Kinetrol Spring Units - Overview

Spring housing cut away

ATEX approved

Features

- **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
- **Keeper plates available to ensure safe handling of pretensioned springs**
- **Available with ISO/DIN female drive and mounting for models 03-21**
- **ATEX approved**
  Models 01 & 02 - Category 1
  All other models - Category 2

Spring Pack Torques

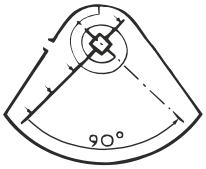
Spring Unit Model	Spring Stroke	Nm	lbf-in
01-020	Start	2.3	20
	Finish	1.8	16
02-020	Start	4.7	42
	Finish	3.7	33
03-020	Start	10.3	91
	Finish	8.7	77
05-020	Start	20.9	185
	Finish	17.5	155
08-020	Start	81.3	720
	Finish	65.5	580
09-020	Start	104.0	925
	Finish	93.8	830
10-020	Start	164.0	1450
	Finish	143.0	1270

Spring Unit Model	Spring Stroke	Nm	lbf-in
12-020	Start	238.0	2110
	Finish	204.0	1810
14-020	Start	588.0	5200
	Finish	478.0	4230
16-020	Start	1321.0	11691
	Finish	1081.0	9567
18-020	Start	2954.0	26143
	Finish	2417.0	21390
21-020	Start	5456.0	48286
	Finish	4464.0	39506
30-020	Start	8184.0	72428
	Finish	6696.0	59260
40-020	Start	11985.0	106077
	Finish	10005.0	88552
60-020	Start	17437.0	154333
	Finish	14558.0	128847

Model 07 & 15 Spring units - see Modular springs pages 3 to 5

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.

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.

Kinetrol Spring Units - Overview

Material Specification

Spring Casing	Models 02 & 03 pressure die-cast in ZL 16 zinc alloy. Models 05 to 60 in aluminium alloy.
Finish	Epoxy thermoset powder.
Spring	Clock type spring steel.
Square	Steel, zinc plated.
Mount Holes (output end)	Please see Single Acting Spring Return datasheet

Female Drive Spring Units

ATEX Category 2

Features

- **Simple, elegant direct-mount interface**
- **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**

Torques are identical to standard male-drive units.

Directions of spring action are as described above. 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 21.
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 074-020 code becomes 073F020.

Coding of Alternative Flange Drillings

Some female spring fail-safe star models are available with alternative ISO mounting hole patterns (see TD141). The digits ‘8’ and ‘9’ are used to designate clockwise and anti-clockwise versions respectively: e.g. clockwise code 053F080 specifies the F04 flange alternative of the 053F020 which specifies the clockwise F03/05/07 version.

Kinetrol Spring Units - Overview

Kinetrol Modular Spring Unit

ATEX Category 2

- Available for Model sizes 03, 05, 07, 08, 12, 14 & 15 (Model 07 & 15 Standard Supply)
- A variety of different configurations possible from one core unit
- Fully reversible direction of spring from clockwise to counter clockwise or counter clockwise to clockwise
- No air or special tools required and direction reverse can be completed in minutes
- International patents
- Keeper plates no longer required for removal of the spring from the actuator
- The only spring which allows the actuator to be removed whilst the valve remains in its safe position
- Sealed, non breathing housing
- End stop redundancy gives higher SIL data
- Can be converted from male to female drive and vice versa
- Spring can be converted to manual fail-safe or fire fail-safe spring units
- Special output drives available

The modular spring units' patented design takes the Kinetrol expertise and low stress range clock type spring to a new level. The direction of the spring can be reversed from clockwise to counter clockwise or vice versa with only simple tools and can be completed within minutes.

The units' fully sealed, non breathing housing protects the spring from corrosive environments the enhanced durability which Kinetrol is known for.

Factory assembled actuator and springs have the spring tension set for a balanced torque output when the actuator is operated at 80 psi (5.5 Bar). If required, the spring can be set for different air pressures on request.

Kinetrol Spring Units - Overview

Spring Pack Torques

Spring Unit Model	Spring Stroke	Nm	lbf-in
03-0C0	Start	10.3	91
	Finish	8.7	77
05-0C0	Start	20.9	185
	Finish	17.5	155
07-0C0	Start	50.8	450
	Finish	42.4	375
08-0C0	Start	81.3	720
	Finish	65.5	580
12-0C0	Start	238.0	2110
	Finish	204.0	1810
14-0C0	Start	588.0	5200
	Finish	478.0	4230
15-0C0	Start	962.0	8514
	Finish	790.0	6992

ATEX Category 2

Direction of Spring Action

The reversible spring unit is available either clockwise or counter clockwise and is determined by looking at the unit from the end which interfaces with the actuator.

Suffix
- 0A0 = counter clockwise (male drive)
- 0C0 = clockwise (male drive)
- 0R0 = reversible spring core only
- 0R0-90 = reversible spring core only for manual handle and fire fail safe units

ISO / DIN "Star" Drive

Female bi-square (star) drive option is also available.

Suffix
F0A0 = counter clockwise F05/F07
F0C0 = clockwise F05/F07
F0B0 = counter clockwise (alternative F pattern)
F0D0 = clockwise (alternative F pattern)

Specification

Angle of Travel
0 - 97° (alternative angles available)
0 - 90° (for manual handles and fire fail safe units only)

Materials of Construction
Casing: Extruded & pressure die cast aluminium alloy
Output Shaft: See spring datasheets
Shaft bushes: PTFE coated bronze (lead free)
Clock Type Spring: Carbon spring steel
Stop Elements: Mild steel

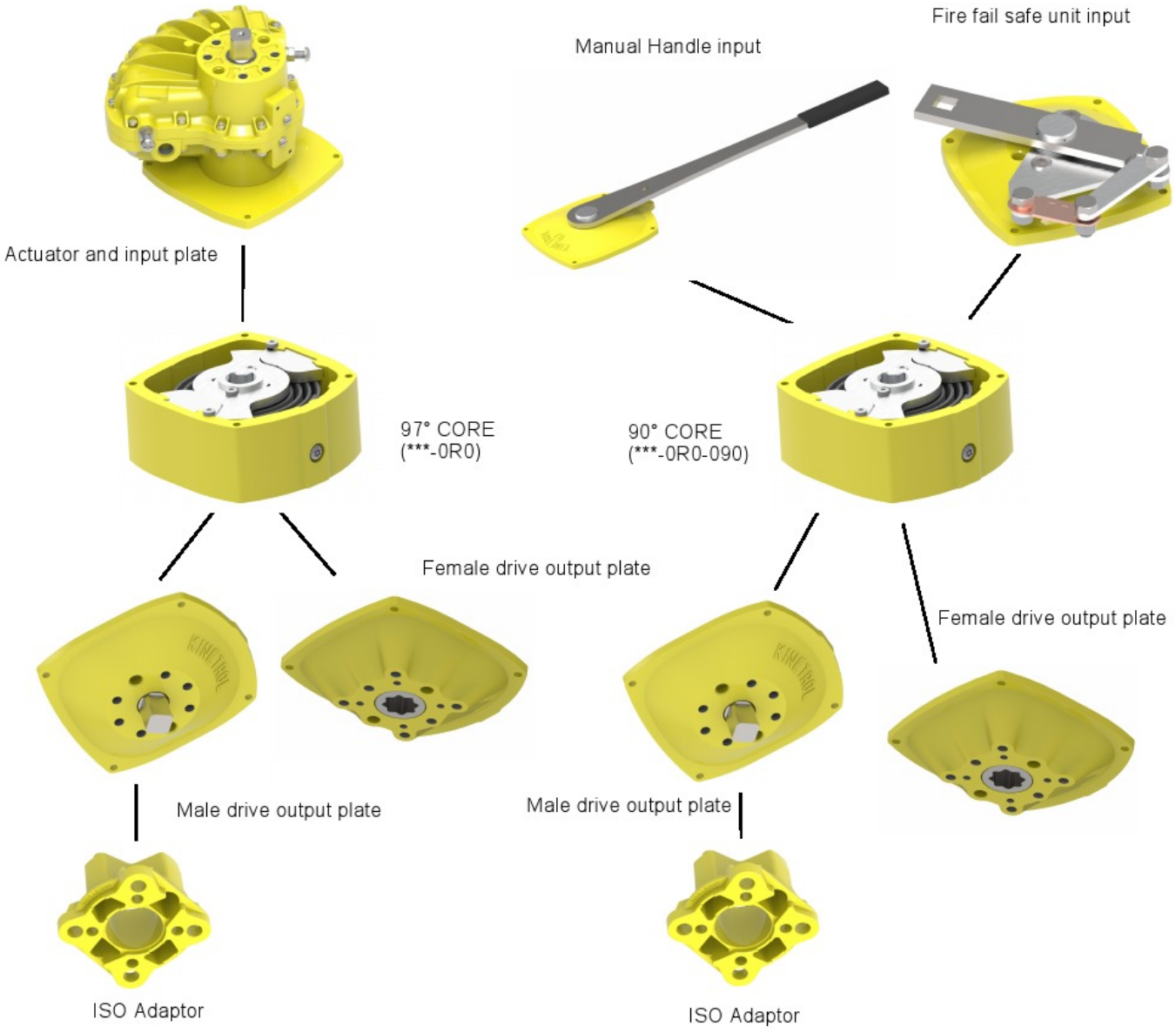
Finish
Epoxy thermoset powder

Operating Temperature
-40°C to +80°C (-40°F to +176°F)

Options

- Male or Female drive options may be fitted to both ends
- High temperature / Low temperature options
- Available in Blueline paint finish
- Available as a manual fail-safe spring unit - see datasheet WEBDS121
- Available as a fire fail-safe spring unit - see datasheet WEBDS 122
- Two spring cores available 97° for actuators and 90° for manual handles and fire fail safe units

Kinetrol Spring Units - Overview



Non Kinetrol Actuator Application Notes

Kinetrol spring units can be used in non Kinetrol actuator applications however the following must be considered.

A static gasket is provided to seal the base plate mounting face but the user's shaft must also be sealed to prevent water ingress into the spring housing.

External stops will need to be used to prevent the spring angle of travel from exceeding 90°.

See Kinetrol installation, operation and maintenance instructions for application example.

Kinetrol Spring Units - Overview

ISO/DIN with Pilot-hole

The female drive option is also available with a special modified pilot-hole coupling with standard thread holes. The female drive coupling has a 5mm x 19mm deep pilot-hole which enables customers to machine couplings themselves to any output drive required (e.g. double D or a non standard size female square.

Direction of Spring Action

Suffix

Model 03 and 05
- F0E0 = anti-clockwise F03/F05/F07
- F0F0 = clockwise F03/F05/F07
- F0G0 = anti-clockwise F04
- F0H0 = clockwise F04

Model 07 and 08
- F0E0 = anti-clockwise F05/F07
- F0F0 = clockwise F05/F07

Model 12 and 14
- F0E0 = anti-clockwise F12
- F0F0 = clockwise F12

Model 15
- F0E0 = anti-clockwise F14
- F0F0 = clockwise F14

ISO/DIN with through holes

The female drive option is available with through holes allowing the mounting of hardware to be secured from the inside out. This enable the spring to be fitted to ISO5211 compatible devices and the Kinetrol extrusion spacers without the need for the mounting adaptor plate used on double acting units.
For more details on double acting refer to web data sheet 085
For more detail on spring return refer to web data sheet 090

Direction of Spring Action

Suffix

Model 03, 05, 07 and 08
- F0J0 = anti-clockwise F05
- F0K0 = clockwise F05
- F0L0 = anti-clockwise F07
- F0M0 = clockwise F07

Extrusion spacers must be purchased as separate items and are not included in the above codes

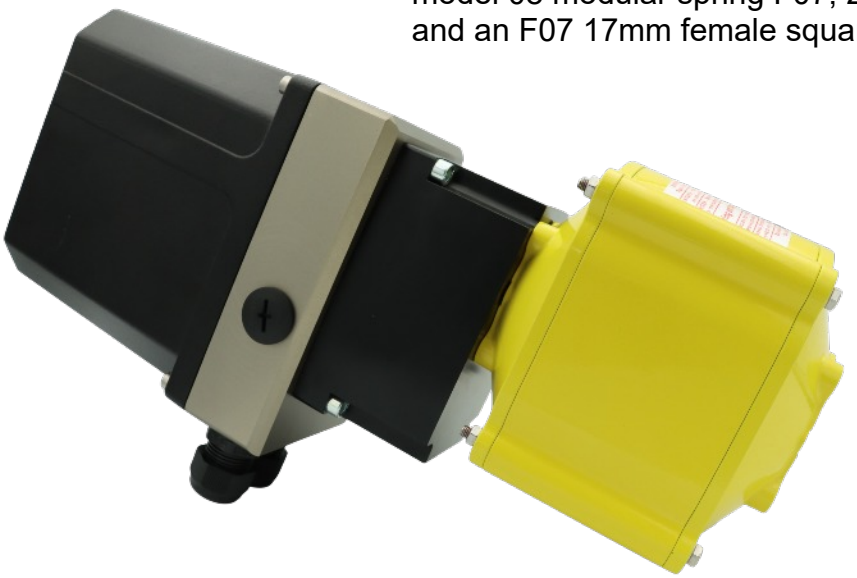
Kinetrol Spring Units - Overview

Kinetrol Modular Spring Units for Non-Kinetrol Actuator Applications (Electric Actuators)

The Kinetrol modular spring can be used in non-Kinetrol actuator applications such as electric actuators, other actuators with ISO5211 style interface and machines anywhere a mechanical failsafe device is needed.
The units consist of a central core and two output drives which can offer male and female shafts either end, or a mix of both plus the possibility of non-standard interfaces / drives to suit the application

Features

- Available for Model sizes 03, 05, 07, 08, 12, 14 & 15
- Fully reversible direction of spring from clockwise to counter clockwise or counter clockwise to clockwise
- No air or special tools required and direction reverse can be completed in minutes
- Sealed, non breathing housing
- Keeper plates no longer required for removal of the spring from the actuator
- International patents
- End stop redundancy gives higher SIL data
- Can be converted from male to female drive and vice versa
- Easy attachment to ISO5211 compliant devices.

For more information please see web data sheet WEBDS 089

ARIS Tensor HS L electric actuator with Kinetrol model 08 modular spring F07, 22mm square interface and an F07 17mm female square output use 083C07L22F0717