

ME-4140, ME-4240, ME-4340 and ME-4344 Spartan non-spring-return Syncube Actuators



Description

There are three different Syncube actuator models available.

ME-4140 three point floating,

ME-4240 PWM 0.25-5.0 sec,

ME-4340 modulating 0-10 or 2-10Vdc

ME-4344 modulating 0-5 or 5 -10Vdc

They drive 2-, 3- and 4-port control valves with a unique, patented, non-spring-return movement having five robust moving parts.

Without small toothed, high pitched gears to wear out or whine, the compact movement has a life expectancy in excess of 500,000 cycles.

The reversible, brushless, synchronous, electric motor maintains accurate positioning and provides creep-free control with extreme accuracy.

All of the actuators ride high and clear of pipes, insulation (lagging) and heat, yet the overall height above the actuator remains low.

General Features:

The maximum stem output is force-balance controlled in floating ME-4140 types, electronically controlled in PWM ME-4240 and modulating ME-4340/4344 types. However, in all cases, valve stem force is enough to maintain and control high differential pressures to at least 60 psig (4.0 Bar) or more, except on steam (see valve body specifications).

A blue/semi-clear case or an opaque cream white case are both available, the former allowing viewing of the moving parts, the latter not. (check with your distributor to ascertain which is kept in local stock). In both cases, a top mounted position indicator is available for viewing or for feeling its rise and fall (useful in dark, cramped places such as ceiling spaces and/or inside fan coil cabinets, etc.).

General Actuator Specifications

All versions of these actuators share a common rail mechanical design with specific electronic variations for floating, PWM and modulating with end of travel shut off.

Mounting yoke: glass filled nylon based, high temperature composite to brass fixing ring. M30 x 1.5

Ambient temperature: 5°C to +50°C; 40°F to 120°F non-condensing

Cover: clear-blue 'K' resin or optional off white ABS

Motor: synchronous reversible brushless

Output cable: PVC coated copper 20ga wire or optional 18ga Plenum cable
Output cable length 36" (1m) standard, optional lengths available.

Stroke: 0.177" (4.5mm)

Enclosure: IP51 (IP54 optional in vertical installation)

Input voltage: 24 Vac, 60/50 Hz, +10% -5% all versions

Noise Level: 35 dB

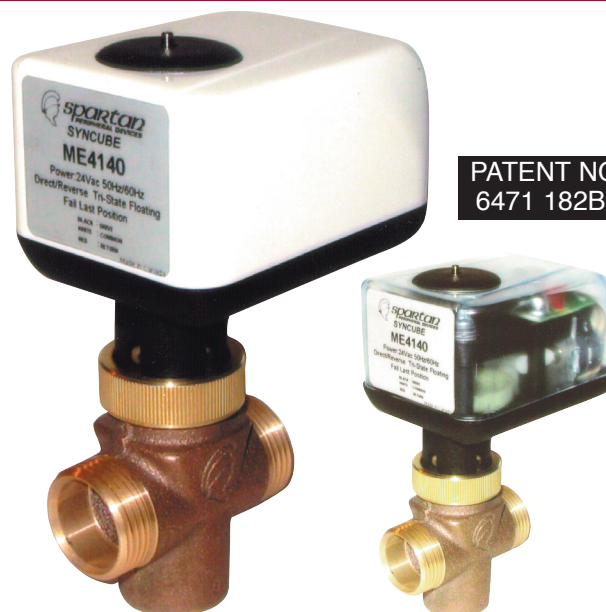
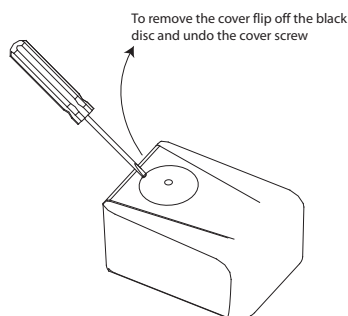
Consumption: 45mA, 1 Va

Position indication: top mounted stem position height both visual and touch sensitive. Clear case unit gearing is also visible through the cover.

Conforms to: CE and ROHS requirements

Low voltage as per CSA Class II 24Vac device

Releasing the Cover:

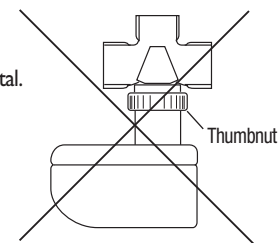


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Installation Instructions

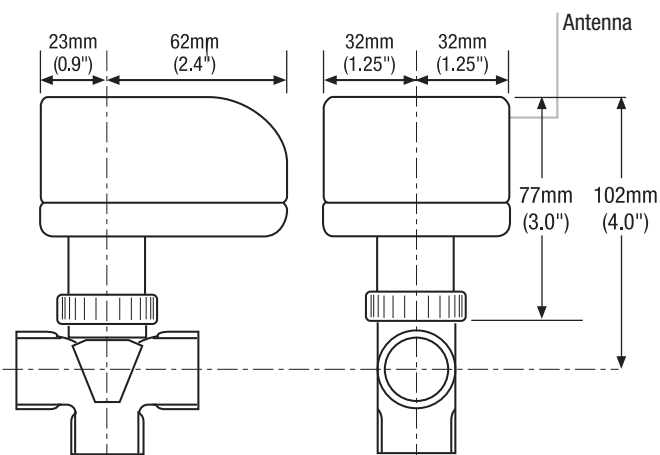
All Syncube ME-4140, ME-4240 and ME-4340 actuators can be installed on all **Spartan zone valves bodies** which are designed for use on hot or chilled water, up to 50% glycol mix, or for low-pressure steam. The commercial type valve bodies all utilise low zinc anti-dezincification bronze coupled with long life replaceable and inter-changeable internals from 0.15 to 9.0 Cv (0.13 to 7.75 Kv's). Refer to Control Valve Bodies Data Sheet.

The actuator can be installed vertically, or at any angle not exceeding the horizontal. The Actuator mounting thumbnut is to be hand-tightened only, using tools may result in over-tightening.

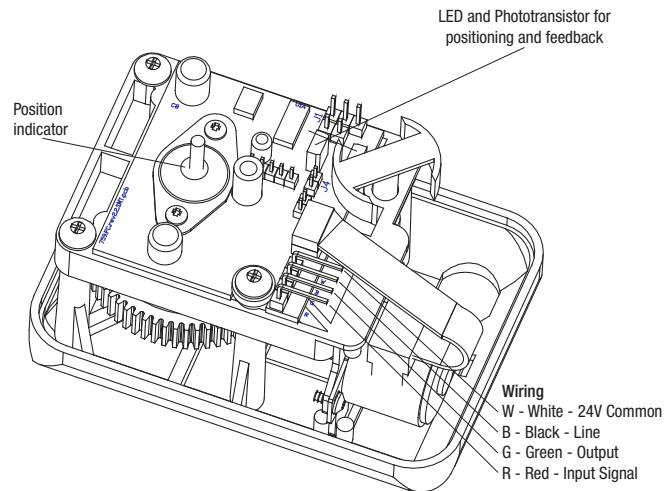


Take note that the actuator should never be attached to the valve if its stem has been electrically driven down for fear of damaging the operating mechanism inside. Actuators shipped separately from the factory are always delivered stem up.

Dimensions



ME-4240 Syncube Non Spring Return PWM Valve Actuator



The ME-4240 microprocessor based 24Vac PWM actuator uses an LED and photo transistor pick up for precise positioning and for end travel automatic shut off. On start up an automatic calibration sequence takes place with the unit running from open to closed position during which the two ends of travel are programmed. The microprocessor also transmits a 1 to 5Vdc signal (0 volts indicates loss of power) on the fourth (green) wire for position transmission to remote BAS system. There is a two second delay before the actuators direction change is implemented.

Input Signal: Input Signal: 0.2 seconds to 5 seconds impedance 2 Kilo ohms, current 12mA RMS, 24Vac

Output Signal: 1-5 Vdc, 33 Kohms impedance.
 0Vdc = no power to the unit,
 1 Vdc = actuator stem up,
 5 Vdc = actuator stem down

Output Force: 50Lbs (222N)

Stroke: 0.177" (4.5mm)

Travel Time: Fully open to fully closed 90 seconds

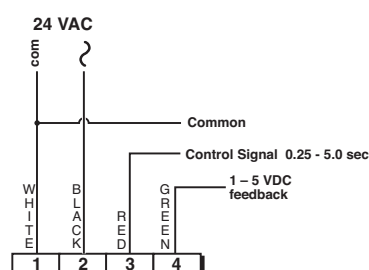
Actuator Resolution: 90:1

Direct Acting Mode: 0.25 secs drive up, 5.0 secs drive down

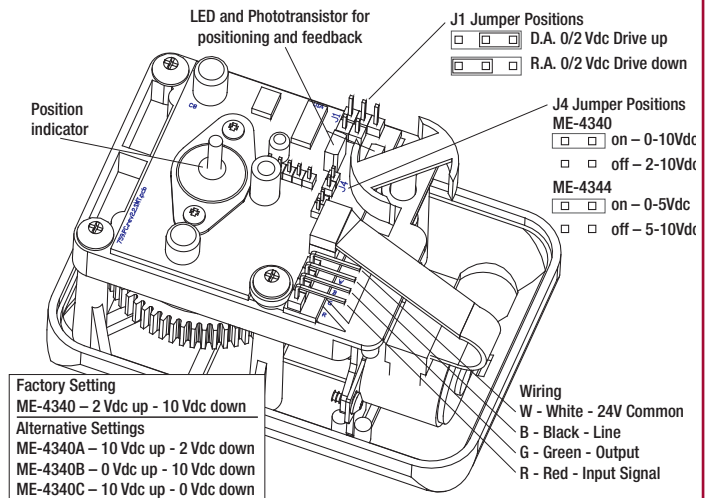
Input Polarity: Input to common (white wire)

Minimum off cycle required: 250 milliseconds

WIRING DIAGRAM ME-4240 PWM CONTROL



ME-4340/ME-4344 Syncube Non Spring Return Modulating Valve Actuator



The ME-4340, 0/2-10Vdc and ME-4344, 0-5/5-10 Vdc microprocessor based modulating actuator uses a LED and photo transistor pick up for precise positioning and for end travel automatic shut off. On start up an automatic calibration sequence takes place with the unit running from open to closed position during which the two ends of travel are programmed. The microprocessor also transmits a 1 to 5Vdc signal (0 volts indicates loss of power) on the fourth (green) wire for position transmission to remote BAS system. There is a two second delay before the actuators direction change is implemented.

Input Signal ME4340: 0-10Vdc or 2-10Vdc, 100 Kohms impedance.

Input Signal ME4344: 0-5Vdc or 5-10Vdc, 100 Kohms impedance.

Selected by jumper J4

* If 4-20 mA input is used, select 2-10Vdc with 500 Ohm 1% resistor.

* If 0-20 mA input is used, select 0-10Vdc with 500 Ohm 1% resistor.

See wiring diagram

Positioning: 0.10V steps over 0-10Vdc input signal

Output Signal: 1-5 Vdc, 1 Kohms impedance, 0.50 mA max.

0Vdc = no power to the unit,

1 Vdc = actuator stem up,

5 Vdc = actuator stem down

Used for monitoring of valve position.

Output Force: 50Lbs (222N)

Stroke: 0.177" (4.5mm)

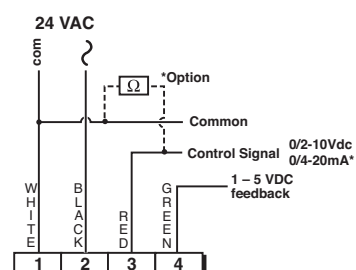
Travel Time: From fully open to fully closed 90 seconds

Actuator Resolution: 90:1

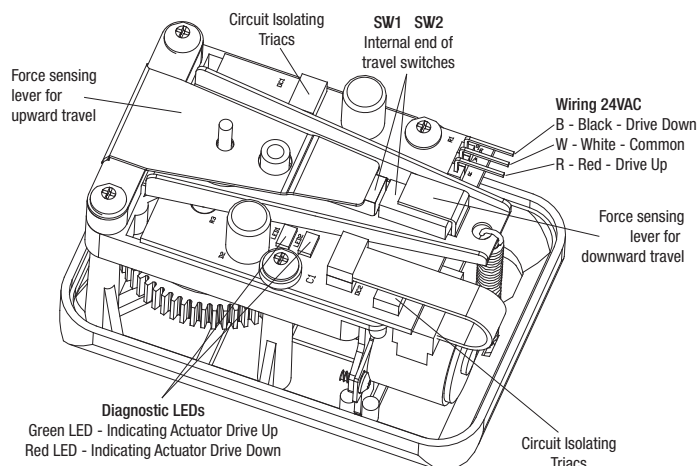
Direct/Reverse Acting: Jumper J1 positions - see diagram above

Input Polarity: Input to common (white wire)

WIRING DIAGRAM ME-4340 MODULATING CONTROL



ME-4140 Syncube Non Spring Return Floating (tri-state: increase-decrease) Valve Actuators



The ME-4140 3 point (raise lower) floating actuator utilizes a brushless, reversible synchronous A/C motor with constant torque and constant speed for accurate positioning over the full span of the travel. The ME4140 can be controlled by a triac or dry contact relays.

Stroke: 0.177" (4.5mm)

Force: 38Lbs (170N)

Travel time:

From fully open to fully closed position, 90 seconds on 60Hz and 108 seconds on 50Hz. The same applies for the reverse.

End of travel shut off:

ME4140, floating actuator has a controlled force balanced output and an end of the travel shut off for long life expectancy. The unit can be left powered by the controller indefinitely without damaging or wearing out the base motor.

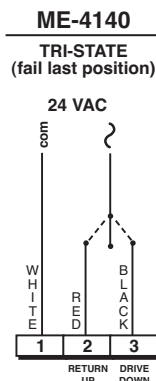
Parallel connection:

Isolating triacs will allow the units to be connected in parallel from the same output point without electrical interference.

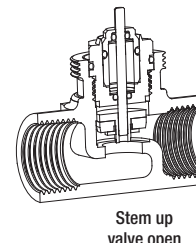
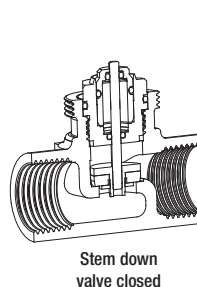
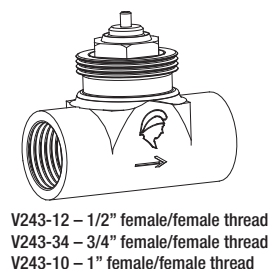
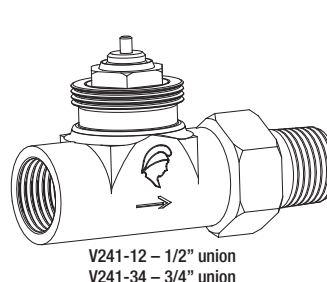
Diagnostics:

Diagnostic LED's, green for up travel and red for down travel will be lit while the signal is on in their particular direction. When the unit achieves its end position or when there is no signal, the LED's will turn off.

WIRING DIAGRAM



Control Valve Bodies



All Spartan Peripheral Devices syncube actuators can be installed on a multitude of Spartan 2 way and 3 way zone control valve bodies with different type of connections, female x female threads in 1/2", 3/4" and 1" sizes, single male union in 1/2" and 3/4" sizes and direct solder in 1/2" and 3/4" sizes. The commercial type valve bodies are designed for use on hot or chilled water up to 50% glycol mix or low pressure steam. The valve bodies all utilize low zinc anti-dezincification bronze casting and are coupled with long life replaceable and interchangeable internals.

All valve bodies have spring-loaded stems, being actuator-power driven stem down to open or close as required by the valve configuration. All valve bodies have replaceable and/or interchangeable internals from 0.15 to 9.0 US Cv (0.13 to 7.75 Kv's). To enable Cv (Kv) size change or configuration change on-site, resizing or servicing without removing the valve from the line. In all cases, the internals are complete with world-class specification including 1.5 million cycle (3,000,000-stroke) packing, mirror finished stainless-steel stems, and micro-machined accurate parabolic characterizing plugs. Refer to the valve selection charts for complete specifications and selection. Ordering using Cv's implies North American NPT threads to ANSI standards and ordering using Kv's implies metric BSPT threads to DIN standards.

Pressure rating

These ANSI 250 (PN16) valve bodies are rated (400# @ 150°F and 250# @ 250 °F).

Water Temperature and Steam Rating

- Nominal rating for liquids (water or glycol solution to 50%), is limited from 40°F to 265°F (5°C to 130°C).
- Nominal rating for steam using EV cartridge is limited to 15psig.

Control Valve Assemblies with Syncube Actuators ME4140, ME4240, ME4340

Valve Body	Description	Size	*Cartridge CV/KV selection	Actuator ME4140 3 Point Floating	Actuator ME4240 PWM 0.25-5.0 sec.	Actuator ME4340 Modulating 2-10 or 0-10 Vdc	EP Cartridge Max. Close-off PSI / Bar	EB Cartridge Max. Close-off PSI / Bar
V240 - 2 way valve body - union connection both ports								
V240-12X	2 Unions in-line - Select 1/2" or 3/4"		BC-0.15,0.25	VE240-BCXX-4140	VE240-BCXX-4240	VE240-BCXX-4340	60 / 4.0	-
V240-34X	unions, solder S or threaded N		(EP or EB)-0.50,1.0,1.5,2.0,2.5,3.5	VE240-EP/EBXX-4140	VE240-EPXX-4240	VE240-EPXX-4340	60 / 4.0	100 / 6.8
V241 - 2 way valve body - female port in, X union connection port out								
V241-12	Single Union Straight	1/2"	BC-0.15,0.25	VE241-12-BCXX-4140	VE241-12-BCXX-4240	VE241-12-BCXX-4340	60 / 4.0	-
V241-12	Female port in	1/2"	(EP or EB)-0.50,1.0,1.5,2.0,2.5,3.5	VE241-12-EPXX-4140	VE241-12-EP/EBXX-4240	VE241-12-EP/EBXX-4340	60 / 4.0	100 / 6.8
V241-34	Male union out	3/4"	(EP or EB)-1.0,1.5,2.0,2.5,3.5,4.5	VE241-34-EP/EBXX-4140	VE241-34-EP/EBXX-4240	VE241-34-EP/EBXX-4340	60 / 4.0	100 / 6.8
V241-10	Male union out	1"	EB-6.0,6.4,8.0,9.0	VE241-10-EBXX-4140	VE241-10-EBXX-4240	VE241-10-EBXX-4340		100 / 6.8
V243 - 2 way valve body - female port in, X female port out								
V243-12	Female by Female Port	1/2"	BC-0.15,0.25	VE243-12-BCXX-4140	VE243-12-BCXX-4240	VE243-12-BCXX-4340	60 / 4.0	-
V243-12	Straight	1/2"	(EP or EB)-0.50,1.0,1.5,2.0,2.5,3.5	VE243-12-EP/EBXX-4140	VE243-12-EP/EBXX-4240	VE243-12-EP/EBXX-4340	60 / 4.0	100 / 6.8
V243-34		3/4"	(EP or EB)-1.0,1.5,2.0,2.5,3.5,4.5	VE243-34-EP/EBXX-4140	VE243-34-EP/EBXX-4240	VE243-34-EP/EBXX-4340	60 / 4.0	100 / 6.8
V243-10		1"	EB-6.0,6.4,8.0,9.0	VE243-10-EBXX-4140	VE243-10-EBXX-4240	VE243-10-EBXX-4340		100 / 6.8
V245 - 2 way valve body - female port in, X female port out								
V245-12	Direct solder body	1/2"	BC-0.15,0.25	VE245-12-BCXX-4140	VE245-12-BCXX-4240	VE245-12-BCXX-4340	60 / 4.0	-
V245-12		1/2"	(EP or EB)-0.50,1.0,1.5,2.0,2.5,3.5	VE245-12-EP/EBXX-4140	VE245-12-EP/EBXX-4240	VE245-12-EP/EBXX-4340	60 / 4.0	100 / 6.8
V245-34		3/4"	(EP or EB)-1.0,1.5,2.0,2.5,3.5,4.5	VE245-34-EP/EBXX-4140	VE245-34-EP/EBXX-4240	VE245-34-EP/EBXX-4340	60 / 4.0	100 / 6.8
V261 - 2 way angle valve body - single union								
V261-12	Angle body	1/2"	(EP or EB)-0.50,1.0,1.5,2.0,2.5,3.5	VE261-12-EP/EBXX-4140	VE261-12-EP/EBXX-4240	VE261-12-EP/EBXX-4340	60 / 4.0	100 / 6.8
V261-34	Single or Double Union	3/4"	(EP or EB)-1.0,1.5,2.0,2.5,3.5,4.5	VE261-34-EP/EBXX-4140	VE261-34-EP/EBXX-4240	VE261-34-EP/EBXX-4340	60 / 4.0	100 / 6.8
V261-10	Single Union	1"	EB-6.0,6.4,8.0,9.0	VE261-10-EBXX-4140	VE261-10-EBXX-4240	VE261-10-EBXX-4340		100 / 6.8
V320 - 3 way diverting valve body - unions on all three ports								
V320-12X	3 Way Diverting - Select 1/2" or 3/4"		ED1.0,2.0,3.0,3.5	VE320-12-EDXX-4140	VE320-12-EDXX-4240	VE320-12-EDXX-4340	60 / 4.0	-
V320-34X	unions, solder S or threaded N		ED1.0,2.0,3.0,3.5	VE320-34-EDXX-4140	VE320-34-EDXX-4240	VE320-34-EDXX-4340	60 / 4.0	-
V345-34			CV5.5	VE345-34-5-5-4140	VE345-34-5-5-4240	VE345-34-5-5-4340	60 / 4.0	-
V345-10			CV5.5	VE345-10-5-5-4140	VE345-10-5-5-4240	VE345-10-5-5-4340	60 / 4.0	-
V323 - 3 way diverting valve body - Female thread all ports								
V323-12	Female thread	1/2"	ED1.0,2.0,3.0	VE323-12-EDXX-4140	VE323-12-EDXX-4240	VE323-12-EDXX-4340	60 / 4.0	-
V325 - 3 way diverting valve body - direct solder								
V325-12	3 Way Diverting	1/2"	ED1.0,2.0,3.0,3.5	VE325-12-EDXX-4140	VE325-12-EDXX-4240	VE325-12-EDXX-4340	60 / 4.0	-
V325-34	Direct Solder	3/4"	ED1.0,2.0,3.0,3.5	VE325-34-EDXX-4140	VE325-34-EDXX-4240	VE325-34-EDXX-4340	60 / 4.0	-

*Select CV from available cartridges and replace XX with CV value in complete part number of the assembly. †Maximum differential pressure to prevent water noise.