

## Air–Oil power cylinder

### Operational principle:

BS series air–oil power cylinder, drives by pure air pressure. Use scale of sectional area which from big and small piston, converts the low air pressure to high pressure oil, the output rate of supercharging reach around 25:1. Mainly for stamping work, such as stamping, riveting, bending and so on.

### Characteristic:

- The speed of pneumatic system and stability of hydraulic system integrates air–oil power cylinder
- Driven by pressured air , produce power 1–40T
- Without shake and noise when working, improves quality of workpiece and life of mold.
- Design to save energy when continue pressure or stop action, not like pure hydraulic system
- Simple device, easy to control and maintain.
- Driven by pneumatic source, clean working environment, servicing easily.
- Simple and light, easy to handle.
- Stroke of capacity is limited
- Mainly for stamping work, such as bending, shear, pulling, riveting, marking and pressure assembly etc.

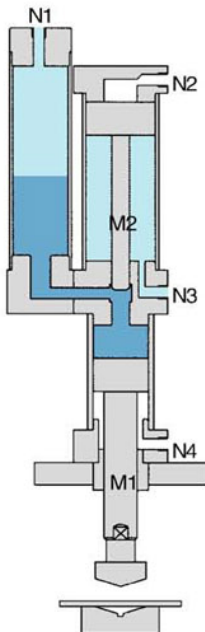
### Installation and maintenance:

- Adopt multi–directional mounting, general use flange mounting, power axis is downward
- In using, the piston should avoids big radial load
- After install, run 2–3 times in the work pressure range and without load
- The power source from filter of compressed dry air, pressure about 2–7kg/cm<sup>2</sup>
- The temperature range is –5--+60C for air–oil power cylinder, special requirements with OEM.
- It will be loss power oil after use of long–term, it need add in time.

### Instructions:

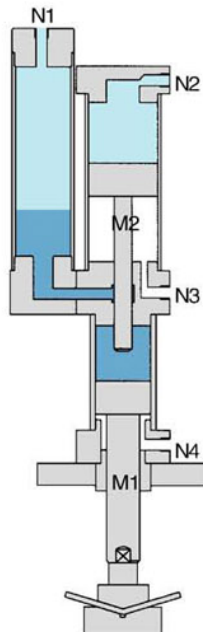
#### First step: Preloading

N1 Admission air  
M1 Fall  
N4 Exhaust air



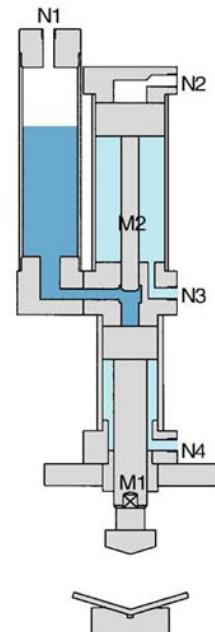
#### Second step: Boost

N2 Admission air  
M2 fall boost  
N3 Exhaust air



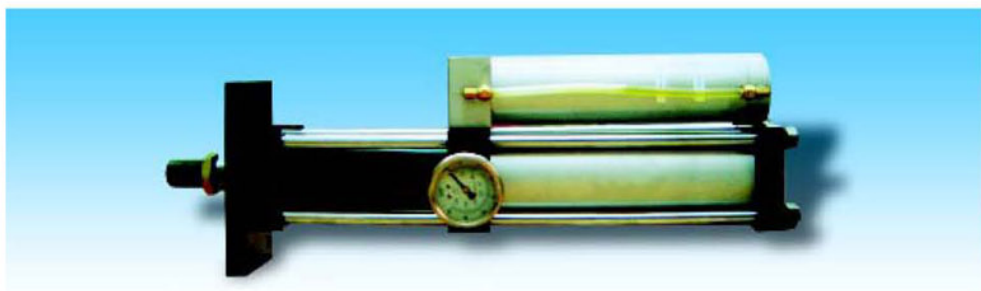
#### Third step: Reset

N3 N4 Admission air  
M1 M2 Reset  
N1 N2 Exhaust air

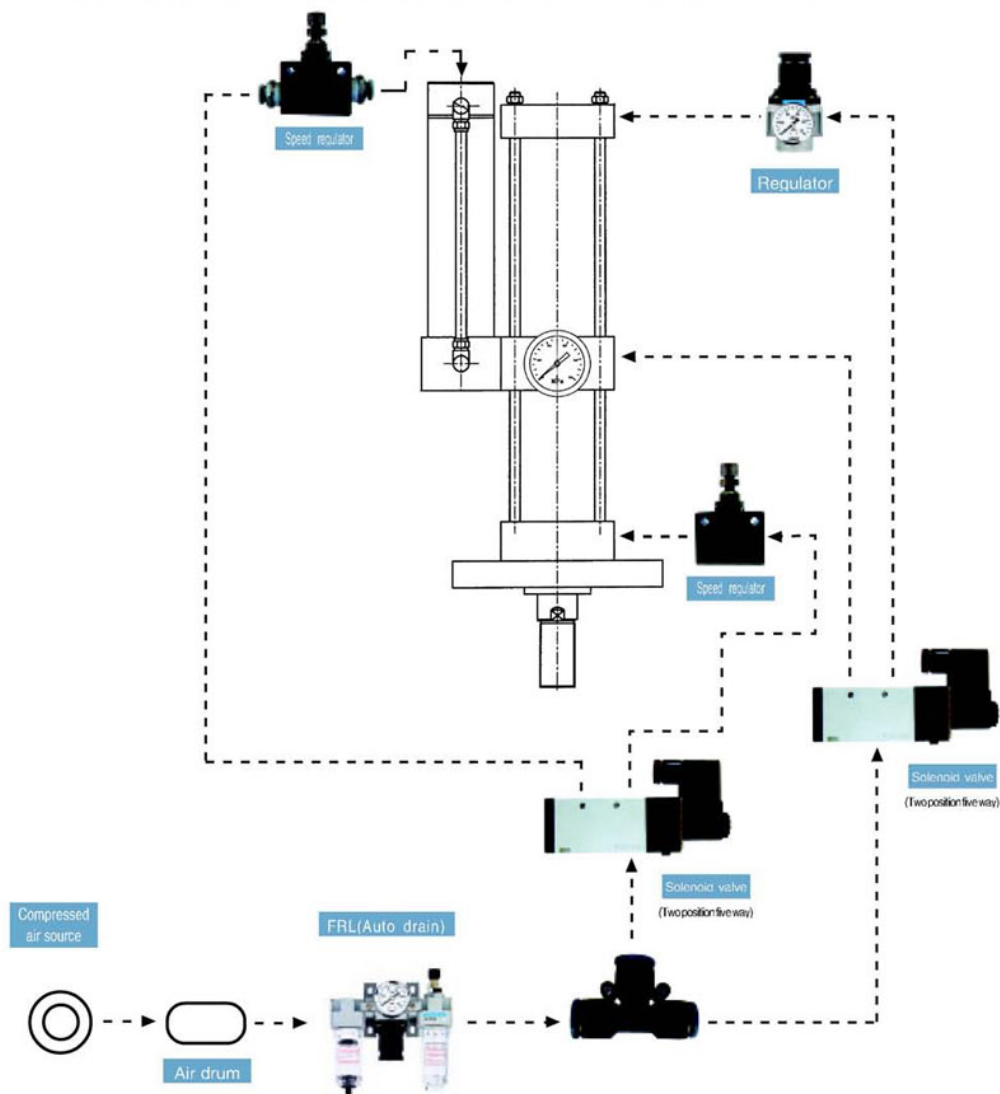


Compressed Air

Hydraulic Fluid

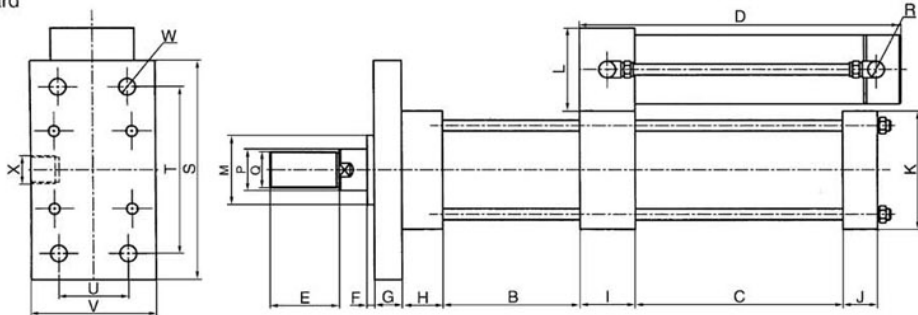


### Recommend circuit diagram for standard air-oil power pressure



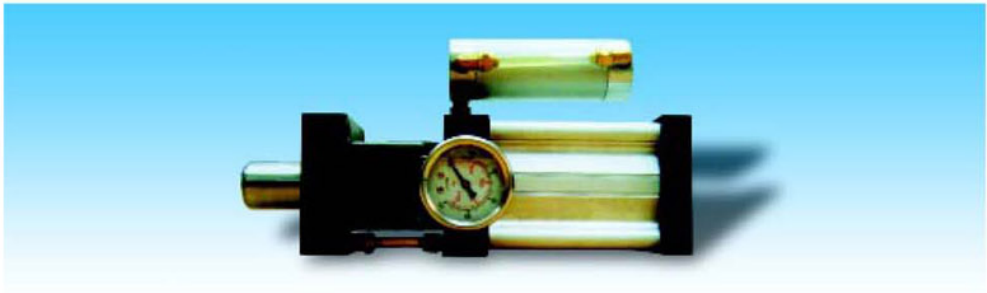
Dimension:

■ Standard

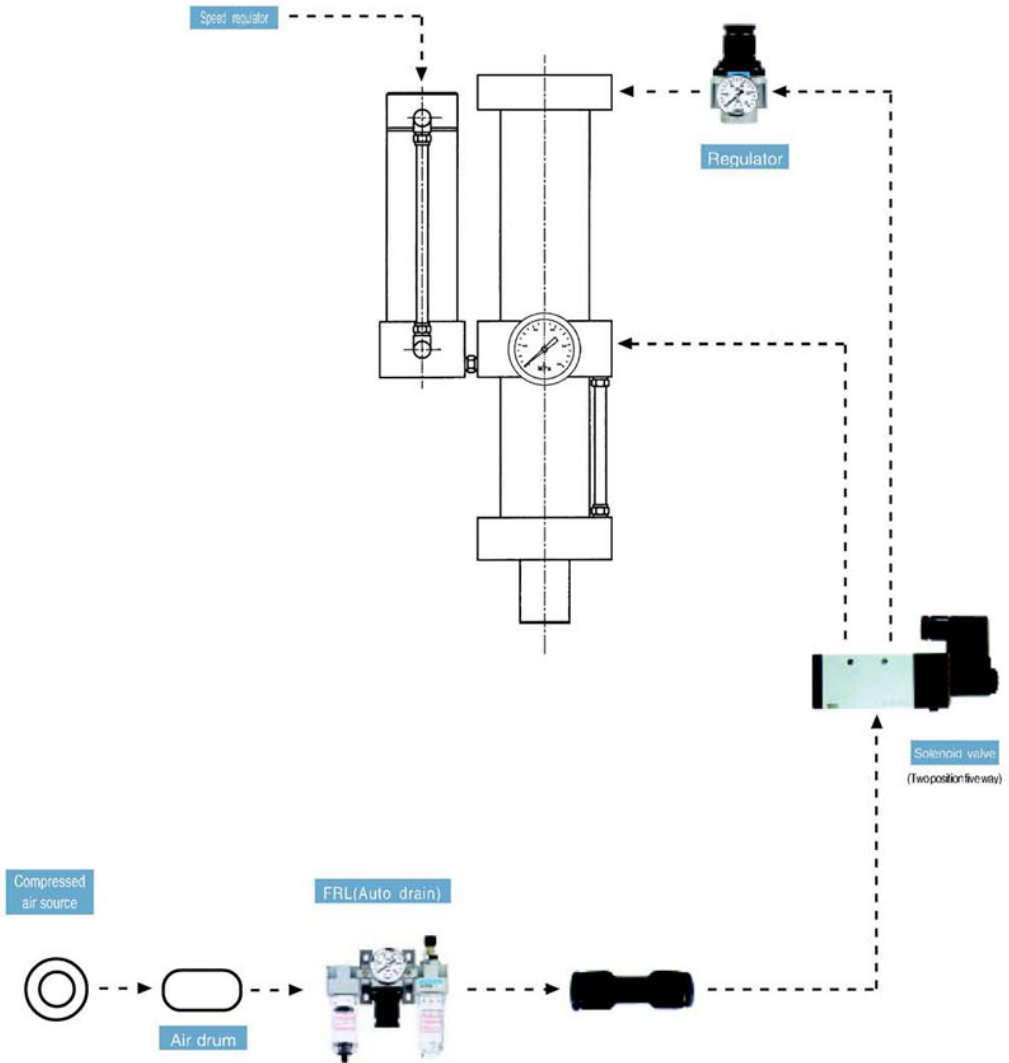


Inner diameter of oil cylinder(T)	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
50(1T)	50	5	20	30	30	25	85 x 85	60 x 60	φ 50	75	φ 30	M26 x 1.5	G1/4"	156	120	90	50	φ 12	G1/4"
63(3T)	50	5	20	35	40	25	100 x 100	69 x 69	φ 55	75	φ 35	M30 x 1.5	G3/8"	190	150	105	65	φ 14	G3/8"
80(5T)	50	5	20	35	40	25	114 x 114	90 x 90	φ 55	90	φ 35	M30 x 1.5	G3/8"	220	170	120	70	φ 16	G3/8"
100(10T)	55	5	25	40	40	30	140 x 140	112 x 112	φ 65	90	φ 45	M40 x 2	G1/2"	250	200	145	80	φ 20	G1/2"
100(13T)	55	5	25	40	40	30	140 x 140	112 x 112	φ 65	90	φ 45	M40 x 2	G1/2"	250	200	145	80	φ 20	G1/2"
125(15T)	55	5	25	40	50	30	180 x 180	112 x 112	φ 80	90	φ 60	M50 x 2	G1/2"	320	250	190	120	φ 22	G1/2"
125(20T)	55	5	25	40	50	30	180 x 180	112 x 112	φ 80	90	φ 60	M50 x 2	G1/2"	320	250	190	120	φ 22	G1/2"
160(30T)	55	5	30	40	60	40	210 x 210	140 x 140	φ 100	90	φ 60	M63 x 2	G3/4"	355	290	218	140	φ 30	G3/4"
160(40T)	55	5	40	40	60	40	250 x 250	140 x 140	φ 100	90	φ 80	M63 x 2	G3/4"	390	320	240	160	φ 35	G3/4"

Tonnage	TTL stroke	Boost stroke	A					D	TTL stroke	Boost stroke	A					D	TTL stroke	Boost stroke	A					D	TTL stroke	Boost stroke	A					D	
			A	B	C	D	E				A	B	C	D	E				A	B	C	D	E				A	B	C	D	E		
1T	50	5	360	110	260	100	5	400	110	310	155	5	450	110	300	200	5	500	110	410	255	410	5	550	110	300	200	5	600	110	410	255	410
		10	400	160	260	100	10	450	160	310	155	10	500	160	300	200	10	550	160	410	255	410	10	600	160	300	200	10	650	160	410	255	410
		15	450	210	260	100	15	500	210	310	155	15	550	210	300	200	15	600	210	410	255	410	15	650	210	300	200	15	700	210	410	255	410
		20	500	260	260	100	20	550	260	310	155	20	600	260	300	200	20	650	260	410	255	410	20	700	260	300	200	20	750	260	410	255	410
3T	50	5	360	110	260	100	5	410	110	310	160	5	460	110	300	200	5	510	110	410	260	410	5	560	110	300	200	5	610	110	410	260	410
		10	410	160	260	100	10	460	160	310	160	10	510	160	300	200	10	560	160	410	260	410	10	610	160	300	200	10	660	160	410	260	410
		15	460	210	260	100	15	510	210	310	160	15	560	210	300	200	15	610	210	410	260	410	15	660	210	300	200	15	710	210	410	260	410
		20	510	260	260	100	20	560	260	310	160	20	610	260	300	200	20	660	260	410	260	410	20	710	260	300	200	20	760	260	410	260	410
5T	50	5	380	130	290	100	5	430	130	340	160	5	480	130	300	200	5	500	130	410	260	440	5	550	130	300	200	5	600	130	410	260	440
		10	445	195	290	100	10	495	195	340	160	10	545	195	300	200	10	560	195	410	260	440	10	610	195	300	200	10	660	195	410	260	440
		15	510	260	290	100	15	560	260	340	160	15	610	260	300	200	15	630	260	410	260	440	15	680	260	300	200	15	730	260	410	260	440
		20	575	325	290	100	20	625	325	340	160	20	675	325	300	200	20	690	325	410	260	440	20	740	325	300	200	20	790	325	410	260	440
10T	50	5	360	130	295	100	5	465	130	345	175	5	515	130	300	200	5	565	130	410	275	445	5	615	130	300	200	5	665	130	410	275	445
		10	410	195	295	100	10	530	195	345	175	10	580	195	300	200	10	630	195	410	275	445	10	680	195	300	200	10	730	195	410	275	445
		15	460	260	295	100	15	595	260	345	175	15	645	260	300	200	15	695	260	410	275	445	15	745	260	300	200	15	795	260	410	275	445
		20	510	325	295	100	20	660	325	345	175	20	710	325	300	200	20	760	325	410	275	445	20	810	325	300	200	20	860	325	410	275	445
13T	50	5	430	145	295	100	5	480	145	310	175	5	530	145	300	200	5	580	145	410	275	445	5	630	145	300	200	5	680	145	410	275	445
		10	510	225	295	100	10	560	225	310	175	10	610	225	300	200	10	660	225	410	275	445	10	710	225	300	200	10	760	225	410	275	445
		15	590	305	295	100	15	640	305	310	175	15	690	305	300	200	15	740	305	410	275	445	15	790	305	300	200	15	840	305	410	275	445
		20	670	385	295	100	20	720	385	310	175	20	770	385	300	200	20	820	385	410	275	445	20	870	385	300	200	20	920	385	410	275	445
15T	50	5	443	138	295	100	5	493	138	345	180	5	543	138	300	200	5	593	138	410	280	445	5	643	138	300	200	5	693	138	410	280	445
		10	508	203	295	100	10	558	203	345	180	10	608	203	300	200	10	658	203	410	280	445	10	708	203	300	200	10	758	203	410	280	445
		15	573	268	295	100	15	623	268	345	180	15	673	268	300	200	15	723	268	410	280	445	15	773	268	300	200	15	823	268	410	280	445
		20	638	333	295	100	20	688	333	345	180	20	738	333	300	200	20	788	333	410	280	445	20	838	333	300	200	20	888	333	410	280	445
20T	50	5	468	163	295	100	5	518	163	345	180	5	568	163	300	200	5	618	163	410	280	445	5	668	163	300	200	5	718	163	410	280	445
		10	558	253	295	100	10	608	253	345	180	10	658	253	300	200	10	708	253	410	280	445	10	758	253	300	200	10	808	253	410	280	445
		15	648	343	295	100	15	698	343	345	180	15	748	343	300	200	15	798	343	410	280	445	15	848	343	300	200	15	898	343	410	280	445
		20	738	433	295	100	20	788	433	345	180	20	838	433	300	200	20	888	433	410	280	445	20	938	433	300	200	20	988	433	410	280	445
30T	50	5	526	191	300	100	5	576	191	360	180	5	626	191	300	200	5	676	191	410	280	450	5	726	191	300	200	5	776	191	410	280	450
		10	631	296	300	100	10	681	296	360	180	10	731	296	300	200	10	781	296	410	280	450	10	831	296	300	200	10	881	296	410	280	450
		15	738	401	300	100	15	788	401	360	180	15	838	401	300	200	15	888	401	410	280	450	15	938	401	300	200	15	988	401	410	280	450
		20	841	506	300	100	20	891	506	360	180	20	941	506	300	200	20	991	506	410	280	450	20	1041	506	300	200	20	1091	506	410	280	450
40T	50	5	536	191	300	100	5	586	191	360	180	5	636	191	300	200	5	686	191	410	280	450	5	736	191	300	200	5	786	191	410	280	450
		10	641	296	300	100	10	691																									

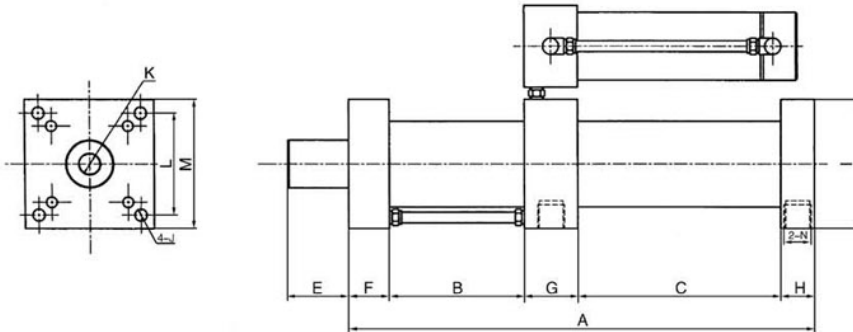


### Recommend circuit diagram for vertical compression air-oil power pressure



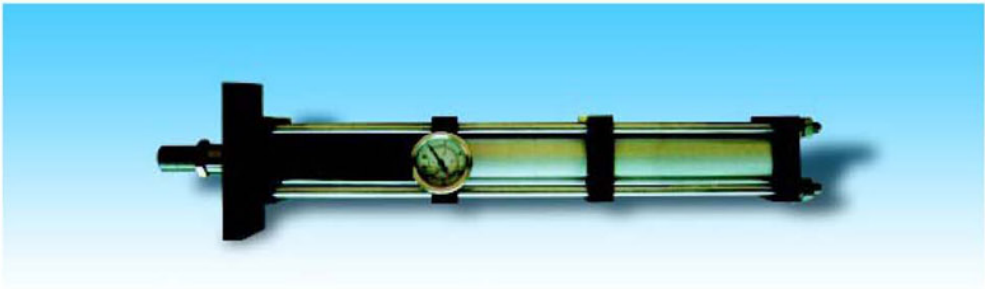
## Dimension:

■ vertical compression

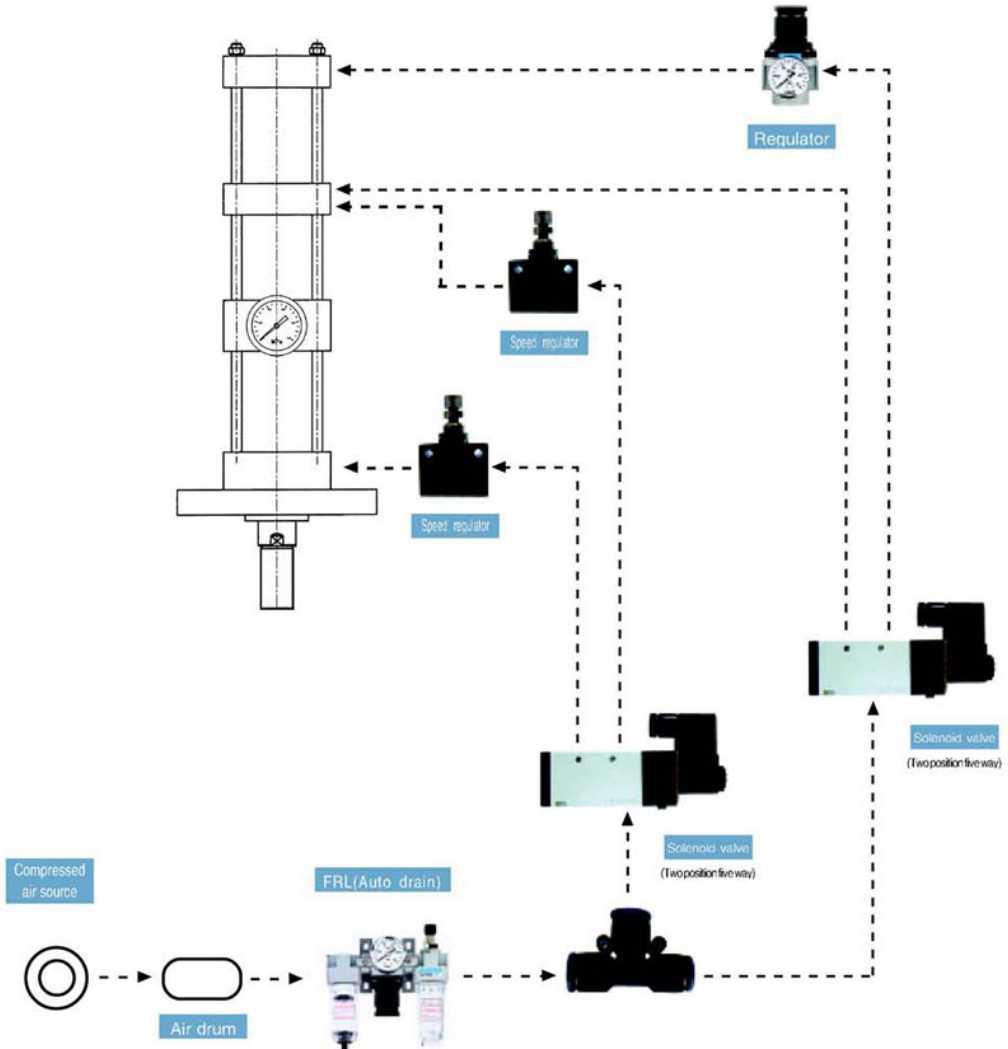


Inner diameter of oil cylinder(T)	E	F	G	H	I	J	K	L	M	N
50(1T)	50	30	30	20	95 × 95	φ 9	M16 深 25	75 × 75	95 × 95	G1/4"
50(2T)	50	30	30	20	95 × 95	φ 9	M16 深 25	75 × 75	95 × 95	G1/4"
63(3T)	50	30	30	20	114 × 114	φ 11	M16 深 25	92 × 92	114 × 114	G1/4"
63(5T)	50	30	30	20	114 × 114	φ 11	M16 深 25	92 × 92	114 × 114	G1/4"
80(5T)	50	40	40	30	140 × 140	φ 13	M16 深 25	110 × 110	140 × 140	G3/8"

Tonnage	A B C			Tonnage	Boost stroke	A B C			Tonnage	Boost stroke	A B C			Tonnage	Boost stroke	A B C								
	A	B	C			A	B	C			A	B	C			A	B	C						
1T	5	231	60	91	2T	5	241	60	101	3T	5	251	65	106	5T	5	275	65	130	8T	5	306	65	131
	10	261	65	116		10	286	65	141		10	296	70	146		10	375	105	190		10	401	95	196
	15	291	70	141		15	356	90	181		15	366	100	186		15	495	165	250		15	531	160	261
	20	326	80	166		20	436	135	221		20	446	140	226		20	615	225	310		20	661	225	326

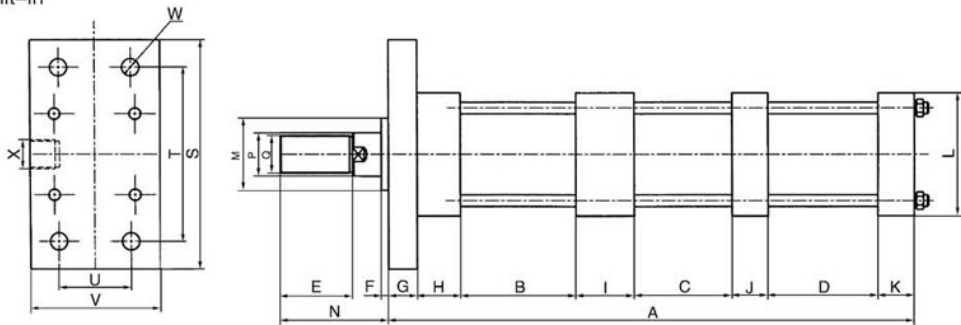


### Recommend circuit diagram for built-in air-oil power pressure



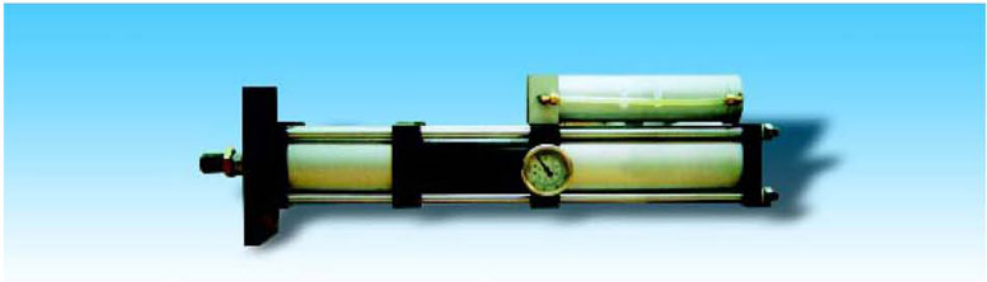
Dimension:

■ Built-in

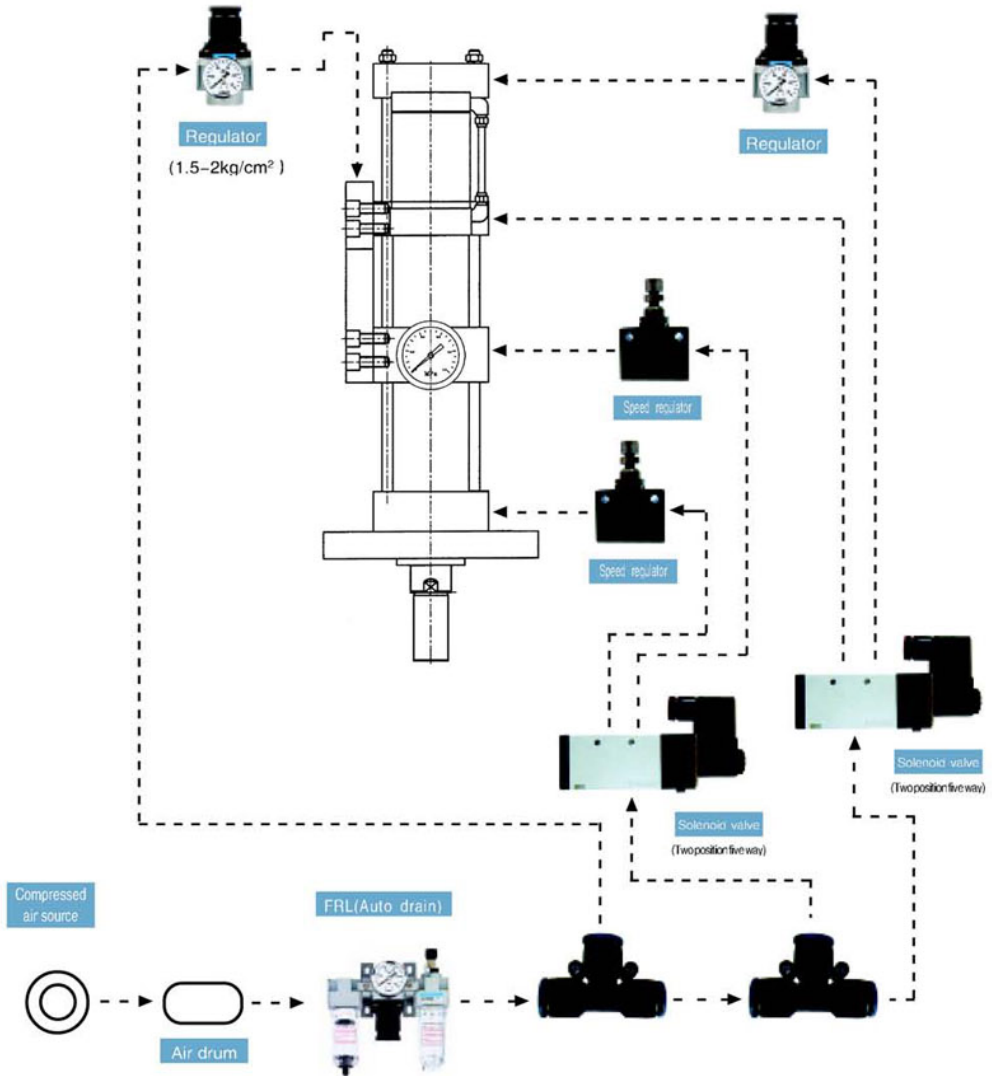


Inner diameter of oil cylinder(T)	E	F	G	H	I	J	K	L	M	N	P	Q	S	T	U	V	W	X
50(1T)	50	5	20	30	30	25	25	85 × 85	φ 50	75	φ 30	M26 × 1.5	156	120	90	50	φ 12	G1/4"
63(3T)	50	5	20	35	40	25	25	100 × 100	φ 55	75	φ 35	M30 × 1.5	190	150	105	65	φ 14	G3/8"
80(5T)	50	5	20	35	40	25	25	114 × 114	φ 55	90	φ 35	M30 × 1.5	220	170	120	70	φ 16	G3/8"
100(10T)	55	5	25	40	40	30	30	140 × 140	φ 65	90	φ 45	M40 × 2	250	200	145	80	φ 20	G1/2"
100(13T)	55	5	25	40	40	30	30	140 × 140	φ 65	90	φ 45	M40 × 2	250	200	145	80	φ 20	G1/2"
125(15T)	55	5	25	40	50	30	30	180 × 180	φ 80	90	φ 60	M50 × 2	320	250	190	120	φ 22	G1/2"
125(20T)	55	5	25	40	50	30	30	180 × 180	φ 80	90	φ 60	M50 × 2	320	250	190	120	φ 22	G1/2"
160(30T)	55	5	30	40	60	40	40	210 × 210	φ 100	90	φ 60	M63 × 2	355	290	218	140	φ 30	G3/4"
160(40T)	55	5	40	40	60	40	40	250 × 250	φ 100	90	φ 80	M63 × 2	390	320	240	160	φ 35	G3/4"

Tonnage	TTL stroke	Boost stroke				TTL stroke	Boost stroke				TTL stroke	Boost stroke				TTL stroke	Boost stroke					
		A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D		
1T	50	5	475		110	100	5	555		110	150	5	640		110	200	5	720		110		
		10	525	110	160		10	605	160	135		160	10	690	210		170	160	10	770	260	110
		15	575		210		15	655				210	15	740				210	15	820		210
		20	625		260		20	705				260	20	790				260	20	870		260
3T	50	5	495		110	105	5	575		110	150	5	660		110	200	5	740		110		
		10	545	115	160		10	625	165	135		160	10	710	215		170	160	10	790	265	105
		15	595		210		15	675				210	15	760				210	15	840		210
		20	645		260		20	725				260	20	810				260	20	890		260
5T	50	5	520		130	110	5	605		130	150	5	695		130	200	5	770		130		
		10	585	115	195		10	670	165	145		195	10	750	215		175	195	10	835	265	110
		15	650		260		15	735				260	15	815				260	15	900		260
		20	715		325		20	800				325	20	880				325	20	965		325
10T	50	5	565		130	110	5	650		130	150	5	730		130	200	5	815		130		
		10	630	130	195		10	715	180	145		195	10	795	230		175	195	10	880	280	110
		15	695		260		15	780				260	15	860				260	15	945		260
		20	760		325		20	845				325	20	925				325	20	1010		325
13T	50	5	580		145	110	5	665		145	150	5	745		145	200	5	830		145		
		10	660	130	225		10	745	180	145		225	10	825	230		175	225	10	910	280	110
		15	740		305		15	825				305	15	905				305	15	990		305
		20	820		385		20	905				385	20	985				385	20	1070		385
15T	50	5	583		138	110	5	668		138	150	5	748		138	200	5	833		138		
		10	648	135	203		10	733	185	145		203	10	813	235		175	203	10	898	285	110
		15	713		268		15	798				268	15	878				268	15	963		268
		20	778		333		20	863				333	20	943				333	20	1028		333
20T	50	5	608		163	110	5	693		163	150	5	773		163	200	5	858		163		
		10	698	135	253		10	783	185	145		253	10	863	235		175	253	10	948	285	110
		15	788		343		15	873				343	15	953				343	15	1038		343
		20	878		433		20	963				433	20	1043				433	20	1128		433
30T	50	5	686		191	125	5	776		191	150	5	866		191	200	5	956		191		
		10	791	135	296		10	881	185	165		296	10	971	235		205	296	10	1061	285	125
		15	896		401		15	986				401	15	1076				401	15	1166		401
		20	1001		506		20	1091				506	20	1181				506	20	1271		506
40T	50	5	691		191	120	5	776		191	150	5	866		191	200	5	941		191		
		10	796	135	296		10	881	185	155		296	10	961	235		185	296	10	1046	285	120
		15	901		401		15	988				401	15	1066				401	15	1151		401
		20	1006		506		20	1091				506	20	1171				506	20	1256		506



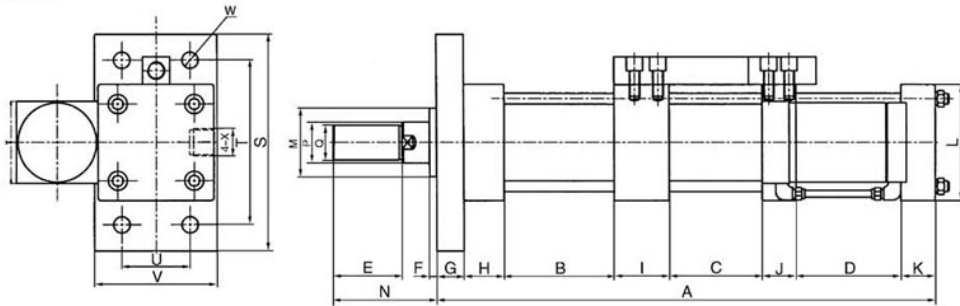
### Recommend circuit diagram for speed air-oil power pressure





Dimension:

Speed



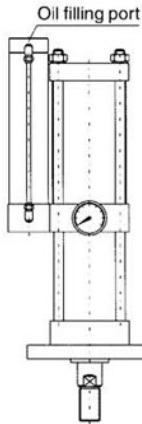
Inner diameter of oil cylinder(T)	E	F	G	H	I	J	K	L	M	N	P	Q	S	T	U	V	W	X	L
50(1T)	50	5	20	30	30	25	25	85 x 85	φ 50	75	φ 30	M26 x 1.5	156	120	90	50	φ 12	G1/4"	60 x 60
63(3T)	50	5	20	35	40	25	25	100 x 100	φ 55	75	φ 35	M30 x 1.5	190	150	105	65	φ 14	G3/8"	69 x 69
80(5T)	50	5	20	35	40	25	25	114 x 114	φ 55	90	φ 35	M30 x 1.5	220	170	120	70	φ 16	G3/8"	69 x 69
100(10T)	55	5	25	40	40	30	30	140 x 140	φ 65	90	φ 45	M40 x 2	250	200	145	80	φ 20	G1/2"	69 x 69
100(13T)	55	5	25	40	40	30	30	140 x 140	φ 65	90	φ 45	M40 x 2	250	200	145	80	φ 20	G1/2"	69 x 69
125(15T)	55	5	25	40	50	30	30	180 x 180	φ 80	90	φ 60	M50 x 2	320	250	190	120	φ 22	G1/2"	69 x 69
125(20T)	55	5	25	40	50	30	30	180 x 180	φ 80	90	φ 60	M50 x 2	320	250	190	120	φ 22	G1/2"	69 x 69
160(30T)	55	5	30	40	60	40	40	210 x 210	φ 100	90	φ 60	M63 x 2	355	290	218	140	φ 30	G3/4"	69 x 69
160(40T)	55	5	40	40	60	40	40	250 x 250	φ 100	90	φ 80	M63 x 2	390	320	240	160	φ 35	G3/4"	69 x 69

Tonnage	TTL stroke	Boost stroke				TTL stroke	Boost stroke				TTL stroke	Boost stroke				TTL stroke	Boost stroke									
		A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D						
1T	50	5	486	95	95	110	100	5	586	145	145	110	150	5	686	195	195	110	200	5	786	245	245	110		
		10	536			10		636	10			736		10	836			10		840	10			940		
		15	586			15		686	15			786		15	886			15		990	15			1090	15	1190
		20	636			20		736	20			836		20	940			20		1040	20			1140		
3T	50	5	490	95	100	110	100	5	590	145	150	110	150	5	690	195	200	110	200	5	790	245	250	110		
		10	540			10		640	10			740		10	840			10		940						
		15	590			15		690	15			790		15	890			15		990						
		20	640			20		740	20			840		20	940			20		1040						
5T	50	5	510	95	100	130	100	5	610	145	150	130	150	5	710	195	200	130	2002	5	810	245	250	130		
		10	575			10		675	10			775		10	875			10		975						
		15	640			15		740	15			840		15	940			15		1040						
		20	705			20		805	20			905		20	1005			20		1105						
10T	50	5	545	95	110	130	100	5	645	145	160	130	150	5	745	195	210	130	200	5	845	245	260	130		
		10	610			10		710	10			810		10	910			10		1010						
		15	675			15		775	15			875		15	975			15		1075						
		20	740			20		840	20			940		20	1040			20		1140						
13T	50	5	560	95	110	145	100	5	660	145	160	145	150	5	760	195	210	145	200	5	860	245	260	145		
		10	640			10		740	10			840		10	940			10		1040						
		15	720			15		820	15			920		15	1020			15		1120						
		20	800			20		900	20			1000		20	1100			20		1200						
15T	50	5	578	105	110	138	100	5	678	155	160	138	150	5	778	205	210	138	200	5	878	255	260	138		
		10	643			10		743	10			843		10	943			10		1043						
		15	708			15		808	15			908		15	1008			15		1108						
		20	773			20		873	20			973		20	1073			20		1173						
20T	50	5	578	105	110	163	100	5	703	155	160	163	150	5	803	205	210	163	200	5	903	255	260	163		
		10	693			10		793	10			893		10	993			10		1093						
		15	783			15		883	15			983		15	1083			15		1183						
		20	873			20		973	20			1073		20	1173			20		1273						
30T	50	5	666	115	115	191	100	5	796	165	165	191	150	5	896	215	215	191	200	5	996	265	265	191		
		10	801			10		901	10			1001		10	1101			10		1201						
		15	906			15		1006	15			1106		15	1206			15		1306						
		20	1011			20		1111	20			1211		20	1311			20		1411						
40T	50	5	716	120	115	199	100	5	816	170	165	199	150	5	916	220	215	199	200	5	1016	270	265	199		
		10	821			10		921	10			1021		10	1121			10		1221						
		15	926			15		1026	15			1126		15	1226			15		1326						
		20	1031			20		1131	20			1231		20	1331			20		1431						

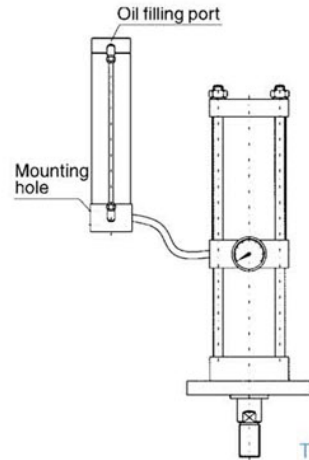
## Mounting:

- Mounting as multi-angle, the oil port must ensure upwards when installing.

### Vertical overhead mounting(Recommend mounting)

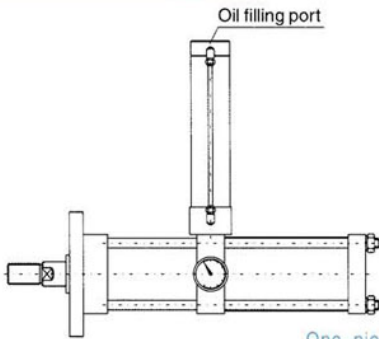


One-piece mounting

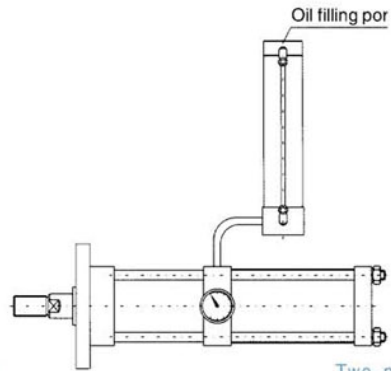


Two-piece mounting

### Horizontal mounting

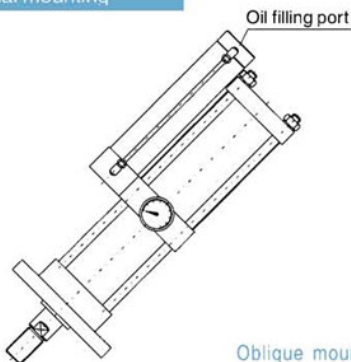


One-piece mounting

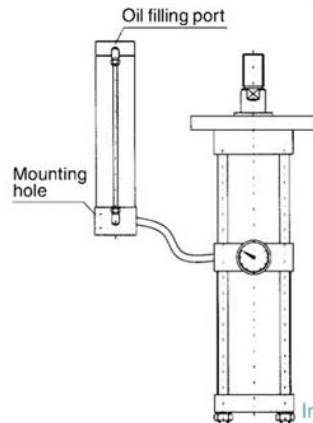


Two-piece mounting

### Special mounting



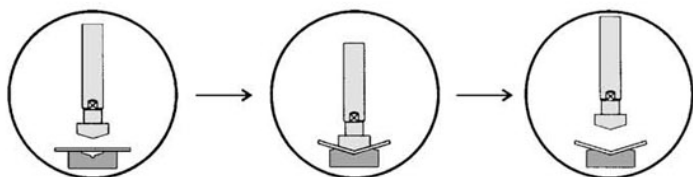
Oblique mounting



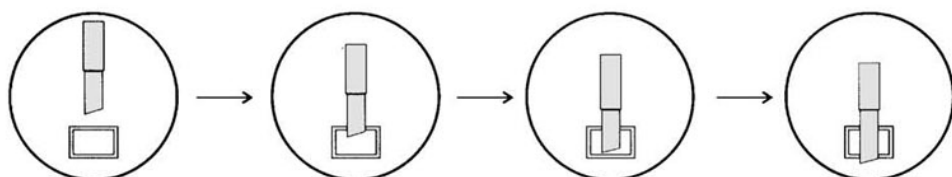
Inverted mounting

## Examples of power cylinder application:

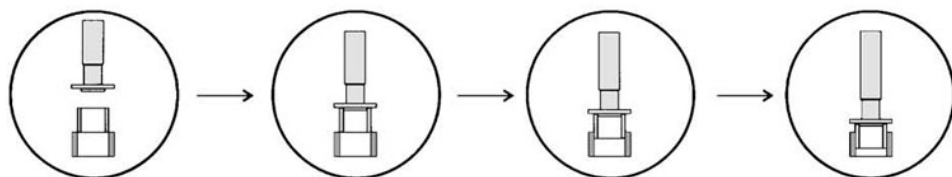
bend forming



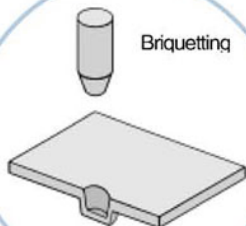
Transfer die



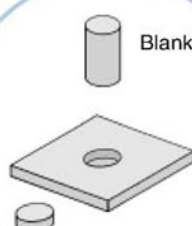
Pressfit



Briquetting



Blanking



Buckling

