

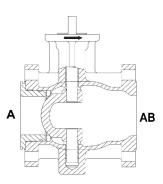
Suitable actuators

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 reheat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

SY4



# Flow/Mounting details



Dimensions			
Туре	DN	Weight	
B61200VB-1905	300	336 lb [152.4 kg]	



## MFT/programmable, Non fail-safe, 230 V





Functional data   Particular			
Nominal voltage frequency Nominal voltage range AC 207253 V Transformer sizing Current consumption 1.1 A Auxiliary switch Switching capacity auxiliary switch Electrical Connection Terminal blocks Overload Protection Internal Humidty Control Torque motor Operating range Y Input impedance Position feedback U note Position feedback U note Direction of motion motor Max. 0.5 mA Position feedback U note Position feedback U note Angle of rotation Sine feedback U hond wheel Angle of rotation Manual override Angle of rotation Safety data Position indication Degree of protection IEC/EN Degree of protection IEC/EN Quality Standard Ambient temperature Vox. 250 V 1.1 A A. 25 DV 1.1 A A. 25 DV 1.1 A A. 25 DV 1.1 A A. 2 10 V 1.1 DV 1.1	Technical data		
Nominal voltage frequency Nominal voltage range AC 207253 V Transformer sizing Current consumption 1.1 A Auxiliary switch Switching capacity auxiliary switch Electrical Connection Terminal blocks Overload Protection Internal Humidty Control Torque motor Operating range Y Input impedance Position feedback U note Position feedback U note Direction of motion motor Max. 0.5 mA Position feedback U note Position feedback U note Angle of rotation Sine feedback U hond wheel Angle of rotation Manual override Angle of rotation Safety data Position indication Degree of protection IEC/EN Degree of protection IEC/EN Quality Standard Ambient temperature Vox. 250 V 1.1 A A. 25 DV 1.1 A A. 25 DV 1.1 A A. 25 DV 1.1 A A. 2 10 V 1.1 DV 1.1	Electrical data	Nominal voltage	AC 230 V
Nominal voltage range			50/60 Hz
Transformer sizing 253 VA Current consumption 1.1 A Auxiliary switch 2x SPDT, 1 mA5 A (3 A inductive), DC 5 VAC 250 V, 1 x 3° / 1 x 87° Switching capacity auxiliary switch 1 mA5 A (3 A inductive), DC 5 VAC 250 V, 1 x 3° / 1 x 87° Switching capacity auxiliary switch 1 mA5 A (3 A inductive), DC 5 VAC 250 V Electrical Connection Terminal blocks Overload Protection thermally protected 135°C cut-out Internal Humidty Control resistive heating element  Functional data Torque motor 400 Nm Operating range Y 210 V Input impedance 100 kΩ Position feedback U 210 V Position feedback U variable VDC variable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN 1P66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing 150, CE, CCSAus Quality Standard 150 9001 Ambient temperature -22149°F [-3065°C] Storage temperature -22149°F [-3065°C]			AC 207253 V
Current consumption 1.1 A  Auxiliary switch 2x SPDT, 1 mA A (3 A inductive), DC 5 VAC 250 V, 1 x 3° / 1 x 87°  Switching capacity auxiliary switch 1 mA 5 A (3 A inductive), DC 5 VAC 250 V  Electrical Connection Terminal blocks  Overload Protection thermally protected 135°C cut-out Internal Humidty Control resistive heating element  Functional data  Torque motor 400 Nm Operating range Y 210 V Input impedance 100 kΩ Position feedback U 210 V Position feedback U 310 V Position feedback U 510 V Position feedback U 510 V Position feedback U 510 V Position feedb			253 VA
Switching capacity auxiliary switch 1 mA5 A (3 A inductive), DC 5 VAC 250 V Electrical Connection Terminal blocks Overload Protection thermally protected 135°C cut-out Internal Humidty Control resistive heating element  Functional data  Torque motor 400 Nm Operating range Y 210 V Input impedance 100 kΩ Position feedback U 210 V Position feedback U ariable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data  Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing 150, CE, CCSAus Quality Standard 150 0001 Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C]		Current consumption	1.1 A
Electrical Connection Terminal blocks Overload Protection thermally protected 135°C cut-out Internal Humidty Control resistive heating element  Functional data  Torque motor 400 Nm Operating range Y 210 V Input impedance 100 kΩ Position feedback U 210 V Position feedback U onte Max. 0.5 mA Position feedback U variable VDC variable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient humidity Max. 100% RH Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C]		Auxiliary switch	
Functional data     Torque motor     400 Nm       Operating range Y     210 V       Input impedance     100 kΩ       Position feedback U     210 V       Position feedback U note     Max. 0.5 mA       Position feedback U variable     VDC variable       Direction of motion motor     selectable with switch 0/1       Manual override     hand wheel       Angle of rotation     90°       Running Time (Motor)     22 s       Duty cycle value     75%       Noise level, motor     45 dB(A)       Position indication     top mounted domed indicator       Safety data     Degree of protection IEC/EN     IP66/67       Degree of protection NEMA/UL     NEMA 4X       Enclosure     UL Enclosure Type 4X       Agency Listing     ISO, CE, cCSAus       Quality Standard     ISO 9001       Ambient humidity     Max. 100% RH       Ambient temperature     -22149°F [-3065°C]       Storage temperature     -40176°F [-4080°C]		Switching capacity auxiliary switch	1 mA5 A (3 A inductive), DC 5 VAC 250 V
Internal Humidty Control resistive heating element  Functional data  Torque motor 400 Nm Operating range Y 210 V Input impedance 100 kΩ Position feedback U 210 V Position feedback U 1000 Nm Nore in the internation of the interna		Electrical Connection	Terminal blocks
Functional data  Torque motor  Operating range Y  Input impedance  Position feedback U  Position feedback U ote  Position feedback U variable  Direction of motion motor  Manual override  Angle of rotation  Running Time (Motor)  Duty cycle value  Noise level, motor  Position indication  Safety data  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  Agency Listing  Quality Standard  Ambient humidity  Max. 100% RH  Ambient temperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]		Overload Protection	thermally protected 135°C cut-out
Operating range Y 210 V Input impedance 100 kΩ Position feedback U 210 V Position feedback U 100 Max. 0.5 mA Position feedback U variable VDC variable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN 1P66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing 1SO, CE, cCSAus Quality Standard 1SO 9001 Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]		Internal Humidty Control	resistive heating element
Input impedance 100 kΩ Position feedback U 210 V Position feedback U note Max. 0.5 mA Position feedback U variable VDC variable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]	Functional data	Torque motor	400 Nm
Position feedback U Position feedback U note Position feedback U variable Position feedback U variable VDC variable Direction of motion motor Selectable with switch 0/1 Manual override Angle of rotation Running Time (Motor) Duty cycle value Noise level, motor Position indication  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient humidity Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]		Operating range Y	210 V
Position feedback U note Max. 0.5 mA Position feedback U variable VDC variable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]		Input impedance	100 kΩ
Position feedback U variable Direction of motion motor Selectable with switch 0/1 Manual override Angle of rotation Running Time (Motor) Duty cycle value Noise level, motor Position indication  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient humidity Ambient temperature  VDC variable		Position feedback U	210 V
Direction of motion motor  Manual override  Angle of rotation  Running Time (Motor)  Duty cycle value  Noise level, motor  Position indication  Safety data  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  Agency Listing  Quality Standard  Ambient humidity  Ambient temperature  -22149°F [-3065°C]  Shore  Manual override  hand wheel  hand		Position feedback U note	Max. 0.5 mA
Manual override Angle of rotation 90° Running Time (Motor) 22 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing Quality Standard Ambient humidity Ambient temperature Storage temperature Manual wheel And And Be(A) And Be(A		Position feedback U variable	VDC variable
Angle of rotation 90° Running Time (Motor) 22 s  Duty cycle value 75%  Noise level, motor 45 dB(A)  Position indication top mounted domed indicator  Safety data  Degree of protection IEC/EN IP66/67  Degree of protection NEMA/UL NEMA 4X  Enclosure UL Enclosure Type 4X  Agency Listing ISO, CE, cCSAus  Quality Standard ISO 9001  Ambient humidity Max. 100% RH  Ambient temperature -22149°F [-3065°C]  Storage temperature -40176°F [-4080°C]		Direction of motion motor	selectable with switch 0/1
Running Time (Motor)  Duty cycle value 75% Noise level, motor 45 dB(A) Position indication  top mounted domed indicator  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient humidity Ambient temperature Storage temperature  V22 s 75%  N68  Running Time (Motor) 22 s 75%  NEMA VA UE prode/67  Degree of protection NEMA/UL NEMA 4X  IP66/67  UL Enclosure Type 4X  ISO, CE, cCSAus  VABABEL STAN STAN STAN STAN STAN STAN STAN STAN		Manual override	hand wheel
Duty cycle value  Noise level, motor  Position indication  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  Agency Listing  Quality Standard  Ambient humidity  Ambient temperature  Duty cycle value  75%  Noise level, motor  45 dB(A)  1P66/67  IP66/67  Degree of protection NEMA/UL  NEMA 4X  ISO, CE, cCSAus  ISO, CE, cCSAus  Ambient louridity  Max. 100% RH  Ambient femperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]		Angle of rotation	90°
Noise level, motor Position indication  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient humidity Ambient temperature Storage temperature  NEMA 4X IP66/67 UL Enclosure Type 4X ISO, CE, cCSAus ISO, CE, cCSAus ISO 9001 Ambient Max. 100% RH -22149°F [-3065°C]		Running Time (Motor)	22 s
Position indication top mounted domed indicator  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]		Duty cycle value	75%
Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient humidity Ambient temperature Storage temperature  P66/67  NEMA 4X  NEMA 4X  ISO, CE, cCSAus  ISO, CE, cCSAus  Max. 1009 RH  -22149°F [-3065°C]		Noise level, motor	45 dB(A)
Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient humidity Max. 100% RH Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]		Position indication	top mounted domed indicator
Enclosure  UL Enclosure Type 4X  Agency Listing  ISO, CE, cCSAus  Quality Standard  ISO 9001  Ambient humidity  Max. 100% RH  Ambient temperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]	Safety data	Degree of protection IEC/EN	IP66/67
Agency Listing ISO, CE, cCSAus  Quality Standard ISO 9001  Ambient humidity Max. 100% RH  Ambient temperature -22149°F [-3065°C]  Storage temperature -40176°F [-4080°C]		Degree of protection NEMA/UL	NEMA 4X
Quality Standard ISO 9001  Ambient humidity Max. 100% RH  Ambient temperature -22149°F [-3065°C]  Storage temperature -40176°F [-4080°C]		Enclosure	UL Enclosure Type 4X
Ambient humidity  Ambient temperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]		Agency Listing	ISO, CE, cCSAus
Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C]		Quality Standard	ISO 9001
Storage temperature -40176°F [-4080°C]		·	Max. 100% RH
		Ambient temperature	-22149°F [-3065°C]
Servicing maintenance-free		Storage temperature	-40176°F [-4080°C]
		Servicing	maintenance-free

44 lb [20 kg]

Weight Weight



#### **Technical data**

Materials	Housing material	die cast aluminium
	Gear train	high alloy steel gear sets, self locking

#### **Product features**

### **Application**

SY Series actuators are fractional horsepower devices, and utilize full-wave power supplies. Observe wire sizing and transformer sizing requirements. Proportional models CANNOT be connected to Belimo direct coupled (AF, AM, GM...etc) actuator power supplies or any type of half-wave device. You MUST use a separate, dedicated transformer or power supply to power the SY actuator. Please do not connect other automation equipment to the dedicated SY supply source. You MUST use four wires (plus a ground) to control a proportional control SY actuator (See SY Wiring Section).

#### **Accessories**

Gateways	Description	Туре
	Gateway MP to BACnet MS/TP	UK24BAC
	Gateway MP to Modbus RTU	UK24MOD
	Gateway MP to LonWorks	UK24LON
Electrical accessories	Description	Туре
	Local electric disconnect for SY412 series actuator, AC 120 V, MFT	HOA-120VMFT
	Service tool, with ZIP-USB function, for programmable and	ZTH US
	communicative Belimo actuators, VAV controller and HVAC performance devices	
	Battery backup system for SY46 series actuator, AC 120 V, on/off	EXT-NSV-B03-120
	Battery backup system for SY46 series actuator, AC 120 V, MFT	EXT-NSV-B04-120
	Battery backup system for SY45 series actuator, AC 24 V, on/off	EXT-NSV-B13-24
	Battery backup system for SY45 series actuator, AC 24 V, MFT	EXT-NSV-B14-24
Tools	Description	Туре
	Connecting cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection	ZK4-GEN
	Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US

#### **Electrical installation**



### **INSTALLATION NOTES**

Do not change sensitivity or dip switch setting with power applied.

Power supply Common/Neutral and Control Signal "-"wiring to a common is prohibited. Terminals 4 and 6 need to be wired separately.



1 Isolation relays must be used in parallel connection of multiple actuators using a common control signal inputs. The relays should be DPDT.

🔬 Isolation relays are required in parallel applications. The reason parallel applications need isolation relays is that the motor uses two sets of windings, one for each direction. When one is energized to turn the actuator in a specific direction a voltage is generated in the other due to the magnetic field created from the first. It's called back EMF. This is not an issue with one actuator because the voltage generated in the second winding isn't connected to anything so there is no flow. On parallel applications without isolation, this EMF voltage energizes the winding it is connected to on the other actuators in the system, the actuators are tying to turn in both directions at once. The EMF voltage is always less than the supply voltage due to the resistance of the windings, so while the actuator still turns in the commanded direction, the drag from the other reduces the torque output and causes overheating.



Warning! Live electrical components!



#### **Electrical installation**

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

