



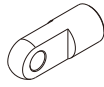
# Standard cylinder—NSU Series

## Compendium of NSU Series

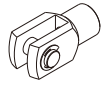
**NFPA Standard cylinder**  
Bore size: 1-1/2", 2", 2-1/2", 3-1/4", 4", 5"

**No tie rod cylinder**  
The cylinder barrel is aluminum profile with hard anodizing treatment.

**Two kinds of cylinder joints**




I Knuckle




Y Knuckle


**Multi-type cylinder**



NSU: Double acting type

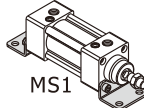


NSUD: Double rod type

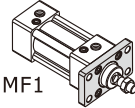


**Convenient and fast fix sensor switch**  
Sensor can be directly fixed onto the groove of the cylinder, which is convenient and fast. the counterpart sensor type is: CMSG, DMSG

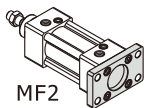
**Multi-mounting accessories**



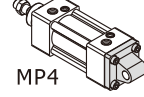
MS1



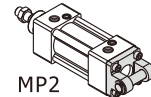
MF1



MF2



MP4



MP2

**Adjustable air buffer**  
With adjustable air buffer on the front and back cover

## Installation and application



1. When load changes in the work, the cylinder with abundant output capacity shall be selected.
2. Relative cylinder with high temperature resistance or corrosion resistance shall be chosen under the condition of high temperature or corrosion.
3. Necessary protection measure shall be taken in the environment with higher humidity, much dust or water drops, oil dust and welding dregs.
4. Dirty substances in the pipe must be eliminated before cylinder is connected with pipeline to prevent the entrance of particles into the cylinder.
5. The medium used by cylinder shall be filtered to 40μm or below.
6. Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
7. The cylinder shall be carried out test run without load before application. Prior to run, buffer shall be turned to the minimum and gradually released to avoid the damage on cylinder caused by excessive impact.
8. The cylinder shall avoid the influence of side load in operation to maintain the normal work of cylinder and extend the service life.
9. If the cylinder is dismantled and stored for a long time, please conduct anti-rust treatment to the surface.  
Anti-dust caps shall be added in air inlet and outlet ports.

## Criteria for selection: Cylinder thrust

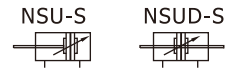
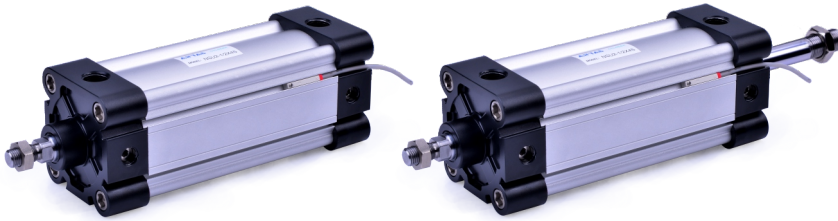
Unit: Newton(N)

Bore size(in)	Rod size(in)	Acting type	Pressure area(mm <sup>2</sup> )	Operating pressure(MPa)									
				0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
1-1/2"	5/8"	Double acting	Push side	1140	114	228	342	456	570	684	798	912	1026
			Pull side	942	94	188	282	377	471	565	659	753	847
2"	5/8"	Double acting	Push side	2026	203	405	608	810	1013	1215	1418	1621	1823
			Pull side	1828	183	366	548	731	914	1097	1279	1462	1645
2-1/2"	5/8"	Double acting	Push side	3165	317	633	950	1266	1583	1899	2216	2532	2849
			Pull side	2967	297	593	890	1187	1484	1780	2077	2374	2671
3-1/4"	1"	Double acting	Push side	5349	535	1070	1605	2140	2675	3210	3745	4280	4814
			Pull side	4843	484	969	1453	1937	2421	2906	3390	3874	4359
4"	1"	Double acting	Push side	8103	810	1621	2431	3241	4052	4862	5672	6483	7293
			Pull side	7597	760	1519	2279	3039	3798	4558	5318	6077	6837
5"	1"	Double acting	Push side	12661	1266	2532	3798	5065	6331	7597	8863	10129	11395
			Pull side	12155	1215	2431	3646	4862	6077	7293	8508	9724	10939



# Standard cylinder

## NSU Series



### Ordering code

**NSU 1-1/2×4 S □ T**

① ② ③ ④ ⑤ ⑥

① Model	② Bore size	③ Stroke	④ Magnet	⑤ Mounting ype[Note1]	Model	⑥ Thread type
NSU: Double acting type	1-1/2"	Refer to stroke table for details	S: With magnet	Blank	NSU	T: NPT
NSUD: Double rod type	2"			MS1		
	2-1/2"	MF1				
	3-1/4"	MF2				
	4"	MP2				
	5"	MP4				
			Blank	NSUD		
			MS1			
			MF1			

[Note1] Please refer to page 261~263 for details of the accessories.

### Stroke

Bore size(in)	Standard stroke (in)	Max.std stroke (in)	Max.stroke (in)
1-1/2"	1 2 3 4 5 6 8 10 12 14 16 18 20 24 28 32	48	72
2"	1 2 3 4 5 6 8 10 12 14 16 18 20 24 28 32 36 40	48	72
2-1/2"	1 2 3 4 5 6 8 10 12 14 16 18 20 24 28 32 36 40	60	72
3-1/4"	1 2 3 4 5 6 8 10 12 14 16 18 20 24 28 32 36 40	60	72
4"	1 2 3 4 5 6 8 10 12 14 16 18 20 24 28 32 36 40	60	72
5"	1 2 3 4 5 6 8 10 12 14 16 18 20 24 28 32 36 40	60	72

[Note] Consult us for non-standard stroke.

### Specification

Bore size(in)	1-1/2	2	2-1/2	3-1/4	4	5
Acting type	Double acting					
Fluid	Air(to be filtered by 40μm filter element)					
Mounting type	Basic MF1 MF2 MP2 MP4 MS1					
	Basic MF1 MS1					
Operating pressure	22~145psi(0.15~1.0MPa)					
Proof pressure	215psi(1.5MPa)					
Temperature	-5°F~160°F(-20°C~70°C)					
Speed range in/s	1~32					
Stroke tolerance in	+0.08 0					
Cushion type	Bumper+Variable cushion					
Adjustable cushion stroke in	15/16		1-1/16		1-1/8	
Port size	NPT3/8		NPT1/2			

Add) Refer to P475 for detail of sensor.

# Standard cylinder

## NSU Series

### Product feature

1. Standard cylinder manufactured by NFPA Standard.
2. The seal of piston adopts heterogeneous two way seal structure. It's dimension is tight and it has the function of oil reservation.
3. It is no tie rod cylinder. The cylinder barrel is aluminum profile with hard anodizing treatment.
4. The buffer adjustment of cylinder is smooth and steady.
5. Various specifications of cylinder and cylinder installation accessories are available for customers to choose.

### Inner structure

**NSU**

NO.	Item	NO.	Item	NO.	Item
1	Rod nut	7	Cushion gasket	13	Wear ring
2	Piston rod	8	Barrel	14	Bolt
3	Front cover packing	9	Piston	15	Back cover
4	Bushing	10	Piston rod O-ring	16	Tie-rod nut
5	Front cover	11	Piston seal		
6	Cushing O-ring	12	Magnet		

### Dimensions

**NSU**

[Unit:inch]

Bore size/Item	A	AB	AC	AD	AE
1-1/2	5-3/8	1-3/4	3-5/8	1.08	1.08
2	5-3/8	1-3/4	3-5/8	1.08	1.08
2-1/2	5-1/2	1-3/4	3-3/4	1.08	1.08
3-1/4	6-3/4	2-1/2	4-1/4	1.28	1.28
4	6-3/4	2-1/2	4-1/4	1.28	1.28
5	7	2-1/2	4-1/2	1.44	1.44

Bore size/Item	B	D	DA	E	EA	F	FA	M	MA	H	K	KA	KB	N	NA	P	PA
1-1/2	2	5/8	1-1/8	7/16-20	3/4	11/16	1/4	1-1/8	5/8	1/2	1/4-28	0.59	1.43	1-1/8	0.12	NPT3/8	0.59
2	2-1/2	5/8	1-1/8	7/16-20	3/4	11/16	1/4	1-1/8	5/8	1/2	5/16-24	0.59	1.84	1-1/8	0.12	NPT3/8	0.59
2-1/2	3	5/8	1-1/8	7/16-20	3/4	11/16	1/4	1-1/8	5/8	1/2	5/16-24	0.59	2.19	1-1/8	0.12	NPT3/8	0.59
3-1/4	3-3/4	1	1-5/8	3/4-16	1-1/8	1-1/8	27/64	1-1/2	7/8	7/8	3/8-24	0.67	2.76	1-1/2	0.20	NPT1/2	0.69
4	4-1/2	1	1-5/8	3/4-16	1-1/8	1-1/8	27/64	1-1/2	7/8	7/8	3/8-24	0.67	3.32	1-1/2	0.20	NPT1/2	0.69
5	5-1/2	1	1-5/8	3/4-16	1-1/8	1-1/8	27/64	1-1/2	7/8	7/8	1/2-20	0.83	4.1	1-1/2	0.20	NPT1/2	0.85

### NSUD

[Unit:inch]

Bore size/Item	A	AB	AC	DA
1-1/2	7-1/8	1-3/4	3-5/8	1-1/8
2	7-1/8	1-3/4	3-5/8	1-1/8
2-1/2	7-1/4	1-3/4	3-3/4	1-1/8
3-1/4	9-1/4	2-1/2	4-1/4	1-5/8
4	9-1/4	2-1/2	4-1/4	1-5/8
5	9-1/2	2-1/2	4-1/2	1-5/8

Remark : The unmarked dimension is the same as NSU standard type.

# Standard cylinder

## NSU Series—Accessories

### List for ordering code of accessories

Accessories Bore size	Mounting accessories			
	MS1	MF1\MF2	MP2	MP4
1-1/2	F-NSU1-1/2MS1	F-NSU1-1/2MF1	F-NSU1-1/2MP2	F-NSU1-1/2MP4
2	F-NSU2MS1	F-NSU2MF1	F-NSU2MP2	F-NSU2MP4
2-1/2	F-NSU2-1/2MS1	F-NSU2-1/2MF1	F-NSU2-1/2MP2	F-NSU2-1/2MP4
3-1/4	F-NSU3-1/4MS1	F-NSU3-1/4MF1	F-NSU3-1/4MP2	F-NSU3-1/4MP4
4	F-NSU4MS1	F-NSU4MF1	F-NSU4MP2	F-NSU4MP4
5	F-NSU5MS1	F-NSU5MF1	F-NSU5MP2	F-NSU5MP4

Accessories Bore size	Knuckle		Sensor switch	
	I : I Knuckle	Y : Y Knuckle	CMSG	DMSG
1-1/2	F-NSU1-1/2I	F-NSU1-1/2Y	CMSG	DMSG
2	F-NSU1-1/2I	F-NSU1-1/2Y		
2-1/2	F-NSU1-1/2I	F-NSU1-1/2Y		
3-1/4	F-NSU3-1/4I	F-NSU3-1/4Y		
4	F-NSU3-1/4I	F-NSU3-1/4Y		
5	F-NSU3-1/4I	F-NSU3-1/4Y		

### Accessory selection

Accessories Cylinder model	Mounting accessories					Knuckle		Sensor switch	
	MS1	MF1	MF2	MP2	MP4	I	Y	CMSG	DMSG
NSU	•	•	•	•	•	•	•	•	•
NSUD	•	•	×	×	×	•	•	•	•

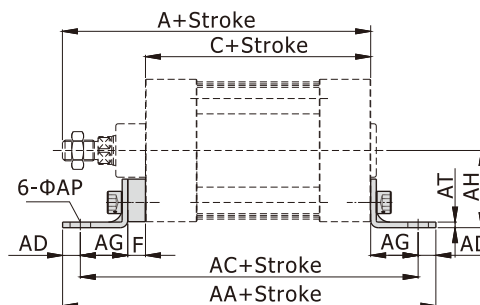
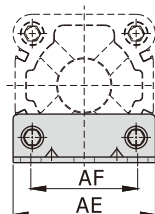
### Material of accessories

Accessories Bore size	Mounting accessories					Knuckle	
	MS1	MF1	MF2	MP2	MP4	I	Y
1-1/2~5	□	□	□	□	□	□	□

□—Steel

### Dimensions

#### MS1



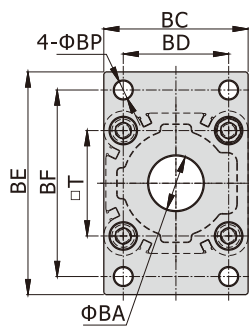
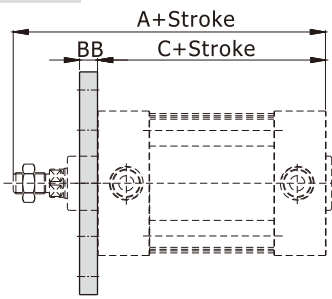
[Unit:inch]

	A	C	AA	AC	AD	AE	AF	AG	AH	AP	AT	F
1-1/2	5-3/8	3-5/8	6-3/4	6	3/8	2	1-1/4	1	1.19	0.43	0.12	3/8
2	5-3/8	3-5/8	6-3/4	6	3/8	2-1/2	1-3/4	1	1.44	0.43	0.12	3/8
2-1/2	5-1/2	3-3/4	6-7/8	6-1/8	3/8	3	2-1/4	1	1.63	0.43	0.12	3/8
3-1/4	6-3/4	4-1/4	8-3/8	7-3/8	1/2	3-3/4	2-3/4	1-1/4	1.94	0.57	0.16	5/8
4	6-3/4	4-1/4	8-3/8	7-3/8	1/2	4-1/2	3-1/2	1-1/4	2.25	0.57	0.16	5/8
5	7	4-1/2	9-1/8	7-7/8	5/8	5-1/2	4-1/4	1-3/8	2.75	0.69	0.24	5/8

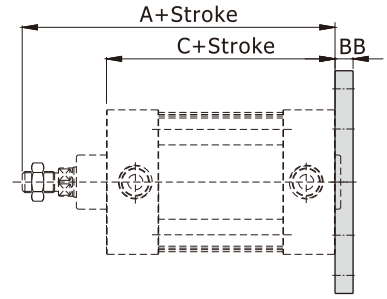
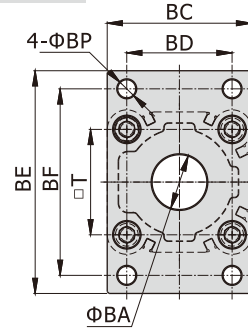
# Standard cylinder

## NSU Series—Accessories

### MF1



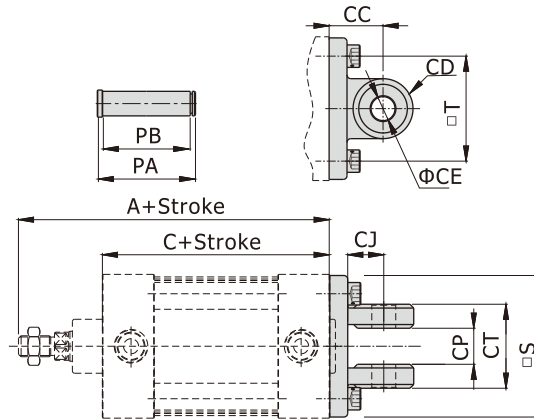
### MF2



[Unit:inch]

Bore size\Item	A	C	BA	BB	BC	BD	BE	BF	BP	T
1-1/2	5-3/8	3-5/8	1-1/8	3/8	2	1.43	3-3/8	2.75	0.28	1.43
2	5-3/8	3-5/8	1-1/8	3/8	2-1/2	1.84	4-1/8	3.38	0.35	1.84
2-1/2	5-1/2	3-3/4	1-1/8	3/8	3	2.19	4-5/8	3.88	0.35	2.19
3-1/4	6-3/4	4-1/4	1-1/2	5/8	3-3/4	2.76	5-1/2	4.69	0.41	2.76
4	6-3/4	4-1/4	1-1/2	5/8	4-1/2	3.32	6-1/4	5.44	0.41	3.32
5	7	4-1/2	1-1/2	5/8	5-1/2	4.1	7-5/8	6.63	0.55	4.1

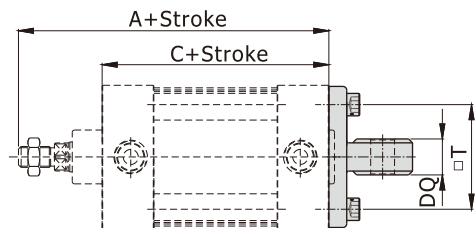
### MP2



[Unit:inch]

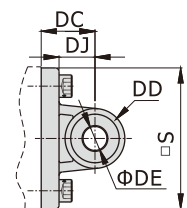
	A	C	CC	CD	CE	CJ	CP	CT	PA	PB	S	T
1-1/2	5-3/8	3-5/8	1-1/8	1/2	1/2	3/4	3/4	1-3/4	2	1.78	1.97	1.43
2	5-3/8	3-5/8	1-1/8	5/8	1/2	3/4	3/4	1-3/4	2	1.78	2.46	1.84
2-1/2	5-1/2	3-3/4	1-1/8	5/8	1/2	3/4	3/4	1-3/4	2	1.78	2.95	2.19
3-1/4	6-3/4	4-1/4	1-7/8	7/8	3/4	1-1/4	1-1/4	2-1/2	2-7/8	2.54	3.7	2.76
4	6-3/4	4-1/4	1-7/8	7/8	3/4	1-1/4	1-1/4	2-1/2	2-7/8	2.54	4.45	3.32
5	7	4-1/2	1-7/8	7/8	3/4	1-1/4	1-1/4	2-1/2	2-7/8	2.54	5.43	4.1

### MP4



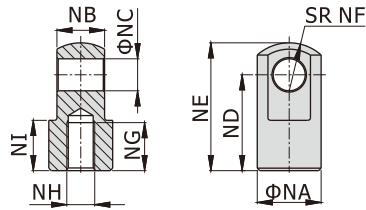
[Unit:inch]

Bore size\Item	A	C	DC	DD	DE	DJ	DQ	S	T
1-1/2	5-3/8	3-5/8	1-1/8	5/8	1/2	3/4	3/4	1.97	1.43
2	5-3/8	3-5/8	1-1/8	5/8	1/2	3/4	3/4	2.46	1.84
2-1/2	5-1/2	3-3/4	1-1/8	5/8	1/2	3/4	3/4	2.95	2.19
3-1/4	6-3/4	4-1/4	1-7/8	7/8	3/4	1-1/4	1-1/4	3.7	2.76
4	6-3/4	4-1/4	1-7/8	7/8	3/4	1-1/4	1-1/4	4.45	3.32
5	7	4-1/2	1-7/8	7/8	3/4	1-1/4	1-1/4	5.43	4.1



## NSU Series—Accessories

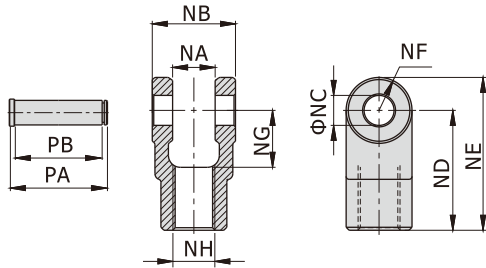
### I Knuckle



[Unit:inch]

Type\Item	NA	NB	NC	ND	NE	NF	NG	NH	NI
F-NSU1-1/2I	1	3/4	1/2	1-1/2	2	0.79	3/4	7/16-20UNF	0.79
F-NSU3-1/4I	1-1/2	1-1/4	3/4	2-1/16	2-13/16	1.18	1-1/8	3/4-16UNF	0.98

### Y Knuckle



[Unit:inch]

Type\Item	NA	NB	NC	ND	NE	NF	NG	NH	PA	PB
F-NSU1-1/2Y	3/4	1-3/4	1/2	1-1/2	2	1/2	3/4	7/16-20UNF	2	1.78
F-NSU3-1/4Y	1-1/4	2-1/2	3/4	2-3/8	3-1/8	3/4	1-1/4	3/4-16UNF	2-7/8	2.54