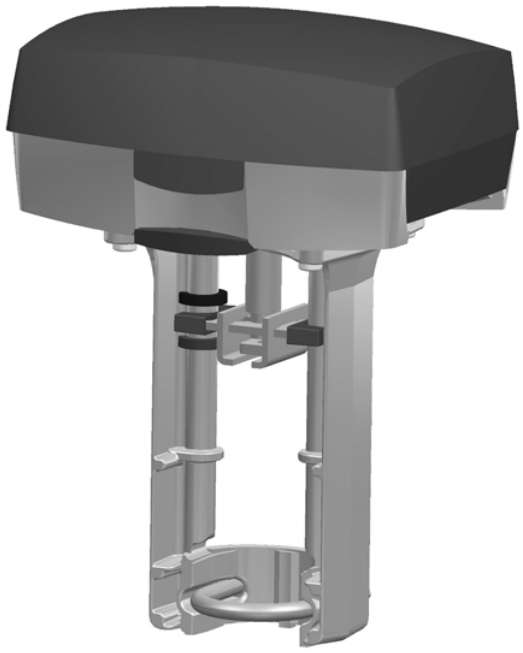
TAC Forta M400A / M800A DIM119E

Globe Valve Actuators General Instructions

12 Mar 2008

Forta M400A / M800A series Non-Spring Return linear actuators are design to mount directly onto globe valves with linkage kits ordered separately, M400A requires AV-811 linkage kit for mounting to VB-7xxx valves and the M800A requires AV-811 linkage kit for mounting to VB-7xxx or AV-812 for mounting to VB-9313-0-5-xx valves. Applications include chilled or hot water and steam. Field selectable input signals include reverse and direct acting, Floating or Proportional 0-10, 2-10 vdc or 4-20 ma with 500 ohm resistor (supplied) plus proportional sequencing input signal ranges.



FEATURES

- Floating configuration controlled by a SPDT floating controllers
- Proportional configuration 0-10, 2-10 vdc or 4-20 ma with the addition of a 500 ohm resistor included Direct/Reverse action switch selectable
- 90 lbf (400N) linear force
- 180 lbf (800N) linear force
- 24 Vac powered
- Die-cast housing with plenum rated plastic cover for NEMA 2 (IP54) applications
- Manual override to allow positioning of valve
- Electronic valve sequencing and Electronic flow curve (equal percentage or Linear) selection.
- Torque overload protection throughout stroke
- Easy “One Touch” input signal/stroke calibration

APPLICABLE LITERATURE

- Forta/VB-7xxx Selection Guide, F-27490
- Forta/VB-8xxx, VB-9xxx Selection Guide, F-27491
- AV-811 Linkage VB-7xxx, F-27442
- AV-812 Linkage VB-8xxx, VB-9xxx, F-27443
- AV-800 Series Linkage Adapters for Competitors Valves, F-27470

TECHNICAL DATA, M400A / M800A

Model Chart

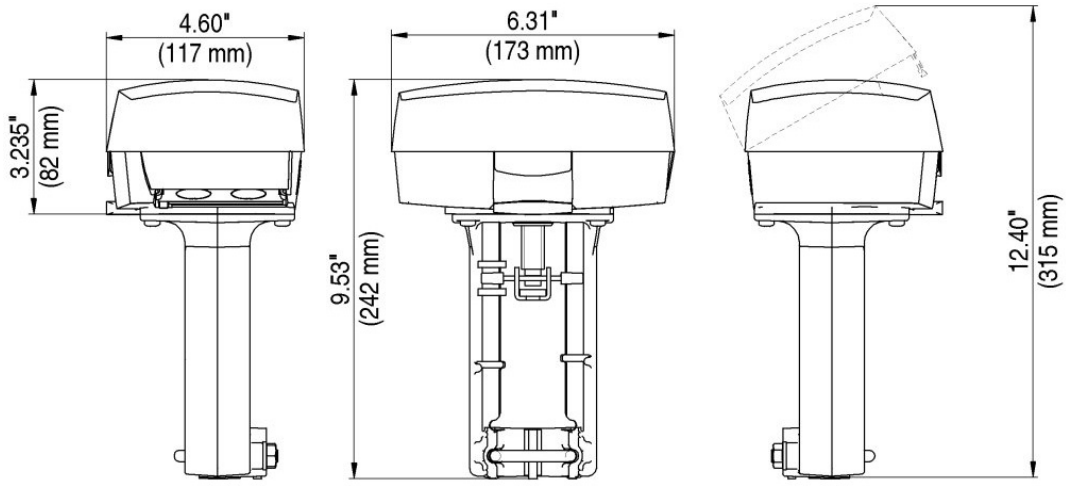
Model	Power	Running VA	Transformer Size VA	Floating Control	Proportional Control	Feedback	Force lbf	2-SPDT Aux Switch
M400A	24vac ±10% 50-60Hz	6	30	Yes	0-10vdc, 2-10vdc or 4-20mA*	2-10vdc	90 (400 N)	No
M400A-S2								24vac 4a res
M800A		15	50				180 (800 N)	No
M800A-S2								24vac 4a res

* 4-20mA with 500 ohm resistor

Stroke	>3/8" to 2" (9-52mm)
Stroke Timing	
	Floating 60 or 300 sec selectable
	Proportional 15 sec @1/2" stroke
Feedback AO	2-10 vdc
Power Supply Type	Half Wave
Motor Type	Brushless DC
Enclosure	NEMA 2 (IP 54) with both conduit connectors used. NEMA 1 IP40 with one connector used.
Sound Power Level	max 32 dba
Agency Listings	UL873, cULus, C-tick, CE

Ambient Temperature	
Storage	-13 °F-+149 °F (-25- +65 °C) ambient
Operational	122 °F (50 °C) For Chilled water applications
	113 °F (45°C) ambient at 281 °F (138°C) Fluid temperature
	107 °F (42 °C) ambient at 300 °F (149 °C) Fluid temperature
	100 °F (38 °C) ambient at 340 °F (171°C) Fluid temperature
	90°F (32°C) ambient at 366 °F (186 °C) Fluid temperature
Min. Operating Temp.	14 °F (-10 °C)
Ambient Humidity	15 to 95 % RH non condensing
Materials	
Housing	Die-Cast Aluminum
Cover	UL94 plenum rated plastic
Weight	3.96 lb (1.8kg)
Dimensions	Figure 1

DIMENSIONS



Dimensions: in. (mm)

Figure 1

FUNCTION

The actuator

The brushless DC-motor of the actuator turns a screw via a gear wheel. The motor receives a control signal from a controller. The screw gets a linear movement which moves the stem of the valve.

Control signal

M400A / M800A can be controlled by a SPDT floating control, Triac source controller or a proportional input signal.

Manual operation

There is a red manual operation handle on the actuator, see figure 2. When it is lowered, the motor stops. Then the actuator can be operated manually if the handle is turned.

ATTENTION: actuators is shipped with manual override lowered (MAN).

For normal operating, the handle must be raised (AUTO).

Position feedback

M400A / M800A actuators are equipped with a 2-10 vdc position feedback.

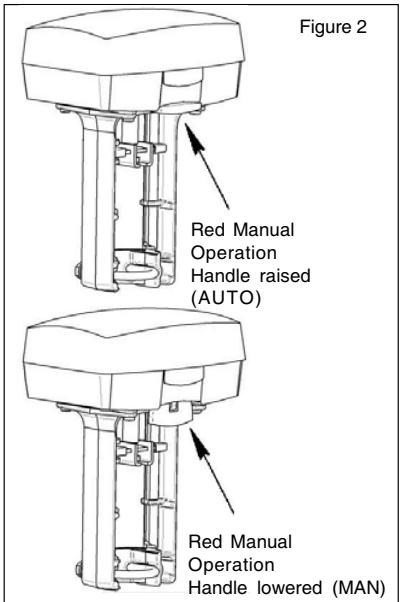


Figure 2

MOUNTING

The actuator may be mounted horizontally, vertically and in any position in between, but **not** upside down, see figure 3.

Forta M400A / M800A actuators mount directly on two and three way VB-7xxx globe valves using the AV-811 linkage kit.

The M800A may be mounted on VB-9313-0-5-xx valves using AV-812 linkage kit.

Either linkage kit must be ordered separately. Please refer to F-27442 for AV-811 mounting instructions and to F-27443 for AV-812 mounting instructions.

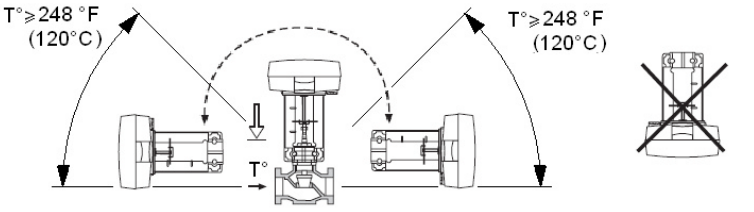


Figure 3

CONNECTIONS

Block	Function	Description
G	24 vac	power
H	24 vac	power
AI	+	input signal
C	-	signal common
D1	floating	Extend/ Retract*
D2	floating	Extend/ Retract*
AO	+	feedback sig

*Exact operation will very based on the settings of DIP switch #1 and #7

Caution: For floating input signals the cables between the controller and the Forta should not exceed 328' (100m) (16 AWG) with the cables connected to one actuator.

When installed with 3 conductors with very long lengths (floating control), where control signal reference is connected to G, the motor current of the actuator will cause varying voltage loss in the cable and thus in the reference level. Forta which has a highly sensitive control signal input, will detect the varying signal and follow it, which makes it difficult for the actuator to find a stable position.

Cable Lengths: The wires to G, H should be max of 328 ft (100m). min AWG 16, all other proportional input signal input wires should be a max of 656 ft (200m) min AWG 20.

Please refer to the Wiring Examples for wiring instructions.

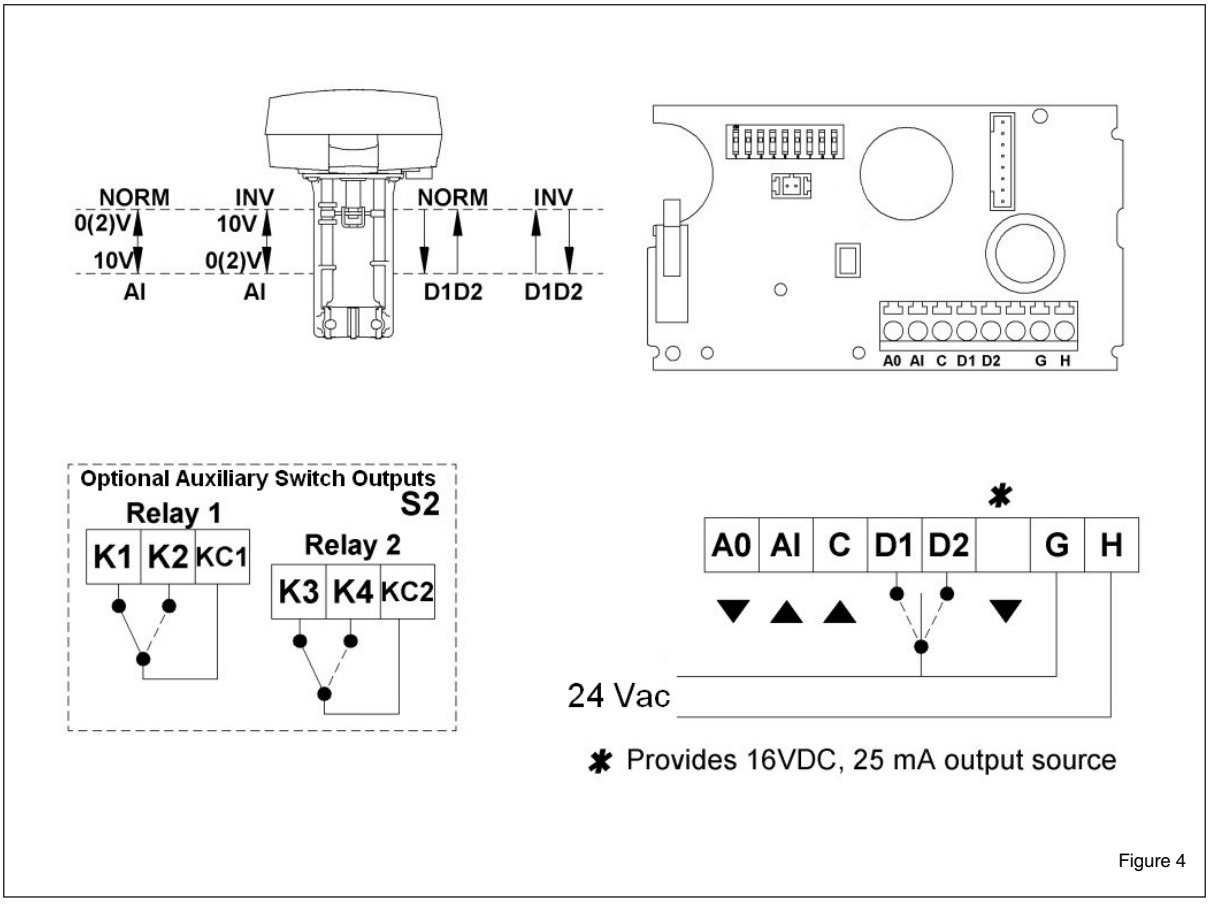


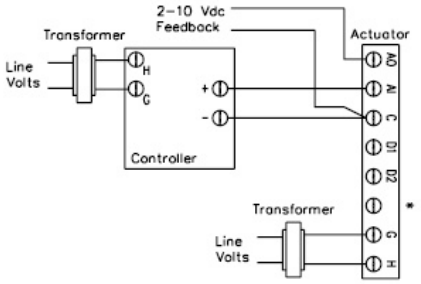
Figure 4

PROPORTIONAL CONTROL WIRING DIAGRAMS

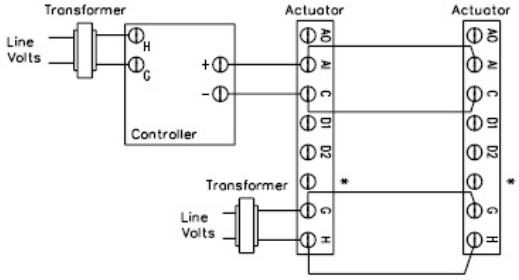
Switches 2 & 4 OFF
0–10V
Proportional operation

Switches 2 OFF & 4 ON
2–10V
Proportional operation

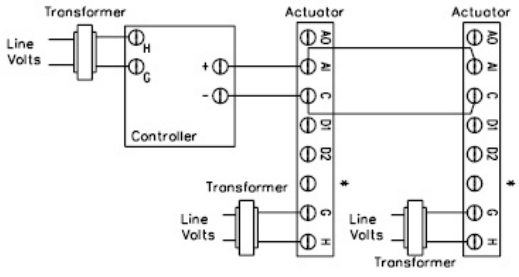
TRANSFORMER TO BE SIZED FOR RECOMMENDED VA REQUIREMENTS PER CONTROLLER/ACTUATOR PRODUCT DATA SHEETS



0–10/2–10 Vdc Proportional Application
* Provides 16 Vdc, 25mA output source



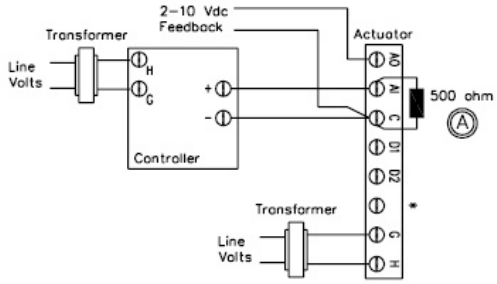
0–10/2–10Vdc Proportional Multiple
Actuators powered from single source.
* Provides 16 Vdc, 25mA output source



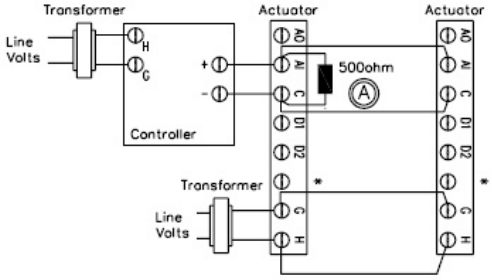
0–10/2–10Vdc Proportional Multiple
Actuators powered from separate sources.
* Provides 16 Vdc, 25mA output source

Switches 2 OFF & 4 ON
4–20mA with 500 ohm resistor
Proportional operation

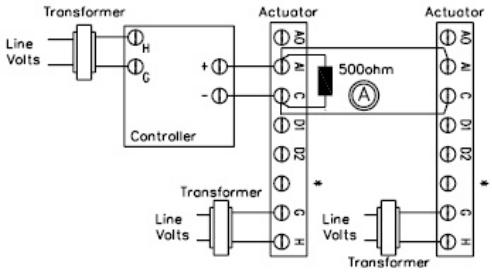
TRANSFORMER TO BE SIZED FOR RECOMMENDED VA REQUIREMENTS PER CONTROLLER/ACTUATOR PRODUCT DATA SHEETS



4–20mA Proportional Application
* Provides 16 Vdc, 25mA output source

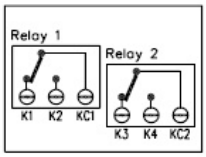


4–20mA Proportional Multiple
Actuators powered from single source.
* Provides 16 Vdc, 25mA output source



4–20mA Proportional Multiple
Actuators powered from separate sources.
* Provides 16 Vdc, 25mA output source

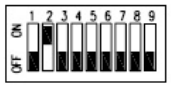
(A) 500 ohm resistor (included w/actuator) is required.
For 4–20mA input Dip Switches 2 OFF and 4 ON



OPTIONAL S2 AUXILIARY SWITCH

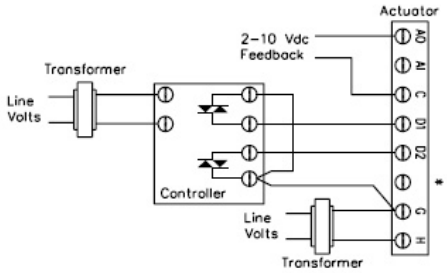
Figure 6

FLOATING CONTROL WIRING DIAGRAMS

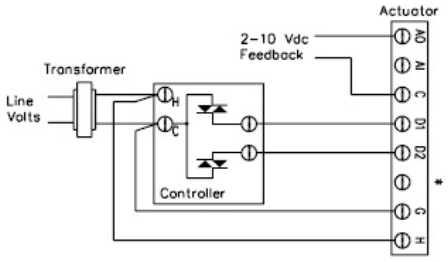


Switch 2 ON for floating operation

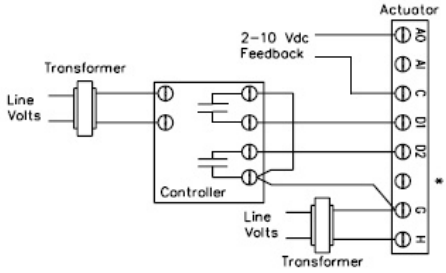
TRANSFORMER TO BE SIZED FOR RECOMMENDED VA REQUIREMENTS
PER CONTROLLER/ACTUATOR PRODUCT DATA SHEETS



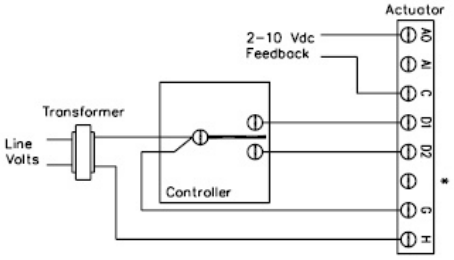
TRIAC SINK Application
Two power sources
* Provides 16 Vdc, 25mA output source



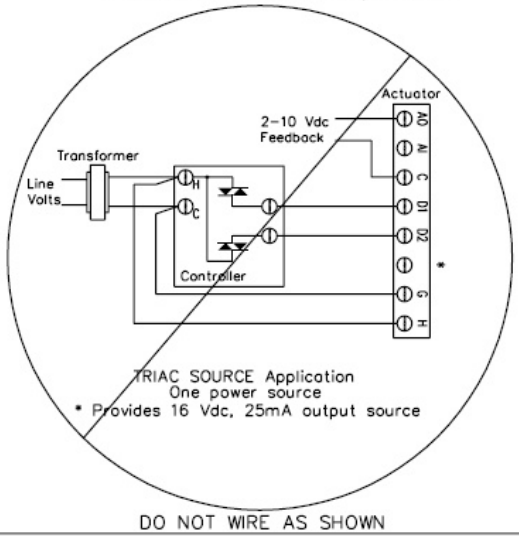
TRIAC SINK Application
One power source
* Provides 16 Vdc, 25mA output source



RELAY SINK Application
Two power sources
* Provides 16 Vdc, 25mA output source

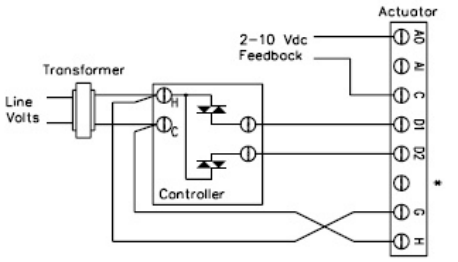


RELAY SINK Application
One power source
* Provides 16 Vdc, 25mA output source

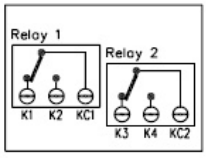


TRIAC SOURCE Application
One power source
* Provides 16 Vdc, 25mA output source

DO NOT WIRE AS SHOWN



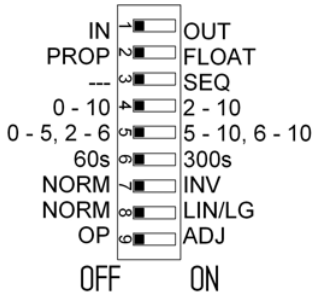
TRIAC SOURCE Application
One power source
* Provides 16 Vdc, 25mA output source



OPTIONAL S2 AUXILIARY SWITCH

Figure 7

PROGRAM SWITCH SETTINGS



*See note below!

	Function in the "OFF" pos.	"ON" position	Description
1	Retract	Extend (see sw7)	Valve closing screw direction
2	Proportional	Floating	Control Mode
3	–	Sequence	Sequence control
4	0-10 V	2-10 V	Input Voltage range
5	0-5 V, 2-6 V	5-10 V, 6-10 V	Part of voltage range
6	60 s	300 s	Running time (Floating control only)
7	Normal	Inverted (see SW 1)	Direction of movement
8	Normal	Linear/Logarithmic	Valve characteristic
9	Operation	Stroke position adjust (mom.)	Input signal/stroke calibration

Figure 8

(*) There are nine switches in a row on the circuit board. The factory shipped default switch positions are all "OFF."

1 Valve Closing Screw

Upon power up with switch 1 OFF the actuator will fully retract before the input control signal takes control. If switch 1 is ON the actuator will fully extend before the input control signal takes over. This switch will change the proportional or floating input signal to direct or reverse action similar to switch 7

2 Control signal—Prop / Float

TAC Forta can either be controlled by a Proportional signal (SW2 OFF), or a floating signal (SW2 ON)

3 Sequence or parallel control— – – – / SEQ

With sequence (or parallel) control (SEQ), two actuators/valves can be controlled by only one proportional control signal.

Switch 2 must be OFF, switch 3 must be ON and switch 5 will configure the range.

Note if sequence or parallel control is not used switch 3 must be in the off position

4 Voltage range

You can choose whether to use the control signal voltage range 0-10Vdc (SW4 off) or 2-10Vdc (SW4 on).

5 Part of voltage range— 0-5, 2-6 / 5-10, 6-10

Allows you to select 0-5/2-6v or 5-10/6-10v working range.

If SW5 is OFF the 0-5/2-6v range is selected, If SW5 is ON the 5-10/6-10v is selected

Note switch 5 is only active if switch 2 is OFF and switch 3 is ON.

6

If switch 2 is ON SW6 controls run time, SW 6 OFF equals 60 sec, ON equals 300 sec run time.

7 Direction of movement— NORM / INV

Changes the proportional or floating input signal to direct or reverse action similar to switch 1

8 Linearization

SW 8 OFF normal
SW8 ON Linear electronic control
The motorized valve characteristics can be modified. If you wish for the characteristics to be affected, the setting LIN/LG will make the characteristics of an equally modified percentage (EQM) valve almost linear.

On the other hand, with LIN/LG setting a motorized valve equipped with a linear valve will operate with "Quick open characteristics."

Note! For the actuator to register new settings of the switches, the supply voltage must be removed by cutting power to the actuator or lowering the manual override lever, then change any of switches one through 8 as required and then restore power to the actuator or raise the manual override level.

Please refer to illustration on page 2, figure 2.

Note: After mounting the actuator on a valve, dipswitch 9 must be momentarily switched off to on to off with the actuator powered for proper actuator valve stroke calibration.

9 (OP/ADJ)

Input Signal/Stroke calibration SW9 OFF normal operation

This switch is only used to calibrate the input control signal and the valve stroke. To calibrate, power to the actuator must be on, momentarily turn switch 9 on and then off. The actuator will automatically match the control input signal to the valve stroke (switch 9 must be left in the off position for normal operation).

ACTUATOR VALVE SELECTION

Refer to the following selection guides for selection of the available Actuator Valve combinations VB-7xxx Selection Guide F-27490 or VB-8xxx/VB-9xxx Selection Guide F-27491 before using the tables on pages 7, 8 and 9

VB-72XX Two Way Globe Valve, Forta Proportional Control Setup Reference

Table 1							
VB-72xx 2 way valves			**Forta M400A / M800A Base Proportional Configuration**				
Valve Type	**Program Switch Position**					**Desired Valve Operations**	
Valve position at low signal input	**Switch 1**	**Switch 2**	**Switch 7**	**Power up Position**	**Input Signal Action**	**Low end of signal input range**	**Feedback signal action**
VB-722x stem up closed	**OFF**	**OFF**	**OFF**	Retract No Flow	DA	Retract No Flow	2 vdc No Flow 10 vdc Full Flow
VB-722x stem down open	**OFF**	**OFF**	**ON**	Retract No Flow	RA	Extend Full Flow	10 vdc Full Flow 2 vdc No Flow
VB-722x stem up closed	**ON**	**OFF**	**ON**	Extend Full Flow	DA	Retract No Flow	10 vdc No Flow 2 vdc Full Flow
VB-722x stem down open	**ON**	**OFF**	**OFF**	Extend Full Flow	RA	Extend Full Flow	2 vdc Full Flow 10 vdc No Flow
VB-721x stem up open	**ON**	**OFF**	**ON**	Extend No Flow	RA	Retract Full Flow	10 vdc Full Flow 2 vdc No Flow
VB-721x stem down closed	**ON**	**OFF**	**OFF**	Extend No Flow	DA	Extend No Flow	2 vdc No Flow 10 vdc Full Flow
VB-721x stem up open	**OFF**	**OFF**	**OFF**	Retract Full Flow	RA	Retract Full Flow	2 vdc Full Flow 10 vdc No Flow
VB-721x stem down closed	**OFF**	**OFF**	**ON**	Retract Full Flow	DA	Extend No Flow	10 vdc No Flow 2 vdc Full Flow

Programming Note: The above switch positions are the base programming configurations, in the base configurations all other switches should be **switched off**. Once the base programming configuration has been set up you may wish to add additional program features and functions that are listed below.

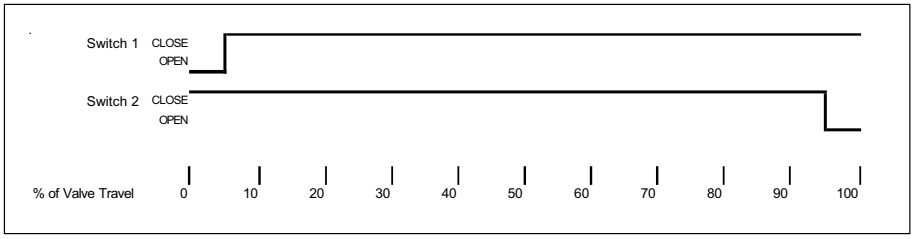
DA = Full open, full flow, 10vdc output / Full closed, no flow, 2vdc output
RA = Full open, full flow, 2vdc output / Full closed, no flow 10vdc output

VB-73XX Three Way Globe Valve, Proportional Control Setup Reference

Table 2						
VB-73x3 3 way valves			**Forta M400A / M800A Base Proportional Configuration**			
Valve Type	**Program Switch Position**				**Desired Valve Operations**	
Valve position at low signal input	**Switch 1**	**Switch 2**	**Switch 7**	**Power up Position**	**Low end of signal input range**	**Feedback signal action @ port B**
VB-731x stem up open B to AB	**OFF**	**OFF**	**OFF**	Retract Full Flow B to AB	Retract Full Flow B to AB	2 vdc Full flow 10 vdc No flow
VB-731x stem down closed B to AB	**OFF**	**OFF**	**ON**	Retract Full Flow B to AB	Extend No Flow B to AB	10 vdc No flow 2 vdc Full flow
VB-731x stem up open B to AB	**ON**	**OFF**	**ON**	Extend Full Flow A to AB	Retract Full Flow B to AB	10 vdc Full flow 2 vdc No flow
VB-731x stem down closed B to AB	**ON**	**OFF**	**OFF**	Extend Full Flow A to AB	Extend No Flow B to AB	2 vdc No flow 10 vdc Full flow
VB-732x stem up flow B to AB	**OFF**	**OFF**	**OFF**	Retract Full Flow B to AB	Retract Full Flow B to AB	2 vdc Full flow 10 vdc No flow
VB-732x stem down flow B to A	**OFF**	**OFF**	**ON**	Retract Full Flow B to AB	Extend No Flow B to AB	10 vdc No flow 2 vdc Full flow
VB-732x stem up flow B to AB	**ON**	**OFF**	**ON**	Extend Full Flow B to A	Retract Full Flow B to AB	10 vdc Full flow 2 vdc No flow
VB-732x stem down flow B to A	**ON**	**OFF**	**OFF**	Extend Full Flow B to A	Extend No Flow B to AB	2 vdc No flow 10 vdc Full flow

Programming Note: The above switch positions are the base programming configurations, in the base configurations all other switches should be **switched off**. Once the base programming configuration has been set up you may wish to add additional program features and functions that are listed below.

Forta Proportional Control Auxiliary Switch (Optional) Setup Reference



With the actuator powered and being controlled by the input signal the optional auxiliary switches only transfer contacts as follows, driving from full retract to full extend the auxiliary contacts transfer when the actuator is about 95% of full extend travel. When the actuator drives from full extend to full retract the contacts will transfer when the actuator is about 95% of full retract travel.

Table 3	**Optional Auxiliary Switch Function (S2)**							
	Example A		**Example B**		**Example C**		**Example D**	
	Proportional Control							
Auxiliary Switches 2 - SPDT	**Program Switch 1off Power Up Retracted**		**Program Switch 1on Power Up Extended**		**Program Switch 1off Power Up Retracted**		**Program Switch 1on Power Up Extended**	
	Closed	Open	Closed	Open	Closed	Open	Closed	Open
KC1 - K1		X	X			X	X	
KC1 - K2	X			X	X			X
KC2 - K3	X			X	X			X
KC2 - K4		X	X			X	X	
Proportional Control Action	Program Switches 1 off, 7 off		Program Switches 1 on, 7 on		Program Switches 1 off, 7 on		Program Switches 1 on, 7 off	
Low Signal Input	Retracts		Retracts		Extends		Extends	
High Signal Input	Extends		Extends		Retracts		Retracts	
	Note: With power to the actuator off, Auxiliary Switches are made KC1 to K1 and KC2 to K3. Upon power up switches will make as shown above after auto start up calibration.							

Note: This table shows the auxiliary switch action based on the dip switch 1 and 7 settings. You should program the dip switches on the actuator based on the application requirements, once programmed review this chart to determine the action of the auxiliary switches and wire the switches accordingly. IF YOU CHANGE EITHER DIP SWITCH 1 or 7 TO GET A DIFFERENT CONTACT CLOSURE YOU WILL CHANGE THE EXTEND/RETEACT MOVEMENT OF THE ACTUATOR.

VB-72XX Two Way Globe Valve, Forta Floating Control Setup Reference

Table 4								
VB-72xx 2 way valves			**Forta M400A / M800A Base Floating Configuration**					
Valve Type	**Program Switch Position**				**Input / Output**			
Valve position with D2 powered	**Switch 1**	**Switch 2**	**Switch 7**	**Power up Position**	**Power to D2 input terminal**	**Feedback signal**	**Power to D1 input terminal**	**Feedback signal**
VB-722x stem up closed	**OFF**	**ON**	**OFF**	Retract No Flow	Retract No Flow	2 vdc	Extend Full Flow	10 vdc
VB-722x stem down open	**OFF**	**ON**	**ON**	Retract No Flow	Extend Full Flow	10 vdc	Retract No Flow	2 vdc
VB-722x stem up closed	**ON**	**ON**	**ON**	Extend Full Flow	Retract No Flow	10 vdc	Extend Full Flow	2 vdc
VB-722x stem down open	**ON**	**ON**	**OFF**	Extend Full Flow	Extend Full Flow	2 vdc	Retract No Flow	10 vdc
VB-721x stem up open	**ON**	**ON**	**ON**	Extend No Flow	Retract Full Flow	10 vdc	Extend No Flow	2 vdc
VB-721x stem down closed	**ON**	**ON**	**OFF**	Extend No Flow	Extend No Flow	2 vdc	Retract Full Flow	10 vdc
VB-721x stem up open	**OFF**	**ON**	**OFF**	Retract Full Flow	Retract Full Flow	2 vdc	Extend No Flow	10 vdc
VB-721x stem down closed	**OFF**	**ON**	**ON**	Retract Full Flow	Extend No Flow	10 vdc	Retract Full Flow	2 vdc

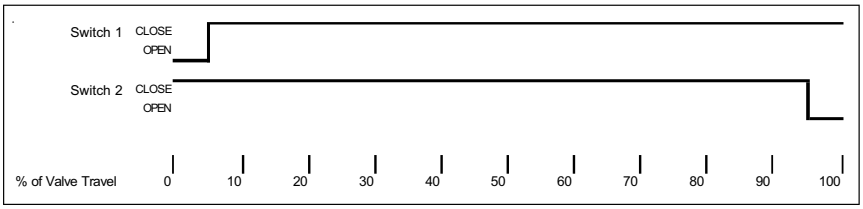
Programming Note: The above switch positions are the base programming configurations, in the base configurations all other switches should be **switched off**. Once the base programming configuration has been set up you may wish to add additional program features and functions that are listed below.
DA = Full open, full flow, 10vdc output / Full closed, no flow, 2vdc output
RA = Full open, full flow, 2vdc output / Full closed, no flow 10vdc output

VB-73XX Three Way Globe Valve, Forta Floating Control Setup Reference

Table 5								
VB-73x3 3 way valves			Forta M400A / M800A Base Floating Configuration					
Valve Type	Program Switch Position					Desired Valve Operations		
Valve position with D2 powered	Switch 1	Switch 2	Switch 7	Power up Position	Power to D2 input terminal	Feedback signal	Power to D1 input terminal	Feedback signal
VB-731x stem up open B to AB	OFF	ON	OFF	Retract Full Flow B to AB	Retract Full Flow B to AB	2 vdc	Extend No Flow B to AB	10 vdc
VB-731x stem down closed B to AB	OFF	ON	ON	Retract Full Flow B to AB	Extend No Flow B to AB	10 vdc	Retract Full Flow B to AB	2 vdc
VB-731x stem up open B to AB	ON	ON	OFF	Extend Full Flow A to AB	Extend No Flow B to AB	2 vdc	Retract Full Flow B to AB	10 vdc
VB-731x stem down closed B to AB	ON	ON	ON	Extend Full Flow A to AB	Retract Full Flow B to AB	10 vdc	Extend No Flow B to AB	2 vdc
VB-732x stem up flow B to AB	OFF	ON	OFF	Retract Full Flow B to AB	Retract Full Flow B to AB	2 vdc	Extend No Flow B to AB	10 vdc
VB-732x stem down flow B to A	OFF	ON	ON	Retract Full Flow B to AB	Extend No Flow B to AB	10 vdc	Retract Full Flow B to AB	2 vdc
VB-732x stem up flow B to AB	ON	ON	OFF	Extend Full Flow B to A	Extend No Flow B to AB	2 vdc	Retract Full Flow B to AB	10 vdc
VB-732x stem down flow B to A	ON	ON	ON	Extend Full Flow B to A	Retract Full Flow B to AB	10 vdc	Extend No Flow B to AB	2 vdc

Programming Notes: The above switch positions are the base programming configurations, in the base configurations all other switches should be **switched off**. Once the base programming configuration has been set up you may wish to add additional programming features and functions that are listed below.

Forta Floating Control Auxiliary Switch (Optional) Setup Reference

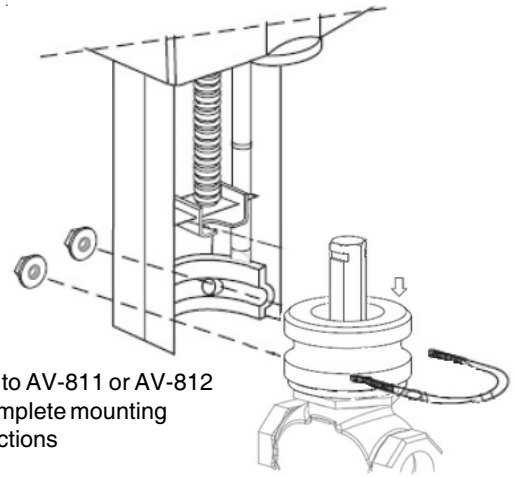


With the actuator powered and being controlled by the input signal the optional auxiliary switches only transfer contacts as follows, driving from full retract to full extend the auxiliary contacts transfer when the actuator is about 95% of full extend travel. When the actuator drives from full extend to full retract the contacts will transfer when the actuator is about 95% of full retract travel.

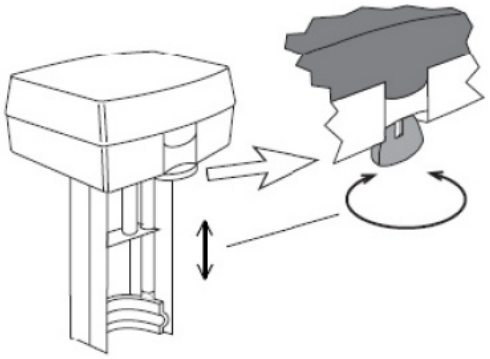
Table 6	Optional Auxiliary Switch Function (S2)							
	Example A		Example B		Example C		Example D	
	Floating Control							
Auxiliary Switches 2 - SPDT	Program Switch 1off Powered Retracted		Program Switch 1on Powered Extended		Program Switch 1off Powered Retracted		Program Switch 1on Powered Extended	
	Closed	Open	Closed	Open	Closed	Open	Closed	Open
KC1 - K1		X	X			X	X	
KC1 - K2	X			X	X			X
KC2 - K3	X			X	X			X
KC2 - K4		X	X			X	X	
Floating Control	Program Switches 1off, 7off		Program Switches 1on, 7on		Program Switches 1off, 7on		Program Switches 1on, 7off	
(contact made)								
D1 action	Extends		Extends		Retracts		Retracts	
D2 action	Retracts		Retracts		Extends		Extends	
	Note: With power to the actuator off, Auxiliary Switches are made KC1 to K1 and KC2 to K3. Upon power up switches will make as shown above after auto start up calibration.							

Note: This table shows the auxiliary switch action based on the dip switch 1 and 7 settings. You should program the dip switches on the actuator based on the application requirements, once programmed review this chart to determine the action of the auxiliary switches and wire the switches accordingly. IF YOU CHANGE EITHER DIP SWITCH 1 or 7 TO GET A DIFFERENT CONTACT CLOSURE YOU WILL CHANGE THE EXTEND/RETRACT MOVEMENT OF THE ACTUATOR.

ACTUATOR INSTALLATION



Refer to AV-811 or AV-812 for complete mounting instructions



Mount actuator as shown and firmly tighten the U-clamp with a 13 mm wrench. Remove cover and discard the shipping bubble wrap.

The switches on the circuit board should be set before the actuator is installed. There are no other switches or potentiometers that should be set or adjusted.

Actuator travel adjustment must be set as follows upon commissioning: Actuator and valve linked, manual override handle raised (AUTO), power on, move switch 9 (OP/ADJ) ON and then OFF.

Forta closes the valve and opens it fully. The adjustment is finished by the actuator closing the valve again; the electronic circuitry then adjusts the stroke. It also scales the actuator input signal, output feedback signal, and optional auxiliary switch outputs to match the valve's travel. The set values are stored in the EEPROM of the actuator so that they will remain after a loss of voltage.

When the end position adjustment is complete, the actuator starts to control the valve according to the control signal.

Note: Switch 9 (OP/ADJ) must be in the off position for normal operation.

MAINTENANCE

The actuator is maintenance-free.

ACCESSORIES

AV-811 VB-7xxx series globe valve linkage kit required for M400A and M800A actuator mounting. Order separately, F-27442.

AV-812 VB-9313 2-1/2" - 4" globe valve linkage kit required for M800A actuator mounting. Order separately, F-27443.

AV-800 series globe valve adapters (competitors valves). F-27470

FEDERAL COMMUNICATION COMMISSION (FCC)
Note: This equipment has been tested and found to comply with the limits for class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can rediate radio frequency energy and may cause harmful interference if not installed and used in acordance with the instructions. Even when instructions are followed, there is no guarantee that interferance will not occur in a particular setting-Which can be determined by turning the equipment off and on-the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna
- Increase the seperation between the equipment and receiver
- Connect the equipment to an outlet on a circuit different form that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help.

CANADIAN DEPARTMENT OF COMMUNICATIONS (D0C)
Note: This class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations
Cet apparel numenique de la classe respects toutes les exigences du reglement sur le material broilleur du Canada.

EUROPEAN STANDARD EN 55022
Warring: This is a class B digital (European Classification) product in a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CAUTION: Avoid locations where excesive moisture, corrosive fumes, vibration, or explosive vapors are present.