

- *Rack & pinion design*
- *Double acting or spring return*
- *Adjustable stroke control*
- *Zero internal leakage*

Powermss Automation

Pneumatic Systems

ACTUATORS & ACCESSORIES



Actuator install Valve automation systems

DA/SA (055-165) /90 Pneumatic Actuator



VALVE AUTOMATION



High strength in a light compact anodized body

Rack and pinion design. Blow –out proof pinion

Double acting or spring return

Direct mounting for NAMUR solenoid

Adjustable stroke control, both inward (option) and outward (standard)

Zero internal leakage

All stainless steel fasteners

Piston is epoxy coated for best internal corrosion Protection

Top side manual override connection

Comply with ISO 5211, DIN 3337, VDI/VED 3845, NAMUR

Various pinion and mounting dimensions upon request

Special design and/or material upon request

GENERAL DESCRIPTION

The **Power Mass Series** actuator is a pneumatic operator for remote actuation control of valves etc. The standard rotation is clockwise to close.

Power Mass Series actuators are rack and pinion, available in two versions: both double acting (air to operate in both directions) and spring return (air to operate in one direction, springs to operate in other direction) for rotation of 90 .

They are ideally suitable for actuating ball valves, plug valves and butterfly valves for on/off applications and other devices in need of 90 rotation.

Power Mass Series actuators are designed for general pneumatic operating pressure from 3 to 10 bar (43.5 to 145 psi) and for temperature ranges of 25 C to 100 C, using clean, dry and non-corrosive air as operating media

Power Mass has its own production line for actuators and a professional engineering team. With perfect design, the Power Mass series actuators are very easy to be disassembled and assembled in safety and can achieve a long life.

They are also protected against normal environmental corrosion by using appropriate material and certain surface treatment.

All Power Mass Series actuators are lubricated during assembly process in the factory to achieve optimum cycle life. No further lubrication is needed under normal operating conditions. The actuators has been tested before delivery to ensure proper operation and are constructed for indoor or outdoor installation.

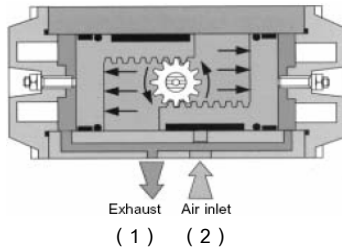
The features actuators-high reliability, economical, high strength long lasting, compactness and simplicity have made Power Mass the most competitive actuators on the market today.



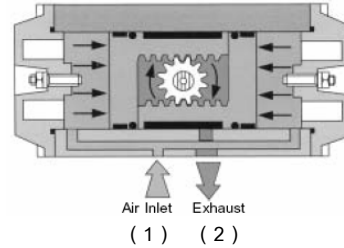
Working Principle

● Double acting actuators (Top View)

The double-acting actuator use air to rotate clockwise and counter clockwise



For counter clockwise operation, air supplied to Port 2.
The pressure moves the pistons apart.
The linear movement of the piston is converted to rotary motion by the piston rack and the output pinion gear.
A counter clockwise rotation is obtained.



For clockwise operation, air supplied to Port 1.
The pressure makes the pistons move together, the pinion rotates clockwise.
A clockwise rotation is obtained.

Linear Torque

The output torque is linear throughout travel

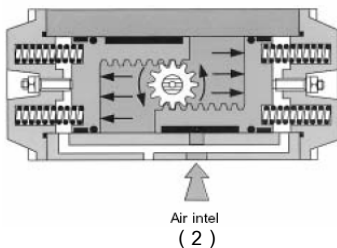
Torque table (double acting)

unit: Nm

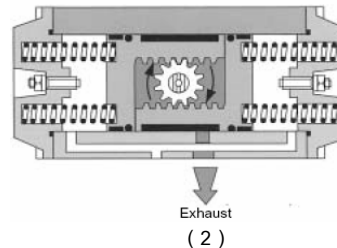
Size	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.5 bar	6 bar	6.5 bar	7 bar	8 bar	9 bar	10 bar	Air consumption liter / Stroke
DA055	12	14	16	18	20	23	25	27	29	33	37	41	0.13
DA065	18	21	24	27	30	33	36	39	42	48	55	61	0.18
DA075	31	36	42	47	52	57	63	68	73	84	94	105	0.30
DA085	44	51	59	66	74	81	88	96	103	118	133	148	0.43
DA095	63	73	84	94	105	115	126	136	147	168	189	210	0.55
DA105	88	103	118	132	147	162	177	191	206	236	265	295	0.93
DA125	178	208	238	267	297	327	357	386	416	476	535	595	1.80
DA165	354	413	472	531	590	649	708	767	826	944	1062	1180	3.41

● Single acting actuators spring return operation (Top View)

Spring return models use air pressure to rotate in one direction. While the actuator rotates, Spring are compressed. When the air pressure is vented , the energy stored in the spring rotates the actuator the other direction. Spring return actuators are mainly in a fail-safe operation in the event of air pressure loss.



For counter clockwise operation, air supplied to Port 2.
The pressure moves the pistons apart and compresses the springs.
The linear movement of the piston is converted to rotary motion by the piston racks and the output pinion gear.
A counter clockwise rotation is obtained.



For clockwise operation, in the absence of air pressure (by design or system failure), the springs force to move the pistons inward.
As the pistons move together, the pinion rotates clockwise. A clockwise rotation is obtained.

SPRING RETURN ACTUATORS

Spring return actuators are used mainly in fail-safe operation in the event of air pressure loss. Power mass spring return actuators are designed with a self-contained spring cartridge system with below advantages

1) Compactness

The housing length of the spring return unit is the same as the double acting unit. Converting from double acting to spring return actuation is just to remove the end caps and add a number of spring cartridges

2) Safety

The spring cartridges made the actuator can be easy disassembled without danger to the installer due to springs releasing

It's safe for installers when the end caps are removed.

Please see the technical data "Torque table (single acting, spring return)" for information of "useful pneumatic torque at minimum control pressure".

TRAVEL STOP ADJUSTMENT

Adjusting screws are located in doth end caps to precisely adjust the travel of the rotation. Actuator to specific degrees of rotation.

The travel stop permits readjusting of actuator movement to open or closed positions

INSTALLATION

Actuators comply with ISO 5211 and VD/VDE 3845 dimensions and can be mounted directly to PMP ISO-5211 series ball valves without using external linkages. Field installation is simple misalignment is minimized and good rigidity achieved.

Can provide linkage for mounting actuators to other devices requiring quarter rotation.

Actuator, when mounted to other valve body etc, may requiring a mounting bracket depending upon the type. Also, a shaft coupling for connecting the valve shaft to the actuator shaft may or may not be required depending upon which device is to be connected with as the type of actuator

The actuator should be installed correctly and safely onto valves etc, include:

- Make sure the actuator is not be pressurized during installation

- Make sure the system is clean and dirt-free

- The top of the drive shaft should be easy to be accessed in case that whenever manual operation is needed.

- Choose same threads for matching (e.g. Imperil or Metric) when connect with valves etc.

- Choose same threads for matching (e.g. Imperil or Metric) when connect with the air ports.

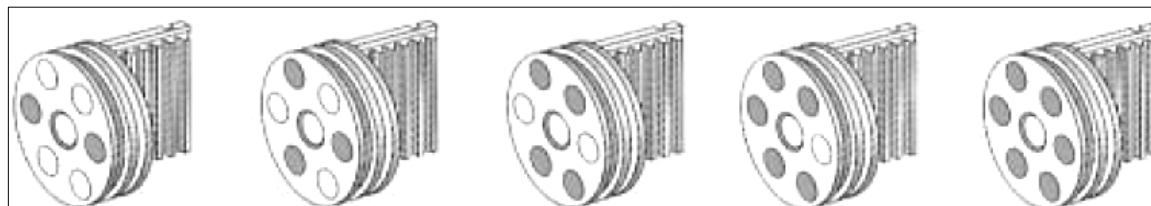
- Make sure correct orientation obtained for both actuator and valves etc

Torque table (single acting , spring return)

unit: Nm

Size	No of Spring	Spring power		Pneumatic torque (POWER MASS actuator)																								
		min	max	3 bar		3.5 bar		4 bar		4.5 bar		5 bar		5.5 bar		6 bar		6.5 bar		7 bar		8 bar		9 bar		10 bar		
				max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	
SA055	4	4	7	6	8	8	10	10	12																			
	6	6.5	10	3	6	4	8	7	10	9	12	11	14															
	8	8.5	13					3	8	6	10	7	12	10	14	11	16											
	12	13	20									4	10	7	12	8	14	10	16	12	18	16	22					
SA065	4	5	9	9	13																							
	6	8	13	5	10	8	13	11	16	14	19																	
	8	11	17			4	10	7	13	10	16	13	19	16	22													
	12	17	25								6	13	9	16	12	19	15	22	18	25								
SA075	4	11	17	14	20	19	25	25	31																			
	6	17	26	5	14	10	19	16	25	21	30	26	35	31	40													
	8	23	34					8	19	13	24	18	29	23	34													
	12	35	52											14	28	20	34	25	39	30	44	41	55					
SA085	4	14	21	23	30	30	37																					
	6	21	32	12	23	19	30	27	38	34	45																	
	8	28	42					17	31	24	38	32	46	39	53													
	12	42	64										21	39	28	46	35	53	43	61	50	68						
SA095	4	20	29	34	43	44	53																					
	6	31	44	19	32	29	42	40	53	50	63																	
	8	41	59					25	43	35	53	46	64	56	74													
	12	62	88									32	54	42	64	53	75	63	85	74	96							
SA105	4	29	46	42	59	57	74																					
	6	43	69	19	45	34	60	49	75	63	89	78	104															
	8	58	92					29	60	40	74	55	89	70	104	85	119											
	12	87	138										32	74	47	89	62	104	76	118	91	133						
SA125	4	58	92	86	120	116	150																					
	6	87	138	40	91	70	121	100	151	129	180																	
	8	116	184					54	122	83	151	113	181	143	211	173	241											
	12	174	276									67	152	97	182	127	212	156	241	186	271							
SA165	4	102	161	193	252																							
	6	153	241	113	201	172	260	231	319																			
	8	204	322			91	209	150	268	209	327	268	386	327	445													
	12	306	483									128	276	187	335	305	453	364	512	343	520	461	638	579	756	697	874	

● **Position of the springs**





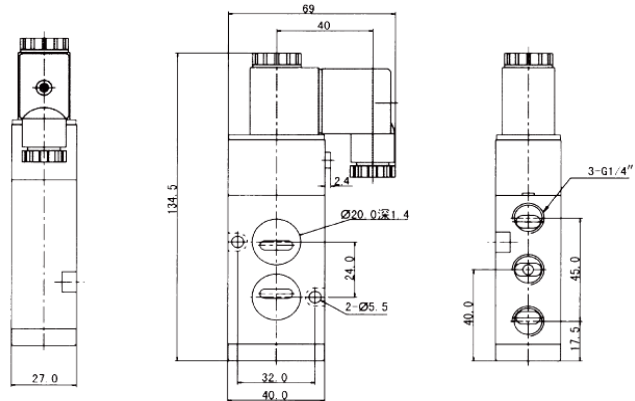
Model : 4M310

5/2-way solenoid valve, actuated by permanent signal with air spring. Interface according to Namur standard.

Available with actuators:
230V/50Hz, 110V/50Hz, 24V/50Hz, 24VDC

The valves are generally equipped with manual override to turn (standard).

Also available with manual override to push, then



■ Delivery includes: 2 screws, 2 O-rings and connector as shown on the photo

Type	4M310-08
Acting type	Internally pilot-actuated
Position number	2 Position 5 Way
Port size (G)	1/4"
Applicable cylinders	63mm - 100mm
Fluid	Air
Lubrication	Lubricated or not
Operating Temperature (Mpa)	0.15 - 0.8
Temperature range	5 - 60° C
Voltage range	± 10%
Power consumption	AC: 4.5VA , DC: 3W

Use for

Actuator install with Butterfly valve ,Brass Ball Valve and Stainless Ball Valve

For Butterfly valve			For Brass Ball Valve			For Stainless Ball Valve		
DN/in	DA	SA	DN/in	DA/4 Bar	DA/5.5 Bar	DN/in	DA/4 Bar	DA/5.5 Bar
			15/ (1/2)"	55	55	15/ (1/2)"	55	55
			20/ (3/4)"	55	55	20/ (3/4)"	55	55
			25/1"	55	55	25/1"	55	55
			32/ (1 1/4)"	65	55	32/ (1 1/4)"	65	55
40/ (1 1/2)"	55	65	40/ (1 1/2)"	65	55	40/ (1 1/2)"	65	65
50/2"	55	75	50/2"	75	65	50/2"	75	65
65/ (2 1/2)"	65	75-85	65/ (2 1/2)"	85	75	65/ (2 1/2)"	95	85
80/3"	65	75-85	80/3"	95	85	80/3"	105	95
100/4"	75	95-105	100/4"	105	95	100/4"	125	105
125/5"	85-95	105-125						
150/6"	95-105	125						
200/8"	105-125	165						
250/10"	125-165	165						
300/12"	165							



model : ALS 10
Enclosure WERTHER-PROOF



model : ALS 20
Enclosure EXPLOSION PROOF
Exd IIB T6 IP67

FEATURES

Visual Position Indicator

Quick-Set Cam A L S Limit Switch adjustment cams are splined and spring loading the switch position can be quickly adjust without tools
(closed - up , open- down)

Multipoint Terminal Strip Terminal strip number with 8 contacts is standard for micro switches.

There are connected solenoid valve service

Dual wire potting

ALS 10 Dual 1/2" conduit entries

ALS 20 Dual 3/4" conduit entries

Captive cover bolts

There are designed to be captive by the cover ,when it removed

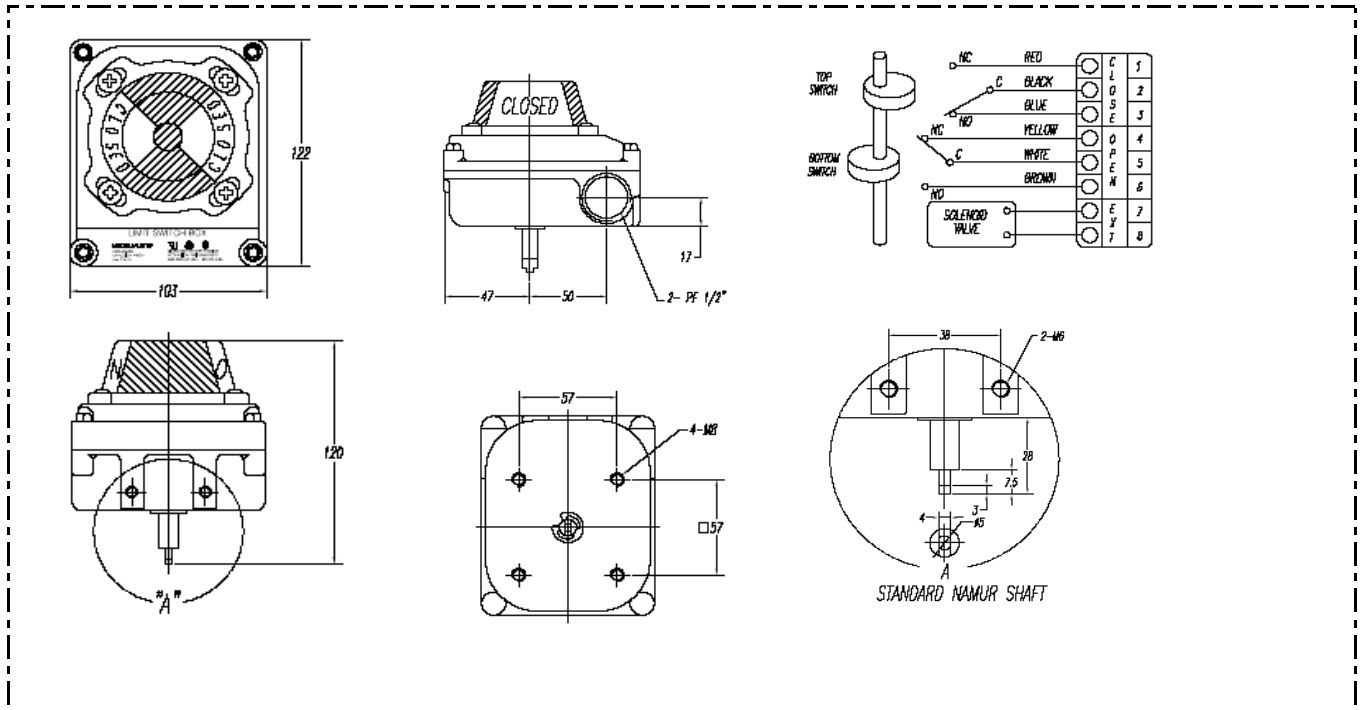
Easy mounting bracket (ISO5211)

Any actuator for rotary motion can be easily mounted in ISO 5211

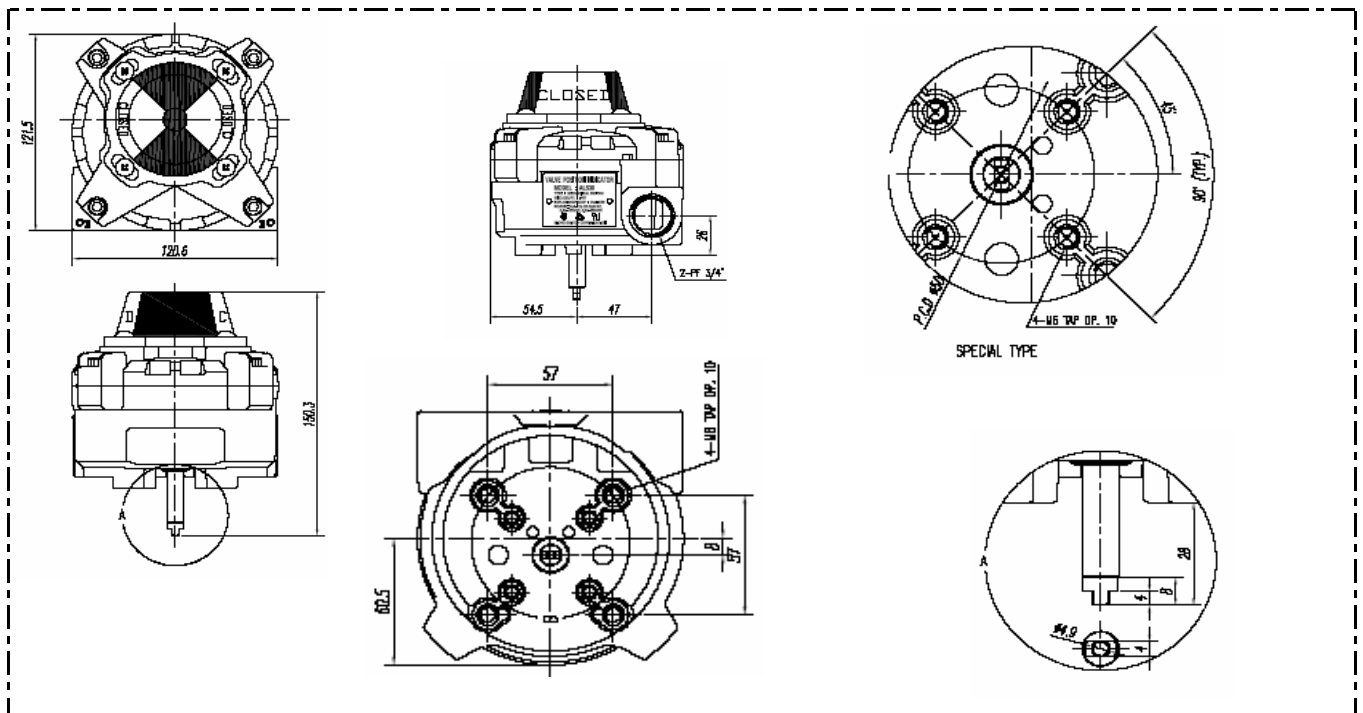
Specification

Model	ALS10	ALS20
Enclosure	Weatherproof, IP67	Explosion proof (Exd II C T6), IP66
Temperature Range	- 20 ~ 85 °C	- 20 ~ 85 °C
Cable Entry	2 x 1/2" PF (PT) (NPT) (M20)	2 x 3/4" PF (PT) (NPT) (M20)
Terminal Strip	8 Points	8 Points
Position Indicator	0 ~ 90 °C ;Open-Yellow, Close-Red	0 ~ 90 °C ;Open-Yellow, Close-Red
Switch Type	2SPDT Mechanical switches (Proximity sensors)	2SPDT Mechanical switches (Proximity sensors)
Painting	Polyester powder coating with black color	Polyester powder coating with black color
Bracket	Plastic, Plate steel	Plastic, Plate steel

DIMENSIONS DRAWING ALS10

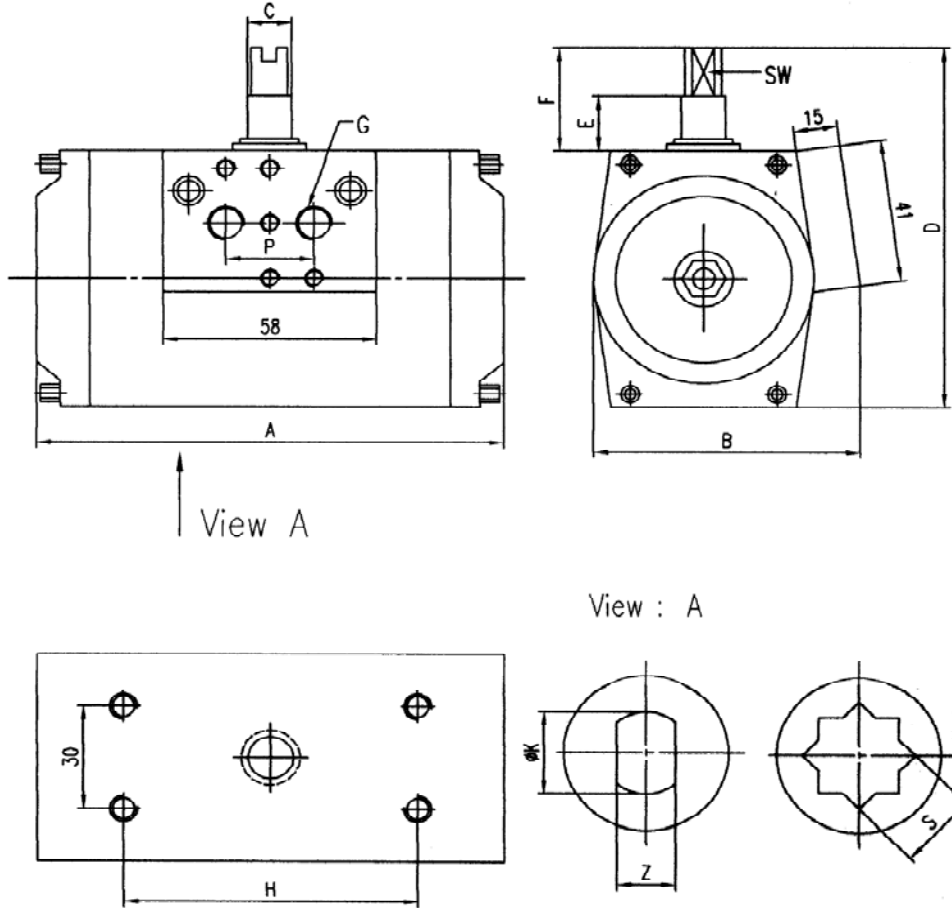


DIMENSIONS DRAWING ALS20



Dimension Actuator

DIMENSIONS DRAWING

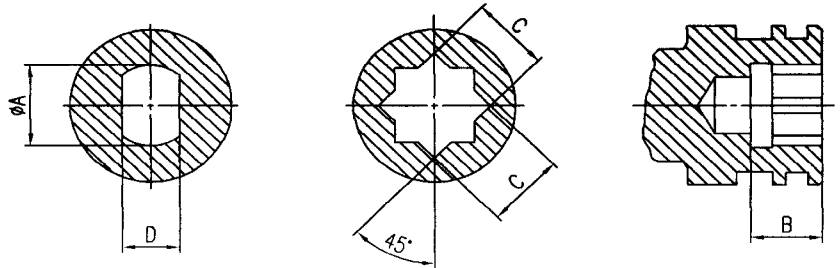


Dimensional data Unit:mm

size	Torque Nm	A	B	ØC	D	E	F	G	P	H	ØK	S		Z	SW	ISO-5211	Weight (kg)
55	12-41	127	74	12	94	6.5	20.5	1/8"	24	80	12 16	11	8 10	10	F03/F05 F04	0.94	
65	18-61	133	85	12	108	7.5	20	1/8"	24	80	12 16	11	8 10	10	F03/F05 F04/F07	1.43	
75	31-105	157	90	18	120	7.5	20	1/4"	24	80	12 16	14	8 10	10	F04/F05 F05/F07	2.18	
85	44-148	177	97	18	128	7.5	20	1/4"	24	80	12 16	17	8 10	10	F05/F07	2.64	
95	63-210	203	100	25	137	6	20.5	1/4"	24	80	22	17	14	14	F05/F07	3.38	
105	88-295	216	120	25	160	6	20.5	1/4"	24	80	22	17	14	14	F07/F10	4.96	
125	178-595	290	140	40	180	8	20.5	1/4"	24	80	30	22	20	20	F07/F10	8.86	
165	354-1180	365	175	45	221	8.5	23	1/4"	24	130	42	27	28	28	F10/F12	15.86	

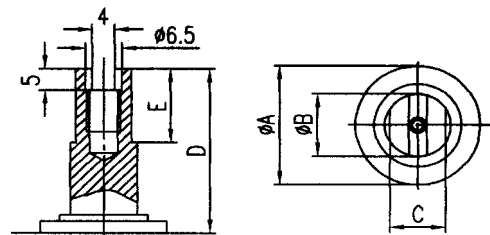
Size	ØA	B	C	D
55	12	10	11	8
	16			10
65	12	16.3	11	8
	16			10
75	12	16.3	14	8
	16			10
85	12	16.3	17	8
	16			10
95	22	20	17	14
105	22	20	17	14
125	30	30	22	20
165	42	33	27	28

DIMENSIONS DRAWING



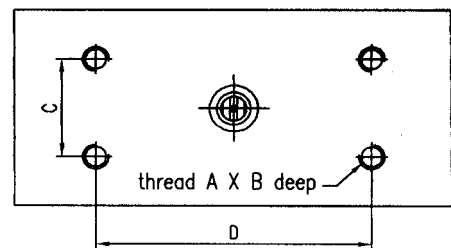
Size	ØA	ØB	C	D	D
55	20	12	10	20	14
65	20	11.9	10	20	12.5
75	26.5	17.9	10	20	12.5
85	26.5	17.9	10	20	12.5
95	35	25	14	20	14.5
105	35	25	14	20	14.5
125	54.5	39.8	20	20	12.5
165	59	45	28	20	14

VDI / VDE Pinion top



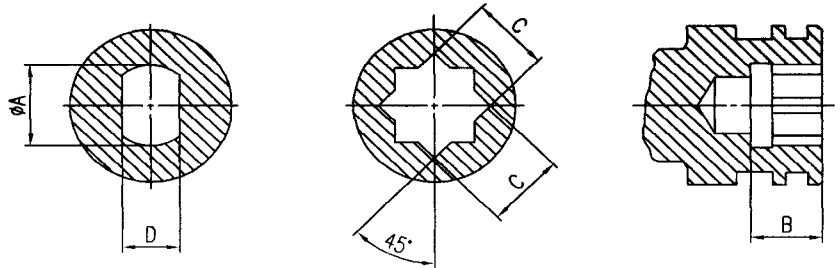
Size	A thread		B	C	D
	G	NPT			
55	M5	UNF 10-32	5	30	80
65	M5	UNF 10-32	6	30	80
75	M5	UNF 10-32	8	30	80
85	M5	UNF 10-32	8	30	80
95	M5	UNF 10-32	8	30	80
105	M5	UNF 10-32	8	30	80
125	M5	UNF 10-32	8	30	80
165	M5	UNF 10-32	8	30	130

VDI / VDE Top Mounting



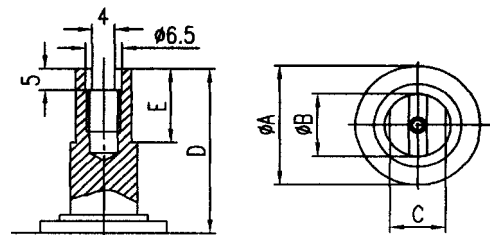
Size	ØA	B	C	D
55	12	10	11	8
	16			10
65	12	16.3	11	8
	16			10
75	12	16.3	14	8
	16			10
85	12	16.3	17	8
	16			10
95	22	20	17	14
105	22	20	17	14
125	30	30	22	20
165	42	33	27	28

DIMENSIONS DRAWING



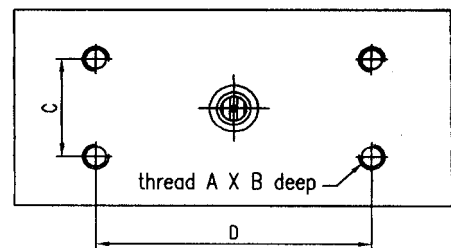
Size	ØA	ØB	C	D	D
55	20	12	10	20	14
65	20	11.9	10	20	12.5
75	26.5	17.9	10	20	12.5
85	26.5	17.9	10	20	12.5
95	35	25	14	20	14.5
105	35	25	14	20	14.5
125	54.5	39.8	20	20	12.5
165	59	45	28	20	14

VDI / VDE Pinion top



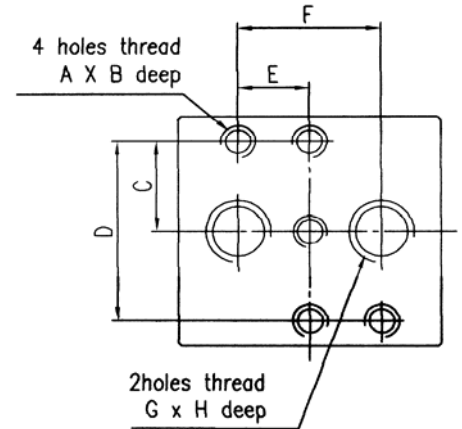
Size	A thread		B	C	D
	G	NPT			
55	M5	UNF 10-32	5	30	80
65	M5	UNF 10-32	6	30	80
75	M5	UNF 10-32	8	30	80
85	M5	UNF 10-32	8	30	80
95	M5	UNF 10-32	8	30	80
105	M5	UNF 10-32	8	30	80
125	M5	UNF 10-32	8	30	80
165	M5	UNF 10-32	8	30	130

VDI / VDE Top Mounting



Unit : mm

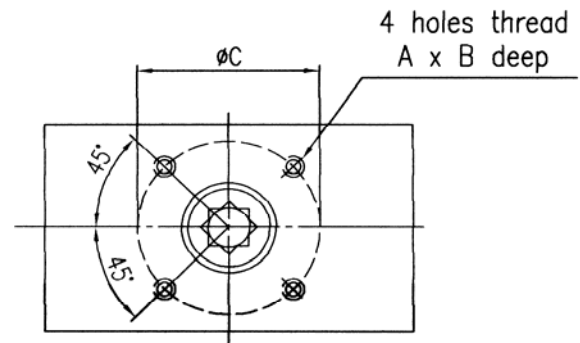
Size	A thread		B	C	D	E	F	G thread		H
	G	NPT						G	NPT	
55	M5	UNF 10-32	8	16	32	12	24	G1/8	NPT1/8	9
65	M5	UNF 10-32	8	16	32	12	24	G1/8	NPT1/8	9
75	M5	UNF 10-32	8	16	32	12	24	G1/4	NPT1/4	12
85	M5	UNF 10-32	8	16	32	12	24	G1/4	NPT1/4	12
95	M5	UNF 10-32	8	16	32	12	24	G1/4	NPT1/4	9
105	M5	UNF 10-32	8	16	32	12	24	G1/4	NPT1/4	10
125	M5	UNF 10-32	8	16	32	12	24	G1/4	NPT1/4	12
165	M5	UNF 10-32	8	16	32	12	24	G1/4	NPT1/4	14



Unit : mm

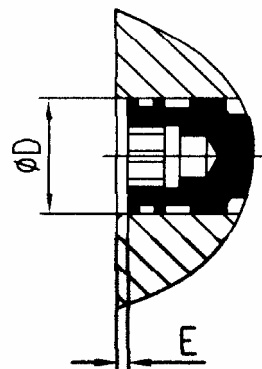
ISO5211	ØC	G	A thread NPT	B depth
F03	36	M5	UNF 10-32	8
F04	42	M5	UNF 10-32	9
F05	50	M6	UNC 1/4-20	9
F07	70	M8	UNC 5/16-18	10
F10	102	M10	UNC 3/8-16	14
F12	125	M12	UNC 1/2-13	16

View from bottom

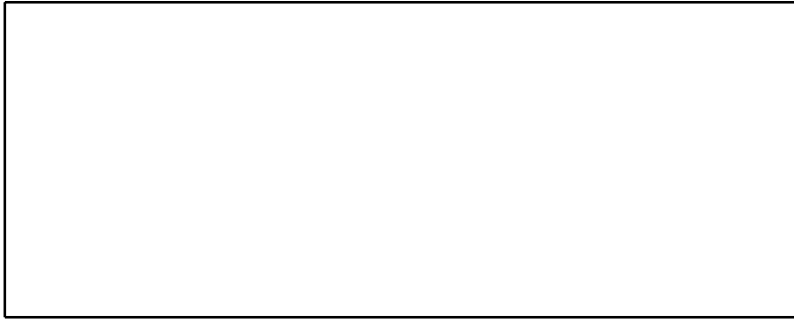


Unit : mm

Size	ISO-5211	ØD	E
55	F03/F05	23.8	1.5
	F04		
65	F03/F05/F07	23.8	2
	F04/F07		
75	F04/F07	29.3	2
	F05/F07		
85	F05/F07	32.3	2
95	F05/F07	37.6	2.5
105	F07/F10	37.6	2
125	F07/F10	53.3	3
165	F10/F12	66.3	3.5



Distributor By :



SAFETY NOTICE



- The actuator should be working within its pressure limits-see the technical data in this manual, do not operate it over the limit.
- Operating temperature limits are -25°C to $+100^{\circ}\text{C}$, do not go beyond.
- Using clean, dry and non-corrosive air as operating media.
- Operating in corrosive environments may damage the internal or external parts.
- Do not disassemble the spring cartridge, it may be dangerous.
- Before installation or disassembly, isolate the air line and make sure the air connection of the actuator is vented.
- Do not disassemble the actuator caps while it is pressurized.
- Make sure get correct position / orientation where it is connected with valves etc

STORAGE

- Store the actuators in a dry environment in its original box if the actuators are not to be used immediately.
- Do not remove the plastic caps on the air supply ports to protect the threads



Please read the instruction manual carefully and keep for future reference.

Only properly instructed persons disassemble or assemble the actuator

