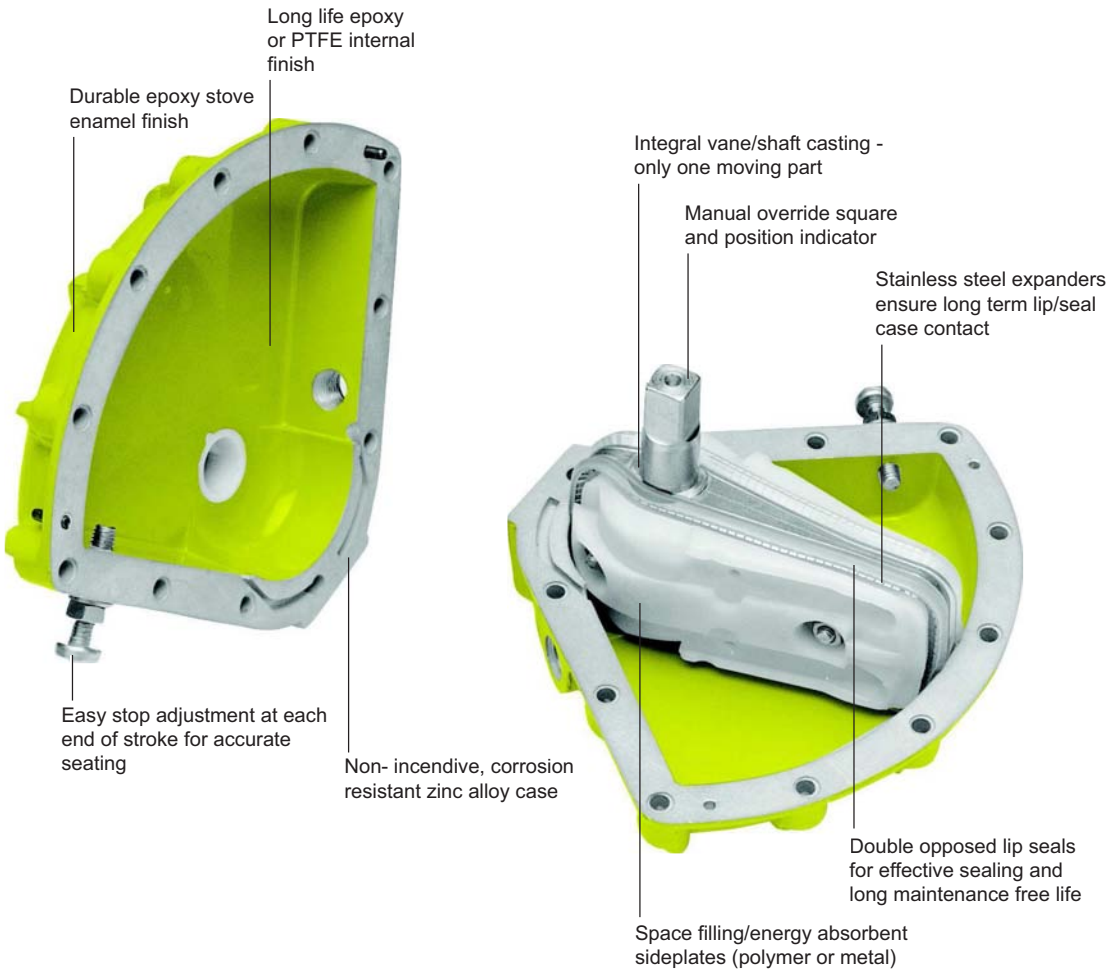
KINETROL




rotary actuators



Certificate No. FM22163

Kinetrol's rigorous quality program is approved to ISO 9001:2000 and AS/EN 9100 ensuring that each unit is manufactured to the highest standards.

Kinetrol Actuators, Springs and Accessories are now approved up to ATEX Category 1.

- **Single moving part**
  Simplest and most reliable mechanism for quarter-turn rotary actuation.
- **Direct mounting control modules**
  Fail-safe spring returns, limit switches, positioners and solenoid valves all just bolt on direct with no brackets needed.
- **No cranks or gearing**
  No power loss or backlash - allows accurate positioning.
- **Durable corrosion resistant finish**
- **Long maintenance-free life**
  Up to 4 million operations guaranteed.
- **Compact - space saving - efficient**
  Best torque/size package available, fast operating speeds, best air consumption, proven design.
- **Hundreds of thousands of units**
  in trouble free service all over the world.
- **Choice of male or female output drive square - easy to interface to application**

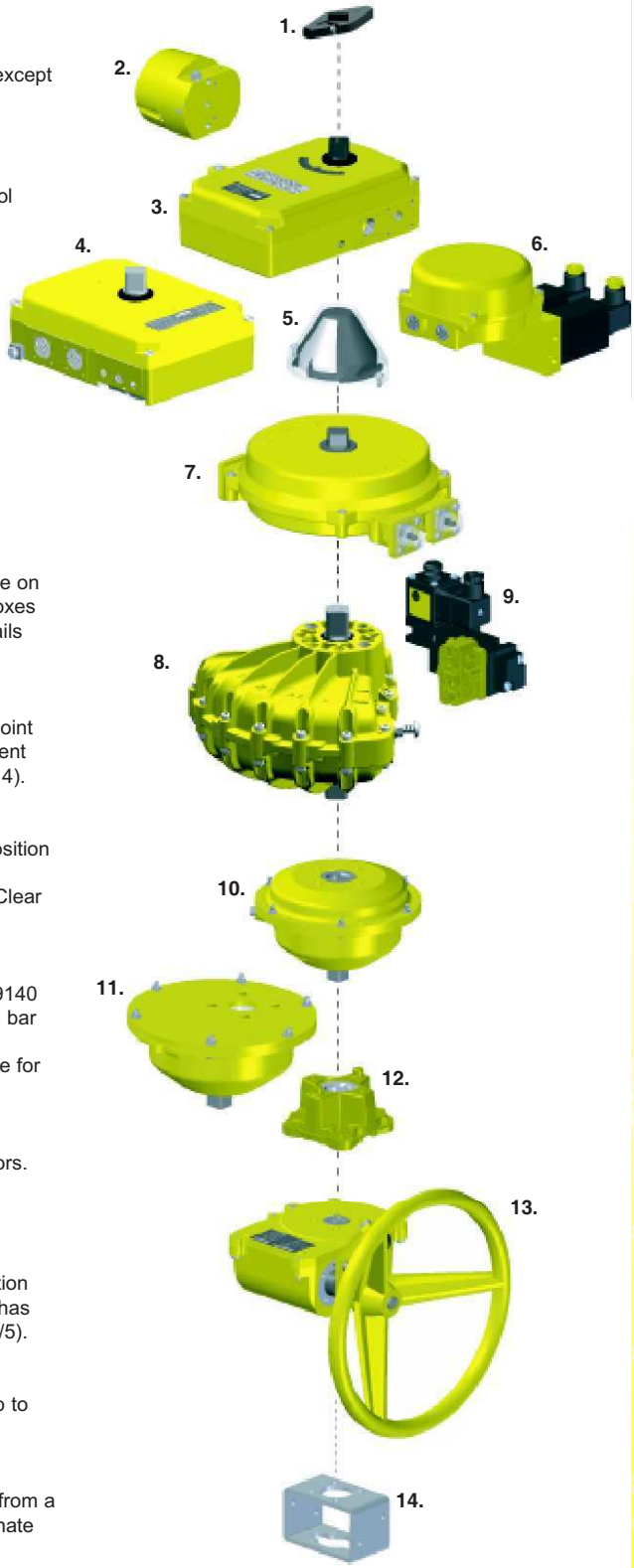
Applications

Operation or positioning of ball, butterfly and plug valves, ventilation dampers and automatic doors. Uses also include movement and positioning of components during manufacture - in fact anything that needs to be turned through 90° or less, automatically or by remote control.

For ordering codes see page 38
For catalogue index see page 50

The policy of KINETROL is one of continuous improvement. We reserve the right to alter the product as described and illustrated without notice.

Kinetrol modular concept easily provides the control assembly needed.



1. Visual Indicator
Gives visual indication of valve position as standard except models OMO, 01, 08, 16, 18, 20 and 30.

2. I/P Controller
4-20mA electrical signal controls main air supply to pneumatic positioner as alternative to air signal control (details page 13).

3. AP Positioner
3-15psi (0.2-1 bar) air signal controls main air supply to turn, stop or hold the actuator vane in proportional response to that air signal. Limit switch and angle retransmit options (details pages 11/12).

4. EL Electropneumatic Positioner
A single unit gives smooth accurate control in response to a 4-20mA signal. Limit switch and angle retransmit options in same housing (details pages 15/16).

5. Clear Cone Position Monitor
Gives 360° and overhead position indication. Available on actuator models 03, 05, 07, 09 and 10, limit switch boxes AP positioners, EL positioners and EHD models (details page 6).

6. 3 Stop Positioner
Provides two endstop positions and a mid-range setpoint anywhere within the 90° span. Easy setpoint adjustment and integral position feedback options (details page 14).

7. Universal Limit Switch Box
Weather tight unit with up to 4 switches for remote position indication or control use. Optional switches for flame proof/explosion proof needs and high visibility Clear Cone position monitor (details pages 7/8).

8. Actuator
15 sizes covering torque range 0.5 Nm (5 lbf in) to 19140 Nm (168,000 lbf in). Operating air pressure range 1.4 bar (20 psi) to 7 bar (100 psi). Adjustable stops standard. Restricted travel stops and DIN/ISO versions available for most models (details pages 23 to 37).

9. Solenoid
Optional integral pneumatic solenoid valve for actuators. Various electrical, environmental and explosion proof requirements covered (details page 6).

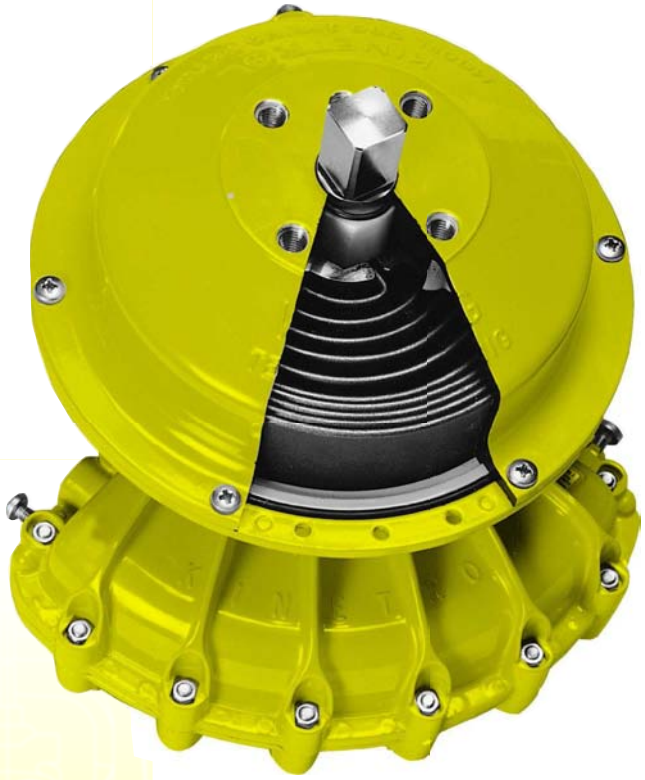
10. Spring Fail-Safe Unit
Clock type spring return gives reliable fail-safe operation with high torque output throughout spring stroke, yet has easy adjustment to suit application (details pages 3/4/5).

11. 180° Converter
Compact units give constant torque output through up to 200° travel (details pages 17/18).

12. ISO Adaptor
The patented ISO adaptor provides easy conversion from a Kinetrol male drive to an ISO flange interface for ultimate mounting flexibility (details page 22).

13. Gearbox
Geared manual override on all models, except 08, from 05 to 16 inclusive (details page 21).

14. Mounting Bracket
A comprehensive range of brackets provides for most ball, plug and butterfly valves (details page 41).



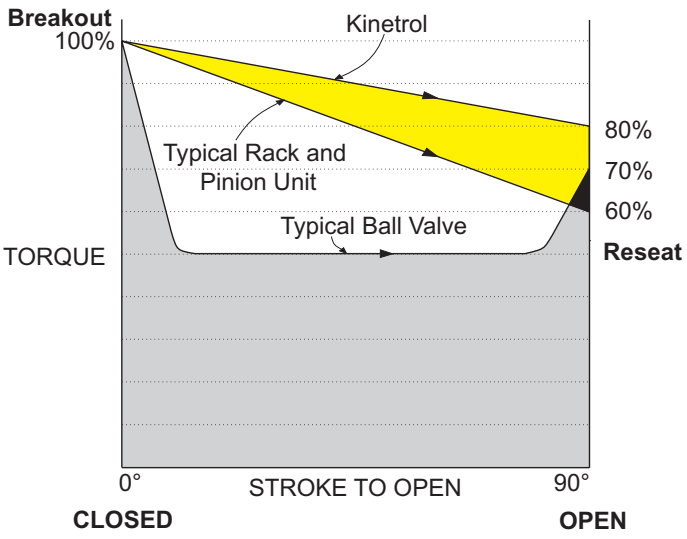
Spring housing cut away

- **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**
  (except model 08)
- **Springs guaranteed against failure for lifetime of actuator.**

  ATEX Category 1 approved for models 01-12 inclusive
  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.



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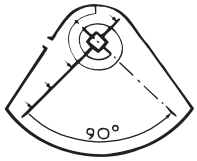
Direction of Spring Action

Spring units are available for either clockwise or counter clockwise spring action.

For spring units alone, direction is determined by looking down at the unit from the end opposite to that which interfaces with an 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 47 & 48 for full torque details and page 43 for dimensions of all models.

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
08-1*0-4100	08 actuator with one 07 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 14 spring unit and one 12 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*0-7200	20 actuator with two 16 spring units
20-1*0-7300	20 actuator with three 16 spring units
30-1*0-7600	30 actuator with three 16 spring units
30-1*0-7700	30 actuator with four 16 spring units
30-1*0-7800	30 actuator with five 16 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.

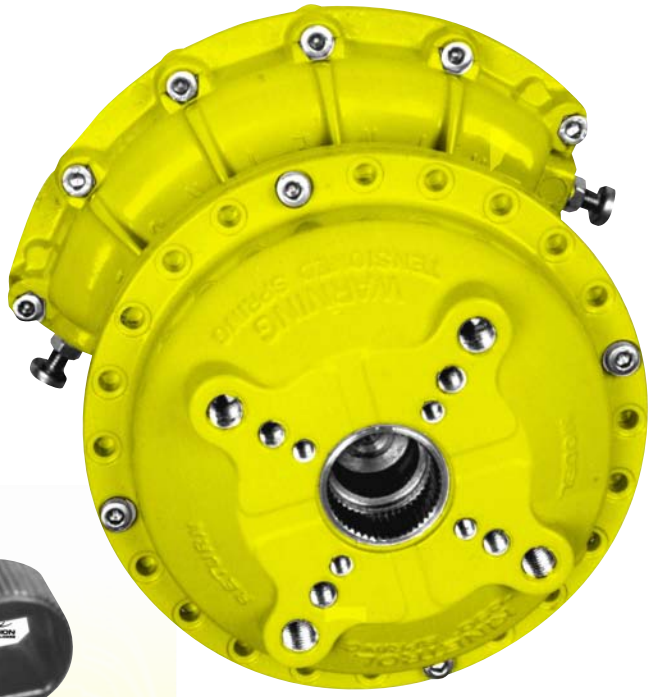
A keeper plate must always be used to restrain spring tension whenever a spring unit case is dismantled.

Materials Specifications

Spring Casing	Models 01-12 pressure die-cast in ZL 16 zinc alloy. Models 14, 16, 18, 20 & 30 aluminium alloy LM25.
Finish	Epoxy stove enamel.
Spring	Clock type spring steel.
Square	Steel, zinc plated.
Mount Holes (output end)	Same as matching actuator except model 01, low pressure combinations & ISO drive versions. (see page 43).

KINETROL SPRINGS
Lifetime Guarantee

Female Drive Spring Units



- **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**
- **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 added to top of actuator** (e.g positioner)

Torques are identical to standard and low pressure spring torques given on pages 47 & 48.

Directions of spring action are as described on page 4. Female drive spring units are designed to be mounted between the actuator and the application. Consequently, a female spring designated 'clockwise' as a separate module will, when mounted to an actuator, result in an 'anti-clockwise' assembly. Female drive springs are not designed to interface directly with modular switch boxes, positioners etc.

ISO/DIN 'Star' Drives

Female star (double square) drive spring fail-safe units are available for models 03 to 20, except for 08.

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 070-120 code becomes 071F120.

See TD121 for full dimensions.

Serrated Drives

Female serrated drive spring fail-safe units are available for models 05, 07 & 09 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 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 070-120 code becomes 071S120.

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 TD121 and TD141). The digits '8' and '9' are used to designate clockwise and anti-clockwise versions respectively:

e.g. clockwise code 051F180 specifies the F04 flange alternative of the 051F120 specifies F03/05/07 version.

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Clear Cone Monitor

The optional Clear Cone provides all round high visibility position monitoring on all limit switch boxes except code -003 type, 02/03 and positioner models. A red/green colour coded monitor is sealed inside a robust, clear polycarbonate cover.

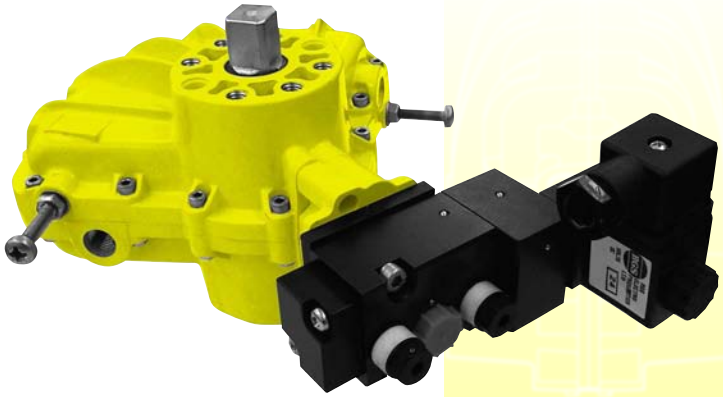
The monitor is also available directly mounted onto actuator models 05, 07, 09 and 10 and all EHD units.

For highly corrosive environments special cover materials are available - contact Kinetrol for details.

Conductive ATEX approved versions are also available - contact Kinetrol for details.

For installation details see pages 42, 44, 45 & 46.

Solenoid Valves

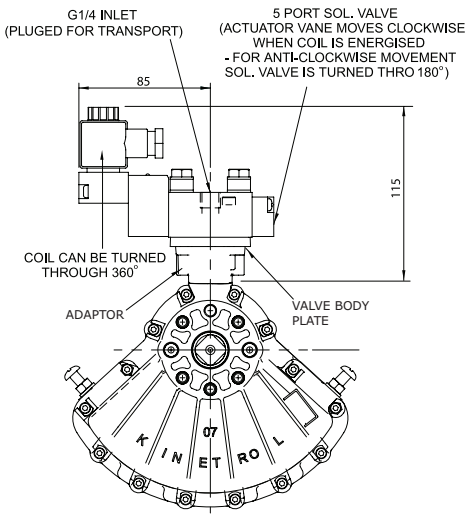


As an option KINETROL actuator sizes 03 to 14 can be supplied with integral solenoid valves with NAMUR interface. Air is ported through the actuator body via an adaptor so no external tubing is necessary.

Standard optional solenoid valves can be converted to 5 or 3 port versions by changing valve body plate supplied with the valve.

Specification

Coil voltages	AC: 50/60Hz 24, 115 & 230 volts DC: 24 Volts For other voltages contact Kinetrol
Electrical connection	DIN 43650 plug with Pg9 cable gland (6-8mm dia) as standard
Manual Override	Extra to order
Exhaust silencers / flow regulators	Extra to order
Hazardous areas	Certified solenoids are available as extras to order
Environmental Protection	To IP65 as standard
Minimum air supply	2 bar



Single solenoid, 3 or 5 port, interchangeable for double acting or spring return, NAMUR interface. Most brands of NAMUR interface solenoid valve can be supplied to special order.

ATEX VERSIONS AVAILABLE

Universal Limit Switch Box

Offers a wide range of signalling options in a zinc alloy fully enclosed corrosion resistant case available for direct mounting onto Kinetrol rotary actuators, or discrete mounting via an industry standard VDI/VDE interface onto any make of rotary actuator. Easy to wire and set up with real industrial quality robustness. Internally fitted options include AS Interface digital communication and a 4-20mA 2-wire modulating angle retransmit circuit.

The range of switch and terminal arrangements includes 2 or 4 switches, extra connections allowing single point termination of wiring for limit switches and solenoid valves, ATEX approved Eexed (Category 2) explosion proof and Eexia intrinsically safe packages (Category 1). Integral sealed Clear Cone Monitor and red/green LED indicator options also give excellent external visual indication of position.

See KF487 for full details.

Specification

Casing
Precision diecast zinc alloy

Finish
Epoxy stove enamel

Seals
Nitrile rubber 'O' ring seals

Weight
1.4 kg

Cable entry options
2 or 4 entries

M20 x 1.5 Conduit thread

Pg 13.5 Conduit thread

$^1/_2$ NPS Conduit thread

4 Way plug DIN 43650A (fits any of conduit thread)

4 Way M12 Connector (M20 Conduit thread only)

Temperature Range
Standard -20°C to 80°C

High Temp Seals up to 100°C

Dimensions see page 44

- **All units sealed to IP65/NEMA 4X.** IP67 options available.
- **Robust corrosion resistant epoxy painted diecast zinc alloy box.**
- **Easy and accurate setting of switch position.**
- **Available for direct mounting to Kinetrol models 03 to 14, for minimum height.**
- **Quick access - No special tools required.**
- **Discrete VDI/VDE (NAMUR) interface option for use with industry standard actuators.**
- **Two or four cable entries as standard to allow back wiring of solenoid valves.**
- **Many switch options available for general and hazardous areas.**
- **AS Interface bus circuit option inside box reads up to 4 switch inputs, drives up to 2 solenoids powered by bus only** (see pages 9 & 10).
- **Optional Clear Cone monitor available.**
- **Integral LED indicator lamps and angle retransmit circuit options are available.**
- **Compact SPST version of type 004 available for model 02 actuator.**

LOAD RATINGS FOR STANDARD MICROSWITCHES (type 004)

Voltage	Resistive Load
125 V AC	15A
250 V AC	15A
up to 12 V DC	15A
up to 24 V DC	10A
up tp 48 V DC	3A
up to 250 V DC	0.25A

MULTIPLICATION FACTORS FOR NON-RESISTIVE LOADS

Steady state tungsten lamp load	- x 0.1
Steady state inductive load	- x 0.2
Peak inductive load	- x 1.0

Ordering Codes

Switch Type 001
2 intrinsically safe inductive proximity sensors for hazardous areas (ATEX CAT 1), -20º to 80ºC.

Switch Type 002
2 pneumatic switches with inlet adaptors for 4mm i/d tube (ATEX CAT 2).

Switch Type 003
Certificated unit to EEx e II T6 for hazardous areas to Zone 1 (ATEX CAT 2).

Switch Type 004
With 2 microswitches wired for SPDT.

Switch Type 005
2 x 2 wire proximity sensors 20-260 volts AC, normally open.

Switch Type 006
2 x 2 wire proximity sensors 5-60 volts DC, normally open, with LED switch status indicators.

Switch Type 007
With 4 microswitches wired for DPDT.

Switch Type 008
With 2 intrinsically safe slotted proximity sensors for hazardous areas (ATEX CAT 2).

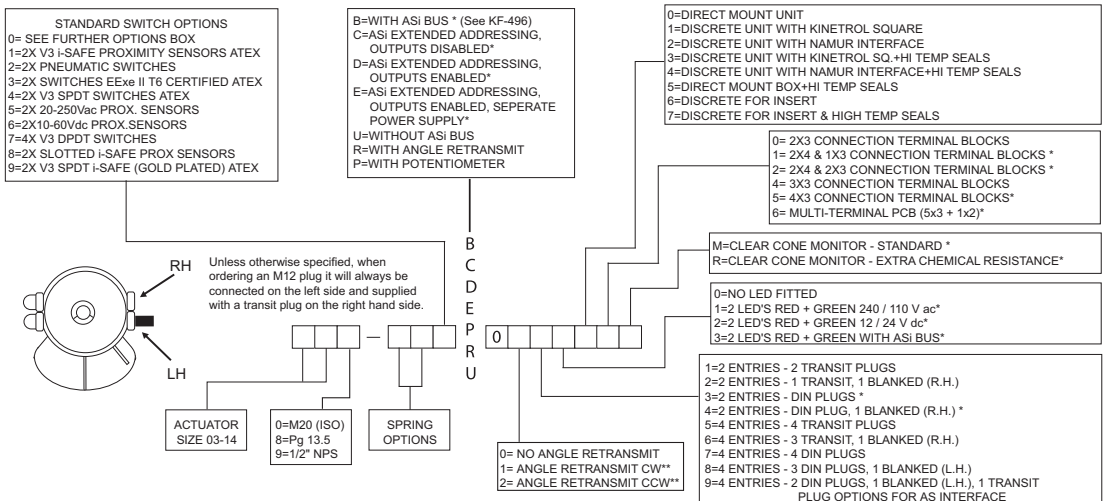
Switch Type 009
2 V3 gold plated contacts intrinsically safe microswitches wired for SPDT (ATEX CAT 1).

Option B - E
AS interface options are available with both the two and four entry Kinetrol Universal limit switch boxes. Options B to E allow for different extended addressing options. For more information on the Kinetrol AS Interface card see page 9.

Option P
Two or four way Universal limit switch box fitted with potentiometer (20K ohms conductive plastic type).

Option R
Two or four entry Universal limit switch fitted with angle retransmit, loop powered two wire circuit passes 4-20mA current, proportional to 0-90° position of actuator.

Option U
Two or four entry Universal limit switch box without AS interface card.



* Not available on ATEX versions
** Multi-terminal PCB required with angle retransmit

EXAMPLES:
050 - 001U001000 = 05 ULS BOX WITH 2 X V3 i-SAFE PROXIMTY SENSORS, 2 TRANSIT PLUGS & 2 X 3 WAY TERMINALS ATEX APPROVED
050 - 001U021000 = 05 ULS BOX WITH 2 X V3 i-SAFE PROXIMTY SENSORS, 2 TRANSIT PLUGS & 2 X 3 WAY TERMINALS NON - ATEX APPROVED
050 - 001U011000 = 05 ULS BOX WITH 1 X V3 i-SAFE PROXIMTY SENSORS, 2 TRANSIT PLUGS & 2 X 3 WAY TERMINALS ATEX APPROVED
070 - 009B001300 = 07 ULS BOX WITH 2 X V3 i-SAFE MECH.SWITCHES G / PLATED, STANDARD ASi + TRANSIT PLUGS & ASi TERMINALS + RED & GREEN LED'S
090 - 004R012000 = 09 ULS BOX WITH 1 X V3 i-SAFE SPDT SWITCH + 1 TRANSIT & 1 BLANKING PLUG & ANGLE RETRANSMIT
101 - 004U001200 = 101 ULS BOX WITH 2 X V3 SPDT SWITCHES + 2 TRANSIT PLUGS + LED'S RED / GREEN 12 / 24 V dc
140 - 004X012000 = 14 ULS BOX WITH 1 X V3 SPDT SWITCH + 1 TRANSIT & 1 BLANKING PLUG, ANGLE RETRANSMIT & ASi BUS
140 - 009C001000 = 14 ULS BOX WITH 2 X V3 i-SAFE PROXIMTY SENSORS, ASi WITH EXTENDED ADDRESSING OUTPUTS DISABLED + TRANSIT PLUGS

Further switch options are available upon request - contact Kinetrol for details

For more information see KF487

ATEX TO CATEGORY 1 APPROVED

AS Interface Bus

The AS interface card allows easy digital serial communication for your sensors and actuators, allowing your actuators to be controlled and monitored when they are in the field, via a single 2 wire cable.

Actuator Sensor interface devices are used to make up control systems based on a two-wire communication cable known as a bus, and can be controlled or monitored by means of a digital signal sent via the bus to and from a "master" device (which can be a computer or a PLC).

The slave devices will always function in response to commands sent by the master device, either to actuate or to return a message reporting the value of a sensed variable, or both. The AS Interface specification allows 31 or fewer slave devices to be powered by a DC voltage fed into the same two wire cable used as the communication bus, with allowed power consumption adequate to drive the slave plus a standard pneumatic solenoid valve.

An AS Interface bus can be used as the final field link in a more complex hierarchy of devices making up a large plant-wide control system. Actuators and sensors must often be installed in unprotected environments where conditions can be demanding; the AS Interface bus can be used as the link between these field devices and the "indoor" equipment making up the upper part of the control system.

The AS Interface bus is designed for on/off control and monitoring and is a good choice when a simple, economical, reliable and robust solution is required for controlling and monitoring a series of actuators and sensors in a process control or machine application.

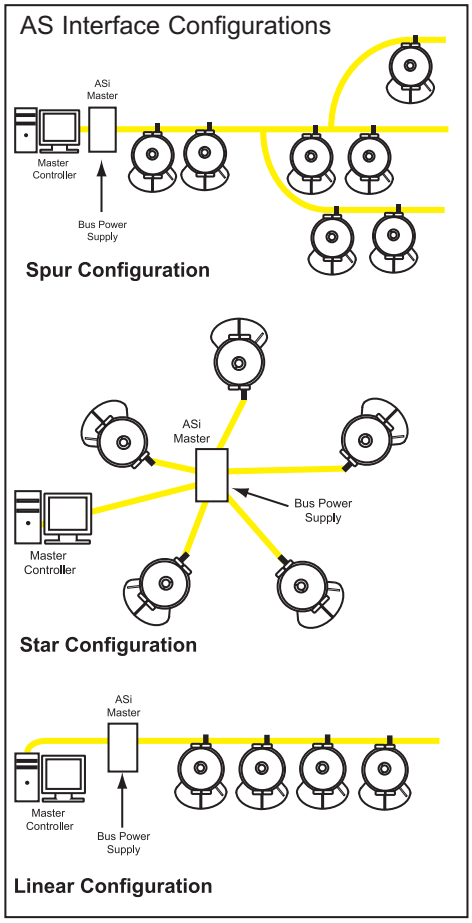
The Kinetrol AS Interface Card

The Kinetrol Actuator Sensor Interface card is fitted inside the Kinetrol Universal Limit Switch box, thus combining the industrial quality robustness of the box with the advantages of digital serial communication.

The AS interface bus cable can be routed in through the conduit entries and connected at internal terminal blocks, alternatively an M12 connector plug facing outwards from conduit entry can be supplied to allow quick connection from M12 sockets or with clip on adaptations for ribbon type yellow AS interface cables.

AS Interface Card Features

- **AS interface 2.1 compatibility**
- **Up to 31 units with solenoid valve on-off control, powered and controlled via one two core cable**
- **Up to 62 units** (using extended addressing)
- **All metal robust industrial-quality limit switch box, direct mounted on a Kinetrol actuator**
- **2 on/off outputs per unit**
- **4 on/off inputs per unit**
- **Reads mechanical switches or inductive sensors**
- **Retrofittable to standard Kinetrol Universal Limit Switch Box**
- **LED external indicator option**
- **Up to 31 24V 2.5W solenoid valves can be connected to bus with no separate power supply**
- **M12 connector plug option available for instant bus connection**
- **Cable clamping connector block for yellow ribbon-type AS interface cable available with M12 socket to fit onto plug option**
- **Output short circuit protection built in**



AS Interface 2.1 Specification

- **Master -** Slave protocol
- **Up to 31 Slaves per master**
- **Each slaves has its own unique address** (set by user)
- **All slaves can be scanned every 5 milliseconds**
- **Baud Rate -** 197 Kbits/second
- **Slaves may be added anywhere in the bus**
- **Slaves may be parallel connected on the bus, using star or spur configurations**
- **Up to 124 inputs per bus**
- **Up to 124 outputs per bus, 62 using the Kinetrol device**
- **26.5 to 31.5 Vdc, 8 A max power supply**
- **100 m (325ft) maximum cable length** (repeaters may extend network distance)
- **Untwisted, unshielded, 2-wire (1.5mm^2) cable can be used**

AS Interface Extended Addressing

Kinetrol's AS Interface circuit is a slave device to allow 32 devices (usually 31 slaves plus an AS Interface master device) to be powered and controlled via a 2-wire bus cable, with full capability to energise one solenoid on every unit all at the same time. This is the standard (Option code B).

The AS Interface 2.1 specification also allows for an extended address option, whereby 62 addresses can be connected and powered via one bus cable. The specified limits on device capacitance however, mean that if the full extended-address compliment of slaves all had standard solenoid valves connected, the bus limit would be exceeded.

Kinetrol offer these options to allow use of extended addressing:

1. (Option Code C)
AS Interface circuit with extended addressing enabled and outputs disabled, to read limit switch sensors only. If a solenoid is connected it will not function.

2. (Option Code D)
AS Interface circuit with extended addressing and outputs enabled, plus added isolating relay option fitted to outputs, to allow up to 31 solenoids to be energised simultaneously even from the bus, though up to 60 slave units may be connected to the bus. This requires the user's control system to include a pre-programmed limit on the maximum number of solenoids to be energised. If the system instructs too many units to switch on solenoids, they will obey, and the bus capacitance limit will be exceeded – thus this option must be at the user's risk with regard to this issue.

3. (Option Code E)
AS Interface circuit with extended addressing and outputs enabled, plus added relay options fitted to outputs to allow solenoid valves to be powered by a supply separate from the AS Interface bus. This option requires a separate 24V DC power supply to each actuator, and allows up to 60 slave units to energise their solenoids simultaneously.

To order the Kinetrol AS Interface card refer to codes for Universal Limit Switch Box on page 8.

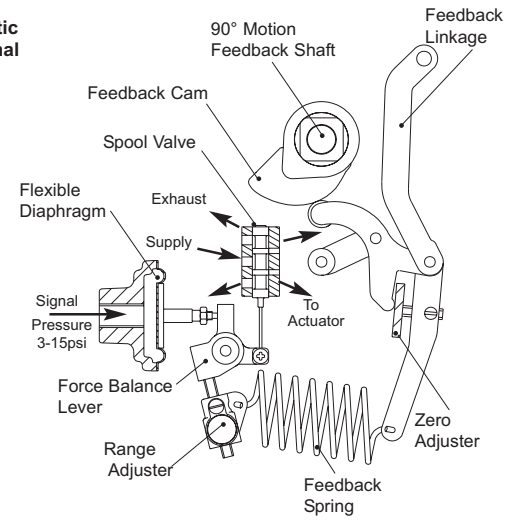
For more information see KF496

Operation

The AP Positioner is designed to drive a rotary or linear actuator to a position set by a 3-15 psi (0.2 to 1.0 bar) signal and hold it there until the signal changes. When a signal pressure is applied to the diaphragm it moves the force balance lever clockwise against the tension of the feedback spring. This moves the spool valve, supplying air pressure to one side of the actuator while exhausting trapped air from the other side. The feedback shaft follows the movement of the actuator and turns the cam counter clockwise, pushing the cam follower and increasing the tension on the feedback spring until it balances the forces on the diaphragm and moves the spool valve to its hold position.

The input signal and desired position is determined by the cam profile. A cam giving 0-90° output movement linearly proportional to a 3-15 psi (0.2-1.0 bar) signal is standard, and almost any desired characteristic can be supplied to order; if it cannot be found in the list of existing options contact Kinetrol.

Schematic Functional Diagram



The AP positioner moves an actuator to a position set by a 3-15psi control signal and holds it there. Its features are:

- **Fast, smooth, accurate response**
- **Simple, all-mechanical function for unbeatable reliability**
- **Three flow options to optimise control on all actuator sizes**
- **Universal application**
  The unit can be mounted in any orientation on to any quarter-turn or linear application
- **Easy set up**
  Quick calibration and reversal of rotational sense (clockwise and anti-clockwise) without special tools or parts change
- **ATEX CAT 1 approved versions available**
- **Easily retrofitted integral module options include:**

  Two wire 4-20mA angle retransmit (inside the same case)

  Mechanical or inductive limit switches (general or hazardous areas)

  4-20mA I/P convertors (general or hazardous areas)

  Clear Cone visual position indicator (general or hazardous areas)

  DIN plug option for retransmit connection

  Low (-40°C) and high (100°C) temperature versions available

  Fail hold options available

  Choice of mount options - see opposite
- **Weatherproof, compact and robust metal housing**
- **Vibration and shock resistant to 4G @ 50Hz**
- **Built in ports for signal air supply and gauge connections**

ATEX CATEGORY 1 APPROVED

The AP positioner can be directly mounted on special versions of Kinetrol models 05, 07, 08, 09, 10, 12 and 14 actuators, both double acting and spring return, giving an assembly with no external plumbing, wiring or mechanical connections and the best in direct backlash free control. Mount kits are available for models 16, 18, 20 and 30.

Alternatively, discrete versions mount on any actuator using VDI/VDE 3845 NAMUR drive, or Kinetrol male square with mounting brackets. Neat adaptations for linear cylinders are also available - consult Kinetrol for details.

Specification

Air supply	instrument quality (dry, clean, oil free) 3.5 to 7 bar, (50 psi to 100 psi) standard. Consult Kinetrol for low pressure application.
Signal	3-15psi (0.2-1.0 bar) standard Consult Kinetrol for split range, 6-30 psi etc.
Control Response	0-90° linear output standard. Consult Kinetrol for other characteristic cam options.
Sensitivity	better than 0.7% of span*
Hysteresis	better than 0.7% of span*
Deviation from linearity	less than 1% of span*
Flowrates @ 5.5 bar	AP: 3.3 scfm (93nl/min) MP: 10.0 scfm (283nl/min) HP: 27.0 scfm (764nl/min)
Operating Temperature Range	-20° to 80°C Standard -20° to 100°C High Temp -40° to 50°C Low Temp
Weight	2.8 Kg/6.2 lb
Materials	• case and cover - zinc alloy • spool and liner - stainless steel • diaphragm: - reinforced polyurethane (standard) - fluorocarbon rubber (high temp) - silicone rubber (low temp) • feedback spring - steel
Finish	epoxy stove enamel
Enclosure Rating	IP54
Output torque	same as double acting or spring return actuator. When controlling fast movement of inertia loads consult Kinetrol

* These refer to the combination of Kinetrol actuator with AP positioner - not just the positioner performance

Maximum vibration tolerance	4G, 50 Hz
I/P Converter options	See Page 13

Travel Times

Maximum velocity (no load) at 80psi 5.5 bar

Model	05	07	09	10	12	12*
Deg/Sec	180	90	45	33	25	32

Model	14	14*	16*	18*	20*
Deg/Sec	10.6	13.8	22.5	11.3	5.6

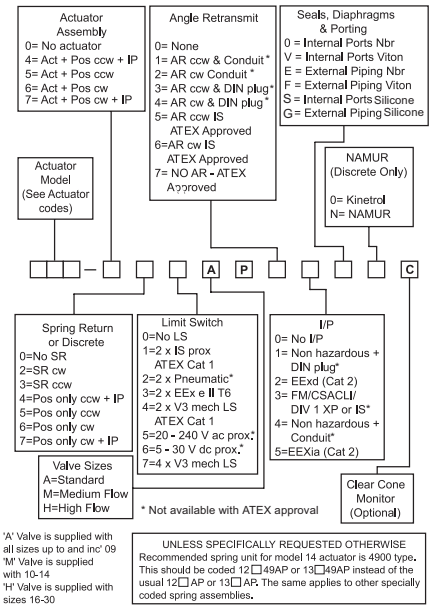
*Externally piped

Cam Options

Giving typical control characteristics. Contact Kinetrol for details of other options.

Input Control Air Signal	Electrical Signal	Output Movement	Characteristic	Cam No.
3-15 psi 0.2-1.0 bar	4-20mA	0-90°	Linear	5-1A
3-9psi 0.2-0.6 bar	4-12mA	0-90°	Linear	5-2A
6-12 psi 0.4-0.8 bar	8-16mA	0-90°	Linear	5-3A
9-15psi 0.6-1.0 bar	12-20mA	0-90°	Linear	5-4A
3-15 psi 0.2-1.0 bar	4-20mA	0-60°	Linear	5-5A
3-15 psi 0.2-1.0 bar	4-20mA	0-45°	Linear	5-6A
3-15 psi 0.2-1.0 bar	4-20mA	0-90°	Proportional Flow	5-7A
3-9 psi 0.2-0.6 bar	4-12mA	0-90°	Proportional Flow	5-8A
9-15 psi 0.6-1.0 bar	12-20mA	0-90°	Proportional Flow	5-22A
3-12 psi 0.2-0.8 bar	4-16mA	0-90°	Linear	5-13A
9-15 psi 0.6-1.0 bar	12-20mA	0-60°	Linear	5-14A

Ordering Codes



For more information see KF391

ATEX CATEGORY 1 APPROVED

The optional Kinetrol I/P Controller is mounted in place of the standard diaphragm housing on the side of the positioner case. The positioner can still be mounted in any attitude and gives an angular output position which is proportional to the input current control signal between 4-20mA.

The 4-20mA signal is converted to an air pressure by a coil and magnet and flapper valve arrangement. This air pressure controls the positioner in the normal way.

Zero and range adjustment is done within the positioner in the same way as with a standard pneumatic positioner. No adjustment is necessary within the I/P Controller. The cover is removed only to connect the two wires - this is not necessary with the DIN plug option.

I/P Controller - Hazardous Area

Kinetrol offers various optional I/P converters which are explosion proof or intrinsically safe certified for use in ATEX Zones 1 & 2 or NEC and CSA CLASS I DIVISION 1. They are mounted directly onto Kinetrol AP positioners with integral air supply.

Certificated as follows

ATEX (Cat 2)	Explosion proof EExd II T6 Intrinsically safe EEx ia II C T4/T5/T6
NEC & CSA	FM explosion proof CLI/DIV1/GRP B C D FM Intrinsically safe CLI/DIV1/GRP A B C D E F G CSA explosion proof CLI/ DIV1/GRP B C G

ATEX TO CATEGORY 2 APPROVED

Specification - Safe Area

Electrical Control Signal	4-20mA
Coil Impedance	20 ohms typical
Cable Entry	16mm conduit or gland (mini DIN plug, IP 65 with Pg9 cable gland, 6-8mm dia optional)
Air Supply	80 psi/5.5 bar nominal
Air Entry	$G^1/_8$ (fitted with 6mm pipe dia. push in connector
Linearity	1.5%*
Hysteresis	less than 1%*
Sensitivity/Deadband	less than 1%*
Supply Pressure Influence	0.2% per psi between 80 and 60 psi
Quiescent Air Consumption	3.5 l/min free air max
Working Temperature Range	-20°C to 80°C

Instrument quality dry clean air obligatory (Class 3.4.4 ISO 8573.1)

* These refer to the combination of Kinetrol actuator with I/P controller - not just the positioner performance

Specification - Hazardous Area

Electrical control Signal	4-20mA
Input Resistance	260 ohms at 20°C
Cable entry	EExd - M20 x 1.5 conduit entry FM/CSA - $^1/_2$ NPT conduit entry
Air Supply	80 psi/5.5 bar nominal
Air Entry	EExd (AP & MP) $G^1/_4$ (HP) $^3/_8$ NPT
Supply Pressure Regulation	20-150 psi/1.4 to 10 bar
Working Temperature	-40°C to 85°C

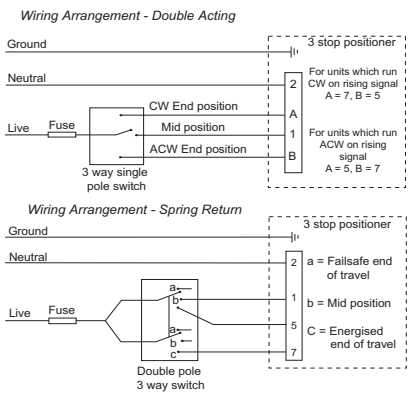
Instrument quality dry clean air obligatory (Class 3.4.4 ISO 8573.1)

- **3 position control using only 4 wires plus air supply**
  For more than 3 positions contact Kinetrol
- **Mid position setpoint anywhere in angular range**
- **Direct mounting onto standard Kinetrol 1/4 turn actuators**
  Double acting or spring return, models 05 to 09 (models 10 to 14 need special actuators)
- **Easy adjustment of mid position setpoint by choice of method selected by links**
  On board potentiometer, external potentiometer or 4-20mA signal
- **Precise electronic circuit in robust metal enclosure** (sealed to IP65/NEMA 4X)
- **Includes direct mounted standard solenoid valves outside positioner box for robustness and accessibility**

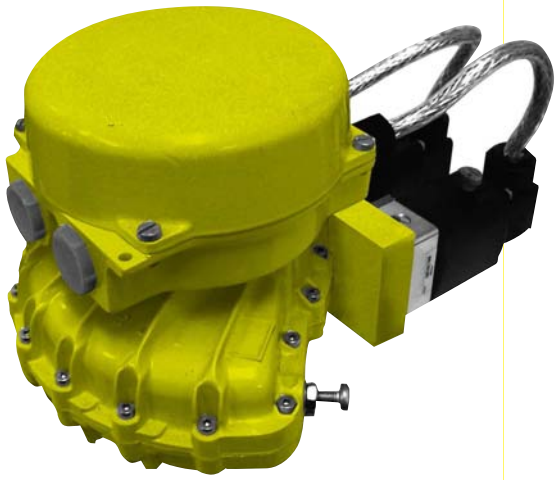
Options

- **Limit Switches** (two mechanical or proximity sensors) inside same box
- **4-20 mA mid position angle feedback circuit inside same box**
- **240 V ac, 115 V ac, 48 V dc and 24 V dc supply options**
- **Consult Kinetrol for the following options:**
  - Spring return from mid position on electrical failure (fail action functions with or without air pressure)
  - "Hold" position on electrical failure (holds without need for air supply pressure)
  - double acting 'fail down' on electrical failure (requires air supply pressure)

Typical Wiring Arrangement



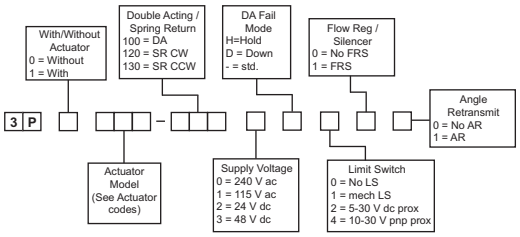
Note - Double pole switch is necessary because terminals 5 and 7 must not be connected to each other when terminal 1 is live (ie. when actuator is set in mid position).



Specification

Supply Voltage	230 V ac ± 10%, 50Hz 115 V ac ± 10%, 50 or 60 Hz 24 V dc ± 10% 48 V dc ± 10%
Power Consumption	Positioner 1.5W maximum Solenoids 20 VA inrush, 10VA hold
Working Temperature	0° to 70°C (32° to 160°F)
4-20mA Input impedance	250 ohms
External Potentiometer Resistance	2000 ohms to 20000 ohms
Linearity	<1% of range
Deadband	0.1% to 3% of range
Repeatability	<1% subject to optimisation of speed and deadband settings
Weight	2.4 kg/5.3 lb.
Dimensions	see page 44

Ordering Codes



Fail-down clockwise is supplied as standard, if counter-clockwise is required, please specify at order placement.

Jumper/Terminal Configurations

Jumper shown thus: ▨	Jumper	Terminals
1. Onboard setpoint pot:	J3 J2 J1	Not Connected
2. User's external setpoint pot: (Minimum 2k Maximum 20K)	J3 J2 J1	9 10 11
3. User's external 4-20mA signal: (must be floating relative to power supply)	J3 J2 J1	9 10 11 - + NC

DA / SR Selection	
Double Acting	J3 J2 J1
Spring Return	J3 J2 J1

Operation

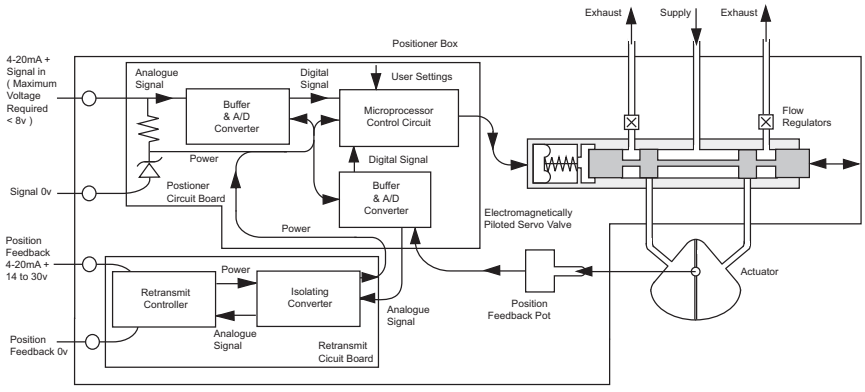
The EL positioner uses a unique low power proportional servo valve to control the position of a quarter-turn actuator.

The microprocessor in the loop-powered 4-20mA position circuit reads the signal via one channel of a 12-bit A-D converter, reads the position voltage from the feedback potentiometer via the second channel of the A-D converter, and compares the two. If it detects a position which is different from that required by the signal, it changes the output to the servo valve in order to to drive the actuator in the direction required to reach the correct position. As the actuator moves, the feedback potentiometer voltage changes and the microprocessor continually calculates the adjustments required for the servo valve in order to guide the actuator accurately into position. The microprocessor is programmed with a sophisticated but compact algorithm which allows this critical dynamic valve adjustment to be made correctly, which in turn gives optimal results with any actuator/load combination - slow or fast, low or high friction, low or high inertia. All can be optimised by tuning the PGAIN and DAMP push buttons via the positioner circuit push buttons.

The EL positioner controls airflow to an actuator and moves it to a position determined by a 4-20mA signal. It's features are:

- **Fast, smooth, and precise control from a digital circuit and proportional servo valve**
- **Simple time saving field set up**
  Quick calibration via push buttons and LED feedback and easy reversal of rotation sense (clockwise/counter clockwise) without special tools or parts change.
- **Universal application**
  The unit can be mounted in any orientation on to any quarter turn or linear application by connection via a NAMUR or Kinetrol square interface.
- **Loop powered**
  No separate power needed, just 4-20mA signal plus air supply.
- **Integral options - easily retrofitted modules include:**
  - two wire 4-20mA isolated angle retransmit
  - mechanical or inductive position indicator switches (general or hazardous areas)
  - Clear Cone high visibility indicator
  - Threaded conduit entries or DIN plugs for external connection
- **Intrinsically safe approved options**
- **Weatherproof, compact and robust metal housing**
- **Zero backlash coupling with easily adjustable switch strikers**
- **Vibration and shock resistant to 4G**
- **Built in gauge ports/external connections**

Simplified Functional Diagram of EL Positioner



ATEX TO CATEGORY 1 APPROVED

Application

This EL positioner can be directly mounted on special versions of Kinetrol models 05, 07, 08, 09, 10, 12 and 14 actuators, both double acting and spring return, giving an assembly with no external plumbing, wiring or mechanical connections and the best backlash free control. Mount kits are available for models 16,18, 20 and 30 actuators.

Alternatively, discrete versions mount on any actuator via VDI/VDE 3845 NAMUR drive, or Kinetrol male square, with mounting bracket. Special adaptations for linear cylinders are also available - consult Kinetrol for details.

The EL Positioner ATEX approval includes the fitting of a special version of the popular Clear Cone high visibility monitor. The EL approval also now allows for the EL Positioner to be used in certain dust atmospheres. It is important to note that the approval of the EL Positioner for use in dust atmospheres is limited to non-conductive dusts having resistance higher than 1000 ohms-m.

Travel Times

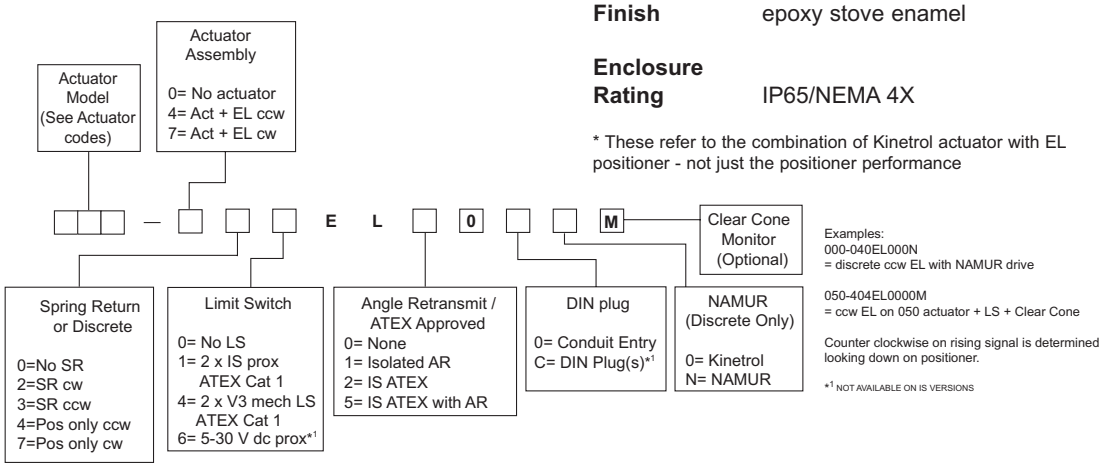
Direct mount from EL positioner to actuator (zero load)

Model	05	07	09	10	12	14
0-90° (sec)	0.7	1.1	2.8	4.1	6.0	12
Deg/Sec	129	82	33	22	15	7.5

Externally piped from EL positioner to actuator (zero load)

Model	07	09	10	12	14	16	18	20
0-90° (sec)	1.0	2.4	3.2	5.0	10.5	22	45	90
Deg/Sec	90	38	28	18	8.6	4.1	2	1

Ordering Codes



Examples:
000-040EL000N
= discrete ccw EL with NAMUR drive

050-404EL0000M
= ccw EL on 050 actuator + LS + Clear Cone

Counter clockwise on rising signal is determined looking down on positioner.

*1 NOT AVAILABLE ON IS VERSIONS

Specification

Air supply	instrument quality (dry, clean, oil free Class 3.4.4 ISO 8573.1), 3.5 to 7 bar (50 psi to 100 psi). Consult Kinetrol for 5µm inlet air filter option
Signal	4-20mA, requiring max 8V to drive through positioner circuit (compatible with standard 24V dc source)
Control Response	0-90° positioning with one linear and 10 non-linear preselected characteristics as standard. Consult Kinetrol for the following versions: i) linearisation of butterfly valve characteristics ii) Pre-selected travel time extension option (with active feedback control of travel speed) iii) customised responses
Sensitivity	better than 0.1mA*
Hysteresis	better than 0.7% of span*
Repeatability	better than 0.7% of span*
Deviation from Linearity	less than 0.7% of span*
Flowrate	3.3 scfm/93 l/m @ 5.5 bar
Operating Temperature	-20° to +70°C (-4°F to 160°F)
Adjustments	low & high points (define range), proportional gain, velocity proportional setpoint advance (damping)
Weight	2.95 Kg/6.5 lb
Dimensions	see page 46
Materials	case and cover - zinc alloy spool and liner - stainless steel
Finish	epoxy stove enamel
Enclosure Rating	IP65/NEMA 4X

* These refer to the combination of Kinetrol actuator with EL positioner - not just the positioner performance

For more information see KF372

ATEX TO CATEGORY 1 APPROVED

180 Degree Pneumatic Actuator

- **Simple compact unit**
  No external moving parts
- **Unique linkage design**
  converts to 180° travel
- **Constant gear-up ratio through travel range**
  Hence constant output torque
- **Rolling contact linkage mechanism**
  Ensures low wear, long life, low friction
- **Linkage sealed for life**
  Protected from the environment, long maintenance free life.
- **Compatible with all Kinetrol modules**
  Direct mounted spring returns, limit switch boxes, positioners etc.
- **Adjustable endstops**
  Giving up to 200° of travel

Operation

KINETROL'S 180° actuator is produced by adding a 2.1 step-up linkage onto the output shaft of well proven 90° vane actuators.

Factory fitted, direct mount linkage units are available to suit model 02, 03,05,07,09,12,14 and 16 actuators, giving a neat single unit with no mount kits or brackets. The linkages unique geometry gives constant 2:1 step-up so that the output torque may be constant throughout the actuator's travel.

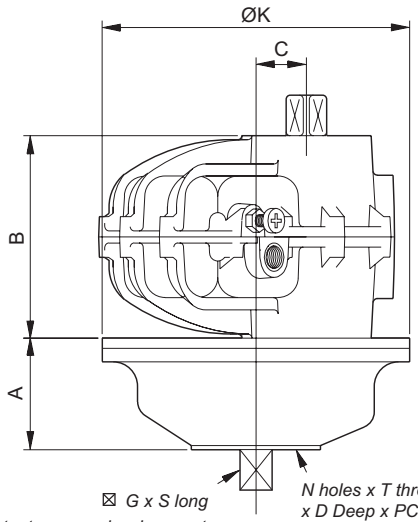
The all-steel mechanism of the linkage employs rolling contacts to minimise frictional losses and wear, and to maximise life. The linkage is lubricated for life, and encased in a robust fully sealed die cast zinc alloy casing. Exterior surfaces are protected by a corrosion resistant epoxy stove enamel finish. Standard adjustable endstops on the 90 degree actuator can be used to set the angle of travel. The other end of the 90 degree actuator allows the full range of Kinetrol modular accessories to be fitted directly.

120 degree actuators are also available for the above model range - contact Kinetrol for details.

Ordering Codes

To order a 180° actuator, add a '1' to the end of the code for the 90° actuator on which it is based.
Example:
To order an 070 cw spring return actuator plus 180° linkage, use code: 070-1201.

ATEX CATEGORY 2 APPROVED



☒ G x S long

Output square is shown at limit of travel (orientation is offset 45° to actuator shaft

N holes x T thread x D Deep x PCD Mounting holes are aligned with actuator interface

Metric Units

Actuator Model	A mm	B mm	C mm	K mm	G mm	S mm	N	T ISO	D mm	PCD mm	W kg
02 - 1001	32	50	12.5	73	8.0	10.0	4	M4	8.0	25.5	1.10
03 - 1001	36	60	20	108	9.0	12.0	4	M5	10.0	31.1	2.00
05 - 1001	35	67	20	108	9.5	13.0	6	M5	8.0	34.9	2.50
07 - 1001	59	100	25	152	16.0	20.0	4	M8	16.0	50.9	5.90
09 - 1001	70	126	35	200	19.0	26.0	4	M10	20.0	65.0	13.20
12 - 1001	99	156	45	258	25.0	31.0	4	M12	22.0	77.8	25.45
14 - 1001	122	200	70	394	28.6	38.0	4	M16	28.5	98.8	51.00
16 - 1001	176	274	100	520	41.0	55.0	4	M24	38.0	152.7	125.00

English Units

Actuator Model	A inch	B inch	C inch	K inch	G inch	S inch	N	T UNC	D inch	PCD inch	Wt lbs
02 - 1001	1.24	1.97	0.49	2.87	0.315	0.39	4	8-32	0.31	1.000	2.43
03 - 1001	1.40	2.36	0.79	4.25	0.354	0.47	4	10-24	0.39	1.225	4.41
05 - 1001	1.38	2.64	0.79	4.25	0.375	0.51	6	10-24	0.31	1.375	5.51
07 - 1001	2.32	3.94	0.98	6.00	0.630	0.79	4	$\frac{5}{16}$-18	0.63	2.000	13.01
09 - 1001	2.76	4.96	1.38	7.90	0.748	1.02	4	$\frac{3}{8}$-16	0.79	2.560	29.10
12 - 1001	3.90	6.14	1.77	10.16	0.984	1.22	4	$\frac{1}{2}$-13	0.87	3.060	56.11
14 - 1001	4.79	7.87	2.76	15.50	1.125	1.50	4	$\frac{5}{8}$-11	1.13	3.890	112.43
16 - 1001	6.93	10.79	3.94	20.47	1.614	2.17	4	$\frac{7}{8}$-9	1.5	6.012	275.00

N.B. Weights are inclusive of actuator and 180 degree assembly, coupling and indicator (except models 14 & 16).

Double Acting Torques/Metric Units Nm

Actuator Model	1.4	2.0	2.8	3.5	4.1	4.8	5.5	6.2	6.9
				Pressure (bar)					
02-1001	0.6	1.1	1.6	2.2	2.7	3.2	3.7	4.2	4.8
03-1001	1.3	2.4	3.5	4.6	5.6	6.7	7.8	8.8	10.0
05-1001	3.2	5.2	7.2	9.3	11.3	13.6	15.6	17.8	19.9
07-1001	7.9	12.6	17.6	22.6	27.6	33.0	38.4	43.2	48.8
09-1001	16.3	20.0	37.1	47.6	58.0	69.2	80.4	91.2	103.0
12-1001	37.5	60.8	84.4	108.0	131.0	156.0	181.0	202.0	226.0
14-1001	97.2	151.0	206.0	262.0	316.0	375.0	434.0	488.0	542.0
16-1001	235.0	357.0	479.1	605.7	727.7	849.8	976.3	1098.4	1220.4

Double Acting Torques/English Units lbf ins

Actuator Model	20	30	40	50	60	70	80	90	100
				Pressure (psi)					
02-1001	5.6	10	14	19	24	28	33	37	42
03-1001	12	21	31	40	50	59	69	78	88
05-1001	28	46	64	82	100	120	138	157	176
07-1001	70	112	156	200	244	292	340	384	432
09-1001	144	236	328	420	512	612	712	808	912
12-1001	332	540	748	960	1160	1376	1588	1792	2000
14-1001	860	1340	1820	2320	2800	3320	3840	4320	4800
16-1001	2080	3160	4240	5360	6440	7520	8640	9720	10800

Spring Return Torques Metric Units Nm

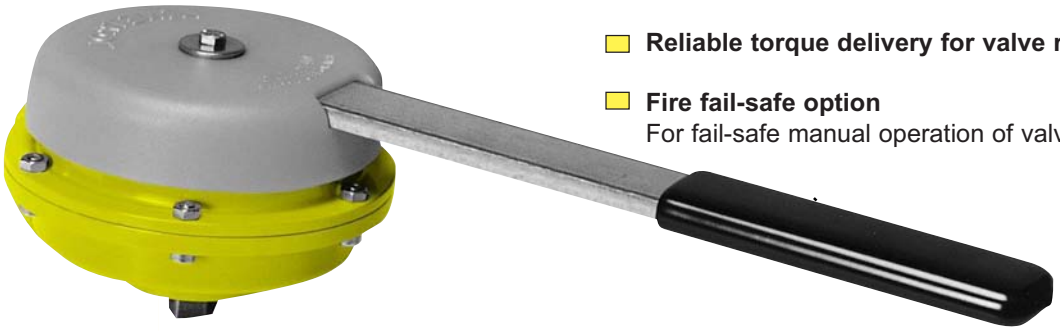
Actuator Model	Position of air OR spring stroke	3.5	4.0	4.5	5.0	5.5
			Pressure Setting (bar)			
02-1201	Start	1.1	1.3	1.4	1.6	1.8
	Finish	0.5	0.7	0.9	1.2	1.4
03-1201	Start	3.3	3.7	4.0	4.3	4.9
	Finish	1.0	1.5	1.9	2.2	2.8
05-1201	Start	4.9	5.5	6.2	7.0	7.9
	Finish	3.2	4.0	4.9	5.8	6.7
07-1201	Start	1.6	13.5	15.5	17.4	19.3
	Finish	7.5	9.5	11.6	13.8	16.1
09-1201	Start	23.2	27.4	31.1	35.3	39.5
	Finish	19.1	23.2	27.0	31.4	35.6
12-1201	Start	55.1	64.8	75.6	81.1	90.4
	Finish	42.2	52.0	60.0	68.9	77.5
14-1201-4900	Start	135.0	156.0	178.0	195.0	201.0
	Finish	109.0	131.0	148.0	164.0	170.0
16-1201	Start	346.8	391.0	426.0	465.0	504.3
	Finish	181.4	237.0	282.0	332.0	381.9

Spring Return Torques English Units lbf ins

Actuator Model	Position of air OR spring stroke	50	60	70	80
			Pressure Setting (psi)		
02-1201	Start	10.3	12.2	14.1	16.0
	Finish	4.6	6.8	9.5	12.5
03-1201	Start	29.6	33.4	37.2	43.7
	Finish	8.7	13.7	19.0	24.7
05-1201	Start	44	51	61	70
	Finish	28	38	49	59
07-1201	Start	103	126	146	171
	Finish	67	92	116	143
09-1201	Start	205	251	300	351
	Finish	169	215	266	315
12-1201	Start	486	595	693	802
	Finish	374	479	585	688
14-1201-4900	Start	1200	1420	1670	1780
	Finish	969	1200	1400	1500
16-1201	Start	3069	3534	3998	4463
	Finish	1605	2197	2788	3380

ATEX CATEGORY 2 APPROVED

If you want to operate a valve manually, but maintain the advantage of the fail-safe spring's certainty of position when unattended, use this device.



- **Manual unit cannot be left in the wrong position**
- **Reliable torque delivery for valve reseat**
- **Fire fail-safe option**
  For fail-safe manual operation of valves etc.
- **ISO5211 female drive & ATEX Category 2 approved options available for models 02, 03, 05 and 07.**
- **Clockwise or counter clockwise 90° spring action** (02 reversible without the need for spring removal)
- **Weatherproof sealed spring housing to protect from internal corrosion**
- **Bi-square (star) and serrated female drive options available**

Application

Manual fail-safe spring units are available in Kinetrol sizes 02, 03, 05 and 07 with factory adjusted torques from 1.4Nm to 45.5Nm.

Models 05, 09 and 12 fire fail-safe units (maximum torque to 260Nm/2300 lbf ins) are available - contact Kinetrol for details.

Specification

Spring Case	Die cast zinc alloy with epoxy paint finish
Shaft	Stainless steel or carbon steel zinc plated
Lever	Stainless steel (03 & 05) Aluminium (02)
Optional fusible link	Soldered type (or equivalent) 2 options

Yield temperature °C	72	93
Max normal ambient temperature °C	42	63

ISO/Female Drive Versions

The 03, 05 and 07 models are available with female drives for direct mount. The model 03 has F03/05 or F04 mounting flanges, the model 05 has F03/05/07 or F04 flanges and the model 07 has a F05/07 flange.

To order female drive versions, replace the 'O-' in the product code with '1F'. For example a model 05 ISO female drive manual fail-safe cw handle with F03/05/07 flanges is coded: 051F020-1006. The F04 flange version is coded 051F020-1006/F4.

Female drive versions with the same flange dimensions are available with ANSI threads eg 059F020-1006/F4.

Serrated female drive options can also be supplied for models 05 and 07. To order these replace the 'F' in the product code with an 'S'.

Ordering Codes

To order a manual fail-safe spring unit, quote model number, direction of spring (as per technical data on page 4) followed by product code.

Type Codes: 1006 - spring unit
1201 - single spring fire fail-safe unit (72°C link)
1203 - double spring fire fail-safe unit (72°C link)
1204 - single spring fire fail-safe unit (93°C link)
1206 - double spring unit (93°C link)

When ordering fire fail-safe units, please state maximum torque required (at or below maximum shown in table).

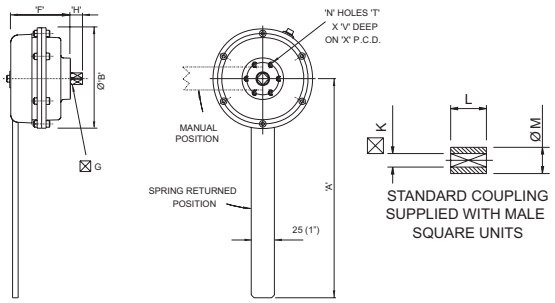
Example: for an 05 model, ISO threads, spring clockwise, 15Nm maximum torque, the code would be:

050-020-1201 -15Nm

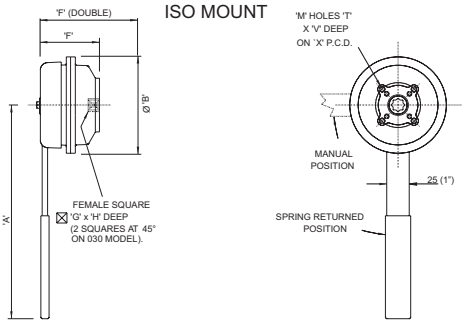
ATEX category 2 versions can be ordered by replacing "0" in code 1006 with "1" (i.e 1016)

ATEX TO CATEGORY 2 APPROVED

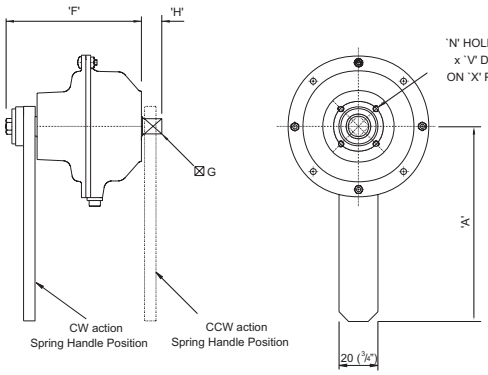
03, 05 and 07 MODELS



ISO MOUNT

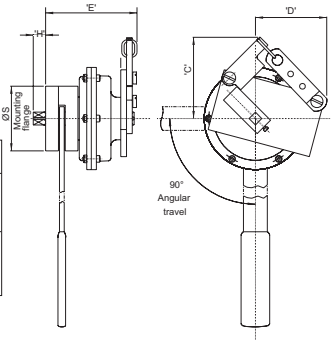


02 MODEL



FIRE FAIL-SAFE DIMENSIONS		C	D	E	S
mm	050-020-1201	85.0	75.0	97.0	68
	050-020-1203	85.0	75.0	142.0	68
inch	050-020-1201	3.45	2.95	3.82	2.68
	050-020-1203	3.45	2.95	5.59	2.68

FIRE FAIL-SAFE
Shown in energised position



Dimensions/Torques

Metric Units

	No Of Springs	A mm	B mm	F mm	G mm	H mm	K mm	L mm	M mm	N	T	V mm	X mm	Maximum Torque Nm	Torque Reduction Thro' Stroke Nm
020-020-1006	1	110.0	73.0	70.0	7.98 7.93	10.0	8.022 8.000	22.0	16.0	4	M4	8.0	25.5	5.1	1.0
030-020-1006	1	238.0	108.0	62.0	8.98 8.93	12.0	9.022 9.000	22.0	18.0	4	M5	10.0	31.1	14.0	3.0
050-020-1006	1	238.0	118.0	62.0	9.525 9.470	13.0	9.58 9.55	25.4	19.0	6	M5	8.0	34.9	24.0	3.5
070-020-1006	1	360.0	152.0	103.0	15.98 15.93	-	16.027 16.000	40.0	32.0	4	M8	15	50.8	45.5	5.8
050-020-1201	1	238.0	118.0	79.0	9.525 9.470	13.0	9.58 9.55	25.4	19.0	6	M5	13.0	34.9	24.0	3.5
050-020-1203	2	238.0	118.0	124.0	9.525 9.470	13.0	9.58 9.55	25.4	19.0	6	M5/M6	13.0	34.9	45.5	5.8
031F020-1006	1	238.0	108.0	66.0	11.0	12.0	-	-	-	4	M5/M6	10/12	36/50	14.0	3.0
031F020-1006/F4	1	238.0	108.0	66.0	11.0	12.0	-	-	-	4	M5	10.0	42.0	14.0	3.0
051F020-1006	1	238.0	118.0	62.0	14.0	16.0	-	-	-	4	M5/M6/M8	10/12/13	36/50/70	24.0	3.5
051S020-1006	1	238.0	118.0	62.0	*	*	-	-	-	4	M5/M6/M8	10/12/13	36/50/70	24.0	3.5
051F020-1006/F4	1	238.0	118.0	62.0	14.0	16.0	-	-	-	4	M5	10.0	42.0	24.0	3.5
071F020-1006	1	360.0	152.0	103.0	17.0	22.0	-	-	-	4	M6/M8	14	50/70	45.5	5.8
071S020-1006	1	360.0	152.0	103.0	*	*	-	-	-	4	M6/M8	14	50/70	45.5	5.8

English Units

	No Of Springs	A inch	B inch	F inch	G inch	H inch	K inch	L inch	M inch	N	T UNC	V inch	X inch	Maximum Torque lbs.ins	Torque Reduction Thro' Stroke lbs.ins
029-020-1006	1	4.33	2.87	2.76	0.314 0.312	0.39	0.316 0.315	0.86	0.63	4	8-32	0.310	1.0	45	8.00
039-020-1006	1	9.37	4.25	2.44	0.354 0.352	0.47	0.355 0.354	0.86	0.70	4	10-24	0.390	1.22	124	26.55
059-020-1006	1	9.37	4.64	2.44	0.375 0.373	0.51	0.377 0.376	1.00	0.75	6	10-24	0.310	1.37	212	31.00
079-020-1006	1	14.17	5.98	4.06	0.629 0.627	-	0.631 0.630	1.57	1.26	4	5/16 -18	0.625	2.00	400	51.00
059-020-1201	1	9.37	4.64	3.11	0.375 0.373	0.51	0.377 0.376	1.00	0.75	6	10-24	0.510	1.37	212	31.00
059-020-1203	2	9.37	4.64	4.88	0.375 0.373	0.51	0.377 0.376	1.00	0.75	6	10-24	0.510	1.37	425	51.00
039F020-1006	1	9.37	4.25	2.60	0.43	0.47	-	-	-	4	10-24	0.31/0.39	1.42/1.97	124	26.55
039F020-1006/F4	1	9.37	4.25	2.60	0.43	0.47	-	-	-	4	10-24	0.390	1.65	124	26.55
059F020-1006	1	9.37	4.64	2.44	0.55	0.63	-	-	-	4	10-24□1/4□5/16	0.39/0.47/0.51	1.42/1.97/2.76	212	30.98
059S020-1006	1	9.37	4.64	2.44	*	*	-	-	-	4	10-24	0.39/0.47/0.51	1.42/1.97/2.76	212	30.98
059F020-1006/F4	1	9.37	4.64	2.44	0.55	0.63	-	-	-	4	10-24	0.390	1.65	212	30.98
079F020-1006	1	14.17	5.98	4.06	0.669	0.75	-	-	-	4	1/4□5/16	0.39/0.51	1.97/2.76	400	51.00

* Refer to TD141 for details on serrations and inserts

Weights in Metric

02 Models - 0.5 Kg
03 Models - 1.87 Kg
05 Models - 1.87 Kg
07 Models - 5.17 Kg

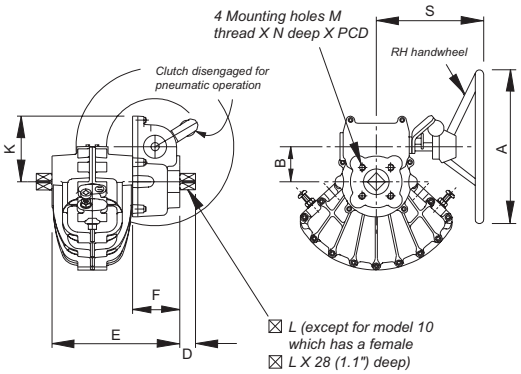
Weights in English

02 Models - 1.102 lb
03 Models - 4.123 lb
05 Models - 4.123 lb
07 Models - 11.374 lb

- **Left hand handwheel option**
- **Declutch lever switch available**
- **Corrosion resistant -** fully sealed to IP65

Kinetrol declutchable geared overrides are available for models 05, 07, 09, 10, 12, 14 and 16, rated for the same torques as the actuators and fitted between the actuator and the load.
The standard unit is supplied with the right hand handwheel option (see drawing below), whereby when the handwheel is moved in a clockwise direction the actuator moves in a counter clockwise direction. A left hand handwheel option is also available.

Dimensions



** N.B. Drawing is not representative of model 16 Gearbox. For full details contact Kinetrol*

Metric Units

Actuator Model (ISO)	A mm	B mm	D mm	E mm	F mm	K mm	☒ L mm	M	N mm	PCD mm	S mm	Wt kgs
05	300	67.8	13	170	103	127	9.5	M5	12	34.9	220	9.18
07	300	67.8	20	192	92	127	16.0	M8	16	50.9	220	11.20
09	300	67.8	26	218	92	127	19.0	M10	20	65.0	220	14.44
10	300	67.8	-	267	92	127	22.0	M10	20	102.0	220	17.50
12	300	67.8	31	248	92	127	25.0	M12	25	77.8	220	20.40
14	400	67.8	38	292	92	127	28.6	M16	28	98.8	250	32.06
16*	605	132.0	55	448	174	194	41.0	M16	28	200.0	276	69.80

English Units

Actuator Model (ANSI)	A Inch	B Inch	D Inch	E Inch	F Inch	K Inch	☒ L Inch	M UNC	N Inch	PCD Inch	S Inch	Wt lbs
05	11.81	2.67	0.51	6.69	4.06	5.0	0.375	10-24	0.47	1.375	8.66	20.2
07	11.81	2.67	0.79	7.56	3.62	5.0	0.630	5/16	0.63	2.000	8.66	24.7
09	11.81	2.67	1.02	8.58	3.62	5.0	0.748	3/8	0.79	2.560	8.66	31.8
10	11.81	2.67	-	10.51	3.62	5.0	0.866	3/8	0.79	4.016	8.66	38.5
12	11.81	2.67	1.22	9.76	3.62	5.0	0.984	1/2	0.98	3.060	8.66	44.9
14	15.7	2.67	1.50	11.50	3.62	5.0	1.125	5/8	1.10	3.890	9.84	70.5
16*	23.8	5.20	2.17	17.64	6.85	7.64	1.614	5/8	1.10	7.874	10.87	154.0

Ordering Codes

Models 05 to 14:
(Standard right hand handwheel)

Example for an 07 model:
070 K/Box (ISO Version)
079 K/Box (ANSI Version)

Models 05 to 14:
(Left hand handwheel)

Example for an 07 model:
070 K/Box LH (ISO Version)
079 K/Box LH (ANSI Version)

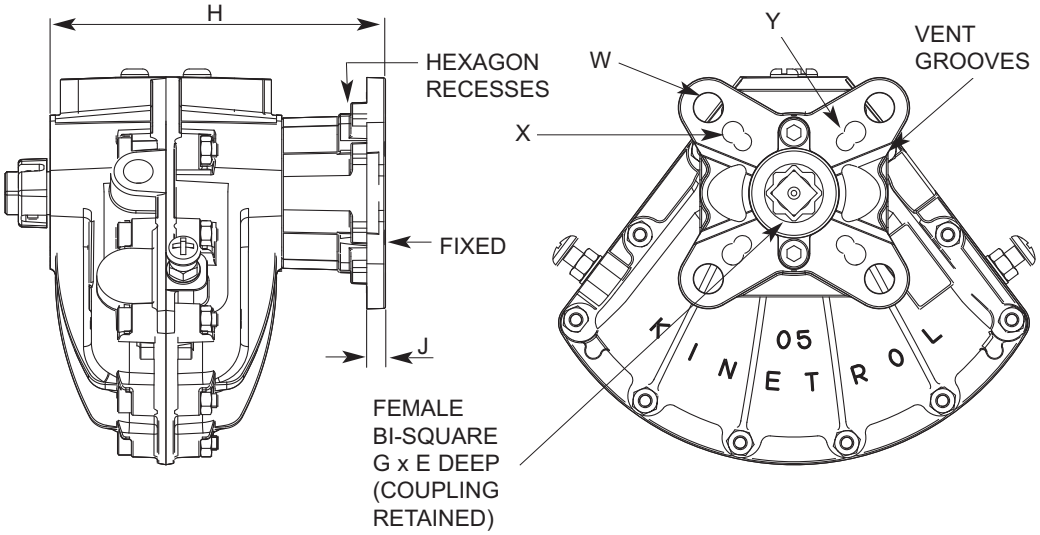
* For model 16 replace 'K' with 'G'

ATEX CATEGORY 2 APPROVED

Ultimate Mounting Flexibility

- **Low cost direct mount flange and coupling for mounting to valves with ISO 5211 drive interfaces, available for actuator models 03, 05, 07 and 09**
- **Mounting directly to standard Kinetrol double acting actuator there by reducing stocking requirements**
- **Multiple mounting hole sets in one part**
- **International patents.** The novel design allows metric mounting screws to face in either direction. Valve flanges with tapped holes can easily be interfaced for the first time. Nut recesses in flange make for easy installation.
- **Robust epoxy coated zinc alloy adaptor with no threads for maximum corrosion resistance.**
- **Female drive bi-square (star) coupling is retained by adaptor and made from zinc plated steel** (other materials available on request).
- **Serrated drive versions also available.**

International Patents

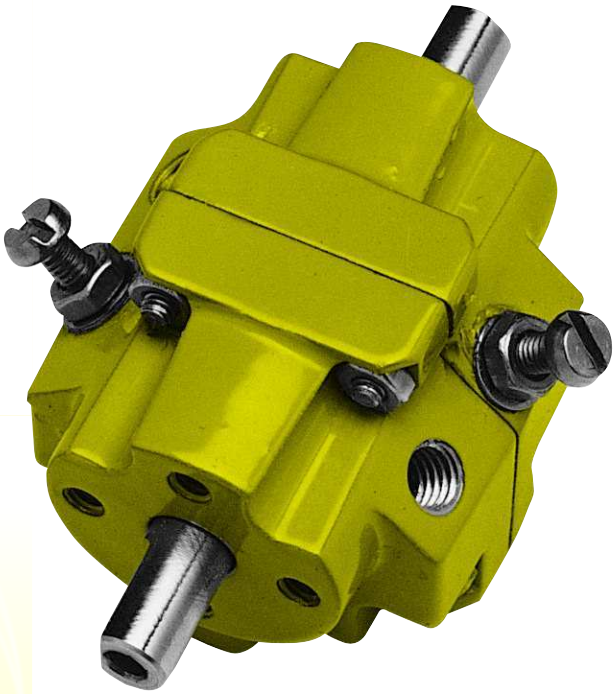


Adaptor Kit*	Order Codes	ISO Flange Sizes	H mm	J mm	G mm	E mm	W PCD mm	X PCD mm	Y PCD mm	WEIGHT kg
SP 1449	031F100**	F03/F0 5	84	5.0	1 1	12	6.6 50	5.5 36		0.13
SP 1454	030-100Z fitted with SP1454	F04	84	5.0	1 1	12	5.5 42	-	-	0.13
SP 1450	051F100	F04/F05/F07	97	5.4	14	17	9.0 70	6.6 50	5.5 42	0.27
SP 1451	071F100	F05/F07	140	8	17	19	9.0 70	6.6 50	-	0.53
SP 1452	091F100	F07/F10	176	10	22	24	11.0 10 2	9.0 70	-	1.04

* ANSI (e.g. ASP1 449) colour versions (identical dimensions) also available.
** Default 03 version

ATEX CATEGORY 1 APPROVED

Model OMO (miniature)



Specification

Output Torque

8.0 lbf ins/0.9 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel versions available)

Displaced Volume

0.15 in^3/2.4 cm^3

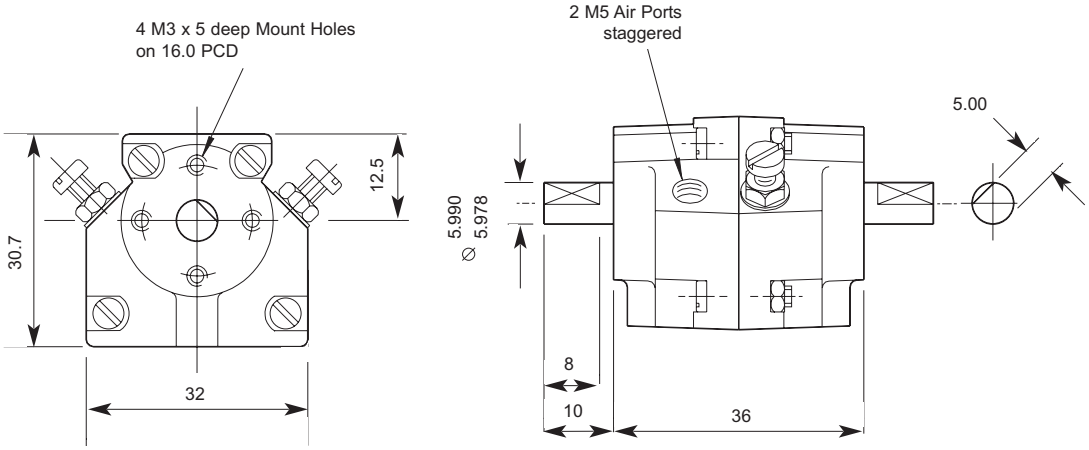
Finish

Epoxy stove enamel

Weight

0.26 lb/0.12 kg

For further information see General Specification on page 49.

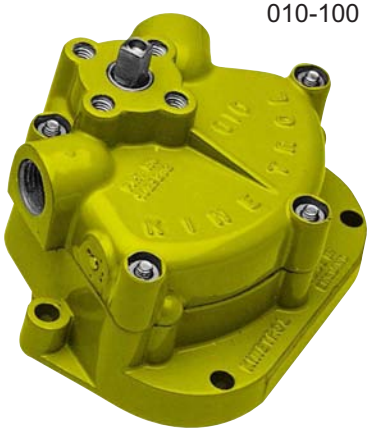


Actual Size

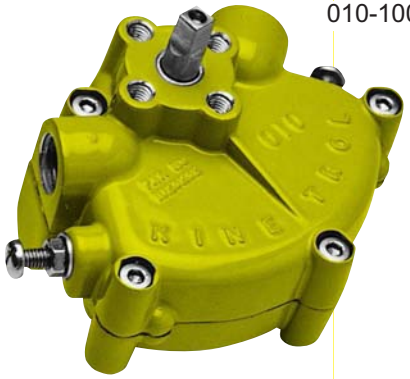
Options

- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **English dimensions see page 42**

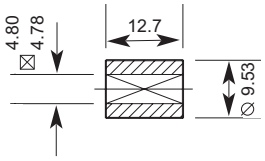
010-100

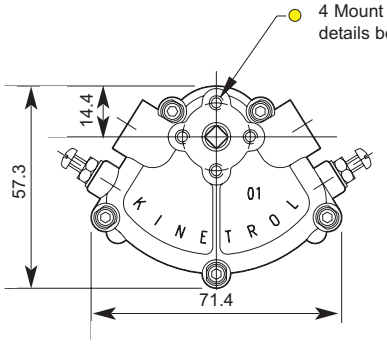


010-100A

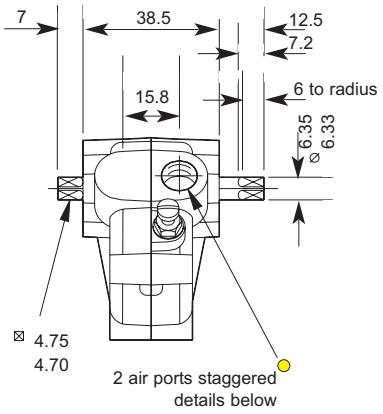


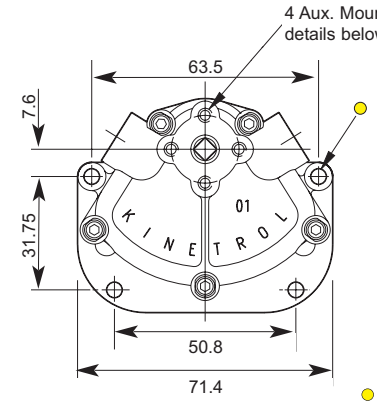
Standard Coupling
(supplied with both actuators
weight 0.2 oz/0.005 kg)



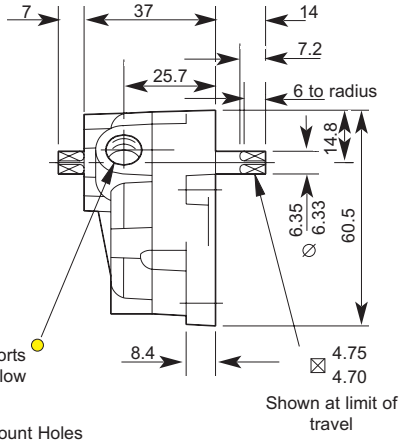


ACTUATOR 010-100A
Angle of travel: 78° - 100°
Weight 0.33 lb/0.15 kg





ACTUATOR 010-100
Angle of travel: 90°
Weight 0.40 lb/0.18 kg



Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
010-100A	$G^1/_8$	M4 x 6 deep x 19.0 PCD
019-100A	$^1/_8$ NPT	8-32 UNC x 0.25" deep on 0.75" PCD
010-100	$G^1/_8$	M4 clearance

Options

- **Fail safe spring return units - clockwise or counter clockwise**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**

Specification

Output Torque

58 lbf ins/6.7 Nm
at 100 psi/7 bar

Angle of Travel

See Drawings
(restricted travel
versions available)

Displaced Volume

0.91 in^3/15 cm^3

Finish

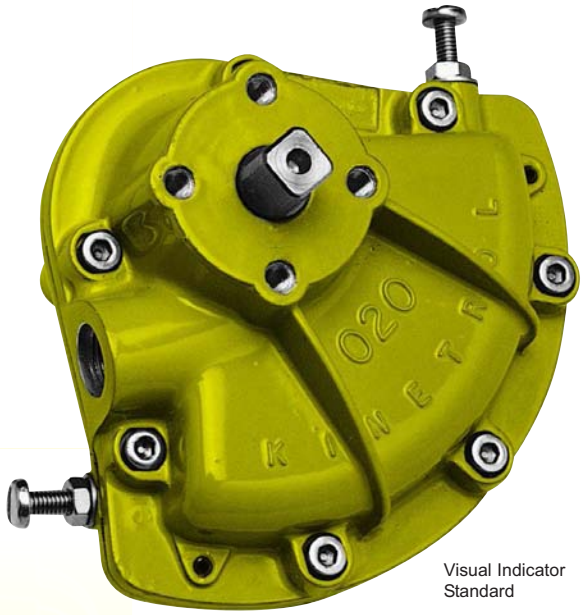
Epoxy stove enamel

Weight

See Drawings

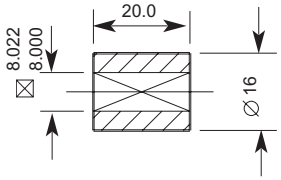
For further information
see General Specification
on page 49.

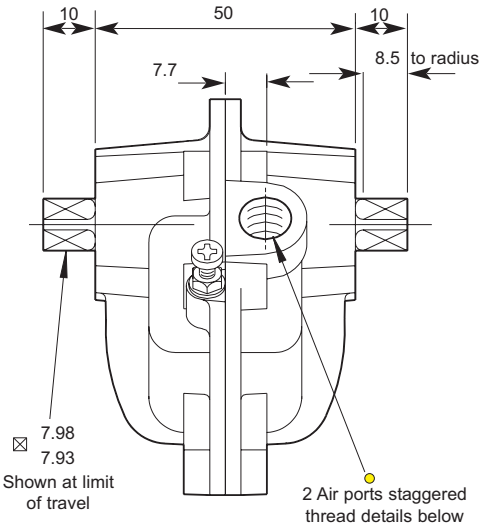
ATEX CATEGORY 1 APPROVED



Visual Indicator
Standard

Standard Coupling
(supplied with actuator
weight 0.04 lbs/0.02 kg)





Specification

Output Torque

106 lbf ins/12.1 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel
versions available)

Displaced Volume

1.89 in³/31 cm³

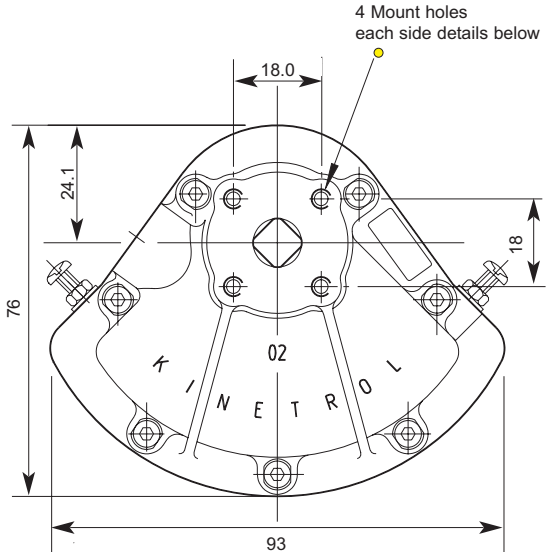
Finish

Epoxy stove enamel

Weight

0.97 lb/0.44 kg
(excluding coupling)

For further information
see General Specification
on page 49



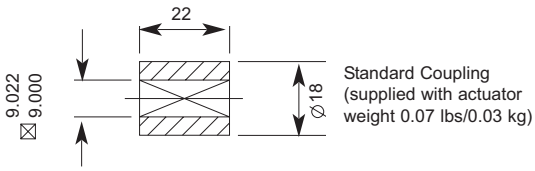
● **Air Port/Mount Hole Details**

Model	Air Ports	Mount Holes
020-100	$G^1/_8$	M4 x 8 deep x 25.5 PCD
028-100	$G^1/_8$	M4 x 8 deep x 25.5 PCD
029-100	$^1/_8$ NPT	8-32 UNC x 0.32" deep on 1.00" PCD

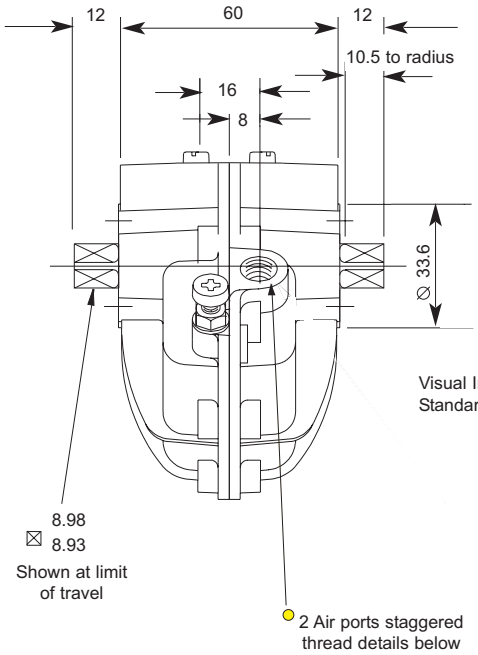
Options

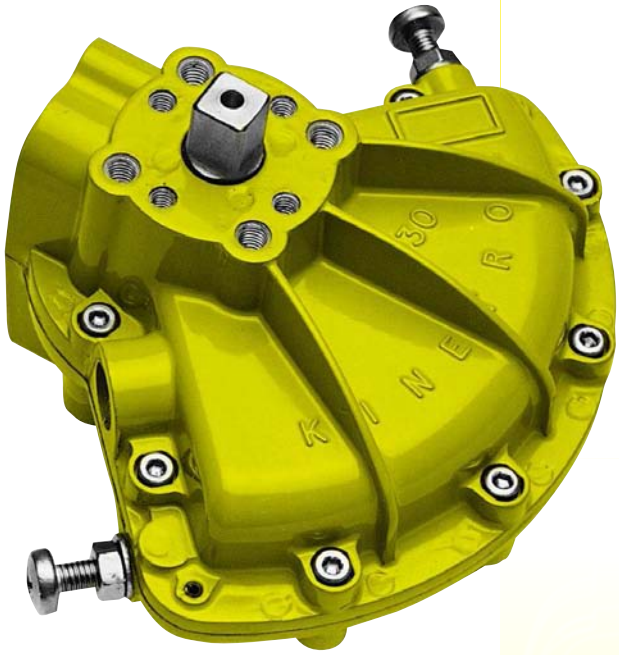
- **Fail safe spring return units - clockwise or counter clockwise**
- **180° model**
- **Female drive and mounting details to DIN 3337 and ISO 5211**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**

ATEX CATEGORY 1 APPROVED

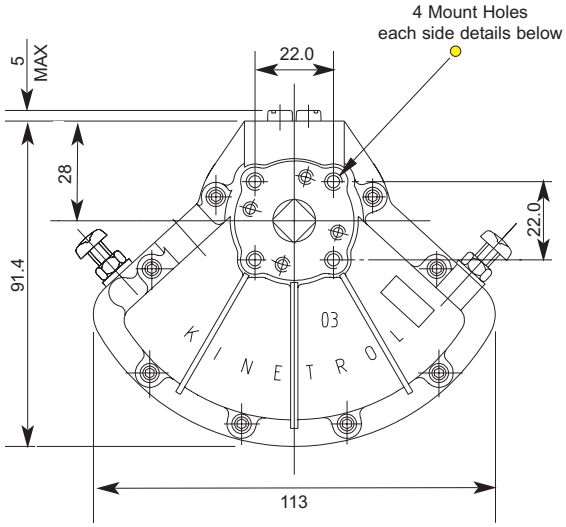


Standard Coupling
(supplied with actuator
weight 0.07 lbs/0.03 kg)





Visual Indicator
Standard



Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
030-100	$G^1/_8$	M5 x 10 deep x 31.1 PCD
038-100	$G^1/_8$	M5 x 10 deep x 31.1 PCD
039-100	$^1/_8$ NPT	10-24 UNC x 0.39" deep on 1.225" PCD

Options

- **Fail safe spring return units - clockwise or counter clockwise**
- **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- **Integral solenoid valve**
- **180° model**
- **Female drive and mounting details to DIN 3337 and ISO 5211**
- **ISO adaptor**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**

Specification

Output Torque

220 lbf ins/25 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel
versions available)

Displaced Volume

3.66 in^3/60 cm^3

Finish

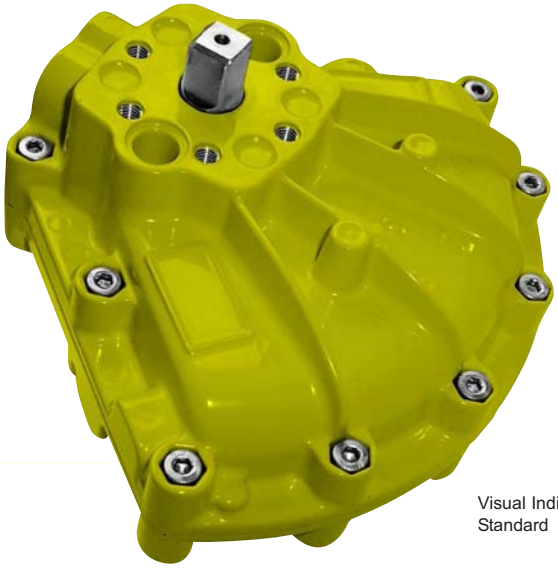
Epoxy stove enamel

Weight

1.53 lb/0.70 kg
(excluding coupling)

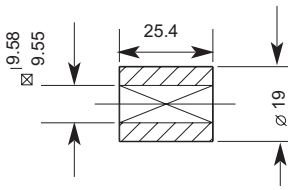
For further information see General Specification on page 49

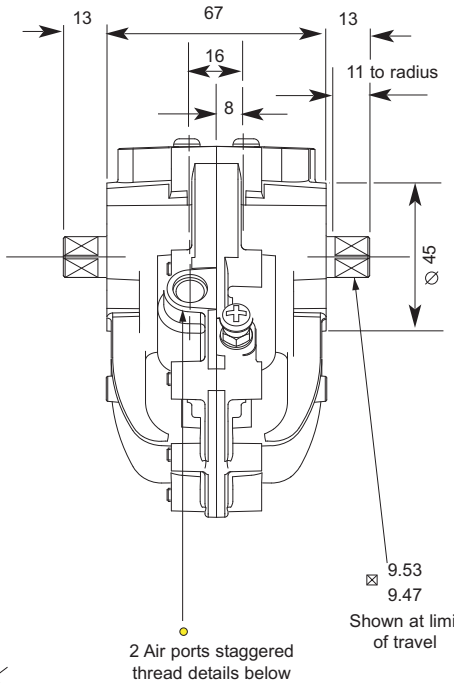
ATEX CATEGORY 1 APPROVED

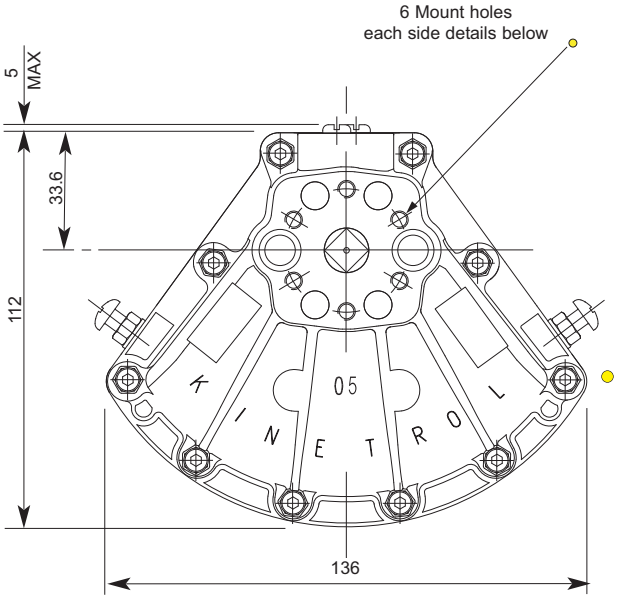


Visual Indicator
Standard

Standard Coupling
(supplied with actuator
weight 0.09 lbs/0.04 kg)







Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
050-100	$G^1/_8$	M5 x 10 deep x 34.9 PCD
058-100	$G^1/_8$	M5 x 10 deep x 34.9 PCD
059-100	$^1/_8$ NPT	10-24 UNC x 0.39" deep on 1.375" PCD

Specification

Output Torque

440 lbf ins/50 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

84° - 100°
(restricted travel versions available)

Displaced Volume

6.9 in^3/113 cm^3

Finish

Epoxy stove enamel

Weight

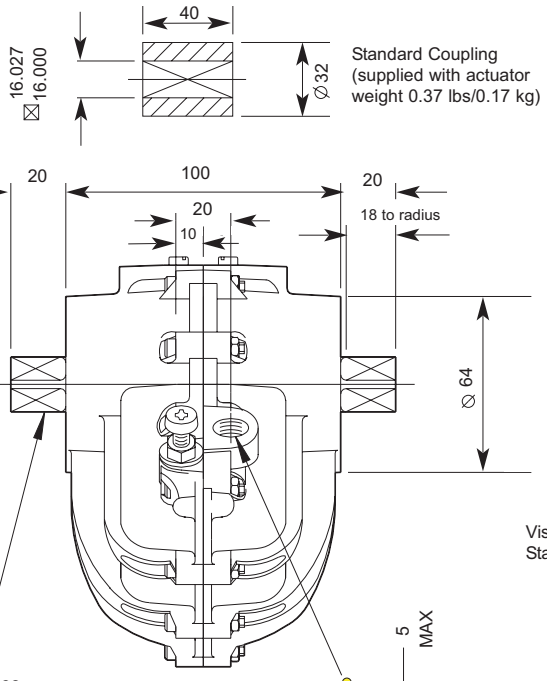
2.73 lb/1.24 kg
(excluding coupling)

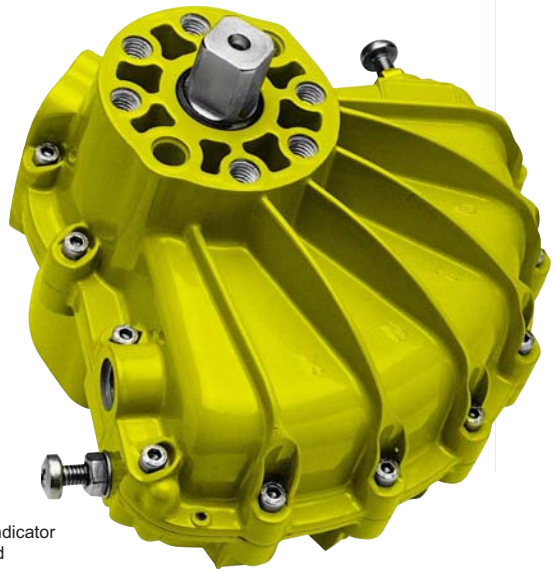
For further information see General Specification on page 49

ATEX CATEGORY 1 APPROVED

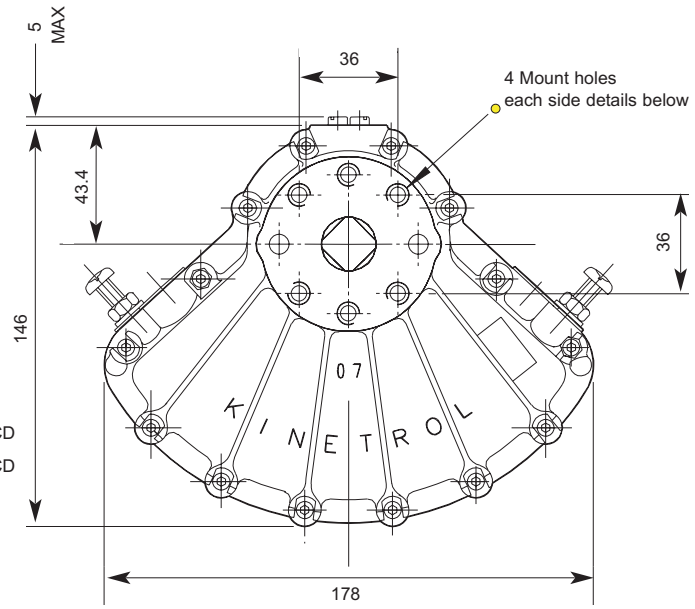
Options

- ☐ **Fail safe spring return units - clockwise or counter clockwise**
- ☐ **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- ☐ **AP pneumatic positioner - full range of options see pages 11/12**
- ☐ **EL electropneumatic positioner - full range of options see pages 15/16**
- ☐ **Integral solenoid valve**
- ☐ **3 stop positioner**
- ☐ **Clear Cone position monitor**
- ☐ **180° model**
- ☐ **Female drive and mounting details to DIN 3337 and ISO 5211**
- ☐ **ISO adaptor**
- ☐ **Geared manual override**
- ☐ **Code identification see page 38**
- ☐ **Torque outputs see pages 47/48**
- ☐ **See pages 42/43 for English dimensions and dimensions of spring options**





Visual Indicator
Standard



Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
070-100	$G^1/_4$	M8 x 16 deep x 50.8 PCD
078-100	$G^1/_4$	M8 x 16 deep x 50.8 PCD
079-100	$^1/_4$ NPT	$^5/_{16}$ UNC -18 x 0.63" deep on 2.00" PCD

Options

- Fail safe spring return units - clockwise or counter clockwise
- Limit switch boxes for open/close indication - various switches for all hazardous areas
- AP pneumatic positioner - full range of options see pages 11 & 12
- EL electropneumatic positioner - full range of options see pages 15 & 16
- Integral solenoid valve
- 3 stop positioner
- Clear Cone position monitor
- 180° model
- Female drive and mounting details to DIN 3337 and ISO 5211
- ISO adaptor
- $^3/_8$ ports
- Geared manual override
- Code identification see page 38
- Torque outputs see pages 47/48
- See pages 42/43 for English dimensions and dimensions of spring options

Specification

Output Torque

1080 lbf ins/124 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel
versions available)

Displaced Volume

18.3 in^3/300 cm^3

Finish

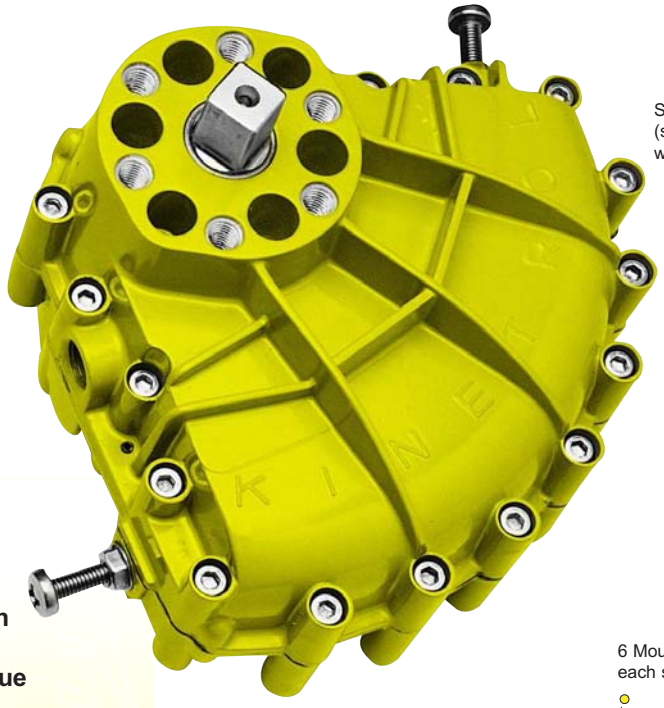
Epoxy stove enamel

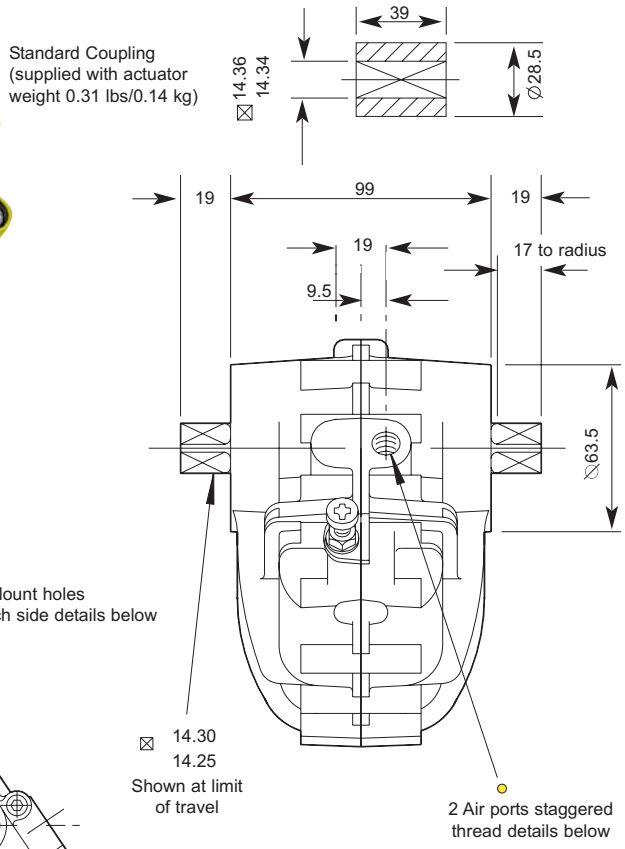
Weight

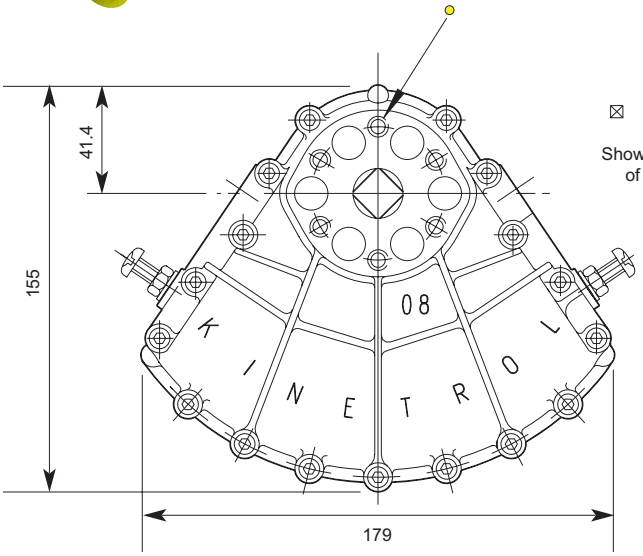
6.91 lb/3.13 kg
(excluding coupling)

For further information
see General Specification
on page 49

ATEX CATEGORY 1 APPROVED







Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
080-100	G 1/4	M8 x 16 deep x 50.8 PCD
088-100	G 1/4	M8 x 16 deep x 50.8 PCD
089-100	1/4 NPT	5/16 UNC x 0.63" deep on 2.00" PCD

Specification

Output Torque

1500 lbf ins/173 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

72° - 93°
(restricted travel versions available)

Displaced Volume

23.9 in³/392 cm³

Finish

Epoxy stove enamel

Weight

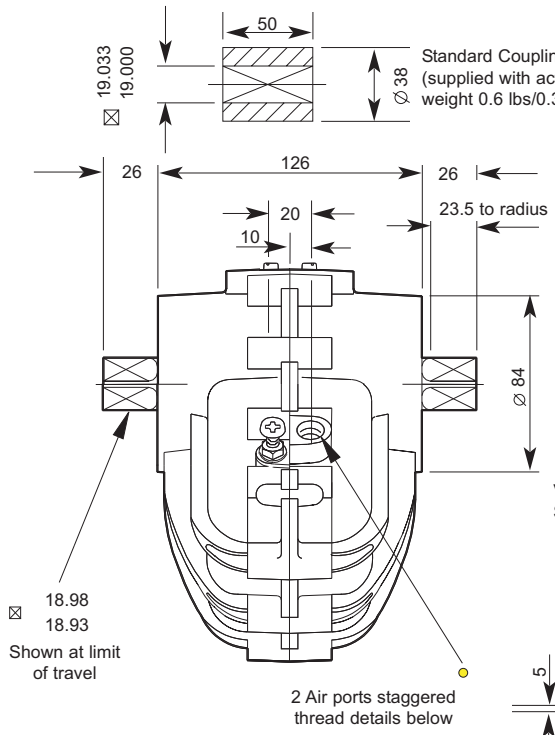
6.85 lb/3.11 kg
(excluding coupling)

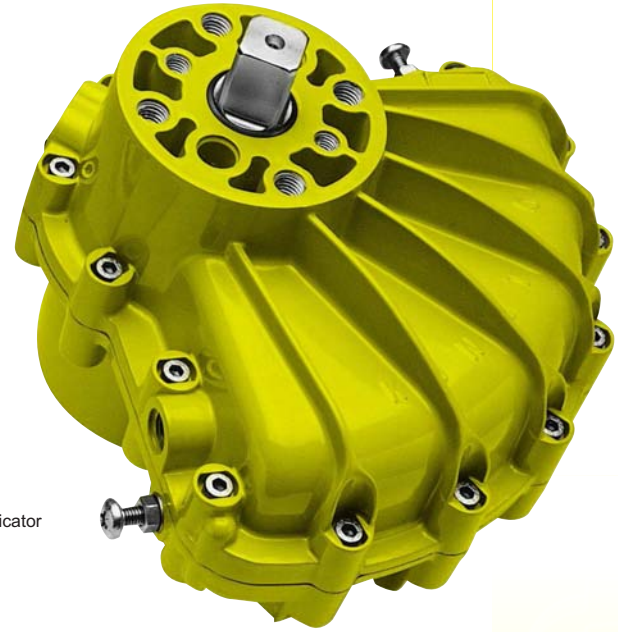
For further information see General Specification on page 49.

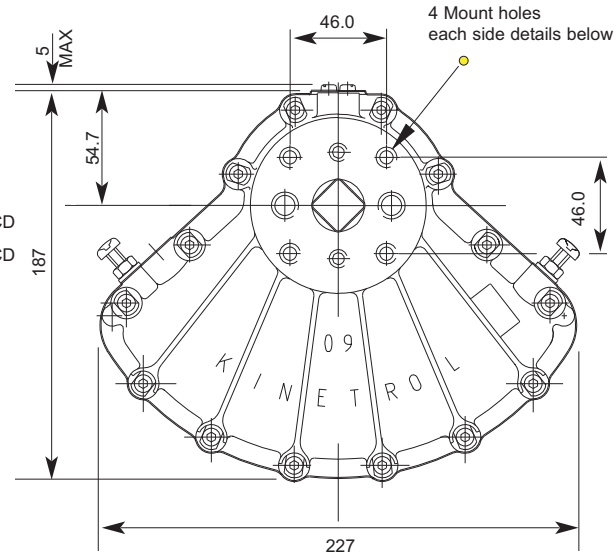
ATEX CATEGORY 1 APPROVED

Options

- **Fail safe spring return units - clockwise or counter clockwise**
- **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- **AP pneumatic positioner - full range of options see pages 11/12**
- **EL electropneumatic positioner - full range of options see pages 15/16**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**







Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
090-100	$G^1/_4$	M10 x 20 deep x 65.0 PCD
098-100	$G^1/_4$	M10 x 20 deep x 65.0 PCD
099-100	$^1/_4$ NPT	$^3/_8$ UNC x 0.79" deep on 2.56" PCD

Options

- Fail safe spring return units - clockwise or counter clockwise
- Limit switch boxes for open/close indication - various switches for all hazardous areas
- AP pneumatic positioner - full range of options see pages 11/12
- EL electropneumatic positioner - full range of options see pages 15/16
- Integral solenoid valve
- 3 stop positioner
- Clear Cone position monitor
- 180° model
- Female drive and mounting details to DIN 3337 and ISO 5211
- ISO adaptor
- $^3/_8$" ports
- Geared manual override
- Code identification see page 38
- Torque outputs see pages 47/48
- See pages 42/43 for English dimensions and dimensions of spring options

Specification

Output Torque

2280 lbf ins/261 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel
versions available)

Displaced Volume

39.3 in^3/644 cm^3

Finish

Epoxy stove enamel

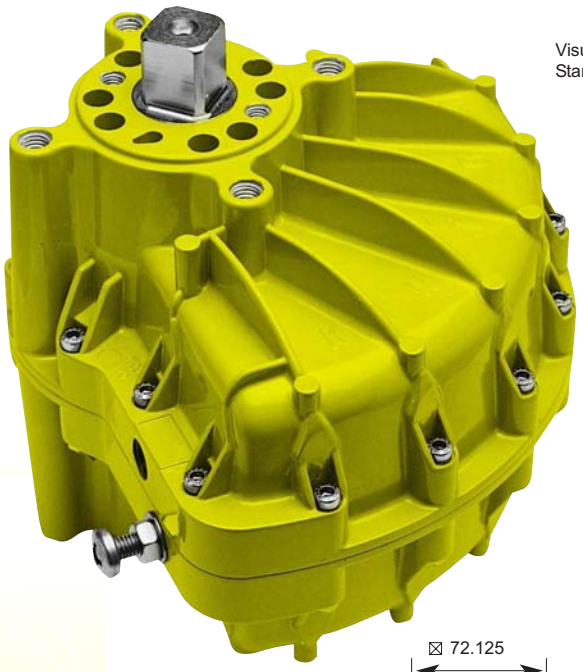
Weight

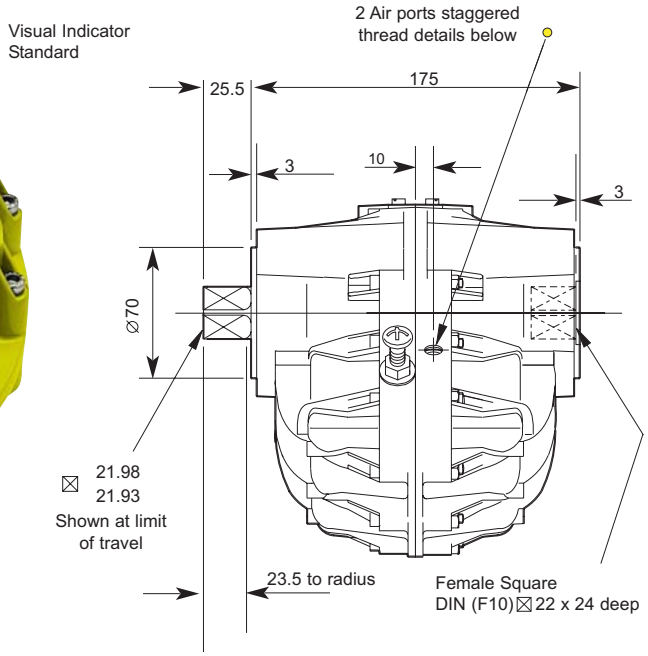
13.82 lb/6.24 kg
(excluding coupling)

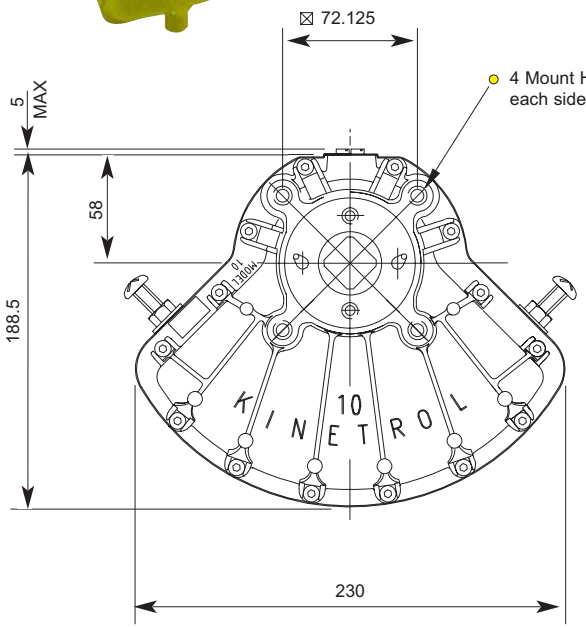
For further information
see General
Specification on page 49

ATEX CATEGORY 1 APPROVED

Model 10







Specification

Output Torque

3625 lbf ins/416 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

78° - 100°
(restricted travel versions available)

Displaced Volume

62.5 in³/1025 cm³

Finish

Epoxy stove enamel

Weight

21.2 lb/9.6 kg
(no coupling)

For further information see General Specification on page 49.

Air Port/Mount Hole Details

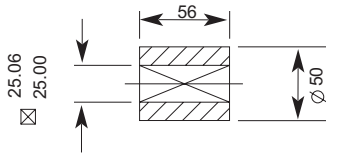
Model	Air Ports	Mount Holes
101-100	$G^1/_4$	M10 x 16 deep x 102.0 PCD
108-100	$G^1/_4$	M10 x 16 deep x 102.0 PCD
109-100	$^1/_4$ NPT	$^3/_8$ UNC x 0.63" deep on 4.02" PCD

Female drive and mounting details to DIN 3337 and ISO 5211 as standard

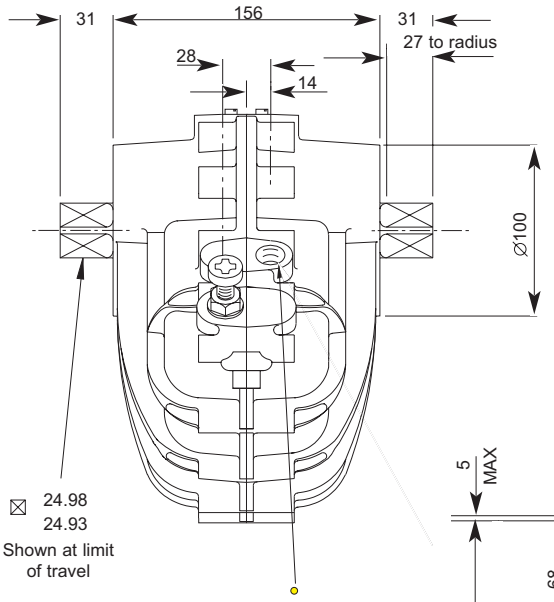
Options

- ☐ **Fail safe spring return units - clockwise or counter clockwise**
- ☐ **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- ☐ **AP pneumatic positioner - full range of options see pages 11/12**
- ☐ **EL electropneumatic positioner - full range of options see pages 15/16**
- ☐ **Integral solenoid valve**
- ☐ **3 stop positioner**
- ☐ **Clear Cone position monitor**
- ☐ **Geared manual override**
- ☐ **Code identification see page 38**
- ☐ **Torque outputs see pages 47/48**
- ☐ **See pages 42/43 for English dimensions and dimensions of spring options**

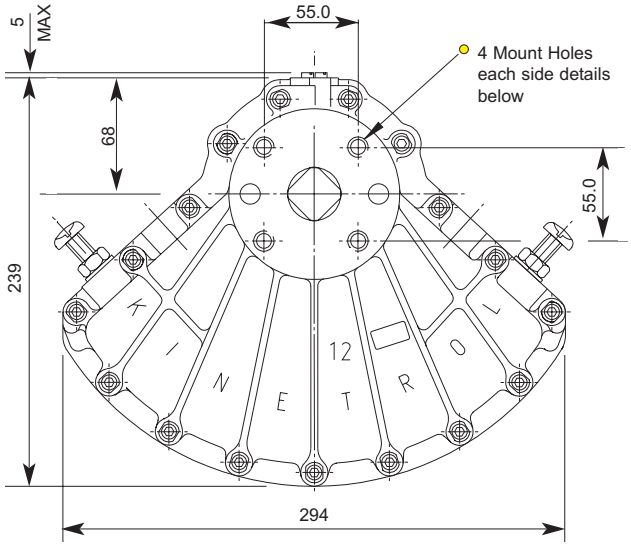
ATEX CATEGORY 1 APPROVED



Standard Coupling
(supplied with actuator
weight 1.3 lbs/0.6 kg)



Visual Indicator
Standard



Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
120-100	G 3/8	M12 x 24 deep x 77.8 PCD
128-100	G 3/8	M12 x 24 deep x 77.8 PCD
129-100	3/8 NPT	1/2 UNC x 0.94" deep on 3.06" PCD

Options

- Fail safe spring return units - clockwise or counter clockwise
- Limit switch boxes for open/close indication - various switches for all hazardous areas
- AP pneumatic positioner - full range of options see pages 11/12
- EL electropneumatic positioner - full range of options see pages 15/16
- Integral solenoid valve
- 3 stop positioner
- 180° model
- Female drive and mounting details to DIN 3337 and ISO 5211
- Geared manual override
- Code identification see page 38
- Torque outputs see pages 47/48
- See pages 42/43 for English dimensions and dimensions of spring options

Specification

Output Torque

5000 lbf ins/575 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 102°
(restricted travel
versions available)

Displaced Volume

86 in³/1410 cm³

Finish

Epoxy stove enamel

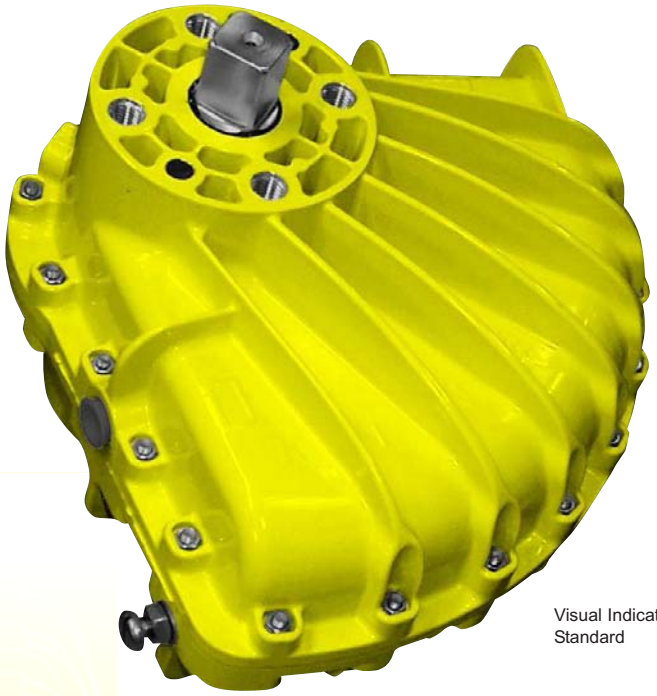
Weight

26.2 lb/11.9 kg
(excluding coupling)

For further information see General Specification on page 49

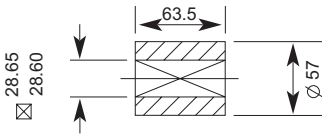
ATEX CATEGORY 1 APPROVED

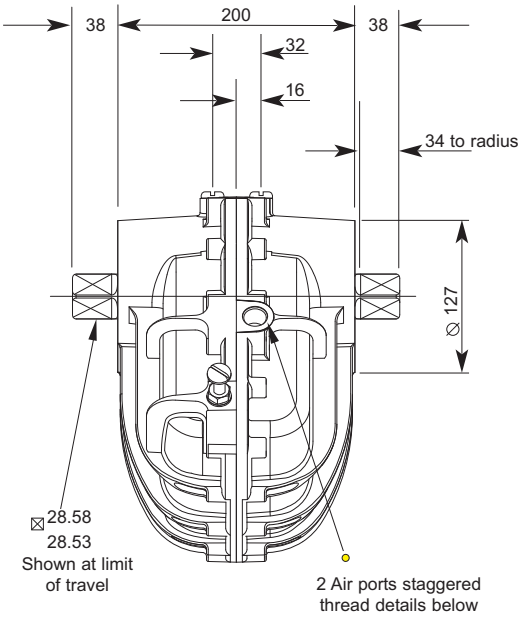
Model 14

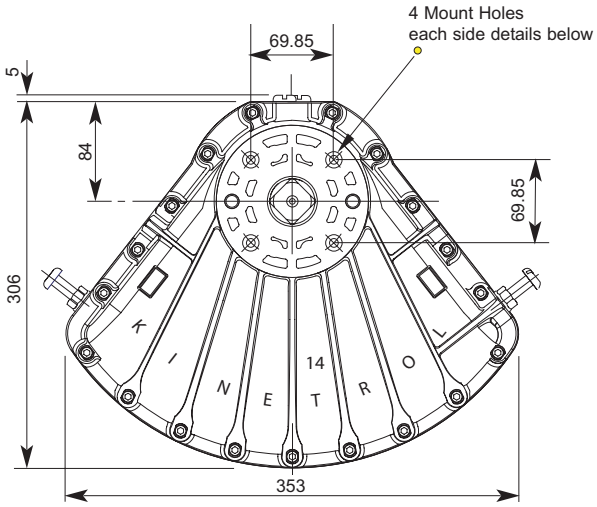


Visual Indicator
Standard

Standard Coupling
(supplied with actuator
weight 1.5 lbs/0.7 kg)







Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
140-100	$G^1/_2$	M16 x 28 deep x 98.8 PCD
148-100	$G^1/_2$	M16 x 28 deep x 98.8 PCD
149-100	$^1/_2$ NPT	$^5/_8$ UNC x 1.12" deep on 3.89" PCD

Specification

Output Torque

12000 lbf ins/1375 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

78° - 93°
(restricted travel
versions available)

Displaced Volume

201 in^3/3294 cm^3

Finish

Epoxy stove enamel

Weight

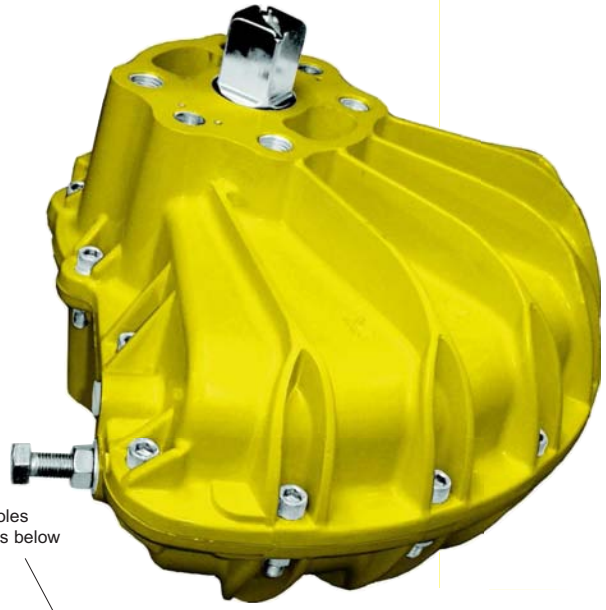
44.5 lb/20.2 kg
(excluding coupling)

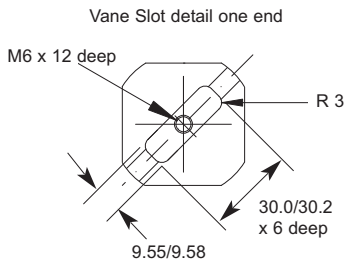
For further information see General Specification on page 49.

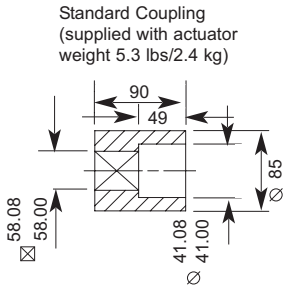
ATEX CATEGORY 1 APPROVED

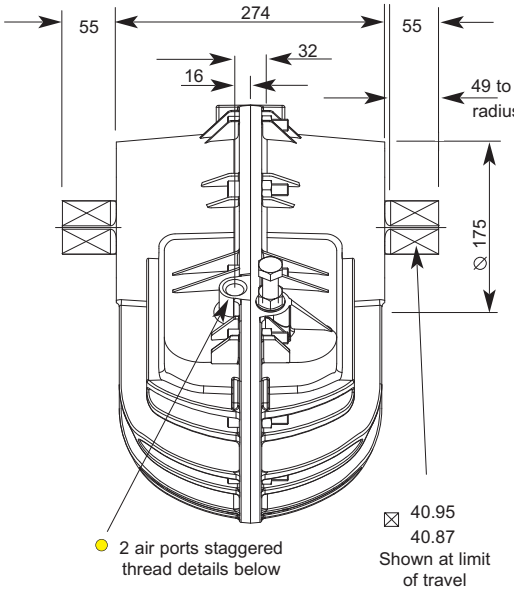
Options

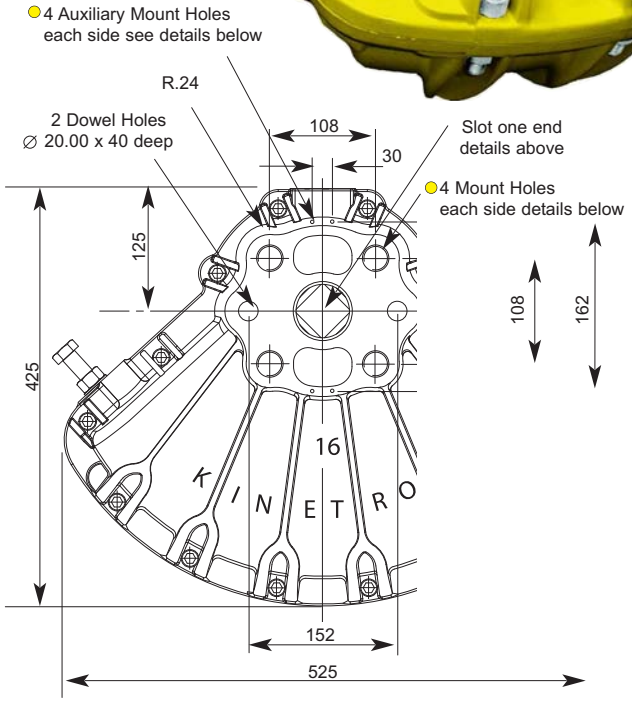
- Fail safe spring return units - clockwise or counter clockwise
- Limit switch boxes for open/close indication - various switches for all hazardous areas
- AP pneumatic positioner - full range of options see pages 11/12
- EL electropneumatic positioner - full range of options see pages 15/16
- Integral solenoid valve
- 3 stop positioner
- 180° model
- Female drive and mounting details to DIN 3337 and ISO 5211
- Geared manual override
- Code identification see page 38
- Torque outputs see pages 47/48
- See pages 42/43 for English dimensions and dimensions of spring options











Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
160-100	G 1/2	M24 x 38 deep x 152.7 PCD
168-100	G 1/2	M24 x 38 deep x 152.7 PCD
169-100	1/2 NPT	7/8 UNC x 1.50" deep on 6.012" PCD

Model	Aux Mount Holes
160/8-100	M5 x 8 deep
169-100	10-24 UNC x 0.31" deep

Options

- **Fail safe spring return units - clockwise or counter clockwise**
- **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- **AP pneumatic positioner - full range of options see pages 11/12**
- **EL electropneumatic positioner - full range of options see pages 15/16**
- **180° model**
- **Female drive and mounting details to DIN 3337 and ISO 5211**
- **Geared manual override**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**

Specification

Output Torque

27000 lbf ins/3100 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel versions available)

Displaced Volume

465 in^3/7630 cm^3

Finish

Epoxy stove enamel

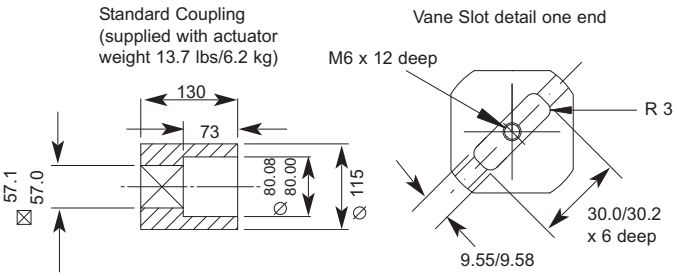
Weight

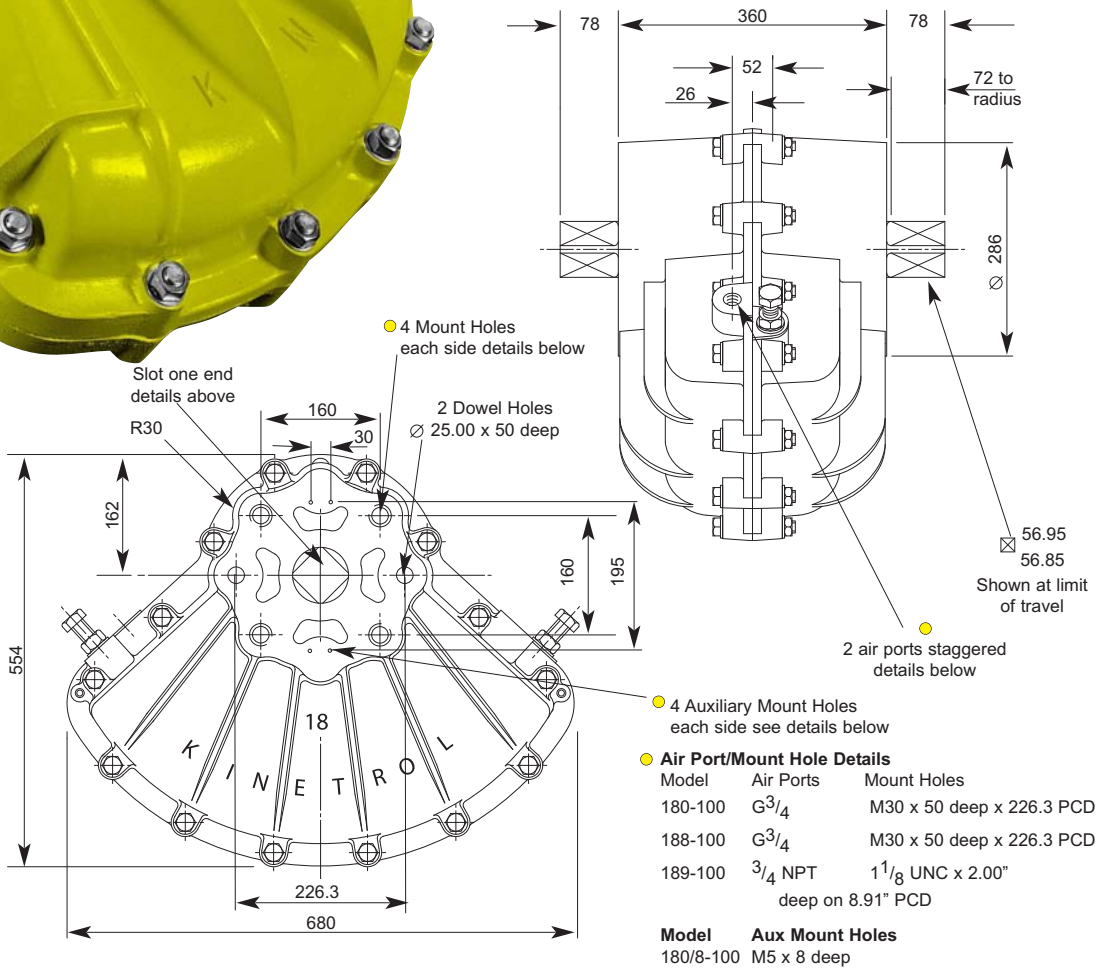
82.5 lb/37.4 kg
(excluding coupling)

For further information see General Specification on page 49

ATEX CATEGORY 2 APPROVED

Model 18





Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
180-100	$G^3/_4$	M30 x 50 deep x 226.3 PCD
188-100	$G^3/_4$	M30 x 50 deep x 226.3 PCD
189-100	$^3/_4$ NPT	$1^1/_8$ UNC x 2.00" deep on 8.91" PCD

Model	Aux Mount Holes
180/8-100	M5 x 8 deep
189-100	10-24 UNC x 0.31" deep

Specification

Output Torque

60000 lbf ins/6900 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel versions available)

Displaced Volume

1048 in^3/17170 cm^3

Finish

Epoxy stove enamel

Weight

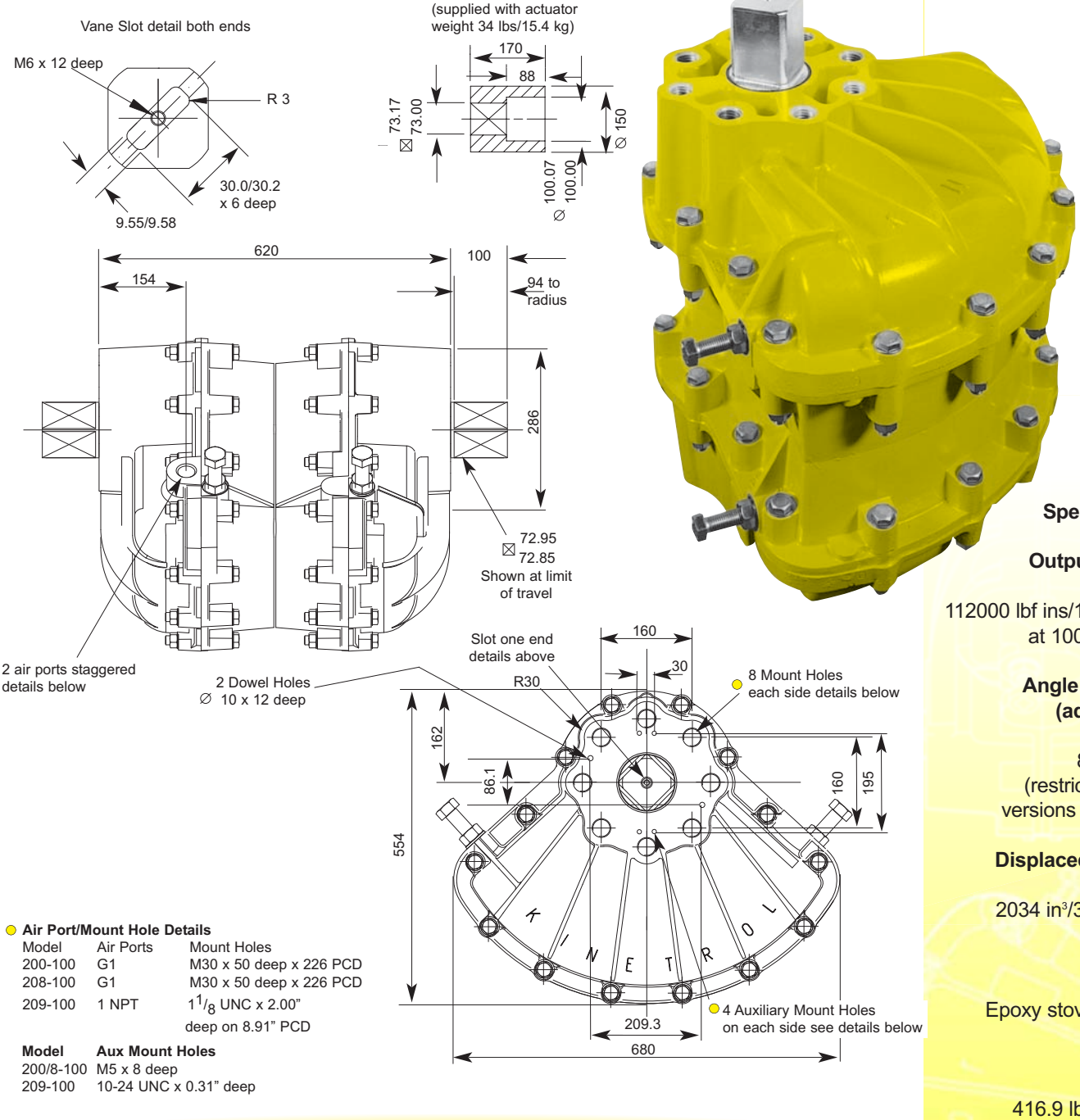
157.4 lb/71.4 kg
(excluding coupling)

For further information see General Specification on page 49

ATEX CATEGORY 2 APPROVED

Options

- ☐ **Fail safe spring return units - clockwise or counter clockwise**
- ☐ **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- ☐ **AP pneumatic positioner - full range of options see pages 11/12**
- ☐ **EL electropneumatic positioner - full range of options see pages 15/16**
- ☐ **Code identification see page 38**
- ☐ **Torque outputs see pages 47/48**
- ☐ **See pages 42/43 for English dimensions and dimensions of spring options**



Air Port/Mount Hole Details

Model	Air Ports	Mount Holes
200-100	G1	M30 x 50 deep x 226 PCD
208-100	G1	M30 x 50 deep x 226 PCD
209-100	1 NPT	$1^1/_8$ UNC x 2.00" deep on 8.91" PCD

Model	Aux Mount Holes
200/8-100	M5 x 8 deep
209-100	10-24 UNC x 0.31" deep

Options

- **Fail safe spring return units - clockwise or counter clockwise**
- **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- **AP pneumatic positioner - full range of options see pages 11/12**
- **EL electropneumatic positioner - full range of options see pages 15 & 16**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**

Specification

Output Torque

112000 lbf ins/12760 Nm
at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100°
(restricted travel versions available)

Displaced Volume

2034 in³/33350 cm³

Finish

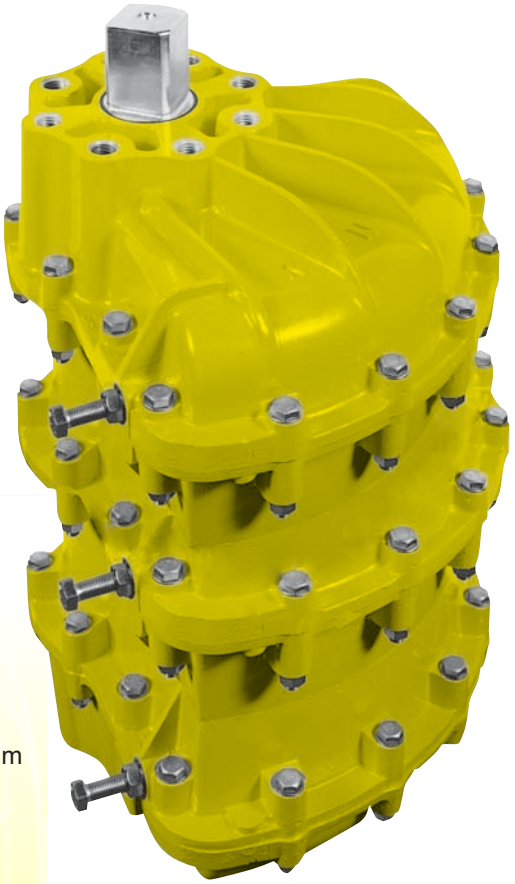
Epoxy stove enamel

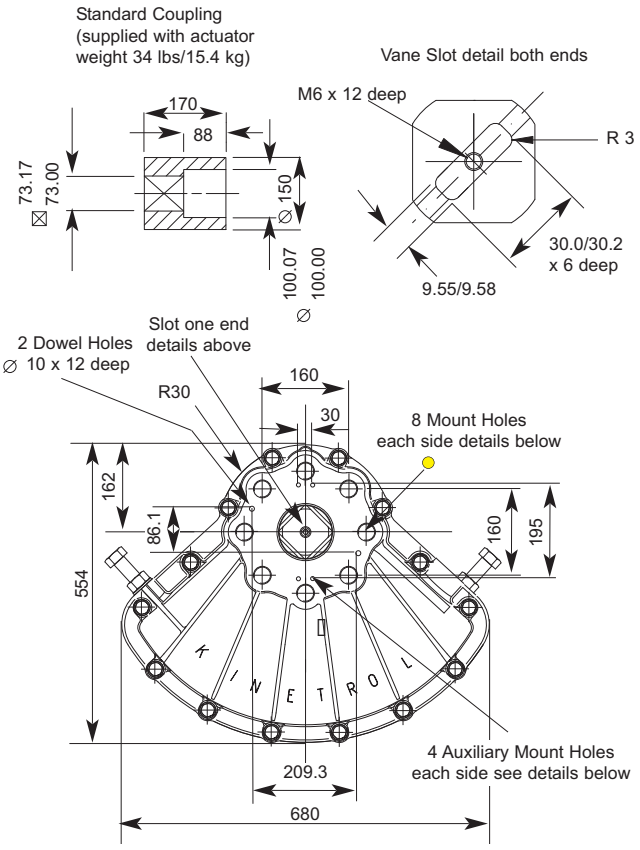
Weight

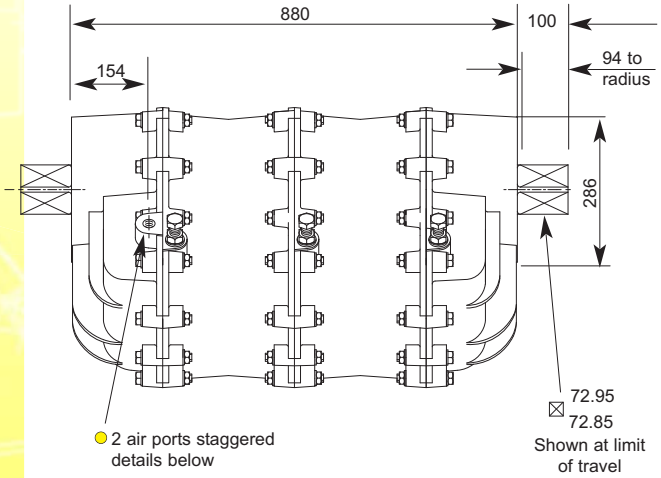
416.9 lb/195.6 kg
(excluding coupling)

For further information see General Specification on page 49.

ATEX CATEGORY 2 APPROVED







Air Ports/Mount Hole Details

Model	Air Ports	Mount Holes
300-100	G1	M30 x 50 deep x 226 PCD
308-100	G1	M30 x 50 deep x 226 PCD
309-100	1 NPT	$1\frac{1}{8}$ UNC x 2.00" deep on 8.91" PCD

Model	Aux Mount Holes
300/8-100	M5 x 8 deep
309-100	10-24 UNC x 0.31" deep

Specification

Output Torque

168000 lbf ins/19140 Nm at 100 psi/7 bar

Angle of Travel (adjustable)

80° - 100° (restricted travel versions available)

Displaced Volume

3050 in^3/50025 cm^3

Finish

Epoxy stove enamel

Weight

601.91 lb/273 kg (excluding coupling)

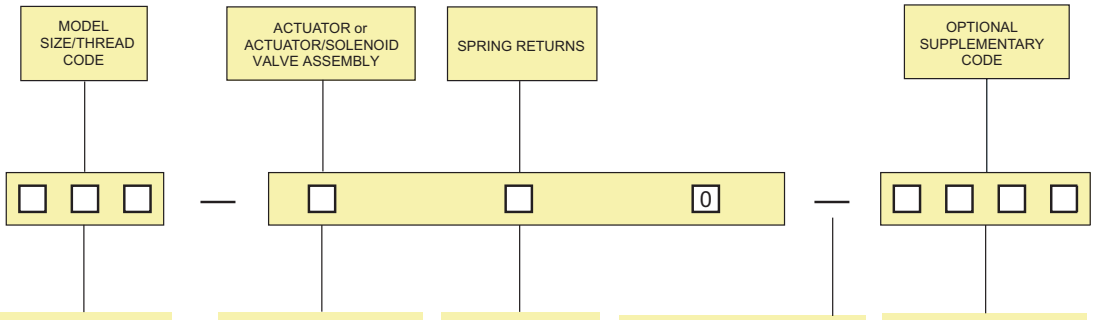
For further information see General Specification on page 49.

ATEX CATEGORY 2 APPROVED

Options

- **Fail safe spring return units - clockwise or counter clockwise**
- **Limit switch boxes for open/close indication - various switches for all hazardous areas**
- **AP pneumatic positioner - full range of options see pages 11/12**
- **EL electropneumatic positioner - full range of options see pages 15/16**
- **Code identification see page 38**
- **Torque outputs see pages 47/48**
- **See pages 42/43 for English dimensions and dimensions of spring options**

Kinetrol Actuators and Add-On Control Units



010 to 200	ISO Thread Standard
018 to 208	Pg Cable Entry Thread Standard
019 to 209	ANSI Thread Standard
031 to 161	DIN Flange Standard (female drive)
032 to 142	DIN Flange Standard with NAMUR Adaptor
033 to 143	DIN Flange Actuator for Positioner
034 to 144	Actuator only for Postioner ISO Thread
035 to 145	ISO Thread Standard with NAMUR Adaptor
036 to 146	ANSI Thread Standard with NAMUR Adaptor
037 to 147	Actuator Only for Positioner ANSI Thread

0	No Actuator
1	With Actuator
2	Actuator & 3 Port Single Solenoid
3	Actuator & 5 Port Single Solenoid
NB	Other Solenoids by description
9	Special Product Specifications - contact Kinetrol

(1) Give electrical details (volts & hertz)

0	No Spring Return
2	Spring Return cw
3	Spring Return ccw

Abbreviations:

cw: clockwise
ccw: counter (or anti) clockwise

Optional Suffixes In Place Of "-":

- L: Low Temperature Grease
- M: Clear Cone Position Monitor
- R: Clear Cone Position Monitor - Chemical Resistant
- S: Solenoid Valve Silencers/ Flow Regulators
- Z: Less coupling

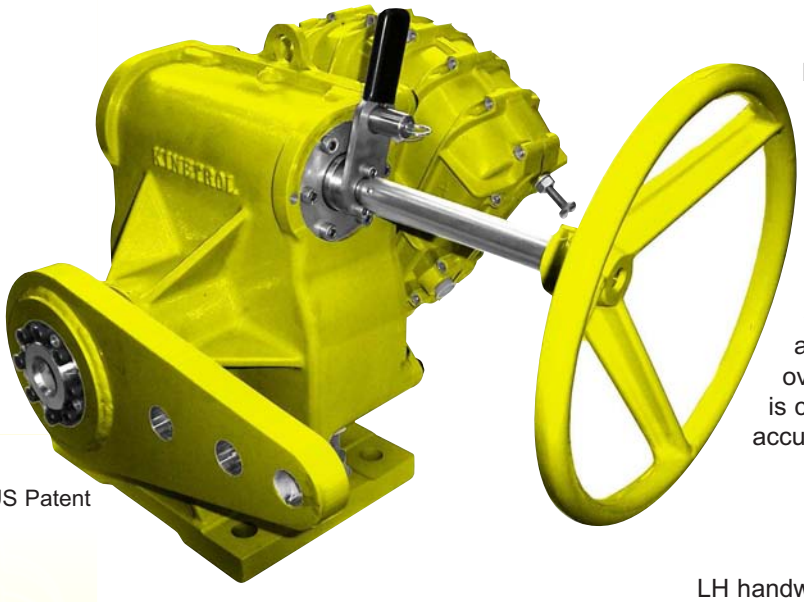
1302	Discrete Limit Switch Unit (non latchable)
1305	Discrete Limit Switch Unit (latchable)
2100	High Tempeature Elastomer Seals

Please Note: There has been a decline in PG cable thread entry requirements. If this is required with a Namur adaptor, order the unit in the normal way along with a SP683 adding a comment to "FIT items together"

EXAMPLES

A:	050-100	Double acting actuator (ISO threads) no optional supplementary item
B.	050-120M	A + spring return (fail-safe cw) + Clear Cone monitor
C.	059-100	Double acting actuator (ANSI threads)
D.	140-130-4900	140 actuator (ISO threads) + spring return fail-safe ccw (2 x 120 springs)
E.	051-100	Double acting actuator with DIN/ISO female drive

G3 Damper Drive

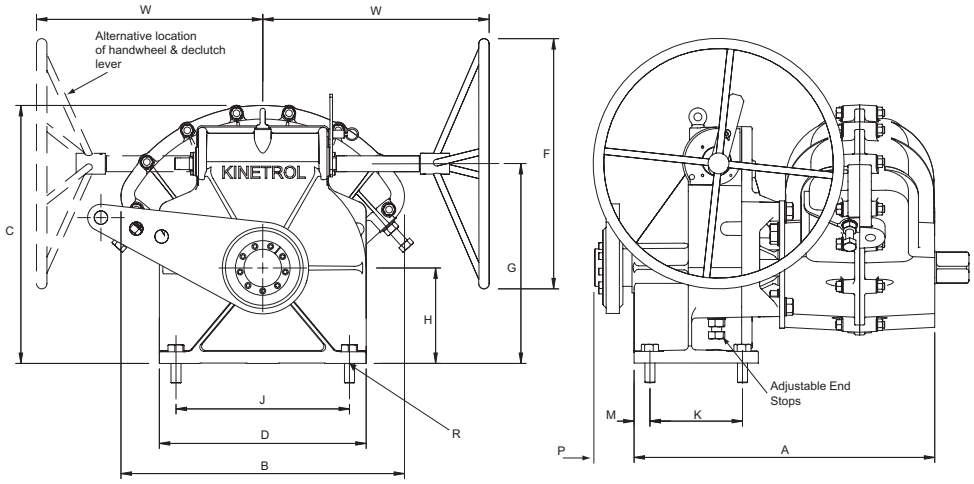


US Patent

Purpose designed, factory built and tested drives for air/gas flow control dampers on burner, heater, boiler and turbine systems in power plants, refineries and a wide range of industrial applications.

Combining the proven performance of Kinetrol's vane type actuator with an equally rugged integral manual override/ mounting frame, the G3 drive is compact with unbeatable control, accuracy and cycle life.

LH handwheel position shown



Principal Dimensions mm

Model	A	B	C	D	W *	F *	G	H	J	K	ØR	M	P	Weight †
140	410	381	390	275	276	300	300	165	216	152	21	25	70	46kg
160	495	525	470	275	305	400	300	165	216	152	21	25	70	51kg
180	721	680	620	496	406	760	479	229	416	222	27	38	94	141kg
200	981	680	620	496	508	600	479	229	416	222	27	38	94	158kg

Principal Dimensions inches

Model	A	B	C	D	W *	F *	G	H	J	K	ØR	M	P	Weight †
149	16.2	14.1	15.4	10.8	11.0	12.0	11.8	6.5	8.50	6.0	0.83	1.0	2.8	102lb
169	19.5	20.7	18.5	10.8	12.0	16.0	11.8	6.5	8.50	6.0	0.83	1.0	2.8	112lb
189	28.4	26.8	24.3	19.5	17.0	24.0	18.9	9.0	16.38	8.75	1.05	1.5	3.7	310lb
209	38.6	27.2	24.3	19.5	20.0	24.0	18.9	9.0	16.38	8.75	1.05	1.5	3.7	350lb

* Default dimensions, may change according to ordering code options.

† Listed weights exclude actuator

- **Integral manual override**
- **Suitable for new installations or replacement of existing electric or pneumatic drives**
- **Available with same mounting foot print to replace existing floor mount drives**
- **Can result in lower energy costs resulting from accurate flow control**
- **Reduced operating costs due to long maintenance-free life (2 million operation warranty)**
- **Compact space saving design**
- **Quick and easy installation and set up**
- **Robust construction with durable epoxy finish**
- **Manual override usable with actuator removed**

ATEX CATEGORY 2 APPROVED

Options

- **Double acting and spring fail-safe (open or closed)**
- **Modulating** (3-15 psi and 4-20mA signal)
- **Fail to low signal**
- **Lock in last position**
- **Limit switch remote position indication**
- **4-20mA angle retransmission**
- **High visibility position indication**
- **Different sided/diameter handwheels and extensions**
- **Infinitely adjustable output levers to suit existing or new requirements**

Ordering Codes

HANDWHEEL SIDE (SEE SKETCH)
L=LEFT
R=RIGHT

WHERE APPLICABLE:
S = STANDARD
Y = NO COST OPTION
E = EXTRA COST OPTION
(blank) = NOT AVAILABLE

HANDWHEEL DIAMETER (F)

	AVAILABLE ON MODELS: 14	16	18	20
2=254mm - 10"	E			
3=300mm - 12"	S	E		
4=400mm - 16"	E	S		
5=600mm - 24"		E	E	S
6=762mm - 30"			S	

INCLUDING D/A ACTUATOR:
140 = ISO BASIC D/A ACT
149 = ANSI BASIC D/A ACT
144 = ISO D/A ACT FOR POSITIONER
147 = ANSI D/A ACT FOR POSITIONER
160, 180, 200 = ISO D/A ACT (FOR USE WITH OR WITHOUT POSITIONER)
169, 189, 209 = ANSI D/A ACT (FOR USE WITH OR WITHOUT POSITIONER)

V = HIGH TEMP
- = STD

OUTPUT LEVER THICKNESS (t)
1=3/8"
2=1/2"
3=5/8"
4=3/4"
5=7/8"
6=1"
7=1 1/8"
8=1 1/4"
9=1 1/2"

OPTIONAL LIMIT SWITCH BOX (TO INDICATE IF HANDWHEEL IS ENGAGED OR DISENGAGED)
OPTIONS:
0 = NO LIMIT SWITCH
1 = 2 x i/S PROX. SENSORS
2 = 2 x PNEUMATIC LS
4 = 2 x V3 MECH LS
5 = 2 x 20-260 Vac PROX.*
6 = 2 x 5-60 Vdc PROX.*
7 = 4 x V3 MECH LS

POSITION MONITOR ON LS BOX:
C=YES
0=NO

HOLE DIAMETER (d)
2=12.7mm - 1/2"
3=15.9mm - 5/8"
A=11/16"
4=19.1mm - 3/4"
5=22.2mm - 7/8"
6=25.4mm - 1"
7=28.6mm - 1 1/8"
8=31.8mm - 1 1/4"
9=38.1mm - 1 1/2"

HANDWHEEL OFFSET (W)

	AVAILABLE ON MODELS: 14	16	18	20
1= - 11"	S			
2=305mm - 12"		S		
3=430mm - 17"	E	E	S	
4=508mm - 20"	E	E	E	S
5=600mm - 24"	E	E	E	E

IF NECESSARY, FIT OPTIONAL EXTENSION TO ENSURE THAT HANDWHEEL IS AT A SAFE DISTANCE FROM MOVING OUTPUT LEVER.

LEVER HOLE PATTERN

No.	DISTANCE FROM CENTRE C1	C2	C3	AVAILABLE ON MODELS 14	16	18	20
01	101.6mm - 4"	152.4mm - 6"	203.2mm - 8"	Y			
02	127mm - 5"	152.4mm - 6"	177.8mm - 7"	Y	Y		
03	127mm - 5"	198.1mm - 7.8"	254mm - 10"	Y	Y		
04	152.4mm - 6"	254mm - 10"	304.8mm - 12"	Y	Y	Y	
05	165.1mm - 6.5"	190.5mm - 7.5"	215.9mm - 8.5"	Y	Y	Y	
06	190.5mm - 7.5"	215.9mm - 8.5"	241.3mm - 9.5"	Y	Y	Y	
07	266.7mm - 10.5"	292.1mm - 11.5"	317.5mm - 12.5"	Y	Y	Y	Y
08	228.6mm - 9"	342.9mm - 13.5"	457.2mm -18"	Y	Y	Y	
09	254mm - 10"	304.8mm - 12"	381mm - 15"	Y	Y	Y	Y
10	254mm - 10"	381mm - 15"	508mm - 20"	Y	Y	Y	Y
11	254mm - 10"	317.5mm - 12.5"	406.4mm - 16"	Y	Y	Y	Y
12	254mm - 10"	330.2mm - 13"	406.4mm - 16"	Y	Y	Y	Y
13	304.8mm - 12"	406.4mm - 16"	444.5mm - 17.5"	Y	Y	Y	Y
14	317.5mm - 12.5"	363.2mm - 14.3"	406.4mm - 16"	Y	Y	Y	Y
15	147.3mm - 5.8"	279.4mm - 11"	304.8mm - 12"	Y	Y	Y	
16	152.4mm - 6"	190.5mm - 7.5"	228.6mm - 9"	Y	Y		
17	101.6mm - 4"	-	304.8mm - 12"	Y			
18	-	-	127mm - 5"	Y	Y		
19	-	-	203.2mm - 8"	Y	Y	Y	

* Not available with ATEX approval

For more information see KF535

Kinetrol Interfacing Options

Kinetrol is continually responding to the evolving requirements of the industry for interfacing arrangements that satisfy user needs and conform to industry standards. We offer a range of designs that enable our equipment to be effectively and economically mounted.

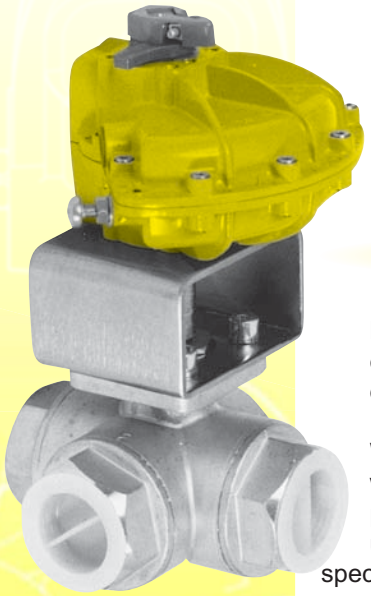
Kinetrol can supply direct mounting limit switch boxes, positioners and other control modules that eliminate the costs associated with interfacing hardware and provide compact assemblies.

Various female drive spring fail-safe and hand spring unit options are available to facilitate direct mounting to valves with topworks details that conform to the ISO 5211 standard.

The innovative, patented, ISO adaptor is now available for Kinetrol actuator models 03-09 and provides a versatile and robust mounting option. The adaptor is suitable for use with a wide range of ISO topworks valves.

Our larger actuator models are manufactured with a drive slot and insert option, designed to interface with ancillary drives that comply with the VDI/VDE 3485 norm.

For compact and space-saving solenoid valve mounting, Kinetrol offers a NAMUR interface adaptor which allows the air supply to be ported directly to the actuator body, thereby eliminating the need for any external piping.



Kinetrol's Valve Mounting Service

Kinetrol has well over 40 years experience in the industry and is renowned for its build quality. Thousands of mount kit designs are available, and new arrangements can be designed to meet specific customer requirements.

We can select Ball, Butterfly and Plug valves from across the world and assemble the packages, using our robust 90° pneumatic actuator and any of our modular 'add on' control units. We engineer packages to meet the most difficult specifications and suit the most demanding applications.

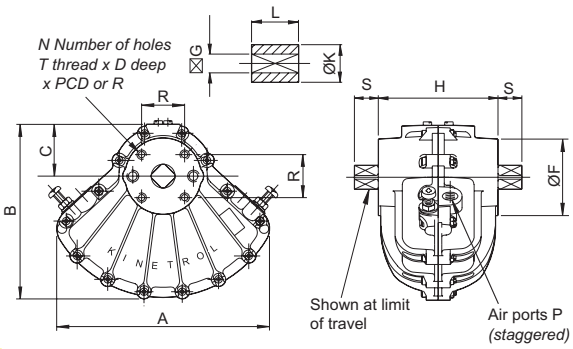
Kinetrol can provide fully certified ATEX packages as well as AS Interface options and a range of control modules.

We can supply complete actuated valve assemblies or mount actuators to free issued valves.

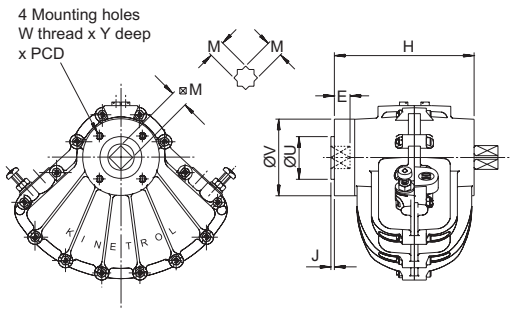
Our build quality and rigorous in-house quality control and testing ensures that you will be supplied with effective solutions.

For questions regarding our valve mounting service please contact Kinetrol.

Actuator



DIN/ISO Options



Actuator Metric Units

Actuator Model	A mm	B mm	C mm	☒G mm	H mm	ØF mm	S mm	N No.	T ISO	D mm	R mm	PCD mm	P ISO	ØK mm	L mm	Wt † kg
OMO	32.0	30.7	12.5	-	36.0	-	10.0	4	M3	5.0	10.0	16.0	M5	-	-	0.12
01	71.4	60.5	14.8	4.8	37.0	see page 24							G 1/8	9.5	12.7	0.19
01A	71.4	57.3	14.4	4.8	38.5	see page 24		4	M4	6.0		19.0	G 1/8	9.5	12.7	0.16
02	93.0	76.0	24.1	8.0	50.0	-	10.0	4	M4	8.0	18.0	25.5	G 1/8	16.0	20.0	0.46
03	113.0	91.4	28.0	9.0	60.0	33.6	12.0	4	M5	10.0	22.0	31.1	G 1/8	18.0	22.0	0.73
05	136.0	112.0	33.6	9.5	67.0	45.0	13.0	6	M5	10.0	-	34.9	G 1/8	19.0	25.4	1.28
07	178.0	146.0	43.4	16.0	100.0	64.0	20.0	4	M8	16.0	36.0	50.9	G 1/4	32.0	40.0	3.30
08	179.0	155.0	41.4	14.3	99.0	63.5	19.0	6	M8	16.0	-	50.8	G 1/4	28.5	39.0	3.25
09	227.0	187.0	54.7	19.0	126.0	84.0	26.0	4	M10	20.0	46.0	65.0	G 1/4	38.0	50.0	6.54
10 *	230.0	188.5	58.0	22.0	175.0	-	25.5	4	M10	16.0	72.1	102.0	G 1/4	-	-	9.60
12	294.0	239.0	68.0	25.0	156.0	100.0	31.0	4	M12	24.0	55.0	77.8	G 3/8	50.0	56.0	12.50
14	353.0	306.0	84.0	28.6	200.0	127.0	38.0	4	M16	28.6	69.9	98.8	G 1/2	57.0	63.5	20.91
16	525.0	425.0	125.0	41.0	274.0	175.0	55.0	4	M24	38.0	108.0	152.7	G 1/2	85.0	90.0	39.77
18	680.0	554.0	162.0	57.0	360.0	286.0	78.0	4	M30	50.0	160.0	226.3	G 1/2	115.0	130.0	77.60
20	680.0	554.0	162.0	73.0	620.0	286.0	100.0	8	M30	50.0	160.0	226.3	G1	150.0	170.0	211.0
30	680.0	554.0	162.0	73.0	880.0	286.0	100.0	8	M30	50.0	160.0	226.3	G1	150.0	170.0	288.4

Actuator English Units

Actuator Model	A inch	B inch	C inch	☒G inch	H inch	ØF inch	S inch	N No.	T UNC	D inch	R inch	PCD inch	P NPT	ØK inch	L inch	Wt † lb
OMO	1.26	1.21	0.49	-	1.42	-	0.39	4		0.20	0.390	0.630		-	-	0.26
01	2.81	2.38	0.58	0.187	1.46	see page 24							1/8	0.375	0.50	0.34
01A	2.81	2.26	0.57	0.187	1.52	see page 24		4	8-32	0.24		0.750	1/8	0.375	0.50	0.34
02	3.67	3.00	0.95	0.315	1.97	-	0.39	4	8-32	0.32	0.709	1.000	1/8	0.63	0.79	1.04
03	4.45	3.60	1.10	0.354	2.36	1.32	0.47	4	10-24	0.39	0.866	1.225	1/8	0.71	0.87	1.60
05	5.35	4.41	1.32	0.375	2.64	1.77	0.51	6	10-24	0.39	-	1.375	1/8	0.75	1.00	2.82
07	7.01	5.75	1.71	0.630	3.94	2.52	0.79	4	5/16-18	0.63	1.417	2.000	1/4	1.26	1.58	7.28
08	7.05	6.10	1.63	0.562	3.90	2.50	0.75	6	5/16-18	0.63	-	2.000	1/4	1.12	1.54	7.16
09	8.94	7.37	2.16	0.748	4.96	3.31	1.02	4	3/8-16	0.79	1.811	2.560	1/4	1.50	1.97	14.42
10 *	9.06	7.42	2.28	0.870	6.89	-	1.00	4	3/8-16	0.63	2.839	4.016	1/4	-	-	21.20
12	11.57	9.41	2.68	0.984	6.14	3.94	1.22	4	1/2-13	0.94	2.165	3.060	3/8	1.97	2.20	27.56
14	14.06	12.05	3.38	1.125	7.87	5.00	1.50	4	5/8-11	1.13	2.750	3.890	1/2	2.24	2.50	46.10
16	20.67	16.73	4.92	1.614	10.79	6.90	2.17	4	7/8-9	1.50	4.250	6.010	1/2	3.35	3.54	87.70
18	26.77	21.81	6.38	2.244	14.17	9.92	3.07	4	1 1/8-7	2.00	6.300	8.910	3/4	4.53	5.12	171.0
20	26.77	21.81	6.38	2.874	24.41	11.26	3.94	8	1 1/8-7	2.00	6.300	8.910	1	5.91	6.69	416.9
30	26.77	21.81	6.38	2.874	34.65	11.26	3.94	8	1 1/8-7	2.00	6.300	8.910	1	5.91	6.69	635.9

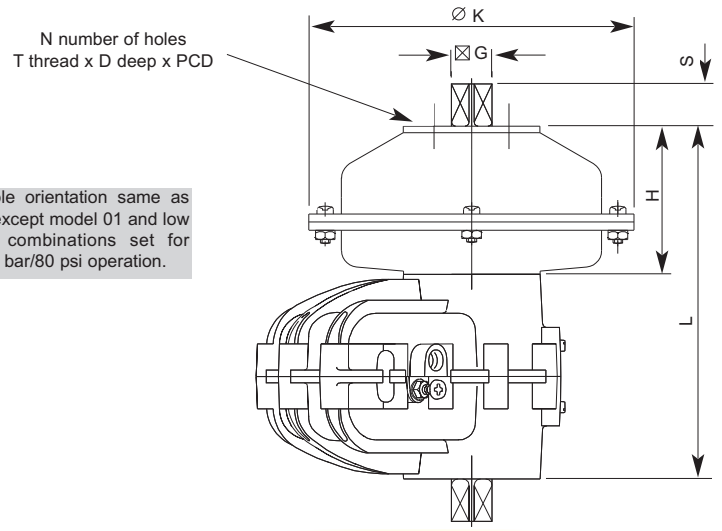
DIN/ISO Options

Actuator Model	H mm	DIN/ISO flange no.	M mm	V mm	U mm	PCD mm	W	Y (min) mm	J mm	E mm
021-100	66.0	F03	9	46	25	36	M5	8	2	10
031-100	74.0	F03	9	46	25	36	M5	8	2	10
051-100	81.0	F04	11	54	30	42	M5	8	2	12
071-100	117.0	F05	14	64	35	50	M6	10	3	16
091-100	146.0	F07	17	90	55	70	M8	13	3	19
121-100	180.5	F10	22	125	70	102	M10	16	3	24
141-100	226.5	F12	27	150	85	125	M12	20	3	29
161-100	380.0	F16	46	203	130	165	M20	32	4	48

† All weights specified include coupling weight except model 10

ATEX TO CATEGORY 1 APPROVED

*Female drive unless specified.



Mount hole orientation same as actuator except model 01 and low pressure combinations set for below 5.5 bar/80 psi operation.

Metric Units

Actuator** Model	L mm	H mm	ØK mm	⊠G mm	S mm	N No.	T ISO	D mm	PCD mm	Wt Kg
01-120	60.2	23.2	58.8	4.8	7.2	3	M3	4.0	15.9	0.53
01-120A	61.7	23.2	58.8	4.8	7.2	3	M3	4.0	15.9	0.50
02-120	90.0	40.0	73.0	8.0	10.0	4	M4	8.0	25.5	0.84
03-120-5600	100.0	40.0	73.0	8.0	10.0	4	M4	8.0	25.5	1.13
03-120	107.0	47.0	107.0	9.0	12.0	4	M5	10.0	31.1	2.08
05-120	117.0	50.0	118.0	9.5	13.0	6	M5	8.0	34.9	2.63
07-120-4000	158.3	55.3	118.0	9.5	13.0	6	M5	8.0	34.9	4.65
07-120	182.0	82.0	152.0	16.0	20.0	4	M8	16.0	50.9	7.26
08-120-4100	181.0	82.0	152.0	16.0	20.0	4	M8	16.0	50.9	7.21
08-120	191.0	92.0	200.0	14.3	19.0	6	M8	12.0	50.8	11.48
09-120-4200	208.0	82.0	152.0	16.0	20.0	4	M8	16.0	50.9	10.50
09-120	218.0	92.0	200.0	19.0	26.0	4	M10	20.0	65.0	14.77
10-120-5800*	265.0	92.0	200.0	19.0	26.0	4	M10	20.0	65.0	17.85
10-120*	285.0	112.0	206.0	22.0	26.0	8	M10	16.0	102.0	22.00
12-120-4300	248.0	92.0	200.0	19.0	26.0	4	M10	20.0	65.0	20.73
12-120-4400	340.0	184.0	200.0	19.0	26.0	4	M10	20.0	65.0	28.96
12-120	293.0	136.0	258.0	25.0	31.0	4	M12	22.0	77.8	27.95
14-120-4900	417.0	217.0	258.0	28.6	38.0	4	M16	28.5	98.8	51.81
14-120	374.0	174.0	394.0	28.6	38.0	4	M16	28.5	98.8	71.25
14-120-5000	337.0	137.0	258.0	28.6	38.0	4	M16	28.5	98.8	38.18
16-120-6000	586.0	312.0	394.0	28.6	38.0	4	M16	28.5	98.8	90.00
16-120-6100	450.0	176.0	394.0	41.0	55.0	4	M24	32.0	152.7	75.00
16-120	485.5	211.5	524.0	41.0	55.0	4	M24	38.0	152.7	123.0
18-120-7000	571.5	211.5	524.0	57.0	78.0	4	M30	50.0	226.3	161.0
18-120	671.5	311.5	524.0	57.0	78.0	4	M30	50.0	226.3	240.0
20-120-7200	931.5	311.5	524.0	73.0	100.0	8	M30	50.0	226.3	350.0
20-120-7300	1031.5	411.5	524.0	73.0	100.0	8	M30	50.0	226.3	408.0
20-120	1131.5	511.5	524.0	73.0	100.0	8	M30	50.0	226.3	479.0
30-120-7600	1293.0	411.5	524.0	73.0	100.0	8	M30	50.0	226.3	524.0
30-120-7700	1393.0	511.5	524.0	73.0	100.0	8	M30	50.0	226.3	606.0
30-120-7800	1493.0	611.5	524.0	73.0	100.0	8	M30	50.0	226.3	688.0
30-120	1593.0	711.5	524.0	73.0	100.0	8	M30	50.0	226.3	770.0

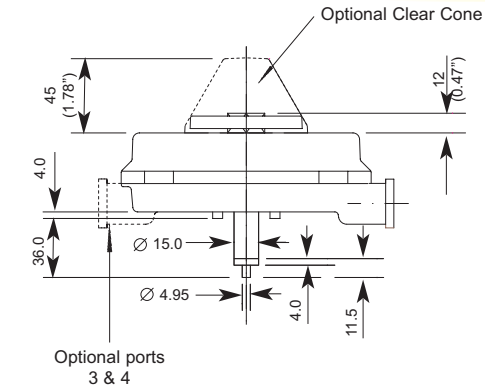
English Units

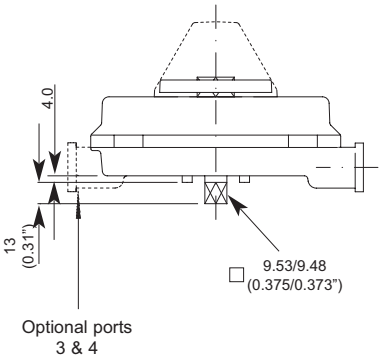
Actuator** Model	L inch	H inch	ØK inch	⊠G inch	S inch	N No.	T UNC	D inch	PCD inch	Wt lb
01-120	2.37	0.91	2.32	0.187	0.28	3	-	0.16	0.625	1.17
01-120A	2.43	0.91	2.32	0.187	0.28	3	-	0.16	0.625	1.10
02-120	3.54	1.58	2.87	0.315	0.39	4	8-32	0.31	1.00	1.85
03-120-5600	3.94	1.58	2.87	0.315	0.39	4	8-32	0.31	1.00	2.49
03-120	4.21	1.85	4.21	0.354	0.47	4	10-24	0.39	1.225	4.58
05-120	4.61	1.97	4.25	0.375	0.51	6	10-24	0.31	1.375	5.80
07-120-4000	6.23	2.18	4.25	0.375	0.51	6	10-24	0.31	1.375	10.25
07-120	7.17	3.23	6.00	0.630	0.79	4	5/16-18	0.63	2.00	16.00
08-120-4100	7.13	3.23	6.00	0.630	0.79	4	5/16-18	0.63	2.00	15.90
08-120	7.52	3.62	7.87	0.563	0.75	6	5/16-18	0.47	2.00	25.31
09-120-4200	8.19	3.23	6.00	0.630	0.79	4	5/16-18	0.63	2.00	23.15
09-120	8.58	3.62	7.90	0.748	1.02	4	3/8-16	0.79	2.56	32.56
10-120-5800*	10.43	3.62	7.90	0.748	1.02	4	3/8-16	0.79	2.56	40.30
10-120*	11.22	4.41	8.11	0.866	1.02	8	3/8-16	0.63	4.02	48.50
12-120-4300	9.76	3.62	7.90	0.748	1.02	4	3/8-16	0.79	2.56	45.71
12-120-4400	13.39	7.25	7.90	0.748	1.02	4	3/8-16	0.79	2.56	63.86
12-120	11.54	5.35	10.16	0.984	1.22	4	1/2-13	0.87	3.06	61.62
14-120-4900	16.43	8.54	10.16	1.125	1.50	4	5/8-11	1.12	3.89	113.98
14-120	14.72	6.85	15.50	1.125	1.50	4	5/8-11	1.13	3.89	157.0
14-120-5000	13.27	5.40	10.16	1.125	1.50	4	5/8-11	1.13	3.89	84.19
16-120-6000	23.07	12.28	15.50	1.125	1.50	4	5/8-11	1.13	3.89	198.0
16-120-6100	17.72	6.93	15.50	1.614	2.17	4	7/8-9	1.26	6.01	165.0
16-120	19.11	8.33	20.63	1.614	2.17	4	7/8-9	1.50	6.01	272.0
18-120-7000	22.50	8.33	20.63	2.244	3.07	4	1 1/8-7	1.97	8.91	356.0
18-120	26.44	12.26	20.63	2.244	3.07	4	1 1/8-7	1.97	8.91	530.0
20-120-7200	36.67	12.26	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	773.0
20-120-7300	40.61	16.20	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	901.0
20-120	44.55	20.14	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	1058.0
30-120-7600	50.91	16.20	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	1158.0
30-120-7700	54.84	20.14	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	1339.0
30-120-7800	58.78	24.07	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	1520.0
30-120	62.72	28.01	20.63	2.874	3.94	8	1 1/8-7	1.97	8.91	1701.0

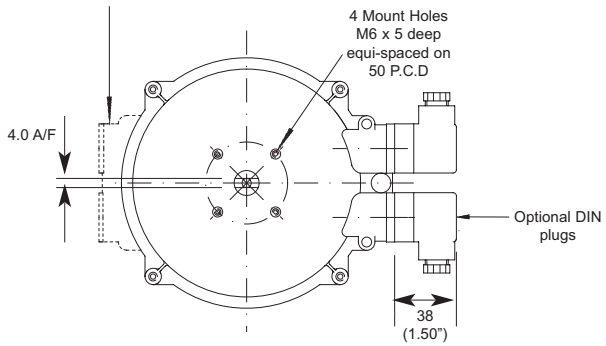
** Clockwise (120) and counterclockwise (130) units have identical dimensions

* Female drive unless specified

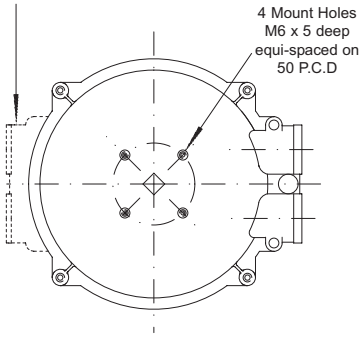
Universal Limit Switch Box Dimensions



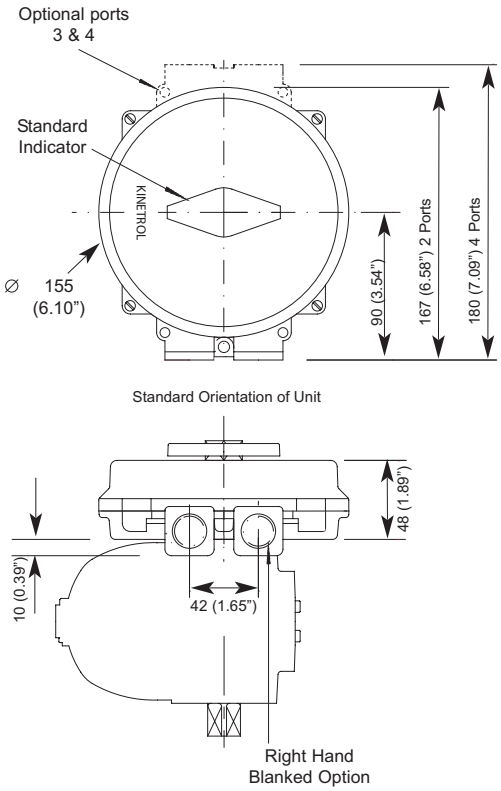




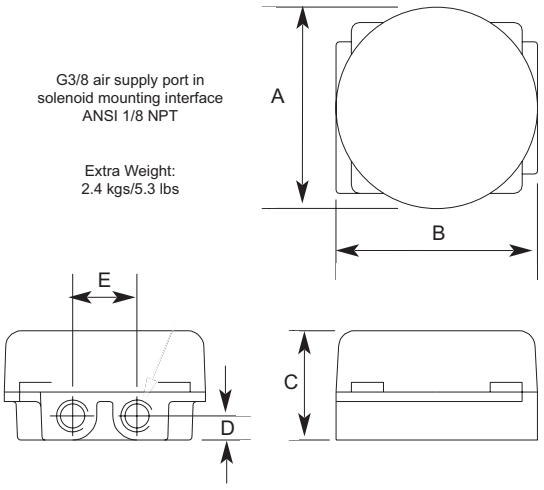
Namur Discrete Mount Option



Kinetrol Discrete Mount option



Direct Mount Option

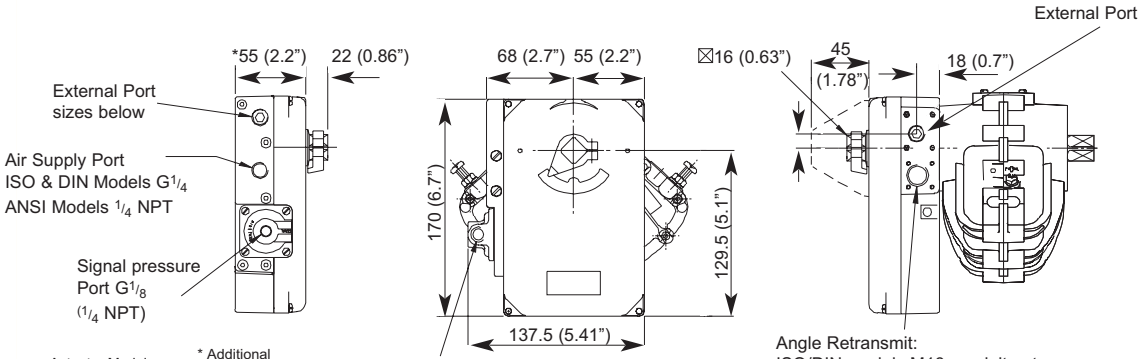


	mm	inches
A	125	4.9
B	125	4.9
C	68	2.7
D	15	0.6
E	40	1.6

F ISO - M20 x 1.5
DIN - Pg 13.5
ANSI - 1/2 - 14 NPS

3 Stop Pneumatic Positioner Dimensions

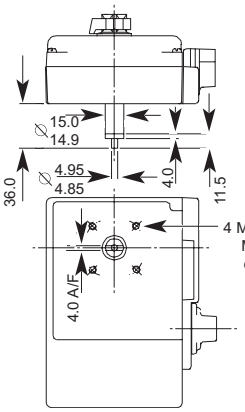
AP Positioner Dimensions



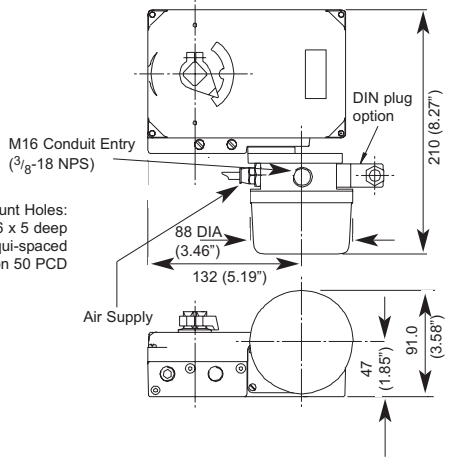
Actuator Model	* Additional Adaptor Dim.
05-10	-
12	15.0 (0.59")
14	18.0 (0.71")

AP Positioner shown direct mounted on a Kinetrol 07 Actuator

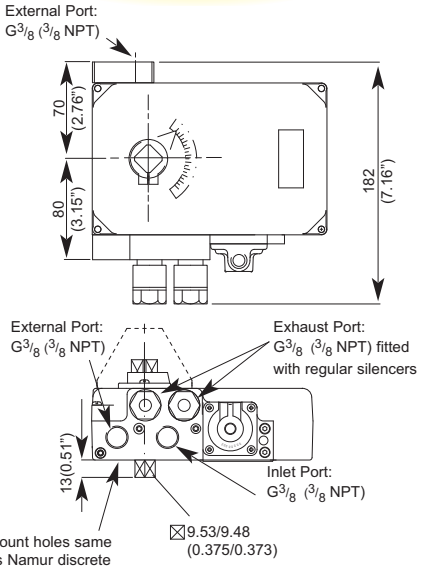
Namur Discrete Version



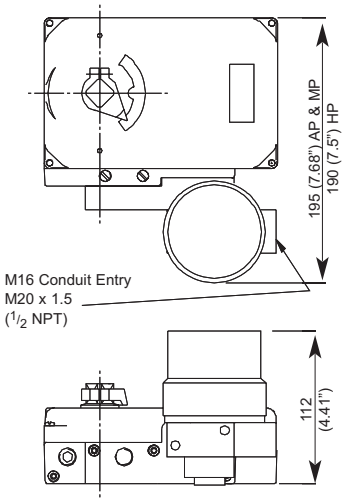
Non-Hazardous I/P Version



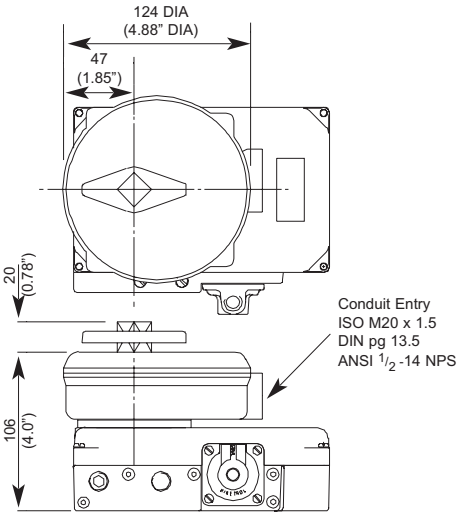
Kinetrol Discrete/ High Flow Version



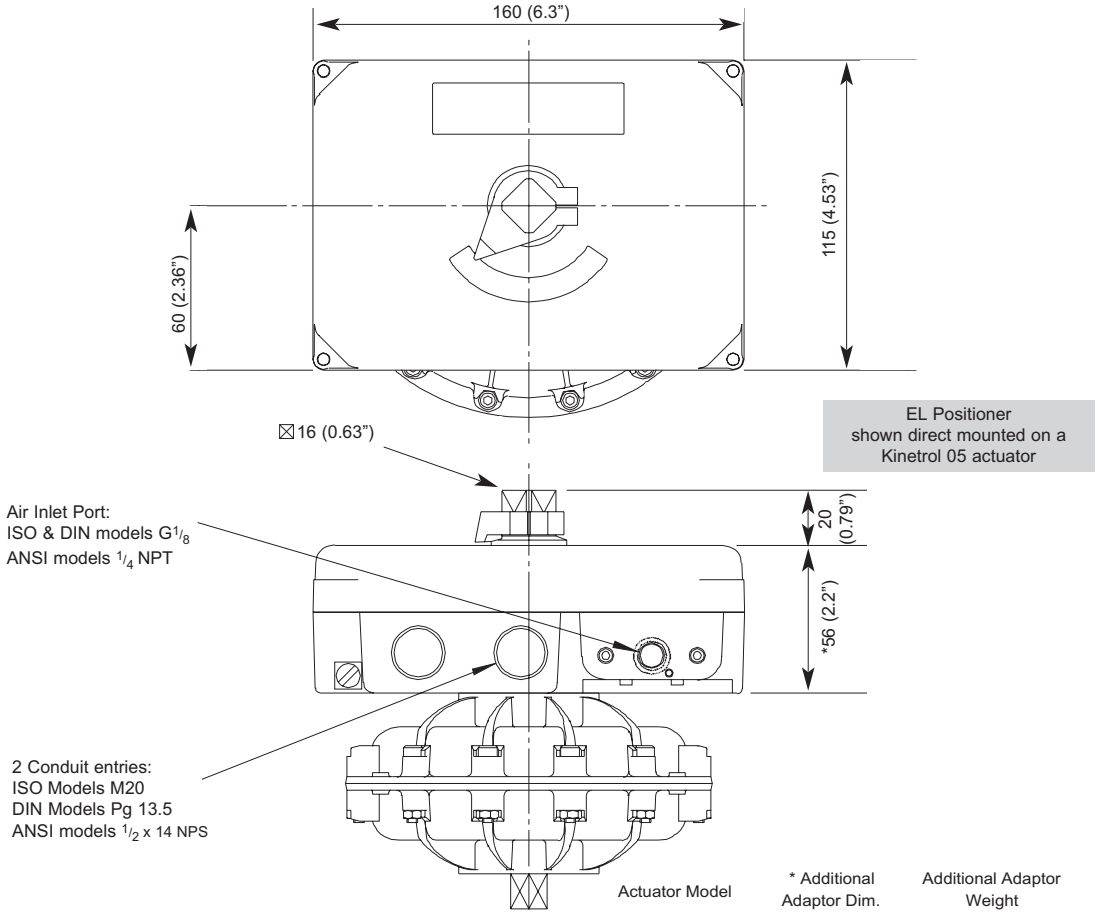
Explosion Proof I/P Version



Switch Box Version



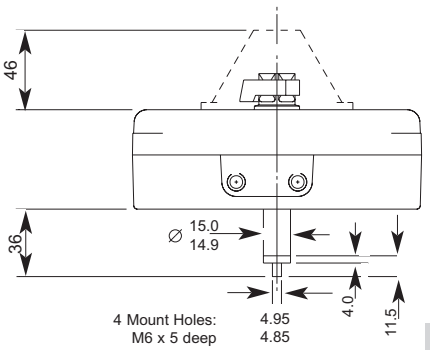
Where drawing information is not given - it is the same as the direct mount version

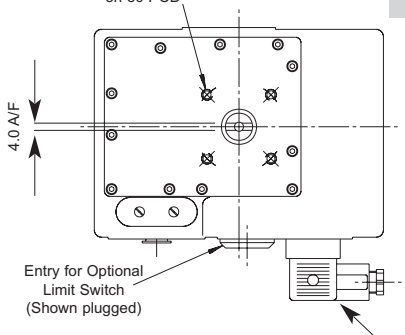


EL Positioner shown direct mounted on a Kinetrol 05 actuator

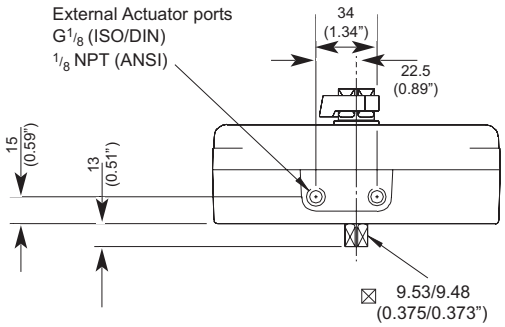
Actuator Model	* Additional Adaptor Dim.	Additional Adaptor Weight
12	15.0 (0.59")	0.65 kg/1.4 lbs
14	18.0 (0.71")	0.65 kg/1.4 lbs

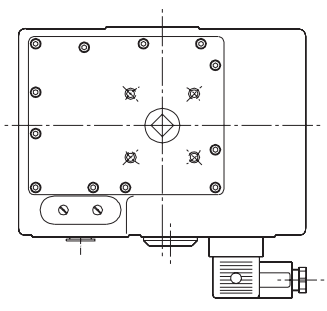
Namur Discrete Version





Kinetrol Discrete Version





Where drawing information is not given - it is the same for both versions

Din Plug options - shown 90° out of true position ISO/DIN models Pg 11 cable gland (8 to 10 mm dia) ANSI models 1/2 NPT cable entry (for use with flexible conduit).

Double Acting Torque Outputs - Metric Units Nm

Actuator Model	pressure (bar) 1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
OMO - 100	0.1	0.2	0.25	0.35	0.4	0.5	0.55	0.6	0.7	0.75	0.85	0.9
01 - 100	1.1	1.6	2.1	2.6	3.0	3.5	4.0	4.5	5.1	5.6	6.1	6.7
02 - 100	1.8	2.7	3.6	4.6	5.5	6.4	7.3	8.2	9.2	10.2	11.1	12.1
03 - 100	3.9	5.8	7.6	9.6	11.5	13.4	15.4	17.4	19.3	21.3	23.2	25.3
05 - 100	9.0	12.5	16.5	20	24.0	27.5	31.5	35.0	39.0	43.0	46.5	50.5
07 - 100	22.0	30.5	39.5	48.5	57.5	66.5	76.0	85.5	95.0	105.0	114.0	124.0
08 - 100	31	44	57	69	82	95	108	121	134	147	160	173
09 - 100	46	64	83	102	121	140	159	179	199	220	241	261
10 - 100	80	111	141	172	202	232	263	294	325	355	385	416
12 - 100	103	147	190	232	275	319	360	403	446	490	532	575
14 - 100	265	360	460	560	660	760	870	975	1080	1180	1280	1375
16 - 100	640	860	1090	1310	1530	1750	1980	2200	2420	2650	2870	3100
18 - 100	1250	1750	2250	2750	3250	3750	4300	4850	5400	5950	6400	6900
20 - 100	2480	3440	4400	5310	6290	7230	8160	9090	10020	10960	11890	12760
30 - 100	3720	5160	6600	7695	9435	10845	12240	13635	15030	16440	17835	19140

Spring Return Torque Outputs - Metric Units Nm

Actuator Model	Position of air OR spring return stroke	pressure setting (bar) 1.7	2.0	2.4	2.8	3.1	3.5	3.8	4.1	4.5	4.8	5.2	5.5
01-120	Start						1.5		1.7		1.9		2.3
	Finish						0.9		1.1		1.5		1.8
02-120	Start						3.0	3.4	3.6	3.8	4.2	4.4	4.7
	Finish						1.4	1.7	2.0	2.4	2.8	3.3	3.7
03-120-5600	Start	2.8	3.4	4.1	4.8	5.3	5.7						
	Finish	2.1	2.8	3.5	4.2	4.8	5.1	*5.1*	*5.1*	*5.1*	*5.1*	*5.1*	*5.1*
03-120	Start						6.3	6.9	7.5	8.1	8.9	9.5	10.3
	Finish						4.1	4.7	5.5	6.4	7.2	7.8	8.7
05-120	Start						13.0	14.1	15.3	16.4	18.1	19.2	20.9
	Finish						8.5	9.6	11.3	13.0	14.7	15.8	17.5
07-120-4000	Start	9.0	11.9	15.3	18.6	22.0							
	Finish	5.1	8.5	11.9	15.3	18.0	*18.0*	*18.0*	*18.0*	*18.0*	*18.0*	*18.0*	*18.0*
07-120	Start						30.5	33.9	37.3	40.7	43.5	46.9	50.8
	Finish						19.8	23.7	27.1	30.5	34.4	38.4	42.4
08-120-4100	Start	18.6	23.7	27.1	31.1	35.0	39.5	44.1	48.0	52.5	56.5		
	Finish	7.9	13.6	16.9	20.9	26.0	30.5	35.0	39.0	43.5	47.5	*47.5*	*47.5*
08-120	Start									56.5	61.0	65.5	70.6
	Finish									45.2	50.3	54.8	59.9
09-120-4200	Start	26.0	31.6	37.3	44.1	50.8							
	Finish	14.7	21.5	28.2	35.0	41.8	*41.8*	*41.8*	*41.8*	*41.8*	*41.8*	*41.8*	*41.8*
09-120	Start						61.0	67.8	74.6	81.9	89.3	96.6	104.0
	Finish						50.3	56.5	63.8	71.2	79.1	86.4	93.8
10-120-5800	Start	56.0	65.0	77.0	89.0	97.0	108.0						
	Finish	41.8	52.0	64.0	77.2	86.9	100.0	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
10-120	Start						107.0	115.5	124.0	136.0	145.0	155.9	164.0
	Finish						78.0	90.0	102.0	114.6	124.0	134.9	143.0
12-120-4300	Start	54.0	68.9	83.6									
	Finish	42.9	57.6	72.3	*72.3*	*72.3*	*72.3*	*72.3*	*72.3*	*72.3*	*72.3*	*72.3*	*72.3*
12-120-4400	Start			89.3	103.0	117.0	132.0	147.0	161.0	176.0	191.0		
	Finish			66.1	80.2	94.9	110.0	124.0	139.0	154.0	168.0	*168.0*	*168.0*
12-120	Start						145.0	160.0	176.0	191.0	206.0	221.0	238.0
	Finish						111.0	127.0	142.0	158.0	174.0	189.0	204.0
14-120-4900	Start	192.0	220.0	249.0	288.0	322.0	356.0	390.0	424.0	469.0	497.0	529.0	529.0
	Finish	119.0	158.0	186.0	220.0	254.0	288.0	2322.0	356.0	390.0	418.0	447.0	447.0
14-120	Start						374.0	408.0	442.0	479.0	517.0	554.0	588.0
	Finish						249.0	290.0	330.0	367.0	406.0	443.0	478.0
14-120-5000	Start	172.0	208.0	237.0									
	Finish	140.0	174.0	198.0	*198.0*	*198.0*	*198.0*	*198.0*	*198.0*	*198.0*	*198.0*	*198.0*	*198.0*
16-120-6100	Start	359.0	428.0	497.0									
	Finish	245.0	333.0	421.0	*421.0*	*421.0*	*421.0*	*421.0*	*421.0*	*421.0*	*421.0*	*421.0*	*421.0*
16-120-6000	Start			514.0	583.0	652.0	722.0						
	Finish			404.0	492.0	580.0	668.0	*668.0*	*668.0*	*668.0*	*668.0*	*668.0*	*668.0*
16-120	Start						864.0	939.0	1004.0	1097.0	1165.0	1256.0	1321.0
	Finish						576.0	660.0	742.0	832.0	906.0	1002.0	1081.0
18-120-7000	Start	807.0	970.0	1182.0	1260.0								
	Finish	484.0	736.0	967.0	1040.0	*1040.0*	*1040.0*	*1040.0*	*1040.0*	*1040.0*	*1040.0*	*1040.0*	*1040.0*
18-120	Start				1457.0	1637.0	1875.0	2053.0	2206.0	2426.0	2585.0	2800.0	2954.0
	Finish				874.0	1036.0	1250.0	1441.0	1630.0	1840.0	2011.0	2234.0	2417.0
20-120-7200	Start	1621.0	1940.0	2325.0	2692.0								
	Finish	1025.0	1362.0	1763.0	2203.0	*2203.0*	*2203.0*	*2203.0*	*2203.0*	*2203.0*	*2203.0*	*2203.0*	*2203.0*
20-120-7300	Start				2788.0	3072.0	3471.0	3739.0	4023.0				
	Finish				1958.0	2271.0	2632.0	2983.0	3291.0	*3291.0*	*3291.0*	*3291.0*	*3291.0*
20-120	Start								4121.0	4514.0	4798.0	5181.0	5456.0
	Finish								3046.0	3423.0	3732.0	4133.0	4464.0
30-120-7600	Start	2433.0	2878.0	3466.0	4038.0								
	Finish	1622.0	2127.0	2696.0	3304.0	*3304.0*	*3304.0*	*3304.0*	*3304.0*	*3304.0*	*3304.0*	*3304.0*	*3304.0*
30-120-7700	Start				4112.0	4554.0	5113.0						
	Finish				3118.0	3542.0	4183.0	*4183.0*	*4183.0*	*4183.0*	*4183.0*	*4183.0*	*4183.0*
30-120-7800	Start						5237.0	5676.0	6072.0	6648.0			
	Finish						3871.0	4304.0	4844.0	5440.0	*5440.0*	*5440.0*	*5440.0*
30-120	Start									6771.0	7179.0	7772.0	8184.0
	Finish									5134.0	5598.0	6200.0	6696.0

Torque outputs identical for counter-clockwise models . *Italic* figures apply to spring end torque only - air end torque will be greater.

Double Acting Torque Outputs - English Units lbf ins

Actuator Model	Pressure (psi) 20	30	40	50	60	70	80	90	100
OMO - 100	1	2	3	3.5	4.5	5	6	7	8
01 - 100	9	15	21	26	32	39	45	51	58
02 - 100	14	25	36	48	59	70	82	93	105
03 - 100	29	53	77	101	124	148	173	196	220
05 - 100	70	116	160	205	250	300	346	393	440
07 - 100	175	280	390	500	610	730	850	960	1080
08 - 100	250	405	560	710	870	1030	1190	1350	1510
09 - 100	360	590	820	1050	1280	1530	1780	2020	2280
10 - 100	640	1020	1390	1760	2130	2500	2880	3250	3625
12 - 100	830	1350	1870	2400	2900	3440	3970	4480	5000
14 - 100	2150	3350	4550	5800	7000	8300	9600	10800	12000
16 - 100	5200	7900	10600	13400	16100	18800	21600	24300	27000
18 - 100	10000	16100	22200	28300	34500	41300	48000	54500	60000
20 - 100	20000	32000	43000	54500	66000	78000	89000	100500	112000
30 - 100	30000	48000	64500	81750	99000	117000	133500	150750	168000

Spring Return Torque Outputs - English Units lbf ins

Actuator Model	Position of air OR spring return stroke	Pressure setting (psi) 20	30	35	40	45	50	55	60	65	70	75	80
01-120	Start						13		15		17		20
	Finish						8		10		13		16
02-120	Start						27	30	32	34	37	39	42
	Finish						12	15	18	21	25	29	33
03-120-5600	Start	25	30	36	42	47	50						
	Finish	19	25	31	37	42	45	*45*	*45*	*45*	*45*	*45*	*45*
03-120	Start						56	61	66	71	79	84	91
	Finish						37	41	49	56	64	69	77
05-120	Start						115	125	135	145	160	170	185
	Finish						75	85	100	115	130	140	155
07-120-4000	Start	80	105	135	165	195							
	Finish	45	75	105	135	160	*160*	*160*	*160*	*160*	*160*	*160*	*160*
07-120	Start						270	300	330	360	385	415	450
	Finish						175	210	240	270	305	340	375
08-120-4100	Start	165	210	240	275	310	350	390	425	465	500		
	Finish	70	120	150	185	230	270	310	345	385	420	*420*	*420*
08-120	Start									500	540	580	625
	Finish									400	445	485	530
09-120-4200	Start	230	280	330	390	450							
	Finish	130	190	250	310	370	*370*	*370*	*370*	*370*	*370*	*370*	*370*
09-120	Start						540	600	660	725	790	855	925
	Finish						445	500	565	630	700	765	830
10-120-5800	Start	500	587	683	760	886	953						
	Finish	366	472	568	645	780	847	*847*	*847*	*847*	*847*	*847*	*847*
10-120	Start						950	1025	1100	1190	1280	1365	1450
	Finish						690	795	900	1000	1100	1185	1270
12-120-4300	Start	480	610	740									
	Finish	380	510	640	*640*	*640*	*640*	*640*	*640*	*640*	*640*	*640*	*640*
12-120-4400	Start			790	910	1040	1170	1300	1430	1560	1690		
	Finish			585	710	840	970	1100	1230	1360	1490	*1490*	*1490*
12-120	Start						1280	1415	1555	1690	1825	1960	2110
	Finish						985	1125	1260	1400	1540	1670	1810
14-120-4900	Start	1700	1950	2200	2550	2850	3150	3450	3750	4150	4400	4680	4680
	Finish	1050	1400	1650	1950	2250	2550	2850	3150	3450	3700	3960	3960
14-120	Start						3310	3610	3915	4240	4580	4900	5200
	Finish						2205	2570	2920	3250	3595	3920	4230
14-120-5000	Start	1520	1840	2100									
	Finish	1240	1540	1750	*1750*	*1750*	*1750*	*1750*	*1750*	*1750*	*1750*	*1750*	*1750*
16-120-6100	Start	3178	3790	4401									
	Finish	2172	2950	3729	*3729*	*3729*	*3729*	*3729*	*3729*	*3729*	*3729*	*3729*	*3729*
16-120-6000	Start			4551	5163	5774	6386						
	Finish			3579	4357	5136	5914	*5914*	*5914*	*5914*	*5914*	*5914*	*5914*
16-120	Start						7646	8310	8885	9708	10310	11116	11691
	Finish						5098	5841	6567	7363	8018	8868	9567
18-120-7000	Start	7142	8585	10461	11151								
	Finish	4283	6514	8558	9204	*9204*	*9204*	*9204*	*9204*	*9204*	*9204*	*9204*	*9204*
18-120	Start				12894	14487	16594	18169	19523	21470	22877	24780	26143
	Finish				7735	9169	11063	12753	14426	16284	17797	19771	21390
20-120-7200	Start	14346	17169	20576	23824								
	Finish	9071	12054	15603	19497	*19497*	*19497*	*19497*	*19497*	*19497*	*19497*	*19497*	*19497*
20-120-7300	Start				24674	27187	30718	33090	35604				
	Finish				17328	20098	23293	26400	29125	*29125*	*29125*	*29125*	*29125*
20-120	Start								36471	39949	42462	45852	48286
	Finish								26957	30294	33028	36577	39506
30-120-7600	Start	16797	25470	30674	35736								
	Finish	9394	18824	23860	29240	*29240*	*29240*	*29240*	*29240*	*29240*	*29240*	*29240*	*29240*
30-120-7700	Start				36391	40303	45250						
	Finish				27594	31347	37020	*37020*	*37020*	*37020*	*37020*	*37020*	*37020*
30-120-7800	Start						46347	50233	53737	58835			
	Finish						34258	38090	42869	48144	*48144*	*48144*	*48144*
30-120	Start									59923	63693	68782	72428
	Finish									45436	49542	54870	59260

Torque outputs identical for counter-clockwise models . *Italic* figures apply to spring end torque only - air end torque will be greater.

Actuator General Specification

Casing: Pressure die cast ZL 16 zinc alloy except models 16/18/20 & 30 (aluminium LM25).

Vane & output shaft: Models OMO, 01, 02, 03 and 05 stainless steel. Models 07 upwards SG iron, zinc plated.

Shaft bushes: PTFE coated bronze.

Seals: Moulded polyurethane. High and low temperature seals also available contact Kinetrol.

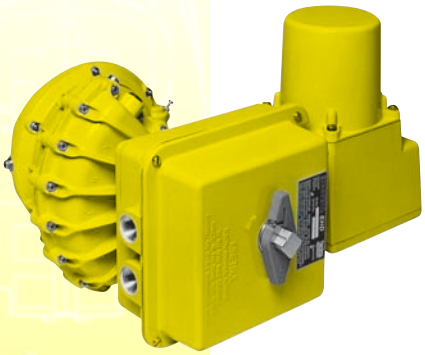
Seal expanders: Stainless spring steel.

Couplings: Weldable mild steel, zinc plated.

Working temperature range: -20°C (-5°F) to 80°C (175°F). Up to 100°C with high temperature seals and higher temperatures with special equipment - contact Kinetrol for details.
Down to -40°C (include option 'L' at end of actuator coding).

Maximum working pressure: 100 psi (7 bar)

Maximum overload pressure: 150 psi (10 bar)

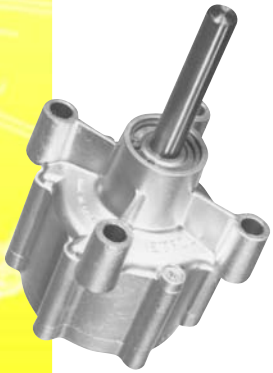


Spring Fail-Safe Electric Actuators

Kinetrol's electrohydraulic actuator is designed for use in areas without compressed air. A hydraulic pump delivers pressurised oil to a Kinetrol quarter-turn actuator, providing double acting torque outputs up to 1220 Nm/10800 lbf in. On power failure a Kinetrol spring return and fail-open solenoid valve produce a positive fail-safe action. A pressure release valve and 100% rated pump motor provide stall protection. This, together with this units capacity for 3000 starts per hour, make it ideal for high cycle double acting and modulating applications. See sales leaflet KF 503 for more information.

Stainless Steel Enclosures

The unique stainless steel enclosure is designed specifically for use in industries such as dairy, food, beverage and pharmaceuticals where hygiene is a primary issue. The stainless steel enclosures are available for Kinetrol actuator models 03 to 09, with a range of options including choice of double acting/spring return, limit switches, solenoid valves, serial communications, all safely inside the polished 316 stainless enclosure. External indication options are also available. Refer to sales leaflet KF 432 to find out more.



Rotary Dampers

Kinetrol's range of fluid dashpots are used to steady drives, decelerate motion and damp vibration. Standard designs include adjustable or fixed rate devices for continuous rotation or restricted travel applications. If required Kinetrol will engineer special dampers to suit your specification. For more information on Kinetrol dampers ask for catalogue KF 72.

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