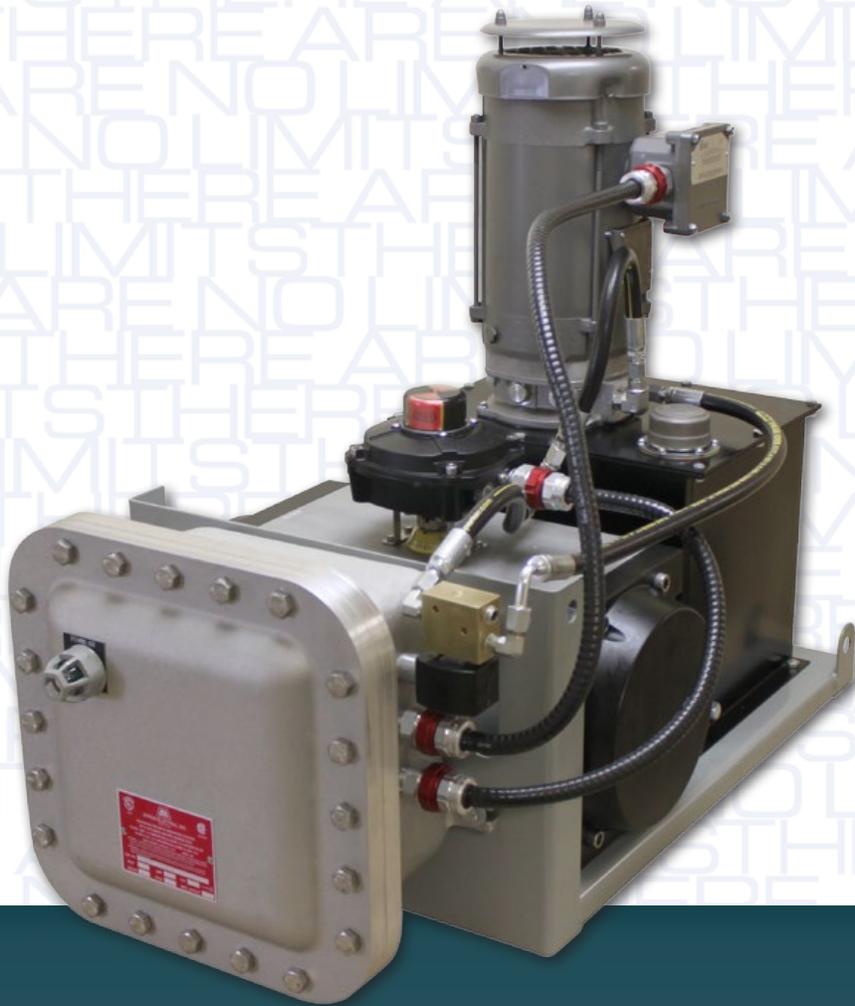


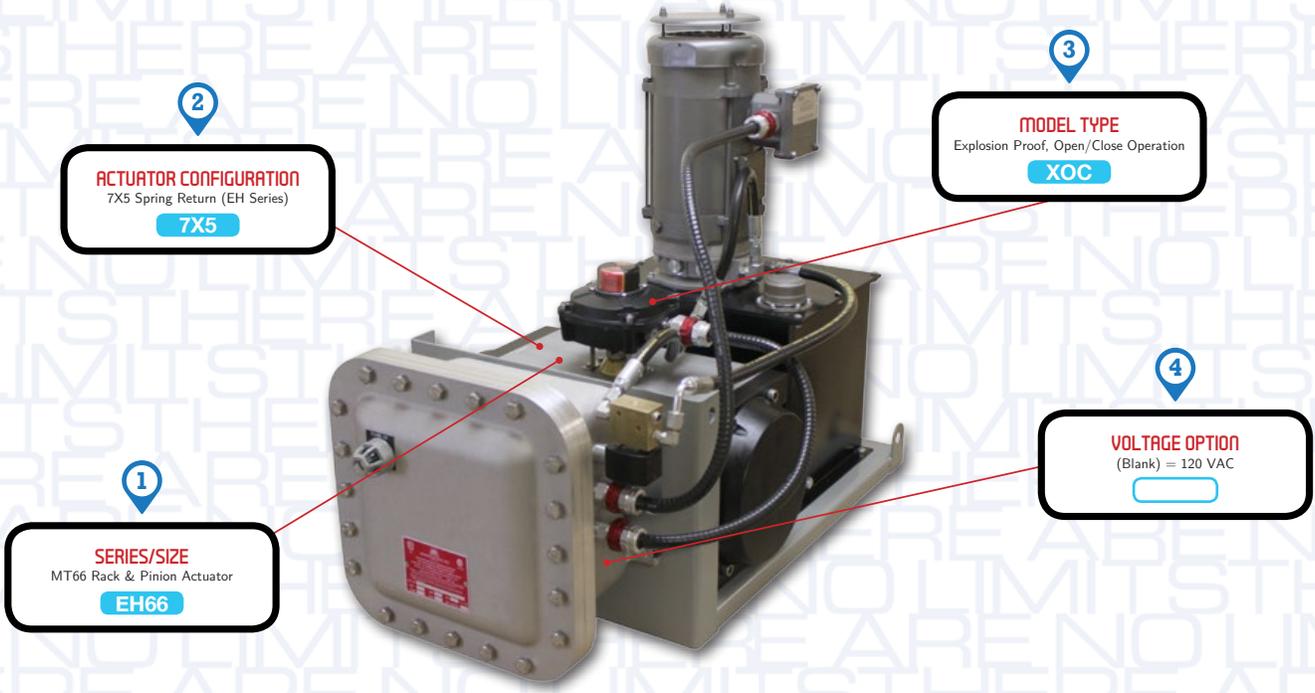
MAX-AIR ELECTRO-HYDRAULIC ACTUATORS



ELECTRO-HYDRAULIC ACTUATORS



PART NUMBER BUILDER



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1	2	3	4
Series/Size	Actuator Configuration	Model Type	Voltage Option
EH66	7X5	XOC	[Blank]
<ul style="list-style-type: none"> EH16 = MT16 rack & pinion EH17 = MT17 rack & pinion EH21 = MT21 rack & pinion EH26 = MT26 rack & pinion EH31 = MT31 rack & pinion EH36 = MT36 rack & pinion EH41 = MT41 rack & pinion EH46 = MT46 rack & pinion EH51 = MT51 rack & pinion EH56 = MT56 rack & pinion EH61 = MT61 rack & pinion EH66 = MT66 rack & pinion EH71 = MT71 rack & pinion EH76 = MT76 rack & pinion EHSY14 = SY14 scotch yoke EHSY16 = SY16 scotch yoke EHSY25 = SY25 scotch yoke EHSY30 = SY30 scotch yoke EHSY35 = SY35 scotch yoke EHSY40 = SY40 scotch yoke EHSY48 = SY48 scotch yoke EHSY60 = SY60 scotch yoke 	<ul style="list-style-type: none"> 7X5 = 7X5 spring config (up to MT66) S8 = 8X8 spring config (MT71 & 76) SR4 = #4 spring config (SY Series) SR5 = #5 spring config (SY Series) SR6 = #6 spring config (SY Series) 	<ul style="list-style-type: none"> OC = Open/Close operation MOD = Modulating operation, 4-20mA MOD2 = Modulating operation, 0-10V XOC = Exp. Proof, Open/Close operation XMOD = Exp. Proof, Modulating operation, 4-20mA XMOD2 = Exp. Proof, Modulating operation, 0-10V 	<ul style="list-style-type: none"> [Blank] = (BLANK) 120 VAC (standard) 220 = 220 VAC 3P240 = 3-Phase, 240 VAC

Example Part Number

1	2	3	4
Series/Size	Actuator Configuration	Model Type	Voltage Option
EH66	7X5	XOC	[Blank]

Description: Series EH, MT66 size rack & pinion actuator, 7X5 spring return configuration, explosion proof model, open/close operation, 120 VAC voltage

OVERVIEW

Fluid process control systems are continuously growing larger in scale and complexity. In industries such as oil, gas, and power these pipeline systems can spread across multiple locations and form networks that span over thousands of miles. Fail-safe valves such as ESD's (Emergency Shutdown Devices) are regularly used in such systems to prevent catastrophic failure, isolate problems areas, and protect pipeline equipment. In many cases, these are installed in remote locations where access to compressed air is impractical, making pneumatic actuators difficult to use. Electrically operated devices can, however, be installed with little additional infrastructure and can provide control and feedback capability - which makes them ideally suited for remote operation.

Fail-safe valves are usually electrically operated with either an electric spring-return actuator or an electro-hydraulic spring-return actuator. A purely electric actuator with spring-return capability is a complex, precision engineered device and is one of the most expensive ways to actuate a valve for a given torque. Although electric actuators do offer the convenience of a single enclosed package, the electro-hydraulic actuator is a more economical and reliable alternative. The electronics required are much simpler and the inherent mechanical simplicity makes the product more robust. Instead of an electric motor and gearing, an electro-hydraulic unit uses a fixed-displacement gear type pump to force hydraulic fluid into an actuator cylinder, which then mechanically turns the valve. The hydraulic fluid acts as a damper during actuation and improves valve control and precision, which is especially critical in modulating applications. Electro-hydraulic actuation packages are self-contained and can typically be mounted directly to the valve as a single unit, giving them the convenience of an electric actuator without the cost and complication.

WHY MAX-AIR ELECTRO-HYDRAULIC?

Max-Air uses the proven principles of electro-hydraulic actuation in our EH and EHSY Series. Our mission is to deliver a robust, reliable product with easy installation and low maintenance requirements. We also provide custom engineering solutions beyond our standard offerings and strive to enable end users with excellent technical training and support. The EH and EHSY Series range is designed for fail-safe actuation across a wide range of torques with reliability and lower cost than an equivalent electric actuator. Max-Air is proud to have the EH Series as a part of our product line. Below are some highlights of the EH and EHSY Series' features and benefits.



Features	Benefits
On/Off control & ESD	Optimal for critical safety applications
Modulating control 4-20mA or 0-10V & ESD	Allows for greater process control
90° standard or 180° optional rotations available	2-way standard or 3-way operation available
Multiple input power options (120VAC, 220 VAC, 3-Phase 240 VAC)	Easy installation with existing infrastructure
Self-contained system, electrically operated	Ideal for remote locations
Mechanical spring fail-safe mechanism	Reliable shutoff on power or signal loss
Standard NEMA 4/4X rating	Suitable for harsh outdoor environments
Optional NEMA 9 design	Suitable for Class 1 Div. 2 environments
Open design for easy maintenance	Quick and straightforward serviceability
Accessible control box enclosure	Easy adjustment & maintenance
Visual state indicators available	Easy identification of valve state (open/closed)
Low pressure operation (< 150 PSI) and vibration resistant	Minimizes maintenance and leaks, reduces environmental impact
Hydraulic fluid reservoir with breather cap	Keeps out unwanted fluids or particles while allowing reservoir fluid to remain unpressurized
Optional declutch-able manual override	Enables valve to lock in position during system maintenance, minimizing down-time
Hydraulics natural dampening properties	Improved valve control and precision
Optional partial stroke testing capability	Enables valve testing while remaining operational
Optional stroke speed control capability (limited)	Increase or decrease stroke times based on customer needs
Epoxy coated steel base plate w/ lift points	Compact design and easy installation & mounting
Safety switch to shut down pump at full rotation	Positive fail-safe to avoid over-pressurization
Optional high pressure operation for systems using scotch yoke actuators (EHSY Series)	Smaller footprint and more compact design
Optional low temperature model	Operation in extreme low temp environments
Advanced communication options	Call for options

EH SERIES RANGE/DESCRIPTIONS

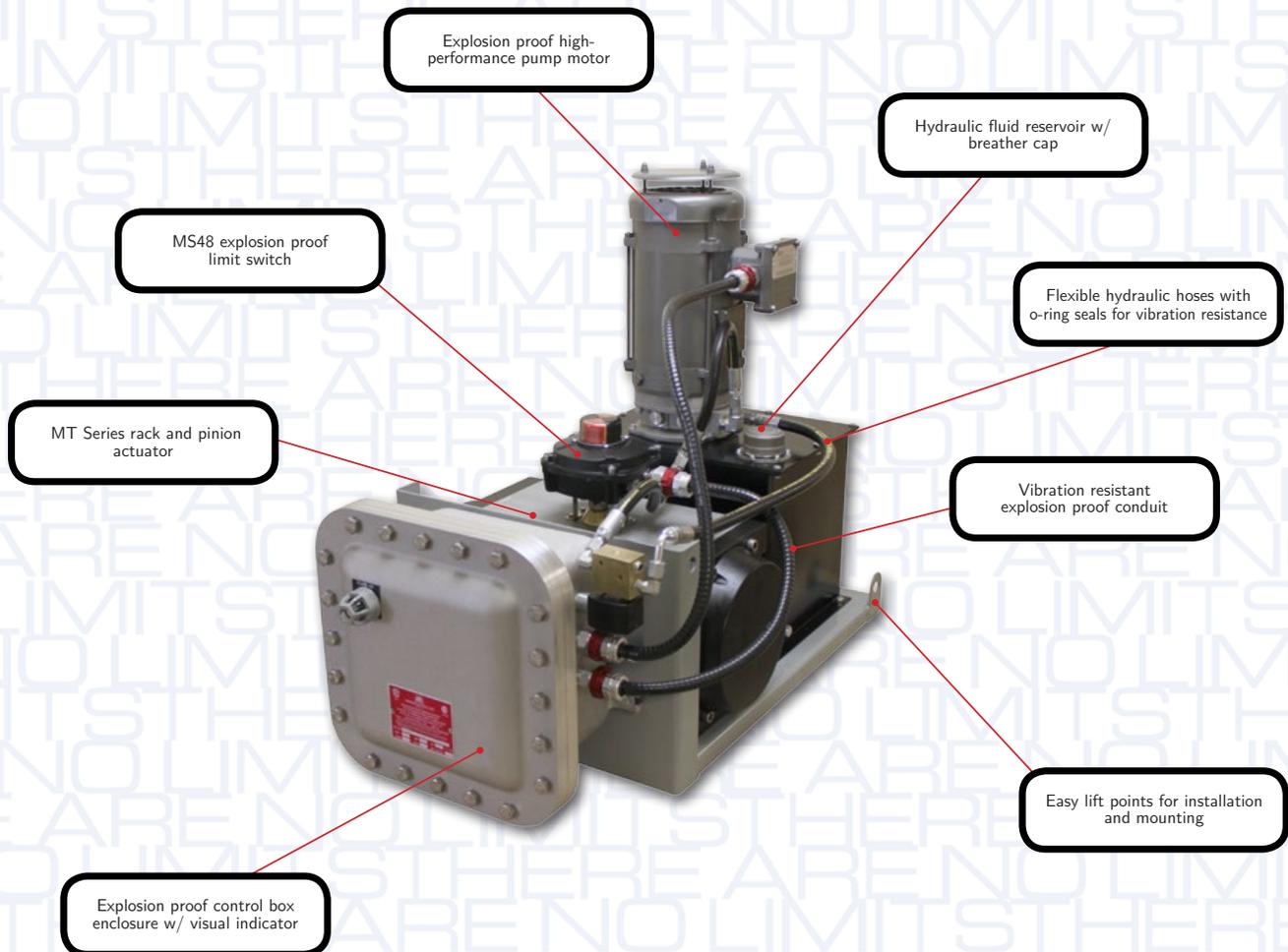


EH SERIES OC AND MOD - NEMA 4/4X

Our standard Electro-hydraulic unit is available for On/Off and Modulating service. The NEMA 4/4X rated design can withstand high pressure wash-down and harsh outdoor environments. For torques up to 14,725 in-lbs, Max-Air's EH Series uses the MT Series rack and pinion actuator paired with a hydraulic power pack unit. Max-Air's EHSY Series uses the SY Series scotch-yoke actuators for higher torques up to 635,000 in-lbs. These self-contained hydraulic systems are mounted to an epoxy-coated steel support structure and come standard with an ISO bolt pattern for valve mounting, as well as lift points for easy installation. All components are integrated into a compact footprint with an accessible control box enclosure and open design for easy serviceability.

EH SERIES XOC AND XMOD - EXPLOSION PROOF

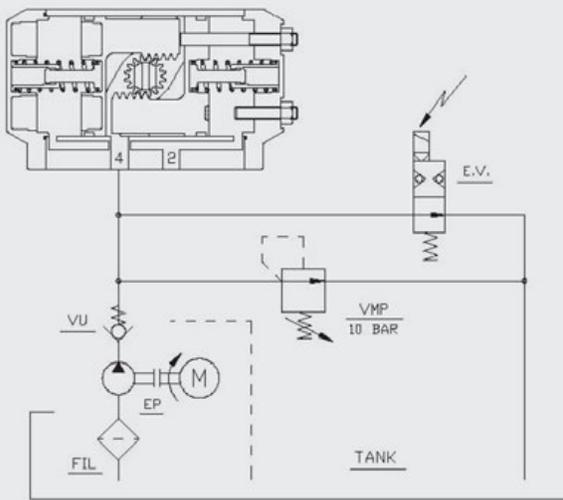
The explosion proof Electro-hydraulic unit is also available in both On/Off and Modulating versions. All components are carefully selected and integrated together to achieve a high-performance unit suitable for Class 1, Div. 2 hazardous environments. This model is both NEMA 4/4X and NEMA 9 rated, and comes in the same compact design including ISO mounting pattern, easy lift points, and an explosion proof control box enclosure.



PRINCIPLE OF OPERATION

The EH and EHSY Series are completely sealed and self-contained fail-safe electro-hydraulic automation packages consisting of a Max-Air spring return actuator (either MT Series rack and pinion style or SY Series scotch yoke), hydraulic power pack (positive displacement pump with reservoir), limit switches, and optional PLC feedback system for modulating control. When power is applied to the unit, hydraulic oil is transferred to the actuator cylinder via the pump, compressing the springs and rotating the actuator shaft to the desired position. An energized 2-way solenoid valve blocks the return line and maintains actuator pressure. Upon power or signal loss, or signal to close, hydraulic fluid is transferred back to the pump reservoir on the low pressure side of the unit by the spring force, returning the unit to the relaxed or extended position. All standard EH and EHSY units operate at a maximum pressure of 150 PSI, which minimizes leaking or depressurizing issues.

OPERATIONAL DIAGRAM



KEY COMPONENTS

EP – Hydraulic Power Pack (Pump)
 FIL – Oil Filter
 EV – Hydraulic NO Solenoid Valve
 VMP – Relief / Bleed Valve
 VU – Check Valve

SPECIFICATIONS

- Gear Type Positive Displacement Hydraulic Power Pack
- Pump pressure: 100-150 PSI
- Standard Operating Temperature Range: -4°F to 140°F
- Standard Oil Type: Dexron III
- Duty Cycle: 80%
- Input Power: 120 VAC, 220 VAC, 3-phase
- Modulating Resolution: 0.60%, or 0.2mA
- Standard Enclosure ratings: NEMA 4/4X
- Area Classifications: Class 1, Div. 2 (explosion proof models only)
- Optional Enclosure ratings: NEMA 9 (explosion proof models only)
- Standard Control and Feedback: 4-20mA, 0-10V
- Repeatability: +/- 0.5% FS
- Linearity: +/- 2% FS
- Hysteresis: 1% FS
- Sensitivity: +/- 0.5% FS

SPRING END TORQUES

EH SERIES		
Model	Spring Start Torque (in-lbs)	Spring End Torque (in-lbs)
EH16	224	160
EH17	278	192
EH21	369	278
EH26	588	372
EH31	753	560
EH36	1,236	921
EH41	1,516	1,113
EH46	2,669	1,679
EH51	3,303	2,607
EH56	4,462	3,166
EH61	6,483	5,133
EH66	8,430	6,252
EH71	16,987	12,271
EH76	22,746	14,275

EHSY SERIES		
Model	Spring Start Torque (in-lbs)	Spring End Torque (in-lbs)
EHSY14	20,277	12,904
EHSY16	34,146	21,649
EHSY25	73,116	41,776
EHSY30	124,619	73,851
EHSY35	256,256	153,012
EHSY40	422,553	259,327
EHSY48	731,780	460,027
EHSY60	994,550	635,165



NOTE: EH and EHSY Series **Stroke Times** are typically 20-45 seconds. (Custom stroke times available.)
 Torques shown are for 90° rotations, call for 180°.



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