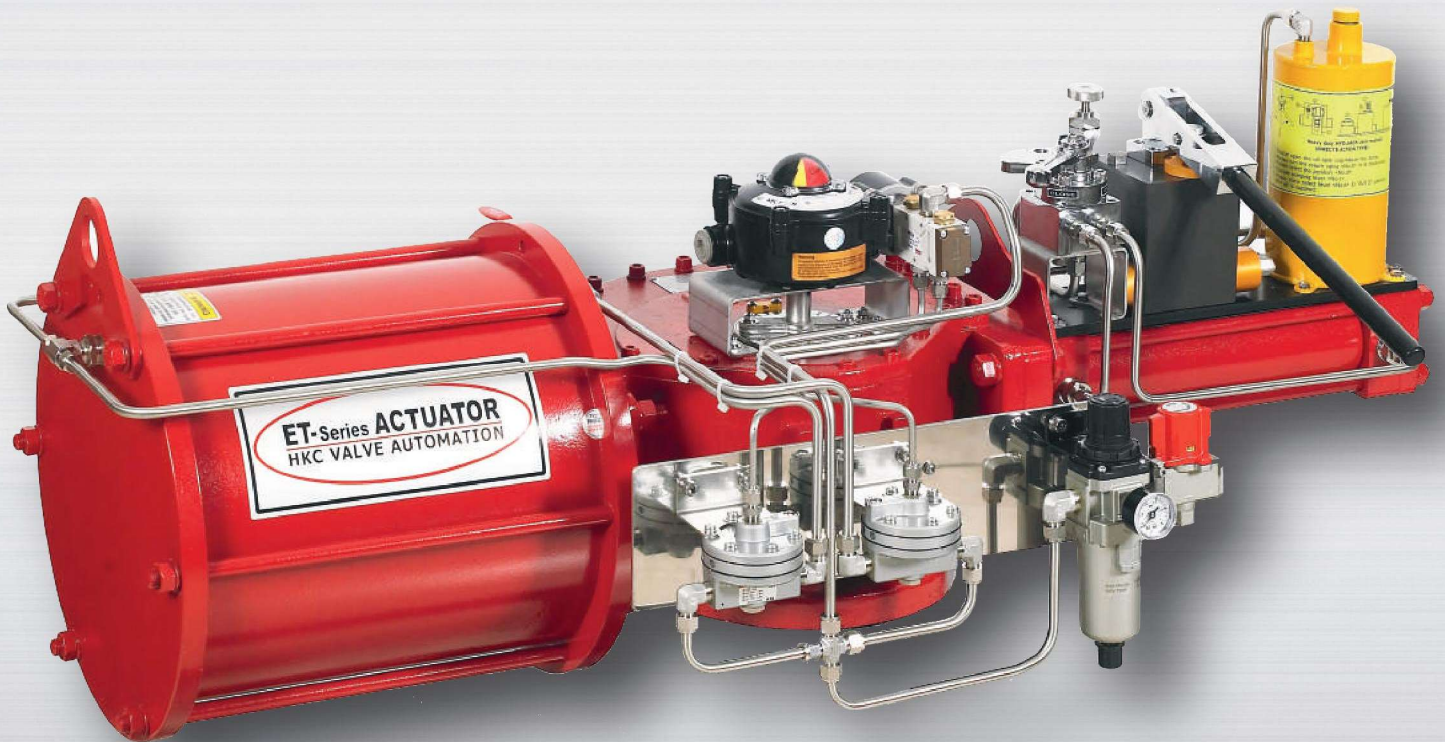




Heavy-duty Pneumatic Actuator

ET-SERIES



Valve automation leader **HKC**

HCAG-ET-16 Rev.0

Heavy-duty Pneumatic Actuator ET-series

Features

- Robust and compact design
- Safe and reliable operation
- Quarter turn (ET-S / ET-C) or linear (ET-L) valve applications
- Wide range of torque output
- Superior water ingress and corrosion protection
- Available in both spring-return or double-acting configurations
- Symmetric or canted scotch yoke design
- Versatile modular design
- MSS or ISO mounting standard
- Quick and easy mounting of accessories

Providing safe and reliable operation, the ET-series heavy duty pneumatic actuators are designed for large, high torque quarter turn valve applications (*ET-S* or *ET-C*) as well as linear valve applications (*ET-L*), used in many industries:

- ✓ Oil and gas
- ✓ Power plant
- ✓ Chemical & petrochemical
- ✓ Municipal wastewater & wastewater treatment
- ✓ Marine
- ✓ Other process industries

The quarter turn ET-series actuators are available in both single acting (spring return) or double acting configurations and with either a symmetric or canted yoke design depending on the needs.

With years of valve automation experience and manufacturing expertise since 1991, HKC provides not only the actuators but also complete customized solutions to the needs of our customers.

■ Inherently Safe Design

The fully welded spring module of the ET-series actuators has been designed to be inherently safe. Located inside the spring case, the springs are held by the piston and piston needle, hence removing the possibility of accidental release of spring force. The different springs may be used to yield different torque outputs.

■ Robust and Reliable Design

Robust and reliable design of the ET-series actuators provides efficient performance with long actuator life. The external surfaces are coated to protect from harsh environment while the internal components are permanently lubricated to provide low friction and corrosion resistant coated.

■ Versatile Modular Design

The ET-series modular design allows easy assembly and disassembly of its components to meet a variety of applications. The combination of different size of pneumatic cylinder and yoke, along with different size of springs, results in different torque characteristics, all of which can be easily configured, if necessary, to give optimum torque outputs.



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■ Specification

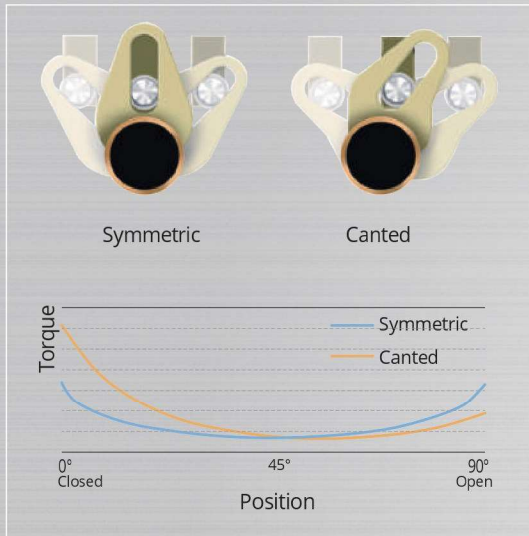
Torque outputs	495 - 250,000 Nm
Operating pressure	3 - 8 bar
Temperature range	Standard: -20 to +80 °C Option: -40 to +100 °C
Valve mounting	ISO or MSS valve mounting
Manual override	Jack screw override (option) Hydraulic override (option)
Others	±5° adjustable travel stops Safe piston guide bar Easy setting indicator Spring rod guide Compact air tubing (option)

■ Design Construction

■ NAMUR Standard

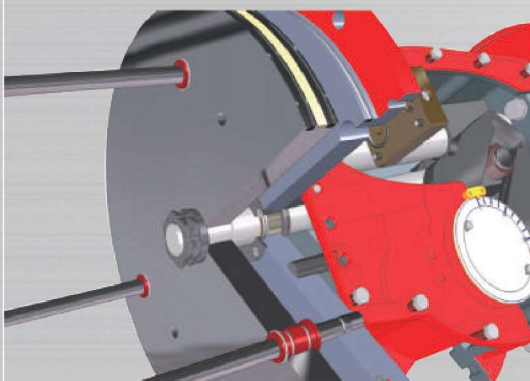
The ET-series provides NAMUR standard interface for quick and convenient mounting of accessories, such as positioners and switchboxes.

■ Symmetric or Canted Type



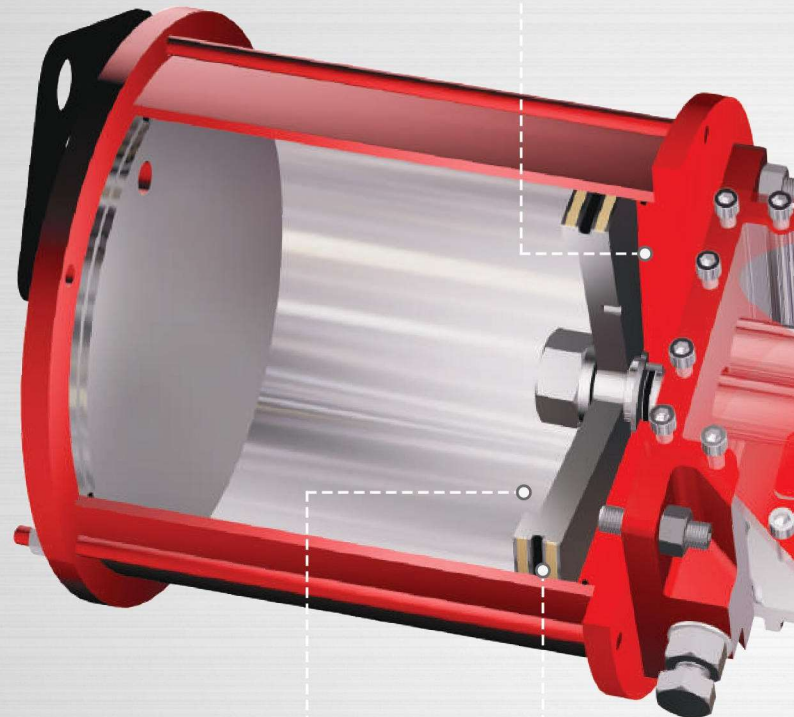
■ Safe Position Guide Bar

The ET-series is designed to minimize friction under low air pressure and position guide bars inside the cylinder are designed to maintain smooth & steady operation. The ET-series prevents any transformation of spring retainer and piston by using anti-abrasive engineering plastic bushing.



■ Compact Air Tubing Type

Optional Built-in air pipe and in/out air blocks on both end of cylinder covers provide simple and easy installation of accessories, such as solenoid valve, air set, etc.



■ Piston Guide Ring

High quality back-up ring prevents any leakage, ensures high performance of piston and extends piston's operating lifespan.



■ Alignment of Modules

The center ring ensures accurate alignment between housing and cylinder case.

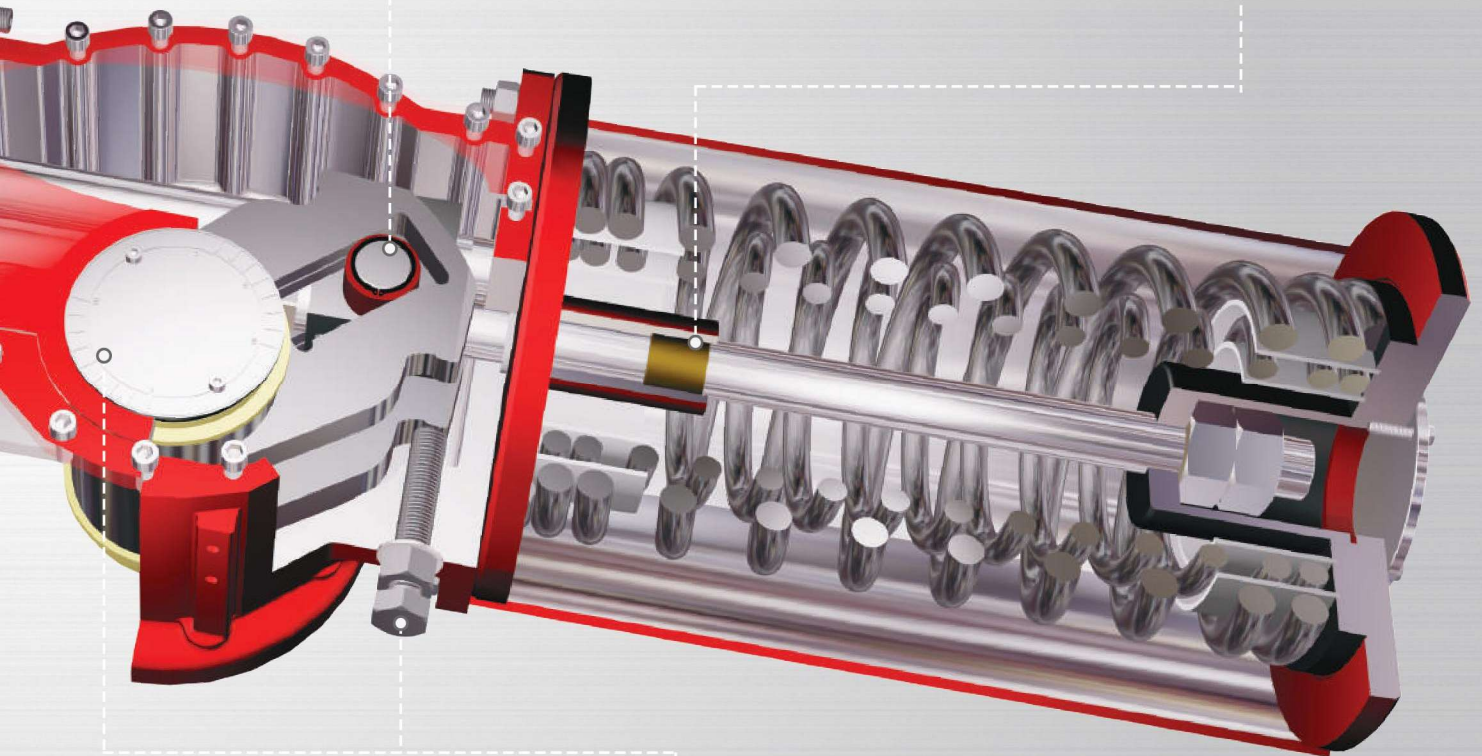
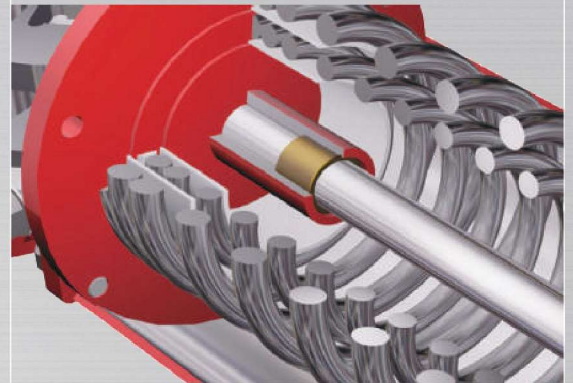
■ Replaceable Bearing

Surface heat treated yoke, bearings and pins extend the actuator's lifespan with low friction and permanent lubrication.



■ Spring Rod Guide

Spring rod guide holder and bushing inside the spring case maintain safe and reliable operation of the spring module.



■ Travel Stops / Indicator

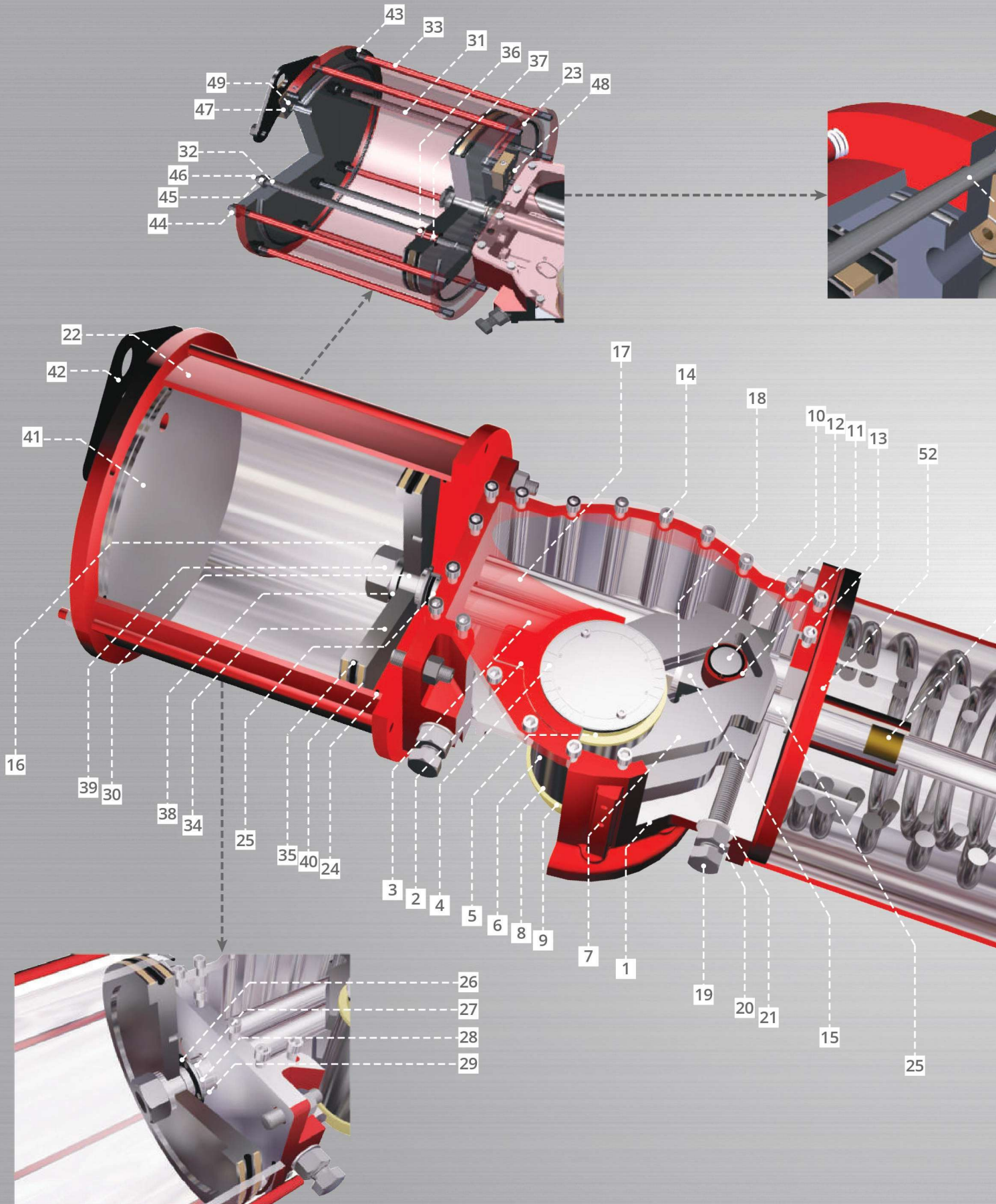
Each two travel stops can be set to $\pm 5^\circ$ of adjustment allowing -5° to 95° travel range. With the simple and clear indicator, the current position of the actuator can be easily determined.

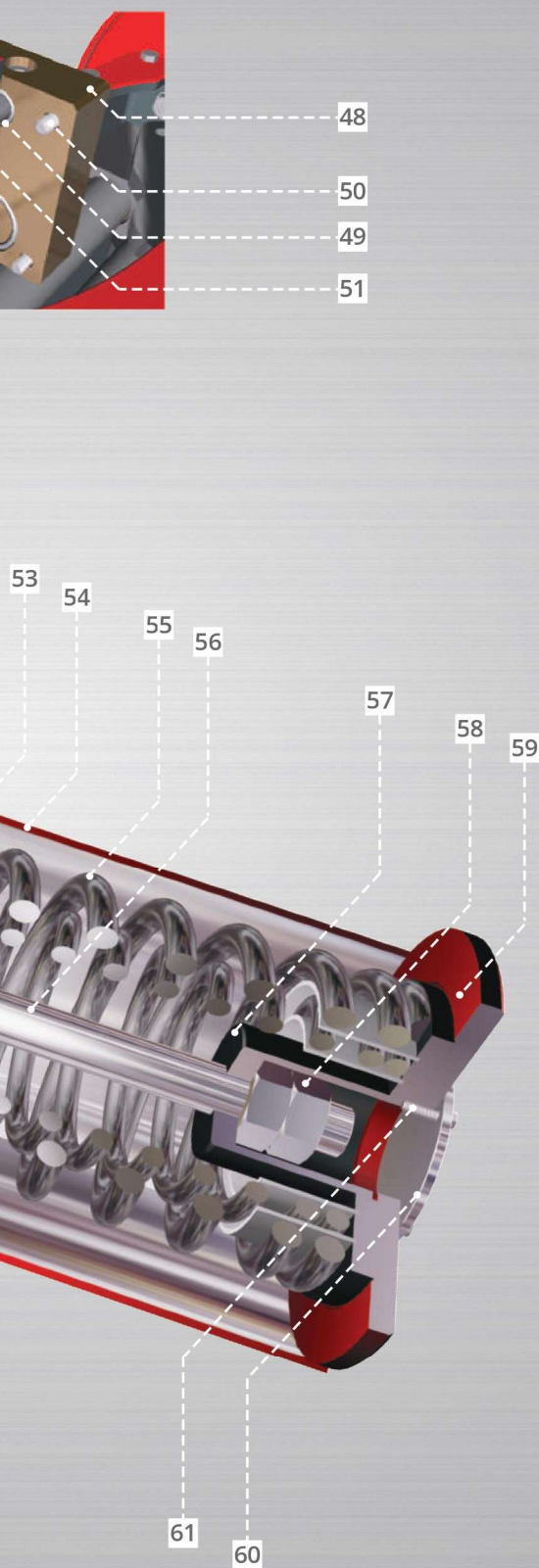


■ Manual Overrides

Optional hydraulic / jack screw overrides can be incorporated in accordance with the customer's requirements.

Construction & Materials





Materials

No.	Description	Material
1	Housing	Housing
2	Housing cover	Alloy steel
3	Position needle	Alloy steel
4	Position indicator	Stainless steel
5	Upper bushing o-ring	NBR
6	Upper bushing	BSC
7	Yoke	Alloy steel
8	Low bushing o-ring	NBR
9	Low bushing	BSC
10	Snap-ring	Alloy steel
11	Slide bearing	Alloy steel
12	Slide pin	Alloy steel
13	Cover Fixed pin	Alloy steel
14	Cover bolt	Alloy steel
15	Slide block	Alloy steel
16	Piston rod rock bolt	Alloy steel
17	Guide bar	Alloy steel
18	Guide bushing	DU dry bushing
19	Travel stopper bolt	Alloy steel
20	Travel stopper nut	Alloy steel
21	Travel stopper washer	Alloy steel
22	Cylinder front cover	Alloy steel
23	Cover o-ring	NBR
24	Center-ring	Alloy steel
25	Piston rod bushing	DU dry bushing
26	Rod seals	PTFE
27	Rod seals o-ring	NBR
28	Piston rod o-ring retainer	Alloy steel
29	Seals retainer bolt	Alloy steel
30	Piston rod	Alloy steel
31	Piston guide bar	Alloy steel
32	Piston guide bar o-ring	NBR
33	Tie bolt	Alloy steel
34	Piston	Alloy steel
35	Piston o-ring	NBR
36	Piston guide bushing	Engineer plastic
37	Piston guide bar bushing o-ring	NBR
38	Rod washer	Alloy steel
39	Rod rock nut	Alloy steel
40	Back-up ring	PTFE
41	Cylinder end cover	Alloy steel
42	Lift plate	Alloy steel
43	Tie bolt washer	Alloy steel
44	Tie bolt nut	Alloy steel
45	Piston guide bar nut	Alloy steel
46	Piston guide bar bolt	Alloy steel
47	End air plate	ALM
48	Front air plate	ALM
49	Air plate o-ring	NBR
50	Air plate bolt	Alloy steel
51	Air pipe	Stainless steel
52	Spring case front cover	Alloy steel
53	Spring rod guide bushing	Engineer plastic
54	Spring case	Carbon steel
55	Spring	Alloy steel
56	Spring rod	Alloy steel
57	Spring retainer	Alloy steel
58	Rod adjust nut	Alloy steel
59	Spring case end cover	Alloy steel
60	Cap	Alloy steel
61	Cap bolt	Alloy steel

■ Torque Range

■ Double Acting

Symmetric

Model	Max. Torque (Nm)
ETS-040	500
ETS-050	1,000
ETS-058	1,900
ETS-065	3,500
ETS-085	9,500
ETS-100	14,000
ETS-130	35,000
ETS-160	40,000
ETS-160w	59,000
ETS-200w	150,000
ETS-270w	250,000

Canted

Model	Max. Torque (Nm)
.	.
.	.
.	.
ETC-065	3,500
ETC-085	9,500
ETC-100	14,000
ETC-130	35,000
ETC-160	40,000
ETC-160w	59,000
ETC-200w	150,000
ETC-270w	250,000

■ Single Acting (Spring Return)

Symmetric

Fail close	
Model	Max. Torque (Nm)
ETS-040	204
ETS-050	515
ETS-058	1,132
ETS-065	2,973
ETS-085	6,399
ETS-100	7,350
ETS-130	16,685
ETS-160	24,924
ETS-160w	31,157
ETS-200w	77,788
ETS-270w	166,924

Fail open	
Model	Max. Torque (Nm)
ETS-040	204
ETS-050	515
ETS-058	1,132
ETS-065	2,973
ETS-085	6,399
ETS-100	7,350
ETS-130	16,685
ETS-160	24,924
ETS-160w	31,157
ETS-200w	77,788
ETS-270w	166,924

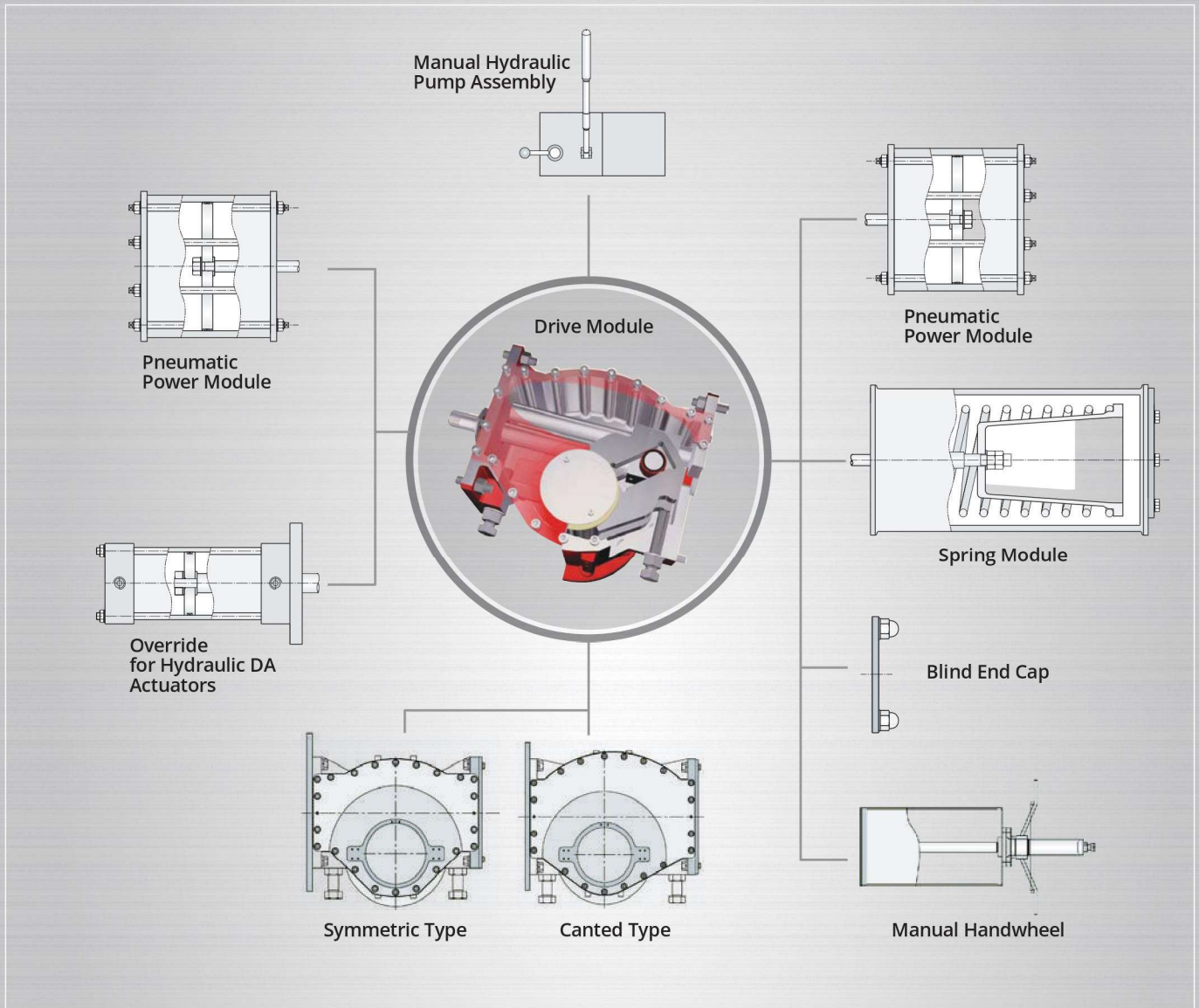
Canted

Fail close	
Model	Max. Torque (Nm)
ETC-065	1,796
ETC-085	4,262
ETC-100	6,391
ETC-130	14,191
ETC-160	20,996
ETC-160w	26,656
ETC-200w	37,501

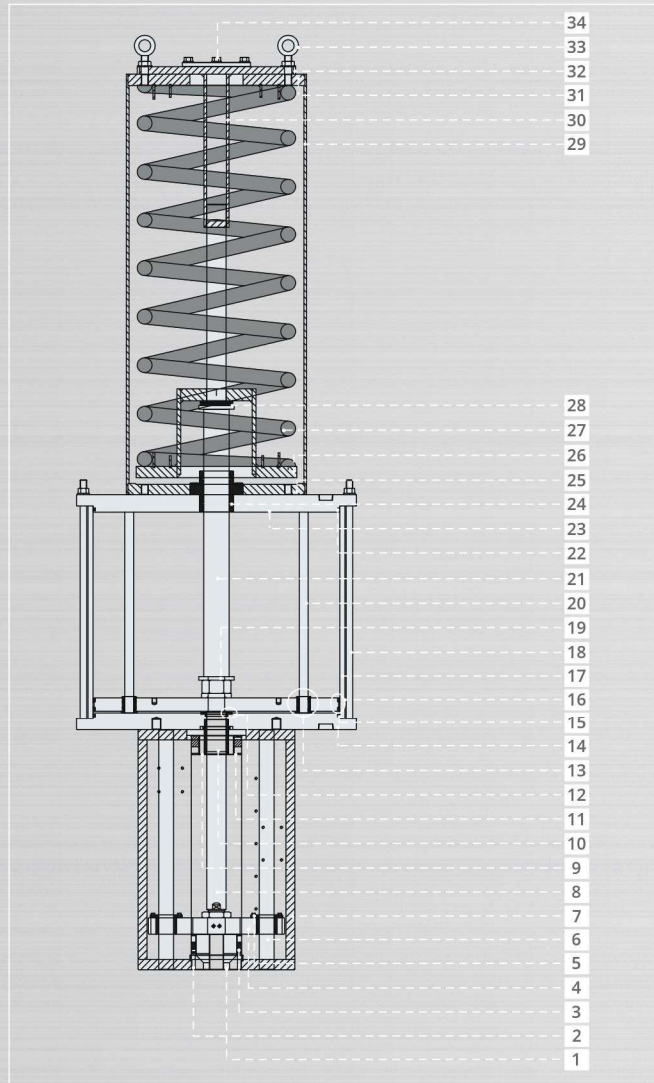
Fail open	
Model	Max. Torque (Nm)
ETC-065	3,540
ETC-085	8,077
ETC-100	12,111
ETC-130	26,903
ETC-160	31,573
ETC-160w	51,097
ETC-200w	71,949

■ Versatile Modular Design

The ET-series provides versatile modular configuration. The following removable modules can be easily added, removed and altered; converting from a single-acting to a double-acting and vice versa, or adding a hydraulic manual override can be done after installation and without the need for disassembly of other modules.



■ ET-L Series: Linear Actuator



■ Materials

No.	Description	Material	Qty
1	Valve stem connector	S45C	1
2	Close stopper	S45C	1
3	Close adjust nut	S45C	1
4	Yoke	S45C	1
5	Yoke guide bush	PBC	2
6	Yoke guide gar	S45C (CR plating)	2
7	Pedestal	SS400	1
8	Piston rod	S45C (CR plating)	1
9	Open stopper	S45C	1
10	Piston rod bush	PBC	1
11	Open adjust nut	S45C	1
12	Rod seal	PTFE	1
12	Rod seal o-ring	NBR	1
12	Rod seal retainer	SS400	1
13	Piston guide bush	PBC	3
13	Guide bush inner o-ring	NBR	6
13	Guide bush outer o-ring	NBR	6
14	Cylinder cover A	S45C	1
15	Cylinder cover A o-ring	NBR	1
16	Piston bearing		1
16	Piston	NBR	1

No.	Description	Material	Qty
16	Piston lower o-ring	NBR	1
17	Cylinder	SB410	1
18	Tie bolt	SCM440	8
19	Piston rod o-ring	NBR	1
19	Piston rod washer	SS400	1
19	Piston nut	SCM400	1
20	Piston guide bar	S45C (CR plating)	3
21	Spring rod	S45C	1
22	Cylinder cover B o-ring	NBR	1
23	Cylinder cover B	S45C	1
24	Spring rod bush	PBC	1
25	Spring pack cover A	SS400	1
26	Spring retainer	SS400	1
27	Return spring	SUP9	1
28	Thrust bearing		1
29	Spring pack case	SPG	1
30	Spring rod guide	SS400	1
31	Spring pack cover B	SS400	1
32	Spring rod guide plate	SS400	1
33	Spring pack cover C	SS400	1
34	Lift nut	SCM440	4

■ Accessories

■ Valve Position Monitor

Providing accurate and reliable valve position monitoring, the APL-series limit switch boxes cover various customer needs: cost-effective, corrosive/ hostile environments, enclosure standards (IP67, IP68, NEMA 4, 4X, 6, flame-proof, intrinsic safety), higher/ lower operating temperature, multiple cable entries, 3-way or 5-way valve applications, current position signalling, solenoid valve, and many more. See APL-series catalog for more details.



■ Manual Override

In case of an air supply failure, the ET-series provides manual overrides in two primary methods: hydraulic manual override and jack screw override.



Hydraulic override



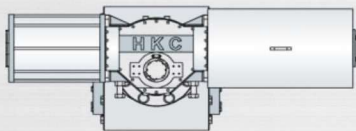
Jack Screw Override

■ Control Panel

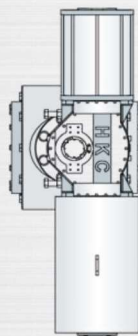


■ Actuator Mounting Position

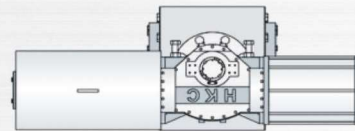
■ M1 Position



■ M2 Position



■ M3 Position



■ M4 Position

