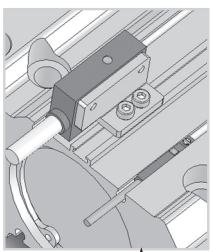
Guide Film Type Cylinder NGQ Series

▣ **Able to treat long stroke**

(Able to manufacture some models until Max. stroke of 300mm)

▣ **Improve plate's squareness and corrosion-resistance by improving process for guide connecting parts**

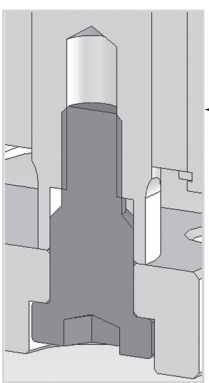
• Apply special high strength bolt

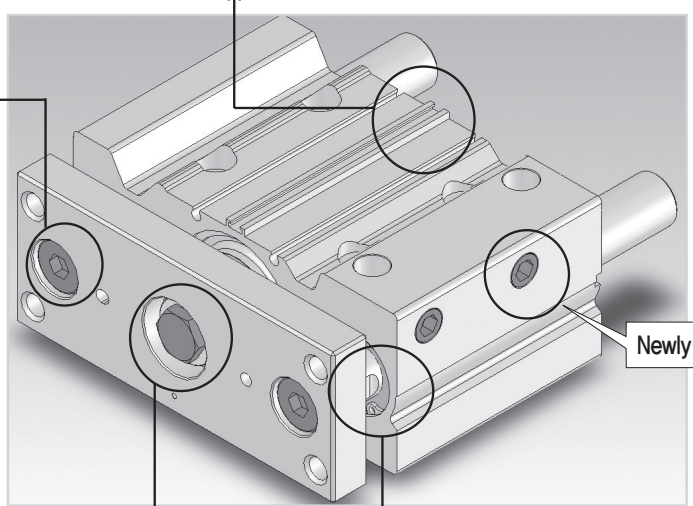


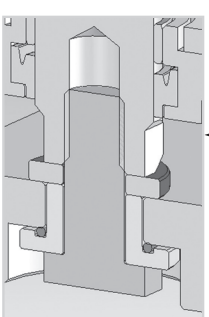
▣ **Diversify how to apply AUTO Switch**

• Apply auto switch of the general type, ø4 ultra-tiny type, strong magnetic field-resistant type

• Able to install top and bottom (some models) switches







▣ **Improve M TYPE's durability**

• Use special slide bearing

▣ **Excellent working performance (100% remove twisted and hung phenomenon during operation)**

• Exert smooth operability by endowed with oil gap to plate and piston rod parts

• Insert O-RING to prevent oil gap from making noise

▣ **Improve customer's convenience for attachment**

• Side attachment (OPTION)

• Add T-SLOT grooves on the bottom

• Extend penetration attachment specification

※ Refer to attachment related data

▣ **Improve TUBE's attachment precision**

• Size, bottom, and back process

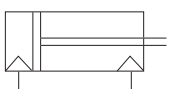
Series NGQ

Guide Attachment Compact Cylinder

Bore Size(mm) : Ø12, Ø16, Ø20, Ø25, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100

- LATERAL LOAD-RESISTANT AND HIGH-PRECISION CYLINDER TO PREVENT ROTATION
- ABLE TO SELECT GUIDE ROAD BEARING OF 2 KINDS ACCORDING TO EACH USE-SLIDE BEARING AND BALL BEARING
- ENSURE EXCELLENT OPERATIONAL PERFORMANCE AND IMPROVE PRECISION
- APPLY AUTO SWITCH FOR DIVERSIFICATION
- BASICALLY INSTALL SIDE PORT
- IMPROVE CUSTOMER' S CONVENIENCE

Symbol



How to Order

NGQ M 20 - 50 □ - ○ ○ - □ □ □

1 2 3 4 5 6 7 8 9 10

1 NGQ = New Guide Compact Cylinder

2 Applied Bearing Type
M : Slide bearing
L : Ball bearing

3 Bore Size

Spec.	12	16	20	25	32
Bore(mm)	12	16	20	25	32
Spec.	40	50	63	80	100
Bore(mm)	40	50	63	80	100

4 Cylinder Stroke

Type	Bore Size	Standard Stroke (mm)
NGQM	Ø12, Ø16	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200
	Ø20, Ø25	20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300
NGQL	Ø32, Ø40, Ø50, Ø63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300
	Ø80, Ø100	25, 50, 75, 100, 125, 150, 175, 200

Note) Able to manufacture middle stroke in 5mm stroke by mounting spacer on standard stroke.
Ex) In the case of NGQM20-25ST, mount 5mm spacer on NGQM20-30ST, in which the whole product shape is the same as 30ST.

5 Port Type

Classification	Blank		US Type
Ø12, Ø16	M5 X 0.8		UNF
Classification	Blank	EU Type	US Type
Ø20~100	RC	G	NPT

※ Please inquiry for the product when you place an order the port of EU/US type.

6 Attachment Specification
Blank : Non-side attachment hole
H : Side attachment hole

7 Series
Blank : Standard (Copper-free type is basic for L type of ϕ12 ~ ϕ40)
XC16 : Copper-free type (Only L type can be in copper-free type)

8 Auto Switch
Blank : None
W4 : W4(2Wire DC 24V, AC100V)
W2P : Strong magnetic field-resistant Auto S/W
* W4, W2P S/W are applied to the ϕ32 ~ ϕ100
W8V : Reed switch(Vertical type)
W8H : Reed switch(Horizontal type)
W9V : Solid state switch(Vertical type)
W9H : Solid state switch(Horizontal type)
* The above S/W is applied to the whole equipment.

9 Lead Wire Length
Blank : 0.5 m
L : 3 m

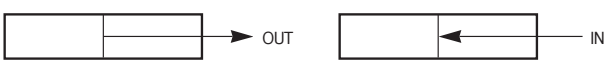
10 Number of Auto Switchs
Blank : 2 pcs
S : 1 pc
N : N pcs

Standard Specification

Item		Specification	
Fluid		Compressed Air	
How to Operate		Double Acting	
Proof Pressure		1.5 Mpa (15kgf/㎠)	
Pressure Range Applied	Max. Pressure	1.0 Mpa (9.9kgf/㎠)	
	Min. Pressure	Ø12, Ø16	0.12 Mpa (1.2kgf/㎠)
		Ø20 ~ Ø100	0.1 Mpa (1.0kgf/㎠)
Surrounding and Used Fluid Temperature		-10℃ ~ +60℃	
Lubrication		Non Lubrication	
Cushion		Both Side Rubber Cushion (Basic)	
Piping		2 Direction Piping (Top and Bottom)	
Cylinder Attachment Type		Through Type Attachment (Top and Bottom), Side Attachment (Option)	
		T-Slot Attachment, Back Attachment	
AUTO S/W		Ultra-tiny AUTO S/W (W8*,W9*), W4	
		Able to Attach 3 Sets of Strong Magnetic Field-Resistant AUTO S/W (W2P)	
Applied Piston Speed		50 ~ 500 mm/S	
Stroke Tolerance		$^{+1.5}_{0}$mm	

Theory Output Table

(Unit : kgf)



Bore Size (㎜)	ROD Diameter (㎜)	Operation Direction	Water Pressure Area (㎠)	Pressure Applied(kgf/㎠)								
				2	3	4	5	6	7	8	9	10
12	6	OUT	1.1	2.3	3.4	4.5	5.7	6.8	7.9	9	10.2	11.3
		IN	0.9	1.7	2.5	3.4	4.2	5.1	5.9	6.8	7.6	8.5
16	8	OUT	2	4	6	8	10.1	12.1	14.1	16.1	18.1	20.1
		IN	1.5	3	4.5	6	7.5	9	10.6	12.1	13.6	15.1
20	10	OUT	3.1	6.3	9.4	12.6	15.7	18.8	22	25.1	28.3	31.4
		IN	2.4	4.7	7.1	9.4	11.8	14.1	16.5	18.8	21.2	23.6
25	12	OUT	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.3	44.2	49.1
		IN	3.8	7.6	11.3	15.1	18.9	22.7	26.4	30.2	34	37.8
32	16	OUT	8	16.1	24.1	32.2	40.2	48.2	56.3	64.3	72.4	80.4
		IN	6	12.1	18.1	24.1	30.1	36.2	42.2	48.2	54.3	60.3
40	16	OUT	12.6	25.1	37.7	50.2	62.8	75.4	87.9	100.5	113	125.6
		IN	10.6	21.1	31.7	42.2	52.8	63.3	73.9	84.4	95	105.5
50	20	OUT	19.6	39.3	58.9	78.5	98.1	117.8	137.4	157	176.6	196.3
		IN	16.5	33	49.5	65.9	82.4	98.9	115.4	131.9	148.4	164.9
63	20	OUT	31.2	62.3	93.5	124.6	155.8	186.9	218.1	249.3	280.4	311.6
		IN	28	56	84.1	112.1	140.1	168.1	196.1	224.1	252.2	280.2
80	25	OUT	50.2	100.5	150.7	201	251.2	301.4	351.7	401.9	452.2	502.4
		IN	45.3	90.7	136	181.3	226.7	272	317.3	362.7	408	453.3
100	30	OUT	78.5	157	235.5	314	392.5	471	549.5	628	706.5	785
		IN	71.4	142.9	214.3	285.7	357.2	428.6	500.1	571.5	642.9	714.4

Note) Theory output(kgf) = Pressure (kgf/㎠) X Piston water pressure area (㎠) 1kgf ≒ 9.8 N, 1kgf/㎠≒0.098Mpa

Weight Table (product weight)

(Unit : kg)

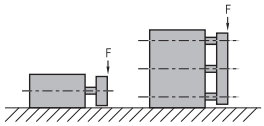
Bore Size	Type	Cylinder Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	M TYPE	0.2	0.3	—	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
Ø 16		0.3	0.4	—	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.3	1.4		
Ø 20		—	0.7	—	0.8	0.8	0.9	1.2	1.4	1.6	1.8	2.0	2.2	2.7	3.1
Ø 25		—	1.0	—	1.1	1.2	1.3	1.7	1.9	2.2	2.5	2.8	3.0	3.6	4.1
Ø 32		—	—	1.7	—	—	2.2	2.5	2.8	3.2	3.6	4.0	4.3	5.3	6.0
Ø 40		—	—	1.8	—	—	2.5	2.8	3.3	3.8	4.2	4.8	5.2	6.4	6.9
Ø 50		—	—	3.1	—	—	3.8	4.5	5.2	5.8	6.5	7.3	7.9	8.8	9.4
Ø 63		—	—	3.7	—	—	4.8	5.4	6.2	6.8	7.6	8.4	9.1	10.1	10.8
Ø 80		—	—	6.6	—	—	7.5	8.8	9.7	10.7	11.6	12.8	13.7		
Ø 100		—	—	9.8	—	—	10.7	12.4	13.7	15.3	16.5	18.0	19.2		
Ø 12	L TYPE	0.2	0.3	—	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	0.9		
Ø 16		0.3	0.4	—	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.3		
Ø 20		—	0.7	—	0.8	0.9	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.5	2.9
Ø 25		—	1.0	—	1.1	1.3	1.3	1.6	1.8	2.1	2.3	2.6	2.8	3.3	3.7
Ø 32		—	—	1.5	—	—	2.0	2.3	2.6	2.9	3.3	3.6	3.9	4.6	5.2
Ø 40		—	—	1.7	—	—	2.2	2.7	3.1	3.5	3.9	4.4	4.8	5.6	6.0
Ø 50		—	—	2.8	—	—	3.5	4.2	4.8	5.4	6.0	6.7	7.3	7.8	10.2
Ø 63		—	—	3.5	—	—	4.5	5.1	5.8	6.5	7.1	7.8	8.5	9.2	9.8
Ø 80		—	—	6.3	—	—	7.5	8.8	9.6	10.5	11.2	12.4	13.1		
Ø 100		—	—	9.3	—	—	10.4	12.2	13.4	14.7	15.9	17.2	18.4		

Allowed Load

(Unit : N)

Bore Size	Type	Cylinder Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	M	20	16	—	13	15	13	19	16	14	12	11	10		
	L	20	37	—	31	36	31	14	8	5	3	2	2		
Ø 16	M	32	26	—	22	22	19	29	24	21	19	18	16		
	L	31	54	—	46	52	46	41	27	17	12	8	6		
Ø 20	M	—	52	—	44	43	38	67	58	51	45	40	36	28	19
	L	—	33	—	88	96	87	77	54	35	24	17	13	8	5
Ø 25	M	—	69	—	58	57	50	90	77	67	60	60	55	55	47
	L	—	49	—	39	102	92	91	77	79	70	52	40	25	17
Ø 32	M	—	—	146	—	—	160	143	122	115	102	117	107	92	80
	L	—	—	73	—	—	160	144	123	145	129	116	89	57	39
Ø 40	M	—	—	148	—	—	162	145	124	116	103	119	109	93	81
	L	—	—	73	—	—	160	144	123	144	129	116	89	56	38
Ø 50	M	—	—	238	—	—	236	221	192	179	160	176	161	138	121
	L	—	—	78	—	—	215	194	167	192	172	198	164	107	73
Ø 63	M	—	—	237	—	—	235	220	190	177	158	174	159	136	118
	L	—	—	74	—	—	215	194	165	191	171	198	160	102	69
Ø 80	M	—	—	298	—	—	245	297	258	241	216	226	207		
	L	—	—	100	—	—	69	274	239	212	190	205	188		
Ø 100	M	—	—	431	—	—	375	405	256	331	298	308	272		
	L	—	—	147	—	—	105	426	375	334	301	323	297		

1kgf ≒ 9.8 N, 1kgf/㎠≒0.098Mpa



Standard Stroke

Classification	Cylinder Stroke (mm)													
	10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	●	●	–	●	●	●	●	●	●	●	●	●		
Ø 16	●	●	–	●	●	●	●	●	●	●	●	●		
Ø 20	–	●	–	●	●	●	●	●	●	●	●	●	●	●
Ø 25	–	●	–	●	●	●	●	●	●	●	●	●	●	●
Ø 32	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 40	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 50	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 63	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 80	–	–	●	–	–	●	●	●	●	●	●	●		
Ø100	–	–	●	–	–	●	●	●	●	●	●	●		

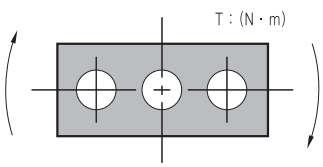
Note) In the case of middle stroke, able to manufacture it in 5 stroke units by mounting spacer (including '– ' mark part)

Allowed Rotation Torque (T)

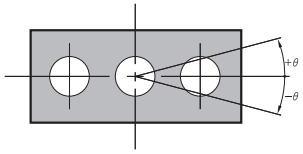
(Unit : N · m)

Bore Size	Type	Cylinder Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	M	0.4	0.4	—	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	—	—
	L	0.4	0.8	—	0.7	0.8	0.7	0.3	0.2	0.1	0.1	0.1	0.1	—	—
Ø 16	M	0.8	0.6	—	0.5	0.5	0.5	0.7	0.6	0.5	0.4	0.4	0.4	—	—
	L	0.7	1.3	—	1.1	1.2	1.1	1	0.6	0.4	0.3	0.2	0.2	—	—
Ø 20	M	—	1.4	—	1.2	1.2	1.1	1.9	1.6	1.4	1.3	1.1	1	0.8	0.5
	L	—	0.9	—	2.5	2.7	2.4	2.2	1.5	1	0.7	0.5	0.4	0.2	0.1
Ø 25	M	—	2.3	—	1.9	1.9	1.7	2.6	2.5	2.2	2	2	1.8	1.8	1.6
	L	—	1.6	—	1.3	3.4	3.1	3	2.6	2.6	2.3	1.7	1.3	0.8	0.5
Ø 32	M	—	—	5.9	—	—	6.4	5.7	4.9	4.6	4.1	4.7	4.3	3.7	3.2
	L	—	—	2.9	—	—	6.4	5.8	4.9	5.8	5.2	4.7	3.6	2.3	1.5
Ø 40	M	—	—	6.5	—	—	7.1	6.3	5.4	5.1	4.5	5.2	4.7	4	3.5
	L	—	—	3.2	—	—	6.9	6.3	5.3	6.3	5.6	5	3.9	2.5	1.7
Ø 50	M	—	—	13.1	—	—	13	12.2	10.5	9.8	8.8	9.7	8.9	7.6	6.6
	L	—	—	4.3	—	—	11.8	10.7	9.2	10.6	9.5	10.9	9	5.9	4
Ø 63	M	—	—	14.7	—	—	14.6	13.7	11.8	11	9.8	10.8	9.9	8.4	7.3
	L	—	—	4.6	—	—	13.3	12	10.3	11.9	10.6	12.3	9.9	6.3	4.3
Ø 80	M	—	—	23.1	—	—	19	23	20	18.7	16.7	17.5	16.1	—	—
	L	—	—	7.7	—	—	5.3	21.3	18.6	16.4	14.7	15.9	14.6	—	—
Ø 100	M	—	—	39.7	—	—	34.4	37.3	32.8	30.5	27.4	29.2	26.9	—	—
	L	—	—	13.6	—	—	9.7	39.2	34.5	30.8	27.7	29.7	27.3	—	—

1kgf ≒ 9.8 N, 1kgf/㎠≒0.098Mpa



Non-load: It is a theoretical rotational angle by guide rod and bearing's clearance in reverse movement



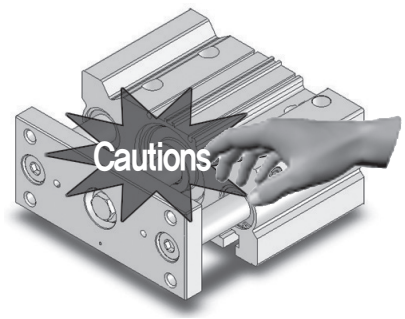
Maximum Rotation Angle

Bore Size	Maximum Rotation Angle(°)	
	NGQM	NGQL
Ø12, 16	±0.10 °	±0.07 °
Ø20, 25	±0.09 °	±0.06 °
Ø32, 40	±0.08 °	±0.06 °
Ø50, 63	±0.06 °	±0.05 °
Ø80, 100	±0.05 °	±0.04 °

Cautions

Please do not insert your hands or fingers between plate and body.

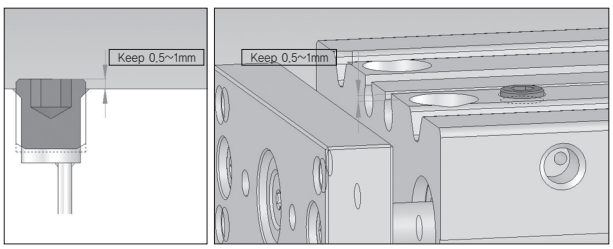
- Please be careful that your hands or fingers are not stuck between cylinder body and plate in air pressure.



In using side port

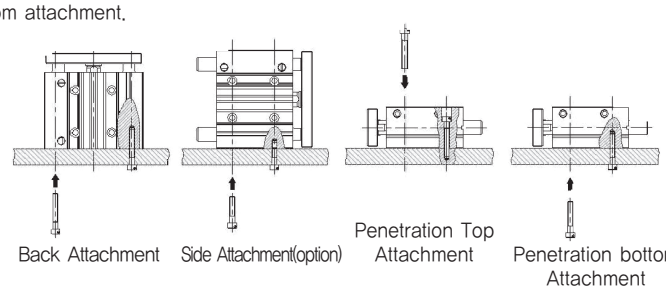
- When you use side port by attaching plug on top port hole, in the case of cylinder internal diameter of ø12,16, please assemble it in order to keep 0.5~1mm with top as below figure.

※Narrowed air orifice hole's diameter might cause cylinder operation problems.



Attachment

You can attach it by four methods such as back attachment, side attachment, penetration top attachment, and penetration bottom attachment.



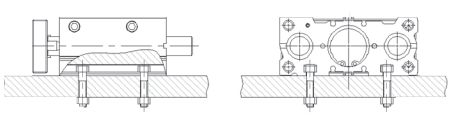


Table 1. T-SLOT Bolts

Bore Size	Applied Bolt	Bore Size	Applied Bolt
Ø12	M4	Ø40	M6
Ø16	M4	Ø50	M8
Ø20	M5	Ø63	M10
Ø25	M5	Ø80	M12
Ø32	M6	Ø100	M14

Note) Used bolt is based on hexagonal (rectangular) bolt.

① Caution in cylinder back attachment
In cylinder back attachment, please process entrance hole in order guide rod's end not to interfere attachment surface (bracket). But in back attachment, as for bolt depth, 1.5d is recommended (Refer to the Table 2. Back attachment area size and bolt size)

② In treating cylinder, please be careful of piston rod or guide rod's damage by impact or strange materials.
- Rod and cylinder damage may cause leakage and malfunction.

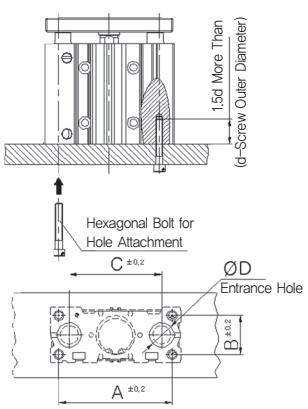
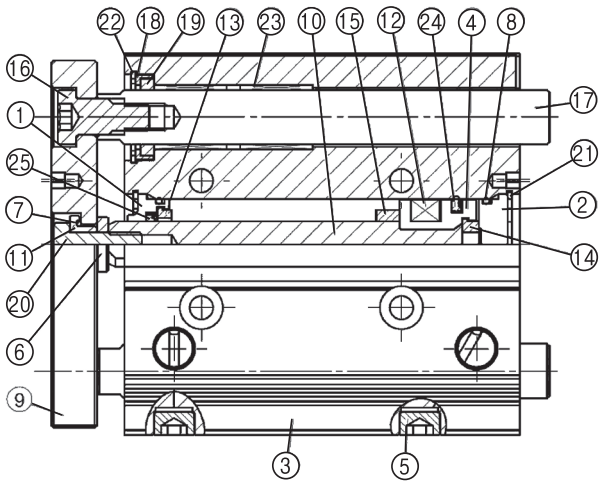


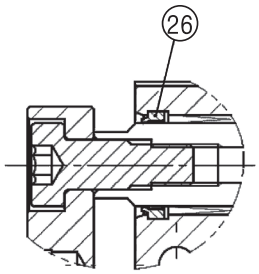
Table 2. Back Attachment Part's Size and Bolt Size

Bore Size	A (mm)	B (mm)	C (mm)	Ø D (mm)		Hexagonal wrench bolt for attachment
				NGQM	NGQL	
Ø12	50	18	44	10	8	M4 X 0.7
Ø16	56	22	48	12	10	M5 X 0.8
Ø20	72	24	56	14	12	M5 X 0.8
Ø25	82	30	66	18	15	M5 X 0.8
Ø32	98	34	80	22	18	M8 X 1.25
Ø40	106	40	87	22	18	M8 X 1.25
Ø50	130	46	110	27	22	M10 X 1.5
Ø63	142	58	124	27	22	M10 X 1.5
Ø80	180	54	155	31	28	M12 X 1.75
Ø100	210	62	184	39	33	M14 X 2.0

Structural Drawing/Part List, Packing List

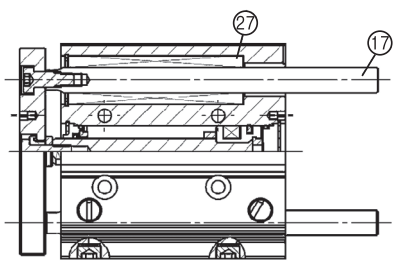
⊙ NGQM 12~25



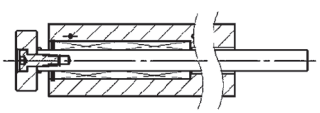


* Ø12, 16

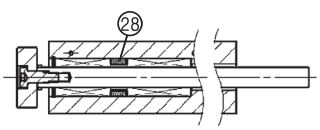
⊙ NGQL 12~25



* Ø12, 16 : More than 10ST
* Ø20 : More than 20ST
* Ø25 : More than 30ST



* Ø12, 16 : Between 10ST and 30ST
* Ø20 : Between 20ST and 30ST



* Ø12, 16, 20, 25 : More than 30ST

Part List

No.	Part Name	Material
1	ROD COVER	Aluminum Alloy
2	HEAD COVER	Aluminum Alloy
3	CYLINDER TUBE	Aluminum Alloy
4	PISTON	Aluminum Alloy
5	PORT PLUG	CarbonTool Steel
6	RETAINER WASHER	Stainless Steel
7	O-RING	NBR
8	GASKET	NBR
9	PLATE	Carbon Steel
10	PISTON ROD	Stainless Steel

No.	Part Name		Material
11	RETAINER		Carbon Steel
12	MAGNET		NBR
13	BUMPER-A		Urethane
14	BUMPER-B		Urethane
15	SPACER		Aluminum Alloy (Non-standard ST)
16	GUIDE ROD BOLT		CarbonTool Steel
17	GUIDE ROD	NGQM	Carbon Steel
		NGQL	High carbon chromium bearing steel
18	HOLDER		Carbon Steel

No.	Part Name	Material
19	FELT	Wool
20	PLATE ATTACHMENT BOLT	CarbonTool Steel
21	SNAP RING-A	CarbonTool Steel
22	SNAP RING-B	CarbonTool Steel
23	SLIDE BEARING	Copper Alloy
24	PISTON PACKING	NBR
25	ROD PACKING	NBR
26	SCRAPER	NBR
27	BALL BEARING	—
28	GUIDE SPACER	Aluminum Alloy

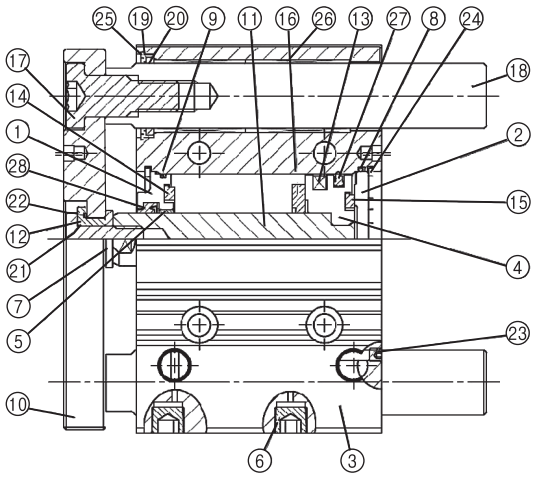
Packing List/Replacement Part

NO.	Part Name	Part Number			
		Ø12	Ø16	Ø20	Ø25
8	GASKET	C-10	C-14	C-18	C-23
24	PISTON PACKING	TPSA-12	TPSA-16	TPSA-20	TPSA-25
25	ROD PACKING	DYR-6	DYR-8	DYR-10SK-K	DYR-12
SEAL KIT		NGQ12-SK	NGQ16-SK	NGQ20-SK	NGQ25-SK

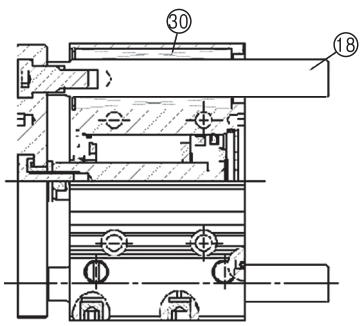
※ As for Seal KIT, 8, 9, 27, and 28 replacement parts are comprised in one type.

Structural Drawing/Part List, Packing List

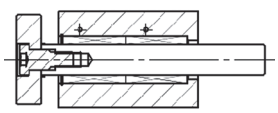
⊙ NGQM 32~63



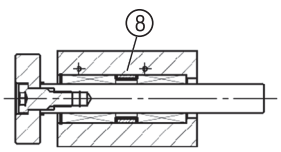
⊙ NGQL 32~63



∗Less than 25ST



∗Between 25ST and 50ST



∗More than 50ST

Part List

No.	Part Name	Material
1	ROD COVER	Aluminum Alloy
2	HEAD COVER	Aluminum Alloy
3	CYLINDER TUBE	Aluminum Alloy
4	PISTON	Aluminum Alloy
5	BUSH	Copper Alloy (Ø32and 40 are Excluded)
6	PORT PLUG	CarbonTool Steel
7	RETAINER WASHER	Carbon Steel
8	HEAD COVER GASKET	NBR
9	GASKET	NBR
10	PLATE	Carbon Steel

No.	Part Name		Material
11	PISTON ROD		Carbon Steel
12	RETAINER		Carbon Steel
13	MAGNET		NBR
14	BUMPER-A		Urethane
15	BUMPER-B		Urethane
16	SPACER		Aluminum Alloy (Non-standard ST)
17	GUIDE ROD BOLT		CarbonTool Steel
18	GUIDE ROD	NGQM	Carbon Steel
		NGQL	High carbon chromium bearing steel
19	HOLDER		Carbon Steel

No.	Part Name	Material
20	FELT	Wool
21	PLATE ATTACHMENT BOLT	CarbonTool Steel
22	O-RING	NBR
23	ACEPHALIA BOLT	CarbonTool Steel
24	SNAP RING-A	CarbonTool Steel
25	SNAP RING-B	CarbonTool Steel
26	SLIDE BUSH	Copper Alloy
27	PISTON PACKING	NBR
28	ROD PACKING	NBR
30	BALL BEARING	—
31	GUIDE SPACER	Aluminum Alloy

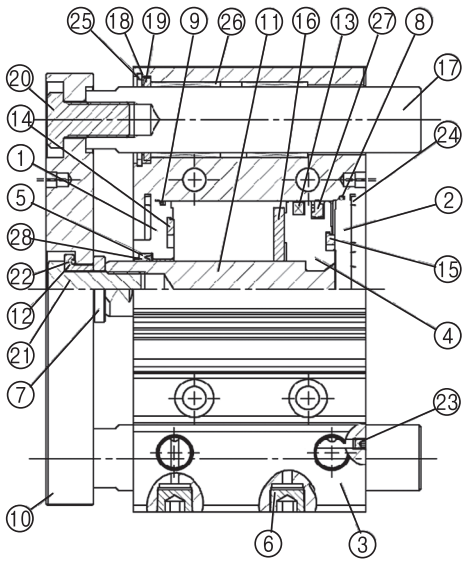
Packing List/Replacement Part

NO.	Part Name	Part Number			
		Ø32	Ø40	Ø50	Ø63
8	HEAD COVER GASKET	TGQM032-18-1586	TGQM040-18-1587	TGQM050-18-1588	TGQM063-18-1589
9	GASKET	C-29	C-36	C-46	C-60
27	PISTON PACKING	TPSA-32	TPSA-40	TPSA-50	TPSA-63
28	ROD PACKING	DYR-16	PDU-16Z	PDU-20Z	PDU-20Z
SEAL KIT		NGQ32-SK	NGQ40-SK	NGQ50-SK	NGQ63-SK

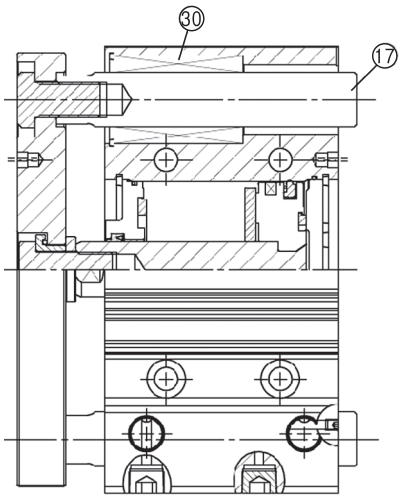
※ As for Seal KIT, 8, 9, 27, and 28 replacement parts are comprised in one type.

Structural Drawing/Part List, Packing List

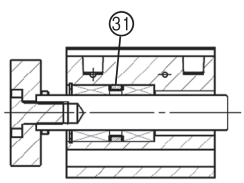
⊙ NGQM 80~100



⊙ NGQL 80~100



∗Less than 50ST



∗More than 50ST

Part List

No.	Part Name	Material
1	ROD COVER	Aluminum Alloy
2	HEAD COVER	Aluminum Alloy
3	CYLINDER TUBE	Aluminum Alloy
4	PISTON	Aluminum Alloy
5	BUSH	Copper Alloy
6	PORT PLUG	CarbonTool Steel
7	RETAINER WASHER	Carbon Steel
8	HEAD COVER GASKET	NBR
9	GASKET	NBR
10	PLATE	Carbon Steel
11	PISTON ROD	Carbon Steel

No.	Part Name		Material
12	RETAINER		Carbon Steel
13	MAGNET		NBR
14	BUMPER-A		Urethane
15	BUMPER-B		Urethane
16	SPACER		Aluminum Alloy (Non-standard ST)
17	GUIDE ROD	NGQM	Carbon Steel
		NGQL	High carbon chromium bearing steel
18	HOLDER		Carbon Steel
19	FELT		Wool
20	GUIDE ROD BOLT		CarbonTool Steel

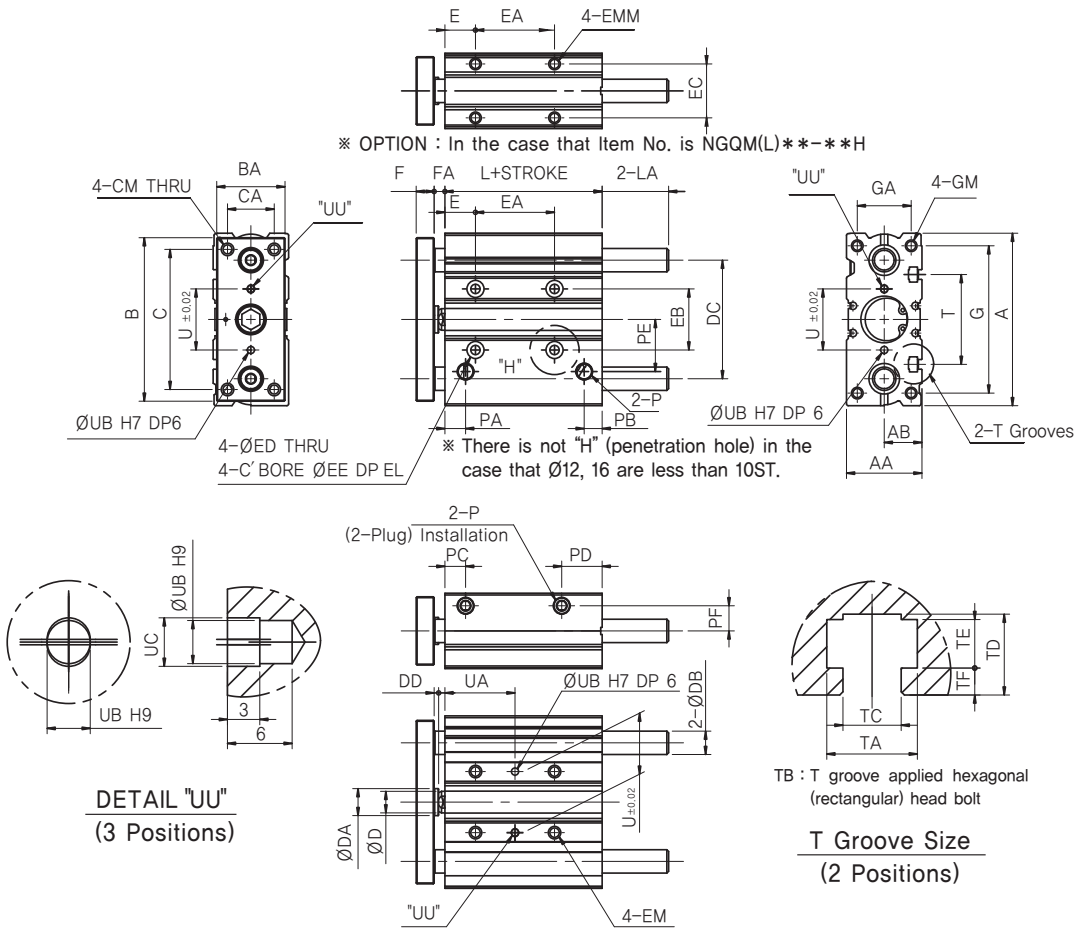
No.	Part Name	Material
21	PLATE ATTACHMENT BOLT	CarbonTool Steel
22	O-RING	NBR
23	ACEPHALIA BOLT	CarbonTool Steel
24	SNAP RING-A	CarbonTool Steel
25	SNAP RING-B	CarbonTool Steel
26	SLIDE BUSH	Copper Alloy
27	PISTON PACKING	NBR
28	ROD PACKING	NBR
30	BALL BEARING	—
31	GUIDE SPACER	Aluminum Alloy

Packing List/Replacement Part

NO.	Part Name	Part Number	
		Ø80	Ø100
8	HEAD COVER GASKET	TGQM080-18-1794	TGQM100-18-1796
9	GASKET	C-75	C-95
27	PISTON PACKING	TPSA-80	TPSA-100
28	ROD PACKING	PDU-25Z	PDU-30Z
SEAL KIT		NGQ80-SK	NGQ100-SK

※ As for Seal KIT, 8, 9, 27, and 28 replacement parts are comprised in one type.

Size Drawing/NGQM, NGQL Ø12~25



NGQM · NGQL Common Size Table(Ø12~25)

Bore Size (mm)	A	AA	AB	B	BA	C	CA	CM	D	DA	DB NGQ M	DB NGQ L	DC	DD	F	FA	G	GA	GM	P	PA	PB	PC	PD	PE	PF	T	TA	TB	TC	TD	TE	TF
12	61	26	13	56	22	48	14	M4×0.7	6	10	8	6	44	2	8	5	50	18	M4×0.7 DP 6	M5×0.8	14.5	12	14.5	12	10.5	8	37	7.4	M4	4.4	6.2	3.7	2
16	68	30	15	62	25	54	16	M5×0.8	8	11	10	8	48	2	8	5	56	22	M5×0.8 DP 8	M5×0.8	15	12	14.5	15	12	10	38	7.4	M4	4.4	6.7	3.7	2.5
20	84	36	18	81	30	70	18	M5×0.8	10	12	12	10	56	2.5	10	6	72	24	M5×0.8 DP 10	1/8	11	9.5	11	22	23	11	44	8.4	M5	5.4	7.5	4.5	2.5
25	96	42	21	91	38	78	26	M6×1.0	12	15	16	13	66	2.5	10	6	82	30	M6×1.0 DP 12	1/8	11.5	10	11.5	22.5	29	14	50	8.4	M5	5.4	7.5	4.5	2.5

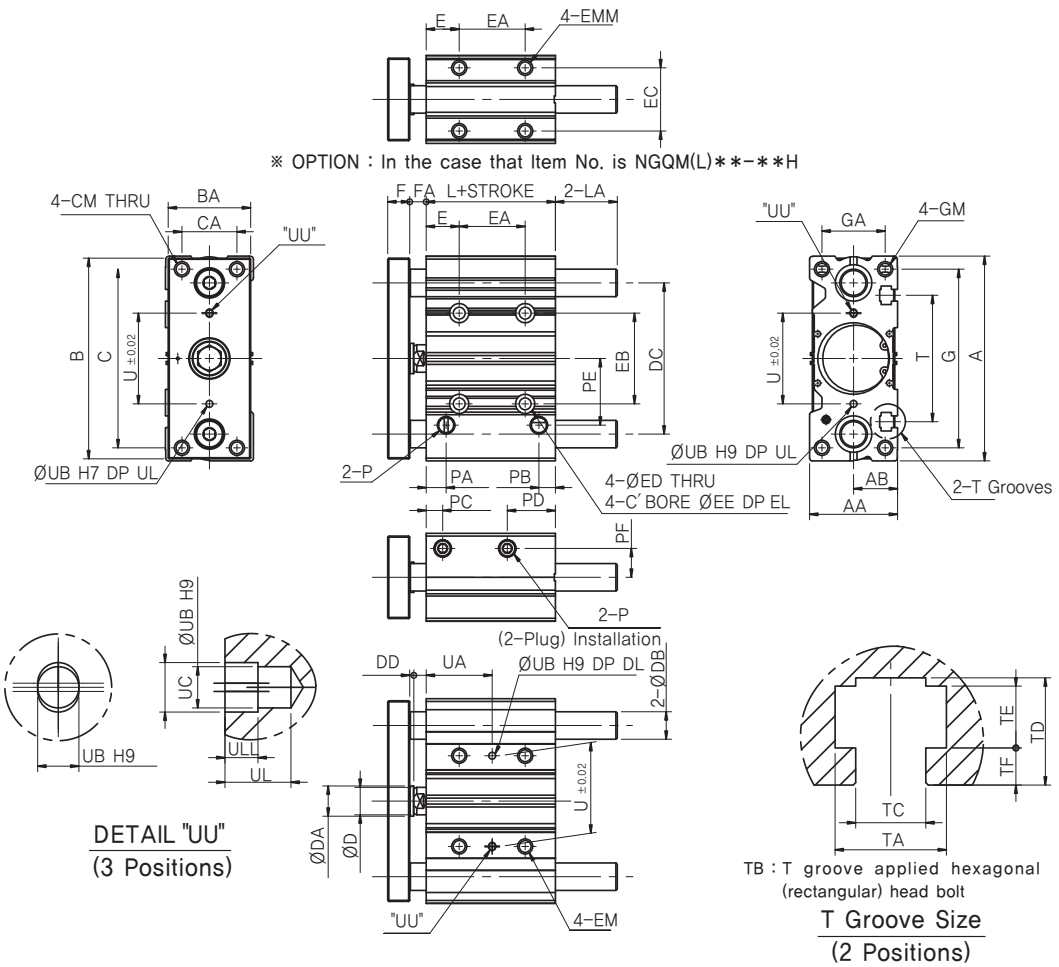
NGQM · NGQL Common Size Table(Ø12~16)

Bore Size (mm)	E	EA Less than 30	EA Between 30 and 100	EA Between 100 and 200	EB	EC	ED	EE	EL	EM	EMM	L	LA NGQM Less than 30	LA NGQM Between 30 and 50	LA NGQM Between 50 and 150	LA NGQM Between 150 and 200	LA NGQL Less than 10	LA NGQL Between 10 and 30	LA NGQL Between 30 and 50	LA NGQL Between 50 and 100	LA NGQL Between 100 and 150	LA NGQL Between 150 and 200	U	UA Less than 30	UA Between 30 and 100	UA Between 100 and 200	UB	UC
12	5	20	40	110	23	18	4.3	8	4.5	M5×0.8 DP 10	M4×0.7 DP 6	29	3	9	37		0	14	24	29	34	39	23	15	25	60	3	3.5
16	5	24	44	110	24	22	4.3	8	4.5	M5×0.8 DP 10	M5×0.8 DP 8	33	5	9	38	43	0	20	30	35	45	55	24	17	27	60	3	3.5

NGQM · NGQL Common Size Table(Ø20~25)

Bore Size (mm)	E	EA Less than 30	EA Between 30 and 100	EA Between 100 and 200	EA Between 200 and 300	EB	EC	ED	EE	EL	EM	EMM	L	LA NGQM Less than 30	LA NGQM Between 30 and 50	LA NGQM Between 50 and 150	LA NGQM Between 150 and 200	LA NGQM Between 200 and 300	LA NGQL Less than 20	LA NGQL Between 20 and 30	LA NGQL Between 30and 50	LA NGQL Between 50and 100	LA NGQL Between 100 and 150	LA NGQL Between 150 and 200	LA NGQL Between 200 and 300	U	UA Less than 30	UA Between 30 and 100	UA Between 100 and 200	UA Between 200 and 300	UB	UC
20	17	24	44	120	200	28	25	5.2	9.5	5.5	M6×1.0 DP 10	M5×0.8 DP 8	37	3.5	6.5	46.5			0	26	36	41	51	61	76	28	29	39	77	117	3	3.5
25	17	24	44	120	200	34	30	5.2	9.5	5.5	M6×1.0 DP 12	M6×1.0 DP 12	37.5	3	6	46	56	61	0	37	47	57	72	87	34	29	39	77	117	4	3.5

Size Drawing/NGQM, NGQL Ø32~63



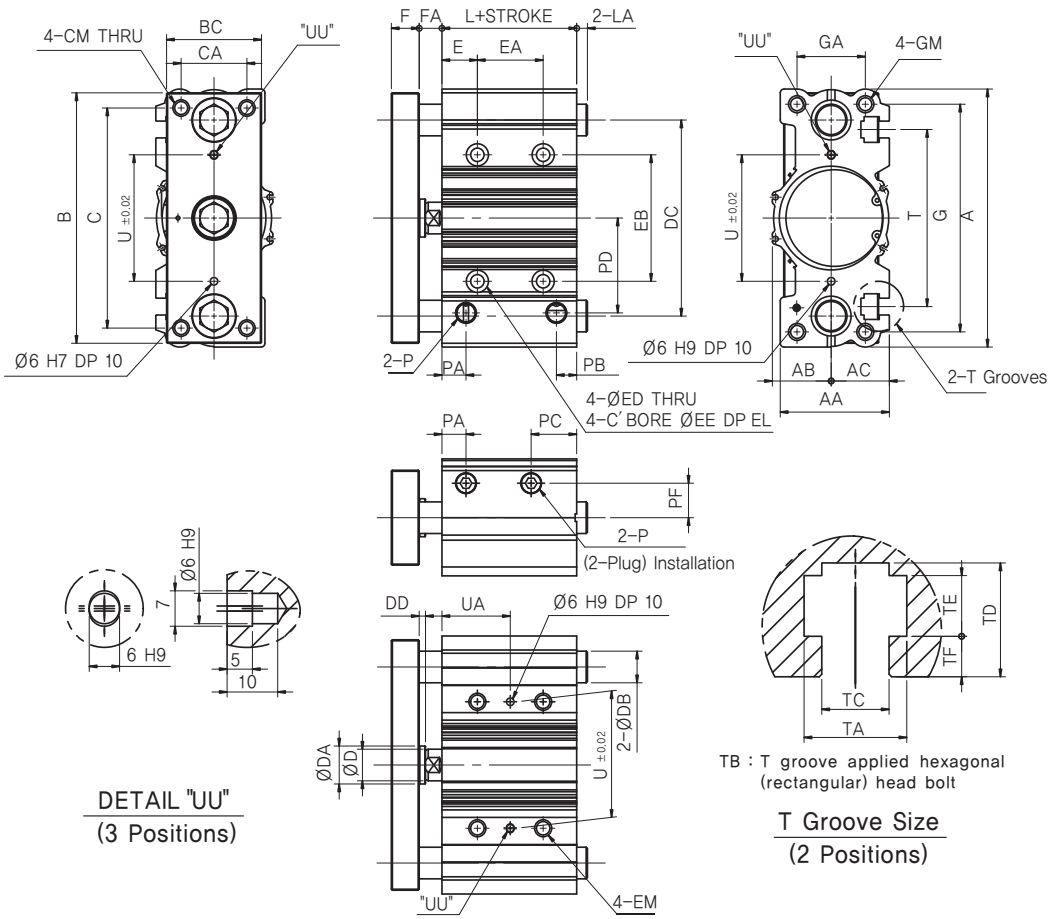
NGQM · NGQL Common Size Table(Ø32~63)

Bore Size (mm)	A	AA	AB	B	BA	C	CA	CM	D	DA	DB		DC	DD	F	FA	G	GA	GM	P	PA	PB	PC	PD	PE	PF
											NGQM	NGQL														
32	113	48	24	110	44	96	30	M8×1.25	16	18	20	16	80	3	12	10	98	34	M8×1.25 DP 16	1/8	12.5	9	12.5	28	36.5	16
40	121	54	27	118	44	104	30	M8×1.25	16	18	20	16	87	3	12	10	106	40	M8×1.25 DP 16	1/8	14	10.5	14	30	40.5	18
50	149	64	32	146	60	130	40	M10×1.5	20	22	25	20	110	3	16	12	130	46	M10×1.5 DP 20	1/4	14.5	11	12	35	48.5	21
63	162	77.5	39	158	70	130	50	M10×1.5	20	22	25	20	124	3	16	12	142	58	M10×1.5 DP 20	1/4	16.5	13.5	16.5	35	55	26.5

Bore Size (mm)	T	TA	TB	TC	TD	TE	TF	E	EA				EB	EC	ED	EE	EL	EM	EMM
									Less than 25	Between 25 and 100	Between 100 and 200	Between 200 and 100							
32	63	10.5	M6	6.5	9	5.5	3	21	24	48	124	200	42	36	6.6	11	7.5	M8×1.25 DP 16	M8×1.25 DP 12
40	72	10.5	M6	6.5	12	5.5	4	22	24	48	124	200	50	38	6.6	11	8.5	M8×1.25 DP 16	M8×1.25 DP 12
50	92	13.5	M8	8.5	13	7.5	4.5	24	24	48	124	200	66	46	8.6	14	12	M10×1.5 DP 20	M10×1.5 DP 12
63	110	17.8	M10	11	19	10	7.5	24	28	52	128	200	80	52	8.6	14	15	M10×1.5 DP 20	M10×1.5 DP 18

Bore Size (mm)	L	LA											U	UA				UB	UC	UL	ULL
		NGQM					NGQL							Less than 25	Between 25 and 100	Between 100 and 200	Between 200 and 100				
		Less than 25	Between 25 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 300	Less than 25	Between 25 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 300										
32	37.5	23.5	41.5	46.5	51.5	71.5	4.5	41.5	46.5	66.5	91.5	42	33	45	83	121	4	4.5	6	3
40	44	17	35	40	45	65	0	35	40	60	85	50	34	46	84	122	4	4.5	6	3
50	44	24	40	50	55	75	3	45	50	70	95	66	36	48	86	124	5	6	8	4
63	49	19	35	45	50	70	0	40	45	65	90	80	38	50	88	124	5	6	8	4

Size Drawing/NGQM, NGQL Ø80~100



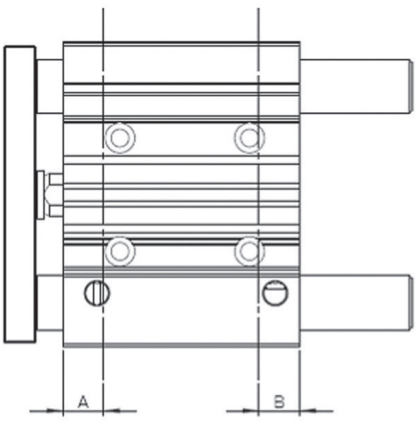
NGQM · NGQL Common Size Table(Ø80, 100)

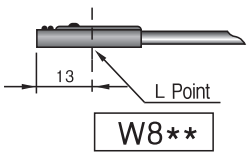
Bore Size (mm)	A	AA	AB	AC	B	BA	C	CA	CM	D	DA	DB		DC	DD	F	FA	G	GA	GM
												NGQ M	NGQ L							
80	204	86.25	46.5	46	198	75	174	52	M12×1.75	25	30	30	25	155	5	22	18	180	54	M12×1.75 DP 18
100	238	102.75	55.5	56	236	90	210	64	M14×2.0	30	35	36	30	184	5	25	25	210	62	M14×2.0 DP 25

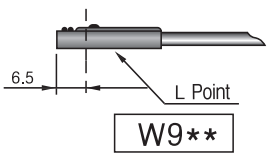
Bore Size (mm)	P	PA	PB	PC	PD	PE	T	TA	TB	TC	TD	TE	TF	E	EA			EB	ED	EE	EL	EM
															25	50 ~ 100	125 ~ 200					
80	3/8	19	15.5	36	75	27.25	140	20.3	M12	13.3	22.5	12	8	28	28	52	128	100	10.6	17.5	11	M12×1.75 DP 24
100	3/8	23	19	41	89	33.75	166	23.3	M14	15.3	26.5	13.5	10	11	48	72	148	124	12.5	20	11	M14×2.0 DP 28

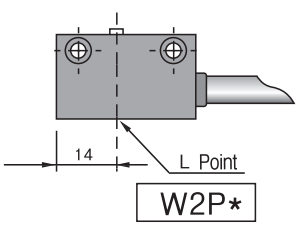
Bore Size (mm)	L	LA								U	UA		
		NGQM					NGQL				Less than 25	Between 25 and 100	Between 200 and 200
		Less than 25	Between 25 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 200	Less than 50	Between 100 and 150	Between 150 and 200				
80	56.5	23.5	25.5	53.5	58.5	78.5	8.5	72.5	87.5	100	42	54	92
100	66	19	24	49	54	74	4	73	88	124	35	47	85

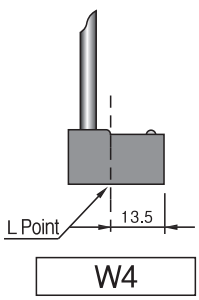
Auto Switch's Proper Attachment Position (Under Condition that Forward and Backward Full Stroke is Used)











(Unit : mm)

Bore Size	A Point Position	B Point Position
Ø12	14	15
Ø16	16.5	16.5
Ø20	16.5	21
Ø25	17.5	20
Ø32	18	20
Ø40	22.5	22
Ø50	20	24
Ø63	23	26.5
Ø80	26	31
Ø100	30	36

(Unit : mm)

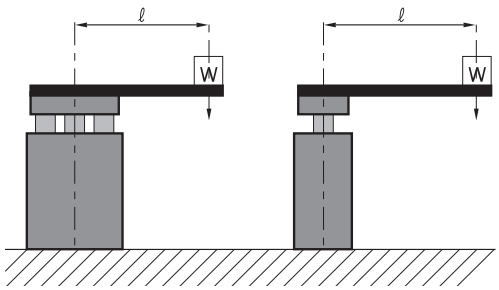
Switch Type	L Point Position (Detection Oosition)	Remarks
W8**	13	Able to use all the NGQ
W9**	6.5	
W4	13.5	Able to use internal diameter between Ø32 and Ø100
W2P*	14	

★ In attaching switch, please use it after matching cylinder's A point or B point with the switch's L point.

〈Cautions〉

In attaching two auto switches, Min. stroke should be operated more than 10 stroke. But in attaching W2P* switch, it can be operated more than 15 stroke.

In Vertical Attachment – NGQM / Slide Bearing



※ Using Condition

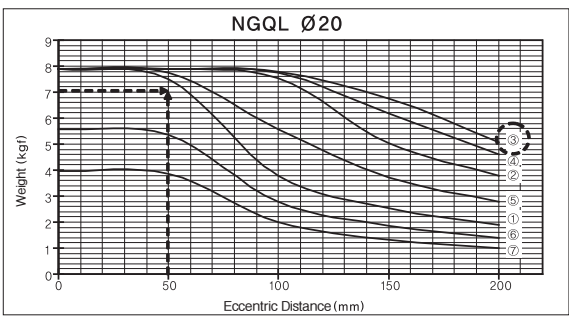
Pressure Applied P = 5 ~ 7 kgf/㎠
Cylinder Speed V ≒ 250mm/s (50 ~ 300 mm/s)
Eccentric Distance = ℓ (mm)
Applied Weight = W (kgf)

Note 1) Used pressure of 5 ~ 7 kgf/㎠ is recommended.
Note 2) When cylinder speed exceeds 30mm/s

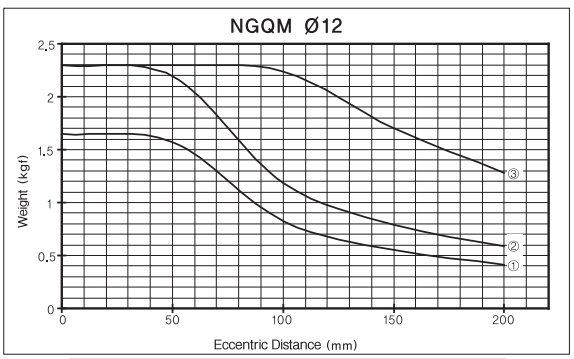
〈Selected Example〉
1. How to Attach : Vertical Attachment
2. Applied Bearing : Ball Bearing
3. Max. Cylinder Speed: 20mm/s
4. Applied Load : 7kgf
5. Applied Stroke : 50 Stroke
6. Eccentric Distance : 50mm

※Selection
1. Select ball bearing among vertical attached graphs.
2. Select a graph to endure load more than 7kgf
   → NGQL Ø20 ~ Ø100
3. Select a graph matched with 50 stroke and eccentric distance of 50mm and then, select device below the graph's line
   → Select NGQL Ø20 and apply eccentric distance of 50mm.
4. Selected device is NGQL Ø20-50ST

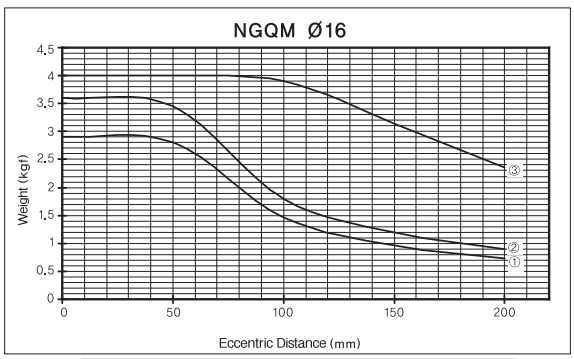
Table 3. Applied Load Ratio



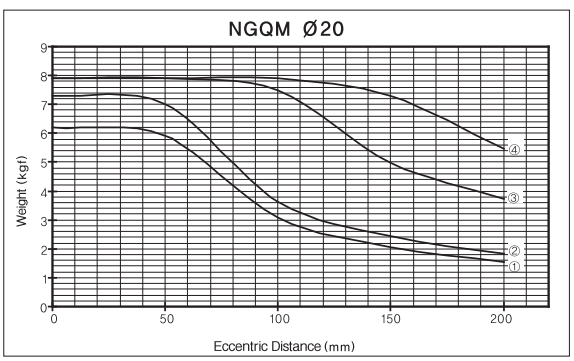
① Less than 20ST ② Between 30ST and 50ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST
⑦ Between 200ST and 300ST



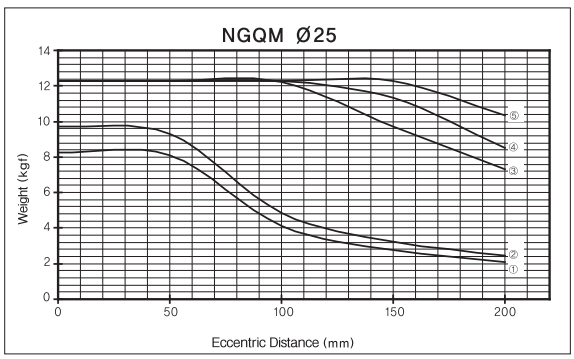
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 200ST



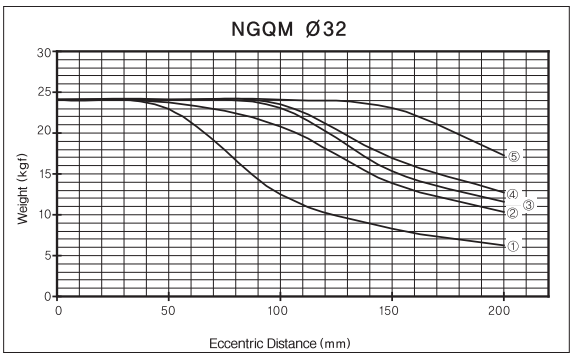
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 200ST



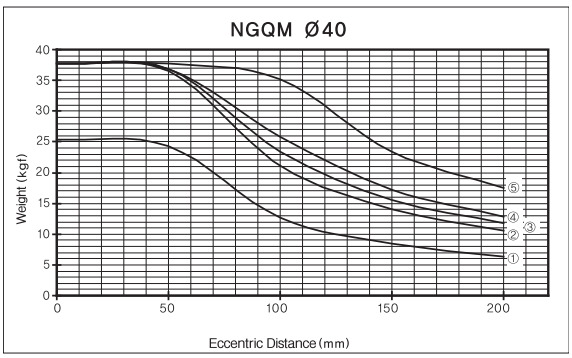
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 200ST ④ Between 200ST and 300ST



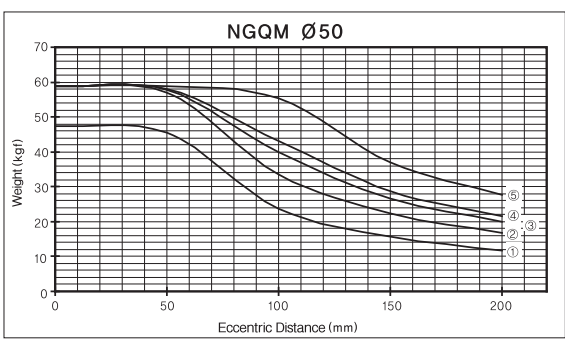
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 150ST ④ Between 150ST and 200ST
⑤ Between 200ST and 300ST



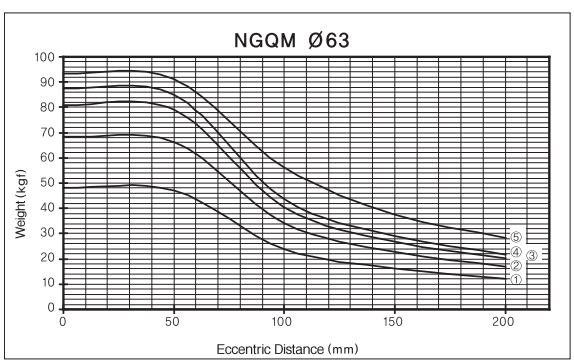
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



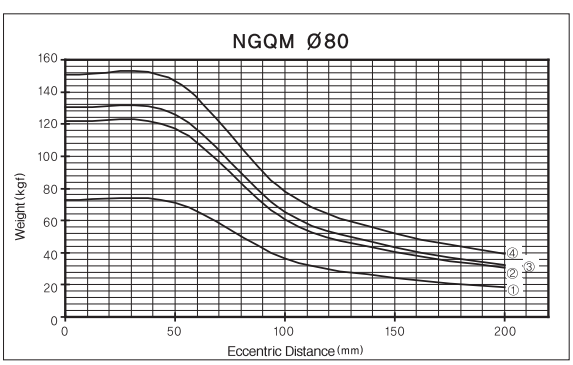
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



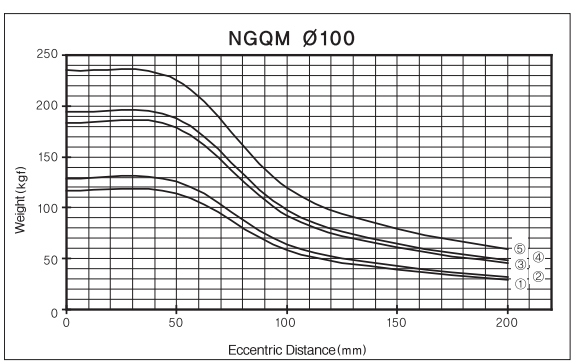
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST

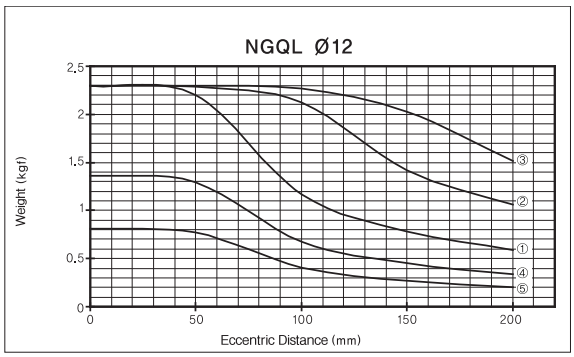


① Less than 50ST ② Between 50ST and 100ST
③ Between 100ST and 150ST ④ Between 150ST and 200ST

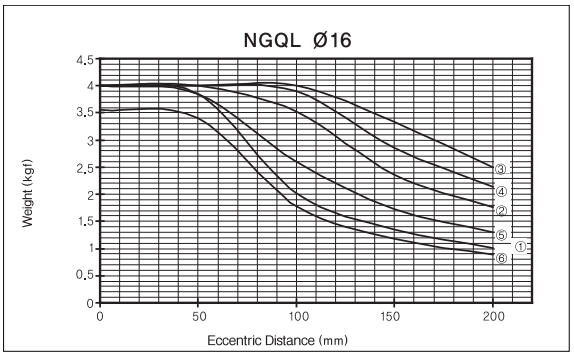


① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST

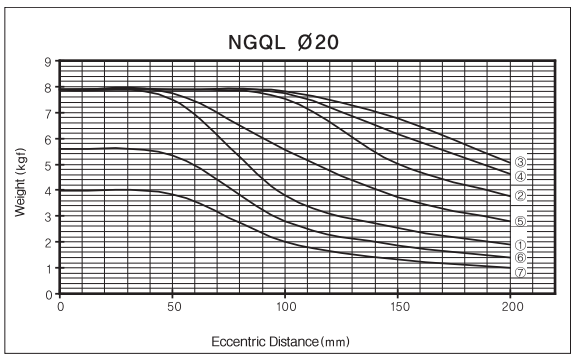
In Vertical Attachment - NGQL / Ball Bearing



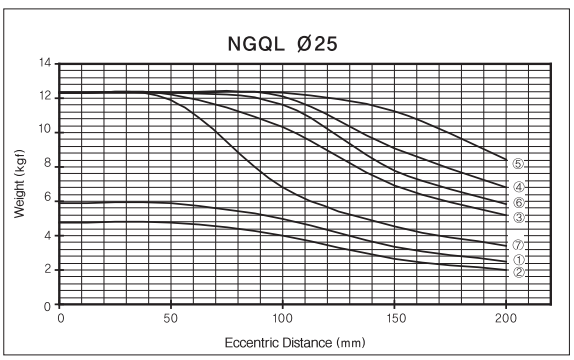
① Less than 10ST, Between 50ST and 100ST ② Between 10ST and 30ST
③ Between 30ST and 50ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



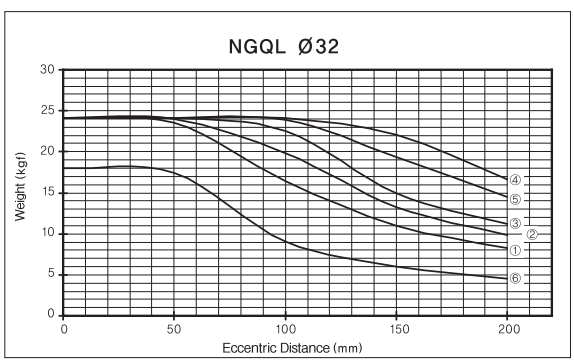
① Less than 10ST ② Between 10ST and 30ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST



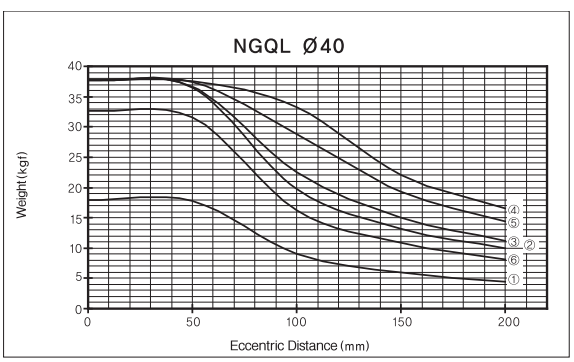
① Less than 20ST ② Between 20ST and 50ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST
⑦ Between 200ST and 300ST



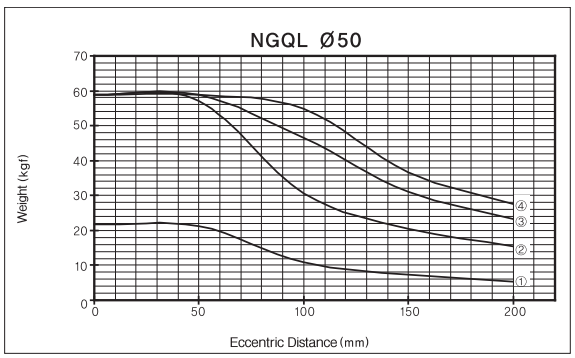
① Less than 20ST ② Between 20ST and 50ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST
⑦ Between 200ST and 300ST



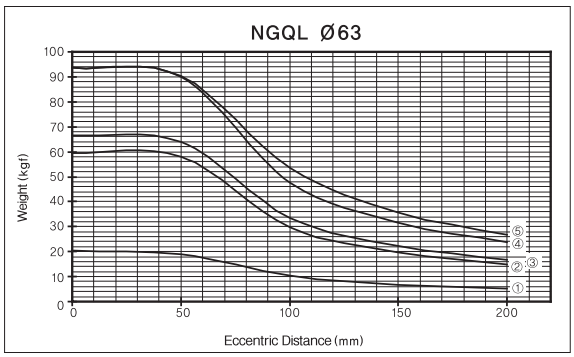
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST ⑥ Between 200ST and 300ST



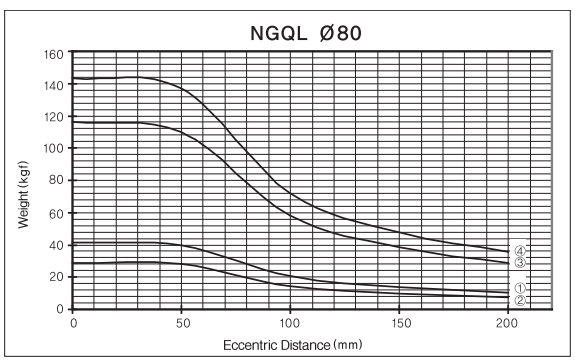
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST ⑥ Between 200ST and 300ST



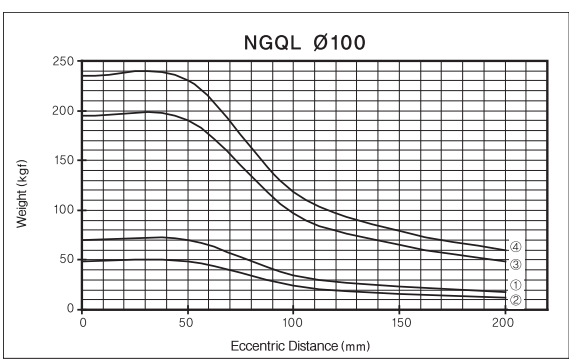
① Less than 25ST ② Between 25ST and 100ST, Between 200ST and 300ST
③ Between 100ST and 150ST ④ Between 150ST and 200ST



① Less than 20ST ② Between 25ST and 50ST, Between 200ST and 300ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 100ST

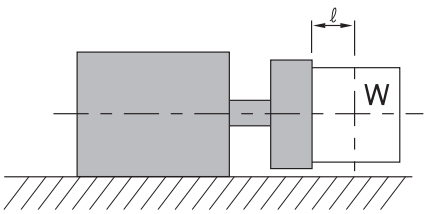


① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST



① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST

In Horizontal Attachment – NGQM / Slide Bearing



※ Using Condition

Pressure Applied P = 5 ~ 7 kgf/㎠
Cylinder Speed V ≒ 250mm/s (50 ~ 300 mm/s)
Eccentric Distance = ℓ (mm)
Applied Weight = W (kgf)

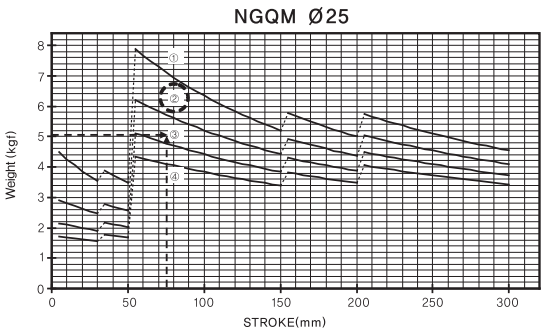
Note 1) Used pressure of 5 ~ 7 kgf/㎠ is recommended.
Note 2) When cylinder speed exceeds 30mm/s

〈Selected Example〉
1. How to Attach : Horizontal Attachment
2. Applied Bearing : Ball Bearing
3. Max. Cylinder Speed : 250 mm/s
4. Applied Load : 5 kgf
5. Applied Stroke : 75 Stroke
6. Eccentric Distance : 100 mm

※Selection
1. Select Slide bearing among vertical attached graphs.
2. Select a graph to endure load more than 5kgf
   → NGQM Ø20 ~ Ø100
3. Select a graph matched with 75 stroke and eccentric distance of 100mm and then, select device below the graph's line
   → Select NGQM Ø25 ② and apply 75 stroke.
4. Selected device is NGQL Ø25-75ST

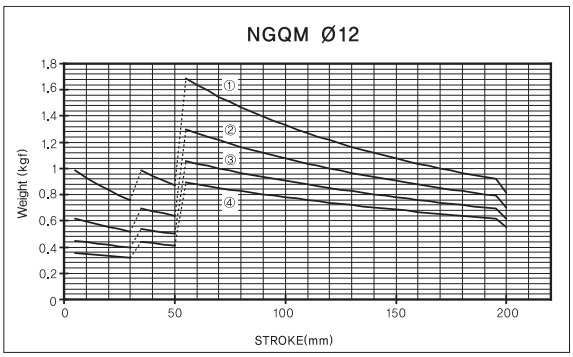
Table 3. Applied Load Ratio

NGQM Ø25



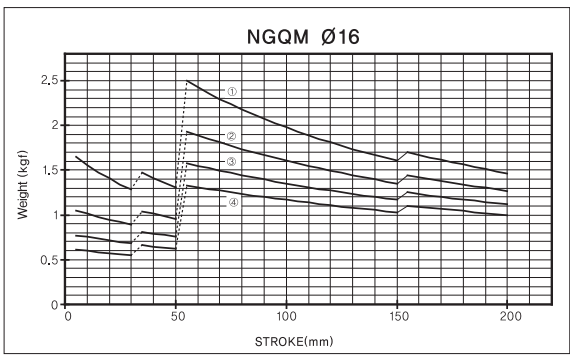
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

NGQM Ø12



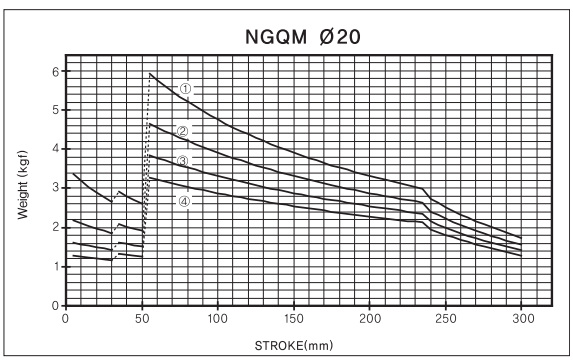
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

NGQM Ø16



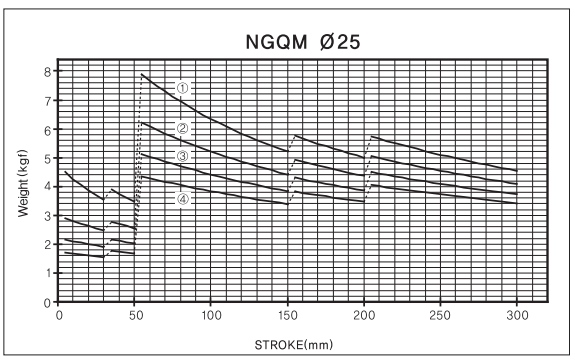
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

NGQM Ø20

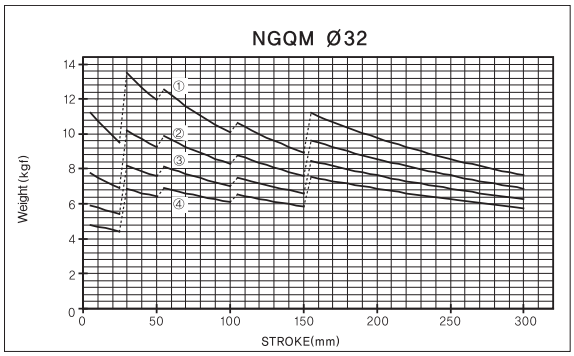


① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

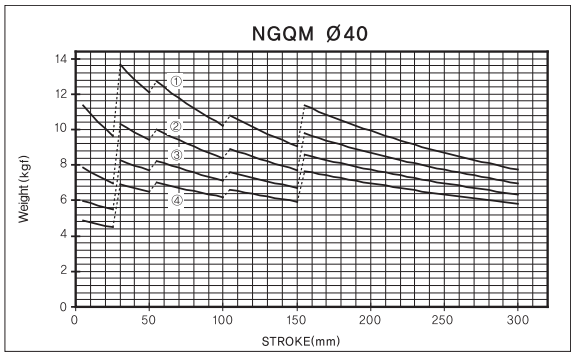
NGQM Ø25



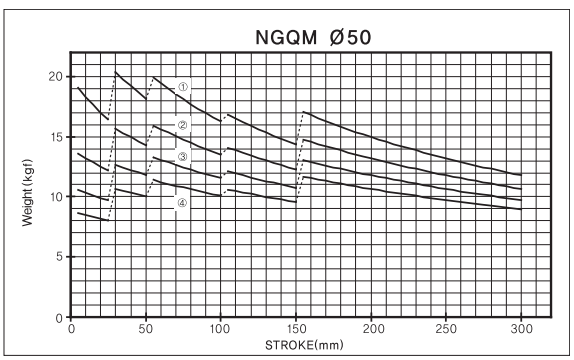
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



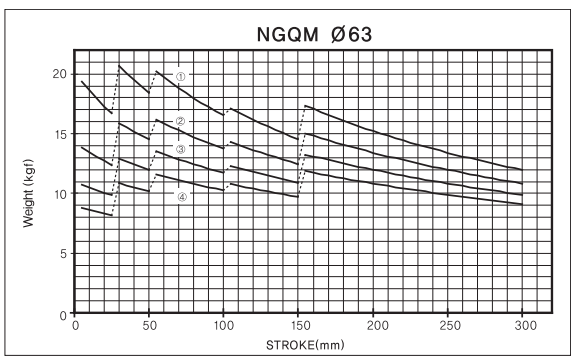
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



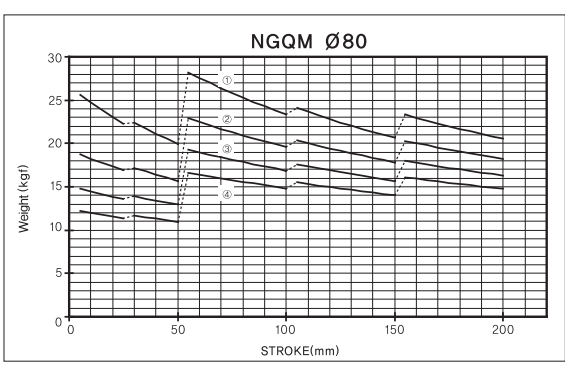
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



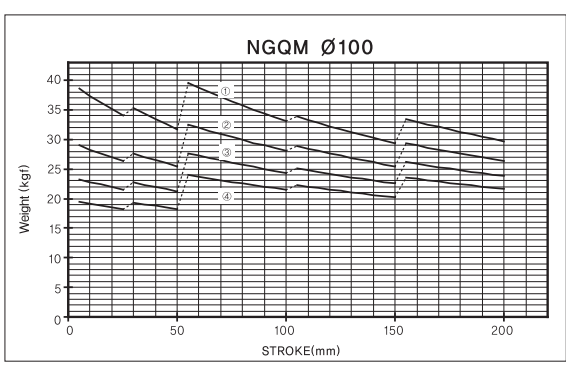
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

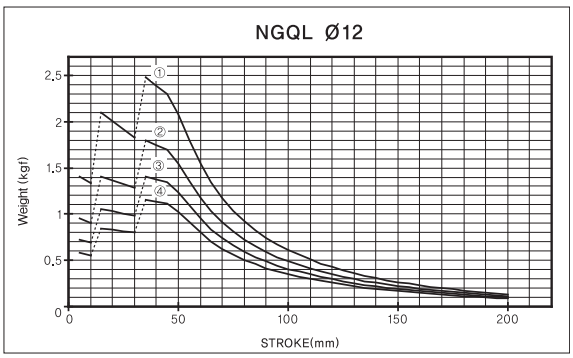


① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

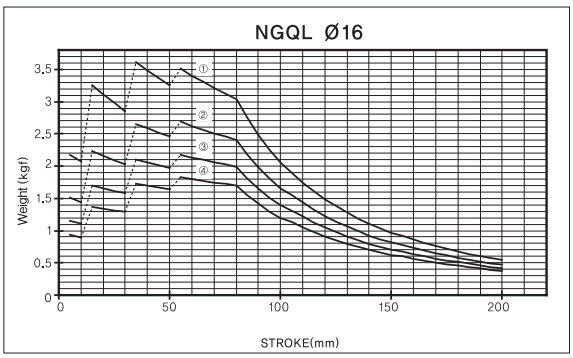


① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

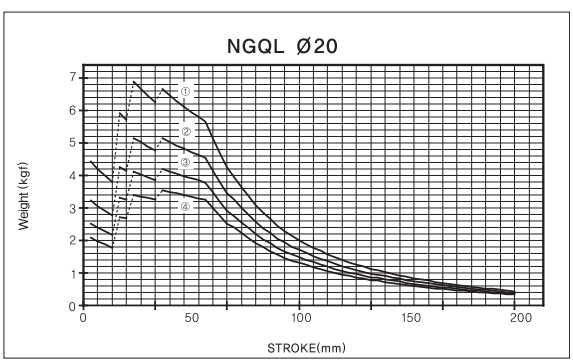
In Horizontal Attachment – NGQL / Ball Bearing



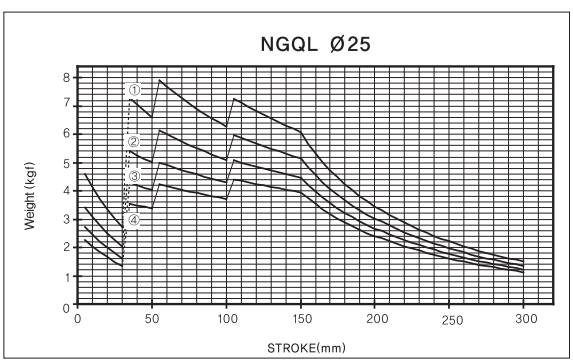
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



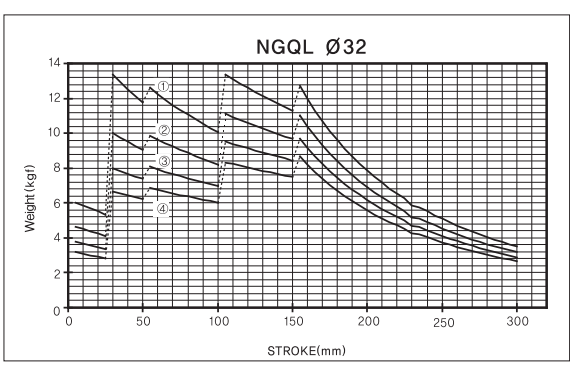
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



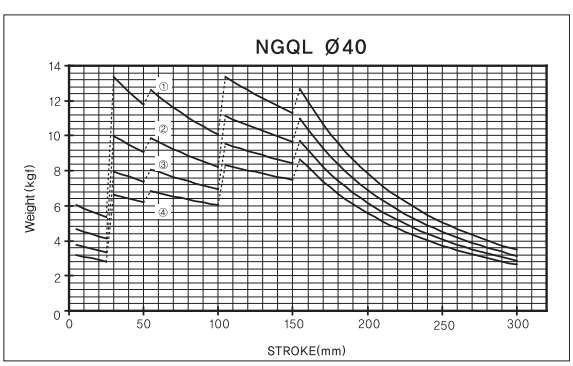
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



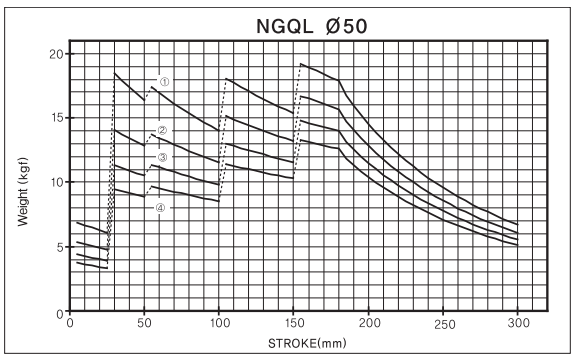
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



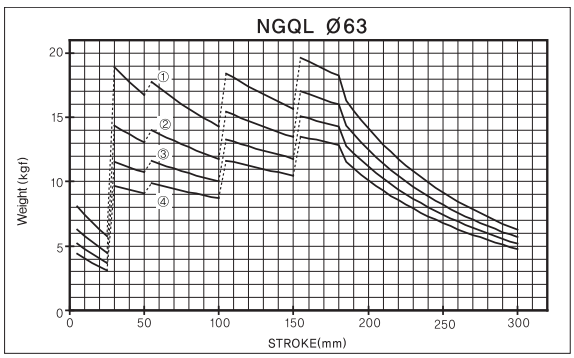
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



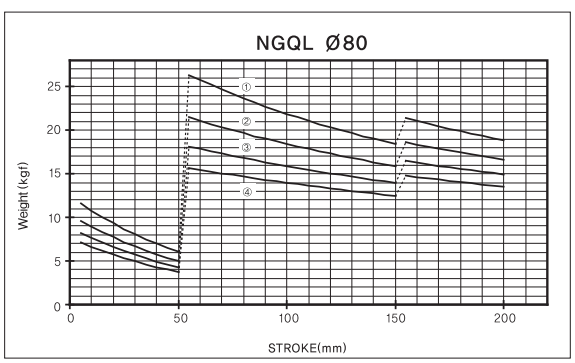
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



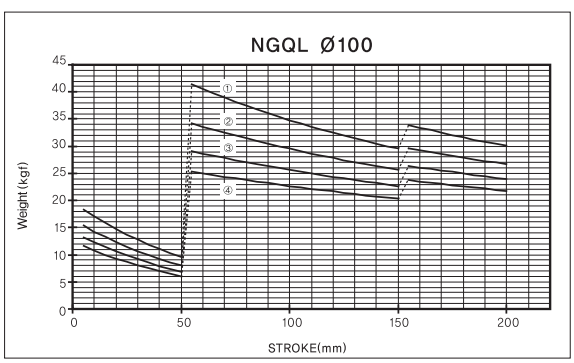
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

Applied Load Ratio

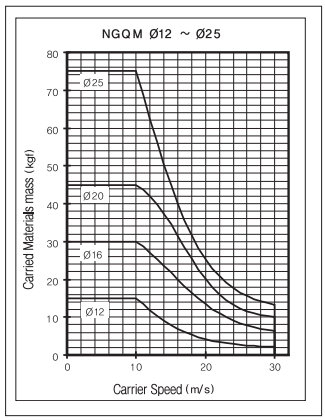
Table 3. Applied Load Ratio When Cylinder Speed is Faster Than 300mm/s

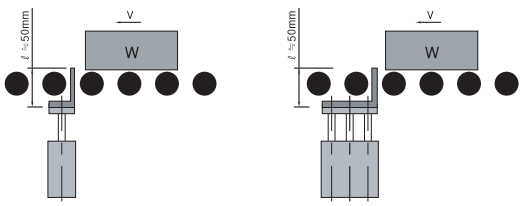
Bore Size	Applied Load Ratio			
	Vertical Attachment		Horizontal Attachment	
	NGQM	NGQL	NGQM	NGQL
Ø12	Lower than 15%	Lower than 20%	Lower than 25%	Lower than 40%
Ø16	Lower than 30%	Lower than 30%	Lower than 40%	Lower than 60%
Ø20	Lower than 20%	Lower than 25%	Lower than 25%	Lower than 50%
Ø25	Lower than 25%	Lower than 25%	Lower than 30%	Lower than 60%
Ø32	Lower than 20%	Lower than 25%	Lower than 30%	Lower than 50%
Ø40	Lower than 25%	Lower than 30%	Lower than 60%	Lower than 80%
Ø50	Lower than 30%	Lower than 30%	–	–
Ø63	Lower than 35%	Lower than 35%	–	–
Ø80	Lower than 30%	Lower than 35%	–	–
Ø100	Lower than 40%	Lower than 40%	–	–

※Recommend that the previous table's selected load is applied to the above table's ratio.

Load Range When it is Used for Stopper

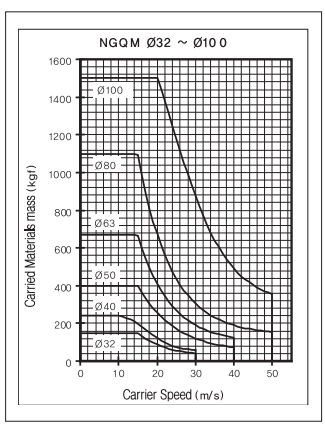
Bore Size Ø12~Ø25 / NGQM12~25(Slide Bearing)

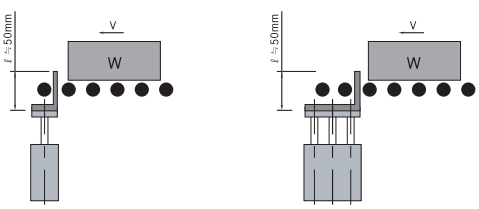




※ When L size is longer, please select right equipment having enough tube internal diameter.
Note 1) When it is used as stopper, please select 30 stroke and lower.
Note 2) NGQL (ball bearing) can be used as stopper.

Bore Size Ø32~Ø100 / NGQM32~100(Slide Bearing)





※ When L size is longer, please select right equipment having enough tube internal diameter.
Note 1) When it is used as stopper, please select 50 stroke and lower.
Note 2) NGQL (ball bearing) can be used as stopper.