

AIR TORQUE HEAVY DUTY AT-HD EXTENDED SERIES

Scotch yoke actuator
“manufactured in Italy”



Global Supply Line Pty Ltd
www.globalsupplyline.com.au
sales@globalsupplyline.com.au

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AIR TORQUE



AT-HD HEAVY DUTY ACTUATORS EXTENDED SERIES

The Air Torque AT-HD Heavy Duty Actuator Extended Series is designed for on/off and modulating duties. The AT-HD actuators can be supplied either with symmetric or canted yoke and can operate ball valves, butterfly valves and plug valves. The AT-HD Series is available in both double acting and spring return configuration. The modular design allows for easy manual overrides.

The AT-HD Series is also available with pneumatic drive supply and hydraulic drive supply.

The AT-HD Series is ready for automation, with all the ancillary attachments in compliance with the international standards. The AT-HD actuators can be equipped with various accessories and panels directly mounted on board or supplied free standing. All is completed in Air Torque factory.

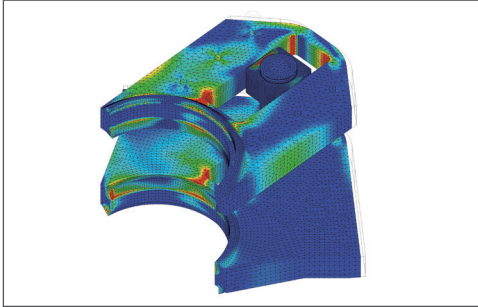
The Air Torque AT-HD Series incorporates several international patents which make these actuators unique for construction details and functionality properties.



MAIN FEATURES

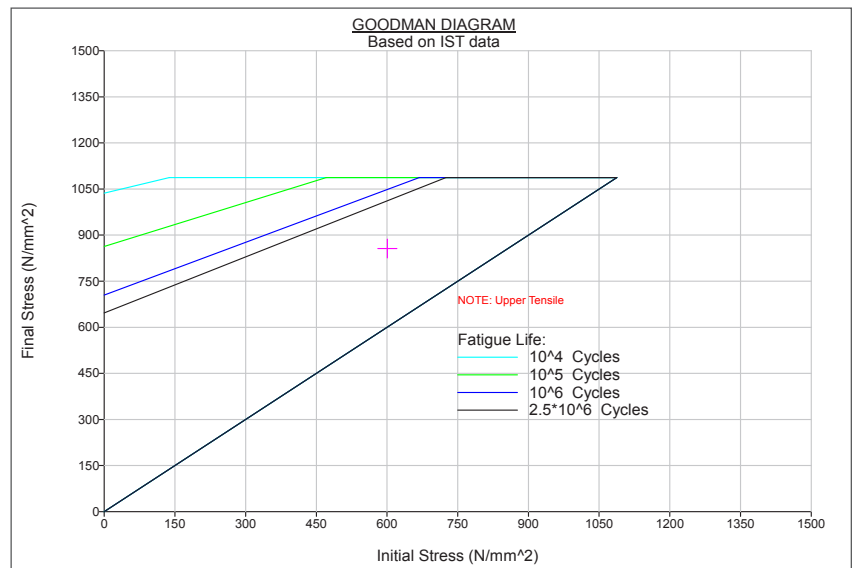
Robust And Innovative Design

The AT-HD series is designed and fully tested in Air Torque facilities according to the latest and most severe international standards. Special technical features and grade materials are integrated in this product line to withstand the heaviest working condition.



Quality Proved by Testing

Thanks to recognized know-how, reliability and strong experience in valve automation, Air Torque performs the test in house in order to guarantee compliance with the technical specification related to the quality and reliability of the AT-HD actuators.



Working conditions

Symmetric and canted yoke:

The scotch yoke mechanism is available both in symmetric and in canted design. These options allow for greater cost efficiency by leveraging changes to internal mechanism.

Working temperature range:

S (standard working temp.) -40°C to +80°C (-40°F to 176°F)

H (high working temp.) -15°C to +150°C (+5°F to 302°F)

L (Low working temp.) -60°C to +80°C (-76°F to 176°F)

Supply medium:

Air, nitrogen or sweet gas, special version available for other gases

Working pressure (for std actuators):

Pneumatic: up to 10 bar (150 PSI) - higher pressure upon request

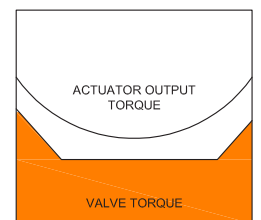
Hydraulic: up to 207 bar (3000 PSI)

Output torque:

Double acting configuration: up to 100.000 Nm (885.000 Lb • in)

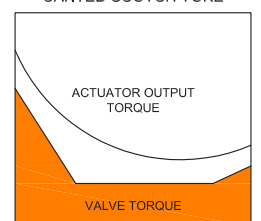
Spring return configuration: up to 60.000 Nm (531.000 Lb • in)

SYMMETRIC SCOTCH YOKE



0° ROTATION 90°

CANTED SCOTCH YOKE



0° ROTATION 90°

DESING DETAILS

1. Power module

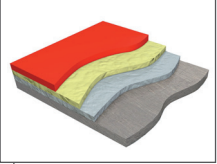
Together with the most popular scotch yoke design with external tie rods for power module, Air Torque developed a new and innovative pneumatic module design without tie rods.

- Cleaner design
- More consistent coating
- Less tie rod elongation trouble under temperature variation
- Easy coating maintenance
- Easier painting process

As standard AT-HD power cylinders are provided without tie rod up to size 685.

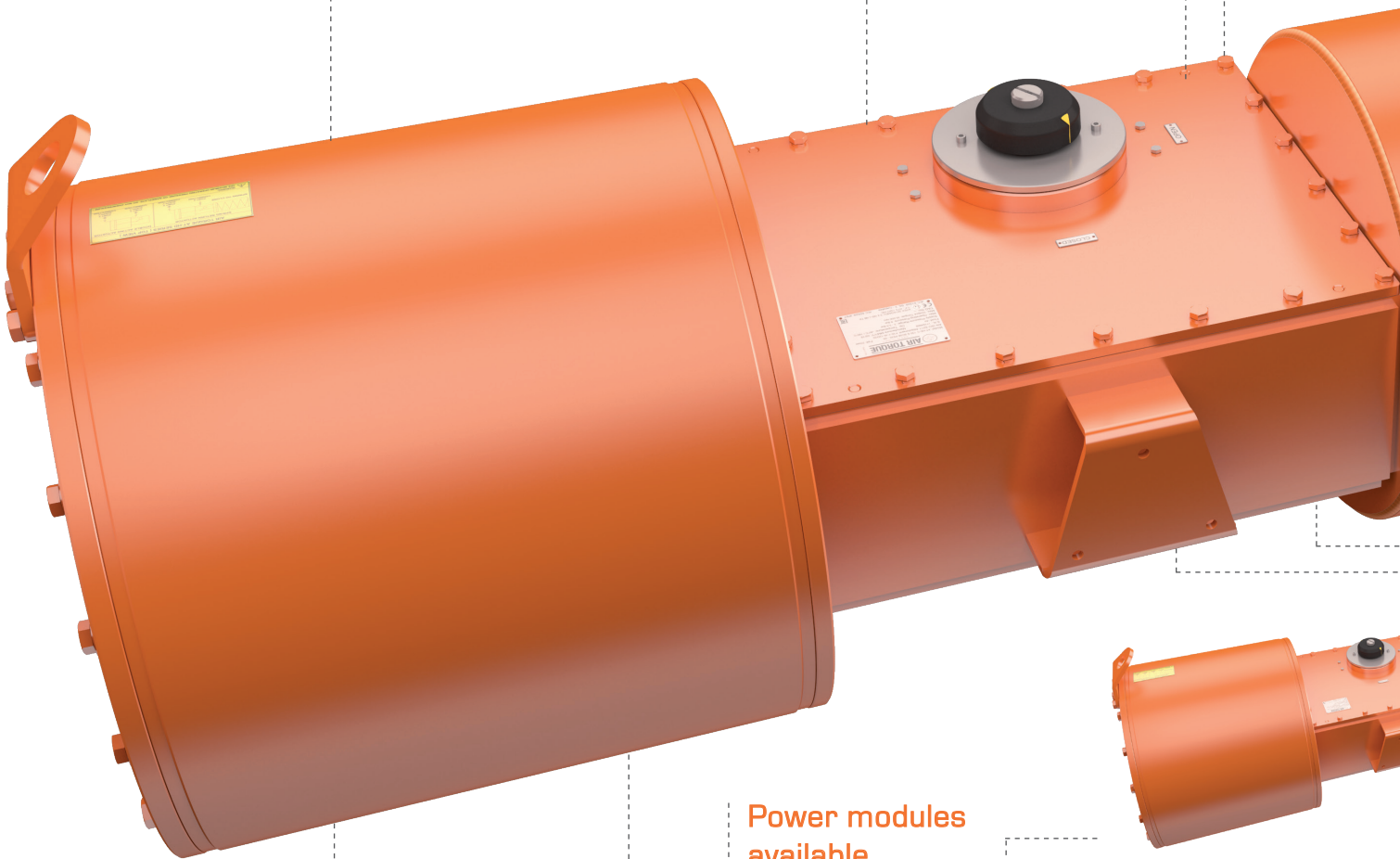
2. Corrosion protection

The AT-HD series is weatherproof. The actuator shaft is offered with coating, adhering to Air Torque's attention to detail commitment maximum level of protection possible. High corrosion resistance material, coupled with multilayer coating of the components, improve the longevity.



3. Flexibility for control panel

As standard the AT-HD can offer fixing points for control panel in both central module sides.

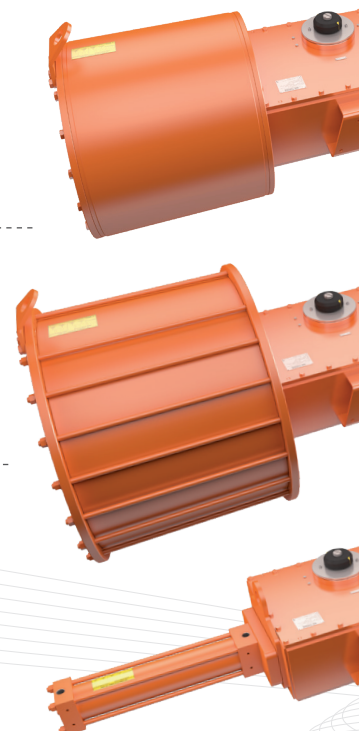


Power modules available

Pneumatic module without tie rods (standard up to P685) (optional above P685)

Pneumatic module with tie rods

Hydraulic module



6. Easy maintenance

The unique Air Torque AT-HD power module configuration allows the direct access to the actuator piston after removing the external flange. The cylinder and inner flange is anyway kept in position without any stress on the piston stem. This feature permits easy, quick and safe power cylinder maintenance.

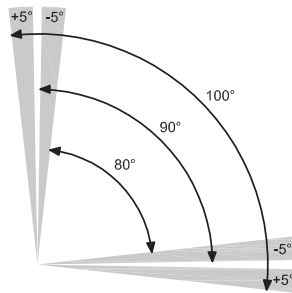
4. Frontal stroke adjustment

The stroke adjustment is possible through screws located in the frontal area of the actuator.

- Simpler stroke adjustment
- Shorter actuator
- Less extended area of potential corrosion



Rotation and stroke adjustment



5. Greased for life

The unique design of the scotch yoke mechanism coupled with special grease selection, delivers a long grease retention and less maintenance over the life of the actuator.

6. Relief valve

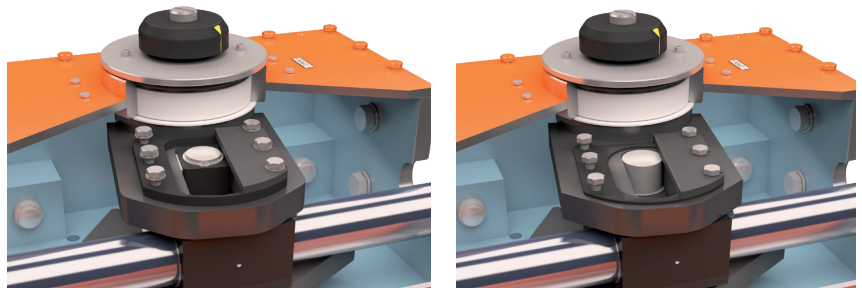
Automatic relief valve to discharge excessive or unwanted pressure.



7. Long life - minimized maintenance

The AT-HD series is designed to minimize the maintenance frequency and so to provide lasting and efficient performance.

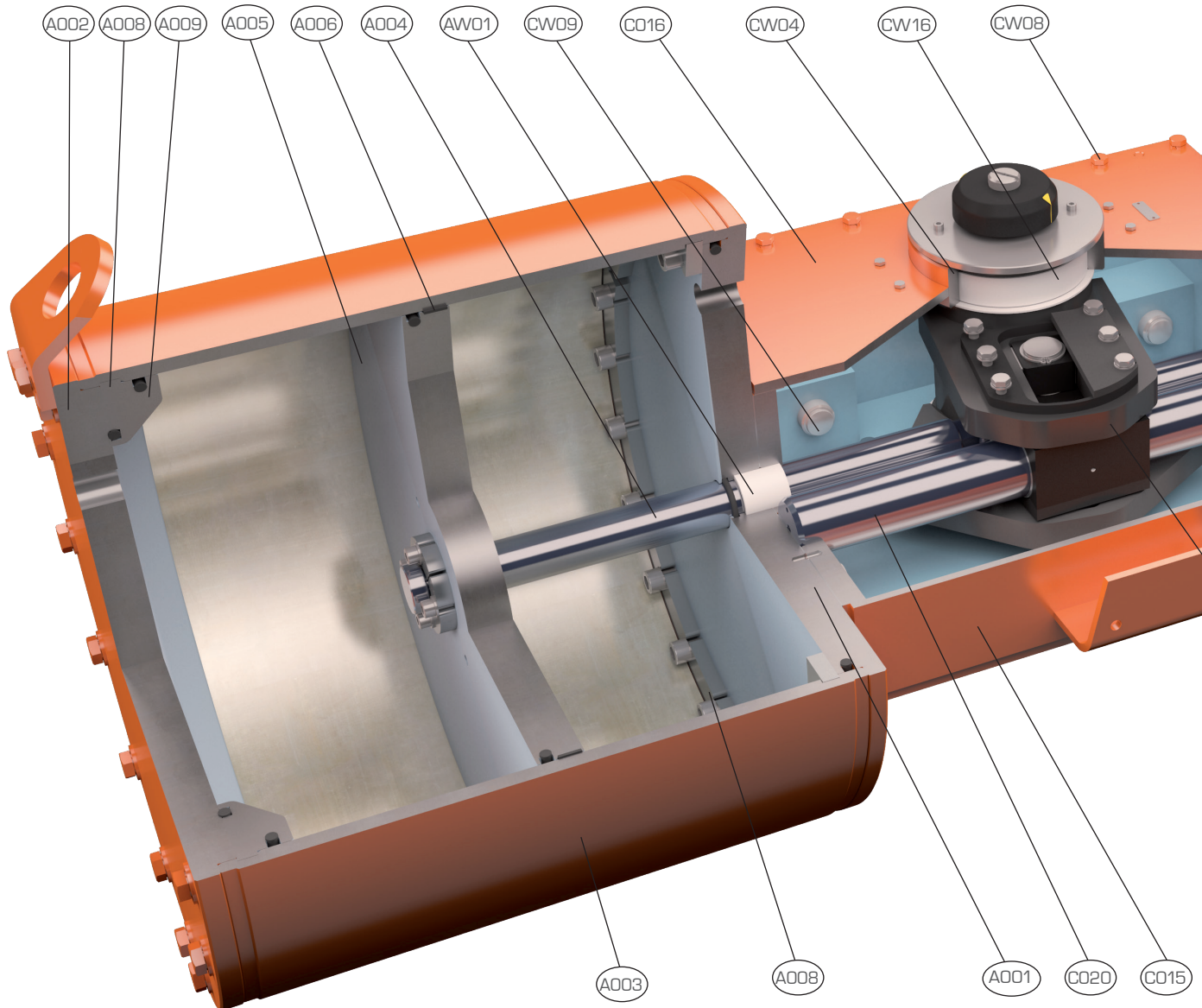
- Innovative and unique engineering
- State-of-art materials and surface treatments
- Extended lifespan
- High frequency cycle service



All these unique benefits are granted by Air Torque two different mechanism concepts, both covered by international patents: rolling pin (for size up to AT-HD 085 included) and sliding block with special insert (from the sizes AT-HD 100 and bigger).

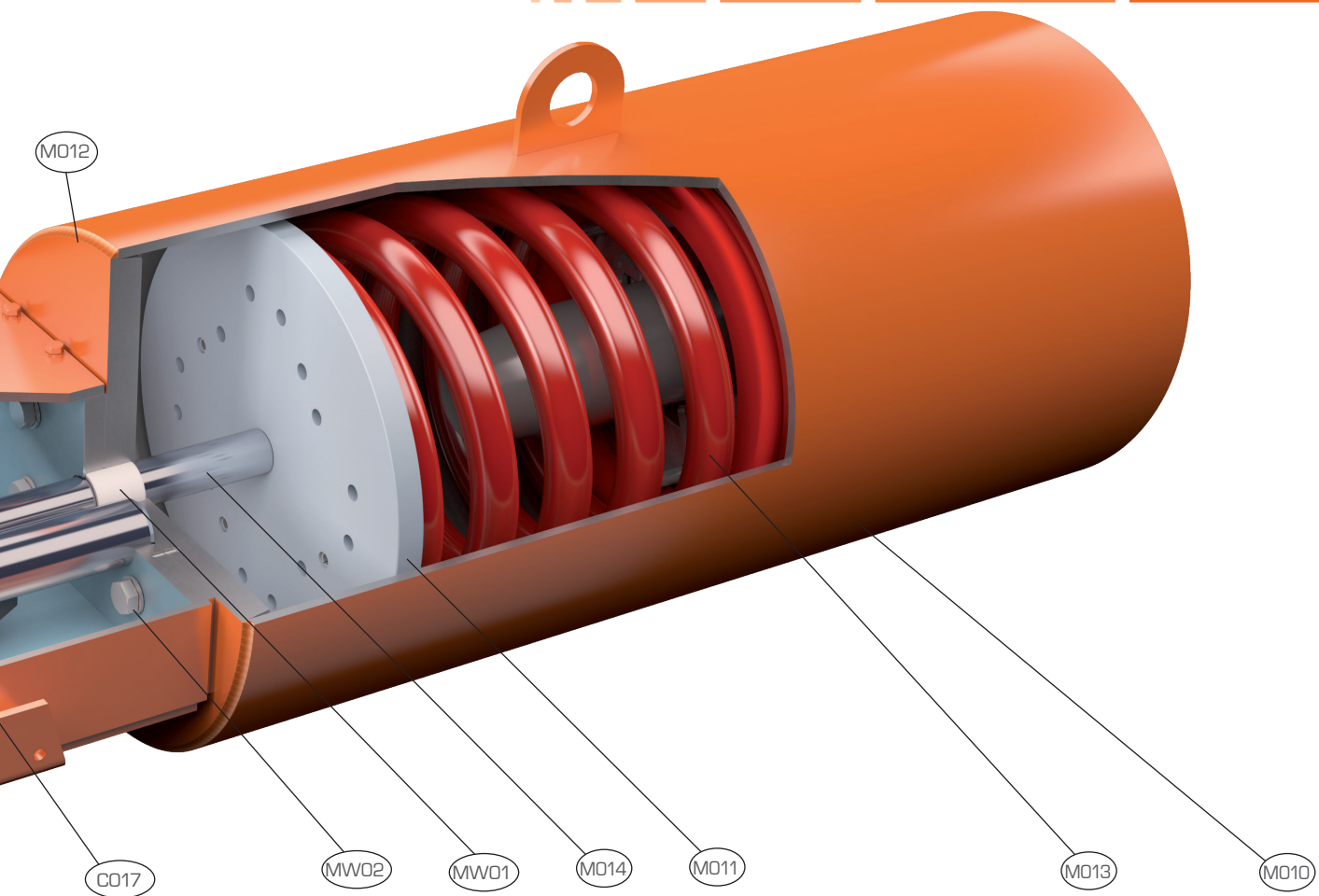
- Low friction level
- Longer life
- Stable actuators output torque through the life of the actuator

ACTUATOR PART LIST

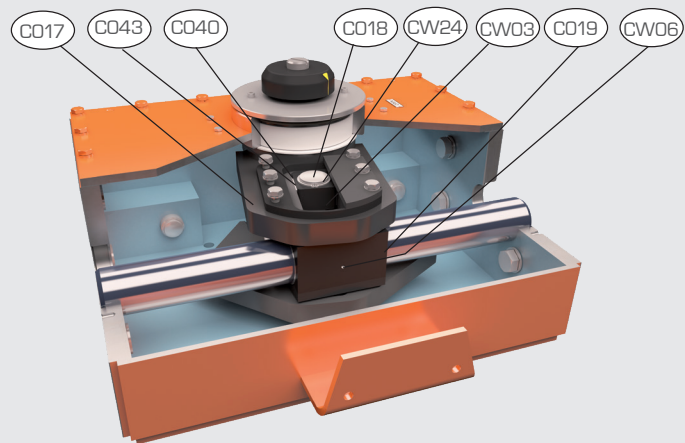


PART N°.	DESCRIPTION	STD OP. TEMP. MATERIAL
C017	Scotch yoke	High alloy steel/ Carbon steel
C015	Housing	Carbon steel
C016	Cover	Carbon steel
C020	Guide bar	High alloy steel
C024	Shaft extension	Stainless steel
C025	Shaft cover	Stainless steel
CW04	O-Ring (shaft)	M-NBR
CW08	Hex. Screw (Cover)	Stainless steel
CW09	Stop hex. Screw	Stainless steel
CW16	Shaft bearing	High grade polymer
A001	Power cylinder connection flange	Carbon steel
A002	End cylinder flange	Carbon steel
A003	Power cylinder	Carbon steel

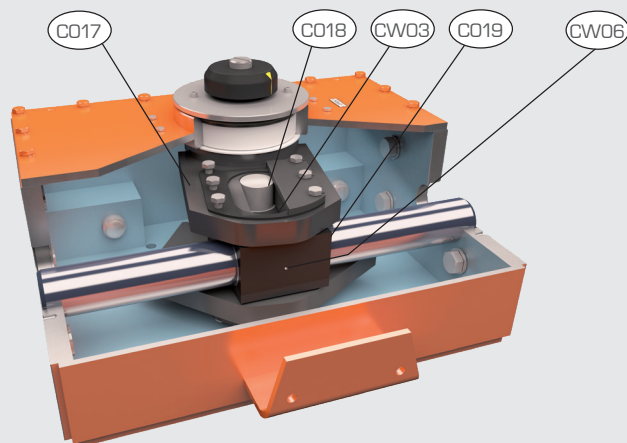
PART N°.	DESCRIPTION	STD OP. TEMP. MATERIAL
A004	Piston shaft	High alloy steel
A005	Piston	Carbon steel
A006	Bearing	PTFE
A008	Sector	High alloy steel/ Carbon steel
A009	Retainer flange	Carbon steel
AW01	Sleeve	High grade polymer
AW03 MW02	Hex. Screw (Module connection)	Carbon steel
M010	Cartridge spring cylinder	Carbon steel
M011	Spring compression plate	Carbon steel
M012	Spring module connection flange	Carbon steel
M013	Spring	Spring alloy steel
M014	Shaft (Spring module)	High alloy steel
MW01	Sleeve	High grade polymer



MECHANISM TYPE



Standard for AT-HD 100 and bigger (Smaller available on request)



Standard for AT-HD 065-085

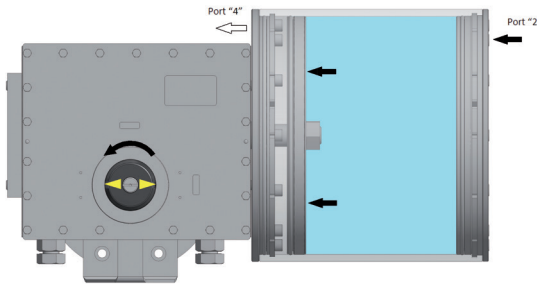
PART N°.	DESCRIPTION	STD OP. TEMP. MATERIAL
C017	Scotch yoke	High alloy steel/ Carbon steel
C018	Pin	Alloy steel
C019	Central sliding block	High strength steel
C040	Yoke sliding block	High strength steel
C043	Sliding block	High grade polymer
CW03	Sleeve (Pin)	Hardened steel
CW06	Screw (Sliding block)	Stainless steel
CW24	Smalley	Stainless steel

PART N°.	DESCRIPTION	STD OP. TEMP. MATERIAL
C017	Scotch yoke	High alloy steel/ Carbon steel
C018	Pin	Alloy steel
C019	Central sliding block	High strength steel
CW03	Sleeve (Pin)	Hardened steel
CW06	Screw (Sliding block)	Stainless steel

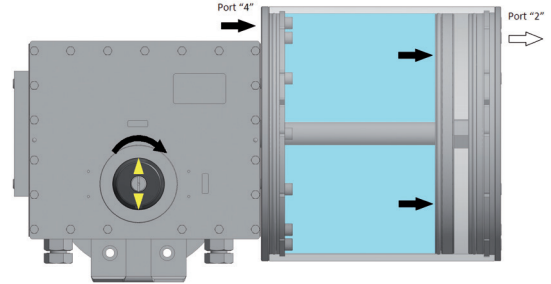
OPERATING FUNCTION SCHEME

DOUBLE ACTING PNEUMATIC ACTUATORS - CLOCKWISE CLOSING ROTATION (top view)

Air supplied to port 2 forces the piston toward the central module. A counter clockwise rotation is achieved. Exhaust air flows through the port 4.

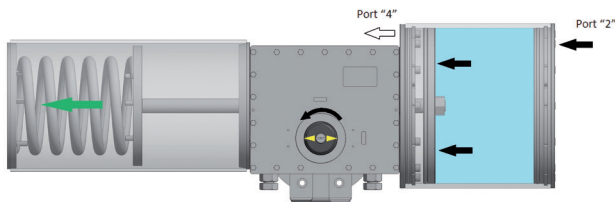


Air supplied to port 4 forces the piston far from the central module/toward the end of the power module. A clockwise rotation is achieved. Exhaust air flows from the port 2.

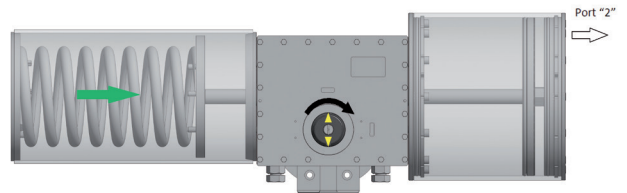


SPRING RETURN PNEUMATIC ACTUATORS - CLOCKWISE CLOSING ROTATION (top view)

Air supplied to port 2 forces the piston toward the central module, compressing the spring. A counter clockwise rotation is achieved. Exhaust air flows from port 4.

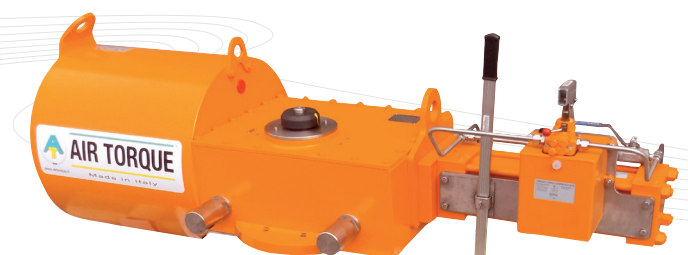
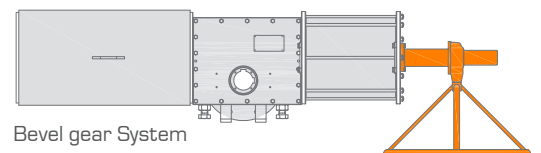
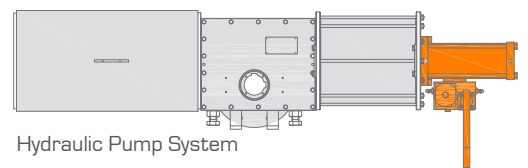


The depressurization to the port 2 (due to air supply cut or electricity cut) allows the spring to move the piston far from the central module/toward the end of the power module. A clockwise rotation is achieved. Exhaust air flows from port 2.



AVAILABLE OPTIONS FOR EMERGENCY MANUAL OPERATIONS

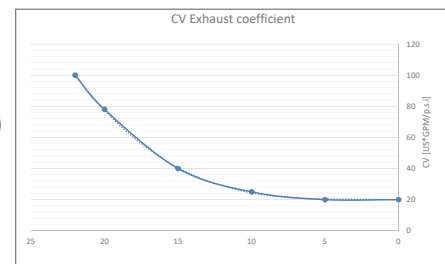
Different options are available for emergency operations. Manual overrides are important options for valve automation.



DESIGNED FOR FIELD SPECIFICATION

FAST ACTING AND Q&D SYSTEM

For specific application Air Torque can supply the AT-HD actuator series with the ability to stroke rapidly (opening and closing). Depending on the application the fast acting option can be combined with the actuator dampening features which allows for the modulation of the content of energy discharged over the valve stem due to quick maneuver.



DEDICATED VALVE INTERFACE

AT-HD actuators can be supplied with linkage to the valve. As alternative the valve interface of the actuator can be designed specifically to fit to the valve top mounting.



CONTROL SYSTEM

The control panels and control systems package is an added value Air Torque can offer. With extensive field experience in valve automation we are able to satisfy almost all the customers requirements. The applications of our control systems are vast, from Emergency shutdown (ESD) to partial stroke (PST), and quick operation to fieldbus modulating duties, to complete HIPPS systems control units.

Air Torque has the ability to size, design and manufacture the control panels.



FIRE PROTECTION SOLUTIONS

Our extensive experience in oil and gas, refineries and petrochemical industries enables us to provide the AT-HD equipped with different fire protections in order to permit the AT-HD actuators and related control system to continuously operate under a direct fire action for example with a temperature up to 1093°C/2000°F for 30 minutes in accordance with the ANSI/UL 1709 Standards.

Air Torque can offer different fire proofing systems from flexible and semirigid jackets to intumescent coating directly applied to the actuators.



CERTIFICATIONS/COMPLIANCE

Air Torque S.p.A. is fully complying with the standard international requirements.

The management and quality system is certified according to the ISO 9001. Together with this certification the Air Torque complete range of actuators has been awarded with additional approvals and certifications.

CERTIFICATION:

- ATEX 2014/34/EU
- SIL3 capable
- EC Declaration of conformity
- TR CU 010/2011
- TR CU 012/2011
- IP67 - Degree of protection
- UKSI 2016:1107 Regulation



12	Pneumatic cylinder size: ⁽³⁾							
	065	085	100	130	160	200		
	0235 0285 0335 0385	0235 0285 0335 0385 0435 0485	0385 0435 0485 0535 0585 0635	0435 0485 0535 0585 0635 0685	0535 0585 0635 0685 0735 0785	0635 0685 0735 0785 0835	0885 0935 0985 1050 1150	
	Hydraulic cylinder size:							
065	085	100	130	160	200			
0040 0050 0063 0080	0040 0050 0063 0080 0100	0063 0080 0100 0125 0140 0160	0063 0080 0100 0125 0140 0160	0100 0125 0140 0160 0200	0100 0125 0140 0160 0200			
13	Ped requirement:							
	00: PED not applicable (standard)		01: PED applicable					
14	Connections: ⁽⁴⁾							
	ST: Standard supply connections		FA: Fast connections		FQ: Fast with quick & Damper (only for spring return actuator)		XX: Special to be specified	
15	Manual override:							
	00: No manual override		BG: Bevel gear Available only for spring return actuator 065, 085, 100, 130		HP: Hydraulic manual override (For high temperature contact Air Torque S.p.a)		XX: Special to be specified	
16	Manual override orientation: (according to Tab. n° HD51700E)							
	Without manual override:		With Bevel gear		With Hydraulic manual override			
	00: Standard		1A: Standard for spring to close 2A: Standard for spring to open		3A: Standard for spring to close 4A: Standard for spring to open			
			1B 1C 1D		2B 2C 2D		3B 4B 5A	5B 6A 6B
17	Manual override options:							
	Without manual override:		Bevel gear:		Hydraulic Manual override			
00: Standard		01: Decluttable handwheel (Standard) 02: Not decluttable handwheel 03: Decluttable handwheel + locking system		04: Removable lever (Standard) 05: Lever + locking system				
18	Actuator painting system:							
	C4: Air Torque S.p.A. standard painting cycle C4 category according to ISO 12944 C5: Painting C5 category according to ISO 12944 XX: Different options are available on request to be specified.							
19	Actuator color:							
	A: RAL 2008 (Standard color) X: Different options are available on request to be specified.							

⁽¹⁾ In case the product is customized, the suffix may be different and must be agreed in advance.

⁽²⁾ Make sure the operating media is compatible with the actuator internal parts and lubricants.

⁽³⁾ The standard configuration includes no tie rod up to pneumatic cylinder size 685 included.

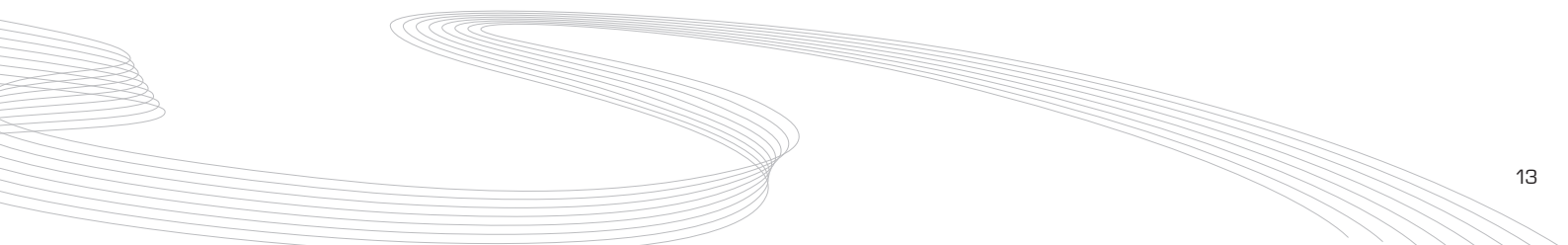
⁽⁴⁾ The standard supply connection is NPT type.

X/XX: Letters for specials proper feature will be specified in OA.

If not specified Air Torque STD Indicator will be provided.

HOW TO ORDER: EXAMPLES

1	2	3	4	5	6	7	8	9	10
AT-HD	S	A	085	S	SC	02	1A	W-072	F25
11	12	13	14	15	16	17	18	19	
P	0385	00	ST	00	00	00	C4	A	





HEAD OFFICE AND WORKS



AIR TORQUE S.P.A.
Head Offices: Via dei Livelli di Sopra, 11
Factory: Via dei Livelli di Sopra, 8
24060 Costa di Mezzate (BG) ITALY
Tel. +39 035 682299 - Fax +39 035 687791
info@airtorque.it - www.airtorque.it