

NELES

Product school

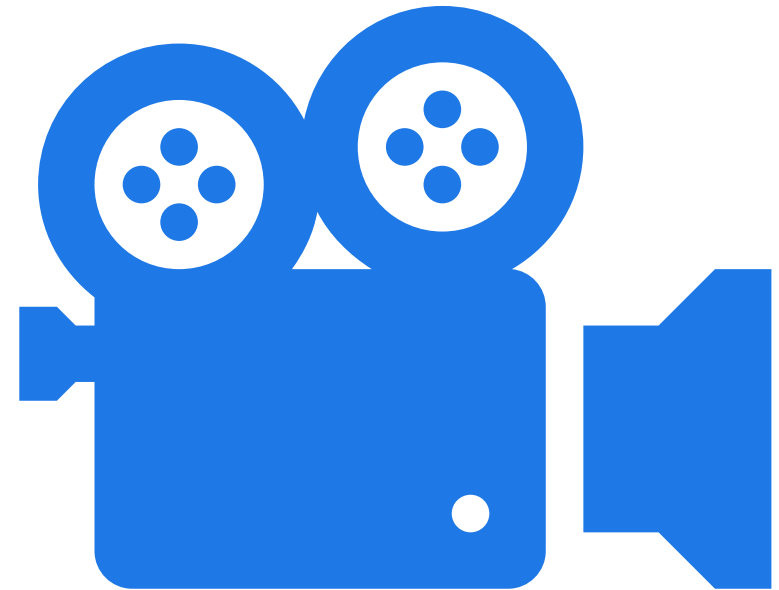
Electric Actuators

Data privacy

Practicalities

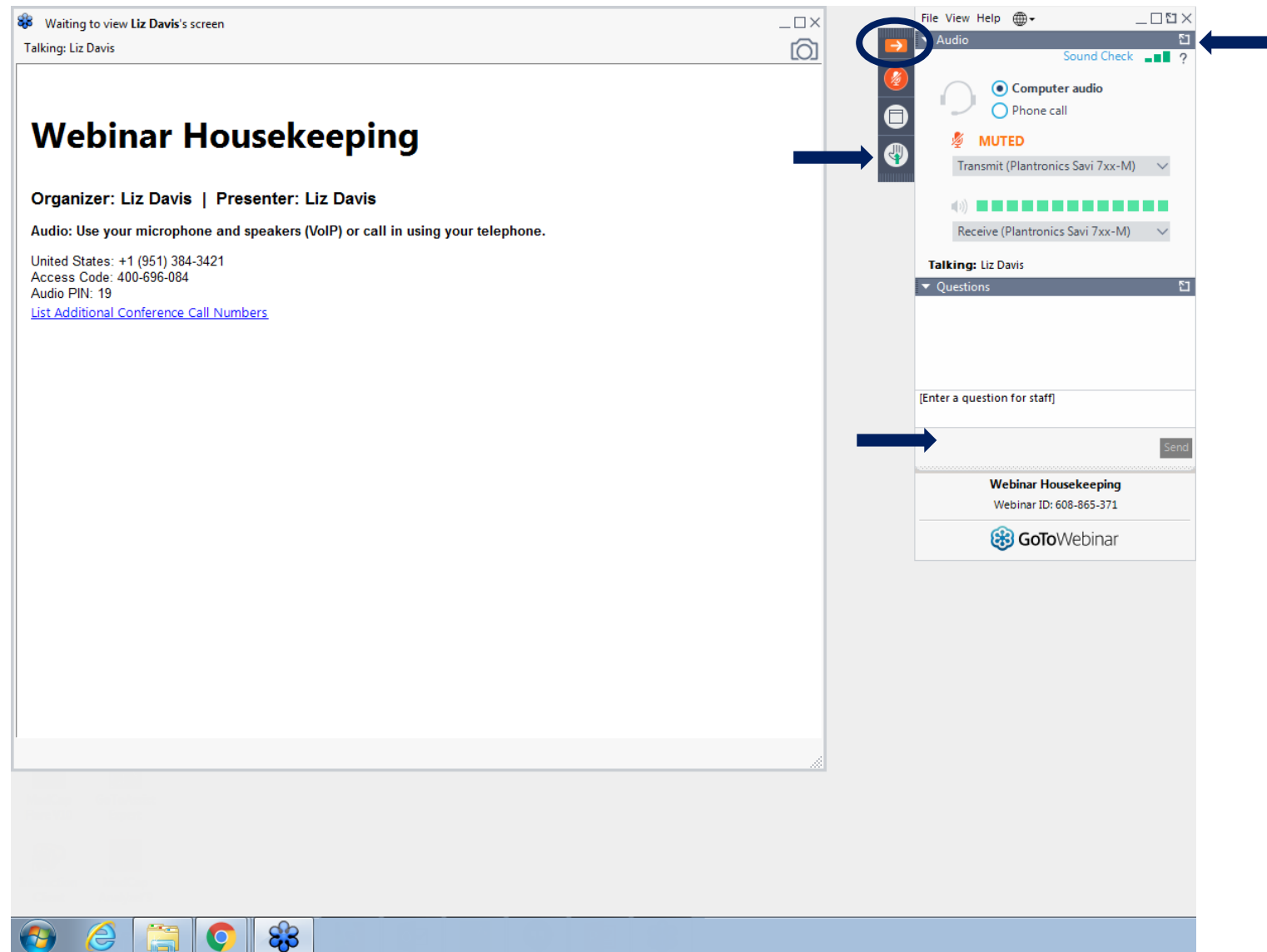
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In session features

NELES



In session features

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▼ Questions

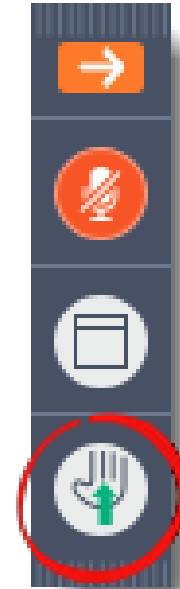
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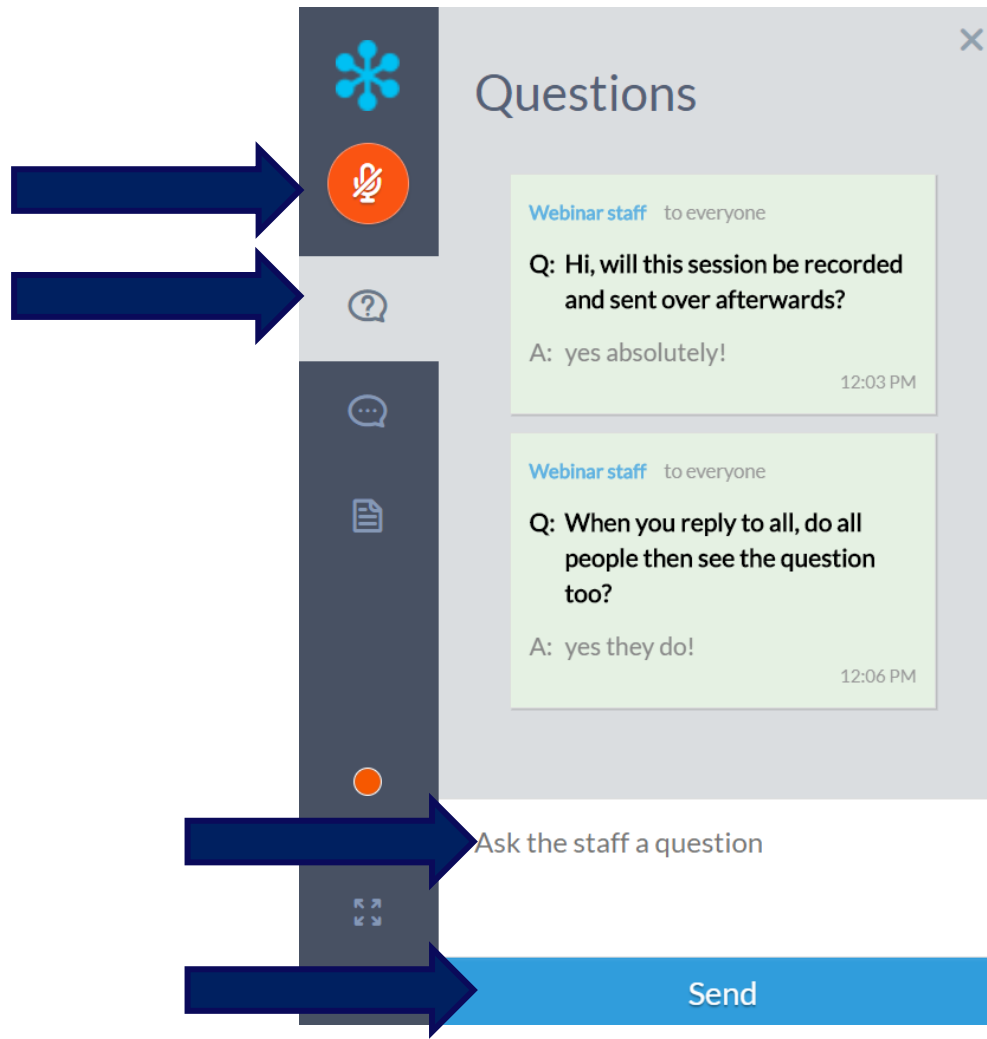
Webinar ID: 608-865-371

 GoToWebinar



In session features

Practicalities



- Dean Lawrence
- Senior Product Manager responsible for the electric actuator product line; working with the products for 26 years
- I will be presenting information on the electric actuators with a focus on the ADC and V series, including some competitive information, and some additional resources for your use



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Electric Actuators

VALVCON™ Electric Actuators

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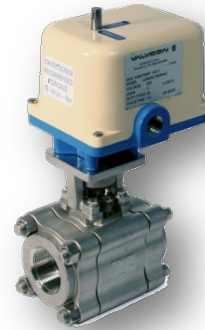
V-Series

On/off, modulating or automatic cycling,
115VAC & 230VAC



ADC-Series

Continuous duty, universal power,
optional battery back-up power



LC-Series

Economical, reversing or
unidirectional

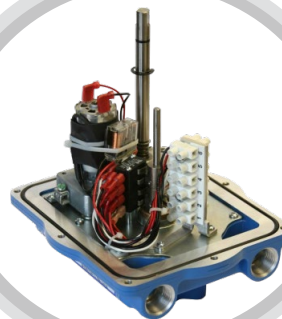


I-Series

Network protocol options

ESR-Series

True two-wire capacitor
back-up, 115VAC &
230VAC



QX-Series

Economical,
NEMA 4/4X/7&9,
12VDC & 24VDC



Q6-Series

12VDC remote, solar
applications

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Electric Actuators

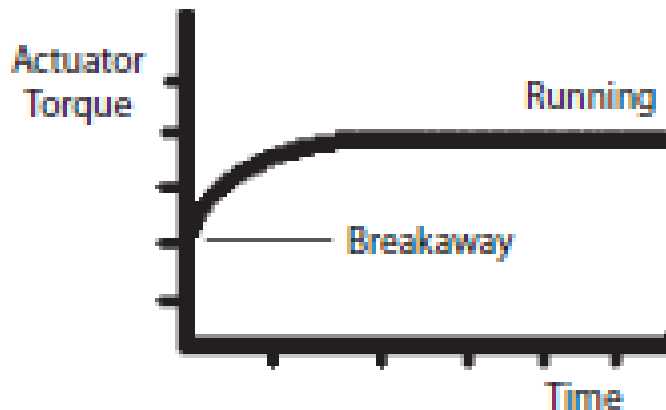
The Basics

Electric Actuators

A couple of things to note

- **Torque:**

- **Breakaway torque** is the amount of torque that an actuator can generate immediately when power is supplied – the torque generated from a standing start.
- **Stall/running torque** is the maximum amount of torque an actuator can generate – measured as the torque required to stall the momentum of a running actuator.



- **Duty cycle:**

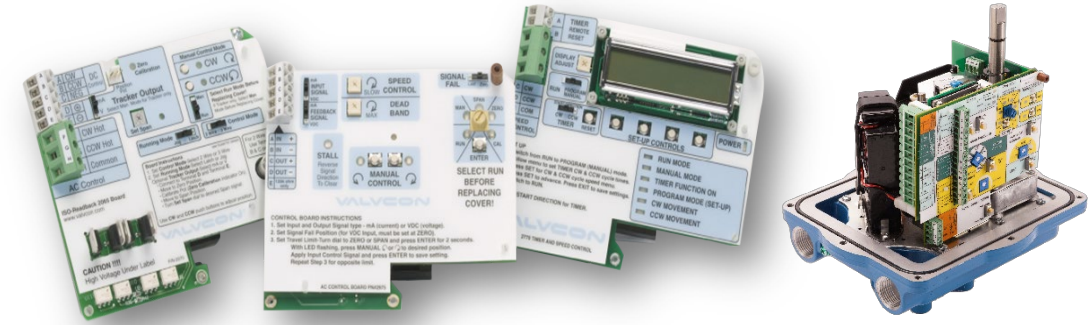
- Duty cycle is the relationship between the time that an actuator may run and the time it must rest (cool). If an electric actuator is run beyond its rated duty cycle, the actuator may “trip” the integral thermal overload in the motor (at best) or “burn up” the motor (at worst).
- Example: a 25% duty cycle means that the actuator can only run 25% of the time and needs to rest 75% of the time.
 - If an actuator with a 25% duty cycle has a 90-degree cycle time of 10 seconds; the rest time will be 30 seconds
 - Using our V-Series, 600 lb-in unit as an example, the duty cycle is 75% and the 90-degree cycle time is 30 seconds; the rest time will be 10 seconds

Electric Actuators

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The Basics

- **Breakaway torque range:**
150 – 3,000 lb-in (12 – 250 lb-ft; 17 – 339 Nm); 8 sizes
- **Available voltages:**
115VAC 50/60Hz (1PH), 230VAC 50/60Hz (1PH),
24VAC 50/60Hz (1PH), 12VDC & 24VDC
- **Available enclosures:**
W – Weathertight
WX – Weathertight, & explosionproof
- **Designed for quarter-turn applications (90°); 180°, & 270° rotations are also available**
- **Temperature range:** -40°F to 150°F / -40°C to 66°C
(max 130°F / 55°C for ADC with SLA battery, & ESR Series)



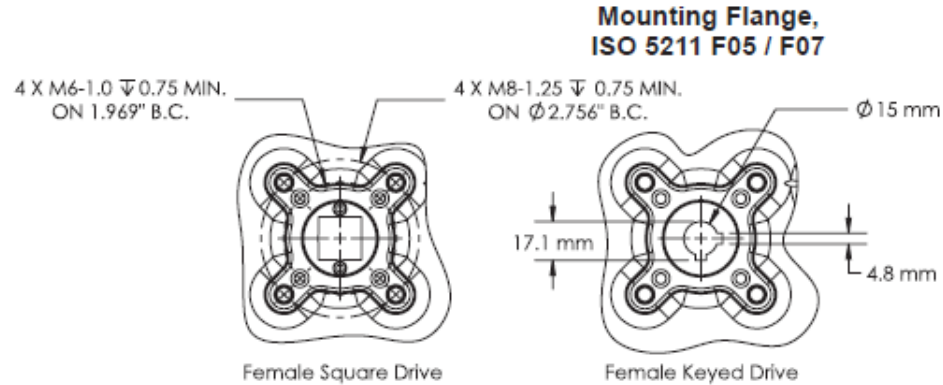
V-Series option boards

ADC-Series

- **Available configurations include:**
On/off, positioning, automatic cycling, & optional battery back-up
- **Options include:**
Auxiliary limit switches, heater/thermostat, motor brake, feedback potentiometer, ISO compliant metric outputs, keyed outputs, & handwheel override

Electric Actuators

ISO 5211 Compliant Mounting



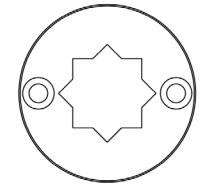
Actuator Size	Drive Option	Drive Type	Drive Size	Depth
150-600 lb-in (12-50 lb-ft; 17-68 Nm)	Standard	Square	0.750 (19mm)	0.90 (22.9mm)
150-600 lb-in (12-50 lb-ft; 17-68 Nm)	Option "I1"	Double Square	0.551 (14mm)	0.90 (22.9mm)
150-600 lb-in (12-50 lb-ft; 17-68 Nm)	Option "I2"	Square	0.669 (17mm)	0.90 (22.9mm)
150-600 lb-in (12-50 lb-ft; 17-68 Nm)	Option "Y1"	Keyed	0.591 (15mm)	1.40 (35.6mm)
150-600 lb-in (12-50 lb-ft; 17-68 Nm)	Option "Y2"	Keyed	0.787 (20mm)	1.40 (35.6mm)

Small enclosure (ADC, V, I, ESR; 150 – 600 lb-in)

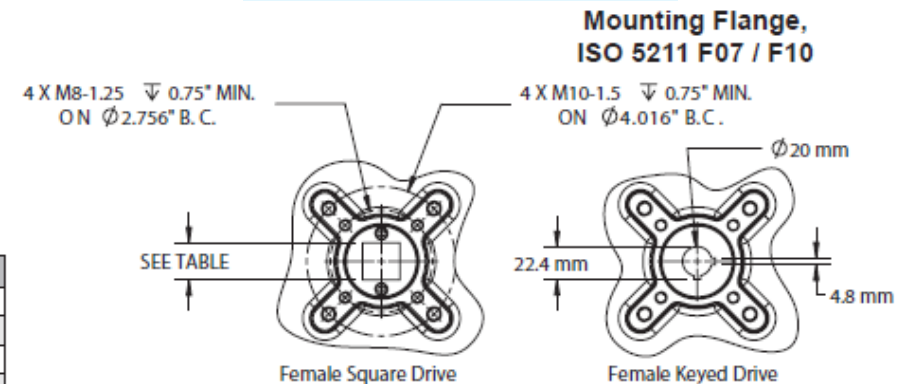


Actuator output

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Double square



Actuator Size	Drive Option	Drive Type	Drive Size	Depth
1000-3000 lb-in (83-250 lb-ft; 113-339 Nm)	Standard	Square	1.000 (25mm)	1.20 (30.5mm)
1000-3000 lb-in (83-250 lb-ft; 113-339 Nm)	Option "I2"	Double Square	0.669 (17mm)	1.20 (30.5mm)
1000-3000 lb-in (83-250 lb-ft; 113-339 Nm)	Option "I3"	Double Square	0.748 (19mm)	1.20 (30.5mm)
1000-3000 lb-in (83-250 lb-ft; 113-339 Nm)	Option "I4"	Double Square	0.866 (22mm)	1.20 (30.5mm)
1000-3000 lb-in (83-250 lb-ft; 113-339 Nm)	Option "Y2"	Keyed	0.787 (20mm)	1.50 (38.1mm)
1000-3000 lb-in (83-250 lb-ft; 113-339 Nm)	Option "Y3"	Keyed	0.984 (25mm)	1.50 (38.1mm)

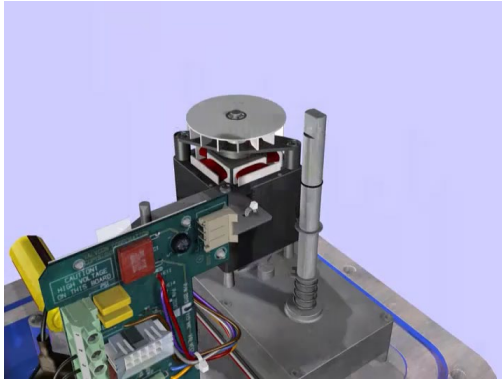
Large enclosure (LADC, LV, LI, and QX; 1000 – 3000 lb-in)

Electric Actuators

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Manual Override (intended for use when power is not available)

- A wrench-operated manual override is standard (all products but LCU, & ESR)
- A handwheel override is optional
- We can also plug the override bore to remove the ability to override the unit



Wrench-operated override



Optional handwheel override



Plugged override

Electric Actuators

Typical Customer Challenges

- Reliable performance
- Ease of use
- Installation / maintenance
- Single vendor accountability

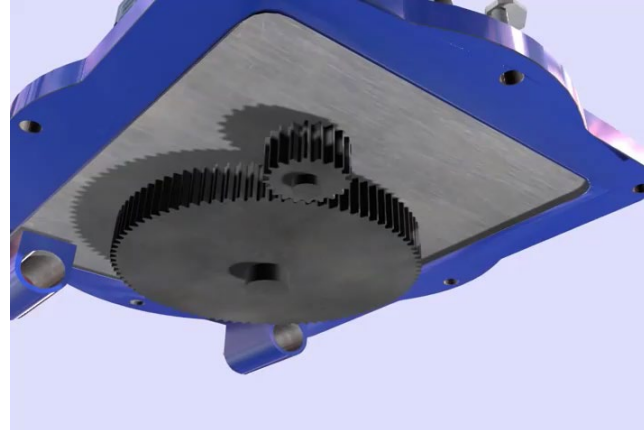
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Designed for Reliable Performance

Electric Actuators

- All hardened steel spur gearing
- Die cast aluminum enclosure
 - Super durable, baked-on polyester powder coat finish
 - Ultra corrosion-resistant, captive cover screws
- Permanent lubrication
- 100% testing prior to shipment
- Certified manufacturing facility
 - ISO 9001:2015 Quality Management
 - ISO 14001:2015 Environmental Management
 - ISO 45001:2018 Occupational Health & Safety



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Challenge

Product reliability

Solution

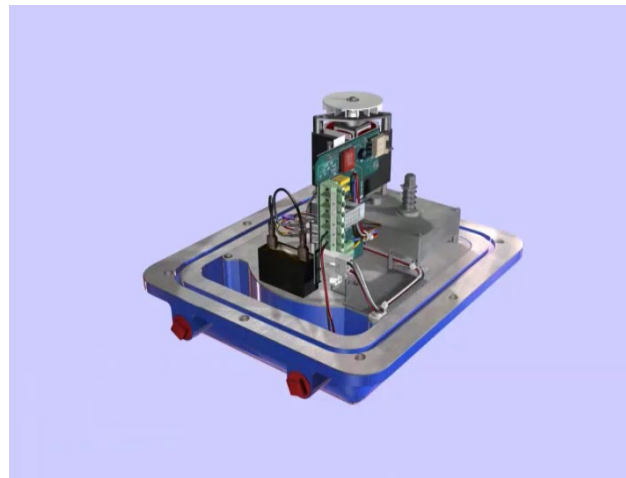
Rugged reliability is built right in

Designed for Easy Adjustment & Addition of Options

Electric Actuators

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- Gain access to adjustments with ease
- Use standard tools to adjust travel limit settings
- Field installable options are easily added using standard tools
- Can be mounted in any position



Challenge

Difficult adjustment
Special tools required
Limits to mounting orientation

Solution

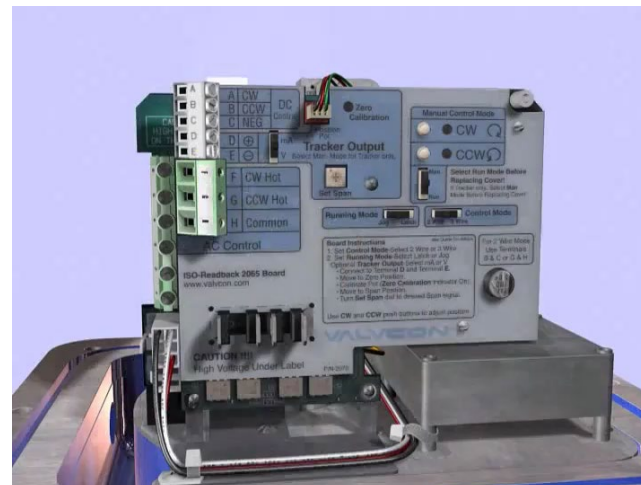
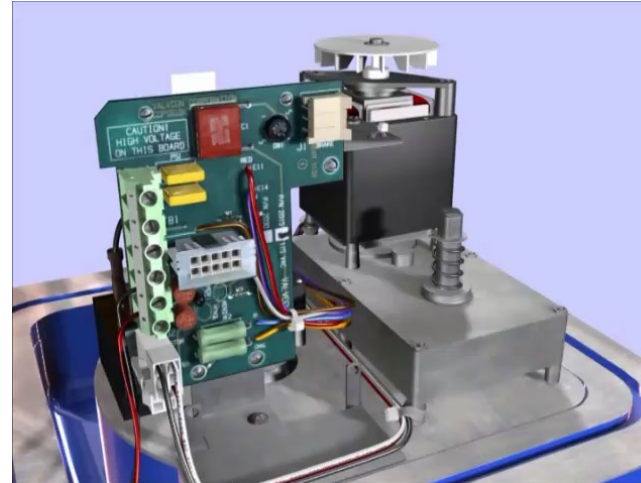
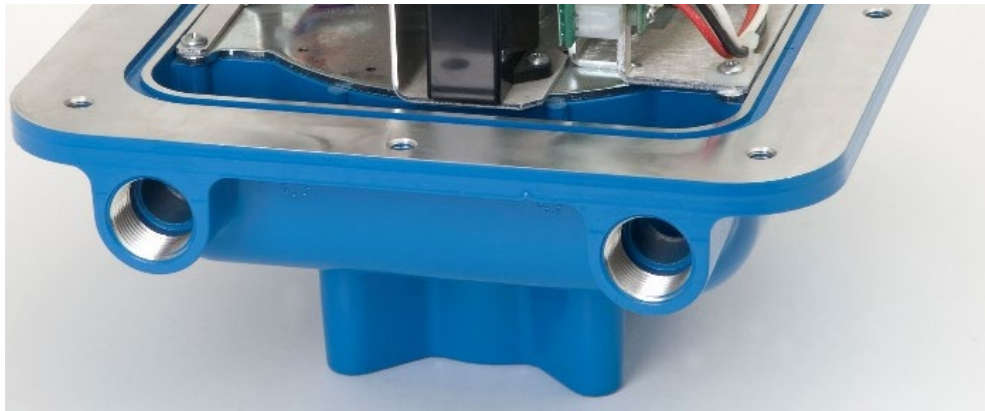
Easy access to internals
Mount in any orientation

Designed for Easy Installation and Wiring

Electric Actuators

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- Large terminal blocks for high voltages
- Smaller terminal blocks for low voltages and control signals
- Dual conduit entries to separate power from control wiring



Challenge

Complicated wiring
Single conduit entry

Solution

Clearly labeled terminals
Dual conduits

Designed for Automated Assembly Performance

Electric Actuators

- Standard ISO 5211 mounting
- Mount to Jamesbury™ valves
 - Metric square drives
 - Using standard linkage kits
- Mount to Neles™ valves
 - Keyed drives
 - Using standard mounting kits
- Single vendor accountability



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Challenge

Determining responsibility when multiple suppliers are involved

Solution

Complete Neles assembly

Electric Actuators

Features That Address Customer Challenges

- Rugged reliability
- Simple user interface
- Easy access
- The complete Neles package



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QUESTIONS?

Questions/Answers from the April 20th Training Sessions

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What is the largest size valve you have supplied with a Valvcon™ electric actuator?

The 3000 lb-in maximum output torque can turn up to maybe a 12” butterfly valve; and maybe a 6” ball valve. If the torque requirements are low enough for a larger valve, the actuator can be used. For more on how to get more torque, see reference section near the end of this presentation.

Is there a specific reason why you are still providing the SLA battery as an option, sometimes this can be confusing to the customer?

We are still offering the SLA battery as a slightly less-expensive alternative to the Li Ion battery; this is the only reason. The SLA will be discontinued within 12-18 months time; but support will continue.

Will the SLA battery work in the Li Ion (battery) actuator, or vice versa?

SLA batteries will work with the current revision, and all previous revisions of the ADC-Series Universal Control board; the Li Ion batteries/upgrade kits will work with board revision E, and later. (For reference, we are currently shipping revision G; revision E was released several years ago)

Is there a danger of injury if the customer is operating an ADC Actuator manually and the actuator starts?

The override is intended for use when power is not available. If, after power loss, an ADC actuator (with back-up battery) has driven to the fail position, the manual override allows for manual positioning of the valve. If power is restored during this operation, the motor will engage, and may “fight” the user; there is not a “motor disable” switch in the override mechanism. If the unit is in multi cycle mode, and a control signal is still present, the battery will attempt to drive the actuator, in response to the control signal; again, a “fight” between the motor and the user, could ensue.

Questions/Answers from the April 20th Training Sessions

NELES

If we have battery backup & if power is lost, then does the actuator automatically go to fail safe position, or do we have to supply an additional electric signal to actuator?

The unit will drive to the fail position immediately upon power loss, if “park” mode is selected. If “multi” mode is selected, and a control signal exists, after power loss, the battery will maintain position, in accordance with the control signal, until the low-voltage threshold is reached, at which point, the unit will “park” at the selected fail position (i.e. CW, MID, or CCW).

How much would be the delivery time for the European market?

We have recently improved our lead times for all ADC and V series models; depending on the quantity, we can have them to the Shipping department within 2-3 weeks after receipt of order. Then it is up to the shipping method selected.

Can this ADC or any other Valvcon™ series suitable for solar powered? If yes, can we use these actuators where there is no power available? when we need to conserve power when the sun is not available then how many strokes would it perform?

The ADC can be used in solar applications, as can the Q6-Series, but when using the “energy save” mode, the ADC idle current is actually lower (for 12VDC power). The internal battery back-up is just that, a back-up, it is not intended to be the sole power source. The solar panel typically feeds a bank of batteries that power the installation; the actuator’s battery should not be the only battery in a solar application.

Is a Valvcon™ series suitable for 3 phase current?

All Neles AC-powered electric actuator models are single-phase power only.

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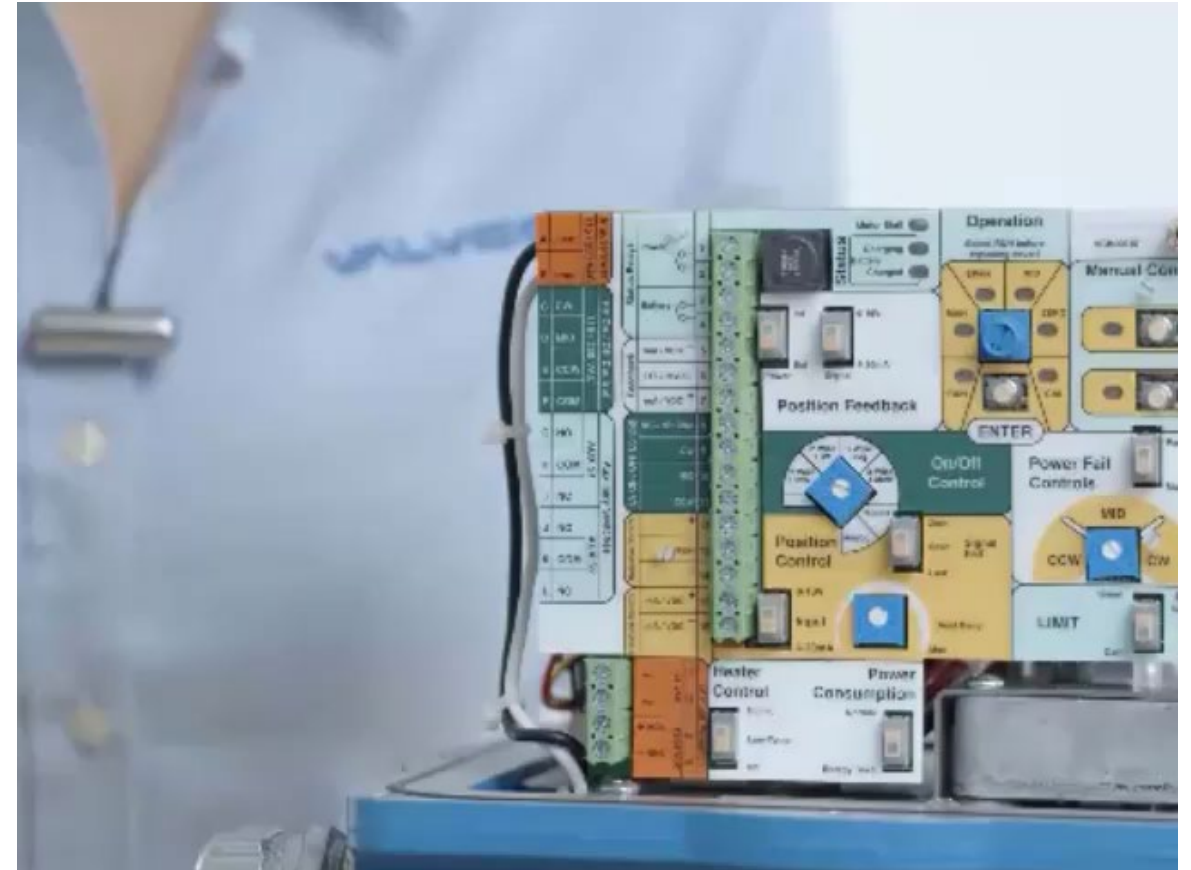
Electric Actuators

ADC-Series

Electric Actuators

ADC-Series

- Extremely versatile:
 - Universal power, and control
 - On/off, or positioning
 - Standard position feedback
 - 3 Rotation options
- Optional battery back-up power
 - Drives to a fail position upon loss of external power
 - Two battery options; Li Ion or SLA
 - Can continue to respond to control signal in multi-cycle mode
- MODBUS® communication option



Electric Actuators

Typical Customer Challenges

- Easy installation and commissioning
- Versatility
- Utility
- Power-loss functionality



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Designed for Simple Set-Up and Calibration

ADC-Series

- Clearly labeled overlay includes wiring info, as well as instructive text
- Easy to use slide switches, selection potentiometers, and pushbuttons make set-up a snap!



Challenge

Complicated commissioning

Special tools or equipment required for set-up

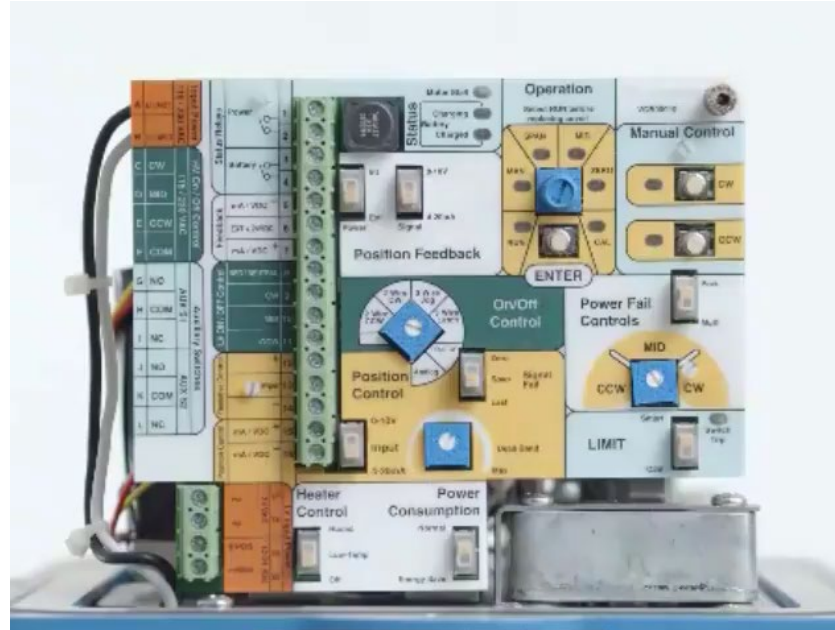
Solution

Simple “set and go” user interface

Designed for Versatility

ADC-Series

- Unit accepts 5 voltages for power, and for on/off control
- Unit can also be configured for positioning control
 - Control with mA or VDC
 - Control with resistive signal



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Challenge

Not having the right actuator for the application

Processes could change/evolve over time

Solution

ADC universal power and control

Designed for Use ADC-Series

- Brushless DC motor
 - No brushes to wear
 - Rated for 120 starts/minute
- Duty cycle is reduced to 75% at the maximum temperature rating (150°F; 66°C)



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Challenge

Process demands continuous operation

High-temp environment with frequent cycle requirement

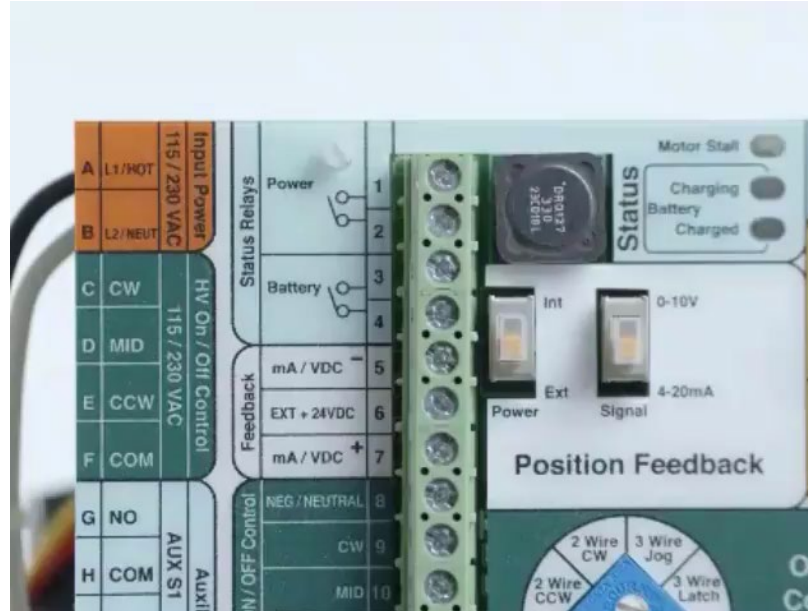
Solution

ADC 100% duty cycle

Designed for Safety

ADC-Series

- Two battery chemistry options
 - Lithium Ion
 - SLA (sealed lead acid)
- Battery status output
 - System runs weekly load test to provide “state of health” to user
 - Also available via optional *MODBUS* board



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Challenge

Process requires driving to a “safe” position in the event of external power loss

Expensive spring-return actuation

Solution

Battery back-up power

Electric Actuators

ADC-Series General Specifications

- **Universal input power:**
115VAC 50/60Hz (1PH), 230VAC 50/60Hz (1PH), 24VAC 50/60Hz (1PH), 12VDC & 24VDC
- **Torque range:**
150 – 3,000 lb-in (12 – 250 lb-ft; 17 – 339 Nm)
- **Output:**
Female square: $\frac{3}{4}$ " for 150 – 600 lb-in (17 – 68 Nm) models; 1" for 1000 – 3000 lb-in (113 – 339 Nm) models
- **Duty cycle:**
100%
- **Approximate weight:**
17 lbs. / 8 kg (150 – 600 lb-in); 31 lbs. / 14 kg (1000 – 3000 lb-in)
- **Temperature range:**
-40°F to 150°F / -40°C to 66°C (*130°F / 55°C with SLA battery)



Electric Actuators

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ADC-Series Standard Features, and Option Information

Universal control board options:

- Universal on/off and modulating control board for 90°, 180°, and 270° rotations
- Optional battery back-up
 - Li Ion (lithium ion) chemistry
 - SLA (sealed lead acid)

Available Options:

- ISO 5211 compliant metric output (use with Jamesbury™ valves)
- Keyed output - metric; female (use with Neles™ valves)
- Handwheel override
- *MODBUS* communication



Standard features

- Visual position indicator
- Holding brake
- Heater/thermostat
- Two auxiliary limit switches
- Manual override

Electric Actuators

ADC-Series Standard Features – in Detail

On/off operation (control signal can be 115/230AC, 24AC, or 12/24DC):

- **2 Wire CCW** (defaults CW until CCW signal is applied)
- **2 Wire CW** (defaults CCW until CW signal is applied)
- **3 Wire** (drive CW or CCW with separate signals; stops when signal is removed)
 - Two modes: jogging or latching
 - Can be configured for three-position operation in 3 wire mode

Positioning/modulating operation:

- **Analog control:** accepts 4-20mA or 0-10VDC (split range capable)
- **Resistive control:** accepts from 0-100Ω to 0-10,000Ω
- Fail to zero, span, or “last” position upon loss of control signal



Standard features:

- **Position feedback:** mA or VDC; internally or externally powered
- **Two auxiliary limit switches:** use for indication, sequencing, etc.
- **Brake:** prevents back-driving
- **Heater:** enable on-board for low-temp or humidity-control

Electric Actuators

ADC-Series Features Optional and Standard

Optional battery back-up:

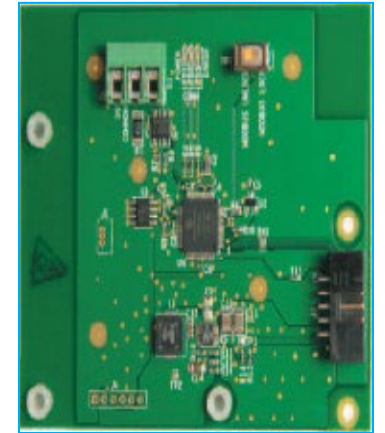
- Built-in charger
- Battery status output
 - Automatically conducts battery load-test and makes state-of-health assessment
- Drive to CW, CCW, or MID upon loss of external power
 - Will continue to respond to control signal, if present, in multi-cycle mode

Additional standard features:

- Power status output (lets user know if board power drops out; also alternates if motor is stalled)
- Motor stall (removes power to the motor if stall condition occurs)
- Energy save (allows unit to “doze” until next command signal change is received)

Optional *MODBUS* communications board:

- Control actuator with *MODBUS* commands (RS-485, two wire)
- Poll actuator for diagnostic information



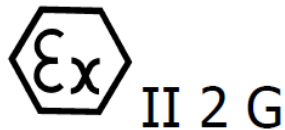
MODBUS board

Electric Actuators

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ADC-Series Product Scope

Sizes	8 sizes; from 150...3000 lb-in, (12...250 lb-ft; 17...339 Nm) of breakaway torque
Temperature	-40...+150°F (-40...+66°C)
Enclosure types	W...Weathertight; WX...Weathertight and explosionproof/dust-ignition proof
Ratings	For W models...NEMA 4/4X; IP66; CE For WX models...NEMA 4/4X, as well as NEMA 7 Class I, Div. 1, Gr. C, & D; NEMA 9 Class II, Div. 1, Gr. E, F, & G; NEMA Class III; *ATEX Directive 2014/34/EU: Ex db IIB T6 Gb; *IECEX CSA 14.0057X; IP66; CE
Voltages	Universal power; all models accept 115, 230, 24VAC (50/60Hz 1-PH), and 12, 24VDC
Duty cycle	100% (at or below 104°F; 40°C); 75% maximum duty cycle at 150°F; 66°C



*not available with SLA battery

Electric Actuators

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ADC-Series Features That Address Customer Challenges

- Simplified set-up
- Universal power/control
- Continuous duty cycle
- Fail "safe" functionality



QUESTIONS?

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Electric Actuators - Competition

ADC-Series vs Common Competitors

Electric Actuators Competition

Emerson / Bettis TorqPlus

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	ADC-Series	EM-300	EM-500	EM-800
Size	150...3000 lb-in	150...600 lb-in	350...1600 lb-in	2000...20000 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+140°F (-40*...+60°C) (*with heater activated)	-40*...+140°F (-40*...+60°C) (*with heater activated)	-40*...+140°F (-40*...+60°C) (*with heater activated)
Available voltages	Universal power	115VAC, 230VAC, 24VAC, 12VDC, 24VDC	115VAC, 220VAC, 24VAC, 12VDC, 24VDC	115VAC, 220VAC (1PH), 220VAC (3PH)
Duty cycle	100% at/below 104°F; 40°C	AC models 30%; DC models 100% at/below 75°F	AC models 30%; AC and DC models 100% at/below 75°F	100% at/below 75°F
Certifications	cCSA _{US} ; ATEX; IECEx	CSA	CSA	CSA



Bettis TorqPlus

[EM-300](#)
[EM-500](#)
[EM-800](#)

Electric Actuators Competition

Emerson / Bettis SCE300 / Keystone EPI 2 / Biffi F02

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	ADC-Series	SCE300 / EPI 2 / F02
Size	150...3000 lb-in (17...339 Nm)	35...2000 Nm
Temp range	-40...+150°F (-40...+66°C)	-25...+70°C (std) -40...+70°C (low-temp)
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	24 to 48 V DC or AC 50/60 Hz; 100 to 240 V DC or AC 50/60 Hz; 208 to 240 V AC (3PH); 380 to 480 V AC (3PH); 500 to 575 V AC (3PH)
Duty cycle	100% at/below 104°F; 40°C	ON-OFF S3-100%; MODULATING S4-50% 1200s/h
Certifications	cCSA _{US} ; ATEX; IECEX	cCSA _{US} ; ATEX; IECEX; FM; INMETRO



Bettis
[SCE300](#)

Keystone
[EPI 2](#)



Biffi
[F02](#)

*Tyco
[PremiTork](#)

Electric Actuators Competition

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Emerson / Fisher™ easy-Drive™ (honorable mention)

	ADC-Series	Fisher™ easy-Drive™ 200L (linear)
Size	150...3000 lb-in	750 lb (max. thrust)
Temp range	-40...+150°F (-40...+66°C)	-4...+158°F -20...+70°C
Available voltages	Universal power	12VDC, 24VDC
Duty cycle	100% at/below 104°F; 40°C	50% (maximum)
Certifications	cCSA _{US} ; ATEX; IECEX	CSA, ATEX, IECEX



Fisher™ easy-Drive™
easy-Drive™ Flyer
easy-Drive™ 200L

Electric Actuators Competition

GE/Baker Hughes/Dresser / RCS

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	ADC-Series	MAR 10, 50, 90	MAR 100, 250
Size	150...3000 lb-in	120...1000 lb-in	1500...10000 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+65°C) (*with heater installed)	-40*...+150°F (-40*...+66°C) (*with heater installed)
Available voltages	Universal power	115VAC, 230VAC, 24VAC	115VAC, 220VAC, 24VAC, 220VAC (3PH), 440VAC (3PH)
Duty cycle	100% at/below 104°F; 40°C	115AC models 25% to 75%; 230AC models 25% to 50%; 24VAC models 25%	Range from 25% to 100% depending on voltage, and torque output
Certifications	cCSA _{US} ; ATEX; IECEx	CSA	CSA



RCS MAR Series
[MAR 10, 50, 90](#)
[MAR 100, 250](#)

Competition

Read the Fine Print...

This is an excerpt from the RCS MAR Series data sheet:

Duty Cycle

The percentage of time the electric motor is energized vs. the time it is at rest, in reversing duty and with the actuator running at its rated load - maximum published torque.

Standard Modulating Duty Rating



- 12 motor starts (corrections) per minute.
- At the rated duty cycle for that model.
- With the speed of operation a minimum of 15 seconds for 90° or slower.

Electric Actuators Competition

GE/Baker Hughes/Dresser / RCS

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	ADC-Series	Sure 65	Sure 100
Size	150...3000 lb-in	780 lb-in	1200 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40...+150°F (-40...+65°C)	-40...+150°F (-40...+65°C)
Available voltages	Universal power	115VAC, 230VAC	115VAC, 230VAC
Duty cycle	100% at/below 104°F; 40°C	45% for 3-sec model; 75% for 7-sec model	50%
Certifications	cCSA _{US} ; ATEX; IECE _x	CSA	CSA



RCS Sure Series

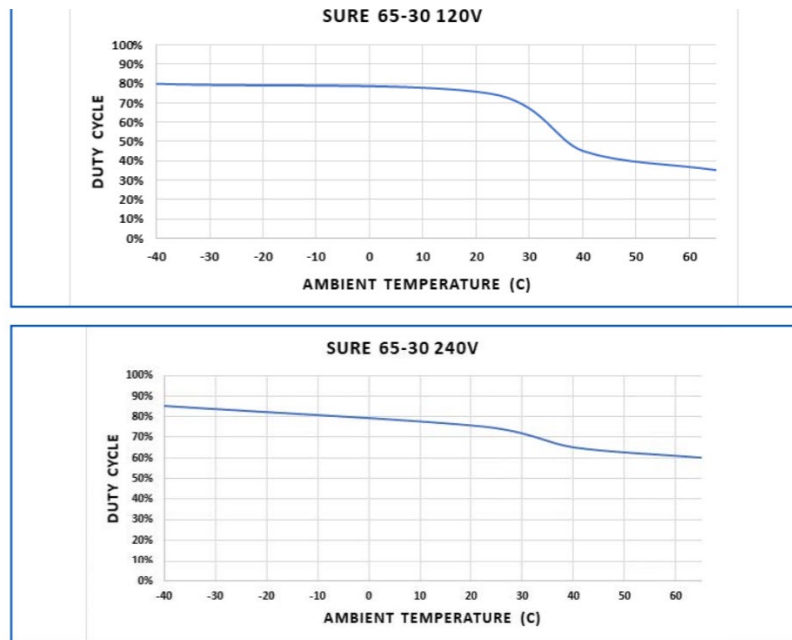
[Sure 65](#)

[Sure 100](#)

Competition

Read the Fine Print...

This is an excerpt from the RCS Sure 65 data sheet:



** 120VAC Actuators Certified Duty Cycle Rating is -40°C To +40°C is 25% and +40°C to +65°C is 20% per UL429, 7th Ed., Clause 27

** 240VAC Actuators Certified Duty Cycle Rating is -40°C To +40°C is 30% and +40°C to +65°C is 20% per UL429, 7th Ed., Clause 27

And here's a familiar caveat from the Sure 100 data sheet:

Duty Cycle

The percentage of time the electric motor is energized vs. the time it is at rest, in reversing duty and with the actuator running at its rated load – maximum published torque.

Standard Modulating Duty Rating

- 12 motor starts (corrections) per minute.
- At the rated duty cycle for that model.
- With the speed of operation a minimum of 15 seconds for 90° or slower.
- With positioning accuracy of (+/-) 1% of total span.



Electric Actuators Competition

Flowserve / Worcester

NELES

	ADC-Series	Series 75
Size	150...3000 lb-in	150...3000 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+66°C) (*with heater installed)
Available voltages	Universal power	115VAC, 230VAC, 12VDC, 24VDC
Duty cycle	100% at/below 104°F; 40°C	Range from 10% to 100% depending on voltage, and torque output
Certifications	cCSA _{US} ; ATEX; IECEX	CSA



Worcester Series 75
[Series 75](#)

Competition

Read the Fine Print...

NELES

This is an excerpt from the
Worcester Series 75 Brochure:

Specifications

Sizes:

Small: 10, 12, 15, 20, 22, 23
Large: 25, 30

Torque:

150-3000 in.-lbs.

Enclosures:

TYPE 1 General Purpose
TYPE 4 Watertight
TYPE 7, Class I, Division 1, 2,
Group C, D
TYPE 9, Class II, Division 1, 2,
Group E, F, G Hazardous
Locations
TYPE 4, 4X, 7, & 9 Combined
Locations

Enclosure Coatings: Corrosion
resistant baked polyester finish
standard. Consult Flowserve for
special applications.

Voltages:

120 V and 240 VAC, 12 V and
24 VDC

Connection:

Male output shaft (female shaft
available on request)

Gearing:

Small: Sealed, permanently lubri-
cated spur gear module driving a
final dual-torque bull gear
Large: Two-stage planetary gear,
permanently lubricated self lock



Actuator Model	Stall Torque in.-lbs.	Start-up Torque in.-lbs.	Voltages		Duty Cycles	90° Time seconds	Current at rated stall torque - amps				Approx. Weight Lbs. (kg.)
			AC	DC			120 VAC	240 VAC	12 VDC	24 VDC	
1075	150	120	120, 240	—	10%	2.5	1.5	.60	—	—	8.20 (3.70)
			120, 240	12, 24	25%	5	.70	.40	1.40	.70	
			120, 240	12, 24	75%	17, 15	.30	.15	.50	.25	
			120	—	100%	17	.25	—	—	—	
1275	225	180	120, 240	—	10%	4	1.5	.60	—	—	8.20 (3.70)
			120, 240	12, 24	25%	8	.70	.40	1.20	.60	
			120, 240	12, 24	75%	27, 25	.30	.15	.50	.25	
			120	—	100%	27	.25	—	—	—	
1575	325	260	120	—	20%	5	.70	—	—	—	8.50 (3.83)
2075	600	480	120, 240	—	10%	2.5	2.90	1.30	—	—	9.50 (4.31)
			120, 240	12, 24	25%	5	1.50	.90	5	2.50	
			120, 240	12, 24	75%	17, 15	.70	.30	1.60	.80	
			120	—	100%	27	.50	—	—	—	
2275*	900	720	120, 240	—	10%	4	2.90	1.30	—	—	9.50 (4.31)
			120, 240	12, 24	25%	8	1.50	.90	4.20	2.10	
			120	12, 24	75%	27, 25	.70	.30	1.50	.75	
2375	1200	950	120, 240	12, 24	75%	25	.70	.30	2	1	17.70 (8.04)
2575	1800	1440	120, 240	—	25%	10	2.70	1.30	—	—	48 (21.80)
			120, 240	—	75%	15	2.20	1.20	—	—	
3075	3000	2400	120, 240	—	25%	15	3.50	1.40	—	—	48 (21.80)
			120, 240	—	75%	23	2.20	1.20	—	—	

Options:

All sizes, all enclosures. Cycle
Length Control (CLC), dual- or
single-feedback potentiometer,
4-20 mA position indicator,
heater/thermostat, condensation
drain plug (V-53), 180° center-
off (three-position), additional
limit switches, mechanical
brake, I-75 computer interface
unit, various duty cycles, posi-

Actuator Sizing



There are a few terms associated with electric actuators that require definition. **Actuator Start-up Torque** is the amount of torque initially produced by an actuator when starting from rest. Use start-up torque when sizing an electric actuator for a ball valve that is used for either on/off or throttling service. **Actuator Stall Torque** is the amount of torque produced by the actuator just prior to the point where the motor stalls. Do not use stall torque for sizing.

Electric Actuators Competition

Flowserve / Worcester

NELES

	ADC-Series	Series 72
Size	150...3000 lb-in	Up to *900 lb-in (*based on data sheet)
Temp range	-40...+150°F (-40...+66°C)	0...+150°F (-18...+66°C) (heat tracing required below 0°F and recommended below 32°F)
Available voltages	Universal power	120VAC, 240VAC, 24VDC
Duty cycle	100% at/below 104°F; 40°C	Not listed
Certifications	cCSA _{US} ; ATEX; IECEX	*CSA, *FM (*notes to consult Flowserve)



Worcester Series 72
[Series 72](#)

Electric Actuators Competition

NELES

Flowserve / Limitorque LTQ (Intrusive Quarter-Turn)

	ADC-Series	LTQ
Size	150...3000 lb-in (17...339 Nm)	35...2300 Nm
Temp range	-40...+150°F (-40...+66°C)	-22...+158°F (-30...+70°C)
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	12, 24 V AC/DC, 120, 230 V AC (1PH); 220, 380, 480, 575 (3PH) for some models
Duty cycle	100% at/below 104°F; 40°C	25% (S2-15 min) and 75% (S4-75%)
Certifications	cCSA _{US} ; ATEX; IECEx	cCSA _{US} ; some models can optionally be XP rated



Limitorque LTQ
[LTQ Bulletin](#)

Electric Actuators Competition

ASAHI/AMERICA®

NELES

	ADC-Series	Series 92
Size	150...3000 lb-in	400...2000 lb-in
Temp range	-40...+150°F (-40...+66°C)	Maximum: 150°F
Available voltages	Universal power	115VAC, 230VAC, 24VAC, 12VDC, 24VDC
Duty cycle	100% at/below 104°F; 40°C	Ranging from 25% to 100% depending on voltage
Certifications	cCSAus; ATEX; IECEx	UL; ATEX (optional?)



Asahi/America
Series 92 Quarter Master Chief
Optional Protek Battery Pack

Competition

You get the idea...

NELES

Some excerpts from the Asahi Series 92 data sheets:

Calling an inductive AC motor
“brushless” is deceiving

Engineering Data

Valve Size	Model	Torque	Duty Cycle	Cycle Time (Sec)	Amp Draw					
					120 VAC	220 VAC	12 VDC	24 VDC	12 VAC	24 VAC
1/2"	S92	400	25%	195	0.5	0.4	2.0	4.0	2.0	3.0
3/4"	S92	400	25%	195	0.5	0.4	2.0	4.0	2.0	3.0
1"	S92	400	25%	195	0.5	0.4	2.0	4.0	2.0	3.0
1 1/2"	S92	400	25%	255	0.5	0.4	2.0	4.0	2.0	3.0
2"	S92	400	25%	315	0.5	0.4	2.0	4.0	2.0	3.0
2 1/2"	S92	400	25%	375	0.5	0.4	2.0	4.0	2.0	3.0
3"	A92	700	25%	375	0.8	0.6	2.0	4.0	2.0	3.0
4"	A92	700	25%	375	0.8	0.6	2.0	4.0	2.0	3.0

* Cycle times approximate. Duty cycle shown for ambient temp. (73° F)

Series 92 120 VAC & 220 VAC Explosion Proof Electric Actuator

Standard Features

- UL1203 Certified (CL.I, DIV. 1&2)
- Motor: Reversing, brushless, capacitor run 120 VAC 50/60 Hz, single phase
- Overload protection: Integral thermal overload



Electric Actuators Competition

A-T Controls TRIAC®

NELES

	ADC-Series	WE_XE_SE	XC	KE
Size/torque (lb-in)	150...3000	690...25900	690...25900	440...3500
Temp range	-40...+150°F (-40...+66°C)	-4...+158°F (-20...+70°C) (XP -4...+140°F)	-4...+158°F (-20...+70°C) (XP -4...+140°F)	-4...+140°F (-20...+60°C)
Available voltages	Universal power	110VAC, 220VAC, 24VAC, 12VDC, 24VDC; 380VAC, 440VAC (3PH)	110VAC, 220VAC, 24VAC, 12VDC, 24VDC	110VAC, 220VAC, 12VDC, 24VDC
Duty cycle	100% at/below 104°F; 40°C	50...70%	30...70%	50% max at 77°F
Certifications	cCSA _{US} ; ATEX; IECEX	CSA, ATEX, IECEX (depending on series)	cCSA _{US}	none listed



A-T Controls
[WE](#) [XE](#) [XC](#) [KE](#)
[SRX](#)
[FSE](#) [BSF](#)

Electric Actuators Competition

NELES

What's the story here?

It sure looks like A-T Controls is a group of private-labeled products from various manufacturers; most of whom are overseas:



A-T Controls KE



Koei (Japan)



A-T Controls SRX



Sure 100

Electric Actuators Competition

NELES

But wait, there's more...

A-T Controls continued:



A-T Controls WE_XE_SE_XC



Nutork (China)



I think Nutork may actually be made by Sun Yeh in Taiwan

A-T Controls E Series

Sun Yeh

Electric Actuators Competition

Indelac

NELES

	ADC-Series	M Series	L Series
Size	150...3000 lb-in	400...1500 lb-in	700...3840 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+65.6°C) (*with heater installed)	-40*...+150°F (-40*...+65.6°C) (*with heater installed)
Available voltages	Universal power	115VAC, 230VAC, 24VAC, 12VDC, 24VDC	115VAC, 230VAC, 24VAC, 12VDC, 24VDC, 230VAC (3PH), 460VAC (3PH)
Duty cycle	100% at/below 104°F; 40°C	25% for 115AC and 230AC models; 75% for 24AC, 12DC and 24DC models	100% for 12DC, 24DC, 24AC, and 115AC models; 230AC, 230AC (3PH), 460AC (3PH), 30-min continuous run
Certifications	cCSAus; ATEX; IECEX	CSA	CSA



Indelac
[M Series NEMA 4](#)
[M Series NEMA 7](#)
[L Series](#)

Competition

Again, Read the Fine Print...

This is an excerpt from the Indelac M Series NEMA 4 data sheet:

APPROVED VOLTAGES	115Vac	
APPROVED ENCLOSURES	Enclosure Type 4, 4X, 7 & 4-7	
APPROVED TEMP.	-4F (-20C) to 104F (40C)	
APPROVED OPTIONS	One or Two, Declutching Manual Override with Hand Wheel, Motor Brake for 115Vac, Visual Position Indicator, Special Mounting Pad Configurations and Mechanical Stop (For complete list of options, see option grid in catalog page 33)	
COATING	Thermally bonded polyester powder	
POSITION INDICATOR	Visual Electric	Dome Indicator Feedback from limit switches, same as operating voltage
SWITCHES	Snap action	SPDT, 15A @ 250Vac

INDELAC CONTROLS, INC

Indelac manuals all include this warning yet the product is “rated” to 150°F

NEMA 7 ENCLOSURE, GENERAL:

In general, operation and maintenance of a NEMA 7 electric actuator is no different than that of a NEMA 4 electric actuator. However, there are some precautions that must be followed.

1. **DO NOT** install in ambient temperatures that exceed **140 degrees F.**

Electric Actuators Competition

Indelac

NELES

	ADC-Series	SN Series (Internal Battery Back-Up)
Size	150...3000 lb-in	400...2800 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+65.6°C) (*with heater installed)
Available voltages	Universal power	115VAC, 230VAC, 24VAC, 12VDC, 24VDC
Duty cycle	100% at/below 104°F; 40°C	100%
Certifications	cCSA _{US} ; ATEX; IECEx	none



Indelac
[SN6](#)
[SN28](#)

Electric Actuators Competition

NELES

Bray Series 70 / 70-HAZ

	ADC-Series	Series 70	Series 70-HAZ
Size	150...3000 lb-in (17...339 Nm)	34...2034 Nm	90...226 Nm
Temp range	-40...+150°F (-40...+66°C)	-29...+65°C	-29...+65°C
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	120/230VAC; 24V AC/DC	120/220VAC
Duty cycle	100% at/below 104°F; 40°C	25%; Continuous (depending on cycle time)	25%; Continuous (depending on cycle time)
Certifications	cCSA _{US} ; ATEX; IECEx	UL, CSA, and CE (most models)	UL (120V only)



Bray
[Series 70 Brochure](#)

Bray
[Series 70 Technical Manual](#)

Electric Actuators Competition

NELES

Rotork IQT (Part-Turn)

	ADC-Series	IQT
Size	150...3000 lb-in (17...339 Nm)	50...3000 Nm
Temp range	-40...+150°F (-40...+66°C)	-30...+70°C
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	24 VDC (up to 2000 Nm); 100 - 240V AC (1PH); 200 – 690 V AC (3PH)
Duty cycle	100% at/below 104°F; 40°C	60 starts/hour On/Off & Inching; 1800 starts/hour Modulating
Certifications	cCSA _{US} ; ATEX; IECEX	ATEX; IECEX; FM; CSA



Rotork IQT
[IQT Flyer](#)

Electric Actuators Competition

AUMA ED/EQ Part-Turn Actuators

NELES

	ADC-Series	ED	EQ
Size	150...3000 lb-in (17...339 Nm)	25 & 50 Nm	40...600 Nm
Temp range	-40...+150°F (-40...+66°C)	-20...+70°C -40°C optional	-20...+70°C -40°C optional
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	24 VDC; 24, 115, 230 VAC (1PH); 400 – 440 V AC (3PH)	24 VDC; 24, 115, 230 VAC (1PH); 400 – 440 V AC (3PH)
Duty cycle	100% at/below 104°F; 40°C	25% (S2-15 min) and S3% (S3-50%); optional for some models S4-100%	25% (S2-15 min) and S3% (S3-50%); optional for some models S4-100%
Certifications	cCSA _{US} ; ATEX; IECEX	Ex II 3D IP65 T 150°C Dc optional	Ex II 3D IP65 T 150°C Dc optional



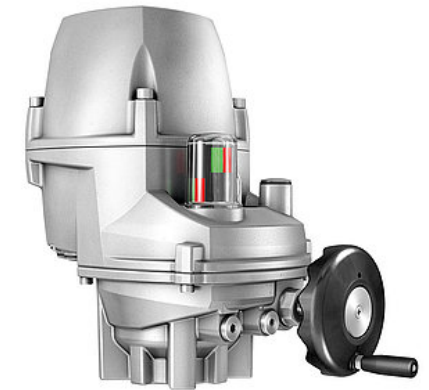
AUMA
AUMA Electric
Actuators

Electric Actuators Competition

AUMA PROFOX PF-Q Part-Turn Actuators

NELES

	ADC-Series	PF-Q
Size	150...3000 lb-in (17...339 Nm)	32...600 Nm
Temp range	-40...+150°F (-40...+66°C)	-30...+70°C
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	100 – 240 VAC (1PH) 50/60 Hz
Duty cycle	100% at/below 104°F; 40°C	Open/Close Duty S2-15 min.; Modulating S4-50% (torque is half of rated)
Certifications	cCSA _{US} ; ATEX; IECEx	IP67/68



AUMA
[PROFOX](#)
[Actuators](#)

Electric Actuators Competition

NELES

Valbia Serie 85 / 86

	ADC-Series	Serie 85	Serie 86
Size	150...3000 lb-in (17...339 Nm)	15...350 Nm	30...350 Nm
Temp range	-40...+150°F (-40...+66°C)	-20...+55°C	-20...+55°C
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	12V AC/DC, 24V AC/DC, 100-240V AC	12V AC/DC, 24V AC/DC, 100-240V AC
Duty cycle	100% at/below 104°F; 40°C	50% (12V AC/DC); 75% (24V AC/DC; 100-240V AC)	50% (12V AC/DC); 75% (24V AC/DC; 100-240V AC)
Certifications	cCSA _{US} ; ATEX; IECEx	UL, CSA (not XP)	UL, CSA (not XP)



Valbia
[Serie 85](#)



Valbia
[Serie 86](#)

Electric Actuators Competition

PS Automation

NELES

	ADC-Series	PS-AMS PSQ	PSQ
Size	150...3000 lb-in (17...339 Nm)	130...1500 Nm	130...1500 Nm
Temp range	-40...+150°F (-40...+66°C)	-20...+60°C	-20°C to +80°C (S2) / -20°C to +60°C (S4)
Available voltages	Universal power: 12/24V DC, 24, 115/230 V AC 50/60 Hz	24 VDC; 24, 115, 230 VAC (1PH); 360 - 460VAC (3PH)	24 VDC; 24, 115, 230 VAC (1PH); 400VAC (3PH)
Duty cycle	100% at/below 104°F; 40°C	Varies - S2-30 min.; S4-50% ED @ 25°C	Varies - S2-30 min.; S4-50% ED @ 25°C
Certifications	cCSA _{US} ; ATEX; IECEx	IP67; IP68 (opt)	IP67; IP68 (opt)



PS Automation
[PS-AMS PSQ](#)
[PSQ](#)

The Most Interesting Actuator Guy in the World

NELES



I DON'T ALWAYS SPEC ELECTRICS, BUT
WHEN I DO, I PREFER ADCs.

STAY SPARKY MY FRIENDS!

PLEASE ACTUATE RESPONSIBLY.

Jonathan Goldsmith. Digital image. *ABC News*. 08 September 2016, <https://abcnews.go.com/GMA/video/dos-equis-reveals-interesting-man-world-41943274>

QUESTIONS?

NELES

Electric Actuators

V-Series

Electric Actuators Pricing Comparison

NELES

ADC-Series vs V-Series; Common Configurations

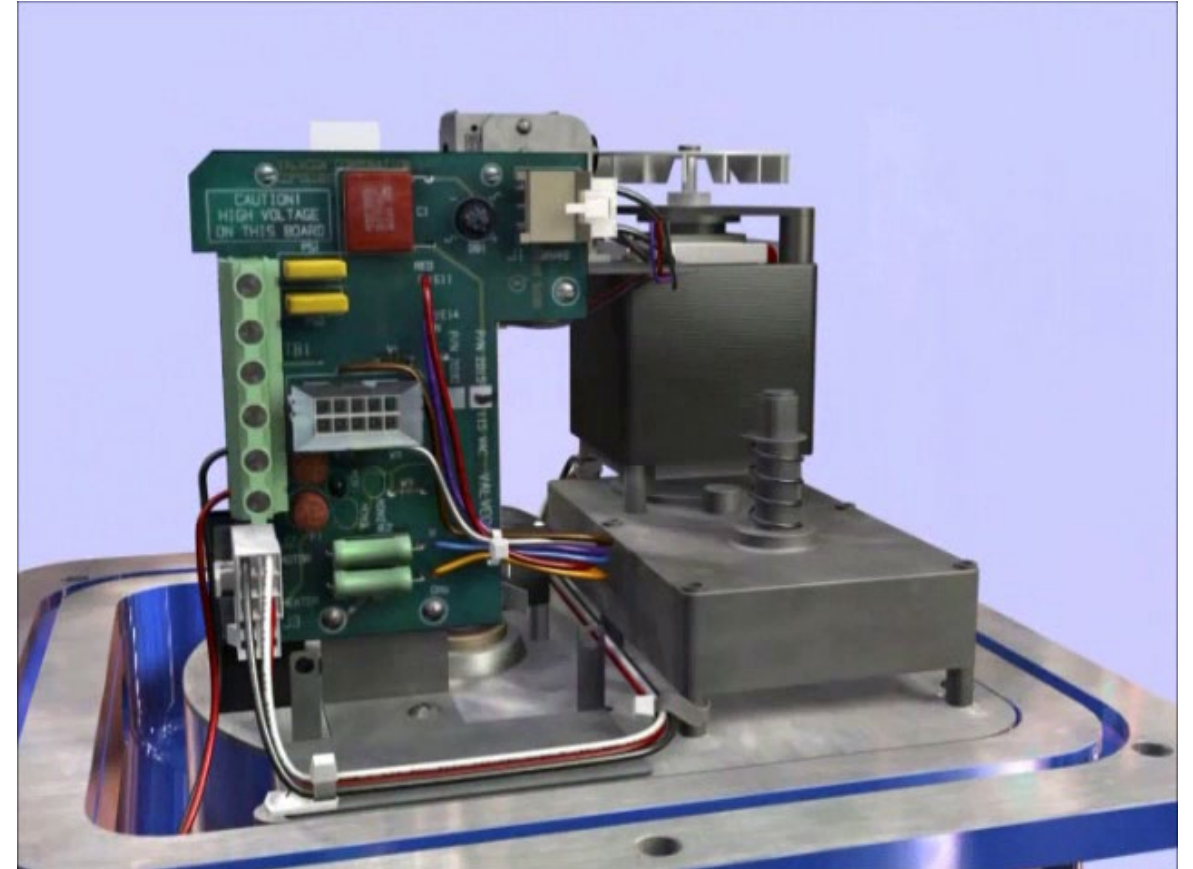
	ADC-Series	V-Series (on/off)	V-Series (positioning)
Model	ADCWX600U-UP ADCWX600UL2-UP ADCWX600UB-UP	VWX600KN115AC	VWX600CKS2TN115AC
List price	\$2,106 \$2,281 \$2,411	\$1,110	\$2,091
	LADC-Series	LV-Series (on/off)	LV-Series (positioning)
Model	LADCW2000U5-UP LADCW2000UL3-UP LADCW2000U5B-UP	LVW2000KN115AC	LVW2000CKS2TN115AC
List price	\$2,741 \$2,916 \$3.046	\$1,829	\$2,810

Electric Actuators

V-Series

NELES

- Modular design available as a basic on/off unit, or with the optional:
 - Control board for positioning in response to an analog control signal
 - Speed control/timer board for automatic cycling or cycle rate regulation
 - Iso/readback board for isolation of the motor and control voltages, and for position feedback

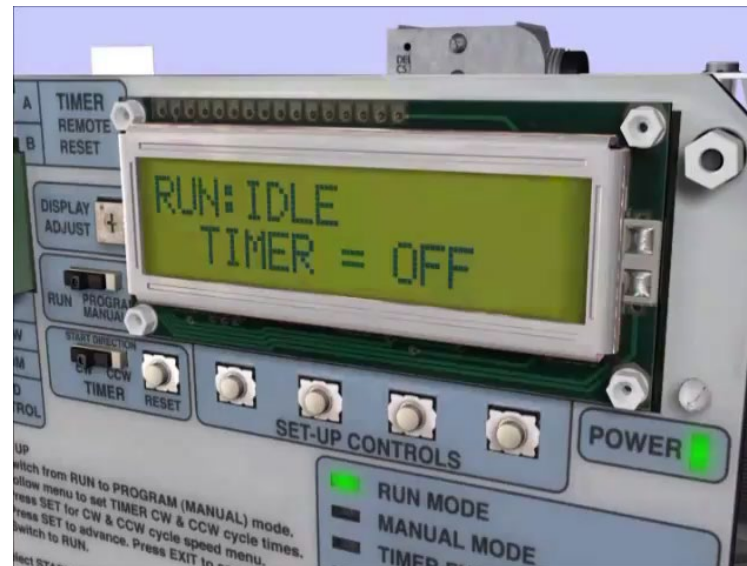
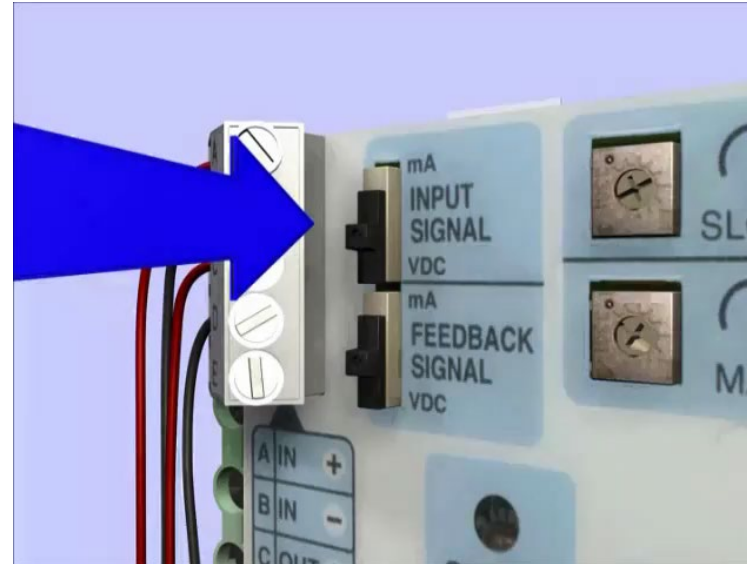


Designed for Simple Set-Up and Calibration

NELES

V-Series

- Clearly labeled overlays include wiring info, as well as instructive text
- Easy to use slide switches, selection potentiometers, and pushbuttons make set-up a snap!



Challenge

Complicated commissioning
Special tools or equipment
required for set-up

Solution

Simple “set and go” user
interface

Electric Actuators

NELES

V-Series Features and Options

- Standard features:
 - Visual position indicator
 - Wrench-operated manual override
 - Available options:
 - “H” - Tropical heater/thermostat (humidity-control)
 - “I1”, “I2”, “I3”, or “I4” - ISO 5211 compliant metric output (use with Jamesbury™ valves)
 - “K” - Motor brake
 - “P” - Feedback potentiometer
 - “S2” - Two auxiliary limit switches
 - “T” - Heater/thermostat (low-temp)
 - “Y1”, “Y2”, or “Y3” - Keyed output - metric; female (use with Neles™ valves)
 - “Z” - Handwheel override
 - Female square output $\frac{3}{4}$ ” for 150 – 600 lb-in models;
1” for 1000 – 3000 lb-in models
- Approximate weight:** 17 lbs. / 8 kg (150 – 600 lb-in);
31 lbs. / 14 kg (1000 – 3000 lb-in)



Electric Actuators

V-Series with Control Board

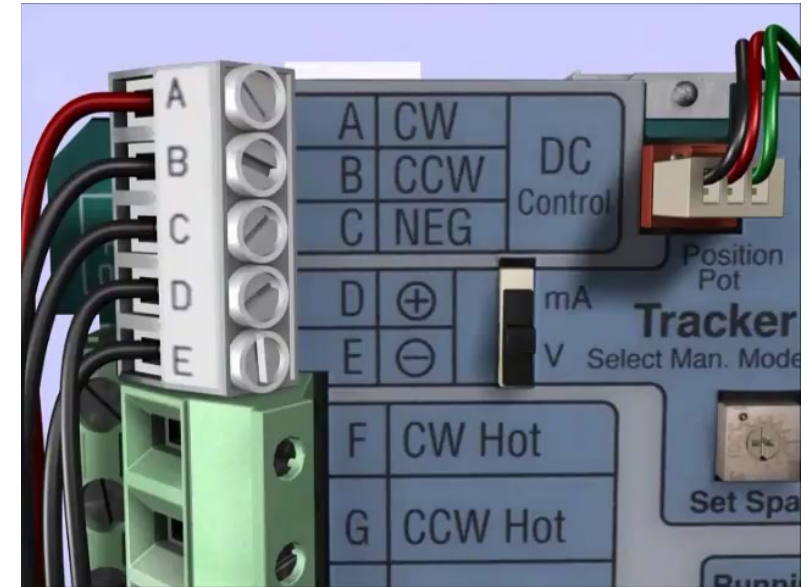
- Positioning/modulating operation
- Control signal Input: 4-20mA or 0-10VDC; split range capable
- Feedback signal output: mA or VDC
- 30 starts/minute
- Accuracy ~1% (at minimum deadband)
- Repeatability ~1% (at minimum deadband)

Calibrate Zero Position

Electric Actuators

V-Series with Iso/Readback Board

- Isolated on/off operation
 - Separate motor power and control power to allow for parallel wiring
- “Two-wire” or “three-wire” control
 - Accepts 115 or 230 VAC control; 12 or 24VDC control
 - “jog” or “latch” in “three-wire” mode
- Feedback signal output: 4-20mA or 0-10VDC



Electric Actuators

V-Series Versatility

- Options can easily be installed in the field
 - A standard on/off actuator on the shelf can easily be “late-configured” per a customer’s need:
 - Whether it is the addition of a brake to prevent back-driving on a butterfly valve
 - Or it is adding a control board for a closed-loop control application
 - Or maybe just a handwheel override
 - V-Series modularity brings flexibility to distributor stock, so they can service the customer!

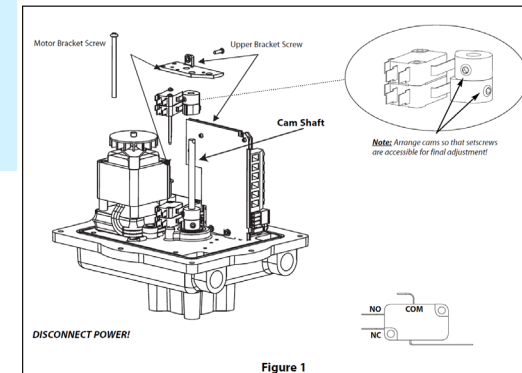
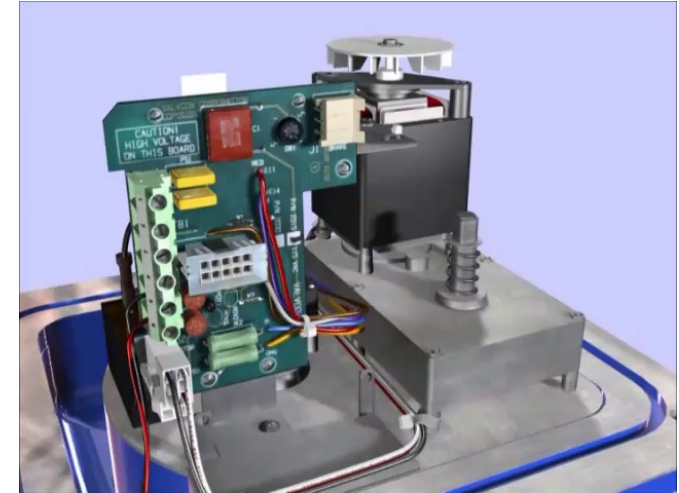


Figure 1

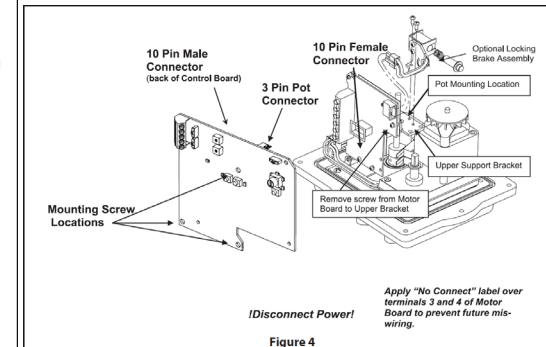


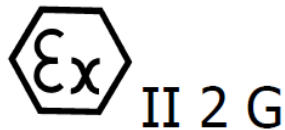
Figure 4

Electric Actuators

NELES

V-Series Product Scope

Sizes	8 sizes; from 150...3000 lb-in, (12...250 lb-ft; 17...339 Nm) of breakaway torque
Temperature	-40...+150°F (-40...+66°C)
Enclosure types	W...Weathertight; WX...Weathertight and explosionproof/dust-ignition proof
Ratings	For W models...NEMA 4/4X; IP66; CE For WX models...NEMA 4/4X, as well as NEMA 7 Class I, Div. 1, Gr. C, & D; NEMA 9 Class II, Div. 1, Gr. E, F, & G; NEMA Class III; ATEX Directive 2014/34/EU: Ex db IIB T6 Gb; IECEx CSA 14.0057X; IP66; CE
Voltages	115VAC 50/60Hz (1PH), or 230VAC 50/60Hz (1PH)
Duty cycle	75% (55% for 3000 lb-in models); 50% maximum duty cycle at 150°F; 66°C (35% for 2500 lb-in models; 25% for 3000 lb-in models)



NELES

Electric Actuators - Competition

V-Series vs Common Competitors

Electric Actuators Competition

Emerson / Bettis TorqPlus

NELES

	V-Series	EM-300	EM-500	EM-800
Size	150...3000 lb-in	150...600 lb-in	350...1600 lb-in	2000...20000 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+140°F (-40*...+60°C) (*with heater activated)	-40*...+140°F (-40*...+60°C) (*with heater activated)	-40*...+140°F (-40*...+60°C) (*with heater activated)
Available voltages	115VAC, 230VAC	115VAC, 230VAC, 24VAC, 12VDC, 24VDC	115VAC, 220VAC, 24VAC, 12VDC, 24VDC	115VAC, 220VAC (1PH), 220VAC (3PH)
Duty cycle	75% at/below 104°F; 40°C (55% for 3000 lb-in models)	AC models 30%; DC models 100% at/below 75°F	AC models 30%; AC and DC models 100% at/below 75°F	100% at/below 75°F
Certifications	cCSA _{US} ; ATEX; IECEx	CSA	CSA	CSA



Bettis TorqPlus

[EM-300](#)
[EM-500](#)
[EM-800](#)

Electric Actuators Competition

GE/Baker Hughes/Dresser / RCS

NELES

	V-Series	MAR 10, 50, 90	MAR 100, 250
Size	150...3000 lb-in	120...1000 lb-in	1500...10000 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+65°C) (*with heater installed)	-40*...+150°F (-40*...+65°C) (*with heater installed)
Available voltages	115VAC, 230VAC	115VAC, 230VAC, 24VAC	115VAC, 220VAC, 24VAC, 220VAC (3PH), 440VAC (3PH)
Duty cycle	75% at/below 104°F; 40°C (55% for 3000 lb-in models)	115AC models 25% to 75%; 230AC models 25% to 50%; 24VAC models 25%	Range from 25% to 100% depending on voltage, and torque output
Certifications	cCSA _{US} ; ATEX; IECEx	CSA	CSA



RCS MAR Series

[MAR 10, 50, 90](#)

[MAR 100, 250](#)

Electric Actuators Competition

Flowserve / Worcester

NELES

	V-Series	Series 75
Size	150...3000 lb-in	150...3000 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+66°C) (*with heater installed)
Available voltages	115VAC, 230VAC (60Hz)	115VAC, 230VAC, 12VDC, 24VDC
Duty cycle	75% at/below 104°F; 40°C (55% for 3000 lb-in models)	Range from 10% to 100% depending on voltage, and torque output
Certifications	cCSA _{US} ; ATEX; IECEx	CSA



Worcester Series 75
[Series 75](#)

Electric Actuators Competition

Indelac

NELES

	V-Series	M Series	L Series
Size	150...3000 lb-in	400...1500 lb-in	700...3840 lb-in
Temp range	-40...+150°F (-40...+66°C)	-40*...+150°F (-40*...+65.6°C) (*with heater installed)	-40*...+150°F (-40*...+65.6°C) (*with heater installed)
Available voltages	115VAC, 230VAC	115VAC, 230VAC, 24VAC, 12VDC, 24VDC	115VAC, 230VAC, 24VAC, 12VDC, 24VDC, 230VAC (3PH), 460VAC (3PH)
Duty cycle	75% at/below 104°F; 40°C (55% for 3000 lb-in models)	25% for 115AC and 230AC models; 75% for 24AC, 12DC and 24DC models	100% for 12DC, 24DC, 24AC, and 115AC models; 230AC, 230AC (3PH), 460AC (3PH), 30-min continuous run
Certifications	cCSA _{US} ; ATEX; IECEx	CSA	CSA



Indelac
[M Series NEMA 4](#)
[M Series NEMA 7](#)
[L Series](#)

QUESTIONS?

NELES

Electric Actuators

Other Product Series

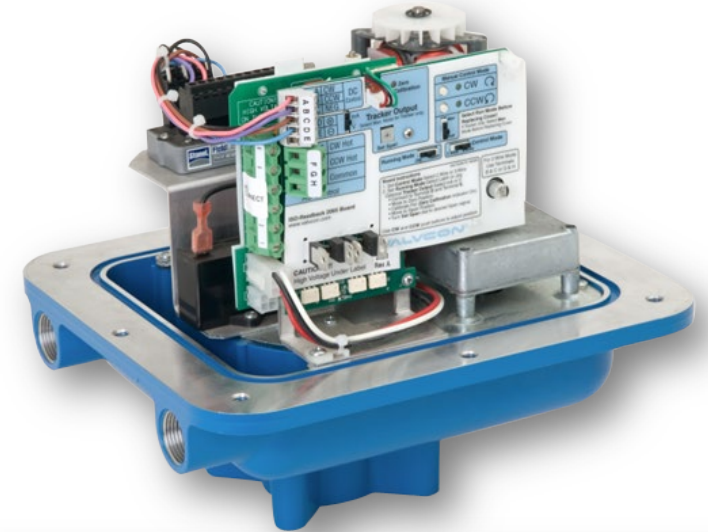
I-Series

Electric Actuators

NELES

I-Series Network Protocol Solutions

- Based on the V-Series
 - AS-i board
 - Utilizes our own board design
 - DeviceNet®
 - Utilizes a StoneL™ I/O module
 - Foundation Fieldbus (certification not available)
 - Utilizes a StoneL™ I/O module
- The same options as the V-Series
 - The auxiliary switches have gold alloy contacts



LC Series

Electric Actuators

NELES

LCU-Series Economical Unidirectional Actuators

- **Available voltages:**
115VAC, 230VAC, 24VAC, 12VDC & 24VDC
- **Torque range:**
150 – 600 lb-in (12 - 50 lb-ft; 17 – 68 Nm)
- **Enclosure:**
Die-cast zinc base with PVC cover; meets NEMA 4/4X
- **Output:**
Male (standard) or female (“L” option)
- **Duty cycle:**
25% (AC models); 80% (DC models)
- **Approximate weight:**
7 lbs. / 3 kg
- **Temperature range:**
32°F to 150°F / 0°C to 66°C; (-40°F to 150°F / -40°C to 66°C with optional heater/thermostat)
- **Available options:**
 - Tropical heater/thermostat
 - 14mm female output
 - Auxiliary limit switch
 - Heater/thermostat (low temp)



Electric Actuators

LCR-Series Economical Reversing Actuators

- **Available voltages:**
115VAC, 230VAC, 24VAC, 12VDC & 24VDC
- **Torque range:**
150 – 600 lb-in (12 - 50 lb-ft; 17 – 68 Nm)
- **Enclosure:**
Die-cast zinc base with PVC cover; meets NEMA 4/4X
- **Output:**
Male (standard) or female (“L” option)
- **Manual override with position indicator**
- **Duty cycle:**
25% (AC models); 80% (DC models)
- **Approximate weight:**
7 lbs. / 3 kg
- **Temperature range:**
32°F to 150°F / 0°C to 66°C; (-40°F to 150°F / -40°C to 66°C with optional heater/thermostat)
- **Available options:**
 - Tropical heater/thermostat
 - 14mm female output
 - 2 Auxiliary limit switches
 - Heater/thermostat (low-temp)



ESR-Series

Electric Actuators

ESR-Series Electronic Spring Return

- **Available voltages:**
115VAC & 230VAC
- **Torque range:**
150 – 600 lb-in (12 - 50 lb-ft; 17 – 68 Nm)
- **Enclosure:**
Powder-coated, die-cast aluminum;
Meets NEMA 4/4X or NEMA 4/4X/7&9
- **Output:**
Female
- **Duty cycle:**
80%
- **Visual position indicator**
- **Approximate weight:**
17 lbs. / 8 kg
- **Temperature range:**
-40°F to 130°F / -40°C to 55°C
- **Electronic spring useful life:**
8-10 years @ 72-80°F (useful life decreases at higher ambient temperatures)
- **Field-selectable power-loss position**
- **Brown-out protection:**
2-Second delay



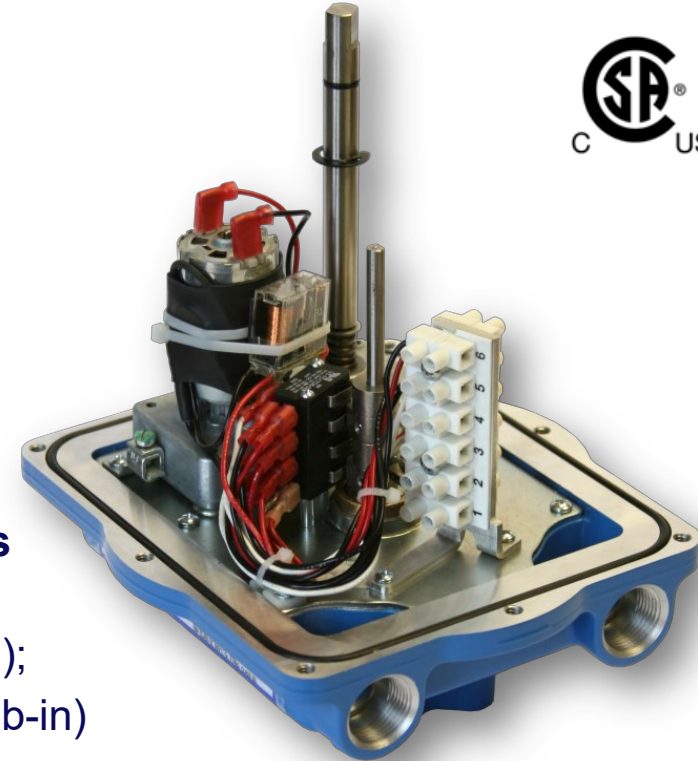
QX-Series

Electric Actuators

NELES

QX-Series DC-Powered On/Off

- **Available voltages:**
12VDC & 24VDC
- **Torque range:**
150 – 3000 lb-in (12 – 250 lb-ft; 17 – 339 Nm)
- **Enclosure:**
Powder-coated, die-cast aluminum;
NEMA 4/4X/7&9; C CSA_{US} certified
- **Output:**
Female
- **Duty cycle:**
80%
- **Temperature range:**
-40°F to 150°F / -40°C to 66°C
- **Manual override (wrench-operated)**
- **Visual position indicator**
- **Holding brake** (integral to motor harness)
- **Two auxiliary limit switches**
- **Approximate weight:**
17 lbs. / 8 kg (150 – 600 lb-in);
31 lbs. / 14 kg (1000 – 3000 lb-in)



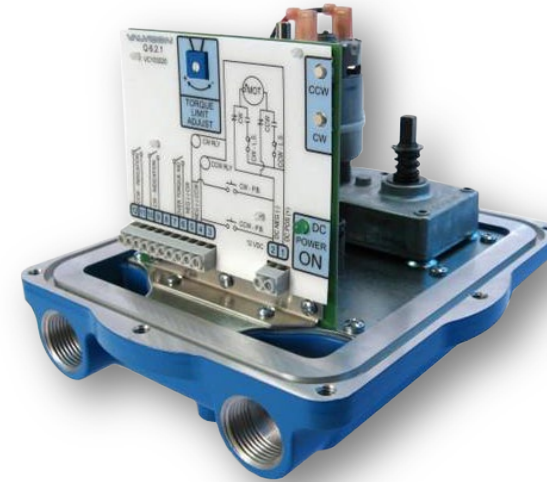
Q6-Series

Electric Actuators

NELES

Q6-Series 12VDC for Remote Locations Utilizing Solar

- **Input voltage:**
12VDC
- **Torque:**
600 lb-in (50 lb-ft; 68 Nm)
- **Enclosure:**
Powder-coated, die-cast aluminum;
NEMA 4/4X/7&9; cCSA_{US} certified
- **Output:**
Female
- **Duty cycle:**
80%
- **Running current:**
1.4A at 600 lb-in
- **Idle current:**
3mA
- **Approximate weight:**
17 lbs. / 8 kg
- **Temperature range:**
-40°F to 150°F / -40°C to 66°C



- Optional features:
- Visual position indication (not on Q6.2.4)
- Wrench-operated manual override (not on Q6.2.3, Q6.2.4 or Q6.2.4F)

Additional options on Q6.2.1 and Q6.2.3 models:

- Transient voltage protection
- Torque switch (potentiometer)
- Manual control (on-board push buttons)



QUESTIONS?

NELES

Electric Actuators

More Information and Resources

Electric Actuators Selection Guidelines

	V-Series	I-Series	ADC-Series	ESR-Series
Application type: on/off	General on/off	Network on/off	General on/off	General on/off
Application type: control	General control	Network control	General control	n/a
Fail safe	n/a	n/a	Battery back-up (optional)	Capacitor back-up
Valve action	Rotary	Rotary	Rotary	Rotary
Torque	150 - 3000 lb-in	150 - 3000 lb-in	150 - 3000 lb-in	150 - 600 lb-in
Actuator rotation	90, 180, 270 degrees	90, 180, 270 degrees	90, 180, 270 degrees	90 degrees
Available Voltage(s)	115, and 230VAC	115, and 230VAC	Universal power	115, and 230VAC
Fail action	Fail-in-place	Fail-in-place	Fail "safe" (optional)	Fail safe
Temperature rating	-40 to 150°F	-40 to 150°F	-40 to 130°F (SLA Battery) -40 to 150°F (Li-Ion battery)	-40 to 130°F
Housing construction	Powder coated A380 aluminum	Powder coated A380 aluminum	Powder coated A380 aluminum	Powder coated A380 aluminum
Certification	cCSA _{US} ; ATEX; IECEx	cCSA _{US}	cCSA _{US} ; ATEX; IECEx	n/a
Valve shaft connection	Small casting = 3/4" female square or 14, 17 mm female square; 15mm, or 20mm female key large casting 1" female square or 17, 19, or 22 mm female square; 20mm, or 25mm female key	Small casting = 3/4" female square or 14, 17 mm female square; 15mm, or 20mm female key large casting 1" female square or 17, 19, or 22 mm female square; 20mm, or 25mm female key	Small casting = 3/4" female square or 14, 17 mm female square; 15mm, or 20mm female key large casting 1" female square or 17, 19, or 22 mm female square; 20mm, or 25mm female key	3/4" female square or 14mm, 17mm female square; 15mm, or 20mm female key
Valve mounting standard	ISO 5211	ISO 5211	ISO 5211	ISO 5211
Manual override	Yes; declutable override	Yes; declutable override	Yes; declutable override	No
Field reversable fail position	No	No	Yes	Yes

Electric Actuators Selection Guidelines

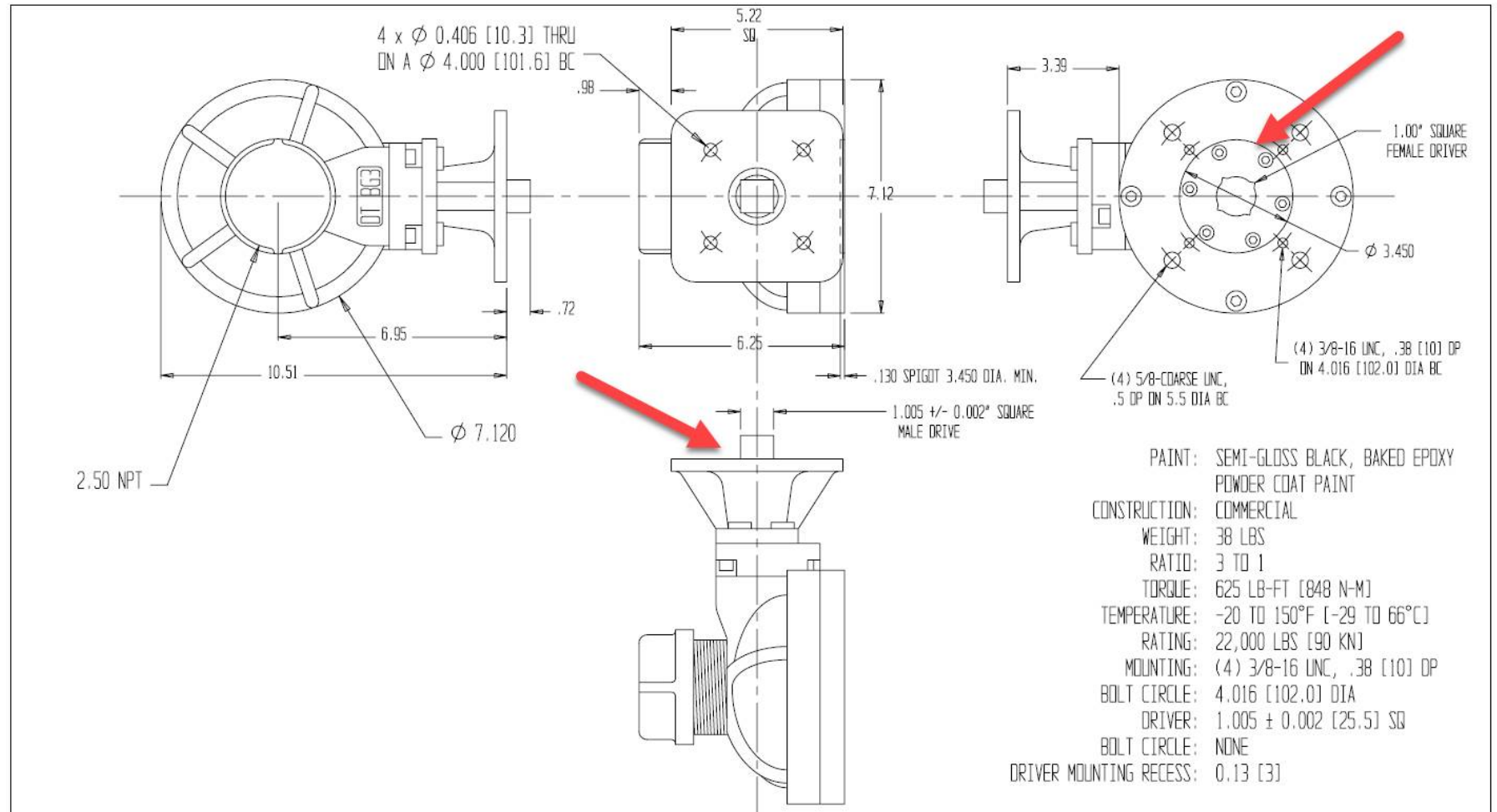
	LC series	Q6-Series	QX-Series
Application type: on/off	General on/off	General on/off	General on/off
Application type: control	n/a	n/a	n/a
Fail safe	n/a	n/a	n/a
Valve action	Rotary	Rotary	Rotary
Torque	150 - 600 lb-in	0 - 600 lb-in	150 - 3000 lb-in
Actuator rotation	90 degrees / unidirectional	90 degrees	90, 180, 270 degrees
Available Voltage(s)	115, 230, 24VAC, 12, 24VDC	12VDC	12, and 24VDC
Fail action	Fail-in-place	Fail-in-place	Fail-in-place
Temperature rating	-40 to 150°F (optional heater required below 32°F)	-40 to 150°F	-40 to 150°F
Housing construction	Zinc cast base poly cover	Powder coated A380 aluminum	Powder coated A380 aluminum
Certification	n/a	cCSA _{US}	cCSA _{US}
Valve shaft connection	14mm female square or 14mm male square	3/4" female square or 14mm, 17mm female square; 15mm, or 20mm female key	Small casting = 3/4" female square or 14, 17 mm female square; 15mm, or 20mm female key large casting 1" female square or 17, 19, or 22 mm female square; 20mm, or 25mm female key
Valve mounting standard	ISO 5211	ISO 5211	ISO 5211
Manual override	Yes; declutable override (LCR-Series only)	Yes; declutable override	Yes; declutable override
Field reversable fail position	No	No	No

How Can We Produce More Torque?

NELES

The BG3-Valvcon from Dynatorque/Cameron/Schlumberger

- The BG3 provides a 2.55 x increase in torque output
- The caveat is the actuator is set-up for 270-degree operation, so the (90-deg) cycle time is tripled
- The 3000 lb-in model, on a BG3, will produce 7650 lb-in



More Information

Electric Actuators

Click on the underlined links below to access the information

More information	<u>Web site</u>	<u>Technical bulletin</u>	<u>IMO</u>	<u>Commercial brochure</u>	Videos (if available)
ADC-Series	<u>✓</u>	<u>✓</u> , <u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
V-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
I-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>		
LCU-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>		
LCR-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>		
QX-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>		
ESR-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>		
Q6-Series	<u>✓</u>	<u>✓</u>	<u>✓</u>		

Actuator Selection Tool

NELES

NELES

Valvcon™ Sizing Tool v1.05

Series: ADC, LADC, V, & LV

 = type in data here
 = select from the dropdown list

Units
SI

Customer Reference			Valve Requirement Data								Actuator Sizing														
			Required Valve Torque (Nm)								Applicable Actuators		Available Actuator Torque (Nm)						Safety Factor						MAST Check
#	Item	Tag	BTO	RTO	ETO	ETC	RTC	BTC	MAST	Safety Factor	Count	Actuator Models	BTO	RTO	ETO	ETC	RTC	BTC	BTO	RTO	ETO	ETC	RTC	BTC	
1			75	108	68	49	75	46		1.20	8	LADC1500	169	169	169	169	169	169	2.3	1.6	2.5	3.5	2.3	3.7	-
2			22	30	27	48	40	18		1.20	12	ADC600	68	68	68	68	68	68	3.1	2.3	2.5	1.4	1.7	3.8	-
3										1.20	-		-	-	-	-	-	-	-	-	-	-	-	-	-
4										1.20	-		-	-	-	-	-	-	-	-	-	-	-	-	-

Actuator Typecode											
1.	3.	2.	4.	5a.	5b.	5c.	5d.	5e.	5f.	6.	Actuator
Series	Enclosure	Torque	Board Options	Other (Output Shaft)	Other (Heater / Comm.)	Other (Hand wheel)	Other (Brake)	Other (Pot.)	Other (Switch)	Operating Voltage	Typecode
LADC	WX	1500	UB5	I4	MB					-UP	LADCWX1500UB5I4MB-UP
ADC	W	600		I1		Z					ADCW600I1Z
			U								
			UB								
			U1								
			UB1								
			U3								
			UB3								
			UL2								
			UL4								

Actuator Typecode											
1.	3.	2.	4.	5a.	5b.	5c.	5d.	5e.	5f.	6.	Actuator
Series	Enclosure	Torque	Board Options	Other (Output Shaft)	Other (Heater / Comm.)	Other (Hand wheel)	Other (Brake)	Other (Pot.)	Other (Switch)	Operating Voltage	Typecode
LADC	WX	1500	UB5	I4	MB					-UP	LADCWX1500UB5I4MB-UP
ADC	W	600	UL2	I1		Z				-UP	ADCW600UL2I1Z-UP

Actuator Typecode								
4.	5a.	5b.	5c.	5d.	5e.	5f.	6.	
Board Options	ADC:							
	- U = On/off / Positioner board							
	- UB = On/off / Positioner board with Li Ion Battery Back-up							
	- U1 = On/off / Positioner board 180-deg							
	- UB1 = On/off / Positioner board 180 deg with Li Ion Battery Back-up							
	- U3 = On/off / Positioner board 270-deg							
	- UB3 = On/off / Positioner board 270 deg with Li Ion Battery Back-up							
	- UL2 = Universal Board with SLA Battery Back-up							
	- UL4 = Universal Board 180-deg w/ SLA Battery back-up							
	- UL6 = Universal Board 270-deg w/ SLA Battery back-up							
	LADC:							
- U5 = On/off / Positioner board								
- UB5 = On/off / Positioner board with Li Ion Battery Back-up								
- U7 = On/off / Positioner board 180-deg								
- UB7 = On/off / Positioner board 180 deg with Li Ion Battery Back-up								
- U9 = On/off / Positioner board 270-deg								
- UB9 = On/off / Positioner board 270 deg with Li Ion Battery Back-up								
- UL3 = Universal Board with SLA Battery Back-up								
- UL5 = Universal Board 180-deg w/ SLA Battery back-up								
- UL7 = Universal Board 270-deg w/ SLA Battery back-up								
V / LV:								
- C = Control Board								
- J = Speed Control/Timer Board								
- U = Iso/Readback Board								

Actuator Selection Tool

Comparison Tab

1/8"

ReadMe

Typecode_Analyzer

Pneumatic_Sizing_Tool

Valvcon_Sizing_Tool

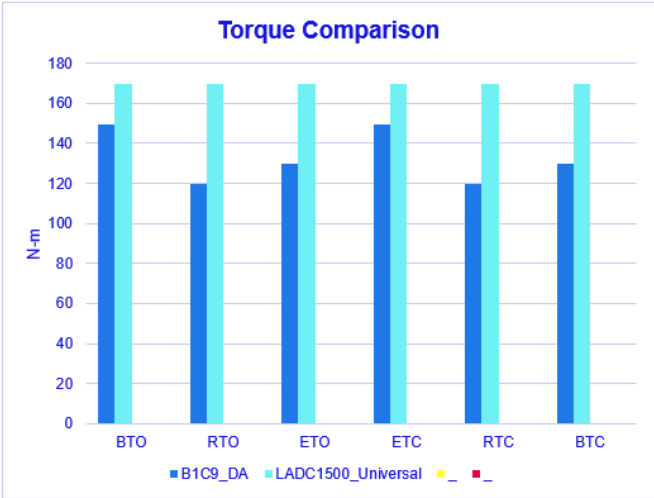
MGR_Sizing_Tool

Actuator_Comparison

Actuator Comparison Tool v1.05
Series: B1, N1, RNP, VPVL, QPX, MGR, & Valvcon™
Obsolete Series: EC, EJ

= select from the dropdown list

Units		SI			
		Main	Comp 1	Comp 2	Comp 3
Actuator	Series	B1C	LADC		
	Size	9	1500		
	Spring / Voltage	DA	Universal		
	First Size Match	-	LADC1500_Universal	-	-
	Type	Piston	Electric	-	-
Fail Safe Action		Fail In Place	Based on model	-	-
Torque values (N-m)	Supply Bar	4.0	-	-	-
	BTO	150	169	-	-
	RTO	120	169	-	-
	ETO	130	169	-	-
	ETC	150	169	-	-
	RTC	120	169	-	-
	BTC	130	169	-	-
	Open Min	120	169	-	-
Close Min		120	169	-	-
Max Supply Pressure	Bar	9	-	-	-
Shaft Bore	mm	35	22 / 25	-	-
	Type	keyed	square / keyed	-	-
ISO 5211 Mounting	F03			-	-
	F05			-	-
	F07	x	x	-	-
	F10		x	-	-
	F12			-	-
	F14			-	-
	F16			-	-



Electric Actuators

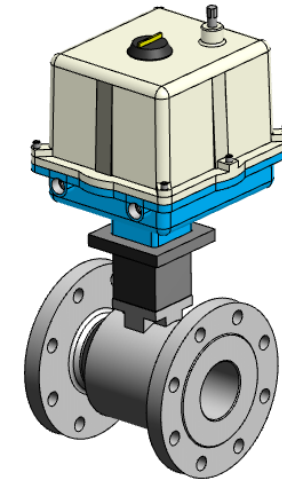
Additional Resources

- Business Center
- Linkage Wizard
- RapidDraw3D™

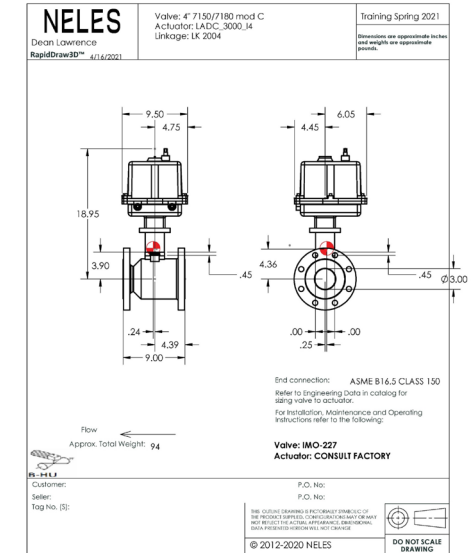
Select Valve Brand, Size and Model	
Brand:	Jamesbury
Size:	4
Model:	7150 Model C ... Series 7000
Select Actuator Brand and Model	
Brand:	Jamesbury
Model:	LADC 3000 I4
Linkage Kit:	LK 2004

Linkages that appear on separate lines are options: Select only one!
When two linkages appear on the same line separated by a comma: Both linkages required!

Please consult the factory for linkages to Neles cryo valve
Result from Linkage Wizard



3D PDF from
RapidDraw3D™



Assembly drawing
from RapidDraw3D™

- Applications Engineering
 - They have you covered 20 hours out of 24!
- Nelprof™ – not yet, but we are working on adding the electric actuators
- Actuator Selection Tool (contact your ASM for the Excel file)

Contact us

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NELES



NELES



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QUESTIONS?

Reinventing reliability

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@neles



@nelesworld



@nelesflow



@Neles



@nelesflow

NELES