



Pneumatic actuator Type A

Si-503 EN

Edition: 2006-01

Double-acting actuator

Single-acting actuator (spring to close)

Single-acting actuator (spring to open)

Type A – DA

Type A – SC

Type A – SO

- **Compact design**
- **Patented backlash-free torque transmission**
- **Low friction seals**
- **Optimized torque curve**
- **Standardised connections between valve and accessories**

SOMAS actuators are designed for optimal function in control and on/off applications. The type A pneumatic actuators are specifically made to fit the SOMAS range of valves. They can also be used with most 90° rotary valves. The A-DA actuator is double-acting and the A-SC and A-SO actuators are single-acting spring return for fail safe operation.

SOMAS offer a patented backlash-free transmission friction coupling (valid for $D \leq 50$) to optimize control performance and eliminate backlash. The actuators are designed to fit valves and accessories with the ISO 5211 and VDI/VDE 3845.

SOMAS actuators have a torque curve corresponding to the torque demand for ball segment, butterfly, and ball valves. Low-friction seals allow for a low starting torque. Single- or dual- cylinder units are used depending on the required torque and air supply pressure.

Single-acting actuators are optimised according to compact dimensions. The springs are supplied in a cartridge to reduce the risk of injury and to simplify maintenance. Adjustable travel stops are provided for both open and closed positions.





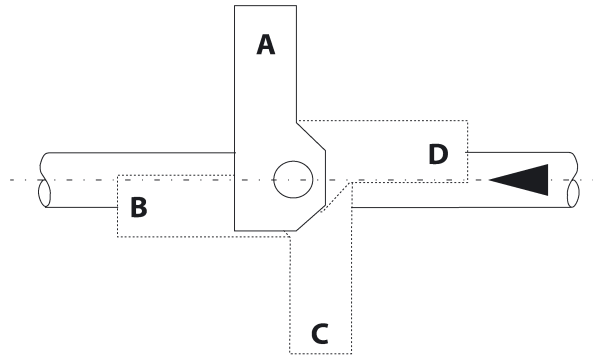
Mounting

The standard actuator mounting is perpendicular to the pipeline as shown in position A (see figure).

Position B, C or D is available on request (specify when ordering).

Always specify mounting position when ordering.

The actuator is mounted in position A if the position is not stated.



Torque

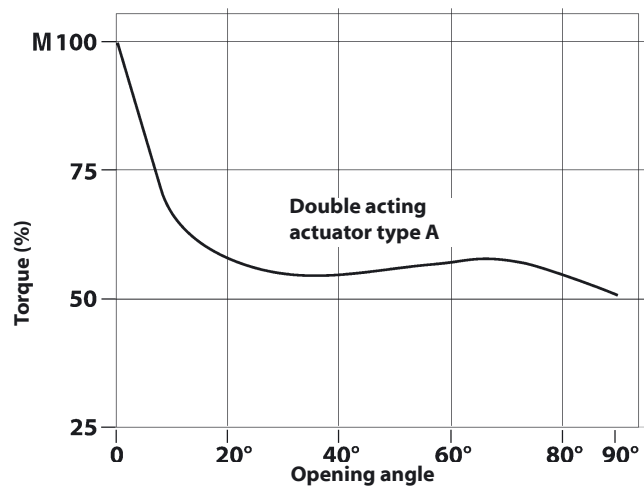
The linear motion from the piston is converted into a rotary motion via a linkage mechanism. The curve shows the output torque from the actuator as a function of the actuator shaft angle.

Maximum torque is achieved in the closed position which corresponds to the demand of ball segment valves, ball valves and metal seated butterfly valves.

For butterfly valves, the dynamic torque can be high in case of high differential pressure across the valve.

This increased torque demand is normally covered by the actuator selection tables.

The highest specified value for each size, in the tables below, is the upper limit of permitted transfer torque.



Closing torque M100 (Nm) at air supply 5.5 bar			
Type	DA	SC (spring to close)	SO (spring to open)
A11	84		
A13	140	55	55
A21	196		
A22	413		
A23	480	150	150
A24		300	300
A31	761		
A32	1609		
A33		600	600
A34		1200	1200
A41	2914		
A42	6117		
A43		2000	2000
A44		4000	4000
A51	9552		
A52	19925		

Closing torque M100 (Nm) at air supply 4 bar			
Type	DA	SC (spring to close)	SO (spring to open)
A11	61		
A13	102	45	45
A21	142		
A22	300		
A23	370	150	150
A24	755	300	300
A31	553		
A32	1170		
A33	1500	600	600
A34	2100	1200	1200
A41	2118		
A42	4447		
A43	5750	2000	2000
A44	8000	4000	4000
A51	6945		
A52	14485		



Actuator selection table for ball segment and butterfly valves (air supply min. 5.5 bar)

Double-acting actuator type DA

Actuator Type	Valve type and size DN								
	KVT/KVX PN 10-25	KVT/KVX PN 50	KVT/KVX PN 100	KVTW/KVXW PN 10-25	KVTF/KVXF PN 25	KVTF/KVXF PN 50	VSS PN 10-25	VSS PN 50	MTV* PN 10-25
A11-DA	25/2-40	25/2-40				25/2-40			
A13-DA	50	50	25/5-40			50	80		80
A21-DA		65	50	80-100	80-100		100	80	100
A22-DA		80-100	80	150	125	80-100	125-200	100-150	125-200
A23-DA			100				250		250
A31-DA		150		200-250	150-200	150	300	200-250	300
A32-DA	300	200	150		250	200	350-400	300	350-400
A41-DA	350-400	250			300-350		450-600	350-400	500
A42-DA	450-500	300			400		700-800	500	
A51-DA	600-700						900-1200	600	
A52-DA									

* valid also for MTVL and MTVF

Actuator selection table for ball segment and butterfly valves (air supply min. 5.5 bar)

Single-acting actuator type SC/SO

SC = Spring to close
SO = Spring to open

Actuator Type	Valve type and size DN								
	KVT/KVX PN 10-25	KVT/KVX PN 50	KVT/KVX PN 100	KVTW/KVXW PN 10-25	KVTF/KVXF PN 25	KVTF/KVXF PN 50	VSS PN 10-25	VSS PN 50	MTV* PN 10-25
A13-SC/SO	25/2-50	25/2-50				25/2-50			
A23-SC/SO	65	65	25/5-50	80-100	80-100		80		80
A24-SC/SO			80	150	125	80-100	100-200	80-100	100-200
A33-SC/SO			100	200-250	150-200	150	250-300	150-200	250-300
A34-SC/SO	300		150		250	200	350	250-300	350
A43-SC	350	250			300-350		400-450	350-400	400
A43-SO	350						400-450	350-400	400
A44-SC	400-450	300			400		500-600	500	500
A44-SO	400-450	300			400		500-700	500	500

The information will also be found in the data sheet for the actual valve type.

* valid also for MTVL and MTVF

Accessories

To achieve certain functions, the actuators can be fitted with different types of accessories; such as positioners, solenoid valves and limit switches.

SOMAS offer many alternative solutions including mechanical micro switches and different types of solid state proximity switches.

Solenoid valves for on/off applications can be mounted directly to the actuator. Limit switches for indicating closed and/or open position are only available for outside mounting.

See data sheet Si-805 and Si-811 below section 4 in the SOMAS product catalogue for codes for positioners.

Design options

In addition to the standard design the actuators are available in different optional designs according to the information below.

- E = ATEX design
- H = High temperature design
- HM = Hand operated
- LC = Locking device (closed position)
- V = Larger air connections
- X = Special design

Standard actuators will be delivered if there are no option codes stated when ordering.



Actuator selection table for ball segment and butterfly valves (air supply min. 4 bar)

Double-acting actuator type DA

Actuator Type	Valve type and size DN								
	KVT/KVX PN 10-25	KVT/KVX PN 50	KVT/KVX PN 100	KVTW/KVXW PN 10-25	KVTF/KVXF PN 25	KVTF/KVXF PN 50	VSS PN 10-25	VSS PN 50	MTV PN 10-25
A11-DA	25/2-40	25/2-40			25/2-40	25/2-40			
A13-DA	50	50	25/5-25		50	50			
A21-DA			40				80		80
A22-DA	65	65	50	80-100	80-100	80	100-200	80-100	100-200
A23-DA			80	150	125			150	
A24-DA				200		100			
A31-DA			100		150		250	200	250
A32-DA			150	250	200-250	150	300-350	250-300	300-350
A33-DA	300					200	400		400
A34-DA							450		
A41-DA					300			350-400	
A42-DA	350-450	250-300			350-400		500-750	500	500
A43-DA	500						800		
A44-DA									
A51-DA	600						900	600	
A52-DA	700						1000-1200		

¹ Ødi = 30

* valid also for MTVL and MTVF

Actuator selection table for ball segment and butterfly valves (air supply min. 4 bar)

Single-acting actuator type SC/SO

SC = Spring to close
SO = Spring to open

Actuator Type	Valve type and size DN								
	KVT/KVX PN 10-25	KVT/KVX PN 50	KVT/KVX PN 100	KVTW/KVXW PN 10-25	KVTF/KVXF PN 25	KVTF/KVXF PN 50	VSS PN 10-25	VSS PN 50	MTV* PN 10-25
A13-SC/SO	25/2-40	25/2-40				25/2-40			
A23-SC/SO	50-65	50-65	25/5-50	80-100	80-100	50	80-100		80
A24-SC/SO			80	150	125	80-100	125-200	80-100	100-200
A33-SC/SO			100	200-250	150-200	150	250-300	150-200	250-300
A34-SC/SO	300		150		250	200	350	250-300	350
A43-SC/SO	350	250			300-350		400-450	350-400	400
A44-SC	400-450	300			400		500	500	500
A44-SO	400-450	300			400		500-600	500	500

* valid also for MTVL and MTVF

Designation for low air supply (4 bar)

The following actuators will have an additional code (L) as the return spring is not the same as in the actuators for 5.5 bar.

SC (Spring closes)

A13-SCL.

SO (Spring opens)

A13-SOL, A23-SOL, A24-SOL, A33-SOL, A34-SOL, A43-SOL, A44-SOL.

The code for low air supply design has to be specified when ordering.



Actuator selection table for ball valves type SKV (air supply min. 5.5 bar)

Double-acting actuator type DA

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		10	20	30	40	50			10	20	30	40	50
25	15	A11-DA	A11-DA	A11-DA	A11-DA	A11-DA	25	15	A11-DA	A11-DA	A11-DA	A11-DA	A13-DA
40	15	A11-DA	A11-DA	A11-DA	A11-DA	A13-DA	40	15	A11-DA	A11-DA	A11-DA	A13-DA	A13-DA
50	20	A11-DA	A11-DA	A13-DA	A13-DA	A21-DA	50	20	A13-DA	A13-DA	A13-DA	A21-DA	A21-DA

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		5	10	15	20	25			5	10	15	20	25
80	25	A21-DA	A21-DA	A22-DA	A22-DA	A22-DA	80	25	A22-DA	A22-DA	A22-DA	A22-DA	A22-DA
100	30	A22-DA	A22-DA	A22-DA	A23-DA	A31-DA	100	30	A22-DA	A23-DA	A31-DA	A31-DA	A32-DA
125	35	A31-DA	A31-DA	A31-DA	A31-DA	A32-DA	125	35	A31-DA	A31-DA	A32-DA	A32-DA	A32-DA
150	40	A31-DA	A31-DA	A32-DA	A32-DA	A32-DA	150	40	A32-DA	A32-DA	A41-DA	A41-DA	A41-DA
200	50	A32-DA	A32-DA	A41-DA	A41-DA	A42-DA	200	50	A32-DA	A41-DA	A42-DA	A42-DA	A42-DA
250	70	A41-DA	A41-DA	A42-DA	A42-DA	A42-DA	250	70	A42-DA	A42-DA	A51-DA	A51-DA	A52-DA
300	80	A41-DA	A42-DA	A42-DA	A51-DA	A51-DA	300	80	A42-DA	A51-DA	A52-DA	A52-DA	A52-DA
350	90	A51-DA	A51-DA	A51-DA	A51-DA	A52-DA	350	90	A51-DA	A52-DA	A52-DA	A52-DA	A52-DA ¹
400	100	A51-DA	A51-DA	A51-DA	A52-DA	A52-DA	400	100	A51-DA	A52-DA	A52-DA	---	---

¹ Air supply = 6 bar

Actuator selection table for ball valves type SKV (air supply min. 5.5 bar)

Single-acting actuator type SC/SO

SC = Spring to close
SO = Spring to open

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		10	20	30	40	50			10	20	30	40	50
25	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	25	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO
40	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	A23-SC/SO	40	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A23-SC/SO	A23-SC/SO
50	20	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO	50	20	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		5	10	15	20	25			5	10	15	20	25
80	25	A23-SC/SO	A23-SC/SO	A23-SC/SO	A24-SC/SO	A24-SC/SO	80	25	A24-SC/SO	A24-SC/SO	A24-SC/SO	A24-SC/SO	A24-SC/SO
100	30	A23-SC/SO	A24-SC/SO	A24-SC/SO	A24-SC/SO	A33-SC/SO	100	30	A24-SC/SO	A33-SC/SO	A33-SC/SO	A33-SC/SO	A34-SC/SO
125	35	A33-SC/SO	A33-SC/SO	A33-SC/SO	A33-SC/SO	A34-SC/SO	125	35	A33-SC/SO	A34-SC/SO	A34-SC/SO	A34-SC/SO	A34-SC/SO
150	40	A33-SC/SO	A33-SC/SO	A34-SC/SO	A34-SC/SO	A34-SC/SO	150	40	A34-SC/SO	A34-SC/SO	A43-SC/SO	A43-SC/SO	A43-SC/SO
200	50	A34-SC/SO	A34-SC/SO	A43-SC/SO	A43-SC/SO	A43-SC/SO	200	50	A34-SC/SO	A43-SC/SO	A44-SC/SO	A44-SC/SO	A44-SC/SO
250	70	A43-SC/SO	A43-SC/SO	A44-SC/SO	A44-SC/SO	A44-SC/SO	250	70	A44-SC/SO	A44-SC/SO	---	---	---
300	80	A43-SC/SO	A44-SC/SO	A44-SC/SO	---	---	300	80	A44-SC/SO	---	---	---	---



Actuator selection table for ball valves type SKV (air supply min. 4 bar)

Double-acting actuator DA

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		10	20	30	40	50			10	20	30	40	50
25	15	A11-DA	A11-DA	A11-DA	A11-DA	A11-DA	25	15	A11-DA	A11-DA	A11-DA	A13-DA	A13-DA
40	15	A11-DA	A11-DA	A11-DA	A13-DA	A13-DA	40	15	A11-DA	A11-DA	A13-DA	A13-DA	A13-DA
50	20	A21-DA	A21-DA	A21-DA	A21-DA	A22-DA	50	20	A21-DA	A21-DA	A21-DA	A22-DA	A22-DA

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		5	10	15	20	25			5	10	15	20	25
80	25	A21-DA	A22-DA	A22-DA	A22-DA	A22-DA	80	25	A22-DA	A22-DA	A23-DA	A24-DA	A24-DA
100	30	A22-DA	A22-DA	A23-DA	A23-DA	A31-DA	100	30	A23-DA	A24-DA	A24-DA	A32-DA	A33-DA
125	35	A31-DA	A31-DA	A31-DA	A32-DA	A32-DA	125	35	A31-DA	A32-DA	A32-DA	A33-DA	A33-DA
150	40	A31-DA	A32-DA	A32-DA	A33-DA	A41-DA	150	40	A32-DA	A33-DA	A41-DA	A42-DA	A43-DA
200	50	A32-DA	A33-DA	A41-DA	A42-DA	A42-DA	200	50	A41-DA	A42-DA	A42-DA	A43-DA	A52-DA
250	70	A41-DA	A42-DA	A42-DA	A43-DA	A43-DA	250	70	A42-DA	A43-DA	A51-DA	A52-DA	---
300	80	A42-DA	A42-DA	A43-DA	A44-DA	A52-DA	300	80	A43-DA	A44-DA	A52-DA	A52-DA	---
350	90	A51-DA	A51-DA	A51-DA	A52-DA	A52-DA	350	90	A52-DA	A52-DA	---	---	---
400	100	A51-DA	A52-DA	A52-DA	A52-DA	---	400	100	A52-DA	---	---	---	---

Actuator selection table for ball valves type SKV (air supply min. 4 bar)

Single-acting actuator type SC/SO

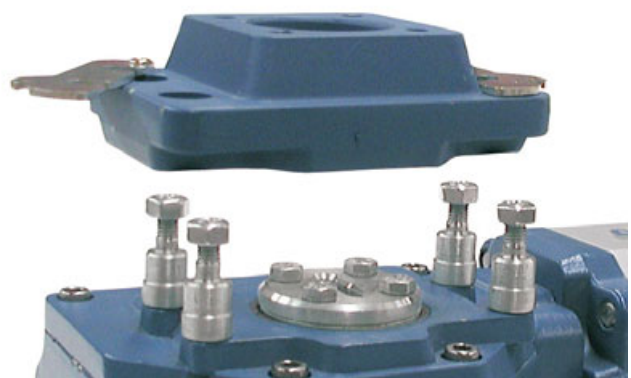
SC = Spring to close
SO = Spring to open

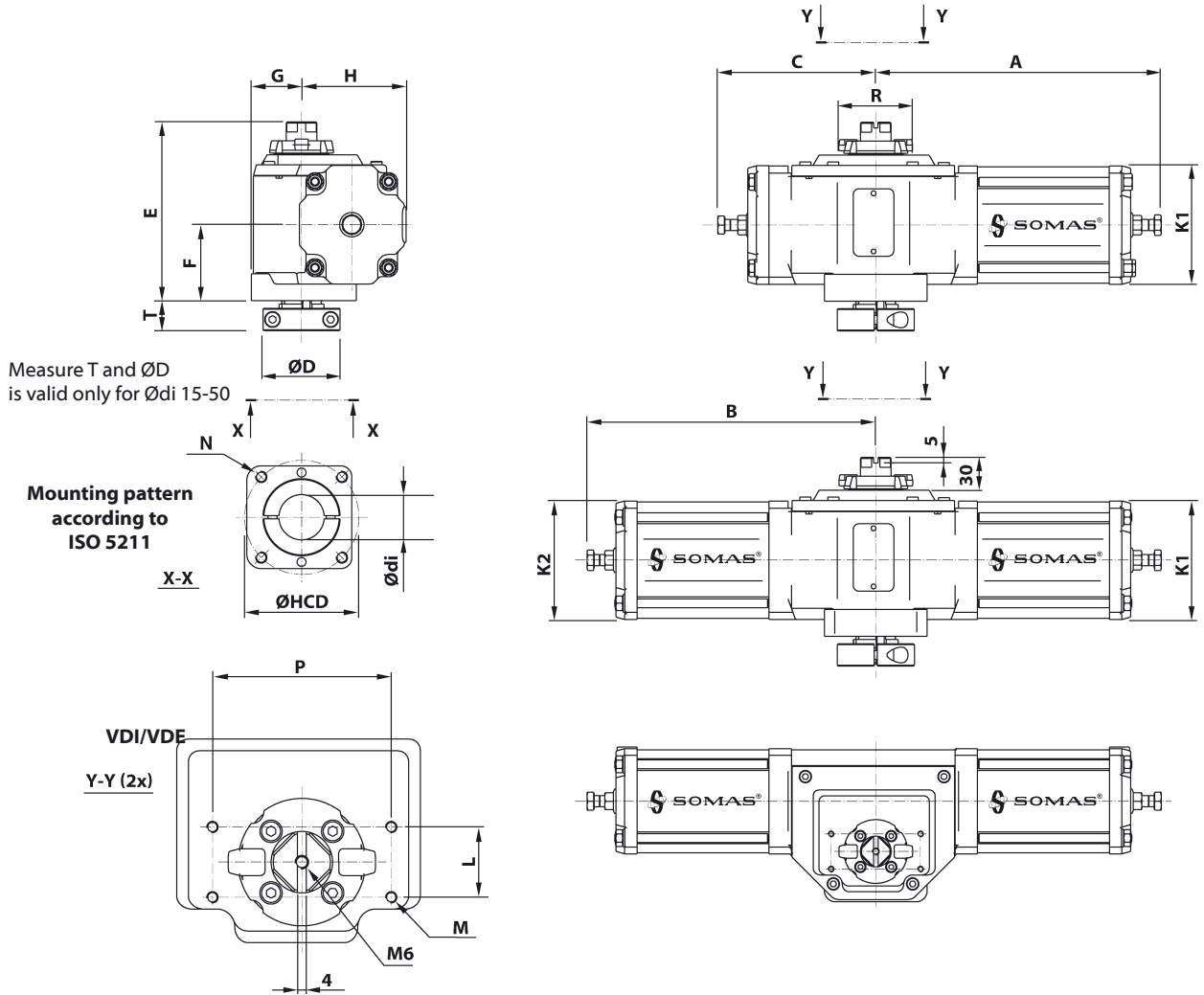
Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		10	20	30	40	50			10	20	30	40	50
25	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	25	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A13-SC/SO	A23-SC/SO
40	15	A13-SC/SO	A13-SC/SO	A13-SC/SO	A23-SC/SO	A23-SC/SO	40	15	A13-SC/SO	A13-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO
50	20	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO	50	20	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO	A23-SC/SO

Valve DN	Shaft dia. (mm)	Actuator for ball valve with PTFE-53-seats at Δp (bar)					Valve DN	Shaft dia. (mm)	Actuator for ball valve with HiCo seats at Δp (bar)				
		5	10	20	25	5			10	15	20	25	
80	25	A23-SC/SO	A23-SC/SO	A23-SC/SO	A24-SC/SO	A24-SC/SO	80	25	A24-SC/SO	A24-SC/SO	A24-SC/SO	A24-SC/SO	A24-SC/SO
100	30	A23-SC/SO	A24-SC/SO	A24-SC/SO	A24-SC/SO	A33-SC/SO	100	30	A24-SC/SO	A33-SC/SO	A33-SC/SO	A33-SC/SO	A34-SC/SO
125	35	A33-SC/SO	A33-SC/SO	A33-SC/SO	A33-SC/SO	A34-SC/SO	125	35	A33-SC/SO	A33-SC/SO	A34-SC/SO	A34-SC/SO	A34-SC/SO
150	40	A33-SC/SO	A33-SC/SO	A34-SC/SO	A34-SC/SO	A34-SC/SO	150	40	A34-SC/SO	A34-SC/SO	A43-SC/SO	A43-SC/SO	A43-SC/SO
200	50	A34-SC/SO	A34-SC/SO	A43-SC/SO	A43-SC/SO	A43-SC	200	50	A34-SC/SO	A43-SC/SO	A44-SC/SO	A44-SC/SO	---
200	50					A44-SO	250	70	A44-SC/SO	A44-SC/SO	---	---	---
250	70	A43-SC/SO	A43-SC/SO	A44-SC/SO	A44-SC/SO	A44-SC/SO	300	80	A44-SO	---	---	---	---
300	80	A43-SC/SO	A44-SC/SO	A44-SC	---	---							

See the information at page 4 for codes for actuators for the low air supply design

Accessories





Actuator type A (DA) double-acting																			Air-conn.	Weight
Type	A	B	C	Ødi	ØD	E	F	G	H	K1	K2	L	M	N	P	R	T	ØHCD		
A11-F07	215	--	90	15-20	48	128	50	37	73	84	--	30	M5	M8	80	56	14	70	1/4"	3
A13-F07	250	--	90	15-20	48	128	50	37	83	106	--	30	M5	M8	80	56	14	70	1/4"	5
A21-F10	255	--	140	20-30	69	160	68	45	94	106	--	30	M5	M10	80	66	27	102	1/4"	7.5
A22-F10	255	260	--	20-30	69	160	68	45	94	106	106	30	M5	M10	80	66	27	102	1/4"	9
A23-F10	305	--	140	20-30	69	160	68	45	117	152	--	30	M5	M10	80	66	27	102	1/4"	11
A24-F10	305	310	--	20-30	69	160	68	45	117	152	106	30	M5	M10	80	66	27	102	1/44"	15
A31-F14	380	--	215	30-50	98	225	107.5	69	144	152	--	30	M5	M16	130	66	40	140	1/4"	23
A32-F14	380	395	--	30-50	98	225	107.5	69	144	152	152	30	M5	M16	130	66	40	140	1/4"	29
A33-F14	470	--	215	30-50	98	225	107.5	69	183	228	--	30	M5	M16	130	66	40	140	3/8"	36
A34-F14	470	485	--	30-50	98	225	107.5	69	183	228	152	30	M5	M16	130	66	40	140	+3/8"	53
A41-F16	550	--	315	40-80	98	309	153	97	211	228	--	50	M6	M20	200	66	40	165	3/8"	70
A42-F16	545	560	--	40-80	98	309	153	97	211	228	228	50	M6	M20	200	66	40	165	3/8"	85
A43-F16	680	--	315	40-80	98	309	153	97	279	354	--	50	M6	M20	200	66	40	165	1/2"	142
A44-F16	680	695	--	40-80	98	309	153	97	279	354	228	50	M6	M20	200	66	40	165	+1/2"	157
A51-F30	745	--	370	70-100	--	412	198	130	314	354	--	50	M6	M20	200	66	-	298	1/2"	198
A52-F30	745	760	--	70-100	--	412	198	130	314	354	354	50	M6	M20	200	66	-	298	1/2"	234

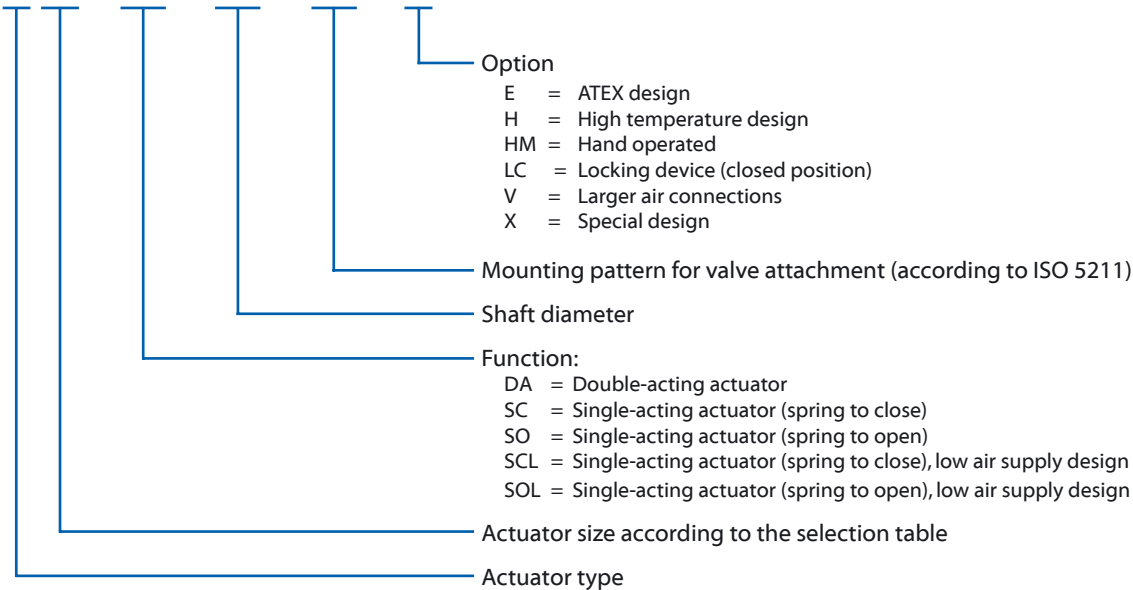
Actuator type A (SC/SO) single-acting																			Air conn.	Weight
Type	A	B	C	Ødi	ØD	E	F	G	H	K1	K2	L	M	N	P	R	T	ØHCD		
A13-F07	325	--	90	15-20	48	128	50	37	83	106	--	30	M5	M8	80	56	14	70	1/4"	7
A23-F10	415	--	140	20-30	69	160	68	45	117	152	--	30	M5	M10	80	66	27	102	1/4"	15
A24-F10	415	420	--	20-30	69	160	68	45	117	152	106	30	M5	M10	80	66	27	102	1/4"	24.5
A33-F14	660	--	215	30-50	98	225	107.5	69	183	228	--	30	M5	M16	130	66	40	140	3/8"	56
A34-F14	665	680	--	30-50	98	225	107.5	69	183	228	152	30	M5	M16	130	66	40	140	+3/8"	84
A43-F16	920	--	315	40-80	98	309	153	97	279	354	--	50	M6	M20	200	66	40	165	1/2"	156
A44-F16	925	935	--	40-80	98	309	153	97	279	354	228	50	M6	M20	200	66	40	165	+1/2"	210

Weight = Weight for actuator without mounting kit



Type designation, actuator type A

A 32 - DA - 050 - F14 - H



Ordering example

Pneumatic double-acting actuator type A 32-DA.
Mounting position A.

When ordering actuators separately, please specify also the mounting kit you require for the actual valve type.

Material specification

Housing, cover, end cover:	Aluminium (Duasolid painted)
Cylinder:	Aluminium (Duasolid painted)
Tie rod:	EN 1.4305
Piston seal:	Carbon filled PTFE + O-ring made of cold-resistant nitrile rubber
Screws/nuts:	Acidproof steel
Connection: (between actuator and accessories)	Plastic tubing (standard) Acidproof steel tubing (option)

Technical specification

Air supply:	4 - 8 bar
Rotary motion:	Max 95° adjustable travel stops
Ambient temperature:	- 40 to + 90 °C (standard) (+ 120 °C Option O-ring made of Viton)

SOMAS reserves the right to make improvements without prior notice.



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