

N-Line Valves[®]

Surface Stepping Actuators



N-Line Valves

SA-II Surface Stepping Actuator For Rising Stem Chokes

The N-Line Valves SA-II Stepping Actuator is a pneumatically or hydraulically powered rotary indexing output actuator. The actuator consists of two power cylinder and pawl assemblies, from which the drive wheel and output shaft are driven.

One operating cycle consists first of pressurizing one cylinder thereby extending the pawl to engage the drive wheel and thus incrementally rotate the output shaft in the appropriate direction, the cylinder is then depressurized retracting the pawl to its rest position. This single operating cycle rotates the output shaft of the actuator and correspondingly the valve stem by 30°. This operating cycle is repeated until the valve reaches the desired position.

To drive the actuator and the valve in the opposite direction, an operating cycle is repeated using the other cylinder.

When the cylinders are depressurized, the pawls are disengaged from the drive wheel, allowing the drive wheel to be rotated manually through the manual override on the outside of the actuator to position the valve. A spring detent prevents position drift from vibration. Local visual position indication is via a stainless steel micrometer for unequaled accuracy and reliability.

A housing containing limit switches, a position transmitter and terminal strip is mounted externally on the yoke for direct valve stem position feedback via 4-20mA signal including HART or digital protocols. All recognized standards for electrical apparatus are available.

The housing is a fully sealed steel housing treated for corrosion resistance and long service life in severe environments.

The SA-II Stepping Actuator is designed to allow in-field retrofit onto existing valves without the requirement to dismantle pressure-containing components.



Pneumatic 5C



Angle Bracket Hydraulic 4C

SA-II Surface Stepping Actuator

Technical Description

N-Line Valves SA-II Surface Stepping Actuator For Production Chokes & Valves

Actuator General Description

Actuator type:	Rotary indexing type actuator	
Failure mode:	Fail in place	
Manual override:	External, 2" male hexagon	
Electrical position indication:	2 - wire position transmitter, 4-20 mA feedback	
Travel limit switches:	2 - single pole, double throw switches	
Solenoid valve isolation:	Electrically wired through travel limit switches	
Actuator rotation per cylinder cycle:	30 degrees	
Cylinder cycle time:	Power extend:	4 second minimum
	Spring retracts:	6 seconds minimum
Cylinder cycles per valve size:	Total cycle time:	10 seconds minimum
	2" N-Line Valve:	135 discreet positions
	3" N-Line Valve:	108 discreet positions
	4" N-Line Valve:	144 discreet positions
	5" N-Line Valve:	180 discreet positions
	6" N-Line Valve:	216 discreet positions
	8" N-Line Valve:	288 discreet positions
12" N-Line Valve:	432 discreet positions	

Pneumatic Cylinder Description

Cylinder size:	4" bore, 1-1/2" stroke
Cylinder retracts power:	Internal mechanical spring
Cylinder ports:	1/2" female NPT
Actuator supply pressure:	30 psi minimum, 125 psi maximum
Actuator supply media:	Clean dry air, 19 cubic inches per cylinder cycle
Media supply rate:	50 Standard cubic feet per minute minimum
Actuator output torque:	295 lb-ft at 120 psi
Actuator weight:	172 pounds, (Does not include solenoid valves)

Hydraulic Cylinder Description

Cylinder size:	1-1/2" bore, 1-1/2" stroke
Cylinder retract power:	Internal mechanical spring
Cylinder ports:	1/2" female NPT
Actuator supply pressure:	1000 psi minimum, 3000 psi maximum
Actuator supply media:	Clean industrial grade hydraulic oil, 2.7 cubic inches per cylinder cycle
Media supply rate:	4.5 GPM minimum
Actuator output torque:	497 lb-ft at 1500 psi
Actuator weight:	165 pounds, (Does not include solenoid valves)

N-Line Valves

SA-II Surface Stepping Actuator For Quarter Turn Axial Flow Chokes

The N-Line Valves SA-II Stepping Actuator is a pneumatically or hydraulically powered rotary indexing output actuator. The actuator consists of two power cylinder and pawl assemblies, from which the drive wheel and output shaft are driven.

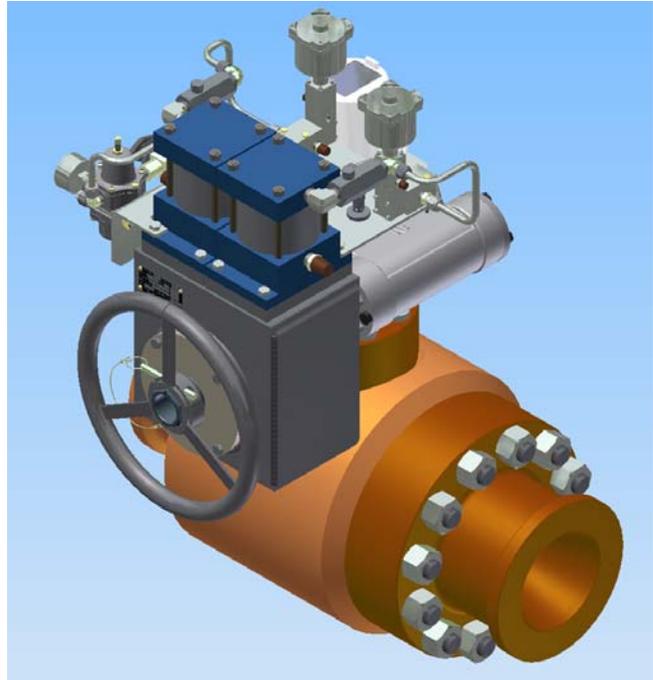
One operating cycle consists first of pressurizing one cylinder thereby extending the pawl to engage the drive wheel and thus incrementally rotate the output shaft in the appropriate direction, the cylinder is then depressurized retracting the pawl to its rest position. This single operating cycle rotates the output shaft of the actuator and correspondingly the valve stem through a gearbox assembly. This operating cycle is repeated until the valve reaches the desired position. To drive the actuator and the valve in the opposite direction, an operating cycle is repeated using the other cylinder.

When the cylinders are depressurized, the pawls are disengaged from the drive wheel, allowing the drive wheel to be rotated manually through the manual override on the outside of the actuator to position the valve. A spring detent prevents position drift from vibration. Local visual position indication is via a stainless steel micrometer for unequaled accuracy and reliability.

A housing containing limit switches, a position transmitter and terminal strip is mounted externally on the gearbox for direct valve stem position feedback via 4-20mA signal including HART or digital protocols. All recognized standards for electrical apparatus are available.

The housing is a fully sealed steel housing treated for corrosion resistance and long service life in severe environments.

The SA-II Stepping Actuator is designed to allow in-field retrofit onto existing valves without the requirement to dismantle pressure-containing components.



Technical Description

N-Line Valves SA-II Surface Stepping Actuator

For Axial Flow Production Chokes

Actuator General Description

Actuator type:	Rotary indexing type actuator
Failure mode:	Fail in place
Manual override:	Handwheel
Electrical position indication:	2 - wire position transmitter, 4-20 mA feedback
Travel limit switches:	2 - single pole, double throw switches
Solenoid valve isolation:	Electrically wired through travel limit switches
Cylinder cycle time:	Power extend: 4 seconds minimum
	Spring retracts: 4 seconds minimum
	Total cycle time: 8 seconds minimum
Cylinder cycles per 90 degrees rotation:	3" N-Line AFI: 204 discreet positions
	4" N-Line AFI: 204 discreet positions
	6" N-Line AFI: 204 discreet positions
	8" N-Line AFI: 204 discreet positions
	10" N-Line AFI: 204 discreet positions
	12" N-Line AFI: 204 discreet positions

Pneumatic Cylinder Description

Cylinder size:	4" bore, 1-1/2" stroke
Cylinder retracts power:	Internal mechanical spring
Cylinder ports:	3/4" female NPT
Actuator supply pressure:	80 psi minimum, 100 psi maximum
Actuator supply media:	Clean dry air, 19 cubic inches per cylinder cycle
Media supply rate:	50 Standard cubic feet per minute minimum
Actuator output torque:	Varies with selected gearbox.
Actuator weight:	172 pounds, (Does not include solenoid valves)

Hydraulic Cylinder Description

Cylinder size:	1" bore, 1-1/2" stroke
Cylinder retract power:	Internal mechanical spring
Cylinder ports:	On application
Actuator supply pressure:	1000 psi minimum, 3000 psi maximum
Actuator supply media:	Hydraulic Media as required by application
Media supply rate:	Application based
Actuator output torque:	Varies with selected gearbox
Actuator weight:	160 pounds, (Does not include solenoid valves)

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Stafford, Texas, USA

Phone (1) 281-969-5220
Fax (1) 281-969-5221

Represented by:

E-Mail sales@n-linevalves.com

www.n-linevalves.com