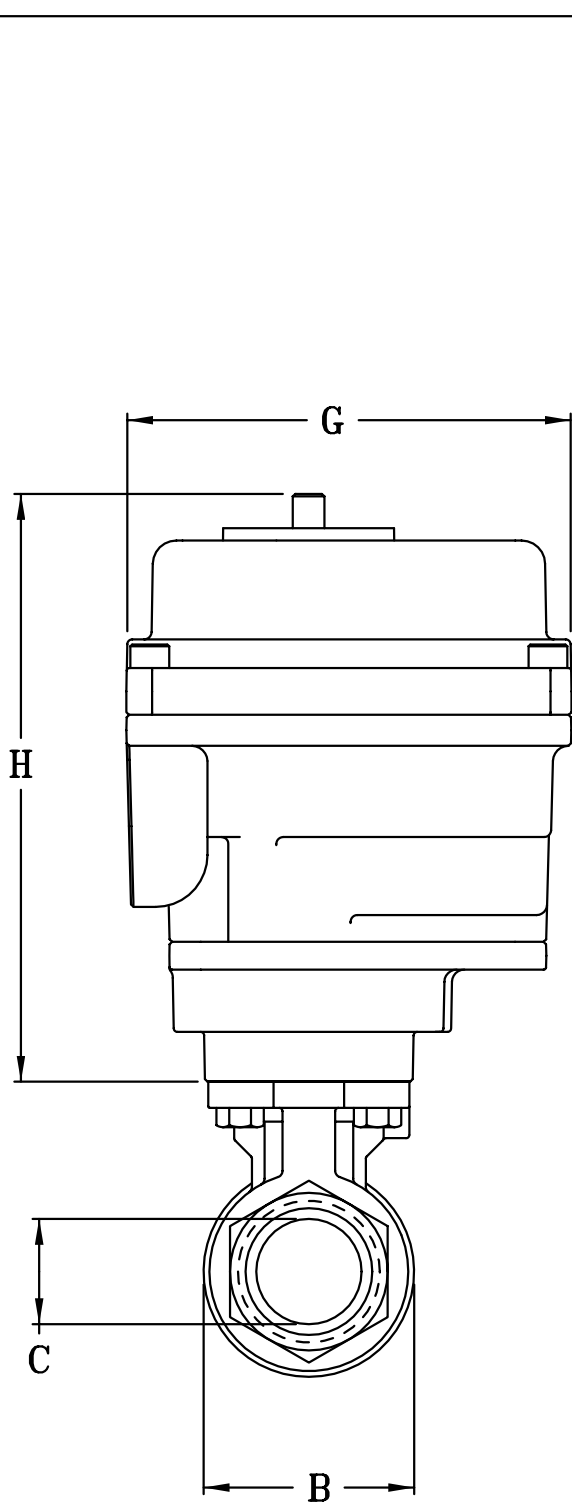
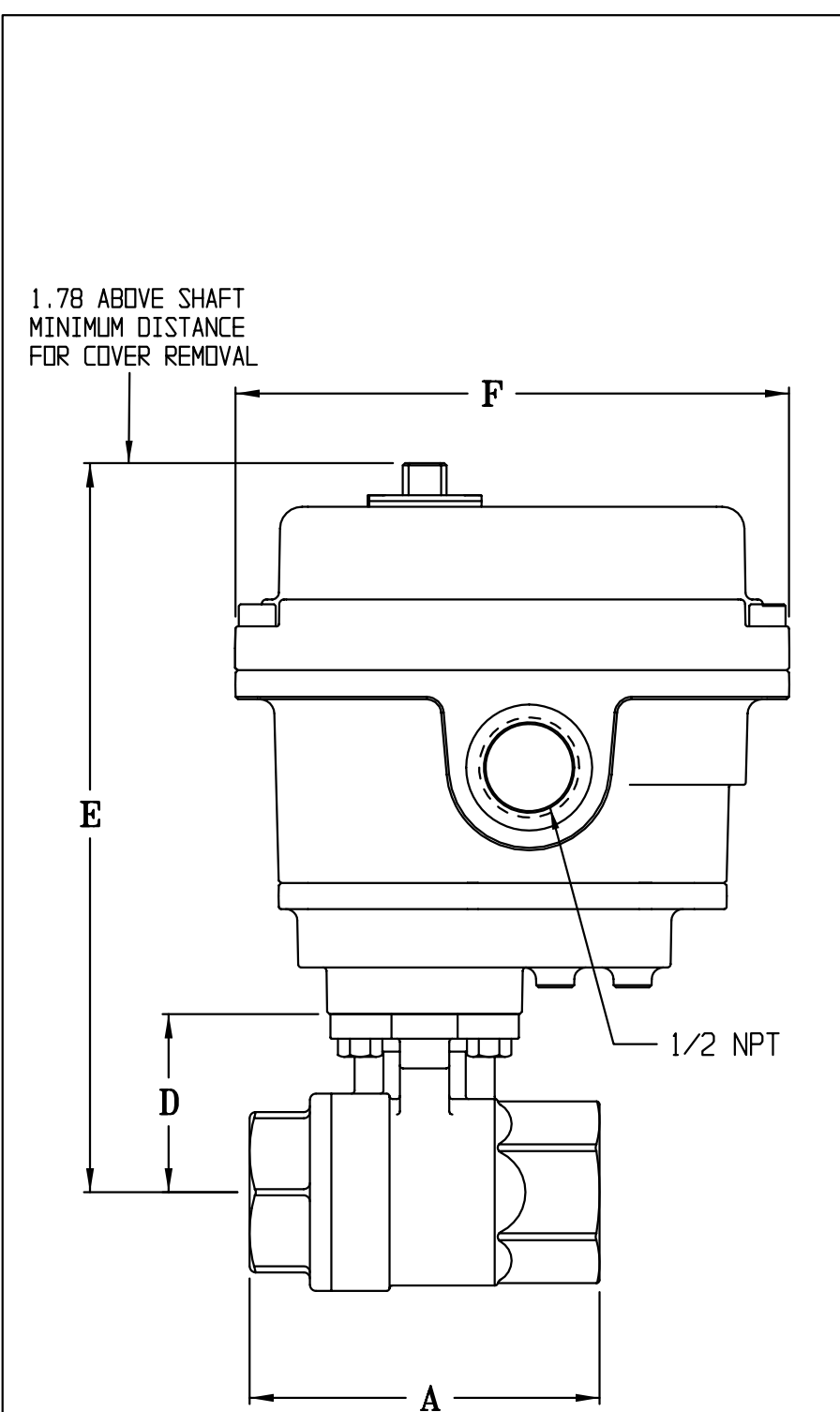
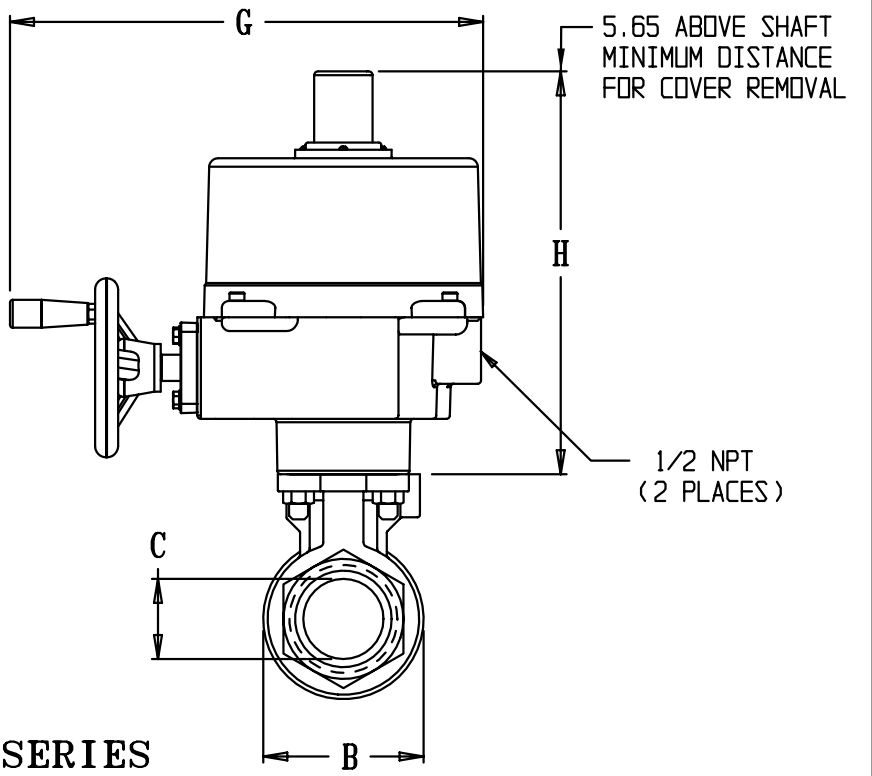
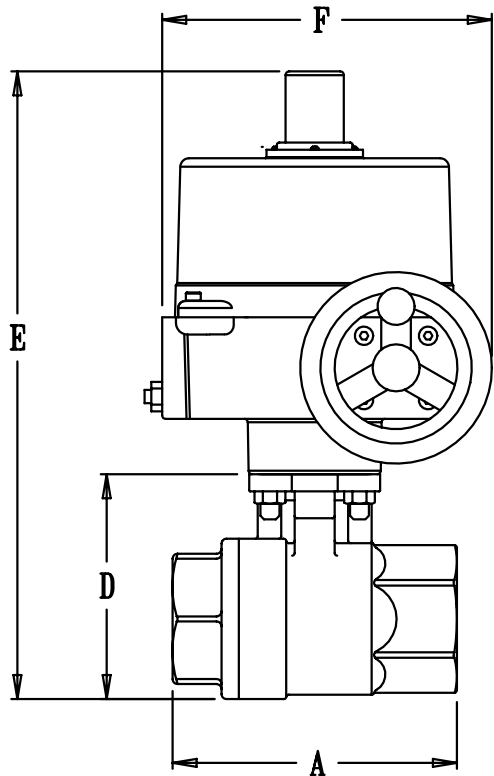




MODEL	EHS21AJE20	EHS23AJ320	EHS24AJE21	EHS25AJE21	EHS27AJE25	EHS28AJE01	EHS2AAJE02
ACTUATOR	DE153	DE153	DE154	DE154	DE305	MA7	MA13
SIZE	1/4 NPT	1/2 NPT	3/4 NPT	1 NPT	1 1/2 NPT	2 NPT	3 NPT
A	1.97	2.95	3.15	3.54	4.72	5.51	7.56
B	1.32	1.38	1.78	2.01	2.95	3.77	5.50
C	0.45	0.59	0.79	0.98	1.50	2.00	3.14
D	1.31	1.38	1.63	1.75	2.17	2.62	4.02
E	6.03	6.10	6.35	6.47	7.54	12.66	14.06
F	4.75	4.75	4.75	4.75	4.75	7.87	7.87
G	3.58	3.58	3.58	3.58	3.58	13.00	13.00
H	4.72	4.72	4.72	4.72	5.37	10.04	10.04
MAX. ΔPSI	500 CWP	500 CWP	500 CWP	500 CWP	300 CWP	300 CWP	300 CWP
WT. LBS	4.25	4.47	5.08	5.55	8.15	27.00	43.80



VALVE DATA	
BODY/END CAP	ASTM A351 GR. CF8M (316 SS)
STEM	316 STAINLESS STEEL
BALL	316 STAINLESS STEEL
SEATS	RTFE (CARBON)
THRUSTWASHER	PTFE
STEM SEAL	PTFE / VITON O-RING

MODEL NO. VOLTAGE CODE
EHS2XAJEXXY
CODE (SUFFIX)

BLANK = 115VAC
B = 240VAC
H = 12 - 24 VAC/VDC (DE)

UNCONTROLLED
DRAWING

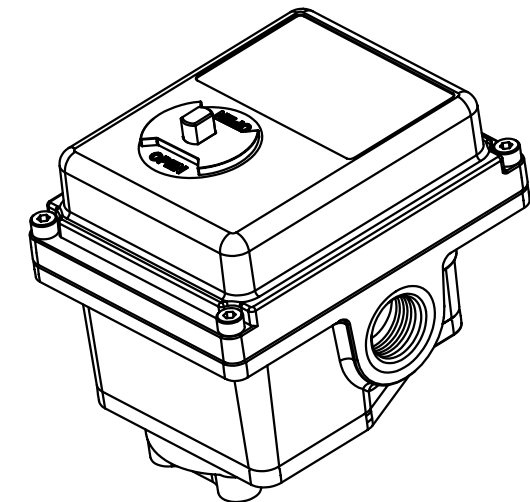
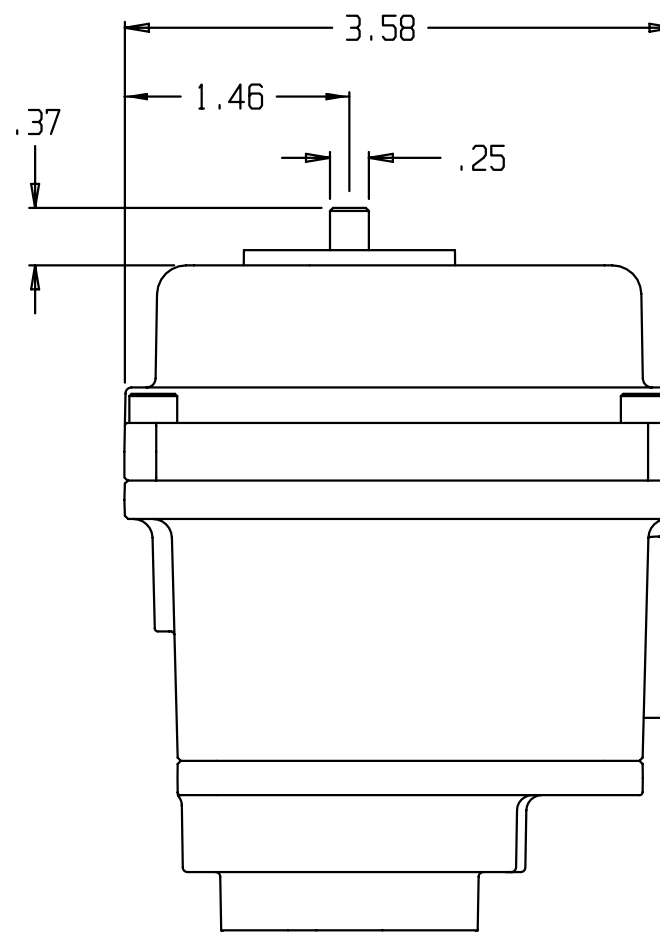
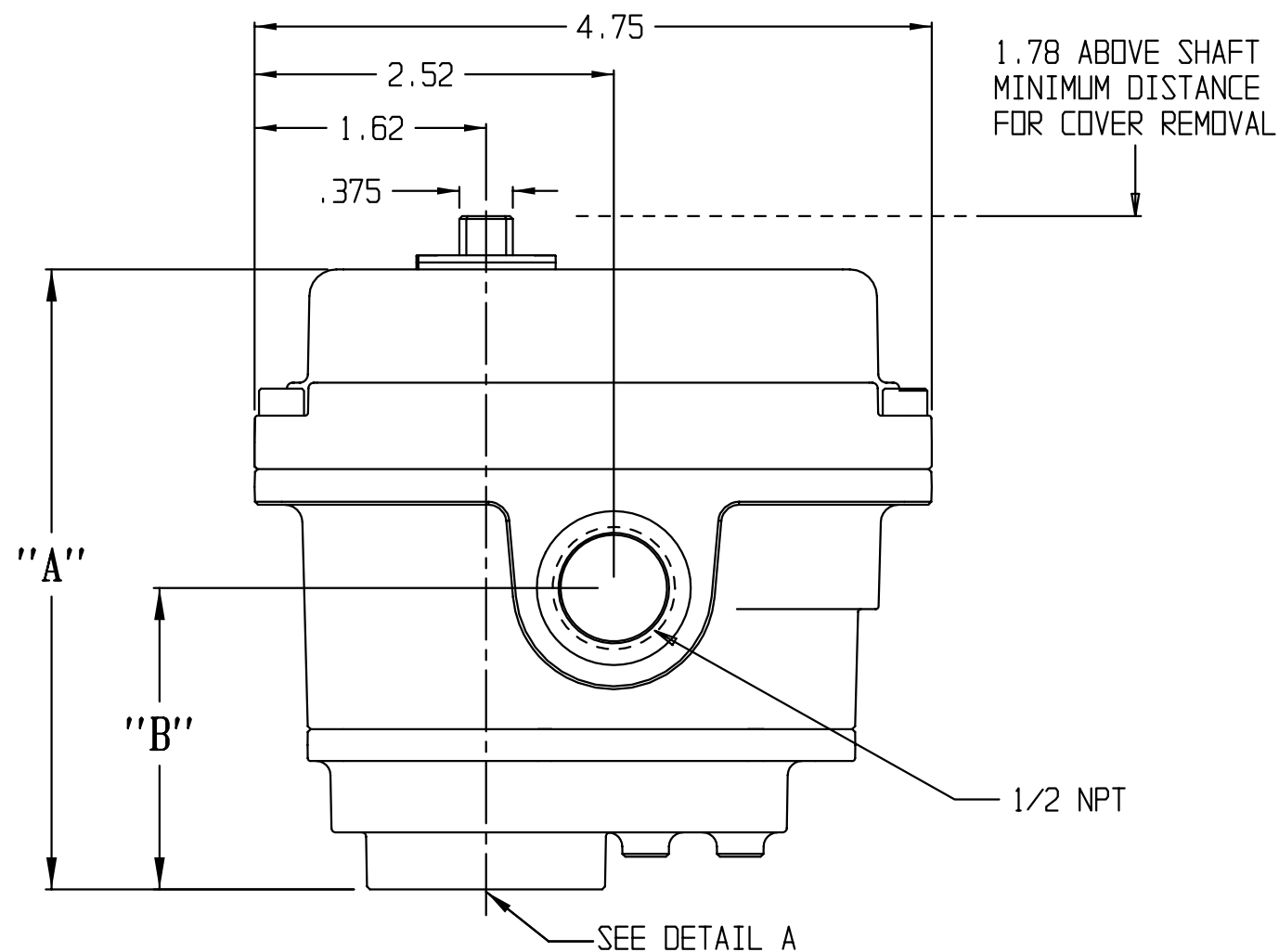
THIS PRINT IS THE PROPERTY OF DYNAQUIP CONTROLS AND SHALL NOT BE COPIED, REPRODUCED, LOANED, OR DISPOSED OF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SPECIFICALLY FURNISHED EXCEPT BY WRITTEN PERMISSION OF DYNAQUIP CONTROLS.

NO. VHS2 SERIES

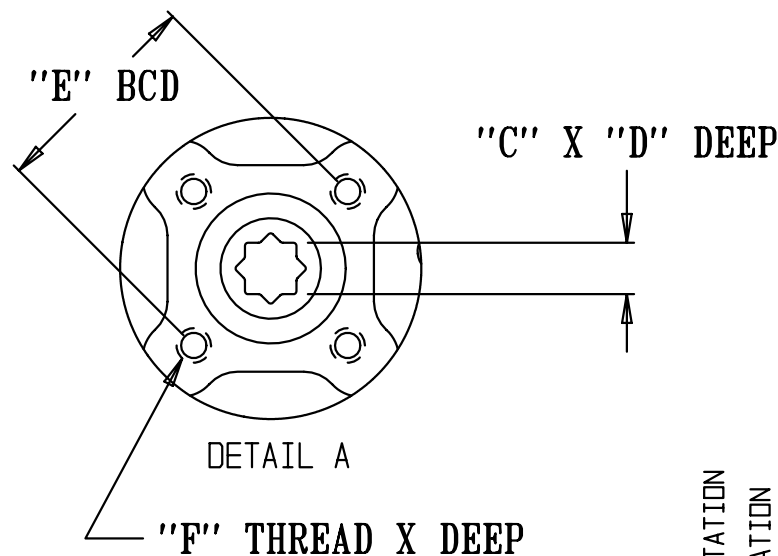
TITLE
BALL VALVE
316 SS - FULL PORT - NPT
ELECTRIC ACTUATOR

DR	DATE	CH' KD	DATE	ENGR	DATE
LJH	09-16-05	LJH	09-16-05	LJH	09-16-05

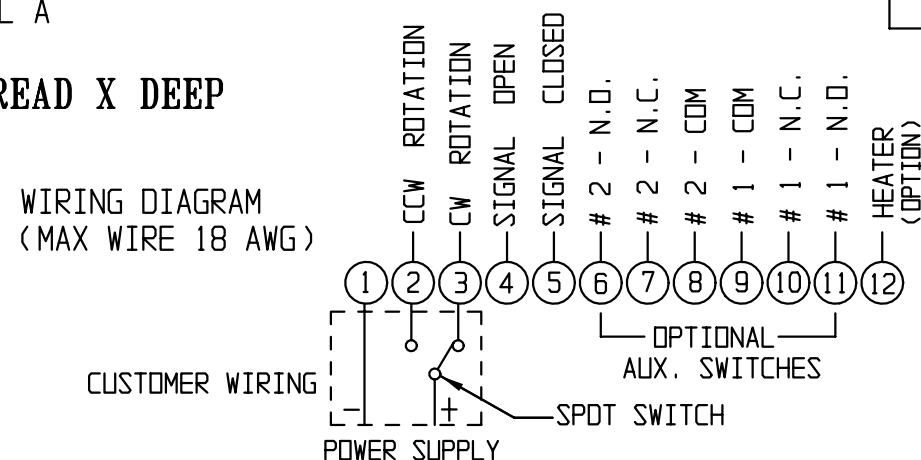




ENCLOSURE - NEMA 4X, ALUMINUM DIE CAST
POLYURETHANE ENAMEL COATING
FASTENERS - STAINLESS STEEL
HEAT TREATED STEEL GEARING
LUBRICATED FOR LIFE
50% RATED REVERSING MOTOR
THERMAL OVERLOAD PROTECTION
SWITCH RATING - 5A 250VAC
MANUAL OVERRIDE - STAINLESS STEEL
POSITION INDICATION
AMBIENT TEMPERATURE; -40°F TO +150°F
VOLTAGES; 12 - 24, 120, & 230 VAC
12 - 24 VDC



MODEL NO.	"A"	"B"	"C"	"D"	"E"	"F"	TORQUE IN - LB	SPEED SEC/90°	AMPS LOCKED ROTOR		WT. (LBS.)
									AC	12-24 AC/DC	
DE153	4.35	2.11	.354	.46	1.417 (F03)	M5 X .38 DP	150	2.5	.50	2.5	3.7
DE154	4.35	2.11	.433	.46	1.654 (F04)	M5 X .38 DP	150	2.5	.50	2.5	3.7
DE305	5.00	2.76	.551	.64	1.969 (F05)	M6 X .41 DP	300	6.5	.50	2.5	3.9



OPTION CODES (SUFFIX);
"B" = 230 VAC
"H" = 12 - 24 VAC / VDC

UNCONTROLLED DRAWING

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NO. DE SERIES
FILE NO. SUB117

TITLE
DE150 & DE300 SERIES
ELECTRIC ACTUATOR

DR	DATE	CH' KD	DATE	ENGR	DATE
LJH	09-16-05	LJH	04-07-03	LJH	04-07-03



Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Electric Actuator

Features

- Can be wired in parallel with same model actuators
- Easy access for cam adjustment
- Type 316 stainless output shaft
- 50% Duty cycle at ambient temperature and rated torque
- Thermal overload protection to guard motor against overheating
- Manual overrides on all standard models
- Rotates clockwise to close valve and counterclockwise to open valve
- Operates mounted in any position

⚠ WARNING Do not apply electric power unless unit is fully assembled and mounted.

Always disconnect electric power source and relieve pressure in the system prior to maintenance.

It is recommended that eye protection be worn while servicing the system.

Failure to comply with above warnings could result in personal injury and/or damage to this product.

Manual Override

In the event of power failure, the actuator may be cycled manually. To manually cycle the actuator apply a wrench to the exposed flats on upper end of the shaft and turn it in the desired direction. Actuators rotate clockwise to close valve and counterclockwise to open valve. Failure to rotate in the proper direction will cause limit switches to malfunction.

Inspection Upon Receipt

1. Visually inspect to be sure actuator has not been damaged in transit.
2. Verify that the manual override is in working condition.
3. Verify that Model Number is correct as ordered.
4. Verify that electrical supply voltage is the same as specified on the actuator label.

5. Verify that NEMA rating on label is as required: Weatherproof/Corrosion Resistant (NEMA 4, 4X).

6. Check that mounting bolt pattern and output shaft/adaptor configurations are as required.

Installation

1. Before mounting the actuator, verify that the valve torque requirement is less than the rated output torque of the actuator.
2. Check that the output shaft adapter fits the stem of valve or damper before inserting into the actuator.
3. Insert output shaft adapter into actuator. Make sure fit is satisfactory.
4. Determine that actuator position, open or closed, matches position of equipment with which it is to be mounted. Use manual override to change position, if necessary.
5. Mount to top plate of valve, valve bracket or damper. Be sure that base of actuator is flush with top plate.
6. Insert bolts but do not tighten.
7. Use manual override to move stem of valve or damper slightly to correct side thrust or misalignment.
8. Manually place valve to either full travel position.

9. Tighten bolts using a cross pattern and equally drawing bolts down to finish.

Electrical Installation

Verify that the electrical supply voltage is the same as the required actuator voltage.

Follow the wiring diagram on the next page. Use the wiring diagram inside actuator cover for voltages other than 115VAC.

Electric power to terminals 1 & 2 will cause the camshaft to rotate counterclockwise. Electric power to terminals 1 & 3 will cause the camshaft to rotate clockwise.

NOTE: This series actuators may be wired in parallel with other same model actuators to simplify multiple installations.

Cam Adjustment

The cams are preset at the factory. When additional adjustments are needed, follow steps described below.

TO SET OPEN POSITION

NOTE: "OPEN" (Cam indicator) is printed on the edge of circuit board opposite the "open" adjustment knob.

1. Turn power off.
2. Use manual override to turn valve counterclockwise to the fully open position.
3. With the power turned off, remove cover.



ENGLISH

ESPAÑOL

FRANÇAIS

Electric Actuator

ENGLISH

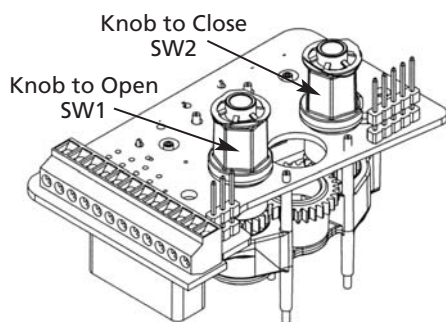
Cam Adjustment (Continued)

4. Turn cam adjusting knob (open position) counterclockwise until the notch at the base of the board aligns with the "SW1" on the circuit board. Then turn knob clockwise until you hear a soft click of the switch.
5. Release knob.

TO SET CLOSED POSITION

NOTE: "CLOSE" (Cam indicator) is printed on the edge of circuit board opposite the "close" adjustment knob.

1. Turn power off.



2. Use manual override to turn valve clockwise to the fully closed position.
3. With the power turned off, remove cover.
4. Turn cam adjusting knob (closed position) clockwise until the notch at the base of the board aligns with the "SW2" on the circuit board. Then turn knob counterclockwise until you hear a soft click of the switch.
5. Release knob.

NOTE: To adjust auxiliary limit switches, insert a small screwdriver through the hole in the adjusting knob and follow instructions 4 and 5 above with power turned off.

Maintenance

Under normal operation, electric actuators require no formal maintenance program.

Regularly scheduled inspections should be performed to check for:

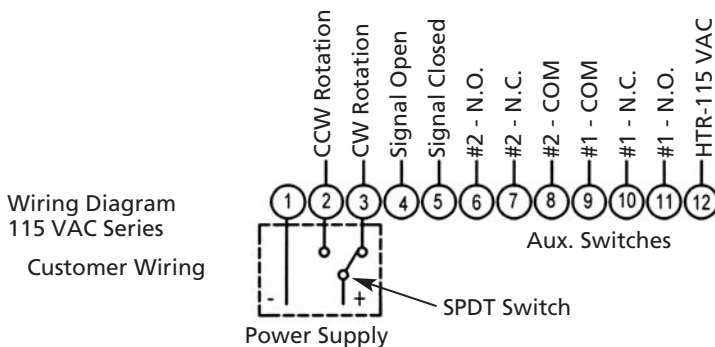
- Actuator-to-valve misalignment
- Damaged housing or mounting hardware
- Worn, loose or shifted parts due to shock, vibration, etc.

STORAGE

Store in clean, dry place and protect from severe temperature changes and vibration.

NOTE: After Installation it is the customers responsibility to be certain that all set screws, terminal screws, housing bolts and mounting bolts are tight and that all limit switches, potentiometers and position transmitters are calibrated to the individual settings required for their specific application.

Wiring Diagram



Problem	Cause / Corrective Action
Actuator Stops Operating	• Interrupted power. Check for broken or loose wires. Blown fuses or tripped breaker. Check switches. • Tripped thermal overload caused by overheating (see overheating below). • Motor burnout. Check to insure that correct voltage type is in use. Check all wiring against installation wiring diagrams. • Malfunctioning valve. Check that valve is operating properly.
Overheating	• Excessive duty cycle. Check duty cycle (frequency of operation). This electric actuator has a duty cycle of 50% (actuator is energized no more than 50% of the time). • Low voltage "brown out". Measure line voltage to insure that actuator is receiving full rated voltage. • Ambient temperature too high and/or heat being conducted through mounting hardware. • Motor stall. Check for foreign obstruction. Check valve for proper operation. Check for increased torque load due to line pressure, etc.
Low Torque Output	• Low voltage or current. Check to insure that power supply is within listed specifications. • Overheating. See overheating above.
Incorrect Travel or Operation	• Refer to "Cam Adjustment" in this manual. • Circuit not energized for full duration of cycle. Malfunction in control device (relay, switch, etc.), inspect and correct or replace.

Safety First

In the maintenance and operation of mechanical equipment, safety is a basic factor that must be considered at all times. By using proper clothing, tools and procedures, serious accidents to you and your fellow workers can be prevented.

After inspecting the actuator keep the following information for future reference.

Electric Actuator Model Number _____

Output Torque _____

Voltage _____

Serial Number _____

Date of Installation _____

Location _____

Valve / Line Tag Number _____

**E
N
G
L
I
S
H**

Por favor lea y guarde estas instrucciones. Léalas cuidadosamente antes de tratar de montar, instalar, operar o dar mantenimiento al producto aquí descrito. Protéjase usted mismo y a los demás observando toda la información de seguridad. ¡El no cumplir con las instrucciones puede ocasionar daños, tanto personales como a la propiedad! Guarde estas instrucciones para referencia en el futuro.

Actuador Eléctrico

Características

- Puede conectarse en paralelo con actuadores del mismo modelo
- Fácilmente accesible para hacer ajustes de la leva
- Eje de salida inoxidable tipo 316
- Ciclo de servicio de un 50% a temperatura ambiente y par de fuerzas nominal
- Protección contra sobrecargas térmicas para proteger el motor contra el sobrecalentamiento
- Sobrecontroles manuales en todos los modelos estándar
- Gira en sentido horario (hacia la derecha) para cerrar la válvula y antihorario (hacia la izquierda) para abrir la válvula
- Funciona en cualquier posición de montaje

⚠ ADVERTENCIA No conecte la alimentación eléctrica a la unidad a menos que ésta se encuentre totalmente armada y montada.

Siempre desconecte el suministro eléctrico y despresurice el sistema antes de realizar el mantenimiento.

Se recomienda utilizar un protector de ojos mientras se realiza el mantenimiento del sistema.

El incumplimiento de las advertencias anteriores podría ocasionar lesiones personales y/o daños a este producto.

Sobrecontrol manual

De producirse un corte de alimentación eléctrica, el actuador se puede ciclar manualmente. Para ciclar manualmente el actuador, coloque una llave en las partes planas expuestas en el extremo superior del eje y gire éste en la dirección deseada. Los actuadores giran en sentido horario (hacia la derecha) para cerrar la válvula y antihorario (hacia la izquierda) para abrir la válvula. Los interruptores limitadores se malogran si el eje no gira en el sentido correcto.

Inspección de entrega

1. Inspeccione visualmente el actuador para asegurarse que no se haya dañado en tránsito.
2. Verifique que el sobrecontrol manual funcione.
3. Verifique que el Número de Modelo sea el número correcto que se pidió.

4. Verifique que el voltaje del suministro eléctrico sea el mismo que el voltaje especificado en la etiqueta del actuador.
5. Verifique que la especificación NEMA indicada en la etiqueta satisfaga el requisito: Protegido contra la intemperie, resistente a la corrosión (NEMA 4, 4X).
6. Verifique que las configuraciones de posición de los pernos de montaje y de adaptador y eje de salida sean correctas.

Instalación

1. Antes de montar el actuador, verifique que el requisito de par de fuerzas para la válvula sea menor que la capacidad de par de fuerzas de salida del actuador.
2. Antes de insertarlo en el actuador, verifique que el adaptador del eje de salida sea del tamaño correcto para el vástago de la válvula o el amortiguador.
3. Inserte el adaptador del eje de salida en el actuador. Asegúrese que el encaje sea satisfactorio.
4. Determine si la posición del actuador, abierto o cerrado, coincide con la posición del equipo con el cual se va a montar. Utilice el sobrecontrol manual para cambiar la posición si es necesario.



5. Móntelo en la placa superior de la válvula, pieza de soporte de la válvula o el amortiguador. Asegúrese que la base del actuador esté al ras con la placa superior.
6. Inserte los pernos pero no los apriete.
7. Utilice el sobrecontrol manual para mover ligeramente el vástago de la válvula o el amortiguador, a fin de corregir el desplazamiento lateral o la desalineación.
8. Ponga manualmente la válvula en posición totalmente abierta o totalmente cerrada.
9. Apriete los pernos en forma pareja y alternando en forma cruzada hasta que todos estén bien apretados.

Instalación eléctrica

Verifique que el voltaje del suministro eléctrico sea el mismo que el voltaje necesario para el actuador.

Utilice el diagrama de cableado que aparece en la página siguiente. Utilice el diagrama de cableado que está dentro de la cubierta del actuador, para voltajes diferentes de 115V CA.

La alimentación eléctrica para las terminales 1 y 2 hace girar la leva en sentido antihorario (hacia la izquierda). La alimentación eléctrica para las terminales 1 y 3 hace girar la leva en sentido horario (hacia la derecha).

Actuador Eléctrico

Instalación eléctrica (continuación)

AVISO: Los actuadores de esta serie pueden conectarse en paralelo con otros actuadores del mismo modelo para simplificar las instalaciones múltiples.

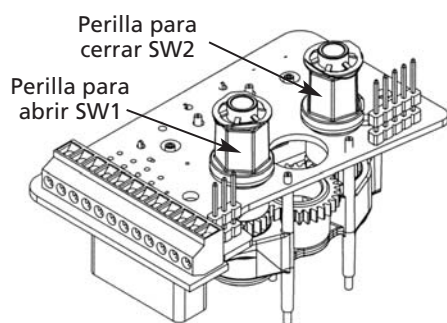
Ajuste de la leva

Las levas se ajustan inicialmente en la fábrica. Si necesitan un ajuste adicional, siga los pasos que se describen a continuación.

PARA ESTABLECER LA POSICION ABIERTA

AVISO: La palabra "OPEN" (indicación de leva) aparece impresa en el borde de la tarjeta de circuitos, enfrente de la perilla de ajuste de "abierto".

1. Desconecte la alimentación eléctrica.



2. Use el sobrecontrol manual para girar la válvula en sentido antihorario (hacia la izquierda) hasta su posición totalmente abierta.

3. Con la alimentación desconectada, retire la cubierta.
4. Gire la perilla de ajuste de la leva (posición abierta) en sentido antihorario (hacia la izquierda) hasta que la muesca en la base de la tarjeta esté alineada con la indicación "SW1" en la tarjeta de circuitos. Luego gire la perilla en sentido horario (hacia la derecha) hasta que escuche un clic suave emitido por el interruptor.
5. Suelte la perilla.

PARA ESTABLECER LA POSICION CERRADA

AVISO: La palabra "CLOSE" (indicación de leva) aparece impresa en el borde de la tarjeta de circuitos, enfrente de la perilla de ajuste de "cerrado".

1. Desconecte la alimentación eléctrica.
2. Use el sobrecontrol manual para girar la válvula en sentido horario (hacia la derecha) hasta su posición totalmente cerrada.
3. Con la alimentación desconectada, retire la cubierta.
4. Gire la perilla de ajuste de la leva (posición cerrada) en sentido horario (hacia la derecha) hasta que la muesca en la base de la tarjeta esté alineada con la indicación "SW2" en la tarjeta de circuitos. Luego gire la perilla en sentido antihorario (hacia la izquierda) hasta que escuche un clic suave emitido por el interruptor.
5. Suelte la perilla.

AVISO: Para ajustar los interruptores limitadores auxiliares, inserte un pequeño destornillador a través del orificio en la perilla de ajuste y siga las instrucciones 4 y 5 anteriores, con la alimentación eléctrica desconectada.

Mantenimiento

Bajo uso normal, los actuadores eléctricos no necesitan un programa de mantenimiento formal.

Se recomienda realizar inspecciones programadas en forma regular para observar las posibles condiciones siguientes:

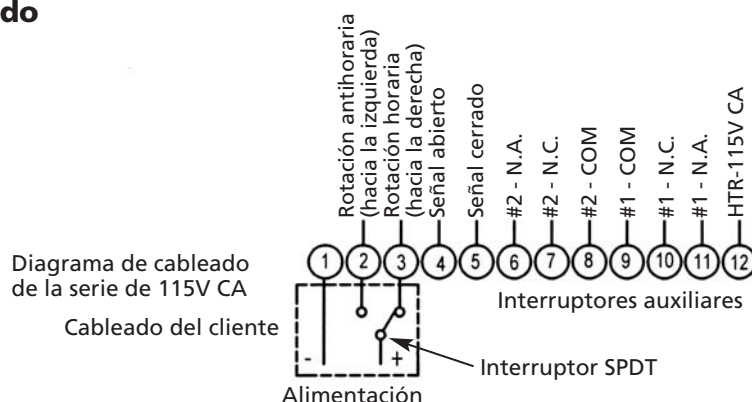
- Desalineación de actuador y válvula
- Caja o herraje de montaje dañados
- Partes o piezas desgastadas, sueltas o desplazadas debido a golpes, vibraciones, etc.

ALMACENAMIENTO

Almacene la unidad en un lugar limpio, seco y protegido contra vibraciones fuertes y cambios de temperatura severos.

AVISO: Después de la instalación, el cliente deberá asegurarse que todos los tornillos de fijación, tornillos de terminales, pernos de la caja y pernos de montaje estén bien apretados y que todos los interruptores limitadores, potenciómetros y transmisores de posición estén calibrados a los ajustes individuales necesarios para su uso en particular.

Diagrama de cableado



Problema	Causa/Acción correctiva
El actuador no funciona	- Alimentación interrumpida. Inspeccione para ver si hay conductores rotos o sueltos. Fusibles quemados o cortacircuito disparado. Revise los interruptores. - Protección de sobrecarga térmica disparada debido a un sobrecalentamiento (consulte el problema de sobrecalentamiento a continuación). - Motor quemado. Compruebe que se esté utilizando el tipo de voltaje correcto. Compruebe el cableado contra los diagramas de cableado de instalación. - Válvula defectuosa. Compruebe que la válvula funcione correctamente.
Sobrecalentamiento	- Ciclo de servicio excesivo. Verifique el ciclo de servicio (frecuencia de funcionamiento). Este actuador eléctrico tiene un ciclo de servicio de un 50% (el actuador está energizado no más de un 50% del tiempo). “Caída del voltaje de alimentación” por bajo voltaje. Mida el voltaje de línea para asegurarse que el actuador esté recibiendo el pleno voltaje nominal. - Temperatura ambiente demasiado alta y/o absorción de calor a través del herraje de montaje. - El motor se para. Inspeccione para ver si hay obstrucciones extrañas. Compruebe que la válvula funcione correctamente. Compruebe si hay una mayor carga de par de fuerzas debido a la presión en la línea, etc.
Produce un bajo par de fuerzas de salida	- Bajo voltaje o baja corriente. Compruebe que el suministro eléctrico esté dentro de las especificaciones indicadas. - Sobrecalentamiento. Consulte sobrecalentamiento arriba.
Un funcionamiento o recorrido incorrecto	- Consulte “Ajuste de la leva” en este manual. - Circuito no energizado durante todo el ciclo. Malfuncionamiento de un dispositivo de control (relé, interruptor, etc.), inspeccione y corrija o reemplace.

La seguridad es primero

En el mantenimiento y uso de los equipos mecánicos, la seguridad es un factor básico que se debe tener en cuenta en todo momento. El uso de ropa, herramientas y procedimientos adecuados puede prevenir los accidentes graves de usted y de sus compañeros de trabajo.

Después de inspeccionar el actuador, retenga la siguiente información para referencia en el futuro.

Número de modelo del actuador eléctrico _____

Par de fuerzas de salida _____

Voltaje _____

Número de serie _____

Fecha de instalación _____

Lugar _____

Número de identificación de válvula y línea _____

Notas

E
S
P
A
Ñ
O
L

Lined area for notes.

Veuillez lire et conserver ces instructions. Lire attentivement avant de commencer à assembler, installer, faire fonctionner ou entretenir l'appareil décrit. Protégez-vous et les autres en observant toutes les informations sur la sécurité. Négliger d'appliquer ces instructions peut résulter en des blessures corporelles et/ou en des dommages matériels ! Conserver ces instructions pour références ultérieures.

Servomoteur électrique

Caractéristiques

- Peut être câblé en parallèle avec des servomoteurs de même modèle
- Accès facile pour l'ajustement de la came
- Arbre secondaire en acier inoxydable de type 316
- Cycle de service de 50 % à température ambiante et couple aux caractéristiques nominales
- Protection contre la surcharge thermique pour prévenir la surchauffe du moteur
- Actionnements manuels sur tous les modèles standard
- Tourne dans le sens horaire pour fermer la soupape et dans le sens antihoraire pour l'ouvrir
- Fonctionne monté dans n'importe quelle position

⚠ AVERTISSEMENT *Ne pas mettre sous tension tant que l'appareil n'est pas entièrement assemblé et monté.*

Toujours débrancher de la source d'alimentation électrique et purger la pression du système avant d'effectuer l'entretien.

Il est recommandé de porter une protection oculaire lors de l'entretien du système.

Négliger d'appliquer les avertissements ci-dessus peut entraîner des blessures et (ou) des dommages à la propriété.

Actionnement manuel

En cas de panne de courant, le servomoteur peut être actionné manuellement. Pour actionner manuellement le servomoteur, appliquer une clé sur les méplats exposés à l'extrémité supérieure de l'arbre et tourner dans le sens voulu. Les servomoteurs tournent dans le sens horaire pour fermer la soupape et dans le sens antihoraire pour l'ouvrir. Négliger de faire tourner dans le sens correct entraînera un mauvais fonctionnement des rupteurs.

Inspection à la réception

1. Effectuer une inspection oculaire pour s'assurer que le servomoteur n'a pas été endommagé pendant le transport.

2. Vérifier que l'actionnement manuel fonctionne correctement.
3. Vérifier que le numéro de modèle correspond à l'appareil commandé.
4. Vérifier que l'alimentation électrique est identique à celle spécifiée sur l'étiquette du servomoteur.
5. Vérifier que les caractéristiques nominales NEMA sur l'étiquette sont celles requises : À l'épreuve des intempéries / Résistant à la corrosion (NEMA 4, 4X).
6. Vérifier que le motif du boulon de montage et les configurations de l'arbre / adaptateur de sortie correspondent aux spécifications requises.

Installation

1. Avant de monter le servomoteur, vérifier que l'exigence de couple de la soupape est inférieure au couple de sortie nominal du servomoteur.
2. Vérifier que l'adaptateur d'arbre de sortie s'ajuste à la tige de la soupape ou de l'amortisseur avant de l'insérer dans le servomoteur.
3. Insérer l'adaptateur d'arbre de sortie dans le servomoteur. S'assurer que l'ajustement est satisfaisant.
4. Déterminer que la position du servomoteur, ouverte ou fermée,

correspond à la position de l'équipement avec lequel il doit être monté. Au besoin, utiliser l'actionnement manuel pour changer la position.

5. Monter sur la plaque supérieure de la soupape, sur le support de soupape ou sur l'amortisseur. S'assurer que la base du servomoteur est à l'affleurement de la plaque supérieure.
6. Insérer les boulons mais sans les serrer.
7. Utiliser l'actionnement manuel pour déplacer légèrement la tige de soupape ou l'amortisseur afin de corriger une poussée latérale ou un désalignement.
8. Placer manuellement la soupape à l'une des deux positions de pleine course.
9. Serrer les boulons en utilisant un motif croisé et en vissant les boulons à égalité jusqu'à la fin.

Installation électrique

Vérifier que la tension de l'alimentation électrique est identique à la tension requise pour le servomoteur.

Suivre le schéma de câblage sur la page suivante. Utiliser le schéma de câblage situé à l'intérieur du couvercle du servomoteur pour des tensions autres que 115 V c.a.



2-Fr

Problème	Cause/Action correctrice
Arrêt du servomoteur	- Alimentation coupée. Vérifier que des fils ne sont pas coupés ou desserrés. Fusibles grillés ou disjoncteur déclenché. Vérifier les sélecteurs. - Déclenchement de la surcharge thermique causé par une surchauffe (voir la rubrique Surchauffe plus bas). - Moteur brûlé. Vérifier pour s'assurer que la tension correcte est utilisée. Vérifier l'intégralité du câblage en consultant les schémas de câblage. - Mauvais fonctionnement de soupape. Vérifier que la soupape fonctionne correctement.
Surchauffe	- Cycle de service excessif. Vérifier le cycle de service (fréquence d'utilisation). Ce servomoteur électrique a un cycle de service de 50 % (le servomoteur est activé à un maximum de 50 % du temps). - Faible tension « délestage du réseau d'électricité ». Mesurer la tension de ligne pour s'assurer que le servomoteur reçoit sa pleine tension. - Température ambiante trop élevée et (ou) la chaleur est conduite par les pièces de montage. - Calage du moteur. Vérifier si un corps étranger crée une obstruction. Vérifier si la soupape fonctionne correctement. Vérifier si la charge de couple a augmenté en raison d'une pression de ligne, etc.
Faible sortie de couple	- Faible tension ou courant. Vérifier pour s'assurer que l'alimentation électrique correspond aux spécifications indiquées. - Surchauffe. Voir la rubrique Surchauffe ci-dessus.
Course ou fonctionnement incorrect	- Consulter « Ajustement de la came » dans ce manuel. - Le circuit n'est pas activé pour toute la durée du cycle. Mauvais fonctionnement dans un dispositif de commande (relais, rupteur, etc.), inspecter et corriger ou remplacer.

Sécurité d'abord

Lors de l'entretien et de l'utilisation d'équipement mécanique, la sécurité est un facteur de base dont il faut tenir compte en tout temps. L'utilisation de vêtements, d'outils et de procédures appropriés, permet de prévenir des accidents pour soi-même et pour ses compagnons de travail.

Après avoir inspecté le servomoteur, conserver les informations qui suivent pour référence future.

Numéro de modèle du servomoteur électrique _____

Couple de sortie _____

Tension _____

Numéro de série _____

Date de l'installation _____

Emplacement _____

Numéro d'étiquette de soupape/ligne _____

Notes

Lined area for notes.

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Electric Actuator

DC Voltage, 12 – 24 Vdc

ADJUST OPEN POSITION

Unit not in full open position.

a) Apply power to terminals 1 & 2 to move the open cam knob clockwise toward open position. Do not remove power.

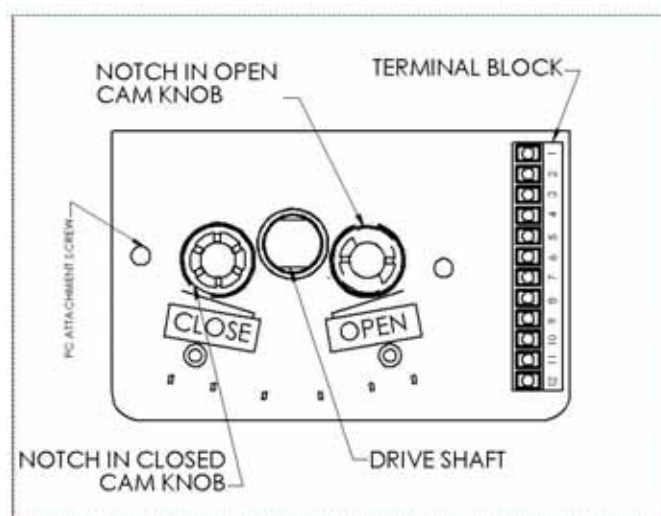
b) With a 3/8 wrench, move open cam knob counter-clockwise slightly and release, to jog motor, until motor moves the drive shaft to the desired open position. If necessary, repeat jogging movement until desired open position is attained. Use the flats on the drive shaft as a guide for position.

Unit past full open position.

a) Apply power to terminals 1 & 3 to move actuator drive shaft to the closed position. At this time turn open cam knob to align the notch at the base of the knob, with the ground screw.

b) Reapply power to terminals 1 & 2.

c) With a 3/8 wrench, move open cam knob counter-clockwise slightly and release, to jog motor, until motor moves the shaft to the desired open position. If necessary, repeat jogging movement until desired open position is attained.



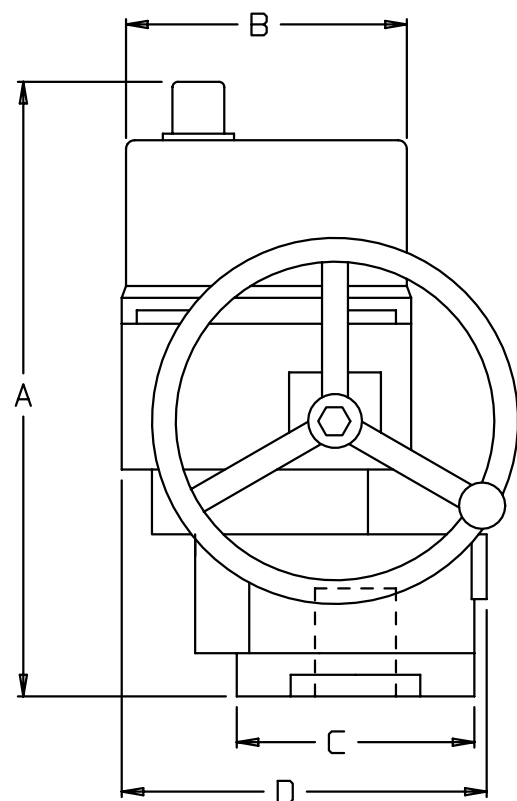
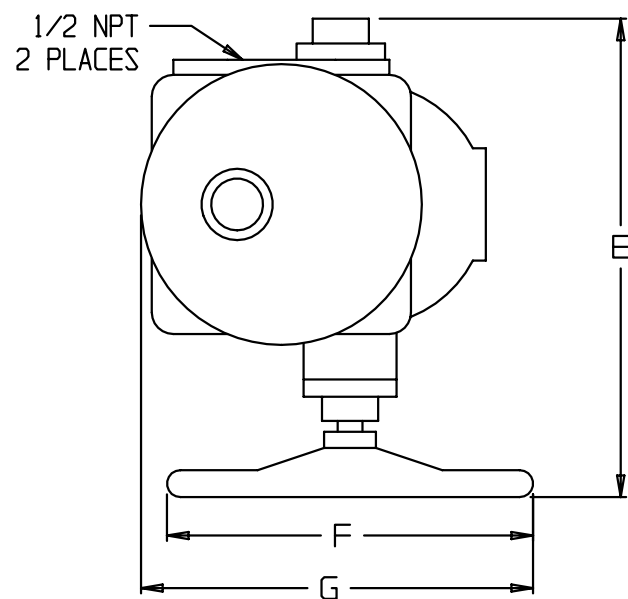
ADJUST CLOSED POSITION

Unit not in full closed position.

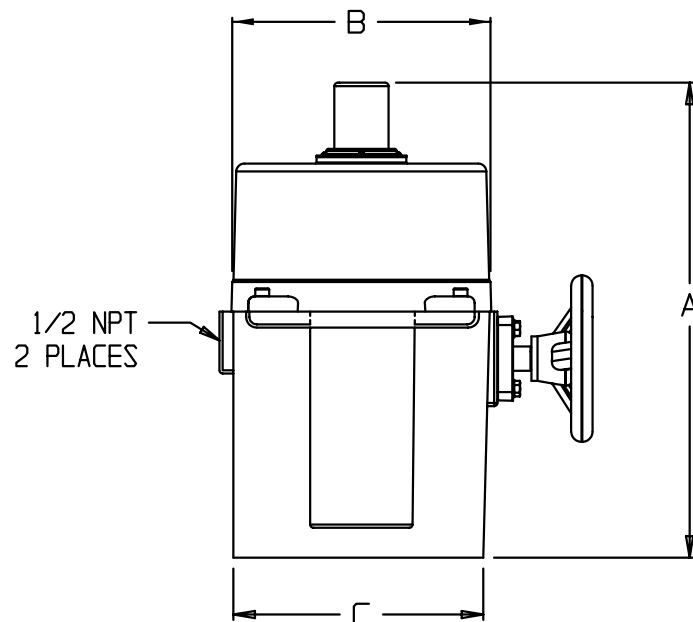
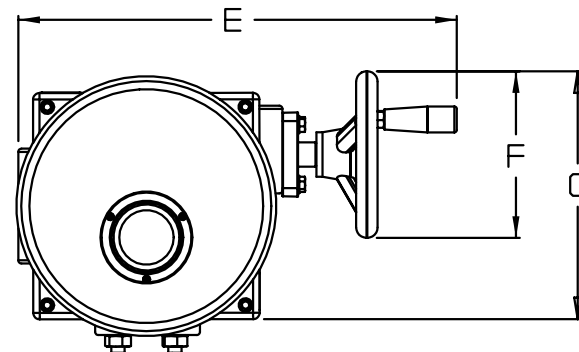
- a) Apply power to terminals 1 & 3 to move close cam knob counter-clockwise toward closed position. Do not remove power.
- b) With a 3/8 wrench, move close cam knob clockwise slightly and release, to jog motor, until motor moves the drive shaft to the desired closed position. If necessary, repeat jogging movement until desired closed position is attained. Use the flats on the drive shaft as a guide for position.

Unit past full closed position.

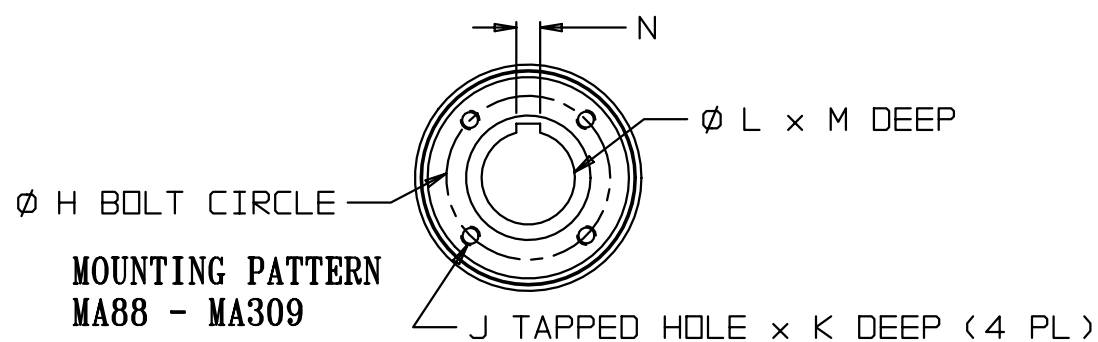
- a) Apply power to terminals 1 & 2 to move actuator shaft to the open position. At this time move the close cam knob to align the notch at the base of the cam knob, with the PC board attachment screw.
- b) Reapply power to terminals 1 & 3.
- c) With a 3/8 wrench, move close cam knob clockwise slightly and release, to jog motor, until the motor moves the drive shaft to the desired closed position. If necessary, repeat jogging movement until the desired closed position is attained.



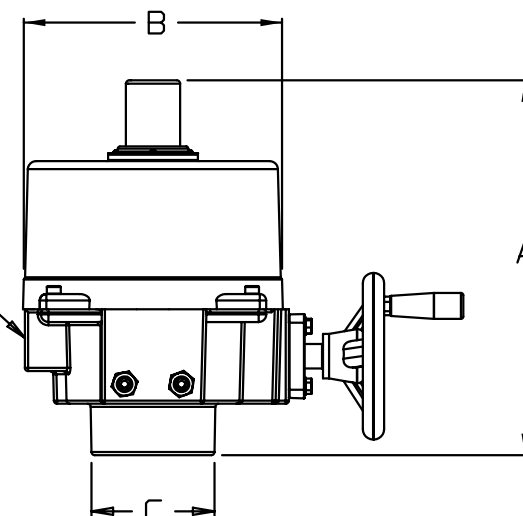
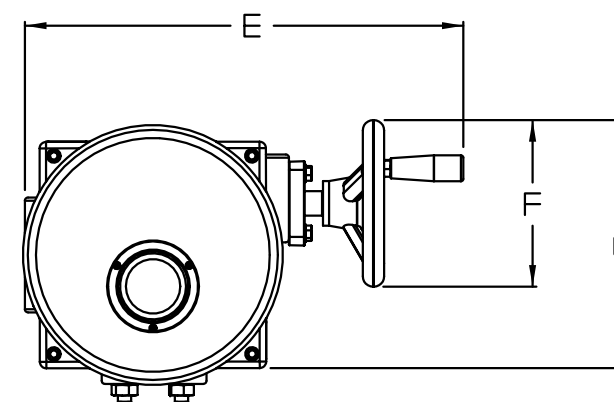
MA177
MA221
MA265
MA306



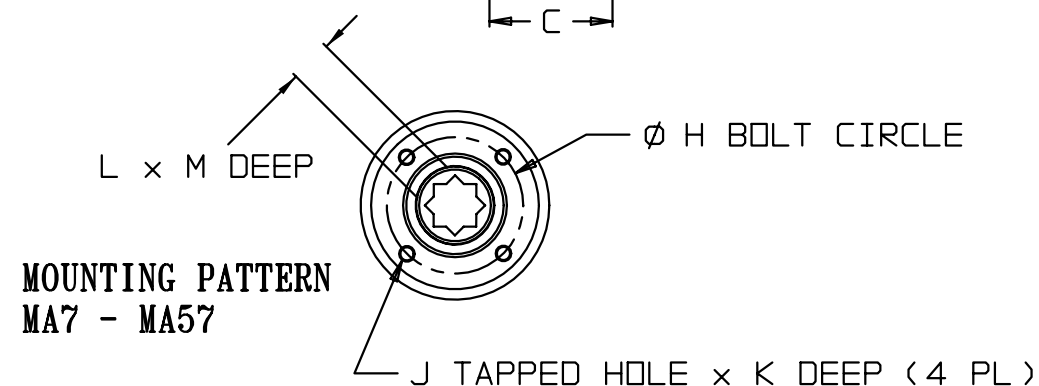
MA88
MA32



MOUNTING PATTERN
MA88 - MA309



MA7
MA13
MA20
MA35
MA44
MA57



MOUNTING PATTERN
MA7 - MA57

SEE PAGE 2 FOR ADDITIONAL SPECIFICATIONS

MODEL	TORQUE IN-LB	CYCLE TIME	A	B	C	D	E	F	G	H	J	K	L	M	N
MA7	795	15 sec	10.04	7.87	3.55	---	13.00	4.92	7.87	2.76	M8	.75	.866	1.18	
MA13	1325	22 sec													
MA20	2000	28 sec													
MA35	3540	22 sec	12.40	9.21	4.92	---	14.96	7.68	11.81	4.02	M10	.63	1.378	1.57	---
MA44	4425	28 sec													
MA57	5750	35 sec													
MA88	8850	46 sec	16.54	9.21	7.09	---	17.72	11.61	13.39	5.51	M16	1.14	1.378	2.36	.394
MA132	13275	46 sec													
MA177	17700	58 sec													
MA221	22125	58 sec	23.23	10.24	8.70	13.00	18.50	15.75	13.79	6.496	M20	1.14	2.953	3.94	.472
MA265	26550	58 sec													
MA309	30975	58 sec													

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PG 1 OF 2

NO. MA SERIES FILE NO. SUB116.1

TITLE
MA7 - MA309 SERIES
ELECTRIC ACTUATOR

DR	DATE	CH'KD	DATE	ENGR	DATE
LJH	09-22-05	LJH	03-31-03	LJH	03-31-03



Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

DynaQuip® Controls MA Series Electric Actuator

Features

- 30% Duty cycle at ambient temperature and rated torque
- Thermal overload protection to guard motor against overheating
- Manual overrides on all standard models
- Rotates clockwise to close valve and counterclockwise to open valve
- Mechanical dial position indicator
- Self-locking gearing

⚠ WARNING Do not apply electric power unless unit is fully assembled and mounted.

Always disconnect electric power source and relieve pressure in the system before working on this unit.

It is recommended that eye protection be worn while servicing the system.

Failure to comply with above warnings could result in personal injury and/or damage to the unit.

Manual Override

In the event of power failure, the DynaQuip actuator may be cycled manually. Handwheel manual override is always engaged. Actuators rotate clockwise to close valve and counterclockwise to open valve. Failure to rotate in the proper direction will cause limit switches to malfunction.

Inspection Upon Receipt

1. Visually inspect to be sure actuator has not been damaged in transit.
2. Verify that Model Number is correct as ordered.
3. Verify that electrical supply voltage is the same as specified on the actuator label.
4. Verify that NEMA rating on label is as required: Weatherproof/Corrosion Resistant (NEMA 4).
5. Check that mounting bolt pattern and output shaft/adaptor configurations are as required.

6. Turn handwheel to be certain that manual override and position indicator are in working condition and have not been damaged in transit.

Installation

1. Before mounting actuator, verify that the torque requirement is less than the output torque of the actuator.
2. Check that output shaft adapter fits stem of valve or damper before inserting into actuator.
3. Insert output shaft adapter into actuator. Make sure fit is satisfactory.
4. Determine that actuator position, open or closed, matches position of equipment with which it is to be mounted. Use manual override to change position, if necessary.
5. Mount to top plate of valve, valve bracket or damper. Be sure that base of actuator is flush with top plate.
6. Insert bolts but do not tighten.
7. Use manual override to move stem of valve or damper slightly to correct side thrust or misalignment.
8. Manually place valve in either full stroke position.
9. Tighten bolts using a cross pattern and equally drawing bolts down to finish.

Electrical Installation

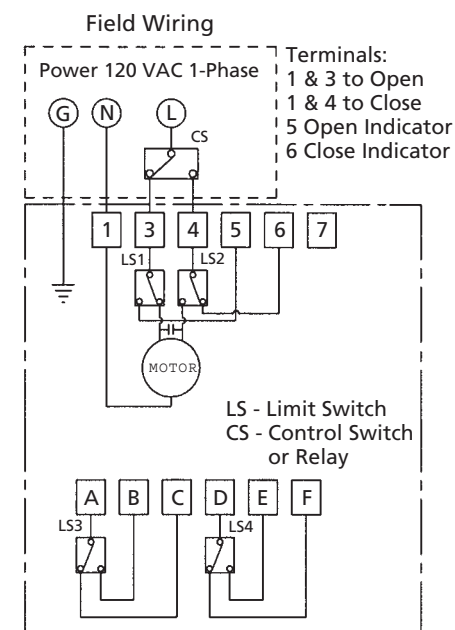
Verify that the electrical supply voltage is the same as required actuator voltage.



Follow wiring diagram below. Use the wiring diagram inside actuator cover for voltages other than 115VAC.

NOTE: Electric power to terminals 1 & 3 will cause the camshaft to rotate counterclockwise.

Electric power to terminals 1 & 4 will cause the camshaft to rotate clockwise.



DynaQuip® Controls MA Series Electric Actuator

Travel Stop Adjustment

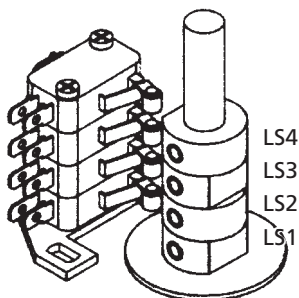
At the base of the DynaQuip Controls MA series electric are two (2) adjustable travel stops.

1. Facing the actuator, with housing vertical, the adjustable bolt to the left controls CCW movement (valve open). The bolt to the right controls CW movement (valve close).
2. Loosen both adjustable stops so that full travel in either direction will not engage them.
3. After mounting and tightening actuator to valve use manual override to drive valve to the fully closed position.
4. Tighten the adjustable stop bolt on the right side until it engages the stop. Back the bolt off one-half turn. Tighten nut.
5. Follow same procedure in item 4 after fully opening the valve.

Cam Adjustment

The cams are preset at the factory. When additional adjustments are needed, follow steps described below.

- LS4 - Sets with LS2
- LS3 - Sets with LS1
- LS2 - Close
- LS1 - Open



TO SET OPEN POSITION

1. Turn power off.
2. Use manual override to turn valve to the fully open position.
3. With the power turned off, remove cover, loosen set screw in the bottom cam. This cam controls the open position.
4. Rotate cam clockwise into the switch.
5. Slowly rotate cam counterclockwise until you hear a light click. Tighten set screw.
6. Reinstall cover and turn power back on.

TO SET CLOSED POSITION

1. Turn power off.
2. Use manual override to turn valve to the fully closed position.
3. With the power turned off, remove cover, loosen set screw in the second from bottom cam. This cam controls the closed position.
4. Rotate cam counterclockwise into switch.
5. Slowly rotate cam clockwise until you hear a light click. Tighten set screw.
6. Reinstall cover and turn power back on.

Maintenance

Under normal operation, DynaQuip electric actuators require no formal maintenance program.

Regularly scheduled inspections should be performed, to check:

- Actuator-to-valve alignment
- Damaged housing or mounting hardware
- Worn, loose or shifted parts due to shock, vibration, etc.

STORAGE

Store in climate controlled environment to prevent condensation. If stored outdoors internal heaters must be installed and functioning.

Note: After Installation it is the customers responsibility to be certain that all set screws, terminal screws, housing bolts and mounting bolts are tight and that all limit switches, potentiometers and position transmitters are calibrated to the individual settings required for their specific application.

See back cover for modulating control interface instructions.

MA SERIES

Troubleshooting Chart

Problem	Cause / Corrective Action
Actuator Stops Operating	• Interrupted power. Check for broken or loose wires. Blown fuses or tripped breaker. Check switches. • Tripped thermal overload caused by overheating (see overheating below). • Motor burnout. Check to insure that correct voltage type is in use. Check all wiring against installation wiring diagrams. • Malfunctioning valve. Check to insure that valve is operating properly.
Overheating	• Excessive duty cycle. Check duty cycle (frequency of operation). DynaQuip electric actuators have a duty cycle of 30% (actuator is energized no more than 30% of the time). • Low voltage "brown out". Measure line voltage to insure that actuator is receiving full rated voltage. • Ambient temperature too high and/or heat being conducted through mounting hardware. • Motor stall. Check for foreign obstruction. Check valve for proper operation. Check for increased torque load due to line pressure, etc.
Low Torque Output	• Low voltage or current. Check to insure that power supply is within listed specifications. • Overheating. See overheating above.
Incorrect Travel or Operation	• Refer to "Cam Adjustment" in this manual. • Circuit not energized for full duration of cycle. Malfunction in control device (relay, switch, etc.), inspect and correct or replace. • Out of phase for three phase actuators. Switch two incoming power leads.

Safety First

In the maintenance and operation of mechanical equipment, safety is a basic factor that must be considered at all times. By using proper clothing, tools and procedures, serious accidents to you and your fellow workers can be prevented.

After inspecting the actuator keep the following information for future reference.

Electric Actuator Model Number _____

Output Torque _____

Voltage _____

Serial Number _____

Date of Installation _____

Location _____

Valve / Line Tag Number _____

DynaQuip® Controls MA Series Electric Actuator

Modulating Control Board; Interface

TURN POWER OFF BEFORE CHANGING ANY SETTINGS

Instrument Input Signal, Output Signal and Failure Mode Selection

The selection of "input signal", "output signal" and "failure mode" is determined by "Dip Switches" S1 to S8.

Instrument Input Signal Selection

- A) 4 - 20 mA: Set 1 "ON" / 2 "OFF"
- B) 2 - 10 VDC : Set 1 "OFF" / 2 "ON"
- C) 1 - 5 VDC : Set 1 "OFF" / 2 "OFF"

Output Signal Position Transmission Signal

- A) 4 - 20 mA: Set 3 "OFF" / 4 "ON" / 5 "OFF"
- B) 2 - 10 VDC : Set 3 "ON" / 4 "OFF" / 5 "ON"

Valve Position at Signal Input

- A) Fully "Closed" at 4 mA, 2 V or 1 V and fully "Open" at 20 mA, 10 V, or 5 V : Set 6 "OFF"
- B) Fully "Closed" at 20 mA, 10 V or 5 V and fully "Open" at 4 mA, 2 V, or 1 V : set 6 "ON"

Valve Position upon Loss of Instrument Signal

- A) Valve stays in "LAST POSITION" when 4 mA (2 V or 1 V) is "Fully Closed" : Set 7 "ON" / 8 "ON"
- B) Valve moves to "Closed" when 4 mA (2 V or 1 V) is "Fully Closed" : Set 7 "OFF" / 8 "ON"
- C) Valve moves to "Open" when 4 mA (2 V or 1 V) is "Fully Closed" : Set 7 "ON" / 8 "OFF"
- A) Valve stays in "LAST POSITION" when 20 mA (10 V or 5 V) is "Fully Closed" : Set 7 "ON" / 8 "ON"
- B) Valve moves to "Closed" when 20 mA (10 V or 5 V) is "Fully Closed" : Set 7 "ON" / 8 "OFF"
- C) Valve moves to "Open" when 20 mA (10 V or 5 V) is "Fully Closed" : Set 7 "OFF" / 8 "ON"

ZERO & SPAN ADJUSTMENT

Zero (VR2)

- A) Place actuator in full clockwise position.
- B) Input signal (4 mA, 2 V, or 1 V).
- C) Turn VR2 in a counterclockwise direction until RED LIGHT remains ON.

SPAN (VR1)

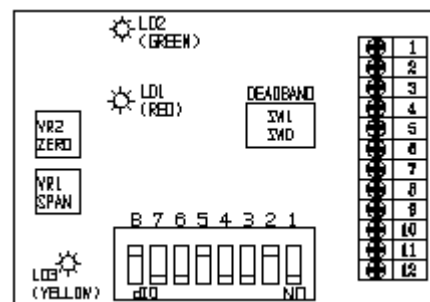
- A) Place Actuator in full counterclockwise position.
- B) Input signal (20 mA, 10 V, or 5 V).
- C) Turn VR1 in a clockwise direction until the GREEN LIGHT remains ON.

DEADBAND ADJUSTMENT

Deadband (SW1 - SW0 adjust sensitivity to input signals)

- A) Greatest sensitivity is with switch "1" (0 - 90° is divided into 80 set points)
- B) Least sensitivity is with switch at "0". (17 set points)

(Each selected number after "1" drops the number of inputs by 17 from the previous setting.)
(Setting 2 would have 63 set points, etc.)



Thank you for selecting DynaQuip electric actuators for your valve automation requirements.