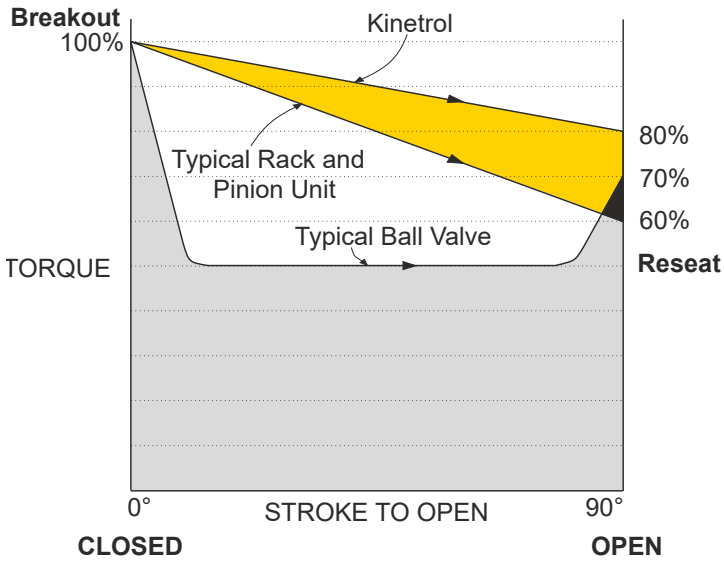
Spring housing cut away

- **Lowest Torque Loss**
  Typically 20% through 90° yields extra torque through spring stroke - enables the selection of smaller actuators (see diagram)
- **Reliable low stress range clock type spring**
- **Separate housing for modular assembly, easily retrofitted**
- **Sealed, non-breathing housing**
  Protects spring in corrosive environments
- **Adjustable pretension for 'balanced' air and spring stroke torques**
  Various combinations available for balanced / optimised torques at various air pressures
- **Keeper plates available to ensure safe handling of pretensioned springs**
- **Available with ISO/DIN female drive and mounting for models 03-20**
- **Springs guaranteed against failure for lifetime of actuator**
- **ATEX Category 1 approved for many models**
  Category 2 for other models

The diagram shows the torque requirement of a typical ball valve under normal conditions. The typical torque output characteristics of Kinetrol and Rack and Pinion actuators, both sized to overcome the valve's breakout torque, are also illustrated. The diagram demonstrates that the Kinetrol actuator will exceed the torque requirement of the valve throughout the entire stroke whilst the rack and pinion unit will fail to reseat the valve.

The higher torque losses associated with the rack and pinion actuators (torque loss can be as high as 70%) dictate the selection of larger units to ensure complete reseating.

All spring units are guaranteed, in normal use, to operate correctly for as long as the original actuators to which they were fitted.

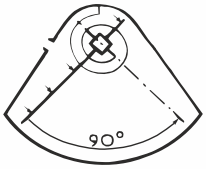


KINETROL SPRINGS
Lifetime Guarantee

ATEX UP TO CATEGORY 1 APPROVED

Direction of Spring Action

Spring units are available for either clockwise or counter clockwise spring action.
Spring units are mounted as standard between the actuator and what it drives (except model 01 & 60).
With spring units alone, direction is determined by looking at the unit from the end which interfaces with the actuator.



Suffix - 020 = clockwise
Suffix - 030 = counter clockwise

The direction of actuator/spring assemblies are determined by looking at whole assembly from the non-output end.

Asymmetrical Torque Applications

If high torque is required in one direction and lower torque in the other direction this can be set up easily by changing spring pretension to be higher or lower as required. Air stroke torque will always be double-acting torque (at air pressures available) less spring pretension torque.

Low Air Pressure Applications

If air pressure available for actuator operation is less than 50psi (3.5 bar), 'balanced' torque output on air and spring strokes is still possible by using a spring return unit from a smaller actuator size. Listed below are factory assembled options of this kind.

Replace the '*' used in ordering codes below with a '2' (clockwise) or '3' (counter clockwise) depending on direction of spring action required.

See pages 7 & 8 for full torque details and pages 59 & 60 for dimensions of all models. Refer to TD121 for available male and female drive low pressure spring options.

Ordering Code	Description
03-1*0-5600	03 actuator with one 02 spring unit
07-1*0-4000	07 actuator with one 05 spring unit
09-1*0-4200	09 actuator with one 07 spring unit
10-1*0-5800	10 actuator with one 09 spring unit
12-1*0-4300	12 actuator with one 09 spring unit
12-1*0-4400	12 actuator with two 09 spring units
14-1*0-4900	14 actuator with two 12 spring units
14-1*0-5000	14 actuator with one 12 spring unit
16-1*0-6000	16 actuator with one 15 spring unit
16-1*0-6100	16 actuator with one 14 spring unit
18-1*0-7000	18 actuator with one 16 spring unit
20-1*0-8000	20 actuator with one 18 spring unit
20-1*0-7300	20 actuator with three 16 spring units
30-1*0-7600	30 actuator with three 16 spring units
30-1*0-8300	30 actuator with two 18 spring units
30-1*0-7800	30 actuator with five 16 spring units
60-1*0-8400	60 actuator with four 18 spring units
60-1*0-8500	60 actuator with five 18 spring units

Pretension Setting

Factory assembled actuator/spring return assemblies have the spring pretension set for 'balanced' torque output when the actuator is operated by air at 80psi (5.5bar).

Factory assemblies can be preset for different air pressures below 80psi (5.5 bar) on request.

Spring return units supplied separate from actuators are also pretensioned for 80psi (5.5 bar) air operation unless otherwise stated.

Keeper Plates

These are provided on all pretensioned spring return units supplied separate from actuators. They are also available as spare parts. Refer to TD129 for part numbers.

A keeper plate must always be used to restrain spring tension whenever a spring unit case is removed from the actuator.

Materials Specifications

Spring Casing	Models 02 to 05 pressure die-cast in ZL 16 zinc alloy. Models 07 to 60 in aluminium alloy.
Finish	Epoxy stove enamel.
Spring	Clock type spring steel.
Square	Steel, zinc plated.
Mount Holes (output end)	Same as matching actuator (except model 01 & 60), low pressure combinations & ISO drive versions. See pages 59/60 & TD121.

KINETROL SPRINGS
Lifetime Guarantee

ATEX
UP TO CATEGORY 1
APPROVED

- **Simple, elegant direct-mount interface for most valves**
- **Multiple ISO mounting flange hole drillings for each model**
- **Large ISO/DIN compatible 'star' drive for most models**
- **Valve leak tell-tale/relief slots in mounting face**
- **Female serrated insert drive options available for maximum direct mount flexibility on some models**
- **Keeper plates available to ensure safe handling**
- **Same reliable, long-life, fully sealed spring unit as on male-drive units**
- **Allows accessories to be direct mounted to top of actuator** (e.g positioner)

Torques are identical to standard and low pressure spring torques given on pages 7 & 8.

Directions of spring action are as described on page 28. Female drive spring units are always designed to be mounted between the actuator and the application. Consequently, a female spring designated 'clockwise' as a separate module will, when mounted below an actuator, result in a 'clockwise' assembly. Female drive springs are not designed to interface directly with modular switch boxes, positioners etc.

ISO/DIN 'Star' Drives

Female bi-square (star) drive spring fail-safe units are available for models 03 to 20.

Star drive units are specified by adding a 'F' to the DIN/ISO code:

e.g. for a standard model 07 actuator with a female star drive, a regular 074-120 code becomes 073F120.

See page 60 for full dimensions.

Serrated Drives

Female serrated drive spring fail-safe units are available for models 05, 07, 08, 09 & 10 to give maximum mounting flexibility.
Features include:
- Can accommodate large diameter valve stems
- Deep hole in shaft for long valve stems
- Precision stainless steel inserts
- Common internal drive shapes available
- Same spring can be used with different valve type/sizes
- 48 teeth allow many different orientations

Serrated drive units are (excluding couplings) specified by adding an 'S' to the ISO/DIN code:

e.g. for a standard model 07 actuator with a serrated female drive, a regular 074-120 code becomes 073S120.

See TD141 for full dimensions of the serrated drive springs and associated couplings.

A range of blank and internally profiled serrated stainless steel couplings are available (see TD141 for codes).

Coding of Alternative Flange Drillings

Some female spring fail-safe star and serrated drive models are available with alternative ISO mounting hole patterns (see page 60 and TD141). The digits '8' and '9' are used to designate clockwise and anti-clockwise versions respectively:

e.g. clockwise code 053F180 specifies the F04 flange alternative of the 053F120 which specifies the clockwise F03/05/07 version.

KINETROL SPRINGS
Lifetime Guarantee

ATEX
UP TO CATEGORY 1
APPROVED