

System is designed to convert air pressure to high oil pressure with booster for the high power application of small clamp head.

- It is appropriate for work hoisting performance or clamp head with high output needed for all strokes.
- High output of 0.15~4.5 tons is available optionally with non-phase by adjusting air pressure with an air regulator.
- As oil pressure is used, the balanced, accurate force is always available.

SPECIFICATIONS

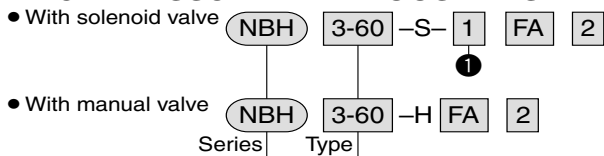
Item	Model code	NBH3-40	NBH3-60	NBH3-60-130	NBH-80	NBH-100
Boosting ratio		11	25	25	25	25
Output oil capacity (cm ³)		77	77	130	176	304
Theoretical output oil pressure at max. air pressure		10.8MPa	17.5MPa			
Working oil		Cosmo Mighty Super 10 (Cosmo Oil)				
Temperature range		+5~+60°C				
Air pressure	Working fluid	Air				
	Lubrication	Unnecessary (But possible)		Necessary		
	Pressure range	0.2~1MPa	0.2~0.7MPa			
	Recommended lubricating oil	JIS K2213-1 (Natural turbine oil ISO VG32) or equivalent				
Weight (kg)		9.5	15	17	41	92
With reed switch		Available			None	
Related instruments		Pressure switch · Pressure gauge				

MODEL CODE For order, specify the following code.

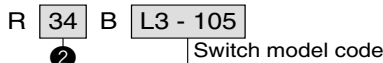
DIRECT PRESSURE TYPE BOOSTER



DIRECT PRESSURE TYPE BOOSTER SET



SWITCH-BRACKET ASSEMBLY

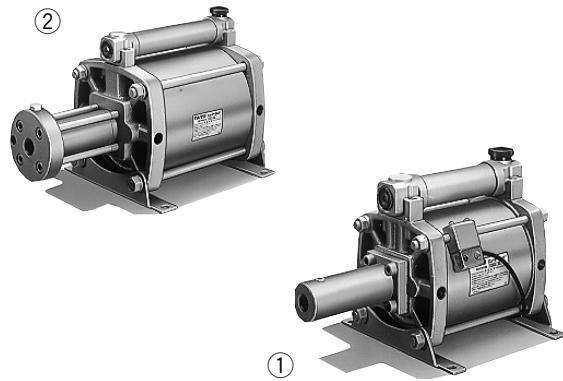


Select applicable switches out of the IRON PROXIMITY SWITCH SPECIFICATIONS

①	Solenoid valve voltage		②	Booster model code	
	1	AC100V (50/60Hz)		34	NBH3-40
2	AC200V (50/60Hz)	35	NBH3-60		
8	DC24V		NBH3-60-130		

DELIVERY INFORMATION

- It is delivered with reed switch not mounted.
- It is delivered with working fluid (Cosmo Mighty Super 10) NBH-80 2 ℓ, NBH-100 3 ℓ.
- For NBH-80/NBH-100, there is no model with reed switch.



①NBH3-60 ②NBH-80

IRON PROXIMITY SWITCH SPECIFICATIONS

Kind	With contact			
	FA L3-101	FB L3-105	FC L3-241	FD L3-245
Switch symbol	AC:80~220V		DC:20~28V	
Load voltage range	2~20mA		3~50mA	
Load current range	2VA		1.5W	
Maximum open / close capacity	Present		Present	
Contact protective circuit	Neon lamp (lights up during ON)		LED (lights up during OFF)	
Indicating lamp	0.3mm ² 2-core, outside diameter φ5.3mm		Rear wiring	
Wiring method	1m	5m	1m	5m
Code length	Small relay·Programmable controller			
Applied load				

ACTUAL OUTPUT

Unit: kN

Booster	Clamp head	Operating air pressure MPa								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
NBH3-40	LHA-LHA-25-LHA-40	2.7	4.1	5.5	6.9	8.2	9.6	11.0	12.4	13.5
	LHAS-2	5.1	7.8	10.4	12.9	15.5	18.1	20.7	23.3	25.6
	LHC	2.5	3.8	5.1	6.4	7.7	8.9	10.2	11.5	12.6
	LHD	1.1	1.7	2.3	2.8	3.3	3.9	4.5	5.0	5.5
NBH3-60	LHA-LHA-25-LHA-40	6.2	9.3	12.3	15.5	18.5	21.7	-	-	-
NBH3-60-130	LHAS-2	11.7	17.5	23.3	29.1	35.0	40.8	-	-	-
NBH-80	LHC	5.7	8.6	11.5	14.3	17.3	20.1	-	-	-
NBH-100	LHD	2.5	3.8	5.0	6.3	7.6	8.8	-	-	-

AIR CONSUMPTION

Unit: Nℓ/1 Reciprocating motion

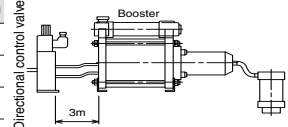
Booster	Operating air pressure MPa								
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
NBH3-40	6	8	10	12	14	16	18	20	21.8
NBH3-60	13.5	18	22.5	27	31.5	36	-	-	-
NBH3-60-130	21.5	29	36	43	50	57	-	-	-
NBH-80	31.5	42	52.5	63	73.5	84	-	-	-
NBH-100	60	80	100	120	140	160	-	-	-

(Note) The above air consumption indicates the atmospheric pressure converted from air capacity in 1 reciprocating motion with respective air pressure by booster.

WORKING VELOCITY OF CLAMP HEAD

Unit: sec

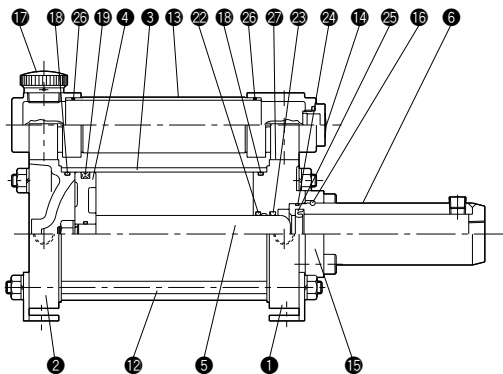
Booster	Common for all clamp heads	
	Stroke time (Push)	Stroke time (Pull)
NBH3-40	1	1
NBH3-60	1.5	1.5
NBH3-60-130	1.8	1.8
NBH-80	2	2
NBH-100	3.5	3.5



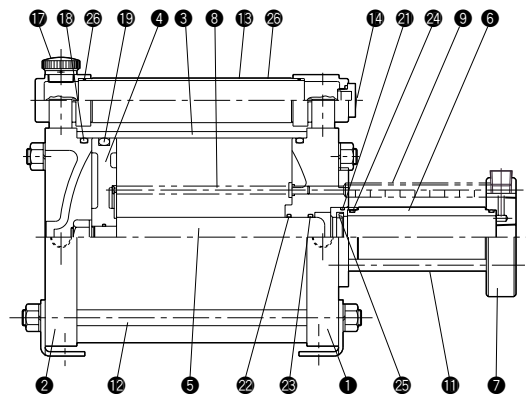
The working velocity of clamp head varies depending on booster to be used. The above table indicates the stroke time (push) and (pull) for the piping length of about 3m between booster and directional control valve. Based on the stroke time, the cycle time shall be set. For the direct pressure type booster set (product on order), it shall also be set according to the stroke time.

SECTIONAL DRAWINGS

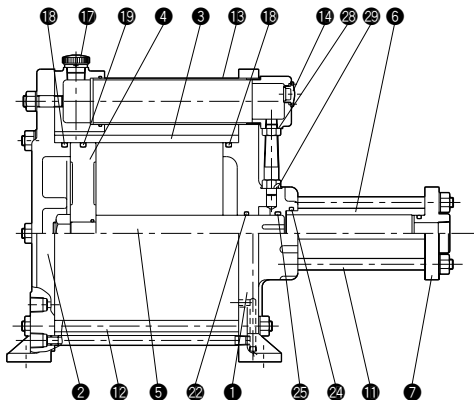
● NBH3-40/NBH3-60/NBH3-60-130



● NBH-80



● NBH-100



PARTS LIST

No.	Name	Material	Q'ty
①	Hydraulic cylinder mounting cover	Gray cast iron	1
②	Pneumatic cylinder cover	Gray cast iron	1
③	Pneumatic cylinder body	Aluminum alloy (NBH3-40-60) Carbon steel (NBH-80-100)	1
④	Pneumatic piston	Gray cast iron	1
⑤	Hydraulic piston	Carbon steel	1
⑥	Hydraulic cylinder body	Carbon steel	1
⑦	Hydraulic cap	Rolled steel	1
⑧	Indicator rod	Carbon steel	1
⑨	Indicator pipe	Resin	1

No.	Name	Material	Q'ty
⑩	Hydraulic tie rod	Chrome molybdenum steel	4
⑫	Pneumatic tie rod	Rolled steel	4
⑬	Reserve tube	Aluminum alloy (NBH3-40-60-NBH-80) Carbon steel (NBH-100)	1
⑭	Oil pot	Resin	1
⑮	Flange	Rolled steel	1
⑯	Ring	Hard steel wire	1
⑰	Lubricating plug	Resin	1

SEAL LIST

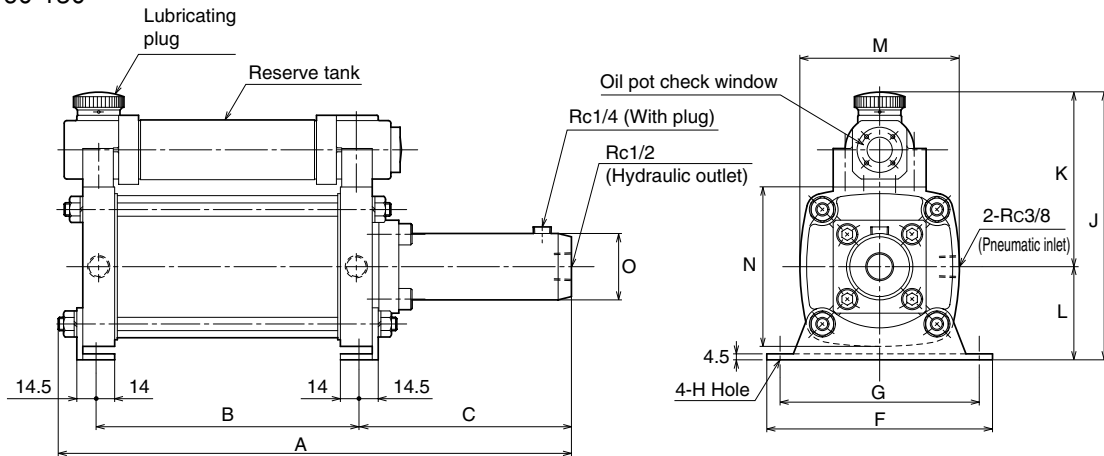
Name	⑬	⑰	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘
	Cylinder body gasket	Pneumatic piston seal	Gland gasket	Rod seal	Rod seal	Hydraulic cylinder body gasket	Hydraulic seal	Reserve tube gasket	Reserve tube gasket	Oil pipe nut gasket	Oil pipe gasket	
Material	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	Nitrile rubber	
Quantity	2	1	1	1	1	1(2)*1	1	2(1)*2	2	1	1	
NBH3-40	G95	DXP100	—	P30	PS-30	S46	IDU-30	AS568 030	P15	—	—	
NBH3-60-NBH3-60-130	G145	DXP150	—	P30	PS-30	S46	IDU-30	AS568 030	P15	—	—	
NBH-80	G190	P185	G55	P40	PS-40	G50	IDU-40	AS568 030	P15	—	—	
NBH-100	AS568 448	AS568 448	—	AS568 329	—	AS568 ³²⁹ / ₃₃₃	AS568 329	G65	—	P14	P14	

● Numerical value in parenthesis *1 is that of NBH-80.
● Numerical value in parenthesis *2 is that of NBH-100.

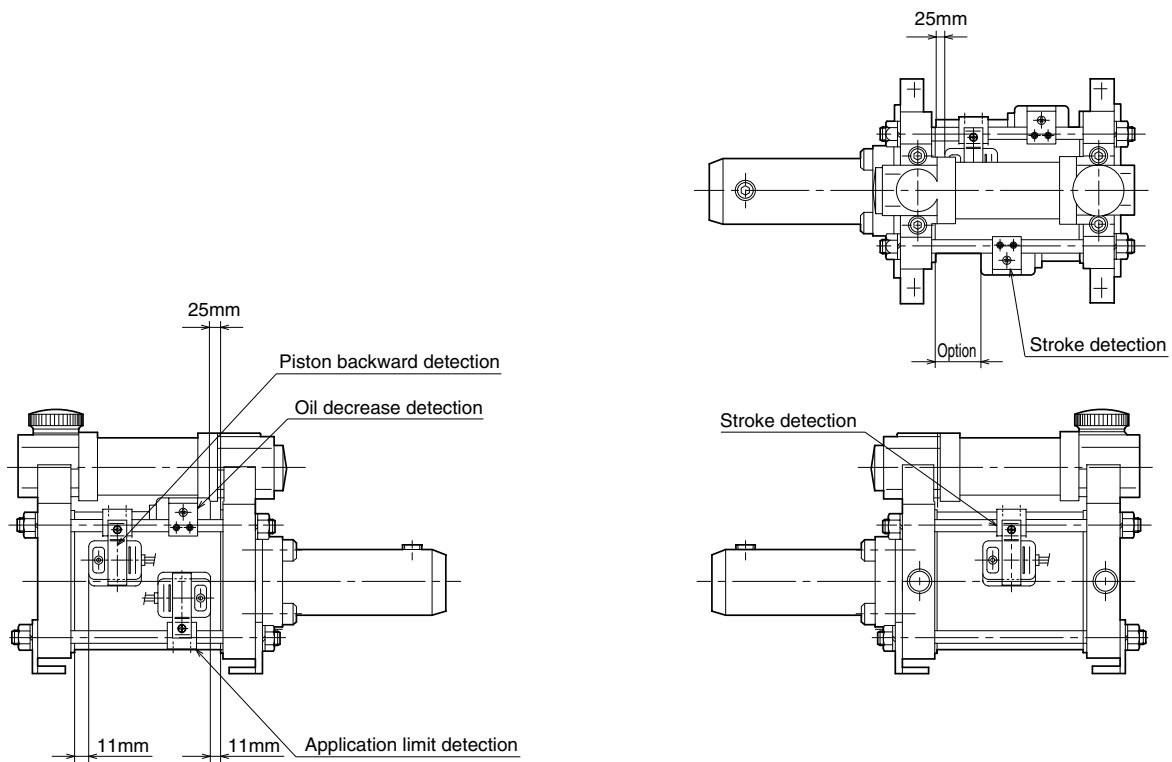
DIMENSIONAL DRAWINGS

Unit: mm

NBH3-40
NBH3-60
NBH3-60-130



SWITCH SET MOUNTING DIMENSION



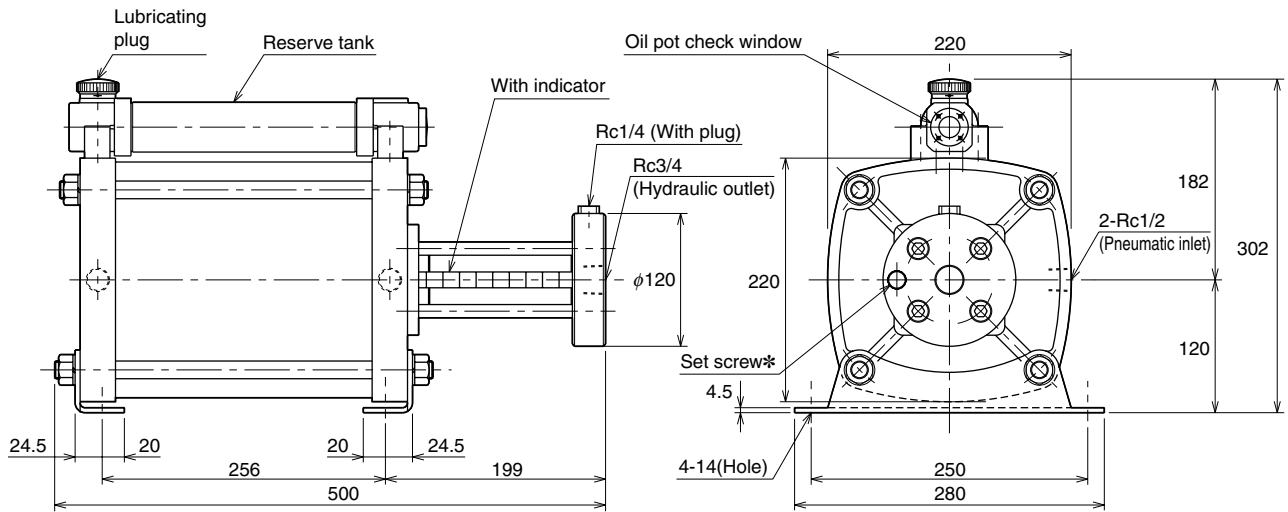
DIMENSIONAL TABLE

Symbol Model code	A	B	C	F	G	H	J	K	L	M	N	O
NBH3-40	389	198	160	170	150	9	202	132	70	120	120	φ50
NBH3-60	387	198	160	250	220	11	252	157	95	170	170	φ50
NBH3-60-130	537	273	235	250	220	11	252	157	95	170	170	φ50

DIMENSIONAL DRAWINGS

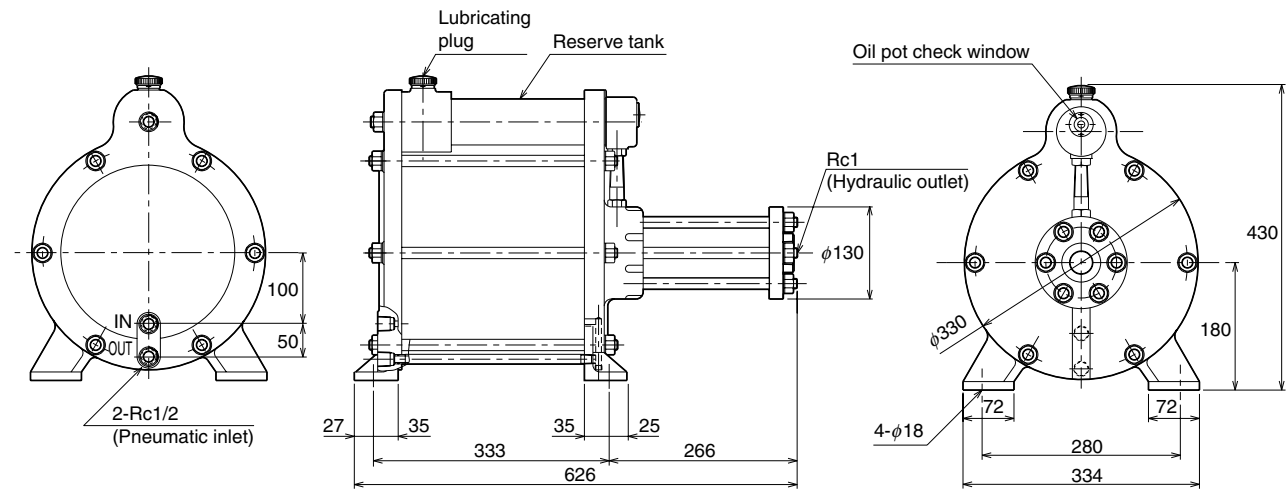
Unit: mm

NBH-80



Note*) Do not loosen the set screw of the end of indicator. (the indicator will loose and bolt out)

NBH-100



A set of booster, regulator, solenoid valve, manual valve located on one bed is produced on order.

SPECIFICATIONS

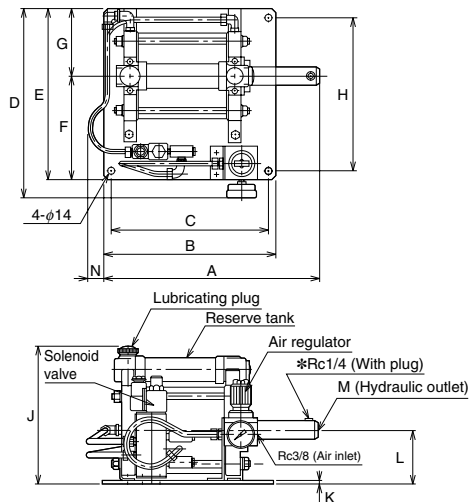
Model code	NBH3-40-S	NBH3-60-S	NBH3-60-130-S	NBH-80-S	NBH3-40-H	NBH3-60-H	NBH3-60-130-H
Boosting ratio	11	25	25	25	11	25	25
Output oil capacity (cm ³)	77	77	130	176	77	77	130
Theoretical output oil pressure at max. air pressure	11.1MPa	17.5MPa			11.1MPa	17.5MPa	
Working oil	Cosmo Mighty Super 10 (Cosmo oil)						
Temperature range	+5~+60°C						
Air Pressure	Working fluid	Air					
	Lubrication	Unnecessary (But possible)			Necessary	Unnecessary (But possible)	
	Pressure range	0.2~1MPa	0.2~0.7MPa			0.2~1MPa	0.2~0.7MPa
	Recommended lubricating oil	JIS K2213-1 (Natural turbine oil ISO VG32) or equivalent					
Weight	15	22	25	54	15	22	25
With reed switch	Available			None	Available		
Applied valve	Solenoid valve 5ER-8E (5 port 2 position Air return type) Rated power supply : AC100V (50/60Hz), AC200V (50/60Hz), DC24V				Manual valve (4PN-20)		
Accessories	Pressure switch · Pressure gauge						

DIMENSIONAL DRAWINGS

Unit: mm

WITH SOLENOID VALVE

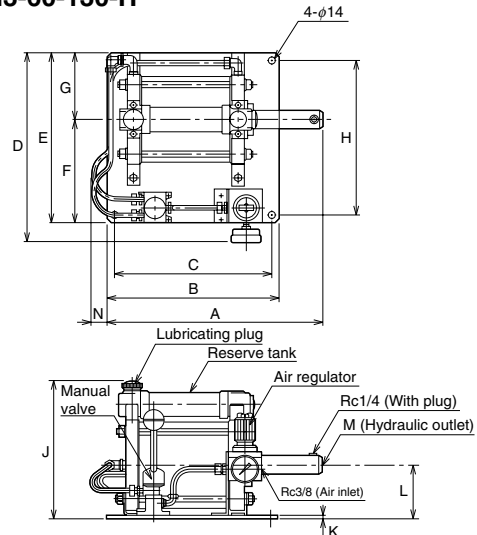
NBH3-40-S NBH3-60-S NBH3-60-130-S NBH-80-S



- For models NBH3-40-S·NBH3-60-S·NBH3-60-130-S·NBH-80-S, the style of set assembled on bed in the above drawings is indicated.
- For NBH-80-S, the external view of booster varies from that in the above drawings. * NBH-80-S is G1/4 (with plug).

WITH MANUAL VALVE

NBH3-40-H NBH3-60-H
NBH3-60-130-H



- For models NBH3-40-H·NBH3-60-H·NBH3-60-130H, the style of set assembled on bed in the above drawings is indicated.

DIMENSIONAL TABLE

Symbol	A	B	C	D	E	F	G	H	J	K	L	M	N
NBH3-40-S	404	300	270	286	250	165	85	220	208	6	76	Rc ¹ / ₂	35
NBH3-60-S	404	320	290	356	320	195	125	290	261	6	101	Rc ¹ / ₂	30
NBH3-60-130-S	553	400	370	356	320	195	125	290	261	6	101	Rc ¹ / ₂	—
NBH-80-S	520	400	370	430	440	275	165	410	313	8	128	Rc ³ / ₄	—
NBH3-40-H	404	300	270	286	250	165	85	220	221	6	76	Rc ¹ / ₂	35
NBH3-60-H	404	320	290	356	320	195	125	290	261	6	101	Rc ¹ / ₂	30
NBH3-60-130-H	553	400	370	356	320	195	125	290	261	6	101	Rc ¹ / ₂	—