

# ABV Actuators and Control Systems



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# ABV Index



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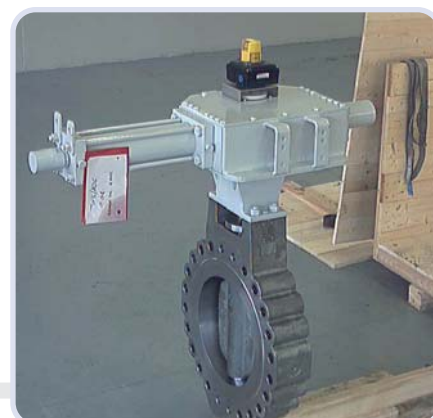
# ABV Actuators and Control Systems Overview

With a production typology including hydraulic, pneumatic, gas-over-oil and sub-sea actuators, together with the capability of developing and assembling the relevant control systems, **ABV S.r.l.** proposes itself as a modern, versatile and competitive company in the valve automation market.

**ABV S.r.l.** has a Quality System implemented according to ISO 9001 Standards, and it has obtained Lloyd's Register Certification for the design and the production of sub-sea actuators, making use of a proper testing procedure in hyperbaric chamber.

In order to satisfy specific customer's needs, **ABV S.r.l.** is also able to guarantee the full accordance to the 97/23/EC Directive (Pressure Equipment Directive). The design of all ABV products is carried out by technicians and engineers experienced in operating with the most actual and sophisticated 3D computer programs (CAD-CAM).

The structural verifications, executed with proper programs of structural calculation based on the finite elements analysis (FEA), allows high levels of safety and structural integrity, hence improving the quality of the products. Thanks to the flexibility that has always characterized the Company, **ABV S.r.l.** is able to satisfy the broadest customer's needs, elaborating special solutions for particular services.



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# ABV

## Actuators Production Range

All **ABV** actuators are specifically designed and manufactured to operate quarter-turn valves (i.e. ball, butterfly, plug valves). However, depending on specific customer's needs, **ABV S.r.l.** may develop actuator typologies different from those listed above.

Please contact our Commercial Dept. for more details and information.

**ABV** actuators production range may be divided into the following main typologies:

PNEUMATIC AND HYDRAULIC ACTUATORS					
Mechanism Type	Operating Fluid	Actuator Type	Actuators Series	Torque Range	Service
Scotch Yoke Compact Type	Pneumatic	Double Acting	CD	From 40 Nm up to 2500 Nm (350 lb in π 22100 lb in)	-ON/OFF (1) -MODULATING (1)
		Single Acting	CS	From 40 Nm up to 2500 Nm (350 lb in π 22100 lb in)	-ON/OFF (1) -MODULATING (1)
Scotch Yoke	Pneumatic	Double Acting	PD	From 700 Nm up to 250000 Nm (6200 lb in π 2212000 lb in)	-ON/OFF (1) -MODULATING (1)
		Single Acting	PS	From 700 Nm up to 240000 Nm (6200 lb in π 2124000 lb in)	-ON/OFF (1) -MODULATING (1)
	Hydraulic	Double Acting	HD	From 700 Nm up to 240000 Nm (6200 lb in π 2124000 lb in)	-ON/OFF -MODULATING
		Single Acting	HS	From 700 Nm up to 250000 Nm (6200 lb in π 2212000 lb in)	-ON/OFF -MODULATING
Rack and Pinion	Hydraulic	Double Acting	SA-HDA	From 100 Nm up to 3000 Nm (880 lb in π 26500 lb in)	-SUBSEA ON/OFF ACTUATOR
		Single Acting	SA-HSA	From 100 Nm up to 3000 Nm (880 lb in π 26500 lb in)	-SUBSEA ON/OFF ACTUATOR

MANUAL GEAR OPERATORS		
Mechanism Type	Actuators Series	Service
Worm Gear	TMG	-STANDARD SERVICE
	SMG	-OFF-SHORE SERVICE (2) (3)
Straight-toothed Spur-gears	SD	-OFF-SHORE SERVICE (3)

**Notes :**

(1) : on request, pneumatic cylinders materials according to NACE MR 0175 (for Sour Gas service).

(2) : provided with hand-wheel, for divers operations.

(3) : for divers and/or R.O.V. operations (R.O.V. interface according to API 17D).

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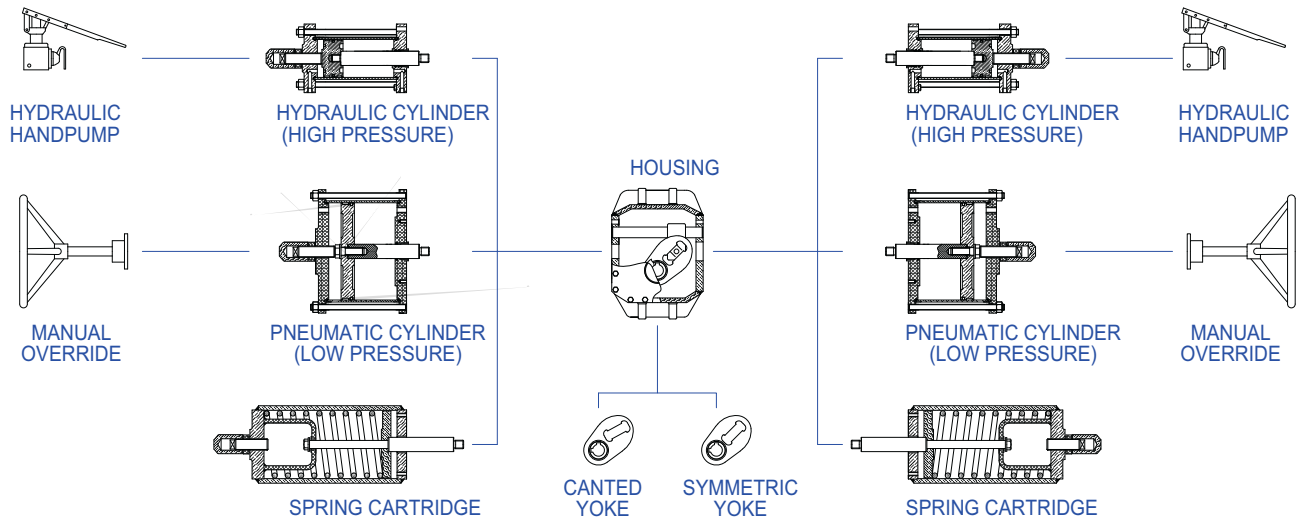


# ABV

## Series PD, PS, HD, DS

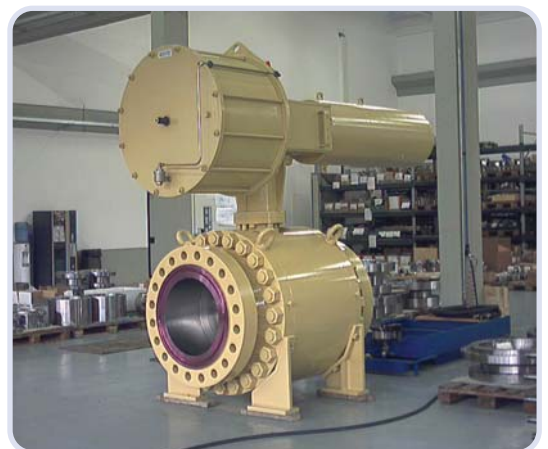
### Standard Scotch Yoke Actuators

#### Modular Assembly



**ABV** scotch-yoke actuators share a modular design and assembly, with considerable advantages with regard to the economic and productive aspects. The scotch-yoke mechanism (symmetric or canted) is fully contained in a housing, which is available in different standard sizes. According to specific needs, a hydraulic or pneumatic cylinder, and if necessary a spring cartridge for emergency operations (on spring-return actuators), can be connected to the left or to the right side of the housing.

On customer's request, all **ABV** actuators may be provided with a suitable manual control, consisting handwheel or a hydraulic handpump.



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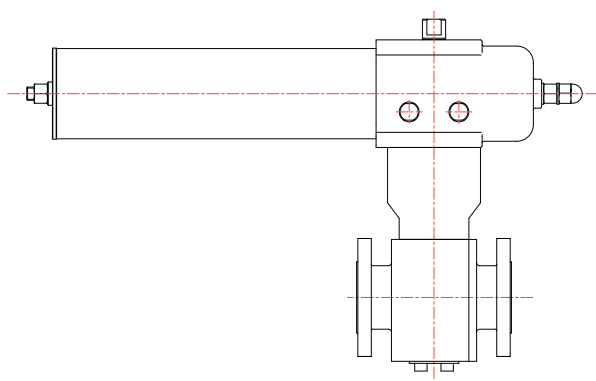


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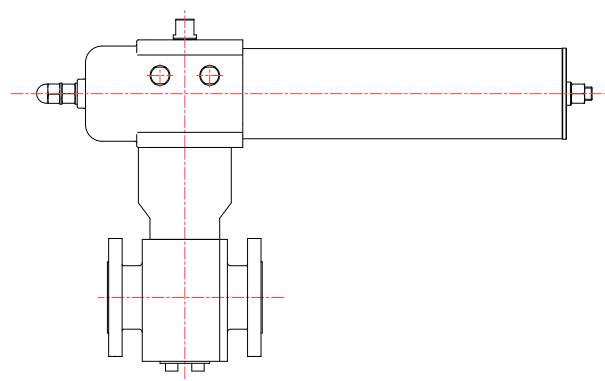
## Series CD, CS

### Compact Scotch-Yoke Actuators

### Dual Valve Mounting Interface



FAIL TO CLOSE  
CONFIGURATION

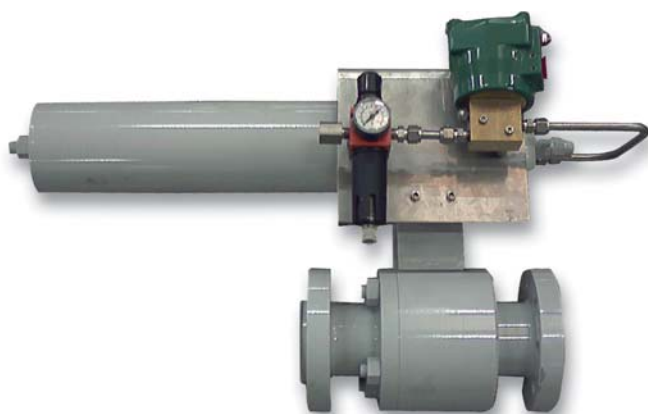


FAIL TO OPEN CONFIGURATION

ABV Compact Type actuators Series C are economical, lightweight and low maintenance pneumatic actuators, particularly designed to operate quarter-turn valves characterized by medium-low torque values.

ABV Compact Type actuators are available with double-acting cylinders (Series CD) or with single-acting cylinders (Series CS), and they may be provided with jackscrew manual override (as an optional), to satisfy any customer's requirement. In order to achieve a high level of flexibility, Series C actuators are provided with a dual valve mounting interface that allows to change the failure mode simply upsetting the whole actuator (see figure above), with no need to disassembly.

At last, as for the other ABV standard actuators, Compact Type actuators Series C can be installed parallel or perpendicular with regard to the flow line, and in a vertical or horizontal plane.



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## Scotch-Yoke vs. Rack and Pinion Mechanism

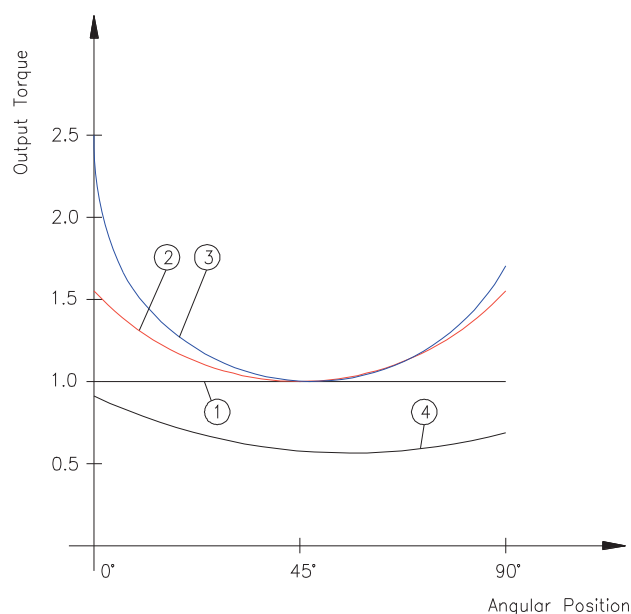
In the diagram plotted beside, the output torque curves for different types of quarter-turn valve actuators are shown. For explanation purposes, all the graphs refers to the opening conditions of ball valve and double-acting actuators.

The curve 1 is relevant to a rack and pinion actuator : the output torque remains constant independently from the angular position of the valve stem connection. Furthermore, the curve 2 is typical of a symmetric scotch-yoke actuator, while the curve 3 is relevant to a canted scotch-yoke actuator.

Considering the typical trend of a ball valve opening torque (curve 4), it should be clear that scotch-yoke actuators are particularly suitable for automatic control of this type of valves.

In particular, a symmetric scotch-yoke is convenient for small size valves, characterized by low break-to-open/running torque ratios.

For large size valves, with high break-to-open/running torque ratios, the use of a canted scotch-yoke is preferable.



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# ABV Codes for Scotch-Yoke Actuators Series CD and CS

## Operating Fluid

**Code Description**  
C = Pneumatic

## Acting Type

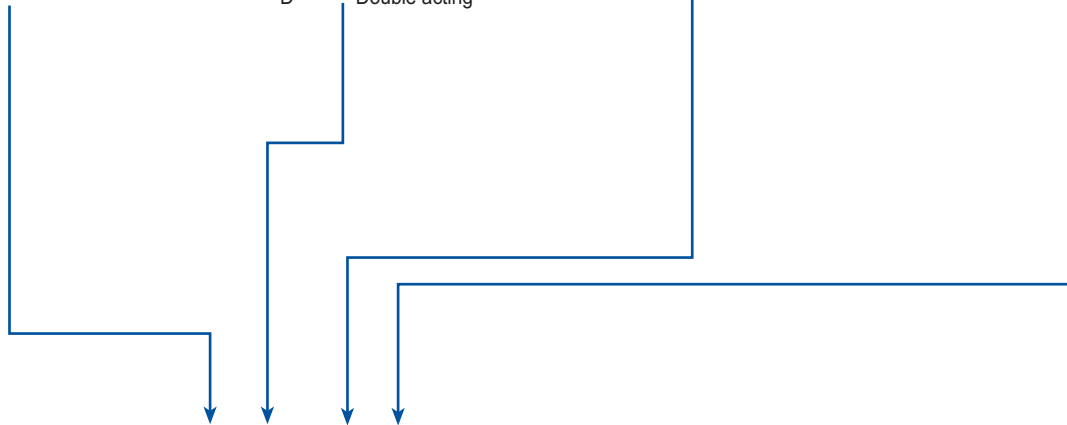
**Code Description**  
S = Single Acting  
D = Double acting

## Body Size (Torque Arm)

**Code Description**  
1, 2, 3

## Yoke Design

**Code Description**  
N = Symmetric Yoke



# CS2/N-A/040/M3-J2

## Service and Seals Material

**Code Description**  
A = low pressure (up to 12 barg), NBR  
B = low pressure (up to 12 barg), Viton®  
C = low pressure (up to 12 barg), Fluorosilicon

## Cylinder Size

## Spring Container Size

**Code Description**  
D1 = double acting actuator  
M1,..., M4 = single acting actuator

## Manual Override

**Code Description**  
00 = no manual override  
J1 = manual override with screw  
J2 = manual override with screw and handwheel

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# ABV Codes for Scotch-Yoke Actuators Series PD/PS and HD/HS

## Operating Fluid

Code	Description
P	Pneumatic
H	Hydraulic

## Acting Type

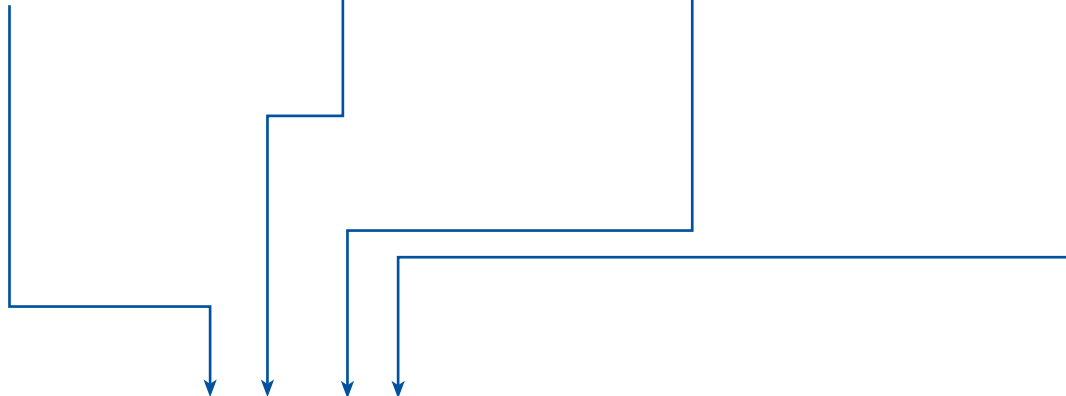
Code	Description
S	Single Acting
D	Double acting

## Body Size

Code	Description
1, ..., 7	

## Yoke Design

Code	Description
S	Simmetric Yoke
A	Canted Yoke



# PS2/S-A/060/C1-W1

## Service and Seals Material

### Code Description

A	low pressure (up to 12 barg), NBR
B	low pressure (up to 12 barg), Viton®
C	low pressure (up to 12 barg), Fluorosilicon
M	medium pressure (from 13 up to 103 barg), NBR
N	medium pressure (from 13 up to 103 barg), Viton®
P	medium pressure (from 13 up to 103 barg), Fluorosilicon
Q	medium-high pressure (from 104 up to 207 barg), NBR
R	medium-high pressure (from 104 up to 207 barg), Viton®
T	medium-high pressure (from 104 up to 207 barg), Fluorosilicon
U	high pressure (from 208 up to 345 barg), NBR
X	high pressure (from 208 up to 345 barg), Viton®
Y	high pressure (from 208 up to 345 barg), Fluorosilicon

## Cylinder Size

## Spring Container Size

Code	Description
D1	Double Acting Actuator
O1, O2, ...	Fail Open Actuator
C1, C2, ...	Fail Close Actuator

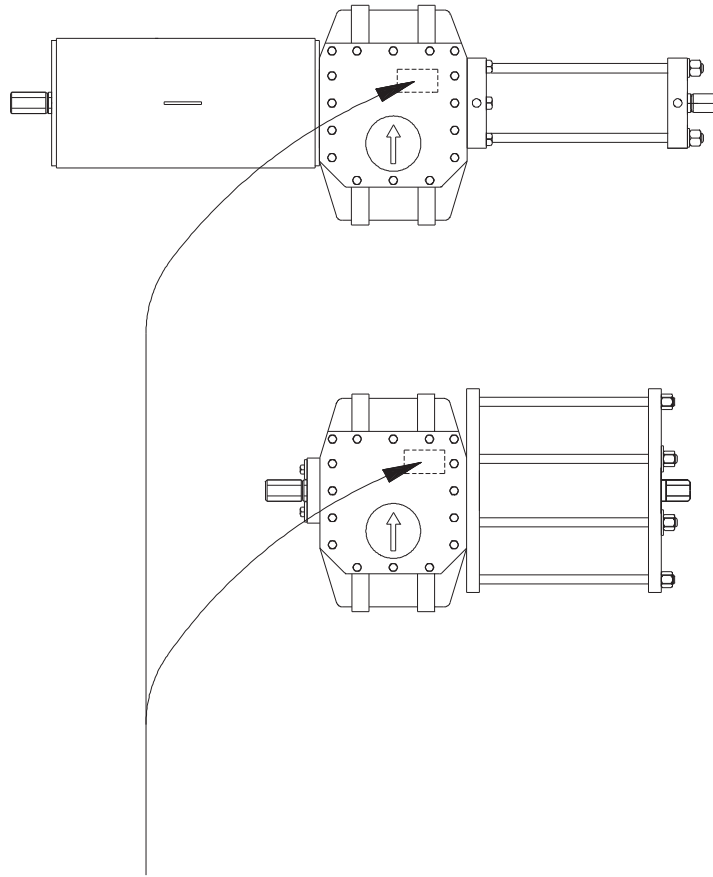
## Manual Override


Code	Description
00	no manual override
J1	manual override with screw
J2	manuam override with screw and handwheel
W1	manual override by handwheel
W2	manual override by declutchable handwheel
H1	manual override by hydraulic pump (single acting actuators)
H2	manual override by hydraulic pump (double acting actuators)

Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.



# ABV Actuators - Name Plate



 ABV S.r.l. - LUCCA - ITALY	P.O.		ITEM
	SERIAL N.		DATE
MODEL			
OUTPUT TORQUE			
OUTPUT TORQUE			
SUPPLY PRESSURE RANGE			
TAG NUMBER			
VALVE NS / RATING			
ABV S.r.l. - LUCCA - ITALY			

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# ABV

## Series CS and CD

Compact Type  
Pneumatic Actuators



### MAIN FEATURES

- Output torque up to 2500 Nm ( 22100 lb in )
- Operating pressure up to 12 bar ( 174 psi )
- Suitable to operate quarter turn valves (i.e. ball, butterfly type)
- Nodular cast iron housing, weatherproof type
- Die cast aluminium piston, for weight limitation
- Centre Chromium plated guide bar, to guide the piston throughout its stroke, for alignment, transversal thrust support purposes and tightening of the cylinder
- Electroless nickel plated cylinder tube to assure perfect dynamic seal, corrosion resistance and low friction
- Floating type piston seal to guarantee minimum wear and minimum friction avoiding stick slip effect
- On request, possibility to have mechanical manual override (by handwheel)
- Dual valve mounting interface, so to change the failure mode simply upsetting the whole actuator

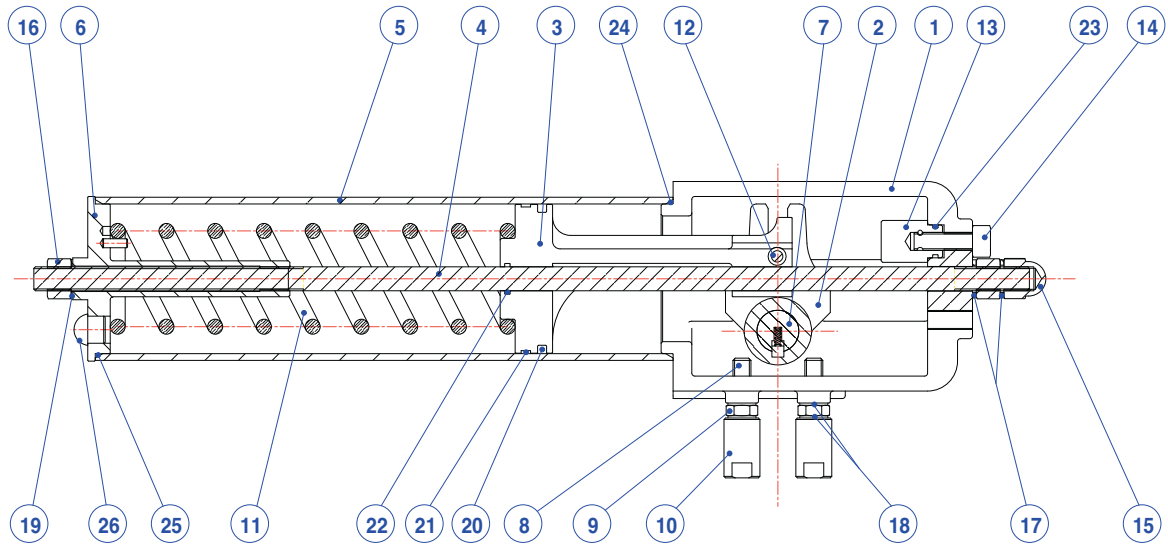
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# ABV

## Series CS

### Compact Type Spring Return Pneumatic Actuators



ABV Actuators Series CS Part List and Typical Materials						
Part No.	Description	Material		Part No.	Description	Material
1	Housing	Nodular Cast Iron		14	Cap Screw	Alloy Steel
2	Yoke	Nodular Cast Iron		15	Cap Nut	Alloy Steel
3	Piston	Die Cast Aluminium		16	Nut	Steel
4	Guide Bar	Alloy Steel (1)		17	Seal	Steel + NBR
5	Cylinder	Carbon Steel (2)		18	Seal	Steel + NBR
6	End Flange	Carbon Steel		19	Seal	Steel + NBR
7	Torque Shaft	Alloy Steel		20	O-Ring	NBR
8	Stop Setting Screw	Alloy Steel		21	Sliding Ring	PTFE
9	Nut	Steel		22	O-Ring	NBR
10	Cap Nut	Steel		23	O-Ring	NBR
11	Spring	Chrome Alloy		24	O-Ring	NBR
12	Guide Pin	Alloy Steel		25	O-Ring	NBR
13	Thrust Plug	Bronze		26	Bug Screen	Brass

**Notes :**  
 (1) : Chromium plated.  
 (2) : ENP 25 microns thickness.

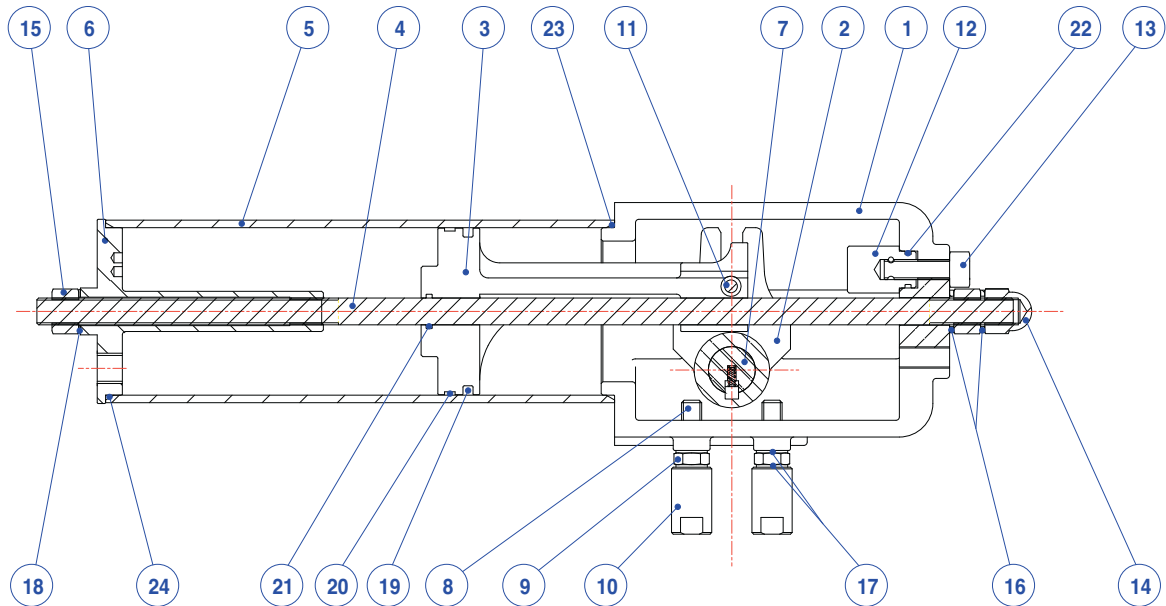
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# ABV

## Series CD

Compact Type  
Double Acting  
Pneumatic Actuators



ABV Actuators Series CS Part List and Typical Materials						
Part No.	Description	Material		Part No.	Description	Material
1	Housing	Nodular Cast Iron		13	Cap Screw	Alloy Steel
2	Yoke	Nodular Cast Iron		14	Cap Nut	Alloy Steel
3	Piston	Die Cast Aluminium		15	Nut	Steel
4	Guide Bar	Alloy Steel (1)		16	Seal	Steel + NBR
5	Cylinder	Carbon Steel (2)		17	Seal	Steel + NBR
6	End Flange	Carbon Steel		18	Seal	Steel + NBR
7	Torque Shaft	Alloy Steel		19	O-Ring	NBR
8	Stop Setting Screw	Alloy Steel		20	Sliding Ring	PTFE
9	Nut	Steel		21	O-Ring	NBR
10	Cap Nut	Steel		22	O-Ring	NBR
11	Guide Pin	Alloy Steel		23	O-Ring	NBR
12	Thrust Plug	Bronze		24	O-Ring	NBR

**Notes :**  
 (1) : Chromium plated.  
 (2) : ENP 25 microns thickness.

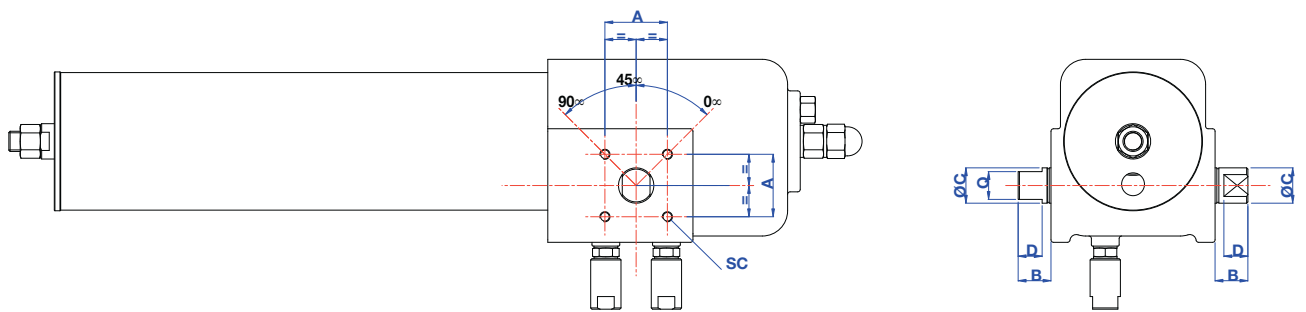
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# ABV

## Series CD and CS

Compact Type  
Pneumatic Actuators  
Coupling Dimensions



Scotch Yoke shown in position labelled "0°"

Actuator	A (mm)	B (mm)	D (mm)	C (mm)	Q (mm)	SC
CS1 – CD1	57.2	25	19	22	16 (square)	No.4 threaded holes 5/16"-18UNC x9.7mm deep
CS2 – CD2	76.2	25	19	28	22 (square)	No.4 threaded holes 3/8"-16UNC x12.7mm deep
CS3 – CD3	88.9	38	28	38	28 (square)	No.4 threaded holes 1/2"-13UNC x12.7mm deep

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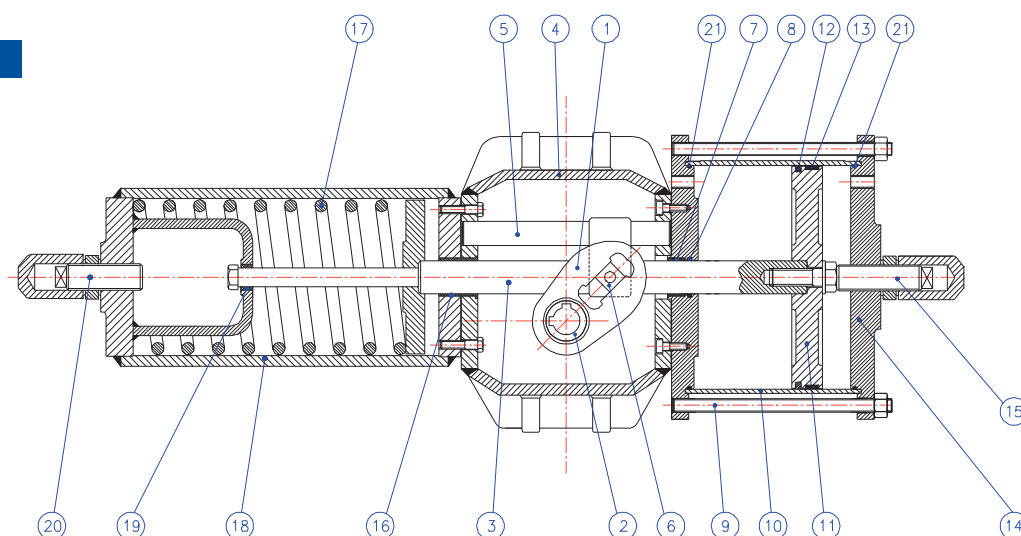
# ABV

## Series PS

### Scotch-Yoke Spring Return Pneumatic Actuators

#### DESCRIPTION

1. Yoke
2. Yoke Bushing
3. Piston Rod
4. Housing
5. Thrust Bar
6. Sliding Block
7. Bushing
8. Seal
9. Tie-Rod
10. Cylinder Tube
11. Piston
12. O-Ring
13. Sliding Ring
14. End Flange
15. Stop Setting Screw
16. Bushing
17. Spring
18. Spring Cartridge
19. Bushing
20. Stop Setting Screw
21. O-Ring



#### MAIN FEATURES

- Output torque up to 250000 Nm (1)
- Operating pressure up to 12 bar (1)
- Suitable to operate quarter turn valves (i.e. ball, butterfly type) where an emergency action (by spring) in case of supply failure is required
- Fabricated carbon steel housing weatherproof type
- Chromium plated guide bar for alignment and transversal thrust support purposes
- Bronze bushings and slidings to guarantee high efficiency and self lubricating
- Chromium plated piston rod to assure perfect dynamic seal, corrosion resistance and low friction
- Electroless nickel plated cylinder tube to assure perfect dynamic seal, corrosion resistance and low friction
- Floating type piston seal to guarantee minimum wear and minimum friction avoiding stick slip effect
- Totally welded spring container for maximum safety and long life spring design
- On request, possibility to have mechanical (by handweel) or hydraulic manual override (by pump)

(1) : Special actuators are available on request.

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# ABV

## Series PD

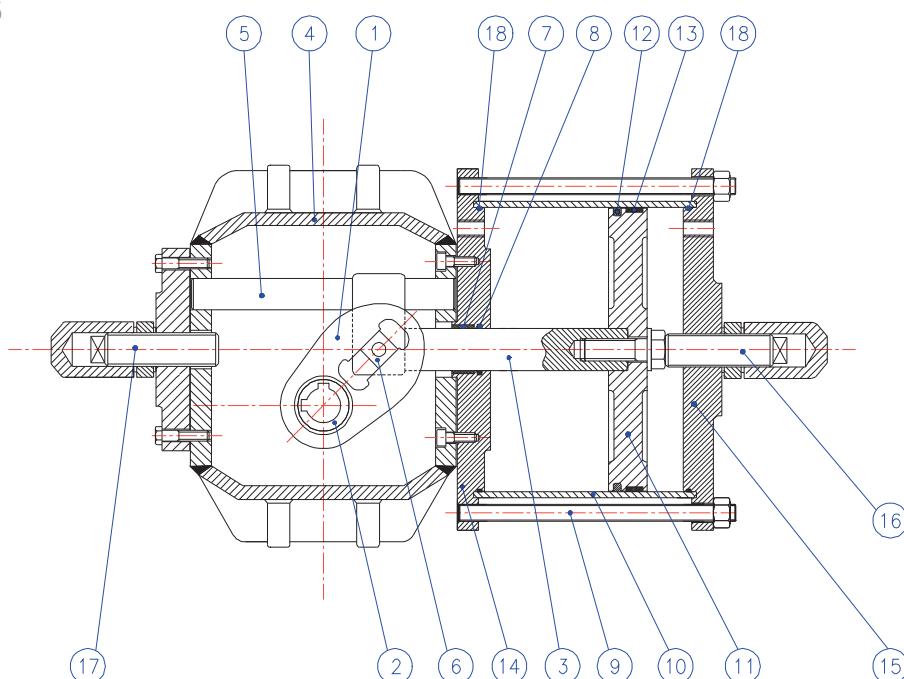
### Scotch-Yoke

### Double Acting

### Pneumatic Actuators

#### DESCRIPTION

1. Yoke
2. Yoke Bushing
3. Piston Rod
4. Housing
5. Thrust Bar
6. Sliding Block
7. Bushing
8. Seal
9. Tie-Rod
10. Cylinder Tube
11. Piston
12. O-Ring
13. Sliding Ring
14. Head Flange
15. End Flange
16. Stop Setting Screw
17. Stop Setting Screw
18. O-Ring



#### MAIN FEATURES

- Output torque up to 250000 Nm (1)
- Operating pressure up to 12 bar (1)
- Suitable to operate quarter turn valves (i.e. ball, butterfly type)
- Fabricated carbon steel housing weatherproof type
- Chromium plated guide bar for alignment and transversal thrust support purposes
- Bronze bushings and slidings to guarantee high efficiency and self lubricating
- Chromium plated piston rod to assure perfect dynamic seal, corrosion resistance and low friction
- Electroless nickel plated cylinder tube to assure perfect dynamic seal, corrosion resistance and low friction
- Floating type piston seal to guarantee minimum wear and minimum friction avoiding stick slip effect
- On request, possibility to have mechanical (by handweel) or hydraulic manual override (by pump)

(1) : Special actuators are available on request.

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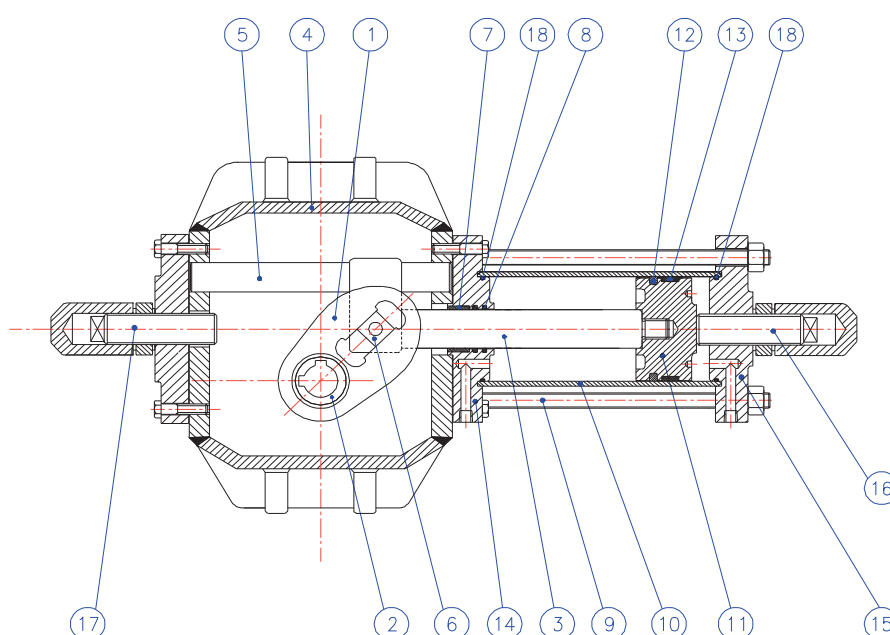
# ABV

## Series HD

### Scotch-Yoke Double Acting Hydraulic Actuators

#### DESCRIPTION

1. Yoke
2. Yoke Bushing
3. Piston Rod
4. Housing
5. Thrust Bar
6. Sliding Block
7. Bushing
8. Seal
9. Tie-Rod
10. Cylinder
11. Piston
12. Seal
13. Sliding Ring
14. Head Flange
15. End Flange
16. Stop Setting Screw
17. Stop Setting Screw
18. O-Ring



#### MAIN FEATURES

- Output torque up to 250000 Nm (1)
- Operating pressure up to 210 bar (1)
- Suitable to operate quarter turn valves (i.e. ball, butterfly type)
- Fabricated carbon steel housing weatherproof type
- Chromium plated guide bar for alignment and transversal thrust support purposes
- Bronze bushings and slidings to guarantee high efficiency and self lubricating
- Chromium plated piston rod to assure perfect dynamic seal, corrosion resistance and low friction
- Electroless nickel plated cylinder tube to assure perfect dynamic seal, corrosion resistance and low friction
- PTFE/rubber piston seal type to guarantee minimum wear and minimum friction avoiding stick slip effect
- On request, possibility to have hydraulic manual override (by pump)

(1) : Special actuators are available on request.

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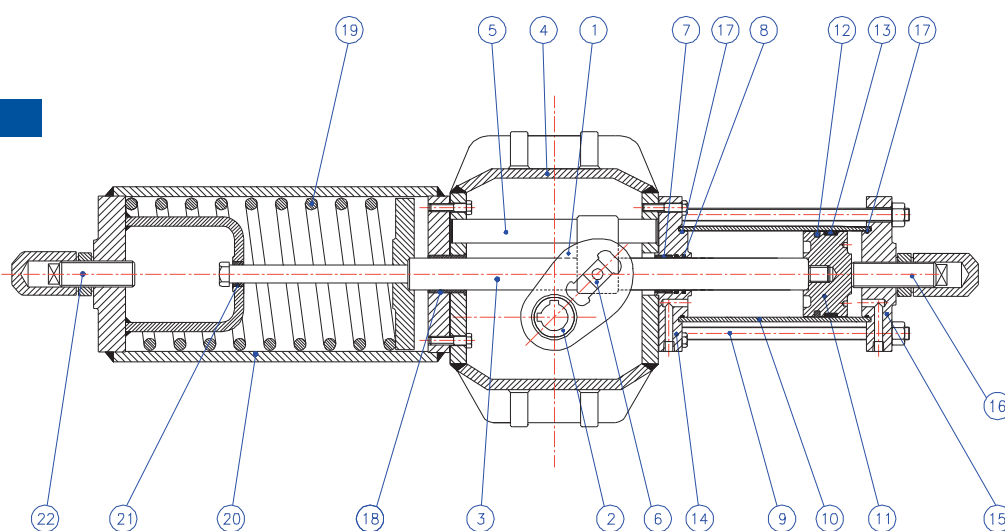
# ABV

## Series HS

### Scotch-Yoke Spring Return Hydraulic Actuators

#### DESCRIPTION

1. Yoke
2. Yoke Bushing
3. Piston Rod
4. Housing
5. Thrust Bar
6. Sliding Block
7. Bushing
8. Seal
9. Tie-Rod
10. Cylinder
11. Piston
12. Seal
13. Sliding Ring
14. Head Flange
15. End Flange
16. Stop Setting Screw
17. O-Ring
18. Bushing
19. Spring
20. Spring Cartridge
21. Bushing
22. Stop Setting Screw



#### MAIN FEATURES

- Output torque up to 250000 Nm (1)
- Operating pressure up to 210 bar (1)
- Suitable to operate quarter turn valves (i.e. ball, butterfly type) where an emergency action (by spring) in case of supply failure is required
- Fabricated carbon steel housing weatherproof type
- Chromium plated guide bar for alignment and transversal thrust support purposes
- Bronze bushings and slidings to guarantee high efficiency and self lubricating
- Chromium plated piston rod to assure perfect dynamic seal, corrosion resistance and low friction
- Electroless nickel plated cylinder tube to assure perfect dynamic seal, corrosion resistance and low friction
- PTFE/rubber piston seal type to guarantee minimum wear and minimum friction avoiding stick slip effect
- Totally welded spring container for maximum safety and long life spring design
- On request, possibility to have hydraulic manual override (by pump)

(1) : Special actuators are available on request.

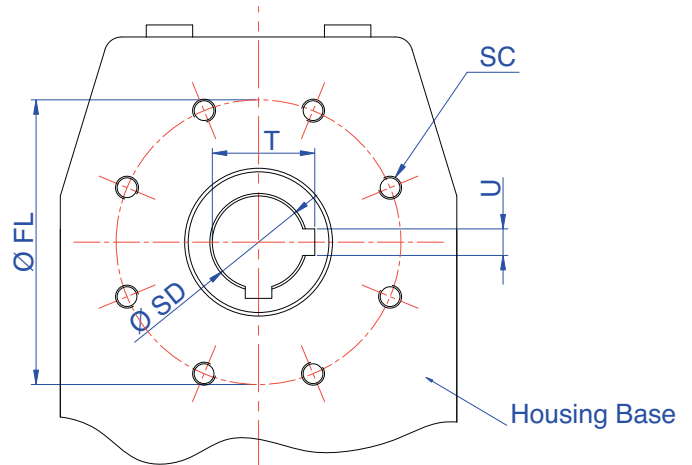
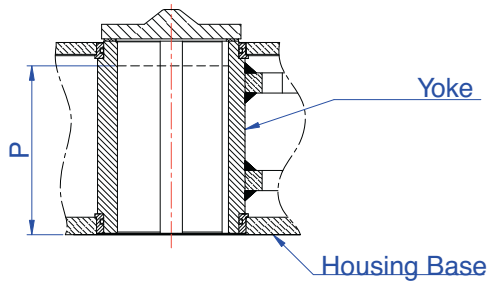
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# ABV

## Series PD, PS, HD, DS Standard Scotch Yoke Actuators Coupling Dimensions

P = Maximum Stem Insertion



Bottom view of the actuator  
Scotch-Yoke shown in closed position

Actuator	FL (mm)	SD (mm)	U (mm)	T (mm)	P (mm)	SC
PS1 – PD1	254	50	14	53.8	120	No.8 threaded holes M16
PS2 – PD2	254	65	18	69.4	120	No.8 threaded holes M16
PS3 – PD3	350	110	32	116.4	155	No.8 threaded holes M20
PS5 – PD5	356	130	32	137.4	195	No.8 threaded holes M30
PS6 – PD6	406	150	36	169.4	250	No.8 threaded holes M36
PS7 – PD7	483	170	40	179.4	285	No.12 threaded holes M36
HS1 – HD1	254	50	14	53.8	120	No.8 threaded holes M16
HS2 – HD2	254	65	18	69.4	120	No.8 threaded holes M16
HS3 – HD3	350	110	32	116.4	155	No.8 threaded holes M20
HS5 – HD5	356	130	32	137.4	195	No.8 threaded holes M30
HS6 – HD6	406	150	36	169.4	250	No.8 threaded holes M36
HS7 – HD7	483	170	40	179.4	285	No.12 threaded holes M36

- Other dimensions are available on demand.

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# ABV

Series SA-HDA - Double Acting

Series SA-HSA - Single Acting

## Sub-sea Rack and Pinion Hydraulic Actuators



### MAIN FEATURES

- Output torque up to 10000 N·m (1)
- Operating pressure up to 210 bar (1)
- Suitable to operate quarter turn valves (i.e. ball, butterfly type)
- Design life 30 years
- Operable by R.O.V. (R.O.V. interface according to API 17D)
- Manual override on request
- Mechanical/Tactile valve position indicator (remote on request)
- Separate flushing ports
- Fully pressure equalization to assure complete internal corrosion protection, and to obtain the required performances at every operating depth
- Possibility of installing the actuator on the valve by means of diver or R.O.V. assistance
- Pressure containing parts according to ASME VIII
- Power hydraulic oil cleanness according to NAS 6

(1) : Special actuators are available on request.

*Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.*



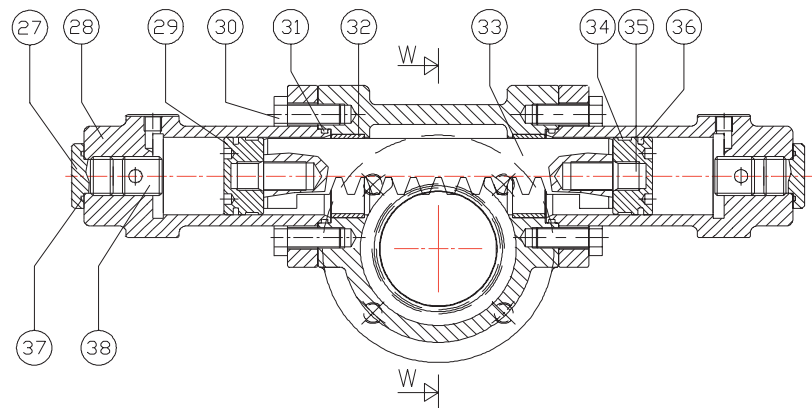
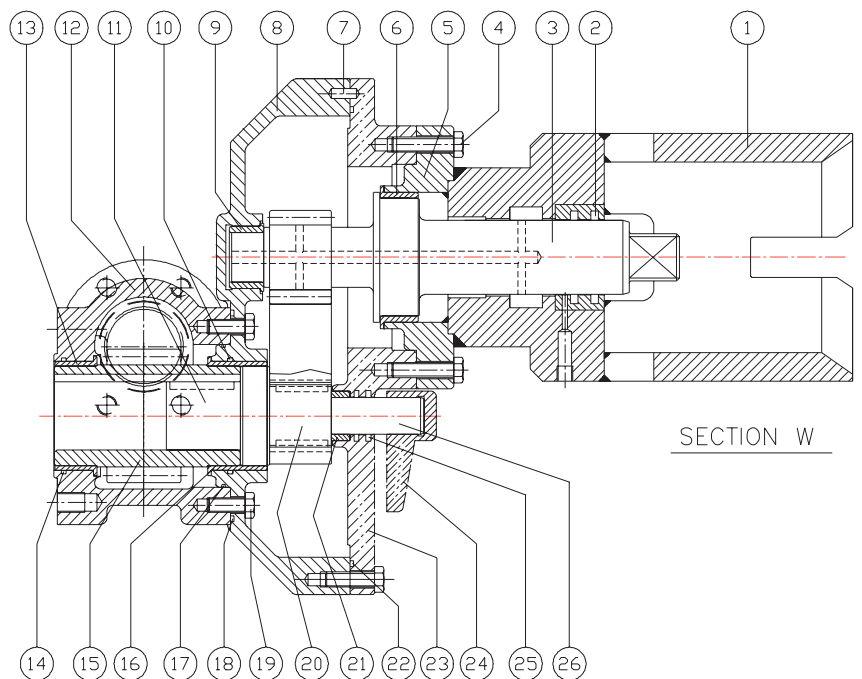
# ABV

## Series SA-HDA

### Double Acting Sub-sea Hydraulic Actuators

#### DESCRIPTION

1. R.O.V. Interface
2. Seal
3. R.O.V. Shaft
4. Screw
5. Flange
6. Bushing
7. Pin
8. Gear Housing
9. Bushing
10. O-Ring
11. Gear Shaft
12. Actuator Housing
13. Bushing
14. O-Ring
15. Pinion
16. Bushing
17. O-Ring
18. O-Ring
19. Screw
20. Gear
21. Bushing
22. O-Ring
23. Gear Cover
24. Position Indicator
25. Seal
26. Shaft
27. Cylinder Plug
28. Cylinder
29. Piston
30. Screw
31. O-Ring
32. Bushing
33. Rack
34. Sleeding Ring
35. Screw
36. Seal
37. O-Ring
38. Stopper



*Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.*



# Scheme H-D00-001-00-Q-0

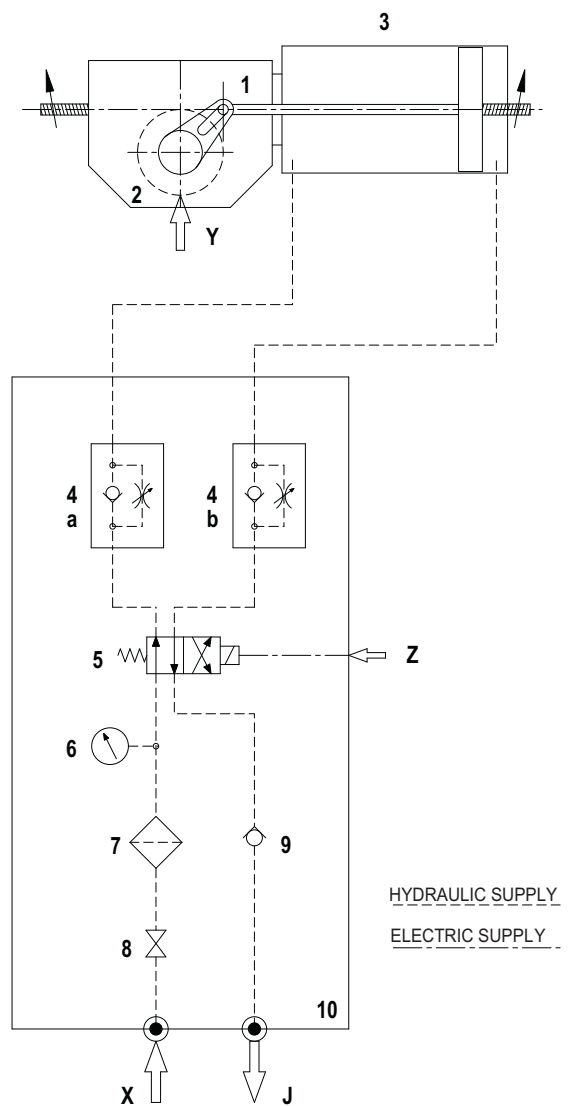
## Control System for Hydraulic Double Acting Actuator Series HD

### DESCRIPTION

1. Mechanism
2. Limit Switches Enclosure
3. Hydraulic Cylinder
4. Unidirectional Flow Regulator
5. 4/2 Solenoid Valve
6. Pressure Gauge
7. Filter
8. Stop Valve
9. Check Valve
10. Control Panel

### CONNECTIONS

- X = Oil Supply Line  
J = Oil Return Line  
Y = Electric Connection to Limit Switches Enclosure  
Z = Electric Connection to Coil of Solenoid Valve

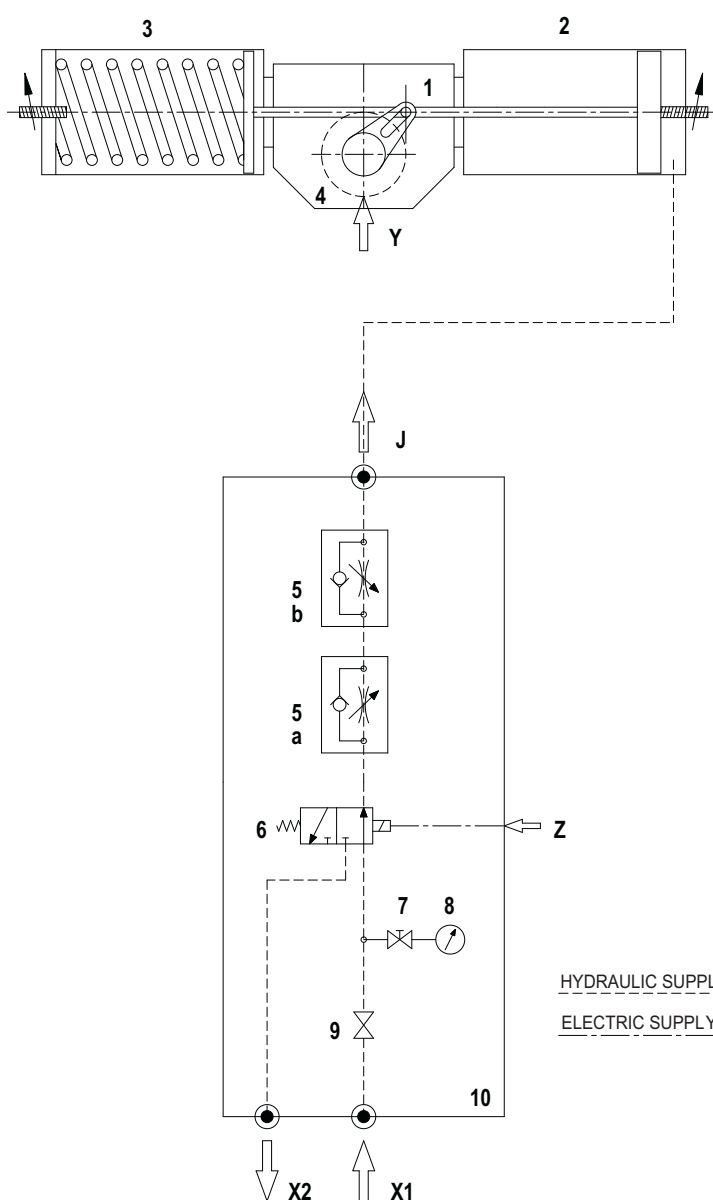


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# Scheme H-SC0-001-00-C-0

## Control System for Hydraulic Single Acting Actuator Series HS



### DESCRIPTION

1. Mechanism
2. Limit Switches Enclosure
3. Filter Regulator with Gauge
4. Silencer
5. 3/2 Manual Valve
6. 5/2 Spring Return Pneumatic Solenoid Valve
7. Unidirectional Flow regulator
8. Control Panel

### CONNECTIONS

- X1 = Oil Supply Line  
X2 = Oil Return Line  
J = Oil Supply Line to Actuator  
Y = Electric Connection to Limit Switches Enclosure  
Z = Electric Connection to Coil of Solenoid Valve

Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.



# Scheme P-D00-001-00-C-0

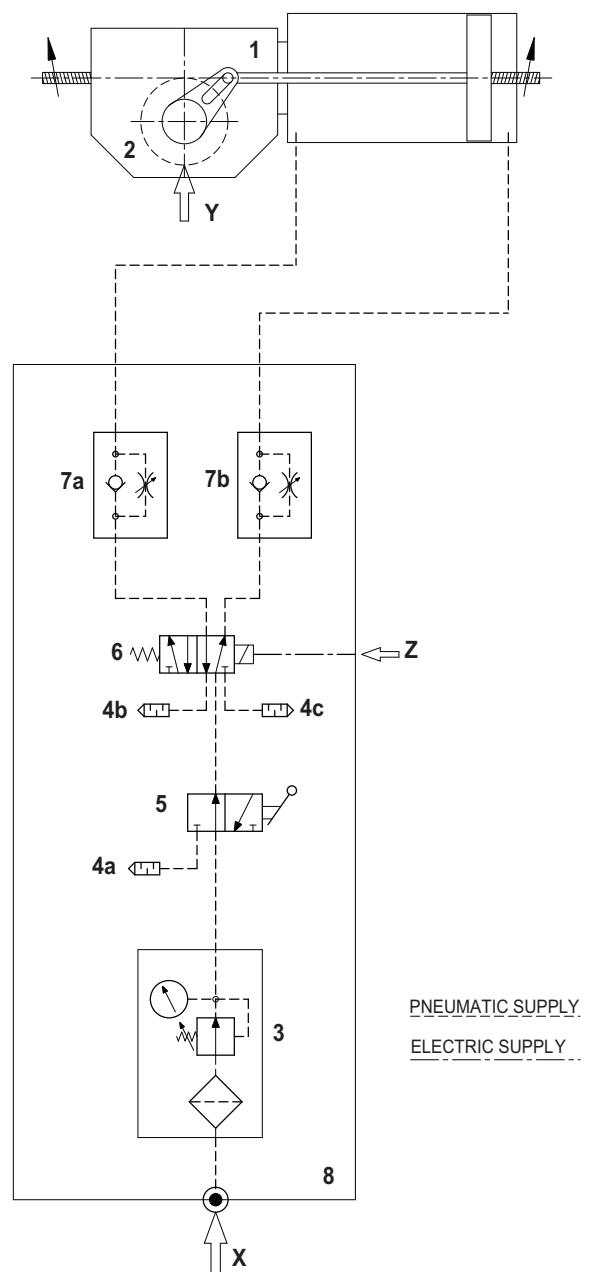
## Control System for Pneumatic Double Acting Actuator Series PD

### DESCRIPTION

1. Mechanism
2. Limit Switches Enclosure
3. Filter Regulator with Gauge
4. Silencer
5. 3/2 Manual Valve
6. 5/2 Spring Return Pneumatic Solenoid Valve
7. Unidirectional Flow Regulator
8. Control Panel

### CONNECTIONS

- X = Pneumatic Supply  
Y = Electric Connection to  
Limit Switches Enclosure  
Z = Electric Connection to  
Coil of Solenoid Valve



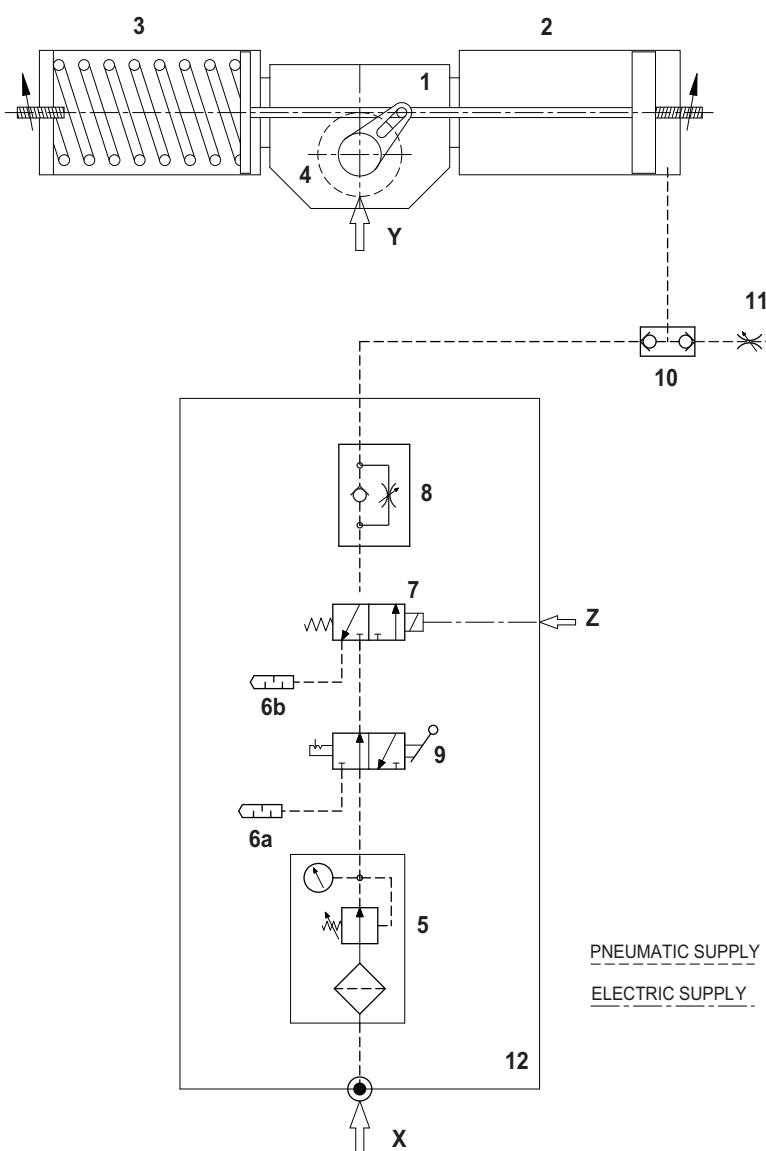
Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.





# Scheme P-SC0-004-00-C-0

## Control System for Pneumatic Single Acting Actuator Series PS



### DESCRIPTION

1. Mechanism
2. Pneumatic Cylinder
3. Spring Enclosure
4. Limit Switches Enclosure
5. Filter Regulator with Gauge
6. Silencer
7. 3/2 Solenoid Valve
8. Unidirectional Flow Regulator
9. 3/2 Manual Valve
10. Quick Exhaust Valve
11. Flow Regulator
12. Control Panel

### CONNECTIONS

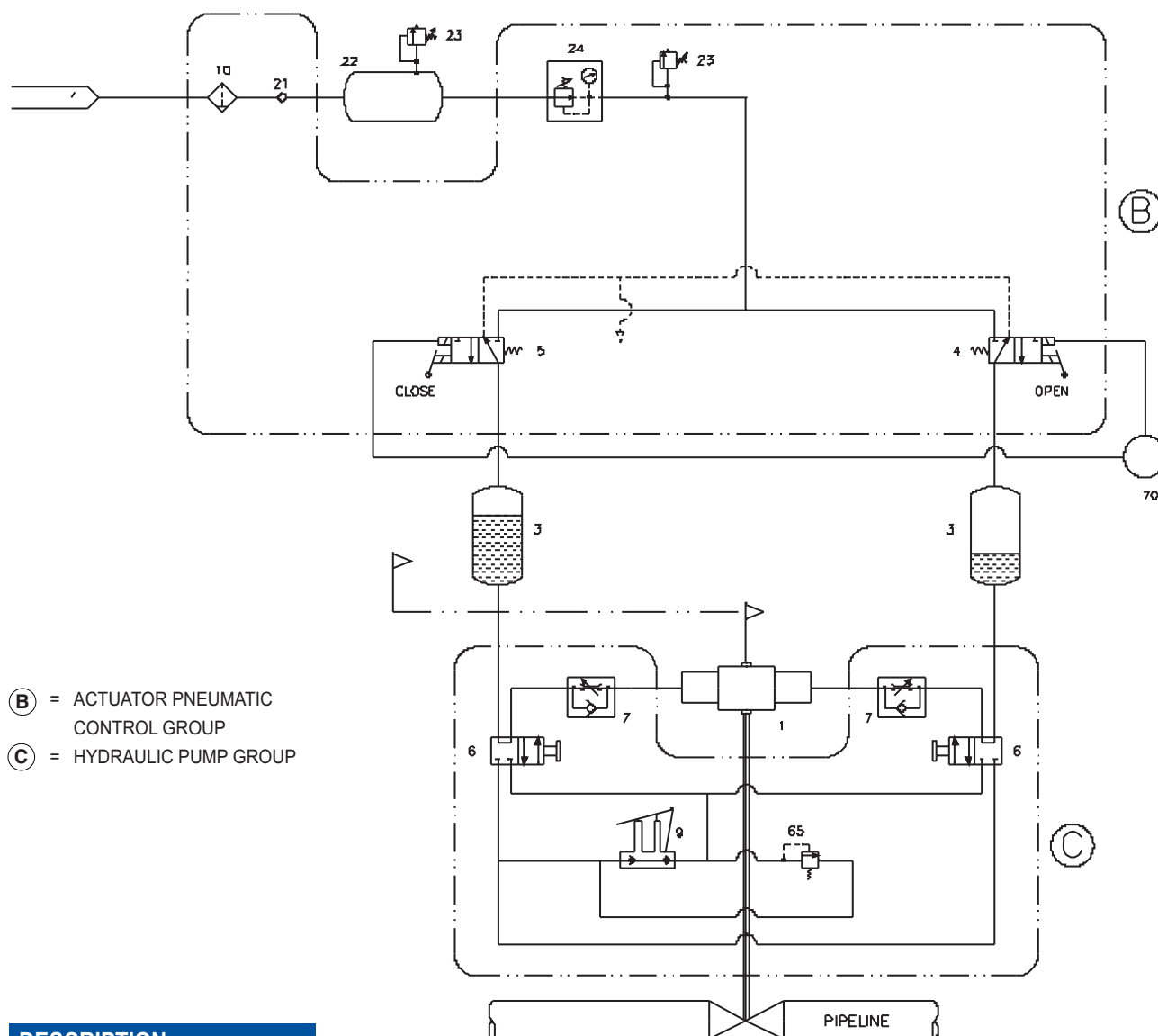
- X = Pneumatic Supply  
Y = Electric Connection to  
Limit Switches Enclosure  
Z = Electric Connection to  
Coil of Solenoid Valve

Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.



# Scheme K-D00-002-00-Q-0

## Control System for Gas-over-Oil Actuator Local/Remote Control and Storage Tank



- Ⓑ = ACTUATOR PNEUMATIC CONTROL GROUP
- Ⓒ = HYDRAULIC PUMP GROUP

### DESCRIPTION

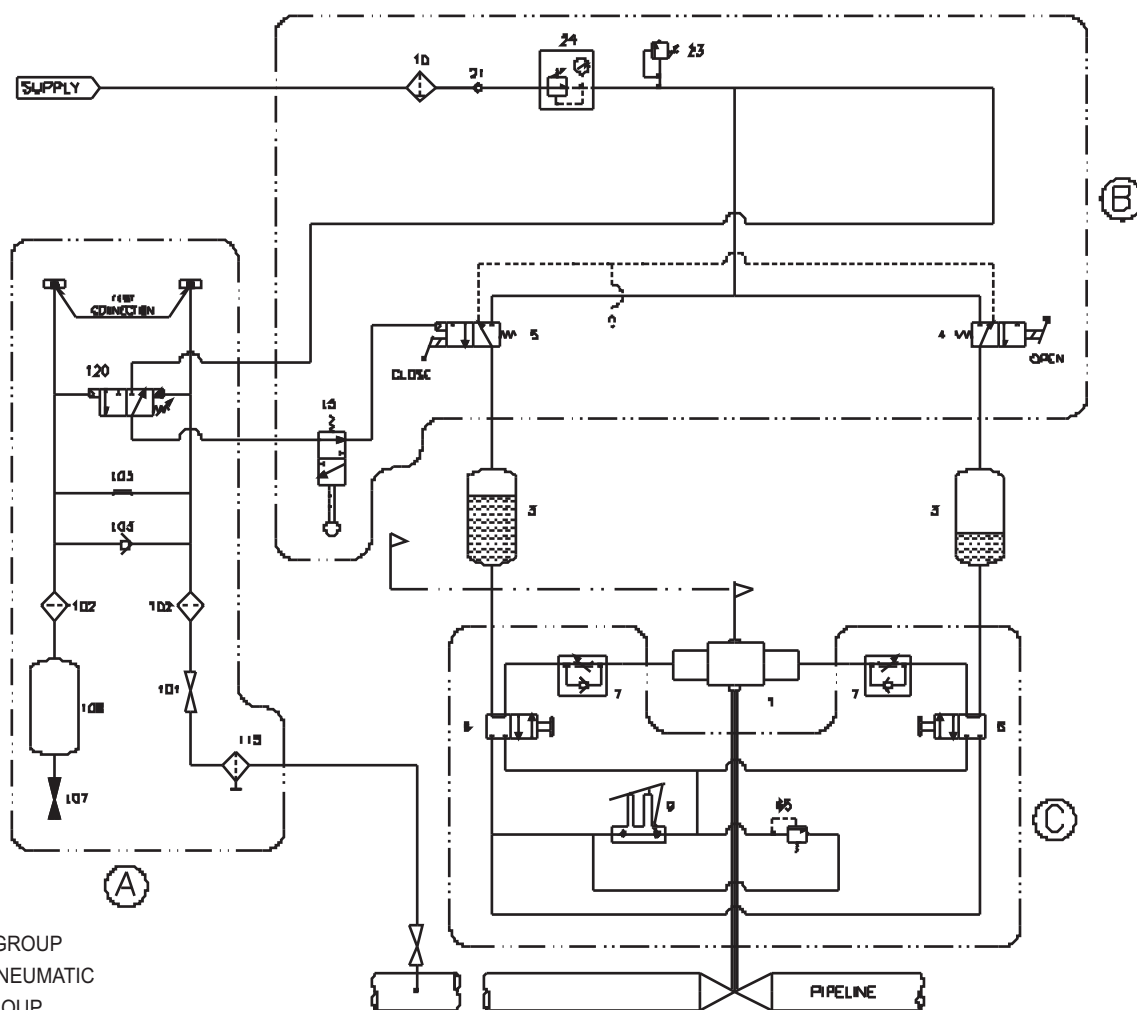
- |   |                         |
|---|-------------------------|
| 1. Hydraulic Actuator                   | 10. Filter Dehydrator   |
| 3. Gas/Hydraulic Tank                   | 15. End of Stroke Valve |
| 4. 3-Way Valve,<br>with Manual Override | 21. Check Valve         |
| 5. 3-Way Valve,<br>with Manual Override | 22. Volume Tank         |
| 6. Selector Valve for manual Pump       | 23. Relief Valve        |
| 7. Speed Control Valve                  | 24. Pressure Reducer    |
| 9. Handpump                             | 65. Relief Valve        |
|   | 70. Junction Box        |

Design and dimensions may be subject to change without notice, except the dimensions established by international standard specifications.



# Scheme K-D00-001-00-Q-0

## Control System for Gas-over-Oil Actuator LocalControl and Mechanical Line Break System



- (A) = LINE BREAK GROUP
- (B) = ACTUATOR PNEUMATIC CONTROL GROUP
- (C) = HYDRAULIC PUMP GROUP

### DESCRIPTION

- |                                      |                               |                                  |
|--------------------------------------|-------------------------------|----------------------------------|
| 1. Hydraulic Actuator                | 23. Relief Valve              | 119. Pre-Filter                  |
| 3. Gas/Hydraulic Tank                | 24. Pressure Reducer          | 120. Differential Pressure Pilot |
| 4. 3-Way Valve, with Manual Override | 65. Relief Valve              |                                  |
| 5. 3-Way Valve, Manual/Pilot         | 101. Pipeline Isolation Valve |                                  |
| 6. Selector Valve for manual Pump    | 102. Filter Dehydrator        |                                  |
| 7. Speed Control Valve               | 103. Check Valve              |                                  |
| 9. Handpump                          | 105. Restrictor               |                                  |
| 10. Filter Dehydrator                | 107. Tank Drain Valve         |                                  |
| 15. End of Stroke Valve              | 108. Rate Tank                |                                  |
| 21. Check Valve                      |                               |                                  |

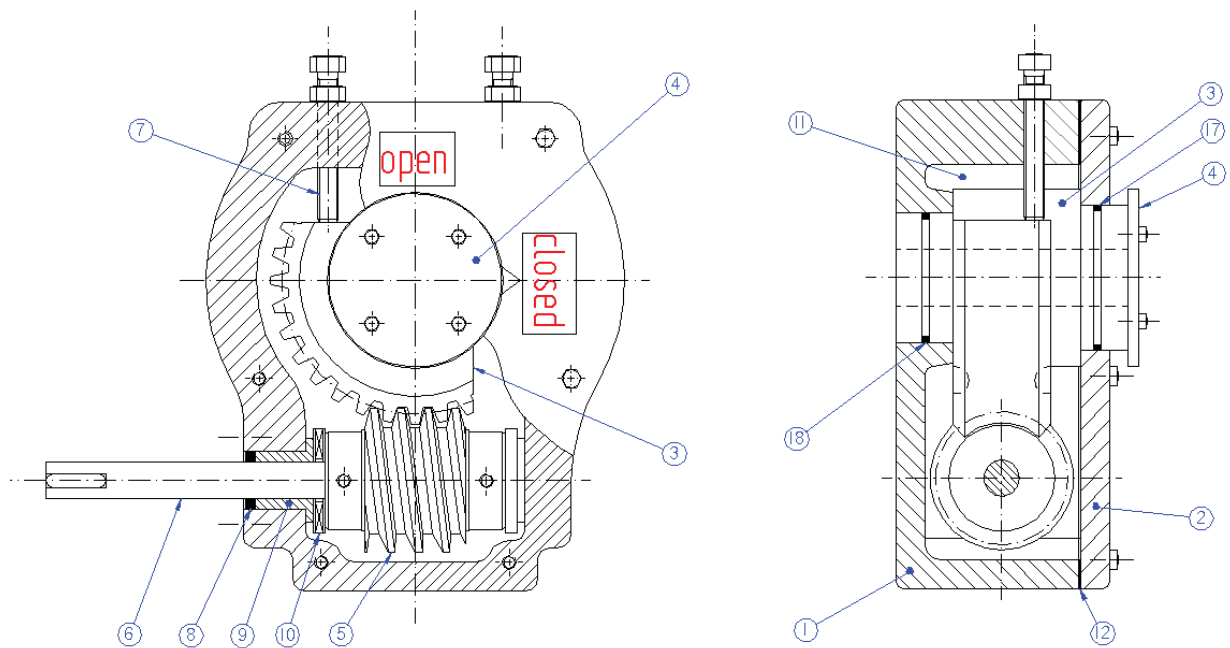
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# ABV

## Series TMG

Manual Gear Operators  
Worm Gear Operators



### DESCRIPTION

1. Body
2. Coverplate
3. Gear
4. Position Indicator
5. Worm
6. Shaft
7. Set Screw
8. Seal
9. Bushing
10. Needle-Bearing
11. Grease
12. Gasket
13. Gear
14. Seal
15. Gasket
16. Gasket
17. Seal

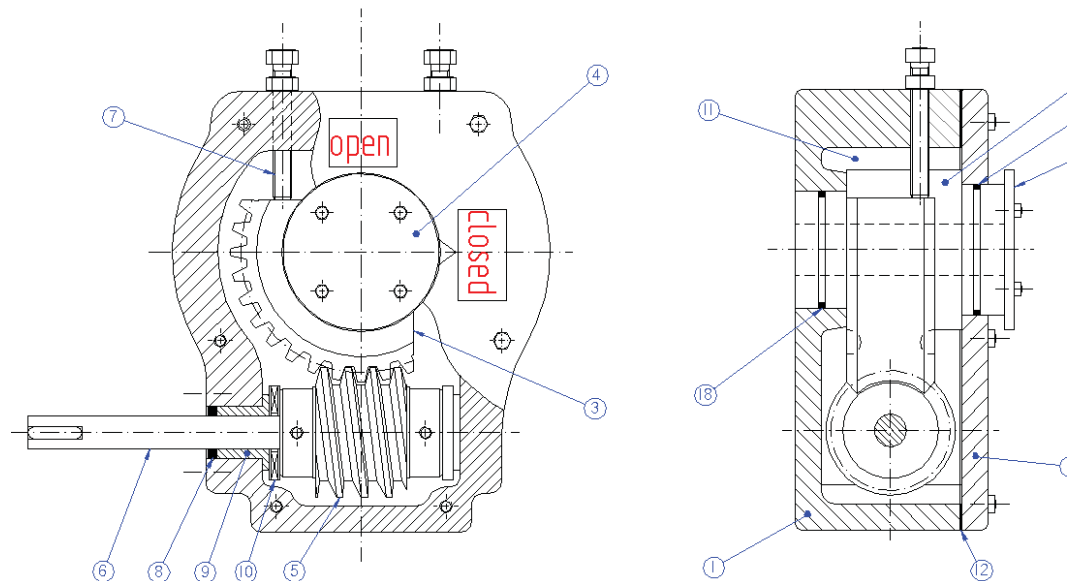
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# ABV

## Series SMG

Manual Gear Operators  
Sub-sea Worm Gear Operators



### DESCRIPTION

1. Body
2. Coverplate
3. Quadrant
4. Visual-Tactile Position indicator
5. Worm
6. Shaft
7. Set Screw
8. Seal
9. Bushing
10. Needle-Bearing
11. Protective Oil
12. Gasket
13. Gear
14. Seal
15. Gasket
16. O-Ring
17. O-Ring
18. Seal
19. O-Ring
20. O-Ring
21. Set Screw Cover

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# How to contact us

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**Contacts:**

Mr. Luca Marianetti  
MANAGING DIRECTOR

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# ABV

## Conversions Tables

### LENGHT EQUIVALENTS

	METERS	INCHES	FEET	MILIMETERS	Miles
<b>METERS</b>	1	39.37	3.2808	1000	0.0006214
<b>INCHES</b>	0.0254	1	0.0833	25.4	0.00001578
<b>FEET</b>	0.3048	12	1	304.8	0.0001894
<b>MILLIMETERS</b>	0.0001	0.03937	0.0032808	1	0.000000621
<b>MILES</b>	1609.35	633360	5280	1609350	1

### FORCE EQUIVALENTS

	kg	N	lb
<b>FORCE-KILOGRAMS,</b>	kg	1	9.80665
<b>NEWTONS,</b>	N	0.101972	0.224809
<b>POUNDS,</b>	lb	0.453592	4.44822

### PRESSURE EQUIVALENTS

	kg/cm <sup>2</sup>	lb/in <sup>2</sup>	atm	bar	In. of Hg	kPa	In. of H <sub>2</sub> O	Ft. of H <sub>2</sub> O
<b>kg/cm<sup>2</sup></b>	1	14.22	0.9678	0.98067	28.96	98.067	394.05	32.84
<b>lb/in<sup>2</sup></b>	0.07031	1	0.06804	0.06895	2.036	6.895	27.7	2.309
<b>atm</b>	1.0332	14.696	1	1.01325	29.92	101.325	407.14	33.93
<b>bar</b>	1.01972	14.5038	0.98692	1	29.53	100	402.156	33.513
<b>In. of Hg</b>	0.03453	0.4912	0.03342	0.033864	1	3.3864	13.61	11.134
<b>kPa</b>	0.0101972	0.145038	0.0098696	0.01	0.2953	1	4.02156	0.33513
<b>In. of H<sub>2</sub>O</b>	0.002538	0.0361	0.002456	0.00249	0.07349	0.249	1	0.0833
<b>Ft. of H<sub>2</sub>O</b>	0.03045	0.4332	0.02947	0.029839	0.8819	2.9839	12	1

### VOLUME EQUIVALENTS

	l	m <sup>3</sup>	U.S. gal	in <sup>3</sup>
<b>LITER,</b>	l	1	0.001	61.024
<b>CUBIC METER,</b>	m <sup>3</sup>	1000	1	61023.744
<b>U.S. gallon,</b>	gal	3.785	0.0037854	231
<b>CUBIC INCH,</b>	in <sup>3</sup>	0.016387	0.0000164	0.004329

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# ABV

## Conversions Tables

### TEMPERATURE CONVERSIONS

Degrees Celsius (C°)	Degrees Fahrenheit (°F)	Kelvin (K)	Degrees Rankine (°R)
-273.15	-459.7	0	0
-250	-418	23.15	41.7
-200	-328	73.15	131.7
-150	-238	123.15	221.7
-100	-148	173.15	311.7
-90	-130	183.15	329.7
-80	-112	193.15	347.7
-70	-94	203.15	365.67
-60	-76	213.15	383.7
-50	-58	223.15	401.7
-40	-40	233.15	419.7
-30	-22	243.15	437.7
-20	-4	253.15	455.7
-17.8	0	255.37	459.67
-10	14	263.15	473.7
0	32	273.15	491.7
10	50	283.15	509.7
20	68	293.15	527.7
30	86	303.15	545.7
40	104	313.15	563.7
50	122	323.15	581.7
60	140	333.15	599.7
70	158	343.15	617.7
80	176	353.15	635.7
90	194	363.15	653.7
100	212	373.15	671.7
150	302	423.15	761.7
200	392	473.15	851.7
250	482	523.15	941.7
300	572	573.15	1031.7
350	662	623.15	1121.7

### TEMPERATURE CONVERSION FORMULAS

- (°Celsius) = (Kelvin) - 273.15
- (°Fahrenheit) = 1.8 . (Kelvin) - 459.67
- (°Fahrenheit) = 1.8 . (°Celsius) + 32
- (°Rankine) = 1.8 . (Kelvin)

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