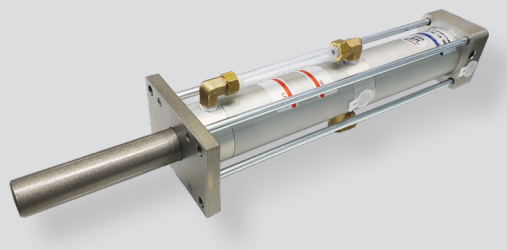
KAHB series



Overview

- Air-hydro booster is a device that converts hydraulic pressure from several times to several tens of times by pressurizing air pressure to a air booster with built-in hydraulic oil
- In particular, it is convenient because it is possible to discharge a low pressure large flow rate during rapid feeding and a high pressure low flow rate discharge for increased pressure feeding
- With low cost pneumatic pressure, automation that requires high pressure such as stamping, rivetting, and pressing is possible

Features

- With pneumatic pressure, large-capacity high pressure and low hydraulic pressure can be obtained
- With the pneumatic valve, it is possible to simply operate the two-stage discharge operation of rapid feeding and increasing pressure feeding
- The hydraulic pressure can be adjusted steplessly by pneumatic adjustment
- Less air consumption to get the same output power
- Stable operation is possible because there is no increase in oil temperature
- The unique structure does not require air mixing or air bleed operation

How to order

KAHB-100 - 30 - 05 15

① ② ③ ④

① Model		② Pressure ratio		③ Rapid feeding								④ Increased pressure feeding							
Model	Bore size	Symbol	Ratio	Stroke	Flow rate	Stroke	Flow rate	Stroke	Flow rate	Stroke	Flow rate	Stroke	Flow rate	Stroke	Flow rate	Stroke	Flow rate	Stroke	Flow rate
KAHB-50	Ø50	13	1:13	05 (50)	90	10 (100)	180	15 (150)	270	20 (200)	360	05 (50)	10	10 (100)	17	15 (150)	25	20 (200)	33
		25	1:25		94		188		280		380		5		9		13		16
KAHB-100	Ø100	4	1:04		294		588		880		1180		123		221		320		418
		16	1:16		370		740		1110		1480		30		55		80		104
		30	1:30		380		760		1140		1520		16		28		41		54
KAHB-160	Ø160	4	1:04		750		1500		2550		3000		356		608		859		1110
		16	1:16		940		1880		2820		3760		89		152		214		277
		28	1:28		950		1900		2850		3800		50		85		120		156

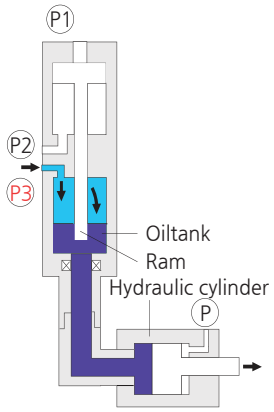
Specifications

Model	KAHB-50-13	KAHB-50-25	KAHB-100-4	KAHB-100-16	KAHB-100-30	KAHB-160-4	KAHB-160-16	KAHB-160-28
Bore size	Ø50		Ø100			Ø160		
Fluid	Compressed air							
Max. operating pressure	0.2 ~ 0.99MPa(2 ~ 9.9kgf/㎠)							
Proof pressure	1.5MPa(15kgf/㎠)							
Ambient & fluid temperature	5 ~ 60℃							
Hydraulic fluid	Turbine oil type 1 ISO VG32							
Pressure ratio	1:13	1:25	1:4	1:16	1:30	1:4	1:16	1:28
Rapid feeding discharge(㏄) min~max	90 ~ 360	95 ~ 370	295~1180	370~1480	380~1510	750~3000	940~3760	970~3800
High pressure discharge(㏄) min~max	8 ~ 30	5 ~ 16	100~400	30~100	15~50	300~1000	80~260	40~140
Pressure intensifier kgf/㎠(MPa)	195{19.5}	380{38}	60{6}	240{24}	450{45}	60{60}	240{24}	420{42}

※ The mounting direction should face the hydraulic outlet and install it vertically.
※ Fill the oil level within the range of the level indicator.

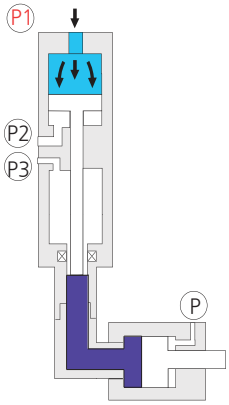
How it works

Rapid feeding move forward



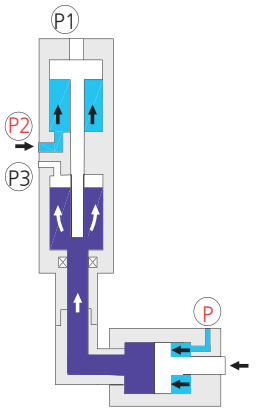
When air is supplied to port P3, the oil in the oil tank move forward the hydraulic cylinder rapidly. The pressure is the same as the pneumatic pressure, but the flow rate flowing into athe hydraulic cylinder is large, so the hydraulic cylinder advances at high speed.

High thrust advance



When air is supplied through port P1, the ram advances and high pressure hydraulic pressure flows into the hydraulic cylinder to move forward the cylinder with high thrust.

Rapid feeding move forward



When air is supplied to port P and port P2, the ram returns, and the hydraulic cylinder rapidly moves backward.

How to select a model

1. Select the hydraulic cylinder required for work.
- Determination of cylinder stroke (Add about 70 mm of clearance between the punch and the workpiece so that there is no interference with the removal of the workpiece)
- Determination of cylinder operating pressure (thrust) (refer to the table of theoretical thrust and pressure area below)
- Determination of strokes that require high thrust (thickness of punching, bending, etc.)

※ Select the pressure transfer flow rate to be 1.5 times or more of the net flow rate.

2. Calculation of the flow rate of rapid feeding and increased pressure feeding (when piercing 1.6t steel plate with 140kgf/cm2 of ex cylinder Φ63x100St cylinder)
- Calculation of cylinder volume: Φ63 cross-sectional area (πx6.3^2/4) x stroke (10cm) = 312cc
- Calculation of the volume of the increased pressure feeding: Φ63 cross-sectional area (πx6.3^2/4) x stroke (0.16cm + margin 0.14) = about 9.3cc (For the increased pressure feeding flow rate, add the flow rate loss due to the expansion of the hose pipe and the volumetric compression ratio of the hydraulic oil.)

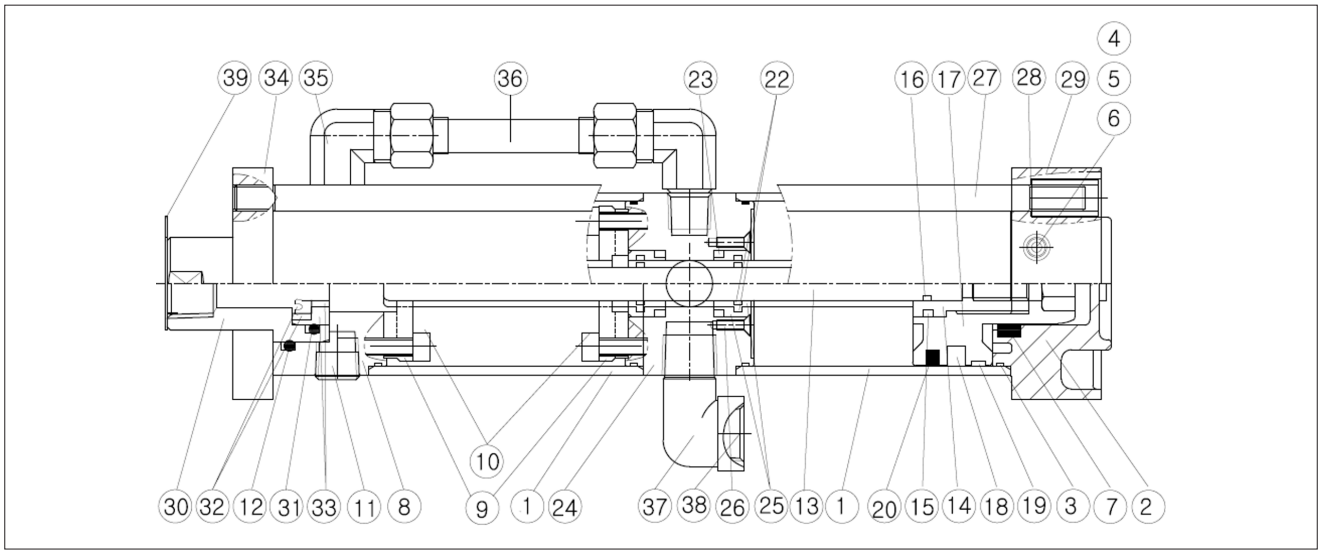
3. Calculation and determination of the pressure intensification ratio: Hydraulic 140kgf/cm2/Pneumatic 5kgf/cm2 = 28 times or more 30 times selection (KAHB*-28 or 30)**

4. Air-hydro booster flow rate selection
- Selection of 380cc rapid transfer flow close to 312cc cylinder volume (KAHB100-30-05)
- Selected 11cc for increased pressure feeding flow exceeding 9.3cc for boosting pressure transfer volume (KAHB100-30-0505)

Hydraulic area and theoretical thrust by cylinder bore

Pneumatic ratio(MPa)		0.3			0.4			0.5			0.6			0.7		
Bore size	Boost ratio	4	16	28	4	16	28	4	16	28	4	16	28	4	16	28
	Hydraulic(MPa) / Hydraulic area(㎠)	1.2	4.8	8.4	1.6	6.4	11.2	4.5	16.5	28.5	2.4	9.6	16.8	2.8	11.2	19.6
Ø40	12.6	1.5	6.0	10.6	2.0	8.1	14.1	5.7	20.8	35.9	3.0	12.1	21.2	3.5	14.1	24.7
Ø50	19.6	2.4	9.4	16.5	3.1	12.5	22.0	8.8	32.3	55.9	4.7	18.8	32.9	5.5	22.0	38.4
Ø63	31.2	3.7	15.0	26.2	5.0	20.0	34.9	14.0	51.5	88.9	7.5	30.0	52.4	8.7	34.9	61.2
Ø80	50.3	6.0	24.1	42.3	8.0	32.2	56.3	22.6	83.0	143.4	12.1	48.3	84.5	14.1	56.3	98.6
Ø100	78.5	9.4	37.7	65.9	12.6	50.2	87.9	35.3	129.5	223.7	18.8	75.4	131.9	22.0	87.9	153.9
Ø125	122.7	14.7	58.9	103.1	19.6	78.5	137.4	55.2	202.5	349.7	29.4	117.8	206.1	34.4	137.4	240.5
Ø140	153.9	18.5	73.9	129.3	24.6	98.5	172.4	69.3	253.9	438.6	36.9	147.7	258.6	43.1	172.4	301.6
Ø160	201.1	24.1	96.5	168.9	32.2	128.7	225.2	90.5	331.8	573.1	48.3	193.1	337.8	56.3	225.2	394.2
Ø180	254.5	30.5	122.2	213.8	40.7	162.9	285.0	114.5	419.9	725.3	61.1	244.3	427.6	71.3	285.0	498.8
Ø200	314.2	37.7	150.8	263.9	50.3	201.1	351.9	141.4	518.4	895.5	75.4	301.6	527.9	88.0	351.9	615.8

Structure



No.	Parts	Material	No.	Parts	Material	No.	Parts	Material
1	Cylinder tube / Oil tank tube	A6063	14	Rod connect	SM45C	28	Washer of T.R nut	SWRH62B
2	Head cover	12 types of ALDC	15	O-Ring of rod connect	NBR	29	Nut of tie rod	SM45C
3	O-Ring of uube	NBR	16	O-Ring of rod	NBR	30	High pressure tube	SM45C
4	Cushion needle	STS303/C3604	17	Piston	12 types of ALDC	31	O-Ring of H.P.T	NBR
5	O-Ring of cushion needle	NBR	18	Magnet	Sr Ferrite+NBR	32	Packing of H.P.T	Urethane
6	Stop ring of needle	STS304	19	Wearing of piston	POM	33	Packing stopper	SM45C
7	Cushion packing	NBR	20	Piston packing	NBR	34	Flange for mounting	SS400
8	Rod cover	A6061	22	O-Ring of M.C bush(25)	NBR	35	Male elbow of oil level	C3771
9	Baffle plate(**)	A6061	23	O-Ring of M.C	NBR	36	Oil level tube	PFA
10	Bolt of baffle plate	SCM435	24	Middle cover	A6061	37	Elbow for oil filling	C3771
11	Port cap of cover	SM45C	25	Bush(**) Of middle cover	A6061			
12	O-Ring of rod cover	NBR	26	Bolt of M.C bush mounting	SCM435			
13	Rod	SM45C	27	Tie rod	SM45C			

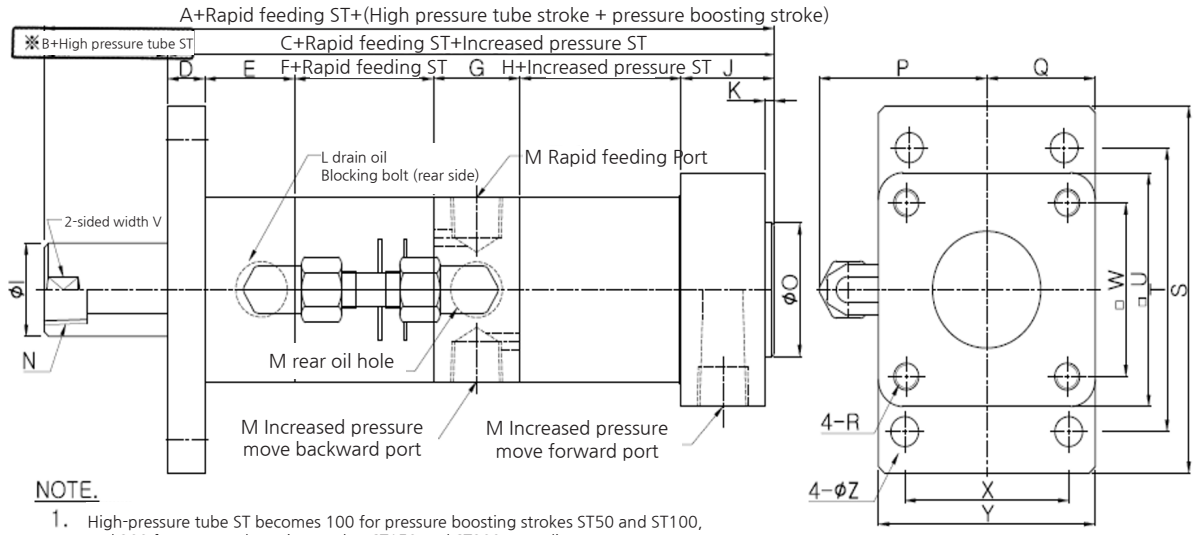
List of consumables

Model \ Symbol	3	5	7	12	15	16	20	22	23	31	32
KAHB-50-13	S48x1.5	AS568-10	PP24	G35	P16	P7	OPA50	P14	P16	G25	IDI-14.24.5
KAHB-50-25								P10			IDI-10.18.5
KAHB-100-4	S95x2.0	AS568-10	K53-036	G70	-	G25	OPA100	-	P50	G35	IDI-50.60.8
KAHB-100-16				G45	P14			P18	G30		IDI-25.35.8
KAHB-100-30								P25			IDI-18.28.8
KAHB-160-4	S160x2.0	AS568-10	PP50	G100	-	G35	OPA160	-	PNY80	G45	IDI-80.90.8
KAHB-160-16				G60	G25			P40	G45		IDI-40.50.8
KAHB-160-28								P30			IDI-30.40.8

Weight

Model	Weight \ Symbol	05	10	15	20
KAHB-50-13	3.7	0.3	0.6	0.9	1.2
KAHB-50-25	3.6	0.4	0.8	1.2	1.6
KAHB-100-4	14.6	1.8	3.6	5.4	7.2
KAHB-100-16	11.9	1.1	2.2	3.3	4.4
KAHB-100-30	11.4	1	2	3	4
KAHB-160-4	36.7	3.5	7	10.5	14
KAHB-160-16	35.2	1.8	3.6	5.4	7.2
KAHB-160-28	24.2	1.7	3.4	5.1	6.8

Dimensions



NOTE.

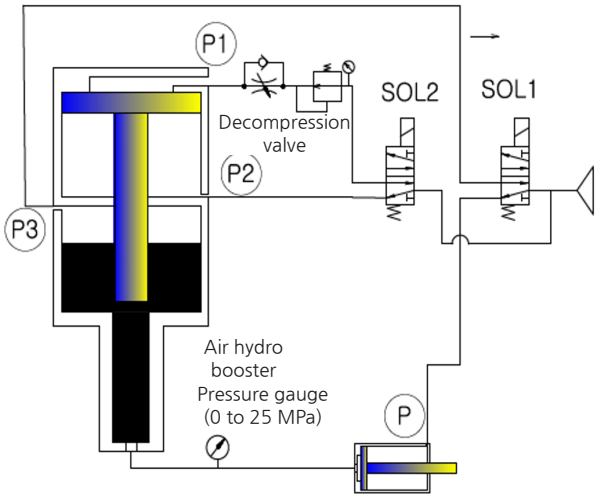
1. High-pressure tube ST becomes 100 for pressure boosting strokes ST50 and ST100, and 200 for pressure boosting strokes ST150 and ST200 according to common use.

Symbol / Bore size	A	B	C	D	E	F	G	H	J	K	L	M	O	P	Q	R	S	T	U	W	X	Y	Z
Ø50	285.5	20	265.5	12	29	83	28	83.5	30	3	Rc 1/4	Rc 3/8	40	65.0	35	M8x1.25	110	85	70	52	53	70	9
Ø100	327.5	28	299.5	14	30	90	32	90.5	43	7	Rc 1/4	Rc 1/2	52	90	58	M12x1.75	160	130	116	92	90	116	13
Ø160	377	40	337	16	31	98	38	95	59	23	Rc 3/8	Rc 3/4	-	120	92	M16x1.5	220	190	184	144	140	177	15

Model / Symbol	50-13	50-25	100-4	100-16	100-30	160-4	160-16	160-28
I	28.0	28.0	65.0	40.0	40.0	95	55	55
N	Rc 1/2	Rc 1/2	Rc 1	Rc 1	Rc 1	Rc 1/2	Rc 1/2	Rc 1/2
V	27	27	60	38	38	90	50	50

Schematic

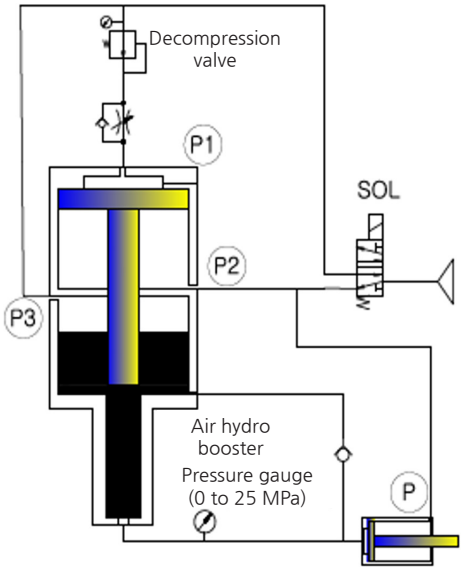
Standard



It is a circuit used in riveting machines, engraving machines, etc. If SOL1 is energized, rapid feed is performed, and if SOL2 is energized, pressure-increased feed is performed. When SOL1 and SOL2 are de-energized, rapid feed return occurs.

1. If you need to adjust the speed of rapid traverse and return, attach a speed controller to P3 and P.
2. Install the speed controller on P1 in the direction of meta-out to prevent the oil from forming bubbles or oil from being released into P3.
3. Combine the pressure reducing valve when using less high force. (To prevent hydraulic pressure decompression of rapid feed thrust)

High power at start



This is a circuit when high thrust is required only at the start, such as when moving with a low thrust after loosening the encroachment.

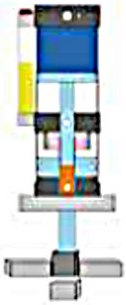
1. The speed adjustment etc. are the same as the standard circuit.

※ This model is a special order specification, so please consult with us when ordering.

Operation sequence

Driving state	SOL1	SOL2	P	P1	P2	P3
Stop	OFF	OFF	○	X	○	X
Pneumatic thrust stroke drive	ON	OFF	X	X	○	○
High thrust stroke drive	ON	ON	X	○	X	○
Return drive	OFF	OFF	○	X	○	X

Usage example


Penetrate


Penetrate


Trimming


Engrave


Bend


Pressure


Thinly cut


Merge


Thinly cut


Pressure


Riveting


Piling


Unfold


Welding


Unclamping cylinder